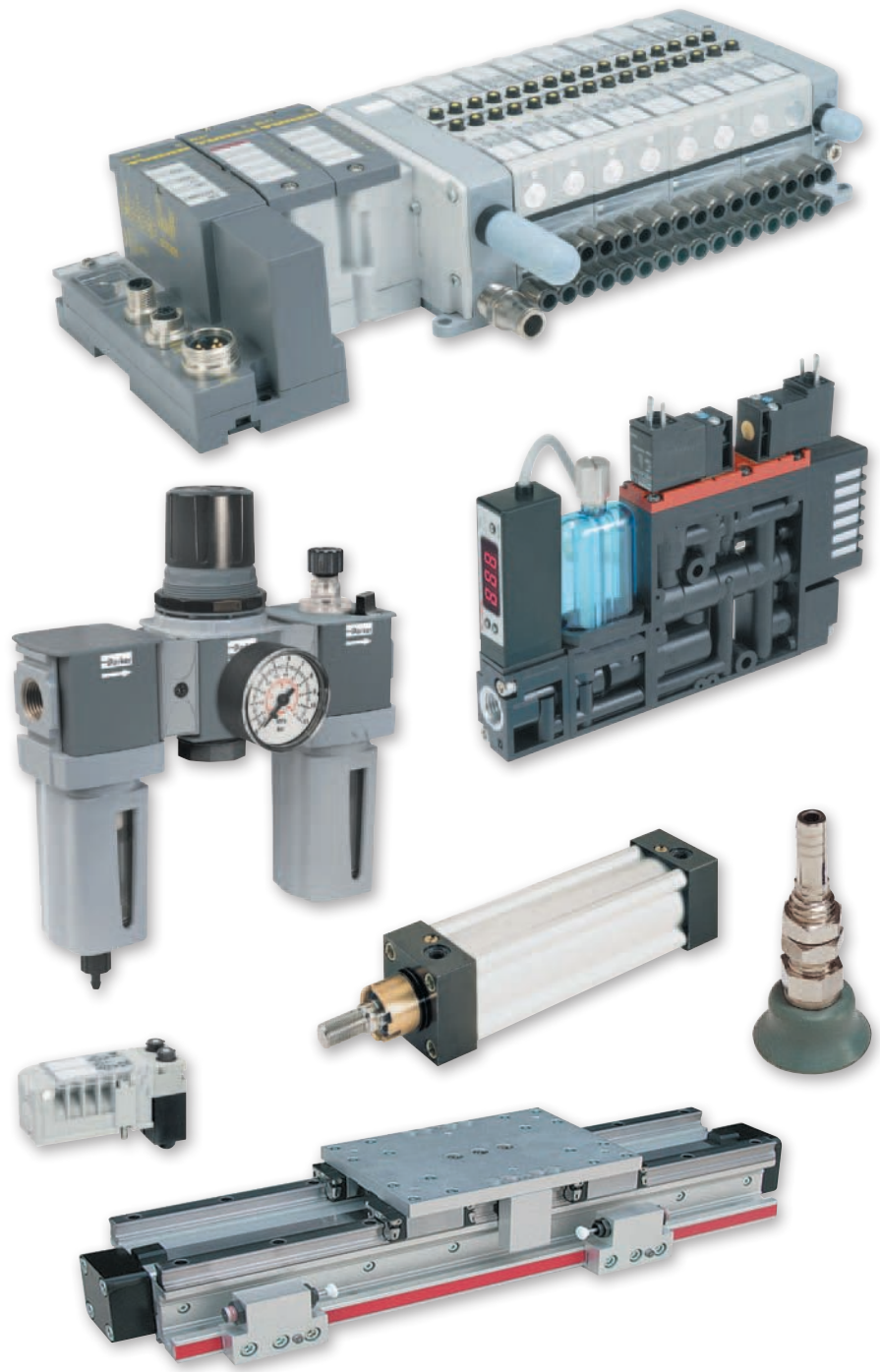
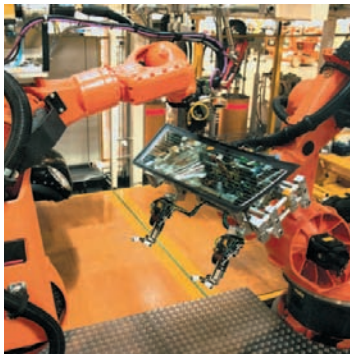


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Parker's obligation under this warranty is limited to the replacement or repair of any failed components. The buyer understands that the seller will not be liable for any other costs or damages.

The buyers of quality Parker components and filters benefit by having ONE source for all pneumatic needs - Parker.



Roger Sherrard
President
Automation Group





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Tie Rod Cylinders

P1D Series - ISO 15552 / ISO 6431



B62

- 5 available for maximum flexibility
- Bore sizes 32mm through 200mm
- 10 standard mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

Round Body Cylinders

P Series - Repairable



B131

- Bore sizes 1-1/8 through 4 inch
- 4 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

3MA Series - Economy NFPA Cylinder



B6

- Bore sizes 1-1/2 through 5 inch
- 18 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

P1A Series - ISO Non-Repairable



B127

- Bore sizes 10mm through 25mm
- 5 mounting styles
- Pressures up to 145 PSIG
- Temperatures -40°F to 302°F
- Stainless steel body construction

3MAJ / 4MAJ - Rodlock Cylinder



B37

- Bore sizes 1-1/2 through 8 inch
- 17 standard mounting styles
- Pressures up to 100 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

P1L Series - Repairable



B113

- Bore sizes 20mm through 100mm
- 9 mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

4MA Series - Flexible NFPA Cylinder



B16

- Bore sizes 1-1/2 through 8 inch
- 20 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -50°F to 250°F
- Aluminum body construction

SR Series - Non-Repairable



B79

- Bore sizes 5/16 through 3 inch
- 28 mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Stainless steel body construction

4MNR Series - Non-Rotating Cylinder



B55

- Bore sizes 1-1/8 through 4 inch
- 14 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

SRX Series - Position Feedback



B105

- Bore sizes 1-1/16 through 3 inch
- Continuous position feedback
- Pressures up to 150 PSIG
- Temperatures 40°F to 165°F
- Stainless steel body construction

Compact Cylinders

LP / LPM Series - Compact Cylinder



- Bore sizes 9/16 through 4 inch
- 6 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 200°F
- Aluminum body construction

B157

P1M Series - Compact Cylinder



- Bore sizes 12mm through 100mm
- 6 mounting options
- Pressures up to 145 PSIG
- Temperatures -4°F to 250°F
- Aluminum body construction

B145

P1Q Series - Economy Compact Cylinder



- Bore sizes 12mm through 100mm
- 4 flexible mounting options
- Pressures up to 10 PSIG
- Temperatures 23°F to 158°F
- Aluminum body construction

B137

Guided Cylinders

HB Series - Heavy Duty Guided



- Bore sizes 1-1/2 through 2-1/2 inch
- Thrust, reach and compact versions available
- Air service pressure up to 250 PSIG, hydraulic service up to 750 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Rod lock version available

B173

P5E Series - P1D ISO Guided



- Bore sizes 32mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 14°F to 165°F
- Aluminum body construction
- Rod lock version available

B177

P5L Series - Guided



- Bore sizes 20mm through 100mm
- Direct mounting
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Extruded aluminum body construction

B169

P5T Series - Compact Guided



- Bore sizes 16mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Flexible porting: top, rear, side

B163

P5T2 Series - Compact Guided

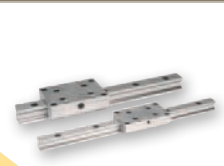


- Bore sizes 12mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Through hole mounting

B166

Rodless Cylinders

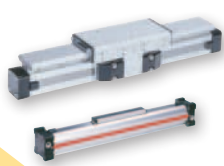
GDL Series - Rails & Cassettes



B265

- 6 sizes available
- Speed up to 10m/s (33 ft/s)
- Temperatures -10°C to 80°C
- Aluminum alloy rail
- Aluminum body construction

OSP-P Series - Band Type Rodless



B179

- Bore sizes 10mm through 80mm
- Pressures to max. 8 bar
- Temperatures -10°F to 80°F
- Aluminum body construction

P1X Series - Band Type Rodless



B241

- 7 bore sizes 16mm through 63mm
- Integral sensor mounting rail
- Pressures 7 to 100 PSIG
- Temperatures 40°F to 140°F
- Aluminum body construction

P1Z Series - Magnetically Coupled Rodless



B253

- 3 bore sizes 16mm, 20mm & 32mm
- Pressures 29 to 100 PSIG
- Temperatures 15°F to 140°F
- Stainless steel body construction

Rotary Actuators

HP Series - Large Rack & Pinion Rotary



B281

- 2 large bore models
- 3 standard rotations
- Pressures to 100 PSIG
- Temperatures 0°F to 250°F
- 4500 and 10,000 lb-in output at 100 PSIG

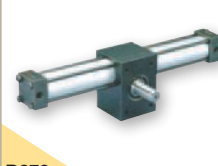
PRN(A) Series - Vane Rotary



B273

- 5 miniature and 4 standard models
- Temperatures -23°F to 176°F
- 1.33 to 2355 in-lb torque at 100 PSIG

PTR Series - Rack & Pinion Rotary



B279

- Bore sizes 1 through 3-1/4 inch
- Pressures to 250 PSIG
- Temperatures 0°F to 250°F
- 39 to 2281 lb-in output torque

PV Series - Vane Rotary



B270

- 8 model sizes
- Single or double vane models
- Pressures to 150 PSIG
- Temperatures 30°F to 250°F
- 7 to 1800 lb-in output torque

P1V-S Series - Air Motors



B283

- Power from 20 through 1200 watts
- Speeds 5 to 24,000 RPM
- Pressures to max. 7 bar
- Temperatures -30°C to 100°C

P5W Series - Rotary Table



B277

- 7 bore sizes (10 to 63mm)
- Pressures 1 to 8 bar max.
- Temperatures 41°F to 140°F
- Theoretical torque (.28 to 39 Nm at 6 bar)

Grippers

Grippers



B285

- Stroke ranges: 0.12 to 6.0 inches
- Grip forces: up to 2800 lbs
- Operating characteristics:
 - Single acting
 - Double acting
 - Spring assist and spring return

Electronic Sensors

Sensors

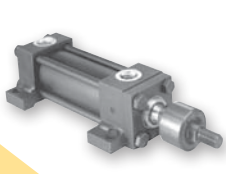


B296

- Solid state
- Reed
- NAMUR
- Proximity

Actuator Accessories

Linear Alignment Couplers



B287

- 12 standard thread sizes
- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available

Shock Absorbers

Linear Alignment Couplers



B320

- Miniature - self-compensating
- Heavyweight - soft contact and self-compensating
- Miniature - soft contact and self-compensating
- Magnum series - adjustable
- Heavy - self-compensating
- Heavy - adjustable

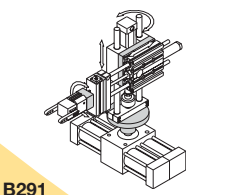
PRL Series - Stand Alone Rodlock



B289

- 5 different sizes
- Large holding forces
- 2 different mounting styles
- Case-hardened rod material available

Transition Kits



B291

- Plate kits - attach component to slide / guided cylinder
- Coupler kits - attach component to rotary actuator

4TK Series - Air-Oil Tanks



B288

- 6 standard bore sizes
- Lightweight aluminum / fiberglass design
- 2 fluid flow baffles reduce agitation and aeration
- 8 standard mounting styles

Vacuum Cups

PBG Bellows Cups



C17

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products
- Cup sizes: 10mm to 150mm

PCG Multiple Bellows Cups



C42

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces
- 2-1/2 bellows design minimizes contact pressure applied to products
- Cup sizes: 5mm to 90mm

PFG Flat Cups



C4

- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Low profile design makes flat pads ideal for fast response
- Cup Sizes: 1.5mm to 200mm

PJG Short Bellows Cups



C30

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products
- Shorter stroke provides fast response
- Cup sizes: 6mm to 80mm

PUGB Flat Swivel Cups



C50

- 30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products
- Rigid stem or level compensator provides good stability for horizontal lift
- Cup Sizes: 60mm to 100mm

P5V-CFS Flat Cups



C29

- Precision molded double lip flat cup for slightly curved surfaces
- Double lip for additional security. If outside lip bends and loses its seal, the inner lip remains sealed.
- Outer ribs prevent the cup lip from being cut
- Cup Sizes: 50mm to 150mm

Vacuum Generators

CEK Integrated Generators



C64

- Air-economizing functions with emergency stop logic that maintains degree of vacuum with loss of output power
- Includes vacuum and blow-off solenoids, check valve, vacuum filter and optional MPS-23 pressure sensor
- Inline versions can be mounted in manifolds up to 5 stations

CHF Inline Generators



C56

- CHF- High Flow Series is a multistage vacuum generator
- Intended for high flow vacuum applications
- Ideal for porous applications
- Standard with flow thru exhaust mufflers to reduce clogging in dirty environments

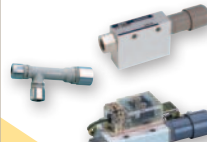
CVCEK Integrated Generators



C67

- Basic 2 station CEK generator manifold with additional electrical capabilities
- Integrates MPS-23 sensor for on board air-economizing programming
- M12 electrical wiring package with optional 18-pin single connection

MCA, CV, CV-CK Inline Generators



C54

- MCA: Light weight vacuum generator
- CV: Basic aluminum body vacuum generator
- CV-CK: Basic aluminum body vacuum generator with mechanical switch for part present confirmation

MC22 Integrated Generators



C58

- Compact vacuum generator includes vacuum and blow-off solenoids and vacuum filters
- Optional check valve and MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 8 stations

MC72 Integrated Generators



C61

- Light weight vacuum generator includes vacuum and blow-off solenoids.
- Includes check valve, vacuum filter and optional MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 5 stations

Vacuum Generator Accessories

CH01 One Way Check Valve



C74

- Poppet design
- Low leakage
- Low cracking pressure

VFP Vacuum Filters



C76

- Provides easy monitoring, economy and safety
- 10 micron porous plastic element prolongs element life
- Shatterproof and airtight
- Replaceable filter element

Convum Vacuum Silencers



C77

- Pressure up to 128 PSIG
- Temperature 41°F to 132°F (5°C to 55.5°C)
- Silencing effect 20 dB

Pressure Sensors

Cables



C85

- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: swivel straight or angled
- IP67 swivel connector

FSV Metered Flow Sensing Valve



C73

- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter

MPS-33 Pressure Sensors



C78

- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

MPS-23 Integrated Generator Sensors



C69

- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

MPS-34 Pressure Sensors



C80

- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

MVS-201 Integrated Generator Sensors



C71

- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

SCPSD Pressure Sensors



C83

- CV-CK is a Venturi Generator with adjustable open contact mechanical switch for vacuum confirmation.
- Great for low cost vacuum confirmation

VF & VL Vacuum Filters



C75

- Filters the vacuum system to protect the components from damaging particles absorbed from the environment
- Elements easily replaced

SCP01 Pressure Sensor



C82

- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

Direct Acting Valves

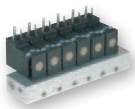
XM Series - Direct Acting



D4

- Inline or stacking
- 1/8 inch ports
- Pressures 0 to 125 PSIG
- Temperatures 32°F to 125°F
- Flow - .15 Cv

15mm Series - Direct Acting

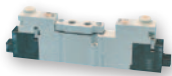


D8

- Subbase or manifold
- 1/8 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 140°F
- Flow - .033 to .05 Cv

Inline Valves

ADEX Series - Inline



D43

- Inline, subbase or bar manifold
- M3, M5, 1/8 inch ports
- Pressures VAC to 100 PSIG
- Temperatures 32°F to 122°F
- Flow - .1 to .47 Cv

B Series - Inline



D11

- Inline, subbase or bar manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .75 to 7.0 Cv

N Series - Inline Poppet



D53

- Inline mounted
- 3/8 through 1-1/2 inch ports
- Pressures 30 to 250 PSIG
- Temperatures 0°F to 200°F
- Flow - 3.6 to 29.9 Cv

Inline - continued

Viking Xtreme Series - Inline

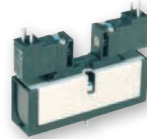


D33

- Inline or bar manifold
- 1/8 through 1/2 inch ports
- Pressures VAC to 232 PSIG
- Temperatures -40°F to 158°F
- Flow - .7 to 2.7 Cv

Subbase & Manifold Valves

DX ISOMAX Series



D147

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 14°F to 140°F
- Flow - .55 to 4.15 Cv

Fieldbus Series



D128

- Fieldbus interface for Isys and Moduflex valves
- Up to 256 inputs
- Up to 256 outputs
- Digital or analog

Isys ISO Series



D95

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .55 to 6.0 Cv

Isys Micro Series - Subbase




D84

- Subbase or manifold
- 4mm through 1/4 tube
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .35 Cv

Subbase & Manifold – continued


Moduflex Series Valves



- Inline or stacking
- 4mm tube, 1/4, 3/8 inch ports
- Pressures VAC to 120 PSIG
- Temperatures 5°F to 140°F
- Flow - .18 to .80 Cv

D60

Valvair II Series - Plug-in



- Subbase or manifold
- 3/8 through 1-1/2 inch ports
- Pressures VAC to 225 PSIG
- Temperatures 0°F to 200°F
- Flow - 1.9 to 12.0 Cv

D160

Manual / Mechanical Valves

Brass Poppet, Sliding Seal



- 4-way, 3-position rotary disc, direct air operated valves
- Pressures 0 to 150 PSIG
- Temperatures 18°F to 200°F
- Flow - 2.5 to 6.2 Cv

D189


Directair 2 & 4 Series - Inline



- Manual / mechanical
- 1/8 and 1/4 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 32°F to 175°F
- Flow - .20 to .84 Cv

D168

LV / EZ Lockout Valves




- Port sizes 3/8 through 1-1/4 inch
- Max. supply pressure 300 PSIG
- Max. operating temperature 175°F
- Cv from 3.7 to 14

D188

Manual / Mechanical – continued


M0 Series - Inline



- Air Pilot, Manual / mechanical
- 1/4 and 1 inch ports
- Pressures VAC to 225 PSIG
- Temperatures -15°F to 200°F
- Flow - .5 to 1.25 Cv

D184


Viking Xtreme Lever Series - Inline



- Manual / mechanical
- 1/8, 1/4 and 3/8 inch ports
- Pressures:
 - Type A & B - VAC to 232 PSIG
 - Type C & D - VAC to 174 Psig
- Temperatures -40°F to 140°F
- Flow - .5 to 2.7 Cv

D179

42 Series - Inline




- Manual / mechanical
- 1/4 and 3/8 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 0°F to 140°F
- Flow - 1.3 to 2.9 Cv

D177

Valve Accessories


Control Panel Products



- A wide variety of push buttons and selector switches
- Visual indicators
- Foot pedal switches
- Modular pneumatic / electric push buttons

D192

Sensing / Limit Switches



- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleen or blocking for detection

D196

Modular Air Preparation Products

Global FRL's



E3

- Port size: 1/4 through 3/4 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -13°F through 150°F
- Flows to 212 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

Dryer Products

Dryer Products



E101

- Refrigeration (10-2400 SCFM)
- Inline desiccant (15-60 SCFM)
- Regenerative desiccant (3-800 SCFM)
- Zero loss & timer drains
- Environmentally friendly refrigerant

General Industrial Air Preparation Products

Miniature, Compact, Standard, Hi-Flow



E27

- Port size: 1/8 through 3 inch
- Maximum supply pressure: 250 PSIG
- Operating temperature: -14°F through 176°F
- Flows to 2900 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

Accessories

Ball Valves / Plug Valves



F10

- Forged brass, general purpose, industrial ball valves
- Stainless steel, general purpose, industrial ball valves
- One piece extruded brass body plug valves

Stainless Steel Air Preparation Products

Stainless Steel FRL's



E82

- Port sizes: 1/4 and 1/2 inch
- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- Filters, regulators, filter / regulators, and lubricators

Flow Controls & Accessories



F5

- Full range of flow controls, mufflers, silencers, drain valves, blow guns, relief, shuttle and quick exhaust valves
- Ports from M5 through 3/4 inch

Precision / Proportional Regulator Products

Precision / Proportional Regulators



E89

- Port sizes: 1/4 through 2 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -40°F through 200°F
- Flows to 1600 SCFM
- Electronic proportional

Hose & Fittings



F16

- 801 General purpose hose
- Push-on hose barb fittings

Integrated Fittings



F11

- Flow control regulators
- Inline check valves
- Blocking valves
- Threshold sensors

Accessories – continued

Mufflers & Silencers



- Compact
- Lightweight
- Easy to install
- Excellent noise reduction
- Protects components from contamination
- NPT & BSPT threads available

F4

Quick Couplings



- Industrial interchange nipples
–1/4" to 3/4" body size
- Sleevematic couplers
–1/4" to 1/2" body size
- Saffromatic couplers
–1/4" to 3/4" body size
- Economatic quick connect couplings
–1/4" body size

F7

Tank Valves & Air Chucks



- Maximum operating pressure 185 PSIG
- Temperature range -40°F to 220°F
- N/P finish
- Model No. 05499 0000 ball-foot air chuck, 1/4" female port
- Model No. 06739 0000 ball-foot air chuck with clip, 1/4" female port

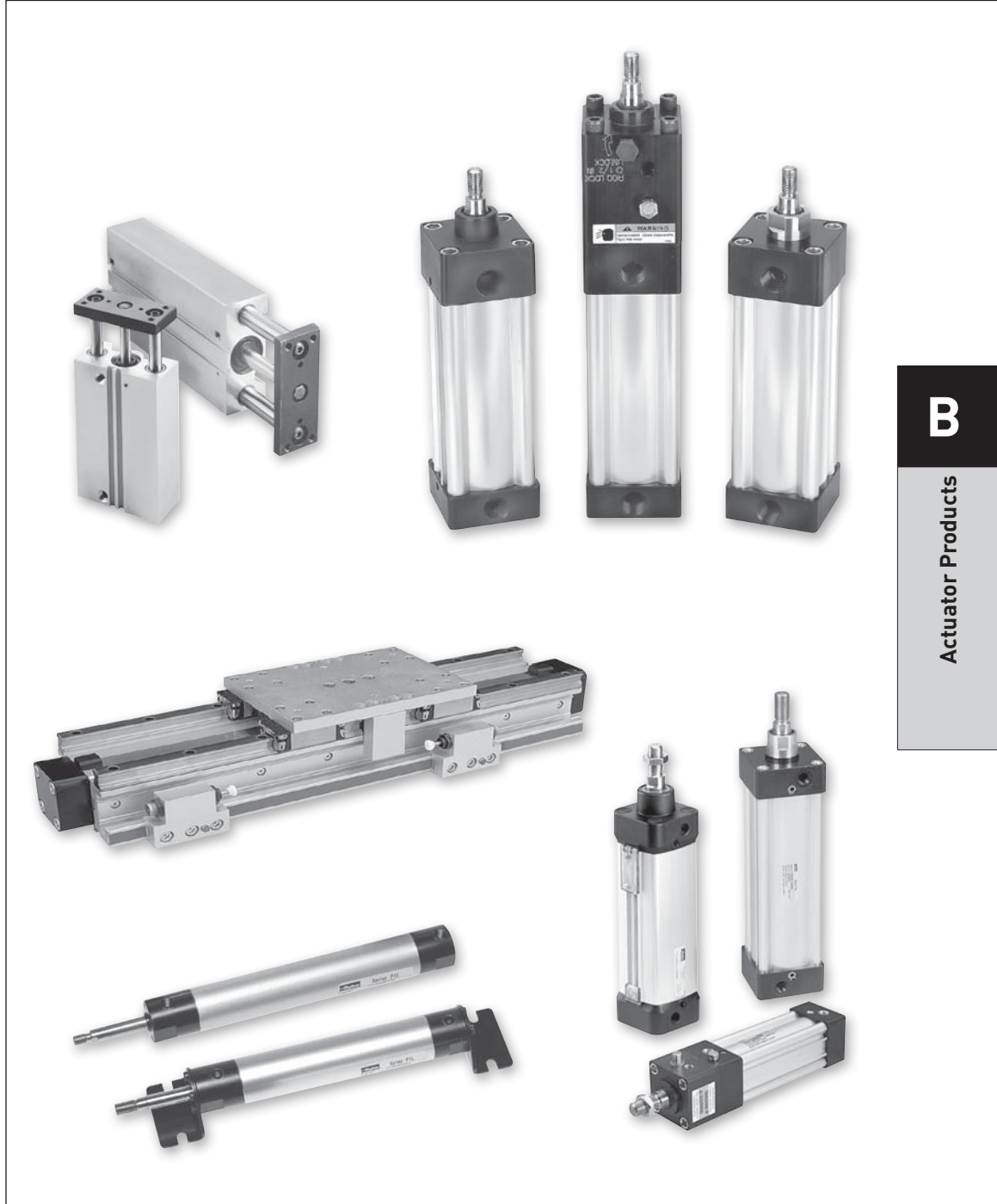
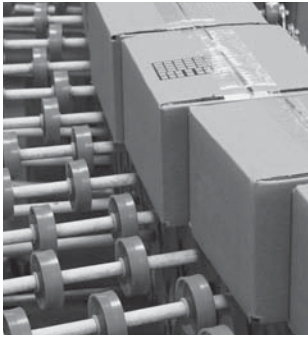
F3

Tubing & Fittings



- Push-to-connect, Prestolok composite fittings
- Push-to-connect, Prestolok metal fittings
- Pipe fittings
- E: instrument grade tubing, N: flexible tubing, FRPE: flame resistant tubing, NR: semi-rigid high strength tubing, U: polyether base tubing

F19



B
Actuator Products

Actuator Products

Tie Rod Cylinders

P1D Series - ISO 15552 / ISO 6431



B62

- 5 available for maximum flexibility
- Bore sizes 32mm through 200mm
- 10 standard mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

Round Body Cylinders

P Series - Repairable



B131

- Bore sizes 1-1/8 through 4 inch
- 4 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

3MA Series - Economy NFPA Cylinder



B6

- Bore sizes 1-1/2 through 5 inch
- 18 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

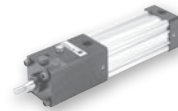
P1A Series - ISO Non-Repairable



B127

- Bore sizes 10mm through 25mm
- 5 mounting styles
- Pressures up to 145 PSIG
- Temperatures -40°F to 302°F
- Stainless steel body construction

3MAJ / 4MAJ - Rodlock Cylinder



B37

- Bore sizes 1-1/2 through 8 inch
- 17 standard mounting styles
- Pressures up to 100 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

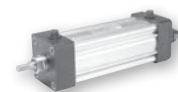
P1L Series - Repairable



B113

- Bore sizes 20mm through 100mm
- 9 mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

4MA Series - Flexible NFPA Cylinder



B16

- Bore sizes 1-1/2 through 8 inch
- 20 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -50°F to 250°F
- Aluminum body construction

SR Series - Non-Repairable



B79

- Bore sizes 5/16 through 3 inch
- 28 mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Stainless steel body construction

4MNR Series - Non-Rotating Cylinder



B55

- Bore sizes 1-1/8 through 4 inch
- 14 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

SRX Series - Position Feedback



B105

- Bore sizes 1-1/16 through 3 inch
- Continuous position feedback
- Pressures up to 150 PSIG
- Temperatures 40°F to 165°F
- Stainless steel body construction

Compact Cylinders

LP / LPM Series - Compact Cylinder



- Bore sizes 9/16 through 4 inch
- 6 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 200°F
- Aluminum body construction

B157

P1M Series - Compact Cylinder



- Bore sizes 12mm through 100mm
- 6 mounting options
- Pressures up to 145 PSIG
- Temperatures -4°F to 250°F
- Aluminum body construction

B145

P1Q Series - Economy Compact Cylinder



- Bore sizes 12mm through 100mm
- 4 flexible mounting options
- Pressures up to 10 PSIG
- Temperatures 23°F to 158°F
- Aluminum body construction

B137

Guided Cylinders

HB Series - Heavy Duty Guided



- Bore sizes 1-1/2 through 2-1/2 inch
- Thrust, reach and compact versions available
- Air service pressure up to 250 PSIG, hydraulic service up to 750 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Rod lock version available

B173

P5E Series - P1D ISO Guided



- Bore sizes 32mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 14°F to 165°F
- Aluminum body construction
- Rod lock version available

B177

P5L Series - Guided



- Bore sizes 20mm through 100mm
- Direct mounting
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Extruded aluminum body construction

B169

P5T Series - Compact Guided



- Bore sizes 16mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Flexible porting: top, rear, side

B163

P5T2 Series - Compact Guided



- Bore sizes 12mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Through hole mounting

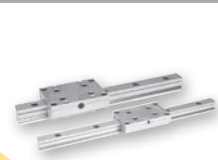
B166

B

Index
 Actuator Products

Rodless Cylinders

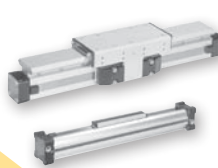
GDL Series - Rails & Cassettes



- 6 sizes available
- Speed up to 10m/s (33 ft/s)
- Temperatures -10°C to 80°C
- Aluminum alloy rail
- Aluminum body construction

B265

OSP-P Series - Band Type Rodless



- Bore sizes 10mm through 80mm
- Pressures to max. 8 bar
- Temperatures -10°F to 80°F
- Aluminum body construction

B179

P1X Series - Band Type Rodless



- 7 bore sizes 16mm through 63mm
- Integral sensor mounting rail
- Pressures 7 to 100 PSIG
- Temperatures 40°F to 140°F
- Aluminum body construction

B241

P1Z Series - Magnetically Coupled Rodless

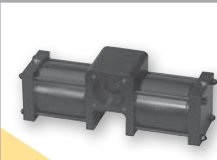


- 3 bore sizes 16mm, 20mm & 32mm
- Pressures 29 to 100 PSIG
- Temperatures 15°F to 140°F
- Stainless steel body construction

B253

Rotary Actuators

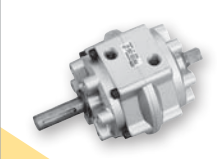
HP Series - Large Rack & Pinion Rotary



- 2 large bore models
- 3 standard rotations
- Pressures to 100 PSIG
- Temperatures 0°F to 250°F
- 4500 and 10,000 lb-in output at 100 PSIG

B281

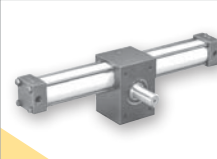
PRN(A) Series - Vane Rotary



- 5 miniature and 4 standard models
- Temperatures -23°F to 176°F
- 1.33 to 2355 in-lb torque at 100 PSIG

B273

PTR Series - Rack & Pinion Rotary



- Bore sizes 1 through 3-1/4 inch
- Pressures to 250 PSIG
- Temperatures 0°F to 250°F
- 39 to 2281 lb-in output torque

B279

PV Series - Vane Rotary



- 8 model sizes
- Single or double vane models
- Pressures to 150 PSIG
- Temperatures 30°F to 250°F
- 7 to 1800 lb-in output torque

B270

P1V-S Series - Air Motors



- Power from 20 through 1200 watts
- Speeds 5 to 24,000 RPM
- Pressures to max. 7 bar
- Temperatures -30°C to 100°C

B283

P5W Series - Rotary Table

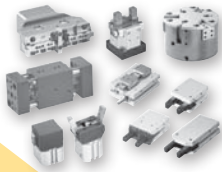


- 7 bore sizes (10 to 63mm)
- Pressures 1 to 8 bar max.
- Temperatures 41°F to 140°F
- Theoretical torque (.28 to 39 Nm at 6 bar)

B277

Grippers

Grippers



B285

- Stroke ranges: 0.12 to 6.0 inches
- Grip forces: up to 2800 lbs
- Operating characteristics:
 - Single acting
 - Double acting
 - Spring assist and spring return

Electronic Sensors

Sensors

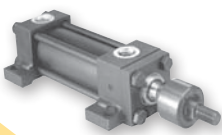


B296

- Solid state
- Reed
- NAMUR
- Proximity

Actuator Accessories

Linear Alignment Couplers



B287

- 12 standard thread sizes
- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available

Shock Absorbers

Linear Alignment Couplers



B320

- Miniature - self-compensating
- Heavyweight - soft contact and self-compensating
- Miniature - soft contact and self-compensating
- Magnum series - adjustable
- Heavy - self-compensating
- Heavy - adjustable

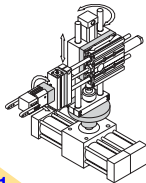
PRL Series - Stand Alone Rodlock



B289

- 5 different sizes
- Large holding forces
- 2 different mounting styles
- Case-hardened rod material available

Transition Kits



B291

- Plate kits - attach component to slide / guided cylinder
- Coupler kits - attach component to rotary actuator

4TK Series - Air Oil Tanks



B288

- 6 standard bore sizes
- Lightweight aluminum / fiberglass design
- 2 fluid flow baffles reduce agitation and aeration
- 8 standard mounting styles

B

Index
 Actuator Products

3MA Mounting Styles for 1-1/2" to 5" Bore

Mounting style	NFPA mounting	Description	Bore size
TEF	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 5
T	MX0	No Mount (same construction as TEF)	1-1/2 - 5
TE	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 5
F	MS4	Side Tap (same construction as TEF)	1-1/2 - 5
J	MF1	Head Rectangular Flange	1-1/2 - 5
H	MF2	Cap Rectangular Flange	1-1/2 - 5
TB	MX3	Tie Rods Extended Head End	1-1/2 - 5
TC	MX2	Tie Rods Extended Cap End	1-1/2 - 5
TD	MX1	Tie Rods Extended Both Ends	1-1/2 - 5

Mounting style	NFPA mounting	Description	Bore size
C	MS2	Side Lug	1-1/2 - 5
CB	MS1	Side End Angle	1-1/2 - 5
G	MS7	Side End Lug	1-1/2 - 4
NB	N/A	Base Bar	1-1/2 - 4
BB	MP1	Cap Fixed Clevis	1-1/2 - 5
BC	MP2	Cap Detachable Clevis	1-1/2 - 5
BE	MP4	Cap Detachable Eye	1-1/2 - 4
DD	MT4	Intermediate Trunnion	1-1/2 - 5
KTEF*	MDX5/ MDS4	Double Rod End, TEF Mount	1-1/2 - 5

* Double rod end cylinders can be ordered with head mountings, i.e. KJ.

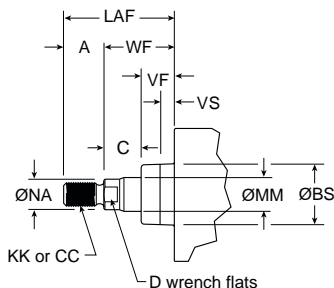
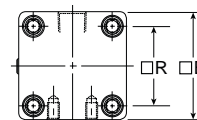
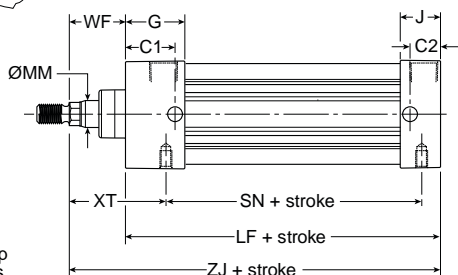
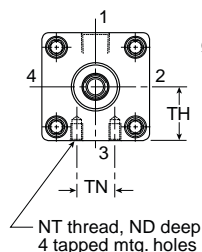
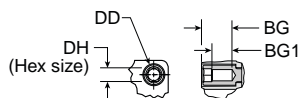
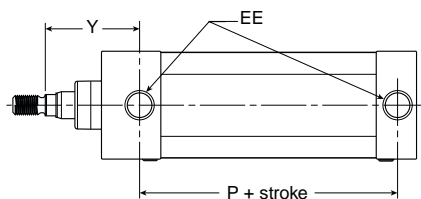
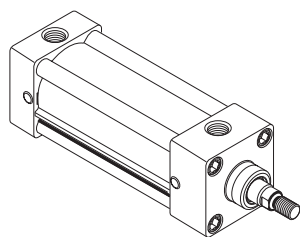
Sensors

For sensors see page B296.



B
 Tie Rod Cylinders
 Actuator Products

3MA Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)



For dimensions of all standard rod end styles, please see next page.
 BS = pilot diameter
 VS = length of pilot diameter

B

Tie Rod Cylinders
 Actuator Products

Styles TEF, T, TE and F

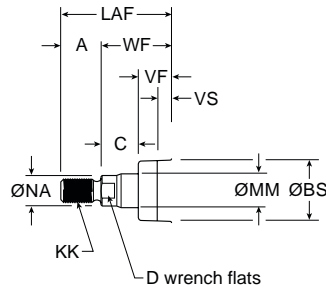
Bore size	Rod no.	Rod dia. MM	Thread																EE (NPTF)	
			Style 8 CC	Style 4 & 9 KK	A	AA	BG	BG1	BS	C	C1	C2	D	DD	DH	E	G			
1-1/2	1	5/8	1/2-20	7/16-20	0.750	2.020	0.562	0.374	1.124	0.385	1.000	0.500	1/2	1/4-28	1/4	2.000	3/8	1.438		
2	1	5/8	1/2-20	7/16-20	0.750	2.600	0.562	0.362	1.124	0.385	1.148	0.711	1/2	5/16-24	5/16	2.500	3/8	1.375		
2-1/2	1	5/8	1/2-20	7/16-20	0.750	3.100	0.562	0.362	1.124	0.385	1.117	0.711	1/2	5/16-24	5/16	3.000	3/8	1.344		
3-1/4	1	1	7/8-14	3/4-16	1.125	3.900	0.700	0.500	1.499	0.510	1.350	0.881	7/8	3/8-24	3/8	3.750	1/2	1.594		
4	1	1	7/8-14	3/4-16	1.125	4.700	0.700	0.500	1.499	0.510	1.350	0.881	7/8	3/8-24	3/8	4.500	1/2	1.594		
5	1	1	7/8-14	3/4-16	1.125	5.800	0.781	0.531	1.499	0.510	1.350	0.975	7/8	1/2-20	1/2	5.500	1/2	1.594		

Bore size	Rod no.	Rod dia. MM															Add stroke			
			J	LAF	NA	ND	NT	R	TH	TN	VF	VS	WF	XT	Y	LF	P	SN	ZJ	
1-1/2	1	5/8	0.938	1.750	0.563	0.375	1/4-20	1.430	0.993	0.625	0.615	-	1.000	1.938	1.875	3.625	2.313	2.250	4.625	
2	1	5/8	0.938	1.750	0.563	0.438	5/16-18	1.840	1.243	0.875	0.615	0.250	1.000	1.938	1.875	3.625	2.313	2.250	4.625	
2-1/2	1	5/8	0.938	1.750	0.563	0.625	3/8-16	2.190	1.493	1.250	0.615	0.250	1.000	1.938	1.938	3.750	2.375	2.375	4.750	
3-1/4	1	1	1.125	2.500	0.938	0.750	1/2-13	2.760	1.868	1.500	0.865	0.250	1.375	2.438	2.438	4.250	2.625	2.625	5.625	
4	1	1	1.125	2.500	0.938	0.750	1/2-13	3.320	2.243	2.063	0.865	0.250	1.375	2.438	2.438	4.250	2.625	2.625	5.625	
5	1	1	1.219	2.500	0.938	0.938	5/8-11	4.100	2.743	2.688	0.865	0.250	1.375	2.438	2.438	4.500	2.875	2.875	5.875	

3MA Rod End Dimensions

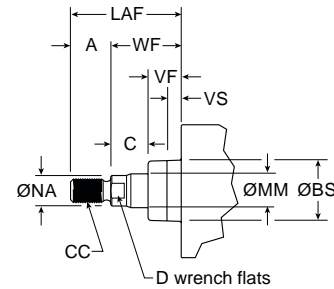
Thread Style 4

(NFPA Style SM)
 Small Male



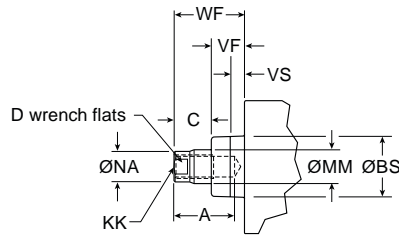
Thread Style 8

(NFPA Style IM)
 Intermediate Male



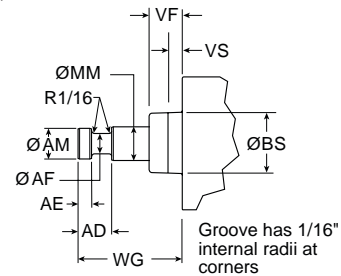
Thread Style 9

(NFPA Style SF)
 Short Female



Thread Style 55

For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - “Special Thread”

Special threads, rod extensions, rod eyes, blanks, etc. are also available.
 To order, specify “Style 3” and give desired dimensions for KK or CC, A and W or WF.
 If otherwise special, please supply dimensioned sketch.

Applies to all rod ends:
 BS = pilot diameter
 VS = length of pilot diameter

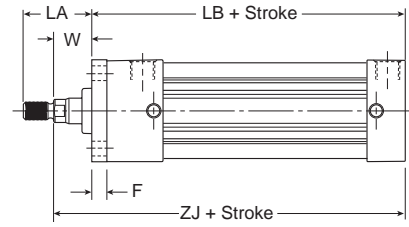
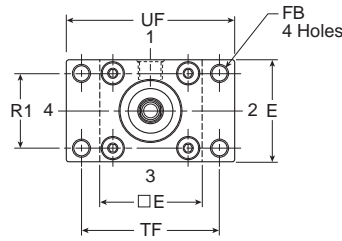
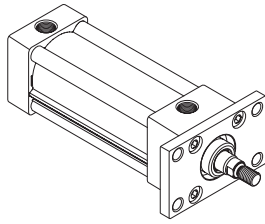
Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		A	AD	AE	AF	AM	BS	C	D	LAF	NA	VF	VS	WF	WG
			Style 8 CC	Style 4 & 9 KK														
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	-	1.000	1.750
2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	0.250	1.000	1.750
2-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	0.250	1.000	1.750
3-1/4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375
4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375
5	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375

B
 Tie Rod Cylinders
 Actuator Products

Head Rectangular Flange

Style J
 (NFPA MF1)



Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

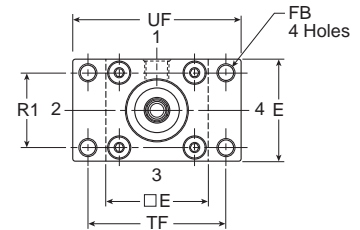
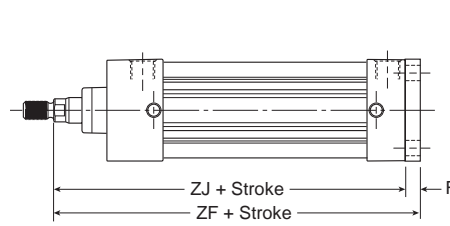
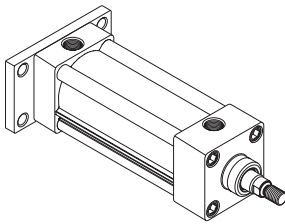
For reference, $WF = W + F$ and $LA = W + A$.

B

Tie Rod Cylinders
 Actuator Products

Cap Rectangular Flange

Style H
 (NFPA MF2)

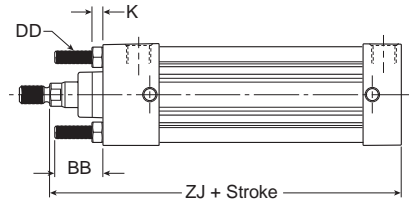
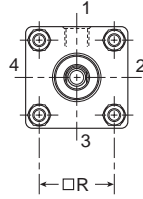
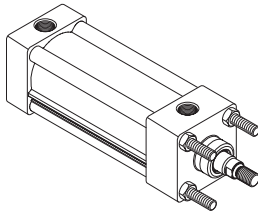


Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke		
												LB	ZF	ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	4.000	5.000	4.625
	2	1	1.125	2.000	0.375	0.313	2.125	1.430	2.750	3.375	1.000	4.000	5.375	5.000
2	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	4.000	5.000	4.625
	3	1	1.125	2.500	0.375	0.375	2.125	1.840	3.375	4.125	1.000	4.000	5.375	5.000
2-1/2	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	4.125	5.125	4.750
	3	1	1.125	3.000	0.375	0.375	2.125	2.190	3.875	4.625	1.000	4.125	5.500	5.125
3-1/4	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	3.750	0.625	0.438	2.625	2.760	4.688	5.500	1.000	4.875	6.500	5.875
4	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	4.500	0.625	0.438	2.625	3.320	5.438	6.250	1.000	4.875	6.500	5.875
5	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	5.125	6.500	5.875
	3	1-3/8	1.625	5.500	0.625	0.563	2.625	4.100	6.625	7.625	1.000	5.125	6.750	6.125

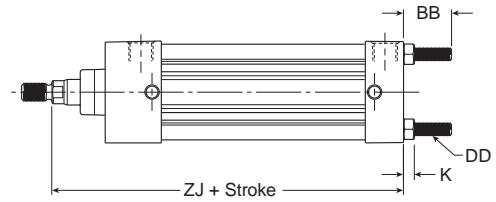
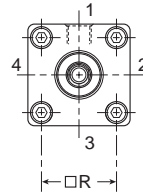
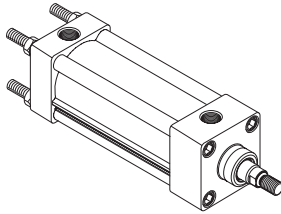
Tie Rods Ext. Head End

Style TB
 (NFPA MX3)



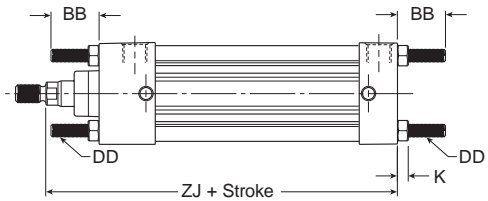
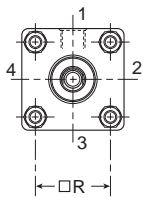
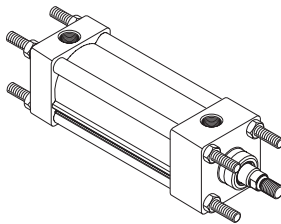
Tie Rods Ext. Cap End

Style TC
 (NFPA MX2)



Tie Rods Ext. Both Ends

Style TD
 (NFPA MX1)



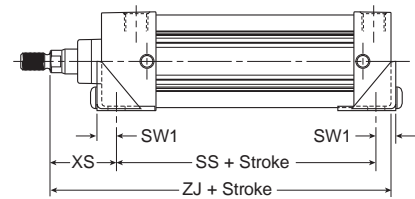
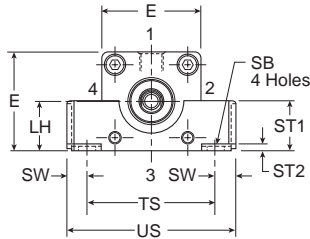
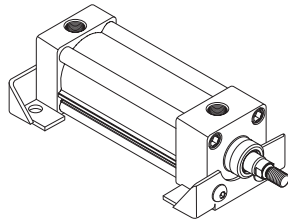
Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	BB	DD	E	K	R	Add stroke	
								ZJ	
1-1/2	1	5/8	1.000	1/4-28	2.000	0.250	1.430	4.625	
	2	1	1.000	1/4-28	2.000	0.250	1.430	5.000	
2	1	5/8	1.125	5/16-24	2.500	0.313	1.840	4.625	
	3	1	1.125	5/16-24	2.500	0.313	1.840	5.000	
2-1/2	1	5/8	1.125	5/16-24	3.000	0.313	2.190	4.750	
	3	1	1.125	5/16-24	3.000	0.313	2.190	5.125	
3-1/4	1	1	1.375	3/8-24	3.750	0.375	2.760	5.625	
	3	1-3/8	1.375	3/8-24	3.750	0.375	2.760	5.875	
4	1	1	1.375	3/8-24	4.500	0.375	3.320	5.625	
	3	1-3/8	1.375	3/8-24	4.500	0.375	3.320	5.875	
5	1	1	1.813	1/2-20	5.500	0.438	4.100	5.875	
	3	1-3/8	1.813	1/2-20	5.500	0.438	4.100	6.125	

B
 Tie Rod Cylinders
 Actuator Products

Side Lug

Style C
 (NFPA MS2)

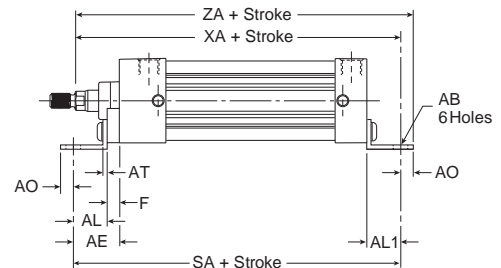
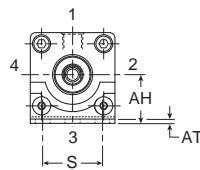
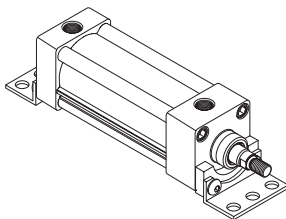


Style C

Bore size	Rod no.	Rod dia. MM	E	LH	SB	ST	ST1	ST2	SW	SW1	TS	US	XS	Add stroke	
														SS	ZJ
1-1/2	1	5/8	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.375	2.875	4.625
	2	1	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.750	2.875	5.000
2	1	5/8	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.375	2.875	4.625
	3	1	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.375	3.000	4.750
	3	1	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	2.125	3.250	5.875
4	1	1	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	2.125	3.250	5.875
5	1	1	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.063	3.125	5.875
	3	1-3/8	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.313	3.125	6.125

Side End Angle*

Style CB
 (NFPA MS1)



Note: Dimension "S" is for the holes in the mount (not the screw to screw dimension)

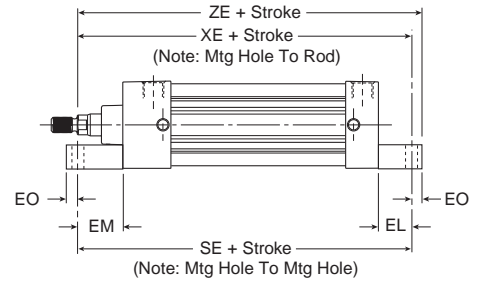
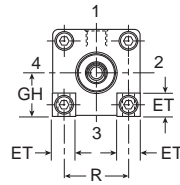
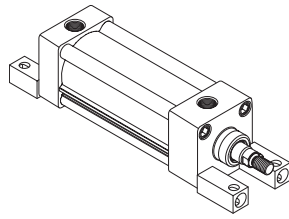
*Maximum recommended pressure for this mount is 150 PSIG

Style CB

Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AL1	AO	AT	E	F	S	Add stroke		
													SA	XA	ZA
1-1/2	1	5/8	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	5.625	6.000
	2	1	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	6.000	6.375
2	1	5/8	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	5.625	6.000
	3	1	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	6.000	6.375
2-1/2	1	5/8	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	5.750	6.125
	3	1	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	6.125	6.500
3-1/4	1	1	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	6.875	7.375
	3	1-3/8	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	7.125	7.625
4	1	1	0.563	-	2.250	1.875	1.250	0.500	0.125	4.500	-	3.500	7.375	6.875	7.375
	3	1-3/8	0.563	-	2.250	1.875	1.250	0.500	0.125	4.500	-	3.500	7.375	7.125	7.625
5	1	1	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.250	7.875
	3	1-3/8	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.500	8.125

Side End Lug

Style G
 (NFPA MS7)

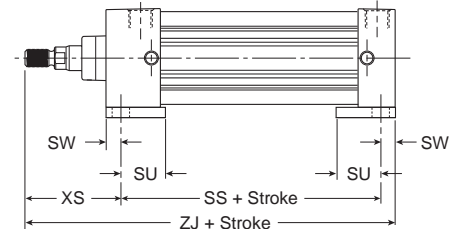
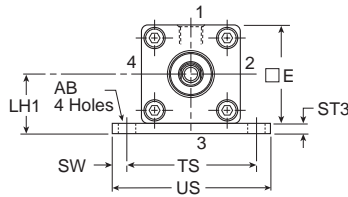
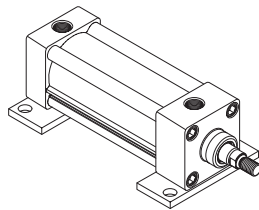


Style G

Bore Size	Rod No.	Rod Dia. MM	E	EB	EL	EM	EO	ET	GH	R	Add stroke		
											SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	5.500	5.375	5.625
	2	1	-	-	-	-	-	-	-	-	-	-	-
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.563	5.875
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.938	6.250
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	5.813	6.125
	3	1	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	6.188	6.500
3-1/4	1	1	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.500	6.875
	3	1-3/8	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.750	7.125
4	1	1	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.625	7.000
	3	1-3/8	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.875	7.250

Base Bar Mount

Style NB



Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.

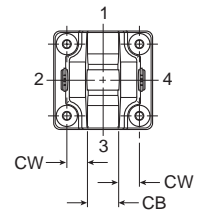
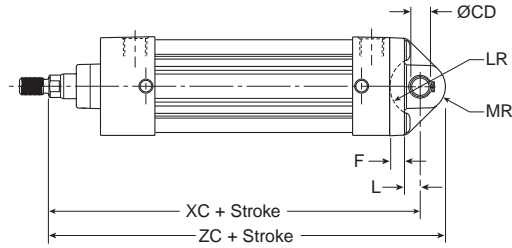
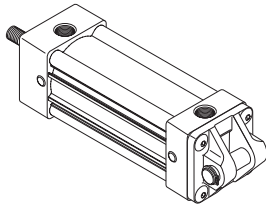
Style NB

Bore size	Rod no.	Rod dia. MM	AB	E	LH1	ST3	SU	SW	TS	US	XS	Add stroke	
												SS	ZJ
1-1/2	1	5/8	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	1.375	2.875	4.625
	2	1	-	-	-	-	-	-	-	-	-	-	-
2	1	5/8	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.375	2.875	4.625
	3	1	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.375	3.000	4.750
	3	1	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	2.125	3.250	5.875
4	1	1	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	2.125	3.250	5.875

B
 Tie Rod Cylinders
 Actuator Products

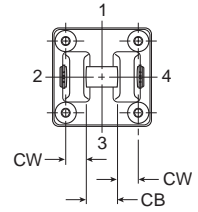
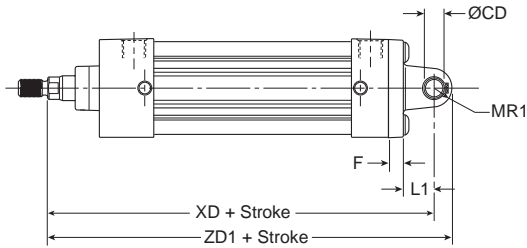
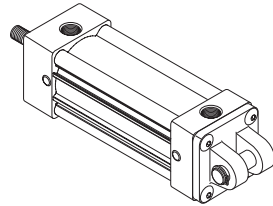
Cap Fixed Clevis

Style BB
 (NFPA MP1)



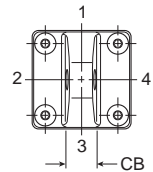
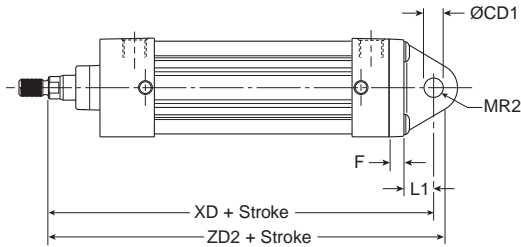
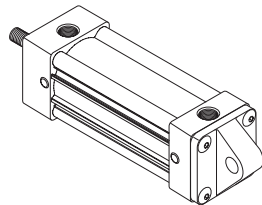
Cap Detachable Clevis

Style BC
 (NFPA MP2)



Cap Detachable Eye*

Style BE
 (NFPA MP4)



Note: 5 inch bore not available on BE mount, see 4MA series.

Note: For maximum swivel angle of BB mount with rear mounting plate, please reference Catalog 0900P-E, cylinder accessories on page B108.

Styles BB, BC and BE

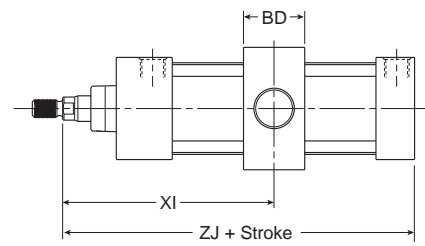
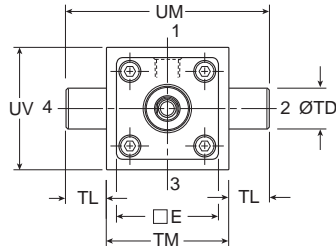
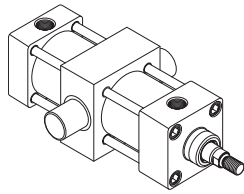
Bore size	Rod no.	Rod dia. MM	CB	Rod dia.		CW	E	F	L	LR	L1	MR	MR1	MR2	Add stroke				
				+0.002	+0.004										XC	XD	ZC	ZD1	ZD2
1-1/2	1	5/8	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	2	1	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2	1	5/8	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	3	1	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2-1/2	1	5/8	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.500	5.875	6.125	6.375	6.563
	3	1	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.875	6.250	6.500	6.750	6.313
3-1/4	1	1	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
4	1	1	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
5*	1	1	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
	3	1-3/8	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.375	8.000	8.313	8.750	8.875

* 5 inch bore not available on BE mount, see 4MA series

Intermediate Trunnion

Style DD
(NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of internal hex.



Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.000 -0.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke	
													XJ	ZJ
1-1/2	1	5/8	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	1.750	3.036	4.125	4.625
	2	1	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	-	3.437	4.250	5.000
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	1.750	3.125	4.125	4.625
	3	1	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	2.125	3.500	4.500	5.000
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	1.750	3.094	4.250	4.750
	3	1	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	2.125	3.469	4.625	5.125
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.250	3.969	5.000	5.625
	3	1-3/8	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.500	4.219	5.250	5.875
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.250	3.969	5.000	5.625
	3	1-3/8	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.500	4.219	5.250	5.875
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.250	3.969	5.250	5.875
	3	1-3/8	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.500	4.219	5.500	6.125

B

Tie Rod Cylinders
Actuator Products

- Industry leading aluminum NFPA interchangeable cylinder with flexible construction
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4" and 5"
- Removable bronze alloy gland/bearing for easy maintenance
- Available in any practical stroke length
- 20 standard mounting styles available
- Extruded-profile aluminum body with integrated switch grooves
- Single rod end or double rod ends
- Cushions – standard and adjustable at both ends, optional non-cushioned
- RoHS compliant



Operating information

	4MA	4ML
Operating pressure:	250 PSIG (17 bar) maximum air service	400 PSIG (27 bar) maximum hydraulic service
Temperature range:	Standard seals -10°F to 165°F (-23°C to 74°C) Fluorocarbon seals -10°F to 250°F (-23°C to 121°C) Low temperature seals -50°F to 150°F (-46°C to 66°C)	
Filtration requirements:	40 micron, dry filtered air	Filtered hydraulic oil
For technical information see CD		

Ordering information

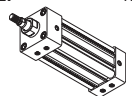
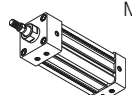
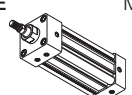
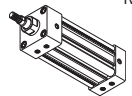
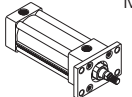
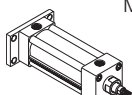
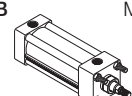
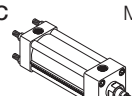
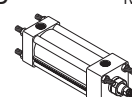
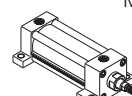
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Bore size	Double rod cylinder ¹²	Series	Ports	Piston rod number		Cushion cap end	Stroke length
1.50 ¹	Specify "K" only if double rod cylinder is required.	4MA Air service 4ML Hydraulic service ²	U NPTF R BSPP B BSPT T SAE	Specify rod code number for required diameter. ^{8, 2}		Blank Non-cushioned cap end C Cushioned cap end (not available for 4ML)	Specify stroke length required in inches. ¹¹
2.00 2.50 3.25 4.00 5.00							
	Mounting style			Special modification		Piston rod thread type	
	Specify mounting style code (see table on following page).			Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MA with Linear Position Sensor Option) ⁷		A Standard (UNF unified thread) W BSF British fine M* Metric	
						* Please reference catalog 0900P-E, page B106.	
			Seals			Rod material and gland code	
Cushion head end			Blank Standard (nitrile seals) V Fluorocarbon seals ⁴ E Fluorocarbon rod wiper and rod seal only ⁵ 4 Low temperature seals ⁴ M Metallic rod wiper, nitrile seals ⁶			Blank Standard rod and gland H Standard rod and HI LOAD gland Y 17-4 PH stainless steel rod and standard gland Z 17-4 PH stainless steel rod and HI LOAD gland J 303 stainless steel rod and standard gland ¹⁰ K 303 stainless steel rod and HI LOAD gland ¹⁰ S 316 stainless steel rod and standard gland ¹⁰ T 316 stainless steel rod and HI LOAD gland ¹⁰	
Blank Non-cushioned head end C Cushioned head end (not available for 1.50" bore with 1" rod or 4ML)				Piston rod thread style			
				4 Small male 8 Intermediate male 9 Short female 55 For use with split coupler ⁹ 3 Special (and specify all dimensions required)			
Cylinder construction							
Blank* Standard (extruded body, standard round lobe orientation) A* Extruded body, round lobe orientation rotated 90 degrees from standard N* Extruded body, round lobe orientation rotated 180 degrees from standard Z* Extruded body, round lobe orientation rotated 270 degrees from standard T Aluminum round tube and carbon steel tie rods & nuts							
* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore size.							
	Piston type ²						
	Blank Standard (lipseals and magnetic ring) ¹² 1 Lipseals, no magnetic ring ¹² 2 Lipseals, no magnetic ring (aluminum piston) 3 Lipseals and magnetic ring (aluminum piston) (standard for 4ML) 4 Bumper seals, no magnetic ring 6 Bumper seals and magnetic ring B Lipseals, 1/4" thick bumpers both ends ³ H Lipseals, 1/4" thick bumper head end ³ C Lipseals, 1/4" thick bumper cap end ³ D Lipseals and magnetic ring, 1/4" thick bumpers both ends ³ F Lipseals and magnetic ring, 1/4" thick bumper head end ³ R Lipseals and magnetic ring, 1/4" thick bumper cap end ³						

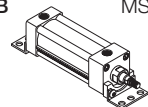
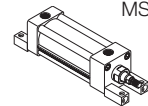
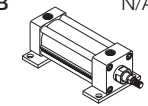
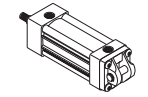
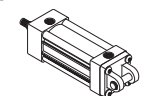
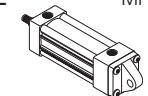
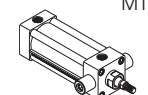
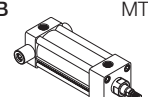
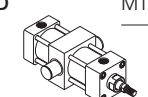
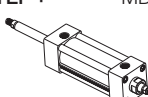
¹ Not available with Linear Position Sensor Option (LPSO).
² Piston Types (blank), 1, 4 and 6 not available for 4ML. Piston Types (blank) and 1 not available for oversize rod numbers 2 and 3. Seals option V only available with Piston Types 2 and 4. Seals option 4 only available with Piston Types 2 and 3.
³ Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".
⁴ Reed and solid-state sensors only available with standard seals or options E and M. See footnote 2.
⁵ Used for external chemical compatibility applications, not high temperature.
⁶ If fluorocarbon seals are required with this option, please place an "S" for special in the Special Modification field and specify the "fluorocarbon seals and metallic rod wiper" in the item notes.
⁷ For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:
 a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)
 b. Sensor position
 c. Port position (if other than position 1)
 d. Length of stop tubing, gross stroke and net stroke (if required)
 Also, Piston Type option (blank), 3, 6, D, F or R is required.
⁸ Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter.
⁹ For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.
¹⁰ Not available for 4ML.
¹¹ If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes. Not available with Piston Types (blank) and 1.
¹² Double rod cylinders not available with composite piston type.

B

Tie Rod Cylinders
Actuator Products

4MA/4ML Mounting Styles for 1-1/2" to 5" Bore

Mounting style	NFPA mounting	Description	Bore size
TEF 	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 5*
T 	MX0	No Mount (same construction as TEF)	1-1/2 - 5
TE 	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 5
F 	MS4	Side Tap (same construction as TEF)	1-1/2 - 5*
J 	MF1	Head Rectangular Flange	1-1/2 - 5
H 	MF2	Cap Rectangular Flange	1-1/2 - 5
TB 	MX3	Tie Rods Extended Head End	1-1/2 - 5
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 5
TD 	MX1	Tie Rods Extended Both Ends	1-1/2 - 5
C 	MS2	Side Lug	1-1/2 - 5

Mounting style	NFPA mounting	Description	Bore size
CB 	MS1	Side End Angle	1-1/2 - 5
G 	MS7	Side End Lug	1-1/2 - 4*
NB 	N/A	Base Bar	1-1/2 - 4*
BB 	MP1	Cap Fixed Clevis	1-1/2 - 5
BC 	MP2	Cap Detachable Clevis	1-1/2 - 5
BE 	MP4	Cap Detachable Eye	1-1/2 - 5
D 	MT1	Head Trunnion	1-1/2 - 5*
DB 	MT2	Cap Trunnion	1-1/2 - 5
DD 	MT4	Intermediate Trunnion	1-1/2 - 5
KTEF † 	MDX5/MDS4	Double Rod End, TEF Mount	1-1/2 - 5

* Not available for 1-1/2" bore with 1" rod.

† Double rod end cylinders can be ordered with head mountings, i.e. KJ.

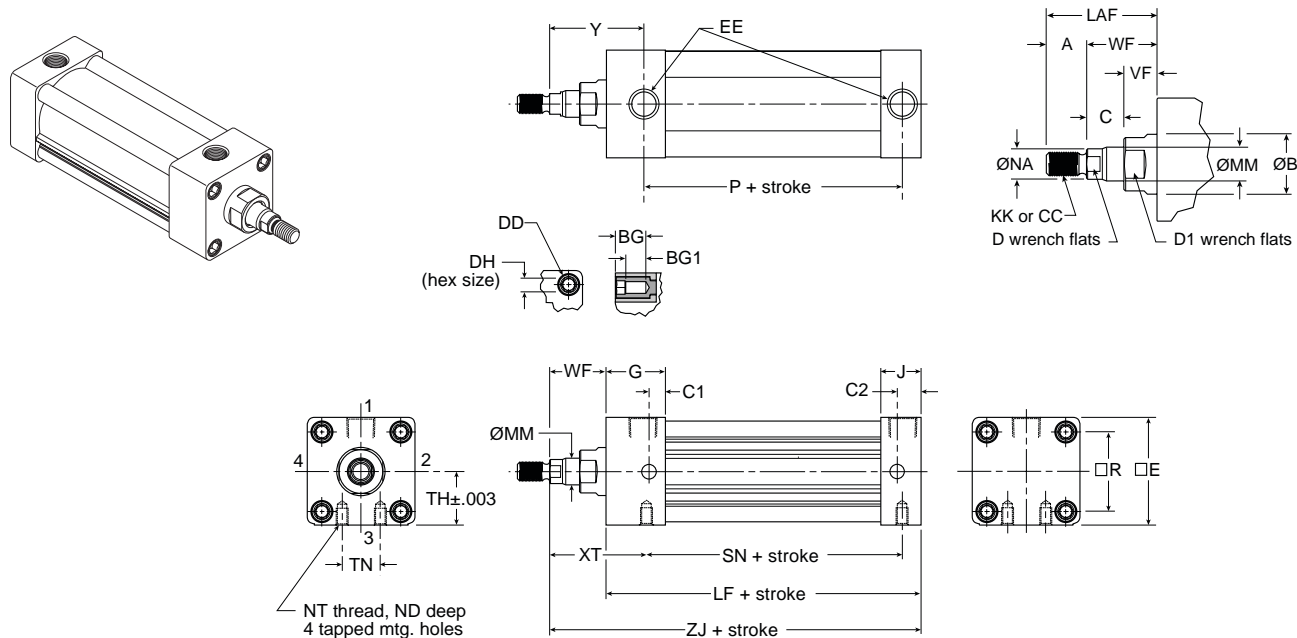
Sensors

For sensors see page B296.



B
 Tie Rod Cylinders
 Actuator Products

Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)



Styles TEF, T, TE and F

Bore size	Rod no.	Rod dia. MM	Thread															EE (NPTF)	
			Style 8 CC	Style 4 & 9 KK	A	AA	B	BG	BG1	C	C1	C2	D	D1	DD	DH	E	G	
1-1/2	1*	5/8	1/2-20	7/16-20	0.750	2.020	1.124	0.562	0.374	0.385	1.000	0.500	1/2	1	1/4-28	1/4	2.000	3/8	1.438
	2	1	7/8-14	3/4-16	1.125	2.020	1.499	0.562	0.374	0.510	-	0.500	7/8	1-3/8	1/4-28	1/4	2.000	3/8	1.438
2	1	5/8	1/2-20	7/16-20	0.750	2.600	1.124	0.562	0.362	0.385	1.000	0.562	1/2	1	5/16-24	5/16	2.500	3/8	1.375
	3	1	7/8-14	3/4-16	1.125	2.600	1.499	0.562	0.362	0.510	1.000	0.562	7/8	1-3/8	5/16-24	5/16	2.500	3/8	1.375
2-1/2	1	5/8	1/2-20	7/16-20	0.750	3.100	1.124	0.562	0.362	0.385	1.000	0.594	1/2	1	5/16-24	5/16	3.000	3/8	1.344
	3	1	7/8-14	3/4-16	1.125	3.100	1.499	0.562	0.362	0.510	1.000	0.594	7/8	1-3/8	5/16-24	5/16	3.000	3/8	1.344
3-1/4	1	1	7/8-14	3/4-16	1.125	3.900	1.499	0.700	0.500	0.510	1.188	0.719	7/8	1-3/8	3/8-24	3/8	3.750	1/2	1.594
	3	1-3/8	1-1/4-12	1-14	1.625	3.900	1.999	0.700	0.500	0.635	1.188	0.719	1-1/8	1-7/8	3/8-24	3/8	3.750	1/2	1.594
4	1	1	7/8-14	3/4-16	1.125	4.700	1.499	0.700	0.500	0.510	1.188	0.719	7/8	1-3/8	3/8-24	3/8	4.500	1/2	1.594
	3	1-3/8	1-1/4-12	1-14	1.625	4.700	1.999	0.700	0.500	0.635	1.188	0.719	1-1/8	1-7/8	3/8-24	3/8	4.500	1/2	1.594
5	1	1	7/8-14	3/4-16	1.125	5.800	1.499	0.781	0.531	0.510	1.188	0.813	7/8	1-3/8	1/2-20	1/2	5.500	1/2	1.594
	3	1-3/8	1-1/4-12	1-14	1.625	5.800	1.999	0.781	0.531	0.635	1.188	0.813	1-1/8	1-7/8	1/2-20	1/2	5.500	1/2	1.594

Bore size	Rod no.	Rod dia. MM														Add stroke				
			J	LAF	NA	ND	NT	R	TH	TN	VF	WF	XT	Y	LF	P	SN	ZJ		
1-1/2	1*	5/8	0.938	1.750	0.563	0.375	1/4-20	1.430	0.993	0.625	0.615	1.000	1.938	1.875	3.625	2.313	2.250	4.625		
	2	1	0.938	2.500	0.938	-	-	1.430	0.993	-	0.865	1.375	-	2.250	3.625	2.313	-	5.000		
2	1	5/8	0.937	1.750	0.563	0.438	5/16-18	1.840	1.243	0.875	0.615	1.000	1.938	1.875	3.625	2.313	2.250	4.625		
	3	1	0.937	2.500	0.938	0.375	5/16-18	1.840	1.243	0.875	0.865	1.375	2.313	2.250	3.625	2.313	2.250	5.000		
2-1/2	1	5/8	0.938	1.750	0.563	0.625	3/8-16	2.190	1.493	1.250	0.615	1.000	1.938	1.938	3.750	2.375	2.375	4.750		
	3	1	0.938	2.500	0.938	0.625	3/8-16	2.190	1.493	1.250	0.865	1.375	2.313	2.313	3.750	2.375	2.375	5.125		
3-1/4	1	1	1.125	2.500	0.938	0.750	1/2-13	2.760	1.868	1.500	0.865	1.375	2.438	2.438	4.250	2.625	2.625	5.625		
	3	1-3/8	1.125	3.250	1.313	0.750	1/2-13	2.760	1.868	1.500	0.990	1.625	2.688	2.688	4.250	2.625	2.625	5.875		
4	1	1	1.125	2.500	0.938	0.750	1/2-13	3.320	2.243	2.063	0.865	1.375	2.438	2.438	4.250	2.625	2.625	5.625		
	3	1-3/8	1.125	3.250	1.313	0.750	1/2-13	3.320	2.243	2.063	0.990	1.625	2.688	2.688	4.250	2.625	2.625	5.875		
5	1	1	1.219	2.500	0.938	0.938	5/8-11	4.100	2.743	2.688	0.865	1.375	2.438	2.438	4.500	2.875	2.875	5.875		
	3	1-3/8	1.219	3.250	1.313	0.938	5/8-11	4.100	2.743	2.688	0.990	1.625	2.688	2.688	4.500	2.875	2.875	6.125		

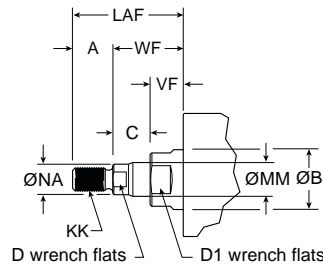
* NOTE - 1-1/2" bore with 1" rod is TE mount, F mount not available.
 1-1/2" bore with 1" rod cannot have a cushion at head end.

B

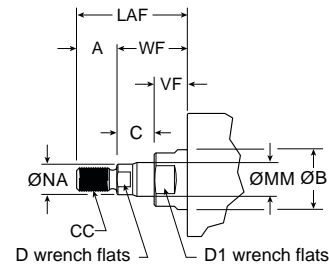
Tie Rod Cylinders
 Actuator Products

4MA Rod End Dimensions

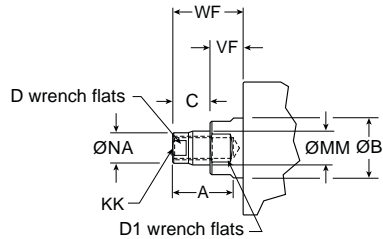
Thread Style 4
 (NFPA Style SM)
 Small Male



Thread Style 8
 (NFPA Style IM)
 Intermediate Male

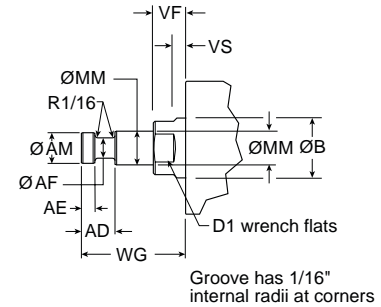


Thread Style 9
 (NFPA Style SF)
 Short Female



Thread Style 55

For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available.
 To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
 If otherwise special, please supply dimensioned sketch.

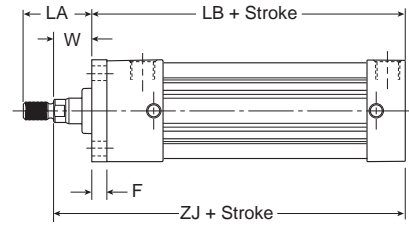
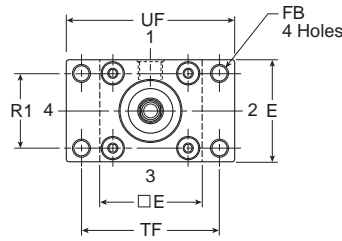
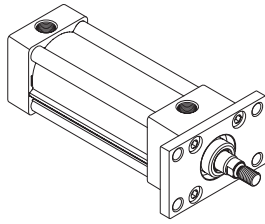
Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		+0.000 -0.002													
			Style 8 CC	Style 4 & 9 KK	A	AD	AE	AF	AM	B	C	D	D1	LAF	NA	VF	WF	WG
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	2	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
2-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
3-1/4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
5	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750

B
 Tie Rod Cylinders
 Actuator Products

Head Rectangular Flange

Style J
 (NFPA MF1)



Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

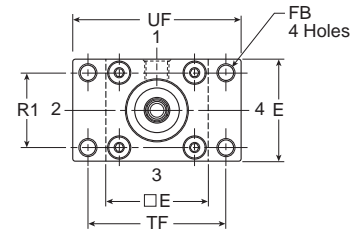
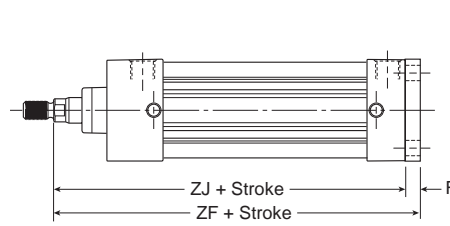
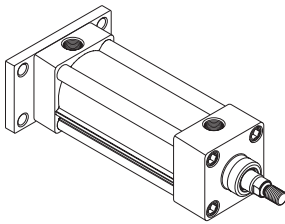
For reference, $WF = W + F$ and $LA = W + A$.

B

Tie Rod Cylinders
 Actuator Products

Cap Rectangular Flange

Style H
 (NFPA MF2)

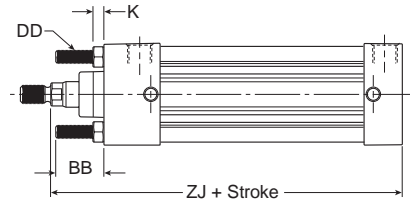
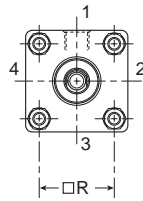
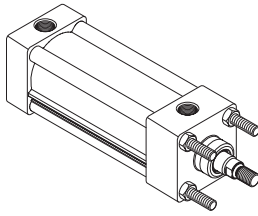


Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke		
												LB	ZF	ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	4.000	5.000	4.625
	2	1	1.125	2.000	0.375	0.313	2.125	1.430	2.750	3.375	1.000	4.000	5.375	5.000
2	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	4.000	5.000	4.625
	3	1	1.125	2.500	0.375	0.375	2.125	1.840	3.375	4.125	1.000	4.000	5.375	5.000
2-1/2	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	4.125	5.125	4.750
	3	1	1.125	3.000	0.375	0.375	2.125	2.190	3.875	4.625	1.000	4.125	5.500	5.125
3-1/4	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	3.750	0.625	0.438	2.625	2.760	4.688	5.500	1.000	4.875	6.500	5.875
4	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	4.500	0.625	0.438	2.625	3.320	5.438	6.250	1.000	4.875	6.500	5.875
5	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	5.125	6.500	5.875
	3	1-3/8	1.625	5.500	0.625	0.563	2.625	4.100	6.625	7.625	1.000	5.125	6.750	6.125

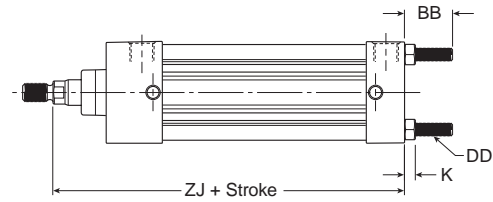
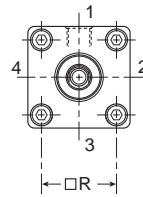
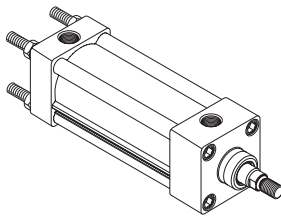
Tie Rods Ext. Head End

Style TB
 (NFPA MX3)



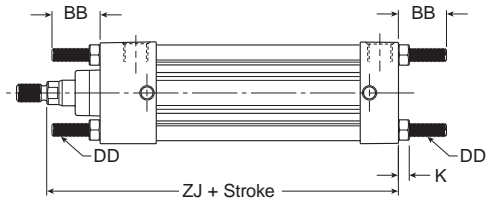
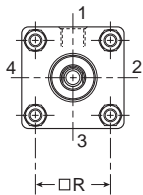
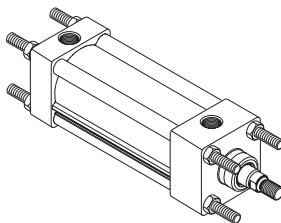
Tie Rods Ext. Cap End

Style TC
 (NFPA MX2)



Tie Rods Ext. Both Ends

Style TD
 (NFPA MX1)



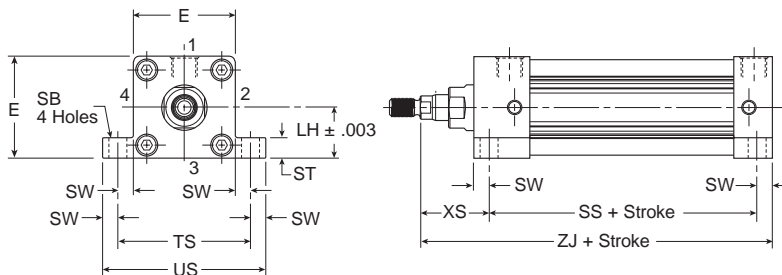
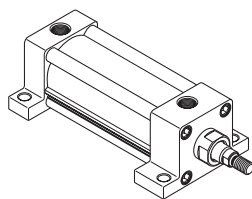
Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	BB	DD	E	K	R	Add stroke	
								ZJ	
1-1/2	1	5/8	1.000	1/4-28	2.000	0.250	1.430	4.625	
	2	1	1.000	1/4-28	2.000	0.250	1.430	5.000	
2	1	5/8	1.125	5/16-24	2.500	0.313	1.840	4.625	
	3	1	1.125	5/16-24	2.500	0.313	1.840	5.000	
2-1/2	1	5/8	1.125	5/16-24	3.000	0.313	2.190	4.750	
	3	1	1.125	5/16-24	3.000	0.313	2.190	5.125	
3-1/4	1	1	1.375	3/8-24	3.750	0.375	2.760	5.625	
	3	1-3/8	1.375	3/8-24	3.750	0.375	2.760	5.875	
4	1	1	1.375	3/8-24	4.500	0.375	3.320	5.625	
	3	1-3/8	1.375	3/8-24	4.500	0.375	3.320	5.875	
5	1	1	1.813	1/2-20	5.500	0.438	4.100	5.875	
	3	1-3/8	1.813	1/2-20	5.500	0.438	4.100	6.125	

B
 Tie Rod Cylinders
 Actuator Products

Side Lug

Style C for
(NFPA MS2)

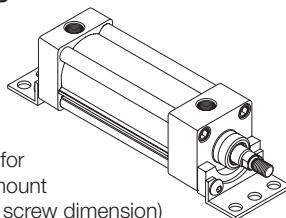


Styles C

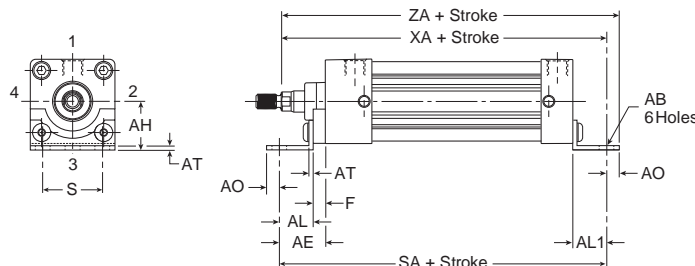
Bore size	Rod no.	Rod dia. MM	E	LH	SB	ST	ST1	ST2	SW	SW1	TS	US	XS	Add stroke	
														SS	ZJ
1-1/2	1	5/8	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.375	2.875	4.625
	2	1	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.750	2.875	5.000
2	1	5/8	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.375	2.875	4.625
	3	1	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.375	3.000	4.750
	3	1	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	2.125	3.250	5.875
4	1	1	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	2.125	3.250	5.875
5	1	1	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.063	3.125	5.875
	3	1-3/8	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.313	3.125	6.125

Side End Angle*

Style CB
(NFPA MS1)



Note:
Dimension "S" is for the holes in the mount (not the screw to screw dimension)



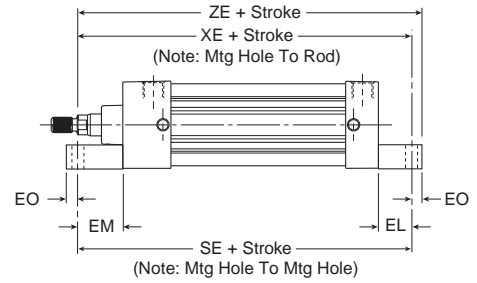
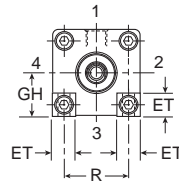
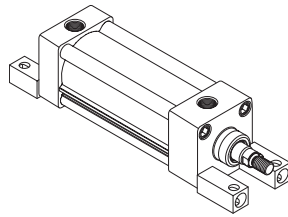
*Maximum recommended pressure for this mount is 150 PSIG

Style CB

Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AL1	AO	AT	E	F	S	Add stroke		
													SA	XA	ZA
1-1/2	1	5/8	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	5.625	6.000
	2	1	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	6.000	6.375
2	1	5/8	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	5.625	6.000
	3	1	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	6.000	6.375
2-1/2	1	5/8	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	5.750	6.125
	3	1	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	6.125	6.500
3-1/4	1	1	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	6.875	7.375
	3	1-3/8	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	7.125	7.625
4	1	1	0.563	-	2.250	1.875	1.250	0.500	0.125	4.500	-	3.500	7.375	6.875	7.375
	3	1-3/8	0.563	-	2.250	1.875	1.250	0.500	0.125	4.500	-	3.500	7.375	7.125	7.625
5	1	1	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.250	7.875
	3	1-3/8	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.500	8.125

Side End Lug

Style G
 (NFPA MS7)



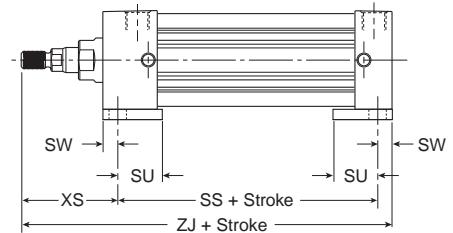
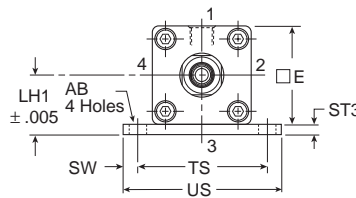
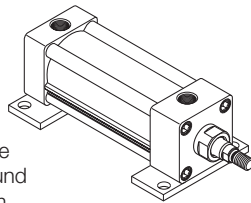
Style G

Bore size	Rod no.	Rod dia. MM	E	EB	EL	EM	EO	ET	GH	R	Add Stroke		
											SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	5.500	5.375	5.625
	2	1	-	-	-	-	-	-	-	-	-	-	-
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.563	5.875
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.938	6.250
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	5.813	6.125
	3	1	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	6.188	6.500
3-1/4	1	1	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.500	6.875
	3	1-3/8	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.750	7.125
4	1	1	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.625	7.000
	3	1-3/8	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.875	7.250

Base Bar Mount

Style NB for 4MA

Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.



Style NB

Bore size	Rod no.	Rod dia. MM	AB	E	LH1	ST3	SU	SW	TS	US	XS	Add stroke	
												SS	ZJ
1-1/2	1	5/8	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	1.375	2.875	4.625
	2	1	-	-	-	-	-	-	-	-	-	-	-
2	1	5/8	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.375	2.875	4.625
	3	1	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.375	3.000	4.750
	3	1	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	2.125	3.250	5.875
4	1	1	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	2.125	3.250	5.875

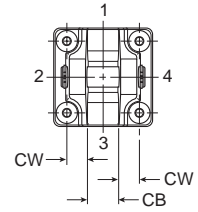
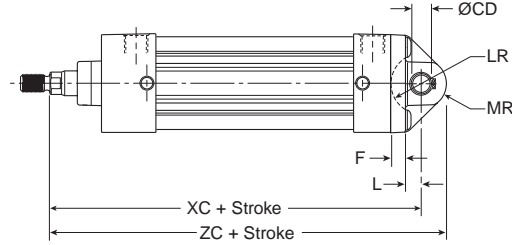
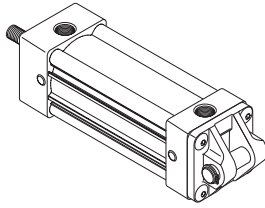
B

Tie Rod Cylinders
 Actuator Products

Cap Fixed Clevis

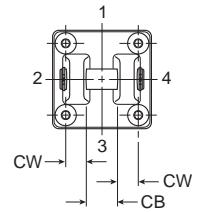
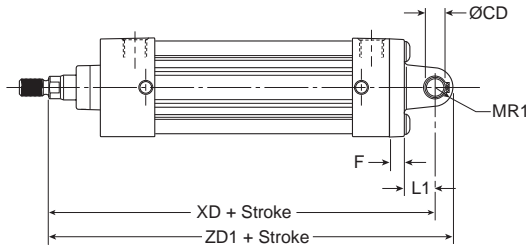
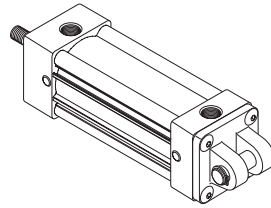
Style BB
 (NFPA MP1)

Note: For maximum swivel angle of BB mount with rear mounting plate, see cylinder accessories



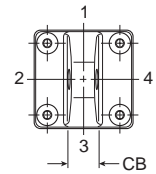
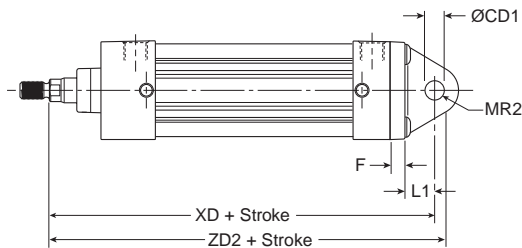
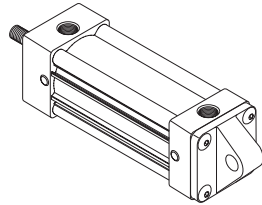
Cap Detachable Clevis

Style BC
 (NFPA MP2)



Cap Detachable Eye

Style BE
 (NFPA MP4)



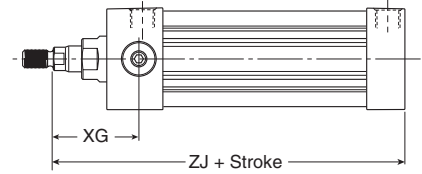
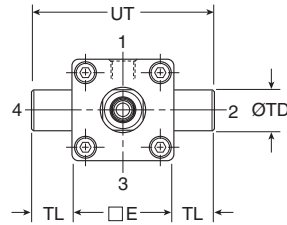
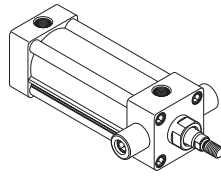
Styles BB, BC and BE

Bore size	Rod no.	Rod dia. MM	CB	Rod dia. tolerance		CW	E	F	L	LR	L1	MR	MR1	MR2	Add stroke				
				+0.000 -0.002	+0.002 +0.004										XC	XD	ZC	ZD1	ZD2
1-1/2	1	5/8	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	2	1	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2	1	5/8	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	3	1	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2-1/2	1	5/8	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.500	5.875	6.125	6.375	6.563
	3	1	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.875	6.250	6.500	6.750	6.313
3-1/4	1	1	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
4	1	1	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
5	1	1	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
	3	1-3/8	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.375	8.000	8.313	8.750	8.875

Head Trunnion*

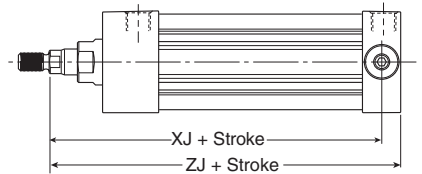
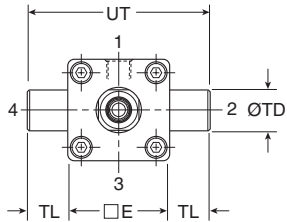
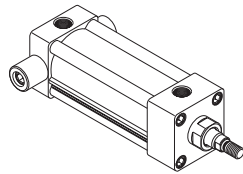
Style D
 (NFPA MT1)

Note: not available for 1-1/2" bore with 1" rod.



Cap Trunnion

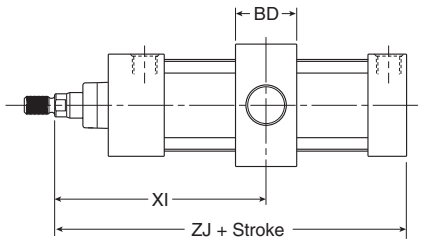
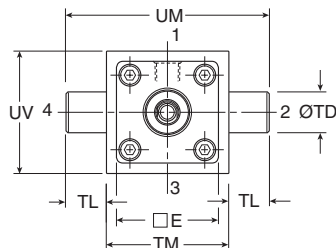
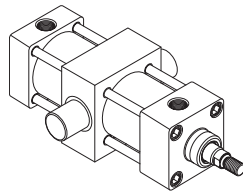
Style DB
 (NFPA MT2)



Intermediate Trunnion

Style DD
 (NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of internal hex.













Styles D, DB and DD











Bore size	Rod no.	Rod dia. MM	E	BD	+.000 -.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke	
													XJ	ZJ
1-1/2	1 *	5/8	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	1.750	3.036	4.125	4.625
	2	1	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	-	3.437	4.250	5.000
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	1.750	3.125	4.125	4.625
	3	1	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	2.125	3.500	4.500	5.000
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	1.750	3.094	4.250	4.750
	3	1	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	2.125	3.469	4.625	5.125
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.250	3.969	5.000	5.625
	3	1-3/8	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.500	4.219	5.250	5.875
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.250	3.969	5.000	5.625
	3	1-3/8	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.500	4.219	5.250	5.875
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.250	3.969	5.250	5.875
	3	1-3/8	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.500	4.219	5.500	6.125

* Head trunnion style D not available for 1-1/2" bore with 1" rod

B
 Tie Rod Cylinders
 Actuator Products

4MA/4ML Mounting Styles for 6" to 8" Bore

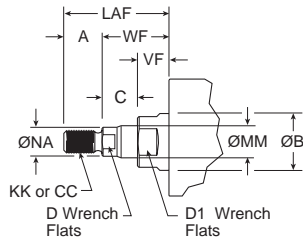
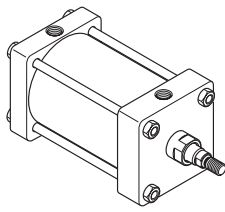
Mounting style	NFPA mounting	Description	Bore size
T 	MX0	No Mount	6 - 8
J 	MF1	Head Rectangular Flange	6
H 	MF2	Cap Rectangular Flange	6
TB 	MX3	Tie Rods Extended Head End	6 - 8
TC 	MX2	Tie Rods Extended Cap End	6 - 8
TD 	MX1	Tie Rods Extended Both Ends	6 - 8
TE 	MX5	Sleeve Nut	6 - 8
TEF 	MX5/MS4	Sleeve Nut with Side Tap	6 - 8
C 	MS2	Side Lug	6 - 8
F 	MS4	Side Tap	6 - 8

Mounting style	NFPA mounting	Description	Bore size
CB 	MS1	Side End Angle	6 - 8
BB 	MP1	Cap Fixed Clevis	6 - 8
BC 	MP2	Cap Detachable Clevis	6 - 8
BE 	MP4	Cap Detachable Eye	6
D 	MT1	Head Trunnion	6 - 8
DB 	MT2	Cap Trunnion	6 - 8
DD 	MT4	Intermediate Trunnion	6 - 8
JB 	ME3	Head Square	8
HB 	ME4	Cap Square	8
KT † 	MDX0	Double Rod End, No Mount	6 - 8

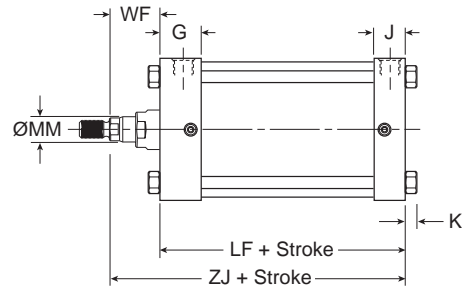
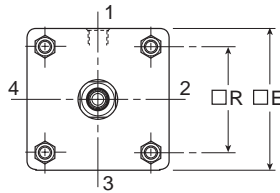
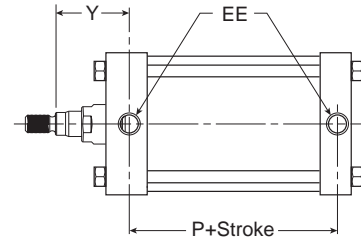
† Double rod end cylinders can be ordered with head mountings, i.e. KJ.

B
 Tie Rod Cylinders
 Actuator Products

Single Rod Dimensioned Drawings – (Style T)



For dimensions of all standard rod end styles, please see next page.



B

Tie Rod Cylinders
 Actuator Products

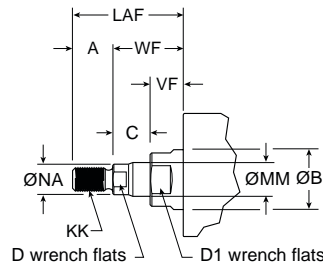
Style T

Bore size	Rod no.	Rod dia. MM	Thread		A	AA	+0.000 -0.002 B	C	D	D1	E	EE (NPTF)	G
			Style 8 CC	Style 4 & 9 KK									
6	1	1-3/8	1-1/4-12	1-14	1.625	6.900	1.999	0.635	1-1/8	1-7/8	6.500	3/4	1.910
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	6.900	2.374	0.760	1-1/2	2-3/16	6.500	3/4	1.910
8	1	1-3/8	1-1/4-12	1-14	1.625	9.100	1.999	0.635	1-1/8	1-7/8	8.500	3/4	1.810
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	9.100	2.374	0.760	1-1/2	2-3/16	8.500	3/4	1.810

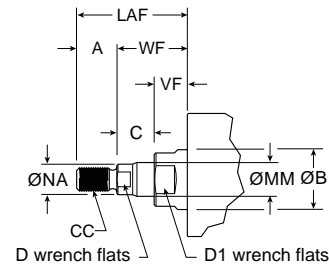
Bore size	Rod no.	Rod dia. MM											Add stroke		
			J	K	LAF	NA	R	VF	WF	Y	LF	P	ZJ		
6	1	1-3/8	1.410	0.438	3.250	1.313	4.880	0.990	1.625	2.813	5.000	3.125	6.625		
	3	1-3/4	1.410	0.438	3.875	1.688	4.880	1.115	1.875	3.063	5.000	3.125	6.875		
8	1	1-3/8	1.440	0.563	3.250	1.313	6.440	0.990	1.625	2.750	5.125	3.250	6.750		
	3	1-3/4	1.440	0.563	3.875	1.688	6.440	1.115	1.875	3.000	5.125	3.250	7.000		

4MA Rod End Dimensions

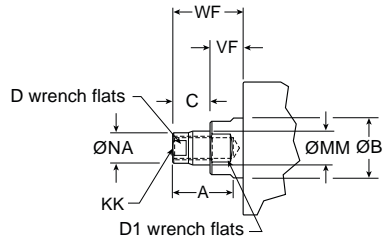
Thread Style 4
 (NFPA Style SM)
 Small Male



Thread Style 8
 (NFPA Style IM)
 Intermediate Male

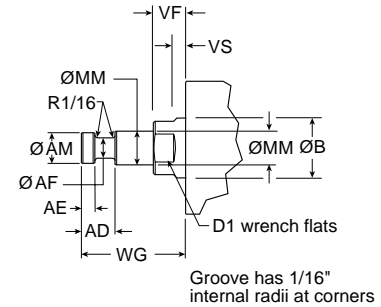


Thread Style 9
 (NFPA Style SF)
 Short Female



Thread Style 55

For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available.
 To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
 If otherwise special, please supply dimensioned sketch.

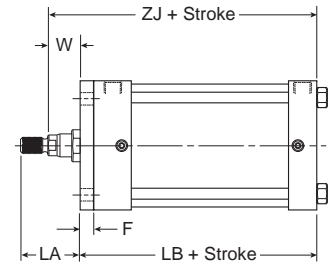
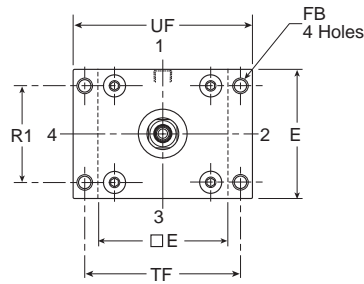
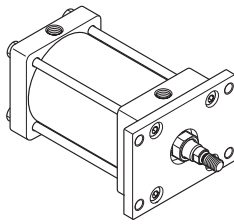
Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		A	AD	AE	AF	AM	B	C	D	D1	LAF	NA	VF	WF	WG
			Style 8 CC	Style 4 & 9 KK														
6	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	0.760	1-1/2	2-3/16	3.875	1.688	1.115	1.875	3.125
8	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	0.760	1-1/2	2-3/16	3.875	1.688	1.115	1.875	3.125

B
 Tie Rod Cylinders
 Actuator Products

Head Rectangular Flange

Style J
 (NFFA MF1)
 (only 6" Bore)



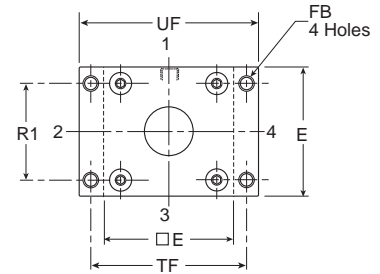
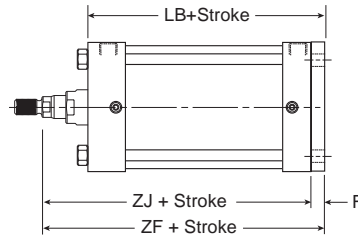
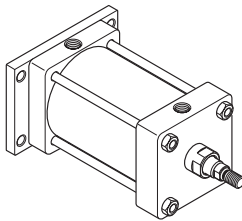
Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J. For reference, $WF = W + F$ and $LA = W + A$.

B

Tie Rod Cylinders
 Actuator Products

Cap Rectangular Flange

Style H
 (NFFA MF2)
 (only 6" Bore)

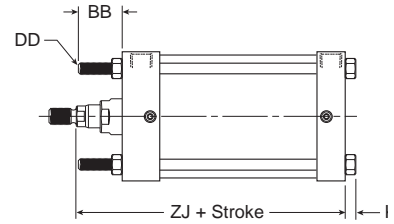
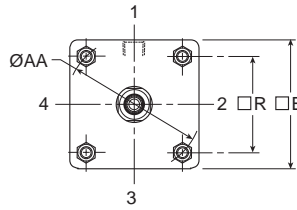
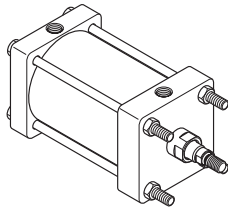


Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke		
												LB	ZF	ZJ
6	1	1-3/8	1.625	6.500	0.750	0.563	2.500	4.880	7.625	8.625	0.875	5.750	7.375	6.625
	3	1-3/4	2.000	6.500	0.750	0.563	3.125	4.880	7.625	8.625	1.125	5.750	7.625	6.875

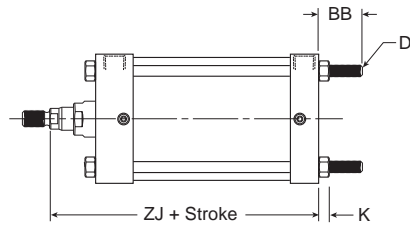
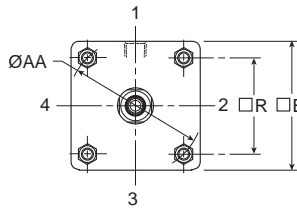
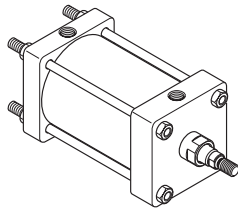
Tie Rods Ext. Head End

Style TB
 (NFPA MX3)



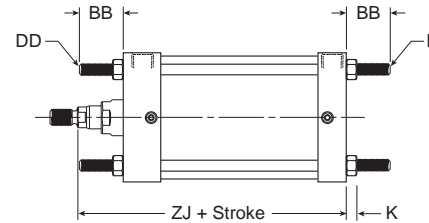
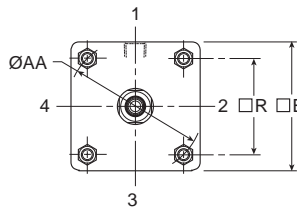
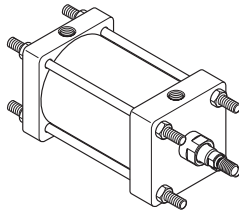
Tie Rods Ext. Cap End

Style TC
 (NFPA MX2)



Tie Rods Ext. Both Ends

Style TD
 (NFPA MX1)



Styles TB, TC and TD

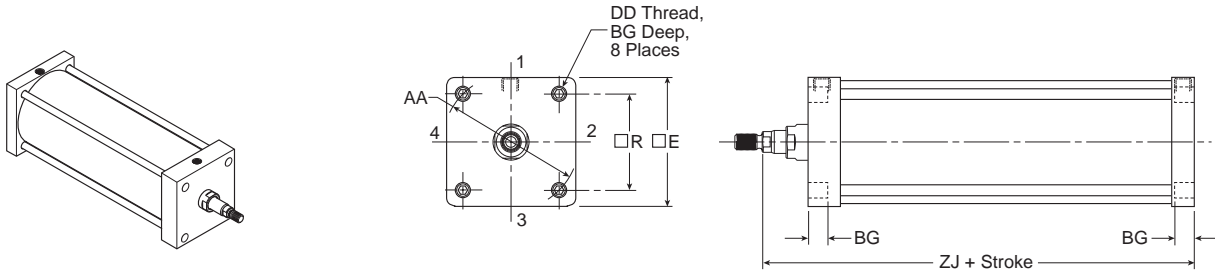
Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R	Add stroke
									ZJ
6	1	1-3/8	6.900	1.813	1/2-20	6.500	0.438	4.880	6.625
	3	1-3/4	6.900	1.813	1/2-20	6.500	0.438	4.880	6.875
8	1	1-3/8	9.100	2.313	5/8-18	8.500	0.563	6.440	6.750
	3	1-3/4	9.100	2.313	5/8-18	8.500	0.563	6.440	7.000

B

Tie Rod Cylinders
 Actuator Products

Sleeve Nut

Style TE
 (NFFA MX5)



Style TE

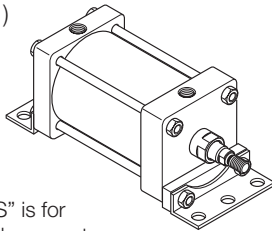
Bore size	Rod no.	Rod dia. MM	AA	BG	DD	E	R	Add stroke	
								ZJ	
6	1	1-3/8	6.900	0.500	1/2-20	6.500	4.880	6.625	
	3	1-3/4	6.900	0.500	1/2-20	6.500	4.880	6.875	
8	1	1-3/8	9.100	0.620	5/8-18	8.500	6.440	6.750	
	3	1-3/4	9.100	0.620	5/8-18	8.500	6.440	7.000	

B

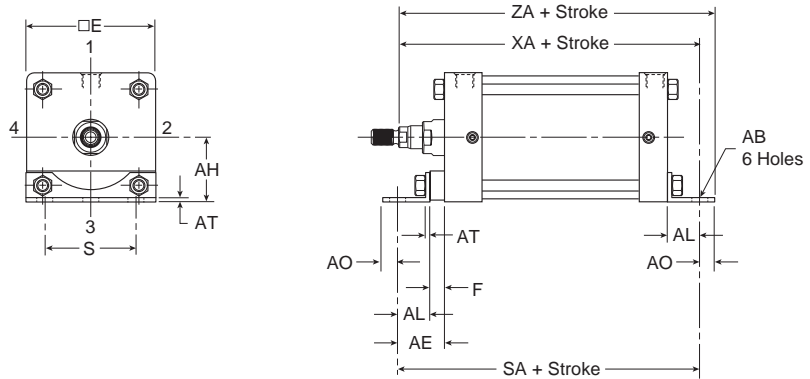
Tie Rod Cylinders
Actuator Products

Side End Angle*

Style CB
 (NFFA MS1)



Note:
 Dimension "S" is for the holes in the mount (not the screw to screw dimension)



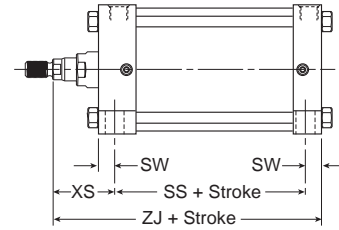
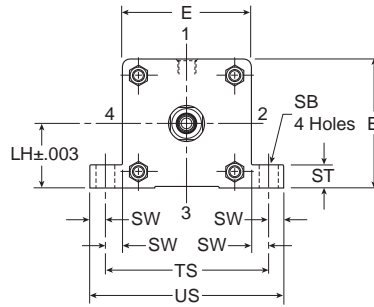
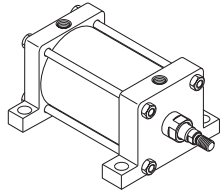
*Maximum recommended pressure for this mount is 150 PSIG

Style CB

Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AO	AT	E	F	S	Add stroke		
												SA	XA	ZA
6	1	1-3/8	0.813	2.125	3.250	1.375	0.625	0.188	6.500	0.750	5.250	8.500	8.000	8.625
	3	1-3/4	0.813	2.125	3.250	1.375	0.625	0.188	6.500	0.750	5.250	8.500	8.250	8.875
8	1	1-3/8	0.813	1.813	4.250	1.813	0.688	0.250	8.500	-	7.125	8.750	8.563	9.250
	3	1-3/4	0.813	1.813	4.250	1.813	0.688	0.250	8.500	-	7.125	8.750	8.813	9.500

Side Lug

Style C
 (NFPA MS2)

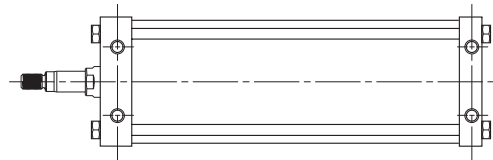
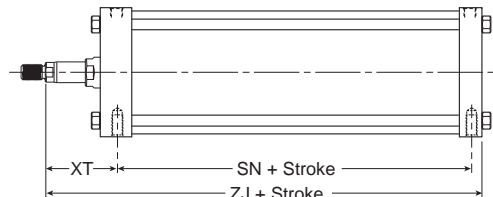
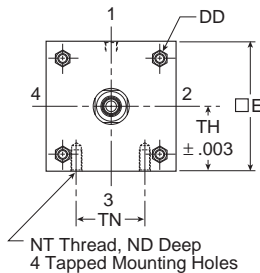
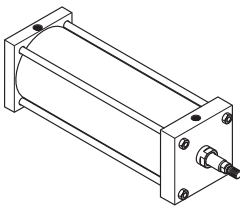


Style C

Bore size	Rod no.	Rod dia. MM	E	+/- .003 LH	SB	ST	SW	TS	US	XS	Add stroke	
											SS	ZJ
6	1	1-3/8	6.500	3.243	0.813	1.000	0.688	7.875	9.250	2.313	3.625	6.625
	3	1-3/4	6.500	3.243	0.813	1.000	0.688	7.875	9.250	2.563	3.625	6.875
8	1	1-3/8	8.500	4.243	0.813	1.000	0.688	9.875	11.250	2.313	3.750	6.750
	3	1-3/4	8.500	4.243	0.813	1.000	0.688	9.875	11.250	2.563	3.750	7.000

Side Tap

Style F
 (NFPA MS4)



Style F

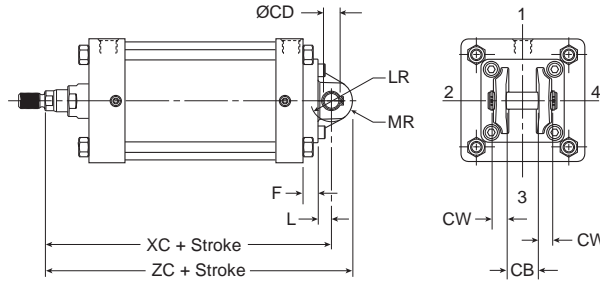
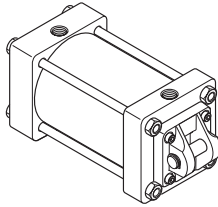
Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/- .003 TH	TN	XT	Add stroke	
									SN	ZJ
6	1	1-3/8	6.500	1.125	3/4-10	3.243	3.250	2.813	3.125	6.625
	3	1-3/4	6.500	1.125	3/4-10	3.243	3.250	3.063	3.125	6.875
8	1	1-3/8	8.500	1.125	3/4-10	4.243	4.500	2.813	3.250	6.750
	3	1-3/4	8.500	1.125	3/4-10	4.243	4.500	3.063	3.250	7.000

B
 Tie Rod Cylinders
 Actuator Products

Cap Fixed Clevis

Style BB
 (NFPA MP1)

Note: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.

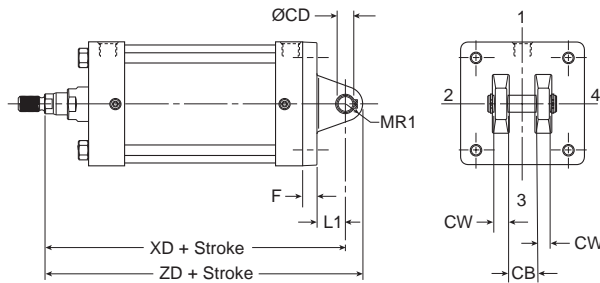
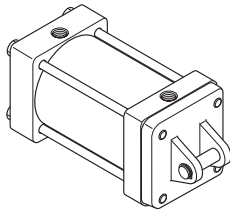


Cap Detachable Clevis

Style BC
 (NFPA MP2)

B

Tie Rod Cylinders
 Actuator Products

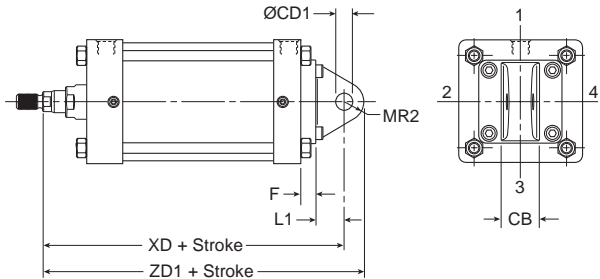
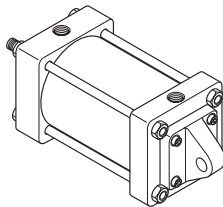


Styles BB and BC

Bore size	Rod no.	Rod dia. MM	CB	Rod dia. +.000 -0.002 CD	CW	E	F	L	LR	L1	MR	MR1	Add stroke			
													XC	XD	ZC	ZD
6	1	1-3/8	1.500	1.001	0.750	6.500	0.750	0.750	1.250	1.500	1.125	1.000	8.125	8.875	9.250	9.875
	3	1-3/4	1.500	1.001	0.750	6.500	0.750	0.750	1.250	1.500	1.125	1.000	8.375	9.125	9.500	10.125
8	1	1-3/8	1.500	1.001	0.750	8.500	0.750	0.750	1.250	1.500	1.125	1.000	8.250	9.000	9.375	10.000
	3	1-3/4	1.500	1.001	0.750	8.500	0.750	0.750	1.250	1.500	1.125	1.000	8.500	9.250	9.625	10.250

Cap Detachable Eye

Style BE
 (NFPA MP4)
 (only 6" Bore)

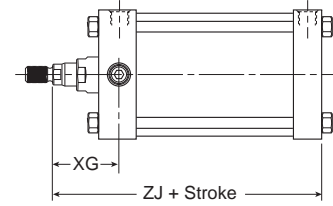
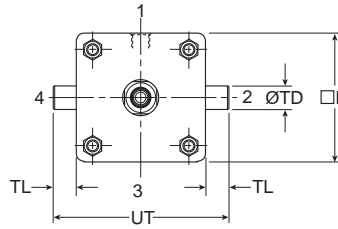
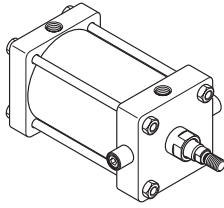


Style BE

Bore size	Rod no.	Rod dia. MM	CB	Rod dia. +.002 +.004 CD1	E	F	L1	MR2	Add stroke	
									XD	ZD1
6	1	1-3/8	1.500	1.000	6.500	0.750	1.500	1.125	8.875	10.000
	3	1-3/4	1.500	1.000	6.500	0.750	1.500	1.125	9.125	10.250

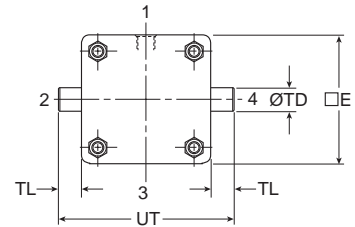
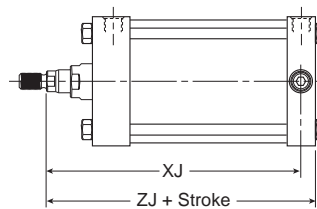
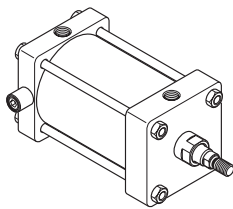
Head Trunnion

Style D
 (NFPA MT1)



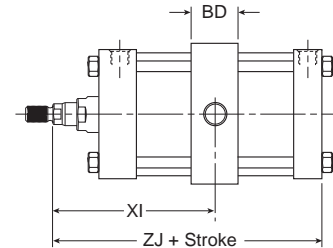
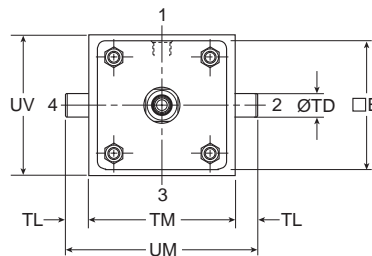
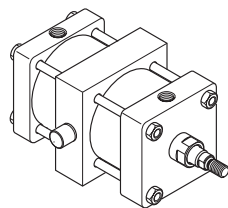
Cap Trunnion

Style DB
 (NFPA MT2)



Intermediate Trunnion

Style DD
 (NFPA MT4)



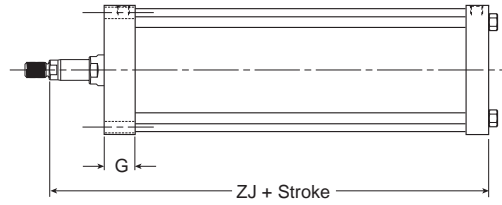
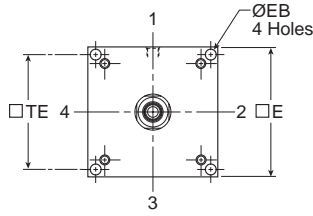
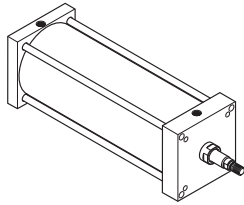
Styles D, DB and DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.000 -0.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke	
													XJ	ZJ
	1	1-3/8	6.500	2.500	1.375	1.375	7.625	10.375	9.250	7.000	2.625	4.813	5.875	6.625
6	3	1-3/4	6.500	2.500	1.375	1.375	7.625	10.375	9.250	7.000	2.875	5.063	6.125	6.875
	1	1-3/8	8.500	2.500	1.375	1.375	9.750	12.500	11.250	9.500	2.625	4.750	6.000	6.750
8	3	1-3/4	8.500	2.500	1.375	1.375	9.750	12.500	11.250	9.500	2.875	5.000	6.250	7.000

B
 Tie Rod Cylinders
 Actuator Products

Head Square

Style JB
 (NFPA ME3)

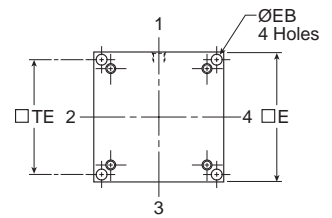
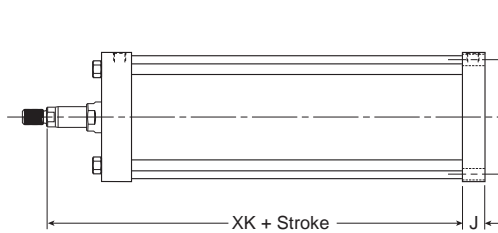
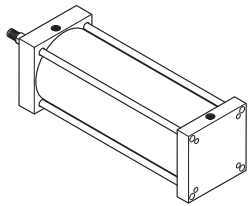


B

Tie Rod Cylinders
 Actuator Products

Cap Square

Style HB
 (NFPA ME4)



Styles JB and HB

Bore size	Rod no.	Rod dia. MM	E	EB	G	J	TE	Add stroke	
								XK	ZJ
8	1	1-3/8	8.500	0.688	1.810	1.440	7.570	5.313	6.750
	3	1-3/4	8.500	0.688	1.810	1.440	7.570	5.563	7.000

- Industry leading NFPA interchangeable rod lock cylinder with flexible construction
- Rod lock holding force equivalent to cylinder output force at 100 PSIG
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4", 5", 6" and 8"
- 17 standard styles mounting styles available
- Available in any practical stroke length
- Rod diameters – 5/8", 1", 1-3/8" and 1-3/4"
- Single rod end or double rod ends
- Adjustable cushions are standard at both ends
- Manual override feature standard on all configurations



Operating information

Operating pressure: 100 PSIG (7 bar) maximum air pressure, except 2" bore with 1" rod rated at 80 PSIG)
 60 PSIG (4.1 bar) minimum air pressure to release rod lock

Temperature range:
 Standard seals -10°F to 165°F (-23°C to 74°C)
 Fluorocarbon seals -10°F to 250°F (-23°C to 121°C)

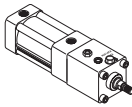
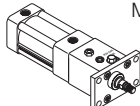
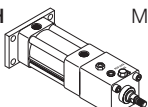
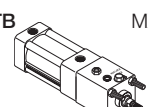
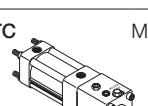
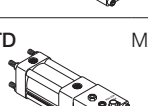
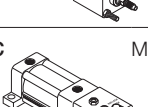
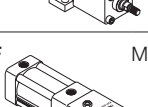
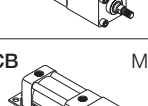
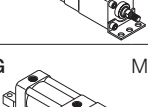
Filtration requirements: 40 micron, dry filtered air

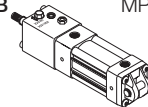
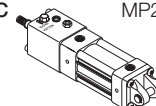
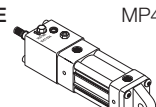
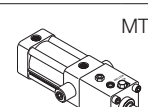
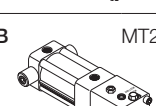
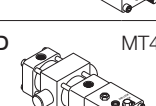
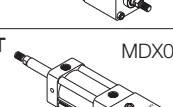
For technical information see CD

Ordering information

2.00	C	J	4MAJ	U	1	4	A	C	6.000																																		
Bore size 1.50 ¹ 2.00 2.50 3.25 4.00 5.00 6.00 ^{2, 11} 8.00 ^{2, 11}	Double Rod Cylinder ¹² Specify "K" only if double rod cylinder is required.	Mounting style Specify mounting style code (see table on following page).	Series 4MAJ 4MA rod lock cylinder 3MAJ 3MA rod lock cylinder	Ports ⁴ U NPTF R BSPP B BSPT T SAE	Piston rod number Specify rod code number for required diameter. ⁸	Special modification Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MAJ with Linear Position Sensor Option) ⁷	Stroke length Specify stroke length required in inches. ⁸	Cushion cap end C Cushioned cap end "C" is required	Piston rod thread type A Standard (UNF unified thread) W BSF British fine M* Metric																																		
Cushion head end C Cushioned head end "C" is required	Cylinder construction		Seals		Piston rod thread style		Rod material and gland code																																				
	<table border="1"> <tr><td>Blank*</td><td>Standard (extruded body, standard round lobe orientation)</td></tr> <tr><td>A*</td><td>Extruded body, round lobe orientation rotated 90 degrees from standard</td></tr> <tr><td>N*</td><td>Extruded body, round lobe orientation rotated 180 degrees from standard</td></tr> <tr><td>Z*</td><td>Extruded body, round lobe orientation rotated 270 degrees from standard</td></tr> <tr><td>T</td><td>Aluminum round tube and carbon steel tie rods & nuts</td></tr> </table>		Blank*	Standard (extruded body, standard round lobe orientation)	A*	Extruded body, round lobe orientation rotated 90 degrees from standard	N*	Extruded body, round lobe orientation rotated 180 degrees from standard	Z*	Extruded body, round lobe orientation rotated 270 degrees from standard	T	Aluminum round tube and carbon steel tie rods & nuts	<table border="1"> <tr><td>Blank</td><td>Standard (nitrile seals)</td></tr> <tr><td>V</td><td>Fluorocarbon seals^{2, 5}</td></tr> <tr><td>E</td><td>Fluorocarbon rod wiper and rod seal only⁶</td></tr> </table>		Blank	Standard (nitrile seals)	V	Fluorocarbon seals ^{2, 5}	E	Fluorocarbon rod wiper and rod seal only ⁶	<table border="1"> <tr><td>4</td><td>Small male</td></tr> <tr><td>8</td><td>Intermediate male</td></tr> <tr><td>9</td><td>Short female</td></tr> <tr><td>55</td><td>For use with split coupler⁹</td></tr> <tr><td>3</td><td>Special (and specify all dimensions required)</td></tr> </table>		4	Small male	8	Intermediate male	9	Short female	55	For use with split coupler ⁹	3	Special (and specify all dimensions required)	<table border="1"> <tr><td>Blank</td><td>Standard rod and gland</td></tr> <tr><td>H</td><td>Standard rod and HI LOAD gland</td></tr> <tr><td>Y</td><td>17-4 PH stainless steel rod and standard gland</td></tr> <tr><td>Z</td><td>17-4 PH stainless steel rod and HI LOAD gland</td></tr> </table>			Blank	Standard rod and gland	H	Standard rod and HI LOAD gland	Y	17-4 PH stainless steel rod and standard gland	Z	17-4 PH stainless steel rod and HI LOAD gland
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Piston type ¹¹	<table border="1"> <tr><td>Blank</td><td>Standard (lipseals and magnetic ring)¹²</td></tr> <tr><td>1</td><td>Lipseals, no magnetic ring¹²</td></tr> <tr><td>2</td><td>Lipseals, no magnetic ring (aluminum piston)</td></tr> <tr><td>3</td><td>Lipseals and magnetic ring (aluminum piston)</td></tr> <tr><td>4</td><td>Bumper seals, no magnetic ring</td></tr> <tr><td>6</td><td>Bumper seals and magnetic ring</td></tr> <tr><td>B</td><td>Lipseals, 1/4" thick bumpers both ends³</td></tr> <tr><td>H</td><td>Lipseals, 1/4" thick bumper head end³</td></tr> <tr><td>C</td><td>Lipseals, 1/4" thick bumper cap end³</td></tr> <tr><td>D</td><td>Lipseals and magnetic ring, 1/4" thick bumpers both ends³</td></tr> <tr><td>F</td><td>Lipseals and magnetic ring, 1/4" thick bumper head end³</td></tr> <tr><td>R</td><td>Lipseals and magnetic ring, 1/4" thick bumper cap end³</td></tr> </table>									Blank	Standard (lipseals and magnetic ring) ¹²	1	Lipseals, no magnetic ring ¹²	2	Lipseals, no magnetic ring (aluminum piston)	3	Lipseals and magnetic ring (aluminum piston)	4	Bumper seals, no magnetic ring	6	Bumper seals and magnetic ring	B	Lipseals, 1/4" thick bumpers both ends ³	H	Lipseals, 1/4" thick bumper head end ³	C	Lipseals, 1/4" thick bumper cap end ³	D	Lipseals and magnetic ring, 1/4" thick bumpers both ends ³	F	Lipseals and magnetic ring, 1/4" thick bumper head end ³	R	Lipseals and magnetic ring, 1/4" thick bumper cap end ³										
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<p>* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore.</p> <p>¹ Not available with 1" rod diameter (rod number 2) for 1-1/2" bore. Not available with Linear Position Sensor Option (LPSO).</p> <p>² Not available for 3MAJ, please specify 4MAJ.</p> <p>³ Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".</p> <p>⁴ Port thread styles only for base cylinder. Rod lock port is always NPTF. If a different rod lock port thread style is required, place an "S" for special in the Special Modification field and indicate the desired rod lock port thread style in the item notes. NPTF cylinder ports are not ordered for 3MAJ.</p> <p>⁵ Fluorocarbon seals for 4MAJ are only for external chemical compatibility applications, not high temperature.</p> <p>⁶ Used for external chemical compatibility applications, not high temperature.</p> <p>⁷ For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes: a. Sensor part number (please reference catalog 0900P-E, pages B100-B104) b. Sensor position c. Port position (if other than position 1) d. Length of stop tubing, gross stroke and net stroke (if required) LPSO not available for 3MAJ, please specify 4MAJ. Cylinder dimensions will</p> <p>⁸ Review Piston Rod Selection Chart, please reference catalog 0900P-E, on page A14 to determine proper piston rod diameter.</p> <p>⁹ For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.</p> <p>¹⁰ If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes. Not available with Piston Types (blank) and 1 for 1-1/2" - 5" bore cylinders. Stop tube not available for 3MAJ, please specify 4MAJ.</p> <p>¹¹ 6"-8" bore 4MAJ can accept only Piston Types (blank) and 3. The (blank) piston for 6"-8" bores is aluminum, lipseals, no magnetic ring. Composite pistons not available with oversize rod number 3.</p> <p>¹² Double rod cylinders not available with composite piston type.</p>																																											

3MAJ*/4MAJ Mounting Styles for 6" to 8" Bore

Mounting style	NFPA mounting	Description	Bore size
T 	MX0	No Mount	1-1/2 - 8
J 	MF1	Head Rectangular Flange	1-1/2 - 6
H 	MF2	Cap Rectangular Flange	1-1/2 - 6
TB 	MX3	Tie Rods Extended Head End	1-1/2 - 8
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 8
TD 	MX1	Tie Rods Extended Both Ends	1-1/2 - 8
C 	MS2	Side Lug	1-1/2 - 8
F 	MS4	Side Tap	1-1/2 - 8
CB 	MS1	Side End Angle	1-1/2 - 8
G 	MS7	Side End Lug	1-1/2 - 4

Mounting style	NFPA mounting	Description	Bore size
BB 	MP1	Cap Fixed Clevis	1-1/2 - 8
BC 	MP2	Cap Detachable Clevis	1-1/2 - 8
BE 	MP4	Cap Detachable Eye	1-1/2 - 6
D 	MT1	Head Trunnion	1-1/2 - 8
DB 	MT2	Cap Trunnion	1-1/2 - 8
DD 	MT4	Intermediate Trunnion	1-1/2 - 8
KT 	MDX0	Double Rod End, No Mount	1-1/2 - 8

* 3MAJ utilizes base 3MA cylinder and is available in 1-1/2" to 5" bore sizes. Mounting style codes C, D and DB not available for 3MAJ

B

Tie Rod Cylinders
 Actuator Products

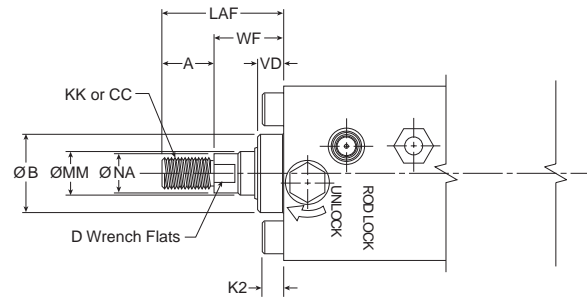
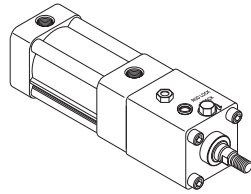
Sensors

For sensors see page B296.

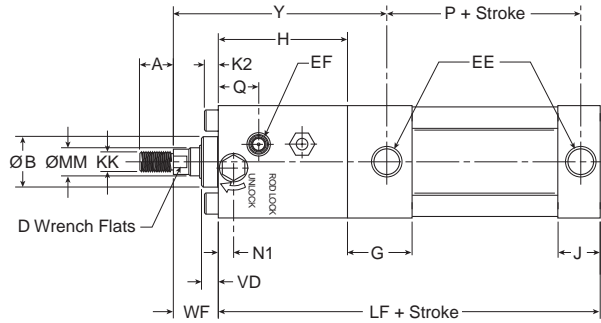
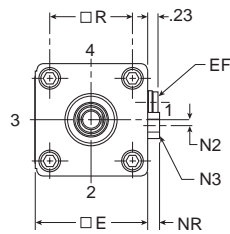


3MAJ/4MAJ Series Single Rod Dimensions

No Mount Basic
 Style T
 (NFPA MX0)



For dimensions of all standard rod end styles, see next page.



Style T

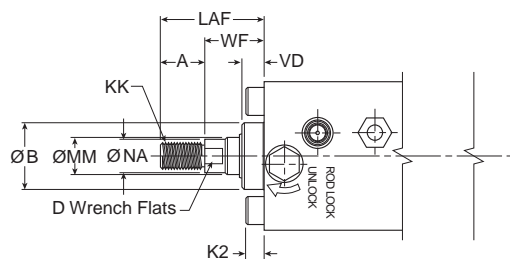
Bore size	Rod no.	Rod dia. MM	Thread		A	AA	+.000 -.002 B	D	E	EE (NPTF)	EF (NPTF)	G	H	J
			Style 8 CC	Style 4 & 9 KK										
1-1/2	1	5/8	1/2-20	7/16-20	0.750	2.020	1.124	1/2	2.000	3/8	1/8	1.438	2.625	0.938
	2	5/8	1/2-20	7/16-20	0.750	2.600	1.124	1/2	2.500	3/8	1/8	1.375	2.875	0.937
2	3	1	7/8-14	3/4-16	1.125	2.600	1.499	7/8	2.500	3/8	1/8	1.375	3.875	0.937
	1	5/8	1/2-20	7/16-20	0.750	3.100	1.124	1/2	3.000	3/8	1/8	1.344	2.875	0.938
2-1/2	3	1	7/8-14	3/4-16	1.125	3.100	1.499	7/8	3.000	3/8	1/8	1.344	4.000	0.938
	1	1	7/8-14	3/4-16	1.125	3.900	1.499	7/8	3.750	1/2	1/4	1.594	4.500	1.125
3-1/4	3	1-3/8	1-1/4-12	1-14	1.625	3.900	1.999	1-1/8	3.750	1/2	1/4	1.594	4.875	1.125
	1	1	7/8-14	3/4-16	1.125	4.700	1.499	7/8	4.500	1/2	1/4	1.594	4.875	1.125
4	3	1-3/8	1-1/4-12	1-14	1.625	4.700	1.999	1-1/8	4.500	1/2	1/4	1.594	5.125	1.125
	1	1	7/8-14	3/4-16	1.125	5.800	1.499	7/8	5.500	1/2	1/4	1.594	5.375	1.219
5	3	1-3/8	1-1/4-12	1-14	1.625	5.800	1.999	1-1/8	5.500	1/2	1/4	1.594	5.750	1.219

Bore size	Rod no.	Rod dia. MM	K2	LAF	N1	N2	Hex N3	NA	NR	Q	R	VD	WF	Y	Add stroke	
															LF	P
1-1/2	1	5/8	0.250	1.750	0.220	0.140	5/16	0.563	0.190	0.715	1.430	0.375	1.000	4.500	6.250	2.313
	2	5/8	0.313	1.750	0.340	0.130	1/2	0.563	0.265	0.895	1.840	0.375	1.000	4.750	6.500	2.313
2	3	1	0.313	2.500	0.338	0.146	1/2	0.938	0.275	1.065	1.840	0.500	1.375	6.125	7.500	2.313
	1	5/8	0.313	1.750	0.346	0.150	1/2	0.563	0.265	0.755	2.190	0.500	1.000	4.813	6.625	2.375
2-1/2	3	1	0.313	2.500	0.346	0.148	1/2	0.938	0.265	1.120	2.190	0.500	1.375	6.313	7.750	2.375
	1	1	0.375	2.500	0.631	0.180	5/8	0.938	0.340	1.510	2.760	0.500	1.375	6.938	8.750	2.625
3-1/4	3	1-3/8	0.375	3.250	0.813	0.247	5/8	1.313	0.350	1.645	2.760	0.625	1.625	7.563	9.125	2.625
	1	1	0.375	2.500	0.625	0.240	7/8	0.938	0.500	1.725	3.320	0.500	1.375	7.313	9.125	2.625
4	3	1-3/8	0.375	3.250	0.771	0.276	7/8	1.313	0.490	1.679	3.320	0.750	1.625	7.813	9.375	2.625
	1	1	0.500	2.500	0.720	0.220	7/8	0.938	0.500	1.995	4.100	0.500	1.375	7.813	9.875	2.875
5	3	1-3/8	0.500	3.250	0.720	0.220	7/8	1.313	0.490	2.330	4.100	0.750	1.625	8.438	10.250	2.875

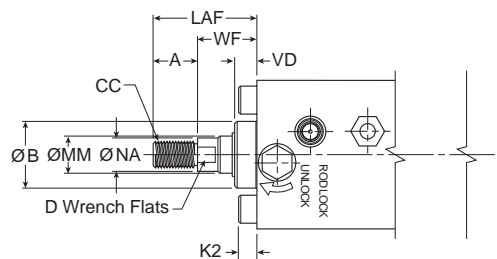
B
 Tie Rod Cylinders
 Actuator Products

Rod End Dimensions

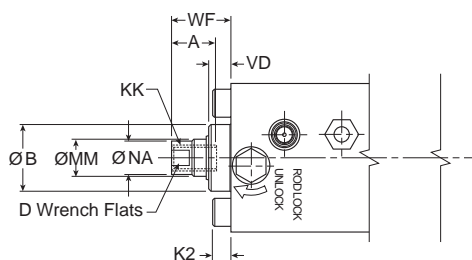
Thread Style 4
 (NFPA Style SM)
 Small Male



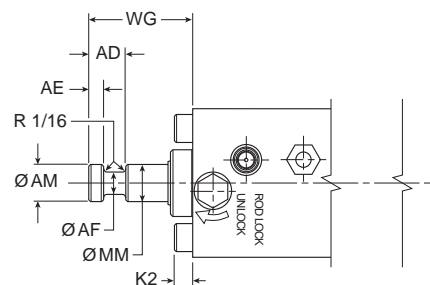
Thread Style 8
 (NFPA Style IM)
 Intermediate Male



Thread Style 9
 (NFPA Style SF)
 Short Female



Thread Style 55
 For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - “Special Thread”

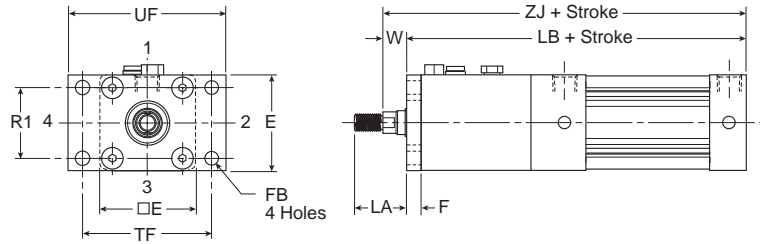
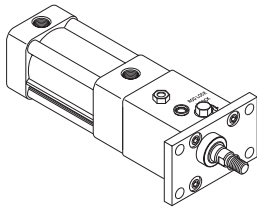
Special threads, rod extensions, rod eyes, blanks, etc. are also available. To order, specify “Style 3” and give desired dimensions for KK or CC, A and W or WF. If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		A	AD	AE	AF	AM	B	D	K2	LAF	NA	VD	WF	WG
			Style 8 CC	Style 4 & 9 KK													
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	1/2	0.250	1.750	0.563	0.375	1.000	1.750
	2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.313	1.750	0.563	0.375	1.000	1.750
2	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.313	2.500	0.938	0.500	1.375	2.375
	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	1/2	0.313	1.750	0.563	0.500	1.000	1.750
2-1/2	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.313	2.500	0.938	0.500	1.375	2.375
	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.375	2.500	0.938	0.500	1.375	2.375
3-1/4	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.375	3.250	1.313	0.625	1.625	2.750
	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.375	2.500	0.938	0.500	1.375	2.375
4	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.375	3.250	1.313	0.750	1.625	2.750
	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.500	2.500	0.938	0.500	1.375	2.375
5	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.500	3.250	1.313	0.750	1.625	2.750

Head Rectangular Flange

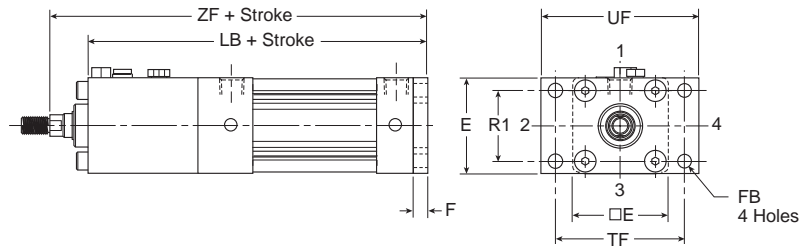
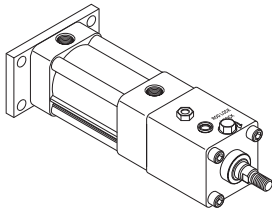
Style J
 (NFPA MF1)



Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J. For reference, $WF = W + F$ and $LA = W + A$.

Cap Rectangular Flange

Style H
 (NFPA MF2)



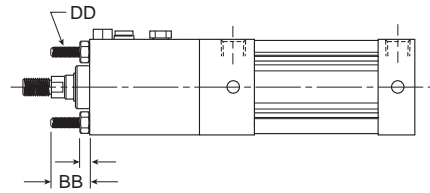
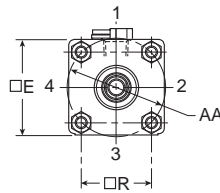
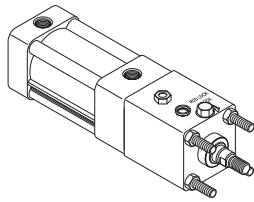
Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	Add stroke			
											W	LB	ZF	ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	6.625	7.625	7.250
	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	6.875	7.875	7.500
2	3	1	1.125	2.500	0.375	0.375	2.125	1.840	3.375	4.125	1.000	7.875	9.250	8.875
	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	7.000	8.000	7.625
2-1/2	3	1	1.125	3.000	0.375	0.375	2.125	2.190	3.875	4.625	1.000	8.125	9.500	9.125
	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	9.375	10.750	10.125
3-1/4	3	1-3/8	1.625	3.750	0.625	0.438	2.625	2.760	4.688	5.500	1.000	9.750	11.375	10.750
	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	9.750	11.125	10.500
4	3	1-3/8	1.625	4.500	0.625	0.438	2.625	3.320	5.438	6.250	1.000	10.000	11.625	11.000
	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	10.500	11.875	11.250
5	3	1-3/8	1.625	5.500	0.625	0.563	2.625	4.100	6.625	7.625	1.000	10.875	12.500	11.875

B
 Tie Rod Cylinders
 Actuator Products

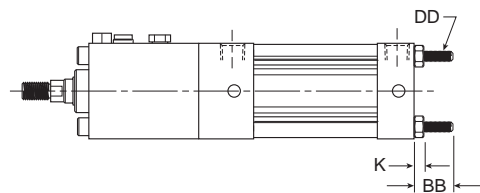
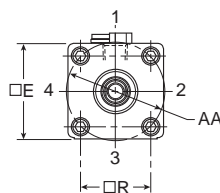
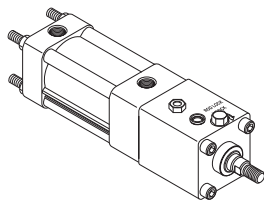
Tie Rods Extended Head End Mount

Style TB
 (NFFPA MX3)



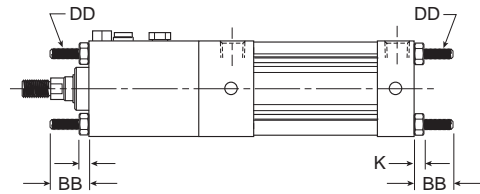
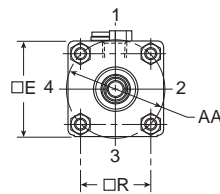
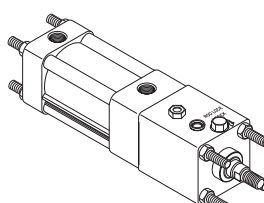
Tie Rods Extended Cap End Mount

Style TC
 (NFFPA MX2)



Tie Rods Extended Both Ends Mount

Style TD
 (NFFPA MX1)



B

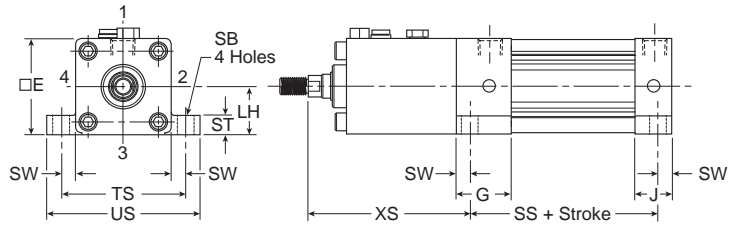
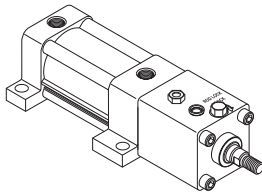
Tie Rod Cylinders
 Actuator Products

Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R
1-1/2	1	5/8	2.020	1.000	1/4-28	2.000	0.250	1.430
2	1	5/8	2.600	1.125	5/16-24	2.500	0.313	1.840
	3	1	2.600	1.125	5/16-24	2.500	0.313	1.840
2-1/2	1	5/8	3.100	1.125	5/16-24	3.000	0.313	2.190
	3	1	3.100	1.125	5/16-24	3.000	0.313	2.190
3-1/4	1	1	3.900	1.375	3/8-24	3.750	0.375	2.760
	3	1-3/8	3.900	1.375	3/8-24	3.750	0.375	2.760
4	1	1	4.700	1.375	3/8-24	4.500	0.375	3.320
	3	1-3/8	4.700	1.375	3/8-24	4.500	0.375	3.320
5	1	1	5.800	1.813	1/2-20	5.500	0.438	4.100
	3	1-3/8	5.800	1.813	1/2-20	5.500	0.438	4.100

Side Lug Mount

Style C (only 4MAJ)
 (NFPA MS2)

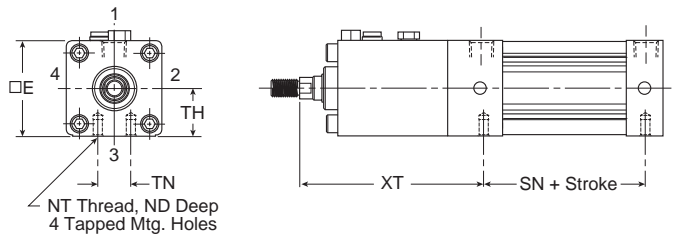
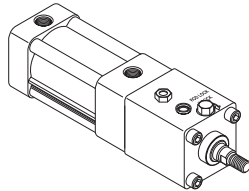


Style C

Bore size	Rod no.	Rod dia. MM	E	G	J	+/- .003 LH	SB	ST	SW	TS	US	XS	Add stroke SS
1-1/2	1	5/8	2.000	1.438	0.938	0.993	0.438	0.500	0.375	2.750	3.500	4.000	2.875
	2	5/8	2.500	1.375	0.937	1.243	0.438	0.500	0.375	3.250	4.000	4.250	2.875
2	3	1	2.500	1.375	0.937	1.243	0.438	0.500	0.375	3.250	4.000	5.625	2.875
	1	5/8	3.000	1.344	0.938	1.493	0.438	0.500	0.375	3.750	4.500	4.250	3.000
2-1/2	3	1	3.000	1.344	0.938	1.493	0.438	0.500	0.375	3.750	4.500	5.750	3.000
	1	1	3.750	1.594	1.125	1.868	0.563	0.750	0.500	4.750	5.750	6.375	3.250
3-1/4	3	1-3/8	3.750	1.594	1.125	1.868	0.563	0.750	0.500	4.750	5.750	7.000	3.250
	1	1	4.500	1.594	1.125	2.243	0.563	0.750	0.500	5.500	6.500	6.750	3.250
4	3	1-3/8	4.500	1.594	1.125	2.243	0.563	0.750	0.500	5.500	6.500	7.250	3.250
	1	1	5.500	1.594	1.219	2.743	0.813	1.000	0.688	6.875	8.250	7.438	3.125
5	3	1-3/8	5.500	1.594	1.219	2.743	0.813	1.000	0.688	6.875	8.250	8.063	3.125

Side Tap Mount

Style F
 (NFPA MS4)



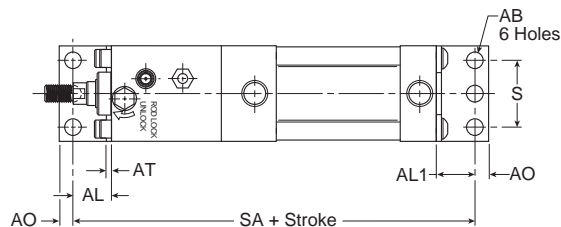
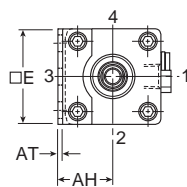
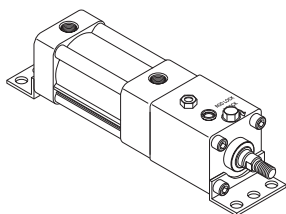
Style F

Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/- .003 TH	TN	XT	Add stroke SN
1-1/2	1	5/8	2.000	0.375	1/4-20	0.993	0.625	4.563	2.250
	2	5/8	2.500	0.438	5/16-18	1.243	0.875	4.813	2.250
2	3	1	2.500	0.375	5/16-18	1.243	0.875	6.188	2.250
	1	5/8	3.000	0.625	3/8-16	1.493	1.250	4.813	2.375
2-1/2	3	1	3.000	0.625	3/8-16	1.493	1.250	6.313	2.375
	1	1	3.750	0.750	1/2-13	1.868	1.500	6.938	2.625
3-1/4	3	1-3/8	3.750	0.750	1/2-13	1.868	1.500	7.563	2.625
	1	1	4.500	0.750	1/2-13	2.243	2.063	7.313	2.625
4	3	1-3/8	4.500	0.750	1/2-13	2.243	2.063	7.813	2.625
	1	1	5.500	0.938	5/8-11	2.743	2.688	7.813	2.875
5	3	1-3/8	5.500	0.938	5/8-11	2.743	2.688	8.438	2.875

B
 Tie Rod Cylinders
 Actuator Products

Side End Angle Mount

Style CB
 (NFPA MS1)



Style CB

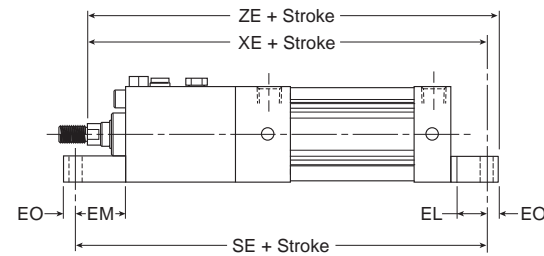
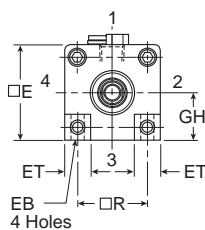
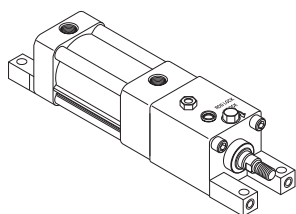
Bore size	Rod no.	Rod dia. MM	AB	AH	AL	AL1	AO	AT	E	S	Add stroke
											SA
1-1/2	1	5/8	0.438	1.188	1.000	1.000	0.375	0.125	2.000	1.250	8.250
	3	1	0.438	1.438	1.000	1.000	0.375	0.125	2.500	1.750	8.500
2	1	5/8	0.438	1.625	1.000	1.000	0.375	0.125	3.000	2.250	8.625
	3	1	0.438	1.625	1.000	1.000	0.375	0.125	3.000	2.250	9.750
2-1/2	1	5/8	0.563	1.938	1.250	1.250	0.500	0.125	3.750	2.750	11.250
	3	1-3/8	0.563	1.938	1.250	1.250	0.500	0.125	3.750	2.750	11.625
3-1/4	1	1	0.563	2.250	1.875	1.250	0.500	0.125	4.500	3.500	12.250
	3	1-3/8	0.563	2.250	1.875	1.250	0.500	0.125	4.500	3.500	12.500
4	1	1	0.688	2.750	1.375	1.375	0.625	0.188	5.500	4.250	12.625
	3	1-3/8	0.688	2.750	1.375	1.375	0.625	0.188	5.500	4.250	13.000

B

Tie Rod Cylinders
 Actuator Products

Side End Lug Mount

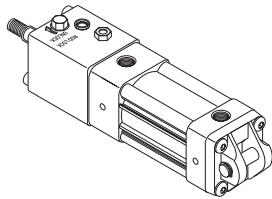
Style G
 (NFPA MS7)



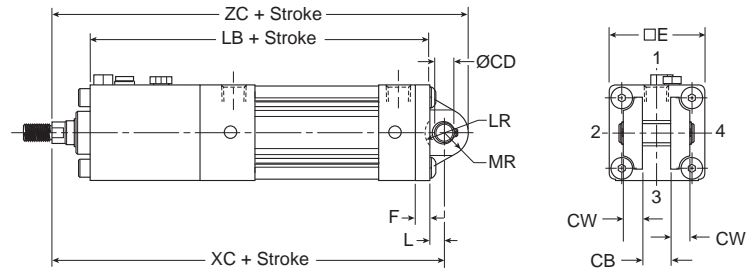
Style G

Bore size	Rod no.	Rod dia. MM	E	EB	EL	EM	EO	ET	+/- .003 GH	R	Add stroke		
											SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	8.125	8.000	8.250
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	8.750	8.438	8.750
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	9.750	9.813	10.125
	3	1	2.500	0.344	1.063	1.438	0.313	0.813	1.493	2.190	9.125	8.688	9.000
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	10.250	10.188	10.500
	3	1	3.000	0.406	0.875	1.500	0.375	1.000	1.868	2.760	11.125	11.000	11.375
3-1/4	1	1	3.750	0.406	1.000	1.625	0.375	1.188	2.243	3.320	11.750	11.500	11.875
	3	1-3/8	3.750	0.406	1.000	1.625	0.375	1.188	2.243	3.320	12.000	12.000	12.375

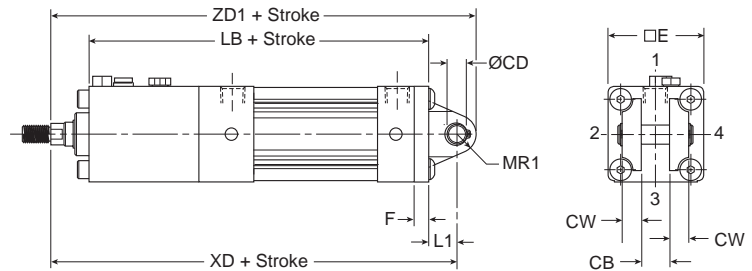
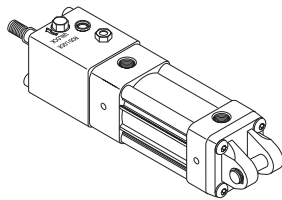
Cap Fixed Clevis Mount
 Style BB
 (NFPA MP1)



NOTE: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.



Cap Detachable Clevis Mount
 Style BC
 (NFPA MP2)



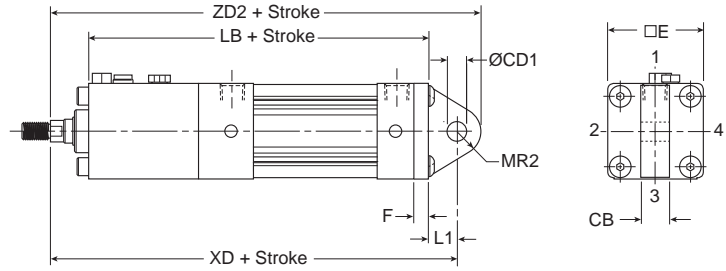
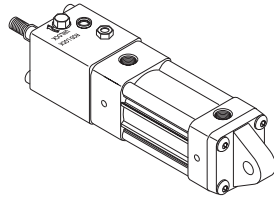
Styles BB and BC

Bore size	Rod no.	Rod dia. MM	CB	+.000 -.002 CD	CW	E	F	L	L1	LR	MR	MR1	Add stroke				
													LB	XC	XD	ZC	ZD1
1-1/2	1	5/8	0.750	0.501	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	6.625	8.000	8.375	8.625	8.875
	1	5/8	0.750	0.501	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	6.875	8.250	8.625	8.875	9.125
2	3	1	0.750	0.501	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	7.875	9.625	10.000	10.250	10.500
	1	5/8	0.750	0.501	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	7.000	8.375	8.750	9.000	9.250
2-1/2	3	1	0.750	0.501	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	8.125	9.875	10.250	10.500	10.750
	1	1	1.250	0.751	0.625	3.750	0.625	0.625	1.250	1.000	0.938	0.750	9.375	11.375	12.000	12.313	12.750
3-1/4	3	1-3/8	1.250	0.751	0.625	3.750	0.625	0.625	1.250	1.000	0.938	0.750	9.750	12.000	12.625	12.938	13.375
	1	1	1.250	0.751	0.625	4.500	0.625	0.625	1.250	1.000	0.938	0.750	9.750	11.750	12.375	12.688	13.125
4	3	1-3/8	1.250	0.751	0.625	4.500	0.625	0.625	1.250	1.000	0.938	0.750	10.000	12.250	12.875	13.188	13.625
	1	1	1.250	0.751	0.625	5.500	0.625	0.625	1.250	1.000	0.938	0.750	10.500	12.500	13.125	13.438	13.875
5	3	1-3/8	1.250	0.751	0.625	5.500	0.625	0.625	1.250	1.000	0.938	0.750	10.875	13.125	13.750	14.063	14.500

Cap Detachable Eye Mount*

Style BE
 (NFPA MP4)

* Not available for
 5" bore 3MAJ,
 please specify 4MAJ.



Style BE

Bore size	Rod no.	Rod dia. MM	CB	+0.002 +0.004 CD1	E	F	L1	MR2	Add Stroke		
									LB	XD	ZD2
1-1/2	1	5/8	0.750	0.500	2.000	0.375	0.750	0.625	6.625	8.375	9.000
	3	1	0.750	0.500	2.500	0.375	0.750	0.625	7.875	10.000	10.625
2	1	5/8	0.750	0.500	2.500	0.375	0.750	0.625	6.875	8.625	9.250
	3	1	0.750	0.500	2.500	0.375	0.750	0.625	7.875	10.000	10.625
2-1/2	1	5/8	0.750	0.500	3.000	0.375	0.750	0.688	7.000	8.750	9.438
	3	1	0.750	0.500	3.000	0.375	0.750	0.688	8.125	10.250	10.938
3-1/4	1	1	1.250	0.750	3.750	0.625	1.250	0.875	9.375	12.000	12.875
	3	1-3/8	1.250	0.750	3.750	0.625	1.250	0.875	9.750	12.625	13.500
4	1	1	1.250	0.750	4.500	0.625	1.250	0.875	9.750	12.375	13.250
	3	1-3/8	1.250	0.750	4.500	0.625	1.250	0.875	10.000	12.875	13.750
5 *	1	1	1.250	0.750	5.500	0.625	1.250	0.875	10.500	13.125	14.000
	3	1-3/8	1.250	0.750	5.500	0.625	1.250	0.875	10.875	13.750	14.625

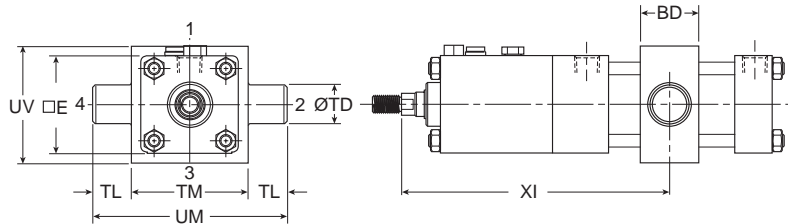
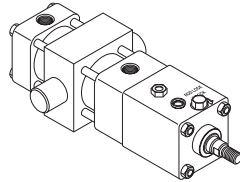
B

Tie Rod Cylinders
 Actuator Products

Intermediate Trunnion Mount

Style DD
 (NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of external hex.



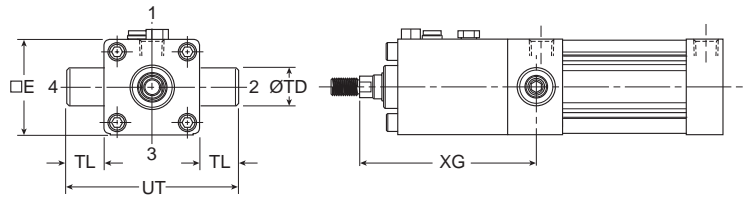
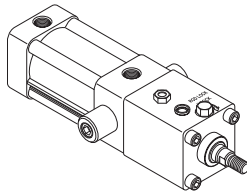
Note: Style DD requires minimum stroke per table.

Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.000 -0.001 TD	TL	TM	UM	UV	Min. XI	Min. stroke
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	3.000	6.00	4.000
	3	1	2.500	1.500	1.000	1.000	3.000	5.000	3.000	7.38	4.000
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	3.500	5.97	3.875
	3	1	3.000	1.500	1.000	1.000	3.500	5.500	3.500	7.47	3.875
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	4.250	13.72	4.375
	3	1-3/8	3.750	2.000	1.000	1.000	4.500	6.500	4.250	14.34	4.375
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	5.000	14.09	4.875
	3	1-3/8	4.500	2.000	1.000	1.000	5.250	7.250	5.000	14.59	4.875
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	6.000	16.34	5.125
	3	1-3/8	5.500	2.000	1.000	1.000	6.250	8.250	6.000	16.97	5.125

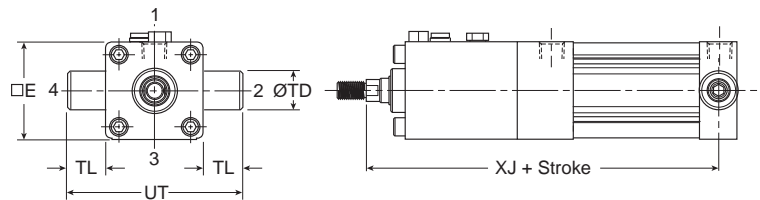
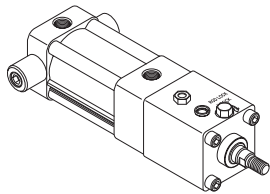
Head Trunnion Mount

Style D (only 4MAJ)
 (NFPA MT1)



Cap Trunnion Mount

Style DB (only 4MAJ)
 (NFPA MT2)

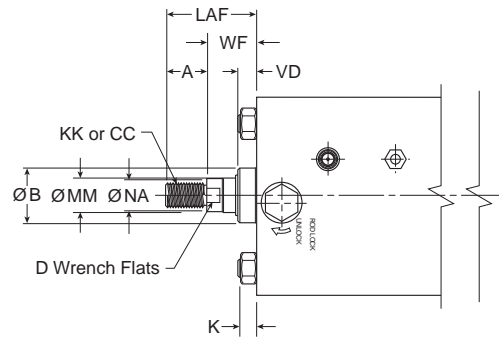
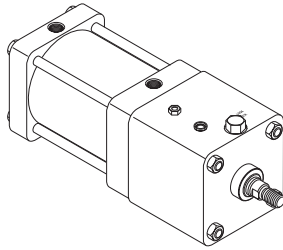


Styles D and DB

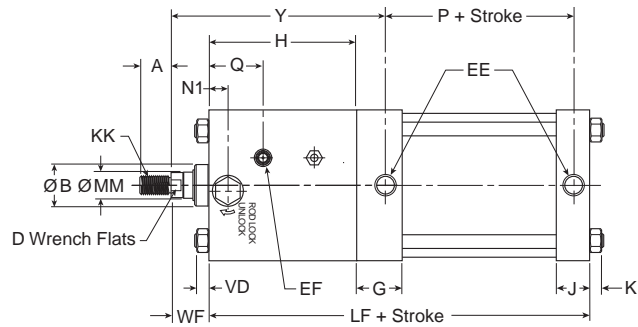
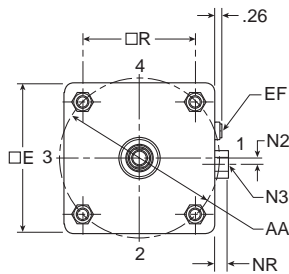
Bore size	Rod no.	Rod dia. MM	E	+0.000 -0.001 TD	TL	UT	XG	XJ
1-1/2	1	5/8	2.000	1.000	1.000	4.000	4.375	6.750
	3	1	2.500	1.000	1.000	4.500	6.000	8.375
2	1	5/8	2.500	1.000	1.000	4.500	4.625	7.000
	3	1	2.500	1.000	1.000	4.500	6.000	8.375
2-1/2	1	5/8	3.000	1.000	1.000	5.000	4.625	7.125
	3	1	3.000	1.000	1.000	5.000	6.125	8.625
3-1/4	1	1	3.750	1.000	1.000	5.750	6.750	9.500
	3	1-3/8	3.750	1.000	1.000	5.750	7.375	10.125
4	1	1	4.500	1.000	1.000	6.500	7.125	9.875
	3	1-3/8	4.500	1.000	1.000	6.500	7.625	10.375
5	1	1	5.500	1.000	1.000	7.500	7.625	10.625
	3	1-3/8	5.500	1.000	1.000	7.500	8.250	11.250

B
 Tie Rod Cylinders
 Actuator Products

No Mount
 Style T
 (NFPA MX0)



For dimensions of all standard rod end styles, see next page.



B

Tie Rod Cylinders
 Actuator Products

Style T

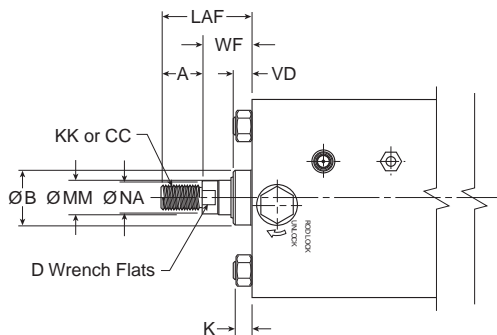
Bore size	Rod no.	Rod dia. MM	Thread		A	AA	B	D	E	EE (NPTF)	EF (NPTF)	G	H	J
			Style 8 CC	Style 4 & 9 KK										
6	1	1-3/8	1-1/4 - 12	1-14	1.625	6.900	1.999	1-1/8	6.500	3/4	1/4	1.910	6.375	1.410
	3	1-3/4	1-1/2 - 12	1-1/4 - 12	2.000	6.900	2.374	1-1/2	6.500	3/4	1/4	1.910	6.875	1.410
8	1	1-3/8	1-1/4 - 12	1-14	1.625	9.100	1.999	1-1/8	8.500	3/4	1/4	1.810	6.625	1.440
	3	1-3/4	1-1/2 - 12	1-1/4 - 12	2.000	9.100	2.374	1-1/2	8.500	3/4	1/4	1.810	7.125	1.440

Bore size	Rod no.	Rod dia. MM	K	LAF	N1	N2	Hex N3	NA	NR	Q	R	VD	WF	Y	Add stroke	
															LF	P
6	1	1-3/8	0.438	3.250	1.165	0.177	1-5/16	1.313	0.750	2.705	4.880	0.755	1.625	9.188	11.375	3.125
	3	1-3/4	0.438	3.875	1.495	0.177	1-5/16	1.688	0.740	3.055	4.880	0.875	1.875	9.938	11.875	3.125
8	1	1-3/8	0.563	3.250	1.305	0.177	1-5/16	1.313	0.740	2.885	6.440	0.755	1.625	9.375	11.750	3.250
	3	1-3/4	0.563	3.875	1.570	0.177	1-5/16	1.688	0.740	3.145	6.440	0.875	1.875	10.125	12.250	3.250

Rod End Dimensions – 6" to 8" Bore Sizes

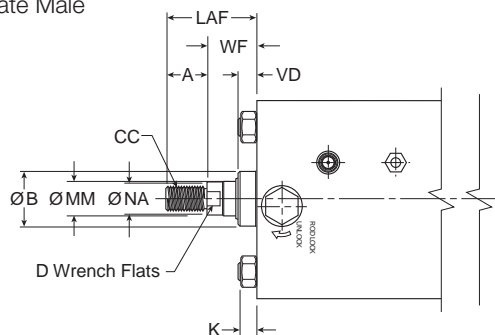
Thread Style 4

(NFPA Style SM)
 Small Male



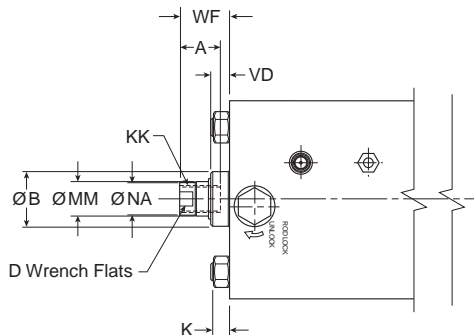
Thread Style 8

(NFPA Style IM)
 Intermediate Male



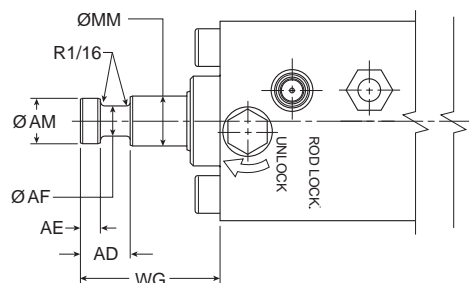
Thread Style 9

(NFPA Style SF)
 Short Female



Thread Style 55

For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available.
 To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
 If otherwise special, please supply dimensioned sketch.

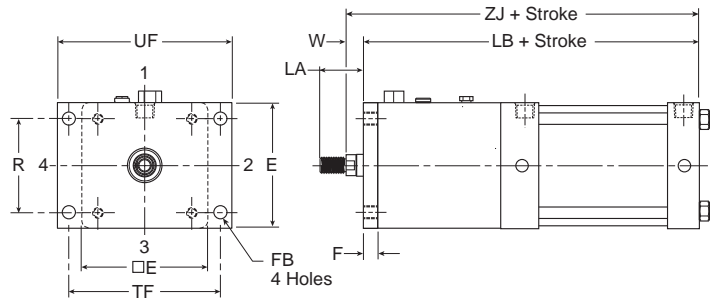
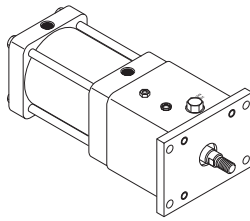
Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		A	AD	AE	AF	AM	+0.000 -0.002 B	D	K	LAF	NA	VD	WF	WG
			Style 8 CC	Style 4 & 9 KK													
6	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.438	3.250	1.313	0.755	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	1-1/2	0.438	3.875	1.688	0.875	1.875	3.125
8	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.563	3.250	1.313	0.755	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	1-1/2	0.563	3.875	1.688	0.875	1.875	3.125

B
 Tie Rod Cylinders
 Actuator Products

Head Rectangular Flange Mount

Style J
 (NFPA MF1)
 (only 6" Bore)



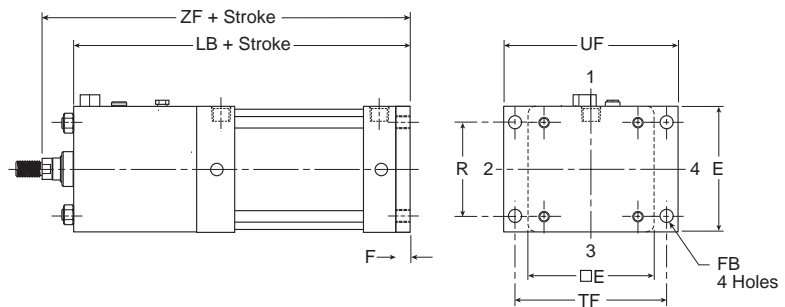
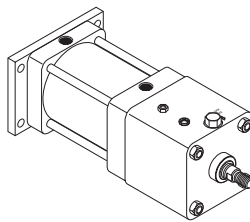
Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.
 For reference, $WF = W + F$ and $LA = W + A$.

B

Tie Rod Cylinders
 Actuator Products

Cap Rectangular Flange Mount

Style H
 (NFPA MF2)
 (only 6" Bore)

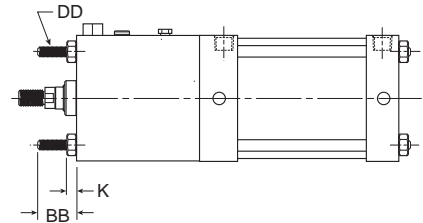
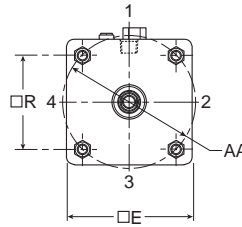
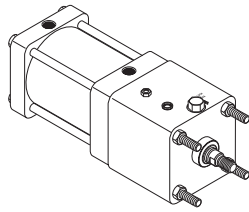


Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R	TF	UF	W	Add stroke		
												LB	ZF	ZJ
6	1	1-3/8	1.625	6.500	0.750	0.563	2.500	4.880	7.625	8.625	0.875	12.125	13.750	13.000
	3	1-3/4	2.000	6.500	0.750	0.563	3.125	4.880	7.625	8.625	1.125	12.625	14.500	13.750

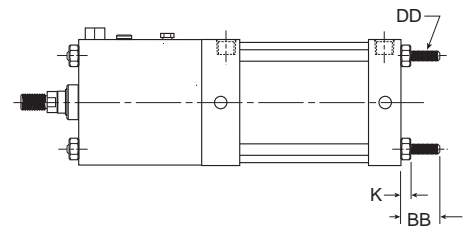
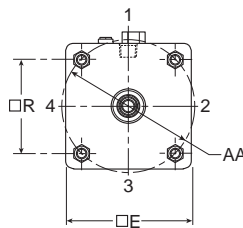
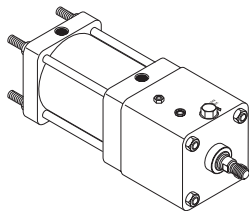
Tie Rods Extended Head End Mount

Style TB
 (NFPA MX3)



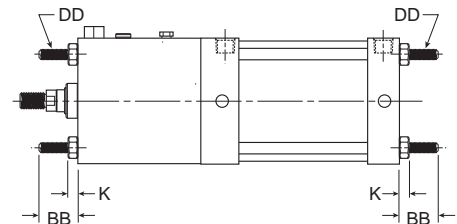
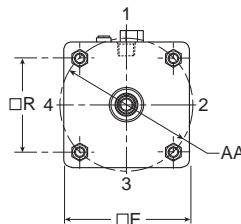
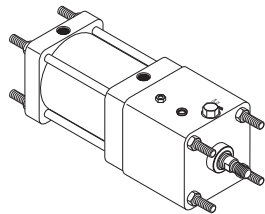
Tie Rods Extended Cap End Mount

Style TC
 (NFPA MX2)



Tie Rods Extended Both Ends Mount

Style TD
 (NFPA MX1)



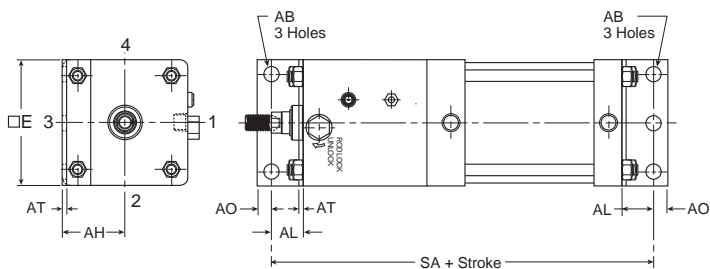
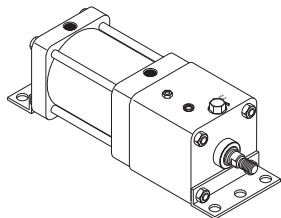
Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R
6	1	1-3/8	6.900	1.813	1/2-20	6.500	0.438	4.880
	3	1-3/4	6.900	1.813	1/2-20	6.500	0.438	4.880
8	1	1-3/8	9.100	2.313	5/8-18	8.500	0.563	6.440
	3	1-3/4	9.100	2.313	5/8-18	8.500	0.563	6.440

B
 Tie Rod Cylinders
 Actuator Products

Side End Angle Mount

Style CB
 (NFPA MS1)



Style CB

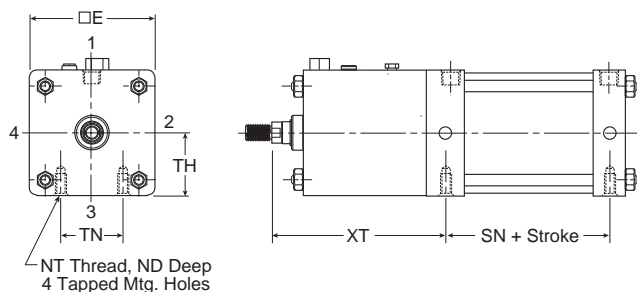
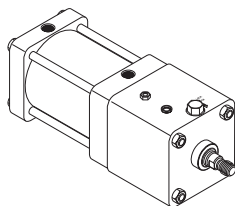
Bore size	Rod no.	Rod dia. MM	AB	AH	AL	AO	AT	E	S	Add stroke SA
6	1	1-3/8	0.813	3.250	1.375	0.625	0.188	6.500	5.250	14.125
	3	1-3/4	0.813	3.250	1.375	0.625	0.188	6.500	5.250	14.625
8	1	1-3/8	0.813	4.250	1.813	0.688	0.250	8.500	7.125	15.375
	3	1-3/4	0.813	4.250	1.813	0.688	0.250	8.500	7.125	15.875

B

Tie Rod Cylinders
 Actuator Products

Side Tap Mount

Style F
 (NFPA MS4)

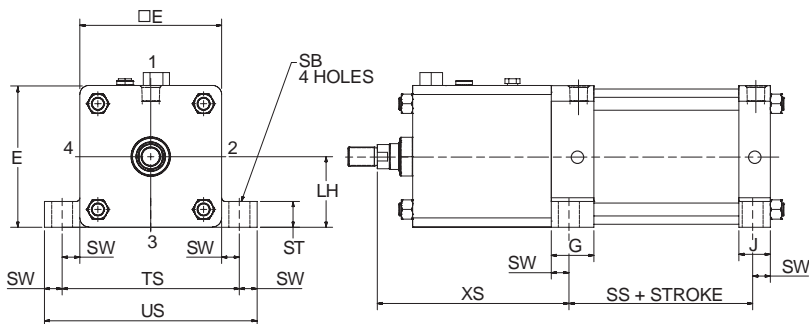
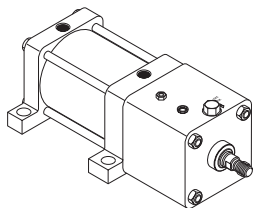


Style F

Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/- .003 TH	TN	XT	Add stroke SN
6	1	1-3/8	6.500	1.125	3/4-10	3.243	3.250	9.188	3.125
	3	1-3/4	6.500	1.125	3/4-10	3.243	3.250	9.938	3.125
8	1	1-3/8	8.500	1.125	3/4-10	4.243	4.500	9.438	3.250
	3	1-3/4	8.500	1.125	3/4-10	4.243	4.500	10.188	3.250

Side Lug Mount

Style C
 (NFPA MS2)

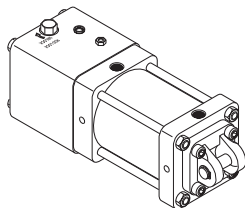


Style C

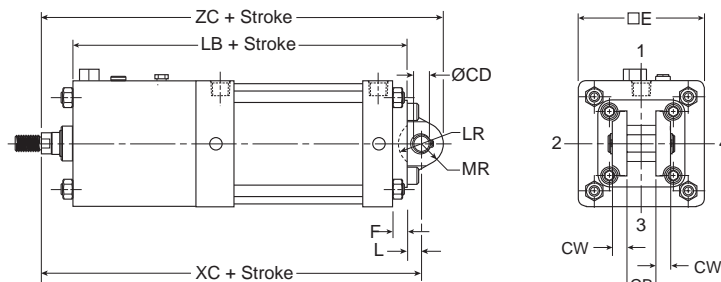
Bore size	Rod no.	Rod dia. MM	E	G	J	+/- .003 LH	SB	ST	SW	TS	US	XS	Add stroke SS
6	1	1-3/8	6.500	1.910	1.410	3.243	0.813	1.000	0.688	7.875	9.250	8.688	3.625
	3	1-3/4	6.500	1.910	1.410	3.243	0.813	1.000	0.688	7.875	9.250	9.438	3.625
8	1	1-3/8	8.500	1.810	1.440	4.243	0.813	1.000	0.688	9.875	11.250	8.938	3.750
	3	1-3/4	8.500	1.810	1.440	4.243	0.813	1.000	0.688	9.875	11.250	9.688	3.750

Cap Fixed Clevis

Style BB
 (NFPA MP1)

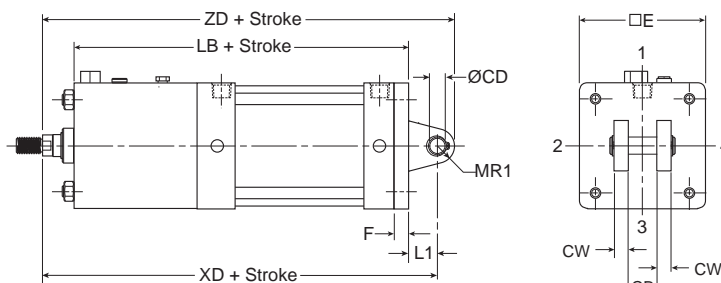
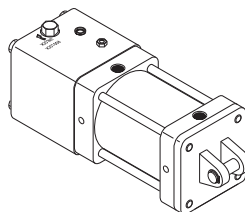


NOTE: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.



Cap Detachable Clevis

Style BC
 (NFPA MP2)

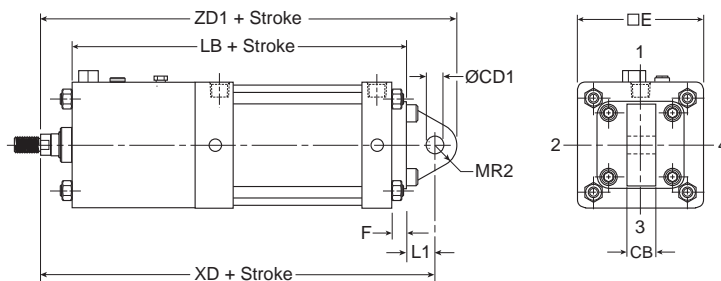
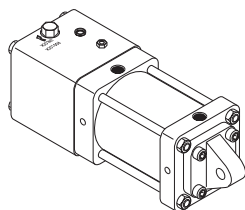


Styles BB and BC

Bore size	Rod no.	Rod dia. MM	CB	Rod dia. tolerance		CW	E	F	L	L1	LR	MR	MR1	Add stroke			
				+0.000	-0.002									LB	XC	XD	ZC
6	1	1-3/8	1.500	1.001	0.750	6.500	0.750	0.750	1.500	1.250	1.125	1.000	12.125	14.500	15.250	15.625	16.250
	3	1-3/4	1.500	1.001	0.750	6.500	0.750	0.750	1.500	1.250	1.125	1.000	12.625	15.250	16.000	16.375	17.000
8	1	1-3/8	1.500	1.001	0.750	8.500	0.750	0.750	1.500	1.250	1.125	1.000	12.500	14.875	15.625	16.000	16.625
	3	1-3/4	1.500	1.001	0.750	8.500	0.750	0.750	1.500	1.250	1.125	1.000	13.000	15.625	16.375	16.750	17.375

Cap Detachable Eye Mount

Style BE
 (NFPA MP4)
 (only 6" Bore)



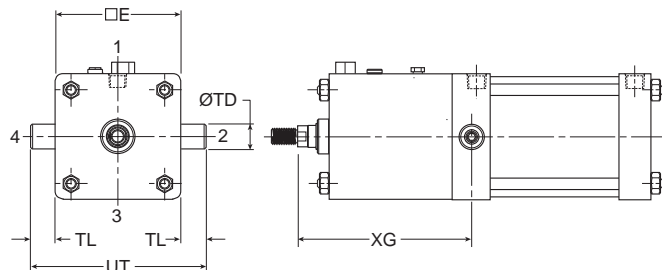
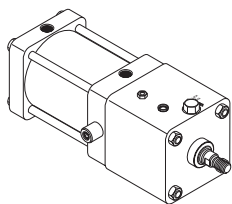
Style BE

Bore size	Rod no.	Rod dia. MM	CB	Rod dia. tolerance		E	F	L1	MR2	Add stroke		
				+0.002	+0.004					LB	XD	ZD1
6	1	1-3/8	1.500	1.000	0.750	6.500	0.750	1.500	1.125	12.125	15.250	16.375
	3	1-3/4	1.500	1.000	0.750	6.500	0.750	1.500	1.125	12.625	16.000	17.125

B
 Tie Rod Cylinders
 Actuator Products

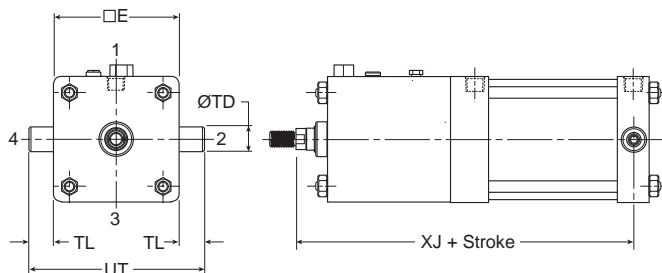
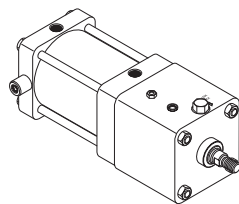
Head Trunnion Mount

Style D
 (NFPA MT1)



Cap Trunnion Mount

Style DB
 (NFPA MT2)

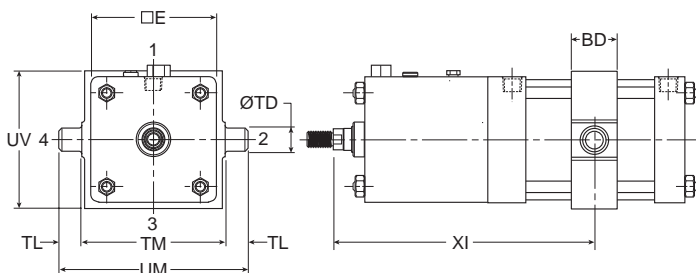
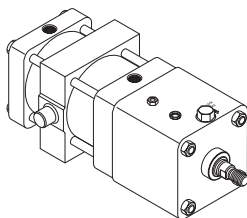


Styles D and DB

Bore size	Rod no.	Rod dia. MM	E	+0.000 -0.001 TD	TL	UT	XG	XJ
6	1	1-3/8	6.500	1.375	1.375	9.250	9.000	12.250
	3	1-3/4	6.500	1.375	1.375	9.250	9.750	13.000
8	1	1-3/8	8.500	1.375	1.375	11.250	9.250	12.625
	3	1-3/4	8.500	1.375	1.375	11.250	10.000	13.375

Intermediate Trunnion Mount

Style DD
 (NFPA MT4)

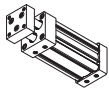
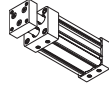
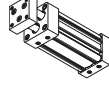
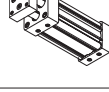
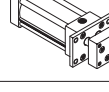
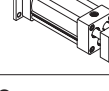
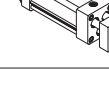
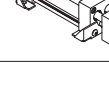


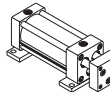
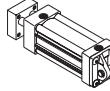
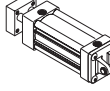
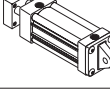
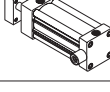
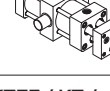
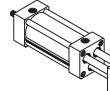
Note: Style DD requires minimum stroke per table.

Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.000 -0.001 TD	TL	TM	UM	UV	Min. XI	Min. stroke
6	1	1-3/8	6.500	2.500	1.375	1.375	7.625	10.375	7.000	20.16	6.125
	3	1-3/4	6.500	2.500	1.375	1.375	7.625	10.375	7.000	20.19	6.125
8	1	1-3/8	8.500	2.500	1.375	1.375	9.750	12.500	9.500	26.31	6.500
	3	1-3/4	8.500	2.500	1.375	1.375	9.750	12.500	9.500	27.06	6.500

4MNR Mounting Styles

Mounting style	NFPA mounting	Description	Bore size
TEF 	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 4
T 	MX0	No Mount (same construction as TEF)	1-1/8 - 4
TE 	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 4
F 	MS4	Side Tap (same construction as TEF)	1-1/8 - 4
J 	MF1	Head Rectangular Flange	1-1/8 - 4
H 	MF2	Cap Rectangular Flange	1-1/2 - 4
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 5
C 	MS2	Side Lug	1-1/2 - 4

Mounting style	NFPA mounting	Description	Bore size
NB 	N/A	Base Bar	1-1/8 - 4
BB 	MP1	Cap Fixed Clevis	1-1/2 - 4
BC 	MP2	Cap Detachable Clevis	1-1/8 - 4
BE 	MP4	Cap Detachable Eye	1-1/8 - 4
DB 	MT2	Cap Trunnion	1-1/2 - 4
DD 	MT4	Intermediate Trunnion	1-1/2 - 4
KTEF / KT / KTE / KF * 	MDX0 / MDX5 / MDS4	Double Rod End	1-1/2 - 4

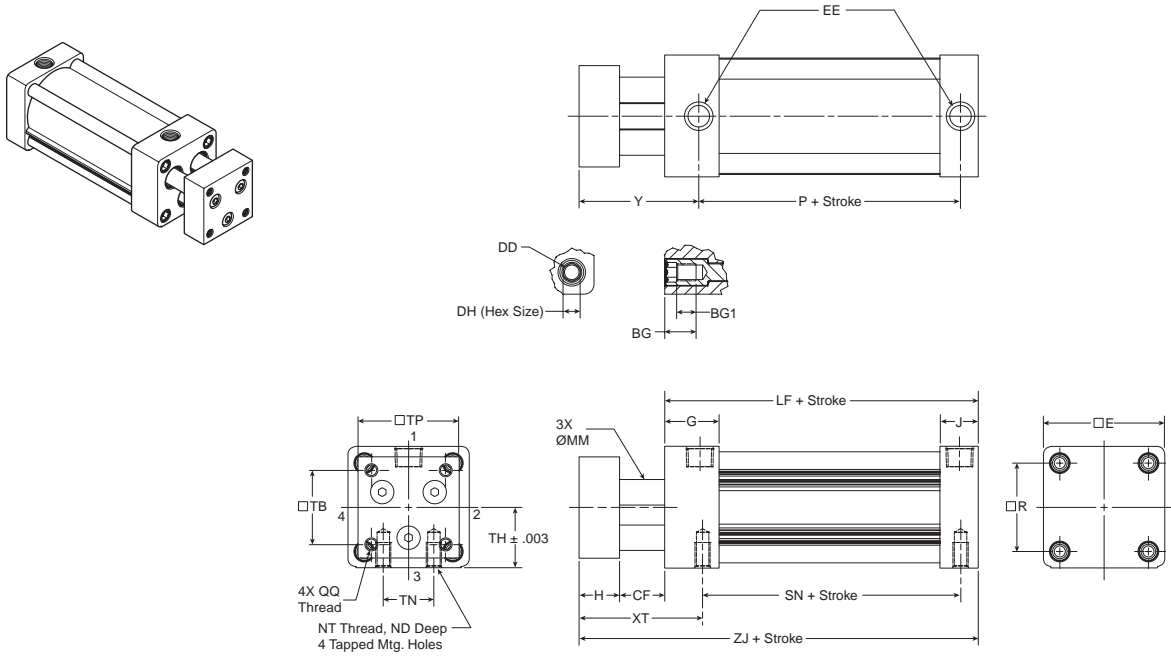
* Double rod end cylinders can be ordered with head mountings i.e. KJ.

B

Tie Rod Cylinders
 Actuator Products

4MNR Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)

(NFPA MX0, MX5, MS4)



Thread Style 3 - “Special Thread”

Special threads, rod extensions, rod eyes, blanks, etc. are also available.
 To order, specify “Style 3” and give desired dimensions for KK (thread size), A (thread length) and W or WF.
 If otherwise special, please supply dimensioned sketch.

Styles TEF, T, TE and F

Bore size	Rod dia. MM	BG	BG1	CF	DD	DH	E	EE (NPTF)	G	H	J	ND	NT
1-1/8 *	5/16	-	-	0.875	10-32	-	1.500	1/8	1.000	0.625	0.625	0.250	10-32
1-1/2	8mm	0.056	0.375	1.125	1/4-28	1/4	2.000	3/8	1.438	0.750	0.938	0.375	1/4-20
2	12mm	0.056	0.362	1.125	5/16-24	5/16	2.500	3/8	1.375	0.750	0.938	0.438	5/16-18
2-1/2	16mm	0.056	0.362	1.125	5/16-24	5/16	3.000	3/8	1.344	1.000	0.938	0.625	3/8-16
3-1/4	16mm	0.700	0.500	1.375	3/8-24	3/8	3.750	1/2	1.594	1.000	1.125	0.750	1/2-13
4	16mm	0.700	0.500	1.375	3/8-24	3/8	4.500	1/2	1.594	1.000	1.125	0.750	1/2-13

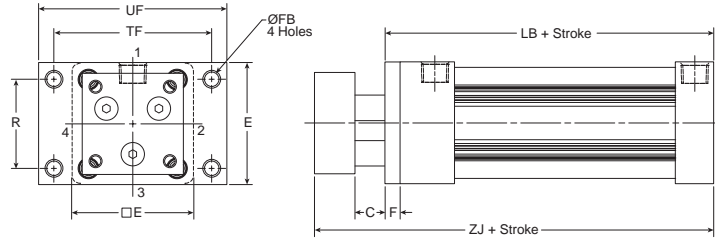
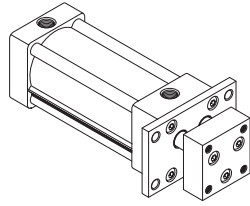
Bore size	Rod dia. MM	QQ	R	TB	TH	TP	TN	XT	Y	Add stroke			
										LF	P	SN	ZJ
1-1/8 *	5/16	6-32	1.125	0.750	0.750	1.250	0.500	2.000	2.031	2.500	1.468	1.500	3.750
1-1/2	8mm	10-32	1.430	1.120	0.993	1.500	0.625	2.812	2.750	3.625	2.313	2.250	5.375
2	12mm	1/4-28	1.840	1.430	1.243	2.000	0.875	2.812	2.750	3.625	2.313	2.250	5.375
2-1/2	16mm	5/16-24	2.190	1.840	1.493	2.500	1.250	3.062	3.062	3.750	2.375	2.375	5.875
3-1/4	16mm	3/8-24	2.760	2.190	1.680	3.250	1.500	3.437	3.437	4.250	2.625	2.625	6.500
4	16mm	3/8-24	3.320	2.760	2.243	4.000	2.063	3.437	3.437	4.250	2.625	2.625	6.500

* Twin rod with flange construction (not shown)

B
 Tie Rod Cylinders
 Actuator Products

Head Rectangular Flange

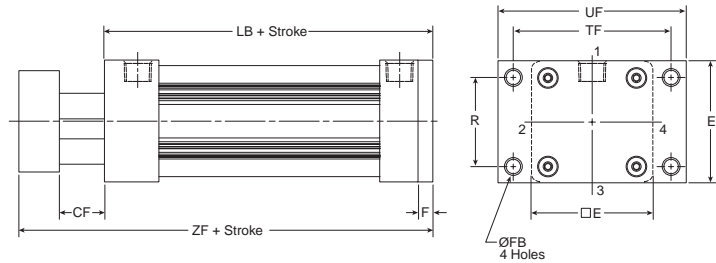
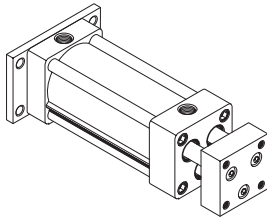
Style J
 (NFPA MF1)



Note: Style J has a “C” dimension instead of “CF” because of the flange installation.
 For reference, CF = C + F

Cap Rectangular Flange

Style H
 (NFPA MF2)



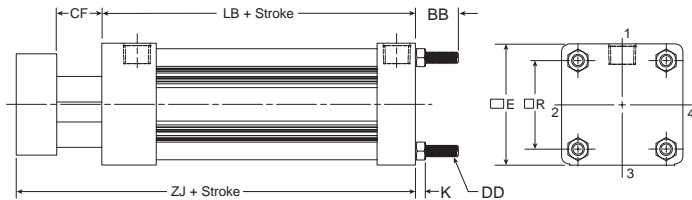
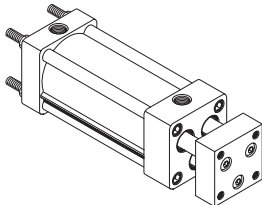
Styles J and H

Bore size	Rod dia. MM	C	CF	E	F	FB	H	R	TF	UF	Add stroke		
											LB	ZF	ZJ
1-1/8 *	5/16	0.625	0.875	1.500	0.250	0.219	0.625	1.000	2.000	2.500	2.750	4.250	4.000
1-1/2	8mm	0.750	1.125	2.000	0.375	0.313	0.750	1.430	2.750	3.375	4.000	5.875	5.500
2	12mm	0.750	1.125	2.500	0.375	0.375	0.750	1.840	3.375	4.125	4.000	5.875	5.500
2-1/2	16mm	0.750	1.125	3.000	0.375	0.375	1.000	2.190	3.875	4.625	4.125	6.250	5.875
3-1/4	16mm	0.750	1.375	3.750	0.625	0.438	1.000	2.760	4.688	5.500	4.875	7.250	6.625
4	16mm	0.750	1.375	4.500	0.625	0.438	1.000	3.320	5.438	6.250	4.875	7.250	6.625

* Twin rod with flange construction (not shown)

Tie Rods Ext. Cap End

Style TC
 (NFPA MX2)



Style TC

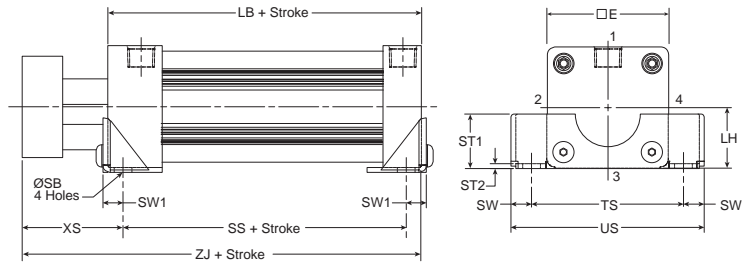
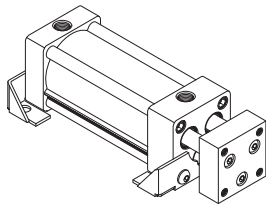
Bore size	Rod dia. MM	BB	DD	CF	E	K	R	Add stroke	
								LB	ZJ
1-1/2	8mm	1.000	1/4-28	1.125	2.000	0.250	1.430	4.000	5.500
2	12mm	1.125	5/16-24	1.125	2.500	0.313	1.840	4.000	5.500
2-1/2	16mm	1.125	5/16-24	1.125	3.000	0.313	2.190	4.125	5.875
3-1/4	16mm	1.375	3/8-24	1.375	3.750	0.375	2.760	4.875	6.625
4	16mm	1.375	3/8-24	1.375	4.500	0.375	3.320	4.875	6.625

B

Tie Rod Cylinders
 Actuator Products

Side Lug

Style C
 (NFPA MS2)

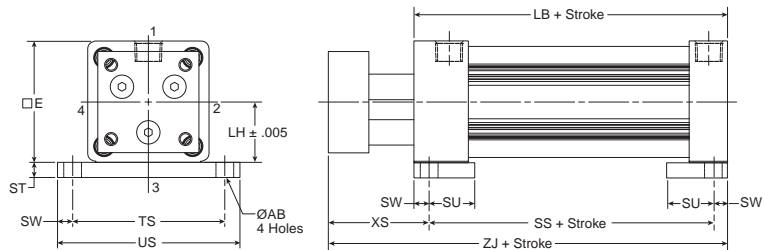
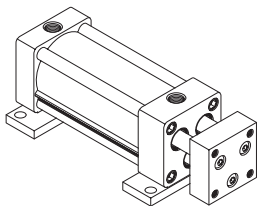


Style C

Bore size	Rod dia. MM	E	LH	SB	ST1	ST2	SW	SW1	TS	US	XS	Add stroke		
												LB	SS	ZJ
1-1/2	8mm	2.000	0.993	0.438	1.000	0.120	0.375	0.495	2.750	3.500	2.250	4.000	2.875	5.500
2	12mm	2.500	1.243	0.438	1.250	0.120	0.375	0.495	3.250	4.000	2.250	4.000	2.875	5.500
2-1/2	16mm	3.000	1.493	0.438	1.343	0.120	0.375	0.495	3.750	4.500	2.500	4.125	3.000	5.875
3-1/4	16mm	3.750	1.868	0.563	1.500	0.188	0.500	0.688	4.750	5.750	2.875	4.875	3.250	6.625
4	16mm	4.500	2.243	0.563	1.500	0.188	0.500	0.688	5.500	6.500	2.875	4.875	3.250	6.625

Base Bar Mount

Style NB



Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.

Style NB

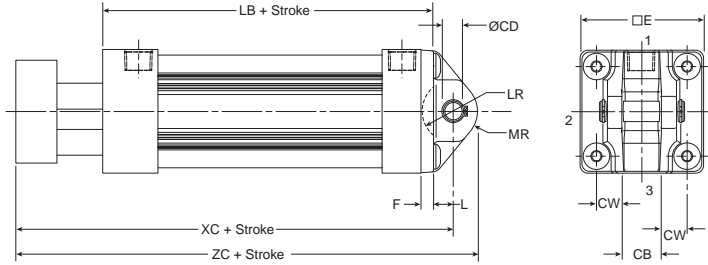
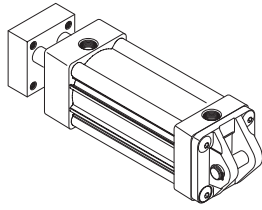
Bore size	Rod dia. MM	AB	E	LH	ST	SU	SW	TS	US	XS	Add stroke		
											LB	SS	ZJ
1-1/8 *	5/16	0.203	1.500	1.000	0.250	0.750	0.250	1.875	2.375	1.750	2.750	1.750	3.750
1-1/2	8mm	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	2.250	4.000	2.875	5.500
2	12mm	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	2.250	4.000	2.875	5.500
2-1/2	16mm	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	2.500	4.125	3.000	5.875
3-1/4	16mm	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	2.875	4.875	3.250	6.625
4	16mm	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	2.875	4.875	3.250	6.625

* Twin rod with flange construction (not shown)

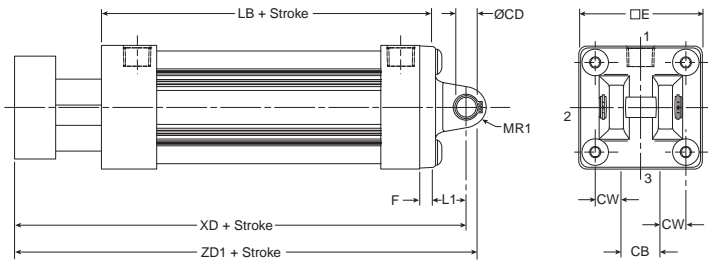
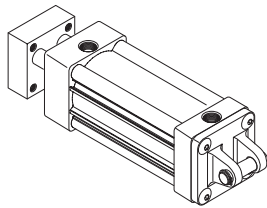
B
 Tie Rod Cylinders
 Actuator Products

Cap Fixed Clevis
 Style BB (NFPA MP1)

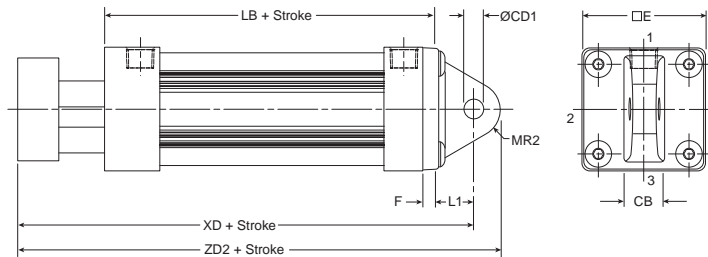
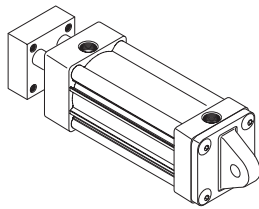
Note: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, accessories page B141.



Cap Detachable Clevis
 Style BC (NFPA MP2)



Cap Detachable Eye
 Style BE (NFPA MP4)



B

Tie Rod Cylinders
 Actuator Products

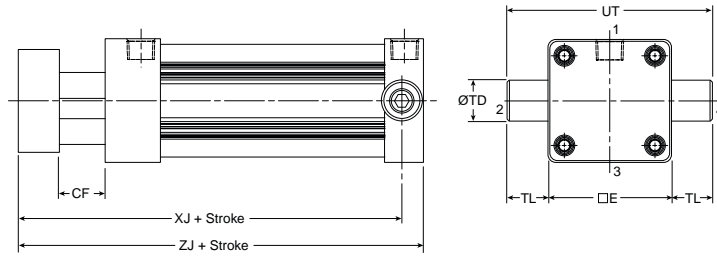
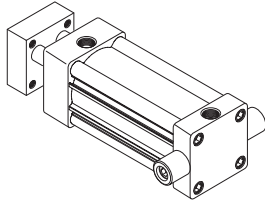
Styles BB, BC and BE

Bore size	Rod dia. MM	CB	CD	CD1	CW	E	F	L	LR	L1
1-1/2	8mm	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750
2	12mm	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750
2-1/2	16mm	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750
3-1/4	16mm	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250
4	16mm	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250

Bore size	Rod dia. MM	MR	MR1	MR2	Add stroke					
					LB	XC	XD	ZC	ZD1	ZD2
1-1/2	8mm	0.625	0.500	0.625	4.000	6.250	6.625	6.875	7.125	7.250
2	12mm	0.625	0.500	0.625	4.000	6.250	6.625	6.875	7.125	7.250
2-1/2	16mm	0.625	0.500	0.688	4.125	6.625	7.000	7.250	7.500	7.688
3-1/4	16mm	0.938	0.750	0.875	4.875	7.875	8.500	8.813	9.250	9.375
4	16mm	0.938	0.750	0.875	4.875	7.875	8.500	8.813	9.250	9.375

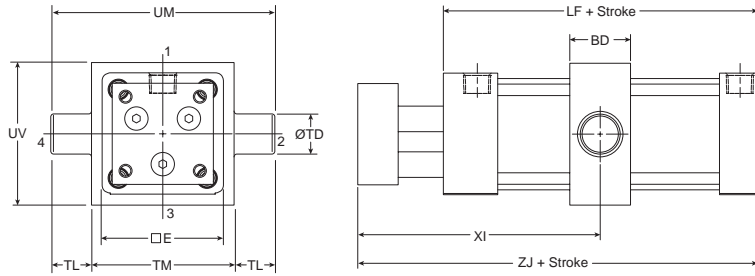
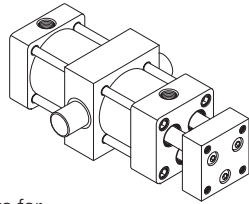
Cap Trunnion

Style DB
 (NFPA MT2)



Intermediate Trunnion

Style DD
 (NFPA MT4)



Note: Tie rod nuts for Style DD have a slot instead of internal hex.

Styles DD and DD

Bore size	Rod dia. MM	E	BD	CF	TD	TL	TM	UM	UT	UV	Add stroke			
											Min. XI	LF	XJ	ZJ
1-1/2	8mm	2.000	1.250	1.125	1.000	1.000	2.500	4.500	4.000	2.500	4.000	4.000	5.000	5.875
2	12mm	2.500	1.500	1.125	1.000	1.000	3.000	5.000	4.500	3.000	4.125	4.000	5.000	5.875
2-1/2	16mm	3.000	1.500	1.125	1.000	1.000	3.500	5.500	5.000	3.500	4.375	4.125	5.375	6.250
3-1/4	16mm	3.750	2.000	1.375	1.000	1.000	4.500	6.500	5.750	4.250	5.125	4.875	6.000	7.250
4	16mm	4.500	2.000	1.375	1.000	1.000	5.250	7.250	6.500	5.000	5.125	4.875	6.000	7.250

B
 Tie Rod Cylinders
 Actuator Products

The innovative P1D is a future-proof generation of ISO/VDMA cylinders. The cylinders are double acting, with a new design of air cushioning.

The P1D complies with the current ISO 6431, ISO 15552, VDMA 24562 and AFNOR installation dimension standards

- Available in 32 to 200mm bores
- PUR seals for long service life
- Drop-in sensors
- Corrosion resistant design
- Magnetic piston as standard
- Lubricated with food grade grease



Operating information

Operating pressure:	145 PSIG (10 bar) maximum
Temperature range:	Standard: -4°F to 176°F (-20°C to 80°C) High temperature: 14°F to 250°F (-10°C to 121°C)
Cylinders for low pressure hydraulic operation:	Ø32 - 125mm
ATEX approval:	CE Ex IIGD c T4 248°F (120°C)
Filtration requirements:	40 micron, dry filtered air
For technical information see CD	

P1D Standard - Double acting

Ø32mm - (G¹/₈)

Stroke (mm)	Order Code
25	P1D-S032MC-0025NNNNN
40	P1D-S032MC-0040NNNNN
50	P1D-S032MC-0050NNNNN
80	P1D-S032MC-0080NNNNN
100	P1D-S032MC-0100NNNNN
125	P1D-S032MC-0125NNNNN
160	P1D-S032MC-0160NNNNN
200	P1D-S032MC-0200NNNNN
250	P1D-S032MC-0250NNNNN
320	P1D-S032MC-0320NNNNN
400	P1D-S032MC-0400NNNNN
500	P1D-S032MC-0500NNNNN

Ø40mm - (G¹/₄)

25	P1D-S040MC-0025NNNNN
40	P1D-S040MC-0040NNNNN
50	P1D-S040MC-0050NNNNN
80	P1D-S040MC-0080NNNNN
100	P1D-S040MC-0100NNNNN
125	P1D-S040MC-0125NNNNN
160	P1D-S040MC-0160NNNNN
200	P1D-S040MC-0200NNNNN
250	P1D-S040MC-0250NNNNN
320	P1D-S040MC-0320NNNNN
400	P1D-S040MC-0400NNNNN
500	P1D-S040MC-0500NNNNN

Ø50mm - (G¹/₄)

25	P1D-S050MC-0025NNNNN
40	P1D-S050MC-0040NNNNN
50	P1D-S050MC-0050NNNNN
80	P1D-S050MC-0080NNNNN
100	P1D-S050MC-0100NNNNN
125	P1D-S050MC-0125NNNNN
160	P1D-S050MC-0160NNNNN
200	P1D-S050MC-0200NNNNN
250	P1D-S050MC-0250NNNNN
320	P1D-S050MC-0320NNNNN
400	P1D-S050MC-0400NNNNN
500	P1D-S050MC-0500NNNNN

Ø63mm - (G³/₈)

Stroke (mm)	Order Code
25	P1D-S063MC-0025NNNNN
40	P1D-S063MC-0040NNNNN
50	P1D-S063MC-0050NNNNN
80	P1D-S063MC-0080NNNNN
100	P1D-S063MC-0100NNNNN
125	P1D-S063MC-0125NNNNN
160	P1D-S063MC-0160NNNNN
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320	P1D-S063MC-0320NNNNN
400	P1D-S063MC-0400NNNNN
500	P1D-S063MC-0500NNNNN

Ø80mm - (G³/₈)

25	P1D-S080MC-0025NNNNN
40	P1D-S080MC-0040NNNNN
50	P1D-S080MC-0050NNNNN
80	P1D-S080MC-0080NNNNN
100	P1D-S080MC-0100NNNNN
125	P1D-S080MC-0125NNNNN
160	P1D-S080MC-0160NNNNN
200	P1D-S080MC-0200NNNNN
250	P1D-S080MC-0250NNNNN
320	P1D-S080MC-0320NNNNN
400	P1D-S080MC-0400NNNNN
500	P1D-S080MC-0500NNNNN

Ø100mm - (G¹/₂)

Stroke (mm)	Order Code
25	P1D-S100MC-0025NNNNN
40	P1D-S100MC-0040NNNNN
50	P1D-S100MC-0050NNNNN
80	P1D-S100MC-0080NNNNN
100	P1D-S100MC-0100NNNNN
125	P1D-S100MC-0125NNNNN
160	P1D-S100MC-0160NNNNN
200	P1D-S100MC-0200NNNNN
250	P1D-S100MC-0250NNNNN
320	P1D-S100MC-0320NNNNN
400	P1D-S100MC-0400NNNNN
500	P1D-S100MC-0500NNNNN

Ø125mm - (G¹/₂)

25	P1D-S125MC-0025NNNNN
40	P1D-S125MC-0040NNNNN
50	P1D-S125MC-0050NNNNN
80	P1D-S125MC-0080NNNNN
100	P1D-S125MC-0100NNNNN
125	P1D-S125MC-0125NNNNN
160	P1D-S125MC-0160NNNNN
200	P1D-S125MC-0200NNNNN
250	P1D-S125MC-0250NNNNN
320	P1D-S125MC-0320NNNNN
400	P1D-S125MC-0400NNNNN
500	P1D-S125MC-0500NNNNN

The cylinders are supplied complete with a zinc plated steel piston rod nut.

Sensors

For sensors see page B296.



B

Tie Rod Cylinders
Actuator Products

Most popular.

Design Versions

P1D Standard Version

P1D Standard Version cylinders are available in 32-125mm bores and utilize internal composite technology to save weight, while assuring the high performance and functionality expected of ISO cylinders. Cushions and bumpers at both ends and a magnetic piston are included as standard. The Standard Version serves all markets where performance at an affordable price is desired.



P1D Removable Gland Version

P1D Removable Gland Version cylinders are available in 32-200mm bores and utilize bar stock endcaps and a removable high-strength bronze bearing for traditional and custom applications. The bronze bearing assembly is externally removable for quick and easy maintenance. No other ISO cylinder manufacturer in the world produces a Removable Gland Version and meets these demands. This version covers all applications which require performance and customization at all bore sizes.



P1D Series Rod Lock Cylinder

The P1D Series Rod Lock Cylinder incorporates a powerful piston rod locking device, which clamps the piston rod and locks it in position. The locking device is a spring lock with an air pressure release and is integrated into the front (head) cover of the cylinder.



P1D Clean Version

The P1D Clean Version is completely designed for the food industry. The stringent requirements for hygiene regarding choice of material and corrosion resistance have guided the development of this cylinder version. Available with BSPP ports (ISO 1179-1 with ISO 228-1 threads).



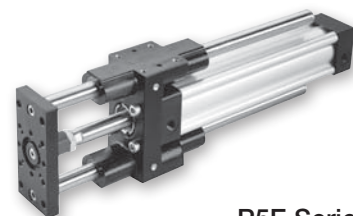
P1D Tie-Rod Version

The P1D Tie-Rod Version cylinders are based on the same high level technology as the Standard Version. They accept either Standard Version or Removable Gland Version heads and caps. This cylinder is the perfect choice wherever a true tie-rod cylinder is needed.



Guided Cylinders

For guided versions of the P1D, see the P5E Series and HB Series.



P5E Series

B
Tie Rod Cylinders
Actuator Products

Ordering information

P1D - S 032 M C - 0500 N N N N N

Piston Style		
Cushions	Piston material	
	Composite ¹	Aluminum ²
None	M	Y
Cush B/E	– ³	4
Cush head	J	5
Cush cap	K	6

Bore size	
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm
125	125mm
160	160mm ⁸
200	200mm ⁸

Stroke ¹⁴
Specify whole mm using 4 digits, i.e. 0500

Rod end	
N	Metric male
6	Metric female
3	Special*

* Please provide desired dimensions for KK, AM and WH or W. If otherwise, please provide dimensioned sketch.

Cylinder ports front & rear	
–	BSPP Ports (G Threads)**
E	NPTF Ports*
Q	BSPT Ports (RC Threads)*†

* Not available on clean version.
† Not available on die cast version.
** ISO 1179-1 with ISO 228-1 threads.

Sensors ¹⁷			
Prepared for factory-fitted sensors	Cable location		
	Front or left	Rear or right	Front & rear
P1D clean version	6	7	8
P1D all versions (except Clean) prepared for sensors or clean version without sensor capability ¹⁸	N		

Version				
Die cast end caps ⁴	Cylinder body profile	Rod lock		
		None	Fitted w/ standard rod lock ⁷	Fitted w/ manual override rod lock ⁷
Removable gland ⁵ (machined end caps)	Standard	S	L	N/A
	Tie Rod ¹³	T	M	N/A
	Clean	C	D	N/A
Special ⁶	Standard	G	R	J
	Tie Rod ¹³	E	7⁴	Consult Factory
Any Special	/			

Rod mountings & plugs ¹⁵		
Rod mounting	No plugs ¹⁶	With plugs ¹
Swivel rod eye	S	A
Swivel rod eye SS	T	1
Swivel rod eye with clevis bracket GA ¹⁹	V	E
Swivel rod eye SS with clevis bracket GA	W	2
Clevis	C	B
Clevis SS	D	3
Flexco coupling	F	G
One additional piston rod nut	X	P
Stainless steel piston rod nut	Y	4
Acid-resistant nut	Z	5
None (piston rod nut only)	N	R

Function				
Fastener type	Rod wiper style	Double acting	Double rod	Tandem ¹³
Standard end cover screws	Std scraper	M	F	C
	Metal scraper	Q	R	J
Stainless steel end cover screws ⁹	Std scraper	A	G	N/A
	Metal scraper	S	T	N/A

Piston rod & seal material			
Piston rod material	Seal material		
	Standard	Fluorocarbon ¹⁰	Hydraulic ¹¹
Chrome plated carbon steel ²	C	G	J
Chrome plated stainless steel ^{2, 19}	R	D	Z
316 Stainless steel ¹³	S	N/A	N/A
Acid-resistant stainless steel	M	N²	N/A

Mounting style		
	Standard	Rotated 90°
Flange MF1 at head (front) end	1	3
Flange MF2 at cap (rear) end	B	4
Flanges MF1 and MF2 at both ends	2	K
Foot brackets MS1	F	R
Clevis bracket GA aluminum	C	U
Rear eye MP4 aluminum	E	V
Rear swivel eye MP6 aluminum	S	W
Clevis bracket MP2 aluminum	T	Y
Rear eye + clevis (MP4 + MP2) aluminum	L	Z
Clevis bracket MP2 + pivot hinge aluminum	X	5
Clevis bracket GA aluminum + steel swivel hinge	Q	0
Rear swivel eye + clevis bracket GA aluminum	M	A
Intermediate trunnion MT4 (requires XV dimension)	G	7
Trunnion flange at head (front) end ⁴	H	P
Trunnion flange at cap (rear) end ⁴	J	8
None (MX0)	N	9

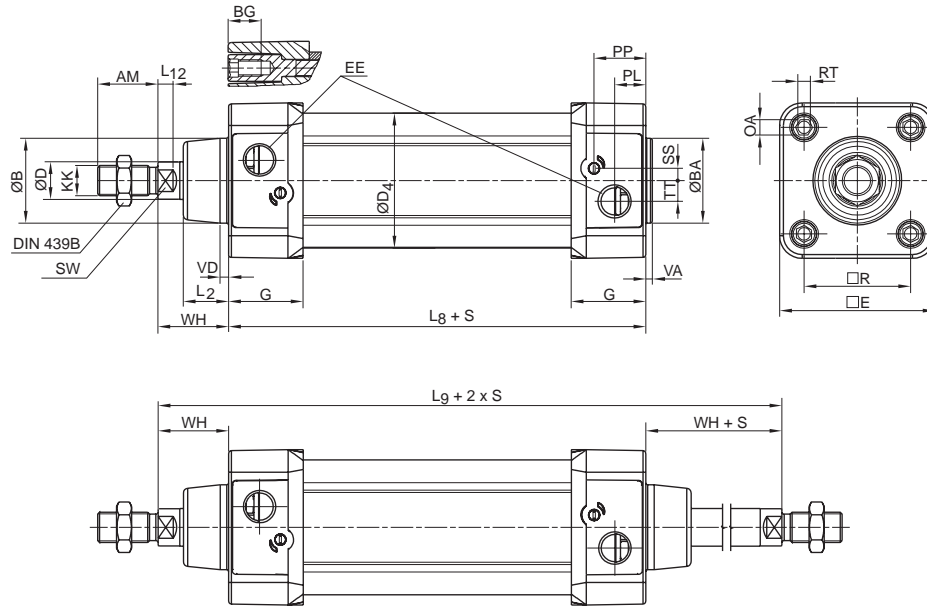
Notes:

- Not available for 160-200mm bores.
 - Not available on Clean Version.
 - Must be placed in model code.
 - Not available for 160-200mm bores or with fluorocarbon seals.
 - When Removable Gland Version is fitted with rod lock, gland cannot be replaced without disassembling cylinder.
 - If special cylinder is ordered (other than rod end), End Cap Style, Cylinder Body Profile and Rod Lock option must be given in addition to the special request.
 - Cylinders fitted with rod locks must be cushioned on both ends.
 - Tie Rod Version E must be specified for these bores.
 - Applies only to end cover screws for 32-125mm bores. For stainless steel tie rods and nuts (all bore sizes), change Version to special and request stainless steel tie rods and nuts.
 - If used for temperature above 80°C (176°F), aluminum piston required. Not available with die cast end caps.
 - Hydraulic seal option valid for Removable Gland Version only. Adjustable cushion options and Rod Lock Versions not available.
 - Only available on Clean Version.
 - Tie Rod Version is required for Tandem Function.
 - When specifying a stop tube, place a “/” in the version field. Then specify the version, amount of stop tube and amount of net stroke. The stroke used in the model code should be gross stroke (net stroke plus stop tube).
 - Please review Piston Rod Selection Chart in the Engineering Section to check for a rod buckling condition.
 - Clean Version comes standard with plugs. Use this column when ordering Clean Version.
 - For sensor part numbers and specifications, please refer to Electronic Sensors section.
 - P1D Clean Version ordered without sensors cannot be retrofitted with sensor capability.
 - Consult factory for this option.
- Double Rod Cylinders**
Double rod option is available with Mounting Styles MX0, MS1, MF1, MF2 and MT4.
For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of ‘3’ and be sure to clearly state which rod end is to be assembled at which end.

B

**Tie Rod Cylinders
Actuator Products**

P1D Standard Version



S = Stroke

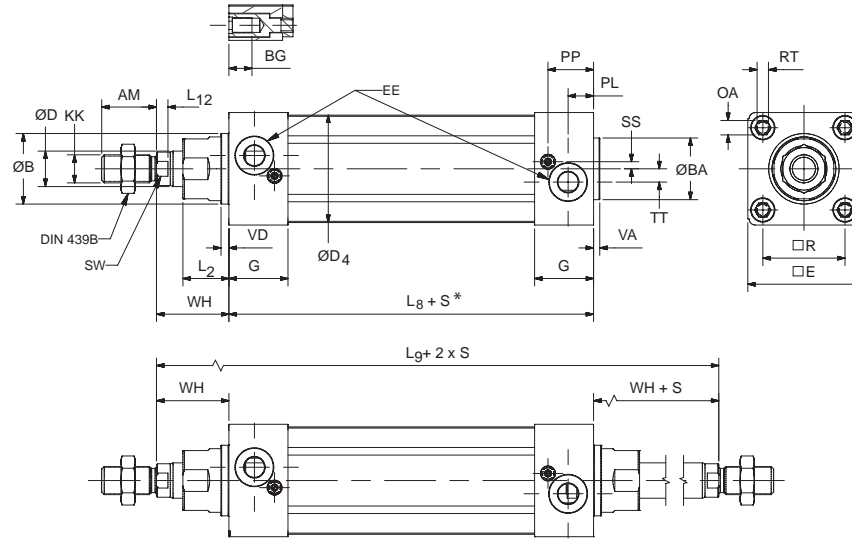
Bore size	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E	EE		G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
								BSPP*	NPTF/BSPT						
32	22	30	30	16	12	45.0	50.0	G1/8	1/8	28.5	M10x1.25	16.0	94	146	6.0
40	24	35	35	16	16	52.0	57.4	G1/4	1/4	33.0	M12x1.25	19.0	105	165	6.5
50	32	40	40	16	20	60.7	69.4	G1/4	1/4	33.5	M16x1.5	24.0	106	180	8.0
63	32	45	45	16	20	71.5	82.4	G3/8	3/8	39.5	M16x1.5	24.0	121	195	8.0
80	40	45	45	17	25	86.7	99.4	G3/8	3/8	39.5	M20x1.5	30.0	128	220	10.0
100	40	55	55	17	25	106.7	116.0	G1/2	1/2	44.5	M20x1.5	32.4	138	240	10.0
125	54	60	60	20	32	134.0	139.0	G1/2	1/2	51.0	M27x2	45.0	160	290	13.0

Bore size	OA mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm
32	6	13	21.8	32.5	M6	4.0	10	4.5	3.5	4.5	26
40	6	14	21.9	38.0	M6	8.0	13	5.5	3.5	4.5	30
50	8	14	25.9	46.5	M8	4.0	17	7.5	3.5	4.5	37
63	8	16	27.4	56.5	M8	6.5	17	11.0	3.5	4.5	37
80	6	16	30.5	72.0	M10	0	22	15.0	3.5	4.5	46
100	6	18	35.8	89.0	M10	0	22	20.0	3.5	4.5	51
125	8	23	40.5	110.0	M12	0	27	17.5	3.5	6.5	65

* ISO 1179-1 with ISO 228-1 threads

B
Tie Rod Cylinders
Actuator Products

P1D Removable Gland Version



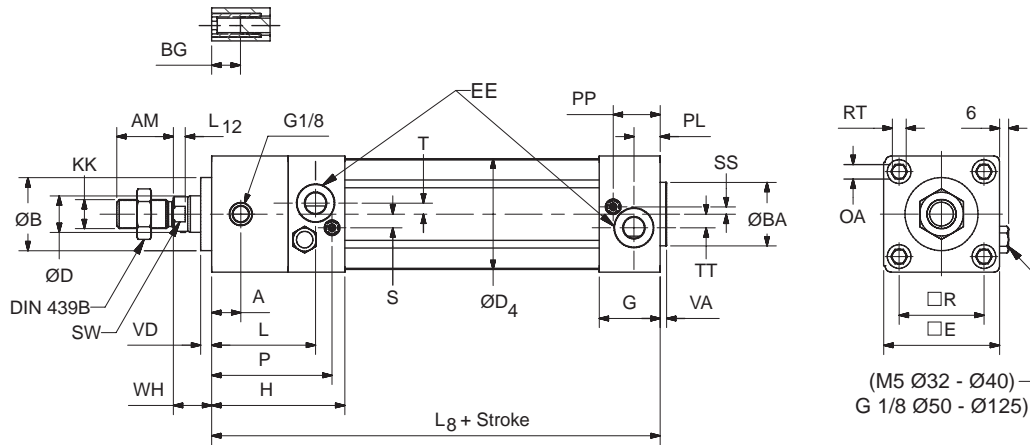
S = Stroke

Bore size	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E mm	EE		G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
								BSPP *	NPTF/BSPT						
32	22	30	30	16	12	45.0	46.5	G1/8	1/8	28.5	M10x1.25	18	94	146	6.0
40	24	35	35	16	16	52.0	52.0	G1/4	1/4	33.0	M12x1.25	20	105	165	6.5
50	32	40	40	16	20	60.7	63.5	G1/4	1/4	33.5	M16x1.5	26	106	180	6.5
63	32	45	45	16	20	71.5	76.0	G3/8	3/8	39.5	M16x1.5	26	121	195	6.5
80	40	45	45	17	25	86.7	95.5	G3/8	3/8	39.5	M20x1.5	33	128	220	10.0
100	40	55	55	17	25	106.7	114.5	G1/2	1/2	44.5	M20x1.5	33	138	240	10.0
125	54	60	60	20	32	134.0	140.0	G1/2	1/2	51.0	M27x2	41	160	290	13.0

Bore size	OA mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm
32	6	13	21.8	32.5	M6	6.5	10	4.5	3.5	4.5	26
40	6	14	21.9	38.0	M6	8.0	13	5.5	3.5	4.5	30
50	8	14	25.9	46.5	M8	4.0	17	7.5	3.5	4.5	37
63	8	16	27.4	56.5	M8	6.5	17	11.0	3.5	4.5	37
80	6	16	30.5	72.0	M10	0	22	15.0	3.5	4.5	46
100	6	18	35.8	89.0	M10	0	22	20.0	3.5	4.5	51
125	8	23	40.5	110.0	M12	0	27	17.5	5.5	6.5	65

* ISO 1179-1 with ISO 228-1 threads

P1D Rod Lock Version
 (Version R or L)



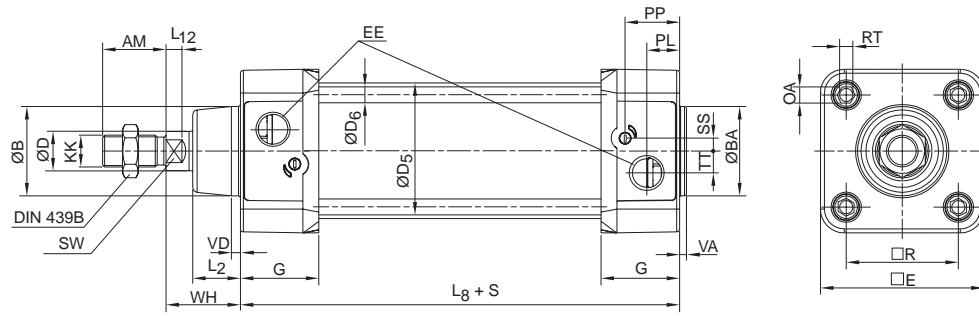
Bore size	A mm	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E mm	EE *	G mm	H mm	KK	L mm	L8 mm	L12 mm
32	16	22	30	30	16	12	45.0	46.5	G1/8	28.5	71.5	M10x1.25	56.0	137	6.0
40	16	24	35	35	16	16	52.0	52.0	G1/4	33.0	77.0	M12x1.25	56.0	149	6.5
50	18	32	40	40	16	20	60.7	63.5	G1/4	33.5	80.5	M16x1.5	62.5	153	6.5
63	26	32	45	45	16	20	71.5	76.0	G3/8	39.5	96.5	M16x1.5	74.5	178	6.5
80	35	40	45	45	17	25	86.7	95.5	G3/8	39.5	110.5	M20x1.5	87.0	199	10.0
100	50	40	55	55	17	25	106.7	114.5	G1/2	44.5	132.5	M20x1.5	106.0	226	10.0
125	60	54	60	60	20	32	134.0	140.0	G1/2	51.0	145.0	M27x2	117.0	254	13.0

Bore size	OA mm	P mm	PL mm	PP mm	R mm	RT mm	S mm	SS mm	SW mm	T mm	TT mm	VA mm	VD mm	WH mm
32	6	64.8	13	21.8	32.5	M6	7	6.5	10	2.5	4.5	3.5	4.5	15
40	6	68.0	14	21.9	38.0	M6	9	8.0	13	2.0	5.5	3.5	4.5	16
50	8	73.5	14	25.9	46.5	M8	8	4.0	17	4.0	7.5	3.5	5.0	17
63	8	89.5	16	27.4	56.5	M8	8	6.5	17	2.0	11.0	3.5	5.0	17
80	6	101.5	16	30.5	72.0	M10	9	0	22	5.0	15.0	3.5	4.0	20
100	6	123.5	18	35.8	89.0	M10	12	0	22	6.0	20.0	3.5	4.0	20
125	8	136.0	23	40.5	110.0	M12	12	0	27	6.0	17.5	5.5	6.0	27

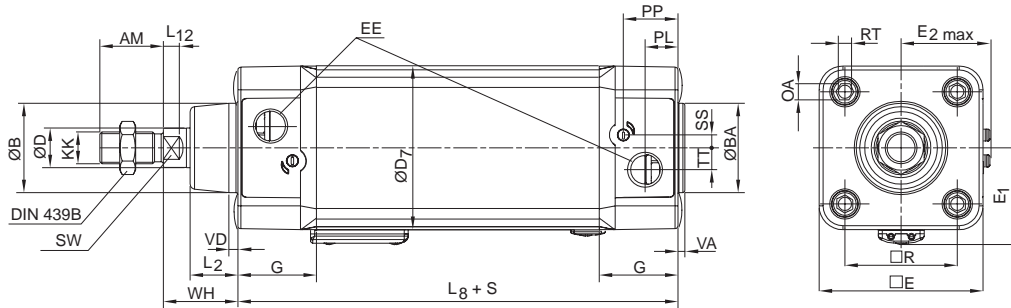
* ISO 1179-1 with ISO 228-1 threads

B
 Tie Rod Cylinders
 Actuator Products

P1D Tie-Rod Version (32-125mm)



P1D Clean Version



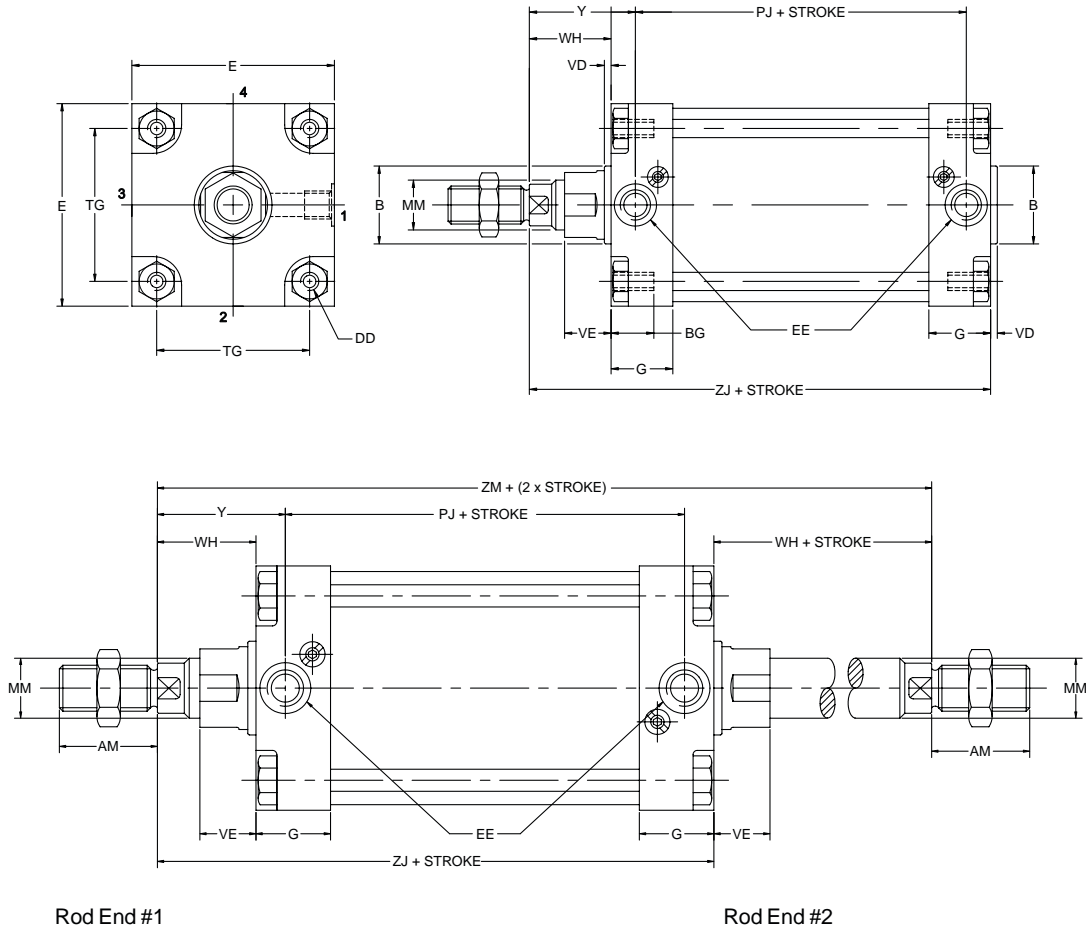
B

Tie Rod Cylinders
 Actuator Products

Bore size	D5 mm	D6 mm	D7 mm	E1 mm	E2 max mm
32	36	5.3	49.6	32	5
40	45	5.3	57.3	36	6
50	55	7.1	69.3	42	6
63	68	7.1	82.3	49	5
80	85	8.9	99.3	57	5
100	105	8.9	117.6	68	6
125	132	10.7	142.8	81	6

Other dimensions, see P1D removable gland version.

P1D Tie-Rod Version (160-200mm)



B
 Tie Rod Cylinders
 Actuator Products

Bore size	AM mm	B d11 mm	BG mm	DD	E mm	EE		G mm	MM mm	TG mm	VD mm	VE mm	WH mm	Y mm	PJ ¹ mm	ZJ ¹ mm	ZM ² mm
						BSPP ³	NPTF/BSPT										
160	72	65	24	M16	177	G3/4	3/4	54	40	140	6	56	80	105	130	260	340
200	72	75	24	M16	214	G3/4	3/4	54	40	175	6	56	95	120	130	275	370

¹ Add stroke
² Add 2x stroke
³ ISO 1179-1 with ISO 228-1 threads

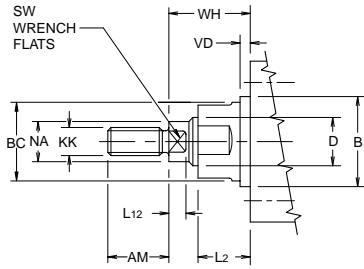
Double Rod Cylinders

Double rod option is available on Mounting Styles MX0, MS1, MF1, MF2 and MT4.

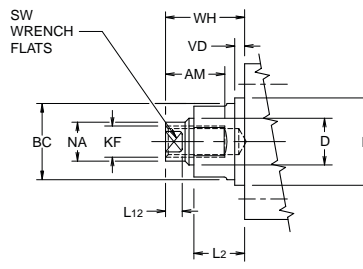
For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

All Mountings Except MF1

Thread Style N



Thread Style 6



**Thread Style 3 -
 “Special Thread”**

Special thread, extension, rod eye, blank, etc are also available. To order, specify “Style 3” and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

B

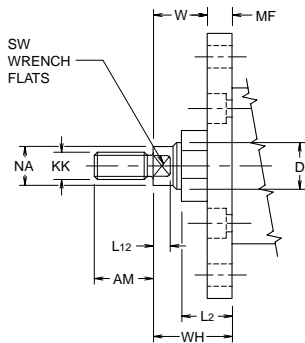
**Tie Rod Cylinders
 Actuator Products**

Bore size	D	KK	KF	AM	B d11	BC	SW across flats	L12	NA	VD	L2	WH*
32	12	M10x1.25	M8x1	22	30	27	10	6	11	4.5	18	26
40	16	M12x1.25	M10x1.25	24	35	32	13	6.5	15	4.5	20	30
50	20	M16x1.5	M14x1.5	32	40	36	17	6.5	19	4.5	26	37
63	20	M16x1.5	M14x1.5	32	45	36	17	6.5	19	4.5	26	37
80	25	M20x1.5	M18x1.5	40	45	41	22	10	24	4.5	33	46
100	25	M20x1.5	M18x1.5	40	55	41	22	10	24	4.5	33	51
125	32	M27x2	M24x2	54	60	50	27	13	31	6.5	41	65
160	40	M36x2	M30x2	72	65	60	36	16	39	6	56	80
200	40	M36x2	M30x2	72	75	60	36	16	39	6	56	95

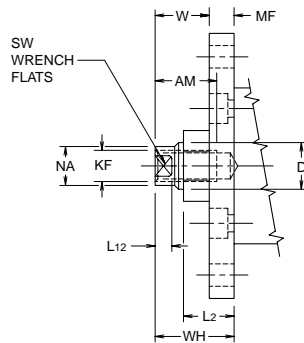
*NOTE: Dimensions do not apply to Rod Lock Versions.

With MF1 Mounting

Thread Style N



Thread Style 6



**“Special Thread”
 Style 3**

Special thread, extension, rod eye, blank, etc are also available. To order, specify “Style 3” and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

Bore size	D	KK	KF	AM	SW across flats	L12	MF	NA	L2	W†	WH†
32	12	M10x1.25	M8x1	22	10	6	10	11	18	16	26
40	16	M12x1.25	M10x1.25	24	13	6.5	10	15	20	20	30
50	20	M16x1.5	M14x1.5	32	17	6.5	12	19	26	25	37
63	20	M16x1.5	M14x1.5	32	17	6.5	12	19	26	25	37
80	25	M20x1.5	M18x1.5	40	22	10	16	24	33	30	46
100	25	M20x1.5	M18x1.5	40	22	10	16	24	33	35	51
125	32	M27x2	M24x2	54	27	13	20	31	41	45	65
160	40	M36x2	M30x2	72	36	16	20	39	56	60	80
200	40	M36x2	M30x2	72	36	16	25	39	56	70	95

†NOTE: Dimensions do not apply to Rod Lock Versions.

Flange – MF1, MF2



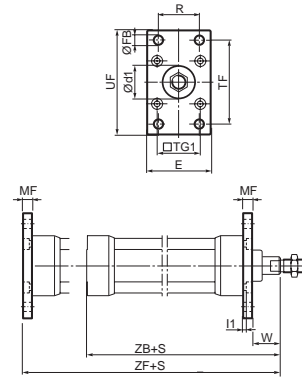
Intended for fixed mounting of cylinder. Flange can be fitted to front or rear end cover of cylinder.

Materials

32-100mm bore flange: Surface-treated aluminum, black
 125-200mm bore flange: Steel, black

Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.

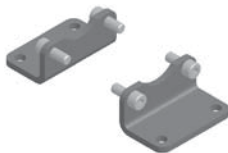


According to ISO MF1/MF2, VDMA 24 562, AFNOR

Bore size mm	d1 H11 mm	FB H13 mm	TG1 mm	E mm	R JS14 mm	MF JS14 mm	TF JS14 mm	UF	I1 -0.5 mm	W mm	ZF mm	ZB mm	Weight kg	Part number
32	30	7	32.5	45	32	10	64	80	5.0	16	130	123.5	0.23	P1C-4KMBA
40	35	9	38.0	52	36	10	72	90	5.0	20	145	138.5	0.28	P1C-4LMBA
50	40	9	46.5	65	45	12	90	110	6.5	25	155	146.5	0.53	P1C-4MMBA
63	45	9	56.5	75	50	12	100	120	6.5	25	170	161.5	0.71	P1C-4NMBA
80	45	12	72.0	95	63	16	126	150	8.0	30	190	177.5	1.59	P1C-4PMBA
100	55	14	89.0	112	75	16	150	185	8.0	35	205	192.5	2.19	P1C-4QMBA
125	60	16	110.0	140	90	20	180	220	10.5	45	245	230.5	3.78	P1C-4RMB
160	65	18	140.0	180	115	20	230	260	9.5	60	280	266	C.F.	L075370160
200	75	22	175.0	220	135	25	270	300	12.5	70	300	281	C.F.	L075370200

S = Stroke length C.F. = Consult Factory

Foot Bracket – MS1

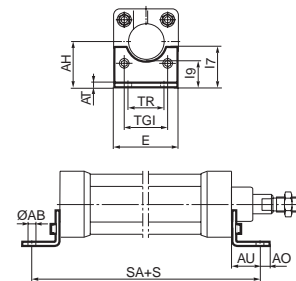


Intended for fixed mounting of cylinder. Foot bracket can be fitted to front and rear end covers of cylinder.

Materials

Foot bracket: Surface-treated steel, black
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied in pairs with mounting screws for attachment to cylinder.



According to ISO MS1, VDMA 24 562, AFNOR

Bore size mm	AB H14 mm	TG1 mm	E mm	TR JS14 mm	AO mm	AU mm	AH JS15 mm	I7 mm	AT mm	I9 JS14 mm	SA mm	Weight* kg	Part number
32	7	32.5	45	32	10	24	32	30	4.5	17.0	142	0.06	P1C-4KMF
40	9	38.0	52	36	8	28	36	30	4.5	18.5	161	0.08	P1C-4LMF
50	9	46.5	65	45	13	32	45	36	5.5	25.0	170	0.16	P1C-4MMF
63	9	56.5	75	50	13	32	50	35	5.5	27.5	185	0.25	P1C-4NMF
80	12	72.0	95	63	14	41	63	49	6.5	40.5	210	0.50	P1C-4PMF
100	14	89.0	115	75	15	41	71	54	6.5	43.5	220	0.85	P1C-4QMF
125	16	110.0	140	90	22	45	90	71	8.0	60.0	250	1.48	P1C-4RMF
160	18	140.0	180	115	15	60	115	100	9.0	63.5	300	C.F.	L075380160
200	22	175.0	220	135	30	70	135	100	12.0	65.0	320	C.F.	L075380200

S = Stroke length C.F. = Consult Factory

*Weight per item

B
 Tie Rod Cylinders
 Actuator Products

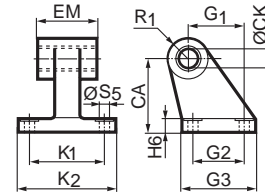
Pivot Bracket with Rigid Bearing



Intended for flexible mounting of cylinder. The pivot bracket can be combined with clevis bracket MP2.

Materials

Pivot bracket: Surface-treated aluminium, black
 Bearing: Sintered oil-bronze bushing



According to CETOP RP 107 P, VDMA 24 562, AFNOR

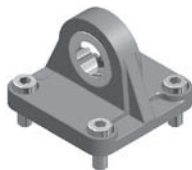
Bore size mm	CK H9 mm	S5 H13 mm	K1 JS14 mm	K2	G1 JS14 mm	G2 JS14 mm	EM mm	G3 mm	CA JS15 mm	H6 mm	R1 mm	Weight kg	Part number
32	10	6.6	38	51	21	18	25.5	31	32	8	10.0	0.06	P1C-4KMD
40	12	6.6	41	54	24	22	27.0	35	36	10	11.0	0.08	P1C-4LMD
50	12	9.0	50	65	33	30	31.0	45	45	12	13.0	0.15	P1C-4MMD
63	16	9.0	52	67	37	35	39.0	50	50	12	15.0	0.20	P1C-4NMD
80	16	11.0	66	86	47	40	49.0	60	63	14	15.0	0.33	P1C-4PMD
100	20	11.0	76	96	55	50	59.0	70	71	15	19.0	0.49	P1C-4QMD
125	25	14.0	94	124	70	60	69.0	90	90	20	22.5	1.02	P1C-4RMD
160	30	14.0	118	156	97	89	88.5	126	115	25	31.0	C.F.	L075480160
200	30	16.0	122	162	105	89	88.5	130	135	30	31.0	C.F.	L075480200

C.F. = Consult Factory

B

Tie Rod Cylinders
 Actuator Products

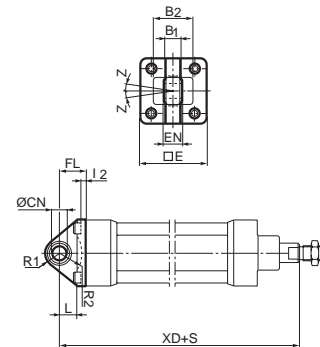
Swivel Eye Bracket – MP6



Intended for use together with clevis bracket GA

Material

Bracket: Surface-treated aluminium, black
 (Cast iron for 160-200mm bores)
 Swivel bearing acc. to DIN 648K: Hardened steel
 Supplied complete with mounting screws for attachment to cylinder.



According to VDMA 24 562, AFNOR

Bore size mm	E mm	B1 mm	B2 mm	EN mm	R1 mm	R2 mm	FL mm	I2 mm	L mm	CN H7 mm	XD mm	Z	Weight kg	Part number
32	45	10.5	–	14	16	–	22	5.5	12	10	142	4°	0.08	P1C-4KMSA
40	52	12.0	–	16	18	–	25	5.5	15	12	160	4°	0.11	P1C-4LMSA
50	65	15.0	51	21	21	19	27	6.5	15	16	170	4°	0.20	P1C-4MMSA
63	75	15.0	–	21	23	–	32	6.5	20	16	190	4°	0.27	P1C-4NMSA
80	95	18.0	–	25	29	–	36	10.0	20	20	210	4°	0.52	P1C-4PMSA
100	115	18.0	–	25	31	–	41	10.0	25	20	230	4°	0.72	P1C-4QMSA
125	140	25.0	–	37	40	–	50	10.0	30	30	275	4°	1.53	P1C-4RMSA
160	177	30.0	–	43	44	41	55	4.0	41	35	315	16°	C.F.	L075420160
200	214	30.0	–	43	48	42	60	8.0	42	35	335	16°	C.F.	L075420200

S = Stroke length C.F. = Consult Factory

Clevis Bracket – MP2



Intended for flexible mounting of cylinder. Clevis bracket MP2 can be combined with clevis bracket MP4.

Materials

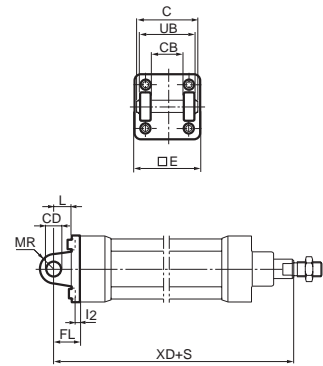
Clevis bracket: Surface-treated aluminium, black for 32-160mm bores; Cast iron for 200mm bore

Pin: Surface hardened steel

Circlips according to DIN 471: Spring steel

Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.

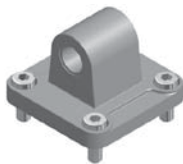


According to ISO MP2, VDMA 24 562, AFNOR

Bore size mm	C mm	E mm	UB h14 mm	CB H14 mm	FL ±0.2 mm	L mm	I2 mm	CD H9 mm	MR mm	XD mm	Weight kg	Part number
32	53	45	45	26	22	13	5.5	10	10	142	0.08	P1C-4KMT
40	60	52	52	28	25	16	5.5	12	12	160	0.11	P1C-4LMT
50	68	65	60	32	27	16	6.5	12	12	170	0.14	P1C-4MMT
63	78	75	70	40	32	21	6.5	16	16	190	0.29	P1C-4NMT
80	98	95	90	50	36	22	10.0	16	16	210	0.36	P1C-4PMT
100	118	115	110	60	41	27	10.0	20	20	230	0.64	P1C-4QMT
125	139	140	130	70	50	30	10.0	25	25	275	1.17	P1C-4RMT
160	178	180	170	90	55	35	10.0	30	25	315	C.F.	L075390160
200	178	200	170	90	60	35	14.0	30	25	335	C.F.	L075390200

S = Stroke length C.F. = Consult Factory

Clevis Bracket – MP4



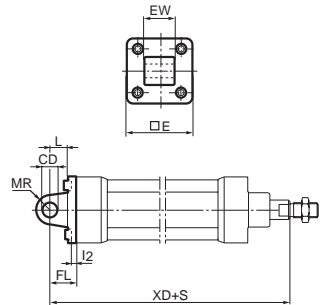
Intended for flexible mounting of cylinder. Clevis bracket MP4 can be combined with clevis bracket MP2.

Materials

Clevis bracket: Surface-treated aluminium, black for 32-125mm bores; Cast iron for 160-200mm bores

Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP4, VDMA 24 562, AFNOR

Bore size mm	E mm	EW mm	FL mm	L ±0.2 mm	I2 mm	CD mm	MR H9 mm	XD mm	Weight kg	Part number
32	45	26	22	13	5.5	10	10	142	0.09	P1C-4KME
40	52	28	25	16	5.5	12	12	160	0.13	P1C-4LME
50	65	32	27	16	6.5	12	12	170	0.17	P1C-4MME
63	75	40	32	21	6.5	16	16	190	0.36	P1C-4NME
80	95	50	36	22	10.0	16	16	210	0.46	P1C-4PME
100	115	60	41	27	10.0	20	20	230	0.83	P1C-4QME
125	140	70	50	30	10.0	25	25	275	1.53	P1C-4RME
160	180	90	55	35	10.0	30	25	315	C.F.	L075410160
200	220	90	60	35	14.0	30	25	335	C.F.	L075410200

S = Stroke length C.F. = Consult Factory

B
 Tie Rod Cylinders
 Actuator Products

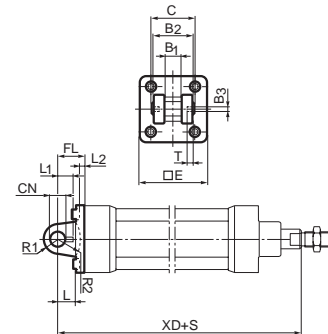
Clevis Bracket – GA



Intended for flexible mounting of cylinder. Clevis bracket GA can be combined with pivot bracket with swivel bearing, swivel eye bracket and swivel rod eye.

Materials

Clevis bracket: Surface-treated aluminium
 Pin: Surface hardened steel
 Locking pin: Spring steel
 Circlips according to DIN 471: Spring steel
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
 Supplied complete with mounting screws for attachment to cylinder.

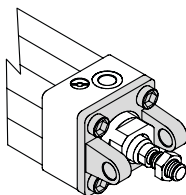


According to VDMA 24 562, AFNOR

Bore size mm	C mm	E mm	B2 d12 mm	B1 H14 mm	T mm	B3 mm	R2 mm	L1 mm	FL ±0.2 mm	I2 mm	L mm	CN F7 mm	R1 mm	XD mm	Weight kg	Part number
32	41	45	34	14	3	3.3	17	11.5	22	5.5	12	10	11	142	0.09	P1C-4KMCA
40	48	52	40	16	4	4.3	20	12.0	25	5.5	15	12	13	160	0.13	P1C-4LMCA
50	54	65	45	21	4	4.3	22	14.0	27	6.5	17	16	18	170	0.17	P1C-4MMCA
63	60	75	51	21	4	4.3	25	14.0	32	6.5	20	16	18	190	0.36	P1C-4NMCA
80	75	95	65	25	4	4.3	30	16.0	36	10.0	20	20	22	210	0.58	P1C-4PMCA
100	85	115	75	25	4	4.3	32	16.0	41	10.0	25	20	22	230	0.89	P1C-4QMCA
125	110	140	97	37	6	6.3	42	24.0	50	10.0	30	30	30	275	1.75	P1C-4RMCA
160	140	178	122	43	6	6.3	46	26.5	55	10.0	37	35 h9	36	C.F.	C.F.	L075510160
200	175	218	122	43	6	6.3	49	26.5	60	11.5	40	35 h9	38	C.F.	C.F.	L075510200

S = Stroke length C.F. = Consult Factory

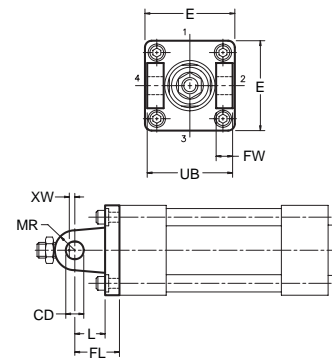
Head Detachable Clevis – MP7



Intended for flexible mounting of cylinder

Materials

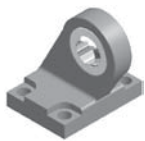
Clevis bracket: Cast iron for 32-63mm bores;
 Surface treated aluminum, black for 80-200mm bores
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
 Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP7, VDMA 24 562, AFNOR

Bore size	CD mm	E mm	FL mm	FW mm	L mm	MR mm	UB mm	XW mm	Part number
32	10	46.5	22	8	12	10	45	4	L075400032
40	12	52	25	9	15	12	52	5	L075400040
50	12	63.5	27	10	15	13	60	10	L075400050
63	16	76	32	15	20	16	70	5	L075400063
80	16	95.5	36	20	20	17	90	10	L075400080
100	20	114.5	41	25	25	21	110	10	L075400100
125	25	140	50	30	35	25	130	15	L075400125
160	30	177	55	40	36	30	170	25	L075400160
200	30	214	60	40	41	30	170	35	L075400200

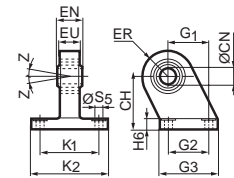
Pivot Bracket with Swivel Bearing



Intended for use together with clevis bracket GA.

Material

Pivot bracket: Surface-treated steel, black
 Swivel bearing acc. to DIN 648K: Hardened steel



According to VDMA 24 562, AFNOR

Bore size mm	CN H7 mm	S5 H13 mm	K1 JS14 mm	K2 mm	EU mm	G1 JS14 mm	G2 JS14 mm	EN mm	G3 mm	CH JS15 mm	H6 mm	ER mm	Z	Weight kg	Part number
32	10	6.6	38	51	10.5	21	18	14	31	32	10	16	4°	0.18	P1C-4KMA
40	12	6.6	41	54	12.0	24	22	16	35	36	10	18	4°	0.25	P1C-4LMA
50	16	9.0	50	65	15.0	33	30	21	45	45	12	21	4°	0.47	P1C-4MMA
63	16	9.0	52	67	15.0	37	35	21	50	50	12	23	4°	0.57	P1C-4NMA
80	20	11.0	66	86	18.0	47	40	25	60	63	14	28	4°	1.05	P1C-4PMA
100	20	11.0	76	96	18.0	55	50	25	70	71	15	30	4°	1.42	P1C-4QMA
125	30	14.0	94	124	25.0	70	60	37	90	90	20	40	4°	3.10	P1C-4RMA

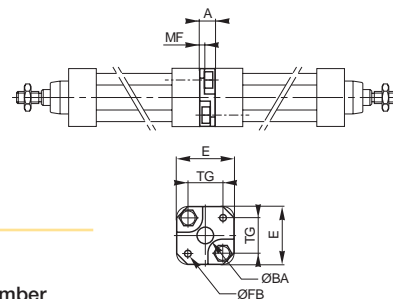
Mounting kit



Mounting kit for back to back mounted cylinders, 3 and 4 position duplex cylinders.

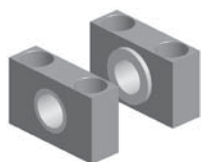
Material

Mounting: Aluminium
 Mounting screws: Zinc-plated steel 8.8



Bore size mm	E mm	TG mm	ØFB mm	MF mm	A mm	ØBA mm	Weight kg	Part number
32	50	32.5	6.5	5	16	30	0.060	P1E-6KB0
40	60	38.0	6.5	5	16	35	0.078	P1E-6LB0
50	66	46.5	8.5	6	20	40	0.162	P1E-6MB0
63	80	56.5	8.5	6	20	45	0.194	P1E-6NB0
80	100	72.0	10.5	8	25	45	0.450	P1E-6PB0
100	118	89.0	10.5	8	25	55	0.672	P1E-6QB0

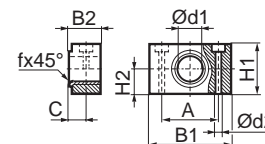
Pivot Bracket – MT4



Intended for use together with central trunnion MT4.

Material

Pivot bracket: Surface-treated aluminium
 Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing
 Supplied in pairs.



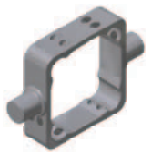
According to ISO, VDMA 24 562, AFNOR

Bore size mm	B1 mm	B2 mm	A mm	C mm	d1 mm	d2 H13 mm	H1 mm	H2 mm	fx45° min mm	Weight* kg	Part number
32	46	18.0	32	10.5	12	6.6	30	15	1.0	0.04	9301054261
40	55	21.0	36	12.0	16	9.0	36	18	1.6	0.07	9301054262
50	55	21.0	36	12.0	16	9.0	36	18	1.6	0.07	9301054263
63	65	23.0	42	13.0	20	11.0	40	20	1.6	0.12	9301054264
80	65	23.0	42	13.0	20	11.0	40	20	1.6	0.12	9301054265
100	75	28.5	50	16.0	25	14.0	50	25	2.0	0.21	9301054266
125	75	28.5	50	16.0	25	14.0	50	25	2.0	0.21	9301054267

* Weight per item

B
 Tie Rod Cylinders
 Actuator Products

Intermediate Trunnion – MT4



Standard*



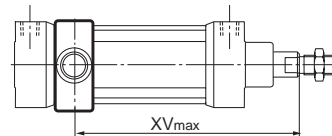
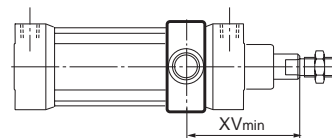
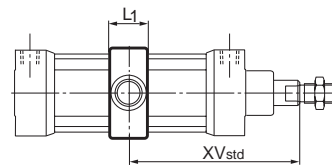
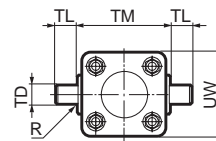
Tie Rod Version

Intended for articulated mounting of cylinder. The trunnion is factory-fitted at an optional location. Order by specifying Mounting Style G or 7 and providing the desired XV dimension (3-digit measure in mm). See page B64 for ordering information. Combined with pivot bracket for MT4 for 32-125mm bores.

Material:

Trunnion: Zinc plated steel
 (Cast iron for 160-200mm bores)

* Standard mounting is for the Standard cylinder body and is permanently affixed by the factory.



According to ISO MT4, VDMA 24 562, AFNOR

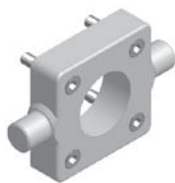
Bore size mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	X1 mm	XVmin mm	X2 mm	Weight kg
32	50	12	12	1.0	46	15	73.0	62.0	84.0	0.13
40	63	16	16	1.6	59	20	82.5	73.0	92.0	0.31
50	75	16	16	1.6	69	20	90.0	80.5	99.5	0.37
63	90	20	20	1.6	84	25	97.5	89.5	106.0	0.69
80	110	20	20	1.6	102	25	110.0	98.0	122.0	0.89
100	132	25	25	2.0	125	30	120.0	110.5	129.5	1.58
125	160	25	25	2.0	155	32	145.0	132.0	158.0	2.60
160	200	32	32	2.5	190	70	C.F.	169	C.F.	C.F.
200	250	32	32	2.5	242	70	C.F.	184	C.F.	C.F.

$XV_{std} = X1 + \text{Stroke length}/2$

$XV_{max} = X2 + \text{Stroke length}$

C.F. = Consult Factory

Flange Mounted Trunnion

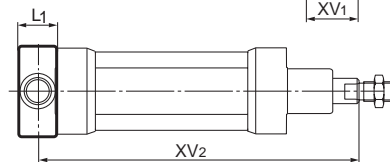
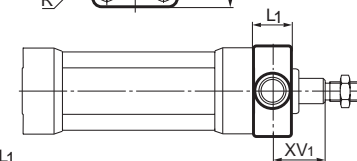
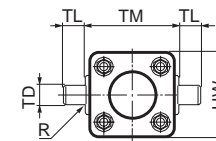


Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end cover of all P1D cylinders. If you choose, you can order a complete cylinder with factory-fitted flange mounted trunnion – see the ordering information on page B64 Individual trunnions have part numbers as shown below.

Material

Trunnion: zinc plated steel
 Screws: zinc plated steel, 8.8

Delivered complete with mounting screws for attachment to the cylinder



According to ISO MT4, VDMA 24 562, AFNOR

Bore size mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	XV1 mm	X mm	Weight kg	Part number
32	50	12	12	1.0	46	14	19.0	127.0	0.17	P1D-4KMYF
40	63	16	16	1.6	59	19	20.5	144.5	0.43	P1D-4LMYF
50	75	16	16	1.6	69	19	27.5	152.5	0.55	P1D-4MMYF
63	90	20	20	1.6	84	24	25.0	170.0	1.10	P1D-4NMYF
80	110	20	20	1.6	102	24	34.0	186.0	1.66	P1D-4PMYF
100	132	25	25	2.0	155	29	36.5	203.5	3.00	P1D-4QMYF

$XV2 = X + \text{Stroke length}$

Swivel Rod Eye



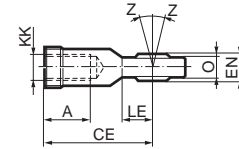
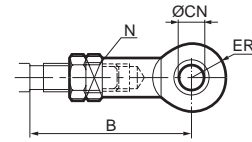
Stainless Steel
 Swivel Rod Eye

Swivel rod eye for articulated mounting of cylinder.
 Swivel rod eye can be combined with clevis bracket GA.
 Maintenance-free.

Materials

Swivel rod eye: Zinc-plated steel
 Swivel bearing according to DIN 648K: Hardened steel

Swivel rod eye: Stainless steel
 Swivel bearing according to DIN 648K: Stainless steel
 Use stainless steel nut (see next page) with stainless steel swivel rod eye.



According to ISO 8139

Bore size mm	A mm	B min mm	B max mm	CE mm	CN H9 mm	EN h12 mm	ER mm	KK	LE min mm	N mm	O mm	Z	Weight kg	Part number	Stainless steel part number
32	20	48.0	55	3	10	14	14	M10x1.25	15	17	10.5	12°	0.08	P1C-4KRS	P1S-4JRT
40	22	56.0	62	50	12	16	16	M12x1.25	17	19	12.0	12°	0.12	P1C-4LRS	P1S-4LRT
50	28	72.0	80	64	16	21	21	M16x1.5	22	22	15.0	15°	0.25	P1C-4MRS	P1S-4MRT
63	28	72.0	80	64	16	21	21	M16x1.5	22	22	15.0	15°	0.25	P1C-4PRS	P1S-4PRT
80	33	87.0	97	77	20	25	25	M20x1.5	26	32	18.0	15°	0.46	P1C-4RRS	P1S-4RRT
100	33	87.0	97	77	20	25	25	M20x1.5	26	32	18.0	15°	0.46	L075470036	C.F.
125	51	123.5	137	110	30	37	35	M27x2	36	41	25.0	15°	1.28	L075490036	C.F.
160/200	56	C.F.	C.F.	125	35*	43	40	M36x2	40	50	28.0	15°	C.F.	L075470036	C.F.

*H7 C.F. = Consult Factory

Clevis



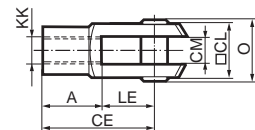
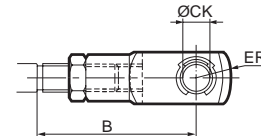
Stainless Steel
 Clevis

Clevis for articulated mounting of cylinder.

Material

Clevis, clip: Galvanized steel
 Pin: Hardened steel

Clevis: Stainless steel
 Pin: Stainless steel
 Circlips according to DIN 471: Stainless steel



According to ISO 8140

Bore size mm	A mm	B min mm	B max mm	CE mm	CK h11/E9 mm	CL mm	CM mm	ER mm	KK	LE mm	O mm	Weight kg	Part number	Stainless steel part number
32	20	45.0	52	40	10	20	10	16	M10x1.25	20	28.0	0.09	P1C-4KRC	P1S-4JRD
40	24	54.0	60	48	12	24	12	19	M12x1.25	24	32.0	0.15	P1C-4LRC	P1S-4LRD
50	32	72.0	80	64	16	32	16	25	M16x1.5	32	41.5	0.35	P1C-4MRC	P1S-4MRD
63	32	72.0	80	64	16	32	16	25	M16x1.5	32	41.5	0.35	P1C-4PRC	P1S-4PRD
80	40	90.0	100	80	20	40	20	32	M20x1.5	40	50.0	0.75	P1C-4RRC	P1S-4RRD
100	40	90.0	100	80	20	40	20	32	M20x1.5	40	50.0	0.75	L075490036	C.F.
125	56	123.5	137	110	30	55	30	45	M27x2	54	72.0	2.10	L075490036	C.F.
160/200	71	C.F.	C.F.	144	35	70	35	57	M36x2	72	95	C.F.	L075490036	C.F.

C.F. = Consult Factory

B
 Tie Rod Cylinders
 Actuator Products

Flexo Coupling

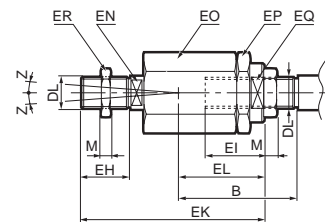


Flexo coupling for articulated mounting of piston rod.
 Flexo fitting is intended to take up axial angle errors within a range of $\pm 4^\circ$.

Material

Flexo coupling, nut: Zinc-plated steel
 Socket: Hardened steel

Supplied complete with galvanized adjustment nut.



Bore size mm	B min mm	B max mm	DL	EH mm	EI mm	EK mm	EL mm	EN mm	EO mm	EP mm	EQ mm	ER mm	M mm	Z	Weight kg	Part number
32	36.0	43	M10x1.25	20	23	70	31	12	30	30	19	30	5.0	4°	0.21	P1C-4KRF
40	37.0	43	M12x1.25	23	23	67	31	12	30	30	19	30	6.0	4°	0.22	P1C-4LRF
50	53.0	61	M16x1.5	40	32	112	45	19	41	41	30	41	8.0	4°	0.67	P1C-4MRF
63	53.0	61	M16x1.5	40	32	112	45	19	41	41	30	41	8.0	4°	0.67	P1C-4PRF
80	57.0	67	M20x1.5	39	42	122	56	19	41	41	30	41	10.0	4°	0.72	P1C-4RRF
100	57.0	67	M20x1.5	39	42	122	56	19	41	41	30	41	10.0	4°	0.72	P1C-4RRF
125	75.5	89	M27x2	48	48	145	60	24	55	55	32	55	13.5	4°	1.80	P1C-4RRF
160/200	C.F.	C.F.	M36x2	72	78	251	C.F.	36	75	75	50	55	18.0	4°	C.F.	L075530036

C.F. = Consult Factory

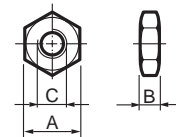
Nuts



Intended for fixed mounting of accessories to the piston rod.

Material: Zinc-plated steel

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.



Stainless Steel Nut

Material: Stainless steel A2

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.

Acid-proof nut

Material: Acid-proof steel A4

Cylinders with acid-proof piston rod are supplied with nut of acid-proof steel

According to DIN 439 B

Bore size mm	A mm	B mm	C	Weight kg	Part numbers		
					Steel	Stainless steel	Acid-proof
32	17	5.0	M10x1.25	0.007	9128985601	9126725404	0261109919
40	19	6.0	M12x1.25	0.010	0261109910	9126725405	0261109920
50	24	8.0	M16x1.5	0.021	9128985603	9126725406	0261109917
63	24	8.0	M16x1.5	0.021			
80	30	10.0	M20x1.5	0.040	0261109911	0261109921	0261109916
100	30	10.0	M20x1.5	0.040			
125	41	13.5	M27x2	0.100	0261109912	0261109922	0261109918
160/200	55	18.0	M36x2	C.F.	L075540036	C.F.	C.F.

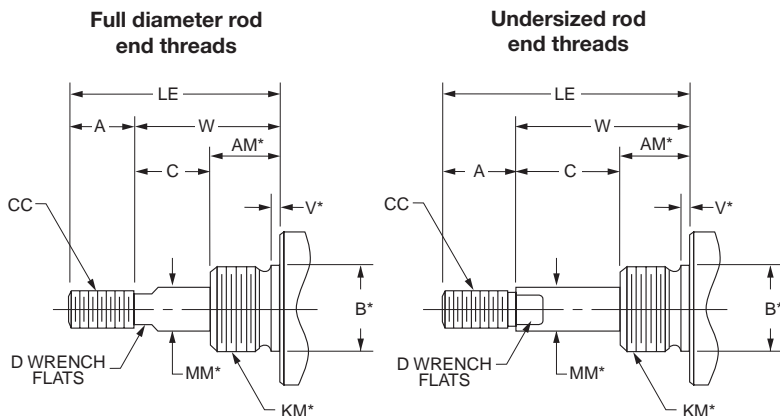
C.F. = Consult Factory

B

Tie Rod Cylinders
 Actuator Products

Non-Standard Rods

For non-standard rod dimensions, or undersized rod end threads, put a “3” in model number and describe the rod using the letters shown in the drawing. Specify CC, LE and A dimensions.



* Requires an S designation in model number.

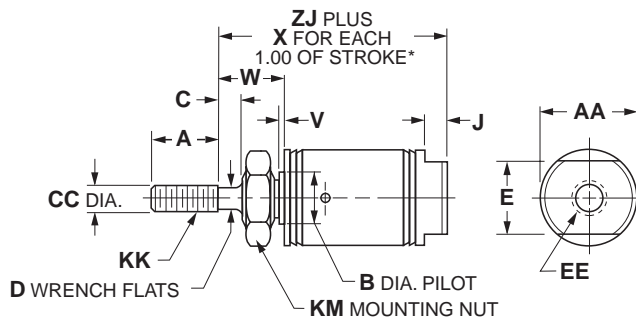
B

Round Body Cylinders
 Actuator Products

Mounting Style N

Nose Mount, Spring Return

Bore size	SR	SRM	Std. strokes (in)	Max.. stroke (in)	SS rod std
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✓
7/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	✓
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
7/8"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
1-1/4"	•	•	1/2, 1, 2, 3, 4	6	✓
1-1/2"	•	•	1/2, 1, 2, 3, 4	6	✓
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	
2"	•	•	–	4	



Bore size	ZJ															
	A	AA	B	C	CC	D	E	EE	J	KK	KM	V	W	X	SR	SRM
5/16"	0.38	0.36	–	–	0.125	–	0.36	#10-32	–	#5-40 UNC	1/4-28	0	0.25	0.75**	1.12	–
7/16"	0.50	0.50	0.374	–	0.188	–	0.38	#10-32	0.19	#10-32 UNF	3/8-24	0.05	0.31	0.94**	1.31	–
9/16"	0.50	0.62	0.437	–	0.188	–	0.50	#10-32	0.19	#10-32 UNF	7/16-20	0.06	0.38	1.62	1.53	1.76
3/4"	0.50	0.81	0.499	–	0.250	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	1/2-20	0.09	0.44	1.69	1.50	1.75
7/8"	0.50	0.93	0.624	–	0.250	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.09	0.50	1.56	1.84	–
1-1/16"	0.50	1.12	0.624	0.12	0.312	0.25	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	0.09	0.62	1.56	2.06	2.31
1-1/4"	0.75	1.34	0.749	0.25	0.437	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.81	2.66	2.78
1-1/2"	0.75	1.56	0.749	0.25	0.437	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.69	2.44	2.69
1-3/4"	0.88	1.84	1.031	0.38	0.500	7/16	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	0.09	0.75	2.0	2.97	3.09
2"	0.88	2.08	1.374	0.38	0.625	0.50	1.25	1/4 NPTF	0.31	1/2-20 UNF	1-1/4-120.12	1.19	–	▲	▲	

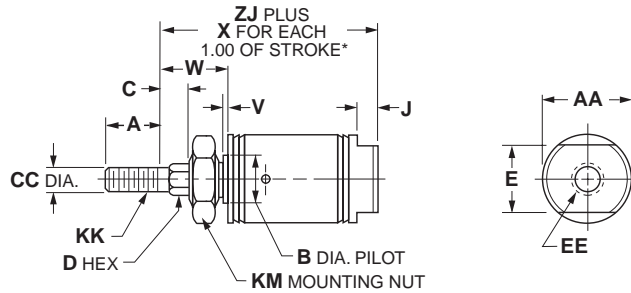
▲ 5.66" for 1" stroke; 7.66" for 2" stroke; 8.91" for 3" stroke; 11.84" for 4" stroke.

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract a half inch.

** For each 0.50" of stroke

Mounting Style NR

Nose Mount, Spring Return, Hex Rod



Bore size	SR	SRM	Std. stroke (in)	Max.. stroke (in)	SS rod std
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
7/8"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
1-1/4"	•	•	1, 2, 3, 4	6	✓
1-1/2"	•	•	1/2, 1, 2, 3, 4	6	✓
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	

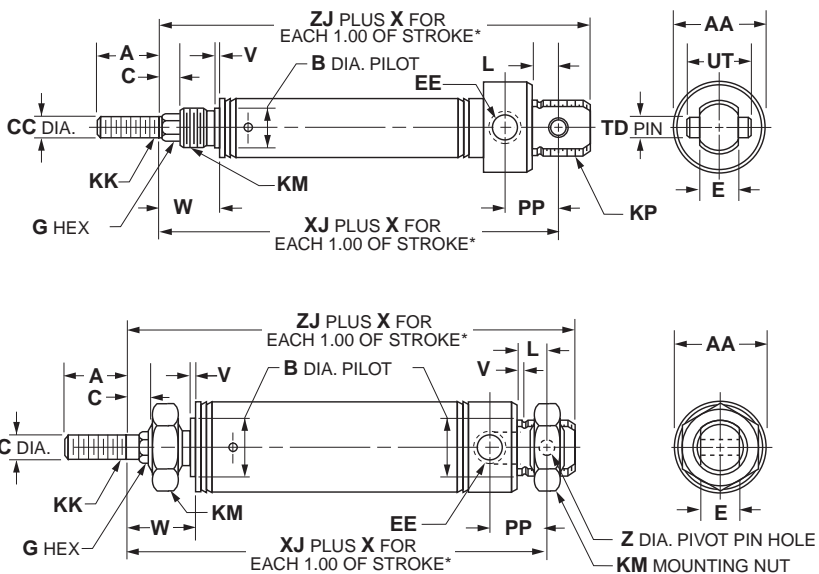
Bore size	A	AA	B	C	CC	D	E	EE	J	KK	KM	V	W	X	ZJ	
															SR	SRM
7/16"	0.50	-	0.374	0.25	0.188	3/16	-	#10-32	0.19	#10-32 UNF	3/8-24	0.05	0.56	0.94	1.56	-
9/16"	0.50	-	0.437	0.25	0.188	3/16	-	#10-32	0.19	#10-32 UNF	7/16-20	0.06	0.62	1.62	1.78	2.03
3/4"	0.50	-	0.499	0.25	0.250	1/4	-	1/8 NPTF	0.19	1/4-28 UNF	1/2-20	0.09	0.69	1.69	1.75	2.00
7/8"	0.50	-	0.624	0.25	0.250	1/4	-	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.09	0.75	1.56	2.09	-
1-1/16"	0.50	1.12	0.624	0.25	0.312	3/8	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	0.09	0.75	1.56	2.19	2.44
1-1/4"	0.88	1.34	0.749	0.25	0.437	7/16	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.81	2.66	2.78
1-1/2"	0.88	1.56	0.749	0.38	0.437	7/16	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	1.00	1.69	2.56	2.81
1-3/4"	0.88	1.84	1.031	0.38	0.500	1/2	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	0.09	1.12	2.0	3.03	3.15

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

B
 Round Body Cylinders
 Actuator Products

Mounting Style NRP

Pivot & Nose Mount, Spring Return, Hex Rod



Bore sizes
7/16" *
3/4"
* No mounting nuts

Bore sizes
9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"
* No mounting nuts

B

Round Body Cylinders
 Actuator Products

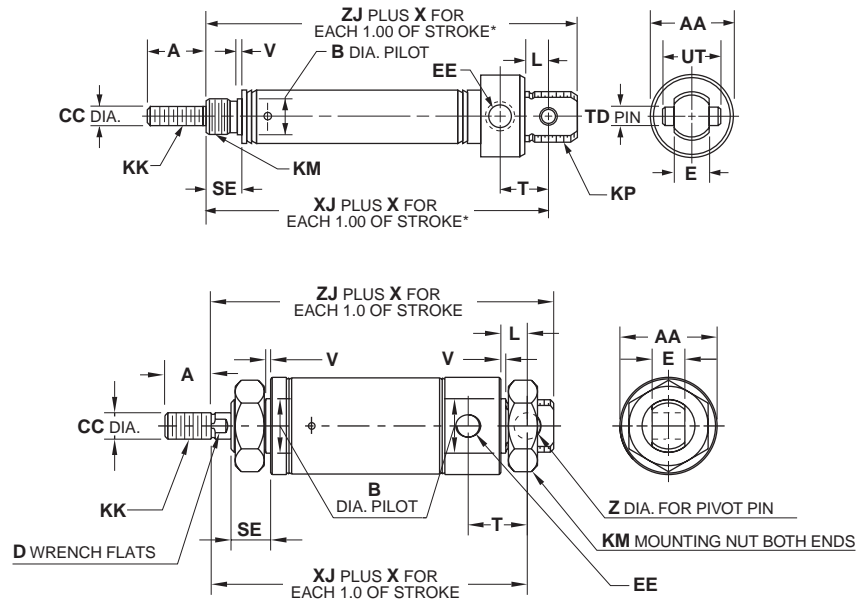
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	E	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.74	0.374	0.25	0.188	0.31	#10-32
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.62	0.437	0.25	0.188	0.31	#10-32
3/4"	•	•	1, 2, 3, 4	6	✓	0.50	0.86	0.499	0.25	0.250	0.38	1/8 NPTF
7/8"	•		1, 2, 3, 4	6	✓	0.50	0.93	0.624	0.25	0.250	0.38	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.50	1.12	0.624	0.25	0.312	0.38	1/8 NPTF
1-1/4"	•	•	1, 2, 3, 4	6	✓	0.88	1.34	0.749	0.25	0.437	0.50	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✓	0.88	1.56	0.749	0.38	0.437	0.62	1/8 NPTF
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.38	0.500	0.62	1/4 NPTF

Bore size	G HEX	KK	KM	KP	L	PP	TD	UT	V	W	X	XJ			ZJ	
												SR	SRM	Z	SR	SRM
7/16"	3/16	#10-32 UNF	3/8-24	7/16-20 UNF	0.25	0.44	0.156	0.50	0.05	0.56	0.94	2.00	-	-	2.25	-
9/16"	3/16	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.38	-	-	0.06	0.62	1.62	2.06	2.31	0.157	2.25	2.50
3/4"	1/4	1/4-28 UNF	1/2-20	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.69	1.69	2.53	2.78	-	2.81	3.06
7/8"	1/4	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.75	1.56	2.72	-	-	3.00	-
1-1/16"	3/8	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.75	1.56	2.78	3.03	-	3.06	3.31
1-1/4"	7/16	7/16-20 UNF	3/4-16	-	0.41	0.78	0.251	-	0.09	0.88	1.81	3.38	3.50	0.251	3.78	3.91
1-1/2"	7/16	7/16-20 UNF	3/4-16	-	0.50	0.81	0.375	1.00	0.09	1.00	1.69	3.25	3.50	-	3.62	3.87
1-3/4"	1/2	1/2-20 UNF	1-14	-	0.50	1.12	0.376	0.62	0.09	1.12	2.0	4.09	4.21	0.376	4.59	4.71

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

Mounting Style P

Pivot Mount, Spring Return



Bore sizes
5/16" *
7/16"
3/4"

* No mounting nuts

Bore sizes
9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"
2" *

* No mounting nuts

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
5/16"	•		1/2, 1, 1-1/2, 2, 3, 4	4	✓	0.38	0.39	–	0.125	–	0.25	#10-32
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.74	0.374	0.188	–	0.31	#10-32
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.62	0.437	0.188	–	0.31	#10-32
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.86	0.499	0.250	–	0.38	1/8 NPTF
7/8"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.93	0.624	0.250	–	0.38	1/8 NPTF
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	1.12	0.624	0.312	0.25	0.38	1/8 NPTF
1-1/4"	•	•	1, 2, 3, 4	6	✓	0.75	1.34	0.749	0.437	0.38	0.50	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✓	0.75	1.56	0.749	0.437	0.38	0.62	1/8 NPTF
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.500	7/16	0.62	1/4 NPTF
2"	•	•	–	4		0.88	2.08	1.374	0.625	0.50	0.75	1/4 NPTF

Bore size											XJ		ZJ		
	KK	KM	KP	L	SE	T	TD	UT	V	X	SR	SRM	Z	SR	SRM
5/16"	#5-40 UNC	3/8-24	–	0.34	0.25	0.34	–	–	–	0.75	1.52	–	0.125	1.68	–
7/16"	#10-32 UNF	3/8-24	7/16-20 UNF	0.25	0.31	0.44	0.156	0.50	0.05	0.94	1.75	–	–	2.00	–
9/16"	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.38	0.38	–	–	0.06	1.62	1.81	2.06	0.157	2.00	2.25
3/4"	1/4-28 UNF	1/2-20	5/8-18 UNF	0.34	0.44	0.62	0.250	0.75	0.09	1.69	2.28	2.53	–	2.56	2.81
7/8"	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.50	0.62	0.250	0.75	0.09	1.56	2.47	–	–	2.75	–
1-1/16"	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.50	0.62	0.250	0.75	0.09	1.56	2.66	2.91	–	2.94	3.19
1-1/4"	7/16-20 UNF	3/4-16	–	0.41	0.63	0.78	–	–	0.09	1.81	3.38	3.91	0.251	3.78	3.50
1-1/2"	7/16-20 UNF	3/4-16	–	0.50	0.63	0.81	0.375	1.00	0.09	1.81	3.12	3.37	–	3.50	3.75
1-3/4"	1/2-20 UNF	1-14	–	0.50	0.75	1.12	–	–	0.09	2.0	4.03	4.15	0.376	4.53	4.65
2"	1/2-20 UNF	1-1/4-12	–	0.56	0.81	1.03	–	–	0.12	–	■	*	–	▲	◆

■ 6.34" for 1" stroke, 8.34" for 2" stroke, 9.59" for 3" stroke, 12.53" for 4" stroke*

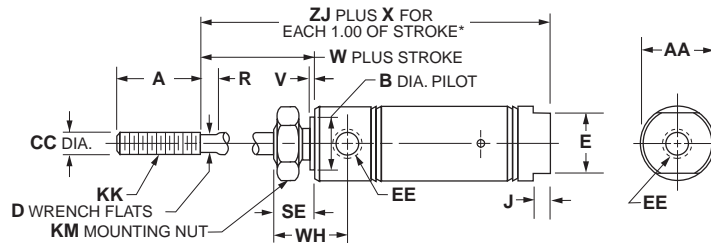
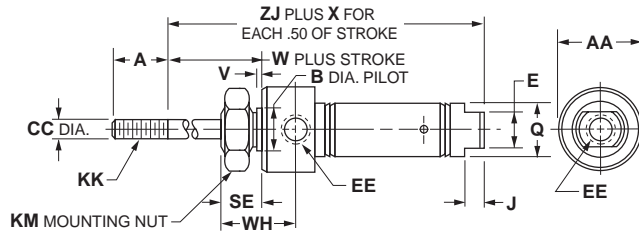
▲ 6.78" for 1" stroke, 8.78" for 2" stroke, 10.03" for 3" stroke, 12.97" for 4" stroke*

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract a half inch.

B
 Round Body Cylinders
 Actuator Products

Mounting Style R

Nose Mount, Spring Extended



Bore sizes

5/16"
7/16"
3/4"

Bore sizes

9/16"
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *

* No mounting nuts

B

Round Body Cylinders
 Actuator Products

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3	4	✓	0.38	0.50 SQ.	–	0.125	–	–
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.74	0.437	0.188	–	0.38
9/16"	•	•	1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.62	0.437	0.188	–	0.50
3/4"	•	•	1/2, 1, 2, 3, 4	6	✓	0.50	0.86	0.624	0.250	–	–
7/8"	•		1/2, 1, 2, 3, 4	6	✓	0.50	0.93	0.624	0.250	–	–
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	1.12	0.624	0.312	0.25	–
1-1/4"	•	•	1, 2, 3, 4	6	✓	0.75	1.34	0.749	0.437	0.38	–
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	0.437	0.38	0.88
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.500	7/16	–
2"	•	•	–	4		0.88	2.08	1.374	0.625	0.50	–

Bore size												ZJ	
	EE	J	KK	KM	Q	R	SE	V	W	WH	X	SR	SM
5/16"	#10-32	–	#5-40 UNC	3/8-24	0.36	–	0.31	–	0.31	0.47	1.25	1.49	–
7/16"	#10-32	0.19	#10-32 UNF	7/16-20	0.50	–	0.38	0.05	0.38	0.72	1.44	1.94	–
9/16"	#10-32	0.19	#10-32 UNF	7/16-20	0.62	–	0.38	0.05	0.38	0.78	2.62	2.00	2.25
3/4"	1/8 NPTF	–	1/4-28 UNF	5/8-18	0.81	–	0.50	0.09	0.50	0.97	2.69**	2.31	2.56
7/8"	1/8 NPTF	–	1/4-28 UNF	5/8-18	–	–	0.50	0.09	0.50	0.97	2.56	2.31	–
1-1/16"	1/8 NPTF	–	5/16-24 UNF	5/8-18	–	0.12	0.50	0.09	0.62	1.06	2.81	2.62	2.87
1-1/4"	1/8 NPTF	–	7/16-20 UNF	3/4-16	–	0.25	0.62	0.09	0.88	1.38	2.81	3.47	3.60
1-1/2"	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	–	0.25	0.62	0.09	0.88	1.25	3.00	3.19	3.44
1-3/4"	1/4 NPTF	–	1/2-20 UNF	1-14	–	–	0.75	0.09	1.06	1.63	3.0	4.03	4.15
2"	1/4 NPTF	–	1/2-20 UNF	1-1/4-12	–	0.38	0.81	0.12	1.19	1.47	–	▲	◆

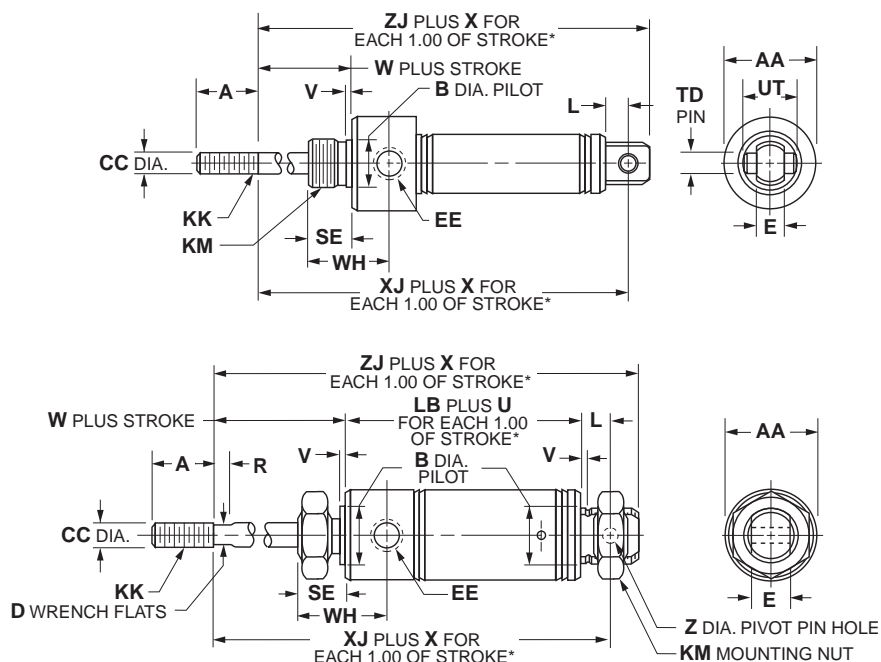
▲ 7.11" for 1" stroke, 10.11" for 2" stroke, 12.34" for 3" stroke, 16.34" for 4" stroke.*

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

** For each 1.00" of stroke.

Mounting Style RP

Pivot and Nose Mount, Spring Extended



Bore sizes
5/16" *
7/16"
3/4"

* No mounting nuts

Bore sizes
9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"
2" *

* No mounting nuts

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE	KK
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3	4	✓	0.38	0.50 SQ.	–	0.125	–	0.25	#10-32	#5-40 UNC
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.74	0.437	0.188	–	0.31	#10-32	#10-32 UNF
9/16"	•	•	1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.62	0.437	0.188	–	0.31	#10-32	#10-32 UNF
3/4"	•	•	1/2, 1, 2, 3, 4	6	✓	0.50	0.86	0.624	0.250	–	0.38	1/8 NPTF	1/4-28 UNF
7/8"	•		1/2, 1, 2, 3, 4	6	✓	0.50	0.93	0.624	0.250	–	0.38	1/8 NPTF	1/4-28 UNF
1-1/16"	•	•	1/2, 1, 1- 1/2, 2, 3, 4	6	✓	0.50	1.12	0.624	0.312	0.25	0.38	1/8 NPTF	5/16-24 UNF
1-1/4"	•	•	1, 2, 3, 4	6	✓	0.75	1.34	0.749	0.437	0.38	0.50	1/8 NPTF	7/16-20 UNF
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	0.437	0.38	0.62	1/8 NPTF	7/16-20 UNF
2"	•	•	–	4		.88	2.08	1.374	0.625	0.50	0.75	1/4 NPTF	1/2-20 UNF

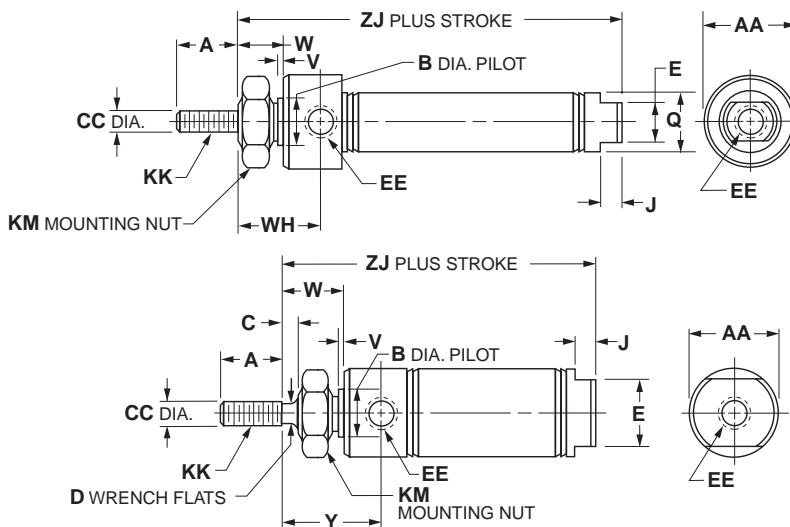
Bore size	KM	L	LB	R	SE	TD	U	UT	V	W	WH	X	XJ		ZJ		
													SR	SRM	Z	SR	SRM
5/16"	3/8-24	0.19	–	–	0.31	–	–	–	–	0.31	0.47	1.25	1.88	–	–	2.04	–
7/16"	7/16-20	0.25	–	–	0.38	0.156	–	0.50	0.05	0.38	0.72	1.44	2.38	–	–	2.62	–
9/16"	7/16-20	0.25	–	–	0.38	–	–	–	0.06	0.38	0.78	2.62	2.28	2.53	0.157	2.47	2.72
3/4"	5/8-18	0.34	–	–	0.50	0.250	–	0.75	0.09	0.50	0.97	2.69	2.44	2.69	–	2.72	2.97
7/8"	5/8-18	0.34	–	–	0.50	0.250	–	0.75	0.09	0.50	0.97	2.56	2.63	–	–	2.91	–
1-1/16"	5/8-18	0.34	–	0.12	0.50	0.250	–	0.75	0.09	0.62	1.06	2.81	2.78	3.03	–	3.06	3.31
1-1/4"	3/4-16	0.41	2.47	0.25	0.62	–	1.81	–	0.09	0.88	1.38	2.81	3.78	3.91	0.251	4.16	4.28
1-1/2"	3/4-16	0.50	–	0.25	0.62	0.375	–	1.00	0.09	0.88	1.25	3.00	3.88	4.13	–	4.25	4.50
2"	1-1/4 -12	0.56	–	0.38	0.81	–	–	–	0.12	1.19	1.47	–	■	★	0.376	▲	◆

■ 8.05" for 1" stroke, 11.05" for 2" stroke, 13.28" for 3" stroke, 17.28" for 4" stroke*
 ▲ 8.50" for 1" stroke, 11.50" for 2" stroke, 13.72" for 3" stroke, 17.72" for 4" stroke*
 * To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

B
 Round Body Cylinders
 Actuator Products

Mounting Style D

Nose Mount, Double Acting



Bore sizes

5/16"
 7/16"
 3/4"

Bore sizes

9/16"
 7/8"
 1-1/16"
 1-1/4"
 1-1/2"
 1-3/4"
 2" *
 2-1/2" *
 3" *

* No mounting nuts

B

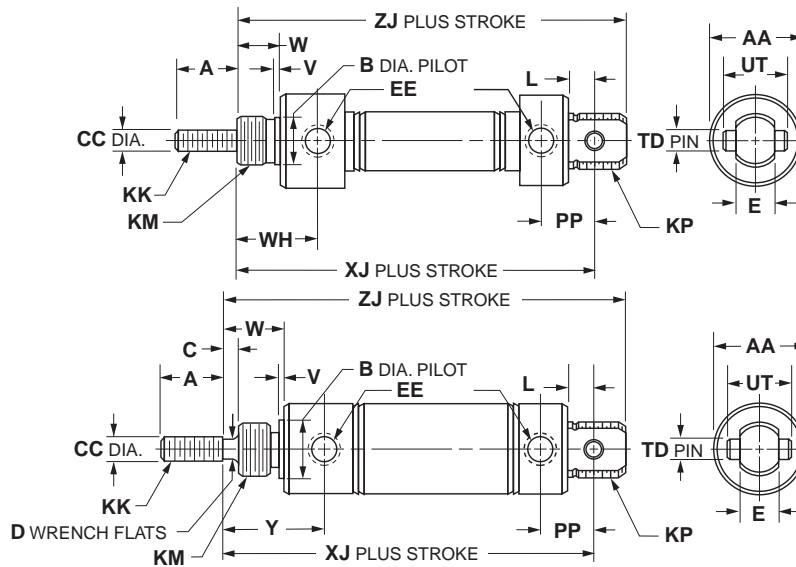
Round Body Cylinders
 Actuator Products

Bore size	SR	SRM	SRD SRDM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC
5/16"	•			1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✓	0.38	0.50 SQ.	–	–	0.125
7/16"	•			1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.74	0.437	–	0.188
9/16"	•	•	•	1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.62	0.437	–	0.188
3/4"	•	•	•	1/2, 1, 2, 2-1/2, 3, 4, 5, 6, 8, 10	12	✓	0.50	0.86	0.624	–	0.250
7/8"	•			1/2, 1, 2, 3, 4, 5, 6	12	✓	0.50	0.93	0.624	–	0.250
1-1/16"	•	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	12	✓	0.50	1.12	0.624	0.12	0.312
1-1/4"	•	•		1, 2, 3, 4, 5, 6	12	✓	0.75	1.34	0.749	0.25	0.437
1-1/2"	•	•	•	1/2, 1, 2, 3, 4, 5, 6, 8, 10, 12	12	✓	0.75	1.56	0.749	0.25	0.437
1-3/4"	•	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6	12		0.88	1.84	1.031	0.31	0.500
2"	•	•	•	–	12		0.88	2.08	1.374	0.38	0.625
2-1/2"	•	•		–	12		0.88	2.62	1.500	0.38	0.625
3"	•			–	12		1.25	3.16	1.630	0.38	0.750

Bore size	D	E	EE	J	KK	KM	Q	V	W	WH	Y	ZJ	
												SR	SRM
5/16"	–	–	#10-32	–	#5-40 UNC	3/8-24	0.36	–	0.31	0.47	–	1.64	–
7/16"	–	0.38	#10-32	0.19	#10-32 UNF	7/16-20	0.50	0.05	0.38	0.72	–	2.12	–
9/16"	–	0.50	#10-32	0.19	#10-32 UNF	7/16-20	–	0.06	0.38	0.78	–	2.28	2.53
3/4"	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.81	0.09	0.50	0.97	–	2.97	2.97
7/8"	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	–	0.09	0.50	0.97	–	2.94	–
1-1/16"	0.25	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	–	0.09	0.62	–	1.19	3.25	3.41
1-1/4"	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	–	0.09	0.88	–	1.62	4.00	4.03
1-1/2"	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	–	0.09	0.88	–	1.50	3.69	3.94
1-3/4"	7/16	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	–	0.09	1.06	1.63	–	4.69	4.69
2"	0.50	1.25	1/4 NPTF	0.31	1/2-20 UNF	1-1/4-12	–	0.12	1.19	–	1.84	4.69	4.97
2-1/2"	1/2	1.75	1/4 NPTF	0.31	1/2-20 UNF	1-3/8-12	–	0.13	1.19	–	1.84	4.69	4.69
3"	5/8	2.00	3/8 NPTF	0.31	5/8-18 UNF	1-1/2-12	–	0.19	1.38	–	2.09	5.25	–

Mounting Style DP

Pivot and Nose Mount, Double Acting, Pivot Pin



Bore sizes
5/16"
7/16"
3/4"

Bore sizes
1-1/16"
1-1/2"

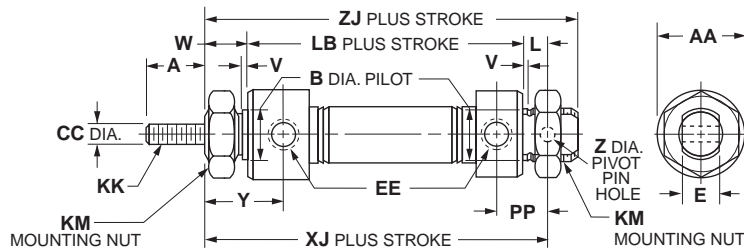
B
 Round Body Cylinders
 Actuator Products

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	B	CC	D	E
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.74	0.437	0.188	-	0.31
3/4"	•	•	1/2, 1, 2, 2-1/2, 3, 4, 5, 6, 8, 10	12	✓	0.50	0.86	0.624	0.250	-	0.38
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	12	✓	0.50	1.12	0.624	0.312	0.25	0.38
1-1/2"	•	•	1, 2, 3, 4, 5, 6, 8, 10, 12	12	✓	0.75	1.56	0.749	0.437	0.38	0.62

Bore size	EE	KK	KM	KP	L	PP	TD	UT	V	W	WH	XJ		ZJ		
												SR	SRM	Y	SR	SRM
7/16"	#10-32	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.44	0.156	0.50	0.05	0.38	0.72	2.56	-	-	2.81	-
3/4"	1/8 NPTF	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.50	0.97	3.75	3.75	-	4.03	4.03
1-1/16"	1/8 NPTF	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.62	-	3.84	4.00	1.19	4.12	4.28
1-1/2"	1/8 NPTF	7/16-20 UNF	3/4-16	-	0.50	0.81	0.375	1.00	0.09	0.87	-	4.38	4.63	1.50	4.75	5.00

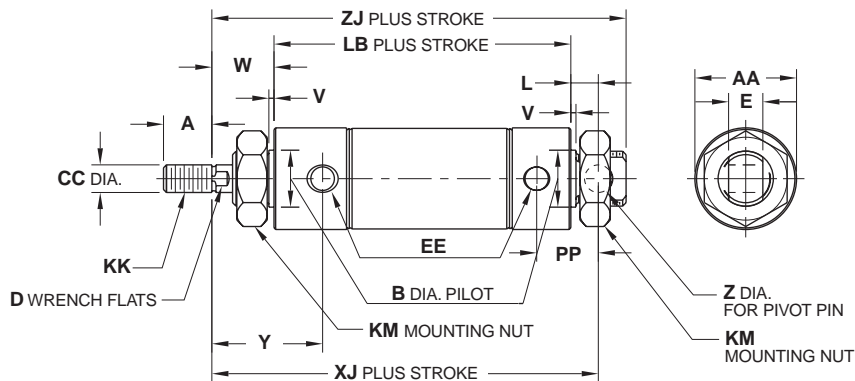
Mounting Style DXP

Pivot & Nose Mount, Double Acting, No Pivot Pin



Bore sizes

- 5/16"
- 7/16"
- 3/4"



Bore sizes

- 9/16" *
- 7/8"
- 1-1/16"
- 1-1/4"
- 1-1/2"
- 1-3/4"
- 2" *
- 2-1/2" *
- 3" *

* No mounting nuts

B

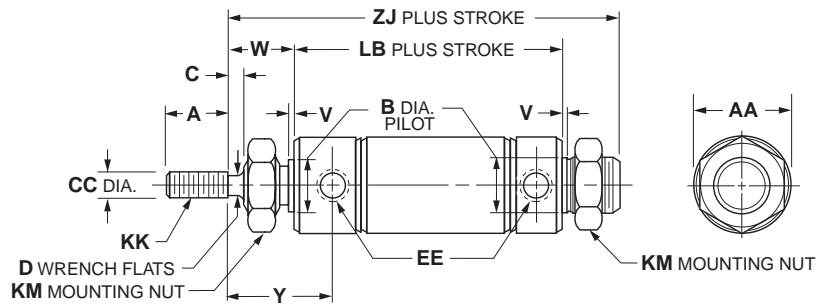
Round Body Cylinders
 Actuator Products

Bore size	SR	SRM	SRD	SRDM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E
5/16"	•				1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✓	0.38	0.50 SQ.	-	0.125	-	0.25
7/16"	•				1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.74	0.437	0.188	-	0.31
9/16"	•	•	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.62	0.437	0.188	-	0.31
3/4"	•	•	•		1, 2, 3, 4, 5, 6, 8, 10	32	✓	0.50	0.86	0.624	0.250	-	0.38
7/8"	•				1, 2, 3, 4, 5, 6, 8, 10	32	✓	0.50	0.93	0.624	0.250	-	0.38
1-1/16"	•	•	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	32	✓	0.50	1.12	0.624	0.312	0.25	0.38
1-1/4"	•	•			1, 2, 3, 4, 5, 6, 7, 8, 10, 12	32	✓	0.75	1.34	0.749	0.437	0.38	0.50
1-1/2"	•	•	•		-	32	✓	0.75	1.56	0.749	0.437	0.38	0.62
1-3/4"	•	•			1, 2, 3, 4, 5, 6, 8, 10, 12	32		0.88	1.84	1.031	0.500	7/16	0.62
2"	•	•	•		-	32		0.88	2.08	1.374	0.625	0.50	0.75
2-1/2"	•	•			-	32		0.88	2.62	1.500	0.625	1/2	0.75
3"	•				-	32		1.25	3.16	1.630	0.750	5/8	0.88

Bore size									XJ			ZJ		
	EE	KK	KM	L	LB	PP	V	W	SR	SRM	Y	Z	SR	SRM
5/16"	#10-32	#5-40 UNC	3/8-24	0.19	-	0.34	-	0.31	2.03	-	-	0.125	2.19	-
7/16"	#10-32	#10-32 UNF	7/16-20	0.25	1.94	0.44	0.05	0.38	2.56	-	0.72	0.157	2.81	-
9/16"	#10-32	#10-32 UNF	7/16-20	0.25	-	0.38	0.06	0.38	2.56	2.81	0.78	0.157	2.75	3.00
3/4"	1/8 NPTF	1/4-28 UNF	5/8-18	0.34	2.91	0.62	0.09	0.50	3.75	3.75	0.97	0.251	4.03	4.03
7/8"	1/8 NPTF	1/4-28 UNF	5/8-18	0.34	-	0.62	0.09	0.50	3.56	-	0.97	0.251	3.84	-
1-1/16"	1/8 NPTF	5/16-24 UNF	5/8-18	0.34	-	0.62	0.09	0.62	3.84	-	1.19	0.251	4.12	4.28
1-1/4"	1/8 NPTF	7/16-20 UNF	3/4-16	0.41	-	0.78	0.09	0.88	4.72	4.75	1.62	0.251	5.12	5.16
1-1/2"	1/8 NPTF	7/16-20 UNF	3/4-16	0.50	-	0.81	0.09	0.88	4.38	4.63	1.50	0.376	4.75	5.00
1-3/4"	1/4 NPTF	1/2-20 UNF	1-14	0.50	4.19	1.12	0.09	1.06	5.75	5.75	1.94	0.376	6.25	6.25
2"	1/4 NPTF	1/2-20 UNF	1-1/4-12	0.56	-	1.03	0.12	1.19	5.62	5.91	-	0.376	6.06	6.34
2-1/2"	1/4 NPTF	1/2-20 UNF	1-3/8-12	0.56	-	1.03	0.13	1.19	5.62	5.62	1.84	0.376	6.06	6.06
3"	3/8 NPTF	5/8-18 UNF	1-1/2-12	0.81	-	1.34	0.19	1.38	6.50	-	2.09	0.500	7.12	-

Mounting Style DX

Threaded Both Ends, Double Acting



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std
7/16" *	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓
9/16" *	•	•	1/2, 1, 1-1/2, 2, 3, 4	12	✓
3/4" *	•	•	1, 2, 3, 4, 5, 6, 8, 10	32	✓
7/8" *	•	•	1, 2, 3, 4, 5, 6, 8, 10	32	✓
1-1/16" *	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	32	✓
1-1/4" *	•	•	1, 2, 3, 4, 5, 6, 7, 8, 10, 12	32	✓
1-1/2"	•	•	1, 2, 3, 4, 5, 6, 8, 10, 12	32	✓
2" *	•	•	–	32	

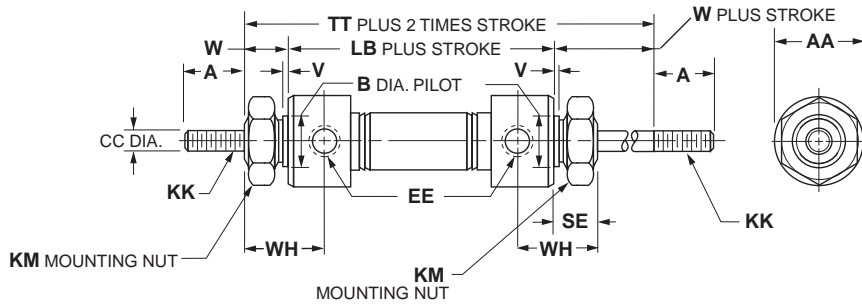
Bore size	A	AA	B	C	CC	D	EE	KK	KM	LB			ZJ		
										SR	SRM	V	W	Y	SR
7/16" *	0.50	0.74	0.437	–	0.188	–	#10-32	#10-32 UNF	7/16-20	1.94		0.05	0.38	0.72	2.81
9/16" *	0.50	0.62	0.437	–	0.188	–	#10-32	#10-32 UNF	7/16-20	–		0.06	0.38	0.78	2.75
3/4" *	0.50	0.86	0.624	–	0.250	–	1/8 NPTF	1/4-28 UNF	5/8-18	2.91		0.09	0.50	0.97	4.03
7/8" *	0.50	0.93	0.624	–	0.250	–	1/8 NPTF	1/4-28 UNF	5/8-18	–		0.09	0.50	0.97	3.84
1-1/16" *	0.50	1.12	0.624	0.12	0.312	0.25	1/8 NPTF	5/16-24 UNF	5/8-18	–		0.09	0.62	1.19	4.12
1-1/4" *	0.75	0.34	0.749	0.25	0.437	0.38	1/8 NPTF	7/16-20 UNF	3/4-16	–		0.09	0.88	1.62	5.12
1-1/2"	0.75	1.56	0.749	0.25	0.437	0.38	1/8 NPTF	7/16-20 UNF	3/4-16	3.00		0.09	0.88	1.50	4.50
2" *	0.88	2.08	1.374	0.38	0.625	0.50	1/4 NPTF	1/2-20 UNF	1-1/4-12	–		0.12	1.19	–	6.06

* Available upon request. Please consult factory.

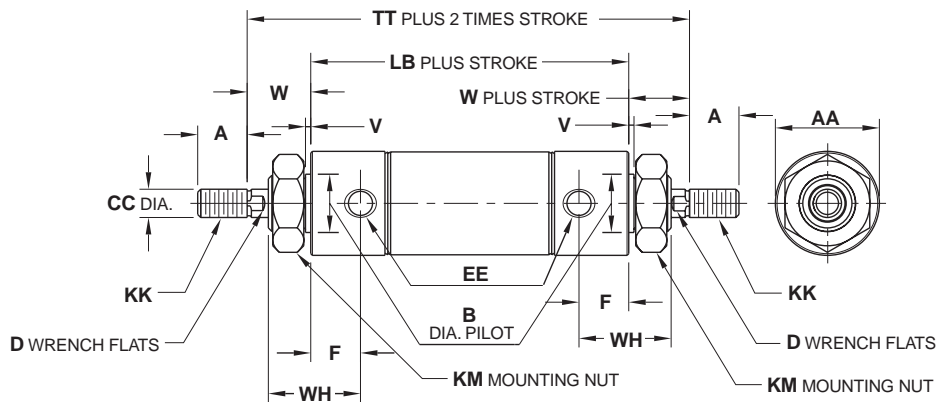
B
 Round Body Cylinders
 Actuator Products

Mounting Style KDX

Threaded Both Ends, Double Acting, Double Rod



Bore sizes
7/16"
3/4"



Bore sizes
9/16" *
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *
2-1/2" *
3" *

* No mounting nuts

B

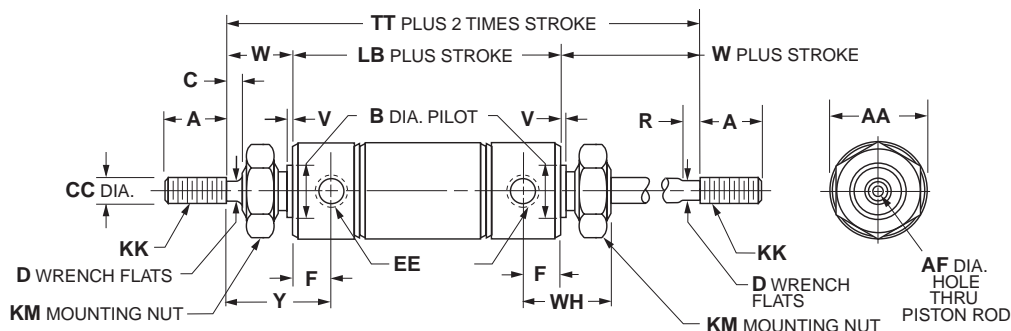
Round Body Cylinders
 Actuator Products

Bore size	SR	SRM	SRD SRDM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	B	CC
7/16"	•			1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.74	0.437	0.188
9/16"	•	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.62	0.437	0.188
3/4"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.50	0.86	0.624	0.250
7/8"	•			1, 2, 3, 4, 6	12	✓	0.50	0.93	0.624	0.250
1-1/16"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.50	1.12	0.624	0.312
1-1/4"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	1.34	0.749	0.437
1-1/2"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	1.56	0.749	0.437
1-3/4"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.88	1.84	1.031	0.500
2"	•	•	•	–	12	✓	0.88	2.08	1.374	0.625
2-1/2"	•	•	•	–	18	✓	0.88	2.62	1.500	0.625
3"	•	•	•	–	12	✓	1.25	3.16	1.630	0.750

Bore size	D	EE	F	KK	KM	LB			TT			V	W	WH
						SR	SRM	SE	SR	SRM	SE			
7/16"	–	#10-32	0.34	#10-32 UNF	7/16-20	2.06	–	0.38	2.81	–	0.05	0.38	0.72	
9/16"	–	#10-32	0.40	#10-32 UNF	7/16-20	2.19	2.44	0.38	2.94	3.19	0.06	0.38	0.78	
3/4"	–	1/8 NPTF	0.47	1/4-28 UNF	5/8-18	3.00	3.00	0.50	4.00	4.00	0.09	0.50	0.97	
7/8"	–	1/8 NPTF	0.47	1/4-28 UNF	5/8-18	2.91	–	0.50	3.91	–	0.09	0.50	0.97	
1-1/16"	0.25	1/8 NPTF	0.56	5/16-24 UNF	5/8-18	2.75	3.28	0.50	4.00	4.53	0.09	0.62	1.19	
1-1/4"	0.38	1/8 NPTF	0.75	7/16-20 UNF	3/4-16	3.81	3.84	0.63	5.56	5.59	0.09	0.88	1.62	
1-1/2"	0.38	1/8 NPTF	0.62	7/16-20 UNF	3/4-16	3.38	3.63	0.63	5.12	5.38	0.09	0.88	1.50	
1-3/4"	7/16	1/4 NPTF	0.88	1/2-20 UNF	1-14	4.44	4.44	0.75	6.56	6.56	0.09	1.06	1.63	
2"	0.50	1/4 NPTF	0.65	1/2-20 UNF	1-1/4-12	4.19	4.47	–	6.56	6.84	0.12	1.19	1.84	
2-1/2"	1/2	1/4 NPTF	0.65	1/2-20 UNF	1-3/8-12	4.19	4.19	–	6.56	6.56	0.13	1.19	1.84	
3"	5/8	3/8 NPTF	0.71	5/8-18 UNF	1-1/2-12	4.56	–	–	7.31	–	0.19	1.38	1.72	

Mounting Style KDXH

Threaded Both Ends, Double Rod, Hollow Rod

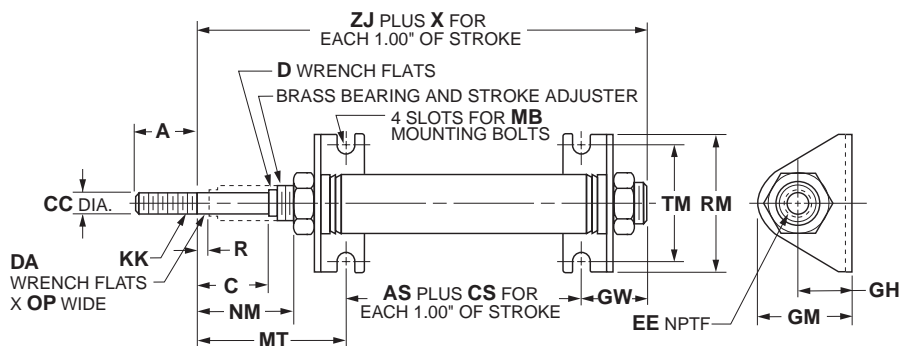


Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	AF	B	C	CC
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.50	1.12	0.187	0.624	0.12	0.312
1-1/4"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.75	1.34	0.250	0.749	0.25	0.437
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.75	1.56	0.250	0.749	0.25	0.437
1-3/4"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.88	1.84	0.328	1.031	0.38	0.500

Bore size	D	EE	F	KK	KM	LB		R	TT		V	W	WH	Y
						SR	SRM		SR	SRM				
1-1/16"	0.25	1/8 NPTF	0.56	5/16-24 UNF	5/8-18	2.75	3.28	0.12	4.00	4.53	0.09	0.62	1.06	1.19
1-1/4"	0.38	1/8 NPTF	0.75	7/16-20 UNF	3/4-16	3.81	3.84	0.25	5.56	5.59	0.09	0.88	1.38	1.62
1-1/2"	0.38	1/8 NPTF	0.62	7/16-20 UNF	3/4-16	3.38	3.63	0.25	5.12	5.38	0.09	0.88	1.25	1.50
1-3/4"	7/16	1/4 NPTF	0.88	1/2-20 UNF	1-14	4.44	4.44	–	6.56	6.56	0.09	1.06	1.63	1.63

Mounting Style A

Nose Mount, Spring Return, Head Adjustable Stroke



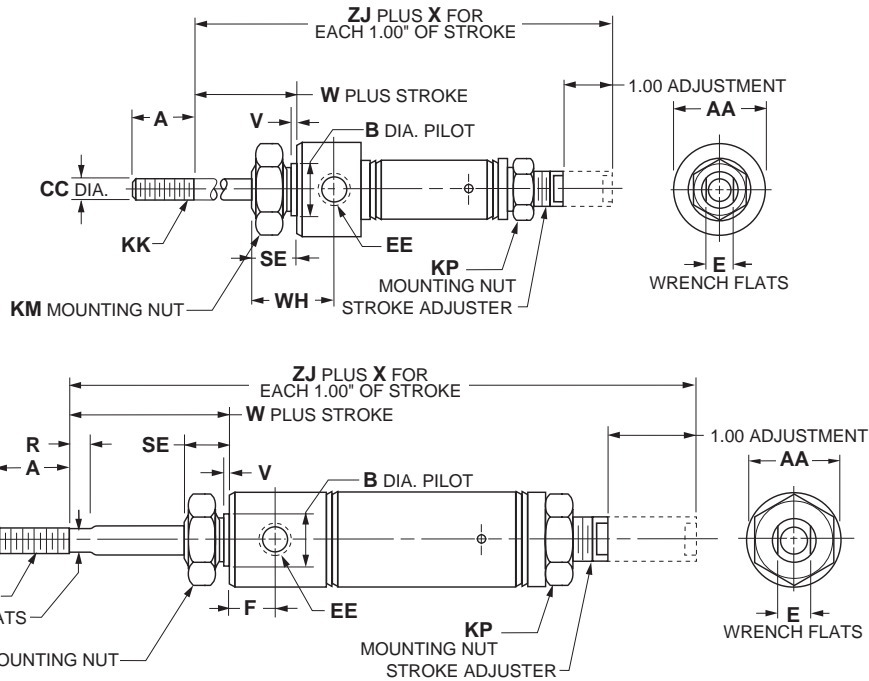
Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std	A	AS	C	CC	CS	D
3/4"	•	•	Stroke adjustment in 1" increments to 3": 1" stroke adjusts 0-1" 2" stroke adjusts 1-2" 3" stroke adjusts 2-3"	6	✓	0.50	–	1.19	0.250	1.69	–
1-1/16"	•	•		6	✓	0.50	0.32	1.25	0.312	1.56	0.25
1-1/2"	•	•		6	✓	0.75	0.19	1.25	0.437	2.00	0.62

Bore size	EE	GH	GM	GW	KK	MB	MT	NM	OP	R	RM	TM	X	ZJ
3/4"	1/8 NPTF	0.81	1.38	0.88	1/4-28 UNF	0.250	2.38	1.44	–	0.19	1.88	1.50	1.69	3.12
1-1/16"	1/8 NPTF	0.81	1.38	0.93	5/16-24 UNF	0.250	2.38	1.44	0.12	0.25	1.88	1.50	1.56	3.63
1-1/2"	1/8 NPTF	1.00	1.78	1.25	7/16-20 UNF	0.250	2.56	1.50	–	0.25	2.50	1.88	2.00	4.00

B
 Round Body Cylinders
 Actuator Products

Mounting Style RA

Nose Mount, Spring Return, Cap Adjustable Stroke



Bore sizes
 3/4"

Bore sizes
 1-1/16"
 1-1/2"

B
 Round Body Cylinders
 Actuator Products

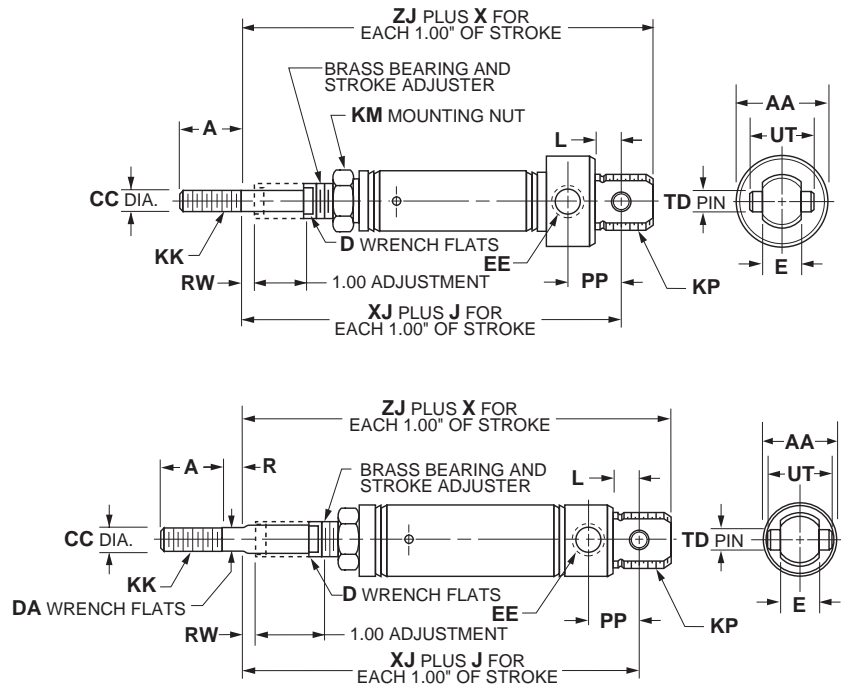
Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std
3/4"	•		Stroke adjustment in 1" increments to 3":	6	✓
1-1/16"	•		1" stroke adjusts 0-1"	6	✓
1-1/2"	•		2" stroke adjusts 1-2"	6	✓
			3" stroke adjusts 2-3"		

Bore size	A	AS	AA	B	CC	D	E	EE	F
3/4"	0.50	1.69	0.86	0.624	0.250	–	0.34	1/8 NPTF	–
1-1/16"	0.50	0.32	1.12	0.624	0.312	0.25	0.50	1/8 NPTF	0.56
1-1/2"	1.25	0.19	1.56	0.749	0.437	0.38	0.62	1/8 NPTF	0.62

3/4"	KK	KM	SE	R	V	W	WH	X	ZJ
1-1/16"	1/4-28 UNF	5/8-18	0.50	–	0.09	0.53	0.97	2.69	3.78
1-1/2"	5/16-24 UNF	5/8-18	0.50	0.12	0.09	0.50	–	2.56	4.03
1-1/2"	7/16-20 UNF	3/4-16	0.62	0.25	0.09	0.88	–	2.00	5.81

Mounting Style AP

Pivot Mount, Spring Return, Head Adjustable Stroke



Bore sizes
 3/4"

Bore sizes
 1-1/16"
 1-1/2"

Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std
3/4"	•		Stroke adjustment in 1" increments to 3"	6	✓
1-1/16"	•		1" stroke adjusts 0-1" 2" stroke adjusts 1-2"	6	✓
1-1/2"	•		3" stroke adjusts 2-3"	6	✓

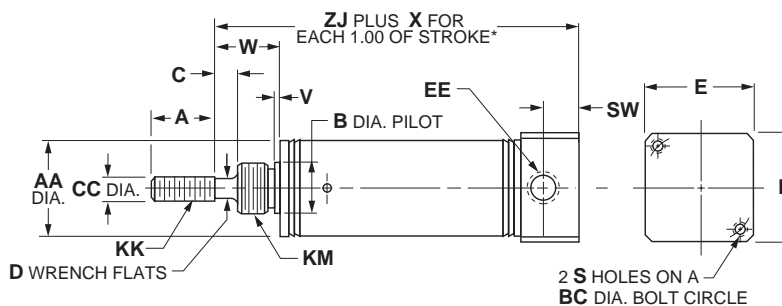
Bore size	A	AA	CC	D	DA	E	EE	J	KK
3/4"	0.50	0.86	0.250	0.34	–	0.38	1/8 NPTF	1.69	1/4-28 UNF
1-1/16"	0.50	1.12	0.312	0.50	0.25	0.38	1/8 NPTF	1.56	5/16-24 UNF
1-1/2"	0.75	1.56	0.437	0.62	0.38	0.62	1/8 NPTF	2.00	7/16-20 UNF

Bore size	KM	KP	L	OP	PP	R	RW	TD	UT	X	XJ	ZJ
3/4"	7/16-20	5/8-18 UNF	0.34	–	0.62	0.19	0.19	0.250	0.75	1.69	3.65	3.93
1-1/16"	–	5/8-18 UNF	0.34	0.25	0.62	0.12	0.25	0.250	0.75	1.56	3.97	4.25
1-1/2"	3/4-16	–	0.50	–	0.81	0.25	0.25	0.375	1.00	2.00	4.31	4.69

B
 Round Body Cylinders
 Actuator Products

Mounting Style BRN

Rear Block Mount, Single Acting, Spring Return



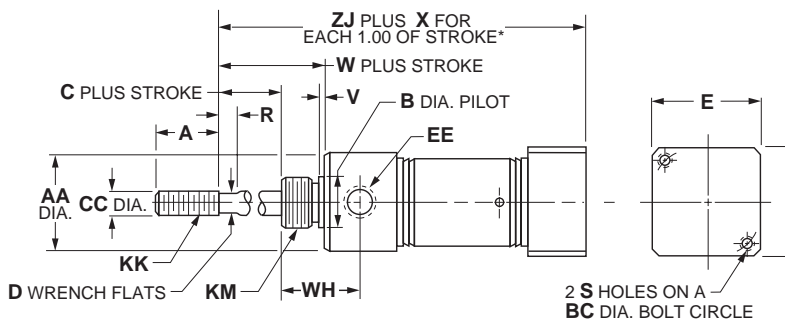
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D
7/16"	•		1/2, 1, 2, 3, 4	6	✓	0.50	0.5	0.374	–	0.188	–
3/4"	•	•	1, 2, 3, 4	6	✓	0.75	0.81	0.499	0.25	0.250	0.22
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.624	0.38	0.312	0.25
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	0.25	0.437	0.38

Bore size	E	EE	KK	KM	SW	V	W	X	ZJ SR	SRM
7/16"	0.75	#10-32	#10-32 UNF	3/8-24	0.38	0.05	0.31	0.94	1.62	–
3/4"	1.00	1/8 NPTF	1/4-28 UNF	1/2-20	0.44	0.09	0.62	1.69	2.31	2.56
1-1/16"	1.25	1/8 NPTF	5/16-24 UNF	5/8-18	0.44	0.09	0.88	1.81	2.81	3.06
1-1/2"	1.75	1/4 NPTF	7/16-20 UNF	3/4-16	0.62	0.09	0.88	2.00	3.06	3.31

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

Mounting Style BRR

Rear Block Mount, Single Acting, Spring Extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	BC	C	CC	D
3/4"	•	•	1, 2, 3, 4	6	✓	0.75	0.86	0.624	1.00	0.25	0.250	0.22
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.624	1.25	0.38	0.312	0.25
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	1.75	0.25	0.437	0.38

Bore size	E	EE	KK	KM	R	S	V	W	WH	X	ZJ SR	SRM
3/4"	1.00	1/8 NPTF	1/4-28 UNF	5/8-18	0.25	#10-32 UNF	0.09	0.75	0.97	2.69	3.22	3.47
1-1/16"	1.25	1/8 NPTF	5/16-24 UNF	5/8-18	0.25	#10-32 UNF	0.09	0.88	1.06	2.81	3.53	3.78
1-1/2"	1.75	1/4 NPTF	7/16-20 UNF	3/4-16	0.25	1/4-20 UNC	0.09	0.88	1.25	3.00	3.88	4.13

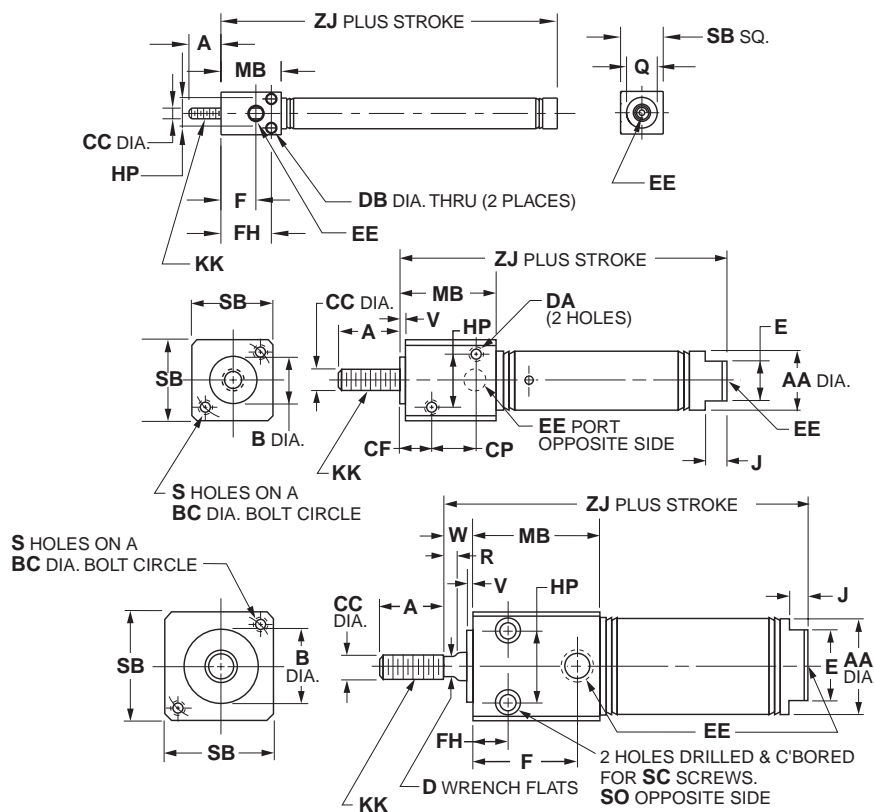
* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

B

Round Body Cylinders
 Actuator Products

Mounting Style BFD

Front Block Mount, Double Acting



Bore sizes
5/16"

Bore sizes
7/16"

Bore sizes
3/4"
1-1/16"
1-1/2"

B
 Round Body Cylinders
 Actuator Products

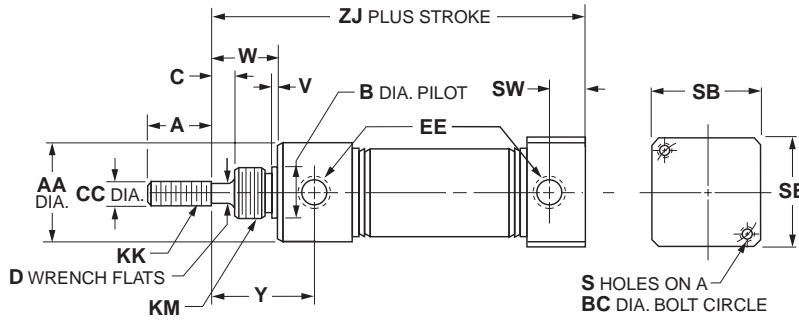
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	BC	CC
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✓	0.38	–	–	–	0.125
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.50	0.437	0.75	0.188
3/4"	•	•	1/2, 1, 2, 3, 4, 5, 6	12	✓	0.75	0.81	0.624	1.00	0.250
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	1.12	0.750	1.25	0.312
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✓	1.25	1.56	1.00	1.75	0.437

Bore size	CF	CP	D	DA	DB	E	EE	F	FH	HP	J
5/16"	–	–	–	–	0.11	–	#10-32	0.41	0.59	0.34	–
7/16"	0.31	0.44	–	#8-32	–	0.38	#10-32	–	0.31	0.44	0.19
3/4"	–	–	0.22	–	–	0.62	1/8 NPTF	0.88	0.38	0.62	0.19
1-1/16"	–	–	0.25	–	–	0.88	1/8 NPTF	1.16	0.62	0.81	0.19
1-1/2"	–	–	0.38	–	–	0.88	1/4 NPTF	1.53	0.88	1.12	0.25

Bore size	KK	MB	Q	R	S	SB	SC	SO	V	W	ZJ	SR	SRM
5/16"	#5-40 UNC	0.71	0.36	–	–	0.50 SQ	–	–	–	–	1.72	–	–
7/16"	#10-32 UNF	0.88	–	–	#8-32 UNC	0.75	–	–	0.062	–	2.12	–	–
3/4"	1/4-28 UNF	1.12	–	–	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	3.22	3.22	–
1-1/16"	5/16-24 UNF	1.41	–	0.25	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	3.75	3.91	–
1-1/2"	7/16-20 UNF	1.88	–	–	1/4-20 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	4.19	4.44	–

Mounting Style BRD

Rear Block Mount, Double Acting



B

Round Body Cylinders
 Actuator Products

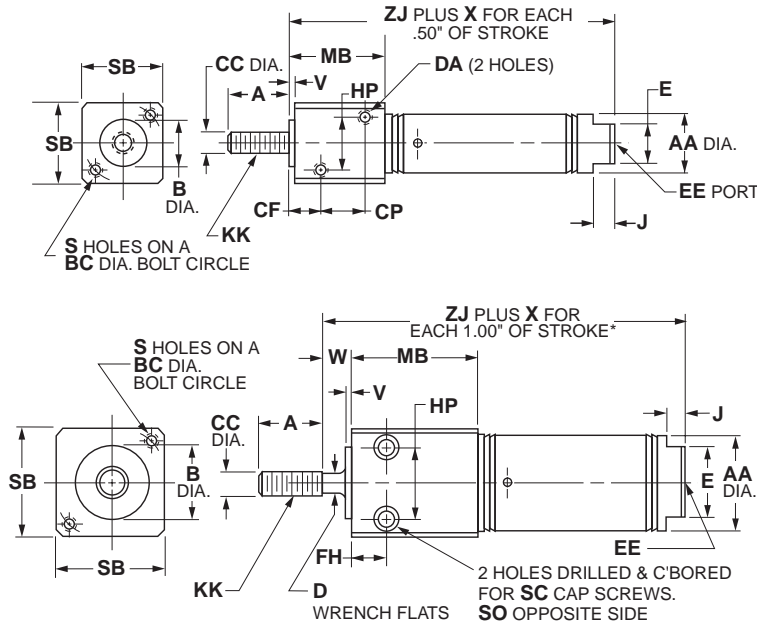
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std
7/16"	•		1/2, 1, 2, 3, 4	12	✓
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✓
1-1/16"	•	•	1, 2, 3, 4	12	✓
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✓

Bore size	A	AA	B	BC	C	CC	D	EE	KK
7/16"	0.50	0.74	0.437	0.75	–	0.188	–	#10-32	#10-32 UNF
3/4"	0.75	0.86	0.624	1.00	0.25	0.250	0.22	1/8 NPTF	1/4-28 UNF
1-1/16"	0.75	1.12	0.624	1.25	0.38	0.312	0.25	1/8 NPTF	5/16-24 UNF
1-1/2"	1.25	1.56	0.749	1.75	0.25	0.437	0.38	1/4 NPTF	7/16-20 UNF

Bore size	ZJ								
	KM	S	SB	SW	V	W	Y	SR	SRM
7/16"	7/16-20 UNF	#8-32 UNC	0.75	0.38	0.05	0.43	0.72	2.44	–
3/4"	5/8-18 UNF	#10-32 UNF	1.00	0.44	0.09	0.75	1.22	3.78	3.78
1-1/16"	5/8-18 UNF	#10-32 UNF	1.25	0.44	0.09	0.88	1.44	4.00	4.16
1-1/2"	3/4-16 UNF	1/4-20 UNC	1.75	0.62	0.09	0.88	1.47	4.38	4.63

Mounting Style BFN

Front Block Mount, Single Acting, Spring Return



Bore sizes
7/16"

Bore sizes
3/4"
1-1/16"
1-1/2"

B
 Round Body Cylinders
 Actuator Products

Bore size	SR	SRM	Std. stroke (in)	Max stroke (in)	SS rod std
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✓
3/4"	•	•	1/2, 1, 2, 3, 4	6	✓
1-1/16"	•	•	1, 2, 3, 4	6	✓
1-1/2"	•	•	1, 2, 3, 4	6	✓

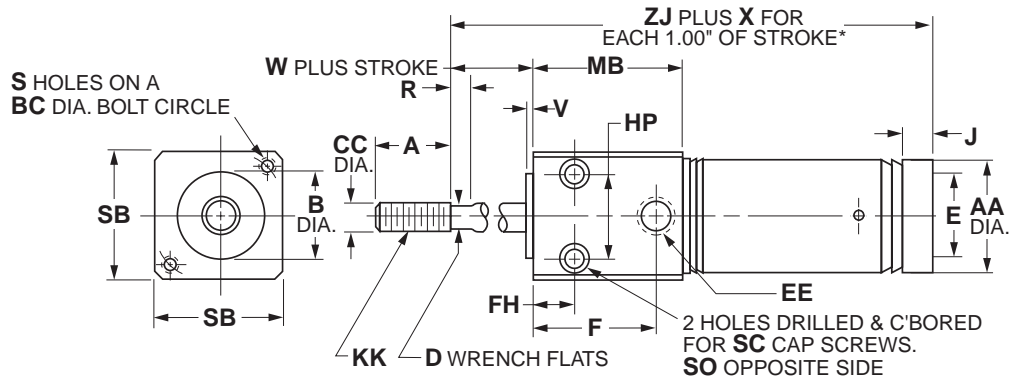
Bore size	A	AA	B	BC	CC	CF	CP	D	DA	E	EE	FH
7/16"	0.50	0.50	0.437	0.75	0.188	0.31	0.44	-	#8-32 UNC	0.38	#10-32	0.31
3/4"	0.75	0.81	0.624	1.00	0.250	-	-	0.22	-	0.62	1/8 NPTF	0.38
1-1/16"	0.75	1.12	0.750	1.25	0.312	-	-	0.25	-	0.88	1/8 NPTF	0.62
1-1/2"	1.25	1.56	1.00	1.75	0.437	-	-	0.38	-	0.88	1/4 NPTF	0.88

Bore size	HP	J	KK	MB	S	SB	SC	SO	V	W	X	ZJ	
												SR	SRM
7/16"	0.44	0.19	#10-32 UNF	0.88	#8-32 UNC	0.75	-	-	0.062	-	0.94	1.94	-
3/4"	0.62	0.19	1/4-28 UNF	1.12	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	1.69	2.66	2.91
1-1/16"	0.81	0.19	5/16-24 UNF	1.41	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	1.81	3.38	3.63
1-1/2"	1.12	0.25	7/16-20 UNF	1.88	1/4 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	2.00	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

Mounting Style BFR

Front Block Mount, Single Acting, Spring Extend



B

Round Body Cylinders
 Actuator Products

Bore size	SR	SRM	Std. stroke (in)	Max stroke (in)	SS rod std
3/4"	•	•	1, 2, 3, 4	6	✓
1-1/16"	•	•	1, 2, 3, 4	6	✓
1-1/2"	•	•	1, 2, 3, 4	6	✓

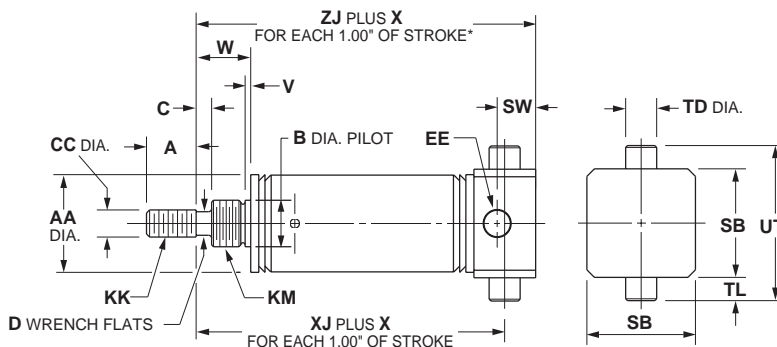
Bore size	A	AA	B	BC	CC	D	E	EE	F	FH	HP	J
3/4"	0.75	0.81	0.624	1.00	0.250	0.22	–	1/8 NPTF	0.88	0.38	0.62	0.19
1-1/16"	0.75	1.12	0.750	1.25	0.312	0.25	–	1/8 NPTF	1.16	0.62	0.81	–
1-1/2"	1.25	1.56	1.00	1.75	0.437	0.38	0.88	1/4 NPTF	1.53	0.88	1.12	0.25

Bore size	KK	MB	R	S	SB	SC	SO	V	W	X	ZJ	
											SR	SRM
3/4"	1/4-28 UNF	1.12	0.25	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	2.69	2.56	2.81
1-1/16"	5/16-24 UNF	1.41	0.25	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	2.81	3.12	3.37
1-1/2"	7/16-20 UNF	1.88	0.25	1/4-20 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	3.00	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

Mounting Style TRN

Rear Trunnion Mount, Single Acting, Spring Return



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
7/16"	•		1/2, 1, 2, 3, 4	6	✓	0.50	0.50	0.374	–	0.188	–	#10-32
3/4"	•	•	1, 2, 3, 4	6	✓	0.75	0.81	0.499	0.25	0.250	0.22	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

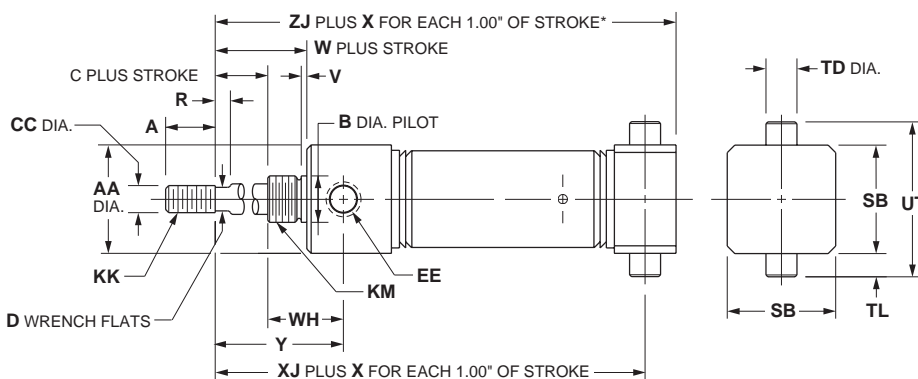
Bore size	KK	KM	SB	SW	TD	TL	UT	V	W	X	XJ		ZJ	
											SR	SRM	SR	SRM
7/16"	#10-32 UNF	3/8-24 UNF	0.75	0.38	0.374	0.50	1.25	0.05	0.32	0.94**	1.38	–	1.62	–
3/4"	1/4-28 UNF	1/2-20 UNF	1.00	0.44	0.500	0.38	1.75	0.09	0.62	1.69	1.94	2.19	2.31	2.56
1-1/16"	5/16-24 UNF	5/8-18 UNF	1.25	0.44	0.500	0.38	2.00	0.09	0.88	1.81	2.44	2.69	2.81	3.06
1-1/2"	7/16-20 UNF	3/4-16 UNF	1.75	0.62	0.500	0.38	2.50	0.09	0.88	2.00	2.56	2.81	3.06	3.31

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

** For each 0.50" of stroke.

Mounting Style TRR

Rear Trunnion Mount, Single Acting, Spring Extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
3/4"			1, 2, 3, 4	6	3	0.75	0.86	0.624	0.25	0.250	0.22	1/8 NPTF
1-1/16"			1, 2, 3, 4	6	3	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"			1, 2, 3, 4	6	3	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

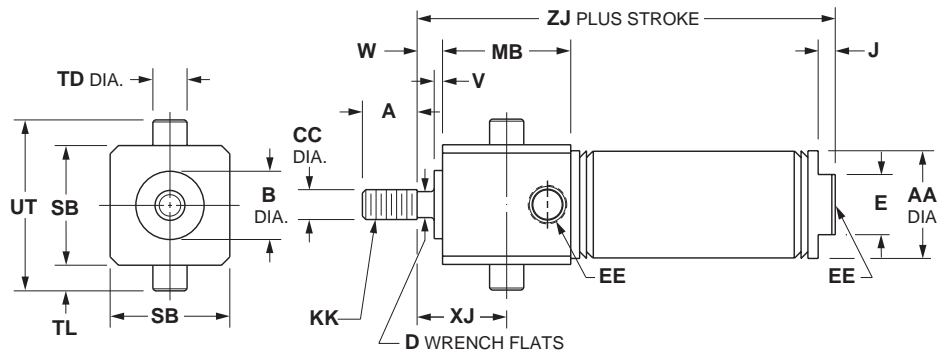
Bore size	KK	KM	R	SB	TD	TL	UT	V	W	WH	X	XJ		ZJ	
												SR	SRM	SR	SRM
3/4"	1/4-28 UNF	1/2-20 UNF	0.25	1.00	0.500	0.38	1.75	0.09	0.75	0.72	2.69	2.85	3.10	3.22	3.47
1-1/16"	5/16-24 UNF	5/8-18 UNF	0.25	1.25	0.500	0.38	2.00	0.09	0.88	0.68	2.81	3.15	3.40	3.53	3.78
1-1/2"	7/16-20 UNF	3/4-16 UNF	0.25	1.75	0.500	0.38	2.50	0.09	0.88	1.25	3.00	3.38	3.63	3.88	4.13

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

B
 Round Body Cylinders
 Actuator Products

Mounting Style TFD

Front Trunnion Mount, Double Acting

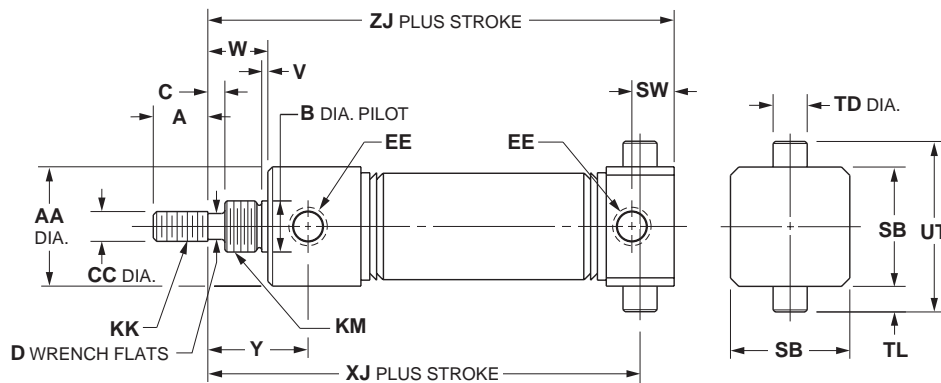


Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.50	0.437	0.188	–	0.38	#10-32
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	0.81	0.624	0.250	0.22	0.62	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	1.12	0.750	0.312	0.25	0.88	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✓	1.25	1.56	1.000	0.437	0.38	0.88	1/4 NPTF

Bore size	J		KK		MB	SB	TD	TL	UT	V	W	XJ	ZJ	
	0.19	#10-32 UNF	MB	SB									SR	SRM
7/16"	0.19	1/4-28 UNF	0.88	0.75	0.374	0.250	1.25	0.062	–	0.31	2.12	–		
3/4"	0.19	5/16-24 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	0.69	3.22	3.22		
1-1/16"	0.25	7/16-20 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	1.09	3.75	3.91		
1-1/2"			1.88	1.75	0.500	0.38	2.50	0.125	0.38	1.31	4.19	4.44		

Mounting Style TRD

Rear Trunnion Mount, Double Acting



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.74	0.437	–	0.188	–	#10-32
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	0.86	0.624	0.25	0.250	0.22	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	12	✓	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✓	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

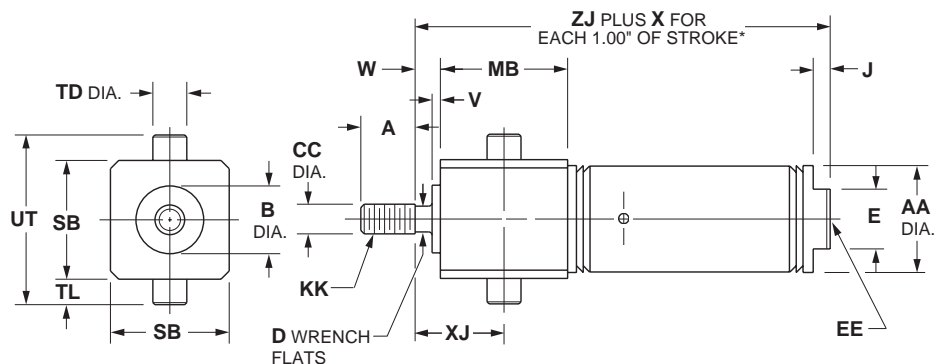
Bore size	KK		KM		SB	SW	TD	TL	UT	V	W	XJ		ZJ	
	#10-32 UNF	7/16-20 UNF	SB	SW								SR	SRM	Y	SR
7/16"	1/4-28 UNF	5/8-18 UNF	0.75	0.38	0.374	0.25	1.25	0.05	0.38	2.19	–	0.72	2.44	–	
3/4"	5/16-24 UNF	5/8-18 UNF	1.00	0.44	0.500	0.38	1.75	0.09	0.75	3.41	3.41	1.22	3.78	3.78	
1-1/16"	7/16-20 UNF	3/4-16 UNF	1.25	0.44	0.500	0.38	2.00	0.09	0.88	3.62	3.62	1.44	4.00	4.16	
1-1/2"			1.75	0.62	0.500	0.38	2.50	0.09	0.88	3.88	4.13	1.47	4.38	4.63	

B

Round Body Cylinders
 Actuator Products

Mounting Style TFN

Front Trunnion Mount, Single Acting, Spring Return



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.50	0.437	0.188	–	0.38	#10-32
3/4"	•	•	1/2, 1, 2, 3, 4	6	✓	0.75	0.81	0.624	0.250	0.22	0.62	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.750	0.312	0.25	0.88	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	1.000	0.437	0.38	0.88	1/4 NPTF

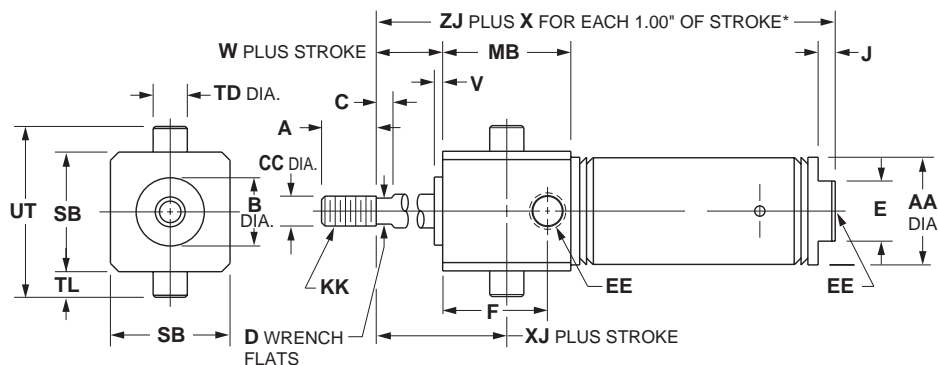
Bore size	J	KK	MB	SB	TD	TL	UT	V	W	X	XJ	ZJ SR	ZJ SRM
7/16"	0.19	#10-32 UNF	0.88	0.75	0.374	0.25	1.25	0.062	0	0.94**	0.31	1.94	–
3/4"	0.19	5/16-24 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	1.69	0.69	2.66	2.91
1-1/16"	0.25	7/16-20 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	1.81	1.09	3.38	3.63
1-1/2"			1.88	1.75	0.500	0.38	2.50	0.125	0.38	2.00	1.31	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

** For each 0.50" of stroke

Mounting Style TFR

Front Trunnion Mount, Single Acting, Spring Extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	E
3/4"	•	•	1, 2, 3, 4	6	✓	0.75	0.81	0.624	0.25	0.250	0.22	0
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.750	0.25	0.312	0.25	0
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	1.000	0.25	0.437	0.38	0.88

Bore size	F	EE	J	KK	MB	SB	TD	TL	UT	V	W	X	XJ	ZJ SR	ZJ SRM
3/4"	0.88	1/8 NPTF	–	1/4-28 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	2.69	0.69	2.56	2.81
1-1/16"	1.16	1/8 NPTF	–	5/16-24 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	2.81	1.09	3.12	3.37
1-1/2"	–	1/4 NPTF	0.25	7/16-20 UNF	1.88	1.75	0.500	0.38	2.50	0.125	0.38	3.00	1.31	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

B
 Round Body Cylinders
 Actuator Products

Air Reservoirs

Air Reservoirs installed can significantly reduce the pulsation of a system. In addition air reservoirs can be used as a means to store energy. Caution should always be used when storing energy. Air reservoirs if installed in the correct location and sized correctly can temporarily increase the flow of an actuator or cylinder.

As always never exceed the rated pressure of the cylinder.

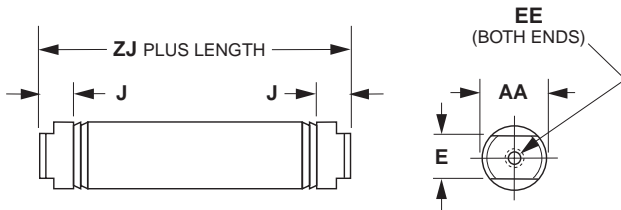
Ordering information

.75	AR	SR	2.00
Bore Size*	Mounting		Length
.75 3/4"	AR Air Reservoir		Specify in inches. See table below.
1.06 1-1/16"			
1.50 1-1/2"			
2.00 2"			
2.50 2-1/2"			
3.00 3"			

B

Round Body Cylinders
 Actuator Products

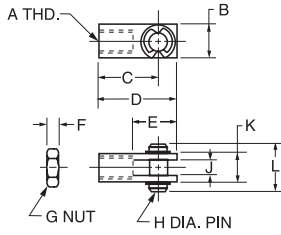
Bore size	Standard lengths	Max. length	Volume (in3)
3/4"	1" increments to 4"	32"	0.39 plus 0.44 per inch length
1-1/16"	1" increments to 8"	32"	0.99 plus 0.89 per inch length
1-1/2"	1" increments to 16"	32"	1.91 plus 1.77 per inch length
2"	1" increments to 16"	32"	4.22 plus 3.14 per inch length
2-1/2"	1" increments to 16"	32"	7.04 plus 4.91 per inch length
3"	1" increments to 16"	32"	9.90 plus 7.07 per inch length



Bore size	AA	E	EE	J	ZJ
3/4"	0.813	0.625	1/8" NPTF	0.19	1.938
1-1/16"	1.125	0.88	1/8" NPTF	0.19	2.375
1-1/2"	1.56	0.88	1/8" NPTF	0.250	2.250
2"	2.08	1.25	1/4" NPTF	0.312	2.875
2-1/2"	2.62	1.75	1/4" NPTF	0.312	2.875
3"	3.16	2.00	3/8" NPTF	0.312	3.190

Piston Rod Clevis

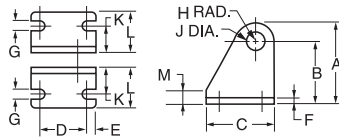
Assembly includes pin and (2) retainer rings and (1) jam nut.



Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
5/16	#5-40	.31	.44	.56	.38	.11	#5-40	.12	.13	.31	.50	L071300025
7/16, 9/16	#10-32	.38	.75	.94	.56	.12	#10-32	.19	.19	.38	.56	L071300100 L077130100*
3/4, 7/8	1/4-28	.50	.94	1.19	.68	.16	1/4-28	.25	.25	.50	.69	L071300200 L077130200*
1-1/16	5/16-24	.50	.94	1.19	.68	.19	5/16-24	.25	.25	.50	.69	L071300300 L077130300*
1-1/4, 1-1/2	7/16-20	.75	1.31	1.69	.94	.25	7/16-20	.38	.38	.75	1.03	L071300400 L077130400*
1-3/4, 2, 2-1/2	1/2-20	.75	1.31	1.69	.94	.31	1/2-20	.38	.38	.75	1.03	L071300500 L077130500*
3	5/8-18	1.00	2.25	2.75	1.50	.38	5/8-18	.50	.50	1.00	1.38	L071300600

* Stainless Steel for use with SRD/SRDM cylinders.

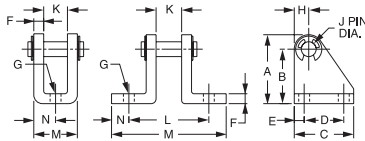
Pivot Brackets



Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
7/16	.76	.56	.75	.50	.12	.06	.19	.20	.160	.28	.50	.12	L071310100
3/4, 7/8, 1-1/16	1.19	.88	1.12	.75	.19	.12	.27	.31	.255	.44	.81	.25	L071310200
1-1/2	1.75	1.38	1.50	1.00	.25	.12	.27	.38	.380	.62	1.00	.25	L071310300

Pivot Bracket Assembly

Assembly includes pin and (2) retainer rings.



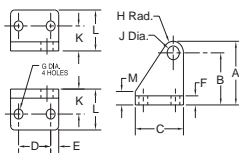
5/16" bore only

Bore size	A	B	C	D	E	F	G	H	J	K	L	M	N	Part number
5/16	.53	.40	.62	.38	.12	.04	.16	.12	.12	.26	-	.36	.18	L071320025
7/16, 9/16	.76	.56	.75	.50	.12	.06	.19	.19	.156	.34	.91	1.34	.22	L071320100 L077150100*
3/4, 7/8, 1-1/16	1.18	.88	1.12	.75	.19	.12	.27	.30	.250	.38	1.25	2.00	.38	L071320200 L077150200*
1-1/4	1.18	.88	1.12	.75	.19	.12	.27	.30	.250	.50	1.38	2.14	.38	L071320300
1-1/2, 1-3/4	1.75	1.38	1.50	1.00	.25	.25	.27	.37	.375	.62	2.00	2.88	.44	L071320400 L077150400*
2, 2-1/2	1.75	1.38	1.50	1.00	.25	.25	.27	.37	.375	.75	2.12	3.00	.44	L071320500 L077150500*
3	2.25	1.75	1.75	1.25	.25	.25	.27	.50	.50	.88	2.62	3.88	.62	L071320600

* Stainless steel for use with SRD/SRDM cylinders.

SR Series Trunnion Brackets

Select brackets for SR series trunnion mount cylinders from the table below. (Note: trunnion brackets are ordered as a separate item from the cylinder.)

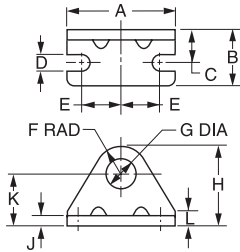


Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
7/16	1.75	1.38	1.50	1	.25	.25	.27	.38	.375	.69	1.12	.37	L076600100
3/4, 11/16, 1-1/2	1.75	1.38	1.50	1	.25	.25	.27	.38	.500	.69	1.12	.37	L076600200

Most popular.

B
 Round Body Cylinders
 Actuator Products

Foot Brackets



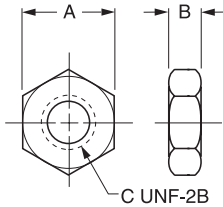
Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
5/16	1.00	.37	.25	.13	.37	.31	.25	.75	.06	.44	.12	L073790016
5/16	1.00	.37	.25	.13	.37	.31	.38	.75	.06	.44	.12	L073790023
7/16	1.38	.62	.31	.19	.50	.31	.38	.88	.07	.56	.12	L073790024
7/16, 9/16	1.38	.62	.38	.19	.50	.38	.44	.94	.09	.56	.12	L073790028 L077160028*
3/4	1.62	.75	.44	.19	.62	.41	.50	1.09	.10	.69	.19	L073790032
3/4, 7/8, 1-1/16	1.88	1.00	.56	.27	.75	.56	.63	1.38	.12	.81	.25	L073790040 L077160040*
1-1/4, 1-1/2	2.50	1.50	.75	.27	.94	.75	.75	1.75	.12	1.00	.38	L073790048 L077160048*
1-3/4	3.00	1.50	.87	.35	1.12	.91	1.03	2.16	.19	1.25	.50	L073790102
2	3.12	1.62	1.00	.34	1.12	1.00	1.38	2.50	.25	1.50	.62	L073790124 L077160124*
2-1/2	3.75	1.62	1.00	.35	1.44	1.25	1.51	3.00	.25	1.75	.75	L073790132
3	4.37	1.62	1.00	.35	1.75	1.25	1.64	3.14	.25	1.89	.89	L073790140

* Stainless Steel for use with SRD/SRDM cylinders.

B

Round Body Cylinders
 Actuator Products

Mounting Nut



Bore size	A	B	C	Part number
5/16	.44	.16	1/4-28	L073800200
5/16, 7/16	.56	.22	3/8-24	L073800400
7/16, 9/16	.69	.25	7/16-20	L073800500 L077170500*
3/4	.75	.31	1/2-20	L073800600
3/4, 7/8, 1-1/16	.94	.38	5/8-18	L073800800 L077170800*
1-1/4, 1-1/2	1.12	.42	3/4-16	L073800900 L077170900*
1-3/4	1.50	.55	1-14	L073801100
2	1.88	.50	1-1/4-12	L073801200 L077171200*
2-1/2	2.06	.78	1-3/8-12	L073801400
3	2.25	.84	1-1/2-12	L073801500

* Stainless Steel for use with SRD/SRDM cylinders.

Most popular.

Ordering Information for CDRO Panel Meter Controller

1	4	9	3	4	5				
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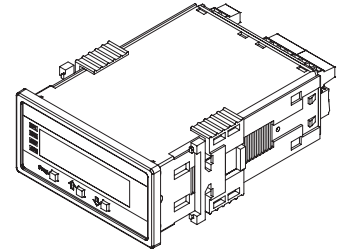
Relay output	
X	No relay output
R1	Single 5A form A relay
R2	Dual 5A form A relays
R4	Four 5A form A relays

Analog output	
X	Noanalog output
C	Isolated 16-bit current output, 4-20 mA
V	Isolated 16-bit voltage output, 0-10 VDC

Power supply	
1	85-265 VAC / 95-370 VDC
2	18-48 VAC / 10-72 VDC

Notes:

- Input requires a 3-wire potentiometer 1 kOhm min. (0 to 100.0).
- Please reference catalog 0900P-E, page D54 for complete electrical and dimensional specifications.



B

**Round Body Cylinders
 Actuator Products**

Ordering Information for CDBRO 101 Segment Bargraph Controller

1	4	9	3	4	6				
---	---	---	---	---	---	--	--	--	--

Display	
R	Red LED vertical bargraph with 4-digit red DPM
T	Tri-color LED vertical bargraph with 4-digit red DPM

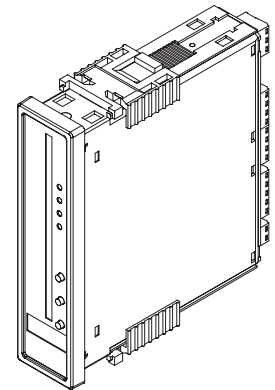
Power supply	
1	85-265 VAC / 95-370 VDC
2	18-48 VAC / 10-72 VDC

Analog output	
X	No analog output
C	Isolated 16-bit current output, 4-20 mA
V	Isolated 16-bit voltage output, 0-10 VDC

Relay output	
X	No relay output
1	Single 10A form C relay
2	Dual 10A form C relays
3	Dual 10A form C & single 5A form A relays
4	Dual 10A form C & dual 5A form A relays
5	Single 10A form C & dual 5A form A relays
6	Single 10A form C & single 5A form A relays

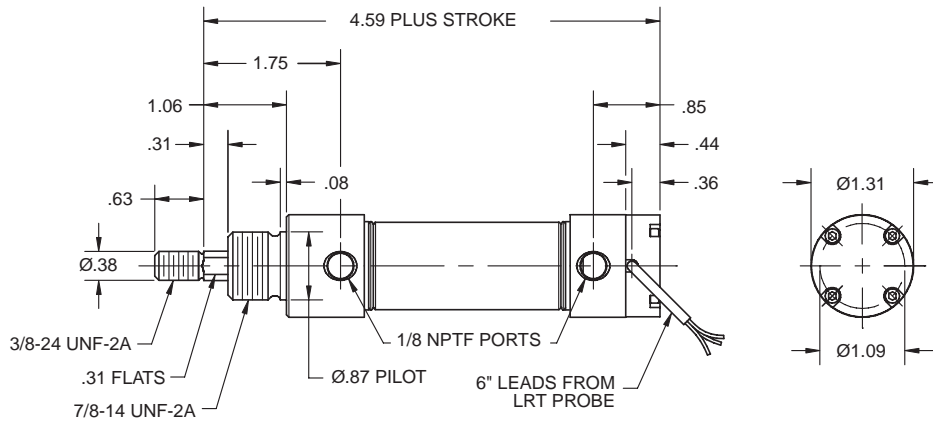
Notes:

- Input requires a 3-wire potentiometer 1 kOhm min. (0 to 100.0).
- Please reference catalog 0900P-E, page D55 for complete electrical and dimensional specifications.

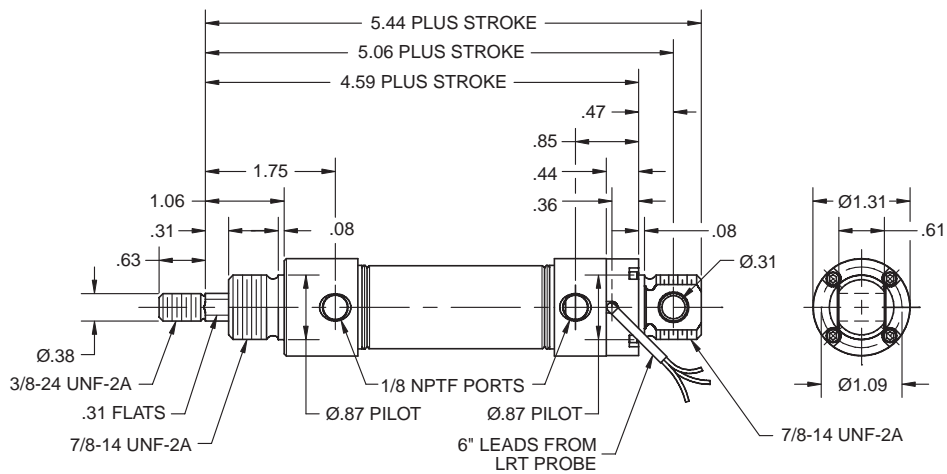


1-1/16" Bore Cylinders

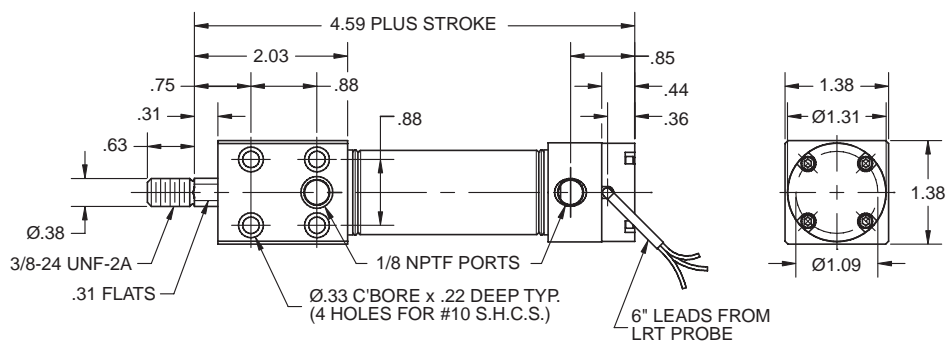
Style D



Style DXP



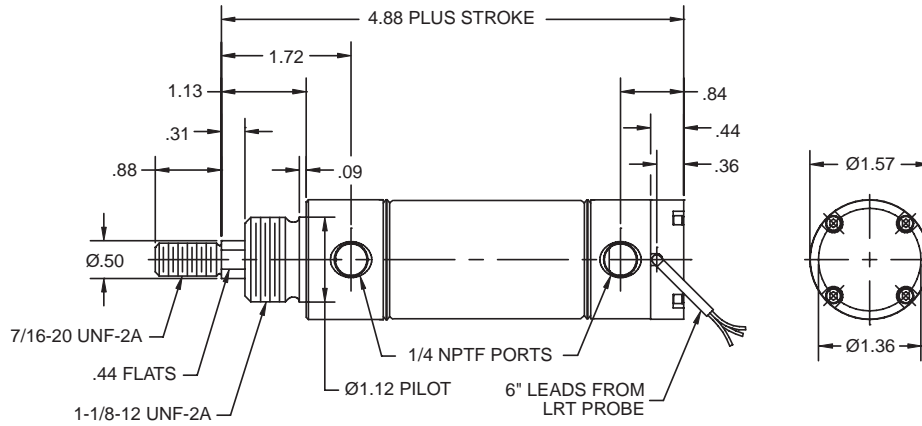
Style BFD



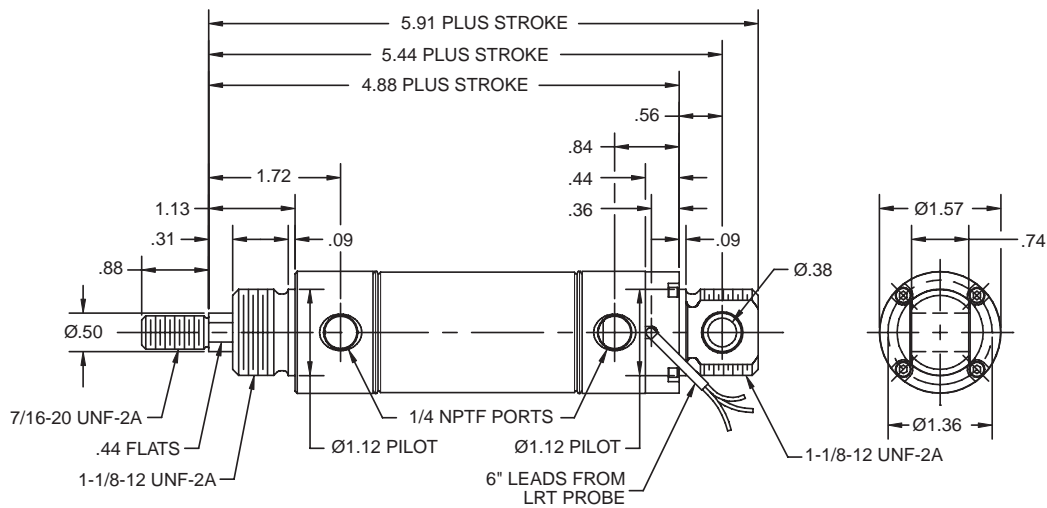
B
 Round Body Cylinders
 Actuator Products

1-1/2" Bore Cylinders

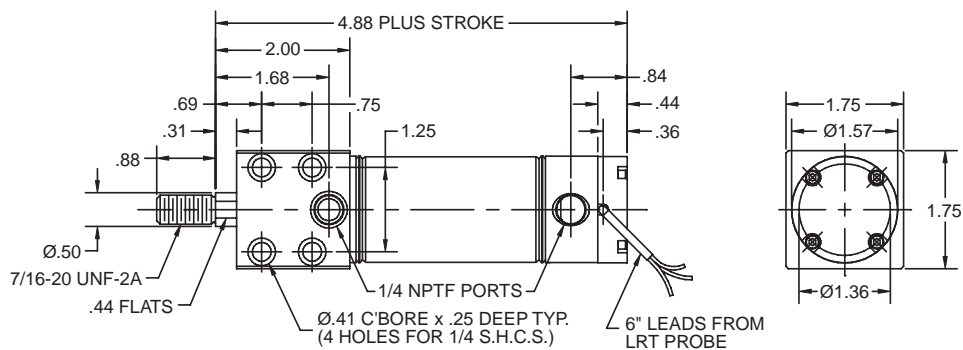
Style D



Style DXP



Style BFD

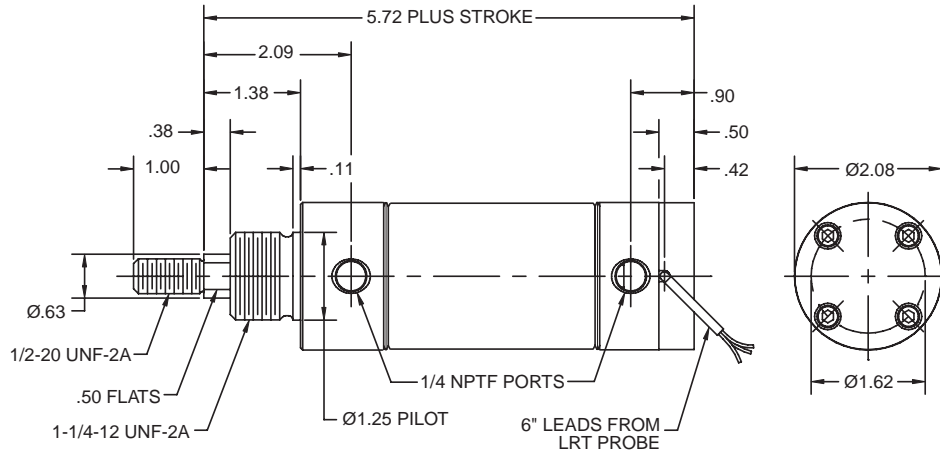


B

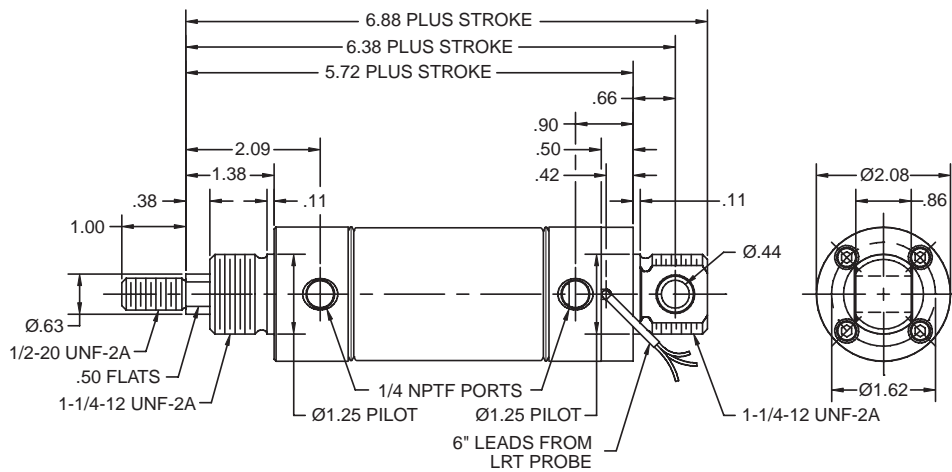
Round Body Cylinders
 Actuator Products

2" Bore Cylinders

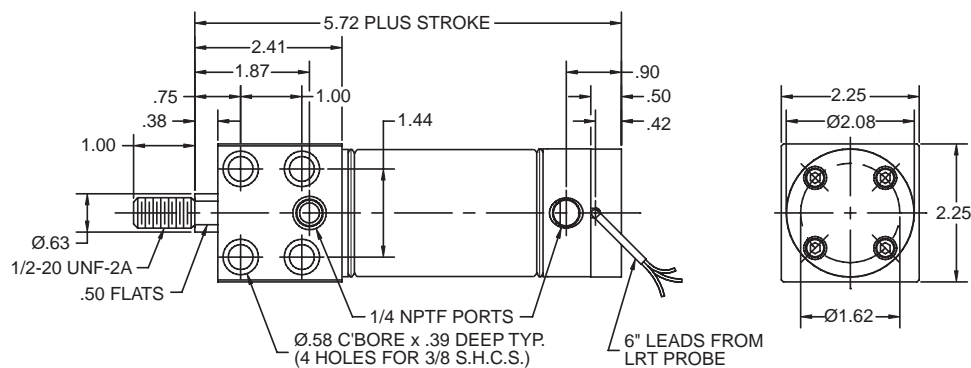
Style D



Style DXP



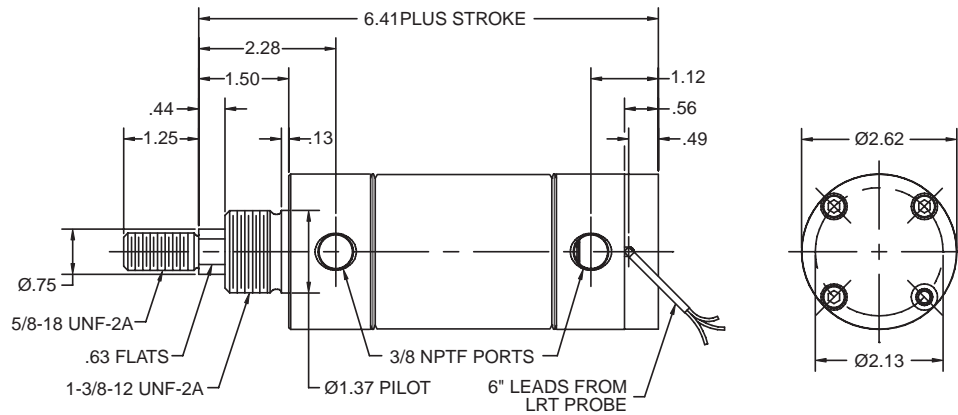
Style BFD



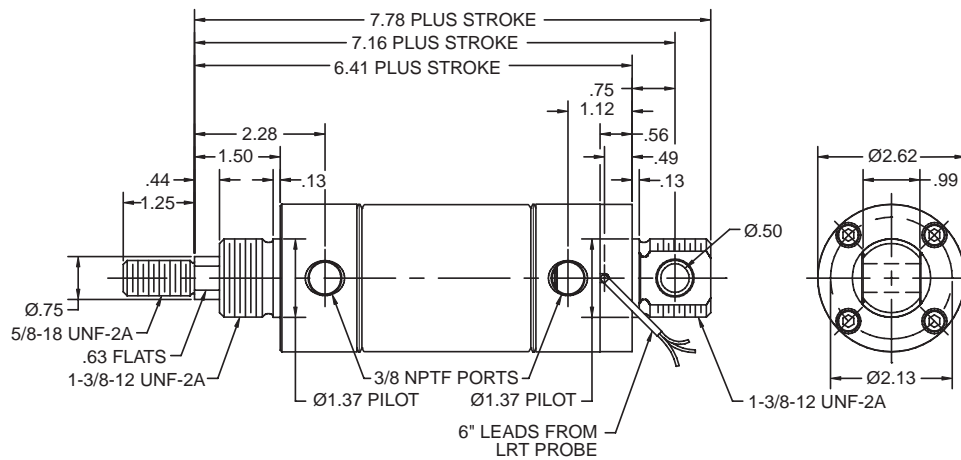
B
 Round Body Cylinders
 Actuator Products

2-1/2" Bore Cylinders

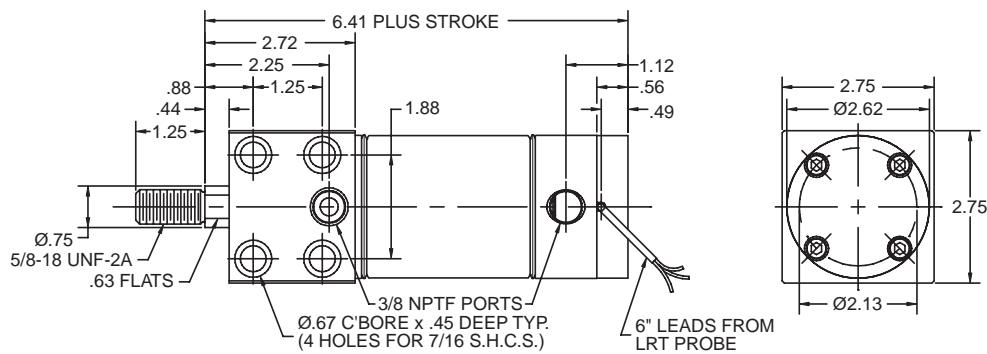
Style D



Style DXP



Style BFD

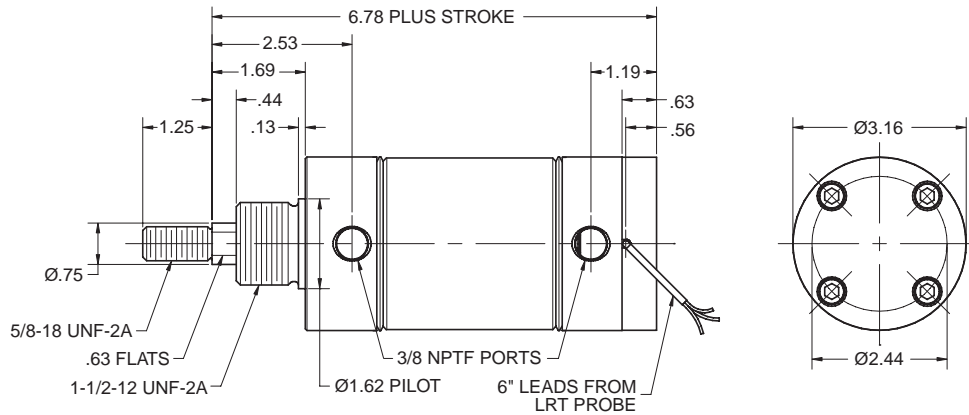


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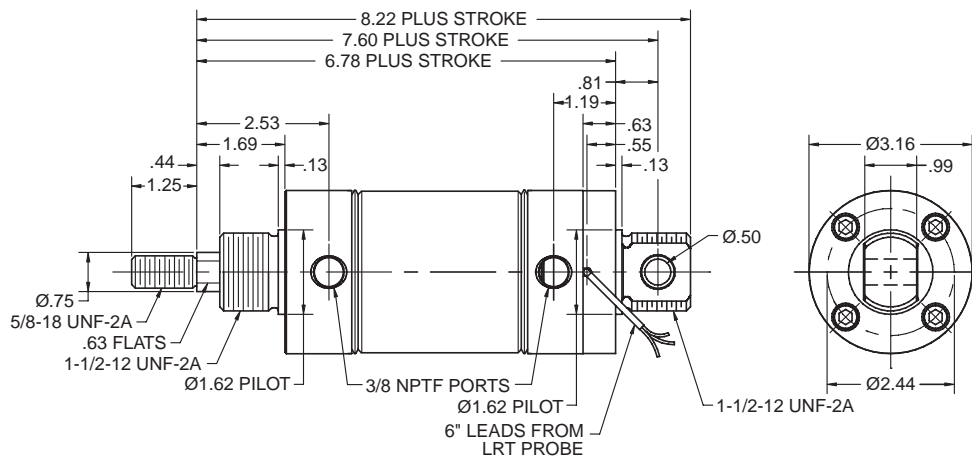
Round Body Cylinders
 Actuator Products

3" Bore Cylinders

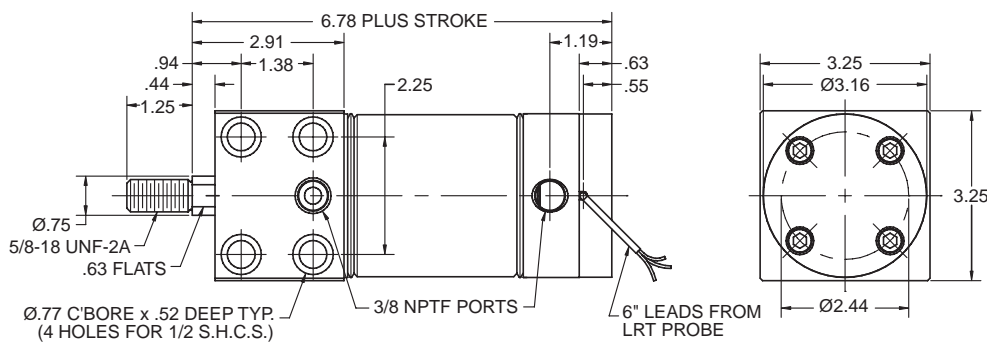
Style D



Style DXP

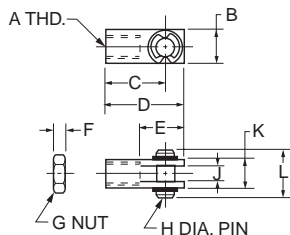


Style BFD



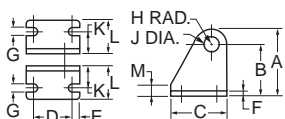
B
 Round Body Cylinders
 Actuator Products

Piston Rod Clevis



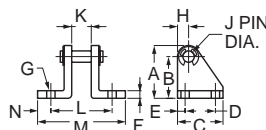
Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
1-1/16	3/8-24	.63	1.38	1.69	.94	.22	3/8-24	.31	.32	.63	.88	L071300350
1-1/2	7/16-20	.75	1.31	1.69	.94	.25	7/16-20	.38	.38	.75	1.03	L071300400
2	1/2-20	.88	1.88	2.31	1.31	.31	1/2-20	.44	.45	.88	1.14	L071300550
2-1/2, 3	5/8-18	1.00	2.25	2.75	1.50	.38	5/8-18	.50	.51	1.00	1.38	L071300600

Pivot Brackets



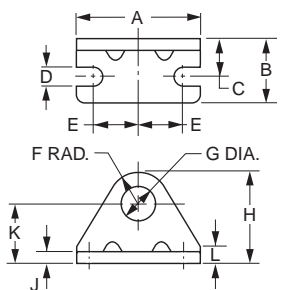
Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
1-1/16	1.31	1.00	1.31	.81	.25	.16	.28	.31	.315	.56	.88	.28	L071310400
1-1/2	1.63	1.25	1.63	1.00	.31	.19	.34	.38	.378	.69	1.13	.31	L071310500
2	1.81	1.38	1.81	1.19	.31	.25	.34	.44	.440	.75	1.19	.38	L071310600
2-1/2, 3	2.13	1.63	2.13	1.38	.38	.25	.41	.50	.503	.88	1.38	.38	L071310700

Pivot Brackets



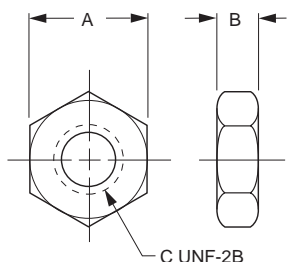
Bore size	A	B	C	D	E	F	G	H	J	K	L	M	N	Part number
1-1/16	1.31	1.00	1.31	.81	.25	.16	.28	.31	.312	.62	1.75	2.38	.31	L071320250
1-1/2	1.63	1.25	1.63	1.00	.31	.19	.34	.38	.375	.75	2.13	3.00	.44	L071320350
2	1.81	1.38	1.81	1.19	.31	.25	.34	.44	.437	.88	2.38	3.25	.44	L071320450
2-1/2, 3	2.13	1.63	2.13	1.38	.38	.25	.41	.50	.500	1.00	2.75	3.75	.50	L071320550

Foot Brackets



Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
1-1/16	2.13	1.16	.66	.28	.75	.75	.88	1.75	.16	1.00	.38	L073790056
1-1/2	2.75	1.44	.81	.35	1.00	.94	1.13	2.19	.19	1.25	.38	L073790108
2	3.00	1.59	.91	.35	1.19	1.06	1.26	2.44	.22	1.38	.44	L073790116
2-1/2	3.75	1.88	1.06	.41	1.50	1.19	1.38	2.81	.25	1.63	.50	L073790125
3	4.38	1.62	1.00	.35	1.75	1.25	1.64	3.14	.25	1.89	.89	L073790140

Mounting Nut



Bore size	A	B	C	Part number
1-1/16	1.31	.48	7/8-14	L073801000
1-1/2	1.69	.61	1-1/8-12	L073801300
2	1.88	.50	1-1/4-12	L073801200
2-1/2	2.06	.78	1-3/8-12	L073801400
3	2.25	.84	1-1/2-12	L073801500

Most popular.

- Repairable aluminum cylinder, anodized body and end caps
- 8 bore sizes: 20mm to 100mm (3/4" to 4")
- 4 Standard rod ends: inch, metric, male, female
- Bumpers standard on both ends
- Adjustable cushions optional at both ends
- Mounting styles: 9 standard
- Strokes available in any practical length
- Available in metric or inch mounting threads



Operating information

Operating pressure: 10 bar (145 PSIG)
 Temperature range:
 Standard -23°C to 74°C (-10°F to 250°F)
 High temperature version* -23°C to 121°C (-10°F to 250°F)

* Option intended for limited exposure to temperatures over 80°C or 176°F. This option is primarily for applications which subject the cylinder to fluids that have an adverse effect on external seals.

Filtration requirements: 40 micron, dry filtered air

For technical information see CD

Ordering information

P1L N 032 D M N 0200 W B N N N

Construction 1		Stroke		Version 3		Rod material	
N	Inch mounting threads	Specify in mm		B	Basic	N	Carbon steel (std on 32-100mm bores)
M	Metric mounting threads			W	With options	S	Stainless (std on 20-25mm bores)
				/	Special		
Bores (mm)		Seal material		Rod end style 1			
020	032	050	080	N	Standard seals		
025	040	063	100	T	Fluorocarbon		
Function							
D	Double acting, single rod						
K	Double acting, double rod						
Cushions/magnetic piston		Mounting style		Port type 1			
N	No cushion, no magnetic piston			N	No mountings fitted (std.)		
M	No cushion, magnetic piston 2			J	Front flange		
F	Cushioned both ends, no magnetic piston			H	Rear flange		
Y	Cushioned both ends, magnetic piston 2			B	Single rear clevis		
				A	Double rear clevis		
				F	Foot, front & rear		
				G	Nose mount		
				E	Front trunnion		
				D	Rear trunnion		
				Stroke length for standard cylinders			
				Bore	Min. stroke (mm)	Max. stroke (mm) 6	
				20	2	1000	
				25	2	1000	
				32	2	1000	
				40	4	1000	
				50	5	1000	
				63	7	1000	
				80	4	1000	
				100	4	1000	

Notes:

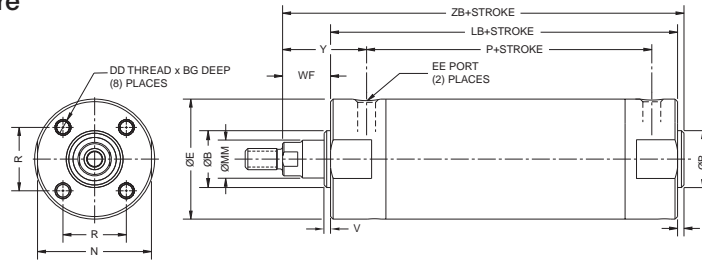
- 1 When selecting inch or metric construction, be advised that the piston rod end and porting thread will coincide with the mounting thread selected as the standard for the basic cylinder. For example, selecting "M" in the construction field will automatically provide a metric male piston rod end and BSPT ports as standard.
- 2 Not available with fluorocarbon seal option.
- 3 If cylinder contains no options, then use "B" as the last digit in the model code. The last 4 boxes are used only when "W" or "/" appears in this field.
- 4 Standard with Inch Construction
- 5 Standard with Metric Construction
- 6 Please consult factory for availability of stroke lengths longer than those listed.

Sensors

For sensors see page B296.

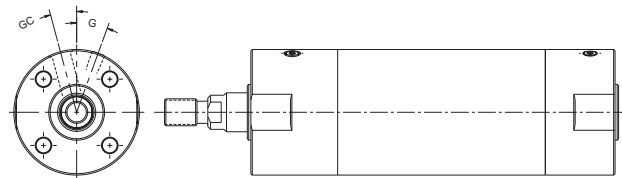
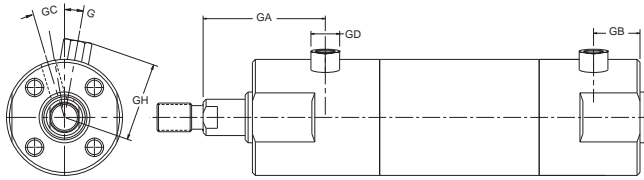
Style N - Basic No Mount

Typical 20 to 100 mm Bore
without air cushion



With adjustable air cushion - 20 to 25 mm bores

With adjustable air cushion - 32 to 100 mm bores
(feature a flush-fit cushion adjustment screw)



Style N, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02 (+0 -0.001)	DD (UNF)	BG depth	ØE	EE (NPTF)	Ø MM rod dia.	N	NA	R	V	WF	Y
20	12 (0.472)	M4x0.7 (8-32)	7 (0.28)	27 (1.06)	1/8* (1/8 †)	8 (0.315)	24 (0.94)	-	14 (0.55)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	M5x0.8 (10-32)	7.6 (0.30)	32 (1.26)	1/8* (1/8 †)	10 (0.394)	29 (1.14)	-	16.5 (0.65)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	M5x0.8 (10-32)	7.6 (0.30)	39 (1.53)	1/8 (1/8)	12 (0.472)	36 (1.42)	11 (0.43)	20 (0.79)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	M6x1 (1/4-28)	12 (0.47)	48.5 (1.91)	1/8 (1/8)	16 (0.630)	44 (1.73)	14 (0.55)	26 (1.02)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	M8x1.25 (5/16-24)	16 (0.63)	59 (2.32)	1/4 (1/4)	20 (0.787)	55 (2.17)	18 (0.71)	32 (1.26)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	M10x1.5 (3/8-24)	16 (0.63)	72 (2.83)	1/4 (1/4)	20 (0.787)	69 (2.72)	18 (0.71)	38 (1.50)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	M10x1.5 (3/8-24)	22 (0.88)	90 (3.54)	3/8 (3/8)	25 (0.984)	86 (3.39)	23 (0.91)	50 (1.97)	3 (0.12)	31 (1.22)	59 (2.32)
100	50 (1.968)	M12x1.75 (1/2-20)	22 (0.88)	110 (4.33)	1/2 (1/2)	32 (1.260)	106 (4.17)	30 (1.18)	60 (2.36)	3 (0.12)	31 (1.22)	57 (2.24)

Add stroke

Bore size	LB	P	ZB
20	69 (2.70)	45 (1.77)	83 (3.28)
25	69 (2.70)	46 (1.81)	86 (3.40)
32	71 (2.78)	43 (1.69)	95 (3.74)
40	78 (3.06)	49 (1.93)	102 (4.02)
50	90 (3.53)	53 (2.09)	122 (4.80)
63	90 (3.53)	52 (2.05)	122 (4.80)
80	108 (4.25)	64 (2.52)	142 (5.59)
100	108 (4.25)	66 (2.60)	142 (5.59)

Adjustable air cushion

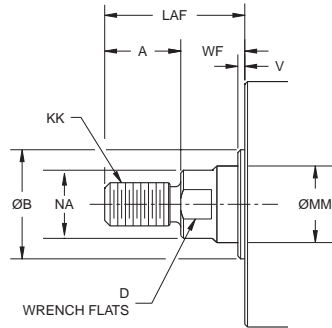
Bore size	GA	GB	GD Hex	GC°	G°	GH	EE	Cushion length
20	33 (1.30)	14 (0.55)	8 (0.31)	13-1/2	25-1/2	20.5 (0.81)	M5 x 0.8 (10-32 UNF)	9 (0.35)
25	35 (1.38)	14 (0.55)	8 (0.31)	15-1/2	20-1/2	23 (0.91)	M5 x 0.8 (10-32 UNF)	9 (0.35)
32	-	-	-	10-1/2	30-1/2	-	1/8 (1/8 NPTF)	10 (0.39)
40	-	-	-	10-1/2	22-1/2	-	1/8 (1/8 NPTF)	12 (0.47)
50	-	-	-	10-1/2	23-1/2	-	1/4 (1/4 NPTF)	15 (0.59)
63	-	-	-	15-1/2	20-1/2	-	1/4 (1/4 NPTF)	15 (0.59)
80	-	-	-	15-1/2	25-1/2	-	3/8 (3/8 NPTF)	15 (0.59)
100	-	-	-	15-1/2	25-1/2	-	1/2 (1/2 NPTF)	15 (0.59)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

Rod End Details

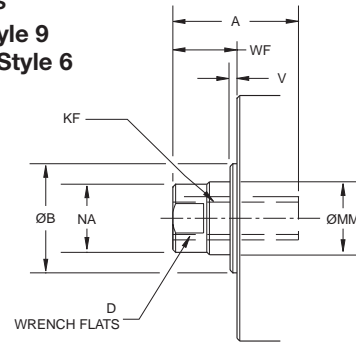
Male threads

Inch male - Style N
Metric male - Style 5



Female threads

Inch female - Style 9
Metric female - Style 6



Special rod end threads

Thread Style 3

Special Metric or Inch threads, extension, blank, etc., are also available.
 To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF.
 If otherwise special, supply a dimensioned sketch.

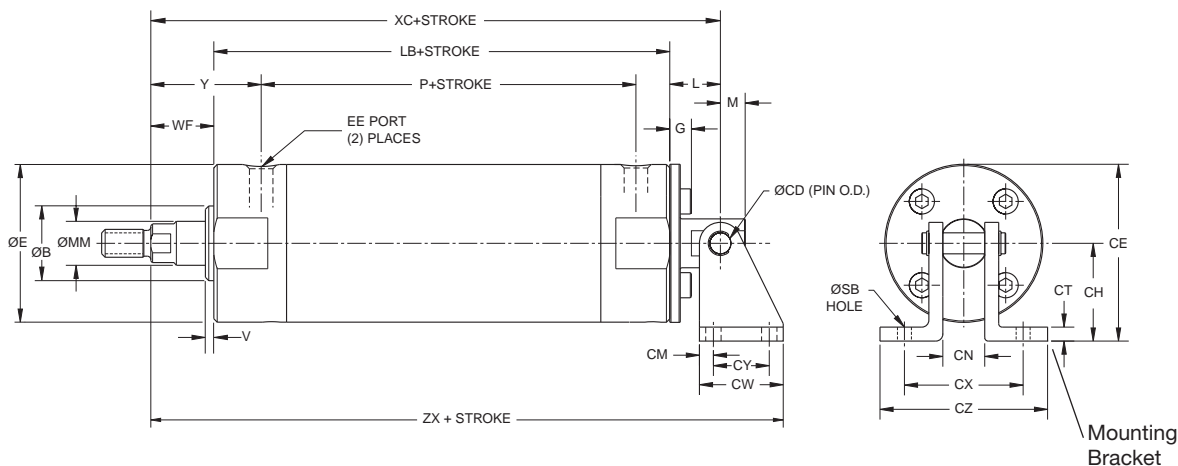
Rod ends – mm (inch)

Bore size	A	ØB +0 -0.02 (+0 -0.001)	D	Thread		LAF	Ø MM rod dia.	NA	V	WF
				KK Style 5 (Style N)	KF Style 6 (Style 9)					
20	13 (0.50)	12 (0.472)	6 (0.24)	M8 x 1.25 (1/4-28)	M5 x 0.80 (#10-32)	26 (1.00)	8 (0.315)	-	2 (0.08)	13 (0.50)
25	13 (0.50)	14 (0.551)	8 (0.31)	M10 x 1.25 (5/16-24)	M6 x 1.00 (1/4-28)	29 (1.12)	10 (0.394)	-	2 (0.08)	16 (0.62)
32	19 (0.75)	18 (0.709)	10 (0.39)	M10 x 1.25 (7/16-20)	M8 x 1.25 (5/16-24)	41 (1.63)	12 (0.472)	11 (0.43)	2 (0.08)	22 (0.88)
40	19 (0.75)	25 (0.984)	12 (0.47)	M14 x 1.5 (7/16-20)	M8 x 1.25 (3/8-24)	41 (1.63)	16 (0.630)	14 (0.55)	2 (0.08)	22 (0.88)
50	22 (0.88)	30 (1.181)	16 (0.63)	M18 x 1.5 (1/2-20)	M10 x 1.25 (1/2-20)	52 (2.07)	20 (0.787)	18 (0.71)	2 (0.08)	30 (1.19)
63	22 (0.88)	32 (1.260)	16 (0.63)	M18 x 1.5 (1/2-20)	M10 x 1.25 (1/2-20)	52 (2.07)	20 (0.787)	18 (0.71)	2 (0.08)	30 (1.19)
80	38 (1.50)	40 (1.575)	20 (0.79)	M22 x 1.5 (3/4-16)	M16 x 1.5 (5/8-18)	69 (2.72)	25 (0.984)	23 (0.91)	3 (0.12)	31 (1.22)
100	48 (1.88)	50 (1.968)	26 (1.02)	M26 x 1.5 (1-14)	M20 x 1.5 (3/4-16)	79 (3.11)	32 (1.260)	30 (1.18)	3 (0.12)	31 (1.22)

B
 Round Body Cylinders
 Actuator Products

Style B - Single Rear Clevis

Typical 20 to 100 mm Bore



Note: Mating Mounting Bracket and Pin must be ordered as separate items

Style B, envelope and mounting dimensions – mm (inch)

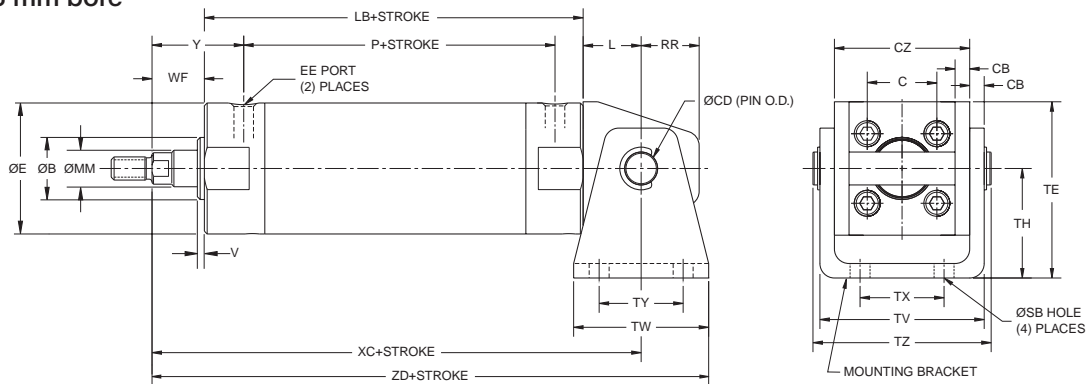
Bore size	ØB +0 - 0.02 (+0 - 0.001)	ØCD h9 (+0 - 0.002)	ØE	EE BSPT (NTPF)	G	L	M	ØMM rod dia.	V	WF	Y
20	12 (0.472)	6.35 (0.250)	27 (1.06)	1/8* (1/8 †)	7 (0.26)	18 (0.70)	7 (0.28)	8 (0.315)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	6.35 (0.250)	32 (1.26)	1/8* (1/8 †)	8 (0.27)	17 (0.68)	7 (0.28)	10 (0.394)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	6.35 (0.250)	39 (1.53)	1/8 (1/8)	15.5 (0.57)	27 (1.07)	10 (0.39)	12 (0.472)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	9.52 (0.375)	48.5 (1.91)	1/8 (1/8)	10 (0.36)	22 (0.88)	10 (0.39)	16 (0.630)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	9.52 (0.375)	59 (2.32)	1/4 (1/4)	12 (0.43)	23 (0.91)	11 (0.44)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	9.52 (0.375)	72 (2.83)	1/4 (1/4)	13 (0.46)	23 (0.91)	11 (0.44)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	19.07 (0.751)	90 (3.54)	3/8 (3/8)	15 (0.54)	35 (1.38)	19 (0.75)	25 (0.984)	3 (0.12)	31 (1.22)	59 (2.32)
100	50 (1.968)	19.07 (0.751)	110 (4.33)	1/2 (1/2)	17 (0.64)	43 (1.69)	19 (0.75)	32 (1.260)	3 (0.12)	31 (1.22)	57 (2.24)

Bore size											Add stroke			
	CE	CH	CM	CN	CT	CW	CX	CY	CZ	ØSB	LB	P	XC	ZX
20	35.5 (1.39)	22 (0.87)	5 (0.19)	10 (0.38)	3 (0.12)	29 (1.13)	32 (1.25)	19 (0.75)	51 (2.00)	7 (0.27)	69 (2.70)	45 (1.77)	99 (3.91)	120 (4.74)
25	38 (1.49)	22 (0.87)	5 (0.19)	10 (0.38)	3 (0.12)	29 (1.13)	32 (1.25)	19 (0.75)	51 (2.00)	7 (0.27)	69 (2.70)	46 (1.81)	102 (4.00)	123 (4.83)
32	41.5 (1.63)	22 (0.87)	5 (0.19)	13 (0.50)	3 (0.12)	29 (1.13)	35 (1.38)	19 (0.75)	54 (2.12)	7 (0.27)	71 (2.78)	43 (1.69)	120 (4.72)	141 (5.55)
40	59 (2.31)	35 (1.38)	6 (0.25)	16 (0.62)	3 (0.12)	38 (1.50)	47 (1.86)	25 (1.00)	67 (2.62)	7 (0.27)	78 (3.06)	49 (1.93)	122 (4.81)	151 (5.94)
50	64.5 (2.52)	35 (1.38)	6 (0.25)	19 (0.75)	6 (0.25)	38 (1.50)	54 (2.12)	25 (1.00)	76 (3.00)	7 (0.27)	90 (3.53)	53 (2.09)	143 (5.63)	172 (6.76)
63	80 (3.17)	44 (1.75)	6 (0.25)	19 (0.75)	6 (0.25)	38 (1.50)	54 (2.12)	25 (1.00)	76 (3.00)	7 (0.27)	90 (3.53)	52 (2.05)	143 (5.63)	172 (6.76)
80	96 (3.77)	51 (2.00)	13 (0.50)	28 (1.09)	6 (0.25)	64 (2.50)	72 (2.84)	38 (1.50)	104 (4.09)	11 (0.42)	108 (4.25)	64 (2.52)	173 (6.82)	218 (8.57)
100	115 (4.54)	60 (2.37)	13 (0.50)	32 (1.25)	6 (0.25)	70 (2.75)	76 (3.00)	44 (1.75)	108 (4.25)	14 (0.55)	108 (4.25)	66 (2.60)	189 (7.44)	240 (9.44)

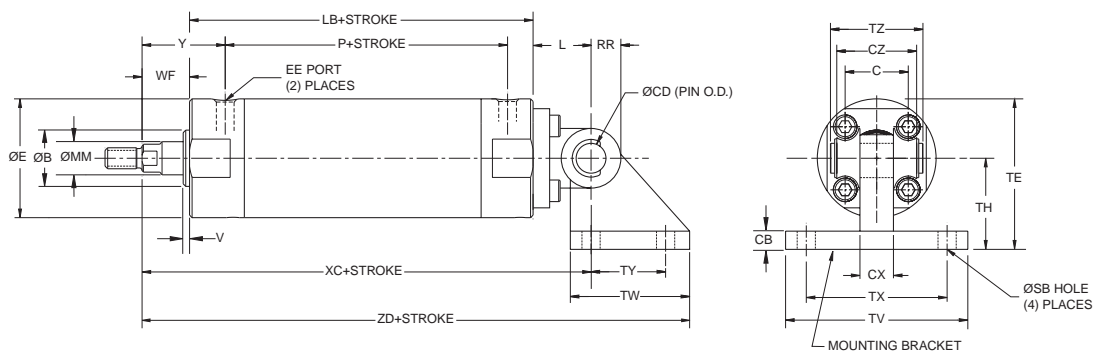
* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

Style A - Double Rear Clevis

Typical 20 to 63 mm bore



Typical 80 to 100 mm bore



Note: Mating Mounting Bracket and Pin must be ordered as separate items.

Style A, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02 (+0 -0.001)	C	CB	ØCD d 9 (-0.001 -0.003)	CZ	CX	ØE	EE BSPT (NPTF)	L	ØMM rod dia.	RR	V	WF
20	12 (0.472)	14 (0.55)	3 (0.12)	8 (0.315)	29 (1.14)	–	27 (1.06)	1/8* (1/8†)	14 (0.55)	8 (0.315)	11 (0.43)	2 (0.08)	13 (0.50)
25	14 (0.551)	16.5 (0.65)	3 (0.12)	10 (0.394)	33 (1.30)	–	32 (1.26)	1/8* (1/8†)	16 (0.63)	10 (0.394)	13 (0.51)	2 (0.08)	16 (0.62)
32	18 (0.709)	20 (0.79)	4.5 (0.18)	12 (0.472)	40 (1.57)	–	39 (1.53)	1/8 (1/8)	20 (0.79)	12 (0.472)	15 (0.59)	2 (0.08)	22 (0.88)
40	25 (0.984)	26 (1.02)	4.5 (0.18)	14 (0.551)	49 (1.93)	–	48.5 (1.91)	1/8 (1/8)	22 (0.87)	16 (0.630)	18 (0.71)	2 (0.08)	22 (0.88)
50	30 (1.181)	32 (1.26)	6 (0.25)	16 (0.630)	60 (2.36)	–	59 (2.32)	1/4 (1/4)	25 (0.98)	20 (0.787)	20 (0.79)	2 (0.08)	30 (1.19)
63	32 (1.260)	38 (1.50)	8 (0.31)	18 (0.709)	74 (2.91)	–	72 (2.83)	1/4 (1/4)	30 (1.18)	20 (0.787)	22 (0.87)	2 (0.08)	30 (1.19)
80	40 (1.575)	50 (1.97)	11 (0.43)	18 (0.709)	56 (2.20)	28 (1.10)	90 (3.54)	3/8 (3/8)	35 (1.38)	25 (0.984)	18 (0.71)	3 (0.12)	31 (1.22)
100	50 (1.968)	60 (2.36)	12 (0.47)	22 (0.866)	64 (2.52)	32 (1.26)	110 (4.33)	1/2 (1/2)	43 (1.69)	32 (1.260)	22 (0.87)	3 (0.12)	31 (1.22)

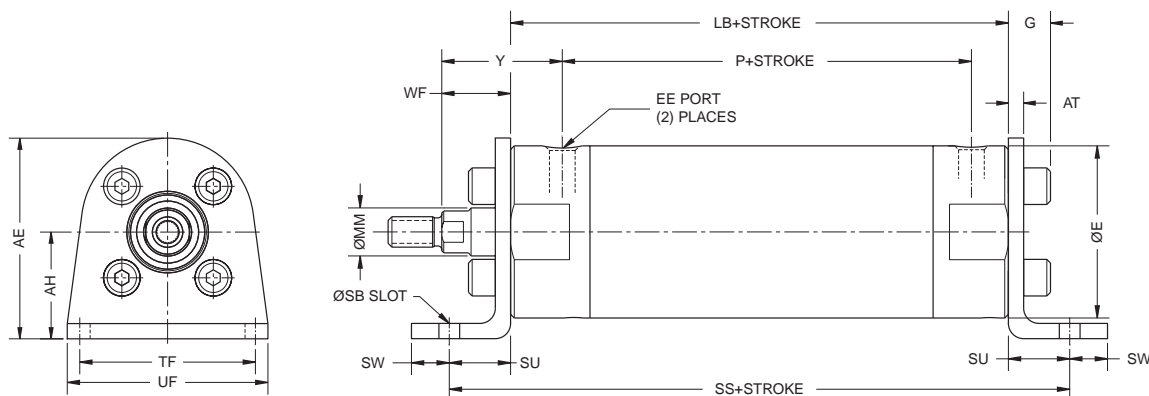
Bore size	Ø SB	TY	TV	TE	TH	TX	TW	TZ	Y	Add Stroke			
										LB	P	XC	ZD
20	5.5 (0.22)	28 (1.10)	35 (1.39)	38 (1.50)	25 (0.98)	16 (0.63)	42 (1.66)	43.4 (1.71)	28 (1.10)	69 (2.70)	45 (1.77)	95 (3.75)	116 (4.58)
25	5.5 (0.22)	28 (1.10)	39 (1.55)	45.5 (1.79)	30 (1.18)	20 (0.79)	42 (1.66)	48 (1.89)	30 (1.18)	69 (2.70)	46 (1.81)	100 (3.95)	121 (4.78)
32	7 (0.28)	28 (1.10)	49 (1.93)	54 (2.13)	35 (1.38)	22 (0.87)	48 (1.88)	59.4 (2.34)	40 (1.57)	71 (2.78)	43 (1.69)	113 (4.45)	137 (5.39)
40	7 (0.28)	30 (1.18)	58 (2.28)	63.5 (2.50)	40 (1.57)	30 (1.18)	56 (2.20)	71.4 (2.81)	42 (1.65)	78 (3.06)	49 (1.93)	122 (4.81)	150 (5.91)
50	9 (0.35)	36 (1.42)	72 (2.83)	79 (3.11)	50 (1.97)	36 (1.42)	64 (2.52)	86 (3.38)	53 (2.09)	90 (3.53)	53 (2.09)	145 (5.70)	177 (6.96)
63	11 (0.43)	46 (1.81)	90 (3.54)	96 (3.78)	60 (2.36)	46 (1.81)	74 (2.91)	105.4 (4.15)	53 (2.09)	90 (3.53)	52 (2.05)	150 (5.90)	187 (7.36)
80	11 (0.43)	45 (1.77)	110 (4.33)	100 (3.94)	55 (2.17)	85 (3.35)	72 (2.83)	64 (2.52)	59 (2.32)	108 (4.25)	64 (2.52)	174 (6.85)	232.5 (9.15)
100	13.5 (0.53)	60 (2.36)	130 (5.12)	120 (4.72)	65 (2.56)	100 (3.94)	93 (3.66)	72 (2.83)	57 (2.24)	108 (4.25)	66 (2.60)	182 (7.17)	258.5 (10.18)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

B
**Round Body Cylinders
Actuator Products**

Style F - Foot Mount

Typical 20 to 100 mm bore



Style F, envelope and mounting dimensions – mm (inch)

Bore size	AE	AH	AT	ØE	EE (BSPT)	G	ØMM rod dia.	ØSB
20	36.5 (1.44)	20.6 (0.81)	3 (0.12)	27 (1.06)	1/8* (1/8†)	6 (0.20)	8 (0.315)	7 (0.27)
25	38.5 (1.52)	20.6 (0.81)	3 (0.12)	32 (1.26)	1/8* (1/8†)	6.5 (0.22)	10 (0.394)	7 (0.27)
32	46.5 (1.83)	25.4 (1.00)	3 (0.12)	39 (1.53)	1/8 (1/8)	6.5 (0.22)	12 (0.472)	7 (0.28)
40	51 (2.02)	25.4 (1.00)	3 (0.12)	48.5 (1.91)	1/8 (1/8)	7 (0.25)	16 (0.630)	7 (0.28)
50	72 (2.84)	38.1 (1.50)	6 (0.25)	59 (2.32)	1/4 (1/4)	11 (0.41)	20 (0.787)	9 (0.34)
63	83.5 (3.29)	44.5 (1.75)	6 (0.25)	72 (2.83)	1/4 (1/4)	12 (0.44)	20 (0.787)	9 (0.34)
80	101 (3.98)	55 (2.17)	6 (0.25)	90 (3.54)	3/8 (3/8)	12 (0.44)	25 (0.984)	11 (0.43)
100	121 (4.76)	65 (2.56)	6 (0.25)	110 (4.33)	1/2 (1/2)	13 (0.50)	32 (1.260)	14 (0.55)

Bore size	SU	SW	TF	UF	WF	Y	Add stroke		
							LB	P	SS
20	14 (0.56)	11 (0.44)	38 (1.50)	48 (1.88)	13 (0.50)	28 (1.10)	69 (2.70)	45 (1.77)	97 (3.82)
25	14 (0.56)	11 (0.44)	38 (1.50)	48 (1.88)	16 (0.62)	30 (1.18)	69 (2.70)	46 (1.81)	97 (3.82)
32	19 (0.75)	19 (0.75)	48 (1.88)	63.5 (2.50)	22 (0.88)	40 (1.57)	71 (2.78)	43 (1.69)	109 (4.28)
40	18 (0.72)	20 (0.78)	48 (1.88)	63.5 (2.50)	22 (0.88)	42 (1.65)	78 (3.06)	49 (1.93)	114 (4.50)
50	25 (1.00)	16 (0.62)	57 (2.24)	79 (3.12)	30 (1.19)	53 (2.09)	90 (3.53)	53 (2.09)	140 (5.53)
63	25 (1.00)	16 (0.62)	73 (2.88)	95 (3.75)	30 (1.19)	53 (2.09)	90 (3.53)	52 (2.05)	140 (5.53)
80	28.5 (1.12)	14 (0.55)	100 (3.94)	125 (4.92)	31 (1.22)	59 (2.32)	108 (4.25)	64 (2.52)	165 (6.49)
100	30 (1.18)	16 (0.63)	120 (4.72)	150 (5.91)	31 (1.22)	57 (2.24)	108 (4.25)	66 (2.60)	168 (6.61)

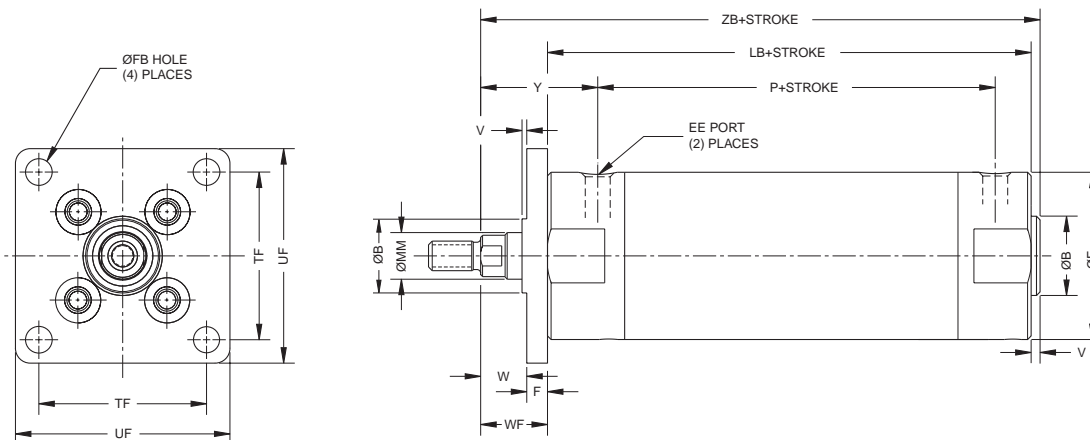
* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

B

Round Body Cylinders
 Actuator Products

Style J - Front Flange

Typical 20 to 100 mm bore



Style J, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	ØE	EE (BSPT)	F	ØFB	ØMM rod dia.	TF	UF	V	WF	W	Y
20	12 (0.472)	27 (1.06)	1/8* (1/8†)	6 (0.24)	5.5 (0.22)	8 (0.315)	28 (1.10)	40 (1.57)	2 (0.08)	13 (0.50)	7 (0.26)	28 (1.10)
25	14 (0.551)	32 (1.26)	1/8* (1/8†)	7 (0.28)	5.5 (0.22)	10 (0.394)	32 (1.26)	44 (1.73)	2 (0.08)	16 (0.62)	9 (0.34)	30 (1.18)
32	18 (0.709)	39 (1.53)	1/8 (1/8)	7 (0.28)	7 (0.28)	12 (0.472)	38 (1.50)	53 (2.09)	2 (0.08)	22 (0.88)	15 (0.60)	40 (1.57)
40	25 (0.984)	48.5 (1.91)	1/8 (1/8)	8 (0.31)	7 (0.28)	16 (0.630)	46 (1.81)	61 (2.40)	2 (0.08)	22 (0.88)	14 (0.57)	42 (1.65)
50	30 (1.181)	59 (2.32)	1/4 (1/4)	9 (0.35)	9 (0.35)	20 (0.787)	58 (2.28)	76 (3.00)	2 (0.08)	30 (1.19)	21 (0.84)	53 (2.09)
63	32 (1.260)	72 (2.83)	1/4 (1/4)	9 (0.35)	11 (0.43)	20 (0.787)	70 (2.76)	92 (3.62)	2 (0.08)	30 (1.19)	21 (0.84)	53 (2.09)
80	40 (1.575)	90 (3.54)	3/8 (3/8)	11 (0.43)	11 (0.43)	25 (0.984)	82 (3.23)	104 (4.09)	3 (0.12)	31 (1.22)	20 (0.79)	59 (2.32)
100	50 (1.968)	110 (4.33)	1/2 (1/2)	14 (0.55)	14 (0.55)	32 (1.260)	100 (3.94)	128 (5.04)	3 (0.12)	31 (1.22)	17 (0.67)	57 (2.24)

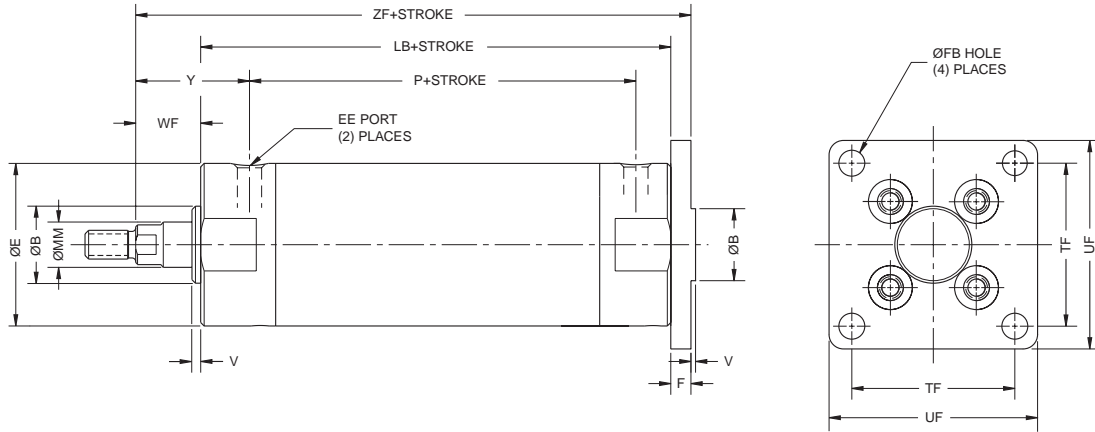
Bore size	Add stroke		
	LB	P	ZB
20	69 (2.70)	45 (1.77)	83 (3.28)
25	69 (2.70)	46 (1.81)	86 (3.40)
32	71 (2.78)	43 (1.69)	95 (3.74)
40	78 (3.06)	49 (1.93)	102 (4.02)
50	90 (3.53)	53 (2.09)	122 (4.80)
63	90 (3.53)	52 (2.05)	122 (4.80)
80	108 (4.25)	64 (2.52)	142 (5.59)
100	108 (4.25)	66 (2.60)	142 (5.59)

* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

B
 Round Body Cylinders
 Actuator Products

Style H - Rear Flange

Typical 20 to 100 mm bore



Style H, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	ØE	EE (BSPT)	F	ØFB	ØMM rod dia.	TF	UF	V	WF	Y
20	12 (0.472)	27 (1.06)	1/8* (1/8†)	6 (0.24)	5.5 (0.22)	8 (0.315)	28 (1.10)	40 (1.57)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	32 (1.26)	1/8* (1/8†)	7 (0.28)	5.5 (0.22)	10 (0.394)	32 (1.26)	44 (1.73)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	39 (1.53)	1/8 (1/8)	7 (0.28)	7 (0.28)	12 (0.472)	38 (1.50)	53 (2.09)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	48.5 (1.91)	1/8 (1/8)	8 (0.31)	7 (0.28)	16 (0.630)	46 (1.81)	61 (2.40)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	59 (2.32)	1/4 (1/4)	9 (0.35)	9 (0.35)	20 (0.787)	58 (2.28)	76 (3.00)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	72 (2.83)	1/4 (1/4)	9 (0.35)	11 (0.43)	20 (0.787)	70 (2.76)	92 (3.62)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	90 (3.54)	3/8 (3/8)	11 (0.43)	11 (0.43)	25 (0.984)	82 (3.23)	104 (4.09)	3 (0.12)	31 (1.22)	59 (2.32)
100	50 (1.968)	110 (4.33)	1/2 (1/2)	14 (0.55)	14 (0.55)	32 (1.260)	100 (3.94)	128 (5.04)	3 (0.12)	31 (1.22)	57 (2.24)

Bore size	Add stroke		
	LB	P	ZF
20	69 (2.70)	45 (1.77)	87 (3.44)
25	69 (2.70)	46 (1.81)	91 (3.60)
32	71 (2.78)	43 (1.69)	100 (3.94)
40	78 (3.06)	49 (1.93)	108 (4.25)
50	90 (3.53)	53 (2.09)	129 (5.07)
63	90 (3.53)	52 (2.05)	129 (5.07)
80	108 (4.25)	64 (2.52)	150 (5.91)
100	108 (4.25)	66 (2.60)	153 (6.02)

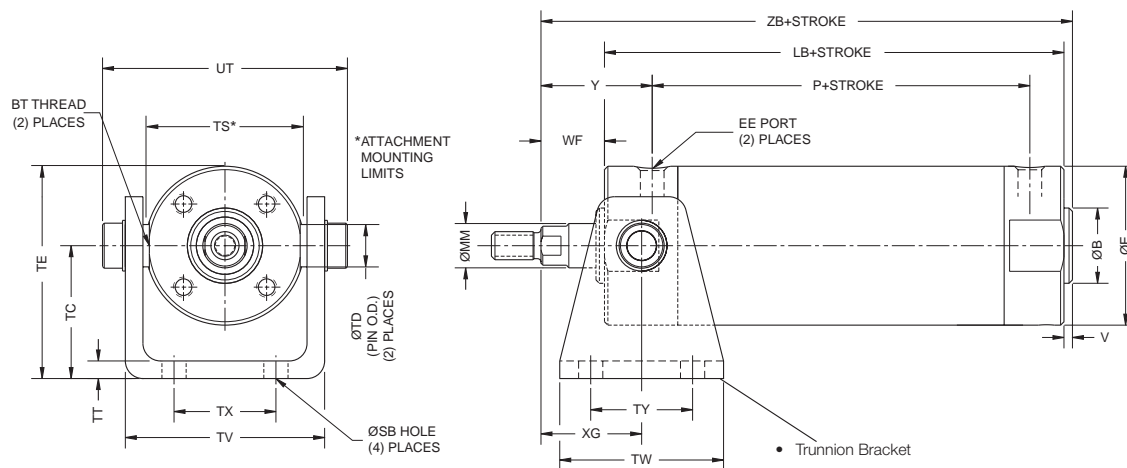
* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

B

Round Body Cylinders
 Actuator Products

Style E - Front Trunnion

Typical 20 to 63 mm bore



Note: Trunnion Bracket must be ordered as separate item

Style E, envelope and mounting dimensions – mm (inch)

Bore size	ØB	BT	D	ØE	EE (BSPT)	ØMM rod dia.	V	WF	XG	Y	ØSB	TC
	+0 -0.02											
20	12 (0.472)	M5x0.80	6 (0.24)	27 (1.06)	1/8* (1/8†)	8 (0.315)	2 (0.08)	13 (0.50)	24 (0.93)	28 (1.10)	5.5 (0.22)	25 (0.98)
25	14 (0.551)	M6x0.75	8 (0.31)	32 (1.26)	1/8* (1/8†)	10 (0.394)	2 (0.08)	16 (0.62)	27 (1.05)	30 (1.18)	5.5 (0.22)	30 (1.18)
32	18 (0.709)	M8x1.00	10 (0.39)	39 (1.53)	1/8 (1/8)	12 (0.472)	2 (0.08)	22 (0.88)	33 (1.31)	40 (1.57)	7 (0.28)	35 (1.38)
40	25 (0.984)	M10x1.25	12 (0.47)	48.5 (1.91)	1/8 (1/8)	16 (0.630)	2 (0.08)	22 (0.88)	34 (1.35)	42 (1.65)	7 (0.28)	40 (1.57)
50	30 (1.181)	M12x1.25	16 (0.63)	59 (2.32)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	43 (1.70)	53 (2.09)	9 (0.35)	50 (1.97)
63	32 (1.260)	M14x1.50	16 (0.63)	72 (2.83)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	43 (1.70)	53 (2.09)	11 (0.43)	60 (2.36)

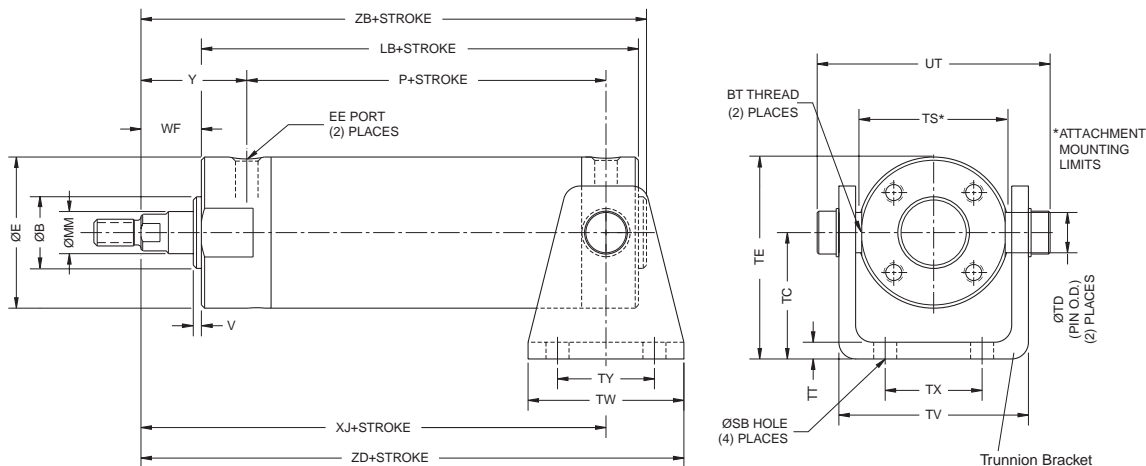
Bore size	ØTD e8	TE	TS	TT	TV	TW	TX	TY	UT	Add stroke		
										LB	P	ZB
20	8 (0.315)	38.5 (1.51)	28 (1.10)	3 (0.12)	35 (1.39)	42 (1.66)	16 (0.63)	28 (1.10)	47.5 (1.87)	69 (2.70)	45 (1.77)	83 (3.28)
25	10 (0.394)	46 (1.81)	33 (1.30)	3 (0.12)	39 (1.55)	42 (1.66)	20 (0.79)	28 (1.10)	53 (2.09)	69 (2.70)	46 (1.81)	86 (3.40)
32	12 (0.472)	54.5 (2.15)	40 (1.58)	4.5 (0.18)	49 (1.93)	48 (1.88)	22 (0.87)	28 (1.10)	68 (2.67)	71 (2.78)	43 (1.69)	95 (3.74)
40	14 (0.551)	64 (2.53)	49 (1.93)	4.5 (0.18)	58 (2.28)	56 (2.20)	30 (1.18)	30 (1.18)	79 (3.10)	78 (3.06)	49 (1.93)	102 (4.02)
50	16 (0.630)	79.5 (3.13)	60 (2.36)	6 (0.25)	72 (2.83)	64 (2.52)	36 (1.42)	36 (1.42)	99 (3.88)	90 (3.53)	53 (2.09)	122 (4.80)
63	18 (0.709)	96 (3.78)	74 (2.91)	8 (0.31)	90 (3.54)	74 (2.91)	46 (1.81)	46 (1.81)	119 (4.69)	90 (3.53)	52 (2.05)	122 (4.80)

* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

B
 Round Body Cylinders
 Actuator Products

Style D - Rear Trunnion

Typical 20 to 63 mm bore



Note: Trunnion Bracket must be ordered as separate item

Style D, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	BT	ØE	EE (BSPT)	ØMM rod dia.	V	WF	Y	ØSB	TC	ØTD e8	TE
20	12 (0.472)	M5x0.80	27 (1.06)	1/8* (1/8†)	8 (0.315)	2 (0.08)	13 (0.50)	28 (1.10)	5.5 (0.22)	25 (0.98)	8 (0.315)	38.5 (1.51)
25	14 (0.551)	M6x0.75	32 (1.26)	1/8* (1/8†)	10 (0.394)	2 (0.08)	16 (0.62)	30 (1.18)	5.5 (0.22)	30 (1.18)	10 (0.394)	46 (1.81)
32	18 (0.709)	M8x1.00	39 (1.53)	1/8 (1/8)	12 (0.472)	2 (0.08)	22 (0.88)	40 (1.57)	7 (0.28)	35 (1.38)	12 (0.472)	54.5 (2.15)
40	25 (0.984)	M10x1.25	48.5 (1.91)	1/8 (1/8)	16 (0.630)	2 (0.08)	22 (0.88)	42 (1.65)	7 (0.28)	40 (1.57)	14 (0.551)	64 (2.53)
50	30 (1.181)	M12x1.25	59 (2.32)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)	9 (0.35)	50 (1.97)	16 (0.630)	79.5 (3.13)
63	32 (1.260)	M14x1.50	72 (2.83)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)	11 (0.43)	60 (2.36)	18 (0.709)	96 (3.78)

Bore size	Add stroke											
	TS	TT	TV	TW	TX	TY	UT	LB	P	XJ	ZB	ZD
20	28 (1.10)	3 (0.12)	35 (1.39)	42 (1.66)	16 (0.63)	28 (1.10)	47.5 (1.87)	69 (2.70)	45 (1.77)	70 (2.77)	83 (3.28)	91 (3.60)
25	33 (1.30)	3 (0.12)	39 (1.55)	42 (1.66)	20 (0.79)	28 (1.10)	53 (2.09)	69 (2.70)	46 (1.81)	73 (2.89)	86 (3.40)	94 (3.72)
32	40 (1.58)	4.5 (0.18)	49 (1.93)	48 (1.88)	22 (0.87)	28 (1.10)	68 (2.67)	71 (2.78)	43 (1.69)	83 (3.27)	95 (3.74)	107 (4.21)
40	49 (1.93)	4.5 (0.18)	58 (2.28)	56 (2.20)	30 (1.18)	30 (1.18)	79 (3.10)	78 (3.06)	49 (1.93)	90 (3.54)	102 (4.02)	118 (4.64)
50	60 (2.36)	6 (0.25)	72 (2.83)	64 (2.52)	36 (1.42)	36 (1.42)	99 (3.88)	90 (3.53)	53 (2.09)	108 (4.25)	122 (4.80)	140 (5.51)
63	74 (2.91)	8 (0.31)	90 (3.54)	74 (2.91)	46 (1.81)	46 (1.81)	119 (4.69)	90 (3.53)	52 (2.05)	108 (4.25)	122 (4.80)	145 (5.71)

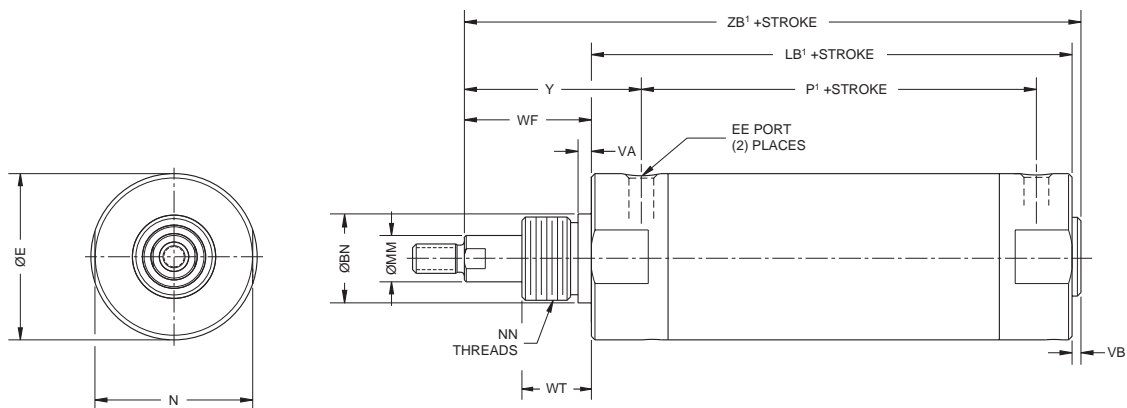
* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

B

Round Body Cylinders
 Actuator Products

Style G - Nose Mount

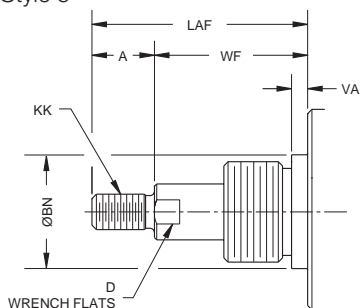
Typical 20 to 25 mm bore



Rod end details – 20 and 25 mm bore

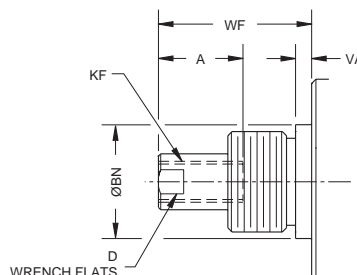
Male threads

Inch male - Style N
 Metric male - Style 5



Female threads

Inch female - Style 9
 Metric female - Style 6



Special rod end threads

Thread style 3

Special metric or inch threads, extension, blank, etc., are also available. To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF. If otherwise special, supply a dimensioned sketch.

Style G, envelope and mounting dimensions – mm (inch)

Bore size	A	BN		D	ØE	EE (BSPT)	Thread KK Style 5	Thread KF Style 6	ØMM rod dia.	LAF	NN	N	VA	VB	WF	WT	Y	Add stroke		
		+0	-0.08															LB ¹	P ¹	ZB ¹
20	13	19.02	6	27	1/8*	M8x1.25	M5x0.80	35	8	3/4-16	24	3	2	22	16	32	66	47	90	
	(0.50)	(0.749)	(0.24)	(1.06)	(1/8†)	(1/4-28)	(#10-32)	(1.38)	(0.315)	(3/4-16)	(0.94)	(0.12)	(0.08)	(0.88)	(0.63)	(1.25)	(2.60)	(1.85)	(3.56)	
25	13	19.02	8	32	1/8*	M10x1.25	M6x1.00	35	10	3/4-16	29	3	2	22	16	32	66	47	90	
	(0.50)	(0.749)	(0.31)	(1.26)	(1/8†)	5/16-24 ()	(1/4-28)	(1.38)	(0.394)	(3/4-16)	(1.14)	(0.12)	(0.08)	(0.88)	(0.63)	(1.25)	(2.60)	(1.85)	(3.56)	

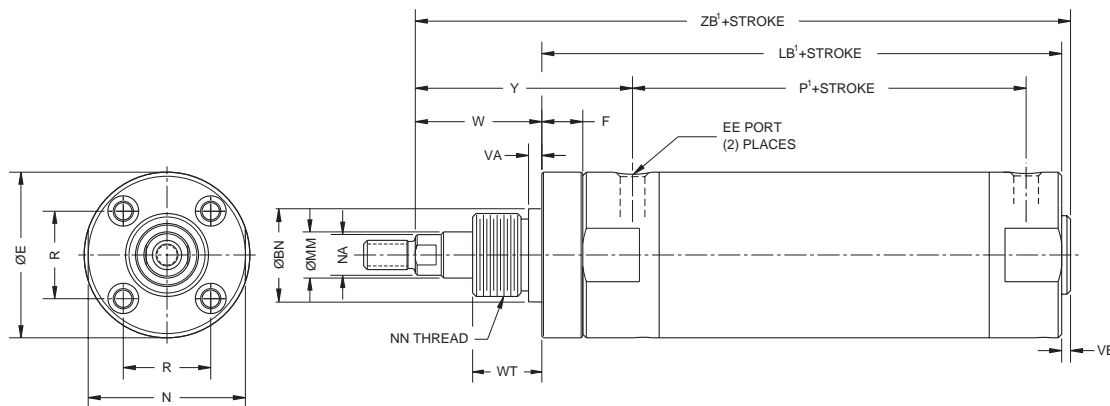
* Ports are M5 for cushioned versions, metric

† Ports are 10-32 for cushioned versions, inch

B
 Round Body Cylinders
 Actuator Products

Style G - Nose Mount

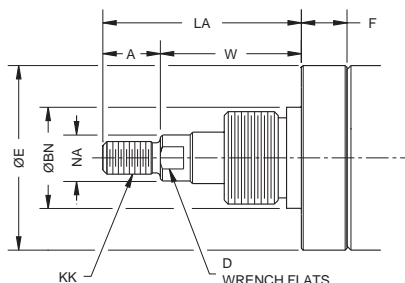
Typical 32 to 63mm bore



Rod end details – 32 to 63mm bore

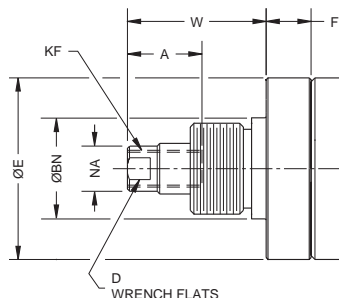
Male threads

Inch male - Style N
 Metric male - Style 5



Female threads

Inch female - Style 9
 Metric female - Style 6



Special rod end threads

Thread style 3

Special metric or inch threads, extension, blank, etc., are also available. To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF (Note: LAF = LA+F and WF = W+F). If otherwise special, supply a dimensioned sketch.

Style G, envelope and mounting dimensions – mm (inch)

Bore size	A	BN		ØE	EE* (BSPT) F	Thread		LA	ØMM rod dia.	Add stroke												
		+0	-0.8			KK Style 5	KF Style 6			NN	N	NA	R	VA	VB	W	WT	Y	LB ¹	P ¹	ZB ¹	
32	19 (0.75)	19.02 (0.749)	10 (0.39)	39 (1.53)	1/8 (1/8)	9 (0.37)	M10x1.25 (7/16-20)	M8x1.25 (5/16-24)	41 (1.63)	12 (0.472)	3/4-16 (3/4-16)	36 (1.42)	11 (0.43)	20 (0.79)	3 (0.12)	2 (0.08)	22 (0.88)	16 (0.63)	49 (1.93)	80 (3.15)	43 (1.69)	104 (4.11)
40	19 (0.75)	26.87 (1.058)	12 (0.47)	48.5 (1.91)	1/8 (1/8)	14 (0.56)	M14x1.5 (7/16-20)	M8x1.25 (3/8-24)	51 (2.00)	16 (0.630)	1-14 (1-14)	44 (1.73)	14 (0.55)	26 (1.02)	5 (0.19)	2 (0.08)	32 (1.25)	22 (0.88)	66 (2.60)	92 (3.62)	49 (1.93)	126 (4.95)
50	22 (0.88)	34.90 (1.374)	16 (0.63)	59 (2.32)	1/4 (1/4)	15 (0.59)	M18x1.5 (1/2-20)	M10x1.25 (1/2-20)	52 (2.07)	20 (0.787)	1-1/4-12 (1-1/4-12)	55 (2.17)	18 (0.71)	32 (1.26)	3 (0.12)	2 (0.08)	30 (1.19)	20.5 (0.81)	68 (2.68)	105 (4.12)	53 (2.09)	137 (5.39)
63	22 (0.88)	38.10 (1.500)	16 (0.63)	72 (2.83)	1/4 (1/4)	16 (0.63)	M18x1.5 (1/2-20)	M10x1.25 (1/2-20)	52 (2.07)	20 (0.787)	1-3/8-12 (1-3/8-12)	69 (2.72)	18 (0.71)	38 (1.50)	3 (0.12)	2 (0.08)	30 (1.19)	20.5 (0.81)	70 (2.76)	106 (4.19)	52 (2.05)	139 (5.46)

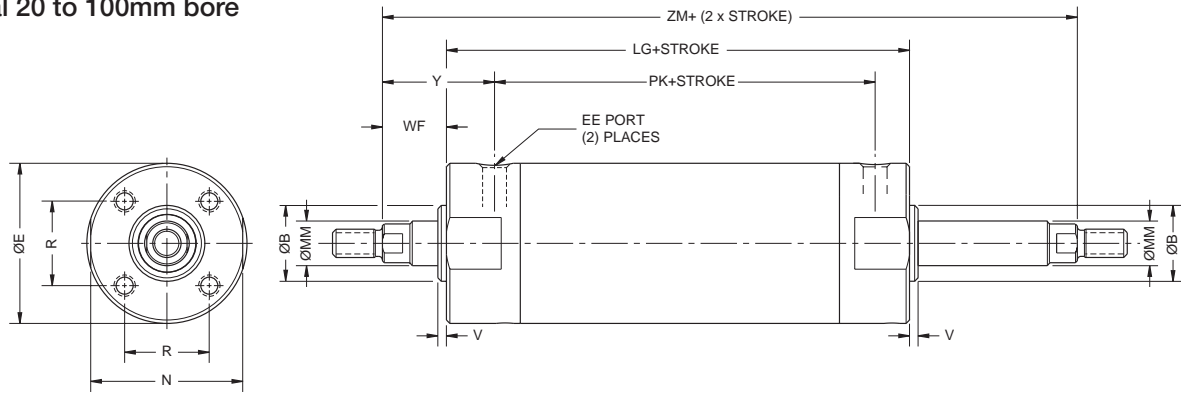
* See Metric Dimensions for BSPT Port Size.
 See Inch Dimensions for NPTF Port Size.

B

Round Body Cylinders
 Actuator Products

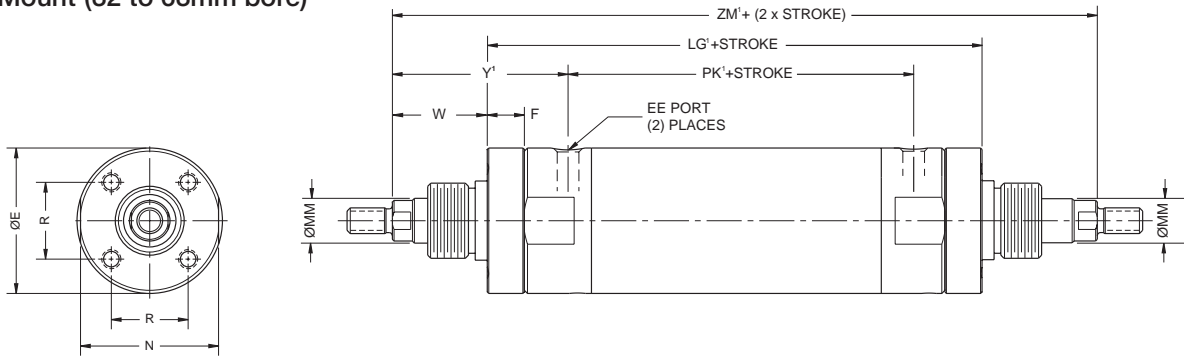
Double-Rod

Typical 20 to 100mm bore



Double-Rod

Nose Mount (32 to 63mm bore)



For detailed dimensions for the nose mount from 20 to 63 mm bore, please reference previous pages.

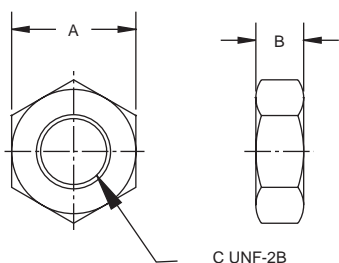
Double rod, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02		F	EE (BSPT)	ØMM rod dia.		Add stroke											
	ØE				N	R	V	W	WF	Y	Y1	LG	LG1	PK	PK1	ZM	ZM1	
20	12 (0.472)	27 (1.06)	-	1/8* (1/8†)	8 (0.315)	24 (0.94)	14 (0.55)	2	-	13 (0.50)	28 (1.10)	32 (1.25)	75 (2.97)	70 (2.74)	45 (1.77)	50 (1.97)	101 (3.97)	95 (3.74)
25	14 (0.551)	32 (1.26)	-	1/8* (1/8†)	10 (0.394)	29 (1.14)	16.5 (0.65)	2	-	16 (0.62)	30 (1.18)	32 (1.25)	75 (2.97)	70 (2.74)	47 (1.85)	50 (1.97)	107 (4.21)	101 (3.98)
32	18 (0.709)	39 (1.53)	9 (0.37)	1/8 (1/8)	12 (0.472)	36 (1.42)	20 (0.79)	2	22 (0.88)	22 (0.88)	40 (1.57)	49 (1.93)	78 (3.06)	78 (3.80)	49 (1.65)	54 (1.65)	122 (4.82)	141 (5.56)
40	25 (0.984)	48.5 (1.91)	14 (0.56)	1/8 (1/8)	16 (0.630)	44 (1.73)	26 (1.02)	2	32 (1.25)	22 (0.88)	42 (1.65)	66 (2.60)	87 (3.41)	115 (4.53)	47 (1.85)	47 (1.85)	131 (5.17)	179 (7.03)
50	30 (1.181)	59 (2.32)	15 (0.59)	1/4 (1/4)	20 (0.787)	55 (2.17)	32 (1.26)	2	30 (0.08)	30 (1.19)	53 (2.09)	68 (2.68)	100 (3.93)	130 (5.11)	54 (2.13)	54 (2.13)	160 (6.31)	190 (7.49)
63	32 (1.260)	72 (2.83)	17 (0.66)	1/4 (1/4)	20 (0.787)	69 (2.72)	38 (1.50)	2	30 (1.19)	30 (1.19)	53 (2.09)	70 (2.76)	100 (3.93)	133 (5.25)	54 (2.13)	54 (2.13)	160 (6.31)	194 (7.63)
80	40 (1.575)	90 (3.54)	-	3/8 (3/8)	25 (0.984)	86 (3.39)	50 (1.97)	3	-	31 (1.22)	59 (2.32)	-	119 (4.70)	-	61 (2.40)	-	181 (7.14)	-
100	50 (1.968)	110 (4.33)	-	1/2 (1/2)	32 (1.260)	106 (4.17)	60 (2.36)	3	-	31 (1.22)	57 (2.24)	-	119 (4.70)	-	65 (2.56)	-	181 (7.14)	-

* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

B
 Round Body Cylinders
 Actuator Products

Rod Jam Nut



Rod jam nut should be ordered separately on all mounting styles.

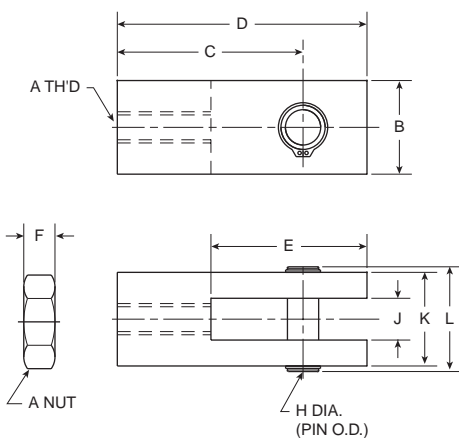
Rod Jam Nut Dimensions – mm

Bore size	A	B	C	Part number
20	13	4	M8 x 1.25	L075540008
25-32	17	5	M10 x 1.25	L075540010
40	22	7	M14 x 1.5	L075540014
50-63	27	8	M18 x 1.5	L075540018
80	32	11	M22 x 1.5	L075540022
100	41	16	M26 x 1.5	L075540026

Rod Jam Nut Dimensions – inch

Bore size	A	B	C	Part number
20	0.44	0.16	1/4-28	L077970025
25	0.50	0.19	5/16-24	L077970031
32-40	0.69	0.25	7/16-20	L077970044
50-63	0.75	0.31	1/2-20	L077970050
80	1.12	0.42	3/4 -16	L077970075
100	1.50	0.55	1-14	L077970100

Piston Rod Clevis



Piston Rod Clevis Dimensions – mm

Bore size	A	B	C	D	E	F	H h9	J	K	L	Part number
20	M8x1.25	13	24	30	18	4	6.35	6.5	13	17.5	L077590020
25	M10x1.25	19	24	30	18	5	6.35	6.5	19	24.5	L077590025
32	M10x1.25	19	34	43	24	5	9.52	10	19	26	L077590032
40	M14x1.5	19	34	43	24	7	9.52	10	19	26	L077590040
50	M18x1.5	28	34	43	24	8	9.52	10	28	36	L077590050
63	M18x1.5	28	34	43	24	8	9.52	10	28	36	L077590050
80	M22x1.5	38	50	71	48	11	18	28	56	64	PIM-4PRC
100	M26x1.5	44	55	79	55	16	22	32	63.5	72	L077590100

Piston Rod Clevis Dimensions – inch

Bore size	A	B	C	D	E	F	H	J	K +0 -0.02	L	Part number
20	1/4-28	0.50	0.94	1.19	0.69	0.16	0.250	0.26	0.50	0.69	L077960025
25	5/16-24	0.50	0.94	1.19	0.69	0.19	0.250	0.26	0.50	0.69	L077960031
32	7/16-20	0.75	1.32	1.69	0.94	0.25	0.375	0.38	0.75	1.03	L077960044
40	7/16-20	0.75	1.32	1.69	0.94	0.25	0.375	0.38	0.75	1.03	L077960044
50	1/2-20	0.75	1.32	1.69	0.94	0.31	0.375	0.38	0.75	1.03	L077960050
63	1/2-20	0.75	1.32	1.69	0.94	0.31	0.375	0.38	0.75	1.03	L077960050
80	3/4-16	1.25	1.81	2.38	1.31	0.42	0.437	0.52	1.25	1.66	L077960075
100	1-14	1.50	2.63	3.38	1.81	0.55	0.500	0.64	1.50	1.91	L077960100

B

Round Body Cylinders
 Actuator Products

- Conforms to ISO 6432 and CETOP RP52P standards
- 5 bore sizes, 10mm to 25mm
- Stainless steel body with black anodized aluminum end caps
- Stainless steel piston rod
- Magnetic piston and bumpers standard



Operating information

Operating pressure: 10 bar (145 PSIG), air
 Temperature range:
 Working -20°C to 80°C (4°F to 176°F)
 High temperature version
 20mm, 25mm -10°C to 150°C (14°F to 302°F)
 10mm, 12mm, 16mm -10°C to 120°C (14°F to 248°F)
 Low temperature version -40°C to 60°C (-40°F to 140°F)
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

P1A - S **016** **M** **S** - **0025**

Bore size		Cylinder type / function		Stroke length, mm									
010	10mm	M	Double-acting, adjustable cushioning, Ø16-25 mm. Not for sealing material type F.	E.g. 0025 = 25 mm For standard stroke length and max length see table below.									
012	12mm	D	Double-acting, bumpers, Ø10 - Ø25	<table border="1"> <thead> <tr> <th colspan="2">Sealing material</th> </tr> </thead> <tbody> <tr> <td>S</td> <td>Standard -20°C to +80°C (-4°F to +176°F) Magnetic piston</td> </tr> <tr> <td>F</td> <td>High temperature: Ø12 mm, 16 mm, 20 mm and 25 mm -10°C to +150°C. (14°F to 302°F) Non magnetic piston</td> </tr> <tr> <td>V</td> <td>External seals of fluorinated rubber -20°C to +80°C (-4°F to +176°F) Magnetic piston</td> </tr> </tbody> </table>		Sealing material		S	Standard -20°C to +80°C (-4°F to +176°F) Magnetic piston	F	High temperature: Ø12 mm, 16 mm, 20 mm and 25 mm -10°C to +150°C. (14°F to 302°F) Non magnetic piston	V	External seals of fluorinated rubber -20°C to +80°C (-4°F to +176°F) Magnetic piston
Sealing material													
S	Standard -20°C to +80°C (-4°F to +176°F) Magnetic piston												
F	High temperature: Ø12 mm, 16 mm, 20 mm and 25 mm -10°C to +150°C. (14°F to 302°F) Non magnetic piston												
V	External seals of fluorinated rubber -20°C to +80°C (-4°F to +176°F) Magnetic piston												
016	16mm	F	Double-acting, adjustable cushioning, double rod, Ø16-25 mm. Not for sealing material type F.										
020	20mm	K	Double-acting, bumpers, double rod, Ø10 - Ø25										
025	25mm	S	Single-acting, bumpers, spring return for retract stroke, Ø10-25 mm										
		T	Single-acting, bumpers, spring extend for advance stroke, Ø16-25 mm										

B
 Round Body Cylinders
 Actuator Products

Stroke Lengths		Stroke Length (* = standard, ° = non-standard, blank = N/A)																
Cylinder model	Bore size	10	15	20	25*	30	40	50*	80*	100*	125*	160*	200*	250*	320*	400*	500*	
Double acting with fixed end-cushioning:																		
P1A-S 010 D	10	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 012 D	12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 016 D	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 020 D	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 025 D	25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Double acting with adjustable end-cushioning:																		
P1A-S 016 M	16			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 020 M	20			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 025 M	25			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Single acting:																		
P1A-S 010 SS	10	•	•	•	•	•	•	•	•									
P1A-S 012 SS	12	•	•	•	•	•	•	•	•									
P1A-S 016 SS(TS)	16	•	•	•	•	•	•	•	•**									
P1A-S 020 SS(TS)	20	•	•	•	•	•	•	•	•									
P1A-S 025 SS(TS)	25	•	•	•	•	•	•	•	•									

* Standard stroke lengths in mm according to ISO 4393
 ** Not for the TS version

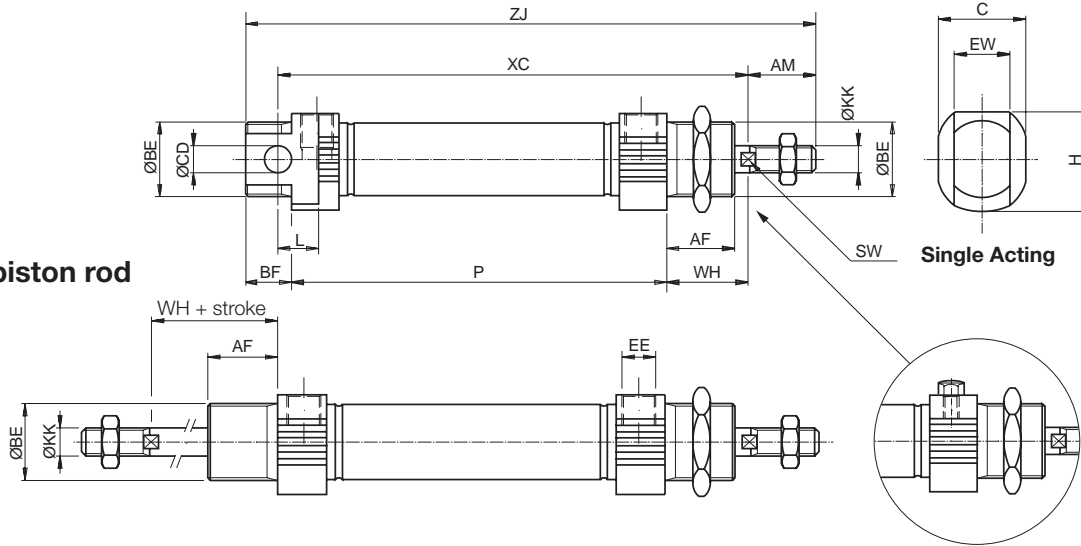
Sensors

For sensors see page B296.



Double acting cylinders

Double piston rod



Bore size mm	AM 0/-2 mm	BE	AF mm	BF mm	C mm	CD h9 mm	EE	EW mm	H mm	KK	L mm	SW mm	WH±1.2 mm
10	12	M12x1.25	12	10	14.0	4	M5	8	16.7	M4	6	–	16
12	16	M16x1.5	18	13	18.0	6	M5	12	19.1	M6	9	5	22
16 ¹⁾	16	M16x1.5	18	13	18.0	6	M5	12	19.1	M6	9	5	22
16 ²⁾	16	M16x1.5	18	13	25.0	6	M5	12	24.0	M6	9	5	22
20	20	M22x1.5	20	14	24.0	8	G1/8	16	27.0	M8	12	7	24
25	22	M22x1.5	22	14	27.5	8	G1/8	16	29.0	M10x1.25	12	9	28

1) P1A-S016DS/SS/TS 2) P1A-S016MS

Double acting cylinders

Bore size mm	XC mm	ZJ mm	P mm
10	64 + stroke	84 + stroke	46 + stroke
12	75 + stroke	99 + stroke	48 + stroke
16	82 + stroke	104 + stroke	53 + stroke
20	95 + stroke	125 + stroke	67 + stroke
25	104 + stroke	132 + stroke	68 + stroke

Single-acting, spring return, type SS

Bore size mm	XC (mm) at various strokes						ZJ (mm) at various strokes						P (mm) at various strokes					
	10	15	25	40	50	80	10	15	25	40	50	80	10	15	25	40	50	80
10	74	79	89	126	136	174	94	99	109	146	156	194	56	61	71	108	118	156
12	85	90	100	132	142	185	109	114	124	156	166	209	58	63	73	105	115	158
16	92	97	107	122	132	184	114	119	129	144	154	206	63	68	78	93	103	155
20	105	110	120	135	145	191	135	140	150	165	175	221	77	82	92	107	117	163
25	114	119	129	144	154	201	142	147	157	172	182	229	78	83	93	108	118	165

Single-acting, spring-extended, type TS

Bore size mm	ZC ³⁾ (mm) at various strokes						ZJ ³⁾ (mm) at various strokes						P (mm) at various strokes					
	10	15	25	40	50	80	10	15	25	40	50	80	10	15	25	40	50	80
16	107	112	122	137	147	–	134	139	149	164	174	–	78	83	93	108	118	–
20	120	125	135	150	160	195	156	161	171	186	196	231	92	97	107	122	132	167
25	129	134	144	159	169	205	165	170	180	195	205	241	93	98	108	123	133	169

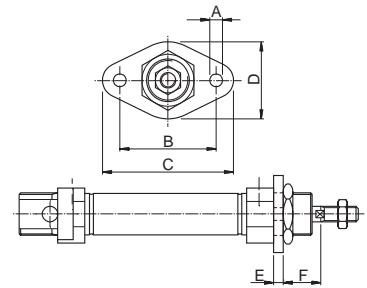
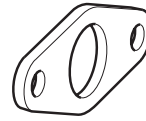
3) With piston rod retracted, as shown in the dimension drawing
 Length tolerances ±1 mm Stroke length tolerance +1.5/0 mm

B

Round Body Cylinders
 Actuator Products

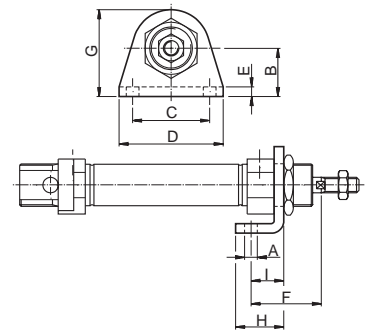
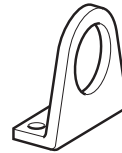
Flange - MF8

Cylinder Ø mm	A	B	C	D	E	F	Weight lbs	Part number
10	4.5	30	40	22	3	13	0.025	P1A-4CMB
12-16	5.5	40	52	30	4	18	0.055	P1A-4DMB
20	6.6	50	66	40	5	19	0.100	P1A-4HMB
25	6.6	50	66	40	5	23	0.100	



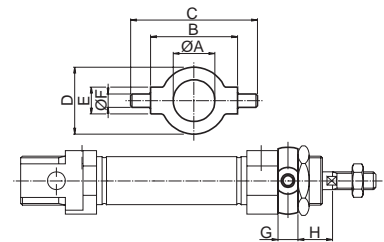
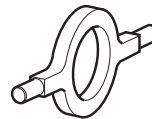
Foot - MS3

Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	Weight lbs	Part number
10	4.5	16	25	35	3	24	26.0	16	11	0.045	P1A-4CMF
12-16	5.5	20	32	42	4	32	32.5	20	14	0.08	P1A-4DMF
20	6.5	25	40	54	5	36	45.0	25	17	0.18	P1A-4HMF
25	6.5	25	40	54	5	40	45.0	25	17	0.18	



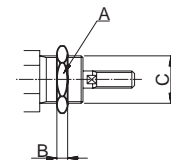
Cover Trunnion

Cylinder Ø mm	A mm	B h14 mm	C mm	D mm	E e9 mm	F mm	G mm	H mm	Weight lbs	Part number
10	12.5	26	38	20	8	4	6	10	0.03	P1A-4CMJ
12-16	16.5	38	58	25	10	6	8	14	0.07	P1A-4DMJ
20	22.5	46	66	30	10	6	8	16	0.08	P1A-4HMJ
25	22.5	46	66	30	10	6	8	20	0.08	



Mounting Nut

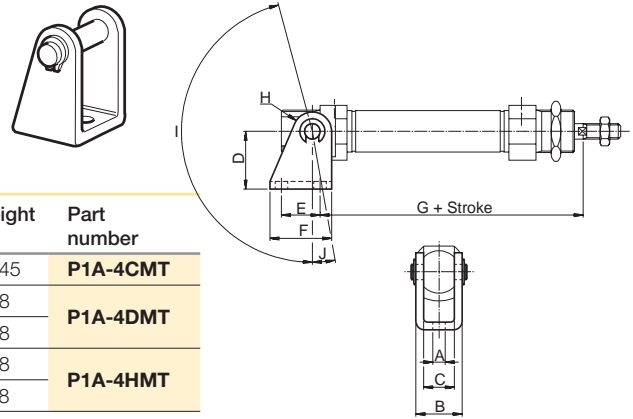
Cylinder Ø mm	A mm	B mm	C mm	Weight lbs	Part number
10	19	6	M12x1.25	0.02	9127385101
12-16	24	8	M16x1.50	0.04	9127385102
20-25	32	11	M22x1.50	0.09	9127385103



Most popular.

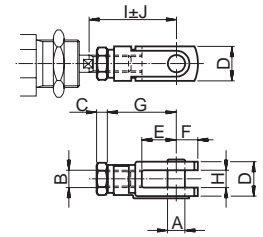
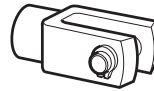
B
 Round Body Cylinders
 Actuator Products

Clevis Bracket



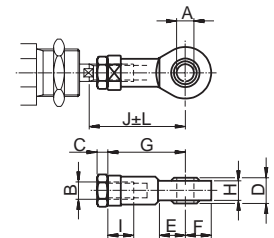
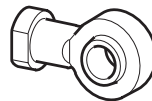
Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I °	J °	Weight lbs	Part number
10	4.5	13	8	24	12.5	20	65.3	5	160	17	0.045	P1A-4CMT
12	5.5	18	12	27	15.0	25	73.0	7	170	15	0.08	P1A-4DMT
16	5.5	18	12	27	15.0	25	80.0	7	170	15	0.08	P1A-4DMT
20	6.5	24	16	30	20.0	32	91.0	10	165	10	0.18	P1A-4HMT
25	6.5	24	16	30	20.0	32	100.0	10	165	10	0.18	P1A-4HMT

Rod clevis



Cylinder Ø mm	A mm	B	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	Weight lbs	Part number
10	4	M4	2.2	8	8	5	16	4	22.0	2.0	0.015	P1A-4CRC
12-16	6	M6	3.2	12	12	7	24	6	31.0	3.0	0.05	P1A-4DRC
20	8	M8	4.0	16	16	10	32	8	40.5	3.5	0.10	P1A-4HRC
25	10	M10 x 1.25	5.0	20	20	12	40	10	49.0	3.0	0.21	P1A-4JRC

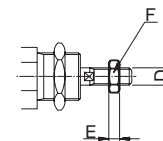
Swivel Rod Eye



Cylinder Ø mm	A mm	B	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	Weight lbs	Part number
10	5	M4	2.2	8	10	9	27	6.0	8	33.0	9	2.0	0.04	P1A-4CRS
12-16	6	M6	3.2	9	10	10	30	6.8	9	38.5	11	1.5	0.06	P1A-4DRS
20	8	M8	4.0	12	12	12	36	9.0	12	46.0	14	2.0	0.10	P1A-4HRS
25	10	M10 x 1.25	5.0	14	14	14	43	10.5	15	52.5	17	2.5	0.19	P1A-4JRS

Rod Nut

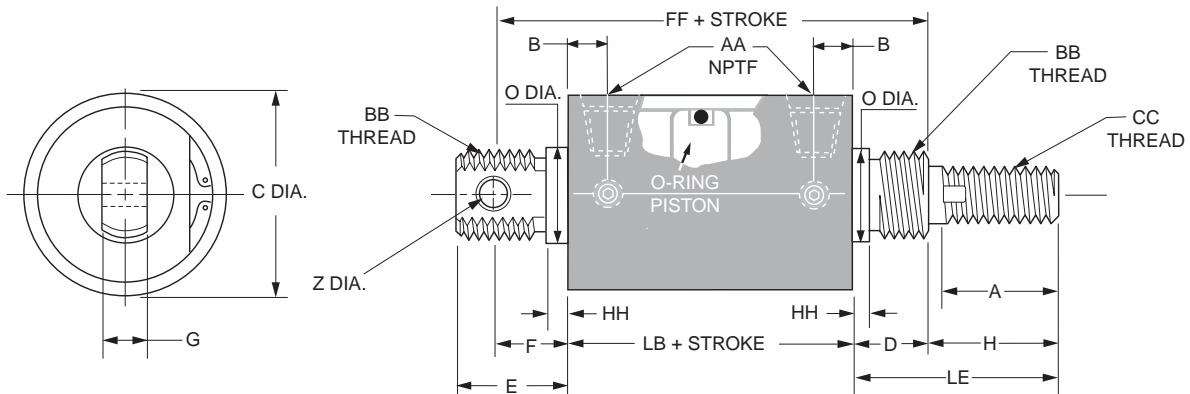
Cylinder Ø mm	D mm	F mm	E mm	Weight lbs	Part number
10	M4	7	2.2	0.002	0261110600
12-16	M6	10	3.2	0.004	0261210800
20	M8	13	4.0	0.010	0261211000
25	M10x1.25	17	5.0	0.015	9128985601



Most popular.

Model P

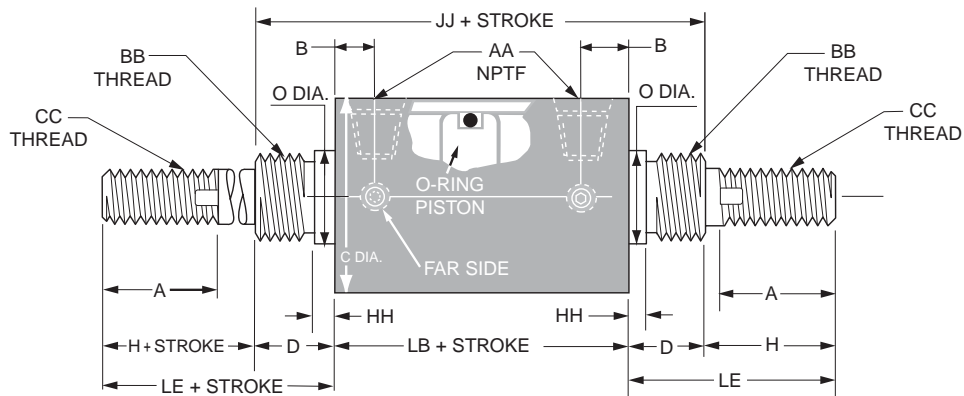
O-ring piston – single rod



Model P cylinders are available without tang covered by dimension E minus HH at no extra charge. To order specify Model NP.

Model KP

O-ring piston – double rod



Mounting nuts not supplied with cylinder.

Model P and KP Single and Double Rod Cylinders

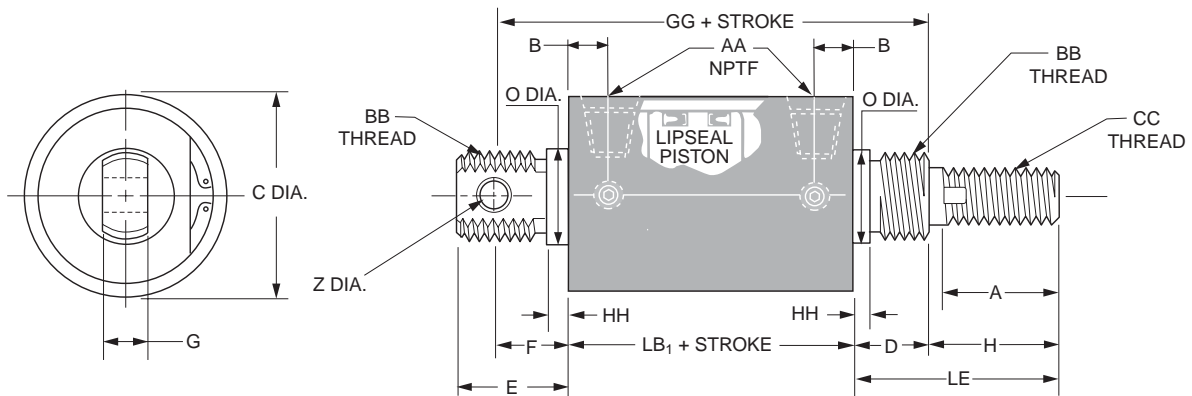
Bore Size	Rod Dia.	LB	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	FF	HH	JJ	LE
1-1/8	3/8	2-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	3-3/8	3/32	3-5/16	1-5/8
1-1/2	1/2	2-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	4-3/8	1/8	4-3/8	2-5/16
2	5/8	2-5/8	1/2	2-1/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	4-3/8	1/8	4-3/8	2-5/16
2-1/2	3/4	3	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	5-3/8	3/16	5	2-11/16
3	3/4	3	5/8	3-1/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	5-3/8	3/16	5	2-11/16

Note: 4" bore size offered only with Lipseal Piston.
 FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PV or KPV.

B
 Round Body Cylinders
 Actuator Products

Model PL

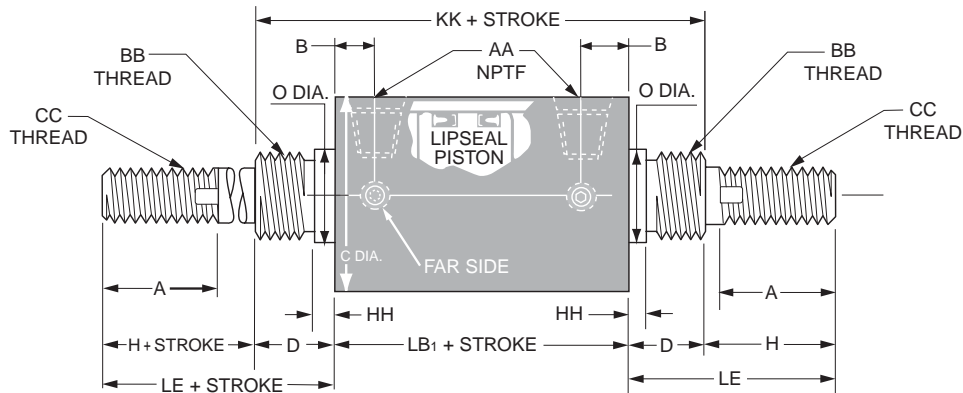
Lipseal piston – single rod



Model PL cylinders are available without tang covered by dimension E minus HH at no extra charge. To order specify Model NPL.

Model KPL

Lipseal piston – double rod



Mounting nuts not supplied with cylinder.

Model PL and KPL Single and Double Rod Cylinders

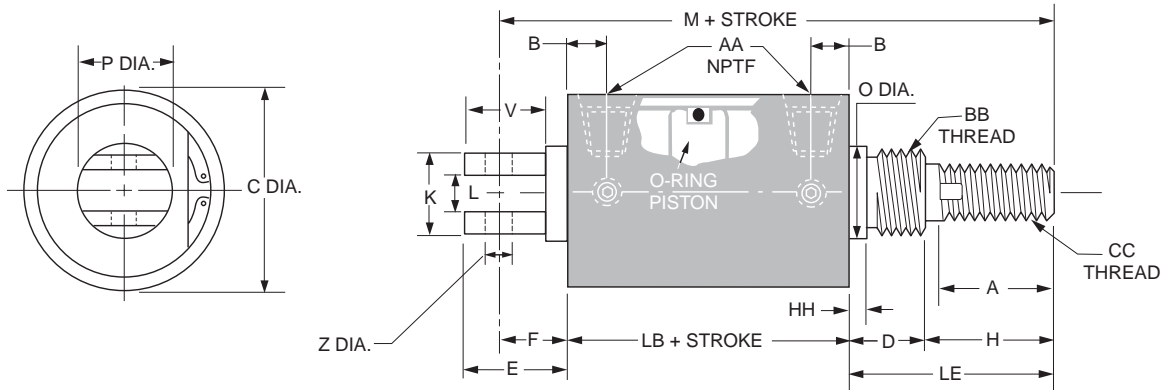
Bore Size	Rod Dia.	LB1	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	GG	HH	KK	LE
1-1/8	3/8	3-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	4-3/8	3/32	4-5/16	1-5/8
1-1/2	1/2	3-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	5-3/8	1/8	5-3/8	2-5/16
2	5/8	3-5/8	1/2	2-1/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	5-3/8	1/8	4-3/8	2-5/16
2-1/2	3/4	4	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	6-3/8	3/16	6	2-11/16
3	3/4	4	5/8	3-1/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	6-3/8	3/16	6	2-11/16
4	1	5-1/2	15/16	4-3/8	1-1/8	2-3/16	1-7/16	3/4	2-1/4	1-7/8	1-3/4	1/2	1/2	1-3/4-12	1-14	8-1/16	3/16	7-1/4	3-3/8

FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PLV or KPLV.

B
 Round Body Cylinders
 Actuator Products

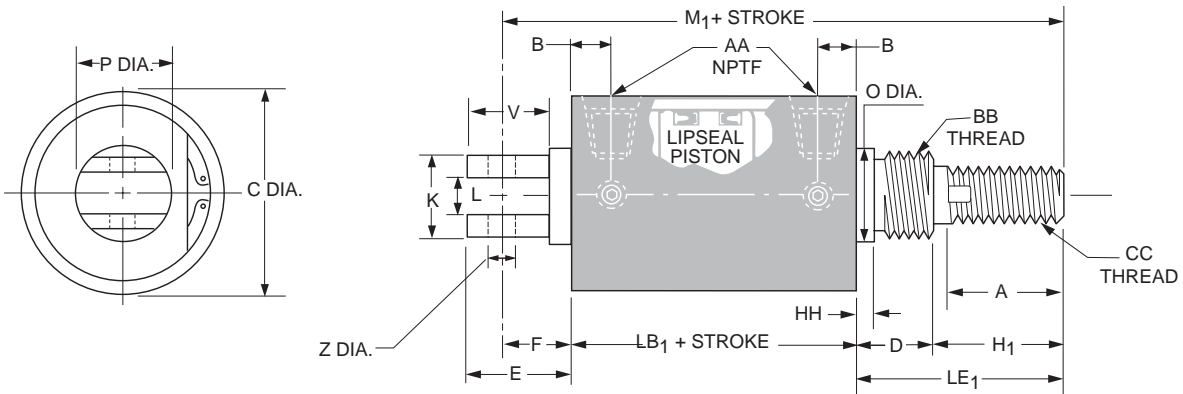
Model AP

O-ring piston – single rod
 1-1/8" bore thru 3" bore



Model APL

Lipseal piston – single rod
 1-1/8" bore thru 4" bore



Mounting nuts not supplied with cylinder.

Models AP and APL only

Bore Rod Size	Dia.	LB	LB ₁	B	C	D	E	F	H	H ₁	A	K	L	M	M ₁	O	P	V	Z	AA	BB	CC	HH	LE	LE ₁
1-1/8	3/8	2-1/16	3-1/16	13/32	1-3/8	5/8	1	11/16	1	1	7/8	15/16	3/8	4-3/8	5-3/8	3/4	15/16	7/8	3/8	1/8	3/4-16	3/8-16	3/32	1-5/8	1-5/8
1-1/2	1/2	2-5/8	3-5/8	1/2	1-3/4	7/8	1-5/8	15/16	2-7/16	1-7/16	1-1/4	1-1/4	1/2	6-7/8	6-7/8	1-1/16	1-1/4	1-1/2	3/8	1/4	1-14	1/2-13	1/8	3-5/16	2-5/16
2	5/8	2-5/8	3-5/8	1/2	2-1/4	7/8	2-1/4	1-9/16	2-7/16	1-7/16	1-1/4	1-1/2	1/2	7-1/2	7-1/2	1-1/16	1-11/16	1-3/4	1/2	1/4	1-14	5/8-11	1/8	3-5/16	2-5/16
2-1/2	3/4	3	4	5/8	2-3/4	1	1-13/16	1-1/8	3-11/16	2-11/16	1-1/2	1-1/2	1/2	8-13/16	8-13/16	1-3/8	2-1/4	1-11/16	1/2	3/8	1-3/8-12	3/4-10	3/16	4-11/16	3-11/16
3	3/4	3	4	5/8	3-1/4	1	2-5/16	1-5/8	3-11/16	2-11/16	1-1/2	1-1/2	1/2	9-5/16	9-5/16	1-3/8	2-1/4	1-3/4	1/2	3/8	1-3/8-12	3/4-10	3/16	4-11/16	3-11/16
4	1	-	5-1/2	15/16	4-3/8	1-1/8	2-7/8	1-7/8	-	2-1/4	1-7/8	2-1/4	3/4	-	10-3/4	1-3/4	3	2-1/2	3/4	1/2	1-3/4-12	1-14	3/16	-	3-3/8

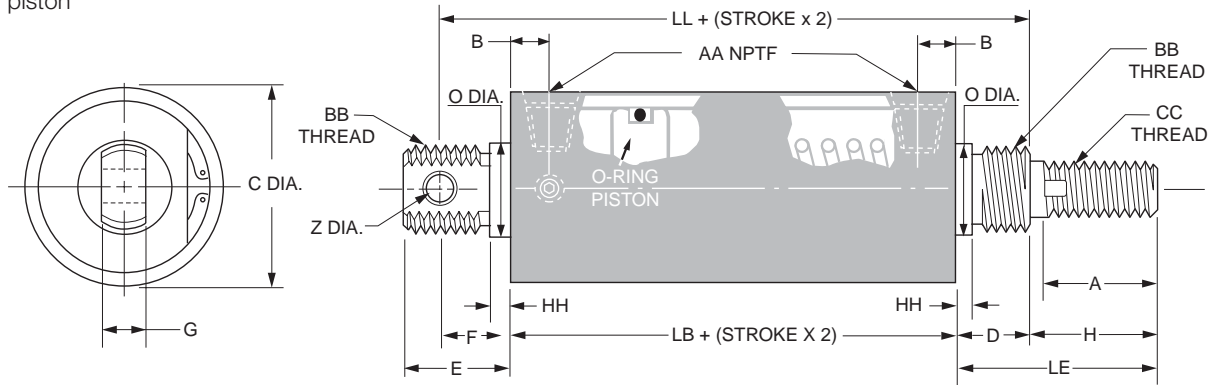
FLUOROCARBON Seals for operation to 250°F are available at extra cost. Specify model ASPV or ASPLV.

B

Round Body Cylinders
 Actuator Products

Model PR – Spring return
Model PE – Spring extend

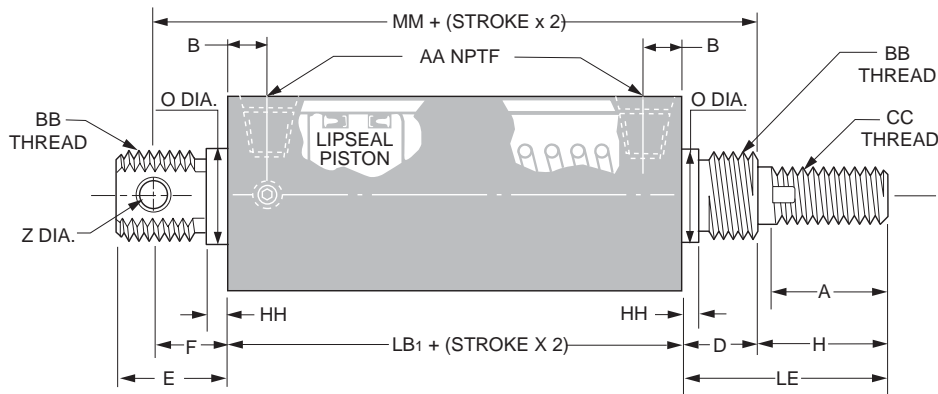
O-ring piston



Spring return cylinders are available without tail section covered by dimension E minus HH at no extra charge. To order, add letter "N" to model number.

Model PLR – Spring return
Model PLE – Spring extend

Lipseal piston



Mounting nuts not supplied with cylinder.

For Single Rod Spring Return Cylinders up to 6" Stroke (no load spring)

Bore Size	Rod Dia.	LB	LB1	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	HH	LL	MM	LE	Spring force	
																					Pre-load (lbs.)	Max. load (lbs.)
1-1/8	3/8	2-1/16	3-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	3/32	3-3/8	4-3/8	1-5/8	12	36
1-1/2	1/2	2-5/8	3-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	1/8	4-3/8	5-3/8	2-5/16	14	45
2	5/8	2-5/8	3-5/8	1/2	2-1/4	7-8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	1/8	4-3/8	5-3/8	2-5/16	18	48
2-1/2	3/4	3	4	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	3/16	5-3/8	6-3/8	2-11/16	30	64
3	3/4	3	4	5/8	3 1/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	3/16	5-3/8	6-3/8	2-11/16	30	64
4	1	▲	5-1/2	15/16	4-3/8	1-1/8	2-3/16	1-7/16	3/4	2-1/4	1-7/8	1-3/4	1/2	1/2	1-3/4-12	1-14	3/16	▲	8-1/16	3-3/8	50	148

▲ 4" bore spring return cylinders, available only with lipseal type piston.

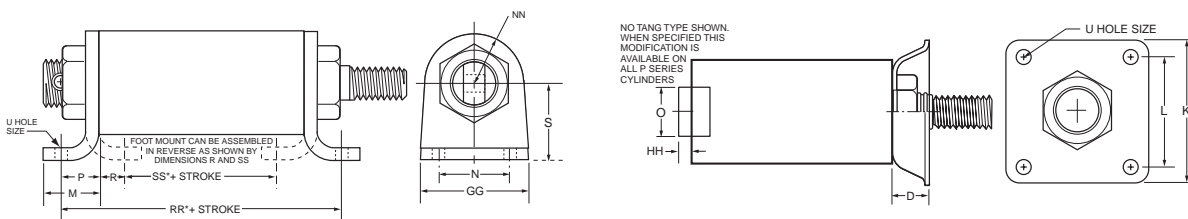
** Net stroke plus stop tube = gross stroke.

FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PVR, PVE, PLVR or PLVE.

* Dimensions shown are for cylinder with no load spring. For heavier springs or double rod spring return cylinders, consult factory.

B
 Round Body Cylinders
 Actuator Products

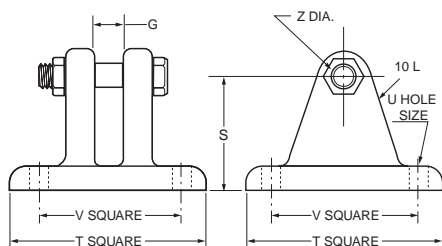
Foot and Flange Mounts



Bore size	D	K	L	M	N	O	P	R	S	U	GG	HH	NN	RR	SS	Foot mount*	Flange mount**
1-1/8	5/8	2-1/2	2	1-3/8	1-11/16	3/4	7/8	5/8	1-9/32	9/32	2-11/16	3/32	11/16	3-13/16	13/16	L069190000	L069230000
1-1/2	7/8	3-1/4	2-1/2	1-9/32	1-5/8	1-1/16	7/8	9/16	1-3/4	9/32	2-7/16	1/8	1-1/8	4-3/8	1-1/2	L069200000	L069240000
2	7/8	3-1/4	2-1/2	1-9/32	1-5/8	1-1/16	7/8	9/16	1-3/4	9/32	2-7/16	1/8	1-1/8	4-3/8	1-1/2	L069200000	L069240000
2-1/2	1	4-1/2	3-3/8	1-29/32	2-1/4	1-3/8	1-1/4	7/8	2-3/8	13/32	3-9/16	3/16	1-5/8	5-1/2	1-1/4	L069210000	L069250000
3	1	4-1/2	3-3/8	1-29/32	2-1/4	1-3/8	1-1/4	7/8	2-3/8	13/32	3-9/16	3/16	1-5/8	5-1/2	1-1/4	L069210000	L069250000
4	1-1/8	5-1/4	4	2-17/32	3-1/4	1-3/4	1-3/4	1-5/16	3-3/16	15/32	4-13/16	3/16	2-3/16	9▲	2-7/8▲	L069220000	L069260000

▲ Dimension shown is for lipseal piston type.
 * Part number includes one foot mounting and one mounting nut.
 ** Includes mounting nut.

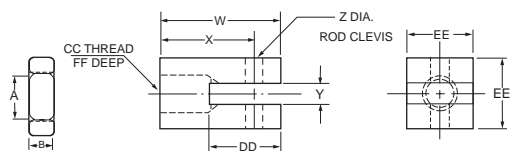
Clevis Bracket



Bore size	G	S	T	U	V	Z	Part number
1-1/8	3/8	1-9/32	2-1/4	9/32	1-3/4	1/4	L06730 0000
1-1/2	1/2	1-3/4	3	9/32	2-1/4	5/16	L06731 0000
2	1/2	1-3/4	3	9/32	2-1/4	5/16	L06731 0000
2-1/2	5/8	2-3/8	4	13/32	3	7/16	L06732 0000
3	5/8	2-3/8	4	13/32	3	7/16	L06732 0000
4	3/4	3-3/16	5	15/32	3-3/4	1/2	L06733 0000

Connecting pin and locknut furnished with clevis bracket.

Rod Clevis

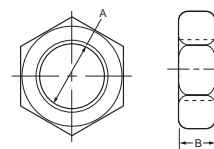


Cyl. bore	Rod dia.	A	B	CC	DD	EE	FF	W	X	Y	Z	Part number
1-1/8	3/8	3/8-16	7/32	3/8-16	1-1/8	3/4	5/8	1-3/4	1-3/8	5/16	1/4	L06734 0000
1-1/2	1/2	1/2-13	5/16	1/2-13	1-5/16	1	15/16	2-1/4	1-3/4	3/8	5/16	L06735 0000
2	5/8	5/8-11	3/8	5/8-11	1-5/16	1	15/16	2-1/4	1-3/4	3/8	5/16	L06736 0000
2-1/2	3/4	3/4-10	27/64	3/4-10	1-5/16	1-1/4	1-1/16	2-3/8	1-13/16	1/2	7/16	L06737 0000
3	3/4	3/4-10	27/64	3/4-10	1-5/16	1-1/4	1-1/16	2-3/8	1-13/16	1/2	7/16	L06737 0000
4	1	1-14	35/64	1-14	1-13/16	1-1/2	1-9/16	3-3/8	2-5/8	5/8	1/2	L06738 0000

Note: Rod end jam nut furnished with rod clevis.

Most popular.

Mounting Nut for Cylinders**



Bore size	A	B	Part number
1-1/8	3/4-16	27/64	083301 0048
1-1/2 & 2	1-14	35/64	083301 0100
2-1/2 & 3	1-3/8-12	25/32	083301 0124
4	1-3/4-12	15/16	083183 0000

Sensors
 For sensors see page B296.

- Economical square body compact cylinder
- 10 bore sizes available 12mm - 100mm
- 4 flexible mounting options
- Female and male rod ends available
- Bumpers standard on all models
- Magnetic and non-magnetic construction available



Operating information

Operating pressure: 10 bar (145 PSIG) maximum
 Temperature range: -5°C to 70°C (23°F to 158°F)
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Metric Double Acting/Magnetic - Female Threaded Piston Rod

12mm

Stroke (mm)	Order Code
5	P1QS012DC7G0005
10	P1QS012DC7G0010
15	P1QS012DC7G0015
25	P1QS012DC7G0025
30	P1QS012DC7G0030

16mm

5	P1QS016DC7G0005
10	P1QS016DC7G0010
15	P1QS016DC7G0015
25	P1QS016DC7G0025
30	P1QS016DC7G0030

20mm

10	P1QS020DC7G0010
15	P1QS020DC7G0015
25	P1QS020DC7G0025
30	P1QS020DC7G0030
40	P1QS020DC7G0040
50	P1QS020DC7G0050

25mm

10	P1QS025DC7G0010
15	P1QS025DC7G0015
25	P1QS025DC7G0025
30	P1QS025DC7G0030
40	P1QS025DC7G0040
50	P1QS025DC7G0050

32mm

Stroke (mm)	Order Code
10	P1QS032DC7N0010
15	P1QS032DC7N0015
25	P1QS032DC7N0025
30	P1QS032DC7N0030
40	P1QS032DC7N0040
50	P1QS032DC7N0050
75	P1QS032DC7N0075
100	P1QS032DC7N0100

40mm

15	P1QS040DC7N0015
25	P1QS040DC7N0025
30	P1QS040DC7N0030
40	P1QS040DC7N0040
50	P1QS040DC7N0050
75	P1QS040DC7N0075
100	P1QS040DC7N0100

50mm

15	P1QS050DC7N0015
25	P1QS050DC7N0025
30	P1QS050DC7N0030
40	P1QS050DC7N0040
50	P1QS050DC7N0050
75	P1QS050DC7N0075
100	P1QS050DC7N0100

63mm

Stroke (mm)	Order Code
15	P1QS063DC7N0015
25	P1QS063DC7N0025
30	P1QS063DC7N0030
40	P1QS063DC7N0040
50	P1QS063DC7N0050
75	P1QS063DC7N0075

80mm

15	P1QS080DC7N0015
25	P1QS080DC7N0025
30	P1QS080DC7N0030
40	P1QS080DC7N0040
50	P1QS080DC7N0050
75	P1QS080DC7N0075

100mm

15	P1QS100DC7N0015
25	P1QS100DC7N0025
30	P1QS100DC7N0030
40	P1QS100DC7N0040
50	P1QS100DC7N0050
75	P1QS100DC7N0075

Most popular.

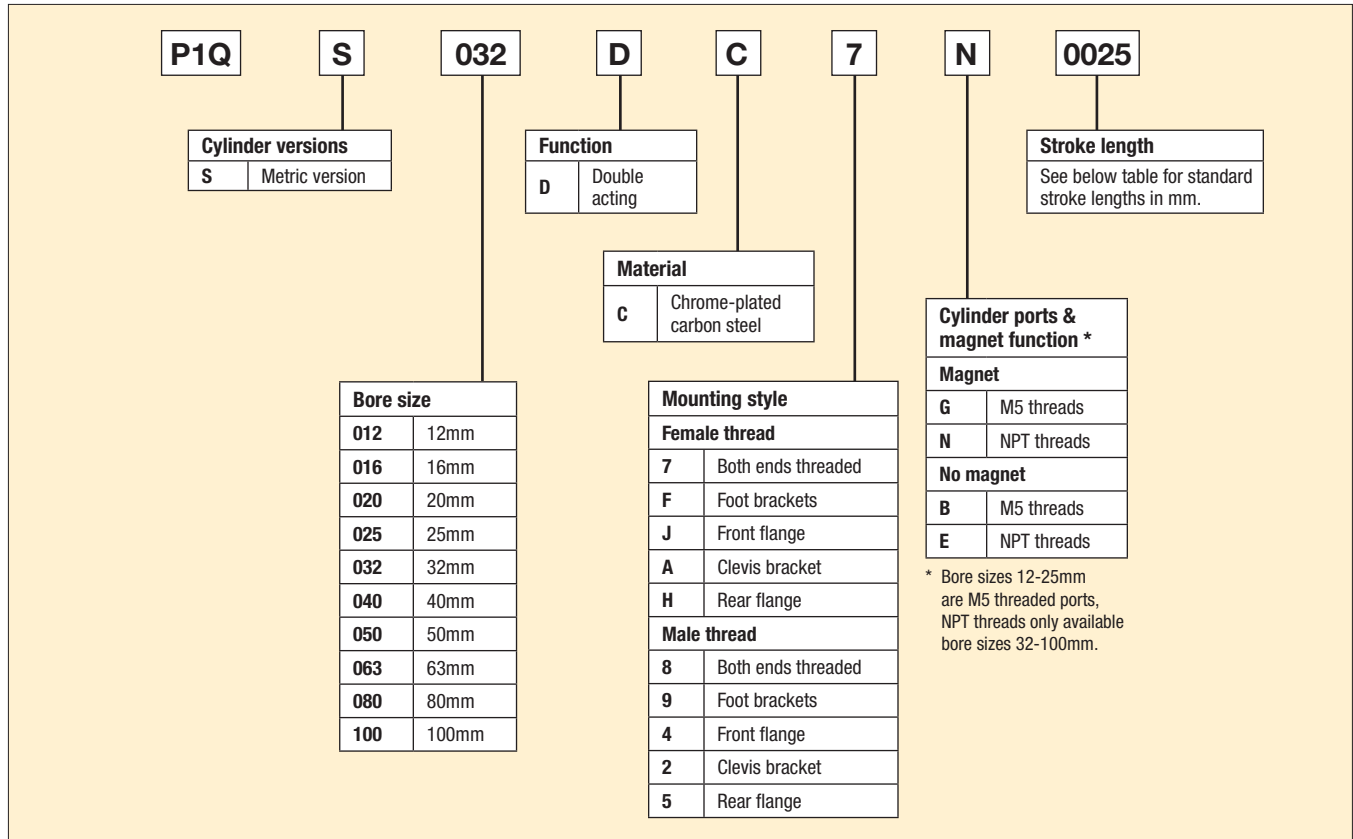
Sensors

For sensors see page B296.



B
 Compact Cylinders
 Actuator Products

Ordering information



B

Compact Cylinders
 Actuator Products

Standard strokes

Bore size	5	10	15	25	30	40	50	75	100
12 - 16	•	•	•	•	•				
20 - 25		•	•	•	•	•	•		
32		•	•	•	•	•	•	•	•
40 - 50			•	•	•	•	•	•	•
63 - 100			•	•	•	•	•	•	

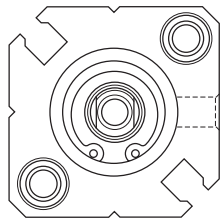
Cylinder forces, double acting variants

Bore size / pist. rod mm	Stroke	piston area cm ²	Max theoretical force in N (bar)								
			1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
12/6	+	1.1	11	23	34	45	57	68	79	90	102
	-	0.8	8	17	25	34	42	51	59	68	76
16/8	+	2.0	20	40	60	80	101	121	141	161	181
	-	1.5	15	30	45	60	75	90	106	121	136
20/10	+	3.1	31	63	94	126	157	188	220	251	283
	-	2.4	24	47	71	94	118	141	165	188	212
25/12	+	4.9	49	98	147	196	245	295	344	393	442
	-	3.8	38	76	113	151	189	227	264	302	340
32/16	+	8.0	80	161	241	322	402	483	563	643	724
	-	6.0	60	121	181	241	302	362	422	483	543
40/16	+	12.6	126	251	377	503	628	754	880	1005	1131
	-	10.6	106	211	317	422	528	633	739	844	950
50/20	+	19.6	196	393	589	785	982	1178	1374	1571	1767
	-	16.5	165	330	495	660	825	990	1155	1319	1484
63/20	+	31.2	312	623	935	1247	1559	1870	2182	2494	2806
	-	28.0	280	561	841	1121	1402	1682	1962	2242	2523
80/25	+	50.3	503	1005	1508	2011	2513	3016	3519	4021	4524
	-	45.4	454	907	1361	1814	2268	2721	3175	3629	4082
100/32	+	78.5	785	1571	2356	3142	3927	4712	5498	6283	7069
	-	70.5	705	1410	2115	2820	3525	4230	4936	5640	6345

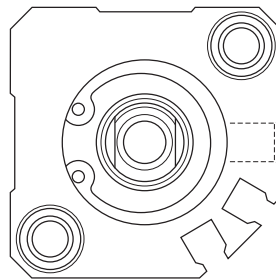
+ = Outward stroke
 - = Return stroke

Note:
 Select a theoretical force 50-100% larger than the force required

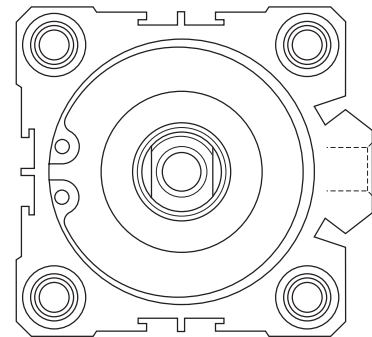
Front profiles by bore size
 Magnetic version



Ø12 - Ø16

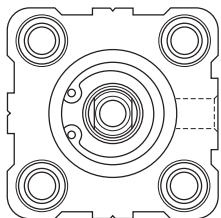


Ø20 - Ø25

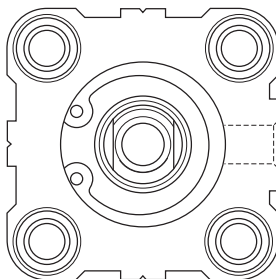


Ø32 - Ø100

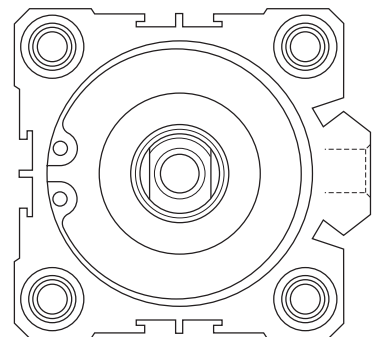
Non magnetic version



Ø12 - Ø16



Ø20 - Ø25

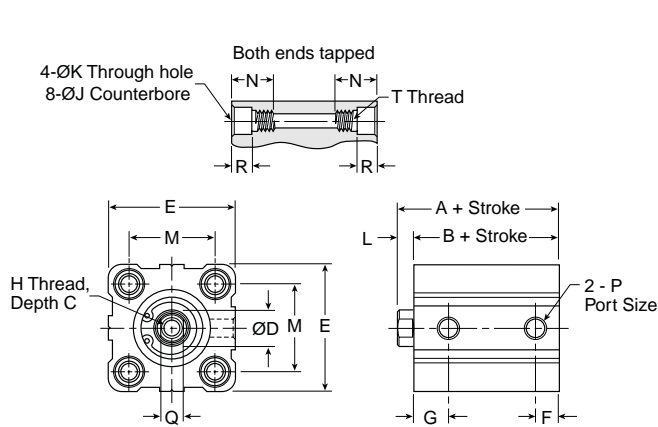


Ø32 - Ø100

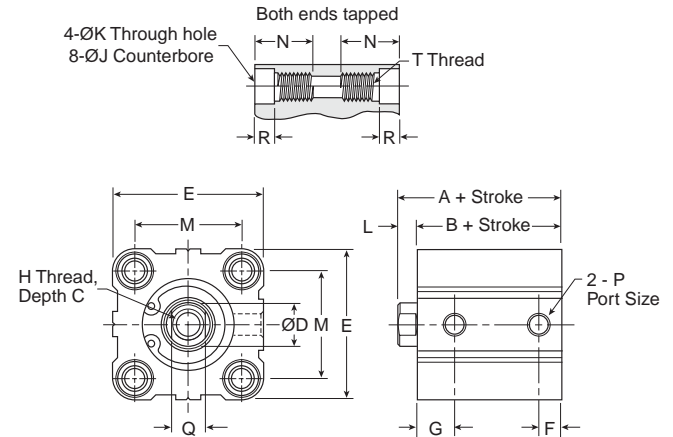
B
 Compact Cylinders
 Actuator Products

Non-magnet dimensions

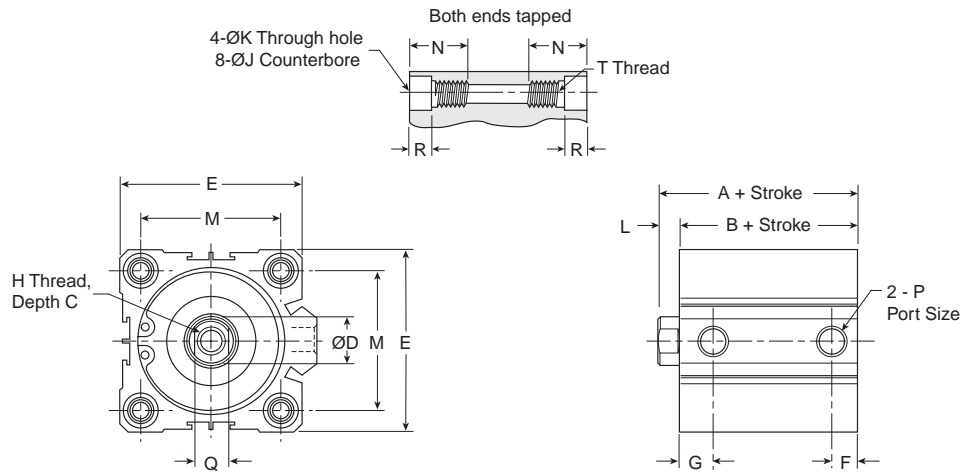
Ø12 - Ø16



Ø20 - Ø25



Ø32 - Ø100



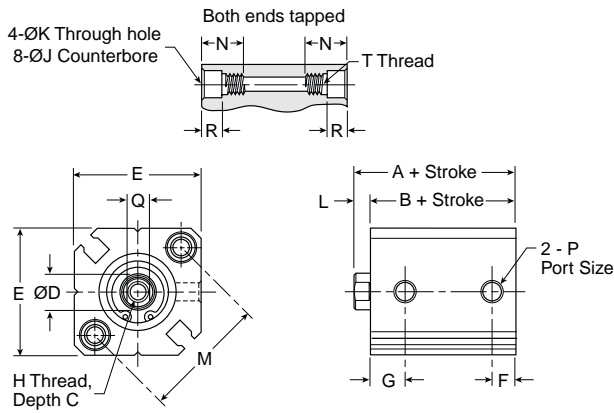
Bore size	A		B		C	D	E	F	G	H	J	K	L	M	N	P	Q	R	T
	5 to 50mm	75 to 100mm	5 to 50mm	75 to 100mm															
12	20.5	-	17	-	6	6	25	5	7.5	M3x0.5	6.5	3.4	3.5	15.5	11	M5x0.8	5	3.5	M4x0.7
16	22	-	18.5	-	8	8	29	5.5	8	M4x0.7	6.5	3.4	3.5	20	11	M5x0.8	6	3.5	M4x0.7
20	24	34	19.5	-	7	10	36	5.5	9	M5x0.8	9	5.2	4.5	25.5	17	M5x0.8	8	7	M6x1.0
25	27.5	37.5	22.5	-	12	12	40	5.5	11	M6x1.0	9	5.2	5	28	17	M5x0.8	10	7	M6x1.0
32	30	40	23	33	13	16	45	7.5	10.5	M8x1.25	9	5.2	7	34	17	1/8"	14	7	M6x1.0
40	36.5	46.5	29.5	39.5	13	16	53	8	11	M8x1.25	9	5.2	7	40	17	1/8"	14	7	M6x1.0
50	38.5	48.5	30.5	40.5	15	20	64	10.5	10.5	M10x1.5	11	6.5	8	50	22	1/4"	17	8	M8x1.25
63	44	54	36	46	15	20	77	10.5	15	M10x1.5	14	8.7	8	60	28.5	1/4"	17	10.5	M10x1.5
80	53.5	63.5	43.5	53.5	20	25	98	14	16	M16x2.0	17.5	10.7	10	77	35.5	3/8"	22	13.5	M12x1.75
100	65	75	53	63	26	32	117	17.5	20	M20x2.5	17.5	10.7	12	94	35.5	3/8"	27	13.5	M12x1.75

B

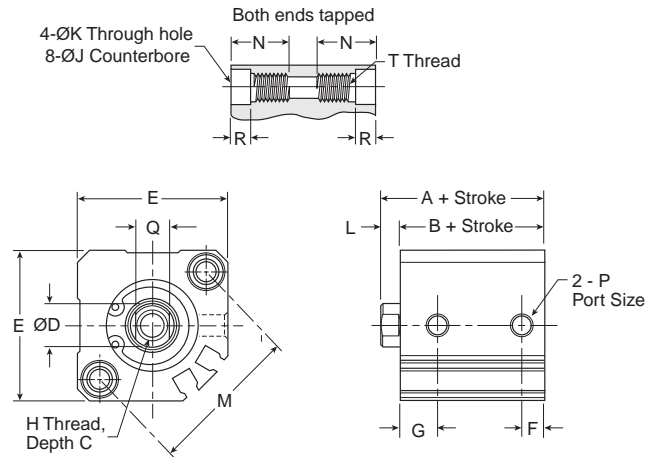
Compact Cylinders
 Actuator Products

Magnet dimensions

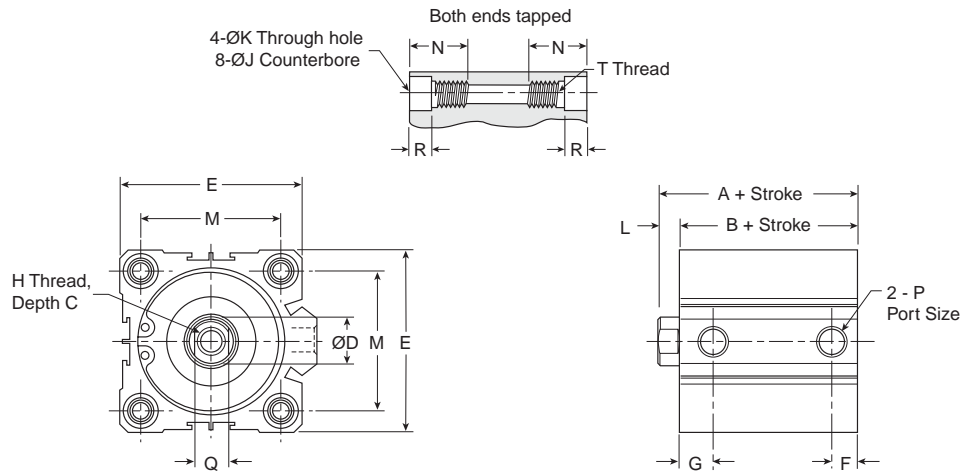
Ø12 - Ø16



Ø20 - Ø25



Ø32 - Ø100



Bore size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	T
12	31.5	28	6	6	25	7	9	M3x0.5	6.5	3.4	3.5	22	11	M5x0.8	5	3.5	M4x0.7
16	34	30.5	8	8	29	5.5	9.5	M4x0.7	6.5	3.4	3.5	28	11	M5x0.8	6	3.5	M4x0.7
20	36	31.5	7	10	36	5.5	9.5	M5x0.8	9	5.2	4.5	36	17	M5x0.8	8	7	M6x1.0
25	37.5	32.5	12	12	40	5.5	11	M6x1.0	9	5.2	5	40	17	M5x0.8	10	7	M6x1.0
32	40	33	13	16	45	7.5	10.5	M8x1.25	9	5.2	7	34	17	1/8"	14	7	M6x1.0
40	46.5	39.5	13	16	53	8	11	M8x1.25	9	5.2	7	40	17	1/8"	14	7	M6x1.0
50	48.5	40.5	15	20	64	10.5	10.5	M10x1.5	11	6.5	8	50	22	1/4"	17	8	M8x1.25
63	54	46	15	20	77	10.5	15	M10x1.5	14	8.7	8	60	28.5	1/4"	17	10.5	M10x1.5
80	63.5	53.5	20	25	98	14	16	M16x2.0	17.5	10.7	10	77	35.5	3/8"	22	13.5	M12x1.75
100	75	63	26	32	117	17.5	20	M20x2.5	17.5	10.7	12	94	35.5	3/8"	27	13.5	M12x1.75

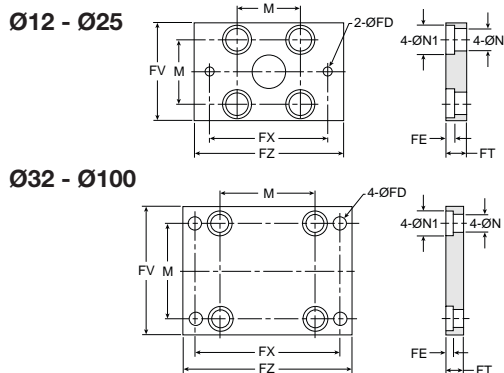
B
 Compact Cylinders
 Actuator Products

Flange Mounting – Style J, H, 4, 5



Intended for fixed mounting of cylinder.
 Flange can be fitted to front or rear of cylinder.

Material
 Flange: surface treated steel, black
 Supplied complete with mounting screws for attachment to cylinder.



Bore size	FD mm	FT mm	FV mm	FX mm	FZ mm	M mm	N mm	N1 mm	Mass kg	Part number
12	4.5	5.5	25	45	55	15.5	4.5	7.5	0.08	P1Q-4DMB
16	4.5	5.5	30	45	55	20	4.5	7.5	0.10	P1Q-4FMB
20	6.5	8	39	48	60	25.5	6.5	10.5	0.16	P1Q-4HMB
25	6.5	8	42	52	64	28	6.5	10.5	0.20	P1Q-4JMB
32	5.5	8	48	56	65	34	6.5	10.5	0.23	P1Q-4KMB
40	5.5	8	54	62	72	40	6.5	10.5	0.28	P1Q-4LMB
50	6.5	9	67	76	89	50	8.5	13.5	0.53	P1Q-4MMB
63	9	9	80	92	108	60	10.5	16.5	0.71	P1Q-4NMB
80	11	11	99	116	134	77	12.5	18.5	1.59	P1Q-4PMB
100	11	11	117	136	154	94	12.5	18.5	2.19	P1Q-4QMB

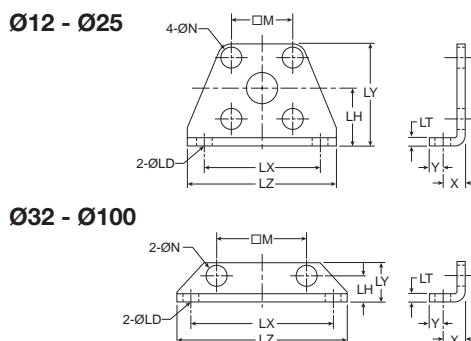
Foot Mounting – Style F, 9



Intended for fixed mounting of cylinder.
 Angle bracket can be fitted to front and rear of cylinder.

Material
 Angle bracket: surface treated steel, black
 Supplied in pairs with mounting screws for attachment to cylinder.

* Weight per item



Bore size	LD mm	LH mm	LT mm	LX mm	LY mm	LZ mm	X mm	Y mm	M mm	N mm	Mass kg	Part number
12	4.5	17	2	34	29.5	44	8	4.5	15.5	4.5	0.02*	P1Q-4DMF
16	4.5	19	2	38	33.5	48	8	5	20	4.5	0.02*	P1Q-4FMF
20	6.5	24	3.2	48	42	62	9.2	5.8	25.5	6.5	0.04*	P1Q-4HMF
25	6.5	26	3.2	52	46	66	10.7	5.8	28	6.5	0.05*	P1Q-4JMF
32	6.5	13	3.2	57	20	71	11.2	5.8	34	6.5	0.06*	P1Q-4KMF
40	6.5	13	3.2	64	20	78	11.2	7	40	6.5	0.08*	P1Q-4LMF
50	8.5	14	3.2	79	22	95	12.2	8	50	8.5	0.16*	P1Q-4MMF
63	10.5	16	3.2	95	26	113	13.7	9	60	10.5	0.25*	P1Q-4NMF
80	13	20.5	4.5	118	32	140	16.5	11	77	13	0.50*	P1Q-4PMF
100	13	24	6	137	36	162	23	11.5	94	13	0.85*	P1Q-4QMF

Clevis Mounting – Style A, 2



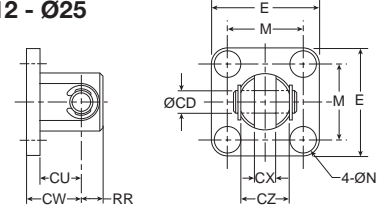
Intended for flexible mounting of cylinder. Clevis bracket can be fitted to the rear of cylinder.

Material

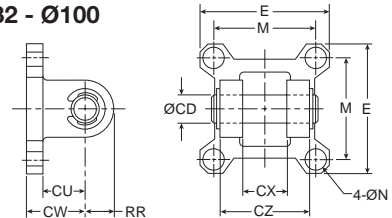
Clevis bracket: surface treated steel, black

Supplied complete with mounting screws for attachment to cylinder.

Ø12 - Ø25



Ø32 - Ø100



Bore size	CD mm	CU mm	CW mm	CX mm	CZ mm	N mm	RR mm	M mm	E mm	Mass kg	Part number
12	5	9.5	14	5.3	9.8	4.5	6	15.5	25	0.02	P1Q-4DMT
16	5	10.5	15	6.8	11.8	4.5	6	20	29	0.03	P1Q-4FMT
20	8	12.5	18	8.3	15.8	6.5	9	25.5	36	0.05	P1Q-4HMT
25	10	14.5	20	10.3	19.8	6.5	10	28	40	0.06	P1Q-4JMT
32	10	14.5	20	18.3	35.8	6.5	10	34	45.5	0.08	P1Q-4KMT
40	10	15	22	18.3	35.8	6.5	10	40	53.5	0.11	P1Q-4LMT
50	14	20	28	22.3	43.8	8.5	14	50	64.5	0.14	P1Q-4MMT
63	14	21	30	22.3	43.8	10.5	14	60	77.5	0.29	P1Q-4NMT
80	18	28	38	28.3	55.8	12.5	18	77	98.5	0.36	P1Q-4PMT
100	22	32	45	32.3	63.8	12.5	22	94	117.5	0.64	P1Q-4QMT

Jam Nut

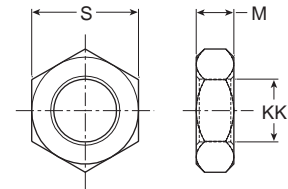


Intended for fixed mounting of accessories to the piston rod.

Materials

Galvanized steel

Cylinders supplied with galvanized nut.



Bore size	KK	M	S	Mass kg	Part number
12	M5x0.8	2.7	18	0.002	L075540005
16	M6x1.0	3.2	10	0.002	L075540006
20	M8x1.25	4	13	0.005	L075540008
25	M10x1.25	5	17	0.007	L075540010
32	M14x1.5	7	22	0.010	L075540014
40	M14x1.5	7	22	0.010	L075540014
50	M18x1.5	8	27	0.021	L075540018
63	M18x1.5	8	27	0.021	L075540018
80	M22x1.5	11	32	0.040	L075540022
100	M26x1.5	16	41	0.040	L075540026

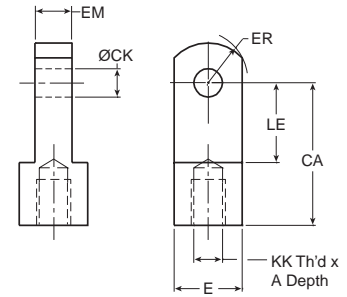
B
 Compact Cylinders
 Actuator Products

Rod Eye



Rod eye for articulated mounting of cylinder.
 Rod eye can be combined with clevis bracket.
 Maintenance-free.

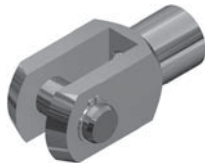
Material
 Rod eye, nut: galvanized steel



Bore size	A	E	CA	KK	ER	LE	CK	EM	Mass kg	Part number
12	7	9.5 Sq.	16	M5x0.8	6.5	7	5	5	0.03	P1M-4DRE
16	8	11 Sq.	25	M6x1.0	8	14	5	6.5	0.03	P1M-4FRE
20	8.5	16 Sq.	25	M8x1.25	10.5	11.5	8	8	0.05	P1M-4HRE
25	10.5	19 Sq.	30	M10x1.25	13	14	10	10	0.07	P1M-4JRE
32	14	22 Dia.	30	M14x1.5	12	14	10	18	0.08	P1M-4LRE
40	14	22 Dia.	30	M14x1.5	12	14	10	18	0.12	P1M-4LRE
50	18.5	28 Dia.	40	M18x1.5	16	20	14	22	0.25	P1M-4MRE
63	18.5	28 Dia.	40	M18x1.5	16	20	14	22	0.25	P1M-4MRE
80	22	38 Dia.	50	M22x1.5	21	27	18	28	0.25	P1M-4PRE

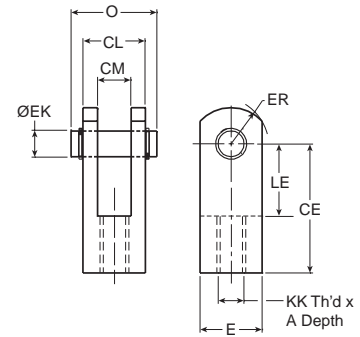
B
 Compact Cylinders
 Actuator Products

Rod Clevis



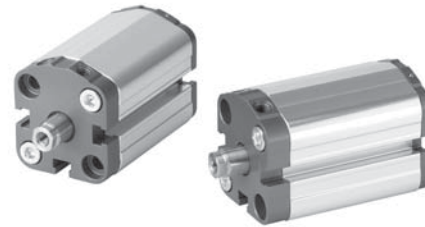
Clevis for articulated mounting of cylinder.

Material
 Clevis, clip, nut: galvanized steel
 Pin: hardened steel



Bore size	A	E	CE	KK	ER	LE	EK (h9)	CM	CL	O	Mass kg	Part number
12	7	9.5	16	M5x0.8	6.5	7	5	5	9.5	14.5	0.02	P1M-4DRC
16	11	11	21	M6x1.0	8	10	5	6.5	11	16.5	0.02	P1M-4FRC
20	8.5	16	25	M8x1.25	10.5	11.5	8	8	16	21	0.05	P1M-4HRC
25	10.5	19	30	M10x1.25	13	14	10	10	19	25.5	0.09	P1M-4JRC
32	16	22 Dia.	30	M14x1.25	12	14	10	18	36	41.5	0.09	P1M-4LRC
40	16	22 Dia.	30	M14x1.25	12	14	10	18	36	41.5	0.15	P1M-4LRC
50	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	0.35	P1M-4MRC
63	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	0.35	P1M-4MRC
80	23	38 Dia.	50	M22x1.5	21	27	18	28	56	64	0.75	P1M-4PRC

- Versatile range of square body style compact cylinder
- Available in Low Profile Version or Long Bearing Version for enhanced rod bearing support
- 10 bore sizes: 12mm through 100mm
- Single and double acting versions available
- Four flexible port configurations available
- Recessed, flush position piston sensing available



Operating information

Operating pressure: 145 PSIG (10 bar) maximum air
 Temperature range: Standard: -4°F to 176°F (-20°C to 80°C)
 High: 14°F to 250°F (-10°C to 121°C)
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

P1M	032	C	/	D	C	P	6	G	012
------------	------------	----------	----------	----------	----------	----------	----------	----------	------------

Bore size

012	12mm
016	16mm
020	20mm
025	25mm
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm

Cylinder style

C	Basic no mtgs.
A	Double rear clevis ^{1,3}
B	Single rear clevis ^{1,3}
F	Foot mount ^{1,4}
J	Front flange ¹
H	Rear flange ^{1,3}

Insert "/" to denote special

Function

D	Double acting
K	Double rod
R	Single acting spring return ⁶
E	Single acting spring extend ⁴

Piston/seal material

Without magnet ²

C	No bumpers class 1 std. temp. seals
G	No bumpers class 5 fluorocarbon seals
B	With bumpers class 1 std. temp. seals ⁷

With magnet ⁵
(Not available on spring extend models)

N	No bumpers class 1 std. temp. seals
M	With bumpers class 1 std. temp. seals ⁷

Piston rod & bearings

Extra low profile rod bearing

P	Chrome plated steel rod not available on 12-25mm bores
Y	Stainless steel rod standard on 12-25mm bores and spring extend models

Long rod bearing ²

C	Chrome plated steel rod not available on 12-25mm bores
A	Stainless steel rod standard on 12-25mm bores and spring extend models

Stroke length

Specify stroke length required in mm.

Ports

Bspp

G	Ported each end
H	Both ports head
J	Both ports cap
K	Both ports cap face ³

NPTF
(Not available on 12-25mm bores)

N	Ported each end
M	Both ports head
L	Both ports cap
P	Both ports cap face ³

Rod threads

Inch

4	Male
9	Female

Metric

5	Male
6	Female
3	Special rod end

Maximum stroke lengths					
Bore	ELP bearing version		Long bearing version		Single acting version
	Min. stroke*	Max. stroke	Min. stroke*	Max. stroke	Standard stroke
12	3	50	4	200	5,10
16	3	50	4	200	5,10
20	3	50	8	200	5,10
25	3	50	8	200	5,10
32	3	100	9	320	5,10
40	3	100	7	320	5,10
50	3	100	13	320	10, 20, 25
63	3	100	18	500	10, 20, 25
80	3	150	23	500	10, 20, 25
100	3	150	18	500	10, 20, 25

* Minimum stroke for double rod cylinders: 12-63mm bores is 5mm
 80 & 100mm bores is 10mm

NOTES:

- 1 Fitted with Mounting Accessory
- 2 Magnetic Piston Option must be specified along with Long Rod Bearing option to achieve Long Bearing Version
- 3 Porting Options 'K' and 'P' (Both ports cap face) not available with rear mountings
- 4 Single Acting Spring Extend available with stainless steel rod only.
- 5 For information regarding sensors, please refer to Electronic Sensors section.
- 6 Spring return is short bearing version only.
- 7 Bumper only available on head end for spring extend. Bumper only available on cap end for spring return.

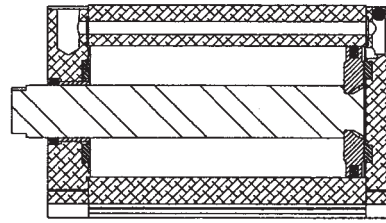
Sensors

For sensors see page B296.



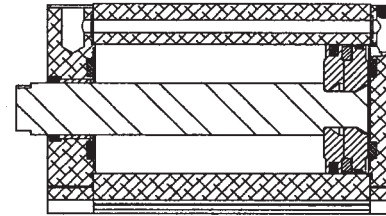
Extra Low Profile Version

The Extra Low Profile Bearing Version provides the most compact cylinder possible. This bearing version is recommended for applications that require shorter stroke lengths or that are light duty. It is available in stroke lengths up to 50mm in the smaller bore sizes and 150 mm in the larger bore sizes.



Long Bearing Version

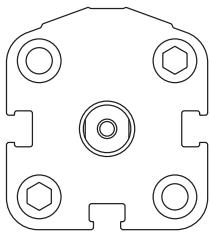
The Long Bearing Version provides additional rod bearing and piston bearing support and also includes a magnetic piston with bearing strip for greater piston bearing support. This Long Bearing version is required for stroke lengths beyond the Extra Low Profile maximum stroke length and is recommended for higher duty applications.



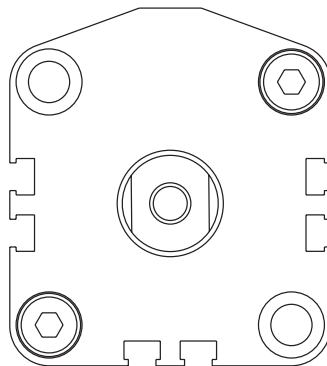
B

Compact Cylinders
 Actuator Products

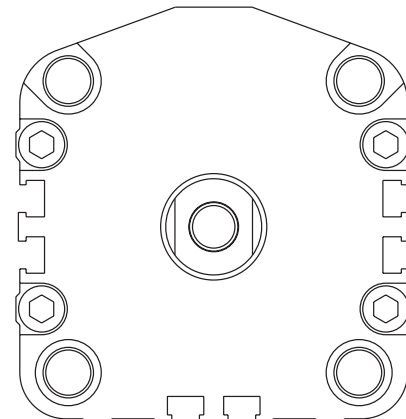
Front profiles by bore size



Bores 12-25mm



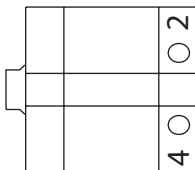
Bores 32-50mm



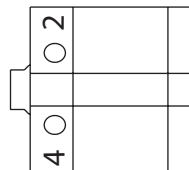
Bores 63-100mm

Porting configurations

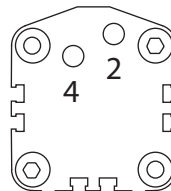
Both Ports Cap



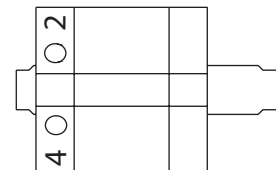
Both Ports Head*



Both Ports Cap Face



Double Rod Both Ports One End

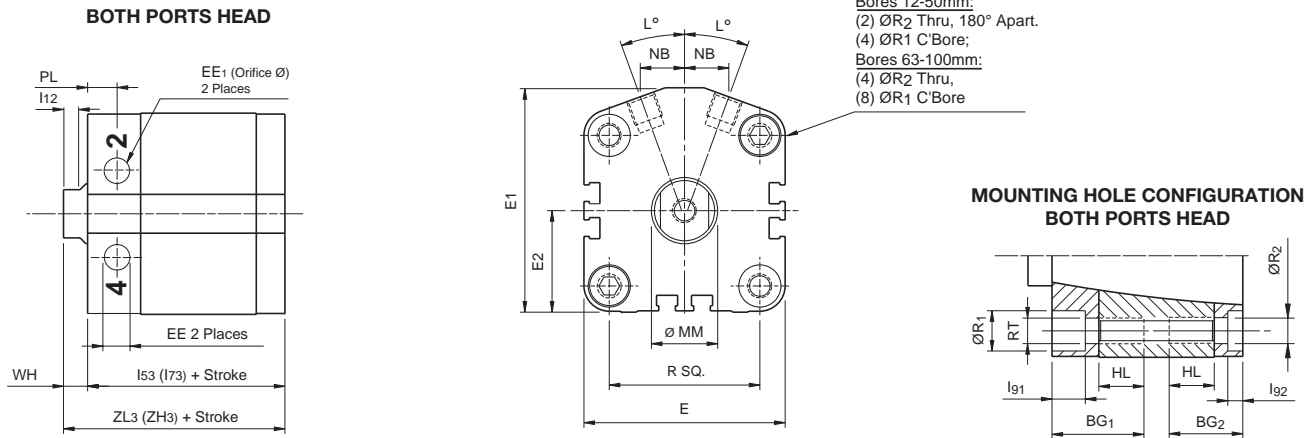


To retract cylinder apply air to port #2
 To extend cylinder apply air to port #4

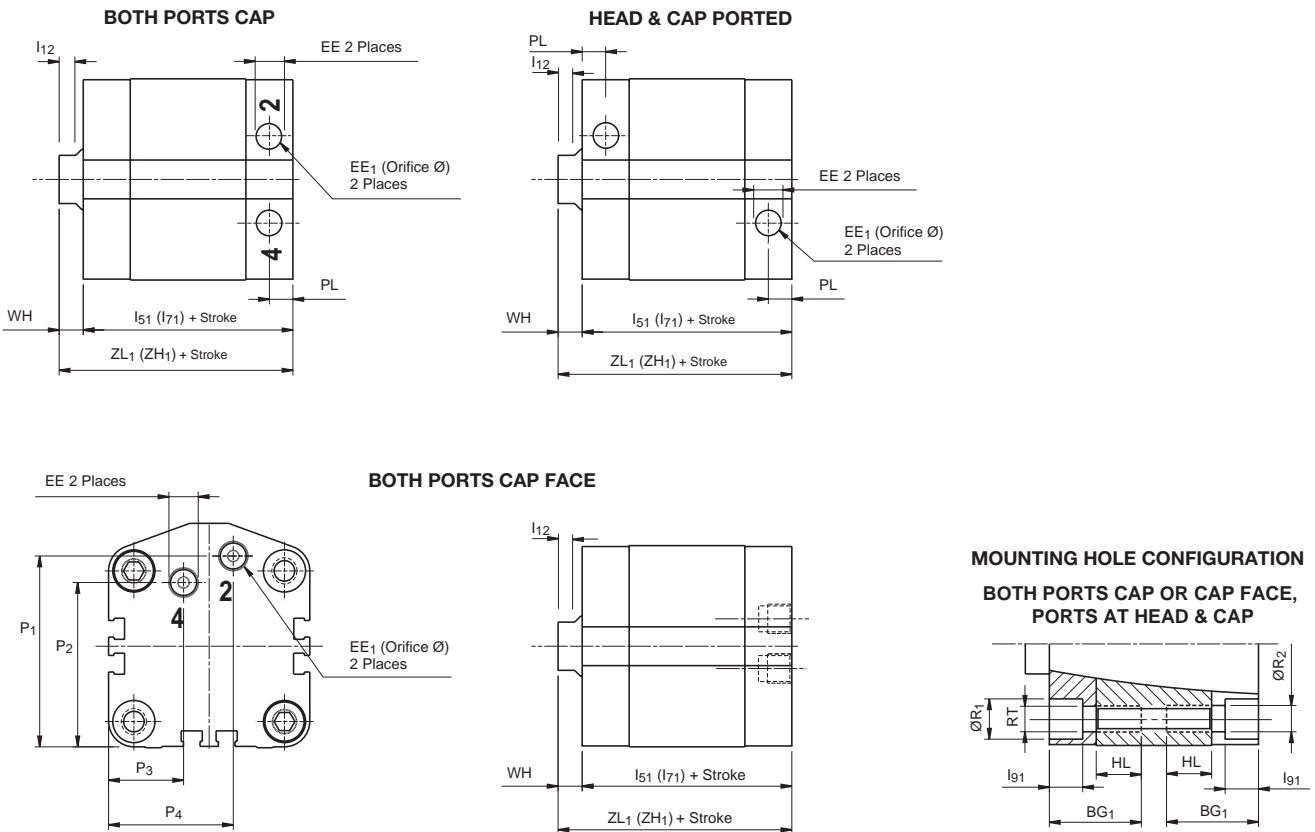
For a double rod cylinder, pressurize port #2 to retract the piston rod into the head containing the ports.

* For 12mm to 16mm bores, although the location of ports #2 and #4 are reversed, porting functions shown above apply.

All porting configurations



Optional porting configurations

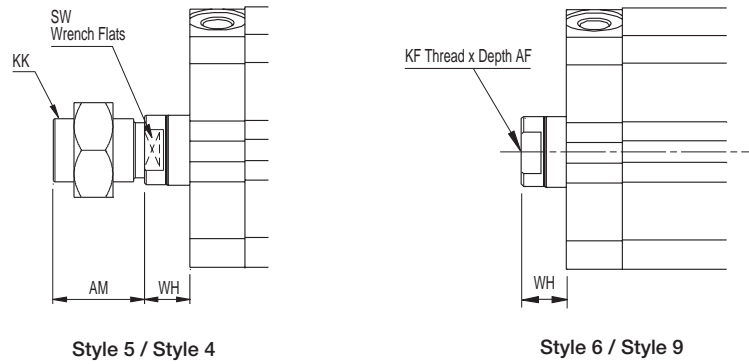


Note: Magnetic Dimensions in Parentheses

B
 Compact Cylinders
 Actuator Products

For special rod ends, specify “3” in model number and give desired WH, AM or AF and KK or KF.

Jam nut is supplied when cylinder is ordered with Style 4 or Style 5 rod end.



B

Compact Cylinders
 Actuator Products

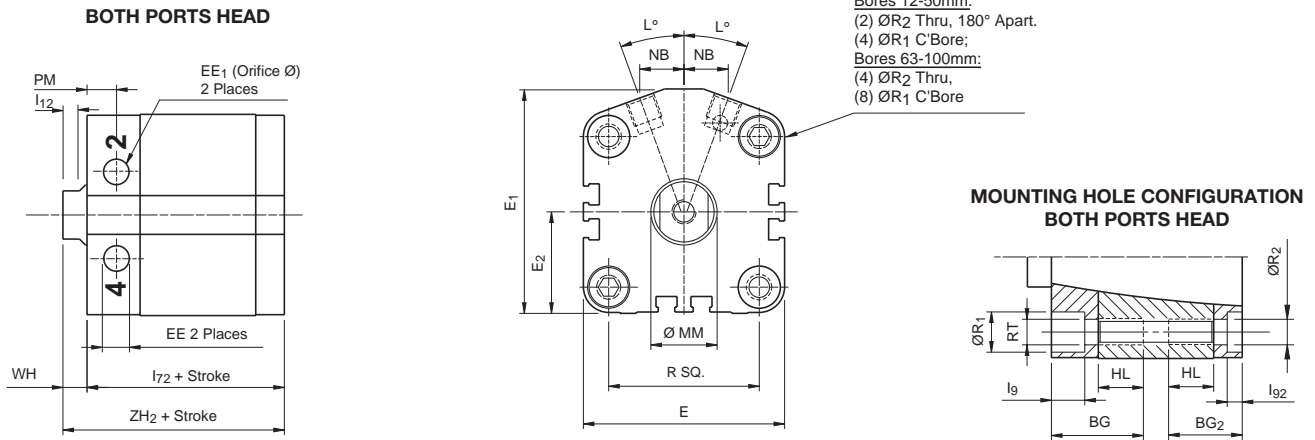
Bore size	Rod	AF		AM		KF		KK		WH			I ₁₂	SW
		Style 6	Style 9	Style 5	Style 4	Style 6	Style 9	Style 5	Style 4	Style 4, 9 & 6	Style 5			
12	6	6	5.4	9	8	M3x0.5	#8-32	M5x0.8	#8-32	3.5	5	3	5	
16	8	8	5.4	10	8	M4x0.7	#8-32	M6x1.0	#8-32	3.5	5.5	3	7	
20	10	7	7	12	8	M5x0.8	#10-32	M8x1.25	#10-32	4.5	6.5	4	9	
25	10	12	10	15	9.5	M6x1.0	1/4-28	M10x1.25	1/4-28	5	7.5	4	9	
32	12	13	13.3	20.5	12.7	M8x1.25	5/16-24	M12x1.25	5/16-24	7	8	5	10	
40	16	13	18.3	20.5	16	M8x1.25	3/8-24	M14x1.5	3/8-24	7	8	5.5	13	
50	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16	
63	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16	
80	25	21	24.3	32.5	25.5	M16x2.0	5/8-18	M22x1.5	5/8-18	10	11	6	21	
100	25	27	27	32.5	28.5	M20x2.5	3/4-16	M22x1.5	3/4-16	12	11	6	21	

Bore size	BG ₁	BG ₂	E	E ₁	E ₂	EE		HL	I ₉₁	I ₉₂	L	NB	P ₁	P ₂	
						BSPP	NPTF								
12	16.5	11.5	27	31	14	M5	-	1	8	3.5	3.5	26	5.5	25	9.5
16	17	12	31.5	35	16	M5	-	1.2	8	4	4	20	7	29.5	9.5
20	19	14.5	38.5	42.5	19.5	M5	-	1.3	10	4.5	4.5	20	8	35	13.5
25	21	15	41.5	45.5	21	M5	-	1.8	10	5	5	20	8.5	38.5	14
32	25	17	48	56	24	G1/8	1/8	2.7	10	4	4	25	9.5	45.5	16.5
40	25.5	17.5	56	62.5	28	G1/8	1/8	3.4	10	4	4	20	11.5	51	12
50	29.5	23.5	67	74.5	33.5	G1/8	1/8	4	14	5	5	20	14.5	63	54.5
63	34	28	82	86	40.5	G1/8	1/8	5	18	6.5	8	20	17.5	73.5	64
80	43	34	98	106.5	48.5	G1/4	1/4	5.5	22	8.5	10	20	25.5	92	79.5
100	44	35.5	119	126.5	59.5	G1/4	1/4	6	22	8.5	10	20	31.5	111.5	97.5

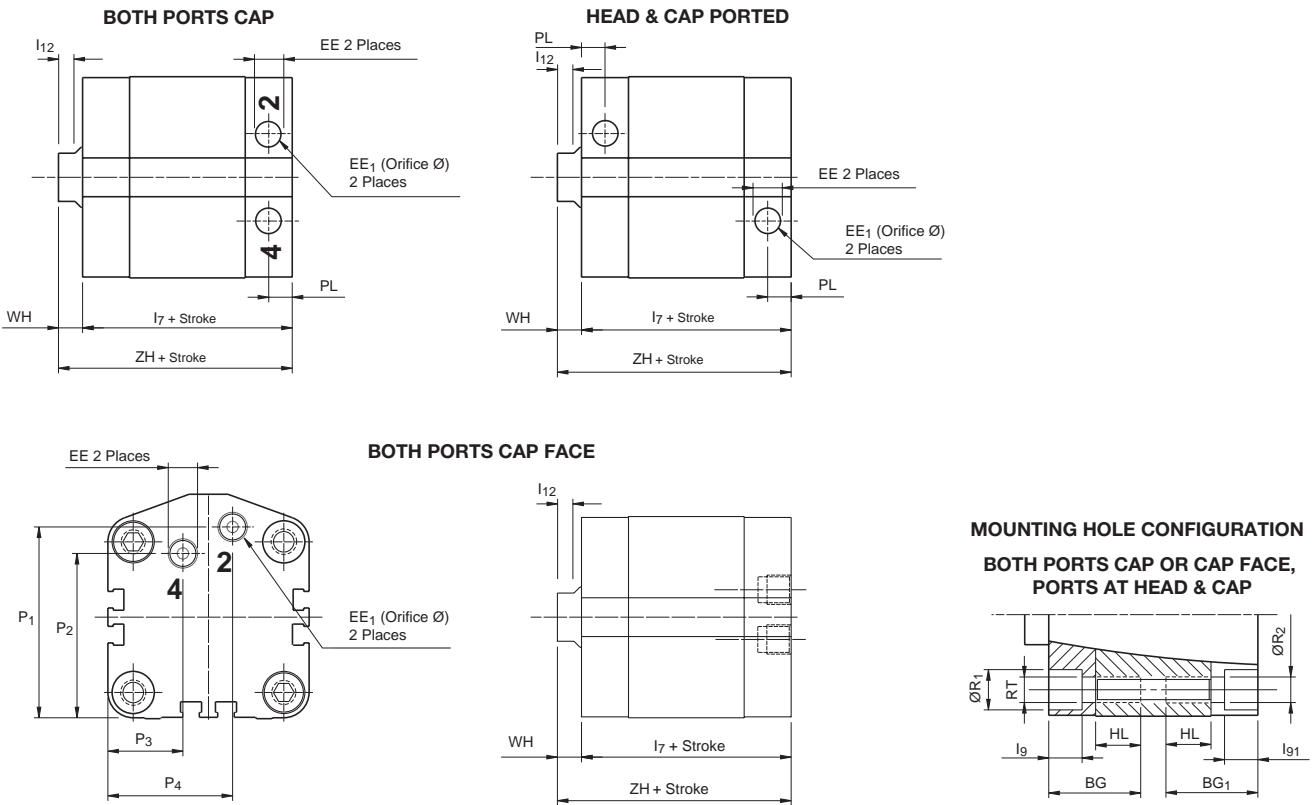
Bore size	P ₃	P ₄	PL	PM	R	R ₁	R ₂	RT	Non-magnetic				Magnetic				ELP Max stroke
									I ₅₁	I ₅₃	ZL ₁	ZL ₃	I ₇₁	I ₇₃	ZH ₁	ZH ₃	
12	13.5	13.5	5	8.5	15.5	5.8	3.5	M4	22	17	25.5	20.5	33	28	36.5	31.5	50
16	15.5	18	5	9	20	7.4	3.5	M4	23.5	18.5	27	22	34.5	29.5	38	33	50
20	24.5	21.5	5	9	25.5	9	5.5	M6	24	19.5	28.5	24	34	29.5	38.5	34	50
25	27.5	24.5	7	9	28	9	5.5	M6	28.5	22.5	33.5	27.5	38.5	32.5	43.5	37.5	50
32	31.5	28.5	8	10.5	34	10.5	5.5	M6	36.5	28.5	43.5	35.5	46	37.5	53	44.5	100
40	23	33	7.5	9.5	40	10.5	5.5	M6	38.5	29.5	44.5	36.5	47.5	39.5	54.5	46.5	100
50	25	41.5	8	10	50	13.5	7.5	M8	38.5	32.5	46.5	40.5	47.5	41.5	55.5	49.5	100
63	30	53	8	11	60	13.5	9.5	M10	39.5	34	47.5	42	51.5	46	59.5	54	100
80	33	69.5	11.5	11.5	77	16.5	11	M12	52	43	62	53	62.5	53.5	72.5	63.5	150
100	36.5	87.5	12	12	94	17	11	M12	57	48.5	69	60.5	71.5	63	83.5	75	150

**R2 thru" not available on 12mm and 16mm bores.

All porting configurations



Optional porting configurations



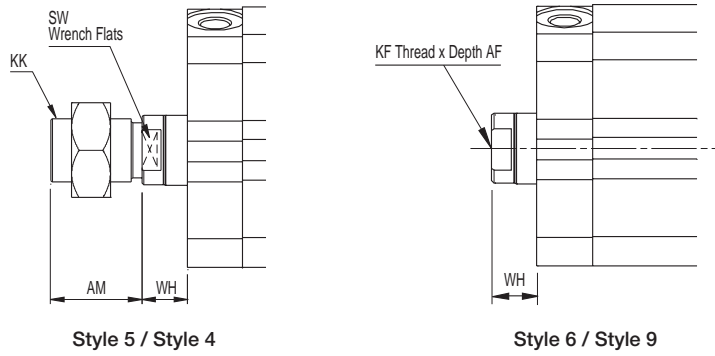
Note: Magnetic Dimensions in Parentheses

B
 Compact Cylinders
 Actuator Products

For special rod ends, specify “3” in model number and give desired WH, AM or AF and KK or KF.

Jam nut is supplied when Style 4 or Style 5 rod end is specified.

Note: Magnetic piston and longer rod bearing are standard with Long Bearing Version.



B

Compact Cylinders
Actuator Products

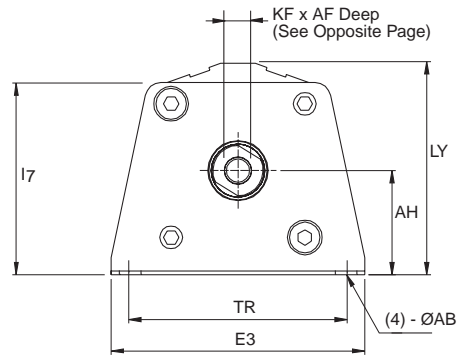
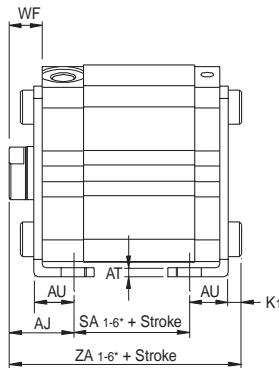
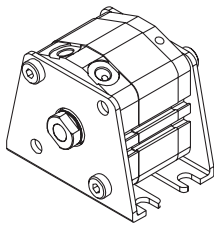
Bore size	Rod MM	AF		AM		KF		KK		WH		I12	SW
		Style 6	Style 9	Style 5	Style 4	Style 6	Style 9	Style 5	Style 4	Style 4, 9 & 6	Style 5		
12	6	6	5.4	9	8	M3x0.5	#8-32	M5x0.8	#8-32	3.5	5	3	5
16	8	8	5.4	10	8	M4x0.7	#8-32	M6x1.0	#8-32	3.5	5.5	3	7
20	10	7	7	12	8	M5x0.8	#10-32	M8x1.25	#10-32	4.5	6.5	4	9
25	10	12	10	15	9.5	M6x1.0	1/4-28	M10x1.25	1/4-28	5	7.5	4	9
32	12	13	13.3	20.5	12.7	M8x1.25	5/16-24	M12x1.25	5/16-24	7	8	5	10
40	16	13	18.3	20.5	16	M8x1.25	3/8-24	M14x1.5	3/8-24	7	8	5.5	13
50	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
63	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
80	25	21	24.3	32.5	25.5	M16x2.0	5/8-18	M22x1.5	5/8-18	10	11	6	21
100	25	27	27	32.5	28.5	M20x2.5	3/4-16	M22x1.5	3/4-16	12	11	6	21

Bore size	EE															
	BG	BG1	BG2	E	E1	E2	BSPP	NPTF	EE1	HL	l7	l72	l9	l91	l92	L
12	21.5	16.5	11.5	27	31	14	M5	–	1	8	38.5	33.5	3.5	3.5	3.5	26
16	22	17	12	31.5	35	16	M5	–	1.2	8	40.5	35.5	5.5	4	4	20
20	24.5	19	14.5	38.5	42.5	19.5	M5	–	1.3	10	40	35.5	10.5	4.5	4.5	20
25	24.5	21	15	41.5	45.5	21	M5	–	1.8	10	42.5	36.5	10.5	5	5	20
32	27.5	25	17	48	56	24	G1/8	1/8	2.7	10	48	40	14	4	4	25
40	27.5	25.5	17.5	56	62.5	28	G1/8	1/8	3.4	10	49.5	41.5	14	4	4	20
50	31.5	29.5	23.5	67	74.5	33.5	G1/8	1/8	4	14	49.5	43.5	13	5	5	20
63	37	34	28	82	86	40.5	G1/8	1/8	5	18	54.5	49	6.5	6.5	8	20
80	43	43	34	98	106.5	48.5	G1/4	1/4	5.5	22	62.5	53.5	9.5	8.5	10	20
100	44	44	35.5	119	126.5	59.5	G1/4	1/4	6	22	71.5	63	9.5	8.5	10	20

Bore size													Min stroke	Max stroke
	NB	P1	P2	P3	P4	PM	R	R1	R2*	RT	ZH	ZH2		
12	5.5	25	9.5	13.5	13.5	8.5	15.5	5.8	3.5	M4	42	37	4	200
16	7	29.5	9.5	15.5	18	9	20	7.4	3.5	M4	44	39	4	200
20	8	35	13.5	24.5	21.5	9	25.5	9	5.5	M6	44.5	40	8	200
25	8.5	38.5	14	27.5	24.5	9	28	9	5.5	M6	47.5	41.5	8	200
32	9.5	45.5	16.5	31.5	28.5	10.5	34	10.5	5.5	M6	55	47	9	320
40	11.5	51	12	23	33	9.5	40	10.5	5.5	M6	56.5	48.5	7	320
50	14.5	63	54.5	25	41.5	10	50	13.5	7.5	M8	57.5	51.5	13	320
63	17.5	73.5	64	30	53	11	60	13.5	9.5	M10	62.5	57	18	500
80	25.5	92	79.5	33	69.5	11.5	77	16.5	11	M12	72.5	62.5	23	500
100	31.5	111.5	97.5	36.5	87.5	12	94	17	11	M12	83.5	75	18	500

* "R2 thru" not available on 12mm and 16mm bores.

Foot Mounting – Style F



Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	AB	AH	AJ	AT	AU	E3	l7	K1	LY	TR	Part number
12	4.5	17	19.5	2	8	44	29.5	2.8	34	35	P1M-4DMF
16	4.5	19	19.5	2	8	48	33.5	2.8	38	39	P1M-4FMF
20	6.5	24	20.5	3.2	9.2	62	42	4	47	50	P1M-4HMF
25	6.5	26	22.5	3.2	10.7	66	46	4	50.5	52	P1M-4JMF
32	6.5	30	25	3.2	11.2	71	54	4	62	60	P1M-4KMF
40	6.5	33	25	3.2	11.2	78	61	4	67.5	67	P1M-4LMF
50	9	39	29.5	3.2	14.7	95	72.5	5	80	82	P1M-4MMF
63	11	46	31	3.2	16.2	113	32	5	91.5	100	P1M-4NMF
80	13	59	35	4.5	19.5	140	42	7	117	118	P1M-4PMF
100	13	71	39	6	23	162	53	7	138	139	P1M-4QMF

Bore size	ELP version non-magnetic					ELP version magnetic					Long bearing version					Style 5 end length adjustment
	Both ports head		Optional porting		Min. **	Both ports head		Optional porting		Min.**	Both ports head		Optional porting		Min.**	
	SA1	ZA1*	SA2*	ZA2*		SA3	ZA3*	SA4	ZA4*		SA5	ZA5*	SA6	ZA6*		
12	5	35.3	10	40.3	15	16	46.3	21	51.3	4	21.5	51.8	26.5	56.8	4	1.5
16	6.5	36.8	11.5	41.8	14	17.5	47.8	22.5	52.8	4	23.5	53.8	28.5	58.8	4	2
20	7.5	41.2	12	45.7	18	17.5	51.2	22	55.7	8	23.5	57.2	28	61.9	8	2
25	7.5	44.7	13.5	50.7	18	17.5	54.7	23.5	60.7	8	21.5	58.7	27.5	64.7	8	2.5
32	12.5	52.5	20.5	60.7	18	21.5	61.7	29.5	69.9	9	24	64	32	72.2	9	1
40	13.5	53.7	21.5	61.9	17	23.5	63.7	31.5	71.9	7	25.5	65.7	33.5	73.9	7	1
50	9.5	58.7	15.5	64.9	22	18.5	67.7	24.5	73.9	13	20.5	69.7	26.5	75.9	13	-0.5
63	8	60.2	13.5	65.7	30	20	72.2	25.5	77.7	18	23	75.2	28.5	80.7	18	-0.5
80	13	74.5	22	83.5	33	23.5	85	32.5	94	23	23.5	85	32.5	94	23	1
100	14.5	83.5	23	92	33	29	98	37.5	106.5	18	29	98	37.5	106.5	18	-1

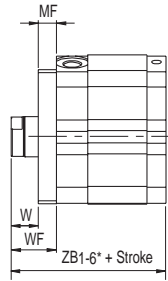
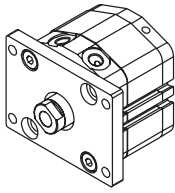
* For strokes less than 'min. stroke', only one bracket will be supplied at rod end.

** Dimensions shown apply only for rod end styles 4, 6 and 9. For rod end style 5, please include the above length adjustment.

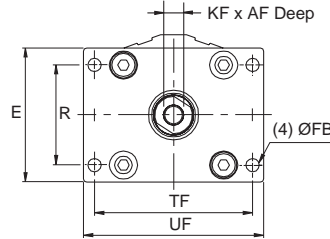
Note: Foot bracket mounting is not available with cap face porting

B
 Compact Cylinders
 Actuator Products

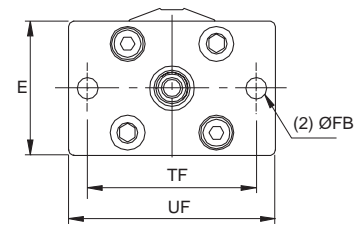
Front Flange Mounting – Style J



Bores 32-100mm



Bores 12-25mm



Please note bearing, piston and porting configuration for selecting proper dimensions.

B

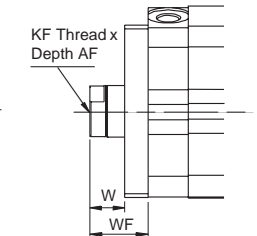
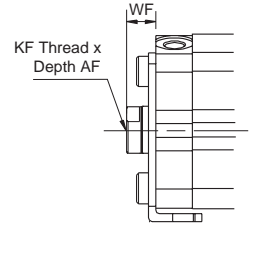
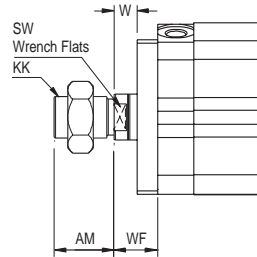
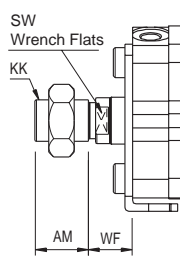
Compact Cylinders
 Actuator Products

Bore size	ELP version Non-magnetic						ELP version Magnetic				Long bearing Version		Style 5 rod end length adjustment	Part number
	Both ports head		Optional Porting		Both ports head		Optional porting		Both ports head		Optional porting			
	ZB1*	ZB2*	ZB3*	ZB4*	ZB5*	ZB6*								
12	25	4.5	5.5	-	45	55	30.5	35.5	41.5	46.5	47	52	1.5	P1M-4DMB
16	30	4.5	5.5	-	45	55	32	37	43	48	49	54	2	P1M-4FMB
20	39	6.5	8	-	50.5	62	34	38.5	44	48.5	50	54.5	2	P1M-4HMB
25	42	6.5	8	-	53	65	37.5	43.5	47.5	53.5	51.5	57.5	2.5	P1M-4JMB
32	48	5.5	8	34	58	68	45.5	53.5	54.5	62.5	57	65	1	P1M-4KMB
40	54	5.5	8	40	66	76	46.5	54.5	56.5	64.5	58.5	66.5	1	P1M-4LMB
50	67	6.5	9	50	79	90	50.5	56.5	59.5	65.5	61.5	67.5	-0.5	P1M-4MMB
63	80	9	9	60	97	112	52	57.5	64	69.5	67	72.5	-0.5	P1M-4NMB
80	99	11	11	77	116	134	63	72	73.5	82.5	73.5	82.5	1	P1M-4PMB
100	117	11	11	94	137	154	70.5	79	85	93.5	85	93.5	-1	P1M-4QMB

* Dimensions shown apply only for Rod End Styles 4, 6 and 9. For Rod End Style 5, please include the above length adjustment.

Rod End Front Mounts F & J

For special rod threads, specify "3" in model number and give desired AM or AF, WF and KK or KF.



Foot Mounting - Style F

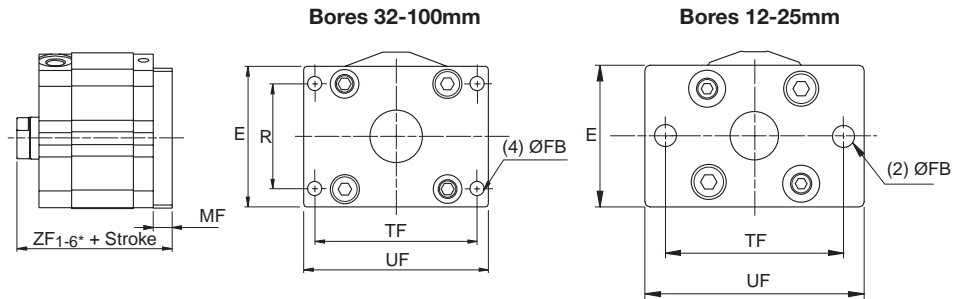
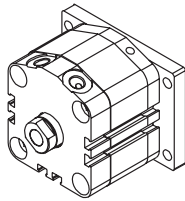
Foot Flange Mounting - Style J

Foot Mounting - Style F

Foot Flange Mounting - Style J

Bore size	AF		AM		KF		KK		W		WF		SW
	Style 9	Style 6	Style 4	Style 5	Style 9	Style 6	Style 4	Style 5	Styles 9, 6, 4	Style 5	Styles 9, 6, 4	Style 5	
12	5.4	6	8	9	#8-32	M3X0.5	#8-32	M5X0.8	8	9.5	13.5	15	5
16	5.4	8	8	10	#8-32	M4x0.7	#8-32	M6x1.0	8	10	13.5	15.5	7
20	7	7	8	12	#10-32	M5x0.8	#10-32	M8x1.25	6.5	8.5	14.5	16.5	9
25	10	12	9.5	15	1/4-28	M6x1.0	1/4-28	M10x1.25	7	9.5	15	17.5	9
32	13.3	13	12.7	20.5	5/16-24	M8x1.25	5/16-24	M12x1.25	9	10	17	18	10
40	18.3	13	16	20.5	3/8-24	M8x1.25	3/8-24	M14x1.5	9	10	17	18	13
50	17.6	15	19.5	26	1/2-20	M10x1.5	1/2-20	M18x1.5	9	8.5	18	17.5	16
63	17.6	15	19.5	26	1/2-20	M10x1.5	1/2-20	M18x1.5	9	8.5	18	17.5	16
80	24.3	21	25.5	32.5	5/8-18	M16x2.0	5/8-18	M22x1.5	9	10	20	21	21
100	27	27	28.5	32.5	3/4-16	M20x2.5	3/4-16	M22x1.5	11	10	22	21	21

Rear Flange Mounting – Style H



Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	E	FB	MF	R	TF	UF	Part number
12	25	4.5	5.5	–	45	55	P1M-4DMB
16	30	4.5	5.5	–	45	55	P1M-4FMB
20	39	6.5	8	–	50.5	62	P1M-4HMB
25	42	6.5	8	–	53	65	P1M-4JMB
32	48	5.5	8	34	58	68	P1M-4KMB
40	54	5.5	8	40	66	76	P1M-4LMB
50	67	6.5	9	50	79	90	P1M-4MMB
63	80	9	9	60	97	112	P1M-4NMB
80	99	11	11	77	116	134	P1M-4PMB
100	117	11	11	94	137	154	P1M-4QMB

Bore size	ELP version non-magnetic		ELP version magnetic		Long bearing version		Style 5 rod end length adjustment
	Both ports head ZF1*	Optional porting ZF2*	Both ports head ZF3*	Optional porting ZF4*	Both ports head ZF5*	Optional porting ZF6*	
12	26	31	37	42	42.5	47.5	1.5
16	27.5	32.5	38.5	43.5	44.5	49.5	2
20	32	36.5	42	46.5	48	52.5	2
25	35.5	41.5	45.5	51.5	49.5	55.5	2.5
32	43.5	51.5	52.5	60.5	55	63	1
40	44.5	52.5	54.5	62.5	56.5	64.5	1
50	49.5	55.5	58.5	64.5	60.5	66.5	-0.5
63	51	57.5	63	68.5	66	71.5	-0.5
80	64	73	74.5	83.5	74.5	83.5	1
100	71.5	80	86	94.5	86	94.5	-1

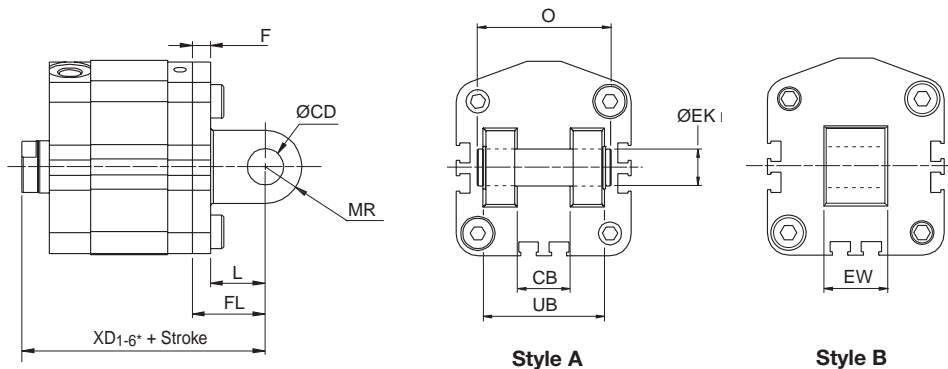
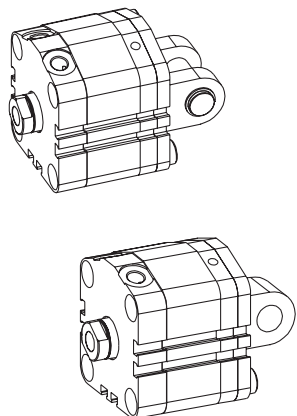
Note: Rear Flange mounting is not available with cap face porting.

* Dimensions shown apply only for Rod End Styles 4, 6 and 9.

For Rod End Style 5, please include the above length adjustment.

B
 Compact Cylinders
 Actuator Products

Rear Clevis Mounts – Styles A & B



B

Compact Cylinders
 Actuator Products

Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	CB	CD/EK	EW	F	FL	L	MR	O	UB	Double clevis kit part number	Single clevis kit part number**
12	5	5	5	4	14	10	6.5	14.5	10	P1M-4DMT	P1M-4DME
16	6.5	5	6.5	4	15	11	6.5	16.5	12	P1M-4FMT	P1M-4FME
20	8	8	8	5	18	13	10	21	16	P1M-4HMT	P1M-4HME
25	10	10	10	5	20	15	11	25.5	20	P1M-4JMT	P1M-4JME
32	18	10	18	5	20	15	10	41.5	36	P1M-4KMT	P1M-4KME
40	18	10	18	6	22	16	10	41.5	36	P1M-4LMT	P1M-4LME
50	22	14	22	7	28	21	14	50.5	44	P1M-4MMT	P1M-4MME
63	22	14	22	8	30	22	14	50.5	44	P1M-4NMT	P1M-4NME
80	28	18	28	10	38	28	18	64	56	P1M-4PMT	P1M-4PME
100	32	22	32	13	45	32	22	72	64	P1M-4QMT	P1M-4QME

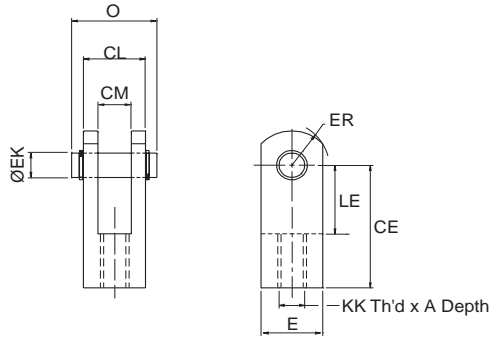
Bore size	ELP version non-magnetic		ELP version magnetic		Long bearing version		Style 5 rod end length adjustment
	Both ports head XD1*	Optional porting XD2*	Both ports head XD3*	Optional porting XD4*	Both ports head XD5*	Optional porting XD6*	
12	34.5	39.5	45.5	50.5	51	56	1.5
16	37	42	48	53	54	59	2
20	42	46.5	52	56.5	58	62.5	2
25	47.5	53.5	57.5	63.5	61.5	67.5	2.5
32	55.5	63.5	64.5	72.5	67	75	1
40	59.5	66.5	68.5	76.5	70.5	78.5	1
50	68.5	74.5	77.5	83.5	79.5	85.5	-0.5
63	72	78.5	84	89.5	87	92.5	-0.5
80	91	100	101.5	110.5	101.5	110.5	1
100	105.5	114	120	128.5	120	128.5	-1

* Dimensions shown apply only for Rod End Styles 4, 6 and 9. For Rod End Style 5, please include the above length adjustment.

** Single Clevis Kit can be used as mounting bracket for double clevis cylinders. Double Clevis Kit can be used as mounting kit for single clevis cylinders.

Note: Rear Clevis mounts are not available with cap face port.

Rod Clevis



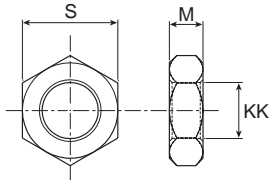
Metric

Bore size	A	E	CE	KK	ER	LE	EK (h9)	CM	CL	O	Part number
12	7	9.5	16	M5x0.8	6.5	7	5	5	9.5	14.5	P1M-4DRC
16	11	11	21	M6x1.0	8	10	5	6.5	11	16.5	P1M-4FRC
20	8.5	16	25	M8x1.25	10.5	11.5	8	8	16	21	P1M-4HRC
25	10.5	19	30	M10x1.25	13	14	10	10	19	25.5	P1M-4JRC
32	16	22 Dia.	30	M12x1.25	12	14	10	18	36	41.5	P1M-4KRC
40	16	22 Dia.	30	M14x1.5	12	14	10	18	36	41.5	P1M-4LRC
50/63	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	P1M-4MRC
80	23	38 Dia.	50	M22x1.5	21	27	18	28	56	64	P1M-4PRC
100	24	44 Dia.	55	M22x1.5	24	31	22	32	64	72	P1M-4QRC

Inch

Bore size	A	E	CE	KK	ER	LE	EK (inch) +0, -0.002	CM	CL (inch)	O (inch)	Part number
12	6	9.5	16	#8-32	6.5	7	3/16	5	0.375	0.563	P1M-4DRC-T
16	6	11	21	#8-32	8	10	3/16	6.5	0.437	0.625	P1M-4FRC-T
20	6	16	25	#10-32	10.5	11.5	5/16	8	0.625	0.875	P1M-4HRC-T
25	8	19	30	1/4-28	13	14	3/8	10	0.750	1.031	P1M-4JRC-T
32	16	22 Dia.	30	5/16-24	12	14	3/8	18	1.437	1.687	P1M-4KRC-T
40	16	22 Dia.	30	3/8-24	12	14	3/8	18	1.437	1.687	P1M-4LRC-T
50/63	20	28 Dia.	40	1/2-20	16	20	1/2	22	1.750	2.125	P1M-4MRC-T
80	23	38 Dia.	50	5/8-18	21	27	3/4	28	2.250	2.625	P1M-4PRC-T
100	24	44 Dia.	55	3/4-16	24	31	7/8	32	2.500	2.875	P1M-4QRC-T

Jam Nuts



Style 4

Bore size	KK	M	S	Part number
12	#8-32	1/8	11/32	L073800080
16	#8-32	1/8	11/32	L073800080
20	#10-32	1/8	3/8	L073800100
25	1/4-28	5/32	7/16	L073800200
32	5/16-24	3/16	1/2	L073800300
40	3/8-24	7/32	9/16	L073800400
50	1/2-20	5/16	3/4	L073800600
63	1/2-20	5/16	3/4	L073800600
80	5/8-18	3/8	15/16	L073800800
100	3/4-16	27/64	1-1/8	L073800900

Dimensions in inches

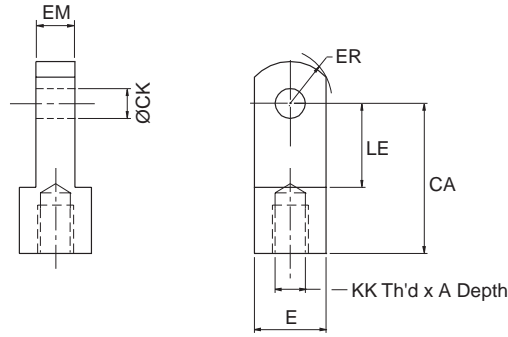
Style 5

Bore size	KK	M	S	Part number
12	M5x0.8	2.7	18	L075540005
16	M6x1.0	3.2	10	L075540006
20	M8x1.25	4	13	L075540008
25	M10x1.25	5	17	L075540010
32	M12x1.25	6	19	L075540012
40	M14x1.5	7	22	L075540014
50	M18x1.5	8	27	L075540018
63	M18x1.5	8	27	L075540018
80	M22x1.5	11	32	L075540022
100	M22x1.5	11	32	L075540022

Dimensions in mm

B
 Compact Cylinders
 Actuator Products

Rod Eye



Metric

Bore size	A	E	CA	KK	ER	LE	CK	EM	Part number
12	7	9.5 Sq.	16	M5x0.8	6.5	7	5	5	P1M-4DRE
16	8	11 Sq.	25	M6x1.0	8	14	5	6.5	P1M-4FRE
20	8.5	16 Sq.	25	M8x1.25	10.5	11.5	8	8	P1M-4HRE
25	10.5	19 Sq.	30	M10x1.25	13	14	10	10	P1M-4JRE
32	15	22 Dia.	30	M12x1.25	12	14	10	18	P1M-4KRE
40	14	22 Dia.	30	M14x1.5	12	14	10	18	P1M-4LRE
50/63	18.5	28 Dia.	40	M18x1.5	16	20	14	22	P1M-4MRE
80	22	38 Dia.	50	M22x1.5	21	27	18	28	P1M-4PRE
100	22	44 Dia.	55	M22x1.5	24	31	22	32	P1M-4QRE

Inch

Bore size	A	E	CA	KK	ER	LE	CK (inch)	EM	Part number
12	6	9.5 Sq.	16	#8-32	6.5	7	3/16	5	P1M-4DRE-T
16	6	11 Sq.	25	#8-32	8	14	3/16	6.5	P1M-4FRE-T
20	6	16 Sq.	25	#10-32	10.5	11.5	5/16	8	P1M-4HRE-T
25	8	19 Sq.	30	1/4-28	13	14	3/8	10	P1M-4JRE-T
32	12	22 Dia.	30	5/16-24	12	14	3/8	18	P1M-4KRE-T
40	11	22 Dia.	30	3/8-24	12	14	3/8	18	P1M-4LRE-T
50/63	18	28 Dia.	40	1/2-20	16	20	1/2	22	P1M-4MRE-T
80	21	38 Dia.	50	5/8-18	21	27	3/4	28	P1M-4PRE-T
100	21	44 Dia.	55	3/4-16	24	31	7/8	32	P1M-4QRE-T

B

Compact Cylinders
 Actuator Products

- Low profile design
- Flexible construction with special modification capability
- High density iron rod bearing provides maximum support for longer life
- Single and double acting versions available
- 6 mounting styles
- 8 bore sizes from 9/16" to 4"
- Strokes from 1/8" to 6"
- Permanent lubrication
- Non-lube service



Operating information


Operating pressure: 200 PSIG (17 bar)
 Temperature range: LP -10°F to 200°F (-23°C to 93°C)
 LPM -10°F to 140°F (-23°C to 60°C)
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

1.50	K	N	LP	L	V	B	E	S	9	1.25"
Bore size			Series				Spring			Stroke length
0.56"			LP Standard				Blank None			Specify stroke length required in inches.
0.75"			LPM Magnetic Piston ⁵				E Spring extended			
1.12"				Piston seal			R Spring return			
1.50"				Blank Standard seal				Rod end thread style		
2.00"				L Lipseal piston seal ³				9 Standard female rod end		
2.50"					Seals			4 Optional male rod end		
3.00"					Blank Standard			3 Special rod end (specify dimensions or sketch)		
4.00"					V Class 5 seals					
	Double rod cylinder					Bumpers*		Special features		
	Blank Single rod					Blank No bumpers		Blank No special feature		
	K Double rod					B Bumpers both ends		S Special feature		
		Mounting style				H Head end only				
		N Basic (Std.)				C Cap end only ⁴				
		Single rod styles								
		4F Head bolt								
		4R Cap bolt								
		2F Head trunnion ¹								
		2R Cap trunnion ¹								
		1 Cap pivot eye								
		Double rod styles								
		N Basic								
		4R Cap bolt								
		2F Head trunnion								
		Hollow rod styles^{1,2,5}								
		NH Basic								
		4RH Cap bolt								
		2FH Head trunnion								

¹ Not available on 9/16" bore.
² Hollow rods are used on double rod cylinders. All hollow rod options require the double rod prefix "K".
³ Lipseal piston is not available on LPM Series.
⁴ Not available on spring extend.
⁵ LPM Series with hollow rod option are not available on the 9/16", 3/4" and 1-1/8" bore sizes.

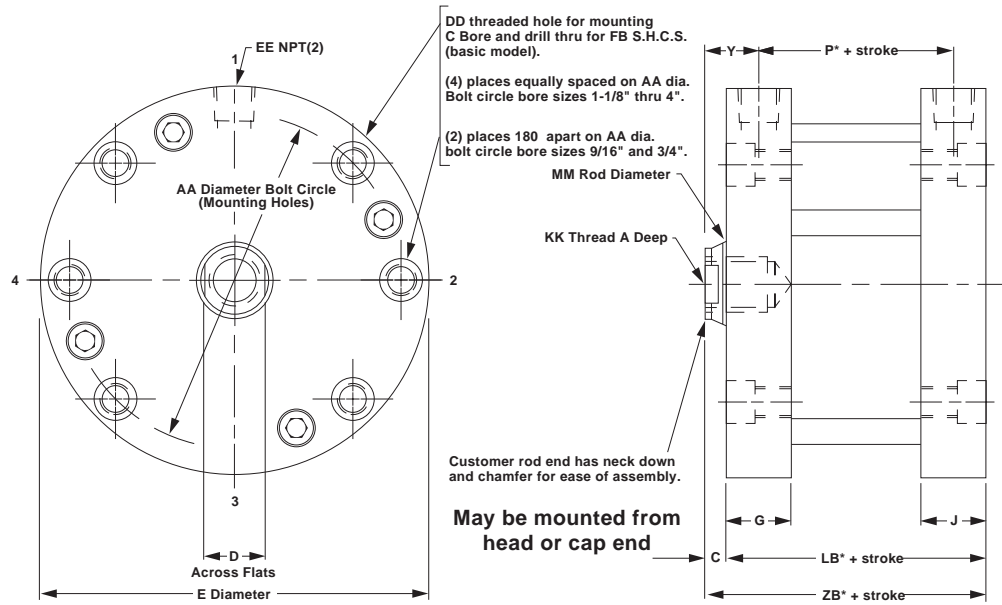
Note: For sensor specifications and part numbers, please refer to the Electronic Sensors section.

Sensors
 For sensors see page B296. 

Mounting Style N

Cylinder Dimensions
 Double Acting
 Single Rod End,
 Female Rod Style No. 9

Temperature: -10°F to 200°F (optional Fluorocarbon seals).
 All air cylinders are permanently lubricated.
 LPM Series maximum temperature 140°F.



B
 Compact Cylinders
 Actuator Products

Bore size	A	C	D	E	G	J	P*	Y	AA	DD	EE	FB	KK	LB*	MM	ZB*
9/16	0.40	1/8	7/32	1-1/8	23/64	23/64	11/32	17/64	0.875	#8-32	#10-32	#4	#8-32	5/8	1/4	3/4
3/4	0.44	1/8	1/4	1-1/2	23/64	23/64	3/8	17/64	1.219	#10-32	#10-32	#6	#10-32	21/32	5/16	25/32
1-1/8	0.62	1/8	7/16	2	1/2	1/2	27/64	3/8	1.687	#10-32	1/8	#6	5/16-24	59/64	1/2	1-3/64
1-1/2	0.62	1/8	1/2	2-5/8	1/2	1/2	1/2	3/8	2.187	1/4-28	1/8	#10	3/8-24	1	5/8	1-1/8
2	0.70†	1/8	5/8	3-1/8	1/2	1/2	9/16	3/8	2.687	1/4-28	1/8	#10	1/2-20	1-1/16	3/4	1-3/16
2-1/2	0.70†	1/8	5/8	3-3/4	5/8	5/8	5/8	7/16	3.250	5/16-24	1/4	1/4	1/2-20	1-1/4	3/4	1-3/8
3	0.75†	1/8	3/4	4-1/4	43/64	43/64	21/32	7/16	3.781	5/16-24	1/4	1/4	5/8-18	1-9/32	7/8	1-13/32
4	0.75†	1/8	7/8	5-1/2	27/32	27/32	49/64	17/32	4.937	3/8-24	3/8	5/16	3/4-16	1-5/8	1	1-3/4

* These dimensions are for the LP Series with standard piston.
 † For strokes less than 0.25", A dimension = 0.66".

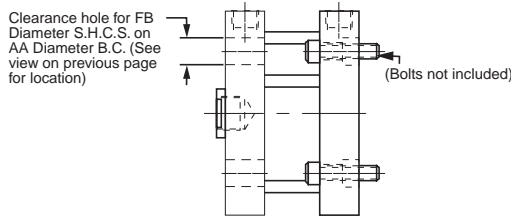
Added length table for LPM or lipseal piston options

Bore size	LPM option*						LP with lipseal piston option				
	P	LB	XD	XJ	ZB	Stroke	P	LB	XD	XJ	ZB
9/16†	15/16	1-7/32	2	-	1-11/32	1/2	5/8	29/32	1-11/16	-	1-1/32
3/4†	31/32	1-1/4	2-1/32	1-3/16	1-3/8	1/2	21/32	15/16	1-23/32	7/8	1-1/16
1-1/8†	63/64	1-31/64	2-3/8	1-23/64	1-39/64	9/16	43/64	1-11/64	2-1/16	1-3/64	1-19/64
1-1/2	1-1/8	1-5/8	2-13/16	1-1/2	1-3/4	7/16	13/16	1-5/16	2-1/2	1-3/16	1-7/16
2	1-9/32	1-25/32	3-1/32	1-21/32	1-29/32	7/16	61/64	1-29/64	2-45/64	1-21/64	1-37/64
2-1/2	1-21/64	1-61/64	3-21/64	1-3/4	2-5/64	1/2	1	1-5/8	3	1-27/64	1-3/4
3	1-27/64	2-3/64	3-53/64	1-53/64	2-11/64	1/2	1-3/32	1-23/32	3-1/2	1-1/2	1-27/32
4	1-1/2	2-23/64	4-11/64	2	2-31/64	1/2	1-11/64	2-1/32	3-27/32	1-43/64	2-5/32

Note minimum strokes for LPM option.
 † These bore sizes not available for the LPM option with the hollow rod option.
 * The LPM option is only available with the standard quad seal.

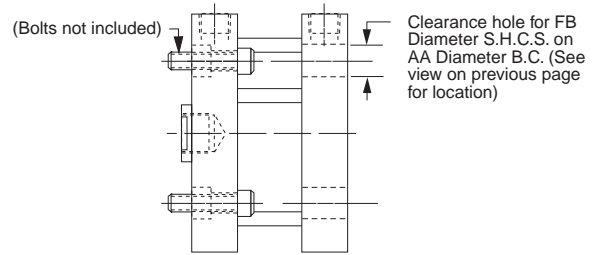
Head Bolt Clearance Holes

Mounting Style 4F
 Available Head End



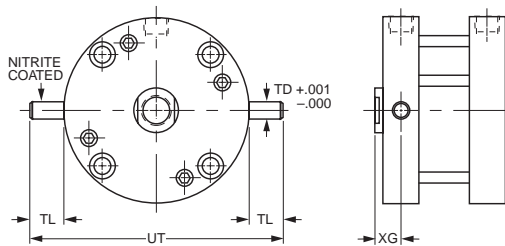
Cap Bolt Clearance Holes

Mounting Style 4R
 Available Cap End



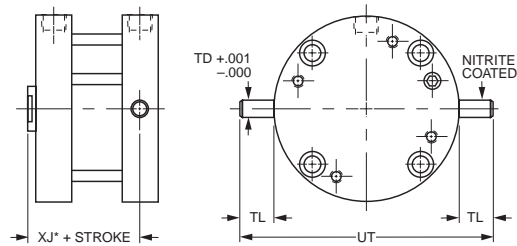
Head Trunnion

Mounting Style 2F (9/16" bore not available)



Cap Trunnion

Mounting Style 2R (9/16" bore not available)

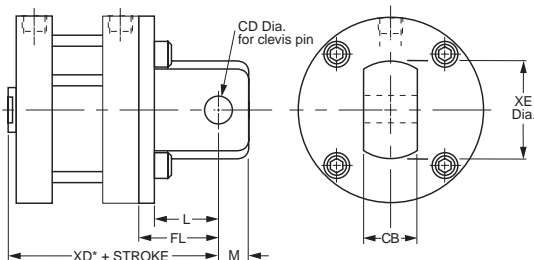


Bore size	TD	TL	UT	XG	XJ*
3/4	0.125	5/16	2-1/8	5/16	19/32
1-1/8	0.250	1/2	3	3/8	51/64
1-1/2	0.250	1/2	3-5/8	3/8	7/8
2	0.250	1/2	4-1/8	3/8	15/16
2-1/2	0.312	5/8	5	29/64	1-3/64
3	0.312	5/8	5-1/2	15/32	1-1/16
4	0.375	3/4	7	35/64	1-17/64

* These dimensions are for the LP Series with standard piston.

Cap Pivot Eye

Mounting Style 1



Bore size	L	M	CB	CD	FL	XD*	XE
9/16	1/2	1/4	3/8	3/16	21/32	1-13/32	19/32
3/4	1/2	1/4	3/8	3/16	21/32	1-7/16	3/4
1-1/8	1/2	1/4	3/8	3/16	49/64	1-13/16	3/4
1-1/2	13/16	7/16	3/4	3/8	1-1/16	2-3/16	1-3/8
2	13/16	7/16	3/4	3/8	1-1/8	2-5/16	1-3/8
2-1/2	13/16	7/16	3/4	3/8	1-1/4	2-5/8	1-3/8
3	1-9/32	9/16	1	5/8	1-21/32	3-1/16	1-7/8
4	1-9/32	9/16	1	5/8	1-11/16	3-7/16	1-7/8

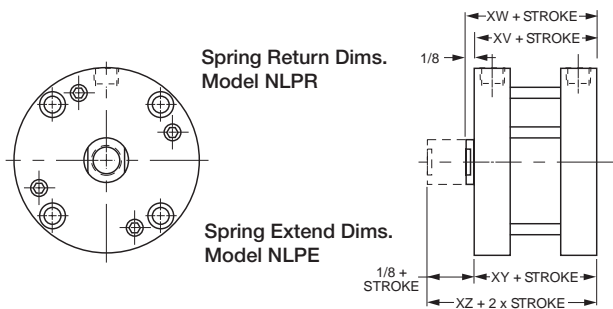
Order clevis pin from accessories when required.

* These dimensions are for the LP Series with standard piston. See table on the previous page for dimensions for the lipseal piston or LPM options.

B
 Compact Cylinders
 Actuator Products

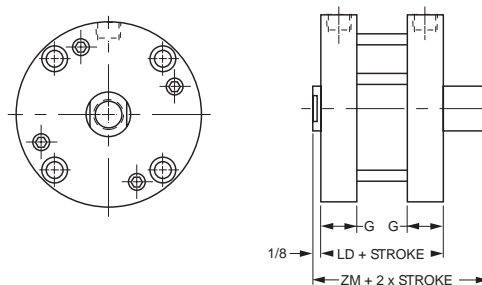
Spring Extend & Spring Return Cylinders

(Available through 2" stroke)



Double Rod Spring Extend & Spring Return Cylinders

(Available through 2" stroke)



B

**Compact Cylinders
 Actuator Products**

Bore size	1/8" to 1" stroke				Over 1" to 2" stroke				Add this length to XV, XW, XY, XZ for Lipseal Piston
	XV	XW	XY	XZ	XV	XW	XY	XZ	
9/16	1	1-1/8	57/64	1-1/64	1-11/16	1-13/16	1-37/64	1-45/64	9/32
3/4	1-1/64	1-9/64	59/64	1-3/64	1-45/64	1-53/64	1-39/64	1-47/64	9/32
1-1/8	1-23/64	1-31/64	1-9/32	1-13/32	1-63/64	2-7/64	1-29/32	2-1/32	1/4
1-1/2	1-25/64	1-33/64	1-11/32	1-15/32	2-1/64	2-9/64	1-31/32	2-3/32	5/16
2	1-11/64	1-19/64	1-13/32	1-17/32	1-51/64	1-59/64	2-1/32	2-5/32	25/64
2-1/2	1-3/8	1-1/2	1-23/32	1-27/32	2	2-1/8	2-11/32	2-15/64	3/8
3	1-1/2	1-5/8	1-55/64	1-63/64	2-1/8	2-1/4	2-31/64	2-39/64	7/16
4	1-27/32	1-31/32	2-13/64	2-21/64	2-15/32	2-19/32	2-53/64	2-61/64	13/32

Bore size	Spring return/extend – LP						Spring return/extend – LPM					
	≥ 1/8", ≤ 1"			<1", ≤ 2"			≥ 1/8", >1"			>1", ≤ 2"		
	G	LD	ZM	Min.* stroke	LD	ZM	LD	ZM	Min.* stroke	LD	ZM	
9/16	23/64	1-1/8	1-3/8	5/16	1-13/16	2-1/16	1-23/32	1-27/32	3/16	2-13/32	2-17/32	
3/4	23/64	1-11/64	1-27/64	1/8	1-55/64	2-7/64	1-49/64	1-57/64	3/16	2-29/64	2-37/64	
1-1/8	1/2	1-1/2	1-3/4	1/8	2-1/8	2-3/8	2-1/16	2-3/16	1/8	2-11/16	2-13/16	
1-1/2	1/2	1-11/16	1-15/16	1/8	2-5/16	2-9/16	2-5/16	2-7/16	1/4	2-15/16	3-1/16	
2	1/2	1-31/64	1-47/64	1/8	2-7/64	2-23/64	2-13/64	2-21/64	1/4	2-53/64	2-61/64	
2-1/2	5/8	1-3/4	2	1/8	2-3/8	2-5/8	2-29/64	2-37/64	3/16	3-5/64	3-13/64	
3	43/64	1-29/32	2-5/32	1/8	2-17/32	2-25/32	2-43/64	2-51/64	1/8	3-19/64	3-27/64	
4	27/32	2-1/4	2-1/2	1/8	2-7/8	3-1/8	2-63/64	3-7/64	1/8	3-39/64	3-47/64	

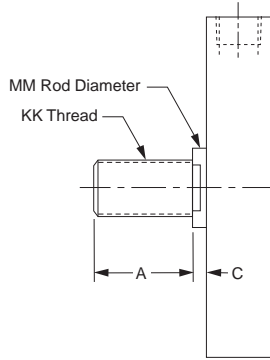
* Note minimum strokes for LPM option.

Spring force data

Bore size	1/8" to 1" Stroke		Over 1" to 2" Stroke		
	Max. Spring Force (lbs)	Spring Rate (lb/in)	Bore dia.	Max. Spring Force (lbs)	Spring Rate (lb/in)
9/16	5.7	4.25	9/16	5.7	1.75
3/4	9	6	3/4	9	2.5
1-1/8	10	6	1-1/8	10	2.5
1-1/2	13	5.5	1-1/2	12	2.25
2	13	5.5	2	12	2.25
2-1/2	17.5	6	2-1/2	16	2.5
3 & 4	24	6.5	3 & 4	23	2.75

Optional Male Rod End

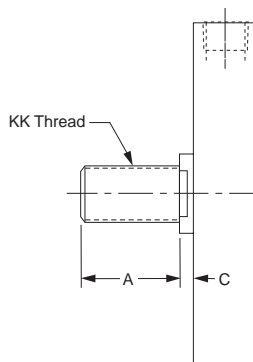
Specify #4



Bore size	A	C	KK	MM
9/16	0.38	1/8	#8-32	1/4
3/4	0.50	1/8	#10-32	5/16
1-1/8	0.50	1/8	5/16-24	1/2
1-1/2	0.50	1/8	3/8-24	5/8
2	0.62	1/8	1/2-20	3/4
2-1/2	0.62	1/8	1/2-20	3/4
3	0.75	1/8	5/8-18	7/8
4	0.75	1/8	3/4-16	1

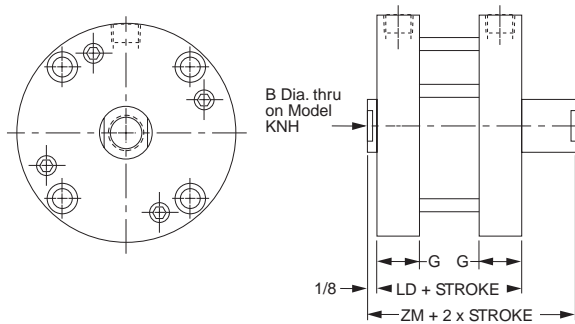
Non-standard Rods

For non-standard rod ends, please specify rod thread style 3 and provide the KK, A, and C dimensions as needed.



Double or Hollow Rod Cylinders

Note: Cylinders with hollow rod option should not be bottomed out during stroke.



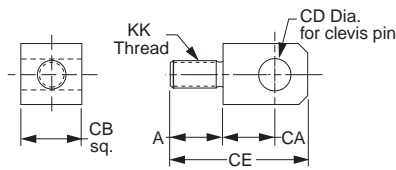
LP double or hollow rod option, LPM, lipseal piston

Bore size	Standard double rod end or with hollow rod		LPM option		LP with lipseal piston option			
	B	G	LD	ZM	LD	ZM	LD	ZM
9/16	*	23/64	3/4	1	1-11/32	1-15/32	1-1/32	1-9/32
3/4	9/64	23/64	13/16	1-1/16	1-13/32	1-17/32	1-3/32	1-11/32
1-1/8	7/32	1/2	1-3/16	1-7/16	1-3/4	1-7/8	1-7/16	1-11/16
1-1/2	9/32	1/2	1-19/64	1-35/64	1-59/64	2-3/64	1-39/64	1-55/64
2	3/8	1/2	1-3/8	1-5/8	2-3/32	2-7/32	1-49/64	2-1/64
2-1/2	3/8	5/8	1-5/8	1-7/8	2-21/64	2-29/64	2	2-1/4
3	7/16	43/64	1-11/16	1-15/16	2-29/64	2-37/64	2-1/8	2-3/8
4	1/2	27/32	2-1/32	2-9/32	2-49/64	2-57/64	2-7/16	2-11/16

*Hollow rod not available on 9/16" bore.

B
 Compact Cylinders
 Actuator Products

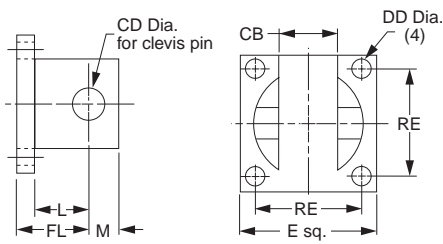
Rod Eye



Bore size	A	CA	CB	CD	CE	KK	Part number
9/16	3/8	15/32	3/8	3/16	1-3/32	#8-32	L073810008
3/4	3/8	15/32	3/8	3/16	1-3/32	#10-32	L073810010
1-1/8	9/16	15/32	3/8	3/16	1-9/32	5/16-24	L073810020
1-1/2	5/8	23/32	3/4	3/8	1-25/32	3/8-24	L073810024
2-2-1/2	21/32	23/32	3/4	3/8	1-27/32	1/2-20	L073810032
3	21/32	1	1	5/8	2-3/8	5/8-18	L073810040
4	21/32	1	1	5/8	2-3/8	3/4-16	L073810048

Clevis Bracket

(Supplied with Pin)

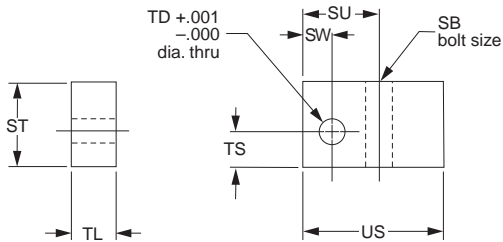


E	L	M	CB	CD	DD	FL	RE	Part number
1	13/32	7/32	25/64	3/16	9/64	9/16	3/4	L073820012
1-3/4	25/32	13/32	49/64	3/8	11/64	15/16	1-3/8	L073820024
2-1/2	1	9/16	1-1/64	5/8	17/64	1-1/4	2	L073820040

Use L073820012 on 9/16", 3/4" and 1-1/8" bore.
 Use L073820024 on 1-1/2", 2" and 2-1/2" bore.
 Use L073820040 on 3" and 4" bore.

Note: The Clevis Bracket is an accessory for the rod eye or the cap pivot eye and cannot be mounted directly to the cylinder.

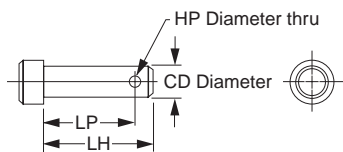
Trunnion Bracket



SB	ST	SU	SW	TD	TL	TS	US	Part number
1/4	7/8	13/16	5/16	.252	1/2	3/8	1-1/2	L073840016
5/16	1	15/16	3/8	.314	5/8	29/64	1-5/8	L073840020
3/8	1-1/4	1-1/16	7/16	.377	3/4	35/64	1-7/8	L073840024

Use L073840016 on 1-1/8", 1-1/2" and 2" bore.
 Use L073840020 on 2- 1/2" and 3" bore.
 Use L073840024 on 4" bore.

Clevis Pin



CD	HP	LH	LP	Part number
3/16	3/32	1	29/32	L073830012
3/8	5/32	1-5/8	1-15/32	L073830024
5/8	5/32	2	1-27/32	L073830040

- Compact guided cylinder for heavy duty short stroke applications
- 9 Bore sizes, 16mm to 200mm
- Strokes 10 to 200mm depending on model
- Standard dowel holes on body and tool plate
- High load bearing option
- Internal bumpers and magnetic piston are standard
- Flexible porting: top, rear, side



Operating information

Operating pressure: 1 MPa (145 PSIG / 10 bar)
 Temperature range:
 Nitrile seals (standard) 0°F to 165°F (-18°C to 74°C)
 Fluorocarbon seals* 0°F to 250°F (-18°C to 121°C)
 * See fluorocarbon seal option for high temperature applications.
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

P5T – J 032 D H S N 100

Shaft / bearing type		Bore size		Seals		Stroke length	
J	Composite bearing, chrome plated shaft (std)	016	16mm	S	Nitrile (std)	See table below for standard stroke lengths. Consult factory for special stroke lengths.	
H	Ball bearing, stainless steel shaft	020	20mm	F	Fluorocarbon (high temp)		
C	Composite bearing, stainless steel shaft	025	25mm				
		032	32mm				
		040	40mm				
		050	50mm				
		063	63mm				
		080	80mm				
		100	100mm				

Port location / mounting	
D	Dowel holes, top ports (std)
R	Dowel holes, rear ports, top plugged (std)
S	Dowel holes, side ports ¹ and top ports

Options	
N	None (std)
B	High load bearings ²
A	Bumpers, adjustable stop collars (extend only) and dual tool plate (side ports rec) ^{3, 4}
E	Bumpers and adjustable stop collars (extend only) ³
G	High load bearings, bumpers and adjustable stop collars (extend only) ^{2, 3}
D	Dual tool plate ^{3, 4}
X	Special

Port style	
H	NPTF (std)
G	BSPP
P	Flow control, BSPP port, prestolok tube (mm) ¹
F	Flow control, NPTF port, prestolok tube (inch) ¹
B	Flow control, BSPP ¹
N	Flow control, NPTF ¹

Standard strokes (mm)*										
Bore size (mm)	10	25	40	50	75	100	125	150	175	200
16	•	•	•	•	•	•				
20		•	•	•	•	•	•			
25		•		•	•	•	•	•		
32 -100		•		•	•	•	•	•	•	•

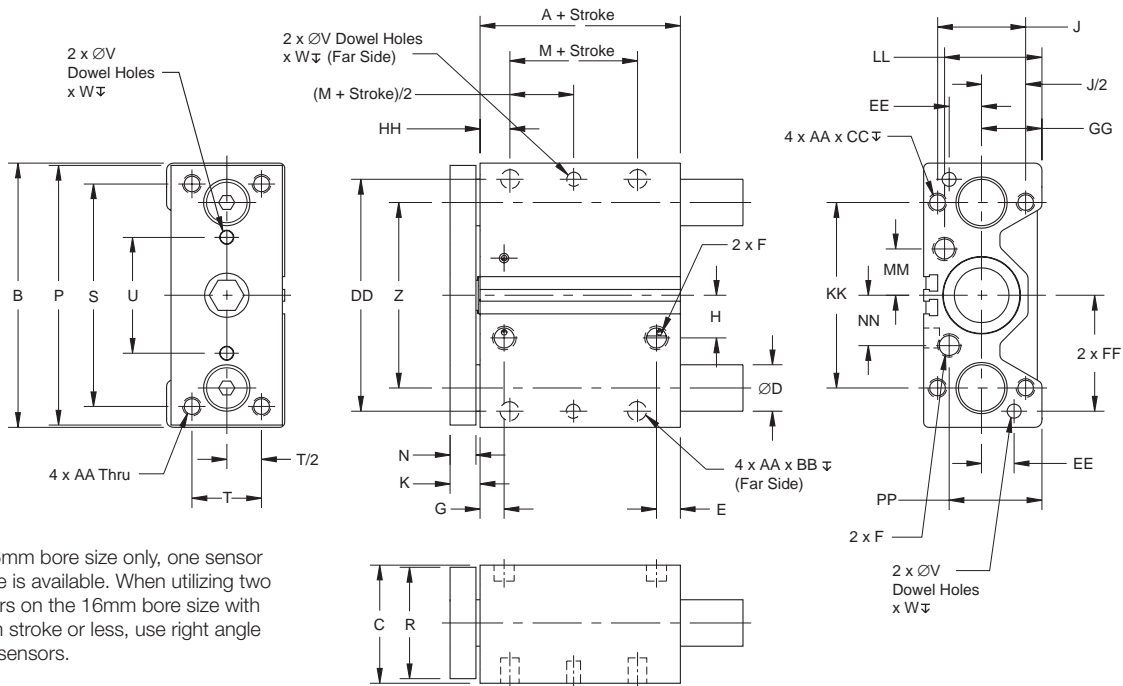
* Consult factory for special stroke lengths.

NOTES:

- 1 Cannot combine flow controls, side ports and 25mm stroke.
- 2 Not available with rear mounting and ports.
- 3 Not available with rear port location (R).
- 4 Includes high load bearings as standard.

Sensors

For sensors see page B296.



Note: On 16mm bore size only, one sensor groove is available. When utilizing two sensors on the 16mm bore size with 25mm stroke or less, use right angle short sensors.

Dimensions in mm (inch)

Model	A**	B	C	D	D ²	E**	F	G	H	J	K
16	37.75 (1.49)	64 (2.52)	31 (1.22)	8 (0.315)	10 (0.394)	10.1 (0.40)	M5/10-32	10.1 (0.40)	6.95 (0.27)	22 (0.866)	9.94 (0.39)
20	36 (1.42)	74 (2.91)	36 (1.42)	10 (0.394)	12 (0.472)	19 (0.75)	1/8 NPTF or BSPP	10 (0.39)	15.8 (0.62)	26 (1.024)	9.94 (0.39)
25	38 (1.50)	88 (3.46)	42 (1.65)	12 (0.472)	16 (0.630)	21 (0.83)	1/8 NPTF or BSPP	11.4 (0.45)	15.5 (0.61)	32 (1.260)	9.94 (0.39)
32	36 (1.42)	114 (4.49)	51 (2.00)	16 (0.630)	20 (0.787)	10.26 (0.40)	1/8 NPTF or BSPP	10.35 (0.41)	18.42 (0.73)	38 (1.496)	13.1 (0.52)
40	44 (1.73)	124 (4.88)	52 (2.05)	16 (0.630)	20 (0.787)	12.10 (0.48)	1/8 NPTF or BSPP	14.9 (0.59)	22.53 (0.89)	38 (1.496)	13.1 (0.52)
50	44.9 (1.77)	140 (5.51)	62 (2.44)	20 (0.787)	25 (0.984)	14.5 (0.57)	1/4 NPTF or BSPP	16.1 (0.63)	27 (1.06)	44 (1.732)	14.7 (0.58)
63	50.05 (1.97)	150 (5.91)	75 (2.95)	20 (0.787)	25 (0.984)	16.4 (0.65)	1/4 NPTF or BSPP	14.5 (0.57)	33 (1.30)	44 (1.732)	14.7 (0.58)
80	60.3 (2.37)	188 (7.40)	95 (3.74)	25 (0.984)	30 (1.181)	17.5 (0.610)	3/8 NPTF or BSPP	19 (0.75)	37 (1.46)	56 (2.205)	18 (0.71)
100**	67.5 (2.60)	224 (8.82)	115 (4.53)	30 (1.181)	35 (1.38)	21.9 (0.862)	3/8 NPTF or BSPP	23 (0.91)	40 (1.57)	62 (2.441)	18 (0.71)

Model	M	N	P	R	S	T	U	V	W	Z	AA	BB
16	7 (0.276)	7.94 (0.31)	62 (2.44)	25.4 (1.00)	52 (2.047)	16 (0.630)	20 (0.787)	3 (0.118)	6 (0.236)	42 (1.654)	M5x0.8	7.5 (0.30)
20	10 (0.394)	7.94 (0.31)	72 (2.83)	31.8 (1.25)	60 (2.362)	18 (0.709)	30 (1.181)	4 (0.157)	6 (0.236)	52 (2.047)	M5x0.8	7.5 (0.30)
25	10 (0.394)	7.94 (0.31)	86 (3.39)	38 (1.50)	70 (2.756)	26 (1.024)	34 (1.339)	4 (0.157)	6 (0.236)	62 (2.441)	M6x1.0	9 (0.35)
32	5 (0.197)	11.1 (0.44)	112 (4.41)	44.5 (1.75)	96 (3.780)	30 (1.181)	50 (1.969)	6 (0.236)	6 (0.236)	80 (3.150)	M8x1.25	11 (0.43)
40	10 (0.394)	11.1 (0.44)	122 (4.80)	44.5 (1.75)	106 (4.173)	30 (1.181)	60 (2.362)	6 (0.236)	6 (0.236)	90 (3.543)	M8x1.25	11 (0.43)
50	10 (0.394)	12.7 (0.50)	138 (5.43)	57.2 (2.25)	120 (4.724)	40 (1.575)	60 (2.362)	8 (0.315)	8 (0.315)	100 (3.937)	M10x1.5	12 (0.47)
63	10 (0.394)	12.7 (0.50)	148 (5.83)	69.9 (2.75)	130 (5.118)	50 (1.969)	72 (2.835)	8 (0.315)	8 (0.315)	110 (4.331)	M10x1.5	15 (0.59)
80	15 (0.591)	16 (0.63)	185 (7.28)	89 (3.50)	160 (6.299)	60 (2.362)	92 (3.622)	10 (0.394)	10 (0.394)	140 (5.512)	M12x1.75	18 (0.71)
100	15 (0.591)	16 (0.63)	221 (8.70)	108 (4.25)	190 (7.480)	80 (3.150)	114 (4.488)	10 (0.394)	10 (0.394)	170 (6.693)	M14x2.0	21 (0.83)

Model	CC	DD	EE	FF	GG	HH	KK	LL	MM	NN	PP	Piston Rod
16	10 (0.39)	54 (2.126)	8 (0.315)	27 (1.063)	15 (0.591)	13.06 (0.514)	42 (1.654)	22.5 (0.88)	11.25 (0.44)	9.7 (0.38)	23.0 (0.91)	8 (0.315)
20	10 (0.39)	64 (2.520)	10 (0.394)	32 (1.260)	17 (0.669)	13.06 (0.514)	52 (2.126)	26.0 (1.02)	15.4 (0.61)	15.4 (0.61)	26.0 (1.0)	10 (0.394)
25	12 (0.47)	76 (2.992)	11 (0.433)	38 (1.496)	21 (0.827)	14.06 (0.553)	62 (2.441)	33.4 (1.31)	17 (0.67)	17 (0.67)	33.4 (1.31)	10 (0.394)
32	16 (0.63)	100 (3.937)	14 (0.551)	50 (1.969)	26 (1.024)	12.9 (0.508)	80 (3.150)	42 (1.65)	20 (0.79)	21.7 (0.85)	38 (1.50)	16 (0.630)
40	16 (0.63)	110 (4.33)	14 (0.551)	55 (2.165)	26 (1.024)	13.9 (0.547)	90 (3.543)	41 (1.61)	24 (0.95)	26.4 (1.04)	37.9 (1.49)	16 (0.630)
50	20 (0.79)	124 (4.882)	16 (0.630)	62 (2.441)	30 (1.181)	14.3 (0.563)	100 (3.937)	51 (2.01)	29 (1.14)	33 (1.30)	44 (1.73)	20 (0.787)
63	20 (0.79)	132 (5.197)	18 (0.709)	66 (2.598)	36.5 (1.437)	16.3 (0.642)	110 (4.331)	62 (2.44)	36 (1.42)	37.75 (1.49)	57.75 (2.27)	20 (0.787)
80	24 (0.94)	166 (6.535)	22 (0.866)	83 (3.268)	46.5 (1.831)	21 (0.83)	140 (5.512)	78 (3.07)	45 (1.77)	48 (1.89)	75.5 (2.97)	25 (0.984)
100	28 (1.10)	200 (7.874)	24 (0.945)	100 (3.937)	56.5 (2.224)	25 (0.98)	170 (6.693)	91.5 (3.60)	53 (2.09)	51 (2.01)	95.5 (3.76)	25 (0.984)

D¹ With linear ball bearing D² With composite bushing
 ** For Model 100 with 25mm stroke, A = 100.3 (3.95") and E = 28 (1.10")

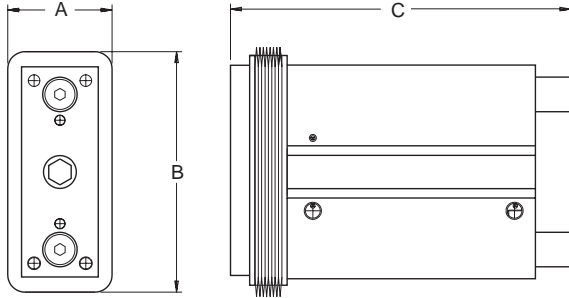
Contaminant & Weld Flash Covers

A contaminant cover protects the guide rods and bearings from particles and fluid that could cause premature failure.

A weld flash cover protects guide rods and bearings from weld spatter.

Cover option can be ordered on models having the bearings both ends option.

Consult factory to order.



Weld Flash Cover Specifications

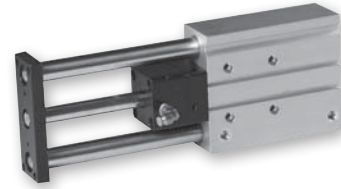
Coating material (exposed side)	PVC (Black)
Base material	Nomex
Coating material (other side)	PVC (Black)
Material thickness range	.012" - .016" (.3-.4mm)
Temperature resistance (nomex)	
Briefly	642°F (450°C)
Continuously	-22° to 572°F (-30° to 300°C)
Temperature resistance (coating)	
Briefly	392°F (200°C)
Continuously	-22° to 302°F (-30° to 150°C)
Resistant to	Chemicals, coolants, solvents, oil
Characteristics	self-extinguishing, abrasion resistant
Material weight	400 grams/square meter

Dimensions in mm (inch)

Model	A	B	10	25	40	50	75	100	125	150	175	200
16	42 (1.65)	86 (3.39)	61.2 (2.41)	100.2 (3.94)	135.2 (5.32)	135.2 (5.32)	160.2 (6.31)	200.2 (7.88)	-	-	-	-
20	45 (1.77)	98 (3.86)	-	106.9 (4.21)	141.9 (5.59)	141.9 (5.59)	166.9 (6.57)	216.9 (8.54)	241.9 (9.52)	-	-	-
25	49 (1.93)	112 (4.41)	-	119.9 (4.72)	-	144.9 (5.70)	169.9 (6.69)	194.9 (7.67)	241.9 (9.52)	266.9 (10.51)	-	-
32	62 (2.44)	142 (5.59)	-	127.9 (5.04)	-	152.9 (6.02)	177.9 (7.00)	202.9 (7.99)	266 (10.47)	291 (11.46)	316 (12.44)	341 (13.43)
40	62 (2.44)	152 (5.98)	-	127.9 (5.04)	-	152.9 (6.02)	177.9 (7.00)	202.9 (7.99)	266 (10.47)	291 (11.46)	316 (12.44)	341 (13.43)
50	66 (2.60)	167 (6.57)	-	134 (5.28)	-	159 (6.26)	184 (7.24)	209 (8.23)	274.1 (10.79)	299.1 (11.78)	324.1 (12.76)	349.1 (13.74)
63	77 (3.03)	187 (7.36)	-	134 (5.28)	-	159 (6.26)	184 (7.24)	209 (8.23)	274.1 (10.79)	299.1 (11.78)	324.1 (12.76)	349.1 (13.74)
80	104 (4.09)	244 (9.61)	-	151.8 (5.98)	-	176.8 (6.96)	201.8 (7.94)	226.8 (8.93)	290 (11.42)	315 (12.40)	340 (13.39)	365 (14.37)
100	109 (4.29)	279 (10.98)	-	170.3 (6.70)	-	195.3 (7.69)	220.3 (8.67)	245.3 (9.66)	308.4 (12.14)	333.4 (13.13)	358.4 (14.11)	383.4 (15.09)

B
Guided Cylinders
Actuator Products

- Compact guided cylinder for heavy duty short stroke applications
- 10 bore sizes 12mm to 100mm
- Strokes 10 to 200mm depending on model
- Rod lock option to hold position upon loss of air pressure
- High load bearing option
- Optional stop collars for adjustable stroke



Operating information

Operating pressure:	1 MPa (145 PSIG / 10 bar)
Temperature range:	
Nitrile seals (standard)	-18°C to 74°C (0°F to 165°F)
Fluorocarbon seals	-18°C to 121°C (0°F to 250°F)
Operating characteristics:	Double acting
Filtration requirements:	40 micron, dry filtered air
For technical information see CD	

B

Guided Cylinders
 Actuator Products

Ordering information

P5T2 A 032 J1 K N 1 B G J 025 A

Construction		Bore size	
A	Standard, metric mounting Threads	012	12mm
E	Cushions ⁶ , metric mounting threads	016	16mm
		020	20mm
		025	25mm
		032	32mm
		040	40mm
		050	50mm
		063	63mm
		080	80mm
		100	100mm

Port location	
1	Top
2	Side
3	Rear

Stroke length	
Order standard stroke from tables below using 3 digits, i.e. 025 = 25mm	

Other options		
Tool Plate	Seals	
	Buna-N	Fluorocarbon
Front	G	L
Front & Rear ⁵	H	M

Ports / flow controls			
Ports	Flow controls ⁵		
	None	Prestolok	Threaded
NPTF	A	E	P
BSP or M5	B	F	R

Bearings / shaft	
J1	Composite bushings, chrome plated rod
J3	Composite bushings, stainless steel rod
K1	Composite high load bearings, chrome plated rod ⁷
K3	Composite high load bearings, stainless steel rod ⁷
H3	Linear ball bearings, stainless steel rod
L3	Linear ball high load bearings, stainless steel rod ⁷

Extend options	
A	Shock absorber ^{1,9}
K	Bumpers and adjustable stop collars ²
L	Bumpers and shock absorbers ^{3,9}
N	None

Retract options	
A	Shock absorber ^{4,9}
K	Bumpers and adjustable stop collars ⁴
L	Bumpers and shock absorber ^{4,9}
R	Rod lock (sizes 32-100 only)
N	None

Sensor option		Proximity sensor ⁸			None
Type	Connection	Extend	Retract	Extend & retract	
PNP	Lead type	U	A	E	N
	Plug in	V	B	F	
NPN	Lead type	W	C	J	
	Plug in	Y	D	K	

Sensors
 For sensors see page B296.

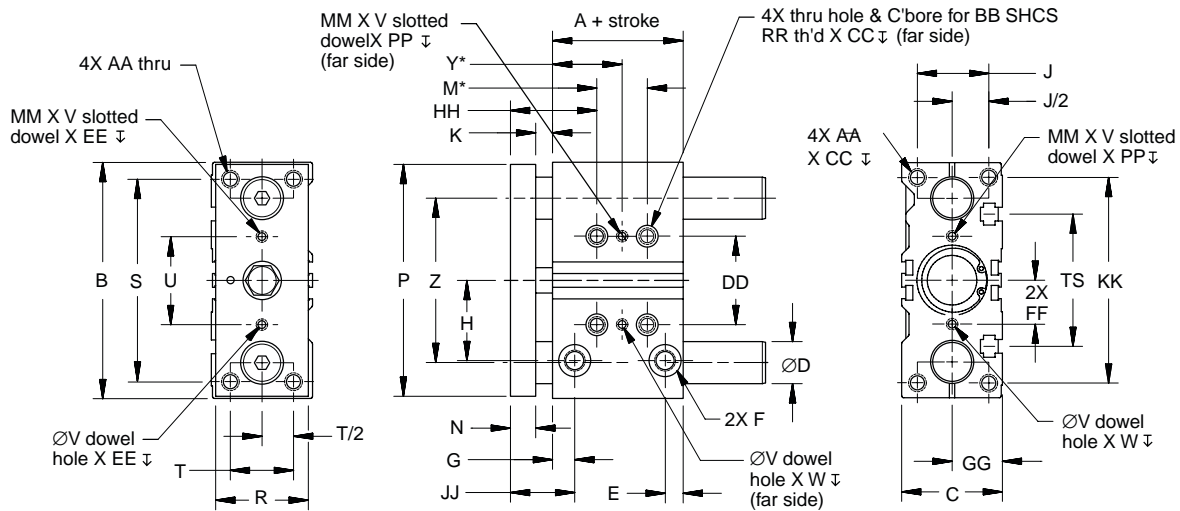
Standard strokes, basic units*												
Bore size	10	20	25	30	40	50	75	100	125	150	175	200
12 - 16	•	•		•	•	•	•	•	•	•	•	•
20 - 25		•		•	•	•	•	•	•	•	•	•
32 - 100			•			•	•	•	•	•	•	•

Standard strokes, cushioned units*												
Bore Size	10	20	25	30	40	50	75	100	125	150	175	200
20 - 63			•			•	•	•	•	•	•	•
80 - 100						•	•	•	•	•	•	•

*Consult factory for special stroke lengths.

Notes:

- 1 not available with rear or side port; not available with retract option I; not available on 100mm size with 25mm stroke.
- 2 Not available with rear ports.
- 3 Not available with rear or side ports; not available with retract option a.
- 4 Not available with rod lock.
- 5 Not available with rear ports.
- 6 Cushions not available on sizes 12 & 16. Cushions may not be effective in combination with shocks or bumpers/stop collars.
- 7 High load bearings option only available with 50mm and greater strokes.
- 8 Consult factory for retract proximity sensors on rodlock unit.
- 9 Shock absorbers not available on sizes 12 & 16.



Dimensions in mm (inch)

Note: See next page for these stroke dependent dimensions.

Bore	A	B	C	D ₁	D ₂	E	F	G	H	J	K	N	P	R	S	T	U
12	29 (1.14)	58 (2.28)	26 (1.02)	6 (0.24)	8 (0.31)	6.75 (0.27)	M5x0.8*	10.5 (0.41)	7.5 (0.30)	18 (0.71)	6 (0.24)	7 (0.28)	56 (2.20)	22 (0.87)	48 (1.89)	14 (0.55)	23 (0.91)
16	33 (1.30)	64 (2.52)	30 (1.18)	8 (0.31)	10 (0.39)	6.2 (0.24)	M5x0.8*	12 (0.47)	16.5 (0.65)	22 (0.87)	5 (0.20)	8 (0.31)	62 (2.44)	25 (0.98)	54 (2.13)	16 (0.63)	24 (0.94)
20	37 (1.46)	83 (3.27)	36 (1.42)	10 (0.39)	12 (0.47)	10 (0.39)	1/8 BSPP 1/8 NPTF	11 (0.43)	25 (0.98)	24 (0.94)	8 (0.31)	8 (0.31)	81 (3.19)	30 (1.18)	70 (2.76)	18 (0.71)	28 (1.10)
25	37.5 (1.48)	93 (3.66)	42 (1.65)	12 (0.47)	16 (0.63)	10.5 (0.41)	1/8 BSPP 1/8 NPTF	10.5 (0.41)	30 (1.18)	30 (1.18)	8 (0.31)	8 (0.31)	91 (3.58)	38 (1.50)	78 (3.07)	26 (1.02)	34 (1.34)
32	37.5 (1.48)	112 (4.41)	48 (1.89)	16 (0.63)	20 (0.79)	10.75 (0.42)	1/8 BSPP 1/8 NPTF	11.75 (0.46)	37.5 (1.48)	34 (1.34)	10 (0.39)	12 (0.47)	110 (4.33)	44 (1.73)	96 (3.78)	30 (1.18)	42 (1.65)
40	44 (1.73)	120 (4.72)	54 (2.13)	16 (0.63)	20 (0.79)	11.5 (0.45)	1/8 BSPP 1/8 NPTF	16 (0.63)	42 (1.65)	40 (1.57)	10 (0.39)	12 (0.47)	118 (4.65)	44 (1.73)	104 (4.09)	30 (1.18)	50 (1.97)
50	44 (1.73)	148 (5.83)	64 (2.52)	20 (0.79)	25 (0.98)	12.5 (0.49)	1/4 BSPP 1/4 NPTF	16 (0.63)	49 (1.93)	46 (1.81)	15 (0.59)	13 (0.51)	146 (5.75)	60 (2.36)	130 (5.12)	40 (1.57)	66 (2.60)
63	49 (1.93)	162 (6.38)	78 (3.07)	20 (0.79)	25 (0.98)	13 (0.51)	1/4 BSPP 1/4 NPTF	16 (0.63)	57 (2.24)	58 (2.28)	15 (0.59)	13 (0.51)	158 (6.22)	70 (2.76)	130 (5.12)	50 (1.97)	80 (3.15)
80	56.5 (2.22)	202 (7.95)	91.5 (3.60)	25 (0.98)	30 (1.18)	17 (0.67)	3/8 BSPP 3/8 NPTF	18 (0.71)	74 (2.91)	54 (2.13)	18 (0.71)	22 (0.87)	198 (7.80)	75 (2.95)	174 (6.85)	52 (2.05)	100 (3.94)
100	66 (2.60)	240 (9.45)	112 (4.41)	30 (1.18)	35 (1.38)	20 (0.79)	3/8 BSPP 3/8 NPTF	23 (0.91)	94 (3.70)	48 (1.89)	25 (0.98)	25 (0.98)	236 (9.29)	89 (3.50)	210 (8.27)	64 (2.52)	124 (4.88)

Bore	V ^{+0.01} -0.00	W	Z	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	MM**	PP	RR	TS
12	3.06 (0.12)	6 (0.24)	41 (1.61)	M4 x 0.7	M4	10 (0.39)	23 (0.91)	4.5 (0.18)	11.5 (0.45)	13 (0.51)	18 (0.71)	23.5 (0.93)	50 (1.97)	3.5 (0.14)	3 (0.12)	M5 x 0.8	37 (1.46)
16	3.06 (0.12)	6 (0.24)	46 (1.81)	M5 x 0.8	M4	10 (0.39)	24 (0.94)	4.5 (0.18)	12 (0.47)	15 (0.59)	18 (0.71)	25 (0.98)	56 (2.20)	3.5 (0.14)	3 (0.12)	M5 x 0.8	38 (1.50)
20	3.06 (0.12)	6 (0.24)	54 (2.13)	M5 x 0.8	M5	12 (0.47)	28 (1.10)	4.5 (0.18)	14 (0.55)	18 (0.71)	33 (1.30)	27 (1.06)	72 (2.83)	3.5 (0.14)	3 (0.12)	M6 x 1.0	44 (1.73)
25	4.06 (0.16)	6 (0.24)	64 (2.52)	M6 x 1.0	M5	12 (0.47)	34 (1.34)	4.5 (0.18)	17 (0.67)	21 (0.83)	33 (1.30)	26.5 (1.04)	82 (3.23)	4.5 (0.18)	3 (0.12)	M6 x 1.0	50 (1.97)
32	4.06 (0.16)	6 (0.24)	78 (3.07)	M8 x 1.25	M6	16 (0.63)	42 (1.65)	5.5 (0.22)	21 (0.83)	24 (0.94)	43 (1.69)	33.75 (1.33)	98 (3.86)	4.5 (0.18)	3 (0.12)	M8 x 1.25	63 (2.48)
40	4.06 (0.16)	6 (0.24)	86 (3.39)	M8 x 1.25	M6	16 (0.63)	50 (1.97)	5.5 (0.22)	25 (0.98)	27 (1.06)	44 (1.73)	38 (1.50)	106 (4.17)	4.5 (0.18)	3 (0.12)	M8 x 1.25	72 (2.83)
50	5.04 (0.20)	8 (0.31)	110 (4.33)	M10 x 1.5	M8	20 (0.79)	66 (2.60)	5.5 (0.22)	33 (1.30)	32 (1.26)	52 (2.05)	44 (1.73)	130 (5.12)	6 (0.24)	4 (0.16)	M1 x 1.5	92 (3.62)
63	5.04 (0.20)	8 (0.31)	124 (4.88)	M10 x 1.5	M8	20 (0.79)	80 (3.15)	5.5 (0.22)	40 (1.57)	39 (1.54)	52 (2.05)	44 (1.73)	142 (5.59)	6 (0.24)	4 (0.16)	M10 x 1.5	110 (4.33)
80	6.04 (0.24)	10 (0.39)	156 (6.14)	M12 x 1.75	M10	24 (0.94)	100 (3.94)	7.0 (0.28)	50 (1.97)	46 (1.81)	68 (2.68)	58 (2.28)	180 (7.09)	7 (0.28)	5 (0.20)	M12 x 1.75	140 (5.51)
100	6.04 (0.24)	10 (0.39)	188 (7.40)	M14 x 2.0	M12	28 (1.10)	124 (4.88)	7.0 (0.28)	62 (2.44)	56 (2.20)	61 (2.40)	73 (2.87)	221 (8.70)	7 (0.28)	5 (0.20)	M14 x 2.0	166 (6.54)

D₁ with linear ball bearing; D₂ with composite bushing

* 10-32 fittings will fit into M5x0.8 ports.

** Slot length

B
 Guided Cylinders
 Actuator Products

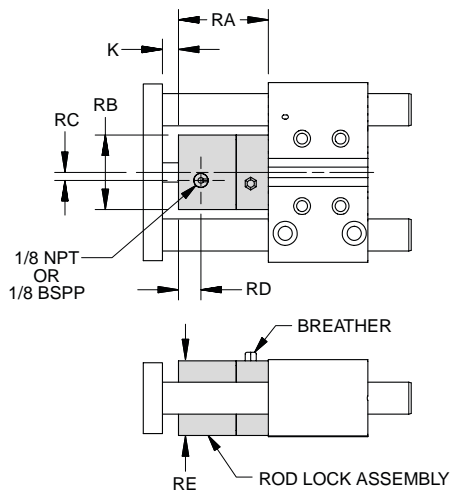
Stroke Dependent Dimensions

Bore size	Dim	Standard stroke length (mm)												
		10	20	25	30	40	50	75	100	125	150	175	200	
12	M	20 (0.79)	20 (0.79)	N/A	20 (0.79)	40 (1.57)	40 (1.57)	40 (1.57)	40 (1.57)	40 (1.57)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)
	Y	15 (0.59)	15 (0.59)	N/A	15 (0.59)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)
16	M	24 (0.94)	24 (0.94)	N/A	24 (0.94)	44 (1.73)	44 (1.73)	44 (1.73)	44 (1.73)	44 (1.73)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)
	Y	17 (0.67)	17 (0.67)	N/A	17 (0.67)	27 (1.06)	27 (1.06)	27 (1.06)	27 (1.06)	27 (1.06)	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)
20, 25	M	N/A	24 (0.94)	N/A	24 (0.94)	44 (1.73)	44 (1.73)	44 (1.73)	44 (1.73)	44 (1.73)	120 (4.72)	120 (4.72)	120 (4.72)	120 (4.72)
	Y	N/A	29 (1.14)	N/A	29 (1.14)	39 (1.54)	39 (1.54)	39 (1.54)	39 (1.54)	39 (1.54)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)
32	M	N/A	N/A	24 (0.94)	N/A	N/A	48 (1.89)	48 (1.89)	48 (1.89)	48 (1.89)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)
	Y	N/A	N/A	33 (1.30)	N/A	N/A	45 (1.77)	45 (1.77)	45 (1.77)	45 (1.77)	83 (3.27)	83 (3.27)	83 (3.27)	83 (3.27)
40	M	N/A	N/A	24 (0.94)	N/A	N/A	48 (1.89)	48 (1.89)	48 (1.89)	48 (1.89)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)
	Y	N/A	N/A	34 (1.34)	N/A	N/A	46 (1.81)	46 (1.81)	46 (1.81)	46 (1.81)	84 (3.31)	84 (3.31)	84 (3.31)	84 (3.31)
50	M	N/A	N/A	24 (0.94)	N/A	N/A	48 (1.89)	48 (1.89)	48 (1.89)	48 (1.89)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)
	Y	N/A	N/A	36 (1.42)	N/A	N/A	48 (1.89)	48 (1.89)	48 (1.89)	48 (1.89)	86 (3.39)	86 (3.39)	86 (3.39)	86 (3.39)
63	M	N/A	N/A	24 (0.94)	N/A	N/A	52 (2.05)	52 (2.05)	52 (2.05)	52 (2.05)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)
	Y	N/A	N/A	38 (1.50)	N/A	N/A	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	88 (3.46)	88 (3.46)	88 (3.46)	88 (3.46)
80	M	N/A	N/A	28 (1.10)	N/A	N/A	52 (2.05)	52 (2.05)	52 (2.05)	52 (2.05)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)
	Y	N/A	N/A	42 (1.65)	N/A	N/A	54 (2.13)	54 (2.13)	54 (2.13)	54 (2.13)	92 (3.62)	92 (3.62)	92 (3.62)	92 (3.62)
100	M	N/A	N/A	48 (1.89)	N/A	N/A	72 (2.83)	72 (2.83)	72 (2.83)	72 (2.83)	148 (5.83)	148 (5.83)	148 (5.83)	148 (5.83)
	Y	N/A	N/A	35 (1.38)	N/A	N/A	47 (1.85)	47 (1.85)	47 (1.85)	47 (1.85)	85 (3.35)	85 (3.35)	85 (3.35)	85 (3.35)

B

**Guided Cylinders
Actuator Products**

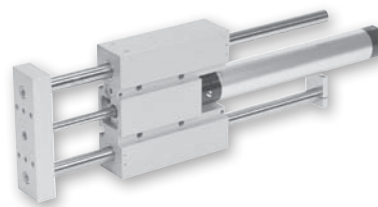
Rod Lock (R)



Dimensions in mm (inch)

Bore size	RA	RB	RC	RD	RE	K
32	56 (2.20)	46.5 (1.83)	5 (0.20)	14 (0.55)	46.5 (1.83)	10 (0.39)
40	58 (2.28)	50.8 (2.00)	6 (0.24)	10 (0.39)	50.8 (2.00)	10 (0.39)
50	66 (2.60)	63.5 (2.50)	0 (0.00)	14 (0.55)	63.5 (2.50)	15 (0.59)
63	83 (3.27)	76.2 (3.00)	7.4 (0.29)	18 (0.71)	76.2 (3.00)	15 (0.59)
80	100 (3.94)	95.25 (3.75)	10 (0.39)	26 (1.02)	92.75 (3.65)	18 (0.71)
100	116 (4.57)	111 (4.37)	10 (0.39)	43 (1.69)	111 (4.37)	25 (0.98)

- 3 body styles (Thrust, Reach, Base)
- 8 bore sizes 20mm to 100mm
- Maximum strokes 400 to 1000mm depending on model
- 3 Bearing options: composite, ball bearing, self-aligning ball bearing
- Dowel holes standard on body and tool plate
- Available with adjustable stroke and shock absorbers
- Direct mount of thrust and reach to same size base
- Powered by P1L cylinder



Operating information

Operating pressure: 10 bar (145 PSIG)
 Temperature range:
 Standard seals -17°C to 74°C (0°F to 165°F)
 Fluorocarbon seals* -17°C to 121°C (0°F to 250°F) *
 See fluorocarbon seal option for high temperature applications.
 Operating characteristics: Double acting
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

P5L - R L 100 J1 A A N F N - 0900 - A

Series		Bore size		Cylinder seals		Stroke length		Design series	
T	Thrust slide	020	20mm	N	Nitrile (standard)	Order in 1mm increments.		A	Current design
R	Reach slide	025	25mm	V	Fluorocarbon (high temperature)				
B	Base slide	032	32mm						
Cylinder type		040	40mm						
L	P1L cylinder	050	50mm						
		063	63mm						
		080	80mm						
		100	100mm						

Bushings	
J1	Composite bushing, chrome plated shafts
J2	Composite bushing, oversized chrome plated shafts
J3	Composite bushing, stainless steel shafts
J4	Composite bushing, oversized stainless steel shafts
G1	Composite bushing, chrome plated shafts, contaminant tolerant seals
G3	Composite bushing, stainless steel shafts, contaminant tolerant seals
H3	Linear ball bearings, stainless steel shafts
H5	Linear ball bearings, carbon steel shafts
S3*	Self aligning linear ball bearings, stainless steel shafts
S5*	Self aligning linear ball bearings, carbon steel shafts

* Not available 20mm bore models

Extend options		Retract options	
N	None	N	None
A	Shock/stroke adjusters	A	Shock/stroke adjusters
B	Bumpers (base slides only)	B	Bumpers only
C	Cushions both ends	C	Cushions both ends
E	Micro-adjusters and cushions (both ends only)	E	Micro-adjusters and cushions (both ends only)
H	Cushions and bumpers (includes options C & K)	H	Cushions and bumpers (includes options C & K)
K	Bumpers and adjustable stop collars	K	Bumpers and adjustable stop collars
L	Shock absorbers and bumpers (N/A on base slides)	L	Shock absorbers and bumpers (N/A on base slides)

T-slots	
-	Standard (Extruded T-slots on sizes 20-40, no T-slots on sizes 50-100)
A**	Machined T-slots (Sizes 50-100)

** Not available on sizes 20-40

Proximity sensor options	
N	No Sensor
P	PNP, lead type
R	NPN, lead type
S	PNP, plug in type
T	NPN, plug in type
W	Prox ready, 8mm (no sensor supplied)
Z	Prox ready, 12mm (no sensor supplied)

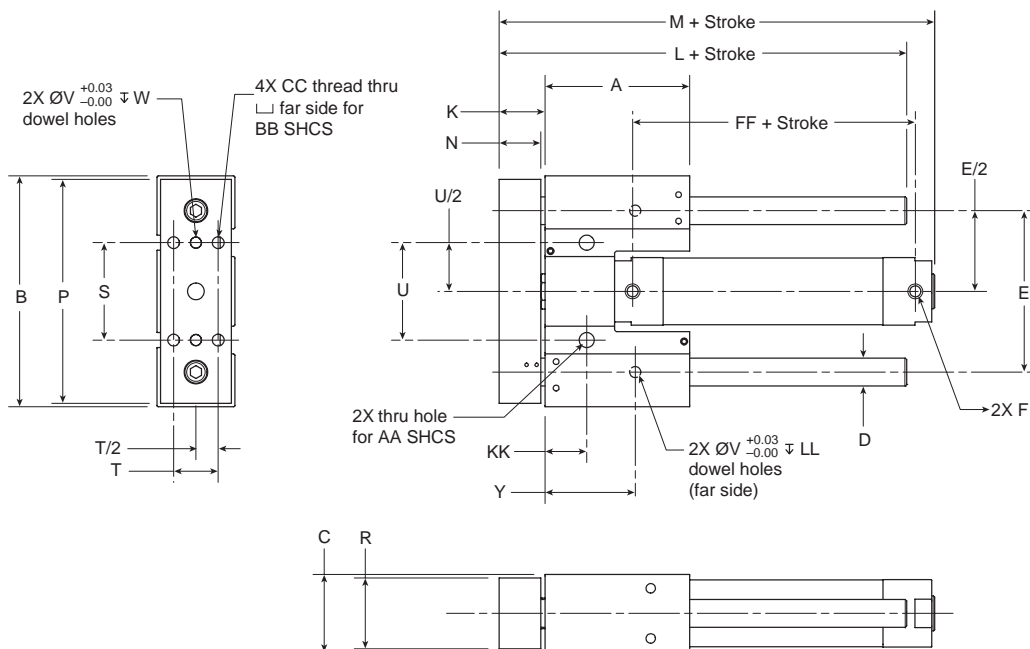
** Note: Piston magnet is standard on all cylinders. Inductive proximity sensors are included with Options P, R, S & T.

Cylinder port style	
G	BSPT ports
H	NPTF ports
P	BSPT ports w/ Presto-lok flow controls (mm)
F	NPTF ports w/ Presto-lok flow controls (inch)
B	BSPT ports w/ flow controls
N	NPTF ports w/ flow controls

Order P8S Series reed and solid state sensors separately from Electronic Sensors Section.

Sensors
 For sensors see page B296.

Thrust Slides



Dimensions in mm (inch)

Bore size	A	B	C	Ds*	Do*	E	F**	K	L	M	N	P	R
20	60 (2.4)	98 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	68 (2.7)	1/8†	20 (0.8)	86 (3.4)	114 (4.5)	17 (0.7)	96 (3.8)	26 (1.0)
25	76 (3.0)	122 (4.8)	38 (1.5)	12 (0.5)	16 (0.6)	84 (3.3)	1/8†	25 (1.0)	107 (4.2)	126 (5.0)	22 (0.9)	119 (4.7)	33 (1.3)
32	84 (3.3)	140 (5.5)	44 (1.7)	16 (0.6)	20 (0.8)	92 (3.6)	1/8	27 (1.1)	117 (4.6)	140 (5.5)	24 (0.9)	137 (5.4)	39 (1.5)
40	104 (4.1)	166 (6.5)	56 (2.2)	20 (0.8)	25 (1.0)	116 (4.6)	1/8	33 (1.3)	143 (5.6)	163 (6.4)	30 (1.2)	161 (6.3)	51 (2.0)
50	130 (5.1)	216 (8.5)	70 (2.8)	25 (1.0)	30 (1.2)	148 (5.8)	1/4	39 (1.5)	175 (6.9)	195 (7.7)	36 (1.4)	211 (8.3)	63 (2.5)
63	152 (6.0)	260 (10.2)	84 (3.3)	30 (1.2)	40 (1.6)	176 (6.9)	1/4	43 (1.7)	203 (8.0)	219 (8.6)	40 (1.6)	255 (10.0)	77 (3.0)
80	180 (7.1)	320 (12.6)	102 (4.0)	40 (1.6)	50 (2.0)	220 (8.7)	3/8	49 (1.9)	237 (9.3)	249 (9.8)	46 (1.8)	315 (12.4)	95 (3.7)
100	222 (8.7)	390 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	260 (10.2)	1/2	59 (2.3)	289 (11.4)	306 (12.0)	56 (2.2)	383 (15.1)	111 (4.4)

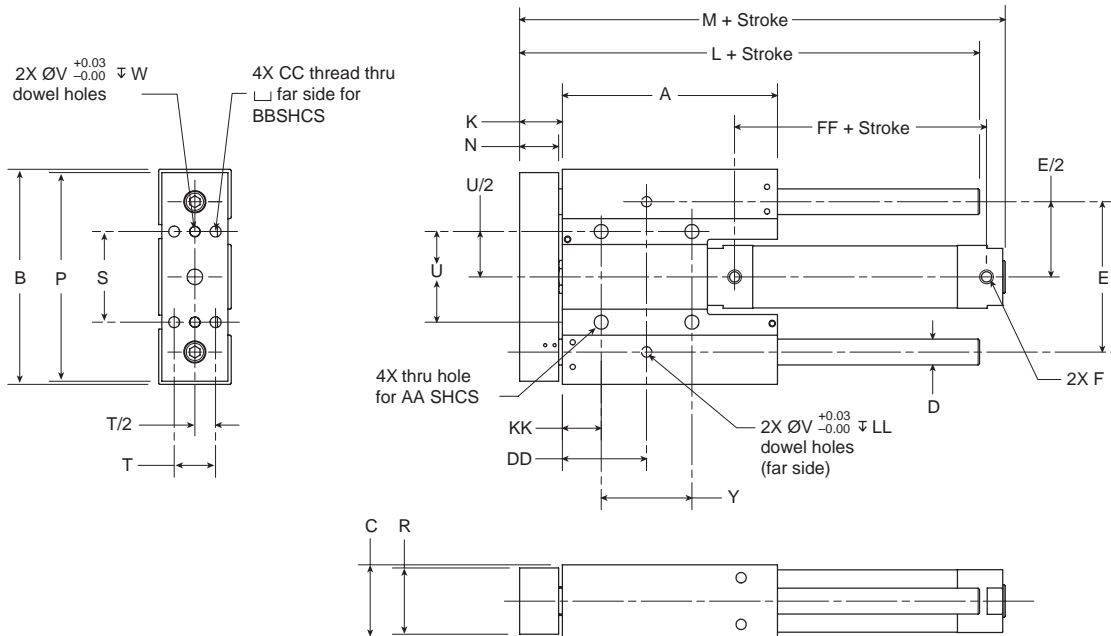
Bore size	S	T	U	V	W	Y	AA	BB	CC	FF	KK	LL
20	40 (1.6)	16 (0.6)	40 (1.6)	4.03 (0.2)	4 (0.2)	36 (1.4)	M5	M4	M5x0.8	45 (1.8)	16 (0.6)	4 (0.2)
25	48 (1.9)	20 (0.8)	48 (1.9)	5.03 (0.2)	5 (0.2)	46 (1.8)	M6	M5	M6x1.0	46 (1.8)	22 (0.9)	5 (0.2)
32	50 (2.0)	24 (0.9)	50 (2.0)	6.03 (0.2)	6 (0.2)	53 (2.1)	M8	M6	M8x1.25	43 (1.7)	28 (1.1)	6 (0.2)
40	70 (2.8)	32 (1.3)	70 (2.8)	8.03 (0.3)	8 (0.3)	65 (2.6)	M10	M8	M10x1.5	49 (1.9)	30 (1.2)	8 (0.3)
50	80 (3.1)	42 (1.7)	80 (3.1)	8.03 (0.3)	8 (0.3)	83 (3.3)	M10	M8	M10x1.5	53 (2.1)	43 (1.7)	8 (0.3)
63	100 (3.9)	52 (2.0)	100 (3.9)	10.03 (0.4)	10 (0.4)	101 (4.0)	M12	M10	M12x1.75	52 (2.0)	51 (2.0)	10 (0.4)
80	124 (4.9)	62 (2.4)	124 (4.9)	12.03 (0.5)	12 (0.5)	127 (5.0)	M16	M14	M16x1.5	64 (2.5)	65 (2.6)	12 (0.5)
100	148 (5.8)	72 (2.8)	148 (5.8)	12.03 (0.5)	12 (0.5)	154 (6.1)	M20	M16	M20x2.5	66 (2.6)	80 (3.1)	12 (0.5)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32

B

Guided Cylinders
 Actuator Products

Reach Slides



Dimensions in mm (inch)

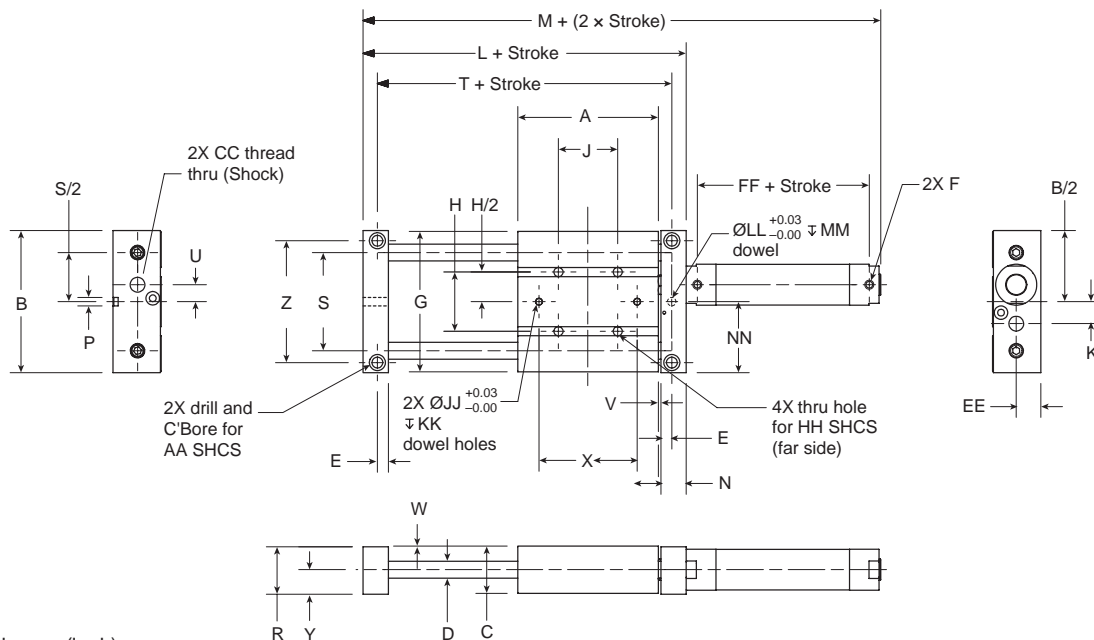
Bore size	A	B	C	Ds*	Do*	E	F**	K	L	M	N	P	R
20	98 (3.9)	98 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	68 (2.7)	1/8†	20 (0.8)	124 (4.9)	152 (6.0)	17 (0.7)	96 (3.8)	26 (1.0)
25	122 (4.8)	122 (4.8)	38 (1.5)	12 (0.5)	16 (0.6)	84 (3.3)	1/8†	25 (1.0)	153 (6.0)	172 (6.8)	22 (0.9)	119 (4.7)	33 (1.3)
32	140 (5.5)	140 (5.5)	44 (1.7)	16 (0.6)	20 (0.8)	92 (3.6)	1/8	27 (1.1)	173 (6.8)	196 (7.7)	24 (0.9)	137 (5.4)	39 (1.5)
40	166 (6.5)	166 (6.5)	56 (2.2)	20 (0.8)	25 (1.0)	116 (4.6)	1/8	33 (1.3)	205 (8.1)	225 (8.9)	30 (1.2)	161 (6.3)	51 (2.0)
50	216 (8.5)	216 (8.5)	70 (2.8)	25 (1.0)	30 (1.2)	148 (5.8)	1/4	39 (1.5)	261 (10.3)	281 (11.1)	36 (1.4)	211 (8.3)	63 (2.5)
63	260 (10.2)	260 (10.2)	84 (3.3)	30 (1.2)	40 (1.6)	176 (6.9)	1/4	43 (1.7)	311 (12.2)	327 (12.9)	40 (1.6)	255 (10.0)	77 (3.0)
80	320 (12.6)	320 (12.6)	102 (4.0)	40 (1.6)	50 (2.0)	220 (8.7)	3/8	49 (1.9)	377 (14.8)	389 (15.3)	46 (1.8)	315 (12.4)	9 (3.7)
100	390 (15.4)	390 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	260 (10.2)	1/2	59 (2.3)	457 (18.0)	474 (18.7)	56 (2.2)	383 (15.1)	111 (4.4)

Bore size	S	T	U	V	W	Y	AA	BB	CC	DD	FF	KK	LL
20	40 (1.6)	16 (0.6)	40 (1.6)	4.03 (0.2)	4 (0.2)	40 (1.6)	M5	M4	M5X0.8	36 (1.4)	45 (1.8)	16 (0.6)	4 (0.2)
25	48 (1.9)	20 (0.8)	48 (1.9)	5.03 (0.2)	5 (0.2)	48 (1.9)	M6	M5	M6X1.0	46 (1.8)	46 (1.8)	22 (0.9)	5 (0.2)
32	50 (2.0)	24 (0.9)	50 (2.0)	6.03 (0.2)	6 (0.2)	50 (2.0)	M8	M6	M8X1.25	53 (2.1)	43 (1.7)	28 (1.1)	6 (0.2)
40	70 (2.8)	32 (1.3)	70 (2.8)	8.03 (0.3)	8 (0.3)	70 (2.8)	M10	M8	M10X1.5	65 (2.6)	49 (1.9)	30 (1.2)	8 (0.3)
50	80 (3.1)	42 (1.7)	80 (3.1)	8.03 (0.3)	8 (0.3)	80 (3.1)	M10	M8	M10X1.5	83 (3.3)	53 (2.1)	43 (1.7)	8 (0.3)
63	100 (3.9)	52 (2.0)	100 (3.9)	10.03 (0.4)	10 (0.4)	100 (3.9)	M12	M10	M12X1.75	101 (4.0)	52 (2.0)	51 (2.0)	10 (0.4)
80	124 (4.9)	62 (2.4)	124 (4.9)	12.03 (0.5)	12 (0.5)	124 (4.9)	M16	M14	M16X1.5	127 (5.0)	64 (2.5)	65 (2.6)	12 (0.5)
100	148 (5.8)	72 (2.8)	148 (5.8)	12.03 (0.5)	12 (0.5)	148 (5.8)	M20	M16	M20X2.5	154 (6.1)	66 (2.6)	80 (3.1)	12 (0.5)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32

B
 Guided Cylinders
 Actuator Products

Base Slides



Dimensions in mm (inch)

Bore size	A	B	C	Ds*	Do*	E	F**	G	H	J	K	L	M	N	P+.03	R	S
20	98 (3.9)	100 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	8 (0.3)	1/8†	98 (3.9)	40 (1.6)	40 (1.6)	18 (0.7)	140 (5.5)	211 (8.3)	18 (0.7)	5.03 (0.2)	30 (1.2)	68 (2.7)
25	122 (4.8)	124 (4.9)	38 (1.5)	12 (0.5)	16 (0.6)	14 (0.6)	1/8†	122 (4.8)	48 (1.9)	48 (1.9)	22 (0.9)	176 (6.9)	247 (9.7)	24 (0.9)	6.03 (0.2)	38 (1.5)	84 (3.3)
32	140 (5.5)	142 (5.6)	44 (1.7)	16 (0.6)	20 (0.8)	12 (0.5)	1/8	140 (5.5)	50 (2.0)	50 (2.0)	22 (0.9)	198 (7.8)	271 (10.7)	26 (1.0)	6.03 (0.2)	44 (1.7)	92 (3.6)
40	166 (6.5)	168 (6.6)	56 (2.2)	20 (0.8)	25 (1.0)	13 (0.5)	1/8	166 (6.5)	70 (2.8)	70 (2.8)	26 (1.0)	232 (9.1)	312 (12.3)	30 (1.2)	10.03 (0.4)	56 (2.2)	116 (4.6)
50	216 (8.5)	218 (8.6)	70 (2.8)	25 (1.0)	30 (1.2)	16 (0.6)	1/4	216 (8.5)	80 (3.1)	80 (3.1)	28 (1.1)	292 (11.5)	384 (15.1)	35 (1.4)	10.03 (0.4)	70 (2.8)	148 (5.8)
63	260 (10.2)	262 (10.3)	84 (3.3)	30 (1.2)	40 (1.6)	19 (0.7)	1/4	260 (10.2)	100 (3.9)	100 (3.9)	42 (1.7)	350 (13.8)	442 (17.4)	42 (1.7)	12.03 (0.5)	84 (3.3)	176 (6.9)
80	320 (12.6)	322 (12.7)	102 (4.0)	40 (1.6)	50 (2.0)	24 (0.9)	3/8	320 (12.6)	124 (4.9)	124 (4.9)	42 (1.7)	434 (17.1)	545 (21.5)	54 (2.1)	16.03 (0.6)	102 (4.0)	220 (8.7)
100	390 (15.4)	392 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	28 (1.1)	1/2	390 (15.4)	148 (5.8)	148 (5.8)	62 (2.4)	528 (20.8)	639 (25.2)	66 (2.6)	16.03 (0.6)	120 (4.7)	260 (10.2)

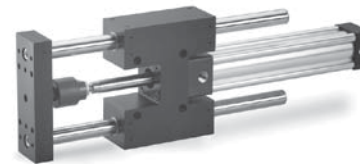
Bore size	T	U	V***	W	X	Y	Z	AA	CC	EE	FF	HH	JJ	KK	LL	MM	NN
20	120 (4.7)	11 (0.4)	3 (0.1)	1 (0.0)	68 (2.7)	14 (0.6)	86 (3.4)	M6	M12	16 (0.6)	45 (1.8)	M5	4.03 (0.2)	4 (0.2)	5.03 (0.2)	5 (0.2)	50 (2.0)
25	156 (6.1)	12 (0.5)	3 (0.1)	1 (0.0)	84 (3.3)	18 (0.7)	104 (4.1)	M8	M14	20 (0.8)	46 (1.8)	M6	5.03 (0.2)	5 (0.2)	6.03 (0.2)	6 (0.2)	62 (2.4)
32	170 (6.7)	11 (0.4)	3 (0.1)	1 (0.0)	92 (3.6)	21 (0.8)	120 (4.7)	M10	M14	23 (0.9)	43 (1.7)	M8	6.03 (0.2)	6 (0.2)	6.03 (0.2)	6 (0.2)	71 (2.8)
40	198 (7.8)	20 (0.8)	3 (0.1)	1 (0.0)	116 (4.6)	27 (1.1)	144 (5.7)	M12	M20	29 (1.1)	49 (1.9)	M10	8.03 (0.3)	8 (0.3)	10.03 (0.4)	10 (0.4)	84 (3.3)
50	254 (10.0)	22 (0.9)	3 (0.1)	1 (0.0)	148 (5.8)	34 (1.3)	188 (7.4)	M16	M25	36 (1.4)	53 (2.1)	M10	8.03 (0.3)	8 (0.3)	10.03 (0.4)	10 (0.4)	109 (4.3)
63	304 (12.0)	30 (1.2)	3 (0.1)	1 (0.0)	176 (6.9)	41 (1.6)	224 (8.8)	M20	M25	43 (1.7)	52 (2.0)	M12	10.03 (0.4)	10 (0.4)	12.03 (0.5)	12 (0.5)	131 (5.2)
80	374 (14.7)	36 (1.4)	3 (0.1)	1 (0.0)	220 (8.7)	50 (2.0)	276 (10.9)	M24	M33	52 (2.0)	64 (2.5)	M16	12.03 (0.5)	12 (0.5)	16.03 (0.6)	16 (0.6)	161 (6.3)
100	452 (17.8)	36 (1.4)	3 (0.1)	1 (0.0)	260 (10.2)	59 (2.3)	336 (13.2)	M30	M36	61 (2.4)	66 (2.6)	M20	12.03 (0.5)	12 (0.5)	16.03 (0.6)	16 (0.6)	196 (7.7)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32
 *** Space between housing and end plate in both extend and retract positions.

B

**Guided Cylinders
 Actuator Products**

- Medium duty to extremely heavy duty linear motion
- Powered by the 3MA or 4MA NFPA cylinder, with ISO options available
- Bore sizes 1-1/2", 2", and 2-1/2"
- Thrust, reach, and compact versions available
- Shock absorber, bumpers/stop collars, and proximity sensor options available



Operating information

Operating pressure:	Maximum	100 PSIG (7 bar), air – 4MAJ cylinder 150 PSIG (10 bar), air – P1D cylinder 250 PSIG (17 bar), air – 3MA, 4MA and 2A cylinders 400 PSIG (28 bar), oil – 4ML cylinder only 750 PSIG (52 bar), oil – 3L cylinder only
Temperature range:	Cylinder	Standard seals 0°F to 165°F (-18°C to 74°C) Fluorocarbon seals* 0°F to 250°F (-18°C to 121°C)
Filtration requirements:		40 micron, dry filtered air
For technical information see CD		

* See fluorocarbon seal option for high temperature applications. Not available for 3MA or rod lock cylinders.

Ordering information for HBC, HBT and HBR

HBT	25	-	08	A	P1	T	F	4A	-	B	
------------	-----------	----------	-----------	----------	-----------	----------	----------	-----------	----------	----------	--

Series	
HBC	Compact slide
HBT	Thrust slide
HBR	Reach slide

Stroke length	
Order in 1" increments. 4	
For 3-position units, specify intermediate and total stroke separated by a "/", i.e. 02/06.	
Consult factory for strokes over 36".	

Bushings	
T	Composite (standard)
D	Linear ball bearing
T1	Composite with oversized support shafts
TC	Composite with contaminant-tolerant seals

Design Series	
B	Current design level

Model	
15	1-1/2" bore, 20mm shaft
20	2" bore, 25mm shaft
25	2-1/2" bore, 30mm shaft

Slide Configuration Options	
Blank	None
A	Shock absorber, both ends
A1	Shock absorber, extend only
A2	Shock absorber, retract only
A3	Shock ready, both ends
A4	Shock ready, extend
A5	Shock ready, retract
B	Bumpers both ends 1
B1	Bumper & adjustable stop collar, extend only
B2	Bumper retract only
B3	Bumper & adjustable stop collar, retract only
B4	Bumper & adjustable stop collar, both ends
C	Cushions on cylinder, both ends 2
C1	Cushion on cylinder, extend only 2
C2	Cushion on cylinder, retract only 2
X	Special slide configuration (please specify)

Proximity Sensor Options	
Blank	None
P	PNP, flying lead type
N	NPN, flying lead type
P1	PNP, plug-in connector
N1	NPN, plug-in connector
J	8mm sensor mounting bracket, no sensor supplied
J1	12mm sensor mounting bracket, no sensor supplied

Note: 8mm inductive proximity sensors are included with Options P, N, P1, N1. Magnetic piston is standard for 3MA, 4MA, 4MAJ, 4ML and P1D cylinders. Order reed and solid state sensors separately for these cylinders from the Electronic Sensors section.

Other Options	
(More than one selection is possible)	
Blank	None
F	Flow controls (presto-lok)
G	Flow controls (NPT)
K	Stainless steel support shafting

Special Options	
Blank	standard
(Two digit code assigned by factory and applies when any "X" appears in the model number or when special options or features are required.)	

Cylinder Options	
(More than one selection is possible)	
Blank	None
V	Fluorocarbon cylinder seals 3
L1	Left hand assembly
L3	Cylinder ports at position 3

Cylinder Type	
3A	3MA NFPA air cylinder, NPTF ports 2
4A	4MA NFPA air cylinder, NPTF ports
4J	4MAJ NFPA air cylinder with manual override rodlock, NPTF ports, 100 PSIG max.
D	P1D ISO cylinder w/ removable gland, BSPP ports
D1	P1D ISO cylinder w/ removable gland, Standard Rodlock, BSPP ports
D2	P1D ISO cylinder w/ removable gland, manual override rodlock, BSPP ports
E	P1D ISO cylinder w/ removable gland, NPTF ports
E1	P1D ISO cylinder w/ removable gland, standard rodlock, NPTF ports
E2	P1D ISO cylinder w/ removable gland, manual override rodlock, NPTF ports
4L	4ML NFPA hydraulic cylinder, NPTF ports, 400 PSIG max. 2
S	2A NFPA steel air cylinder, 250 PSIG max.
S1	3L NFPA steel hydraulic cylinder, 750 PSIG max.
Q	No cylinder, NFPA cylinder mounting
Q1	No cylinder, ISO cylinder mounting
X	Special cylinder type (please specify)

NOTES

1 Option B includes options B1 and B2.

2 Cushions are not available with 4ML cylinders or 3MA cylinders on HB products.

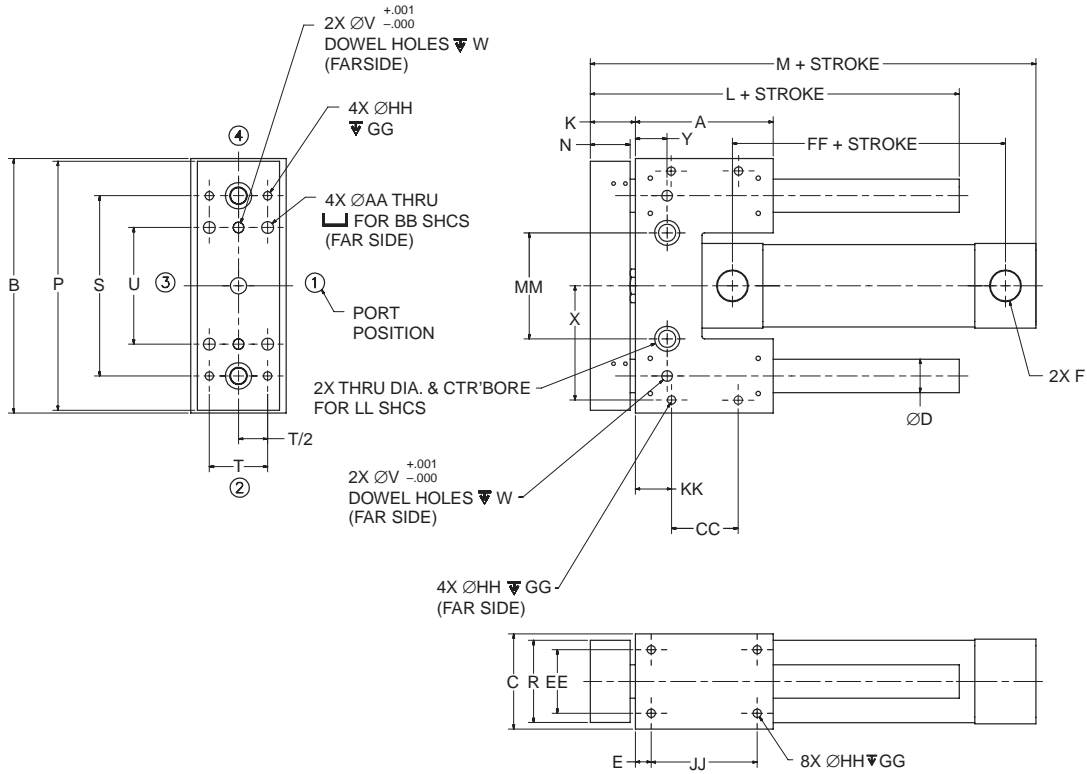
3 Fluorocarbon seals not available with 3MA or rodlock cylinders.

4 P1D cylinders have strokes only in whole mm. The HB inch stroke will be changed (rounded up) to reflect this.

Sensors

For sensors see page B296.

HBC Series



B

Guided Cylinders
 Actuator Products

Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T	U
15 ¹	3.25	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4 ¹	1/4	1.06	5.19	6.26	0.94	5.88	1.94	4.250	1.375	2.750
20	4.00	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	6.39	7.00	1.19	7.13	2.44	5.000	1.750	3.250
25	5.00	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	7.82	8.38	1.44	8.88	2.88	6.500	2.000	3.750

Model number	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK	LL	MM
15 ¹	0.251	0.27	2.750	0.750	0.28	1/4	1.750	1.500	2.31	0.50	1/4-20	2.50	0.75	3/8	2.500
20	0.313	0.33	3.250	0.750	0.34	5/16	2.250	1.750	2.31	0.63	5/16-18	3.00	0.88	3/8	3.000
25	0.376	0.39	4.000	1.532	0.41	3/8	3.000	2.250	2.38	0.75	3/8-16	4.00	1.00	1/2	4.000

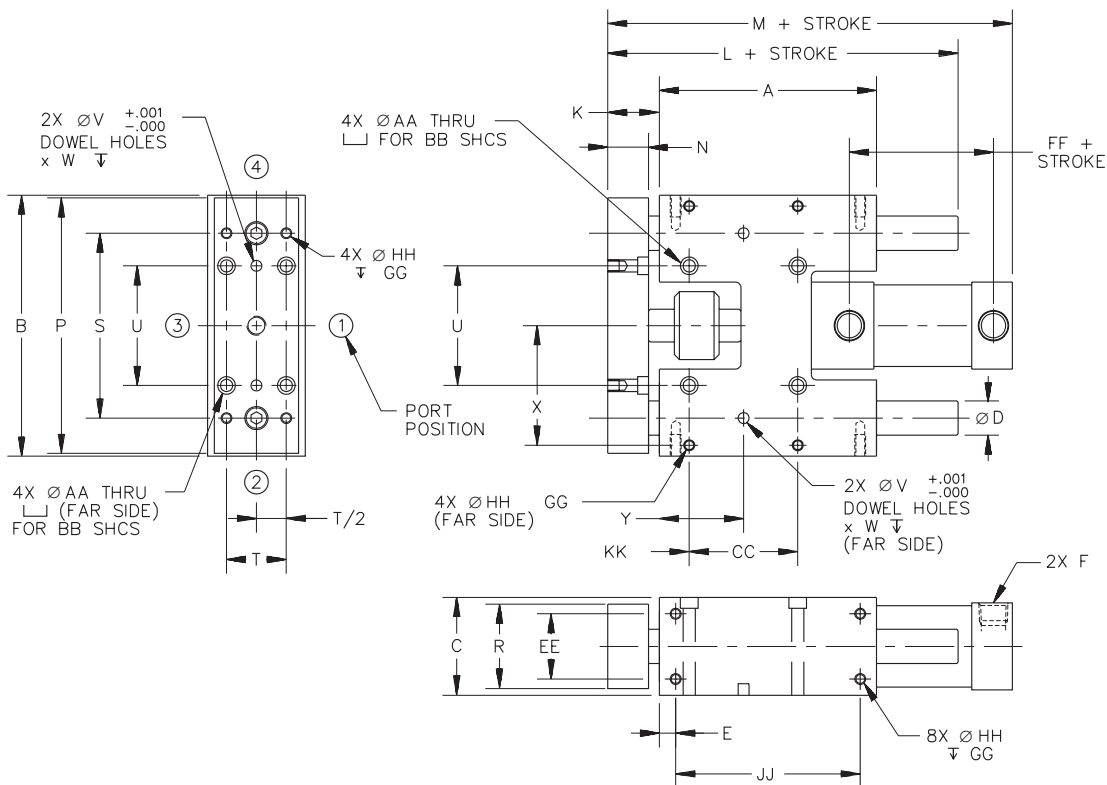
* Standard shafting

** Oversized shafting

¹ Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

HBT Series



B
 Guided Cylinders
 Actuator Products

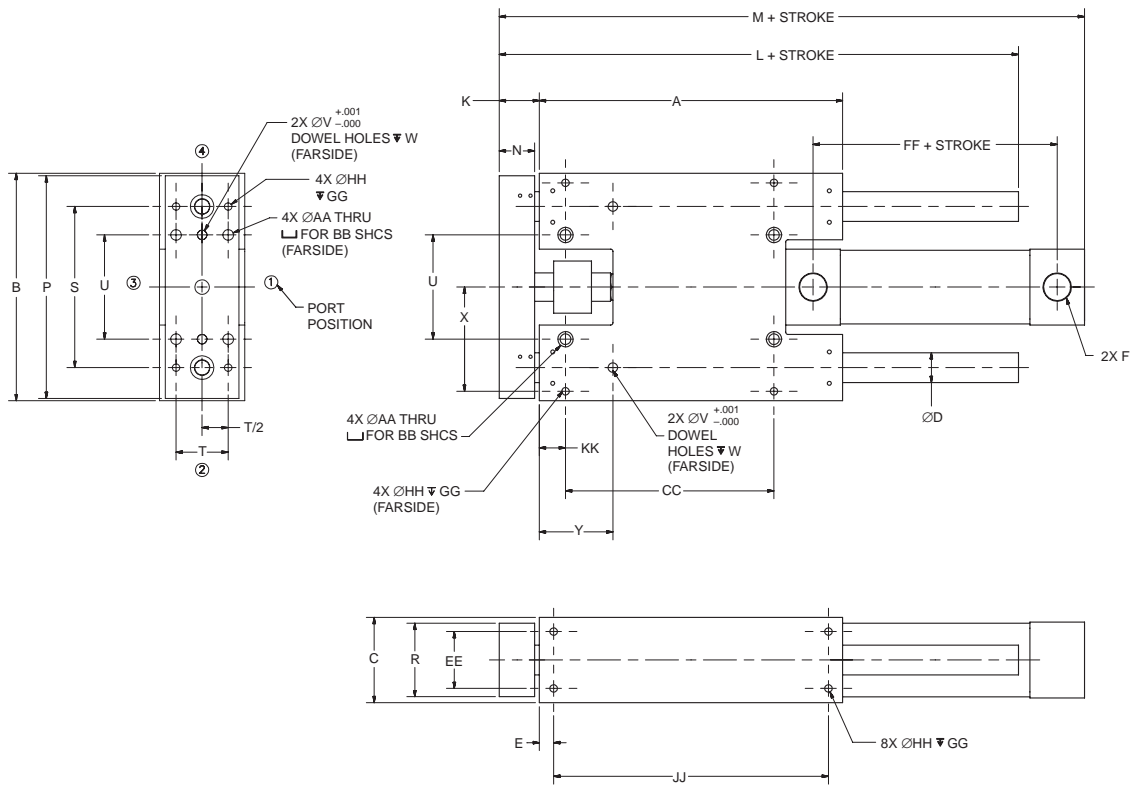
Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T
15	5.0	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4 1	1/4	1.06	6.94	8.19	0.94	5.88	1.94	4.250	1.375
20	5.5	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	7.88	8.94	1.19	7.13	2.44	5.000	1.750
25	6.5	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	9.31	10.31	1.44	8.88	2.88	6.500	2.000

Model number	U	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK
15	2.750	0.251	0.27	2.750	1.938	0.28	1/4	2.500	1.500	2.31	0.50	1/4-20	4.25	0.69
20	3.250	0.313	0.33	3.250	2.250	0.34	5/16	2.750	1.750	2.31	0.63	5/16-18	4.50	0.88
25	3.750	0.376	0.39	4.000	2.750	0.41	3/8	3.500	2.250	2.38	0.75	3/8-16	5.50	1.00

* Standard shafting
 ** Oversized shafting
 1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

HBR Series



B
 Guided Cylinders
 Actuator Products

Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T
15	8.00	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4 1	1/4	1.06	9.94	11.19	0.94	5.88	1.94	4.250	1.375
20	10.00	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	12.39	13.44	1.19	7.13	2.44	5.000	1.750
25	12.00	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	14.82	15.82	1.44	8.88	2.88	6.500	2.000

Model number	U	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK
15	2.750	0.251	0.27	2.750	1.938	0.28	1/4	5.500	1.500	2.31	0.50	1/4-20	7.25	0.69
20	3.250	0.313	0.33	3.250	2.250	0.34	5/16	7.250	1.750	2.31	0.63	5/16-18	9.00	0.88
25	3.750	0.376	0.39	4.000	2.760	0.41	3/8	9.000	2.250	2.38	0.75	3/8-16	11.00	1.00

* Standard shafting
 ** Oversized shafting
 1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

- Low profile guided assembly
- Powered by the P1D cylinder
- Bore sizes 32, 40, 50, 63, 80 and 100mm
- Strokes to any practical length
- Rod lock options available
- Composite and ball bearing options available



Operating information

Operating pressure: 145 PSIG (10 bar) maximum
 Temperature range: 14°F to 165°F (-10°C to 74°C)
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

P5E - J 032 F G N 0250

Shaft / bearing type	
J	Composite bearing, chrome plated standard shaft
M	Composite bearing, chrome plated oversize shaft ¹
C	Composite bearing, stainless steel shaft
H	Ball bearing, stainless steel shaft

Bore size	
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm

Stroke length	
Specify whole millimeters, i.e. 0250 = 250mm stroke	

Bumpers / Adjustable Stop Collars	
N	None
B	Bumpers, retract only ²
E	Bumpers and adjustable stop collars, extend only
T	Bumpers both ends, adjustable stop collars on extend ²
R	Bumpers and adjustable stop collars on retract ²
S	Bumpers and adjustable stop collars both ends ²

Cylinder type ³	
F	P1D removable gland cylinder
G	P1D removable gland cylinder with cushions
K	P1D rod lock cylinder with cushions
S	P1D manual override rod lock cylinder with cushions
Q	No cylinder
X	Special – please specify

Port Style	
H	NPTF (std)
G	BSPP
N	NPTF with flow controls (std. female ports)
B	BSPP with flow controls (ISO female ports)
F	Flow controls, NPTF port, prestolok tube (inch)
P	Flow controls, BSPP port, prestolok tube (mm)

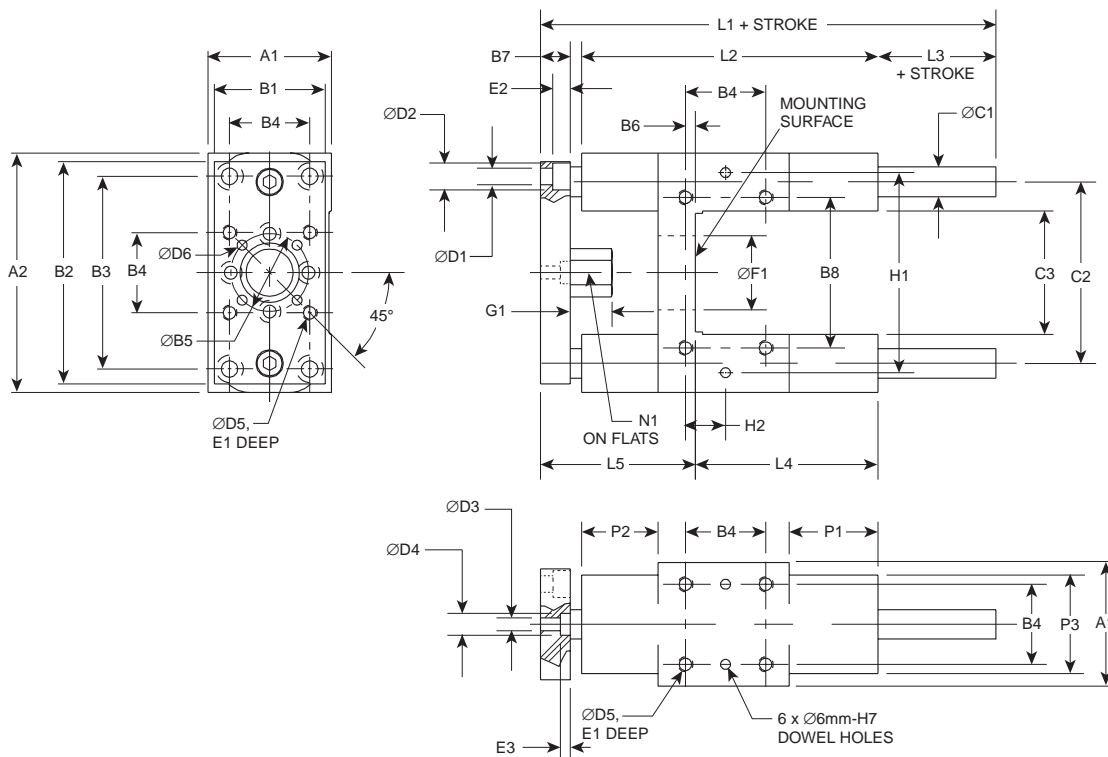
¹ Bumpers and adjustable stop collars are not available with oversize shaft option.

² These options will increase the cylinder length. To achieve a specific usable stroke length with these options, add the corresponding value(s) in the adder table, please reference catalog 0900P-E, page F156 to the desired stroke length. See Bumper Options for explanation.
 Adders are not used when P1D Rod Lock (K) or P1D Manual Override Rod Lock (S) are specified with bumpers.

³ Tie Rod Version or composite piston option must be specified as Special (X).

Sensors

For sensors see page B296.



B

**Guided Cylinders
 Actuator Products**

Metric (inch)

Bore size	A1	A2	B1	B2	B3	B4	ØB5	B6	B7	B8	ØC1 std.	ØC1 O.S.	C2	C3	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6
32	50 (1.97)	97 (3.82)	45 (1.77)	92 (3.62)	78 (3.07)	32.5 (1.28)	31.5 (1.24)	4 (0.16)	12.7 (0.50)	61 (2.40)	12 (0.47)	16 (0.63)	73.5 (2.89)	50 (1.97)	6.6 (0.26)	11 (0.43)	5.2 (0.20)	9 (0.35)	M6 x 1.00	4 (0.16)
40	58 (2.28)	115 (4.53)	50.8 (2.00)	110 (4.33)	84 (3.31)	38 (1.50)	31.5 (1.24)	11 (0.43)	12.7 (0.50)	69 (2.72)	16 (0.63)	20 (0.79)	86.5 (3.41)	58 (2.28)	6.6 (0.26)	11 (0.43)	5.2 (0.20)	9 (0.35)	M6 x 1.00	4 (0.16)
50	70 (2.76)	137 (5.39)	63 (2.48)	132 (5.20)	100 (3.94)	46.5 (1.83)	50 (1.97)	19 (0.75)	16 (0.63)	85 (3.35)	20 (0.79)	25 (0.98)	103.5 (4.07)	70 (2.76)	9 (0.35)	14 (0.55)	6.4 (0.25)	11 (0.43)	M8 x 1.25	4 (0.16)
63	85 (3.35)	152 (5.98)	82.5 (3.25)	145 (5.71)	105 (4.13)	56.5 (2.24)	50 (1.97)	15 (0.59)	16 (0.63)	100 (3.94)	20 (0.79)	25 (0.98)	118.5 (4.67)	85 (3.35)	9 (0.35)	14 (0.55)	6.4 (0.25)	11 (0.43)	M8 x 1.25	4 (0.16)
80	105 (4.13)	189 (7.44)	100 (3.94)	180 (7.09)	130 (5.12)	72 (2.83)	76 (2.99)	21 (0.83)	19 (0.75)	130 (5.12)	25 (0.98)	30 (1.18)	147 (5.79)	105 (4.13)	11 (0.43)	17 (0.67)	8.4 (0.33)	14 (0.55)	M10 x 1.50	6 (0.24)
100	130 (5.12)	213 (8.39)	120 (4.72)	200 (7.87)	150 (5.91)	89 (3.50)	76 (2.99)	24.5 (0.97)	19 (0.75)	150 (5.91)	25 (0.98)	30 (1.18)	171.5 (6.75)	130 (5.12)	11 (0.43)	17 (0.67)	8.4 (0.33)	14 (0.55)	M10 x 1.50	6 (0.24)

Bore size	E1	E2	E3	ØF1	G1	H1	H2	L1	L2	L3	L4	L5	N1	P1	P2	P3	Port size	Piston rod thread
32	12 (0.47)	7 (0.28)	4 (0.16)	30 (1.18)	17 (0.67)	81 (3.19)	16 (0.63)	153 (6.02)	120 (4.72)	17 (0.67)	71 (2.80)	64.7 (2.55)	17 (0.67)	36 (1.42)	31 (1.22)	40 (1.57)	1/8	M10 x 1.25
40	12 (0.47)	7 (0.28)	4 (0.16)	35 (1.38)	24 (0.94)	99 (3.90)	19 (0.75)	166 (6.54)	130 (5.12)	20 (0.79)	71 (2.80)	74.7 (2.94)	17 (0.67)	36 (1.42)	36 (1.42)	44 (1.73)	1/4	M12 x 1.25
50	16 (0.63)	9 (0.35)	9 (0.35)	40 (1.57)	27 (1.06)	119 (4.69)	23 (0.91)	194 (7.64)	150 (5.90)	25 (0.98)	79 (3.11)	90 (3.54)	24 (0.94)	42 (1.65)	44 (1.73)	50 (1.97)	1/4	M16 x 1.5
63	16 (0.63)	9 (0.35)	9 (0.35)	45 (1.77)	27 (1.06)	132 (5.20)	28 (1.10)	224 (8.82)	180 (7.09)	25 (0.98)	109 (4.29)	90 (3.54)	24 (0.94)	58 (2.28)	44 (1.73)	60 (2.36)	3/8	M16 x 1.5
80	20 (0.79)	11 (0.43)	5 (0.19)	45 (1.77)	32 (1.26)	166 (6.54)	36 (1.42)	252 (9.92)	200 (7.87)	30 (1.18)	113 (4.45)	109 (4.29)	30 (1.18)	50 (1.97)	52 (2.05)	70 (2.76)	3/8	M20 x 1.5
100	20 (0.79)	11 (0.43)	5 (0.20)	55 (2.17)	32 (1.26)	190 (7.48)	45 (1.77)	272 (10.71)	220 (8.66)	30 (1.18)	128 (5.04)	114 (4.49)	30 (1.18)	49 (1.93)	51 (2.01)	70 (2.76)	1/2	M20 x 1.5

Based on the original ORIGA rodless cylinder, proven in world wide markets, PARKER-ORIGA now offers the complete solution for linear drive systems. Designed for absolute reliability, high performance, ease of use and optimized engineering the ORIGA SYSTEM PLUS satisfies even the most demanding applications.

ORIGA SYSTEM PLUS

is a totally modular concept which offers the choice of pneumatic or electric actuation, with guidance and control modules to suit the exact needs of individual installations.

The actuators at the core of the system all have a common aluminum extruded profile, with double dovetail mounting rails on three sides, these are the principle building blocks of the system to which all modular options are directly attached.



System modularity

• **Pneumatic drive**

- For all round versatility and convenience, combining ease of control and broad performance capability. Ideally suited for point-to point operations, reciprocating movements and simple traverse / transfer applications.

• **Electric screw drive**

- For high force capability and accurate path and position control.

• **Electric belt drive**

- For high speed applications, accurate path and position control and longer strokes.

For additional information on electric linear actuators, please contact factory for OSP-E literature.

- Different guidance options provide the necessary level of precision, performance and duty for various applications.
- Compact solutions, which are simple to install and can be easily retrofitted.
- Valves and control options can be directly mounted to the actuator system.
- Diverse mounting options to provide total installation flexibility.

B

**Rodless Cylinders
Actuator Productd**

ORIGA SYSTEM PLUS – innovation from a proven design

A completely new generation of linear drives which can be simply and neatly integrated into any machine layout.

A new modular linear drive system

With this second generation linear drive PARKER-ORIGA offers design engineers complete flexibility.

The well known ORIGA cylinder has been further developed into a combined linear actuator, guidance and control package. It forms the basis for the new, versatile ORIGA SYSTEM PLUS linear drive system.

All additional functions are designed into modular system components which replace the previous series of cylinders.

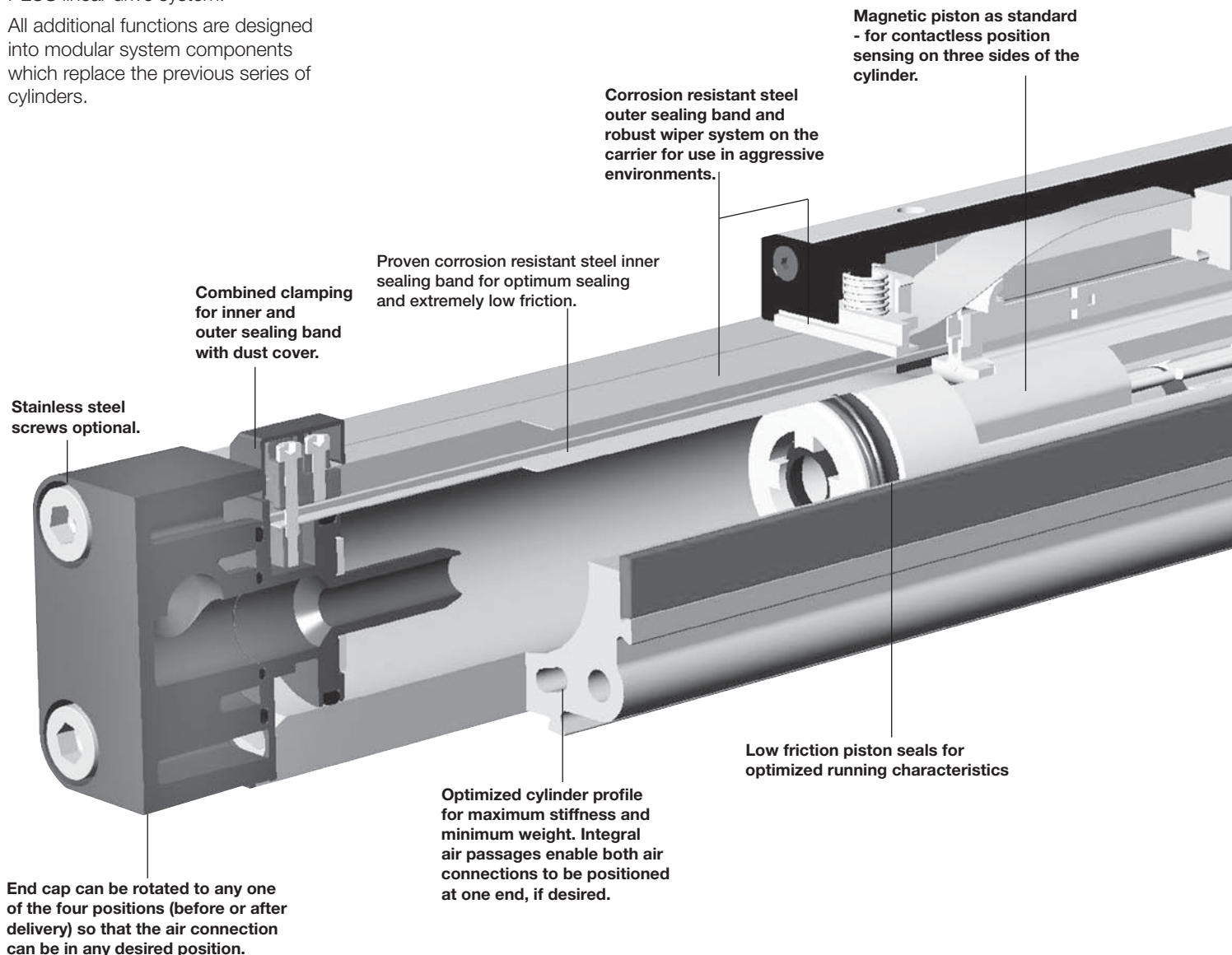
Mounting rails on 3 sides

Mounting rails on 3 sides of the cylinder enable modular components such as linear guides, brakes, valves, magnetic switches etc. to be fitted to the cylinder itself. This solves many installation problems, especially where space is limited.

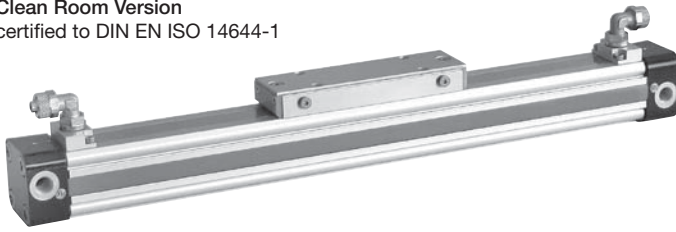
The modular system concept forms an ideal basis for additional customer-specific functions.

B

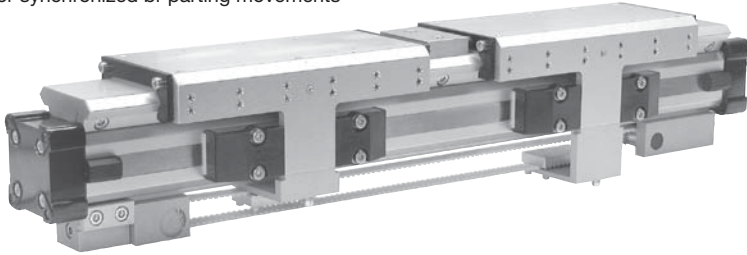
Rodless Cylinders
Actuator Products



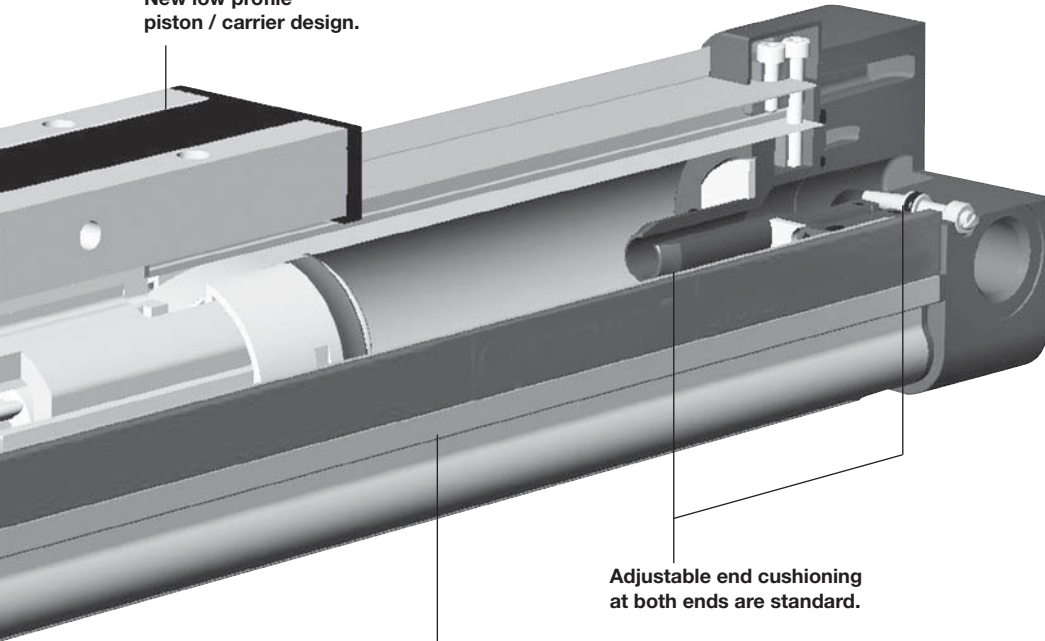
Clean Room Version
 certified to DIN EN ISO 14644-1



Rodless Cylinder
 for synchronized bi-parting movements



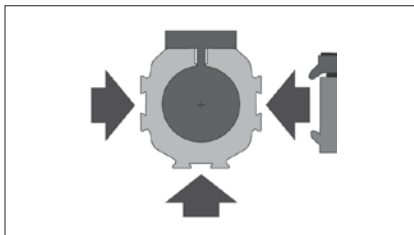
New low profile
 piston / carrier design.



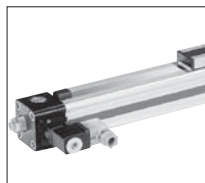
Adjustable end cushioning
 at both ends are standard.

Integral dovetail rails on three sides
 provide many adaptation possibilities
 (linear guides, magnetic switches, etc.).

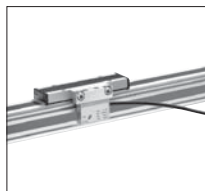
Modular system components
 are simply clamped on.



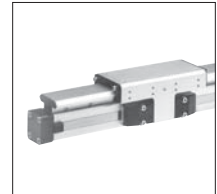
Integrated
 VOE Valves



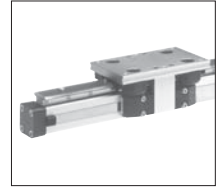
SENSOFLEX SFI-plus
 incremental measuring system
 with 0.1 (1.0) mm
 resolution



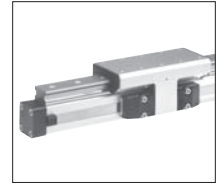
SLIDELINE
 Combination with
 linear guides provides
 for heavier loads



POWERSLIDE
 Roller bearing
 precision guidance
 for smooth travel and
 high dynamic or static
 loads



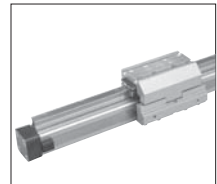
PROLINE
 The compact
 aluminum roller guide
 for high loads and
 velocities



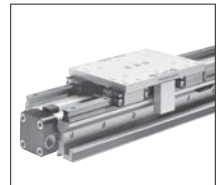
STARLINE
 Recirculating ball
 bearing guide for
 very high loads
 and precision



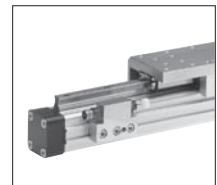
KF Guide
 Recirculating ball
 bearing guide – the
 mounting dimensions
 correspond to FESTO
 Type: DGPL-KF



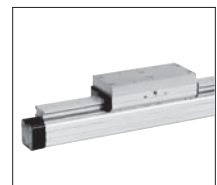
**Heavy Duty
 Guide HD**
 for heavy duty
 applications



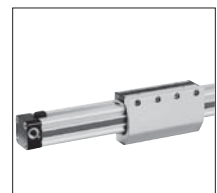
VARIABLE STOP VS
 The variable stop
 provides simple
 stroke limitation



**Passive pneumatic
 brake** reacts
 automatically to
 pressure failure



**Active pneumatic
 brake** for secure,
 positive stopping
 at any position

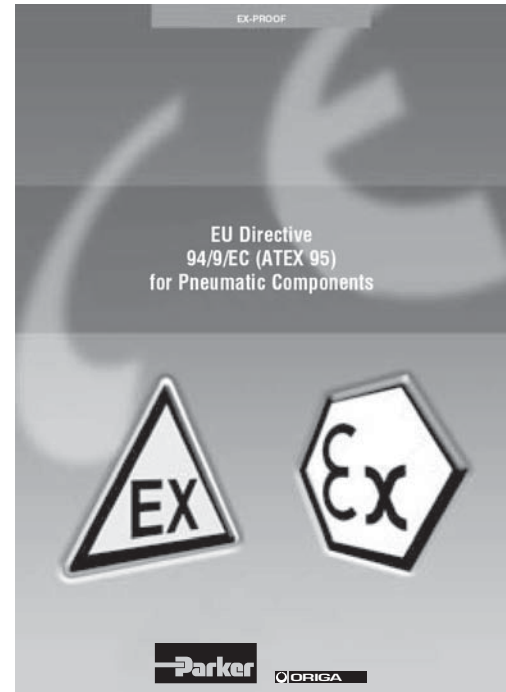


B
 Rodless Cylinders
 Actuator Productd

PARKER-ORIGA rodless pneumatic cylinders are the first rodless cylinders that have been approved for use in potentially explosive atmospheres in Equipment Group II, Category 2 GD

The cylinders are to the ATEX Certification 94/9/EG (ATEX 95) for Pneumatic Components.

For ATEX Certification, consult factory for ordering assistance.



B

Rodless Cylinders
 Actuator Products



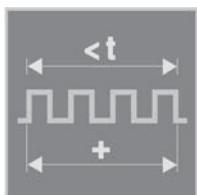
for use in Ex-Areas



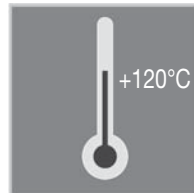
for Clean Room Applications
 certified to DIN EN ISO 14644-1



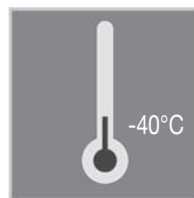
Stainless Steel Version
 for special applications



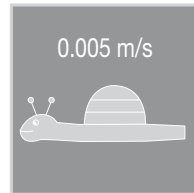
with special pneumatic
 cushioning system for
 cycle time optimization,
 for Ø 16 to 50 mm
 – on request



High Temperature Version
 for temperatures up to +120°C

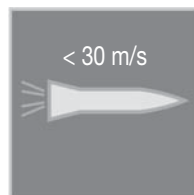


Low Temperature Version
 for temperatures up to
 -40°C





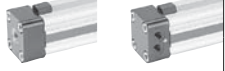

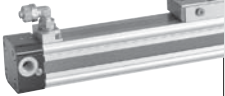


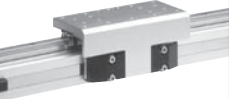
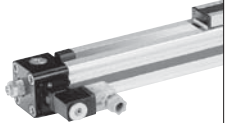


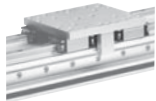


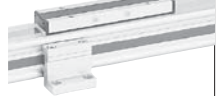



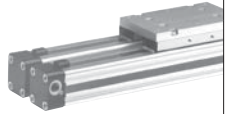



0.005 m/s

Slow Speed Version
 $v = 0.005 - 0.2 \text{ m/s}$



< 30 m/s

High Speed Version
 $v_{max.} = 30 \text{ m/s}$

<p>Basic linear drive Standard version</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E* Belt drive Belt drive with integrated guides Vertical belt drive with recirculating ball bearing guide • Series OSP-E* Screw drive (Ball screw, trapezoidal screw) 		<p>Linear guides – SLIDELINE</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E screw drive* 	
<p>Air connection on the end-face or both at one end</p> <ul style="list-style-type: none"> • Series OSP-P 		<p>Linear guides – POWERSLIDE</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive* 	
<p>Clean room cylinder certified to DIN EN ISO 146644-1</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E..SB 		<p>Linear guides – PROLINE</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive* 	
<p>Bi-parting version</p> <ul style="list-style-type: none"> • Series OSP-P 		<p>Linear guides – STARLINE</p> <ul style="list-style-type: none"> • Series OSP-P 	
<p>Integrated 3/2 way valves</p> <ul style="list-style-type: none"> • Series OSP-P 		<p>Linear guides – KF</p> <ul style="list-style-type: none"> • Series OSP-P 	
<p>Clevis mounting</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive* 		<p>Heavy duty linear guides – HD</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E screw drive* 	
<p>End cap mounting</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive* 		<p>Intermediate stop module – ZSM</p> <ul style="list-style-type: none"> • Series OSP-P 	
<p>Mid-section support</p> <ul style="list-style-type: none"> • Series OSP-Plt drive* • Series OSP-E screw drive • Series OSP-E be* 		<p>Brakes</p> <ul style="list-style-type: none"> • Active brake • Passive brakes 	
<p>Inversion mounting</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive* 		<p>Magnetic switches</p> <ul style="list-style-type: none"> • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive* 	
<p>Standard version</p> <ul style="list-style-type: none"> • Series OSP-P 		<p>SENSOFLEX – Measuring system</p> <ul style="list-style-type: none"> • Series SFI-plus 	
<p>Multiplex connection</p> <ul style="list-style-type: none"> • Series OSP-P 		<p>Variable stop VS</p> <ul style="list-style-type: none"> • Series OSP-P • with linear guide STL, KF, HD 	

* For information on Electric Linear Drives, contact factory for literature

B
 Rodless Cylinders
 Actuator Productd

B

**Rodless Cylinders
 Actuator Products**

Linear drives	OSP-P10	OSP-P16	OSP-P25	OSP-P32	OSP-P40	OSP-P50	OSP-P63	OSP-P80
Theoretical force at 6 bar (N)	47	120	295	483	754	1178	1870	3010
Effective force at 6 bar (N)	32	78	250	420	640	1000	1550	2600
Velocity v (m/s)	> 0.005	> 0.005	> 0.005	> 0.005	> 0.005	> 0.005	> 0.005	> 0.005
Magnetic piston (three sides)	X	□	□	□	□	□	□	□
Lubrication - prelubricated	□	□	□	□	□	□	□	□
Multiple air ports (4 x 90°)	X	□	□	□	□	□	□	□
Both air connections at end-face	X	○	○	○	○	○	○	○
Air connection on the end-face	X	○	○	○	○	○	○	○
Cushioning	□	□	□	□	□	□	□	□
Cushioning length (mm)	2,50	11	17	20	27	30	32	39
Stroke length (mm) ▲	1 - 6000	1 - 6000	1 - 6000	1 - 6000	1 - 6000	1 - 6000	1 - 6000	1 - 6000
Pressure range pmax (bar)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Temperature range (°C) ※	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80
Viton / chemical resistance	○	○	○	○	○	○	○	○
Stainless steel parts	○	○	○	○	○	○	○	○
Clevis mounting	○	○	○	○	○	○	○	○
Slow speed lubrication	○	○	○	○	○	○	○	○
Duplex connection / multiplex connection	X	on request	○	○	○	○	on request	on request
Tandem piston	○	○	○	○	○	○	○	○
Basic cylinder								
F (N)	20	120	300	450	750	1200	1650	2400
Mx (Nm)	0.2	0.45	1.5	3	6	10	12	24
My (Nm)	1	4	15	30	60	115	200	360
Mz (Nm)	0.3	0.5	3	5	8	15	24	48
Slideline								
F (N)	X	325	675	925	1500	2000	2500	2500
Mx (Nm)	X	6	14	29	50	77	120	120
My (Nm)	X	11	34	60	110	180	260	260
Mz (Nm)	X	11	34	60	110	180	260	260
Proline								
F (N)	X	542	857	1171	2074	3111	X	X
Mx (Nm)	X	8	16	29	57	111	X	X
My (Nm)	X	12	39	73	158	249	X	X
Mz (Nm)	X	12	39	73	158	249	X	X
Powerslide								
F (N)	X	1400	1400 - 3000	1400 - 3000	3000	3000 - 4000	X	X
Mx (Nm)	X	14	14 - 65	20 - 65	65 - 90	90 - 140	X	X
My (Nm)	X	45	63 - 175	70 - 175	175 - 250	250 - 350	X	X
Mz (Nm)	X	45	63 - 175	70 - 175	175 - 250	250 - 350	X	X
Starline								
F (N)	X	1000	3100	3100	4000-7500	4000-7500	X	X
Mx (Nm)	X	15	50	62	150	210	X	X
My (Nm)	X	30	110	160	400	580	X	X
Mz (Nm)	X	30	110	160	400	580	X	X
– Variable stop	X	○	○	○	○	○	X	X
KF guide								
F (N)	X	1000	3100	3100	4000-7500	4000-7500	X	X
Mx (Nm)	X	12	35	44	119	170	X	X
My (Nm)	X	25	90	133	346	480	X	X
Mz (Nm)	X	25	90	133	346	480	X	X
– Variable stop	X	○	○	○	○	○	X	X

Linear drives	OSP-P10	OSP-P16	OSP-P25	OSP-P32	OSP-P40	OSP-P50	OSP-P63	OSP-P80
HD heavy duty guide								
F (N)	X	X	6000	6000	15000	18000	X	X
Mx (Nm)	X	X	260	285	800	1100	X	X
My (Nm)	X	X	320	475	1100	1400	X	X
Mz (Nm)	X	X	320	475	1100	1400	X	X
– Variable stop	X	X	○	○	○	○	X	X
– Intermediate stop module	X	X	○	X	X	X	X	X
Active brake								
Braking force at 6 bar (brake surface dry) (N)	X	X	350	590	900	1400	2170	4000
Sideline SL / Proline PL with brakes								
Active brake								
SL braking force at 6 bar (brake surface dry) (N)	X	X	325	545	835	1200	X	X
PL braking force at 6 bar (brake surface dry) (N)	X	X	on request	on request	on request	on request	X	X
Passive brake multibrake								
SL braking force at 6 bar (brake surface dry) (N)	X	X	470	790	1200	1870	2900	2900
PL braking force at 6 bar (brake surface dry) (N)	X	X	315	490	715	1100	–	–
Magnetic switches								
Standard version	○	○	○	○	○	○	○	○
T-nut version	○	○	○	○	○	○	○	○
Displacement measuring systems								
SFI-plus incremental	X	X	○	○	○	○	○	○
Integrated valves 3/2 WV NO VOE	X	X	○	○	○	○	on request	on request
Mountings								
End cap mounting / mid-section support	○	○	○	○	○	○	○	○
Inversion mounting	X	○	○	○	○	○	○	○
Shock absorber for intermediate positioning	X	X	on request	on request	on request	on request	X	X
Adaptor profile / T-nut profile	X	○	○	○	○	○	X	X
Special cylinders								
Special pneumatical cushioning system	X	on request	on request	on request	on request	on request	X	X
Clean room cylinders to DIN EN ISO 14644-1	X	○	○	○	X	X	X	X
Bi-parting version	X	X	X	X	○	X	X	X
High-speed up to 30 m/s	X	on request	on request	on request	X	X	X	X

□ = Standard version
 ▲ = Longer strokes on request
 * = Other temperature ranges on request
 ○ = Option
 X = Not applicable

B
 Rodless Cylinders
 Actuator Productd

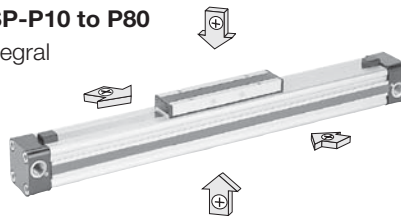
Options and Accessories for System Versatility

Series OSP-P

Standard versions OSP-P10 to P80

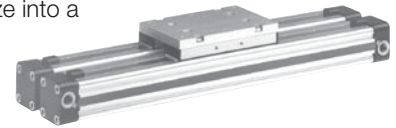
Standard carrier with integral guidance. End cap can be rotated 4 x 90° to position air connection on any side.

Magnetic piston as standard. Dovetail profile for mounting of accessories and the cylinder itself.



Joint clamp connection

The joint clamp connection combines two OSP-P cylinders of the same size into a compact unit with high performance.



Multiplex connection

The multiplex connection combines two or more OSP-P cylinders of the same size into one unit.

The orientation of the carriers can be freely selected.



Basic cylinder options

Clean Room Cylinders

For use in clean room applications, certified with the IPA-Certificate (to DIN EN ISO 14644-1).

The special design of the linear drive enables all emissions to be led away.



Stainless version

For use in constantly damp or wet environments. All screws are A2 quality stainless steel.



Slow speed options

Specially formulated grease lubrication facilitates slow, smooth and uniform piston travel in the speed range from 0.005 to 0.2 m/s. Minimum achievable speeds are dependent on several factors. Please consult our technical department. Slow speed lubrication in combination with Viton® on demand. Oil free operation preferred.



Viton® version

For use in an environment with high temperatures or in chemically aggressive areas.

All seals are made of Viton®. Sealing bands: Stainless steel



End-face air connection

To solve special installation problems.



Both air connections at one end

For simplified tubing connections and space saving.



Integrated VOE valves

The complete compact solution for optimal cylinder control.



Accessories

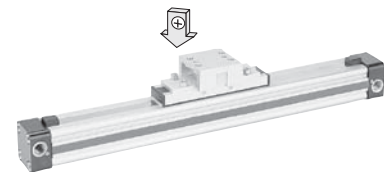
Magnetic switches Type RS, ES, RST, EST

For electrical sensing of end and intermediate piston positions, also in EX-Areas.



Clevis mounting

Carrier with tolerance and parallelism compensation for driving loads supported by external linear guides.



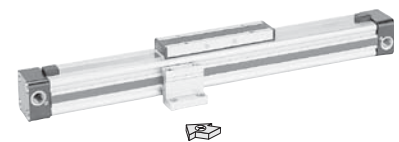
Inversion mounting

The inversion mounting transfers the driving force to the opposite side, e. g. for dirty environments.



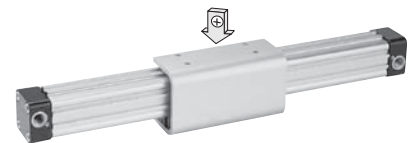
End cap mounting

For end-mounting of the cylinder.



Mid-section support

For supporting long cylinders or mounting the cylinder by its dovetail rails.



B

**Rodless Cylinders
 Actuator Products**

General features

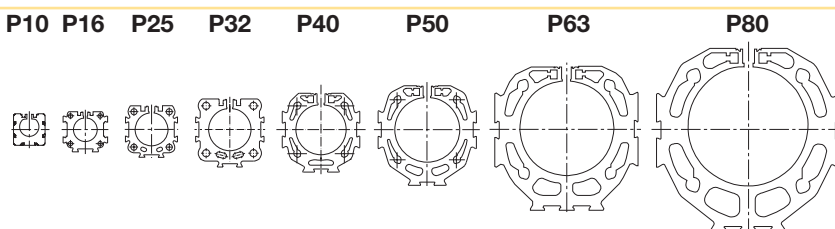
Characteristics	Symbol	Unit	Description
Type			Rodless cylinder
Series			OSP-P
System			Double-acting, with cushioning, position sensing capability
Mounting			See drawings
Air connection			Threaded
Ambient Temperature range	T _{min}	°C	-10
	T _{max}	°C	+80
Weight (mass)		kg	See table below
Installation			In any position
Medium			Filtered, unlubricated compressed air (other media on request)
Lubrication			Permanent grease lubrication (additional oil mist lubrication not required) Option: special slow speed grease
Material	Cylinder profile		Anodized aluminum
	Carrier (piston)		Anodized aluminum
	End caps		Aluminum, lacquered / Plastic (P10)
	Sealing bands		Corrosion resistant steel
	Seals		NBR (Option: Viton®)
	Screws		Galvanized steel Option: stainless steel
	Dust covers, wipers		Plastic
Max. operating pressure*	p _{max}	bar	8

* Pressure quoted as gauge pressure

Weight (mass) kg

Cylinder series (Basic cylinder)	Weight (Mass) kg	
	At 0 mm stroke	per 100 mm stroke
OSP-P10	0.087	0.052
OSP-P16	0.22	0.1
OSP-P25	0.65	0.197
OSP-P32	1.44	0.354
OSP-P40	1.95	0.415
OSP-P50	3.53	0.566
OSP-P63	6.41	0.925
OSP-P80	12.46	1.262

Size Comparison

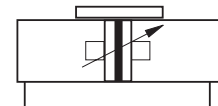


Rodless Pneumatic Cylinder

∅ 10-80 mm



Series OSP-P..



Standard versions:

- Double-acting with adjustable end cushioning
- With magnetic piston for position sensing
- Long-Stroke Cylinders for stroke lengths up to 41m (consult factory)

Special versions:

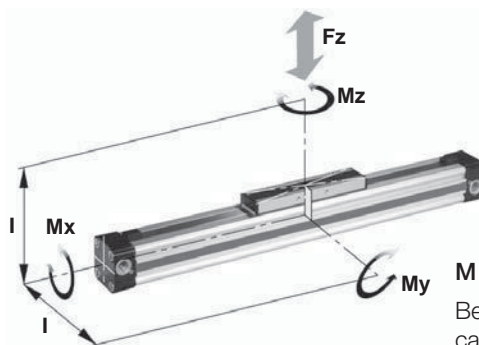
- With special pneumatic cushioning system (on request)
- Clean room cylinders
- Stainless steel screws
- Slow speed lubrication
- Viton® seals
- Both air connections on one end
- Air connection on the end-face
- Integrated Valves
- End cap can be rotated 4 x 90° to position air connection as desired
- Free choice of stroke length up to 6000 mm,
- Long-Stroke version (∅50-80mm) for stroke lengths up to 41m

B
 Rodless Cylinders
 Actuator Productd

Loads, forces and moments

Choice of cylinder is decided by:

- Permissible loads, forces and moments
- Performance of the pneumatic end cushions. The main factors here are the mass to be cushioned and the piston speed at start of cushioning (unless external cushioning is used, e. g. hydraulic shock absorbers).



$$M = F \cdot l$$

Bending moments are calculated from the center of the linear actuator

The adjacent table shows the maximum values for light, shock-free operation, which must not be exceeded even in dynamic operation.

Load and moment data are based on speeds $v \leq 0.5$ m/s.

When working out the action force required, it is essential to take into account the friction forces generated by the specific application or load.

Cylinder series (mm Ø)	Theoretical action force at 6 bar (N)	Effective action force F_A at 6 bar (N)	Max. moments			Max. load F (N)	Cushion length (mm)
			M_x (Nm)	M_y (Nm)	M_z (Nm)		
OSP-P10	47	32	0.2	1	0.3	20	2.5 *
OSP-P16	120	78	0.45	4	0.5	120	11
OSP-P25	295	250	1.5	15	3	300	17
OSP-P32	483	420	3	30	5	450	20
OSP-P40	754	640	6	60	8	750	27
OSP-P50	1178	1000	10	115	15	1200	30
OSP-P63	1870	1550	12	200	24	1650	32
OSP-P80	3016	2600	24	360	48	2400	39

* A rubber element (non-adjustable) is used for end cushioning.

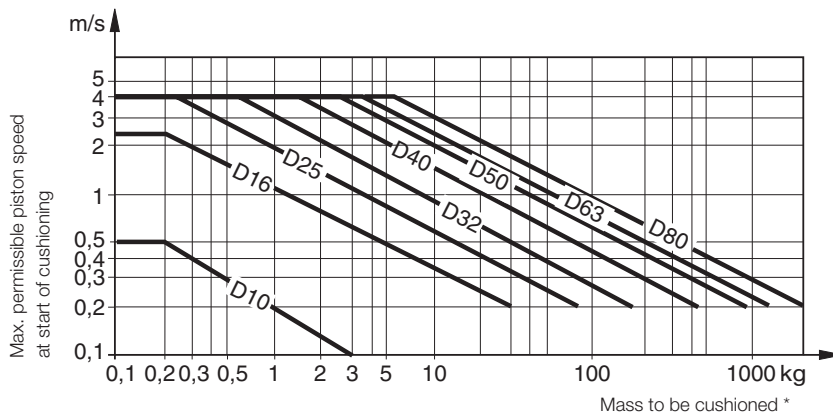
To deform the rubber element enough to reach the absolute end position would require a Dp of 4 bar!

Cushioning diagram

Work out your expected moving mass and read off the maximum permissible speed at start of cushioning.

Alternatively, take your desired speed and expected mass and find the cylinder size required.

Please note that piston speed at start of cushioning is typically ca. 50% higher than the average speed, and that it is this higher speed which determines the choice of cylinder. If these maximum permissible values are exceeded, additional shock absorbers must be used.



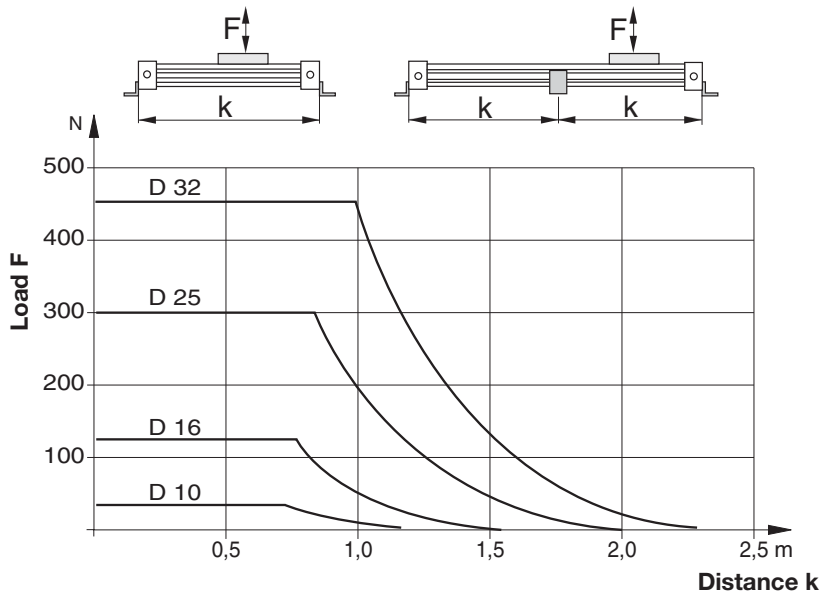
* For cylinders with linear guides or brakes, please be sure to take the mass of the carriage or the brake housing into account.

If the permitted limit values are exceeded, either additional shock absorbers should be fitted in the area of the center of gravity or you can consult us about our special cushioning system – we shall be happy to advise you on your specific application.

B

Rodless Cylinders
 Actuator Products

Permissible support spacings: OSP - P10 - P32

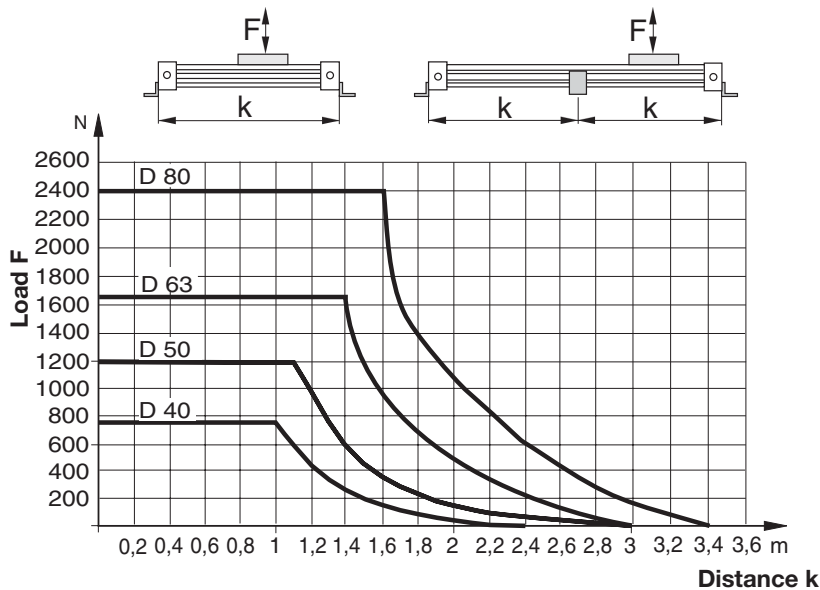


Mid-section supports

To avoid excessive bending and oscillation of the cylinder, mid-section supports are required dependent on specified stroke lengths and applied loads. The diagrams show the maximum possible support spacings depending on the load.

Bending up to max. 0.5 mm is permissible between supports. The mid-section supports are clamped on to the dovetail profile of the cylinder tube. They are also able to take the axial forces.

Permissible support spacings: OSP - P40 - P80



B
 Rodless Cylinders
 Actuator Productd

**Integrated 3/2 Way Valves
 VOE**

For optimal control of the OSP-P cylinder, 3/2 way valves integrated into the cylinder's end caps can be used as a compact and complete solution.

They allow for easy positioning of the cylinder, smooth operation at the lowest speeds and fast response, making them ideally suited for the direct control of production and automation processes.

**Integrated 3/2 way valves VOE
 Series OSP-P25, P32, P40 and P50**



B

**Rodless Cylinders
 Actuator Products**

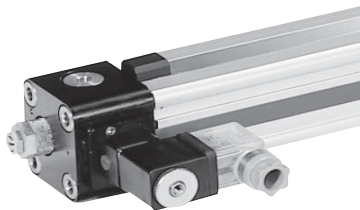
Characteristics:

- Complete compact solution
- Various connection possibilities: Free choice of air connection with rotating end caps with VOE valves, Air connection can be rotated 4 x 90°, Solenoid can be rotated 4 x 90°, Pilot Valve can be rotated 180°
- High piston velocities can be achieved with max. 3 exhaust ports
- Minimal installation requirements
- Requires just one air connection per valve
- Optimal control of the OSP-P cylinder
- Excellent positioning characteristics
- Integrated operation indicator
- Integrated exhaust throttle valve
- Manual override - indexed
- Adjustable end cushioning
- Easily retrofitted – please note the increase in the overall length of the cylinder!

Characteristics 3/2 way valves VOE

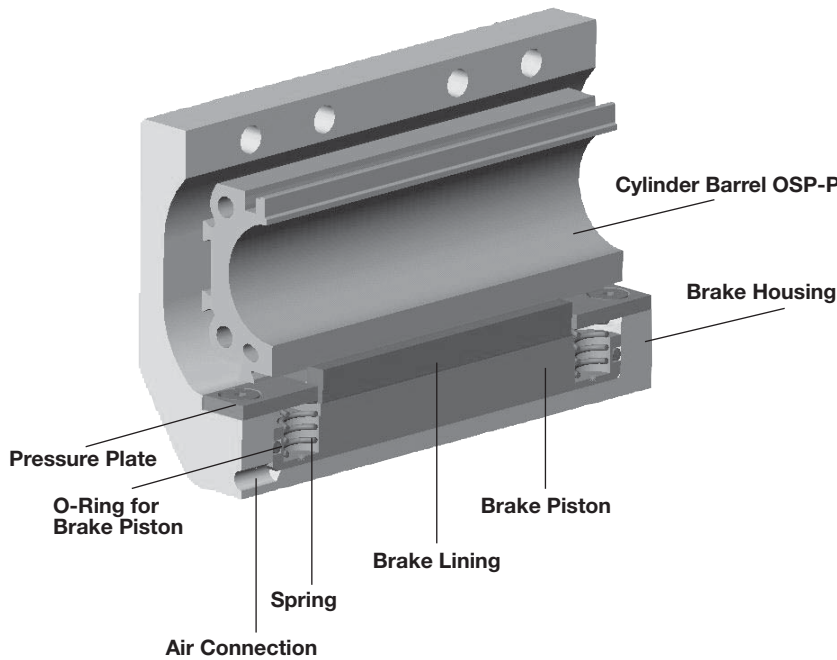
Characteristics	3/2 Way Valves with spring return			
Pneumatic diagram				
Type	VOE-25	VOE-32	VOE-40	VOE-50
Actuation	electrical			
Basic position	P → A open, R closed			
Type	Poppet valve, non overlapping			
Mounting	integrated in end cap			
Installation	in any position			
Port size	G 1/8	G 1/4	G 3/8	G 3/8
Temperature	-10°C to +50°C *			
Operating pressure	2-8 bar			
Nominal voltage	24 V DC / 230 V AC, 50 Hz			
Power consumption	2,5 W / 6 VA			
Duty cycle	100%			
Electrical Protection	IP 65 DIN 40050			

* other temperature ranges on request



Function

Active Brake



Series AB 25 to 80 for linear drive

- Series OSP-P

Features:

- Actuated by pressurization
- Released by spring actuation
- Completely stainless version
- Holds position, even under changing load conditions

For further technical data, please refer to the data sheets for linear drives OSP-P.

Note:

For combinations Active Brake AB + SFI-plus + Magnetic Switch contact our technical department please.

Forces and Weights

Series	For linear drive	Max. braking force (N) (1)	Brake pad way (mm)	Mass (kg)			Order no. active brake
				Linear drive with brake			
				0 mm stroke	Increase per 100mm stroke	brake*	
AB 25	OSP-P25	350	2.5	1.0	0.197	0.35	20806
AB 32	OSP-P32	590	2.5	2.02	0.354	0.58	20807
AB 40	OSP-P40	900	2.5	2.83	0.415	0.88	20808
AB 50	OSP-P50	1400	2.5	5.03	0.566	1.50	20809
AB 63	OSP-P63	2170	3.0	9.45	0.925	3.04	20810
AB 80	OSP-P80	4000	3.0	18.28	1.262	5.82	20811

(1) – at 6 bar
 both chambers pressurized with 6 bar
 Braking surface dry
 – oil on the braking surface will reduce the braking force

* **Please Note:**
 The mass of the brake has to be added to the total moving mass when using the cushioning diagram.

B
 Rodless Cylinders
 Actuator Productd



End cap mountings

On the end-face of each cylinder end cap there are four threaded holes for mounting the cylinder. The hole layout is square, so that the mounting can be fitted to the bottom, top or either side.

Material:

Series OSP-P25, P32: Galvanized steel

The mountings are supplied in pairs.

Material:

Series OSP-P40,P50, P63, P80: Anodized aluminum

The mountings are supplied in pairs.

Stainless steel version on request.

Series	Order number	
	Type A3	Type C3
AB 25	2060	-
AB 32	3060	-
AB 40	-	20339
AB 50	-	20350
AB 63	-	20821
AB 80	-	20822



B

Rodless Cylinders
 Actuator Products

Clevis mounting, ø 10 mm

When external guides are used, parallelism deviations can lead to mechanical strain on the piston. This can be avoided by the use of a clevis mounting.

In the drive direction, the mounting has very little play.

Freedom of movement is provided as follows:

- Tilting in direction of movement
- Vertical compensation
- Tilting sideways
- Horizontal compensation

Series	Order number	
	Standard	Stainless
OSP-P10	20971	-



Actuator Products – Rodless Cylinders OSP-P Series

Clevis mounting, ø 16-80 mm

When external guides are used, parallelism deviations can lead to mechanical strain on the piston. This can be avoided by the use of a clevis mounting.

In the drive direction, the mounting has very little play.

Freedom of movement is provided as follows:

- Tilting in direction of movement
- Vertical compensation
- Tilting sideways
- Horizontal compensation

A stainless steel version is also available.

Series	Order number	
	Standard	Stainless
OSP-P16	20462	20463
OSP-P25	20005	20092
OSP-P32	20096	20094
OSP-P40	20024	20093
OSP-P50	20097	20095
OSP-P63	20466	20467
OSP-P80	20477	20478



Inversion mounting, ø 16-80 mm

In dirty environments, or where there are special space problems, inversion of the cylinder is recommended.

The inversion bracket transfers the driving force to the opposite side of the cylinder. The size and position of the mounting holes are the same as on the standard cylinder.

Stainless steel version on demand.

Please note:

Other components of the OSP system such as **mid-section supports, magnetic switches** and the **external air passage for the P16**, can still be mounted on the free side of the cylinder.

When combining single end porting with inversion mountings, RS magnetic switches can only be mounted directly opposite to the external air-supply profile.

Series	Order number
OSP-P16	20446
OSP-P25	20037
OSP-P32	20161
OSP-P40	20039
OSP-P50	20166
OSP-P63	20459
OSP-P80	20490



End cap mountings, ø 10-80 mm


On the end-face of each end cap there are four threaded holes for mounting the actuator.
 The hole layout is square, so that the mounting can be fitted to the bottom, top or either side, regardless of the position chosen for the air connection.

Material:

Series OSP-P10 – P32: Galvanized steel.

Series OSP-P40 – P80: Anodized aluminum.

The mountings are supplied in pairs.

	Series	Order number (*)	
		Type A1	Type C1
	OSP-P10	0 240	-
	OSP-P16	20408	-
	OSP-P25	2010	-
	OSP-P32	3010	-
	OSP-P40	-	4010
	OSP-P50	-	5010
	OSP-P63	-	6010
	OSP-P80	-	8010


(* = Pair)

Mid-section support, ø 10-80 mm

Note on types E1 and D1 (P16 – P80):

The mid-section support can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.

Stainless steel version on demand.


	Series	Order number	
		Type E1	Type D1
	OSP-P10	0250	-
	OSP-P16	20435	20434
	OSP-P25	20009	20008
	OSP-P32	20158	20157
	OSP-P40	20028	20027
	OSP-P50	20163	20162
	OSP-P63	20452	20451
	OSP-P80	20482	20480

Actuator Products – Rodless Cylinders OSP-P Series

Adaptor profile, ø 16-50 mm

Adaptor profile OSP


- A universal attachment for mounting of valves etc.
- Solid material

	Series	Order number	
		Standard	Stainless
	OSP-P16	20432	20438
	OSP-P25	20006	20186
	OSP-P32	20006	20186
	OSP-P40	20025	20267
	OSP-P50	20025	20267

T-Slot Profile ø 16-50 mm

T-slot profile OSP


- A universal attachment for mounting with standard T-Nuts

	Series	Order number	
		Standard	Stainless
	OSP-P16	20433	20439
	OSP-P25	20007	20187
	OSP-P32	20007	20187
	OSP-P40	20026	20268
	OSP-P50	20026	20268

Connection profile, ø 16-50 mm

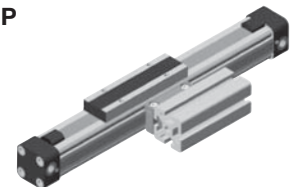
For combining

- Series OSP-P with system profiles
- Series OSP-P with Series OSP-P

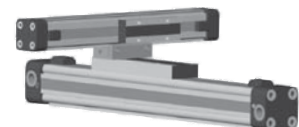
	Series	For mounting on the carrier of	Order number
	OSP-P16	OSP25	20849
	OSP-P25	OSP32-50	20850
	OSP-P32	OSP32-50	20850
	OSP-P40	OSP32-50	20851
	OSP-P50	OSP32-50	20851

Possible Combinations

Combination of Series OSP-P with system profiles



Combination of Series OSP-P with Series OSP-P



Joint clamp connection ø 25-50 mm
For connection of cylinders of the Series OSP-P

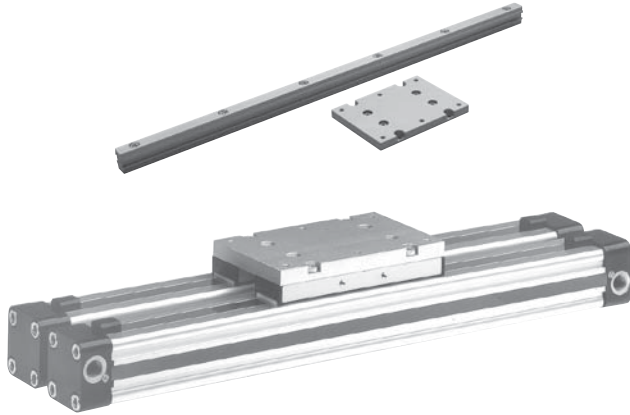
The joint clamp connection combines two OSP-P cylinders of the same size into a compact unit with high performance.

Features

- Increased load and torque capacity
- Higher driving forces

Included in delivery:

- 2 clamping profiles with screws
- 1 mounting plate with fixings



Multiplex connection ø 25-50 mm

For connection of cylinders of the Series OSP-P

The multiplex connection combines two or more OSP-P cylinders of the same size into on unit.

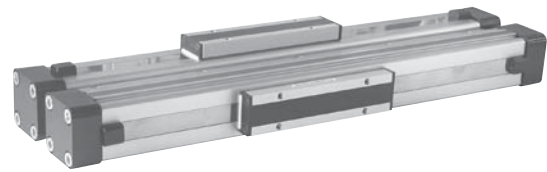
Features

- The orientation of the carriers can be freely selected

Included in delivery:

- 2 clamping profiles with clamping screws

Series	Order number	
	Standard	Stainless
OSP-P25	20035	20193
OSP-P32	20167	20265
OSP-P40	20036	20275
OSP-P50	20168	20283



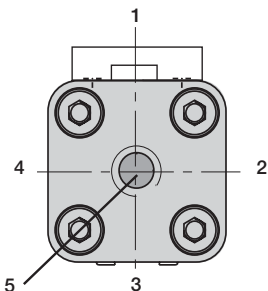
B

Rodless Cylinders
 Actuator Products

Ordering Information / Part Numbering System for OSP-P Rodless Basic Pneumatic Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25					
OSPP	25	0	0	1	0	01100	0	0	1	0	0	0	0	0	0					
	Bore			Seals		Stroke		Piston Mountings		Dovetail Cover				Version						
	10 16 25 32 40 50 63 80			0 Standard 1 Viton S Special		xxxxx		0 None Floating 1 Mount (NR25) Joint Clamp 8 Plate (NR24) S Special		0 Standard X Without Cover Rail S Special										
	Piston Style			Lubrication				Guides / Brakes / Inversion Mounts		add. Carriage					Switches / Measuring System					
	0 Standard 1 Tandem S Special			0 Standard 1 Slow Speed 4 Food 5 Clean Room S Special				0 None A AB Activebrake M Inversion (NR30) N Joint Clamp (25,32,40,50) S Special		0 Without S Special				0 None 1 NO Reed - KL3045 (All except 10mm) Qty. 2 2 NC Reed - KL3048 (All except 10mm) Qty. 2 3 PNP KL3054+4041 (All except 10mm) Qty. 2 4 NPN KL3060+4041 (All except 10mm) Qty. 2 5 NO Reed - KL3045 (10mm only) 6 PNP 3049+4041 (10mm only) Qty. 2 7 PNP 3753+4041 (10mm only) Qty. 2 X 21240 SFI 0.1mm Y 21241 SFI 1mm Z 4650 SFA S Special						
	Air Connections / Porting			Corrosion Resist. Hardware				Cushioning / Stops		End Cap Mounts										
	0 Standard (position #2) 1 End Face (position #5) 2 Single End Porting 3 Left Stand (pos #2), Right End Face (pos #5) 4 Right Stand (pos #2), Left End Face (pos #5) 6 Single End Porting End Face A 3/2 Way Valve VOE 24V = (25, 32, 40, 50) B 3/2 Way Valve VOE 220V~/110V = (25, 32, 40, 50) C 3/2 Way Valve VOE 48V = (25, 32, 40, 50) E 3/2 Way Valve VOE 110V~ (25, 32, 40, 50) S Special			0 Standard 1 Stainless 2 Xylan Coated Aluminum 3 Xylan Coating & Stainless Steel Fasteners S Special				0 Standard S Special		0 Without 1 A1 (10, 16, 25, 32) 2 A2 (16, 25, 32) 3 A3 (25, 32) 4 B1 (25, 32) 6 B3 (16) 7 B4 (25, 32) 8 B5 (32) 9 C1 (40, 50, 63, 80) A C2 (40, 50) B C3 (40, 50, 63, 80) C C4 (40, 50)										
						End Cap Position														
						0 l+r 0° = In Front (pos #2) 1 l+r 90° = Underneath (pos #3) 2 l+r 180° = At the Back (pos # 4) 3 l+r 270° = Same Face as Outerband (pos #2, 1) 4 l 90° = Underneath; r 0° = In Front (pos #3, 2) 5 l 180° = At the Back; r 0° = In Front (pos #4, 2) 6 l 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2) 7 l 0° = In Front; r 90° = Underneath (pos #2, 3) 8 l 180° = At the Back; r 90° = Underneath (pos #4, 3) 9 l 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3) A l 0° = In Front; r 180° = At the Back (pos #2, 4) B l 90° = Underneath; r 180° = At the Back (pos #3, 4) C l 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4) D l 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1) E l 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1) F l 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1) S Special														

Notes: 10mm bore can only have standard port locations.
 Single End Porting on 16mm bore, then end caps cannot be rotated.



Note: Position #2 is the standard location.

B
 Rodless Cylinders
 Actuator Product

Clean Room Cylinder

Ø 16 – 32 mm Rodless Cylinder certified to DIN EN ISO 14644-1



B

Rodless Cylinders
 Actuator Products

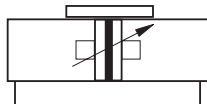
Standard versions:

- Double-acting with adjustable end cushioning
- With magnetic piston for position sensing
- Stainless steel screws

Special versions:

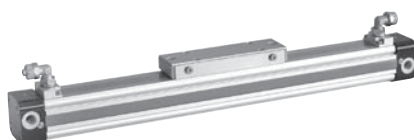
- Slow speed lubrication
- Viton® seals

Series OSP-P..



Features:

- Clean room classification
- ISO Class 4 at $v_m = 0.14$ m/s
- ISO Class 5 at $v_m = 0.5$ m/s
- Suitable for smooth slow speed operation up to $v_{min} = 0.005$ m/s
- Optional stroke length up to 1200 mm (longer strokes on request)
- Low maintenance
- Compact design with equal force and velocity in both directions
- Aluminum piston with bearing rings to support high direct and cantilever loads



General features

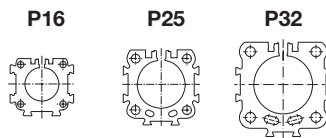
Characteristics	Symbol	Unit	Description
Type			Rodless cylinder
Series			OSP-P
System			Double-acting, with cushioning, position sensing capability
Mounting			See drawings
Air connection			Threaded
Ambient	T_{min}	°C	-10
Medium temperature range	T_{max}	°C	+80
Weight (mass)		kg	See table below
Installation			In any position
Medium			Filtered, unlubricated compressed air (other media on request)
Lubrication			Permanent grease lubrication (additional oil mist lubrication not required) Option: special slow speed grease
Material	Cylinder profile		Anodized aluminum
	Carrier (piston)		Anodized aluminum
	End caps		Aluminum, lacquered
	Sealing bands		Corrosion resistant steel
	Seals		NBR (Option: Viton®)
	Screws		Stainless steel
	Dust covers, wipers		Plastic
Max. operating pressure*	p_{max}	bar	8

* Pressure quoted as gauge pressure

Weight (Mass) kg

Cylinder series (basic cylinder)	Weight (Mass) kg	
	at 0 mm stroke	per 100 mm stroke
OSP-P16	0.22	0.1
OSP-P25	0.65	0.197
OSP-P32	1.44	0.354

Size Comparison



Certification

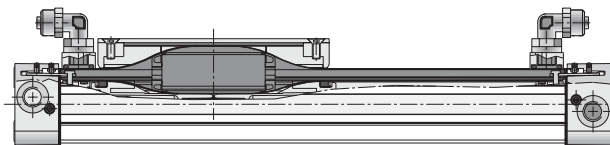
Based on the PARKER-ORIGA rodless cylinder, proven in world wide markets, PARKER-ORIGA now offers the only rodless cylinder on the market with a certification from IPA Institute for the cleanroom specification according to DIN EN ISO 14644-1.



Function:

The clean room cylinders of the ORIGA SYSTEM PLUS (OSP-P) combines the efficiency of the PARKER-ORIGA slot seal system with vacuum protection against progressive wear and contamination from the sliding components. A partial vacuum drawn between inner and outer sealing bands prevents emission into the clean room. To achieve the necessary vacuum a suction flow of ca. 4 m3/h is required.

Function diagram

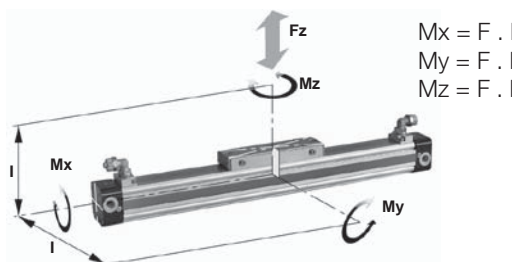


Loads, forces and moments

Cylinder series (mm Ø)	Effective force at 6 bar (N)	Max. moment			Max. load Fz (N)	Cushion length (mm)
		Mx (Nm)	My (Nm)	Mz (Nm)		
OSP-P16	78	0.45	4	0.5	120	11
OSP-P25	250	1.5	15	3.0	300	17
OSP-P32	420	3.0	30	5.0	450	20

Load and moment data are based on speeds v ≤ 0.2 m/s.

The adjacent table shows the maximum values for light, shock-free operation which must not be exceeded even in dynamic operation.



Ordering Information / Part Numbering System for OSP-P Clean Room Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25	
OSPP	32	0	0	0	0	S	02500	0	0	0	G	0	0	2	0	0

Bore

16
25
32

Seals

0	Standard
1	Viton
S	Special

Stroke

x x x x x

Cushioning / Stops

0	Standard
---	----------

End Cap Position

0	l+r 0° = In Front (pos #2)
---	----------------------------

Piston Mountings

0	None
---	------

Guides / Brakes

0	None
---	------

Dovetail Cover

0	Standard
X	Without Cover Rail
S	Special

Version

0	None
1	NO Reed - KL3045 Qty. 2
2	NC Reed - KL3048 Qty. 2
3	PNP KL3054+4041 Qty. 2
4	NPN KL3060+4041 Qty. 2

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.

Piston Style

0	Standard
---	----------

Lubrication

0	Standard
1	Slow Speed
4	Food
5	Clean Room
S	Special

End Cap Mounts

0	Without
1	A1 (16, 25, 32)
2	A2 (16, 25, 32)
3	A3 (25, 32)
4	B1 (25, 32)
6	B3 (16)
7	B4 (25, 32)
8	B5 (32)

Note: Comes in pairs

Air Connection / Porting

7	Clean Room
---	------------

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan Coated Aluminum
3	Xylan Coating & Stainless Steel Fasteners
S	Special

Note: Position #2 is the standard location.

Rodless Cylinder Ø 40 mm

for synchronized
 bi-parting movements

Type OSP-P40-SL-BP

B

Rodless Cylinders
 Actuator Products

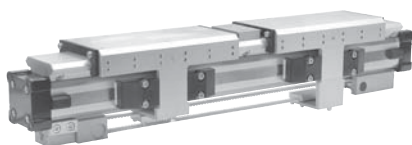


Features:

- Accurate bi-parting movement through toothed belt synchronization
- Optimum slow speed performance
- Increased action force
- Anodized aluminum guide rail with prism-form slideway arrangement
- Adjustable polymer slide units
- Combined sealing system with polymer and felt elements to remove dirt and lubricate the slideway
- Integrated grease nipples for guide lubrication

Applications:

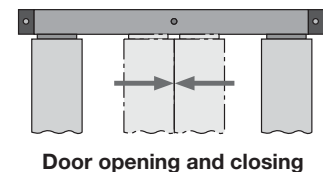
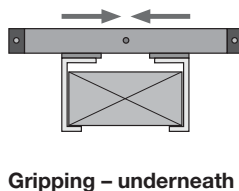
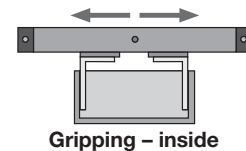
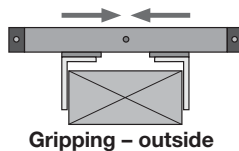
- Opening and closing operations
- Gripping of workpieces – outside
- Gripping of hollow workpieces – inside
- Gripping underneath larger objects
- Clamping force adjustable via pressure regulator



General features

Characteristics	Symbol	Unit	Description
Type			Rodless cylinder for synchronized bi-parting movements
Series			OSP-P
System			Double acting with end cushioning. For contactless position sensing
Guide			Slideline SL40
Synchronization			Toothed belt
Mounting			See drawings
Ambient temperature range	T _{min} T _{max}	°C °C	-10 +60
Weight (Mass)		kg	see table
Medium			Filtered, unlubricated compressed air (other media on request)
Lubrication			Special slow speed grease – additional oil mist lubrication not required
Material			
Toothed Belt			Steel-corded polyurethane
Belt wheel			Aluminum
Operating pressure range	p _{max}	bar	6
Cushioning middle position			Elastic buffer
Max. Speed	v _{max}	m/s	0.2
Max. stroke of each stroke		mm	500
Max. mass per guide carrier		kg	25
Max. moments on guide carrier			
lateral moment	M _{xmax}	Nm	25
axial moment	M _{ymax}	Nm	46
rotating moment	M _{zmax}	Nm	46

Applications

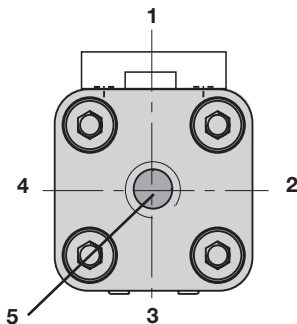


Ordering Information / Part Numbering System for OSP-P Bi-Parting Rodless Cylinders Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSP	40	N	7	0	5	0	01000	0	0	0	0	0	9	0	0
	Bore 40	Piston Style N Bi-Parting	Seals 0 Standard	Lubrication 0 Standard	Stroke x x x x x	Cushioning / Stops 0 Standard	Piston Mountings 0 None	Guides / Brakes 0 None	add. Carriage 0 Without	Dovetail Cover 0 Standard X Without Cover Rail S Special	End Cap Mounts 0 Without 9 C1 A C2 B C3 C C4	Version 0 None 1 NO Reed - KL3045 Qty. 2 2 NC Reed - KL3048 Qty. 2 3 PNP KL3054+4041 Qty. 2 4 NPN KL3060+4041 Qty. 2			
Air Connections / Porting			Corrosion Resist. Hardware			End Cap Position									
0	Standard (position #2)		0	Standard		0	l+r 0° = In Front (pos #2)								
1	End Face (position #5)		1	Stainless		1	l+r 90° = Underneath (pos #3)								
2	Single End Porting		2	Xylan Coated Aluminum		2	l+r 180° = At the Back (pos #4)								
3	Left Stand (pos #2), Right End Face (pos #5)		3	Xylan Coating & Stainless Steel Fasteners		3	l+r 270° = Same Face as Outerband (pos #2, 1)								
4	Right Stand (pos #2), Left End Face (pos #5)		S	Special		4	l 90° = Underneath; r 0° = In Front (pos #3, 2)								
6	Single End Porting End Face					5	l 180° = At the Back; r 0° = In Front (pos #4, 2)								
S	Special					6	l 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2)								
						7	l 0° = In Front; r 90° = Underneath (pos #2, 3)								
						8	l 180° = At the Back; r 90° = Underneath (pos #4, 3)								
						9	l 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3)								
						A	l 0° = In Front; r 180° = At the Back (pos #2, 4)								
						B	l 90° = Underneath; r 180° = At the Back (pos #3, 4)								
						C	l 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4)								
						D	l 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1)								
						E	l 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1)								
						F	l 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1)								
						S	Special								

Note: Comes in pairs

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

B
 Rodless Cylinders
 Actuator Productd

OSP

— ORIGA
— SYSTEM
— PLUS

Adaptive modular system

The Origa system plus – OSP – provides a comprehensive range of linear guides for the pneumatic and electric linear drives.

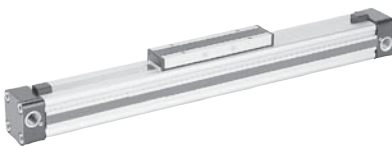
Advantages:

- Takes high loads and forces
- High precision
- Smooth operation
- Can be retrofitted
- Can be installed in any position

Rodless pneumatic cylinder

- Series OSP - P

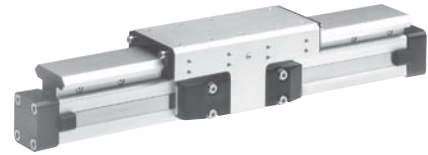
Piston diameters 10 – 80 mm



Linear Guides

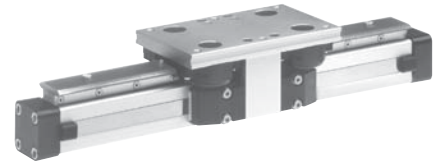
SLIDELINE

The cost-effective plain bearing guide for medium loads.
Active/ Passive Brake optional.
Piston diameters 16 – 80 mm



Powerslide

The roller guide for heavy loads and hard application conditions
Piston diameters 16 – 50 mm



PROLINE

The compact aluminum roller guide for high loads and velocities.
Active/ Passive Brake optional.
Piston diameters 16 – 50 mm



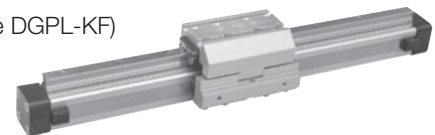
STARLINE

Recirculating ball bearing guide for very high loads and precision
Piston diameters 16 – 50 mm



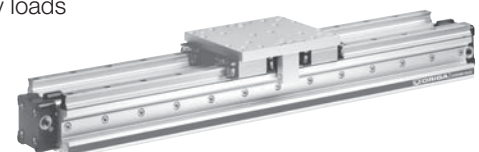
KF Guide

Recirculating ball bearing guide for highest loads and precision.
Correspond to FESTO dimensions (Type DGPL-KF)
Piston diameters 16 – 50 mm



HD Heavy Duty Guide

The ball bushing guide for the heavy loads and greatest accuracy.
Piston diameters 25 – 50 mm

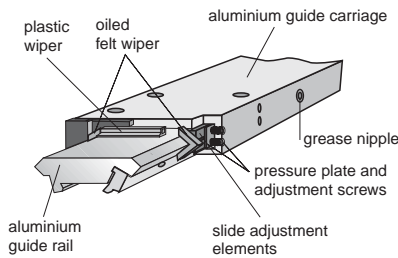


B

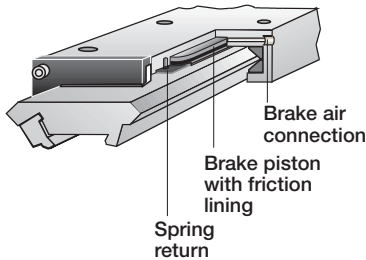
Rodless Cylinders
Actuator Products

Versions

For pneumatic linear drive:
Series OSP-P



Option – Integrated brake

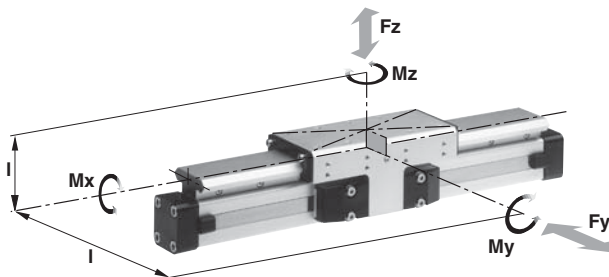


**Integrated brake (optional)
for series OSP-P25 to OSP-P50:**

- Actuated by pressure
- Released by exhausting and spring return

For further technical data see also linear drives OSP-P.

Loads, forces and moments



Technical data:

The table shows the maximum permissible values for smooth operation, which should not be exceeded even under dynamic conditions.

The load and moment figures apply to speeds $v < 0.2$ m/s.

Plain Bearing Guide SLIDELINE



**Series SL 16 to 80
for Linear-drive**

- Series OSP-P

Features:

- Adjustable plastic slide elements – optional with integral brake
- Composite sealing system with plastic and felt wiper elements to remove dirt and lubricate the slideways.
- Corrosion resistant version available on request.
- Any length of stroke up to 5500 mm (longer strokes on request)

- 1) Only with integrated brake:
Braking force on dry oil-free surface
Values are decreased for lubricated slideways
- 2) Corrosion resistant fixtures available on request

*** Please note:**

In the cushioning diagram, add the mass of the guide carriage to the mass to be cushioned.

Series	For linear drive	Max. moments (Nm)			Max. loads (N)	Maximum braking force at 6 bar (N) 1)	Mass of linear drive with guide (kg)		Mass * of guide carriage (kg)
		Mx	My	Mz			With 0mm stroke	Increase per 100mm stroke	
SL16	OSP-P16	6	11	11	325	–	0.57	0.22	0.23
SL 25	OSP-P25	14	34	34	675	325	1.55	0.39	0.61
SL 32	OSP-P32	29	60	60	925	545	2.98	0.65	0.95
SL 40	OSP-P40	50	110	110	1500	835	4.05	0.78	1.22
SL50	OSP-P50	77	180	180	2000	1200	6.72	0.97	2.06
SL63	OSP-P63	120	260	260	2500	–	11.66	1.47	3.32
SL80	OSP-P80	120	260	260	2500	–	15.71	1.81	3.32

B
Rodless Cylinders
Actuator Productd

Multi-Brake Passive Brake



Series MB-SL 25 to 80 for linear-drive

- Series OSP-P

Features:

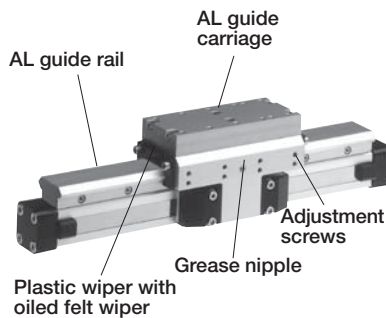
- Brake operated by spring actuation
- Brake release by pressurization
- Optional sensor to indicate brake lining wear
- Anodized aluminum rail, with prism shaped slide elements
- Adjustable plastic slide elements
- Composite sealing system with plastic and felt wiper elements to remove dirt and lubricate the slideway
- Replenishable guide lubrication by integrated grease nipples
- Blocking function in case of pressure loss
- Intermediate stops possible

1) Braking surface dry – oil on the braking surface will reduce the braking force

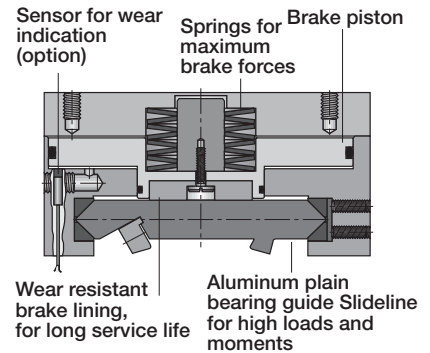
* **Please note:**

In the cushioning diagram, the mass of the guide carriage has to be added to the total moving mass.

Versions



Function

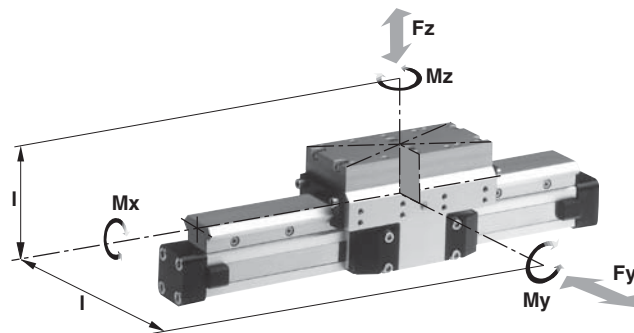


Function:

The Multi-Brake is a passive device. When the air pressure is removed the brake is actuated and movement of the cylinder is blocked. The brake is released by pressurization.

The high friction, wear resistant brake linings allow the Multi-Brake to be used as a dynamic brake to stop cylinder movement in the shortest possible time. The powerful springs also allow the Multi-Brake to be used effectively in positioning applications.

Loads, forces and moments



Technical data:

The table shows the maximum values for light, shock-free operation, which must not be exceeded even in dynamic operation.





Load and moment data are based on speeds $v < 0.2$ m/s.

Operating pressure 4.5 - 8 bar
 A pressure of 4.5 bar is required to release the brake.

For further technical information, please refer to the data sheets for linear drives OSP-P.

Series	For linear drive	Max. moments (Nm)			Max. loads (N)		Mass of linear drive with guide (kg)		Mass* guide carriage (kg)
		Mx	My	Mz	Ly, Lz	Max. brake force (N) 1	With 0mm stroke	Increase per 100mm stroke	
MB-SL 25	OSP-P25	14	34	34	675	470	2.04	0.39	1.10
MB-SL 32	OSP-P32	29	60	60	925	790	3.82	0.65	1.79
MB-SL 40	OSP-P40	50	110	110	1500	1200	5.16	0.78	2.34
MB-SL 50	OSP-P50	77	180	180	2000	1870	8.29	0.97	3.63
MB-SL 63	OSP-P63	120	260	260	2500	2900	13.31	1.47	4.97
MB-SL 80	OSP-P80	120	260	260	2500	2900	17.36	1.81	4.97

Overview

Mounting Type	Type	Type – OSP Guides																
		SLIDELINE PROLINE MULTIBRAKE								POWERSLIDE								
		16*	25	32	40	50	63*	80*	16/ 25	25/ 25	25/ 35	25/ 44	32/ 35	32/ 44	40/ 44	40/ 60	50/ 60	50/ 76
 End cap mounting	Type A1	X							X									
	Type A2	0	0	0														
	Type A3									0	0		0					
 End cap mounting, reinforced	Type B1		X	X					X	X	X	X	X					
	Type B3								0									
	Type B4										0		0					
	Type B5																	
 End cap mounting	Type C1				X	X	X	X							X	X	X	X
	Type C2				0	0												
	Type C3						0	0							0		0	
	Type C4															0		0
Mid-Section support, small	Type D1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
 Mid-Section support, wide	Type E1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E2	0	0	0	0	0												
	Type E3						0	0	0	0	0		0		0		0	
	Type E4											0		0		0		0
	Type E5																	

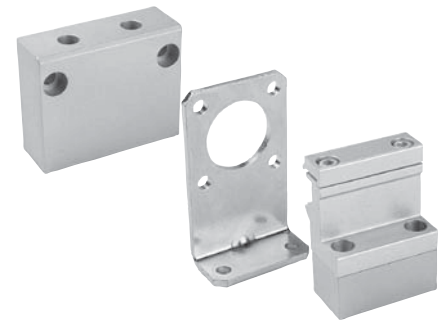
X = carriage mounted in top (12 o'clock position)
 O = carriage mounted in lateral (3 or 9 o'clock position)
 = available components
 * not available for all sizes

Linear Drive Accessories

Mountings for Linear Drives fitted with OSP-Guides



For linear-drives
 • Series OSP-P



B
 Rodless Cylinders
 Actuator Productd

End cap mountings

Four internal screw threads are located in the end faces of all OSP actuators for mounting the drive unit. End cap mountings may be secured across any two adjacent screws.

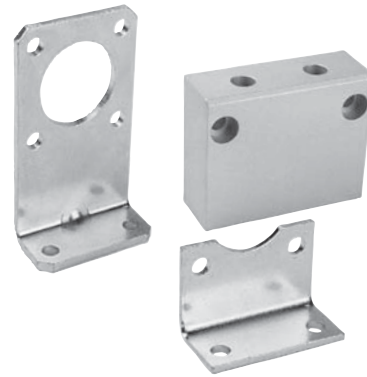
Material: Series OSP-16, 25, 32:

Galvanized steel

Series OSP-40,50, 63, 80:

Anodized aluminum

The mountings are supplied in pairs.



B

Rodless Cylinders
 Actuator Products

Mid-section support

Information regarding type E1 and D1:

Mounting of the Mid-Section supports is also possible on the lower side of the drive. In this case, please note the new center line dimensions.

Stainless steel version on request.



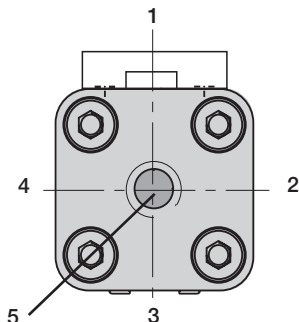
Ordering Information For Mountings Type A – Type B – Type C – Type D – Type E

Mounting type (versions)	Size						
	16	25	32	40	50	63	80
A1 *)	20408	2010	3010	–	–	–	–
A2 *)	20464	2040	3040	–	–	–	–
A3 *)	–	2060	3060	–	–	–	–
B1 *)	–	20311	20313	–	–	–	–
B3 *)	20465	–	–	–	–	–	–
B4 *)	–	20312	20314	–	–	–	–
B5 *)	–	–	20976	–	–	–	–
C1 *)	–	–	–	4010	5010	6010	8010
C2 *)	–	–	–	20338	20349	–	–
C3 *)	–	–	–	20339	20350	20821	20822
C4 *)	–	–	–	20340	20351	–	–
D1	20434	20008	20157	20027	20162	20451	20480
E1	20435	20009	20158	20028	20163	20452	20482
E2	20436	20352	20355	20358	20361	–	–
E3	20437	20353	20356	20359	20362	20453	20819
E4	–	20354	20357	20360	20363	–	–
E5	–	–	20977	–	–	–	–

(* Pair)

Ordering Information / Part Numbering System for OSP-P SLIDELINE Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSP	25	0	2	0	0	01500	0	0	0	2	0	0	0	0	0
Bore		Seals			Stroke			Piston Mountings		Dovetail Cover			Version		
16 25 32 40 50 63 80		0 Standard 1 Viton S Special			x x x x x			0 None		0 Standard X Without Cover Rail S Special			0 None		
Piston Style		Lubrication			Corrosion Resist, Hardware			Cushioning / Stops		End Cap Mounts			Switches/ Measuring System		
0 Standard 1 Tandem S Special		0 Standard 1 Slow Speed 4 Food 5 Clean Room S Special			0 Standard 1 Stainless 2 Xylan Coated Aluminum 3 Xylan Coating & Stainless Steel Fasteners S Special			0 Standard S Special		0 Without 1 A1 (16, 25, 32) 2 A2 (16, 25, 32) 3 A3 (25, 32) 4 B1 (25, 32) 6 B3 (16) 7 B4 (25, 32) 8 B5 (32) 9 C1 (40, 50, 63, 80) A C2 (40,50) B C3 (40, 50, 63, 80) C C4 (40, 50)			0 None 1 NO Reed - KL3045 Qty. 2 2 NC Reed - KL3048 Qty. 2 3 PNP KL3054+4041 Qty. 2 4 NPN KL3060+4041 Qty. 2 X 21240 SFI 0,1mm Y 21241 SFI 1mm Z 4650 SFA S Special		
Air Connections / Porting			End Cap Position			add. Carriage									
0 Standard (position #2) 1 End Face (position #5) 2 Single End Porting 3 Left Stand (pos #2), Right End Face (pos #5) 4 Right Stand (pos #2), Left End Face (pos #5) 6 Single End Porting End Face A 3/2 Way Valve VOE 24V = (25, 32, 40, 50) B 3/2 Way Valve VOE 220V~/110V = (25, 32, 40, 50) C 3/2 Way Valve VOE 48V = (25, 32, 40, 50) E 3/2 Way Valve VOE 110V~ (25, 32, 40, 50) S Special			0 l+r 0° = In Front (pos #2) 1 l+r 90° = Underneath (pos #3) 2 l+r 180° = At the Back (pos # 4) 3 l+r 270° = Same Face as Outerband (pos #2, 1) 4 l 90° = Underneath; r 0° = In Front (pos #3, 2) 5 l 180° = At the Back; r 0° = In Front (pos #4, 2) 6 l 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2) 7 l 0° = In Front; r 90° = Underneath (pos #2, 3) 8 l 180° = At the Back; r 90° = Underneath (pos #4, 3) 9 l 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3) A l 0° = In Front; r 180° = At the Back (pos #2, 4) B l 90° = Underneath; r 180° = At the Back (pos #3, 4) C l 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4) D l 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1) E l 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1) F l 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1) S Special			0 Without 2 Guide Carriage Slideline SL 3 Guide Carriage SL-AB 4 Guide Carriage SL-MB M Guide Carriage SL-MB without Brake Function			Note: Comes in pairs Note: 2 switches will be supplied. For different quantity, please order as a separate line item.						



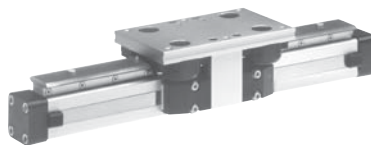
Note: Position #2 is the standard location.

B
 Rodless Cylinders
 Actuator Product

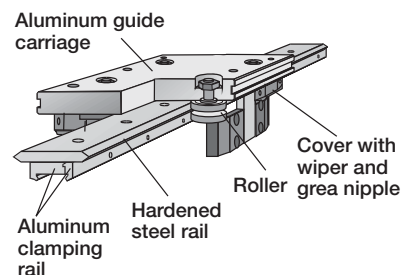
Roller Guide POWERSLIDE

Versions

For pneumatic linear drive:
 Series OSP-P



Function



Series PS 16 to 50 for linear-drive

- Series OSP-P

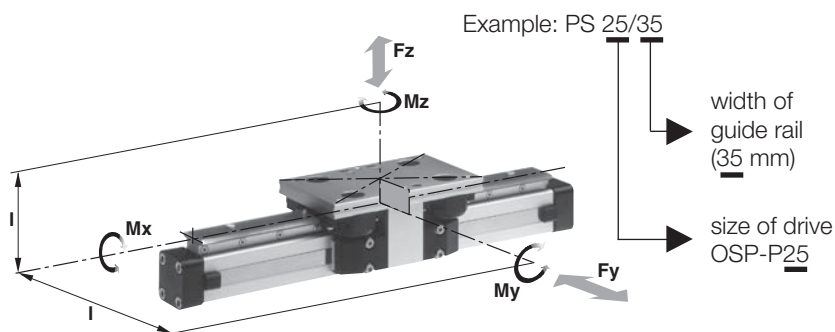
B

Rodless Cylinders
 Actuator Products

Features:

- Anodized aluminum guide carriage with vee rollers having 2 rows of ball bearings
- Hardened steel guide rail
- Several guide sizes can be used on the same drive
- Corrosion resistance version available on request
- Max. Speed $v = 3$ m/s,
- Tough roller cover with wiper and grease nipple
- Any length of stroke up to 3500 mm, (longer strokes on request)

Loads, forces and moments



Technical Data

The Table shows the maximum permissible values for smooth operation, which should not be exceeded even under dynamic conditions.

For further information and technical data see linear drives OSP-P.

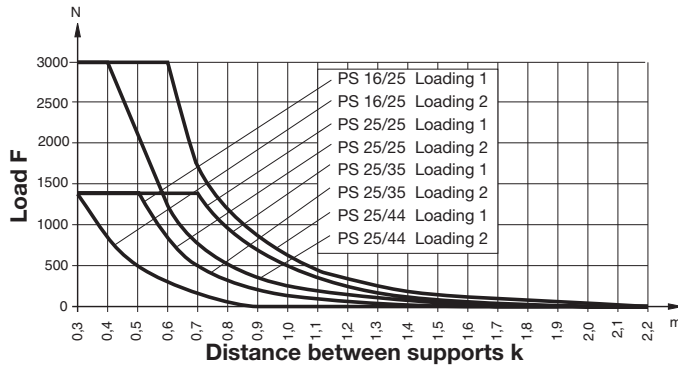
*Please note:

In the cushioning diagram, add the mass of the guide carriage to the mass to be cushioned.

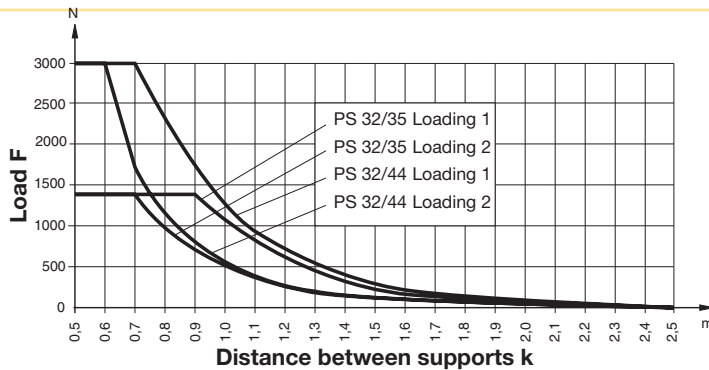
Series	For linear drive	Max. moments (Nm)			Max. load (N)	Mass of linear drive with guide (kg)		
		Mx	My	Mz		Fy, Fz	With 0 mm stroke	Increase per 100 mm stroke
PS 16/25	OSP-P16	14	45	45	1400	0.93	0.24	0.7
PS 25/25	OSP-P25	14	63	63	1400	1.5	0.4	0.7
PS 25/35	OSP-P25	20	70	70	1400	1.7	0.4	0.8
PS 25/44	OSP-P25	65	175	175	3000	2.6	0.5	1.5
PS 32/35	OSP-P32	20	70	70	1400	2.6	0.6	0.8
PS 32/44	OSP-P32	65	175	175	3000	3.4	0.7	1.5
PS 40/44	OSP-P40	65	175	175	3000	4.6	1.1	1.5
PS 40/60	OSP-P40	90	250	250	3000	6	1.3	2.2
PS 50/60	OSP-P50	90	250	250	3000	7.6	1.4	2.3
PS 50/76	OSP-P50	140	350	350	4000	11.5	1.8	4.9

1) corrosion resistance version available on request (max. loads and moments are 25% lower)

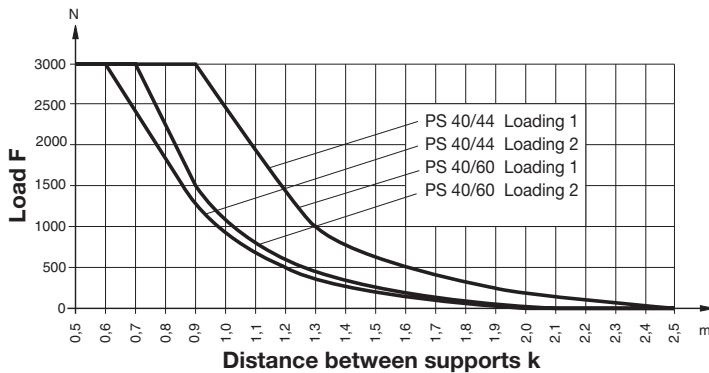
Permissible unsupported length: PS 16/25, PS 25/25, PS 25/35, PS 25/44



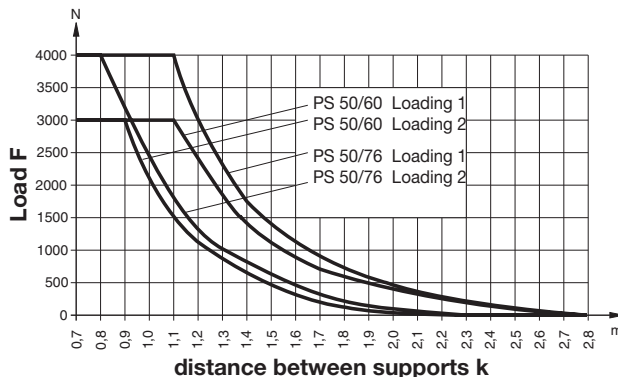
Permissible unsupported length: PS 32/35, PS 32/44



Permissible unsupported length: PS 40/44, PS 40/60



Permissible unsupported length: PS 50/60, PS 50/76



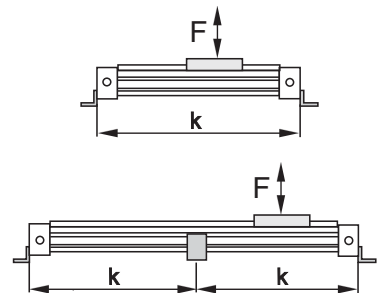
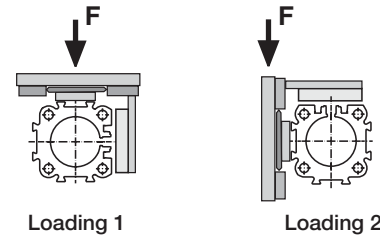
Mid-section support

(for versions, see accessories)

Mid-Section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading. A distinction must be drawn between loading 1 and loading 2. Deflection of 0.5 mm max. between supports is permissible.

Note

For speeds $v > 0.5$ m/s the distance between supports should not exceed 1m.



B
 Rodless Cylinders
 Actuator Productd

Service life

Calculation of service life is achieved in two stages:

- Determination of load factor LF from the loads to be carried
- Calculation of service life in km

1. Calculation of load factor L_F

$$LF = \frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_z}{M_{z_{max}}} + \frac{F_y}{F_{y_{max}}} + \frac{F_z}{F_{z_{max}}}$$

with combined loads, **LF** should not exceed the value 1.

2. Service life calculation

- For PS 16/25, PS 25/25, PS 25/35, Service life (km) = $\frac{106}{(LF + 0,02)^3}$
and PS 32/35
- For PS 25/44, PS 32/44, PS 40/44, Service life (km) = $\frac{314}{(LF + 0,015)^3}$
PS 40/60 and PS 50/60:
- For PS 50/76: Service life (km) = $\frac{680}{(LF + 0,015)^3}$

Lubrication

For maximum system life, lubrication of the rollers must be maintained at all times.

Only high quality Lithium based greases should be used.

Lubrication intervals are dependent on environmental conditions (temperature, running speed, grease quality etc.) therefore the installation should be regularly inspected.

B

Rodless Cylinders
Actuator Products

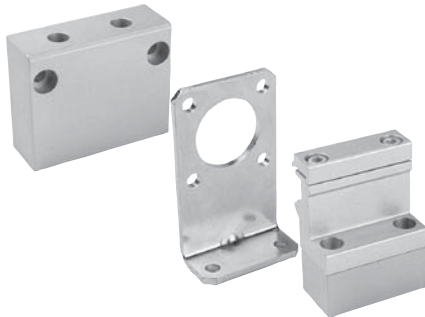
Linear Drive Accessories

Mountings for Linear Drives fitted with OSP-Guides




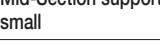
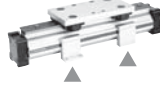



For linear-drives

- Series OSP-P



Overview

Mounting Type	Type	Type – OSP Guides																
		SLIDELINE PROLINE MULTIBRAKE								POWERSLIDE								
		16*	25	32	40	50	63*	80*	16/25	25/25	25/35	25/44	32/35	32/44	40/44	40/60	50/60	50/76
	Type A1	X							X									
	Type A2	0	0	0														
	Type A3									0	0		0					
	Type B1		X	X						X	X	X	X	X				
	Type B3								0									
	Type B4											0		0				
	Type B5																	
	Type C1				X	X	X	X							X	X	X	X
	Type C2				0	0												
	Type C3						0	0							0		0	
	Type C4															0		0
	Type D1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E2	0	0	0	0	0												
	Type E3						0	0	0	0	0		0		0		0	
	Type E4											0		0		0		0
	Type E5																	
	Type E6																	

X = carriage mounted in top (12 o'clock position)
 O = carriage mounted in lateral (3 or 9 o'clock position)
 = available components
 * not available for all sizes

Ordering Information / Part Numbering System for OSP-P POWERSLIDE Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	32	0	2	0	0	02500	0	0	0	G	0	0	2	0	0

Bore	Seals	Stroke	Piston Mountings	Dovetail Cover	Version
16 25 32 40 50	0 Standard 1 Viton S Special	xxxxx	0 None	0 Standard X Without Cover Rail S Special	

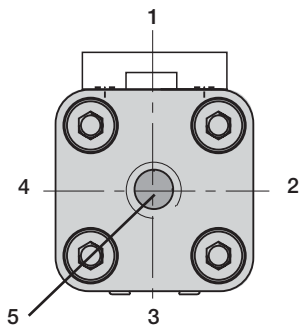
Piston Style	Lubrication	Cushioning / Stops	Guides / Brakes	End Cap Mounts	Switches/ Measuring System
0 Standard 1 Tandem S Special	0 Standard 1 Slow Speed 4 Food 5 Clean Room S Special	0 Standard S Special	E PSXX/25 Powerslide (16, 25) F PSXX/35 Powerslide (25, 32) G PSXX/44 Powerslide (25, 32, 40) H PSXX/60 Powerslide (40, 50) I PSXX/76 Powerslide (50)	0 Without 1 A1 (16, 25, 32) 2 A2 (16, 25, 32) 3 A3 (25, 32) 4 B1 (25, 32) 6 B3 (16) 7 B4 (25, 32) 8 B5 (32) 9 C1 (40, 50) A C2 (40, 50) B C3 (40, 50) C C4 (40, 50)	0 None 1 NO Reed - KL3045 Qty. 2 2 NC Reed - KL3048 Qty. 2 3 PNP KL3054+4041 Qty. 2 4 NPN KL3060+4041 Qty. 2 X 21240 SFI 0.1mm Y 21241 SFI 1mm Z 4650 SFA S Special

Air Connections / Porting	Corrosion Resist. Hardware	End Cap Position	add. Carriage
0 Standard (position #2) 1 End Face (position #5) 2 Single End Porting 3 Left Stand (pos #2), Right End Face (pos #5) 4 Right Stand (pos #2), Left End Face (pos #5) 6 Single End Porting End Face A 3/2 Way Valve VOE 24V = (25, 32, 40, 50) B 3/2 Way Valve VOE 220V~/110V = (25, 32, 40, 50) C 3/2 Way Valve VOE 48V = (25, 32, 40, 50) E 3/2 Way Valve VOE 110V~ (25, 32, 40, 50) S Special	0 Standard 1 Stainless 2 Xylan Coated Aluminum 3 Xylan Coating & Stainless Steel Fasteners S Special	0 l+r 0° = In Front (pos #2) 1 l+r 90° = Underneath (pos #3) 2 l+r 180° = At the Back (pos #4) 3 l+r 270° = Same Face as Outerband (pos #2, 1) 4 l 90° = Underneath; r 0° = In Front (pos #3, 2) 5 l 180° = At the Back; r 0° = In Front (pos #4, 2) 6 l 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2) 7 l 0° = In Front; r 90° = Underneath (pos #2, 3) 8 l 180° = At the Back; r 90° = Underneath (pos #4, 3) 9 l 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3) A l 0° = In Front; r 180° = At the Back (pos #2, 4) B l 90° = Underneath; r 180° = At the Back (pos #3, 4) C l 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4) D l 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1) E l 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1) F l 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1) S Special	0 Without E Guide Carriage Powerslide PSXX/25 (16, 25) F Guide Carriage Powerslide PSXX/35 (16, 25) G Guide Carriage Powerslide PSXX/44 (16, 25) H Guide Carriage Powerslide PSXX/60 (16, 25)

Note: Single End Porting on 16mm bore, then end caps cannot be rotated.

Note: Comes in pairs

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

B
 Rodless Cylinders
 Actuator Productd

Aluminum Roller Guide PROLINE



Series PL 16 to 50 for linear-drive

- Series OSP-P

Features:

- High precision
- High velocities (10 m/s)
- Smooth operation - low noise
- Integrated wiper system
- Long life lubrication
- Compact dimensions - compatible to Slideline plain bearing guide
- Any length of stroke up to 3750 mm

Integrated brake (optional) for Series OSP-P25 to OSP-P50:

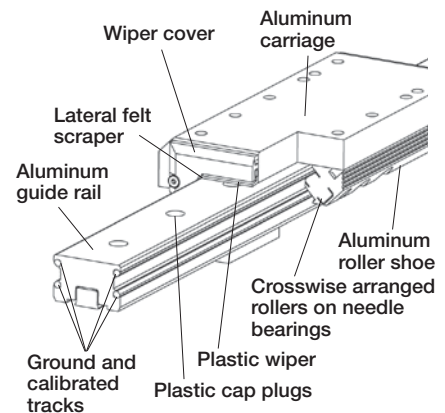
- Actuated by pressurization
- Release by depressurization and spring actuation

* Please note:

The mass of the carriage has to be added to the total moving mass when using the cushioning diagram.

Versions

For pneumatic linear drive:
Series OSP-P



Technical data

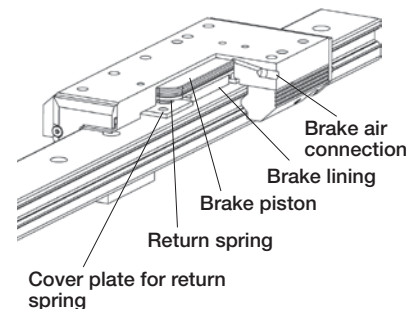
The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_z}{M_{z_{max}}} + \frac{F_y}{F_{y_{max}}} + \frac{F_z}{F_{z_{max}}} \leq 1$$

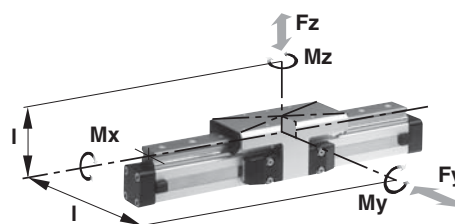
The sum of the loads should not exceed >1. With a load factor of less than 1, service life is 8000 km

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

Option – Integrated Brake



Loads, forces and moments



Series	For linear drive	Max. moments (Nm)			Max. loads (N)	Maximum braking force at 6 bar (N) 1)	Mass of linear drive with guide (kg)		
		Mx	My	Mz	Fy, Fz		With 0 mm stroke	Increase per 100 mm stroke	Mass * guide carriage (kg)
PL 16	OSP-P16	8	12	12	542	–	0.55	0.19	0.24
PL 25	OSP-P25	16	39	39	857	on request	1.65	0.40	0.75
PL 32	OSP-P32	29	73	73	1171	on request	3.24	0.62	1.18
PL 40	OSP-P40	57	158	158	2074	on request	4.35	0.70	1.70
PL 50	OSP-P50	111	249	249	3111	on request	7.03	0.95	2.50

1) Only for version with brake:
 Braking surface dry – oiled surface reduces the effective braking force.

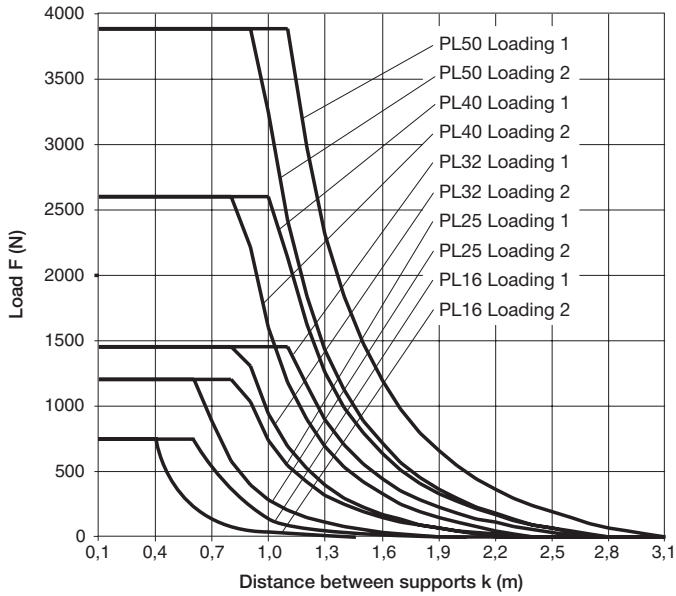
B

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 Actuator Products

Note:

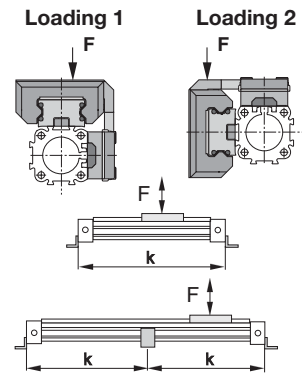
For speeds $v > 0.5$ m/s the distance between supports should not exceed 1 m.

Permissible unsupported length PL16, PL25, PL32, PL40 and PL50



Mid-section support

Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading. A distinction must be drawn between loading 1 and loading 2. Deflection of 0.5 mm max. between supports is permissible.



B

Rodless Cylinders
 Actuator Productd

Multi-Brake Passive Brake with Aluminum Roller Guide Proline PL



**Series MB-PL 25 to 50
 for linear-drive**

- Series OSP-P

Features:

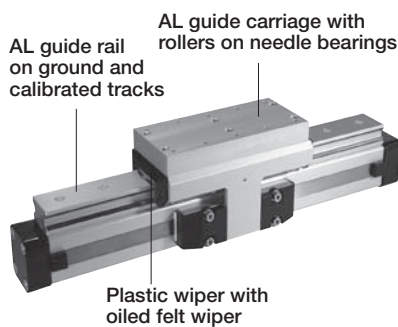
- Brake operated by spring actuation
- Brake release by pressurization
- Optional sensor to indicate brake lining wear
- Composite sealing system with plastic and felt wiper elements to remove dirt and lubricate the slideway
- Blocking function in case of pressure loss
- Intermediate stops possible

1) Braking surface dry – oil on the braking surface will reduce the braking force

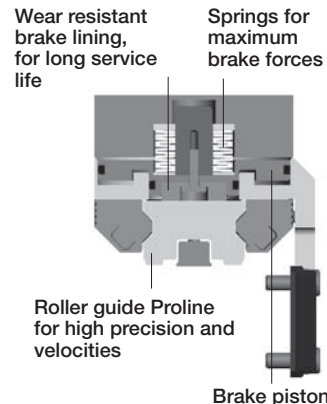
*** Please note:**

In the cushioning diagram, the mass of the guide carriage has to be added to the total moving mass.

Versions



Function

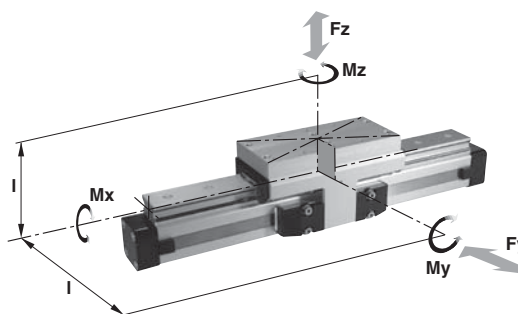


Function:

The Multi-Brake is a passive device. When the air pressure is removed the brake is actuated and movement of the cylinder is blocked. The brake is released by pressurization.

The high friction, wear resistant brake linings allow the Multi-Brake to be used as a dynamic brake to stop cylinder movement in the shortest possible time. The powerful springs also allow the Multi-Brake to be used effectively in positioning applications.

Loads, forces and moments



Technical data

The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_z}{M_{z_{max}}} + \frac{F_y}{F_{y_{max}}} + \frac{F_z}{F_{z_{max}}} \leq 1$$

The sum of the loads should not exceed >1. With a load factor of less than 1, service life is 8000 km

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

Operating Pressure 4.5 - 8 bar.

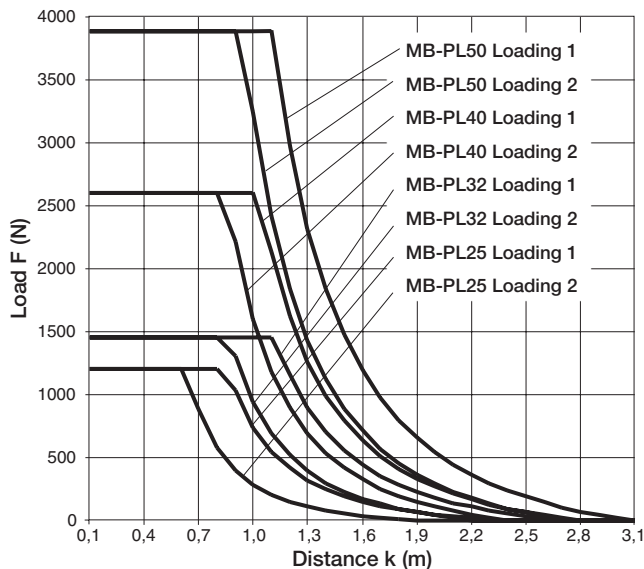
A pressure of min. 4.5 bar release the brake.

Series	For linear drive	Max. moments (Nm)			Max. loads (N)		Max. brake force (N) 1)	Mass of linear drive with guide (kg)		Mass* guide carriage (kg)
		Mx	My	Mz	Fy, Fz	With 0 mm stroke		Increase per 100 mm stroke		
MB-PL25	OSP-P25	16	39	39	857	315	2.14	0.40	1.24	
MB-PL32	OSP-P32	29	73	73	1171	490	4.08	0.62	2.02	
MB-PL40	OSP-P40	57	158	158	2074	715	5.46	0.70	2.82	
MB-PL50	OSP-P50	111	249	249	3111	1100	8.60	0.95	4.07	

Note:

For speeds $v > 0.5$ m/s the distance between supports should not exceed 1 m.

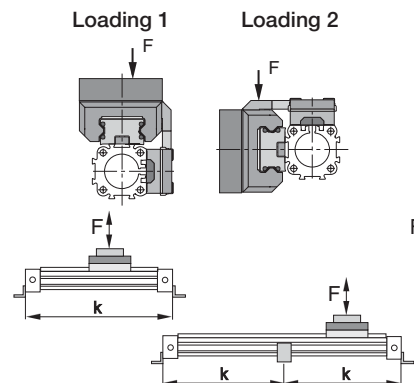
**Permissible Unsupported Length OSP-P
 MB-PL25, MB-PL32, MB-PL40, MB-PL50**



Mid-section support

Mid-Section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading.

A distinction must be drawn between loading 1 and loading 2. Deflection of 0.5 mm max. between supports is permissible.



Overview

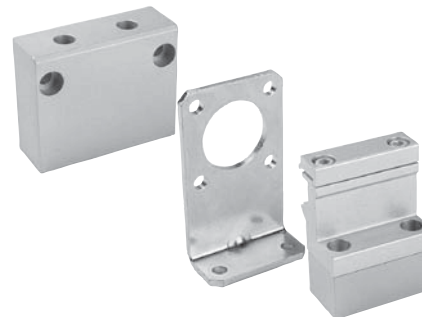
Mounting Type	Type	Type – OSP Guides																	
		SLIDELINE PROLINE MULTIBRAKE						POWERSLIDE											
		16*	25	32	40	50	63*	80*	16/25	25/25	25/35	25/44	32/35	32/44	40/44	40/60	50/60	50/76	
End cap mounting 	Type A1	X							X										
	Type A2	O	O	O															
	Type A3									O	O		O						
End cap mounting, reinforced 	Type B1		X	X						X	X	X	X	X					
	Type B3								O										
	Type B4											O		O					
	Type B5																		
End cap mounting 	Type C1				X	X	X	X							X	X	X	X	
	Type C2				O	O													
	Type C3						O	O							O		O		
	Type C4															O		O	
Mid-section support, small 	Type D1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E2	O	O	O	O	O													
	Type E3						O	O	O	O	O		O		O		O		
	Type E4											O		O		O		O	
Mid-section support, wide 	Type E1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E2	O	O	O	O	O													
	Type E3						O	O	O	O	O		O		O		O		
	Type E4											O		O		O		O	
	Type E5																		

X = carriage mounted in top (12 o'clock position)
 O = carriage mounted in lateral (3 or 9 o'clock position)
 = available components
 * not available for all sizes

Linear Drive Accessories
Mountings for Linear Drives fitted with OSP-Guides



For linear-drives
 • Series OSP-P



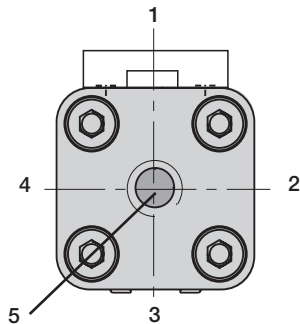
B
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Ordering Information / Part Numbering System for OSP-P PROLINE Series

B

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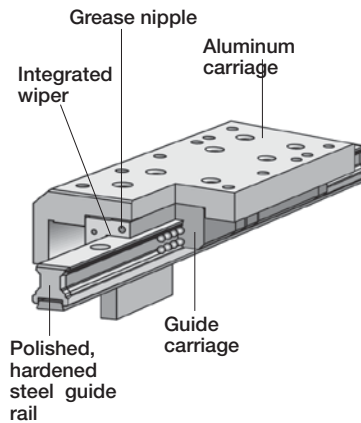
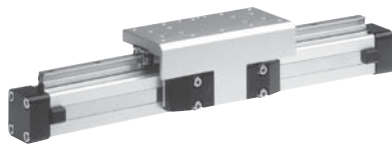
6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSP	32	0	0	0	0	02500	0	0	0	6	0	0	0	0	0
Bore		Seals			Stroke		Piston Mountings		Dovetail Cover			Version			
16 25 32 40 50		0 Standard 1 Viton S Special			xxxxx		0 None		0 Standard X Without Cover Rail S Special			0 None			
Piston Style		Lubrication			Corrosion Resist, Hardware		Cushioning / Stops		End Cap Mounts			Switches Measuring System			
0 Standard 1 Tandem S Special		0 Standard 1 Slow Speed 4 Food 5 Clean Room S Special			0 Standard 1 Stainless 2 Xylan Coated Aluminum 3 Xylan Coating & Stainless Steel Fasteners S Special		0 Standard S Special		0 Without 1 A1 (16, 25, 32) 2 A2 (16, 25, 32) 3 A3 (25, 32) 4 B1 (25, 32) 6 B3 (16) 7 B4 (25, 32) 8 B5 (32) 9 C1 (40, 50) A C2 (40, 50) B C3 (40, 50) C C4 (40, 50)			0 None 1 NO Reed - KL3045 Qty. 2 2 NC Reed - KL3048 Qty. 2 3 PNP KL3054+4041 Qty. 2 4 NPN KL3060+4041 Qty. 2 X 21240 SFI 0.1mm Y 21241 SFI 1mm Z 4650 SFA S Special			
Air Connections / Porting					End Cap Position					add. Carriage			Note: 2 switches will be supplied. For different quantity, please order as a separate line item.		
0 Standard (position #2) 1 End Face (position #5) 2 Single End Porting 3 Left Stand (pos #2), Right End Face (pos #5) 4 Eight Stand (pos #2), Left End Face (pos #5) 6 Single End Porting End Face A 3/2 Way Valve VOE 24V = (25, 32, 40, 50) B 3/2 Way Valve VOE 220V~/110V = (25, 32, 40, 50) C 3/2 Way Valve VOE 48V = (25, 32, 40, 50) E 3/2 Way Valve VOE 110V- (25, 32, 40, 50) S Special					0 l+r 0° = In Front (pos #2) 1 l+r 90° = Underneath (pos #3) 2 l+r 180° = At the Back (pos # 4) 3 l+r 270° = Same Face as Outerband (pos #2, 1) 4 l 90° = Underneath; r 0° = In Front (pos #3, 2) 5 l 180° = At the Back; r 0° = In Front (pos #4, 2) 6 l 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2) 7 l 0° = In Front; r 90° = Underneath (pos #2, 3) 8 l 180° = At the Back; r 90° = Underneath (pos #4, 3) 9 l 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3) A l 0° = In Front; r 180° = At the Back (pos #2, 4) B l 90° = Underneath; r 180° = At the Back (pos #3, 4) C l 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4) D l 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1) E l 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1) F l 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1) S Special					0 Without 2 Guide Carriage Proline PL 3 Guide Carriage PL-AB 4 Guide Carriage PL-MB M Guide Carriage PL-MB without Brake Function					
Note: Single End Porting on 16mm bore, then end caps cannot be rotated.															



Note: Position #2 is the standard location.

Versions

For pneumatic linear drive:
Series OSP-P

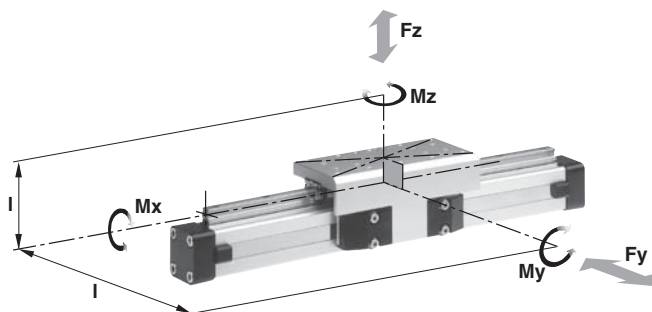


Recirculating Ball Bearing Guide STARLINE



Series STL 16 to 50
For linear drive Series OSP-P

Loads, forces and moments



Technical data

The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{M_x}{M_{x\max}} + \frac{M_y}{M_{y\max}} + \frac{M_z}{M_{z\max}} + \frac{F_y}{F_{y\max}} + \frac{F_z}{F_{z\max}} \leq 1$$

The sum of the loads should not exceed >1

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

Features:

- Polished and hardened steel guide rail
- For very high loads in all directions
- High precision
- Integrated wiper system
- Integrated grease nipples
- Any length of stroke up to 3700 mm
- Anodized aluminum guide carriage – dimensions compatible with OSP guides SLIDELINE and PROLINE
- Installation height (STL16 - 32) compatible with OSP guides SLIDELINE and PROLINE
- **Maximum speed**
STL16: v = 3 m/s
STL25 to 50: v = 5 m/s

**** Please note:**

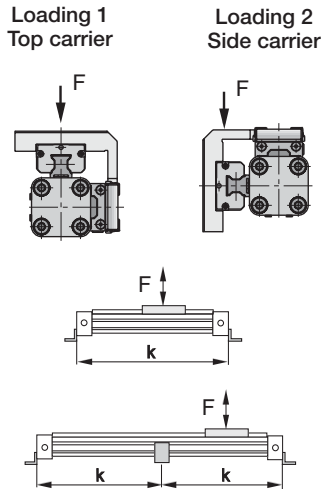
The mass of the carriage has to be added to the total moving mass when using the cushioning diagram.

Series	For linear drive	Max. moments (Nm)			Max. loads (N)		Mass of linear drive with guide (kg)		Mass ** guide carriage (kg)
		Mx	My	Mz	Fy	Fz	With 0 mm stroke	Increase per 100 mm stroke	
STL16	OSP-P16	15	30	30	1000	1000	0.598	0.210	0.268
STL25	OSP-P25	50	110	110	3100	3100	1.733	0.369	0.835
STL32	OSP-P32	62	160	160	3100	3100	2.934	0.526	1.181
STL40	OSP-P40	150	400	400	4000	7500	4.452	0.701	1.901
STL50	OSP-P50	210	580	580	4000	7500	7.361	0.936	2.880

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Mid-section support

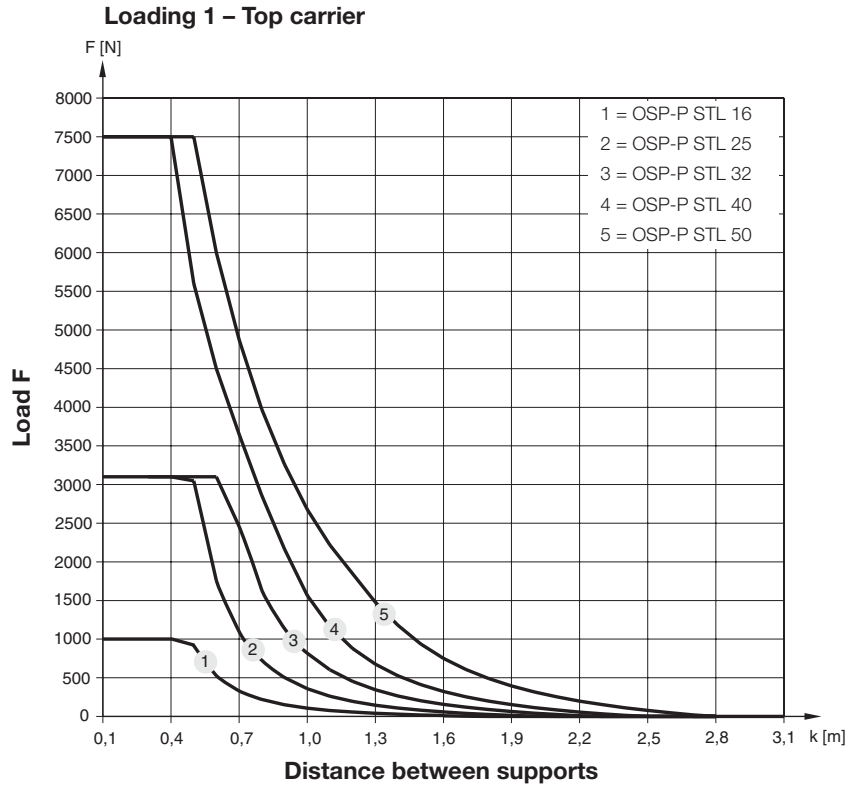
Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading. A distinction must be drawn between loading 1 and loading 2. Deflection of 0.5 mm max. between supports is permissible.



B

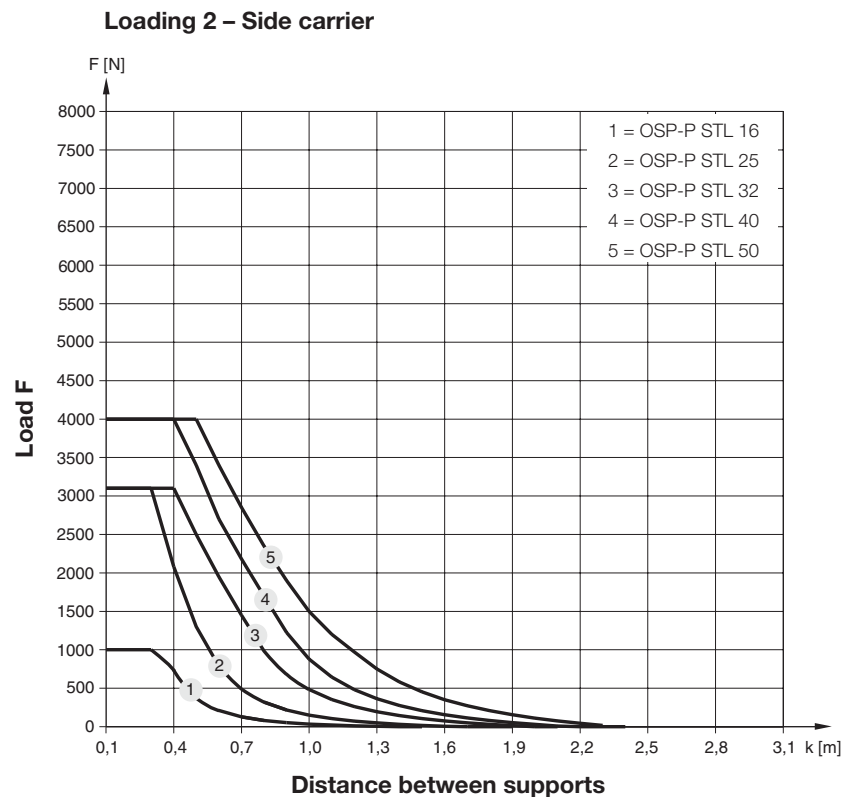
Rodless Cylinders
 Actuator Products

Permissible unsupported length STL16 to STL50



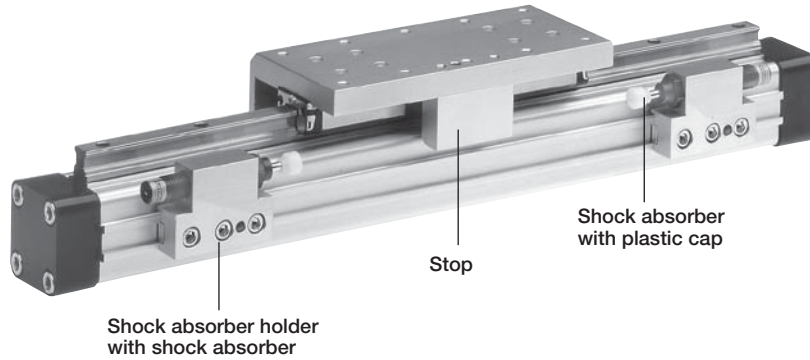
Note:
 For speeds $v > 0.5$ m/s the distance between supports should not exceed 1m.

Permissible unsupported length STL16 to STL50



Variable Stop Type VS16 to VS50

Arrangement with two variable stops



Variable stop

The variable stop Type VS provides simple stroke limitation.

It can be retrofitted and positioned anywhere along the stroke length.

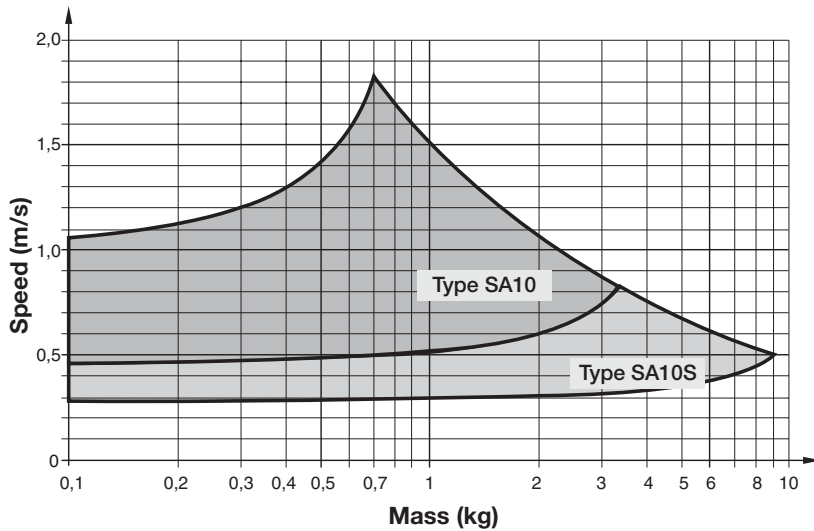
For every cylinder diameter two types of shock absorber are available

– see “Shock Absorber Selection” below.

Mid-section supports and magnetic switches can still be fitted on the same side as the variable stop.

Depending on the application, two variable stops can be fitted if required.

Shock absorber selection in dependence on mass and speed for Series OSP-STL16



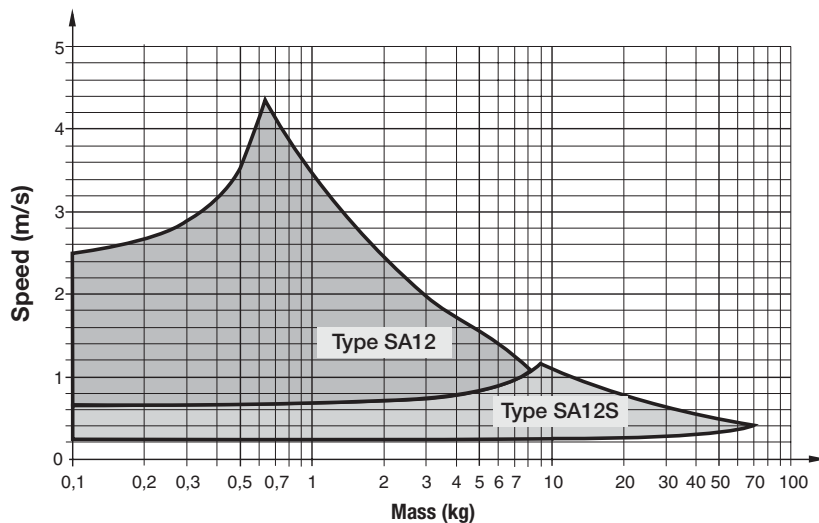
Shock absorber selection

The shock absorber is selected in dependence on the mass and speed.

The mass of the carrier itself must be taken into account.

The values relate to an effective driving force of 78 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-STL25

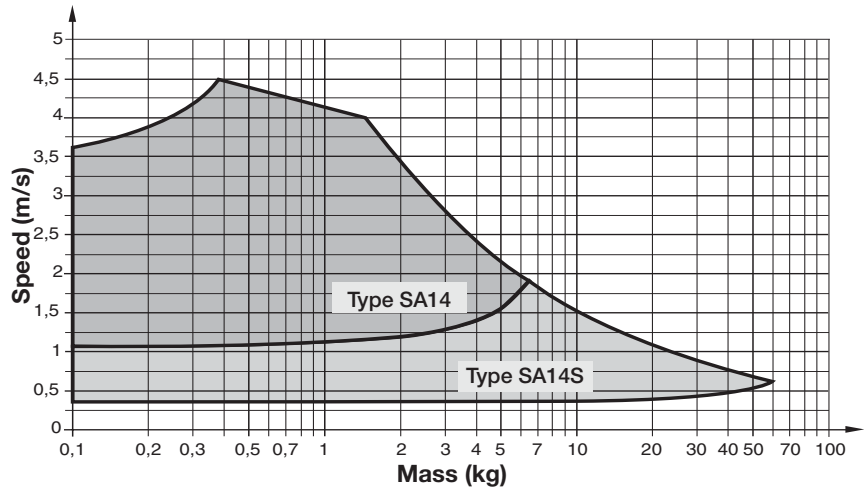


The values relate to an effective driving force of 250 N (6 bar)

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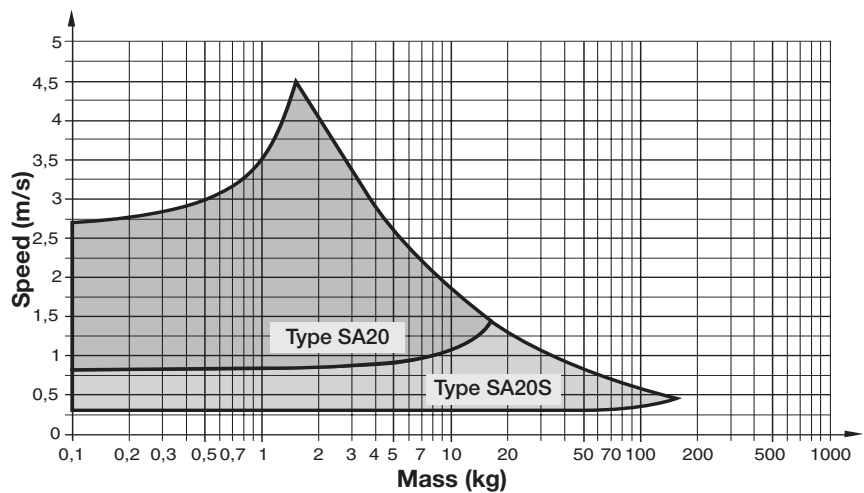
The values relate to an effective driving force of 420 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-STL32



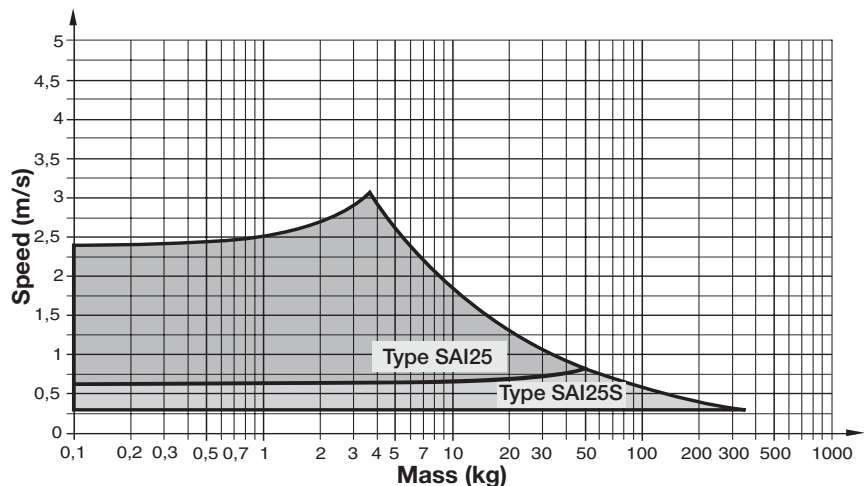
The values relate to an effective driving force of 640 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-STL40



The values relate to an effective driving force of 1000 N (6 bar)

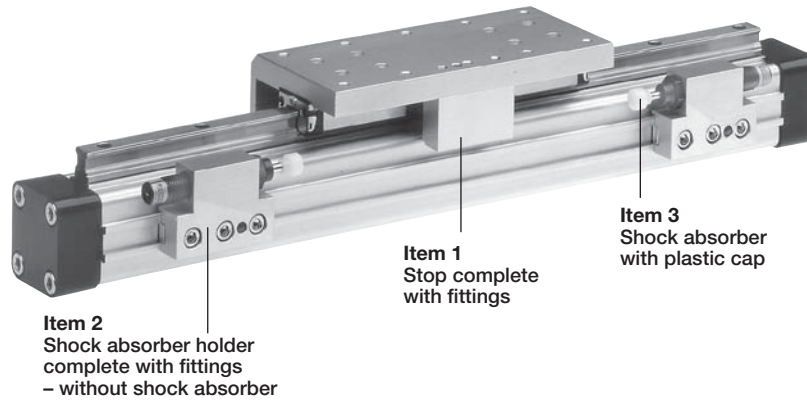
Shock absorber selection in dependence on mass and speed for Series OSP-STL50



B

Rodless Cylinders
 Actuator Products

Order Information – Variable Stop, Type VS16 to VS50



Ordering Information – Variable Stop Type VS16 to VS50

Item	Description	VS16		VS25		VS32		VS40		VS50	
		Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
1	Stop, complete	-	21196	-	21197	-	21198	-	21199	-	21200
2	Shock absorber holder, complete	-	21201	-	21202	-	21203	-	21204	-	21205
3*	Shock absorber, standard	SA10	7718	SA12	7706	SA14	7708	SA20	7710	SAI25	7712
	Shock absorber, version S	SA10S	7721	SA12S	7707	SA14S	7709	SA20S	7711	SAI25S	7835

* Shock absorber with plastic cap

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 Rodless Cylinders
 Actuator Productd

End cap mounting, Type: B, Ø 16 to 32 mm

For Linear Drives with Recirculating Ball Bearing Guide

- Series OSP-P STL
- Series OSP-P KF

Material:

Galvanized steel
 Anodized aluminum

The mountings are supplied in pairs.



Series	Mounting type	Order number (pair)
OSP-P STL16 OSP-P KF16	B1	21135
	B2	21136
	B3	21137
OSP-P STL25 OSP-P KF25	B1	20311
	B2	21138
	B3	21139
OSP-P STL32 OSP-P KF32	B1	20313
	B2	21140
	B5	21141

Mid-section support, Type: D1ST, Ø 16 to 50

For Linear Drives with Recirculating Ball Bearing Guide

- Series OSP-P STL
- Series OSP-P KF

Note on Types D1ST:

The mid-section support can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.



Series OSP-P	Mounting Type	Order number
STL/KF16	D1ST	21125
STL/KF25	D1ST	21126
STL/KF32	D1ST	21127
STL/KF40	D1ST	21128
STL/KF50	D1ST	21129

B

Rodless Cylinders
 Actuator Products

End cap mounting, Type: C, Ø 40 to 50 mm

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Material:

Anodized aluminum

The mountings are supplied in pairs.



Series	Mounting type	Order number (pair)
OSP-P STL40 OSP-P KF40	C1	4010
	C2	20338
	C4	20340
OSP-P STL50 OSP-P KF50	C1	5010
	C2	20349
	C3	20350

Mid-section support, Type: E1ST to E5ST

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF



Type EST1



Type EST2 to EST5

Series OSP-P	Mounting Type	Order number
STL/KF16	E1ST	21130
STL/KF16	E2ST	21142
STL/KF25	E1ST	21131
STL/KF25	E2ST	21143
STL/KF25	E3ST	21148
STL/KF32	E1ST	21132
STL/KF32	E2ST	21144
STL/KF32	E5ST	21151
STL/KF40	E1ST	21133
STL/KF40	E2ST	21145
STL/KF40	E4ST	21150
STL/KF50	E1ST	21134
STL/KF50	E2ST	21146
STL/KF50	E3ST	21149

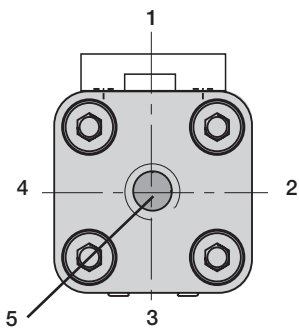
Ordering Information / Part Numbering System for OSP-P STARLINE Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25					
OSP	32	0	0	0	0	02500	0	0	0	6	0	0	0	0	0					
	Bore					Stroke		Piston Mountings			Dovetail Cover			Version						
	16 25 32 40 50					xxxxx		0 None			0 Standard X Without cover rail S Special									
	Piston Style							Cushioning / Stops				End Cap Mounts			Switches Measuring System					
	0 Standard 1 Tandem S Special							0 Standard 2 VS Soft left 3 VS Hard left 4 VS Soft right 5 VS Hard right 6 VS Soft both sides 7 VS Hard both sides S Special				0 Without 4 B1 (16, 25, 32) 5 B2 (16, 25, 32) 6 B3 (16, 25) 8 B5 (32) 9 C1 (40, 50) A C2 (40, 50) B C3 (50) C C4 (40)		0 None 1 NO Reed - KL3045 Qty. 2 2 NC Reed - KL3048 Qty. 2 3 PNP KL3054+4041 Qty. 2 4 NPN KL3060+4041 Qty. 2 X 21240 SFI 0.1mm Y 21241 SFI 1mm Z 4650 SFA S Special						
	Air Connections / Porting					Corrosion Resist. Hardware														
	0 Standard (position #2) 1 End face (position #5) 2 Single end porting 3 Left stand (pos #2), right end face (pos #5) 4 Eight stand (pos #2), left end face (pos #5) 6 Single end porting end face A 3/2 way valve VOE 24V = (25, 32, 40, 50) B 3/2 way valve VOE 220V~/110V = (25, 32, 40, 50) C 3/2 way valve VOE 48V = (25, 32, 40, 50) E 3/2 way valve VOE 110V~ (25, 32, 40, 50) S Special					0 Standard 1 Stainless 2 Xylan coated aluminum 3 Xylan coating & stainless steel fasteners S Special			Guides / Brakes											
									B STL Starline											
						End Cap Position														
						0 l+r 0° = In front (pos #2) 1 l+r 90° = Underneath (pos #3) 2 l+r 180° = At the back (pos #4) 3 l+r 270° = Same face as outerband (pos #2, 1) 4 l 90° = Underneath; r 0° = In front (pos #3, 2) 5 l 180° = At the back; r 0° = In front (pos #4, 2) 6 l 270° = Same face as outerband; r 0° = In front (pos #1, 2) 7 l 0° = In front; r 90° = Underneath (pos #2, 3) 8 l 180° = At the back; r 90° = Underneath (pos #4, 3) 9 l 270° = Same face as outerband; r 90° = Underneath (pos #1, 3) A l 0° = In front; r 180° = At the Back (pos #2, 4) B l 90° = Underneath; r 180° = At the back (pos #3, 4) C l 270° = Same face as outerband; r 180° = At the back (pos #1, 4) D l 0° = In front; r 270° = Same face as outerband (pos #2, 1) E l 90° = Underneath; r 270° = Same face as outerband (pos #3, 1) F l 180° = At the back; r 270° = Same face as outerband (pos #4, 1) S Special														
											add. Carriage									
											0 Without B Guide Carriage Starline STL									

Note: Single End Porting on 16mm bore, then end caps cannot be rotated.

Note: Comes in pairs

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



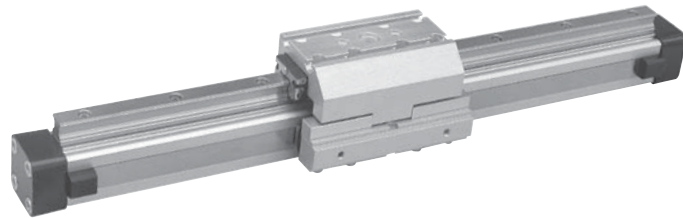
Note: Position #2 is the standard location.

B
 Rodless Cylinders
 Actuator Product

Recirculating Ball Bearing Guide KF

Versions

For Pneumatic Linear Drive:
 Series OSP-P KF



Series KF16 to KF50 For linear drives
 Series OSP-P CLASSIC

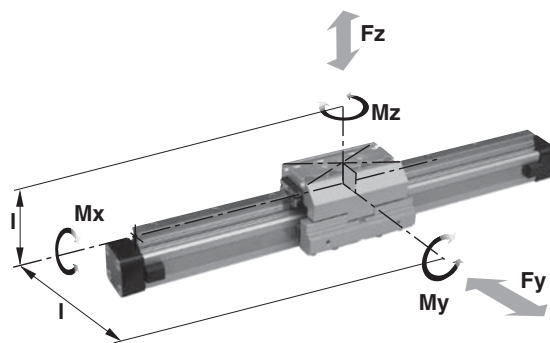
Loads, forces and moments

B

Rodless Cylinders
 Actuator Products

Features:

- Anodized aluminum guide carriage, the mounting dimensions correspond to FESTO Type: DGPL-KF
- Polished and hardened steel guide rail
- For high loads in all directions
- High precision
- Integrated wiper system
- Integrated grease nipples
- Any length of stroke up to 3700 mm
- Maximum speed
 KF16, KF40: v = 3 m/s
 KF25, KF32, KF50: v = 5 m/s



Technical data

The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_z}{M_{z_{max}}} + \frac{F_y}{F_{y_{max}}} + \frac{F_z}{F_{z_{max}}} \leq 1$$

The sum of the loads should not exceed >1

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

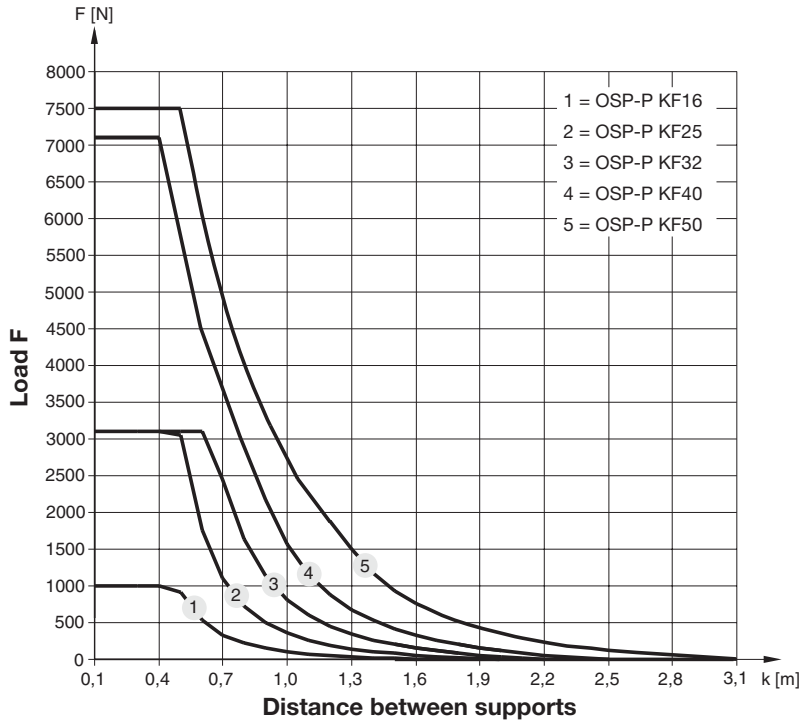
*Please note:

the mass of the carriage has to be added to the total moving mass when using the cushioning diagram.

Series	For linear drive	Max. moments (Nm)			Max. load (N)		Mass of drive with guide (kg)			Groove stone Thread Size
		Mx	My	Mz	Fy	Fz	With 0 mm stroke	Increase per 100 mm stroke	Mass * guide carriage (kg)	
KF16	OSP-P16	12	25	25	1000	1000	0.558	0.21	0.228	–
KF25	OSP-P25	35	90	90	3100	3100	1.522	0.369	0.607	M5
KF32	OSP-P32	44	133	133	3100	3100	2.673	0.526	0.896	M5
KF40	OSP-P40	119	346	346	4000	7100	4.167	0.701	1.531	M6
KF50	OSP-P50	170	480	480	4000	7500	7.328	0.936	2.760	M8

Permissible unsupported length OSP-P KF16 to KF50

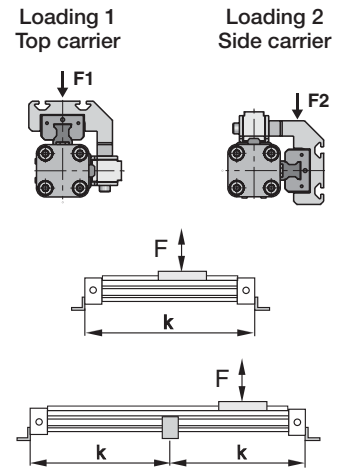
Loading 1 – Top carrier



Mid-section support

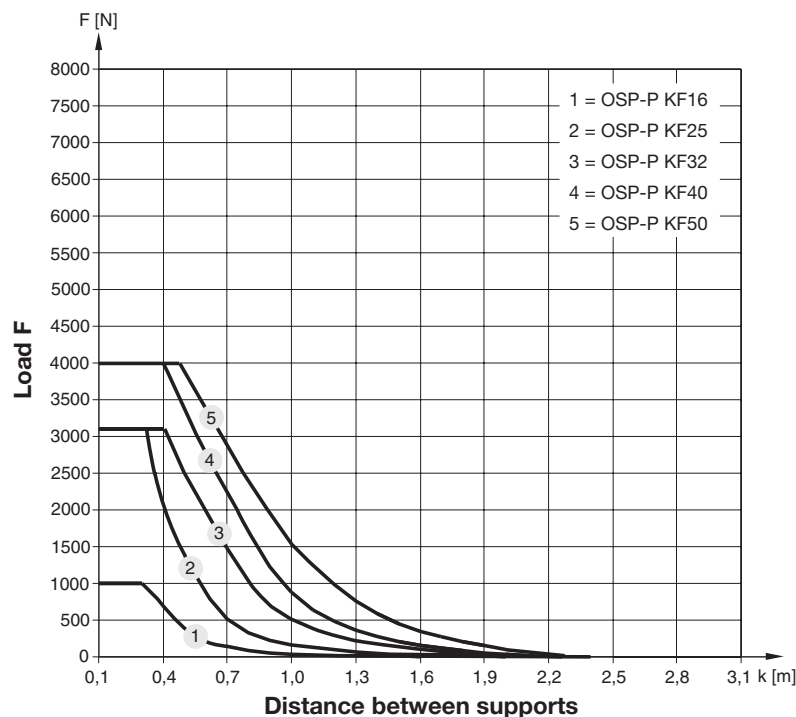
Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading. A distinction must be drawn between loading 1 and loading 2.

Deflection of 0.5 mm max. between supports is permissible.



Permissible unsupported length OSP-P KF16 to KF50

Loading 2 – Side carrier



Note:

For speeds $v > 0.5$ m/s the distance between supports should not exceed 1m.

B
 Rodless Cylinders
 Actuator Product

Variable stop

The variable stop Type VS provides simple stroke limitation.

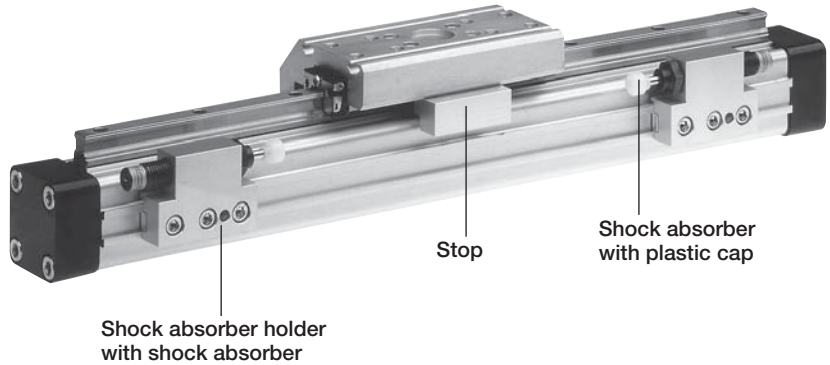
It can be retrofitted and positioned anywhere along the stroke length. For every cylinder diameter two types of shock absorber are available – see “Shock Absorber Selection” below.

Mid-section supports and magnetic switches can still be fitted on the same side as the variable stop.

Depending on the application, two variable stops can be fitted if required.

Variable stop type VS16 to VS50

Arrangement with two variable stops



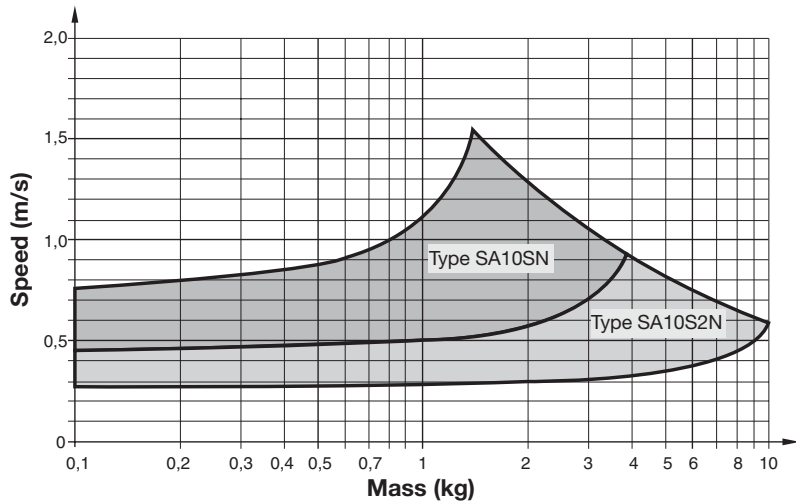
Shock absorber selection

The shock absorber is selected in dependence on the mass and speed.

The mass of the carrier itself must be taken into account.

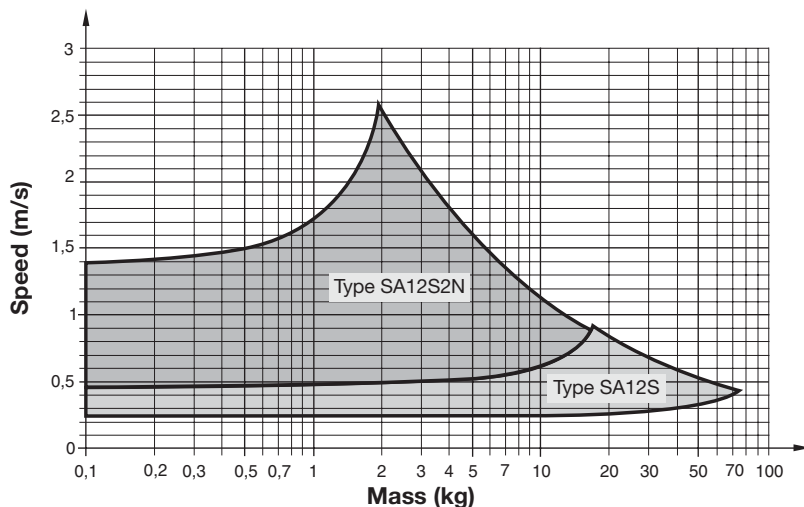
The values relate to an effective driving force of 78 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-KF16



Shock absorber selection in dependence on mass and speed for Series OSP-KF25

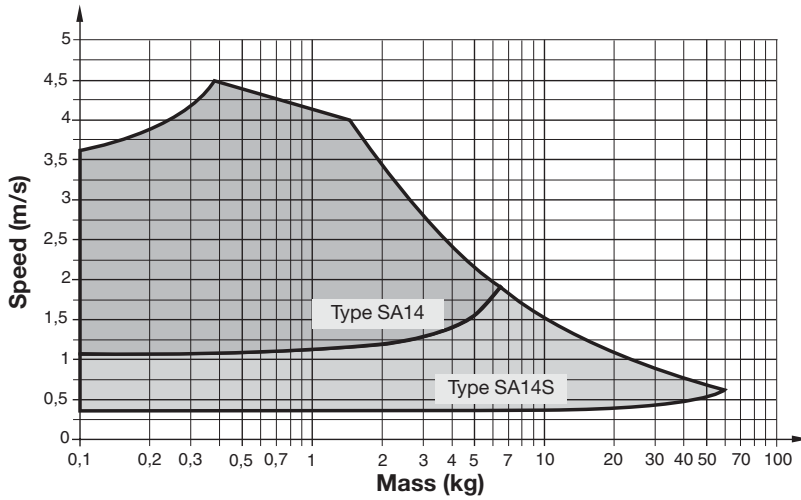
The values relate to an effective driving force of 250 N (6 bar)



B

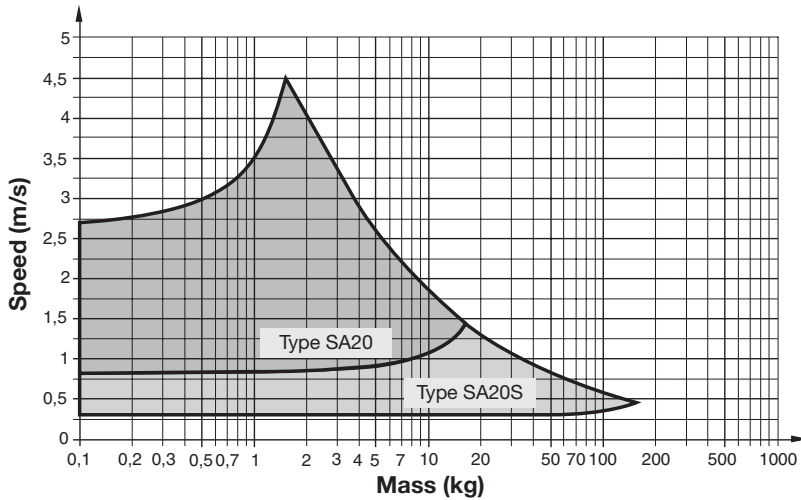
Rodless Cylinders
 Actuator Products

Shock absorber selection in dependence on mass and speed for Series OSP-KF32



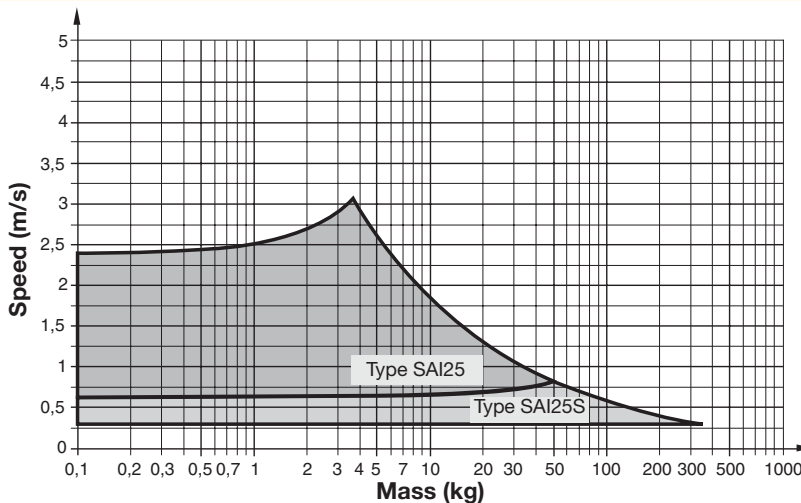
The values relate to an effective driving force of 420 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-KF40



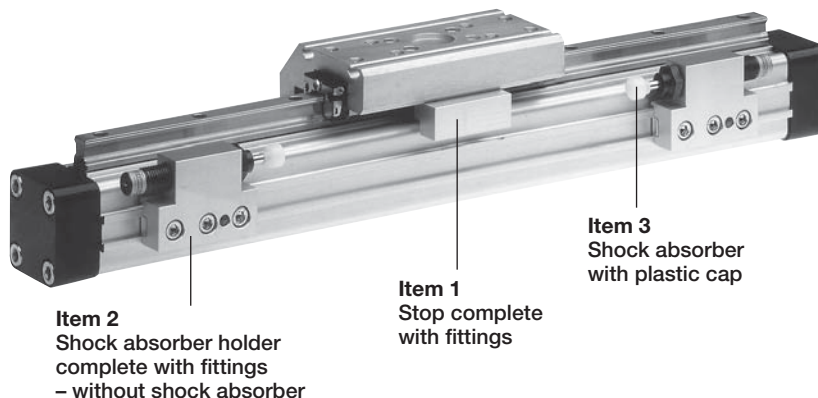
The values relate to an effective driving force of 640 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-KF50



The values relate to an effective driving force of 1000 N (6 bar)

Order information – variable stop type VS16 to VS50



B

Rodless Cylinders
 Actuator Products

Ordering Information – Variable Stop Type VS16 to VS50

Item	Description	VS16		VS25		VS32		VS40		VS50	
		Type	Order no.	Type	Order no.	Type	Order no.	Type	Order no.	Type	Order no.
1	Stop, complete	-	21186	-	21187	-	21188	-	21189	-	21190
2	Shock absorber holder, complete	-	21201	-	21202	-	21203	-	21204	-	21205
3*	Shock absorber, standard	SA10	7718	SA12S2N	7723	SA14	7708	SA20	7710	SAI25	7712
	Shock absorber, version S	SA10S	7721	SA12S	7707	SA14S	7709	SA20S	7711	SAI25S	7835

* Shock absorber with plastic cap

Linear Drive Accessories

End cap mounting, Type: B, Ø 16 to 32 mm

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Material:

Galvanized steel
 Anodized aluminum

The mountings are supplied in pairs.



Series	Mounting type	Order number (pair)
OSP-P STL16 OSP-P KF16	B1	21135
	B2	21136
	B3	21137
OSP-P STL25 OSP-P KF25	B1	20311
	B2	21138
	B3	21139
OSP-P STL32 OSP-P KF32	B1	20313
	B2	21140
	B5	21141

End cap mounting, Type: C, Ø 40 to 50 mm

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Material:

Anodized aluminum

The mountings are supplied in pairs.



Series	Mounting type	Order number (pair)
OSP-P STL40 OSP-P KF40	C1	4010
	C2	20338
	C4	20340
	C3	20340
OSP-P STL50 OSP-P KF50	C1	5010
	C2	20349
	C3	20350

Mid-section support, Type: D1ST, Ø 16 to 50

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Note on Types D1ST:

The mid-section support can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.



Series OSP-P	Mounting type	Order number
STL/KF16	D1ST	21125
STL/KF25	D1ST	21126
STL/KF32	D1ST	21127
STL/KF40	D1ST	21128
STL/KF50	D1ST	21129

Mid-section support, Type: E1ST to E5ST

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF



Type EST1



Type EST2 to EST5

Series OSP-P	Mounting type	Order number
STL/KF16	E1ST	21130
STL/KF16	E2ST	21142
STL/KF25	E1ST	21131
STL/KF25	E2ST	21143
STL/KF25	E3ST	21148
STL/KF32	E1ST	21132
STL/KF32	E2ST	21144
STL/KF32	E5ST	21151
STL/KF40	E1ST	21133
STL/KF40	E2ST	21145
STL/KF40	E4ST	21150
STL/KF50	E1ST	21134
STL/KF50	E2ST	21146
STL/KF50	E3ST	21149

End cap mounting, Ø 25 to 50 mm

Correspond to FESTO dimensions HP25 – 50

For linear drives with recirculating ball bearing guide

- Series OSP-P KF

On the end-face of each end cap there are four threaded holes for mounting the actuator.

Material:

Series OSP-P KF25 – 50:
 Anodized aluminum.

The mountings are supplied in pairs.

Series	Order number
HP25	21107
HP32	21108
HP40	21109
HP50	21110

Mid-section support, Ø 25-50 mm

Correspond to FESTO dimensions MUP25 – 50

For linear drives with recirculating ball bearing guide

- Series OSP-P KF

Note:

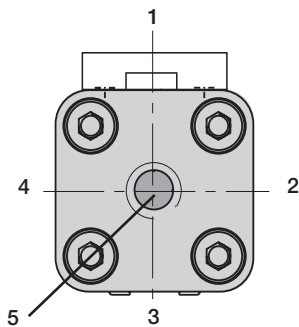
Correspond to FESTO DGPL-KF, when the Mid-Section Support MUP are mounted on the 90° side to the carriage.

Series	Order number
MUP25	21119
MUP32	21120
MUP40	21121
MUP50	21122

Ordering Instructions / Part Numbering System for OSP-P KF Series

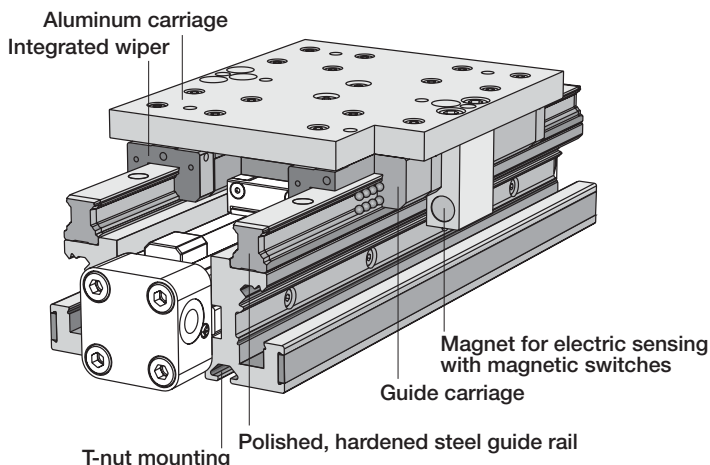
6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25			
OSP	32	0	0	0	0	02500	0	0	0	6	0	0	0	0	0			
Bore		Seals			Stroke		Piston Mountings		Dovetail Cover			Version						
16 25 32 40 50		0 Standard 1 Viton S Special			x x x x x		0 None		0 Standard X Without cover rail S Special			0 None 1 NO Reed - KL3045 Qty. 2 2 NC Reed - KL3048 Qty. 2 3 PNP KL3054+4041 Qty. 2 4 NPN KL3060+4041 Qty. 2 X 21240 SFI 0.1mm Y 21241 SFI 1mm Z 4650 SFA S Special						
Piston style		Lubrication			Corrosion Resist, Hardware		Cushioning / Stops			End Cap Mounts			Switches Measuring System					
0 Standard 1 Tandem S Special		0 Standard 1 Slow speed 4 Food 5 Clean room S Special			0 Standard 1 Stainless 2 Xylan coated aluminum 3 Xylan coating & stainless steel fasteners S Special		0 Standard 2 VS Soft left 3 VS Hard left 4 VS Soft right 5 VS Hard right 6 VS Soft both sides 7 VS Hard both sides S Special			0 Without 4 B1 (16, 25, 32) 5 B2 (16, 25, 32) 6 B3 (16, 25) 8 B5 (32) 9 C1 (40, 50) A C2 (40, 50) B C3 (50) C C4 (40) D HP (25, 32, 40, 50)			0 None 1 NO Reed - KL3045 Qty. 2 2 NC Reed - KL3048 Qty. 2 3 PNP KL3054+4041 Qty. 2 4 NPN KL3060+4041 Qty. 2 X 21240 SFI 0.1mm Y 21241 SFI 1mm Z 4650 SFA S Special					
Air Connections / Porting		Corrosion Resist, Hardware			End Cap Position		Guides / Brakes			add. Carriage			add. Carriage					
0 Standard (position #2) 1 End face (position #5) 2 Single end porting 3 Left stand (pos #2), right end face (pos #5) 4 Eight stand (pos #2), left end face (pos #5) 6 Single end porting end face A 3/2 way valve VOE 24V = (25, 32, 40, 50) B 3/2 way valve VOE 220V~/110V = (25, 32, 40, 50) C 3/2 way valve VOE 48V = (25, 32, 40, 50) E 3/2 way valve VOE 110V~ (25, 32, 40, 50) S Special		0 Standard 1 Stainless 2 Xylan coated aluminum 3 Xylan coating & stainless steel fasteners S Special			0 l+r 0° = In front (pos #2) 1 l+r 90° = Underneath (pos #3) 2 l+r 180° = At the back (pos #4) 3 l+r 270° = Same face as outerband (pos #2, 1) 4 l 90° = Underneath; r 0° = In front (pos #3, 2) 5 l 180° = At the back; r 0° = In front (pos #4, 2) 6 l 270° = Same face as outerband; r 0° = In front (pos #1, 2) 7 l 0° = In front; r 90° = Underneath (pos #2, 3) 8 l 180° = At the back; r 90° = Underneath (pos #4, 3) 9 l 270° = Same face as outerband; r 90° = Underneath (pos #1, 3) A l 0° = In front; r 180° = At the back (pos #2, 4) B l 90° = Underneath; r 180° = At the back (pos #3, 4) C l 270° = Same face as outerband; r 180° = At the back (pos #1, 4) D l 0° = In front; r 270° = Same face as outerband (pos #2, 1) E l 90° = Underneath; r 270° = Same face as outerband (pos #3, 1) F l 180° = At the back; r 270° = Same face as outerband (pos #4, 1) S Special		C KF			0 Without C Guide Carriage KF			0 Without C Guide Carriage KF			Note: Comes in pairs		

Note: Single End Porting on 16mm bore, then end caps cannot be rotated.



Note: Position #2 is the standard location.

Version with pneumatic linear drive series OSP-P



Heavy Duty-Guide HD

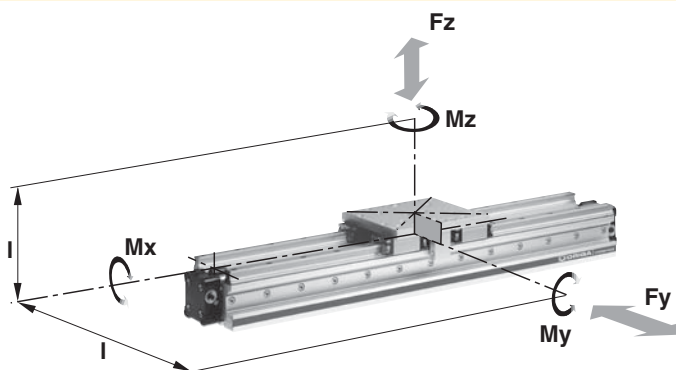


**Series HD 25 to 50
 for Linear Drive Series OSP-P**

Features:

- Guide system: 4-row recirculating ball bearing guide
- Polished and hardened steel guide rail
- For highest loads in all directions
- Highest precision
- Integrated wiper system
- Integrated grease nipples
- Any lengths of stroke up to 3700 mm (longer strokes on request)
- Anodized aluminum guide carriage - dimensions compatible with OSP guide GUIDELINE
- Maximum speed v = 5 m/s

Loads, forces and moments



Technical data

The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

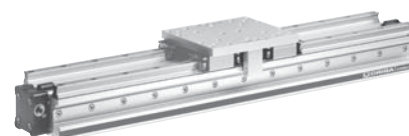
$$\frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_z}{M_{z_{max}}} + \frac{F_y}{F_{y_{max}}} + \frac{F_z}{F_{z_{max}}} \leq 1$$

The sum of the loads should not exceed >1

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

***Please note:**

the mass of the carriage does not have to be added to the total moving mass when using the cushioning diagram.

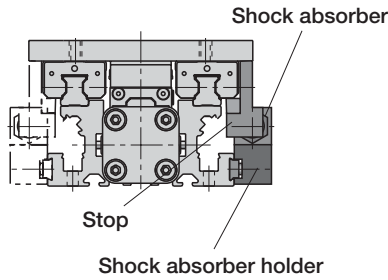


Series	For linear drive	Max. moments (Nm)			Max. loads (N)		Mass of the linear drive		
		Mx	My	Mz	Fy	Fz	With guide (kg) with 0 mm stroke	Increase per 100 mm stroke	Mass * guide carriage (kg)
HD 25	OSP-P25	260	320	320	6000	6000	3.065	0.924	1.289
HD 32	OSP-P32	285	475	475	6000	6000	4.308	1.112	1.367
HD 40	OSP-P40	800	1100	1100	15000	15000	7.901	1.748	2.712
HD 50	OSP-P50	1100	1400	1400	18000	18000	11.648	2.180	3.551

B
 Rodless Cylinders
 Actuator Productd

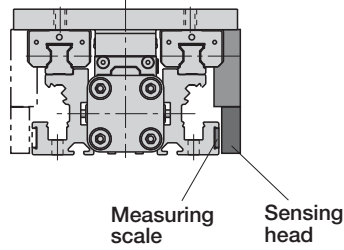
Variable stop
Type VS25 to VS50

The variable stop provides simple stroke limitation and can be supplied mounted on the right or left, as required.



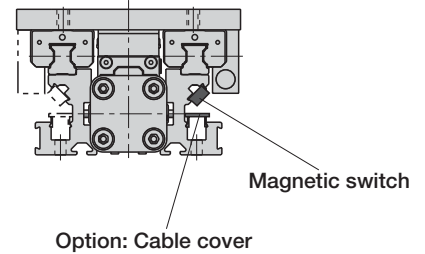
Incremental displacement measuring system
ORIGA-Sensoflex

Series SFI-plus can be supplied mounted on the right or left, as required.



Arrangement of magnetic switches:

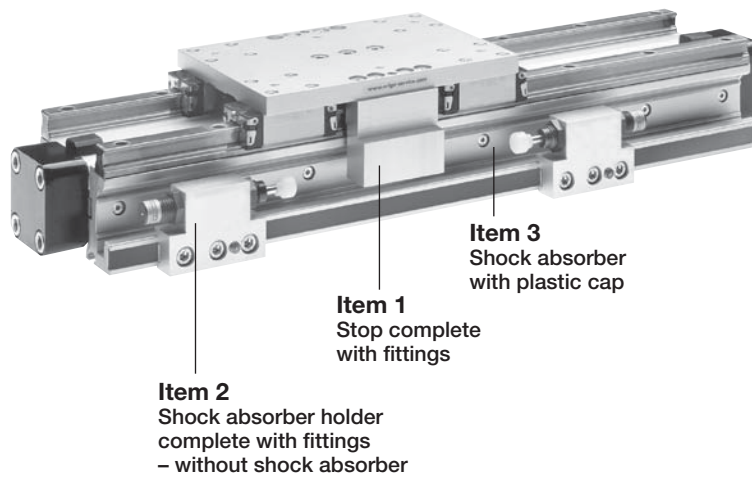
Magnetic switches can be fitted anywhere on either side.



B

Rodless Cylinders
 Actuator Products

Ordering Information – Variable Stop Type VS25 to VS50

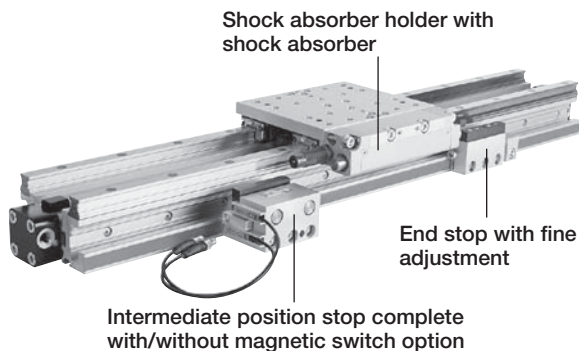


Ordering Information

Item	Description	VS25		VS32		VS40		VS50	
		Type	Order no.	Type	Order no.	Type	Order no.	Type	Order no.
1	Stop, complete	–	21257	–	21258	–	21259	–	21260
2	Shock absorber holder, complete	–	21202	–	21203	–	21204	–	21205
3 *	Shock absorber, standard	SA12	7706	SA14	7708	SA20	7710	SAI25	7712
	Shock absorber, version S	SA12S	7707	SA14S	7709	SA20S	7711	SAI25S	7835

* Shock absorber with plastic cap

Intermediate stop module Type ZSM..HD

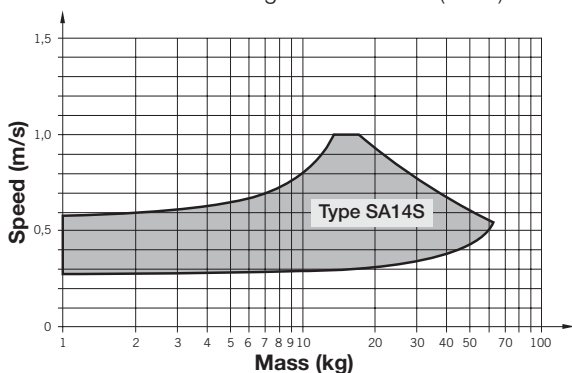


Technical data

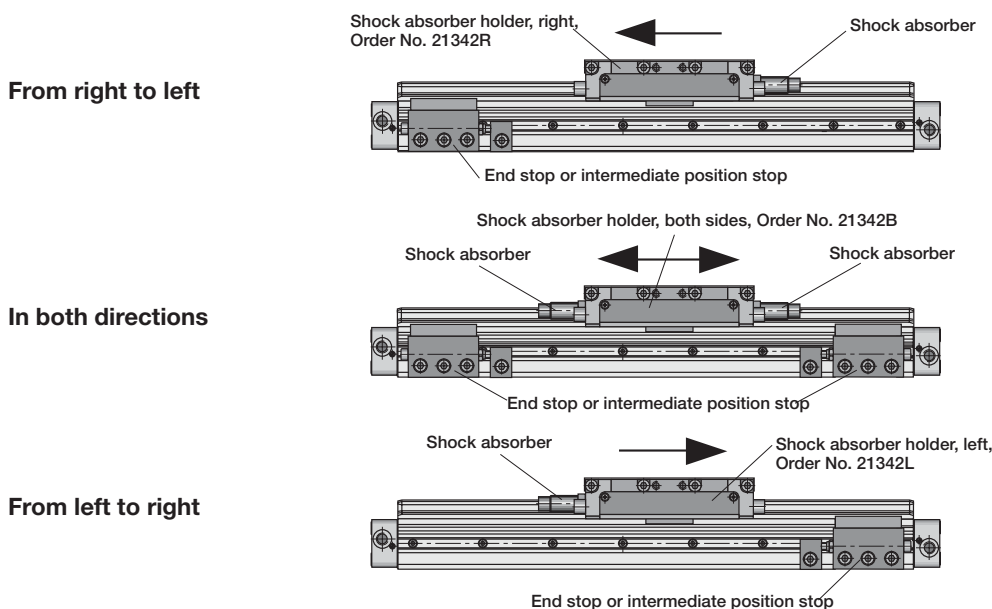
Temperature range	-10°C to +70°C
Operating pressure range	4 – 8 bar
Intermediate position grid	85 mm

Shock absorber Type SA14S

The values relate to an effective driving force of 250 N (6 bar)



Shock absorber arrangement in dependence on direction of movement



Intermediate stop module

The intermediate stop module ZSM allows the guide carriage to stop at any desired intermediate positions with high accuracy. It can be retrofitted. Depending on the application, i.e. the number of intermediate stops, one or more intermediate position stops can be used. The intermediate position stops can be retracted and extended without the need for the guide carriage to be moved back out of position. Therefore the guide carriage can be made to stop at the defined intermediate positions in any order.

ORIGA intermediate stop module ZSM:

- Allows stopping at any intermediate positions
- Intermediate position stops can be located steplessly anywhere along the whole stroke length
- Movement to the next position without reverse stroke
- Compact unit
- Cost-effective positioning module without electrical or electronic components
- Option: end stop with fine adjustment

B
 Rodless Cylinders
 Actuator Product

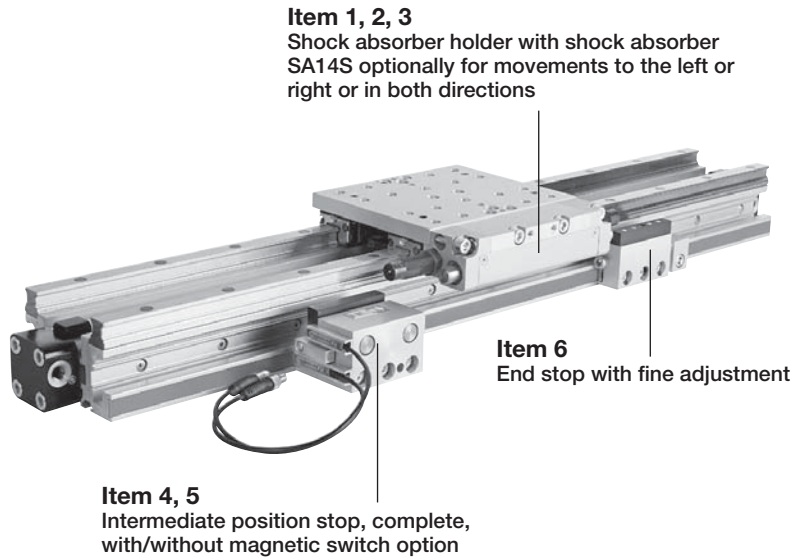


Illustration shows version with shock absorber holder for movement in both directions and magnetic switch option with T-slot switches.

Ordering Information – intermediate stop module Type ZSM..HD

Item	Description	For intermediate stop module	Order number
1*	Shock absorber holder with shock absorber SA14S, both sides	ZSM25HD	21342B
2*	Shock absorber holder with shock absorber SA14S, left	ZSM25HD	21342L
3*	Shock absorber holder with shock absorber SA14S, right	ZSM25HD	21342R
4	Intermediate position stop complete, without magnetic switch option	ZSM25HD	21343
5	Intermediate position stop complete, with magnetic switch option	ZSM25HD	21344
6	End stop with fine adjustment	ZSM25HD	21346

* The shock absorbers are installed in the shock absorber holder and adjusted in our workshop.

Note:

For movement onwards from the intermediate position, the intermediate position stop must advance.

The intermediate position stop can only advance if both cylinder chambers of the OSP-P cylinder are pressurized.

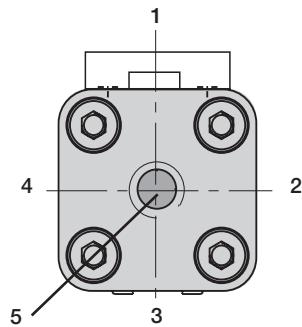
B

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Ordering Information / Part Numbering System for OSP-P HD Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25									
OSP	P	50	0	0	0	0	0	0	0	0	6	0	0	0	0									
		Bore				Seals			Stroke			Piston Mountings			Dovetail Cover			Version						
		25 32 40 50				0 Standard 1 Viton S Special			x x x x x			0 None			0 Standard X Without cover rail S Special			0						
		Piston Style				Lubrication					Cushioning / Stops			End Cap Mounts					Switches Measuring System					
		0 Standard 1 Tandem S Special				0 Standard 1 Slow speed 4 Food 5 Clean room S Special					0 Standard 2 VS Soft left 3 VS Hard left 4 VS Soft right 5 VS Hard right 6 VS Soft both sides 7 VS Hard both sides S Special			0 Without C Guide carriage heavy duty HD					0 None 1 NO Reed - KL3045 Qty. 2 2 NC Reed - KL3048 Qty. 2 3 PNP KL3054+4041 Qty. 2 4 NPN KL3060+4041 Qty. 2 X 21240 SFI 0.1mm Y 21241 SFI 1mm Z 4650 SFA S Special					
		Air Connections / Porting				Corrosion Resist. Hardware						Guides / Brakes												
		0 Standard (position #2) 1 End face (position #5) 2 Single end porting 3 Left stand (pos #2), right end face (pos #5) 4 Eight stand (pos #2), left end face (pos #5) 6 Single end porting end face A 3/2 way valve VOE 24V = (25, 32, 40, 50) B 3/2 way valve VOE 220V~/110V = (25, 32, 40, 50) C 3/2 way valve VOE 48V = (25, 32, 40, 50) E 3/2 way valve VOE 110V~ (25, 32, 40, 50) S Special				0 Standard 1 Stainless 2 Xylan Coated Aluminum 3 Xylan Coating & Stainless Steel Fasteners S Special						C HD Heavy Duty												
						End Cap Position																		
						0 I+r 0° = In front (pos #2) 1 I+r 90° = Underneath (pos #3) 2 I+r 180° = At the back (pos #4) 3 I+r 270° = Same face as outerband (pos #2, 1) 4 I 90° = Underneath; r 0° = In front (pos #3, 2) 5 I 180° = At the back; r 0° = In front (pos #4, 2) 6 I 270° = Same face as outerband; r 0° = In front (pos #1, 2) 7 I 0° = In front; r 90° = Underneath (pos #2, 3) 8 I 180° = At the back; r 90° = Underneath (pos #4, 3) 9 I 270° = Same face as outerband; r 90° = Underneath (pos #1, 3) A I 0° = In front; r 180° = At the back (pos #2, 4) B I 90° = Underneath; r 180° = At the back (pos #3, 4) C I 270° = Same face as outerband; r 180° = At the back (pos #1, 4) D I 0° = In front; r 270° = Same face as outerband (pos #2, 1) E I 90° = Underneath; r 270° = Same face as outerband (pos #3, 1) F I 180° = At the back; r 270° = Same face as outerband (pos #4, 1) S Special																		

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

B
 Rodless Cylinders
 Actuator Product

Linear Drive Accessories

∅ 10-80 mm Magnetic Switches



B

**Rodless Cylinders
 Actuator Products**

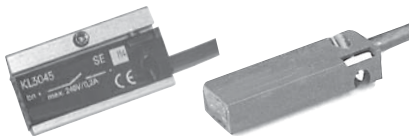
For electrical sensing of the carrier position, e.g. at the end positions, magnetic switches may be fitted.

Position sensing is contactless and is based on magnets fitted as standard to the carrier. A yellow LED indicates operating status.

The universal magnetic switches are suitable for all PARKER-ORIGA OSP-Actuators and aluminum profile rod type cylinders.

Piston, speed and switching distance affect signal duration and should be considered in conjunction with the minimum reaction time of ancillary control equipment.

$$\text{Min. reaction time} = \frac{\text{Switching distance}}{\text{Piston speed}}$$



Characteristics

Characteristics	Unit	Description	
Electrical characteristics		Type RS	Type ES
Switching output		Reed	PNP, NPN
Operating voltage	V	10-240 AC/DC (NO) 10-150 AC/DC (NC)	10-30 DC
Residual voltage	V	< 3	< 3
Connection		Two wire	Three wire
Output function		normally open normally closed	normally open
Permanent current	mA	200	200
Max. Switching capacity	VA (W)	10 VA	—
Power consumption without load	mA	—	< 20
Function indicator		LED, yellow	
Typical switching time	ms	On: < 2	On: < 2
Switch-off delay	ms	—	ca. 25
Pole reversal does not work		LED	—
Pole reversal protection		—	Built in
Short-circuit protection		—	Built in
Switchable capacity load		µF	0.1 at 100 W, 24 VDC
Switching point accuracy	mm	± 0,2	
Switching distance	mm	ca. 15	ca. 15
Hysteresis for OSP	mm	ca. 8	ca. 3
Lifetime		3 x 10 ⁶ , up to 6 x 10 ⁶ cycles	Theoretically unlimited

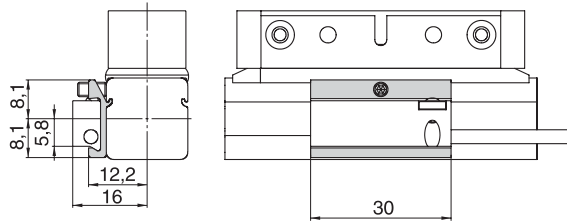
Mechanical characteristics

Housing		Makrolon, smoke color	
Cable cross section	mm ²	2 x 0.14	3 x 0.14
Cable type*		PVC	PUR, black
Bending radius fixed	mm	≥ 20	
Moving	mm	≥ 70	
Weight (Mass)	kg	0.012	
Degree of protection	IP	67 to DIN EN 60529	
Ambient temperature range**	°C	-25°C Other temperature ranges +80°C on request	
Shock resistance	m/s ²	100 (contact switches)	500

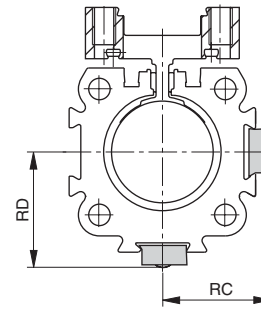
* Other versions on request

† For the magnetic switch temperature range, please take into account the surface temperature and the self-heating properties of the linear drive.

Dimensions series OSP-P10



Dimensions series OSP-P16 to P80



Note:
 Sensors can not be mounted directly opposite of the carrier

Dimensions (mm) and Ordering Information

Series	Dimensions		Order number						Adapter Only for OSP-P10
			RS closer	RS opener	ES		ES Complete with 5 m cable		
	RC	RD	Normally open	Normally closed	PNP	NPN	PNP	NPN	
OSP-P10	–	–							
OSP-P16	20	20.5							
OSP-P25	25	27							
OSP-P32	31	34	Type: RS-K KL3045	Type: RS-K KL 3048	Type: ES-S KL 3054	Type: ES-S KL 3060	Type: ES-S KL 3054 + 4041	Type: ES-S KL 3060 + 4041	20968 please order separately
OSP-P40	36	39							
OSP-P50	43	48							
OSP-P63	53	59							
OSP-P80	66	72							
Cable 5 m with connector and with open end for magnetic switches Type ES-S					4041				

B
 Rodless Cylinders
 Actuator Productd

Linear Drive Accessories

ø 10-80 mm Magnetic Switches for T-Slot



B

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 Actuator Products

Series **RST**
EST

Magnetic switches are used for electrical sensing of the position of the piston, e.g. at its end positions. They can also be used for sensing of intermediate positions.

Sensing is contactless, based on magnets which are built-in as standard. A yellow LED indicates operating status.

The universal magnetic switches are suitable for all PARKER-ORIGA OSP-Actuators and aluminum profile rod type cylinders.

1) For the magnetic switch temperature range, please take into account the surface temperature and the self-heating properties of the linear drive.



Characteristics

Characteristics	Unit	Description	
Electrical characteristics		Type RST	Type EST
Switching output		Reed	PNP
Operating voltage	V	10-30 AC/DC	10-30 DC
Ripple		—	≤ 10%
Voltage drop	V	≤ 3	≤ 2
Electrical configuration		Two wire	Three wire
Output function		normally open normally closed	normally open
Permanent current	mA	≤ 100	≤ 100
Breaking capacity	W	≤ 6 peak	—
Power consumption at UB = 24V, switched on, without load	mA	—	≤ 10
Function indicator		LED, yellow (not for normally closed)	
Response time	ms	≤ 2	≤ 0.5
Sensitivity	mT	2 – 4	2 – 4
Time delay before availability	ms	—	≤ 2
Reverse polarity protection		Yes	Yes
Short-circuit protection		No	Yes (pulsed)
Switchable capacity load	µF	0.1 at 100 W, 24 VDC	
Switching frequency	Hz	≤ 400	≤ 5k
Repeatability	mm	≤ 0.2	≤ 0.2
Hysteresis	mm	≤ 1.5	≤ 1.5
EMC	EN	60947-5-2	
Lifetime		≥ 35 Mio. cycles with PLC load	Unlimited
Power-up pulse suppression		—	Yes
Protection for inductive load		—	Yes
Mechanical characteristics			
Housing		Plastic / PA66 + PA6I red	
Cable cross section	mm ²	2 x 0.14	3 x 0.14
Cable type*		PUR, black	PUR, black
Bending radius	mm	≥ 36	≥ 30
Weight (Mass)	kg	ca. 0.030 RST-K ca. 0.010 RST-S	ca. 0.030 EST-K ca. 0.010 EST-S
Degree of protection	IP	67 to DIN EN 60529	
Ambient temperature range**	°C	-25°C to +80°C	-25°C to +75°C at UB=10 – 30 V -25°C to +80°C at UB=10 – 28 V
– with adapter	°C	-25°C to +60°C	
Adapter tightening torque	Nm	0.15 (tightening torque of screwing adapter onto magnetic switch)	
Shock resistance			
Vibration to EN 60068-2-6	G	15, 11 ms, 10 to 55 Hz, 1 mm	
Shock to EN 60068-2-27	G	50, 11 ms	
Bump to EN 60068-2-29	G	30, 11 ms, 1000 bumps each axis	

Ordering Information

Version	Voltage	Type	Order number
Magnetic switch, reed contact, normally open, LED indicator, cable 2 m	10-30 V AC / DC	RST-K	KL 3301
Magnetic switch, reed contact, normally open, LED indicator, cable 5 m	10-30 V AC / DC	RST-K	KL 3300
Magnetic switch, reed contact, normally open, snap connector M8, LED indicator, cable 0.24 m	10-30 V AC / DC	RST-S	KL 3302
Magnetic switch, reed contact, normally open, screw connector M8, LED indicator, cable 0.24 m	10-30 V AC / DC	RST-S	KL 3303
Magnetic switch, reed contact, normally closed, cable 5 m	10-30 V AC / DC	RST-K	KL 3305
Magnetic switch, electronic, PNP LED indicator, cable 2 m	10-30 V DC	EST-K	KL 3308
Magnetic switch, electronic, PNP LED indicator, cable 5 m	10-30 V DC	EST-K	KL 3309
Magnetic switch, electronic, PNP snap connector M8, LED indicator	10-30 V DC	EST-S	KL 3312
Magnetic switch, electronic, PNP screw connector M8, LED indicator	10-30 V DC	EST-S	KL 3306

Included in delivery: 1 magnetic switch
 1 adapter for dovetail groove mounting

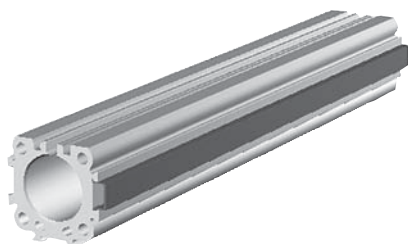
Accessories

Description	Type	Order number
Cable M8, 2.5 m without lock nut	KS 25	KY 3240
Cable M8, 5.0 m without lock nut	KS 50	KY 3241
Cable M8, 10.0 m without lock nut	KS 100	KY 3140
Cable M8, 2.5 m with lock nut	KSG 25	KC 3102
Cable M8, 5.0 m with lock nut	KSG 50	KC 3104
Adapter for dovetail groove (pack of 10)		KL 3333

B
 Rodless Cylinders
 Actuator Productd

Linear Drive Accessories

ø 16-80 mm Dovetail Cover



Ordering Information

Series	Order number
OSP-P16	13039 Minimal length: 1m Max. profile length: 2m Multiple profiles can be used.
OSP-P25	
OSP-P32	
OSP-P40	
OSP-P50	
OSP-P63	
OSP-P80	

MaterialPlastic
 Color..... Red
 Temperature range-10 to +80°C

B

**Rodless Cylinders
 Actuator Products**

For clean guidance of magnetic switch cables along the cylinder body.

Contains a maximum of 3 cables with diameter 3 mm.

Service Packs

		Bore sizes						
		16mm	25mm	32mm	40mm	50mm	63mm	80mm
BUNA service pack - Single piston	Part number	11111	11112	11113	11114	11115	11116	11118
Viton service pack - Single piston	Part number	11121	11122	11123	11124	11125	11126	11128
BUNA service pack - Single piston - Slow speed grease	Part number	11131	11132	11133	11134	11135	11136	11138
Viton service pack - Single piston - Slow speed grease	Part number	11141	11142	11143	11144	11145	11146	11148

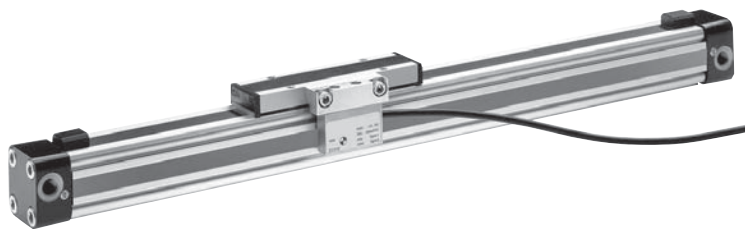
*Behind part number, please add stroke length in mm

Service pack information

Service Packs, containing all the components necessary to completely rebuild a Parker-Origa rodless cylinder, are available. Each pack contains a complete seal kit, inner and outer bands, Parker-Origa grease tube, cleaning tool and repair instructions. It's all packaged in an easy-to-ship, easy-to-store box clearly labeled to indicate the cylinder type, bore and stroke for which it is intended. Contact your local Parker-Origa distributor for more information.

Seal Kits

		Bore sizes						
		16mm	25mm	32mm	40mm	50mm	63mm	80mm
BUNA seal kit - Standard cylinder	Part number	11052	11053	11054	11055	11056	11057	11058
Viton seal kit - Standard cylinder	Part number	11059	11060	11061	11062	11063	11064	11065
Seal kit - Sideline carriage	Part number	11066	11067	11068	11069	11070	-	-
Seal kit active brake - Standard cylinder	Part number	-	11822	11823	11824	11825	11826	11827
Seal kit - Multibrake	Part Number	-	11089	11090	11091	11092	11093	-



Characteristics

Characteristics	Unit	Description	
Type		21210	21211
Output function			
Resolution	mm	0.1	1
Pole lengths magnetic scale	mm	5	
Maximum speed	m/s	10	
Repeat accuracy		± 1 Increment	
Distance between sensor and scale	mm	≤ 4	
Tangential deviation		≤ 5°	
Lateral deviation	mm	≤ ± 1.5	
Switching output		PNP	
Electrical Characteristics			
Operating voltage U_b	V DC	18 – 30	
Voltage drop	V	≤ 2	
Continuous current for each output	mA	≤ 20	
Power consumption at $U_b = 24V$, switched on, without load	mA	≤ 50	
Short-circuit protection		yes	
Reverse polarity protection			yes
Protection from inductive load		yes	
Power-up pulse suppression		yes	
EMC			
Electrostatic discharge immunity	kV	6, B, to EN 61000-4-2	
Electromagnetic field immunity	V/m	10, A, to EN61000-4-3	
Electrical fast transient/burst immunity (for signal connections)	kV	1, B, to EN 61000-4-4	
Electrical fast transient/burst immunity (for DC connections)	kV	2, B, to EN 61000-4-4	
Surge immunity (for signal connections)	kV	1, B, to EN 61000-4-5	
Surge immunity (for DC connections)	kV	0,5, B, to EN 61000-4-5	
Immunity to conducted disturbances	V	10, A, to EN 61000-4-6	
Power frequency magnetic field immunity at 50 Hz	A/m	30, A, to EN 61000-4-8	
Emission standard for residential		to EN 61000-6-4	
Radio disturbance characteristics		to EN 55011, Group 1, A	
Mechanical characteristics			
Housing		Aluminum	
Cable length	m	5.0 – fixed, open end	
Cable cross section	mm ²	4 x 0.14	
Cable type		PUR, black	
Bending radius	mm	≥ 36	
Weigth (mass)	kg	ca. 0.165	
Environmental conditions / Shock resistance			
Degree of protection	IP	67 to EN60529	
Ambient temperature range	°C	-25 to +80	
Broad-band random vibration to EN 60068-2-64	g	5, 5 Hz to 2 kHz, 0.5 h each axis	
Vibration stress to EN 60068-2-6	g	12, 10 Hz to 2 kHz, 2 mm, 5 h each axis	
Shock to EN 60068-2-27	g	100, 6 ms, 50 bumps each axis	
Bump to EN 60068-2-29	g	5, 2 ms, 8000 bumps each axis	

Displacement Measuring System

Displacement measuring system for automated movement

ORIGA-Sensoflex

(Incremental displacement measuring system)

Series SFI-plus for cylinder series

- OSP-P...

Characteristics

- Contactless magnetic displacement measurement system
- Displacement length up to 32 m
- Resolution 0.1 mm (option: 1 mm)
- Displacement speed up to 10 m/s
- For linear and non-linear rotary motion

Suitable for almost any control or display unit with a counter input

Note

For combinations Active Brake AB + SFI-plus + Magnetic Switch contact our technical department please.

The SFI-plus magnetic displacement measuring system consists of 2 main components.

- **Measuring Scale**
Self-adhesive magnetic measuring scale
- **Sensing Head**
Converts the magnetic poles into electrical signals which are then processed by counter inputs downstream (e.g. PLC, PC, digital counter)



B
Rodless Cylinders
Actuator Productd

Sensing head

The sensing head provides two pulsating, 90° out of phase counter signals (phase A/B) with a 0.4 mm resolution (option 4 mm).

External processing can improve the resolution to 0.1 mm (option 1 mm).

The counting direction can be determined automatically from the phase variance of the counter signals.

Electrical connection

Color	Description
bn = brown	+ DC
bu = blue	- DC
bl = black	Phase A
wt = white	Phase B

SFI-plus mounted on a rodless cylinder series OSP-P

The SFI-plus system can be mounted directly on a rodless OSP-P cylinder with the special mounting kit.

The position of the sensing head is generally 90° to the carrier.



Combinations consisting of SFI-plus and OSP-P Cylinders with guides are available on request.

Ordering Information

Description	Order number
Sensing head with measuring scale – Resolution 0.1 mm (scale length = required measuring distance + a minimum of – see table below)	21240
Option: Sensing head with measuring scale – Resolution 1 mm (scale length = required measuring distance + a minimum of – see table below)	21241
Sensing head – Resolution 0.1 mm (spare part)	21210
Option: Sensing head – Resolution 1 mm (spare part)	21211
Measuring scale per meter (spare part)	21235
Mounting kit for OSP-P25	21213
Mounting kit for OSP-P32	21214
Mounting kit for OSP-P40	21215
Mounting kit for OSP-P50	21216
Mounting kit for OSP-P63	21217
Mounting kit for OSP-P80	21218

* Overall length of the measuring scale results from stroke length of the cylinder + dead length
 Dead length for linear drives series OSP-P see table.

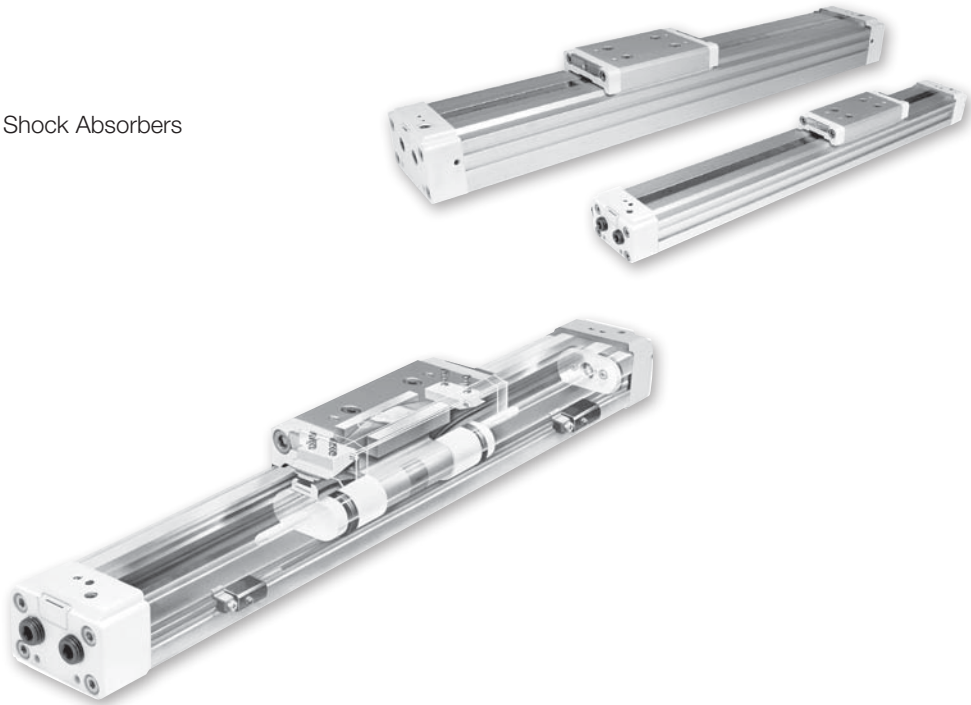
Example:

Cylinder OSP-P, Ø25 mm, stroke length 1000 mm

$$\begin{array}{rcl} \text{Dead length} & + \text{Stroke length} & = \text{Overall length of the measuring scale} \\ \mathbf{154 \text{ mm}} & + \mathbf{1000 \text{ mm}} & = \mathbf{1154 \text{ mm}} \end{array}$$

Series	Dead length (mm)
OSP-P 25	154
OSP-P 32	196
OSP-P 40	240
OSP-P 50	280
OSP-P 63	350
OSP-P 80	422

- 7 Bore Sizes – 16mm through 63mm
- Two Port Locations Standard
- Large Carriage for Stability
- Integral Sensor Mounting Rail
- Optional Adjustable Stroke and Shock Absorbers



B
 Rodless Cylinders
 Actuator Productd

Ordering Information

P1X	N	032	D	A	N	0500	W	D	N	N	N	-B
------------	----------	------------	----------	----------	----------	-------------	----------	----------	----------	----------	----------	-----------

Series	Construction	Carriage	Seal Material	Basic or Options	Porting Options
P1X Global Rodless	N Inch M Metric	D Double acting	N Standard	B† Standard W† With options / Special (for factory use only)	N NPTF G BSPP Q BSPT*

Bore Size	Piston / Shock Style	Carriage Mounting Style
016 16mm 020 20mm 025 25mm 032 32mm 040 40mm 050 50mm 063 63mm	A Cushions both ends (standard) R Cushion right end only* L Cushion left end only* N No cushions or shock absorbers H Shock absorber both ends** B Shock absorber right end only** C Shock absorber left end only**	Standard Inverted Carriage Mounting D (std) J Single, Basic Mount A G Single, Swivel Mount

Mounting Options
No Foot Mount End Mount Foot Bracket Bottom Mount Foot Bracket Intermediate Supports
N F A†† No support H M B†† One support K P C†† Two supports T R D†† Three supports

Fastener Type
N Standard - zinc-plated S Stainless steel

* Stroke is ALWAYS in mm.
 † When "B" is specified, the remaining digits in the part number are not necessary. If "W" is used, the remaining digits in the part number must be filled out.
 †† Not available on 40, 50 and 63mm bore sizes.

* As viewed from port side of cylinder
 ** Cannot be combined with inverted carriage

Sensors
 For sensors see page B296.

Essential Information

Optional Features

Specifications

Model	P1X (Standard w/switch)			
Operating medium	Compressed air			
Maximum pressure	100 PSI (7 bar)			
Minimum pressure	Ø16, Ø20 bores	29 PSI (2 bar)		
	Ø25, Ø32, Ø40 bores	14.5 PSI (1 bar)		
Proof pressure	Ø50, Ø63 bores	7 PSI (0.5 bar)		
	152 PSI (10.5 bar)			
Bore size mm (inch nominal)	16 (5/8)	20 (3/4), 25 (1)	32 (1-1/4), 40 (1-1/2)	50 (2), 63 (21/2)
Port size – N series	M5 (10-32)	1/8 NPT	1/4 NPT	3/8 NPT
Port size – M series	M5 (10-32)	1/8 Rc	1/4 Rc	3/8 Rc
Ambient temperature °F (°C)	40 to 140°F (5 to 60°C)			
Stroke tolerance in.	±0.080 to 39"	±0.100 to 118"	±0.120 to 196"	
Piston speed, *in./sec.	2-80 IPS with side ports on each end (Ø16 & Ø20 bores 2-40 IPS with single end porting with 39" stroke) (Ø25, Ø32, Ø40, Ø50 & Ø63 bores 2-40 IPS with single end porting with 78" stroke)			
Cushion	Air cushion standard			
Lubrication	Not required (if you choose to lubricate your system, continuing lubrication will be required.)			

*Actual piston speed with one end ports will vary depending on stroke length.

Weight & theoretical force characteristics

Bore	Area in ²	Weights													
		Weight at zero stroke						Weight per 1" (25.4mm) stroke		Theoretical force (lbs) At pressure (PSI)					
		M00		MLB		MLB1		lbs	kg	30	40	60	80	100	
16	0.31	0.70	0.3	0.73	0.3	0.77	0.4	0.07	0.03	9	12	19	25	31	
20	0.49	1.15	0.5	1.19	0.5	1.28	0.6	0.10	0.04	15	20	29	39	49	
25	0.84	2.21	1.0	2.43	1.1	2.43	1.1	0.15	0.07	23	30	46	61	76	
32	1.26	3.31	1.5	3.53	1.6	3.75	1.7	0.20	0.09	38	50	69	100	125	
40	1.96	5.29	2.4	5.51	2.5	—	—	0.27	0.12	59	78	117	156	195	
50	3.08	7.94	3.6	8.16	3.7	—	—	0.40	0.18	91	122	182	243	304	
63	4.86	13.67	6.2	14.33	6.5	—	—	0.63	0.28	145	193	290	386	483	

Moments

Figure 1 shows the maximum allowable moments for each of the three types of loading: pitch, roll and yaw.

The sum total of each of these types of moments, divided by each of the maximum values, determines a Load-Moment Factor (LMF) should be equal to or less than 1.0. On horizontal mountings, the total load (L) should also be divided by the maximum load allowable (Figure 2) and factored into the equation.

Horizontal mountings:

$$\frac{L}{[L]} + \frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

Vertical mountings:

$$\frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

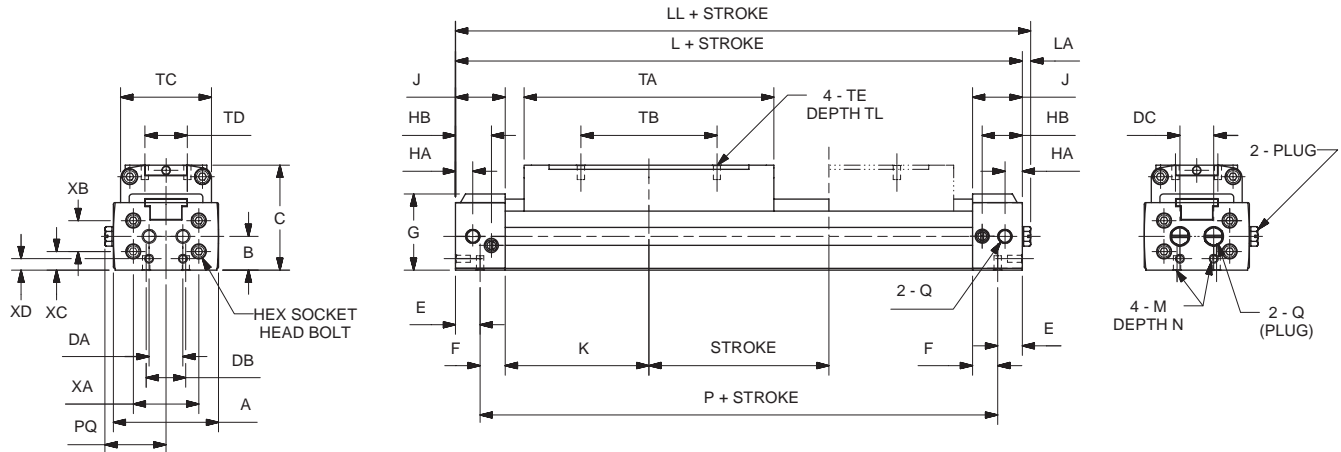
Figure 1

Bore size	Maximum allowable moments n-m (lb-in)					
	[M]		[Ms]		[Mv]	
	Std.	Inverted	Std.	Inverted	Std.	Inverted
16	5 (44)	3.5 (31)	1 (9)	0.5 (4)	1 (9)	1 (9)
20	10 (89)	7 (62)	1.5 (13)	0.7 (6)	3 (27)	3 (27)
25	17 (150)	12 (106)	5 (44)	2.5 (22)	10 (89)	10 (89)
32	36 (319)	25 (221)	10 (89)	5 (44)	21 (186)	21 (186)
40	77 (682)	54 (478)	23 (204)	11.5 (102)	26 (230)	26 (230)
50	154 (1363)	108 (956)	32 (283)	16 (142)	42 (372)	42 (372)
63	275 (2434)	193 (1708)	52 (460)	26 (230)	76 (673)	76 (673)

Figure 2

Bore size	Max. allowable load [L] N (lbs)		Max. unsupported length mm (in) at max. load
	Std.	Inverted	
16	141 (32)	70 (16)	450 (17.7)
20	198 (45)	101 (23)	551 (21.7)
25	356 (81)	180 (41)	899 (35.4)
32	616 (140)	308 (70)	749 (29.5)
40	959 (218)	480 (109)	1000 (39.4)
50	1456 (331)	726 (165)	1300 (51.2)
63	2297 (522)	1148 (261)	1600 (63.0)

Basic cylinder



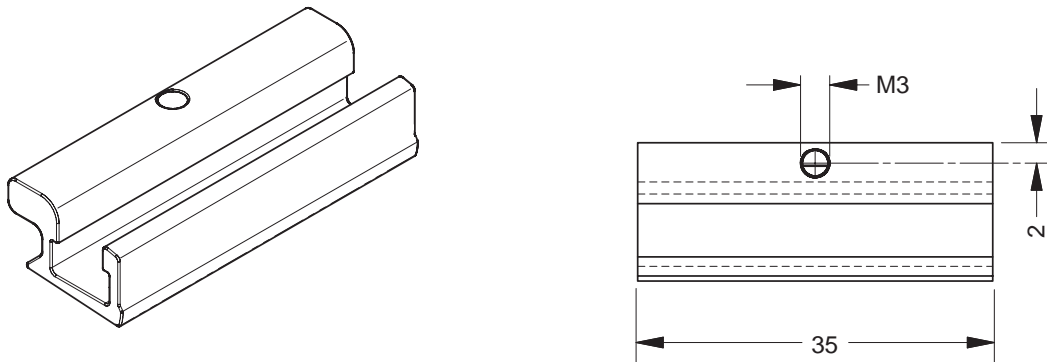
Bore (mm)	A	B	C	DA	DB	DC	E	F	G	HA	HB	J	K	L	LL	LA	M	N
16	1.46 (37)	0.47 (12)	1.46 (37)	0.47 (12)	0.55 (14)	0.47 (12)	0.34 (8.5)	0.35 (9)	1.06 (27)	0.24 (6)	0.55 (14)	0.69 (17.5)	2.24 (57)	5.87 (149)	5.98 (152)	0.12 (3)	5-40 (M3)	0.20 (5)
20	1.73 (44)	0.55 (14)	1.65 (42)	0.55 (14)	0.63 (16)	0.63 (16)	0.41 (10.5)	0.45 (11.5)	1.22 (31)	0.34 (8.5)	0.73 (18.5)	0.87 (22)	2.46 (62.5)	6.65 (169)	6.75 (171.5)	0.10 (2.5)	8-32 (M4)	0.26 (6.5)

Bore (mm)	P	PQ	Q	TA	TB	TC	TD	TE	TL	XA	XB	XC	XD
16	5.20 (132)	0.83 (21)	10-32 NPT (M5)	3.47 (88)	1.89 (48)	1.26 (32)	0.59 (15)	5-40 (M3)	0.20 (5)	0.91 (23)	0.43 (11)	0.26 (6.5)	0.16 (4)
20	5.83 (148)	0.97 (24.5)	1/8 NPT (1/8 Rc)	3.94 (100)	2.36 (60)	1.50 (38)	0.71 (18)	8-32 (M4)	0.24 (6)	1.10 (28)	0.63 (16)	0.24 (6)	0.20 (5)

inches (mm)

Sensor adapter bracket

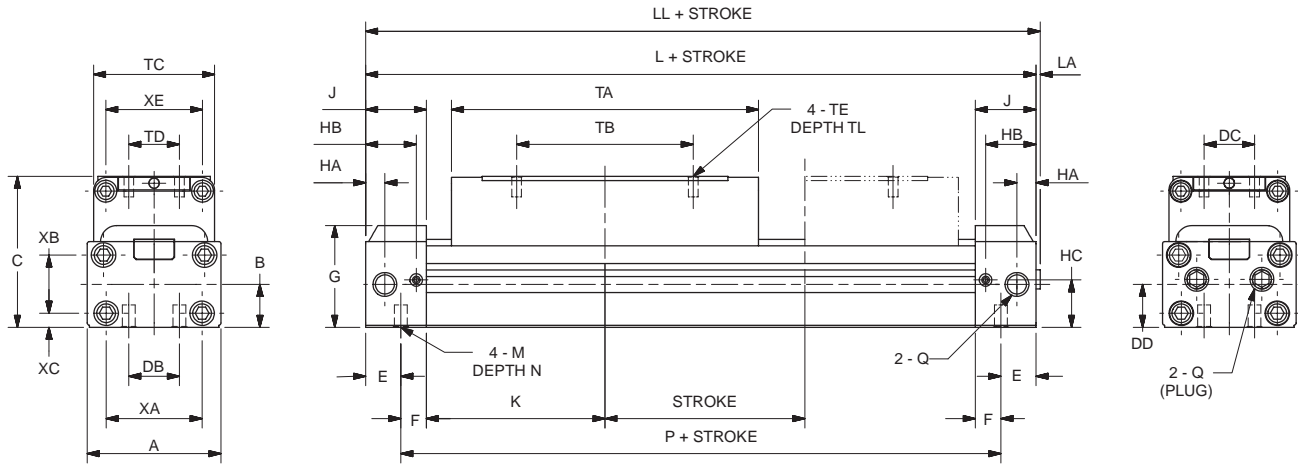
Part number P8S-TMA0Y
 (Shown larger than actual size)



NOTE: Must be ordered separately when ordering sensors.

B
 Rodless Cylinders
 Actuator Productd

Basic cylinder



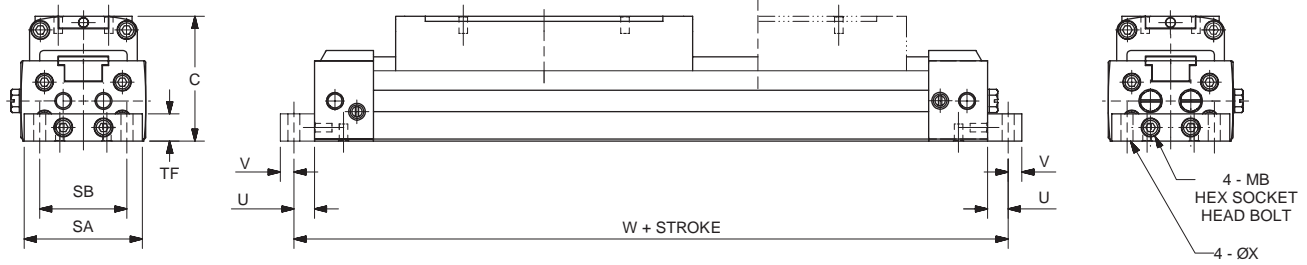
B
 Rodless Cylinders
 Actuator Products

Bore (mm)	A	B	C	DB	DC	DD	E	F	G	HA	HB	HC	J	K	L	LL	LA	M	N
25	2.09 (53)	0.67 (17)	2.09 (53)	0.79 (20)	1.02 (26)	0.75 (19)	0.55 (14)	0.39 (10)	1.59 (40.5)	0.30 (7.5)	0.79 (20)	0.74 (18.9)	0.95 (24)	2.80 (71)	7.48 (190)	7.56 (192)	0.08 (2)	1/4-20 (M6)	0.35 (9)
32	2.60 (66)	0.73 (18.5)	2.24 (57)	1.26 (32)	1.06 (27)	0.83 (21)	0.59 (15)	0.51 (13)	1.71 (43.5)	0.39 (10)	0.93 (23.5)	0.85 (21.5)	1.10 (28)	3.35 (85)	8.90 (226)	9.00 (228.5)	0.10 (2.5)	1/4-20 (M6)	0.35 (9)
40	3.15 (80)	0.87 (22)	2.64 (67)	1.42 (36)	1.38 (35)	1.10 (28)	0.67 (17)	0.55 (14)	2.03 (51.5)	0.51 (13)	1.02 (26)	1.06 (27)	1.22 (31)	3.58 (91)	9.61 (244)	9.71 (246.5)	0.10 (2.5)	5/16-18 (M8)	0.47 (12)
50	3.78 (96)	1.10 (28)	3.23 (82)	1.77 (45)	1.38 (35)	1.38 (35)	0.91 (23)	0.63 (16)	2.40 (61)	0.59 (15)	1.30 (33)	1.39 (35.3)	1.54 (39)	3.54 (90)	10.16 (258)	10.26 (260.5)	0.10 (2.5)	5/16-18 (M8)	0.47 (12)
63	4.65 (118)	1.38 (35)	3.74 (95)	1.97 (50)	1.54 (39)	1.65 (42)	0.75 (19)	0.79 (20)	2.91 (74)	0.59 (15)	1.26 (32)	1.69 (43)	1.54 (39)	4.29 (109)	11.65 (296)	11.75 (298.5)	0.10 (2.5)	3/8-16 (M10)	0.59 (15)

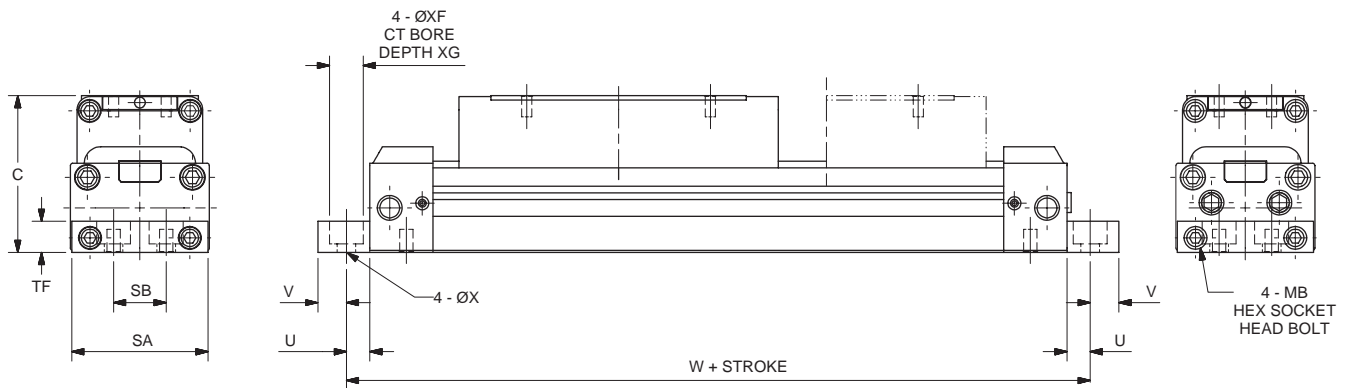
Bore (mm)	P	Q	TA	TB	TC	TD	TE	TL	XA	XB	XC	XE
25	6.38 (162)	1/8 NPT (1/8 Rc)	4.80 (122)	2.76 (70)	1.89 (48)	0.79 (20)	10-24 (M5)	0.32 (8)	1.50 (38)	0.91 (23)	0.22 (5.5)	1.58 (40)
32	7.72 (196)	1/4 NPT (1/4 Rc)	5.28 (134)	3.15 (80)	2.21 (56)	0.79 (20)	1/4-20 (M6)	0.35 (9)	1.89 (48)	0.98 (25)	0.24 (6)	1.85 (47)
40	8.27 (210)	1/4 NPT (1/4 Rc)	5.83 (148)	3.54 (90)	2.68 (68)	1.18 (30)	1/4-20 (M6)	0.43 (11)	2.36 (60)	1.18 (30)	0.28 (7)	2.28 (58)
50	8.35 (212)	3/8 NPT (3/8 Rc)	5.98 (152)	3.94 (100)	3.15 (80)	1.18 (30)	5/16-18 (M8)	0.51 (13)	2.91 (74)	1.42 (36)	0.39 (10)	2.76 (70)
63	10.16 (258)	3/8 NPT (3/8 Rc)	6.61 (168)	4.33 (110)	4.02 (102)	1.58 (40)	5/16-18 (M8)	0.51 (13)	3.78 (96)	1.65 (42)	0.55 (14)	3.54 (90)

inches (mm)

16 to 32 mm bore sizes



40 to 63 mm bore sizes

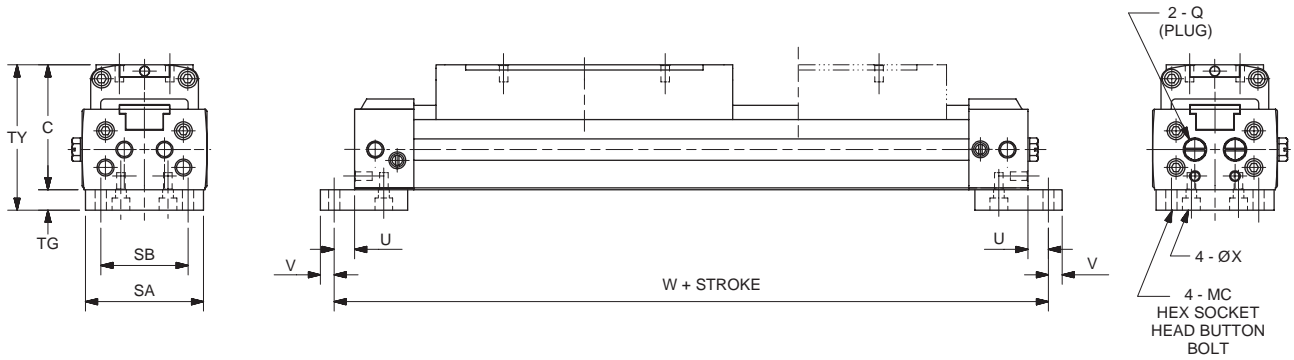


Bore (mm)	C	SA	SB	TF	U	V	W	X	XF	XG	MB
16	1.46 (37)	1.38 (35)	1.02 (26)	0.32 (8)	0.24 (6)	0.16 (4)	6.34 (161)	0.14 (3.6)	—	—	M3x10
20	1.65 (42)	1.69 (43)	1.30 (33)	0.39 (10)	0.24 (6)	0.24 (6)	7.13 (181)	0.19 (4.7)	—	—	M4x12
25	2.09 (53)	2.05 (52)	0.79 (20)	0.47 (12)	0.35 (9)	0.43 (11)	8.19 (208)	0.28 (7)	—	—	M5x50
32	2.24 (57)	2.52 (64)	1.26 (32)	0.47 (12)	0.35 (9)	0.43 (11)	9.61 (244)	0.28 (7)	—	—	M5x50
40	2.64 (67)	3.15 (80)	1.18 (30)	0.59 (15)	0.49 (12.5)	0.45 (11.5)	10.60 (269)	0.35 (9)	0.51 (13)	0.34 (8.7)	M6x55
50	3.23 (82)	3.70 (94)	1.57 (40)	0.79 (20)	0.49 (12.5)	0.45 (11.5)	11.10 (283)	0.35 (9)	0.51 (13)	0.34 (8.7)	M8x65
63	3.74 (95)	4.57 (116)	1.89 (48)	0.98 (25)	0.59 (15)	0.59 (15)	12.80 (326)	0.43 (11)	0.61 (15.5)	0.41 (10.5)	M8x70

inches (mm)

B
 Rodless Cylinders
 Actuator Productd

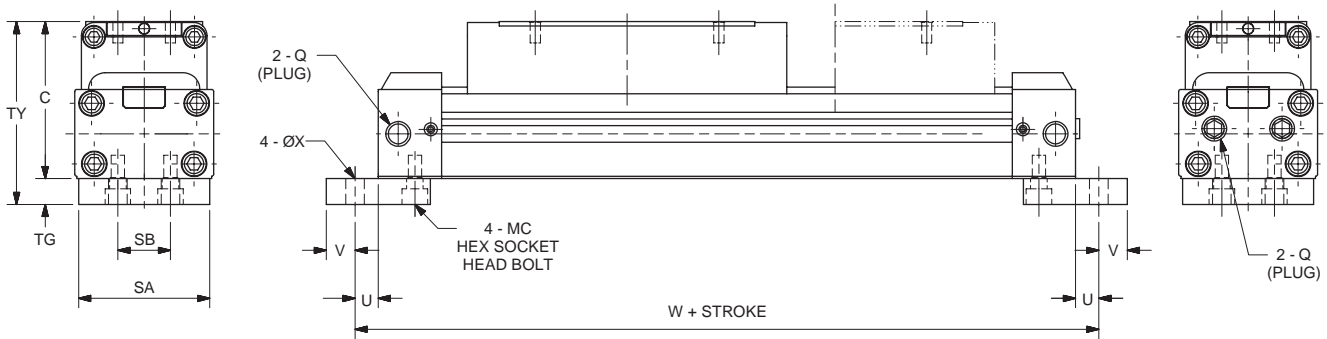
16 to 20 mm bore sizes



B

Rodless Cylinders
 Actuator Products

25 to 32 mm bore sizes

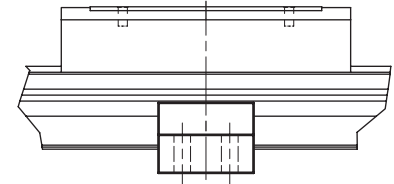
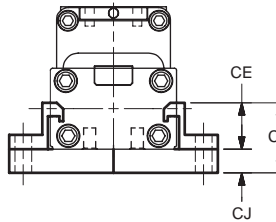
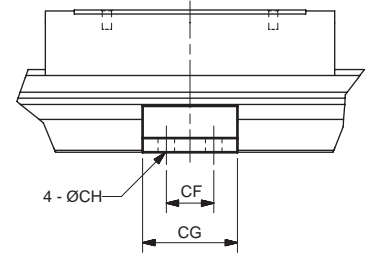
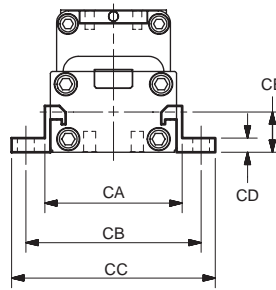
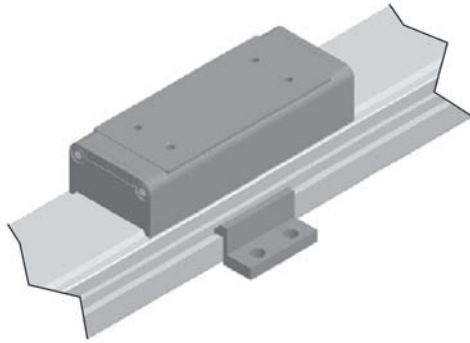


Bore (mm)	C	Q	SA	SB	TG	TY	U	V	W	X	MC
16	1.46 (37)	10-32 (M5)	1.38 (35)	1.02 (26)	0.24 (6)	1.69 (43)	0.24 (6)	0.16 (4)	6.34 (161)	0.13 (3.4)	5-40, 1/4 LG
20	1.65 (42)	1/8 NPT (1/8 Rc)	1.69 (43)	1.30 (33)	0.32 (8)	1.97 (50)	0.24 (6)	0.24 (6)	7.13 (181)	0.18 (4.5)	8-32, 3/8 LG
25	2.09 (53)	1/8 NPT (1/8 Rc)	1.97 (50)	0.79 (20)	0.39 (10)	2.48 (63)	0.35 (9)	0.43 (11)	8.19 (208)	0.28 (7)	1/4-20 x 1/2 LG
32	2.24 (57)	1/4 NPT (1/4 Rc)	2.52 (64)	1.26 (32)	0.39 (10)	2.64 (67)	0.35 (9)	0.43 (11)	9.61 (244)	0.28 (7)	1/4-20 x 1/2 LG
40	2.64 (67)	1/4 NPT (1/4 Rc)	—	—	—	—	—	—	—	—	—
50	3.23 (82)	3/8 NPT (3/8 Rc)	—	—	—	—	—	—	—	—	—
63	3.74 (95)	3/8 NPT (3/8 Rc)	—	—	—	—	—	—	—	—	—

inches (mm)

Intermediate support brackets

End mount



Intermediate support brackets (2 per kit)

Bore (mm)	CA	CB	CC	CD	CE	CF	CG	CH
16	1.654 (42)	2.205 (56)	2.52 (64)	0.118 (3)	0.472 (12)	0.787 (20)	1.378 (35)	0.157 (4)
20	1.929 (49)	2.52 (64)	2.953 (75)	0.157 (4)	0.551 (14)	0.787 (20)	1.496 (38)	0.197 (5)
25	2.362 (60)	2.992 (76)	3.465 (88)	0.236 (6)	0.768 (19.5)	0.787 (20)	1.575 (40)	0.276 (7)
32	2.913 (74)	3.465 (88)	3.937 (100)	0.236 (6)	0.846 (21.5)	0.787 (20)	1.575 (40)	0.276 (7)
40	3.543 (90)	4.252 (108)	4.882 (124)	0.236 (6)	0.965 (24.5)	1.181 (30)	2.362 (60)	0.354 (9)
50	4.173 (106)	4.882 (124)	5.512 (140)	0.315 (8)	1.201 (30.5)	1.181 (30)	2.362 (60)	0.354 (9)
63	5.118 (130)	5.984 (152)	6.772 (172)	0.394 (10)	1.516 (38.5)	1.969 (50)	3.543 (90)	0.433 (11)

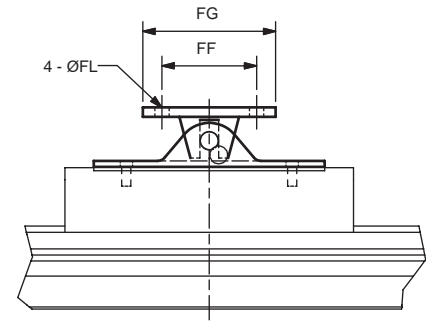
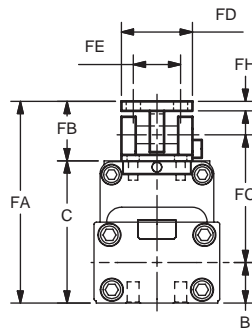
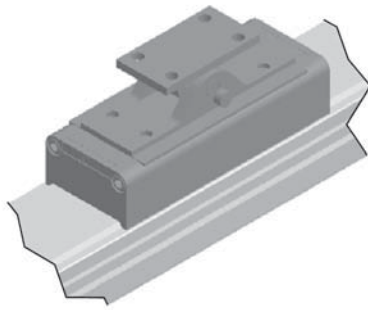
Bore (mm)	CJ	CK	Kit part number	
			End mount or no mount	Bottom mount
16	0.236 (6)	0.709 (18)	L080180016	L080190016
20	0.315 (8)	0.866 (22)	L080180020	L080190020
25	0.394 (10)	1.161 (29.5)	L080180025	L080190025
32	0.394 (10)	1.24 (31.5)	L080180032	L080190032
40	—	—	L080180040	
50	—	—	L080180050	
63	—	—	L080180063	

inches (mm)

B
 Rodless Cylinders
 Actuator Productd

Swivel mount

Absorbs misalignment between cylinder and load



FJ dimension is the maximum horizontal float

FK dimension is the maximum vertical float

B

Rodless Cylinders
 Actuator Products

Swivel mounts

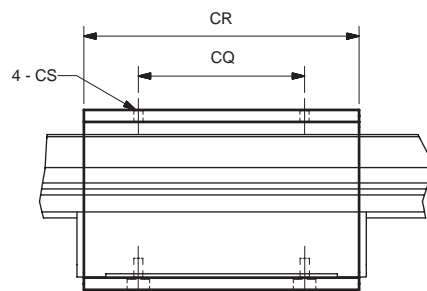
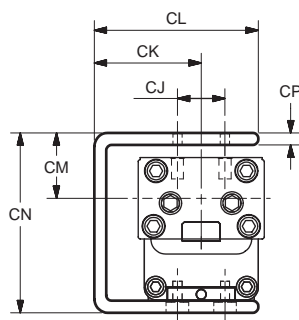
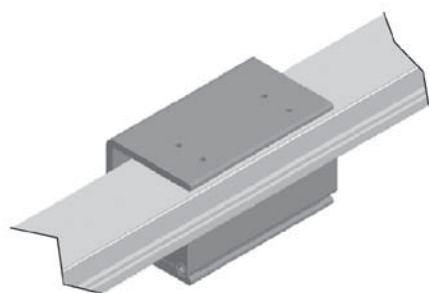
Bore (mm)	FA	FB	FC	FD	FE	FF	FG	FH
16	2.238 (58)	0.827 (21)	1.339 (34)	0.945 (24)	0.673 (16)	1.181 (30)	1.575 (40)	0.118 (3)
20	2.638 (67)	0.984 (25)	1.535 (39)	1.181 (30)	0.787 (20)	1.575 (40)	2.205 (56)	0.157 (4)
25	3.071 (78)	0.984 (25)	1.85 (47)	1.181 (30)	0.787 (20)	1.575 (40)	2.205 (56)	0.157 (4)
32	3.74 (95)	1.496 (38)	2.185 (55.5)	1.772 (45)	1.181 (30)	1.969 (50)	2.756 (70)	0.236 (6)
40	4.134 (105)	1.496 (38)	2.441 (62)	1.772 (45)	1.181 (30)	1.969 (50)	2.756 (70)	0.236 (6)
50	4.961 (126)	1.732 (44)	2.874 (73)	2.362 (60)	1.575 (40)	2.756 (70)	3.543 (90)	0.315 (8)
63	5.472 (139)	1.732 (44)	3.11 (79)	2.362 (60)	1.575 (40)	2.756 (70)	3.543 (90)	0.315 (8)

inches (mm)

Bore (mm)		FJ	FK	FL	B	C	Part number
16	inches	0.118	0.118	0.134	0.472	1.457	L078930016
	mm	3	3	3.4	12	37	
20	inches	0.118	0.118	0.177	0.551	1.654	L080160020
	mm	3	3	4.5	14	42	
25	inches	0.118	0.118	0.236	0.669	2.087	L080160025
	mm	3	3	6	17	53	
32	inches	0.197	0.197	0.276	0.728	2.244	L080160032
	mm	5	5	7	18.5	57	
40	inches	0.197	0.197	0.276	0.866	2.638	L080160040
	mm	5	5	7	22	67	
50	inches	0.197	0.197	0.354	1.102	3.228	L080160050
	mm	5	5	9	28	82	
63	inches	0.197	0.197	0.354	1.378	3.74	L080160063
	mm	5	5	9	35	95	

Inverted mount

Provides mounting surface 180° from carriage



Inverted mounts*

Bore (mm)		CJ	CK	CL	CM	CN	CP	CQ	CR	CS	Part number**
16	inches	0.591	1.398	1.969	1.142	2.362	0.236	1.89	3.465	5-40	L080170016
	mm	15	35.5	50	29	60	6	48	88		L08017M016
20	inches	0.709	1.28	1.969	1.024	2.362	0.236	2.362	3.937	8-32	L080170020
	mm	18	32.5	50	26	60	6	60	100		L08017M020
25	inches	0.787	1.772	2.717	1.102	2.795	0.197	2.756	4.567	10-24	L080170025
	mm	20	45	69	28	71	5	70	116		L08017M025
32	inches	0.787	2.126	3.209	1.319	3.15	0.276	3.15	5.039	1/4-20	L080170032
	mm	20	54	81.5	33.5	80	7	80	128		L08017M032
40	inches	1.181	2.48	3.76	1.496	3.602	0.315	3.543	5.433	1/4-20	L080170040
	mm	30	63	95.5	38	91.5	8	90	138		L08017M040
50	inches	1.181	2.913	4.449	1.89	4.429	0.394	3.937	5.591	5/16-18	L080170050
	mm	30	74	113	48	112.5	10	100	142		L08017M050
63	inches	1.575	3.465	5.433	2.283	5.157	0.512	4.331	6.22	5/16-18	L080170063
	mm	40	88	138	58	131	13	110	158		L08017M063

*Inverted mounts not available with adjustable stroke, shock absorber or tube center support bracket.

**Use this part number when ordering as a separate part. When ordering with cylinder, use "C" option as part of cylinder part number.

End port piping

Refer to Figure 3 to determine when end port piping can be used with various types of mountings relative to fitting clearance.

On all bore sizes with foot mounting, the end port pipe fittings will obstruct the mounting holes. To avoid this problem, mount the cylinder first and tighten the mounting bolts and then attach the pipe fittings to the cylinder ports.

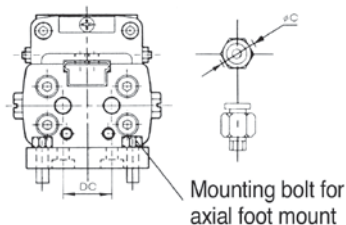


Figure 3

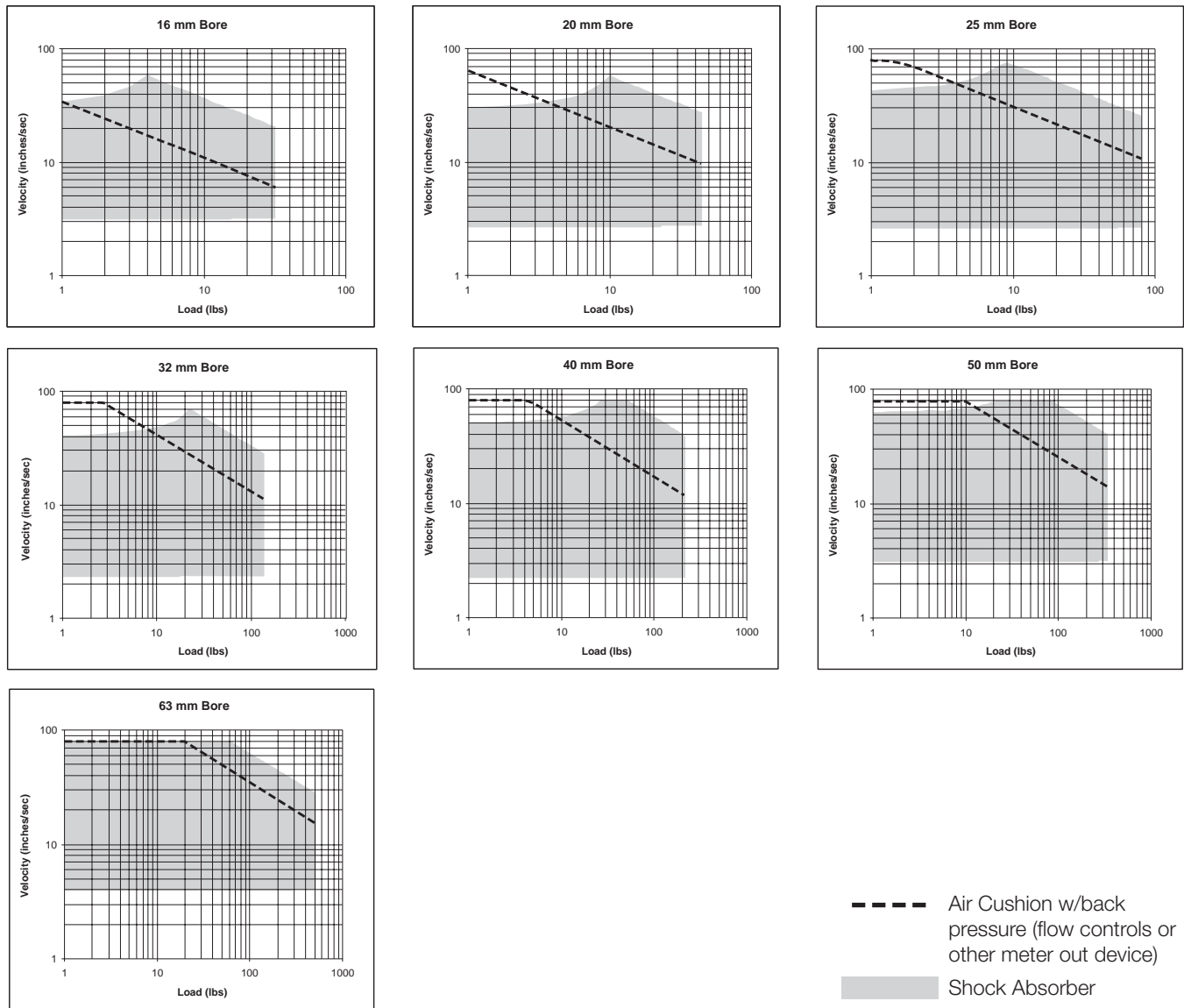
Bore (mm)	øC [O.D. of fittings - mm (in.)]		
	No mount	End mount	Bottom mount
16	12 (0.472)		12 (0.472)
20	16 (0.630)	End Port Piping	16 (0.630)
25	26 (1.024)	Not Available	26 (1.024)
32	27 (1.065)		27 (1.063)
40	35 (1.378)	26 (1.024)	
50	35 (1.378)	30 (1.181)	
63	39 (1.535)	34 (1.339)	

B
 Rodless Cylinders
 Actuator Product

Shock absorber specifications

Cylinder	16mm	20mm	25mm	32mm	40mm	50, 63mm	
Shock absorber number	0887790016	0887790020	0887790025	0887790032	0887790040	0887790050	
Max. energy absorption - in.-lbs (kgf-m)	26.0 (0.3)	60.8 (0.7)	104.2 (1.2)	226 (2.6)	608 (7.0)	1042 (12)	
Stroke - inches	0.236	0.315	0.394	0.590	0.787	0.984	
Energy absorption / hour - in.-lbs / hour	54,700	109,380	187,510	338,560	729,200	750,000	
Max. impact velocity - in. / sec.	59	59	78.7	78.7	98.4	118.1	
Max. cycle rate per hour	2100	1800	1800	1500	1200	720	
Ambient temperature - °F (°C)	41-140 (5-60)						
Spring return force - lb.	Extended	0.65	0.45	0.65	1.33	2.20	3.60
	Compressed	1.01	0.97	1.33	2.65	4.86	7.49
Return time - Sec.	0.3	0.3	0.3	0.3	0.4	0.4	

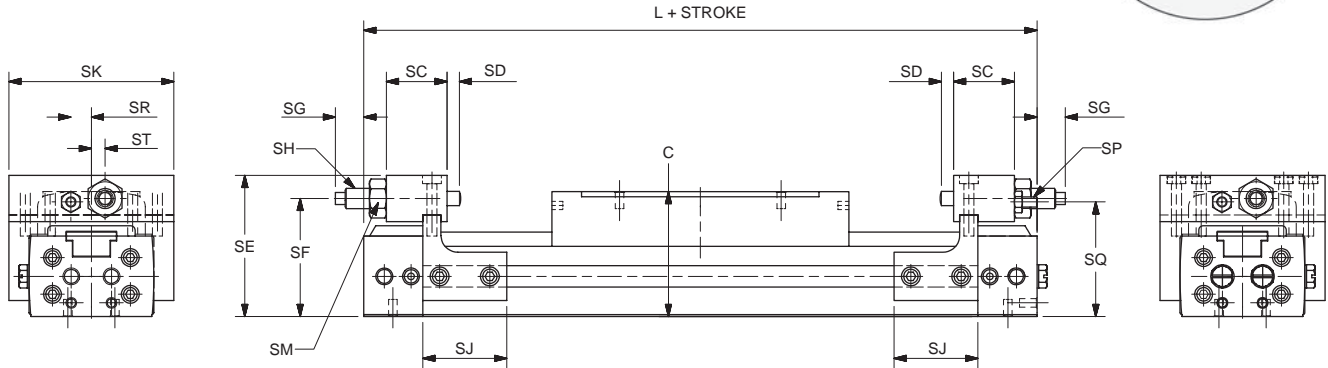
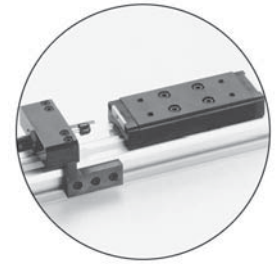
Performance data (16 to 32mm bores)



- Notes:**
1. If the cylinder is vertical in orientation, double the total load for bottom shock absorber.
 2. Use the total load that is being moved by shock absorber. If a weight transfer application, this would include La.
 3. If final velocity cannot be easily determined, use two times the stroke divided by the stroke time.

B
 Rodless Cylinders
 Actuator Products

16 to 25 mm bore sizes

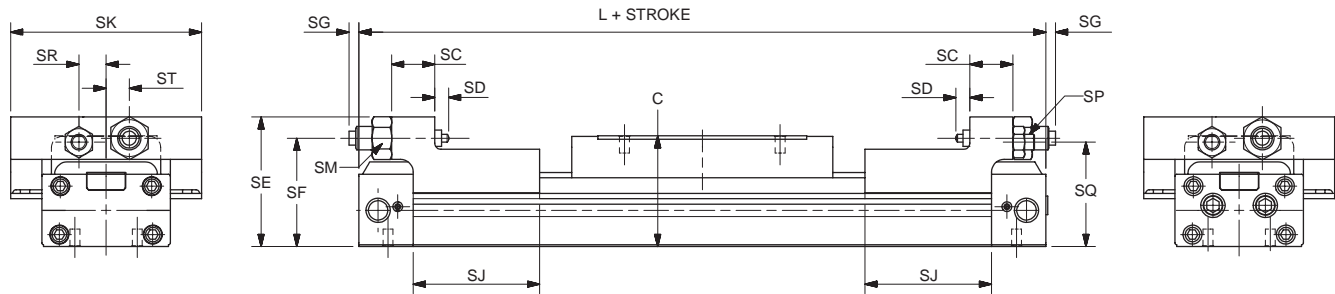


Bore (mm)	SC	SD	SE	SF	SG		SH in-lbs	SJ	SK	SP	SQ	SR	ST	C	L
					Max	Min									
16	0.71 (18)	0.16 (4)	1.65 (42)	1.38 (35)	0.57 (14.5)	0.18 (4.5)	26	0.98 (25)	1.93 (49)	M3	1.34 (34)	0.24 (6)	0.16 (4)	1.46 (37)	5.87 (149)
20	0.89 (22.5)	0.14 (3.5)	1.89 (48)	1.57 (40)	0.57 (14.5)	0.18 (4.5)	61	1.54 (39)	2.24 (57)	M4	1.50 (38)	0.32 (8)	0.20 (5)	1.65 (42)	6.65 (169)
25	0.79 (20)	0.10 (2.5)	2.46 (62.5)	2.03 (51.5)	0.57 (14.5)	0.18 (4.5)	104	1.97 (50)	3.03 (77)	M6	1.97 (50)	0.47 (12)	0.39 (10)	2.09 (53)	7.48 (190)

inches (mm)

SH = max. energy absorption

32 to 63 mm bore sizes



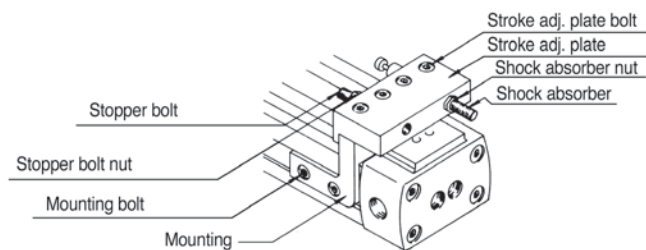
Bore (mm)	SC	SD	SE	SF	SG		SH in-lbs	SJ	SK	SP	SQ	SR	ST	C	L
					Max	Min									
32	0.87 (22)	0.28 (7)	2.62 (66.5)	2.19 (55.5)	1.06 (27)	0.67 (17)	226	2.56 (65)	3.86 (98)	M8	2.11 (53.5)	0.55 (14)	0.47 (12)	2.24 (57)	8.90 (226)
40	1.26 (32)	0.28 (7)	3.09 (78.5)	2.58 (65.5)	1.34 (34)	0.94 (24)	608	2.56 (65)	4.41 (112)	M10	2.50 (63.5)	0.67 (17)	0.47 (12)	2.64 (67)	9.61 (244)
50	1.50 (38)	0.32 (8)	3.90 (99)	3.15 (80)	2.17 (55)	1.77 (45)	1042	2.76 (70)	5.35 (136)	M12	3.05 (77.5)	0.87 (22)	0.67 (17)	3.23 (82)	10.16 (258)
63	1.50 (38)	0.32 (8)	4.41 (112)	3.68 (93.5)	1.73 (44)	1.34 (34)	1042	2.76 (70)	6.22 (158)	M16	3.50 (89)	0.98 (25)	0.79 (20)	3.74 (95)	11.65 (296)

inches (mm)

SH = max. energy absorption

B
 Rodless Cylinders
 Actuator Productd

Positioning of stroke adjustment unit



ø16-ø25

- (1) Moving the stroke adjustment unit.
 The stroke adjustment unit can be moved by loosening the mounting bolts.
- (2) Locking of stroke adjustment unit.
 After moving the stroke adjustment unit to the appropriate position, lock it there by tightening the mounting bolts to the torque values shown in Figure 4. Insufficient torque may cause the stroke adjustment unit to slip out of position.

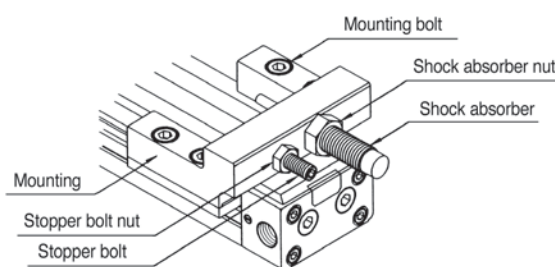
Figure 4
Torque values for tightening stroke adjustment unit.

Bore size	Tightening torque	
	Mounting bolt (lb-in)	Stroke adj. plate bolt (lb-in)
16mm	9-11	4-6
20mm	22-24	
25mm	46-50	22-24
32mm	195-213	-
40mm	390-415	-
50, 63mm	682-735	-

- (3) Stroke adjustment using the stopper bolt.
 Adjust the stroke by loosening the stopper bolt nut and turning the stopper bolt. After adjusting the stroke, tighten the stopper bolt nut to the torque values shown in Figure 5. When adjusting the 16-25 mm cylinders, due to the small amount of clearance between the table and the stroke adjustment plate, adjust the stroke by moving the complete stroke adjustment unit.

Figure 5
Torque values for tightening stopper bolt nut and shock absorber nut.

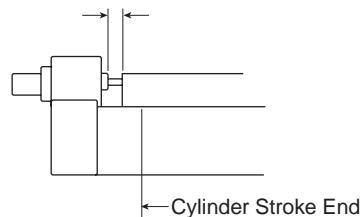
Bore size	Tightening torque	
	Stopper bolt nut (lb-in)	Shock absorber nut (lb-in)
16mm	10-11	12-16
20mm	22-24	26-35
25mm	73-84	40-53
32mm	195-213	66-89
40mm	390-425	195-266
50mm	682-735	487-620
63mm	1772-1914	487-620



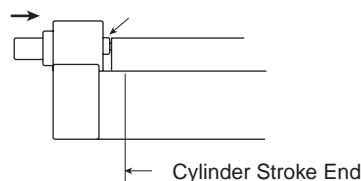
ø32-ø63

- (4) Adjustment of shock absorber.
 Adjust the absorption energy of the shock absorber by changing the operating stroke of the shock absorber. This is done by loosening the shock absorber nut and turning the unit. When adjustment is complete, tighten the shock absorber nut to the torque values shown in Figure 12a.
- (5) Notes on usage.
 The shock absorber absorbs rated energy with rated stroke. The factory setting allows a small amount of shock absorber stroke before it bottoms out. Readjust the location of the shock absorber so that the complete stroke of the absorber is utilized.

Absorption energy as set at factory:
 Small margin with stroke of shock absorber.



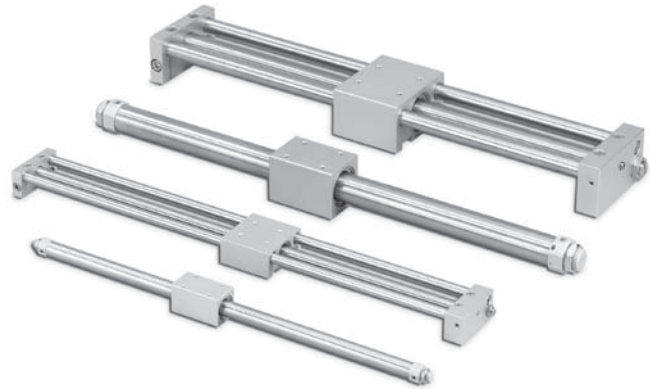
Adjust the position of the shock absorber until the plunger of the shock absorber is fully depressed.



Basic version

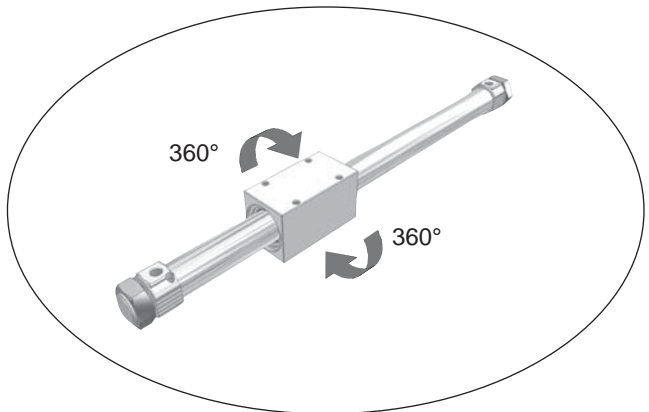
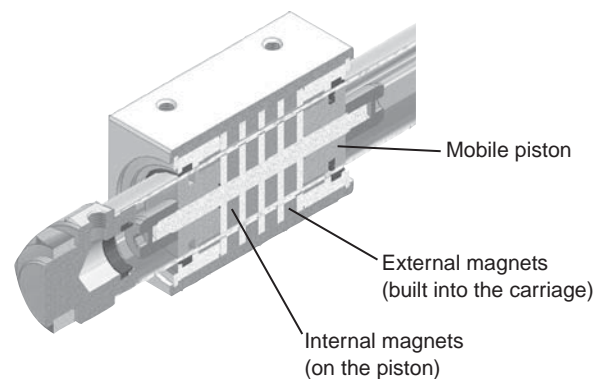
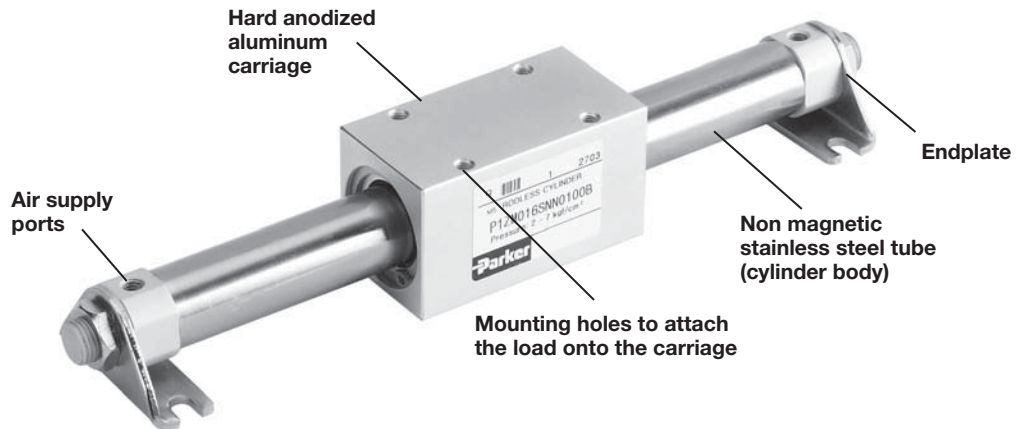
The magnetic rodless cylinder is a pneumatic cylinder featuring a mobile piston fitted with annular magnets. The mobile carriage is also equipped with magnets to provide magnetic coupling between the piston and carriage. It incorporates the following features:

- end of stroke cushioning/bumpers
- mounting:
 - threaded endcaps
 - optional foot mount
 - optional flange mount



Sensors

For sensors see page B296.



Cushioning

Ø 16 mm: non-adjustable bumper or adjustable pneumatic cushioning

Ø 20 and 32 mm: adjustable pneumatic cushioning

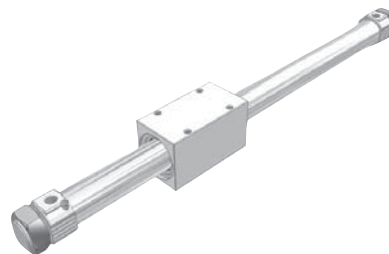
Mounting

The mobile carriage is free to rotate 360° around the cylinder axis. This feature facilitates the adaptation of the cylinder to various mounting arrangements.

The load must be guided by an external device.

Magnetic Rodless cylinder, basic version

- Available in 3 bores with stroke lengths up to 2000 mm
- Adjustable air cushioning is available on all cylinders
- The load is fixed onto the mobile carriage by 4 tapped holes
- The cylinder is attached by the ends with jam nuts, flanges or foot mounts



Specifications for P1Z series magnetically coupled rodless

Operating medium	Compressed air		
Maximum pressure - bar (PSI)	7 (100)		
Minimum pressure - bar (PSI)	2 (29)		
Bore size mm (inch nominal)	16 (5/8)	20 (3/4)	32 (1 1/4)
Port size	M5 BSPP, 10-32 NPT	1/8 BSPP, 1/8 NPT	1/8 BSPP, 1/8 NPT
Ambient temperature °F (°C)	15 to 140°F (-10 to 160°C)		
Maximum stroke mm (inch)	1000 (39.4)	1500 (59.1)	2000 (78.7)
Stroke tolerance mm	+1.5/-0	<=1000 +1.5/-0; >1000 +2/-0	
Piston speed m/s (inch/sec)	0.1 to 0.4 (4 to 15.75)		
Max. coupling force N (lbs)	157 (35)	236 (53)	703 (158)
Cushion	Air cushion standard		
Lubrication	Not required (If you choose to lubricate your system, continuing lubrication will be required.)		

B

**Rodless Cylinders
 Actuator Products**

Technical data

Bore size	Weights				
	Weight at zero stroke		Weight per 25mm of stroke		
mm	inch	kg	lbs	kg	lbs
16	5/8	0.28	0.62	0.01	0.02
20	3/4	0.46	1.01	0.02	0.05
32	1-1/4	1.35	2.98	0.04	0.08

Conditions of use

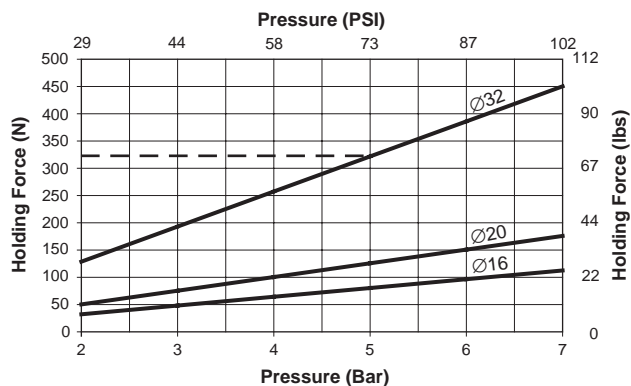
If external lubrication is added, this must always be continued.

Working medium, air quality

Working medium: Dry, filtered compressed air to ISO 8573-1 class 3. 4. 3. or better

Standard cylinder (15 positions)						Options (16 positions)																																																							
P	1	Z	M	0	1	6	S	N	N	0	5	0	0	B	F	M	N																																												
						<table border="1" style="font-size: small;"> <tr><th colspan="2">Bore</th></tr> <tr><td>016</td><td>Ø 16 mm</td></tr> <tr><td>020</td><td>Ø 20 mm</td></tr> <tr><td>032</td><td>Ø 32 mm</td></tr> </table>	Bore		016	Ø 16 mm	020	Ø 20 mm	032	Ø 32 mm	<table border="1" style="font-size: small;"> <tr><th colspan="2">Cushioning</th></tr> <tr><td>N</td><td>None (Ø 16 only)</td></tr> <tr><td>A</td><td>Adjustable Cushions</td></tr> </table>	Cushioning		N	None (Ø 16 only)	A	Adjustable Cushions					<table border="1" style="font-size: small;"> <tr><th colspan="2">Strokes</th></tr> <tr><td>0200</td><td>200 mm</td></tr> <tr><td>1000</td><td>1000 mm</td></tr> </table>	Strokes		0200	200 mm	1000	1000 mm	<table border="1" style="font-size: small;"> <tr><th colspan="2">Mounting Kit*</th></tr> <tr><td>F</td><td>Footmount</td></tr> <tr><td>L</td><td>Flanges</td></tr> <tr><td>N</td><td>None (std.)</td></tr> </table>	Mounting Kit*		F	Footmount	L	Flanges	N	None (std.)			<table border="1" style="font-size: small;"> <tr><th colspan="2">Options *</th></tr> <tr><td>B†</td><td>None</td></tr> <tr><td>W</td><td>With options</td></tr> </table>	Options *		B†	None	W	With options	<table border="1" style="font-size: small;"> <tr><th colspan="2">Cylinder Port Type</th></tr> <tr><td>M†</td><td>Metric (Ø 16 only)</td></tr> <tr><td>B†</td><td>BSPP (Ø 20 & 32)</td></tr> <tr><td>R</td><td>BSPT (Ø 20 & 32)</td></tr> <tr><td>N</td><td>NPTF (Ø 20 & 32)</td></tr> </table>	Cylinder Port Type		M†	Metric (Ø 16 only)	B†	BSPP (Ø 20 & 32)	R	BSPT (Ø 20 & 32)	N	NPTF (Ø 20 & 32)
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<p>* Cylinders are supplied with mounting nuts fitted on each endplate.</p> <table border="1" style="font-size: small; width: 100%;"> <thead> <tr> <th>Ø</th> <th>Stroke (mm)</th> <th>(in)</th> </tr> </thead> <tbody> <tr> <td>16</td> <td>0 to 1000</td> <td>0 to 39.4</td> </tr> <tr> <td>20</td> <td>0 to 1500</td> <td>0 to 59.1</td> </tr> <tr> <td>32</td> <td>0 to 2000</td> <td>0 to 78.7</td> </tr> </tbody> </table>																		Ø	Stroke (mm)	(in)	16	0 to 1000	0 to 39.4	20	0 to 1500	0 to 59.1	32	0 to 2000	0 to 78.7																																
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32	0 to 2000	0 to 78.7																																																											
<p>Order code examples:</p> <ul style="list-style-type: none"> - P1ZM016SNN0100B Ø 16 mm bore 100 mm stroke cylinder supplied with mounting nut on each endplate - P1ZM020SAN1000WFBN Ø 20 mm bore 1 m stroke cylinder with foot mount on each endplate 																																																													

Technical data



Example:

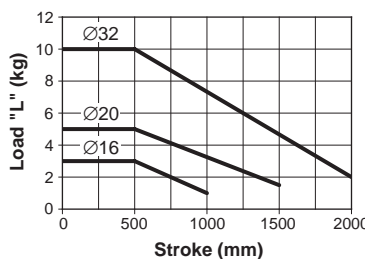
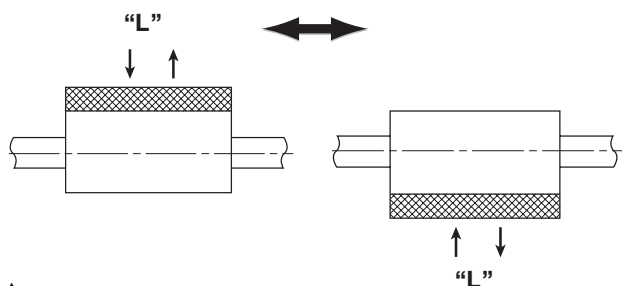
Pressure: 5 bar

$F_{max} = 322 \text{ N}$ for Ø 32 mm cylinder

⚠ Calculate the kinetic energy due to the load moved
 Acceleration or deceleration should not exceed the magnetic coupling force of cylinder

Load diagrams

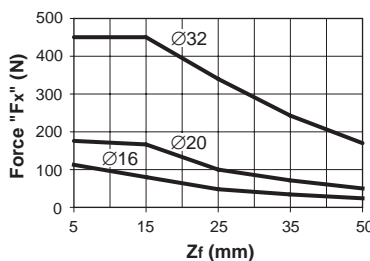
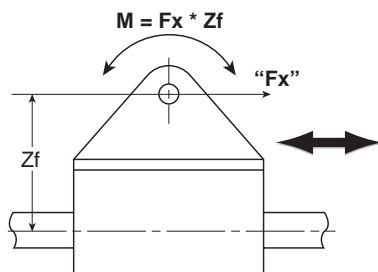
Permissible radial loads, horizontal mounting



Ø	L Max.	
	(kg)	(lbs.)
16	3	6.6
20	5	11.0
32	10	22.0

⚠ The load must be guided by a device from outside the cylinder

Permissible axial loads, horizontal mounting

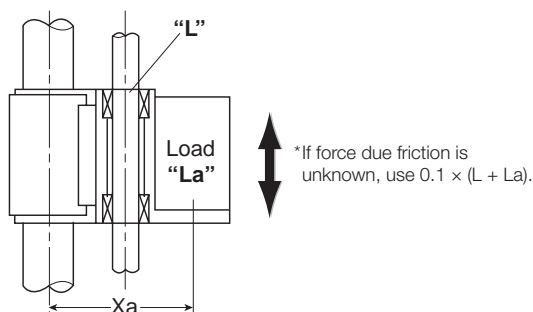


Ø	Max. Moment M		Max. Fx*	
	(Nm)	(in-lbs.)	(N)	(lbs.)
16	1.2	11	112	25
20	2.5	22	175	39
32	8.5	75	450	101

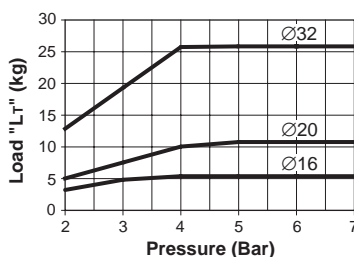
* at 7 bar

⚠ The load must be guided by a device from outside the cylinder

Permissible axial loads, vertical mounting



*If force due to friction is unknown, use $0.1 \times (L + La)$.



Ø	Max. load T		Max. XA	
	(kg)	(lbs.)	(mm)	(in.)
16	5	11	122	4.8
20	10	22	142	5.6
32	24	53	174	6.8

* at 6.5 bar

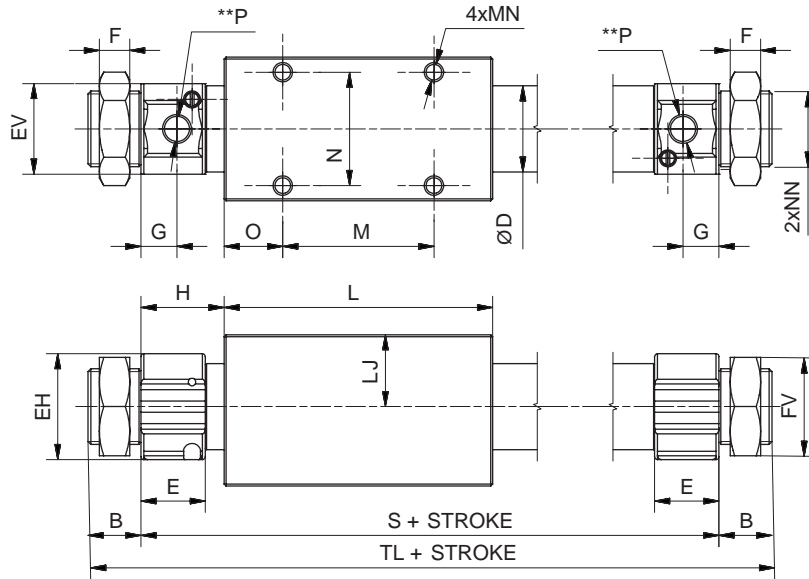
L = Load guided by external device
La = Direct mounting onto the cylinder
Ff = Force due to friction*

LT = Load weight + guiding device weight + force due to friction

B
 Rodless Cylinders
 Actuator Productd

Dimensions

** = Air supply Ports



Ø	A	AA	B	ØD	E	ØEH	ØEV	F	FV	G	H	L	LJ	M	N	O
16	32 (1.26)	34 (1.34)	10 (0.39)	18 (0.71)	11 (0.43)	18 (0.71)	18 (0.71)	4 (0.16)	14 (0.55)	5.5 (0.22)	15.5 (0.61)	61 (2.40)	16 (0.63)	34 (1.34)	25 (0.98)	13.5 (0.53)
20	38 (1.50)	40 (1.57)	14 (0.55)	22.8 (0.90)	17 (0.67)	28 (1.10)	24 (0.94)	8 (0.31)	26 (1.02)	9.5 (0.37)	22 (0.87)	71 (2.80)	19 (0.75)	40 (1.57)	30 (1.18)	15.5 (0.61)
32	60 (2.36)	60 (2.36)	16 (0.63)	35 (1.38)	17 (0.67)	40 (1.57)	36 (1.42)	8 (0.31)	32 (1.26)	9.5 (0.37)	23 (0.91)	87 (3.43)	30 (1.18)	50 (1.97)	40 (1.57)	18.5 (0.73)

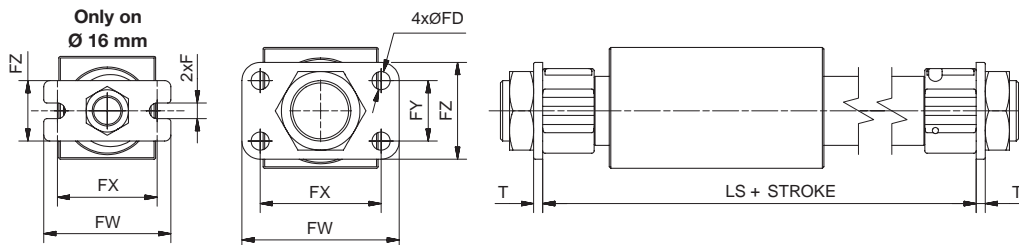
Ø	P	MN	NN	S	TL
16	M5 x 0.8 (10-32)	M4 x 0.7 x 6	M10 x 1 x 6	92 (3.62)	112 (4.41)
20	G 1/8 (1/8)	M5 x 0.8 x 8	M20 x 1.5 x 7	115 (4.53)	143 (5.63)
32	G 1/8 (1/8)	M6 x 1 x 10	M26 x 1.5 x 7	133 (5.24)	165 (6.50)

B

Rodless Cylinders
 Actuator Products

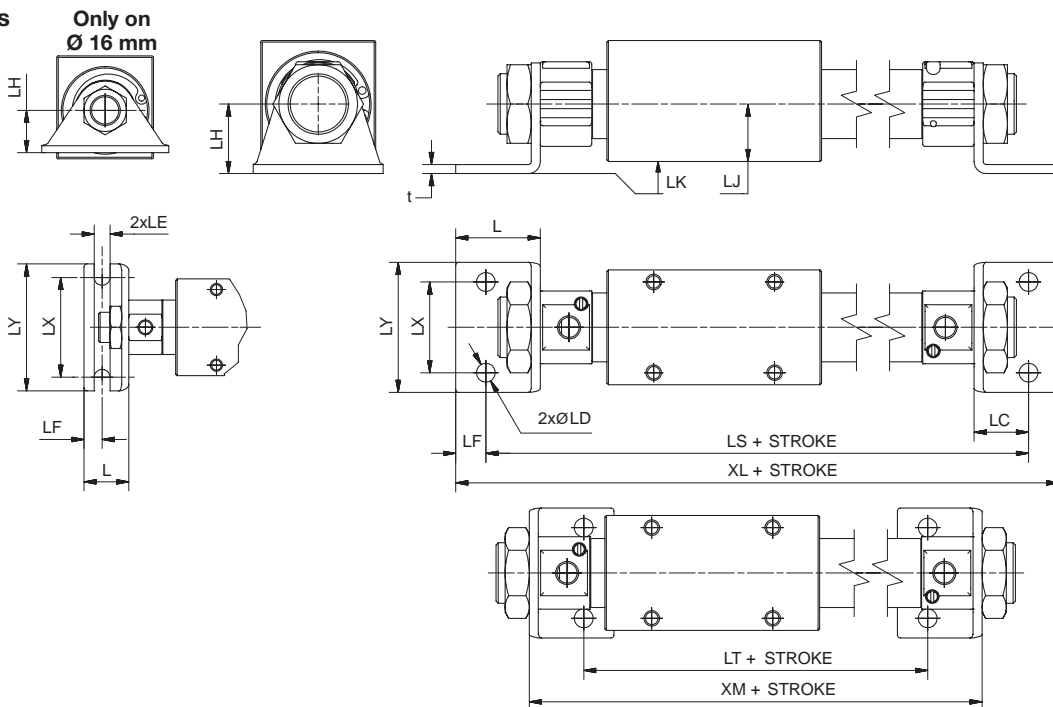
Mountings

Flanges



Ø	F	ØFD	FW	FX	FY	FZ	T	LS	Order code
16	5.2 (0.20)	-	42 (1.65)	33 (1.30)	-	20 (0.79)	2.3 (0.09)	92 (3.62)	PDC15-FH
20	-	6 (0.24)	52 (2.05)	40 (1.57)	20 (0.78)	32 (1.26)	3 (0.12)	115 (4.53)	PK1A20-FH
32	-	7 (0.28)	80 (3.15)	64 (2.52)	28 (1.10)	44 (1.73)	5 (0.20)	133 (5.24)	PK1A25-FH

Brackets



Ø	t	L	LC	ØLD	LE	LF	LH	LJ	LK	LX	LY	LS	LT	XL	XM	Order code
16	2.3 (0.09)	14.8 (0.58)	8.8 (0.35)	-	5.2 (0.20)	6 (0.24)	14 (0.55)	16 (0.63)	-2 (-0.08)	33 (1.30)	42 (1.65)	109.6 (4.32)	79 (3.11)	121.6 (4.79)	96.6 (3.80)	PDC15-LB*
20	3 (0.12)	28 (1.10)	18 (0.71)	6.2 (0.24)	-	10 (0.39)	23 (0.91)	19 (0.75)	4 (0.16)	30 (1.18)	43 (1.69)	151 (5.94)	85 (3.35)	171 (6.73)	121 (4.76)	PK1A20-LB*
32	3 (0.12)	35 (1.38)	23 (0.91)	7 (0.28)	-	12 (0.47)	30 (1.18)	30 (1.18)	0 (0)	46 (1.81)	62 (2.44)	179 (7.05)	**	203 (7.99)	**	PK1A25-LB*

* Set of 2 pcs
 ** Impossible mounting

B
 Rodless Cylinders
 Actuator Productd

The magnetic rodless cylinder is a pneumatic cylinder featuring a mobile piston with annular magnets.

The mobile carriage is also equipped with magnets to give magnetic coupling between the piston and carriage. The carriage slides along the main tube and is guided by two guide rods.

It incorporates the following features:

- Built-in guide rods
- Adjustable end-of-stroke bumpers
- Optional magnetic piston sensing
- Optional transfer porting

Guidance

The guided version consists of a carriage fitted with 4 plain bearings, guided on 2 rods.

This design provides high rigidity, accurate guidance and smooth movement of the carriage.

End of stroke

Each endplate can be fitted with an adjustable bumper or self-compensating shock absorbers.

Optional transfer porting

Cylinder air supply is located on one end only to facilitate cylinder installation and avoid long tube lengths for longer strokes.

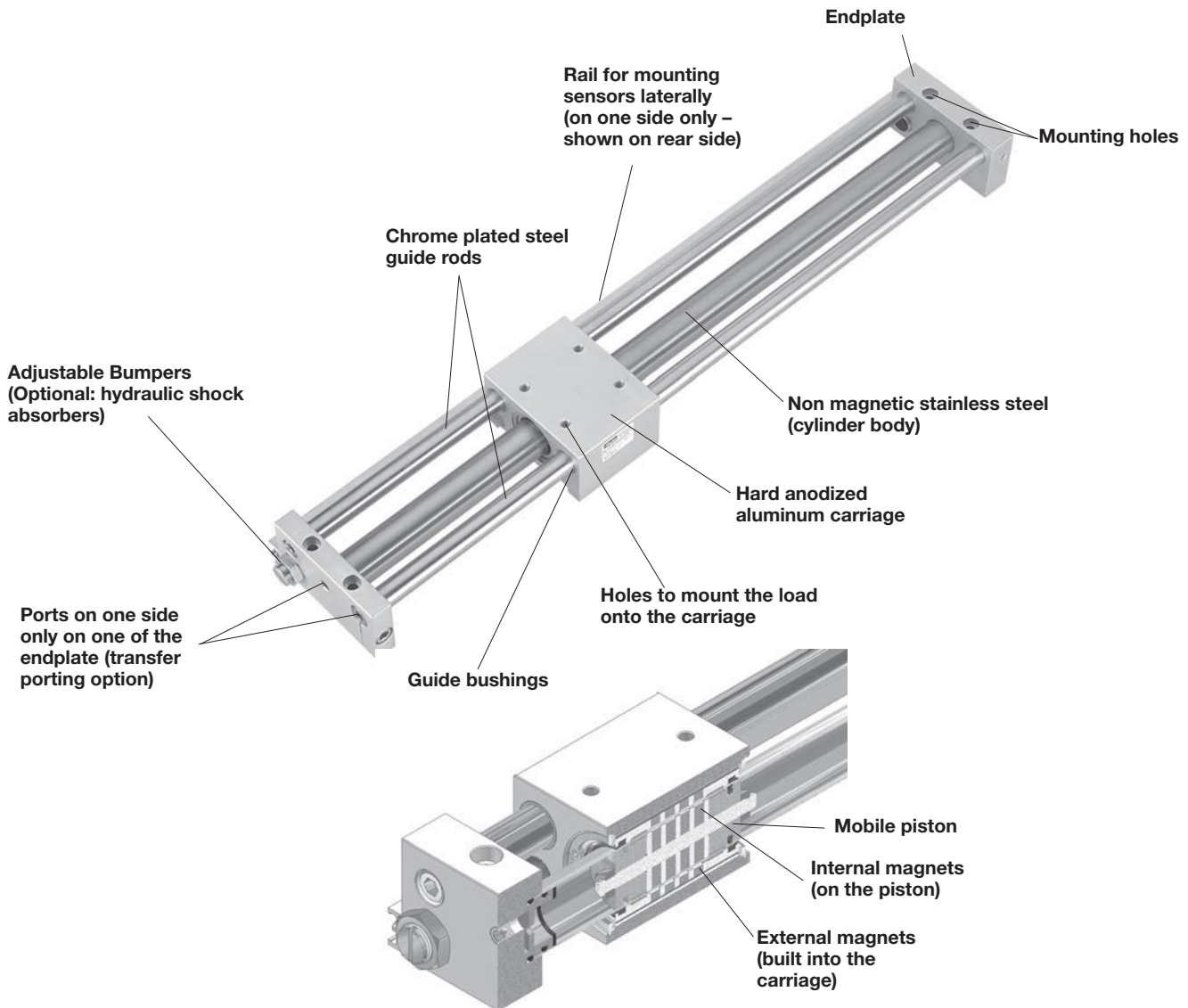
Options



The following options are available to enhance the Magnetic Rodless cylinder functions:

- External bumpers: when low operating pressure, light loads and short strokes.
- External hydraulic shock absorbers: recommended for arduous applications.
- Reed and solid state sensors: provide sensing at an adjustable position along the entire stroke of the cylinder.

B

**Rodless Cylinders
Actuator Products**



Standard cylinder (15 positions)										Options (16 positions)								
P	1	Z	M	0	1	6	T	N	N	0	5	0	0	B	N	M	L	
				Bore			Cushioning			Strokes			Cylinder Port Type					
				016	Ø 16 mm		N	None stops*		0200	200 mm		M†	Metric (Ø 16 only)				
				020	Ø 20 mm		C	Adjustable stop		1000	1000 mm		B†	BSPP (Ø 20 & 32)				
				032	Ø 32 mm		H	Hydraulic shock absorber		Options				R	BSPT (Ø 20 & 32)			
				Function							B†	None			N	NPTF (Ø 20 & 32)		
				G	Guided						W	With options						
				T	Guided with transfer porting										End of stroke sensing			
								NPN	PNP	Reed	Sensors type (Qty: 2)							
								L			With rail, no sensor							
				D	K	S	0.3 m with 8mm connector											
				A	H	C	3 m flying leads											
				F	U	B	10 m flying leads											
				G	W	E	0.3 m with M12 connector											
				N† (std.)				No sensor rail										
				P				Proximity sensor in end caps										

* Do not exceed coupling force on deceleration.
† Standard when "B" option is used.

Ø	Stroke (mm)	(in)
16	0 to 750	0 to 29.5
20	0 to 1000	0 to 39.4
32	0 to 1000	0 to 59.1

Order code examples:
- P1ZM016GCN0100B Ø 16 mm bore 100 mm stroke cylinder supplied with adjustable stop
- P1ZM020GHN1000WNBL Ø 20 mm bore 1 m stroke cylinder with hydraulic shock absorbers and rail for sensors

B
Rodless Cylinders
Actuator Productd

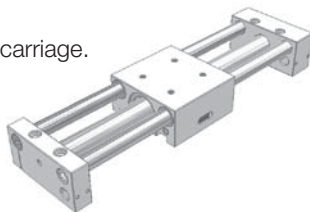
Range

Magnetic rodless cylinder, guided version

Available in 3 diameters with possible strokes up to 1500 mm (59 in).

4 tapped mounting holes on the carriage.

Endcap mounting provided by 4 tapped and counterbored holes.



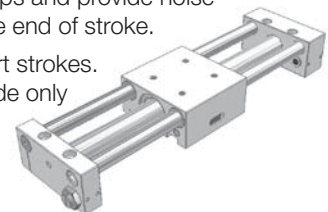
Options

External adjustable bumpers

Can be fitted on cylinder endcaps and provide noise reduction and adjustment at the end of stroke.

Used when light loads and short strokes.

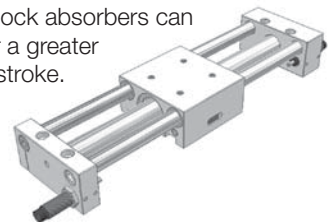
Pneumatic air supply on one side only (transfer porting option).



External hydraulic shock absorbers

Self-compensating hydraulic shock absorbers can be used instead of bumpers for a greater cushioning effect at the end of stroke.

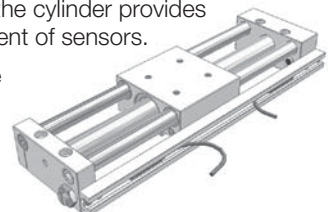
They are recommended for arduous applications.



Reed or solid state sensors:

A rail fitted on one side only of the cylinder provides mounting and position adjustment of sensors.

The rail is located on same side as the end of stroke stops.



General features

Specifications for P1Z series magnetically coupled rodless

Operating medium	Compressed Air		
Maximum pressure bar (PSI)	7 (100)		
Minimum pressure bar (IPS)	2 (29)		
Bore size mm (inch nominal)	16 (5/8)	20 (3/4)	32 (1 1/4)
Port size	M5 BSPP, 10-32 NPT	1/8 BSPP, 1/8 NPT	1/8 BSPP, 1/8 NPT
Ambient temperature °F (°C)	15 to 140°F (-10 to 160°C)		
Maximum stroke mm (inch)	750 (29.5)	1000 (39.4)	1500 (59.1)
Stroke tolerance mm	+1.5/-0	<=1000 +1.5/-0; >1000 +2/-0	
Piston speed m/s (inch/sec)	0.1 to 0.4 (4 to 15.75)		
Max. coupling force N (Lbs)	157 (35)	236 (53)	703 (158)
Cushion	Air cushion standard		
Lubrication	Not required (If you choose to lubricate your system, continuing lubrication will be required.)		

B

**Rodless Cylinders
 Actuator Products**

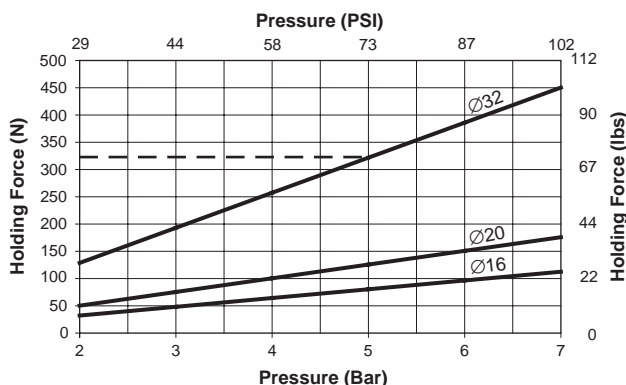
Weights

Bore size		Weight at zero stroke		Weight per 25mm of stroke	
mm	inch	kg	lbs	kg	lbs
16	5/8	0.9	1.98	0.05	0.11
20	3/4	1.52	3.35	0.08	0.17
32	1-1/4	3.63	8.00	0.13	0.29

Options

Function	Description
	Sensors mounting in T-slot
Detection	Reed or solid state sensors (PNP or NPN)
External rubber bumpers	Supplied pre-fitted in endplates if chosen
Hydraulic shock absorbers	Self-compensating shock absorbers supplied pre-fitted in endplates if chosen

Pressure in the cylinder / pneumatic holding force



Example:

Pressure: 5 bar (73 PSI)

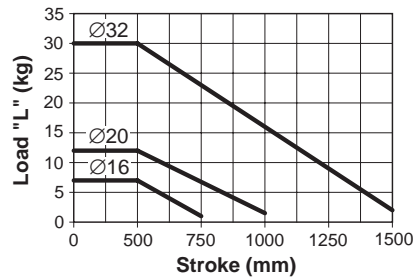
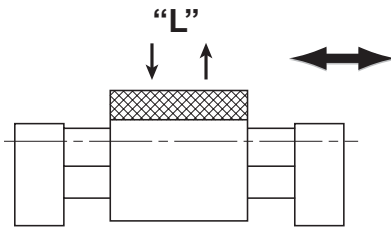
$F_{max} = 322 \text{ N (72 lbs.)}$ for Ø 32 mm cylinder

⚠ Calculate the kinetic energy due to the load moved.

Acceleration or deceleration should not exceed the magnetic coupling force of cylinder.

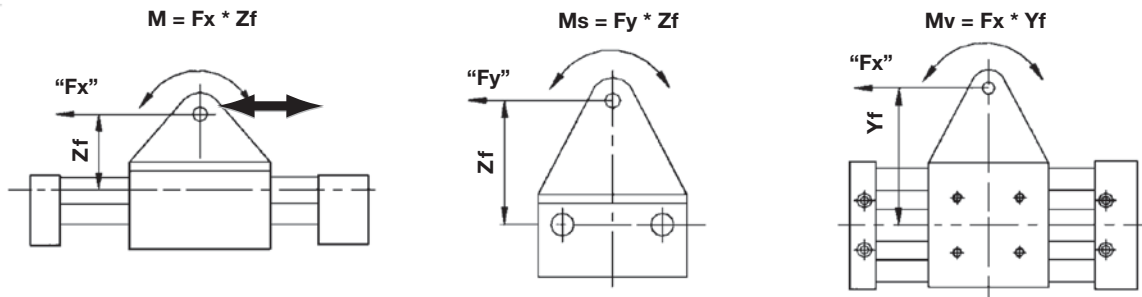
Load diagrams

Permissible radial loads, horizontal mounting



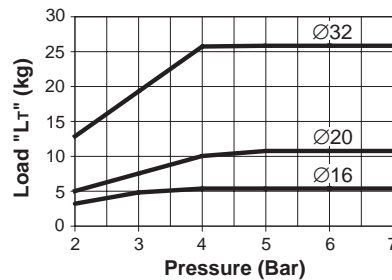
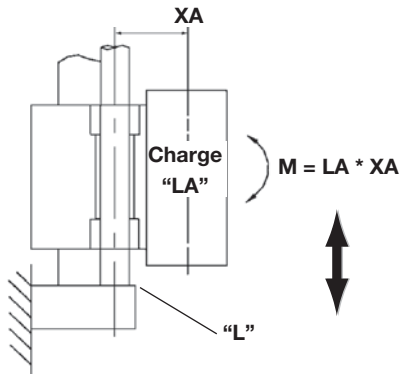
Ø	L Max.	
	(kg)	(lbs.)
16	7	15
20	12	26
32	30	66

Permissible axial loads, horizontal mounting



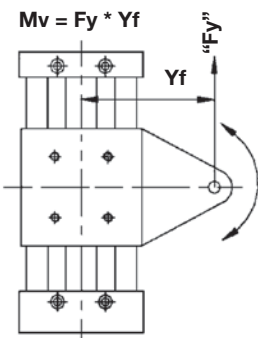
Ø	Max. moment M		Max. moment Ms		Max. moment Mv	
	(Nm)	(in-lbs.)	(Nm)	(in-lbs.)	(Nm)	(in-lbs.)
16	2.4	21	0.5	4.4	2.4	21
20	5	44	1	8.9	5	44
32	15	133	3	26.6	15	133

Permissible axial loads, vertical mounting



Ø	Max. load LT*	Max. XA
	(kg)	(mm)
16	5	122
20	10	142
32	24	174

* at 6.5 bar

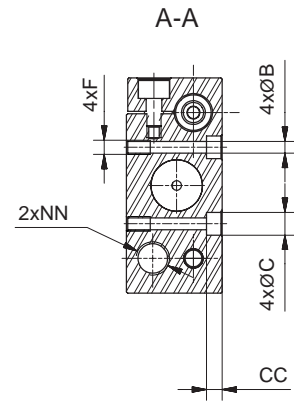
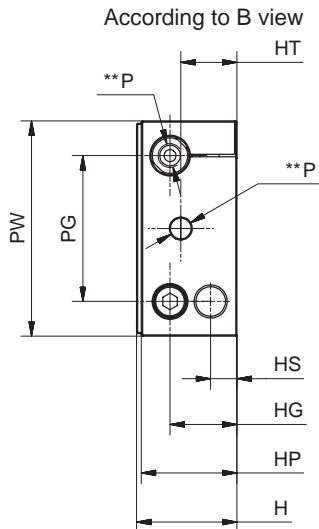
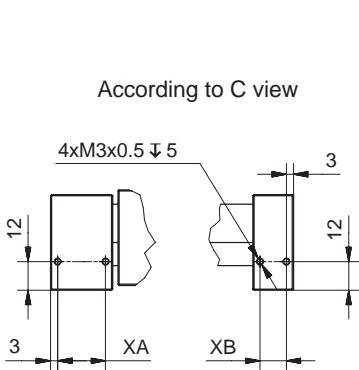
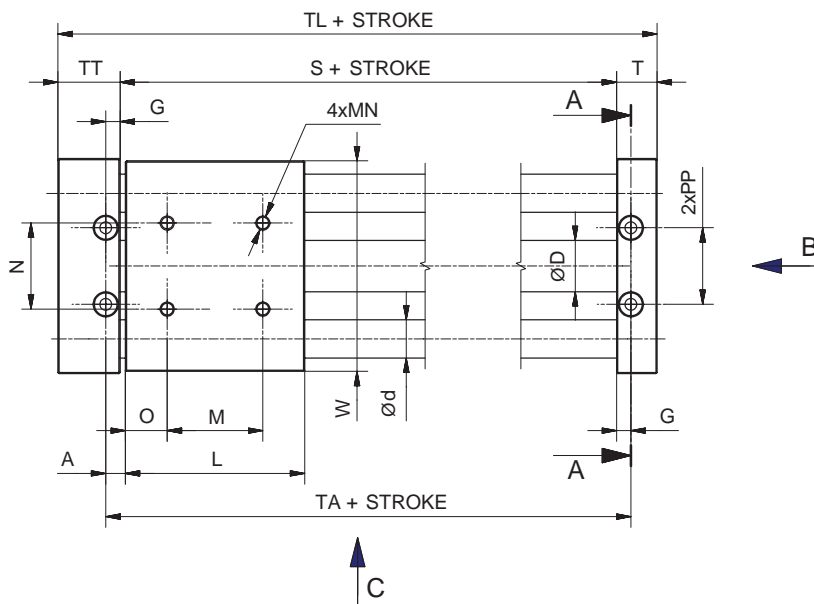


- L** = Load guided by external device
 - LA** = Mounting direct onto cylinder
 - LT** = Load weight + guiding device weight + force due to friction
 - Ff*** = Force due to friction
- *If force due to friction is unknown, use $0.1 * (L + LA)$

B
 Rodless Cylinders
 Actuator Productd

Dimensions

** = Air supply ports

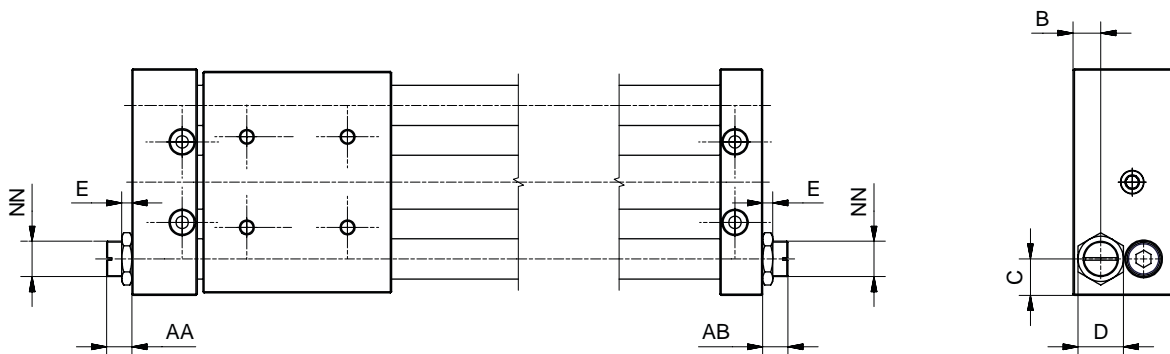


Ø	A	ØB	ØC	CC	ØD	Ød	F	G	H	HP	HG	HS	HT	L	M	N	MN
16	8 (.31)	4.3 (.17)	8 (.31)	4.5 (.18)	17.4 (.69)	12 (.47)	M5x0.8 x 10	6 (.24)	34 (1.34)	33.5 (1.32)	25 (0.98)	12 (.47)	21.5 (0.85)	65 (2.56)	34 (1.34)	30 (1.18)	M5 x 0.8 x 8
20	8 (.31)	5.5 (.22)	9.5 (.37)	6.5 (.26)	21.4 (.84)	16 (.63)	M6x1 x 10	6 (.24)	42 (1.65)	40 (1.57)	28 (1.10)	12 (.47)	23.5 (.93)	75 (2.95)	40 (1.57)	36 (1.42)	M6 x 1 x 10
32	13.5 (.53)	8.7 (.34)	14 (.55)	8 (.31)	33.6 (1.32)	20 (.79)	M10x1.5 x 15	10 (.39)	66 (2.60)	64 (2.52)	46 (1.81)	20 (.79)	41 (1.61)	91 (3.58)	60 (2.36)	50 (1.97)	M8 x 1.25 x 12

Ø	NN	O	P	PG	PW	PP	T	TT	S	TA	TL	W	XA	XB
16	M10 x 1 x 6	15.5 (0.61)	M5 x 0.8	50 (1.97)	70 (2.76)	27 (1.06)	14 (0.55)	23 (0.91)	69 (2.76)	81 (3.19)	106 (4.17)	68 (2.68)	17 (0.67)	8 (0.31)
20	M14 x 1.5 x 7	17.5 (0.69)	G1/8	61 (2.40)	90 (3.54)	32 (1.26)	17 (0.67)	26 (1.02)	79 (3.11)	91 (3.58)	122 (4.80)	88 (3.46)	20 (0.79)	11 (0.43)
32	M20 x 1.5 x 7	15.5 (0.61)	G1/8	86 (3.39)	122 (4.80)	50 (1.97)	20 (0.79)	28 (1.10)	97 (3.82)	117 (4.61)	145 (5.71)	118 (4.65)	22 (0.87)	14 (0.55)

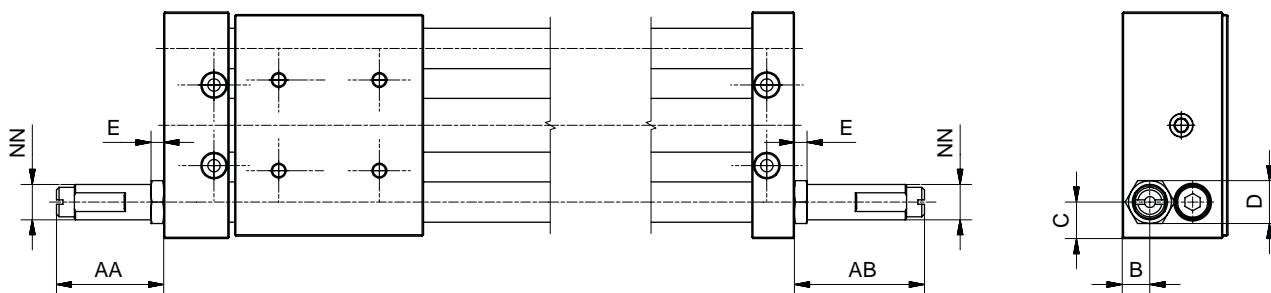
B
 Rodless Cylinders
 Actuator Products

Optional external adjustable bumpers



Ø	AA	AB	B	C	D	E	NN
16	7.5 (0.30)	6.5 (0.26)	12 (0.47)	10 (0.39)	14 (0.55)	4 (0.16)	M10 x 1
20	10 (0.39)	10 (0.39)	11 (0.43)	14.5 (0.57)	18 (0.71)	4 (0.16)	M14 x 1.5
32	11 (0.43)	12 (0.47)	20 (0.79)	18 (0.71)	26 (1.02)	8 (0.31)	M20 x 1.5

External hydraulic shock absorbers



Ø	AA	AB	B	C	D	E	NN
16	18 (0.71)	27 (1.06)	12 (0.47)	10 (0.39)	13 (0.51)	3 (0.12)	M10 x 1
20	50 (1.97)	59 (2.32)	11 (0.43)	14.5 (0.57)	17 (0.67)	5 (0.20)	M14 x 1.5
32	56 (2.20)	66 (2.60)	20 (0.79)	18 (0.71)	24 (0.94)	6 (0.24)	M20 x 1.5

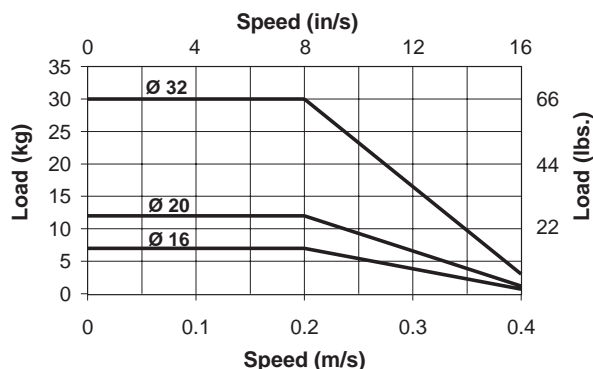
Loads / speeds diagram

The diagram to the right exhibits the P1Z cylinders maximum capacities with an adjustable bumper.

If the intersection exhibits between speed and load is above the curves, it is imperative to use hydraulic shock absorbers to prevent cylinder damage.

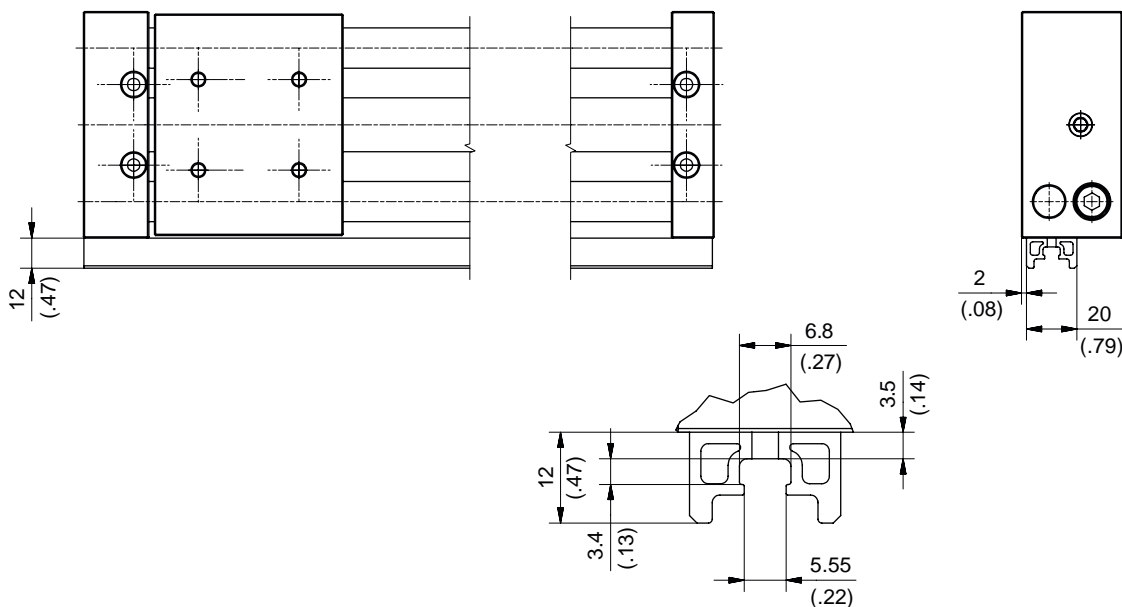
Example:

- Ø 32 mm cylinder with a 0.3 m/s speed and 25 kg load
 Choose the hydraulic shock absorber option
- Ø 20mm cylinder with 0.2 m/s speed and 10 kg load
 Choose the adjustable bumpers option



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 Rodless Cylinders
 Actuator Product

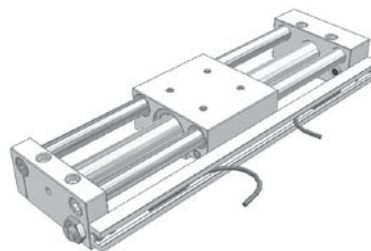
Optional sensor rail



Detection

Reed or solid state sensor mounting is possible on one cylinder side only.

External aluminum profile integrates 1 T-slot for sensor mounting.



Spare parts

End of stroke rubber bumpers (2 pieces)

Ø	Order code
16	9129609AS
20	9129610AS
32	9129611AS

Flow controls (1 piece)

Ø	Order code		
	BSP ports	NPT ports	Metric ports
16	-	-	0876300300
20	PTFL4PB6-1/8	0876300400	-
32	PTFL4PB6-1/8	0876300400	-

End of stroke hydraulic shock absorber (1 piece)

Ø	Order code
16	MC25MH-NB
20	MC150MH
32	SC300M-3 NB

Repair kits

Ø	Basic version	Guided version
16 (Cushioned)	P1ZM016SAN-R	-
16 (Non-cushioned)	P1ZM016SNN-R	P1ZM016GNN-R
20	P1ZM020SAN-R	P1ZM020GNN-R
32	P1ZM032SAN-R	P1ZM032GNN-R

B

Rodless Cylinders
 Actuator Products

GDL Product line overview



Characteristic	Unit	Description
Full profile wipers		Rollershoes and cassette are provided with snap-on full profile wipers. The snap-on full profile wipers are easily replaceable with available wipers kits.
Acceleration and deceleration	m/s ² (ft/sec ²)	40 m/s ² maximum (131 ft/s ² maximum)
Guide installation		Possible in any position.
Drag adjustment set screw		Cassettes can be adjusted at the factory or by the customer. Rollershoes can be set-up by the customer to incorporate the drag adjustment set screw feature. The drag adjustment set screw components are supplied with each pair of rollershoes.
Standard lubrication		Lifetime lubrication with standard grease-packed roller bearings.
Speed	m/s (ft/s)	Up to 10 m/s (or up to 33 ft/s)
Materials for high performance or standard versions / corrosion resistant		Rail: Aluminum alloy
		Guideways: Hardened high alloy spring steel
		Cassettes / rollershoes / top plates: Aluminum alloy
		Rollers: Bearing steel / Stainless steel bearing steel
Bearing types		Steel axial needle, Specials on request (ex: anti-magnetic, grease free, high dynamics) - consult factory
Operating temperature	C (F)	-10° to 80°C (+14 to 176°F) temperature range
Specials available		Custom length cassettes and rollershoes for 100 piece lots minimum.
		Keyed butt-jointed rail sections up to 4000mm.
		Solid continuous length rails between 4000.
		Offset or non-standard "L11" dimensions on opposite ends of cut rails.
		Integrated metal scraper with standard full profile wiper currently available. Rail underside blind mounting holes.

Descriptions of the various GDL series available:

High Performance Series:

(Sizes FDC12HP-... thru FDC45HP-...)

The High Performance series is the basis for GDL's development, which is used in the majority of applications. High Performance guides consist of 8 axial needle roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and shielded, while offering the highest load and moment rating capacities within the GDL product line.

Standard Performance Series:

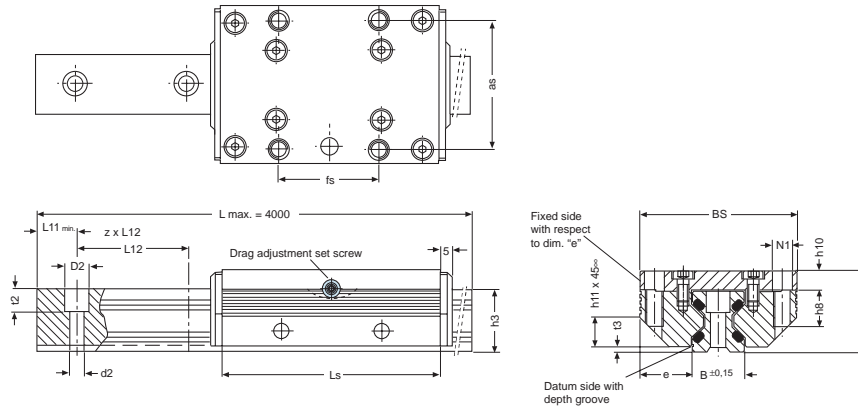
(Sizes FDC12SP-... thru FDC45SP-...)

The Standard Performance series is intended for minor loads and moments for particularly economical guidance solutions. Standard Performance guides consist of 8 radial ball roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and sealed, while offering the lowest load and moment ratings available within the GDL product line, with the exception of the Grease-Free and the Anti-Friction / Corrosion Resistant series. Standard Performance series is the second most commonly used GDL guides for various applications and also provides excellent running behavior.

B

**Rodless Cylinders
 Actuator Productd**

Cassette with double sided rail



Dimensions for both standard FDC version guides

Size	Length		BS	h3	h9	as	d2	D2	e	fs	h8	h10	h11	L11 min.	L12	t2	t3	N1
	Ls	B																
12	64	12.0	37	14.7	19	30	3.4	6	12.50	25	8	4.0	6	10	40	5.5	1.4	M4
15	78	15.5	47	18.7	24	38	4.5	8	15.75	30	10	5.0	8	10	60	6.0	2.0	M5
20	92	21.0	63	22.6	30	53	5.5	10	21.00	40	12	7.0	11	10	60	7.0	2.0	M6
25	98	23.0	70	27.0	36	57	6.6	11	23.50	45	16	8.5	13	10	60	10.0	2.5	M8
35	135	32.0	100	37.0	48	82	9.0	15	34.00	62	20	10.5	20	12	80	11.5	3.5	M10
45	165	45.0	120	46.0	60	100	11.0	18	37.50	80	24	13.5	22	16	105	14.5	4.0	M12

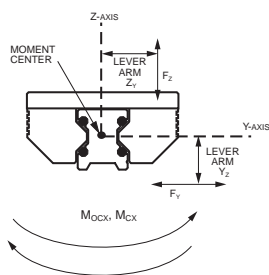
Dimensions (mm)

Dimensions for both underside mounting hole FDC version guides (Ref. ordering instructions)

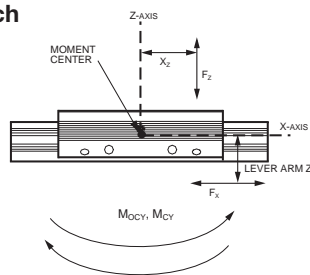
Size	Length		BS	h3	h9	as	d2	D2	e	fs	h8	h10	h11	L11 min.	L12	t2	t3	N1
	Ls	B																
12	64	12.0	37	14.7	19	30	3.4	6	12.50	29	8	4.0	6	10	40	5.5	1.4	M4
15	78	15.5	47	18.7	24	38	4.5	8	15.75	34	10	5.0	8	10	60	6.0	2.0	M5
20	92	21.0	63	22.6	30	53	5.5	10	21.00	40	12	7.0	11	10	60	7.0	2.0	M6
25	98	23.0	70	27.0	36	57	6.6	11	23.50	45	16	8.5	13	10	60	10.0	2.5	M8
35	135	32.0	100	37.0	48	82	9.0	15	34.00	62	20	10.5	20	12	80	11.5	3.5	M10
45	165	45.0	120	46.0	60	100	11.0	18	37.50	90	24	13.5	22	16	105	14.5	4.0	M12

Dimensions (mm)

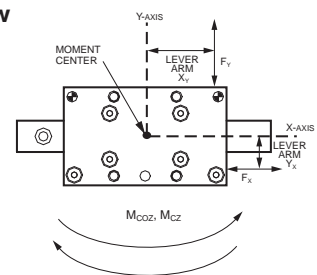
Roll



Pitch



Yaw



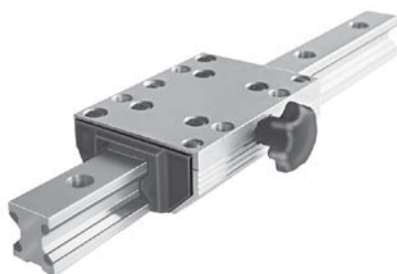
Load & moment rating capacities (for cassettes on double sided rail)

Dynamic load rating C (N)	Static load rating Co (N)	Static moment rating capacities:			Dynamic moment rating capacities:			Cassette weight (kg)	Rail weight (kg)	Cassette series
		Roll Mocc (Nm)	Pitch Mocy (Nm)	Yaw Mocz (Nm)	Roll Mcx (Nm)	Pitch Mcy (Nm)	Yaw Mcz (Nm)			
2800	3000	27	43	43	25	40	40	0.1	0.4	FDC12HP-...
4200	3400	37	58	58	45	72	72	0.3	0.8	FDC15HP-...
5400	5400	76	111	111	76	111	111	0.4	0.9	FDC20HP-...
9000	10100	158	222	222	142	198	198	0.6	1.8	FDC25HP-...
12500	18000	423	559	559	294	388	388	1.5	3.2	FDC35HP-...
21200	25900	827	983	983	678	806	806	2.9	5.5	FDC45HP-...

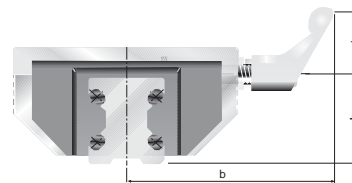
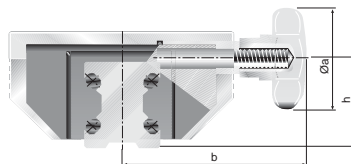
B
 Rodless Cylinders
 Actuator Products

GDL Aluminum roller guides

High performance cassettes with lock device



Special cassette types



The locking cassette with star grip handle can be stopped at any desired location on the rail. The clamping device does not exert forces on the rail guideways.

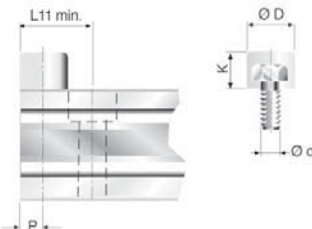
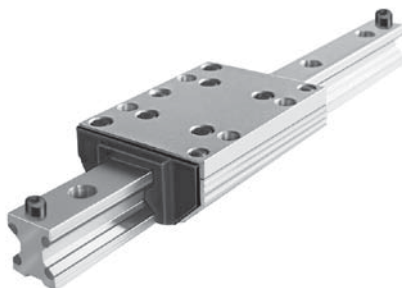
The clamping device is used in fixtures which are movable manually, clamping and stop ledgers, feeding of tools and work pieces. Also available with L-ratchet handle.

Star grip handle dimensions

Size	Øa	b	h	Clamp force	Part numbers star grip knob
12	N/A				
15	25	41	19.0	200	FDC15HP-00020000
20	25	49	23.0	250	FDC20HP-00020000
25	32	56	28.0	250	FDC25HP-00020000
35	50	83	38.5	350	FDC35HP-00020000
45	63	101	48.0	750	FDC45HP-00020000

Dimensions (mm), Force (N) with normal manual tightening.

End of stroke stop screws



The stop screws are screwed into threads (option) on the guide rails. The end of stroke stopping energy is reduced by a rubber cap. With guide rails where the L11 is less than the standard minimum, we offset the mounting hole by half of its diameter.

Note: Customer must drill and tap the holes for the stop screws.

L-ratchet handle dimensions

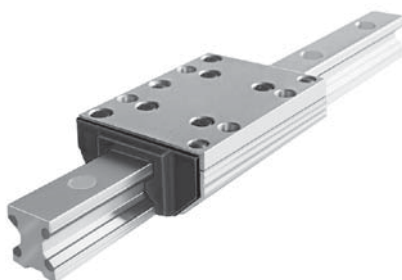
Size	l	b	h	Clamp force	Part numbers L-ratchet handle
12	N/A				
15	45	59.5	19.0	200	FDC15HP-00010000
20	45	67.5	23.0	250	FDC20HP-00010000
25	45	71	28.0	250	FDC25HP-00010000
35	63	96	38.5	350	FDC35HP-00010000
45	78	116	48.0	750	FDC45HP-00010000

Size	Ød	ØD	K	L11 min.	P	Order number
12	M5	12	8	15.0	6.0	63504A
15	M5	12	8	16.0	6.0	63504A
20	M5	12	8	17.0	6.0	63504A
25	M6	15	10	20.5	7.5	63505A
35	M8	19	13	26.5	9.5	63506A
45	M10	24	16	33.0	12.0	63507A

Dimensions (mm)

GDL accessories

Rail mounting screw covers



Material: Wear resistant plastic, resistant to oil and aging.

Mounting: Put a plastic plate on top and pound in uniformly. Remove residual burrs with a soft brush or fingernail.

Note: Use respective order numbers for ordering separately or include in rail part number.

Size	Cylindrical screw DIN912	Ø D	Order number
12	M3	6	87752A
15	M4	8	87753A
20	M5	10	87754A
25	M6	11	87755A
35	M8	15	87756A
45	M10	18	87757A

Dimensions (mm)

B
 Rodless Cylinders
 Actuator Product

GDL Aluminum roller guides

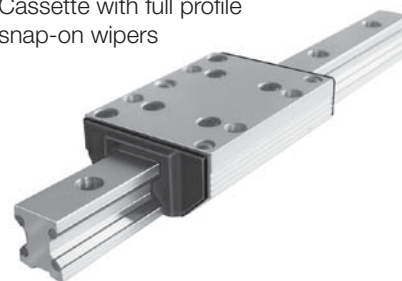
Version with wipers

Integrated into an additional cover, a felt wiper is saturated with oil. Although dependent on the degree of contaminants, these wipers last for

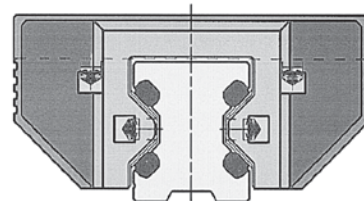
some 6000km, after which the felt wipers can either be washed or replaced.

For optimal cassette rolling performance, all holes in the guide rails should be filled with the plastic rail mounting screw covers.

Cassette with full profile snap-on wipers



Full profile snap-on wiper



Order numbers for replacement wiper kits

FDC series and size	Respective order number
12	84457B
15	84480B
20	84481B
25	84482B
35	84483B
45	84484B

*wiper kits are sold in pairs

NOTE: Use respective order numbers for ordering separately as replacements, or specify in cassette part number.

B

**Rodless Cylinders
 Actuator Products**

GDL's keyed butt-jointed rail option

GUIDELINE rails can be precisely fastened together using a factory offered keyed butt-joint option for continuous rail lengths, as shown in Figures 1 & 2.

Two rail sections are clamped together with mating round bar stock pieces that seat tangent to both rail section guideways on each side of the rail. While the rail sections are clamped together, a keyway slot is machined in the top and bottom sides of the rail, across the butt-joint. Screw holes are then drilled through the rail inside the keyway slot, so the opposing keyways can be drawn together tightly with screws. The round bar stock clamp is then removed, providing a rigid and well aligned keyed butt-joint.

The keyed butt-joint option provides optimum alignment of all guideways from one rail section to the next. This allows for optimum "smooth" guidance of the cassette bearings, while crossing rail butt-joints.

The keyed butt-jointed rail option is currently available in the FDR version 25, 35, & 45 mm rail sizes. For a keyed butt-joint on rail sizes 25, 35 or 45 mm, specify P/N:# GDL-BJK

Consult factory for other size possibilities.

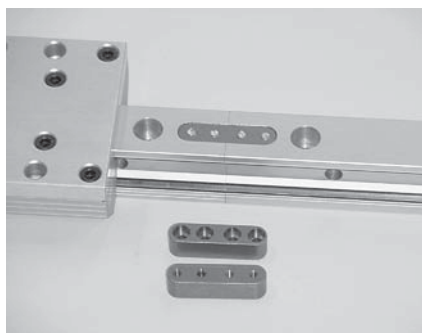


Figure 1



Figure 2

GDL coupled with structural aluminum extrusion material and OSP-E actuator

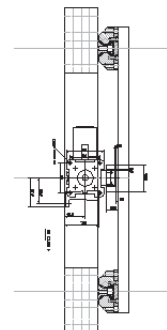


Figure 3

GDL linear guides couple well with various structural aluminum extrusions and Parker-Origa OSP-P and OSP-E actuators. Mounting can be easily accomplished using standard fasteners and mounting brackets. See Figure 3 above.

Ordering Information / Part Numbering System for GDL Rails

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
F	D	R	1	2	H	0	0	0	0	0	0	-	0	0	0	0	0		
Series FD Double sided rail guide* (standard)		Rail Size 1 2* 1 5* 2 0* 2 5* 3 5* 4 5*		Guideway Material H High performance alloy steel* (standard) S Stainless steel		Coatings 0 Anodized aluminum* (standard) Z Custom (consult factory)		"L11" Dimension 00 Equal on both sides* (standard) ?? Actual dimension (mm)**		Mounting Holes 0 Topside thru hole* (standard) 1 Underside blind thread Z Custom (consult factory)		Length (mm) - 0 0 0 0 0		Screw Covers 0 None* (standard) 1 Yes*		Long Rail Joining Option 0 None* (standard) 1 Keyed butt joint (size 25-45 only) 2 Unkeyed butt joint		Adjustment 0 None* (standard) 1 Adjusted to specific rail*	
		Rail R Standard										Note: Maximum length is 4 meters on Size 12.							
								** As measured from left side while viewing the depth groove line.				Note: Quantity supplied to cover all rail holes.							

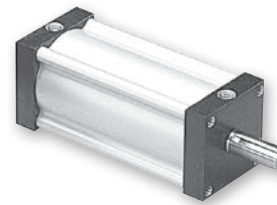
*Stocked Item

B
 Rodless Cylinders
 Actuator Product

Ordering Information / Part Numbering System for GDL Cassettes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
F	D	C	1	2	H	P	-	0	0	0	0	0	0	0	0		
Series FD Double sided rail cassette* (standard)		Cassette C Standard		Rail Size 1 2* 1 5* 2 0* 2 5* 3 5* 4 5*		Bearing Options HP Axial needle - high performance alloy steel* (standard) SP Single row radial ball - standard performance - alloy steel* (standard) ZZ Factory** (consult factory)		Grease 0 High performance* (standard) Z Custom (consult factory)		Lubrication Options 0 None* (standard) z Custom (consult factory)**		Mounting Holes 0 Topside threaded thru* (standard) 1 Underside hole thru (unthreaded) 2 Underside hole thru (threaded)		Locking Mechanism 0 None* (standard) 1 "L" ratchet handle* 2 Star grip handle*		Wiper Options 0 With felt wipers* (standard) 1 Without* 2 With felt wipers and scrapers*	
												* Locking mechanism only available on FD Series size 15 thru 45 with Axial Needle Bearing - High Performance - Alloy Steel.					

*Stocked Item
 **Minimum Order Quantity Required



- Single or double vane rotary actuator
- 8 model sizes
- Output torque @ 100 PSIG: 8 to 1800 lb-in
- Standard rotations:
 - Single vane units: $280^\circ \pm 1^\circ$
(except size 10 & 11: $275^\circ \pm 2.5^\circ$)
 - Double vane units: $100^\circ \pm 1^\circ$
(except size 10 & 11: $95^\circ \pm 2.5^\circ$)
- Available with stroke adjusters and internal stops to provide 90° and 180° rotation
- Stainless steel shaft
- Optional radial ball bushing shaft bearing

Operating information

Operating pressure: 150 PSIG air
 Temperature range: †
 Nitrile seals 30°F to 180°F
 Fluorocarbon seals* 30°F to 250°F
 * See fluorocarbon seal option for high temperature applications.
 † For low temperature version, please consult factory.
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

B

Rotary Actuators
 Actuator Products

Ordering information

PV
22
D
-
090BS
-
B
B
2
V
-
B

Model			
10	22	33	42
11		36	44
			46

Vanes / maximum rotation	
Omit	Single Vane, 280° Rotation (275° on PV10, PV11)
D	Double Vane, 100° Rotation (95° on PV10, PV11)

Rotation Options (may order more than one)	
Omit	Standard Units (no stroke adjusters, bumpers or switches)
090A	Stroke Adjusters adjustable from 60° to maximum unit rotation (preadjusted to 90°)
180A	Stroke Adjusters (single vane only) adjustable from 60° to 190° (preadjusted to 180°)
090B	Internal bumpers, 90° rotation ⁴
180B	Internal bumpers, 180° rotation (single vane only)
090S	Magnets ¹ added, 90° setting
180S	Magnets ¹ added, 180° setting (single vane only)

Special options	
Omit	Standard
Two digit code assigned by factory when any "X" appears in the model number or when special options or features are required.	

Design series	
B	Current design series

Options	
Omit	None
L	Radial ball bushings
V	Fluorocarbon seals

Ports	
2	NPTF Top (Std) (10-32 on PV10 & PV11)
7	NPTF Rear ² (10-32 on PV10 & PV11)

Shaft	
B	Single male keyed (Std)
C	Double end male keyed ²

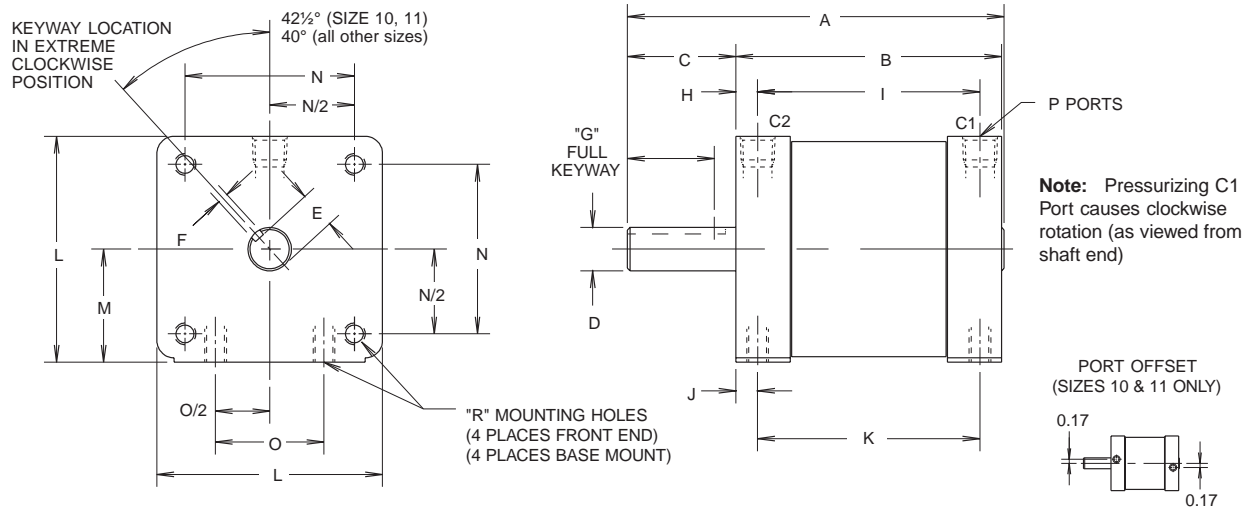
Mounting	
B	Base / Front (Std)
R	Rear Flange ^{2,3}
F	Front Flange
S	Base / Rear Face ²

Sensors	
For sensors see page B296.	

1. Switches can be used with stroke adjusters or bumpers (example: PV22D-090BS-BB2-B).
 2. Not available with switches or stroke adjusters.
 3. No tapped mounting holes in face opposite the flange.
 4. 90° bumpers (090B) not available on PV10/11 sizes.

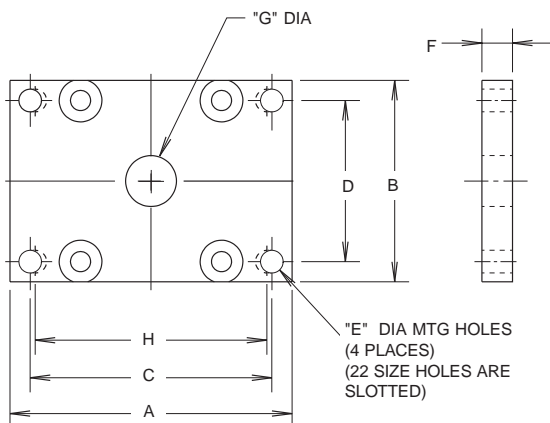
Note:
 Order Hall effect sensors and reed switches separately from the Electronic Sensors section.

Standard Face/Base Mount (B) and Male Keyed Shaft (B)



Model number	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R
10	2.280	1.38	0.88	0.312 0.311	0.258 0.253	0.094 0.095	0.63	0.19	1.00	0.19	1.000	1.62	0.810	1.220	0.750	10-32	8-32 x 0.25 DP
11	2.905	2.00	0.88	0.312 0.311	0.258 0.253	0.094 0.095	0.63	0.19	1.63	0.19	1.625	1.62	0.810	1.220	0.750	10-32	8-32 x 0.25 DP
22	4.340	3.06	1.25	0.500 0.499	0.423 0.418	0.125 0.126	0.94	0.25	2.56	0.25	2.560	2.50	1.250	2.000	1.250	1/8 NPTF	1/4-20NC x 0.38 DP
33	6.180	4.40	1.75	0.749 0.748	0.644 0.639	0.188 0.189	1.38	0.35	3.70	0.26	3.875	3.00	1.500	2.436	1.500	1/4 NPTF	5/16-18NC x 0.47 DP
36	9.180	7.40	1.75	0.749 0.748	0.644 0.639	0.188 0.189	1.38	0.35	6.70	0.26	6.875	3.00	1.500	2.436	1.500	1/4 NPTF	5/16-18NC x 0.47 DP
42	6.280	4.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	3.00	0.50	3.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP
44	8.280	6.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	5.00	0.50	5.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP
46	10.280	8.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	7.00	0.50	7.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP

Flange Mount (F, R)*

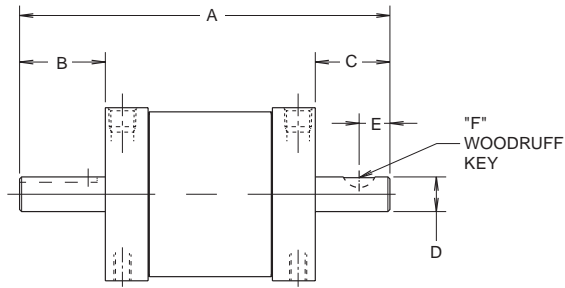


Model number	A	B	C	D	E	F	G	H
10	2.50	1.62	2.000	1.250	0.203	0.19	0.41	N/A
11	2.50	1.62	2.000	1.250	0.203	0.19	0.41	N/A
22	3.50	2.50	3.000	2.000	0.281	0.25	0.66	2.875
33	4.50	3.00	3.750	2.000	0.344	0.38	0.84	N/A
36	4.50	3.00	3.750	2.000	0.344	0.38	0.84	N/A
42	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A
44	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A
46	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A

Note: The face opposite the flange mount does not contain tapped mounting holes. Consult factory if needed.

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 Actuator Products

Double End Male Keyed Shaft (C)



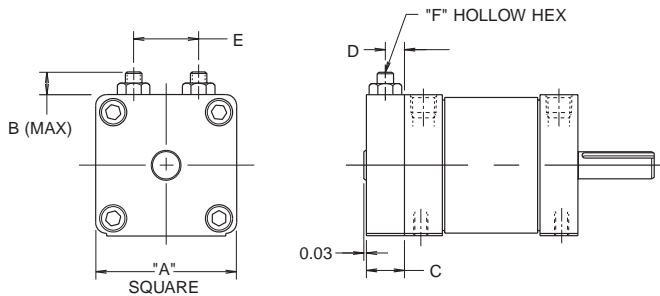
Model number	A	B	C	D	E	F
10	2.75	0.88	0.50	0.312 0.311	0.28	#302.5
11	3.38	0.88	0.50	0.312 0.311	0.28	#302.5
22	5.06	1.25	0.75	0.500 0.499	0.44	#404
33	7.15	1.75	1.00	0.749 0.748	0.56	#606
36	10.15	1.75	1.00	0.749 0.748	0.56	#606
42	7.53	2.25	1.28	0.999 0.998	0.72	#808
44	9.53	2.25	1.28	0.999 0.998	0.72	#808
46	11.53	2.25	1.28	0.999 0.998	0.72	#808

Note: Not available with switches or stroke adjustment.
 Consult factory for rear port option.

B

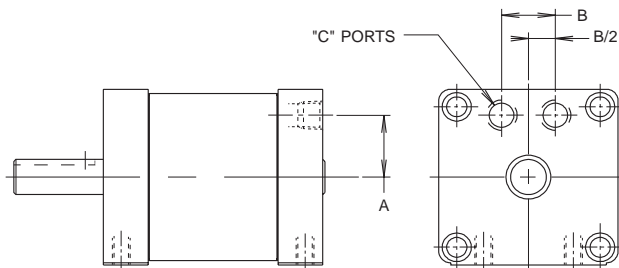
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Adjustable Rotation Stop (090A, 180A)



Model number	A	B	C	D	E	F
10	1.62	0.63	0.47	0.24	0.75	3/32
11	1.62	0.63	0.47	0.24	0.75	3/32
22	2.50	1.00	0.72	0.36	1.25	5/32
33	3.00	1.16	0.97	0.48	1.56	3/16
36	3.00	1.16	0.97	0.48	1.56	3/16
42	4.50	1.38	1.25	0.56	2.25	7/32
44	4.50	1.38	1.25	0.56	2.25	7/32
46	4.50	1.38	1.25	0.56	2.25	7/32

Rear Port (7)



Model number	A	B	C
10	0.54	0.50	10-32
11	0.54	0.50	10-32
22	0.88	0.75	1/8 NPTF
33	1.09	0.90	1/8 NPTF
36	1.09	0.90	1/8 NPTF
42	1.68	1.00	1/4 NPTF
44	1.68	1.00	1/4 NPTF
46	1.68	1.00	1/4 NPTF

- Single or double vane rotary actuator
- 3 standard rotations: 90°, 180°, or 270°
- Output torque @ 0.7 MPa:
 16 to 1120 N•cm (1.4 to 99 in-lb)
- Internal bumpers are standard
- Shock absorbers are available for high inertia loads



Operating information

Operating pressure: 100 PSIG
 Temperature range: -5°C to 80°C (-23°F to 176°F)
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

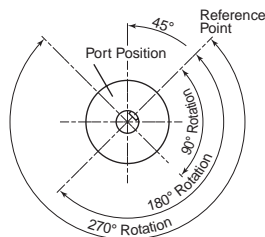
PRNA		20		S - 90 - 90		S	
Type		Size		Type		Porting	
PRNA	Sizes 1-20	1		S	Single vane	Omit	Standard porting
PRN	Sizes 30-800	3		D	Double vane	S	Rear porting (sizes 3-20 only)
		10		Rotation angle		Oscillating reference point*	
		20		90	90° (all sizes, single and double vane)	40	40°
		30		100	100° (sizes 50 through 800, double vane only)	45	45°
		50		180	180° (all sizes, single vane only)	90	90°
		150		270	270° (single vane only, not available on size 1)	* See specification tables for availability of rotation angle/reference point combinations for the selected model.	
		300		280	280° (sizes 50 through 800, single vane only)		
		800					

Sensors
 For sensors see page B296.

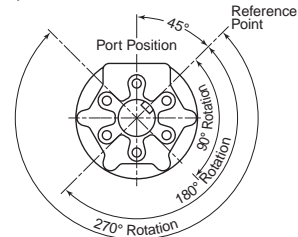
B
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 Actuator Products

Reference Point and Rotation Orientations

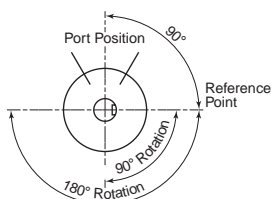
PRNA1S/D, PRNA3S/D, PRNA10S/D, PRNA20S/D, PRN30S/D
 Reference point at 45°



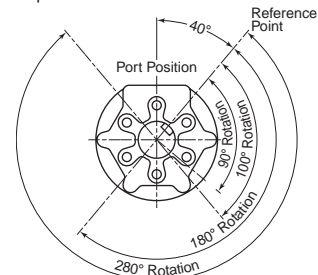
PRN50, 150, 300, 800
 Reference point at 45°



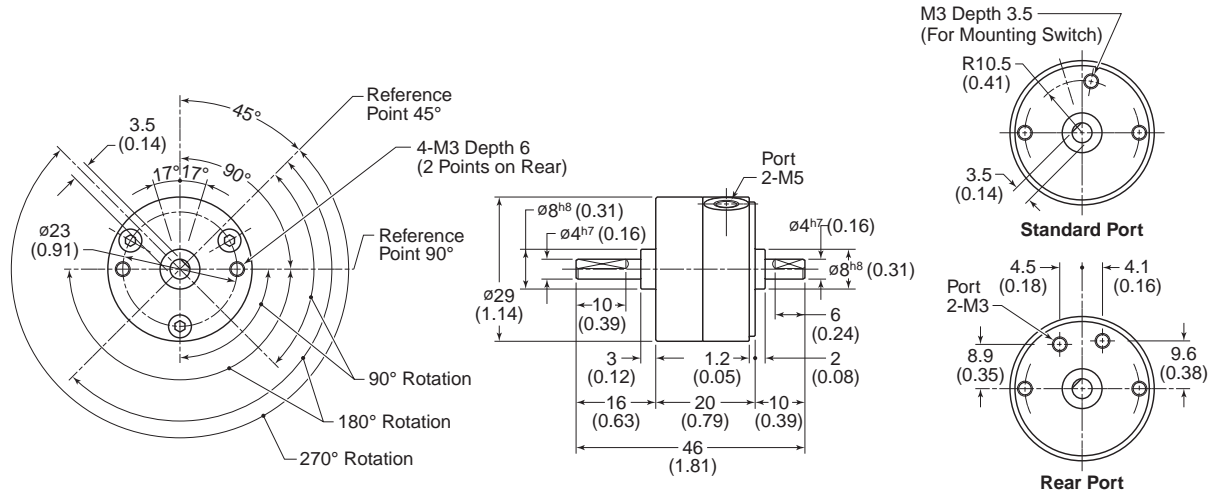
PRN1AS, PRNA3S, PRNA10S, PRNA20S
 Reference point at 90°



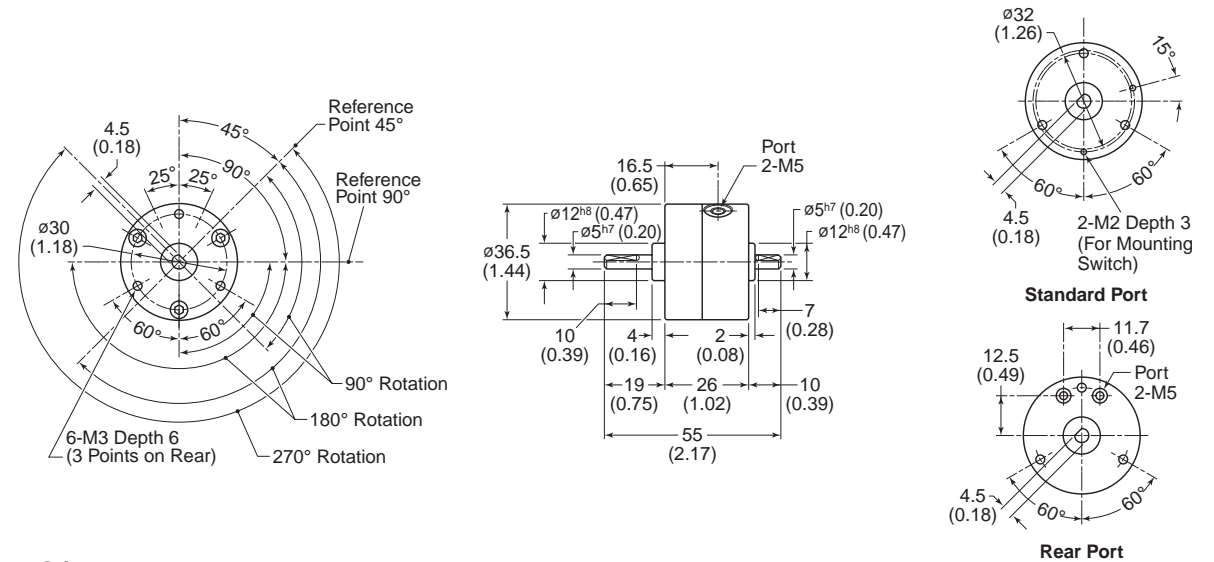
PRN50, 150, 300, 800
 Reference point at 40°



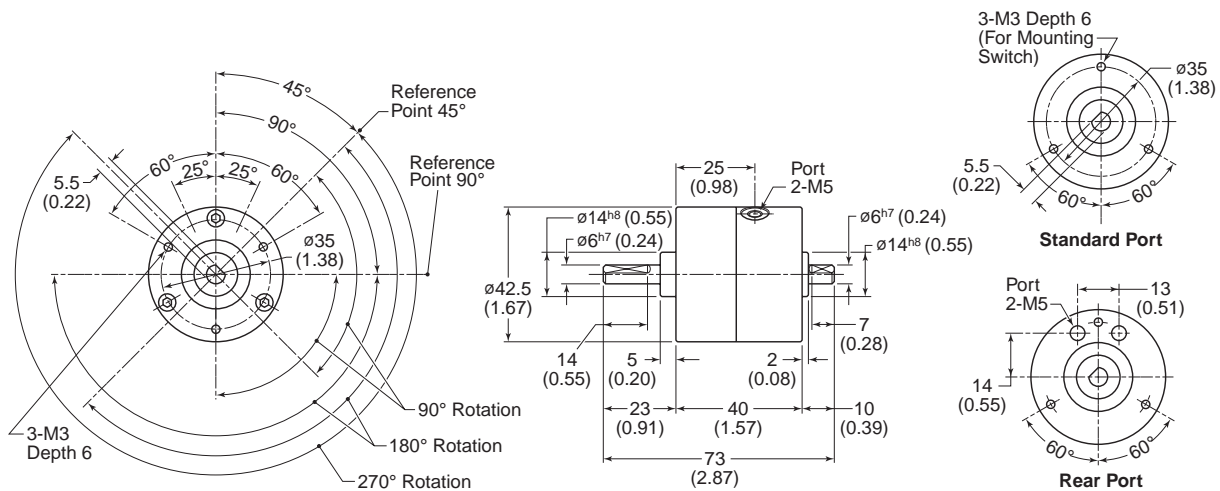
PRNA1S



PRNA3S/D



PRNA10S/D

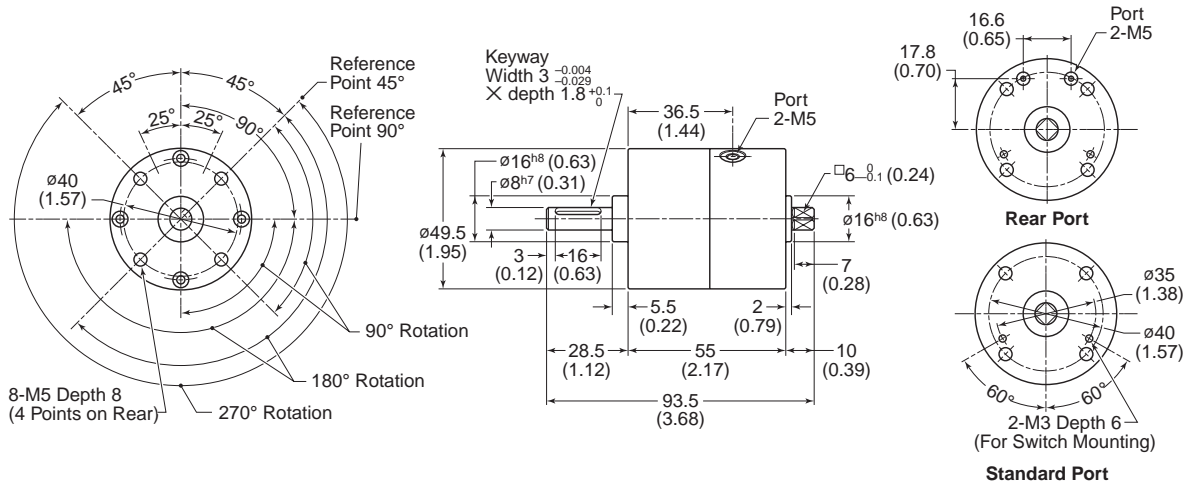


Dimensions in mm (inch)

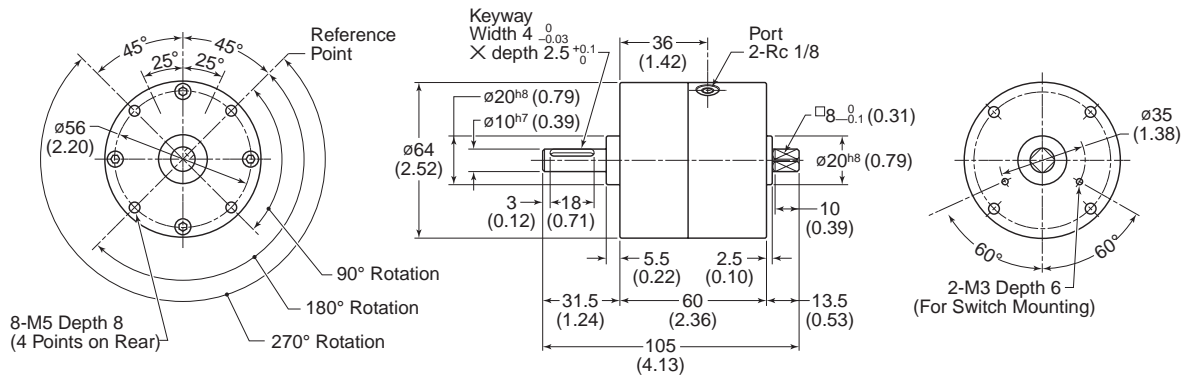
B

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PRNA20S/D



PRN30S/D



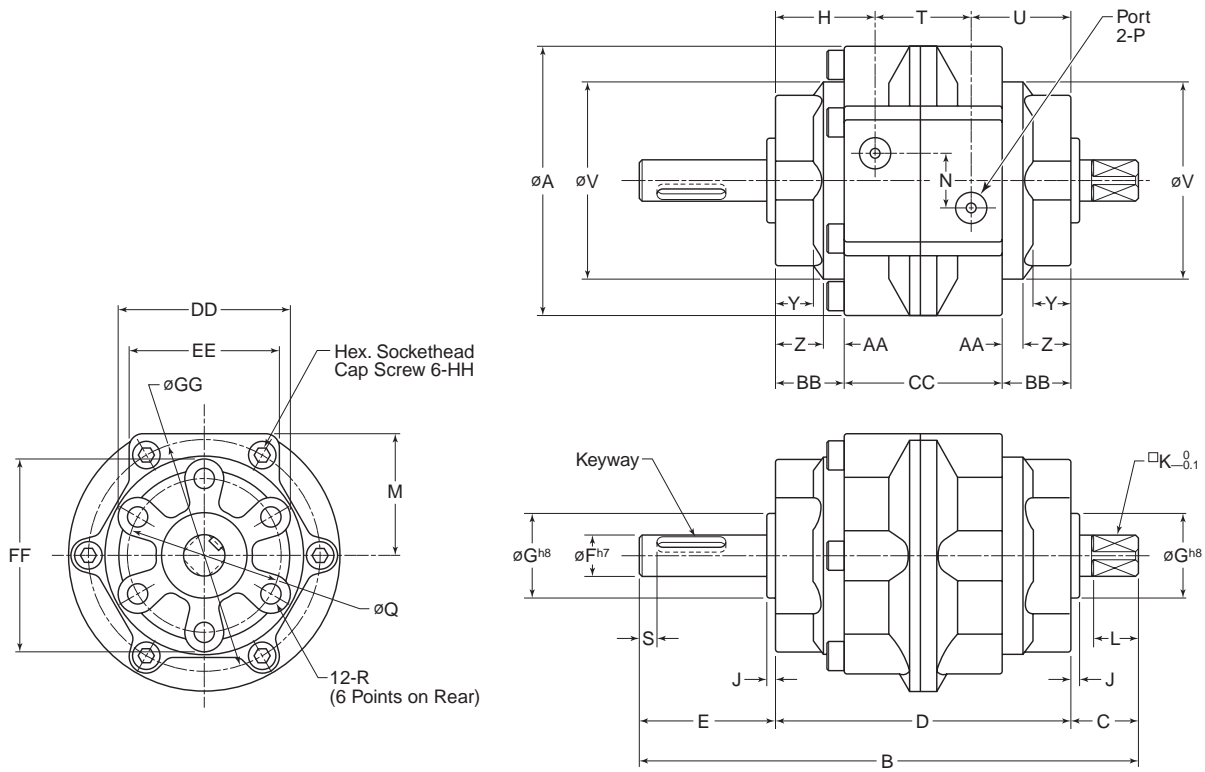
Dimensions in mm (inch)

B
 Rotary Actuators
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PRN Sizes 50 to 800

B

**Rotary Actuators
 Actuator Products**



Dimensions in mm (inch)

Model number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
PRN50	79 (3.11)	145 (5.71)	19.5 (0.77)	86 (3.39)	39.5 (1.56)	12 (0.47)	25 (0.98)	29 (1.14)	2.5 (0.10)	10 (0.39)	13 (0.51)	36 (1.42)	16 (0.63)	Rc1/8	45 (1.77)	M6 x 1, Depth 9	5 (0.20)
PRN150	110 (4.33)	180 (7.09)	23.5 (0.93)	103 (4.06)	53.5 (2.11)	17 (0.67)	30 (1.18)	34.5 (1.36)	3 (0.12)	13 (0.51)	16 (0.63)	51 (2.01)	24 (0.94)	Rc1/4	70 (2.76)	M8 x 1.25, Depth 12	5 (0.20)
PRN300	141.5 (5.57)	220 (8.66)	30 (1.18)	125 (4.92)	65 (2.56)	25 (0.98)	45 (1.77)	41.5 (1.63)	3.5 (0.14)	19 (0.75)	22 (0.87)	66 (2.60)	32 (1.26)	Rc3/8	80 (3.15)	M10 x 1.5, Depth 15	5 (0.20)
PRN800	196 (7.72)	285 (11.22)	44.5 (1.75)	171 (6.73)	69.5 (2.74)	40 (1.57)	70 (2.76)	53.5 (2.11)	4.5 (0.18)	32 (1.26)	35 (1.38)	90 (3.54)	44 (1.73)	Rc1/2	120 (4.72)	M12 x 1.75, Depth 18	10 (0.39)

Model number	T	U	V	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	Keyway width x depth x length
PRN50	28 (1.10)	29 (1.14)	58 (2.28)	11 (0.43)	14 (0.55)	6 (0.24)	20 (0.79)	46 (1.81)	51 (2.01)	44 (1.73)	57 (2.24)	68 (2.68)	M5 x 30	4 ⁰ _{-0.03} x 2.5 ^{+0.1} ₀ x 20
PRN150	34 (1.34)	34.5 (1.36)	85.2 (3.35)	10.5 (0.41)	15.5 (0.61)	8 (0.31)	23.5 (0.93)	56 (2.20)	75 (2.95)	61 (2.40)	85 (3.35)	97 (3.82)	M6 x 35	5 ⁰ _{-0.03} x 3 ^{+0.1} ₀ x 36
PRN300	42 (1.65)	41.5 (1.63)	110 (4.33)	13 (0.51)	17.5 (0.69)	10 (0.39)	27.5 (1.08)	70 (2.76)	88.5 (3.48)	78 (3.07)	98.5 (3.88)	125 (4.92)	M8 x 45	7 ⁰ _{-0.03} x 4 ^{+0.2} ₀ x 40
PRN800	64 (2.52)	53.5 (2.11)	152 (5.98)	14.5 (0.57)	21.1 (0.83)	11.4 (0.45)	32.5 (1.28)	106 (4.17)	130 (5.12)	110 (4.33)	145 (5.71)	173 (6.81)	M12 x 70	12 ⁰ _{-0.043} x 5 ^{+0.2} ₀ x 40

- Rack and pinion patented movement.
- Adjustable rotation 0 to 190°
- 7 bore sizes (10 to 63mm)
- Theoretical torque (.28 to 39 Nm at 6 bar)
- Ball bearing supported shaft
- Through hole in the pinion.
- Optional rubber dampers or hydraulic shock-absorbers.
- Mid position stop (MPS)



Operating information

Temperature range:	41°F to 140°F (5°C to 60°C)
Operating pressure:	1 to 8 bar maximum
Filtration requirements:	40 micron, dry filtered air
For technical information see CD	

Rotary Table

Must be fitted with either external cushioning or other cushioning (MPS Units)

Size Ø mm	Connection	Weight kg	Rotary table order code	Weight kg	Intermediate stop order code
10	M5	0.234	P5WCM10NMN0190B	0.055	P5WCM10M
12	M5	0.557	P5WCM12NMN0190B	0.100	P5WCM12M
20	M5	0.966	P5WCM20NMN0190B	0.190	P5WCM20M
25	G1/8	1.682	P5WCM25NMN0190B	0.300	P5WCM25M
35	G1/8	2.473	P5WCM35NMN0190B	0.450	P5WCM35M
45	G1/4	5.252	P5WCM45NMN0190B	1.000	P5WCM45M
63	G1/4	8.184	P5WCM63NMN0190B	1.675	P5WCM63M

External Cushioning

Size Ø mm	Thread	Weight kg	Hydraulic shock absorbers order code	Weight kg	Rubber dampers order code
10	M8x1	0.008	MC10MH	0.009	P5WCM10B
12	M10x1	0.014	MC25ML-NB	0.016	P5WCM12B
20	M12x1	0.030	MC75M-3-NB-111	0.028	P5WCM20B
25	M12x1	0.030	MC75M-3-NB-111	0.028	P5WCM20B
35	M14x1.5	0.008	MC150MH2		
45	M20x1.5	0.15	MC225MH2		
63	M25x1.5	0.26	MC600MH2		

Sensors

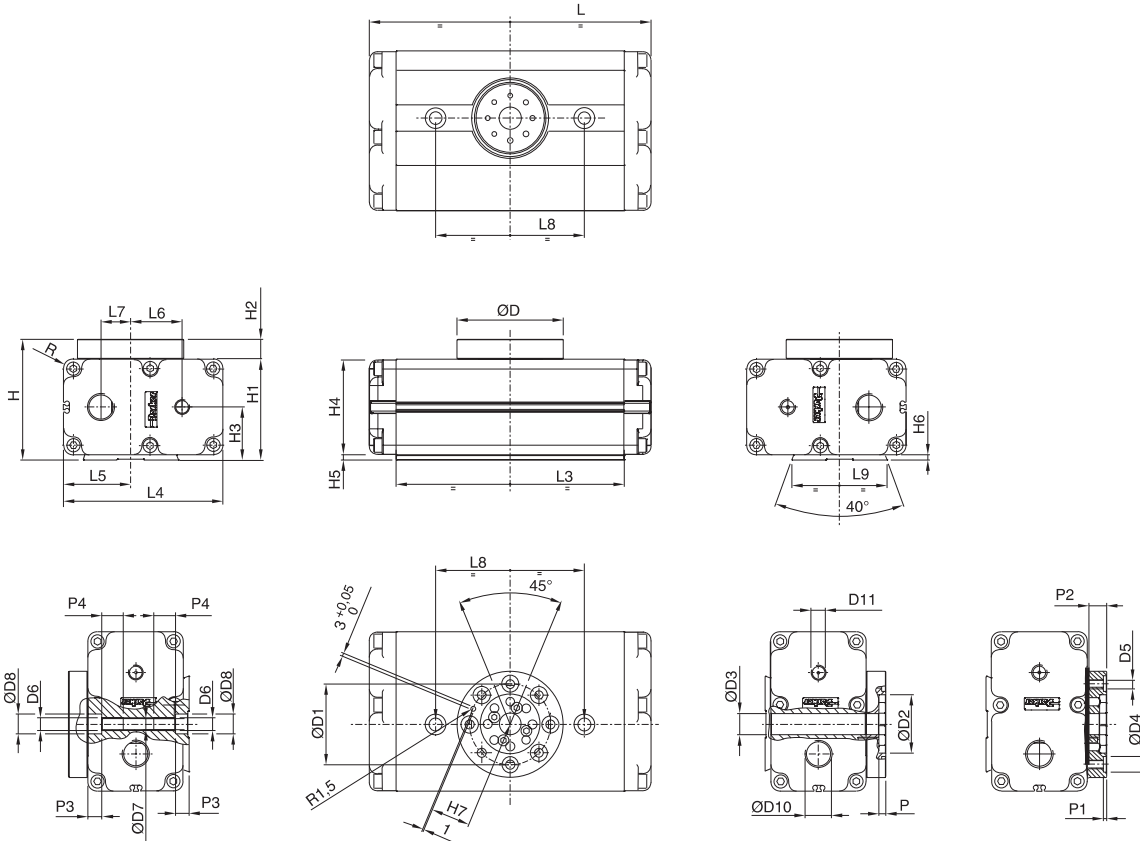
For sensors see page B296.



Most popular.

B

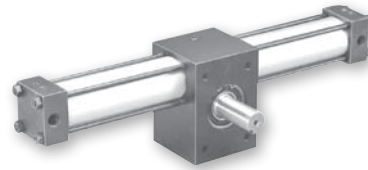
Rotary Actuators
 Actuator Products



Size Ø mm	L mm	L3 mm	L4 mm	L5 mm	L6 mm	L7 mm	L8 ± 0.02 mm	L9 mm	D mm	D1 ±0.02 mm	D2 mm	D3 mm	D4 H8 mm	D5	D6	D7 mm	D8 H8 mm	D10	D11
10	81	65	38	19	10	9	50	40	32	23	-	5	7	M4	M5	4.3	9	M8x1	M5
12	108	88	50	25	13	13	59	40	45	31.5	22	6	7	M4	M6	5.2	11	M10x1	M5
20	130	110	65	32.5	16	13.5	72	56	45	31.5	22	8	7	M4	M6	5.2	11	M12x1	M5
25	162	136	80	40.5	24	18	86	70	65	50	37	10	9	M5	M8	6.8	15	M12x1	G1/8
35	170	140	100	47	28.5	17.5	86	70	65	50	37	12	9	M5	M8	6.8	15	M14x1.5	G1/8
45	230	180	120	56	37	26	140	90	100	76	55	18	15	M8	M12	10.5	19	M20x1.5	G1/4
63	265	215	150	63	48.5	28	140	90	100	76	55	20	15	M8	M12	10.5	19	M25x1.5	G1/4

Size Ø mm	H mm	H1 mm	H2 mm	H3 mm	H4 mm	H5 mm	H6 mm	H7 mm	P mm	P1 mm	P2 mm	P3 mm	P4 mm	R mm
10	35	27	8	16	21.5	5.25	5	-	-	2.5	6.5	6	10	2.75
12	47	37	10	21	31	5.5	5	15.25	4	2.5	8	6	12	3.5
20	54	44	10	24.5	38	5.5	5	15.25	4	2.5	8	6	12	4.5
25	64	50	14	27.5	44	5.5	5	24.5	5	3	12	10	18	5
35	76	62	14	33.5	55	5.5	5	24.5	5	3	12	10	18	7
45	95.5	77	18.5	41	70	5.5	5	37.5	7	3.5	16	13	24	7
63	113.5	95	18.5	50	88	5.5	5	37.5	7	3.5	16	13	24	9

- Rack and pinion rotary actuator
- 5 bore sizes from 1" to 3-1/4"
- Output torque @ 100 PSIG: 39 lb-in to 2281 lb-in
- Standard rotations: 90°, 180°, 270°, 360°
- Available as single or double rack, 3 position, air/oil, antitbacklash
- Optional bumpers, cushions, stroke adjusters, shock absorbers



Sensors

For sensors see page B296.



Operating information

Operating pressure: 250 PSIG
 Temperature range:
 Nitrile seals: 0°F to 180°F
 Fluorocarbon seals: 0°F to 250°F
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

PTR 25 1 - 090 3 F P - A B 2 1 M V - C

Model 1

10	1" Bore
15	1-1/2" Bore
20	2" Bore
25	2-1/2" Bore
32	3-1/4" Bore

Rotation 2

090	90°
180	180°
270	270°
360	360°

Or specify any other rotation.

Configuration

1	Single Rack
2	Double Rack
3	Three Position Actuator
6	Air/Oil Operation
7	Antitbacklash

Mounting

A	Face/base (standard)
F	Front flange
G	Foot flange
P	Pilot ring
R	Rear flange
X	Special

Design Series

C	Current
---	---------

Special Options

Omit	Standard
------	----------

(Two-digit code assigned by factory and applies when any "X" or "9" appears in the model number or when special options or features are required.)

Seals

Omit	Nitrile
V	Fluorocarbon
X	Special

Port flow controls

Omit	None
P	Flow control both rotations
R	Flow control CW rotation 3
S	Flow control CCW rotation 3

Port location

1	Position 1 (standard)
2	Position 2
3	Position 3
4	Position 4
5	Position 5 6
9	Special

Shaft

A	Female keyed
B	Single male keyed (standard)
C	Double male keyed
R	Preload keyway
X	Special

Standard options

Omit	None
M	Magnetic piston ring
S	Shaft seal cover
Q	Prepped for external air/oil tank
L	Air/oil cushion & flow control adj. at location 1 (opposite standard)

Cushion / Bumpers

Omit	None
1	Cushioned CW rotation 3
2	Cushioned CCW rotation 3
3	Cushioned both rotations
4	Four cushions 4
5	Bumper CW rotation 3
6	Bumper CCW rotation 3
7	Bumper both rotations
9	Special

Stroke adjusters

Omit	None
D	0-30° CW rotation 3, 5
E	0-30° CCW rotation 3, 5
F	0-30° both rotations 5
H	Shock/stroke adj. CW rotation 3, 7
K	Shock/stroke adj. CCW rotation 3, 7
L	Shock/stroke adj. both rotations 7
X	Special

Port type

1	SAE straight thread
2	NPTF
4	BSPP (ISO 1179-1 with ISO 228-1 threads)
9	Special

Other options

Detail in clear text:

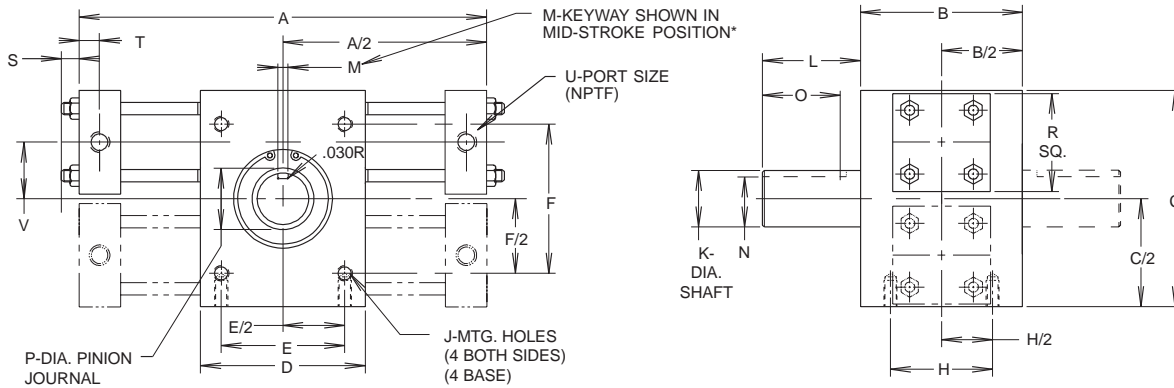
- Proximity Sensors
- Feedback Potentiometer

Notes:

- 1 Cylinder bore size. See appropriate tables for torque output.
- 2 For 3-position units, specify middle and total rotation separated by a "/", ie 090/180. To obtain equal rotation both sides of midstroke (theoretical 12:00), order unit with 5° longer rotation than standard with stroke adjusters.
- 3 Viewed from shaft end.
- 4 Double rack models only.
- 5 Reduces to 10° with cushions.
- 6 Not available with cushions or stroke adjusters.
- 7 Refer to Catalog 0900-E page H45 for option configuration compatibility.

Standard Face Base Mount (A) and Male Keyed Shaft (B)

Double Male Keyed Shaft (C) shown in phantom



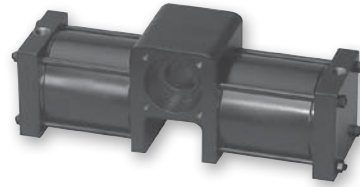
B
 Rotary Actuators
 Actuator Products

Model number	Rotation Degrees	A	B	C	D	E	F	H	J	K	L	M	N
10	90	6-11/16											
	180	8-1/4	2	3	2	1.500	2.000	1.500	1/4-20 x 3/8 DP	0.500 0.499	7/8	0.125 0.127	0.430 0.425
	360	11-7/16											
15	90	9-1/8											
	180	11-3/16	3	4-1/4	3	2.000	3.000	2.000	5/16-18 x 1/2 DP	0.875 0.874	1-7/8	0.188 0.190	0.771 0.761
	360	15-3/8											
20	90	11-3/16											
	180	14-1/16	3	5	4	2.500	3.500	2.000	3/8-16 x 1/2 DP	1.125 1.124	1-7/8	0.250 0.252	0.986
	360	19-11/16											
25	90	12-9/16											
	180	15-1/2	3-1/2	6	4	2.500	4.500	2.000	1/2-13 x 3/4 DP	1.375 1.374	2-1/4	0.313 0.315	1.201 1.191
	360	20-5/8											
32	90	16-5/8											
	180	21-1/8	5	8	5	3.000	5.000	2.500	3/4-10 x 1 DP	1.750 1.749	3-1/2	0.375 0.377	1.542 1.532
	360	29-3/8											

Model number	O	P	R	S	T	U	V
10	5/8	0.59	1-1/2	1/4	0.31	1/8	3/4
15	1-1/2	0.98	2	5/16	0.41	1/4	1-1/16
20	1-1/2	1.18	2-1/2	3/8	0.41	1/4	1-1/4
25	1-3/4	1.38	3	3/8	0.41	1/4	1-1/2
32	3	1.77	3-3/4	7/16	0.56	3/8	1-15/16

*To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.

- Rack & pinion rotary actuator
- 2 large bore models
- 3 standard rotations: 90°, 180°, 360°
- Standard output torque at 100 PSIG: 4,500 and 10,000 lb-in
- Large female pinion
- Available with adjustable cushions and stroke adjusters



Operating information

Operating pressure: 100 PSIG
 Temperature range:
 Nitrile seals: 0°F to 180°F
 Fluorocarbon seals: 0°F to 250°F
 Filtration requirements: 40 micron, dry filtered air
 For technical information see CD

Ordering information

HP 10 - 090 3 C - A A 2 V -

Model	
4.5	4,500 lb-in output torque
10	10,000 lb-in output torque

Rotation 1	
090	90°
180	180°
360	360°

Specify other rotations.

Cushions	
Omit	None
1	CW rotation ²
2	CCW rotation ²
3	Both rotation
9	Special

Stroke adjusters	
Omit	None
A	0-5° CW rotation ²
B	0-5° CCW rotation ²
C	0-5° both rotation
D	0-30° CW rotation ^{2,3}
E	0-30° CCW rotation ^{2,3}
F	0-30° both rotation ³
X	Special


Special options	
Omit	Standard
Two digit code assigned by factory when any "X" or "9" appears in the model number or when special options or features are required.	

Seals	
Omit	Nitrile (standard)
V	Fluorocarbon
X	Special

Port type	
2	NPTF (standard)
9	Special

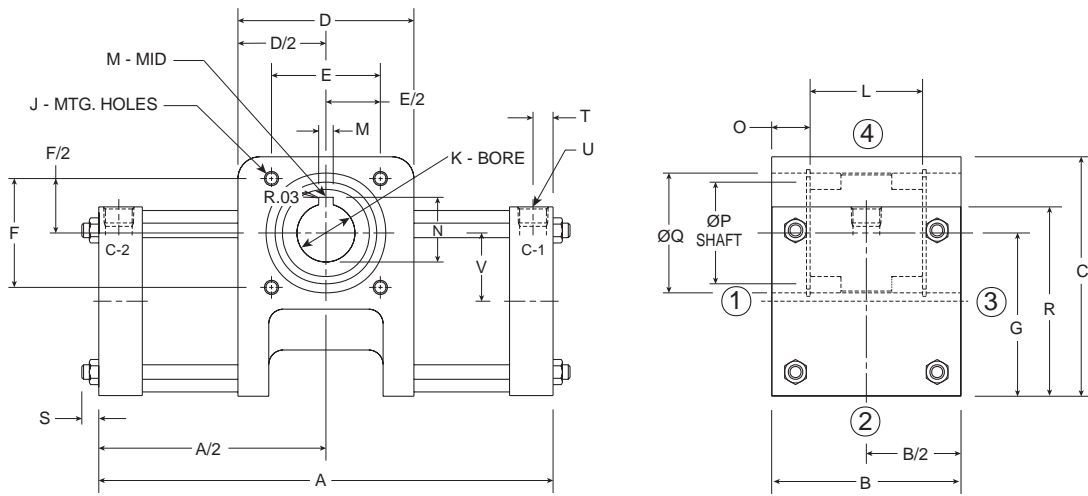
Shaft configuration	
A	Female keyed shaft
B	Male keyed shaft
D	Female SAE 10B spline
E	Male SAE 10B spline
X	Special

Mounting style	
A	Face (standard)
X	Special

Sensors
 For sensors see page B296. 

Notes:
¹ To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.
² Viewed from shaft end.
³ Cannot combine with cushions.

Standard face mount (A) and female keyed shaft (A) shown



Notes: Pressure on C-1 port gives clockwise rotation.
 Pressure on C-2 port gives counterclockwise rotation.

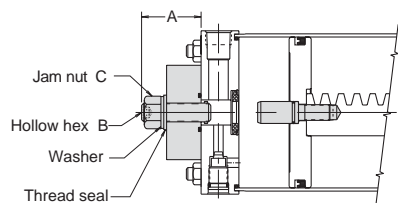
Numbers above represent possible mounting and port positions.

Model number	Rotation	A	B	C	D	E	F	G	J	K
4.5	90°	15-5/8								
	180°	22-1/4	6.525	8-1/4	6.063	3.750	3.750	5.615	7/16-14 x 21/32 DP	2.000 2.003
	360°	33								
10	90°	18								
	180°	26-3/4	8.525	10-1/2	7.813	5.000	5.000	7.265	5/8-11 x 15/16 DP	2.250 2.253
	360°	39-5/8								

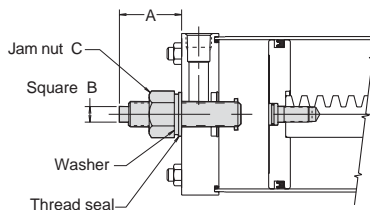
Model number	L	M	N	O	P	Q	R	S	T	U	V
4.5	3-7/8	0.500	2.223	1-5/16	3-1/2	4-1/8	6-1/2	5/8	0.69	3/4 NPTF	2.35
		0.502	2.233								
10	5	0.625	2.525	1-3/4	4-1/2	5-1/4	8-1/2	3/4	0.69	3/4 NPTF	3.00
		0.628	2.535								

Stroke Adjusters (A - F)

5° stroke adjust option with cushion option

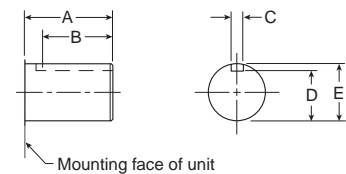


5° or 30° stroke adjust option without cushion option



Model number	(1) Turn Adjust	Cushioned end cap			Non-cushioned end cap				
		A	B	C	(1) Turn Adjust	A		B	C
4.5	2.5°	2.50	5/8	1.00-14	2.0°	5°		3/8	3/4-16
						2.00	2.81		
10	2.0°	2.50	15/16	1.50-12	1.5°	5°		15/16	1-1/2-12
						2.56	3.50		

Male Shaft (B)




Model number	A	B
4.5	2.61	2.38
10	4.38	3.38

Model number	C	D	E
4.5	0.561	1.928	2.249
	0.562	1.933	2.250
10	0.625	1.888	2.249
	0.627	1.893	2.250


- Stainless steel air motor
- Approved for use in food grade applications
- Seven different sizes
- Powers ranging from 20 to 1,200 watts
- Speeds from 5 to 24,000 rpm
- Fluor rubber seals



Operating information

Operating pressure: Max. 7 bar (Max. 6 bar in explosive atmospheres) 

Temperature range: -30 °C to 100 °C

Ambient temperature: -20 °C to 40 °C in explosive atmospheres 

Filtration requirements: 40 µm filtered, oil mist or dry unlubricated compressed air


For technical information see CD

B
 Rotary Actuators
 Actuator Products


Ordering Information

P 1 V - S		0 2 0		A	0	E 5 0	
Air Motor Range		Motor Size		Function		Optional Functions	
P1V-S	Stainless Vane Motor	002	20 W	A	Keyed Shaft, Reversible	0	Standard
		008	80 W	D	Threaded Shaft, Reversible	C*	Continuous Lubrication - Free Operation
		012	120 W			Z*	Spring Loaded Vanes
		020	200 W			M*	Multi: Combination of C+Z
		030	300 W			D**	Standard with Brake
		060	600 W			E**	Option C with Brake
		120	1200 W			F**	Option Z with Brake
						G**	Option M with Brake
						Free Speed per min	
						0005	5
						001	10
						999	9990
						A00	10000
						E00	14000
						E50	14500
						N00	22000
						Q00	24000

* Not for P1V-S002 and P1V-S008
 ** Only for P1V-S020 and P1V-S030



Important!
 Before carrying out service activities, make sure the air motor is vented. Before disassembling the motor, disconnect the primary air hose to ensure that the air supply is interrupted.




NOTE!
 All technical data in the catalog are typical values. The air quality is a major factor in the service life of the motor, see ISO 8573-1.

B

Rotary Actuators
 Actuator Products

Series	Watts	Part number
P1V-S002A	20	P1V-S002A0130 P1V-S002A0095
P1V-S008A	80	P1V-S008A0Q00 P1V-S008A0700 P1V-S008A0190 P1V-S008A0130
P1V-S012A	120	P1V-S012A0N00, P1V-S012D0N00 P1V-S012A0550, P1V-S012D0550 P1V-S012A0360, P1V-S012D0360 P1V-S012A0140, P1V-S012D1400 P1V-S012A0090, P1V-S012D0090 P1V-S012A0060, P1V-S012D0060 P1V-S012A0010, P1V-S012D0010
P1V-S012D		
P1V-S020A	200	P1V-S020A0E50, P1V-S020D0E50 P1V-S020A0460, P1V-S020D0460 P1V-S020A0240, P1V-S020D0240 P1V-S020A0140, P1V-S020D0140 P1V-S020A0070, P1V-S020D0070 P1V-S020A0035, P1V-S020D0035 P1V-S020A0018, P1V-S020D0018 P1V-S020A0011 P1V-S020A0006 P1V-S020A0005, P1V-S020D0005 P1V-S020A0002 P1V-S020A0001 P1V-S020A00005
P1V-S020D		
P1V-S030A	300	P1V-S030A0E50, P1V-S030D0E50 P1V-S030A0460, P1V-S030D0460 P1V-S030A0240, P1V-S030D0240 P1V-S030A0140, P1V-S030D0140 P1V-S030A0060, P1V-S030D0060 P1V-S030A0028, P1V-S030D0028 P1V-S030A0023 P1V-S030A0018, P1V-S030D0018 P1V-S030A0010 P1V-S030A0005, P1V-S030D0005
P1V-S030D		
P1V-S060A	600	P1V-S060A0E00 P1V-S060A0400 P1V-S060A0270 P1V-S060A0170 P1V-S060A0072 P1V-S060A0048 P1V-S060A0030 P1V-S060A0010
P1V-S120A	1200	P1V-S120A0800 P1V-S120A0270 P1V-S120A0110 P1V-S120A0078 P1V-S120A0032 P1V-S120A0012

 Most popular.

Parallel and Angular Grippers

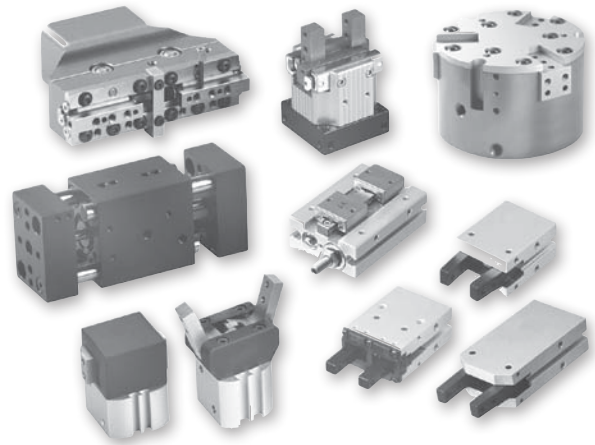
- Miniature
- Precision
- High force
- Long stroke
- Heavy duty
- Compact
- Clean room
- Locking

Common Options














- Sensors
- Dust covers
- Stroke adjuster
- Alternate seals
- Clean room

Specifications

- Stroke Ranges: to 6.0 inches
- Grip Forces: to 2800 lbs
- Operating Characteristics:
 - Single acting
 - Double acting
 - Spring open or closed



Parallel Grippers


	Series	Max. Strokes	Total grip force (lb)	Clean room	Spring open	Spring close	Synch	Non-synch	Reed hall	Prox	High temp seals
	GPR	10-20 mm	11-46							S	
	GPCR	4-14 mm	6-51		O					S	
	P5G-HPM	0.13-0.25 in	22-43	O	O			X			O
	P5G-HP (mini)	0.16-0.25 in	25-35				X				
	P5G-HP	0.25-1.50 in	35-694				X			S	
	GPT	0.625 in	46-86				X		S	S	O
	P5G-AP	5.3-17.9 mm	31-208		O	O	X		O	O	O
	GPEL	16-22 mm	10-27					X		S	
	GPDL	16-80 mm	10-65				X			S	
	P5G-HPL	0.25-1 in	25-33	O			X	O	S		O
	P5G-HP-P	0.5-3.0 in	23-498				X			S	O
	GPK	24-50 mm	20-90				X			S	
	P5G-HPW	0.75-4.50 in	45-450				X	O		S	O

X = standard
 O = optional
 S = order separately









Please reference CD for ordering and specification information.

B
 Grippers
 Actuator Products

Three Jaw Grippers

	Series	Strokes	Total grip force (lb)	Dust cover	Spring open	Spring close	Synch	Non-synch	Reed hall	Prox	High temp seals
	P5G-HPC	0.3-1.38 in	80-2800					X	S		O

Angular Grippers

	Series	Max. Stroke	Total grip force (lb)	Dust cover	Spring open	Spring close	Synch	Reed hall	Prox	High temp seals
	GVC	30°	1.25 - 36		O		X		S	
	GAA	30°	2.7 - 6.3				X	S	S	O
	P5G-HA	30°	11 - 134				X	S		O
	P5G-AA	30°	17.4 - 198			O	X	S	O	O
	P5G-HA	12°	62 - 220				X		S	O
	GVH	180°	5 - 54				X		S	
	GAW	180°	2.7 - 6.3				X	S	S	O
	P5G-AW	180°	14 - 65			O	X	S	O	O

X = standard
 O = optional
 S = order separately

Sensors

For sensors see Catalog 1900-2/US.

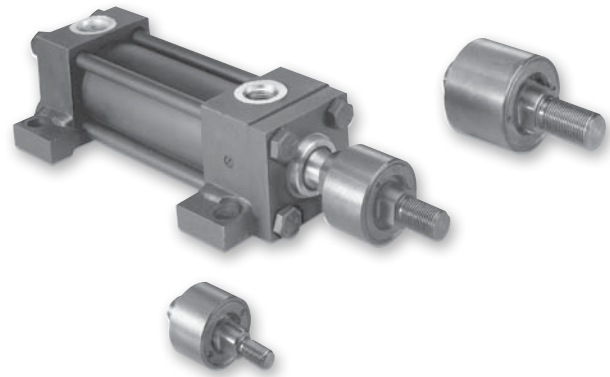


Please reference CD for ordering and specification information.

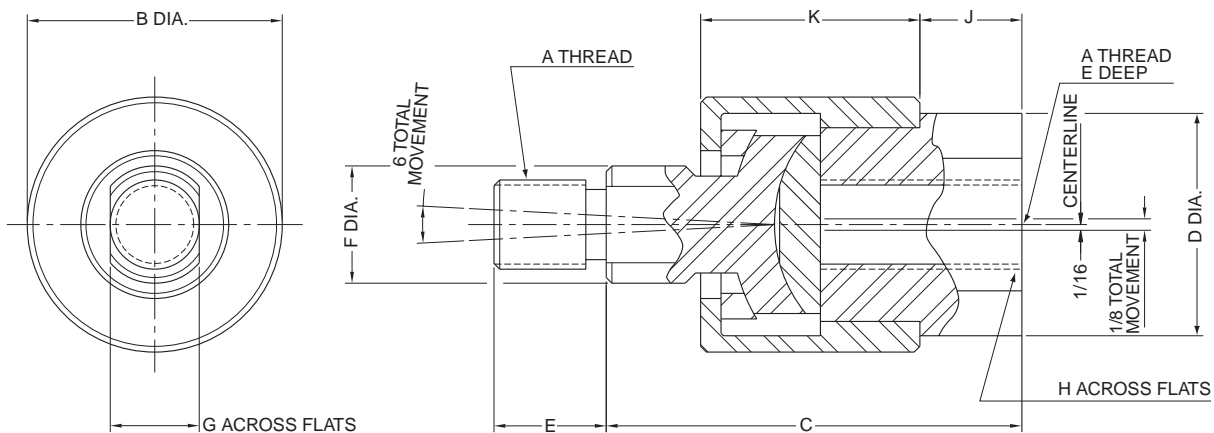
Linear Alignment Couplers are available in 12 standard thread sizes...

Cost Saving Features and Benefits Include...

- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available. Please consult factory.
- Simplifying cylinder installation and reducing assembly costs
- Increase rod bearing and rod seal life for lower maintenance costs



Alignment coupler



See table 1 for part numbers and dimensions

Table 1 – Part numbers and dimensions

A	B	C	D	E	F	G	H	J	K	Max. pull load (lbs.)	Approx. weight (Lbs.)	Part no.
5/16 -24	1-1/8	1-3/4	15/16	1/2	1/2	3/8	3/4	3/8	15/16	1200	0.35	1347570031
3/8 -24	1-1/8	1-3/4	15/16	1/2	1/2	3/8	3/4	3/8	15/16	2425	0.35	1347570038
7/16 -20	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	3250	0.55	1347570044
1/2 -20	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	4450	0.55	1347570050
5/8 -18	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	6800	0.55	1347570063
3/4 -16	2	2-5/16	1-5/8	1-1/8	1-5/16	3/4	1-5/16	7/16	1-9/32	9050	1.4	1347570075
7/8 -14	2	2-5/16	1-5/8	1-1/8	1-5/16	3/4	1-5/16	7/16	1-9/32	14450	1.4	1347570088
1-14	3-1/8	3	2-3/8	1-5/8	1-7/16	1-1/4	1-7/8	3/4	1-25/32	19425	4.8	1347570100
1-1/4 -12	3-1/8	3	2-3/8	1-5/8	1-7/16	1-1/4	1-7/8	3/4	1-25/32	30500	4.8	1347570125
1-1/4 -12	3-1/2	4	2	2	1-1/2	1-1/4	1-11/16	3/4	2-1/2	30500	6.9	1337390125
1-1/2 -12	4	4-3/8	2-1/4	2-1/4	1-3/4	1-1/2	1-15/16	7/8	2-3/4	45750	9.8	1337390150
1-3/4 -12	4	4-3/8	2-1/4	2-1/4	1-3/4	1-1/2	1-15/16	7/8	2-3/4	58350	9.8	1337390175
1-7/8 -12	5	5-5/8	3	3	2-1/4	1-15/16	2-5/8	1-3/8	3-3/8	67550	19.8	1337390188

How to order linear alignment couplers

When ordering a cylinder with a threaded male rod end, specify the coupler of equal thread size by part number as listed in Table 1, i.e.; Piston Rod "KK" or "CC" dimension is 3/4" - 16", specify coupler part number 1347570075.

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4TK Air-Oil Tanks – For Smoother Hydraulic Flow

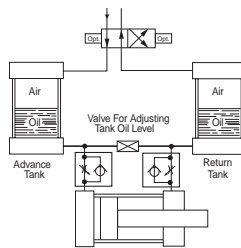
Parker Air-Oil tanks provide a means to convert shop air pressure into hydraulic pressure. Compressed air is applied directly to the oil in the air-oil tank to convert it into hydraulic pressure. The hydraulic pressure is at a 1-to-1 ratio, i.e. 80 PSIG air produces 80 PSIG hydraulic pressure.

All Parker Air-Oil tanks have a fiberglass tube which shows the proper oil level. They also contain two fluid flow baffles. The top baffle disperses the incoming air over the surface of the oil in such a way to avoid agitation and aeration. The bottom baffle insures a smooth flow pattern that minimizes oil turbulence and eliminates swirling, funneling or splashing which in turn could cause oil aeration or the oil to be blown from the tank into the exhaust air.

Air-Oil tanks are used to smooth out the cylinder piston rod travel and to prevent chatter. They are mainly used in slow speed circuits. Since each tank is designed for a specific port size, increasing the port size in a tank to lower the fluid velocity is not recommended. A tank with a larger port size should be selected.

Fluid velocity in or out of the tank through standard ports should be less than 6 feet per second to prevent aeration of the oil. To limit the fluid velocity, flow controls should be applied to the air side of the tank to restrict the exhaust. Metered-in flow controls on the air side may aid in the reduction of aeration. Additional flow controls on the oil side may aid in controlling the actuator motion.

In a basic air-oil circuit the advance tank is connected to the cap end port of a hydraulic cylinder and the return tank to the head end port. Shop air is applied alternately to the two tanks



through a 4-way air control valve. The oil in the advance tank is forced into the cap end of the cylinder to cause the piston rod to extend. At the same time, oil from the head end port is forced into the return tank, the air side of which is open to exhaust. To return the cylinder to retract position, air pressure is applied to the oil in the return tank.

Operating information

Operating pressure	17 bar (250 PSIG) maximum
Operating temperature	74°C (165°F) maximum
Filtration requirements	40 micron, dry filtered air
For technical information see CD	

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Table A – Rated capacities - cubic inches (in³)

Bore size	Usable tank volume (Cu. In.) per internal height of tank											
	4	6	8	10	12	14	16	18	20	24	28	32
2-1/2	9	17	27	35	44	52	62	70	79	97	115	132
3-1/4	16	30	46	60	76	91	107	121	137	167	198	228
4	18	33	58	73	98	120	144	166	191	237	283	330
5	29	53	92	116	155	189	228	261	300	373	446	519
6	42	77	133	168	224	273	329	378	434	539	645	750
8	75	137	237	300	400	487	587	675	775	963	1150	1338

Ordering information

Example: 4.00CB4TKU 6.000

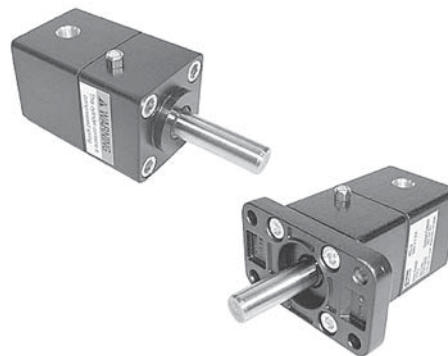
4.00	U	6.000
Tank Diameter (inches)	Ports	Tank Height*
2.50	U NPTF	Internal height in inches
3.25		* Less than 4 Inches, Consult Factory
4.00		
5.00		
6.00		
8.00		
Tank Mounting Style		
TEF Sleeve nut with side tap		
TE Sleeve nut		
TB Tie rods extended, air end		
TC Tie rods extended, oil end		
TD Tie rods extended, both ends		
C Side lug (3MA style)		
CB Side end angles		
NB Base bar		

Note: Standard air-oil tanks are designed for use with petroleum base hydraulic oil. If other fluids will be used, please consult the factory. For larger than 8" Bore Sizes consult factory.

The PRL Series rod lock is used in applications where the locking of linear travel is required. It is commonly used in workholding applications and for locking tools and fixtures in the event of air pressure or electrical control failure.

Application

- **Clamping:** Without an appropriate air signal to the rod lock pressure port, the rod lock clamps to the precision metric rod and prevents rod movement in the axial direction.
- **Delatching:** When 4 Bar (58 PSIG) of air pressure is applied to the port, the rod lock releases and allows free movement of the rod. This will be required for installation.
- **Locking Direction:** The rod lock is designed specifically to prevent rod movement in the axial direction only. It is not recommended for locking rotary rod motion.
- **Rod Material:** The Series PRL rod lock is a precision locking device, therefore strict rod tolerances and rod material specifications are required to ensure safe and proper operation. Minimum requirements for the rod material include a chrome plated surface finish of 10 microns or less and a surface hardness of 52 Rc. Rod material may be ordered separately in custom lengths. See next page for how to order.
- **Environment:** The rod lock is recommended for use in dry, clean conditions. Please take precautions to prevent moisture from entering the pressure port or the exhaust port of the locking device.



There should be no relative motion between the rod and the Rod Lock Device when the locking device is activated. The locking device is not intended to brake a movement in repeated sequences.

Considerations for Rod Sizing

When applying a rod lock device, it is important to consider the loading forces which will be imposed on the rod in the axial direction.

For applications where the rod lock and its associated load impose a compressive force on the rod, please consider the axial compression force and rod length to select the appropriate rod diameter for preventing rod buckling.

In situations where the rod lock and its associated load place the rod in tension, please take care to securely fasten the rod ends to the machine member.

Operating information

Working pressure	Max. 10 bar (145 PSIG)
Working temperature	-20° to 80°C (-4°F to 176°F)
Locking pressure	4 bar (58 PSIG) ±10%
Filtration requirements	40 micron, dry filtered air
For technical information see CD	

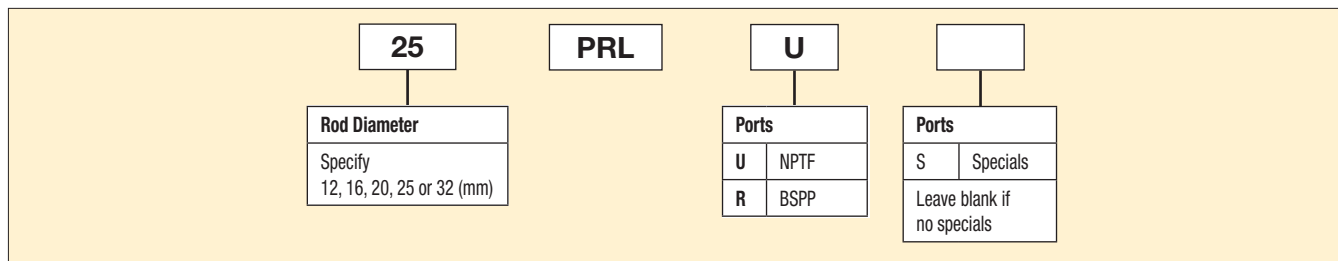
Holding Forces

Model number	Holding force	
	Pounds (lbs.)	Newtons (N)
12PRL*	123	550
16PRL*	193	860
20PRL*	481	2140
25PRL*	1211	5390
32PRL*	1894	8425

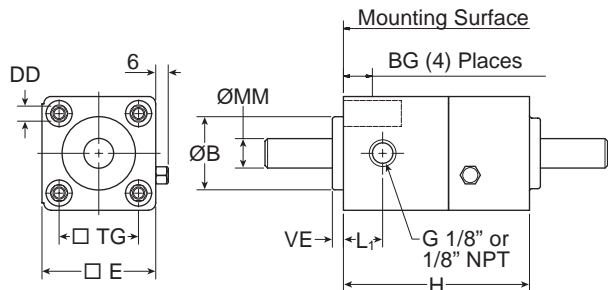
* Character reserved for port style

Ordering information

Example: 25PRLU



Basic rod lock



Rod lock with flange mount

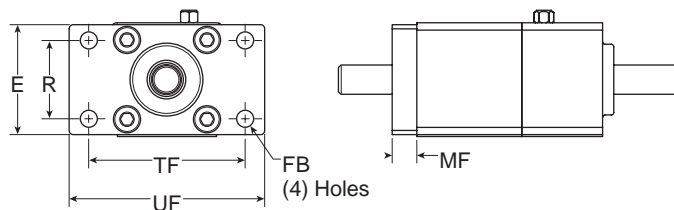


Table 1 – Mounting dimensions

Part	Rod dia. MM	B D11	BG	DD	E	FB	H	L1	MF	R	TF	TG	UF	VE
12PRL*	12.00 (-.04)	30	16	M6	46.5	7	76	16	10	32	64	32.5	80	4.5
16PRL*	16.00 (-.04)	35	16	M6	51	9	81.1	16	10	36	72	38	92	4.5
20PRL*	20.00 (-.04)	45	16	M8	76	9	100.8	26	12	50	100	56.5	129	5
25PRL*	25.00 (-.04)	55	16	M10	114.5	14	146	50	16	75	150	89	186	4
32PRL*	32.00 (-.04)	60	20	M12	140	16	165.2	60	20	90	180	110	220	6

* Character reserved for port style

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Flange mounting kit

Mounting kits are available separately from the rod lock device. Please use the following part numbers to order. Mounting fasteners are included with the kits.

Model number	Flange mount
12PRL*	L075370032
16PRL*	L075370040
20PRL*	L075370063
25PRL*	L075370100
32PRL*	L075370125

* Character reserved for port style

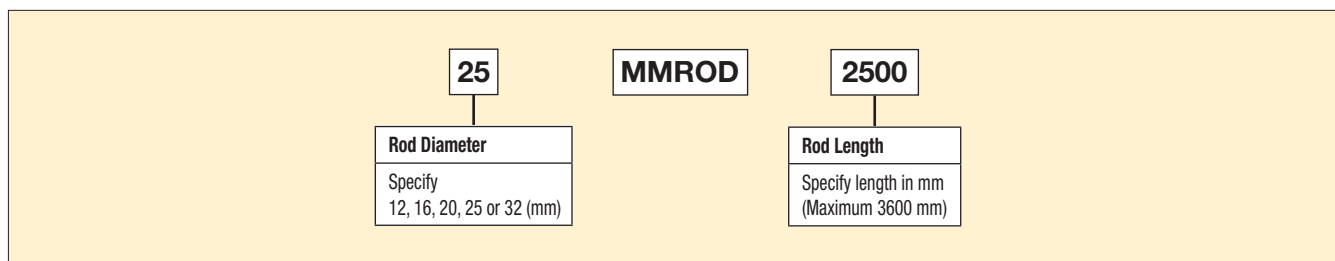
Metric rod material

Rods will be supplied in the specified length with chamfered ends. Please note, the rod material is case hardened and requires annealing prior to machining. Parker is pleased to quote custom machined rods per customer supplied drawings.

⚠ Caution: Using piston rod material which does not meet the tolerance and finished conditions as listed on the previous page may prevent the locking device from properly holding the intended load.

How to order

Example: 25MMROD2500



Transition Kits for Automation Components

Step 1

Establish the primary and secondary units

The Primary Unit is established when the transition plate is mounted to the dynamic portion of the unit, i.e. tool plate, saddle on slides or shaft on rotary actuators.

The Secondary Unit is established when the transition plate is mounted to the stationary portion of the unit, i.e. body mounts.

Step 2

Properly size all components

For sizing of components, refer to the appropriate individual product section in this catalog. Remember to add the entire weight (component + tooling + transition plate + part, etc.) of the secondary unit when determining the size of the primary unit.

Step 3

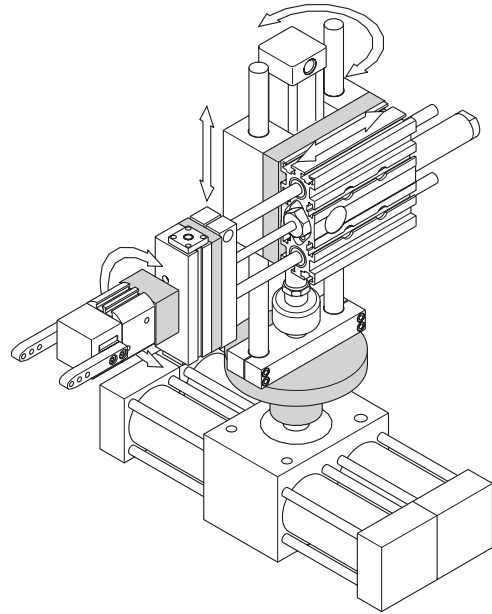
Determine the orientation desired

Secondary units can be mounted in various orientations. From the orientation tables on the following pages, select the one that best illustrates your application.

Step 4

Determine the keyhole orientation (rotary components only)

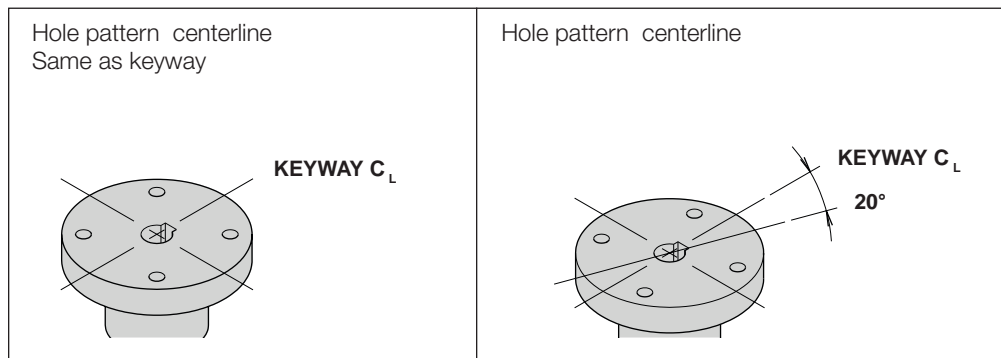
A hole pattern centerline the same as the keyway is standard. The hole pattern centerline can be rotated clockwise to keyway in increments of 5°. Square hole patterns may be rotated up to 85°. Rectangular hole patterns may be rotated up to 175°. See examples below.



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Examples:



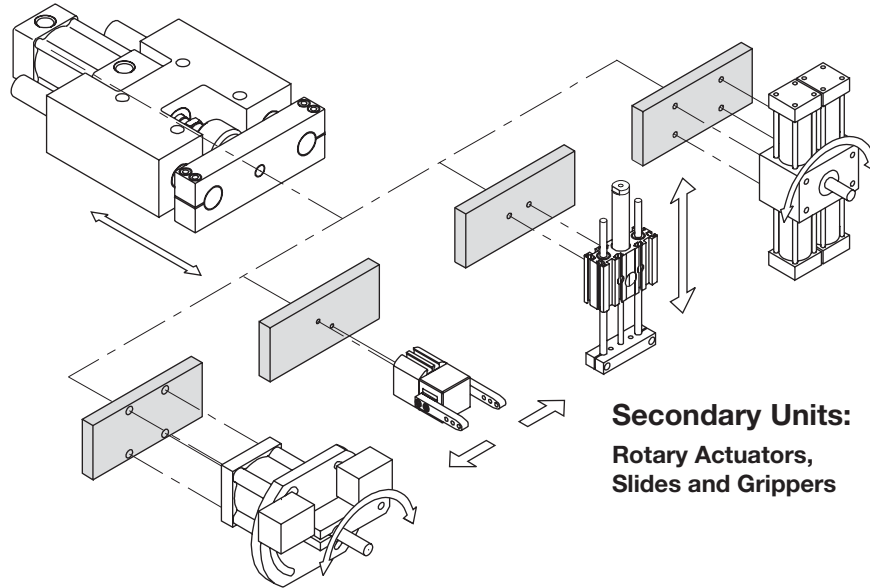
Step 5

Consult applications department to design your kit

Based on the information gathered above, the Applications Department will select the transition kit to fit your requirements.

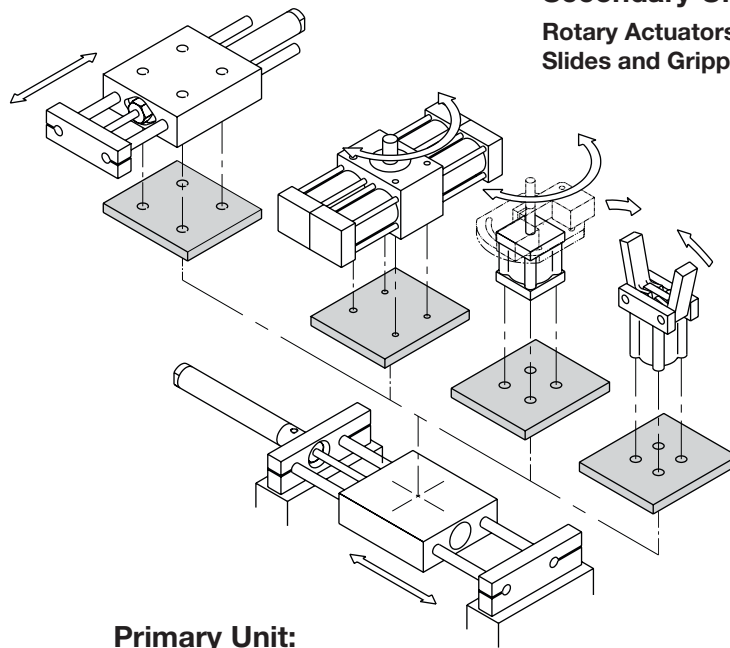
Transition Plate Kits
Connect Components to Thrust, Reach or Base Slides

Primary Unit:
Thrust and Reach Slides



Secondary Units:
Rotary Actuators,
Slides and Grippers

Secondary Units:
Rotary Actuators,
Slides and Grippers



Primary Unit:
Base Slides

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Mounting Slide to Slide

Primary series	Orientation			
	1	2	3	4
P5L P5E HBT/HBR XLT/XLR				
P5L* HBB XLB				

* **Note:** P5L Series units connect without transition plates in Orientation 1, where the thrust or reach version is mounted to a base slide version.

Mounting Rotary Actuator to Slide

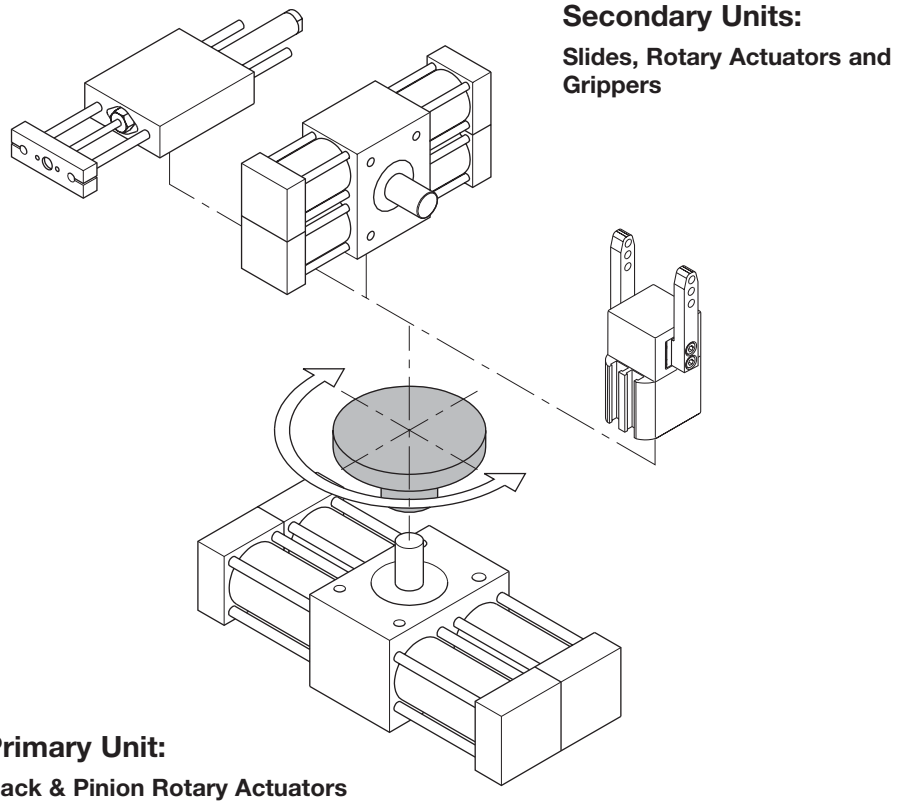
Primary series	Orientation			
	1	2	3	4
P5L P5E HBT/HBR XLT/XLR				
P5L HBB XLB				

Mounting Gripper to Slide

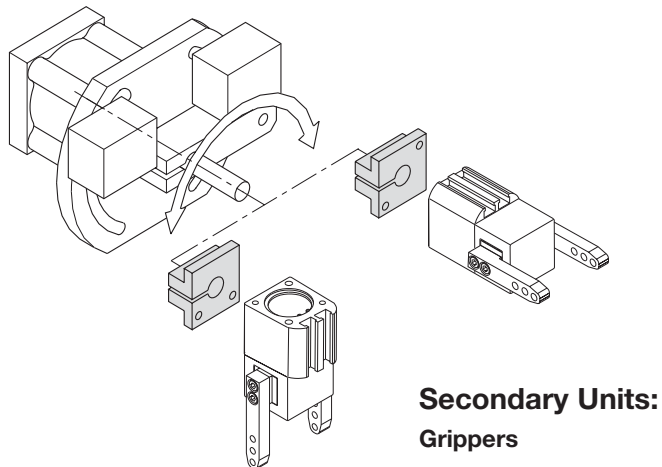
Primary series	Orientation			
	1	2	3	4
P5L HBC HBT/HBR P5E XLT/XLR				
P5L HBB XLB				

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Transition Couplers – Connect Components to Rotary Actuators



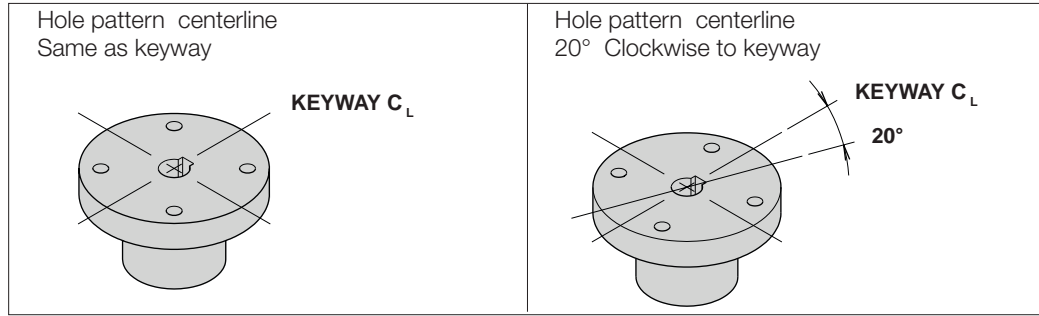
Primary Unit:
Vane Actuators

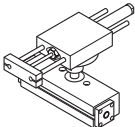
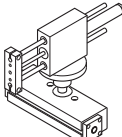
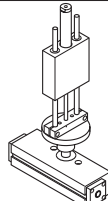
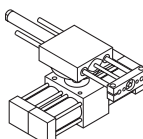
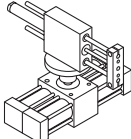
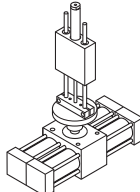


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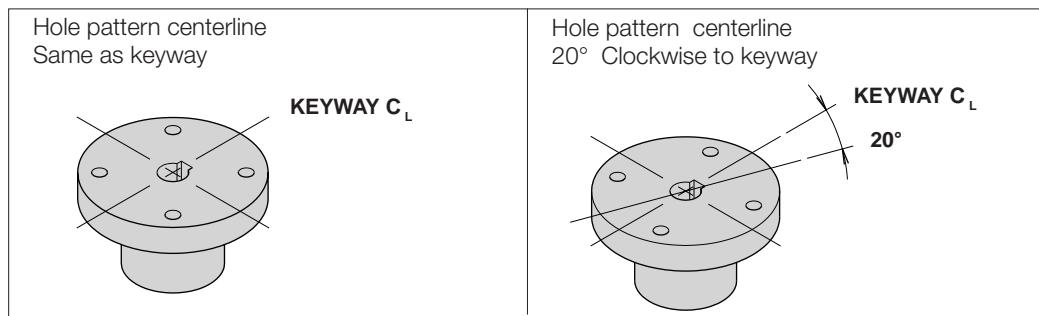
Accessories
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Mounting Slide to Rotary Actuator



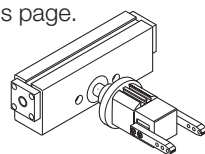
Primary series 1	Orientation		
	1	2	3
XR			
PTR			

Mounting Gripper to Rotary Actuator

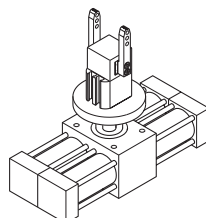


Standard Orientation

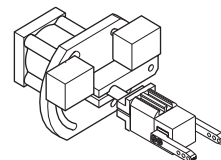
Standard orientation for each series is shown below.
 PV & WR Series coupler can accommodate two positions of the gripper.
 See drawing on previous page.



XR Series



PTR Series



PV & WR Series

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Electronic Sensors
Solid State, Reed and Proximity Sensors



B

Electronic Sensors
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PNP Solid State Sensor Selection Guide

Series	Bore size or type	3M flying leads	10m flying leads	8mm quick connect*	8mm quick connect w/ 1 m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #	
P1Q	12mm - 25mm	P8S-CPFLS	N/A	P8S-CPSHS	N/A	P8S-CPMHS	N/A	N/A	N/A	
	32mm - 100mm	P8S-CPFLR	N/A	P8S-CPSHR	N/A	P8S-CPMHR	N/A	N/A	N/A	
Compact cylinders	P1M standard sensor	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300 —	
	P1M right angle sensor	All	P8S-SPELXD	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	B303 —	
	LPM	9/16"	L076990000 ²	N/A	L07699000C	N/A	N/A	N/A	N/A	B305 —
		3/4" - 1-1/8"	L077000000 ²	N/A	L07700000C	N/A	N/A	N/A	N/A	B305 —
1-1/2" - 2"		L077010000 ²	N/A	L07701000C	N/A	N/A	N/A	N/A	B305 —	
	2-1/2" - 4"	L077020000 ²	N/A	L07702000C	N/A	N/A	N/A	N/A	B305 —	
Round body cylinders	P1L	20 - 25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B300 B303	
		32 - 63mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B300 B303	
		80 - 100mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B300 B303	
	SRM/SRDM	9/16" - 3/4"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B300 B303	
		1-1/16" - 2-1/2"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B300 B303	
	P	1-1/8" - 2-1/2"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B300 B303	
		3" - 4"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B300 B303	
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300 B303	
	3MA/4MA	6" - 8"					P8S-TMA0X	B300 B303		
	3MA/4MA mini global sensor	1-1/8" - 5"	P8S-MPFLX	P8S-MPFTX	P8S-MPSHX	N/A	N/A	P8S-TMA0Z	B302 B303	
Iso cylinders	P1A standard sensor	10-25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B300 B303	
		10mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2CCC	B304 B304	
	P1A right angle sensors	12mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2DCC	B304 B304	
		16mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2FCC	B304 B304	
		20mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2HCC	B304 B304	
		25mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2JCC	B304 B304	
P1D standard & clean profiles	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300 —		
P1D standard profile mini sensors	All	P8S-MPFLX	P8S-MPFTX	P8S-MPSHX	N/A	N/A	N/A	B302 —		
P1D tie rod version	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMA0X	B300 B303		
Rodless cylinders	P1X	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMA0Y	B300 —	
	P1Z	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300 —	
	RC	All	L074820000 ³	N/A	L07482000C	N/A	N/A	N/A	— —	
Guided cylinders	P5T	Flush mount	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300 —	
		Right angle	P8S-SPELXD	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	B303 —	
	P5T2	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300 —	
	P5E	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300 —	
	HB	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300 —	
		20 - 25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B300 B303	
32 - 63mm		P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B300 B303		
P5L	80 - 100mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B300 B303		
Rotary actuators	P5W	All	P8S-SPFL3* 2.5m flying leads	N/A	P8S-SPSH3* .3m lead	N/A	N/A	N/A	N/A N/A	
	PV WR XR	Normally open	SMH-1P ²	N/A	SMH-1PC	N/A	N/A	N/A	B307 —	
		Normally closed	SMC-1P ²	N/A	SMC-1PC	N/A	N/A	N/A	B307 —	
	PRN(A)	All	N/A	N/A	N/A	N/A	N/A	N/A		
	PTR	10, 15	SWH-1P ³	N/A	SWH-1PC	N/A	N/A	Included	B308 —	
20, 25, 32		SWH-2P ³	N/A	SWH-2PC	N/A	N/A	Included	B308 —		

1 Flying leads are 2 meters in length
 2 Flying Leads are 1.5 meters in length
 3 Flying leads are 1 meter in length

Note: See page B309 for Weld Immune Sensors and pages B312-B314 for NAMUR Intrinsically Safe Sensors.

* See page B311 for cord sets.

B
 Electronic Sensors
 Actuator Products

NPN Solid State Sensor Selection Guide

Series	Bore size or type	3m flying leads	10m flying leads	8mm quick connect*	8mm quick connect w/ 1m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #		
P1Q	12mm - 25mm	P8S-CNFLS	N/A	P8S-CNSHS	N/A	P8S-CNMHS	N/A	N/A	N/A		
	32mm - 100mm	P8S-CNFLR	N/A	P8S-CNSHR	N/A	P8S-CNMHR	N/A	N/A	N/A		
Compact cylinders	P1M standard sensor	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—	
	P1M right angle sensor	All	P8S-SNELX	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	B303	—	
	LPM	9/16"	L076950000 ²	N/A	L07695000C	N/A	N/A	N/A	N/A	B305	—
		3/4" - 1-1/8"	L076960000 ²	N/A	L07696000C	N/A	N/A	N/A	N/A	B305	—
1-1/2" - 2"		L076970000 ²	N/A	L07697000C	N/A	N/A	N/A	N/A	B305	—	
Round body cylinders	P1L	20 - 25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B300	B303	
		32 - 63mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B300	B303	
		80 - 100mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B300	B303	
	SRM/SRDM	9/16" - 3/4"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B300	B303	
		1-1/16" - 2-1/2"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B300	B303	
	P	1-1/8" - 2-1/2"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B300	B303	
		3" - 4"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B300	B303	
	Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GNFLX	P8S-GPNFTX	P8S-GNSHX	P8S-GPNSCX	P8S-GNMHX	N/A	B300	B303
		3MA/4MA	6" - 8"					P8S-TMA0X	B300	B303	
		3MA/4MA mini-global sensor	1-1/8" - 5"	P8S-MNFLX	P8S-MNFTX	P8S-MNSHX	N/A	N/A	P8S-TMA0Z	B302	B303
ISO cylinders	P1A standard sensor	10-25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B300	B303	
		10mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	P1A-2CCC	B304	B304	
	P1A right angle sensors	12mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	P1A-2DCC	B304	B304	
		16mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	P1A-2FCC	B304	B304	
		20mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	P1A-2HCC	B304	B304	
		25mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	P1A-2JCC	B304	B304	
ISO cylinders	P1D standard & clean profiles	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—	
	P1D standard profile mini Sensors	All	P8S-MNFLX	P8S-MNFTX	P8S-MNSHX	N/A	N/A	N/A	B302	—	
	P1D tie rod version	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0X	B300	B303	
Rodless Cylinders	P1X	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0Y	B300	—	
	P1Z	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—	
	RC	All	L074810000 ³	N/A	L07481000C	N/A	N/A	N/A	—	—	
Guided cylinders	P5T	Flush mount	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—	
		Right angle	P8S-SNELX	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	B303	—	
	P5T2	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—	
	P5E	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—	
	HB	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—	
		20 - 25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B300	B303	
32 - 63mm		P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B300	B303		
P5L	80 - 100mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B300	B303		
Rotary actuators	P5W	All	P8S-SNFL3* 2.5m flying leads	N/A	P8S-SNSH3* .3m lead	N/A	N/A	N/A	N/A	N/A	
	PV WR XR	Normally open	SMH-1N ²	N/A	SMC-1NC	N/A	N/A	N/A	B307	—	
		Normally closed	SMC-1N ²	N/A	SMC-1NC	N/A	N/A	N/A	B307	—	
	PRN(A)	All	See page B306								
	PTR	10, 15	SWH-1N ³	N/A	SWH-1NC	N/A	N/A	Included	B308	—	
		20, 25, 32	SWH-2N ³	N/A	SWH-2NC	N/A	N/A	Included	B308	—	

1 Flying leads are 2 meters in length
 2 Flying Leads are 1.5 meters in length
 3 Flying leads are 1 meter in length

Note: See page B309 for Weld Immune Sensors and pages B312-B314 for NAMUR Intrinsically Safe Sensors.

* See page B311 for cord sets.

B

Electronic Sensors
 Actuator Products

Reed Sensor Selection Guide

Series	Bore size or type	3m flying leads	10m flying leads	8mm quick connect*	8 mm quick connect w/ 1 m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #		
P1Q	12mm - 25mm	P8S-CRFLS	N/A	P8S-CRSHS	N/A	P8S-CRMHS	N/A	N/A	N/A		
	32mm - 100mm	P8S-CRFLR	N/A	P8S-CRSHR	N/A	P8S-CRMHR	N/A	N/A	N/A		
Compact cylinders	P1M standard sensor	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—	
	P1M right angle sensor	All	P8S-SRELX	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	B303	—	
	LPM	9/16"	L077030000 ¹	N/A	L07703000C	N/A	N/A	N/A	N/A	B305	—
		3/4" - 1-1/8"	L077040000 ¹	N/A	L07704000C	N/A	N/A	N/A	N/A	B305	—
1-1/2" - 2"		L077050000 ¹	N/A	L07705000C	N/A	N/A	N/A	N/A	B305	—	
	2-1/2" - 4"	L077060000 ¹	N/A	L07706000C	N/A	N/A	N/A	N/A	B305	—	
Round body cylinders	P1L	20 - 25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B301	B303	
		32 - 63mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B301	B303	
		80 - 100mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B301	B303	
	SRM/SRDM	9/16" - 3/4"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B301	B303	
		1-1/16" - 2-1/2"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B301	B303	
	P	1-1/8" - 2-1/2"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B301	B303	
		3" - 4"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B301	B303	
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	B303	
	3MA/4MA	6" - 8"						P8S-TMA0X	B301	B303	
	3MA/4MA mini global sensor	1-1/8" - 5"	P8S-MRFLX	P8S-MRFTX	P8S-MRSHX	N/A	N/A	P8S-TMA0Z	B302	B303	
ISO cylinders	P1A standard sensor	10-25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B301	B303	
	P1A alternate sensors	10mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2CCB	B304	B304	
		12mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2DCB	B304	B304	
		16mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2FCB	B304	B304	
		20mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2HCB	B304	B304	
		25mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2JCB	B304	B304	
P1D standard & clean profiles	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—		
P1D standard profile mini sensors	All	P8S-MRFLX	P8S-MRFTX	P8S-MRSHX	N/A	N/A	N/A	B302	—		
P1D tie rod version	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMA0X	B301	B303		
Rodless cylinders	P1X	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMA0Y	B301	—	
	P1Z	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—	
	RC	All	L074800000 ²	N/A	L07480000C	N/A	N/A	N/A	—	—	
Guided cylinders	P5T	Flush mount	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—	
		Right angle	P8S-SRELX	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	N/A	B303	—
	P5T2	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—	
	P5E	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—	
	HB	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—	
		20 - 25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B301	B303	
32 - 63mm		P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B301	B303		
	80 - 100mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B301	B303		
Rotary actuators	P5W	All	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	PV WR XR	N.O. high amp	SMR-1 ¹	N/A	SMR-1C	N/A	N/A	N/A	N/A	B307	—
		N.O. low amp	SMR-1L ¹	N/A	SMR-1LC	N/A	N/A	N/A	N/A	B307	—
		N.C.	SMD-1L ¹	N/A	SMD-1LC	N/A	N/A	N/A	N/A	B307	—
	PRN	50 - 800	See model code						B306	—	
	PTR	10, 15	SWR-1 ²	N/A	SWR-1C	N/A	N/A	Included	B308	—	
20, 25, 32		SWR-2 ²	N/A	SWR-2C	N/A	N/A	Included	B308	—		

1 Flying leads are 1.5 meters in length
 2 Flying Leads are 1 meter in length

Note: See page B309 for Weld Immune Sensors and pages B312-B314 for NAMUR Intrinsically Safe Sensors.
 * See page B311 for cord sets.

B
 Electronic Sensors
 Actuator Products

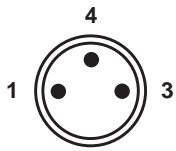
P8S Global Drop-In Solid State Sensors



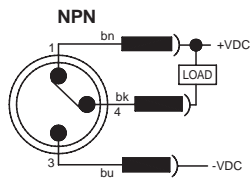
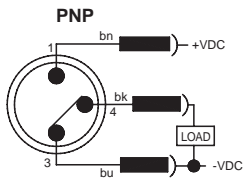
Wiring	PNP sensor	NPN sensor	PNP sensor ATEX certified
3m flying leads	P8S-GPFLX	P8S-GNFLX	P8S-GPFLX/EX
10m flying leads	P8S-GPFTX	P8S-GNFTX	N/A
0.3m lead with 8mm connector	P8S-GPSHX	P8S-GNSHX	
0.3m lead with 12mm connector	P8S-GPMHX	P8S-GNMHX	
1m lead with 8mm connector	P8S-GPSCX	P8S-GNSCX	

Wiring connection

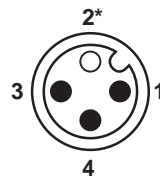
Flying lead or 8 mm connector (shown)



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Black	Output signal (N.O.)
3	Blue	-VDC

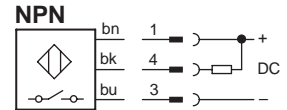
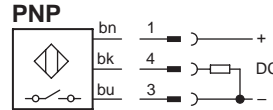


12 mm connector



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Black	Output signal (N.O.)
2*	White	Not used
3	Blue	-VDC

* Pin 2 not present.



P8S Global Drop-in Reed Sensors

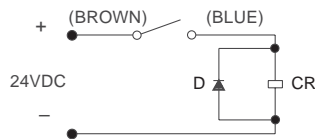


Wiring	Reed sensor
3m flying leads	P8S-GRFLX
10m flying leads	P8S-GRFTX
0.3m lead with 8mm connector	P8S-GRSHX
0.3m lead with 12mm connector	P8S-GRMHX
1m lead with 8mm connector	P8S-GRSCX

Circuit for switching contact protection (for inductive loads, e.g. solenoids, relays)

(Required for proper operation 24VDC)

Put diode parallel to load (CR) following polarity as shown below.

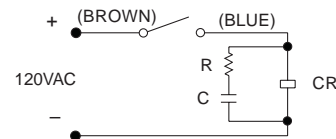


D: Diode: select a diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 volt, 1 amp diode
 CR: Relay coil (under 0.5W coil rating)

(Recommended for longer life 120 VAC)

Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.



Typical Example:

CR: Relay coil (under 2W coil rating)
 R: Resistor 1 K Ω - 5 K Ω , 1/4 W
 C: Capacitor 0.1 Ω F, 600 V

⚠ Caution

- Use an ampmeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- **NOTE:** When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.

- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that $R \text{ (ohms)} > E/0.3$.

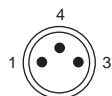
B
 Electronic Sensors
 Actuator Products

P8S Mini-Global Drop-In Solid State Sensors

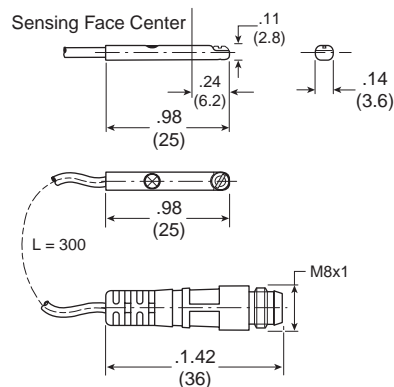
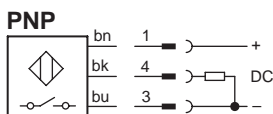
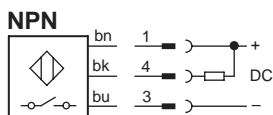


Wiring	PNP sensor	NPN sensor
3m flying leads	P8S-MPFLX	P8S-MNFLX
10m flying leads	P8S-MPFTX	P8S-MNFTX
0.3m lead with 8mm connector	P8S-MPSHX	P8S-MNSHX

Wiring connection



Pin	Wire	Function
1	Brown	+VDC
4	Black	NO
3	Blue	- VDC



B

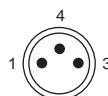
Electronic Sensors
 Actuator Products

P8S Mini-Global Drop-In Reed Sensors

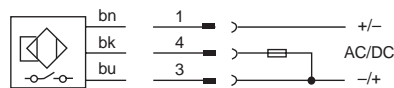


Wiring	Reed sensor
3m flying leads	P8S-MRFLX
10m flying leads	P8S-MRFTX
0.3m lead with 8mm connector	P8S-MRSHX

Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+V)
4	Black	Output signal
3	Blue	Ground (-V)



Caution

- Use an ammeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- **NOTE:** When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.

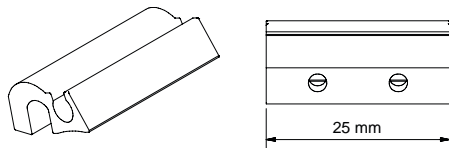
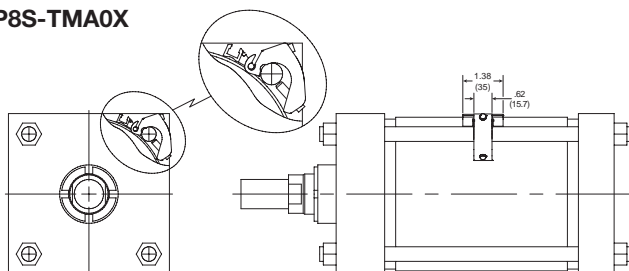
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that $R \text{ (ohms)} > E/0.3$.

Tie Rod Bracket Assembly Part Number and Dimensions

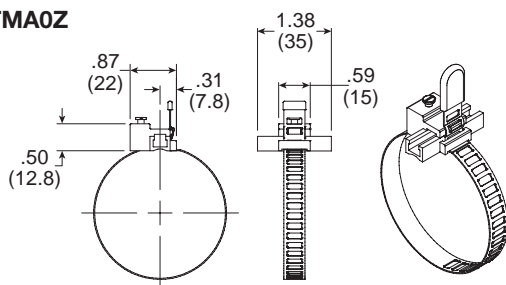
Tie Rod Bracket Assembly is necessary for Global and Mini-Global Sensor installation on all tie rod construction cylinders. This includes all Intermediate Trunnion mounts (Style DD or MT4); some 1-1/8" bore 3MA Series mounts; and all 6"-8" bore Sensors and bracket assemblies must be ordered separately.

Part number P8S-TMA0X fits 1-1/2" to 8" bores and 32-200mm bores for Global Sensors
 Part number P8S-TMA0Z fits 1-1/8" bore for Mini-Global Sensors

P8S-TMA0X



P8S-TMA0Z



Round body bracket assembly part numbers Sensors and brackets must be ordered separately

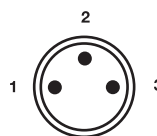
Bore size	Round body bracket
9/16" - 1-1/16"	P8S-TMC01
20 - 25mm	P8S-TMC01
1-1/8" - 2-1/2"	P8S-TMC02
32 - 63mm	P8S-TMC02
3" - 4"	P8S-TMC03
80 - 100mm	P8S-TMC03

P8S Right Angle Solid State Sensors

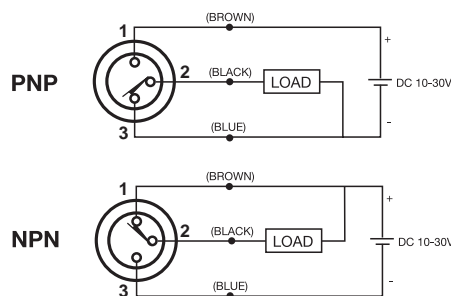


Wiring	PNP sensors	NPN sensors
0.2m lead with 8mm connector	P8S-SPTHXD	P8S-SNTHX
3m flying leads	P8S-SPELXD	P8S-SNELX
10m flying leads	P8S-SPETXD	P8S-SNETX

Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
2	Black	Output signal (N.O.)
3	Blue	-VDC

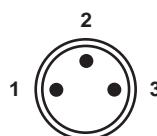


P8S Right Angle Reed Sensors



Wiring	Reed sensors
0.2m lead with 8mm connector	P8S-SRTHX
3m flying leads	P8S-SRELX
10m flying leads	P8S-SRETX

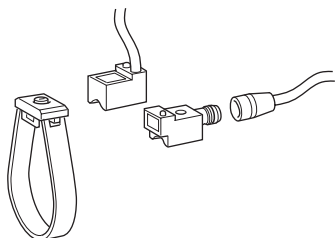
Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+V)
3	Black	Not used
2	Blue	Output signal (-V or Ground)

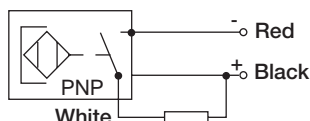
P1A Series Solid State Sensors

These sensors are of solid-state type, with no moving parts. Short-circuit and transient protection is incorporated as standard. The integral electronics make these sensors suitable for applications with very high switching frequencies.

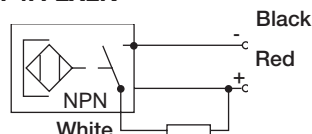


Wiring connection

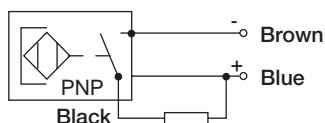
P1A-2XMK



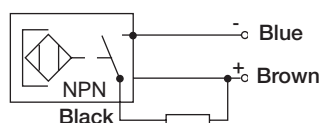
P1A-2XLK



P1A-2XHK, P1A-2XJH

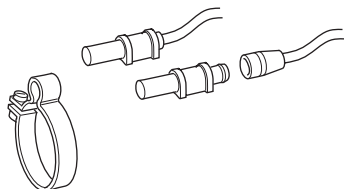


P1A-2XEK, P1A-2XFH

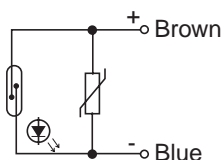


P1A Series Reed Sensors

The reed sensors incorporate a well-proven, universal-voltage, compact reed switch element; making them suitable for a wide range of applications. They can work with electronic control systems or conventional relay systems.



Wiring connection



Electronic Sensors

Output	Cable length	Weight (lb)	Part number
PNP, N.O.	2 m	0.09	P1A-2XMK, Rt. angle
NPN, N.O.	2 m	0.09	P1A-2XLK, Rt. angle
PNP, N.O.	2 m	0.022	P1A-2XHK
NPN, N.O.	2 m	0.022	P1A-2XEK
PNP, N.O.	*	0.033	P1A-2XJH
NPN, N.O.	*	0.033	P1A-2XFH

Mounting Brackets

Fits cylinder bore size	Weight (lb)	Part number
10mm	0.01	P1A-2CCC
12mm	0.01	P1A-2DCC
16mm	0.0176	P1A-2FCC
20mm	0.0176	P1A-2HCC
25mm	0.022	P1A-2JCC

Cable for Sensors

Cable length	Weight (lb)	Part number
3 m	0.12	9126344341**
10 m	0.4	9126344342**

* Cable ordered separately

** Cable includes female part connector for sensor

Electronic Sensors

Output	Cable length	Weight (lb)	Part number
Making (N.O.)	3m	0.12	P1A-2XRL
Making (N.O.)	*	0.004	P1A-2XSH

Mounting Brackets

Fits cylinder bore size	Weight (lb)	Part number
10mm	0.004	P1A-2CCB
12mm	0.005	P1A-2DCB
16mm	0.006	P1A-2FCB
20mm	0.009	P1A-2HCB
25mm	0.010	P1A-2JCB

Cable for Sensors

Cable length	Weight (lb)	Part number
3 m	0.12	9126344341**
10 m	0.4	9126344342**

* Cable ordered separately

** Cable includes female part connector for sensor

B

Electronic Sensors
 Actuator Products

LP/LPM Series Sensors

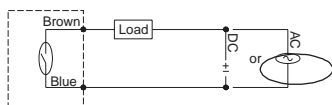
Bore size	Reed (Low AMP)	NPN sinking	PNP sourcing
9/16"	L077030000	L076950000	L076990000
3/4", 1-1/8"	L077040000	L076960000	L077000000
1-1/2", 2"	L077050000	L076970000	L077010000
2-1/2", 3", 4"	L077060000	L076980000	L077020000

Note: For sensors with an 8mm connector, replace the last digit with a 'C'. For example: L07696000C.

Circuits

Reed Sensor

NOTE: Polarity must be observed for DC operation only.



*Number in parentheses pertains to inductive loads.

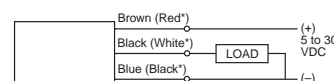
NPN Sensor – Sinking Output

Color of Cable Black
 "On" State Voltage Drop 1.5V Maximum



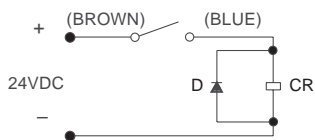
PNP Sensor – Sourcing Output

Color of Cable Black
 "On" State Voltage Drop 1.5V Maximum



Circuit for Switching Contact Protection (Inductive Loads) – for Reed Sensor Only (Required for proper operation 24V DC)

Put Diode parallel to load (CR) following polarity as shown below.

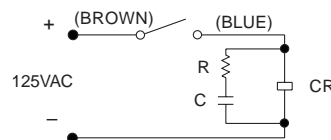


D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 Volt, 1 Amp Diode
 CR: Relay coil (under 0.5W coil rating)
 (Recommended for longer life 125 VAC)

*Wire colors in parentheses pertain to sensors manufactured before 10/15/93.

Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.



Typical Example:
 CR: Relay coil (under 2W coil rating)
 R: Resistor 1 KΩ – 5 KΩ, 1/4 W
 C: Capacitor 0.1 μF, 600 V

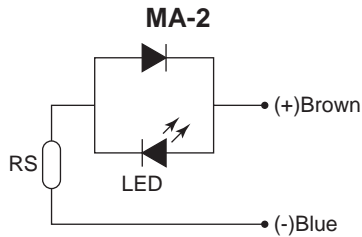
⚠ Caution

- Use an ammeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- NOTE: When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.
- Current capabilities are relative to operational temperatures.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that R (ohms) > E/0.3.

B
 Electronic Sensors
 Actuator Products

PRNA Sizes 3 to 30 Sensors

Fixed position sensor



Variable position sensor

Size	Part number
1	FR-1PRN
3	FR-3PRN
10	FR-10PRN
20	FR-20PRN
30	FR-30PRN

Model code and ordering information

Example: SR20 - 180 - 90

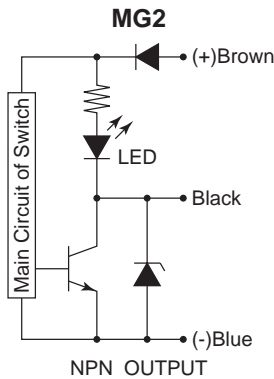
SR	20	-	180	-	90
	Size		Rotation		Reference Point
	3		090 90°		45 45°
	10		100 100°		90 90°
	20		180 180°		
	30		270 270°		

B

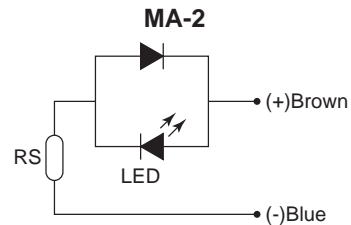
Electronic Sensors
 Actuator Products

PRN Sizes 50 to 800 Sensors

Solid state sensors



Reed sensors



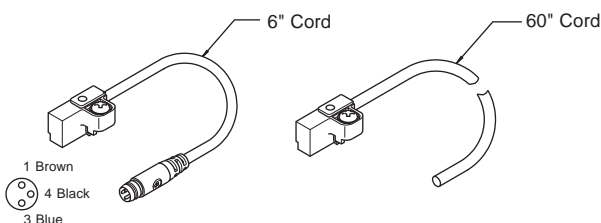
Model code and ordering information

Example: FM50 - 90 - 45 - MA 2

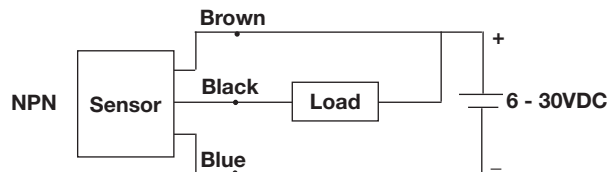
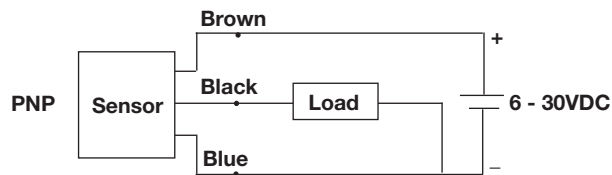
FM	50	-	90	-	45	-	MA	2
	Size		Rotation		Reference Point		Sensor Type	Number Sensors
	50		090 90°		45 45°		MA Reed	2 Standard
	150		180 180°		90 90°		MG Solid State	
	300		270 270°					
	800							

Solid State (Hall Effect) Sensors

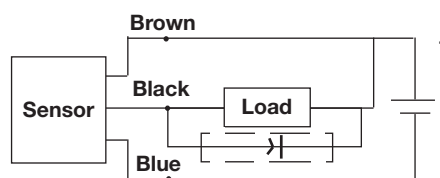
Type	LED color	Logic	Cable/Connector	Part number
N.O.	Green	PNP	1.5m black with leads	SMH-1P
N.O.	Red	NPN		SMH-1N
N.C.	Yellow	PNP		SMC-1P
N.C.	White/Red	NPN	0.15m black with connector	SMC-1N
N.O.	Green	PNP		SMH-1PC
N.O.	Red	NPN		SMH-1NC
N.C.	Yellow	PNP	SMC-1PC	
N.C.	White/Red	NPN	SMC-1NC	



Wiring connection



Protection circuit*



* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)

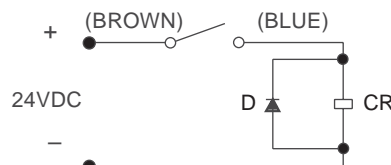
Reed Sensors

Reed sensors are available in a normally open or normally closed configuration. The low amp sensor is suitable for connection to PLCs or other low current devices. The high amp sensor can be used to drive sequencers, relays, coils, or other devices directly.

Type	LED color	Rating	Cable/Connector	Part number
N.O.	Green	High Amp	1.5m Gray with Leads	SMR-1
N.O.	Red	Low Amp		SMR-1L
N.C.	Yellow	Low Amp	0.15m Gray with Connector	SMD-1L
N.O.	Green	High Amp		SMR-1C
N.O.	Red	Low Amp	SMR-1LC	
N.C.	Yellow	Low Amp	SMD-1LD	

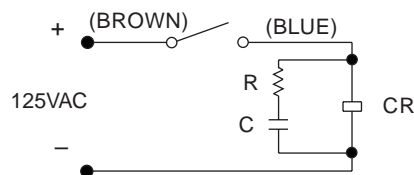
Integral circuit for switching contact protection

(Required for proper operation 24V DC)
 Put Diode parallel to load (CR) with polarity as shown below.



- D: Diode: select a Diode with the breakdown voltage and current rating according to the load.
- CR: Relay coil (under 0.5 W coil rating)

(Recommended for longer sensor life 125V AC)
 Put resistor and capacitor parallel to load (CR).



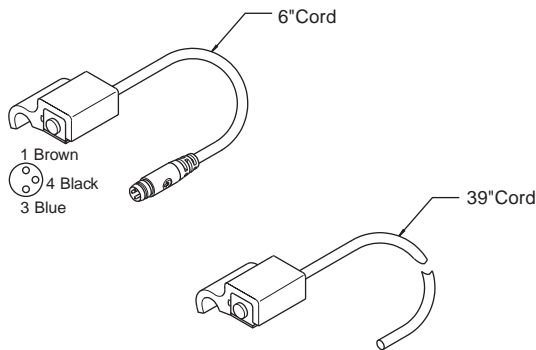
- CR: Relay coil (under 2 W coil ratings)
- R: Resistor under 1 K ohm
- C: Capacitor 0.1 μF

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 Actuator Products

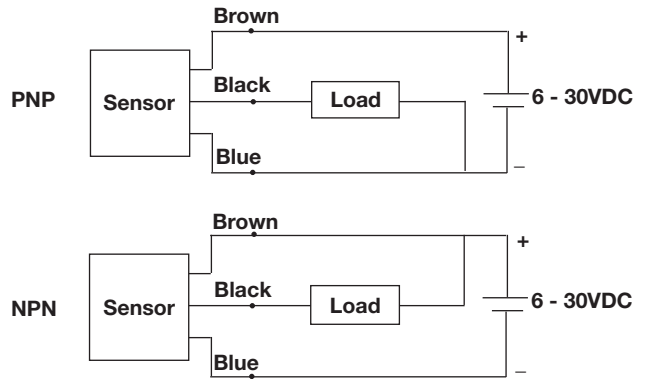
Solid State (Hall Effect) Sensors

PTR model	PNP		NPN	
	With 6" male quick connect	With 39" potted-in leads	With 6" male quick connect	With 39" potted-in leads
10	SWH-1PC	SWH-1P	SWH-1NC	SWH-1N
15	SWH-1PC	SWH-1P	SWH-1NC	SWH-1N
20	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N
25	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N
32	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N

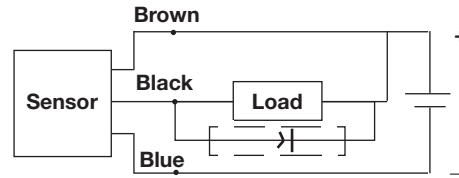
Note: Sensors with male quick connect option require female cordsets to be ordered separately. Please reference catalog 0900P-5, page M22.



Wiring connection



Protection circuit*



* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)

Reed Sensors

PTR model	With 6" male quick connect	With 39" potted-in leads
10	SWR-1C	SWR-1
15	SWR-1C	SWR-1
20	SWR-2C	SWR-2
25	SWR-2C	SWR-2
32	SWR-2C	SWR-2

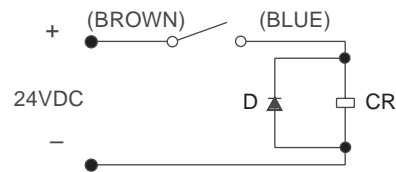
Sensors with male quick connect option require female cordsets to be ordered separately.

Note: Please reference catalog 0900P-5, page M22

Protection circuit (Inductive loads)

(Required for proper operation 24VDC)

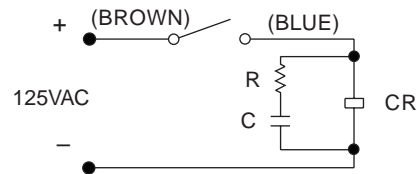
Select a diode with a breakdown voltage and current rating according to the load (CR). Place a diode in parallel to the load with the polarity as indicated:



CR: Relay coil (under 0.5W coil rating)

(Recommended for longer sensor life 125VAC)

Select a resistor and capacitor according to the load (CR). Place a resistor and capacitor in parallel to the load:



CR: Relay coil (under 2W coil rating)

R: Resistor under 1 K ohm

C: Capacitor 0.1 μF

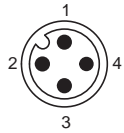
B

Electronic Sensors
 Actuator Products

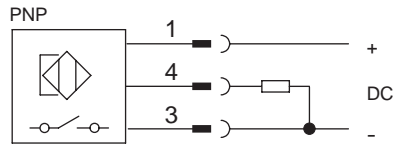
Weld Immune Sensors



- Weld immune in all welding applications (AC, DC and medium frequency welding).
- Sensor locks the output during the welding process; when welding process stops, the sensor updates the output accordingly.
- NOTE: Tie rod construction of the P1D Series can be ordered directly in the model code.

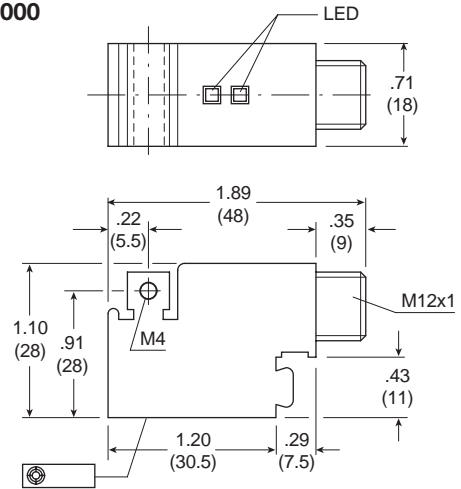


Pin	Function
1	Operating voltage (+VDC)
4	Output signal (N.O.)
3	-VDC
2	Not used

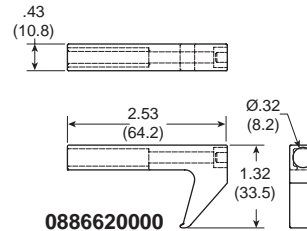


Description	Part number
Weld immune sensor	0886600000
Tie rod bracket kit	0886620000

0886600000



0886620000



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 Electronic Sensors
 Actuator Products

8mm Cordset with Female Quick Connect

A female connector is available for all sensors with the male 8mm quick connect option. The male plug will accept a snap-on or threaded connector. Cordset part numbers are listed below:

Cable length	Threaded connector	Snap on connector
5 meters	086620T005	086620S005
2 meters	086620T002	086620S002

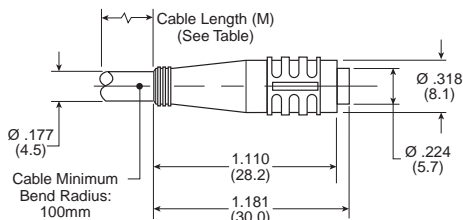
Cordset Specifications

Connector Oil resistant polyurethane body material, PA 6 (Nylon) contact carrier, spacings to VDE 0110 Group C, (150 AC/DC)
 ContactsGold plated beryllium copper, machined from solid stock
 Coupling Method..... Snap-Lock or chrome plated brass nut
 Cord Construction Oil resistant black PUR jacket, non-wicking, non-hygroscopic, 300V.
 Cable end is stripped and tinned.
 ConductorsExtra high flex stranding, PVC insulation
 Temperature -40 to 194°F (-40 to 90°C)
 Protection..... NEMA 1, 3, 4, 6P and IEC 1P67
 Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

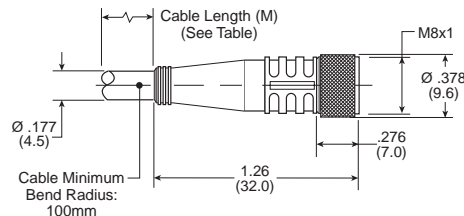
B

Electronic Sensors
 Actuator Products

Snap-On Straight Connector



Threaded Straight Connector



12mm Cordset with Female Quick Connect

M12 Straight connector

Cable length	Part number
5 meters	9126487205
2 meters	9126487202

M12 Right angle Connector

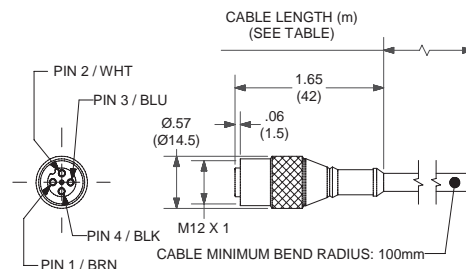
Cable length	Part number
5 meters	9126487205
2 meters	9126487202

A female connector is available for all sensors with the male 12mm quick connect option. The cordsets are available with a right angle or straight connector. Cordset part numbers are listed above.

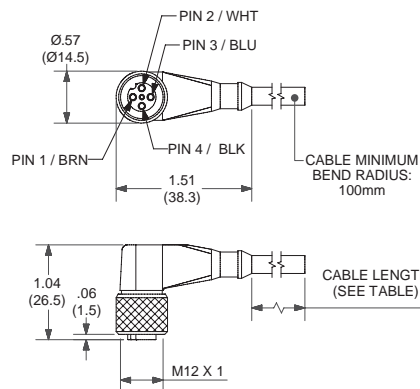
Cordset Specifications

Connector Polyvinylchloride (PVC) body material, PVC contact carrier, spacing to VDE 0110 Group C, (250VAC / 300VDC)
 Contacts Gold Plated Copper Tin (CuSn), stamped from stock.
 Coupling Method..... Threaded nut: Chrome plated brass.
 Cord Construction PVC non-wicking, non-hygroscopic, 250VAC / 300VDC. Cable end is stripped.
 Conductors Extra high flex stranding with PVC insulation
 Temperature -13°F to 158°F (-25°C to 70°C)
 Protection..... NEMA 1, 3, 4, 6P and IEC 1P67
 Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

Straight Connector



Right Angle Connector



Connection Block Valvetronic 110

The Valvetronic 110 is a connection block that can be used for collecting signals from sensors at various points on a machine and connecting them to the control system via a multicore cable. Valvetronic 110 can also be used for central connection of the multi-core cable to the outputs of a control system, and can be laid to a machine where the output signals can be connected. The connection block has ten 8 mm snap-in connectors and a multi-core cable which is available in lengths of 3 or 10 m. The connections on the block are numbered from 1 to 10. Blanking plugs are available for unused connections, as labels for marking the connections of each block.



Technical data

Connections

Ten 3-pole numbered 8 mm round snap-in female contacts
 Input block



- Pin 1 Common, +24 VDC
- Pin 2 Input signal
- Pin 3 Common, 0V

Output block



- Pin 1 Common, GND
- Pin 2 Output signal
- Pin 3 Common, 0V

Electrical data

Voltage 24 VDC (max. 60 V AC/75 V DC)
 Insulation group according to DIN 0110 class C
 Load max. 1 A per connection total max. 3 A

Cable

Length 3 m or 10 m
 Type of cable LifYY11Y
 Conductor 12
 Area 0.34 mm²
 Color marking According to DIN 47 100

Mechanical data

Enclosure IP 67, DIN 40050 with fitted contacts and/or blanking plugs.
 Temperature -20 °C to +70 °C

Material

Body PA 6,6 VD according to UL 94
 Contact holder
 PBTP
 Snap-in ring LDPE
 Moulding mass Epoxy
 Seal NBR
 Screws Plated steel

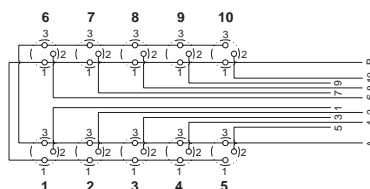
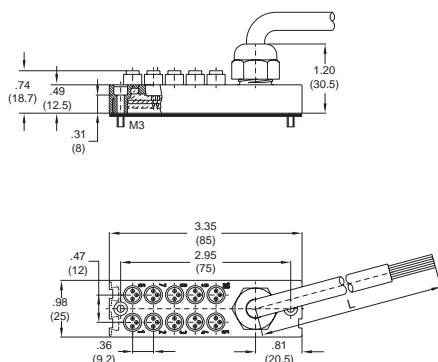
Industrial durability

Good chemical and oil resistance. Tests should be performed in aggressive environments.

Ordering information

Designation	Weight kg	Part number
Connection block Valvetronic 110 with 3 m cable	0.32	9121719001
Connection block Valvetronic 110 with 10 m cable	0.95	9121719002
Blanking plugs (pack of 10) Use blanking plugs to close unused connections	0.02	9121719003
Labels (pack of 10) White labels to insert in grooves on the side of the connection	0.02	9121719004

Dimensions and wiring diagrams



Conductor	Color	Input	Output
1	Pink	Signal 1	Signal 1
2	Grey	Signal 2	Signal 2
3	Yellow	Signal 3	Signal 3
4	Green	Signal 4	Signal 4
5	White	Signal 5	Signal 5
6	Red	Signal 6	Signal 6
7	Black	Signal 7	Signal 7
8	Violet	Signal 8	Signal 8
9	Grey-Pink	Signal 9	Signal 9
10	Red-Blue	Signal 10	Signal 10
A	Blue	0 V	0 V
B	Brown	+24 V	PE

NAMUR Intrinsically Safe Sensors



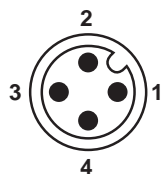
For Tie Rod Style Cylinders

Sensor description	Part number
Fits 1-1/8" to 4" bore and 32-100mm bore (2m flying lead)	089779001
Fits 1-1/8" to 4" bore and 32-100mm bore (12mm connector)	089779002
Fits 5" to 6" bore and 125-160mm bore (2m flying lead)	089779003
Fits 5" to 6" bore and 125-160mm bore (12mm connector)	089779004
Fits 8" bore and 200mm bore (2m flying lead)	089779005
Fits 8" bore and 200mm bore (12mm connector)	089779006

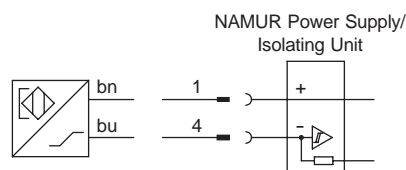
Specifications

Electrical configuration.....	NAMUR 2-wire
Output function	NAMUR
Supply voltage.....	5-25 VDC
Response sensitivity	≤ 30 Gauss
Switching frequency	5 kHz
Switching output	Control current dependent on switching
Residual ripple.....	≤ 5% of supply voltage
Power consumption, attenuated.....	≥ 2.5mA
Power consumption, unattenuated.....	≤ 1mA
Internal capacitance	≤ 15nF
Internal inductance	≤ 25 μH
Cable resistance.....	≤ 50 Ohm
Hysteresis.....	≤ 1mm
Repeatability.....	≤ 0.1mm
EMC.....	EN 60 947-5-6
Short circuit protected.....	Yes
Reverse polarity protected.....	Yes
Enclosure rating.....	IP67
Shock/vibration stress	30 g, 11ms, 10-55 Hz, 1mm
Operating temperature	-25°C to +70°C (-13°F to +158°F)
Housing material.....	Aluminum, plastic
Connector cable.....	PVC with flying leads (shown)
Connector (option).....	M12 connector
Classification	TÜV 99 ATEX 1398 II 2G EEx ib IIC T6

Wiring connection



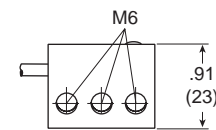
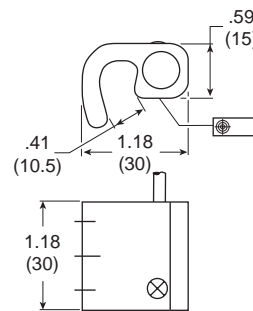
Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Blue	-VDC
2		Not used
3		Not used



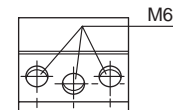
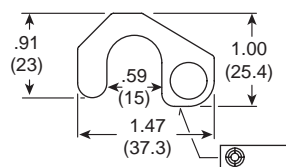
Data for connecting power supplies or other approved isolating amplifiers:

Short circuit current 1Kmax	≤ 30mA
No load voltage	≤ 16VDC
Power loss	≤ 75mW

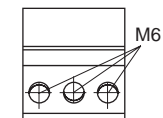
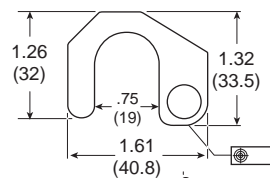
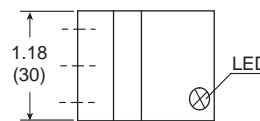
Note: Intrinsically safe solutions must include a NAMUR Power Supply



0897790001



0897790003



0897790005

NAMUR Intrinsically Safe Sensors



For Round Body Cylinders

Description	Part number
NAMUR Sensor for round body cylinder	0897790007
Bracket for 18-29mm (0.71"-1.14") outer diameter	0897800001
Bracket for 28-39mm (1.10"-1.54") outer diameter	0897800002
Bracket for 38-49mm (1.50"-1.93") outer diameter	0897800003
Bracket for 48-59mm (1.89"-2.32") outer diameter	0897800004
Bracket for 58-69mm (2.28"-2.72") outer diameter	0897800005
Bracket for 68-79mm (2.68"-3.11") outer diameter	0897800006
Bracket for 88-99mm (3.46"-3.90") outer diameter	0897800007
Bracket for 98-109mm (3.86"-4.29") outer diameter	0897800008

Specifications

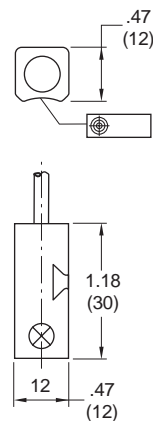
Electrical configuration.....	NAMUR 2-wire
Output function	NAMUR
Supply voltage.....	5-25 VDC
Response sensitivity	≤ 30 Gauss
Switching frequency	5 kHz
Switching output	Control current dependent on switching
Residual ripple.....	≤ 5% of supply voltage
Power consumption, attenuated.....	≥ 2.5mA
Power consumption, unattenuated.....	≤ 1mA
Internal capacitance	≤ 15nF
Internal inductance	≤ 25 μH
Cable resistance.....	≤ 50 Ohm
Hysteresis.....	≤ 1mm
Repeatability.....	≤ 0.1mm
EMC.....	EN 60 947-5-6
Short circuit protected.....	Yes
Reverse polarity protected.....	Yes
Enclosure rating.....	IP67
Shock/vibration stress	30 g, 11ms, 10-55 Hz, 1mm
Operating temperature	-25°C to +70°C (-13°F to +158°F)
Housing material.....	Aluminum, plastic
Connector cable.....	PVC with flying leads (shown)
Classification	TÜV 99 ATEX 1398 II 2G EEx ib IIC T6

Data for connecting power supplies or other approved isolating amplifiers:

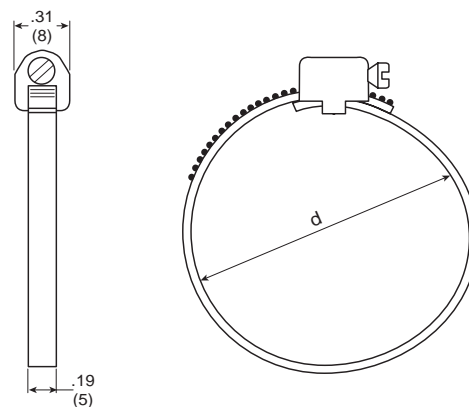
Short circuit current 1Kmax	≤ 30mA
No load voltage	≤ 16VDC
Power loss	≤ 75mW

Note: Intrinsically safe solutions must include a NAMUR Power Supply

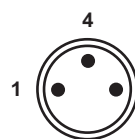
0897790007



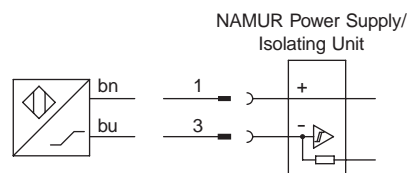
Round Body Brackets



Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
3	Blue	-VDC
4		Not used



NAMUR Sensor Power Supply



For All NAMUR Sensors

Supply voltage	Part number
115VAC	0897810001
230VAC	0897810002
24VDC	0897810003

- Reliable DC-decoupling between input, output and supply voltage in accordance with VDE 0100 Part 410
- 2-channel with one relay output SPDT respectively
- Intrinsically safe inputs complying with [Ex 1a] IIC
- Housing with snap fastening for support rail DIN 46277

Specifications

Supply voltage..... 115 VAC (p/n 0897810001)
 230 VAC (p/n 0897810002)
 24 VDC (p/n 0897810003)

Mains frequency48-62 Hz

Switching frequency≤ 20 Hz

Power consumption per channelApproximately 1.5 VA
 Approximately 0.7 W only for p/n 0897810003

Inputs2 sensors

No load voltage8.5 VDC

Short circuit current≥ 6mA

Permissible external capacitance..... ≤ 567nF

Permissible external inductance..... ≤ 5 mH

Switching outputs..... 1 relay per input: SPDT

Switching voltage ≤ 250 VAC

Switching current.....≤ 5 A

Switching output ≤ 100 VA

Permit.....PTB no. Ex-95.C.2003X

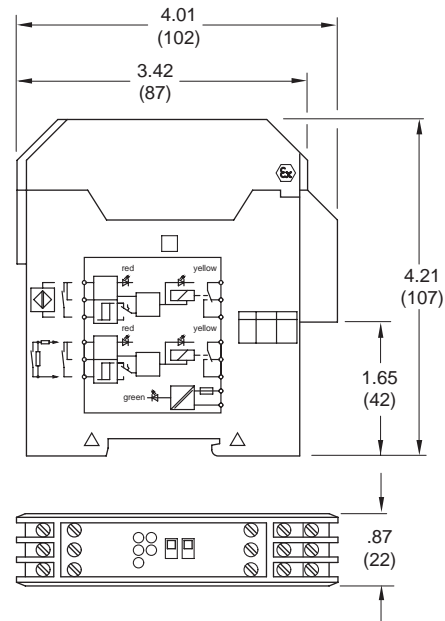
VDE protection class I

Enclosure rating..... IP20

Operating temperature -25°C to +60°C (-13°F to +140°F)

Approximate weight.....250g (8.8 oz.)

Housing material.....Plastic



B

Electronic Sensors
Actuator Products

End-of-Stroke Proximity Sensors

Ordering information

Sensor type	Inductive proximity			Non-contacting magnetically actuated	
Style	EPS-7	EPS-5	EPS-6	CLS-1	CLS-4
Sensor part number	148897****	146617****	148896****	148275****	149109****
6' Cable	0853550006	0853550006	0859170006	0853550006	—
12' Cable	0853550012	0853550012	0859170012	0853550012	—
6' Cable, right angle	0875470006	0875470006	—	0875470006	—

**** Part number suffix: **** 4-digit suffix indicates probe length: 0125=1.25", 0206=2.06", 0288=2.875", 0456=4.562"

Specifications

Style	EPS-7	EPS-5	EPS-6	CLS-1	CLS-4
Code designator	H	R	D	F	B
Sensor type	Inductive proximity	Inductive proximity	Inductive Proximity	Non-contacting magnetically actuated	Non-contacting magnetically actuated
Description	Economical, General Purpose, 2 wire device, primarily for AC applications, not suitable for 24 VDC applications. Use EPS-5 only for automotive industry customers who specify them.		Economical, General Purpose, 3 wire, DC sensor, dual output: sinking and sourcing	Functional replacement for AB (Mechanical) Limit Switches in many applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style.	Functional replacement for AB (Mechanical) Limit Switches in many High Temperature applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style.
Supply voltage	20 to 250 VAC/DC	20 to 230 VAC/DC	10 to 30 VDC	24 to 240 VAC/DC	24 to 240 VAC/DC
Load current, min	8 mA	5 mA	NA	NA	NA
Load current, max	300 mA	500 mA	200 mA	4 AMPS @ 120 VAC 3 AMPS @ 24 VDC	4 AMPS @ 120 VAC 3 AMPS @ 24 VDC
Leakage current:	1.7 mA, max.	1.7 mA, max.	10 micro amps max.	—	—
Voltage drop	7 V, max.	10 V, max	2 VDC max.	NA	NA
Operating temperature	-14° to 158° F	-4° to 158° F	-14° to 158° F	-40°F to 221° F	-40° F to 400° F
Connection	3-pin mini	3-pin mini	5-pin mini	3-pin mini	144" PTFE coated flying leads with 1/2" conduit hub
Enclosure rating	IEC IP67	NEMA 4, 6, 12, 13	IEC IP67	NEMA 1, 2, 3, 4, 4x, 5, 6, 6P, 11, 12, 12K, 13	NEMA 1, 2, 3, 4, 4x, 5
Led indication	Yes	Yes	Yes	No	No
Short circuit protection	Yes	Yes	Yes	No	No
Weld field immunity	Yes	Yes	Yes	Yes	Yes
Output	2 wire, Normally Open with leakage current	2 wire, Normally Open with leakage current	Dual output: DC Sinking and DC Sourcing, user selectable via wiring	SPDT (Single pole double throw), Normally Open/Normally Closed, Form C	SPDT (Single pole double throw), Normally Open/ Normally Closed, Form C
Approvals/marks	CE, UL, CSA	UL	CE, UL, CSA	UL or CSA	UL or CSA
Make / break location	0.125" from end of stroke, typical. Tolerance is 0/-0.125"				
Wiring instructions	Pin 1: AC ground (Green)	Pin 1: AC ground (Green)	Pin 1: +10 to 30 VDC (White)	Pin 1: Common (Green)	Common: (Black)
	Pin 2: Output (Black)	Pin 2: Output (Black)	Pin 2: Sourcing output (Red)	Pin 2: Normally Closed (Black)	Normally Open: (Blue)
	Pin 3: AC line (White)	Pin 3: AC line (White)	Pin 3: Grounded (not connected or required)	Pin 3: Normally Open (White)	Normally Closed: (Red)
			Pin 4: Sinking output (Orange)		
			Pin 5: DC common (Black)		

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Electronic Sensors
Actuator Products

Series and Parallel Wiring

When Parker EPS-5, 6 or 7 proximity sensors are used as inputs to programmable controllers, the preferred practice is to connect each sensor to a separate input channel of the PC. Series or parallel operations may then be accomplished by the internal PC programming.

Parker EPS-5, 6 or 7 sensors may be hard wired for series operation, but the voltage drop through the sensors (see specifications) must not reduce the available voltage below what is needed to actuate the load.

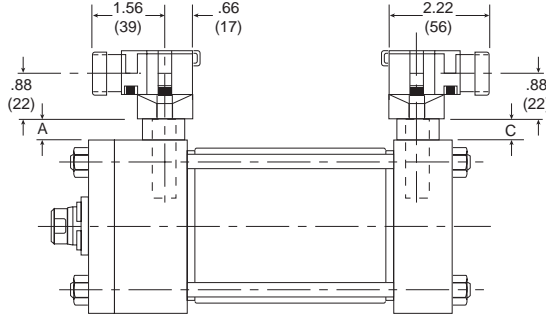
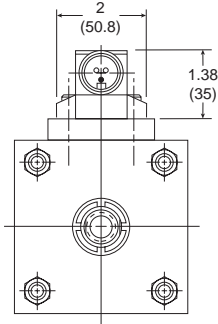
Parker EPS-5, 6 or 7 sensors may also be hard wired for parallel operation. However, the leakage current of each sensor will pass through the load. The total of all leakage currents must not exceed the current required to actuate the load. In most cases, the use of two or more EPS-5, 6 or 7 sensors in parallel will require the use of a bypass (shunt) resistor.

EPS-5
Automotive Applications

(Meets some Automotive Manufacturer's Specifications)

Series	A max.	C max.
2A, 4MA, 4MAJ	1.55"	1.30"

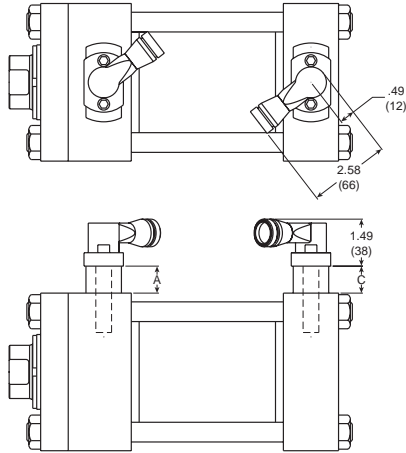
For exact dimensions, see Bulletin 0840-G-E1



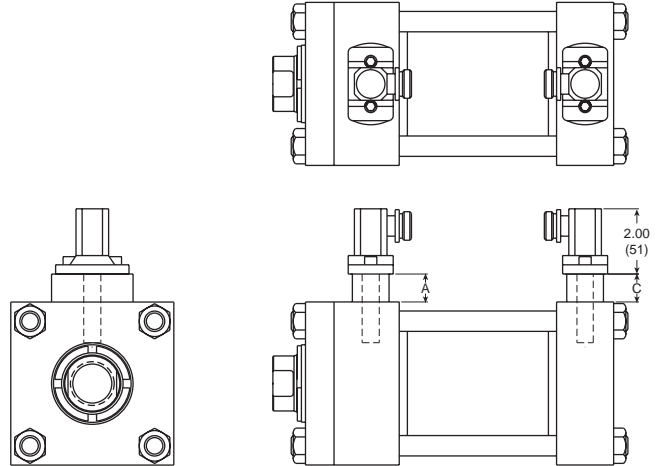
B

Electronic Sensors
 Actuator Products

EPS-7 & EPS-6 sensors

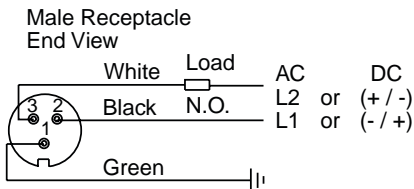


CLS-1 & 4 sensors

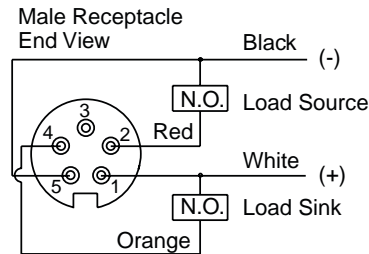


Connector pin numbering

3-pin mini



5-pin mini



How to Specify EPS Sensors

Parker EPS proximity sensors may be ordered on 2A, 2AN, 4MA and 4MAJ Series cylinders as follows:

- 1) Complete the basic cylinder model number.
- 2) Place an "S" in the model number to denote sensors and/or special features.
- 3) Mounting styles D, DB, JB, or HB should be used with caution because of possible mounting interferences. Consult bulletin 0840-G-E1 for additional information.
- 4) Special modifications to cylinders other than sensors must have a written description.

- 5) Specify letter prefix "H" for EPS-7, "D" for EPS-6, "R" for EPS-5, "F" for CLS-1, or "B" for CLS-4, then fill in the four fields specifying port location, sensor orientation and actuation point for both head and cap. If only one sensor is used, place "XXXX" in the unused fields.

Example = H13CGG-XXXX denotes a sensor on the head end only, EPS-7

Example = BXXXX-42BGG denotes a sensor on the cap end only, CLS-4

Head end

R	1	3	A	GG
Specify:	Port	Sensor	Sensor	Actuation Point
R = EPS-5	Location	Location	Orientation	GG = End of Stroke
H = EPS-7	See Figure 1.	See Figure 1.	See Figure 2 for EPS-7 and EPS-6 only.	See Bulletin 0840-G-E1 for stroke remaining.
D = EPS-6	1.	1.		
F = CLS-1				
B = CLS-4				
N = Prep for sensors only				

Cap end

4	2	B	GG
Port Location	Sensor	Sensor	Actuation Point
See Figure 1.	Location See Figure 1.	Orientation See Figure 2 for EPS-7 and EPS-6 only.	GG = End of Stroke
			See Bulletin 0840-G-E1 for stroke remaining.

Note: All specified sensor and port locations are as seen from rod end of cylinder.

*EPS-5 sensors will be oriented so that the connectors face each other.

**Consult the Wadsworth, Ohio facility for this option with 4MA and 4MAJ Series cylinders.

Figure 1

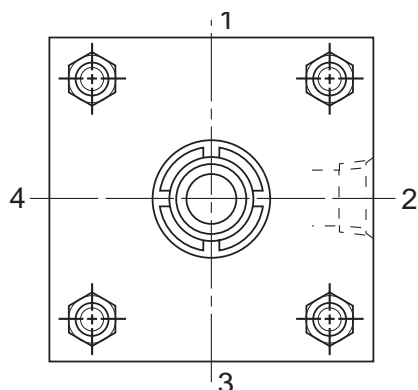
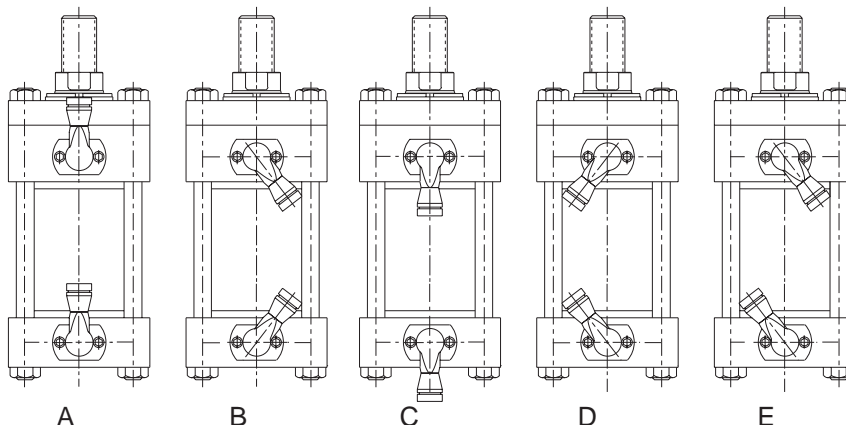


Figure 2



Example:

4.00 CJ4MAUS14AC 12.000
 S = H13CGG-13CGG

B
 Electronic Sensors
 Actuator Products

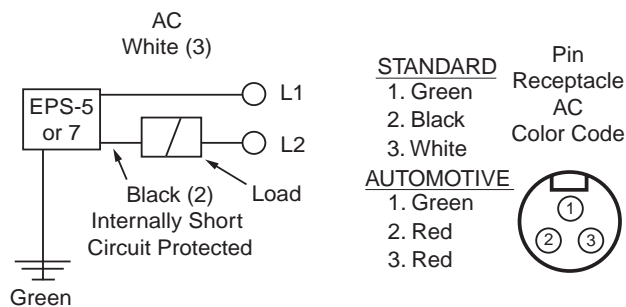
EPS-5 & EPS-7

Connectors

The male quick disconnect on the Parker EPS-5 or 7 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

Cable length	Part number	
	Automotive	Standard
3'	085356003	0853550003
6'	085356006	0853550006
9'	085356009	—
12'	0853560012	0853550012



B

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 Actuator Products

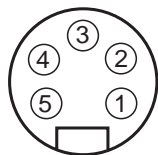
EPS-6

Connectors

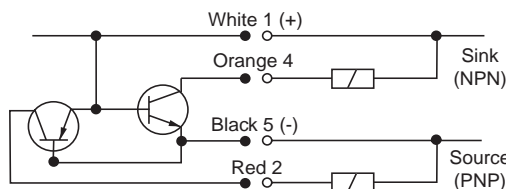
The male quick disconnect on the Parker EPS-6 is a Brad Harrison 41310 connector.

Plug Pin and Cable Identification

- 1) +10 to 30 VDC (White)
- 2) Source (Red)
- 3) Grounded not connected nor required
- 4) Sink (Orange)
- 5) Common (Black)



Cable length	Part number
3	0859170003
6	0859170006
12	0859170012



LED Function	"Ready"	"Target"
Power Applied (No Target)	ON	OFF
Target Present	OFF	ON
Short Circuit Condition	FLASH	FLASH

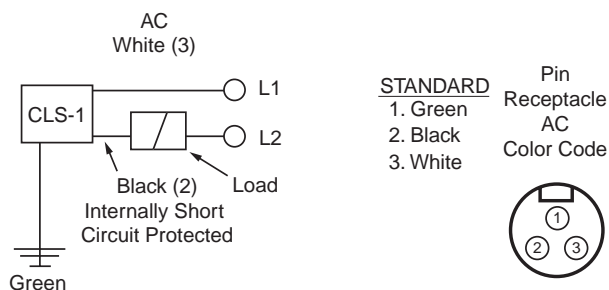
CLS

Connectors

The male quick disconnect on the Parker CLS-1 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

Cable length	Part number
3'	0853550003
6'	0853550006
9'	—
12'	0853550012



The connection for the CLS-4 are 144" PTFE insulated flying leads with 1/2" conduit hub. 3-wire: Common (black), Normally open (blue), and Normally closed (red).

PTR and HP Series Proximity Sensors

The inductive type proximity sensor provides end of rotation indication. The non-contact probe senses the presence of the ferrous cushion spear and has no springs, plungers, cams or dynamic seals that can wear out or go out of adjustment. The sensor is solid state and meets NEMA 3, 4, & 13 specifications. For ease of wiring, the connector housing is rotatable through 360°. To rotate, lift the cover latch, position, and release.

A standard proximity sensor controls 20-230 VAC/DC loads from 5 to 500 mA. The low 1.7 mA off-state leakage current can allow use for direct PLC input. The standard short circuit protection (SCP) protects the sensor from a short in the load or line upon sensing such a condition (5 amp or greater current) by assuming a non-conductive mode. The fault condition must be corrected and the power removed to reset the sensor preventing automatic restarts.

The low voltage DC sensor is also available for use with 10-30 VDC. This sensor is in a non-rotatable housing, but does incorporate the short circuit protection.

Both sensors are equipped with two LEDs, "Ready" and "Target". The "Ready" LED is lit when power is applied and the cushion spear is not present. The "Target" LED will light and the "Ready" LED will go out when the sensor is closed, indicating the presence of the cushion spear. Both LEDs flashing indicates a short circuit condition.

Notes:

1. Available with or without cushions.
2. Not available with stroke adjusters.
3. Pressure rating: 3000 PSIG
4. Operating temperature: -4°F to 150°F
5. Specify sensor type, orientation and voltage when ordering.
6. The low voltage DC sensor is available in non-rotatable style only, consult representative for further information.

Inductive Proximity Sensors – 8mm Barrel Type

Proximity sensors are normally ordered with the unit as part of the model number. Use these part numbers for replacement parts only.

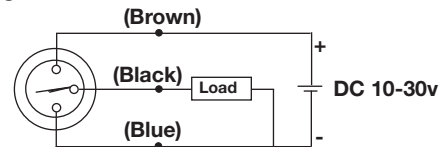
Ordering information

Series	PNP		NPN	
	Quick* connect	Flying leads	Quick ** connect	Flying leads
HB	B8830-P	913090000	B8830-N	913090100
P5L	B8830-P	913090000	B8830-N	913090100
WR	B8830-P	913090000	B8830-N	913090100

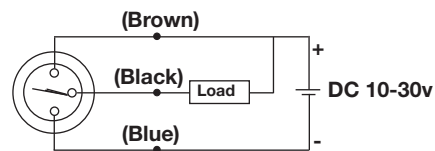
* Order cordset B8757-P separately.

** Order cordset B8757-N separately.

PNP wiring connection



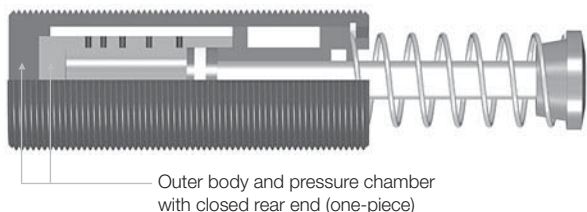
NPN wiring connection



Parker Shock Absorber

The use of one piece / closed end bodies and inner pressure chambers provides an extremely strong construction, which can withstand much higher internal pressures and overload forces without mechanical damage.

Parker builds its shock absorbers with closed end / one piece bodies and inner pressure chambers, which greatly reduces the chance of sudden failure, or machine damage in the event of an overload.



B

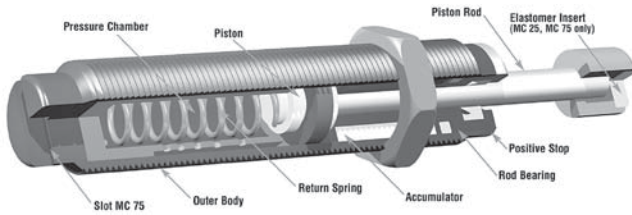
Shocks
 Actuator Products

Specifications

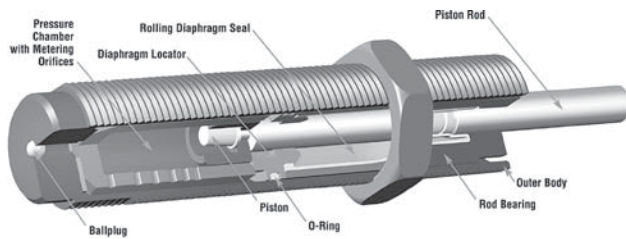
	Oil Type	Materials	Mechanical Stop	Lock Nut
MC 9 - MC 75	Silicone	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.		Included
MC 150 - MC 600	Silicone	Steel body: Black oxide finish. Piston rod: Hardened stainless steel. Rolling seal: EPDM*	Must be provided 0.02 to 0.04 inch (0.5 to 1 mm) before end of stroke.	Included
SC 190 - SC 925	#5	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Integral mechanical stop built into front of units.	Included
SC 300 - SC 650	#5	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Integral mechanical stop built into front of units.	Included
MA 35 - MA 900	MA 35: #5 MA 150: Silicone MA 225, 600, 900: ATF	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Adjustment screw for optimum deceleration.	Included
MC 33 - MC 64 Self-Compensating	ATF	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated.		Included
MC 33 - MC 64 Adjustable	ATF	Rod end button: Hardened steel with black oxide finish. Return spring: Zinc plated	Turn front stop collar or rear adjuster against the scale marked 0 to 9 for optimum deceleration	Included
1-1/2" Bore Series	American 46	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated. Return spring: Zinc plated	Must be provided .09 inch (2.3 mm) before end of stroke.	
CA 2 - CA 4 Self-Compensating	ATF	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated.	Must be provided .09 inch (2.3 mm) before end of stroke.	
A 2 - A 3 Adjustable	ATF	Return spring: Zinc plated	Must be provided .09 inch (2.3 mm) before end of stroke.	

* Seal not compatible with petroleum based fluids) If unit to be used in contact with such fluids specify neoprene rolling seal. Consider the SC2 Series as an alternative.

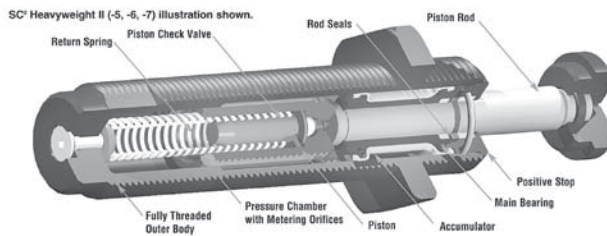
**Miniature shock absorbers
 MC 9 to MC 75
 Self-compensating**



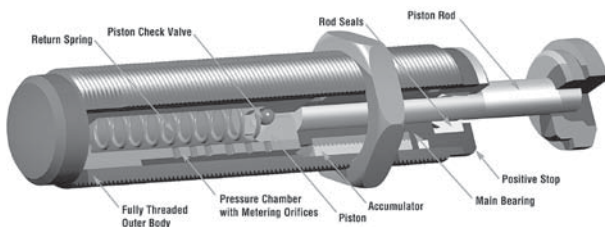
**Miniature shock absorbers
 MC 150, MC 225 and MC 600
 Self-Compensating**



**Heavyweight shock absorbers
 SC 300 and SC 650
 Soft Contact and Self-Compensating**

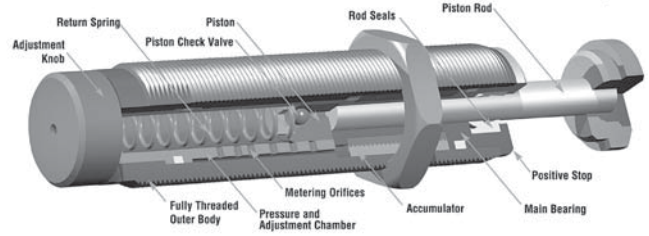


**Miniature shock absorbers
 SC 190 to SC 925
 Soft Contact and Self-Compensating**

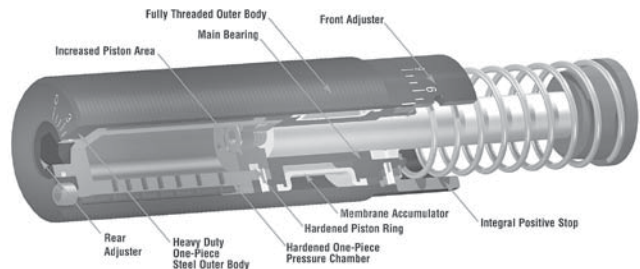


**Shock Absorbers
 Shocks**

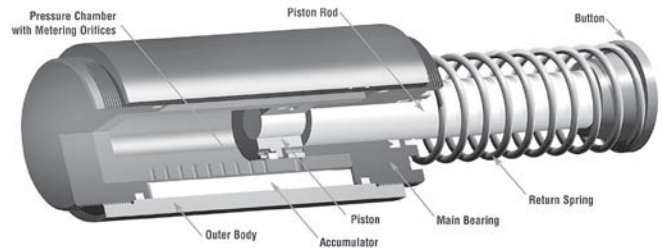
**MA series 225-900 shock absorbers
 (Miniature adjustable)
 Adjustable**



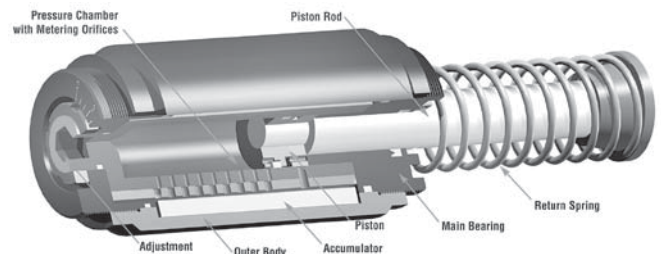
**Magnum series MA and ML 33 to 64
 Adjustable**



**Heavy Industrial Shock Absorbers
 CA to CA 4
 Self-Compensating**



**Heavy Industrial Shock Absorbers
 A2 to A3
 Adjustable**



B
 Shocks
 Actuator Products

Industrial Shock Absorbers are rated by capacity for the purpose of selecting the proper unit for an application's energy requirements. Ratings are determined by the effective weight that the shock absorber can stop and the energy it can absorb per cycle and per hour. These ratings relate to the mechanical and thermal capacity of a shock absorber because the mechanical energy is converted to heat and dissipated.

Self-Compensating Models

Model number	Stroke inches 1 inch = 25.4 mm	E3 max. energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max. energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour		
				Self-contained	A/O tank	A/O Re-circulating
MC 9-1	0.20	9	1.35-7.0	18,000		
MC 9-2	0.20	9	1.75-9.0	18,000	N/A	N/A
MC 10L	0.20	4	0.75-6.0	35,000		
MC 10H	0.20	7	1.5-11	35,000	N/A	N/A
MC 25L	0.25	20	1.5-5	120,000		
MC 25	0.25	20	4-12	120,000	N/A	N/A
MC 25H	0.25	20	10-30	120,000		
MC 75-1	0.40	75	0.5-2.5	250,000		
MC 75-2	0.40	75	2-14	250,000	N/A	N/A
MC 75-3	0.40	75	6-80	250,000		
MC 150	0.50	150	2-22	300,000		
MC 150H	0.50	150	20-200	300,000	N/A	N/A
MC 150H2	0.50	150	150-450	300,000		
MC 225	0.50	225	5-55	400,000		
MC 225H	0.50	225	50-500	400,000	N/A	N/A
MC 225H2	0.50	225	400-2,000	400,000		
MC 600	1.00	600	20-300	600,000		
MC 600H	1.00	600	250-2,500	600,000	N/A	N/A
MC 600H2	1.00	600	880-5,000	600,000		
SC 190-1	0.63	225	3-15	300,000		
SC 190-2	0.63	225	8-40	300,000	N/A	N/A
SC 190-3	0.63	225	20-100	300,000		
SC 190-4	0.63	225	50-225	300,000		
SC 300-1	0.75	300	3-18	400,000		
SC 300-2	0.75	300	10-60	400,000		
SC 300-3	0.75	300	30-180	400,000		
SC 300-4	0.75	300	70-450	400,000		
SC 300-5	0.59	650	25-100	400,000	N/A	N/A
SC 300-6	0.59	650	75-300	400,000		
SC 300-7	0.59	650	200-400	400,000		
SC 300-8	0.59	620	300-1,500	400,000		
SC 300-9	0.59	620	700-4,300	400,000		
SC 650-1	1.00	650	17-100	600,000		
SC 650-2	1.00	650	50-300	600,000		
SC 650-3	1.00	650	150-900	600,000		
SC 650-4	1.00	650	450-2,600	600,000		
SC 650-5	0.91	1,860	50-250	600,000	N/A	N/A
SC 650-6	0.91	1,860	200-800	600,000		
SC 650-7	0.91	1,860	700-2,400	600,000		
SC 650-8	0.91	1,860	1,700-5,800	600,000		
SC 650-9	0.91	1,860	4,000-14,000	600,000		
SC 925-1	1.58	975	30-200	800,000		
SC 925-2	1.58	975	90-600	800,000		
SC 925-3	1.58	975	250-1,600	800,000	N/A	N/A
SC 925-4	1.58	975	750-4,600	800,000		
MC 3325-1			20-80			
MC 3325-2	0.91	1,350	68-272	670,000	1,100,000	1,500,000
MC 3325-3			230-920			
MC 3325-4			780-3,120			
MC 3350-1			40-160			
MC 3350-2	1.91	2,700	136-544	760,000	1,200,000	1,600,000
MC 3350-3			460-1,840			
MC 3350-4			1,560-6,240			
MC 3625-1			20-80			
MC 3625-2	0.91	1,350	68-272	670,000	1,100,000	1,500,000
MC 3625-3			230-920			
MC 3625-4			780-3,120			
MC 3650-1			40-160			
MC 3650-2	1.91	2,700	136-544	760,000	1,200,000	1,600,000
MC 3650-3			460-1,840			
MC 3650-4			1,560-6,240			
MC 4525-1			50-200			
MC 4525-2	0.91	3,000	170-680	950,000	1,400,000	1,700,000
MC 4525-3			575-2,300			
MC 4525-4			1,950-7,800			
MC 4550-1			100-400			
MC 4550-2	1.91	6,000	340-1,360	1,000,000	1,700,000	2,200,000
MC 4550-3			1,150-4,600			
MC 4550-4			3,900-15,600			
MC 4575-1			150-600			
MC 4575-2	2.91	9,000	510-2,040	1,300,000	2,000,000	2,500,000
MC 4575-3	1.91		1,730-6,920			
MC 4575-4			5,850-23,400			
MC 6450-1			300-1,200			
MC 6450-2		15,000	1,020-4,080	1,300,000	2,600,000	3,400,000
MC 6450-3			3,460-13,840			
MC 6450-4			11,700-46,800			
MC 64100-1			600-2,400			
MC 64100-2	3.91	30,000	2,040-8,160	1,700,000	3,400,000	4,400,000
MC 64100-3			6,920-27,680			
MC 64100-4			23,400-93,600			
MC 64150-1			900-3,600			
MC 64150-2	5.91	45,000	3,060-12,240	2,200,000	4,400,000	5,700,000
MC 64150-3			10,380-41,520			
MC 64150-4			35,100-140,400			

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Shocks
 Actuator Products

Self-Compensating Models Continued

Model number	Stroke inches 1 inch = 25.4 mm	E3 max energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour		
				Self-contained	A/O tank	A/O Re-circulating
CA 2x2-1	2.00	32,000	1,600-4,800	9,600,000	12,000,000	15,600,000
CA 2x2-2			4,000-12,000			
CA 2x2-3			10,000-30,000			
CA 2x2-4			25,000-75,000			
CA 2x4-1	4.00	64,000	3,200-9,600	12,000,000	15,000,000	19,500,000
CA 2x4-2			8,000-24,000			
CA 2x4-3			20,000-60,000			
CA 2x4-4			50,000-150,000			
CA 2x6-1	6.00	96,000	4,800-14,400	14,400,000	18,000,000	23,500,000
CA 2x6-2			12,000-36,000			
CA 2x6-3			30,000-90,000			
CA 2x6-4			75,000-225,000			
CA 2x8-1	8.00	128,000	6,400-19,200	16,800,000	21,000,000	27,000,000
CA 2x8-2			16,000-48,000			
CA 2x8-3			40,000-120,000			
CA 2x8-4			100,000-300,000			
CA 2x10-1	10.00	160,000	8,000-24,000	19,200,000	24,000,000	31,000,000
CA 2x10-2			20,000-60,000			
CA 2x10-3			50,000-150,000			
CA 2x10-4			125,000-375,000			
CA 3x5-1	5.00	125,000	6,400-19,200	20,000,000	25,000,000	32,500,000
CA 3x5-2			16,000-48,000			
CA 3x5-3			40,000-120,000			
CA 3x5-4			100,000-300,000			
CA 3x8-1	8.00	200,000	10,240-30,720	32,000,000	40,000,000	52,000,000
CA 3x8-2			25,600-76,800			
CA 3x8-3			64,000-192,000			
CA 3x8-4			160,000-480,000			
CA 3x12-1	12.00	300,000	15,360-46,080	48,000,000	60,000,000	78,000,000
CA 3x12-2			38,400-115,200			
CA 3x12-3			96,000-288,000			
CA 3x12-4			240,000-720,000			
CA 4x6-3	6.00	420,000	8,000-19,000	27,000,000	45,000,000	58,000,000
CA 4x6-5	6.00	420,000	19,000-41,000	27,000,000	45,000,000	58,000,000
CA 4x6-7	6.00	420,000	41,000-94,000	27,000,000	45,000,000	58,000,000
CA 4x8-3	8.00	560,000	11,000-25,000	30,000,000	50,000,000	65,000,000
CA 4x8-5	8.00	560,000	25,000-55,000	30,000,000	50,000,000	65,000,000
CA 4x8-7	8.00	560,000	55,000-125,000	30,000,000	50,000,000	65,000,000
CA 4x16-3	16.00	1,120,000	22,000-50,000	50,000,000	85,000,000	110,000,000
CA 4x16-5	16.00	1,120,000	50,000-110,000	50,000,000	85,000,000	110,000,000
CA 4x16-7	16.00	1,120,000	110,000-250,000	50,000,000	85,000,000	110,000,000

Adjustable Models

MA 35	0.40	35	13-125	53,000		
MA 150	0.50	150	2-200	300,000		
MA 225	0.75	225	5-500	400,000	N/A	N/A
MA 600	1.00	600	20-3,000	600,000		
MA 900	1.58	900	30-4,500	800,000		
MA 3325	0.91	1,500	20-3,800	670,000	1,100,000	1,500,000
MA 3350	1.91	3,000	28-5,400	760,000	1,200,000	1,600,000
MA 3625	0.91	1,500	20-3,800	670,000	1,100,000	1,500,000
MA 3650	1.91	3,000	28-5,400	760,000	1,200,000	1,600,000
MA 4525	0.91	3,450	95-22,000	950,000	1,400,000	1,700,000
MA 4550	1.91	6,900	150-32,000	1,000,000	1,700,000	2,200,000
MA 4575	2.91	10,350	155-33,000	1,300,000	2,000,000	2,500,000
MA 6450	1.91	18,000	480-110,000	1,300,000	2,600,000	3,400,000
MA 64100	3.91	36,000	600-115,000	1,700,000	3,400,000	4,400,000
MA 64150	5.91	54,000	730-175,000	2,200,000	4,400,000	5,700,000
1-1/2x2	2.00	16,000	430-70,000	3,200,000	4,000,000	5,200,000
1-1/2x3-1/2	3.50	28,000	480-80,000	5,600,000	7,000,000	9,100,000
1-1/2x5	5.00	40,000	500-90,000	8,000,000	10,000,000	13,000,000
1-1/2x6-1/2	6.50	52,000	680-100,000	10,400,000	13,000,000	17,000,000
A 2x2	2.00	32,000	560-170,000	9,600,000	12,000,000	15,600,000
A 2x4	4.00	80,000	510-160,000	12,000,000	15,000,000	19,500,000
A 2x6	6.00	120,000	570-190,000	14,400,000	18,000,000	23,500,000
A 2x8	8.00	170,000	580-200,000	16,800,000	21,000,000	27,000,000
A 2x10	10.00	210,000	720-250,000	19,200,000	24,000,000	31,000,000
A 3x5	5.00	140,000	1,050-340,000	20,000,000	25,000,000	32,500,000
A 3x8	8.00	250,000	1,200-400,000	32,000,000	40,000,000	52,000,000
A 3x12	12.00	390,000	1,350-450,000	48,000,000	60,000,000	78,000,000

Low Velocity Adjustable Models

ML 3325	0.91	1,500	.05-1.5	670,000	1,100,000	1,500,000
ML 3350	1.91	3,000	.05-1.5	760,000	1,200,000	1,600,000
ML 3625	0.91	1,500	.05-1.5	670,000	1,100,000	1,500,000
ML 3650	1.91	3,000	.05-1.5	760,000	1,200,000	1,600,000
ML 4525	0.91	3,450	.05-1.5	950,000	1,400,000	1,700,000
ML 4550	1.91	6,900	.05-1.5	1,000,000	1,700,000	2,200,000
ML 6425	0.91	9,000	.05-1.5	1,100,000	2,200,000	2,900,000
ML 6450	1.91	18,000	.05-1.5	1,300,000	2,600,000	3,400,000

B
Shocks
Actuator Products

Miniature Shock Absorbers MC 9 to MC 75 - Self-Compensating

Miniature Shock Absorbers are self-contained hydraulic units. The MC 9 to MC 75 model range has a very short overall length and low return force. Its small size allows for high energy absorption in confined spaces, while the wide effective weight ranges accommodate a variety of load conditions. With threaded outer bodies and multiple accessories, MC models can be mounted in numerous configurations.

Applications include: small linear slides, material handling and packaging equipment, small robotics, office and medical equipment, as well as instrumentation.

Technical data

Impact velocity range:
 MC 9: 0.5 to 6 ft/sec (0.15 to 1.8 m/sec)
 MC 10: 0.5 to 5 ft/sec (0.15 to 1.5 m/sec)
 MC 25: 0.5 to 8 ft/sec (0.15 to 2.4 m/sec)
 MC 75: 0.5 to 12 ft/sec (0.15 to 3.66 m/sec)

Operating temperature:
 MC 9 and MC 10: 14° to 158°F (-10° to 70°C)
 MC 25: 32° to 150°F (0° to 66°C)
 MC 75: 32° to 150°F (0° to 66°C)

Ordering information – Miniature MC Series, Self Compensating

MC	75		-1	
MC Series	Model Number	Mounting Thread	Effective Weight	Button Options
	9	MC9	MC9	MC9 & MC10
	10	M M6 x 1.0 metric	-1 Light	Standard, no button
	25	MC10	-2 Medium	-B Delrin button
	75	M M8 x 1.0 metric	MC10	MC25 & MC75
		E M8 x 0.75 metric	L Light range	Standard, with button
		MC25 Standard (UNEF)	H Heavy range	-NB *No button, short rod
		M Metric	MC25	-880 No button, standard rod
		MC75 Standard (UNEF)	L Light range	
		M Metric	Standard range	
			H Heavy range	
			MC75	
			-1 Light	
			-2 Medium	
			-3 Heavy	

* Consult factory for dimensional details.



B
 Shocks
 Actuator Products

Miniature Shock Absorbers MC 150 to MC 600 - Self-Compensating

Miniature Shock Absorbers

MC 150 to MC 600 model range, feature a hermetically sealed rolling diaphragm seal system that provides the highest possible cycle lifetime and an extremely low rod return force. These models can be directly mounted into the end cover of pneumatic cylinders to provide superior damping compared to normal cylinder cushions. Use of the optional stop collar is recommended to provide a positive mechanical stop. By adding the optional side load adapter (metric threaded models only), it is possible to accept side loads up to 25° from the axis.

Applications for the durable MC Series include: material handling, medium robotics, machine tools, pick and place systems, as well as packaging equipment.

Technical data

Impact velocity range: 0.26 to 19.7 ft/sec (0.08 to 6 m/sec)
 Operating temperature: 32° to 150°F (0° to 66°C)

Note: MC 150 to MC 600 models may be mounted into pressure chambers of pneumatic actuators.

Ordering information – Miniature MC Series, Self Compensating

MC	225		-1	
MC Series	Model Number	Mounting Thread	Effective Weight	Button Options
	150	- Standard (UNF)	MC150, MC255, MC600	Standard, no button
	255	M Metric	Standard range	-B Delrin button
	600	ME* Fine metric	H Heavy range	-BS Steel button
		ML** Course metric	H2 Extra heavy range	

*MC 150 only **MC 600 only



SC² Series SC 190 to SC 925- *Soft Contact and Self-Compensating*

SC² Series Miniature Shock Absorbers provide dual performance benefits. They offer **soft contact deceleration** where initial impact reaction forces are very low, with the advantages of **self-compensation** to react to changing energy conditions, without adjustment. They have long stroke lengths, **SC² 925 with 1.58 inch (40 mm) superstroke**, to provide smooth deceleration and low reaction forces.

With the addition of the **optional side load adapter** (SC² 190M, 300M, and 650M models only), SC² Series shock absorbers can handle side loads up to 25°. SC² Series shock absorbers are fully interchangeable with the adjustable MA range.

Applications include: material handling, medium robotics, machine tools, pick and place systems, rodless cylinders and packaging equipment.

Technical data

Impact velocity range: 0.5 to 12 ft/sec (0.15 to 3.66 m/sec)
 Operating temperature: 32° to 150°F (0° to 66°C)

Note: Integral mechanical stop built into front of units.

Ordering information – Miniature SC² Series, Soft Contact and Self Compensating

SC	300	□	-1	□
SC² Series Soft Contact Self Compensating	Model Number	Mounting Thread	Effective Weight	Button Options
	190	- Standard (UNF)	-1 Ultra light	Standard with button
	300	M Metric	-2 Light	-NB No button, short rod
	650		-3 Medium	-BS No button, standard rod
	925		-4 Heavy	



B
Shocks
Actuator Products

SC² Heavyweight Series SC 300 to SC 650 - *Soft Contact and Self-Compensating*

SC² 300 and SC² 650 Heavyweight Series Shock Absorbers deliver up to 950% of the effective weight capacity and 280% of the energy absorption capability of standard models. These durable units are ideal for decelerating heavy weights moving at low velocities. The Heavyweight Series design combines the piston and the inner tube into a single component, the piston tube. It acts as both the pressure creating and pressure controlling device.

SC² 300 and SC² 650 Heavyweight II Series Shock Absorbers offer effective weight ranges and dramatic increases in energy absorption capability, for handling a wider range of applications.

These revolutionary shock absorbers provide dual performance benefits. They offer **soft contact deceleration** where initial impact reaction forces are very low with the advantages of **self-compensation** to cope with changing input energy conditions without adjustment.

Applications include: rotary actuators, rodless cylinders, conveyors, pick and place operations, slides as well as operations turning heavy weights at slow speeds.

Technical data

Impact velocity range: 0.3 to 12 ft/sec (0.9 to 3.66 m/sec)
 Operating temperature: 32° to 150°F (0° to 66°C)

Note: Integral mechanical stop built into front of units.

Ordering information – SC² Series, Soft Contact and Self Compensating

SC	300	□	-1	□
SC² Series Soft Contact Self Compensating	Model Number	Mounting Thread	Effective Weight	Button Options
	300	- Standard (UNF)	-5 Heavy	Standard with button
	650	M Metric	-6 Heavy plus	-NB No button, short rod
			-7 Heavy duty	-880 No button, standard rod
			-8 Extra heavy	
			-9 Ultra heavy	



Miniature Shock Absorbers MA 35 to MA 900 - Adjustable

MA Series miniature shock absorbers offer a compact design with true linear deceleration, and are adjustable over a wide range of conditions.

If your preference is a fully adjustable shock absorber rather than a self-compensating model on your application, then the MA Series provides a directly interchangeable alternative.

These adjustable models feature long stroke lengths, **MA 900 with 1.58 inch (40 mm) superstroke**, to provide smooth deceleration and low reaction forces. The MA 150 incorporates the proven rolling diaphragm seal (used on the MC 150 to MC

600 range) and shares all the advantages of that technology.

Applications include: material handling, medium robotics, pick and place systems, machine tool and packaging equipment.

Technical data

Impact velocity range:	
MA35	3.3 ft/sec (1.0 m/sec)
MA150, 225, 600, 900	0.5 to 12 ft/sec (0.15 to 3.66 m/sec)
Operating temperature:	32° to 150°F (0° to 66°C)

Ordering information – MA Series, Adjustable

MA	225	-	□
MA Series	Model Number	Mounting Thread	Button Options
MA – Miniature Adjustable	35	- Standard (UNF)	MA35
	150	M Metric	Standard with button
	225	ME Fine metric (MA 150 Only)	-NB No button, short rod
	600		MA150
	900		Standard, no button
			-B Nylon button
			-BS Steel button
			MA 225-900
			Standard steel button
			-NB No button, short rod
			-880 No button, standard rod



B
Shocks
Actuator Products

Magnum Series MC 33 to MC 64 - Self-Compensating

Parker presents the ultimate in industrial shock absorber design...the Magnum Series. These versatile performers offer you the capability to mount shock absorbers that contain the highest energy capacity ratings in the industry. **Up to 150% of the energy per cycle** of previous models in the same package size, means increased safety factors in a wider range of applications.

Up to 390% of the effective weight capacity of previous models, may allow a smaller, lower priced shock absorber to be mounted, to meet your application requirements.

All Magnum Series shock absorbers are **fully threaded** for ease of installation. **Incorporation of high strength**

materials along with an **integral stop collar** translates to extended shock absorber life and cost savings for you.

Applications include: automotive manufacturing and production equipment, large robotics, heavy conveyors, packaging and glass bottling equipment, rotary actuators, theme park rides, and lumber industry equipment.

Technical data

Impact velocity range:	
MC Models:	0.5 to 16.5 ft/sec (0.15 to 5 m/sec)
Operating temperature:	10° to 150°F (-12° to 66°C)

Ordering information – MC Series, Self Compensating

MC	3325	-	1	C
Return Method and Accumulator Style	Model Number	Mounting Thread	Effective Weight	Mounting Options
MC Self-contained spring return, internal accumulator	3325 4525 6450	- Standard (UNF)	-1 Light range	Standard mount
MCA Air return, external accumulator	3350 4550 64100	M Metric	-2 Medium range	Flanged stop collar
MCS Spring return, external accumulator	3625 4575 64150		-3 Heavy range	Rectangular flange*
MCN Self return (clevis), internal accumulator	3650		-4 Heavier range	Square flange*
				-C Clevis mount**
				-S Side-foot mount**
				-P Side port
				-Z Within air cylinder

* Welded versions available upon request.
 ** Not available on MC 3625 and 3650 models.



**Magnum Series MA and ML 33 to 64
 Adjustable**

Magnum Series adjustable shock absorbers feature the latest seal technology, a hardened piston ring, pressure chamber and outer body for increased operating life. Additionally, these rugged units offer the unique feature of front or rear adjustment along with a fully threaded outer body for ease of installation.

Magnum Series adjustable shock absorbers are directly interchangeable with obsolete primary series and competitor models.

Along with the self-compensating models, the adjustable range offers unprecedented increases in energy and effective weight capacity.

Applications are the same as self-compensating models.



Technical data

Impact velocity range:

MA Models 0.5 to 16.5 ft/sec (0.15 to 5 m/sec)

ML Models 0.06 to 1.5 ft/sec (0.02 to 0.46 m/sec)

Operating temperature: 10° to 150°F (-12° to 66°C)

Ordering information – MA and ML Series, Adjustable

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Ordering information – ML Series, Low Velocity, Adjustable

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1-1/2" Bore Series
Adjustable

1-1/2" bore series shock absorbers are designed for the toughest environments. These durable adjustable models provide outstanding deceleration over a wide range of effective weight conditions. Large energy capacities stop heavy loads set into motion by high propelling forces, without damage.

Applications include: Automotive manufacturing and production equipment, large robotics, heavy conveyors, foundries and steel industry equipment.



B

Shocks
 Actuator Products

Technical data

Impact velocity range: 0.5 to 15 ft/sec (0.15 to 4.5 m/sec)
 Operating temperature: 10° to 150°F (-12° to 66°C)

Ordering information – 1-1/2" Bore Series, Adjustable

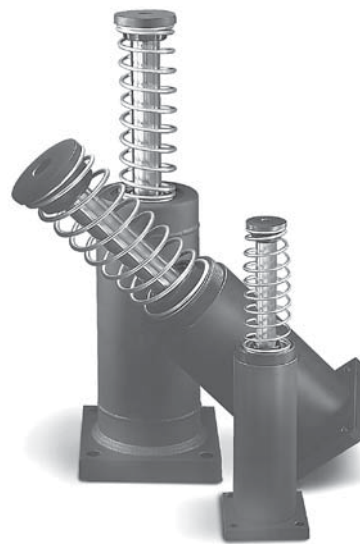
MC		1-1/2	6-1/2	F	
Return Method and Accumulator Style		Bore Size	Stroke Length	Mounting Style	
A	Spring return, internal accumulator	1-1/2	2	-F	Front flange
AA	Air return, external accumulator		3-1/2	-R	Rear flange
SA	Spring return, external accumulator		5	-RF	Front rectangular flange
NA	Self return (clevis), internal accumulator		6-1/2	-RR	Rear rectangular flange
				-S	Side foot mount
				-C	Clevis mount

Heavy Industrial Shock Absorbers CA 2 to CA 4
Self-Compensating

CA 2, CA 3 and 4" Bore Series of self-compensating shock absorbers are designed for extremely heavy duty applications and provide smooth deceleration under changing conditions. High energy capacities combined with wide effective weight ranges qualify these units to perform in the most demanding environments.

The new CA 2 offers up to 170% of the energy per cycle capacity of former models. The rugged new **CA 3 offers up to 125% of the energy capacity** of former models. You can select the correct model for your application by utilizing the PARKERSIZE INDUSTRIAL SHOCK ABSORBER SIZING PROGRAM or the capacity charts. Replacing existing shock absorbers with the new CA Series is easy-just provide us the type and adjustment setting of your existing units and we will, do the rest. These dependable units are available self-contained or for use with an external air/oil tank.

Applications include: foundry, steel, marine, lumber and other heavy equipment industries.



Technical data	
Impact velocity range:	1 to 16.5 ft/sec (0.30 to 5 m/sec)
Operating temperature:	10° to 150°F (-12° to 66°C)

B
 Shocks
 Actuator Products

Ordering information – CA 2 & CA 3 Series, Self-compensating

CA	2	x	8	R	-	3
Return Method and Accumulator Style	Bore Size		Stroke Length	Mounting Style		Effective Weight
CA Spring return, internal accumulator	2		2 8	-F Front flange		-1 Light
CAA Air return, external accumulator	3		4 10	-R Rear flange		-2 Medium light
CSA Spring return, external accumulator			5 12	-RF Front rectangular flange		-3 Medium heavy
CNA Self return (clevis), internal accumulator			6	-RR Rear rectangular flange		-4 Heavy
				-S Side foot mount		
				-C Clevis mount		

Ordering information – CA 4 Series, Self-compensating

CA	4	x	8	R	-	5
Return Method and Accumulator Style	Bore Size		Stroke Length	Mounting Style		Effective Weight
CA Spring return, internal accumulator	4		6	-F Front flange		-3 Light
CAA Air return, external accumulator			8	-R Rear flange		-5 Medium
CSA Spring return, external accumulator			16	-RP Rear standard		-7 Heavy
CNA Self return (clevis), internal accumulator				-FP Front standard		
				-FRP Front and rear standard		
				-S Side foot mount		
				-C Clevis mount		

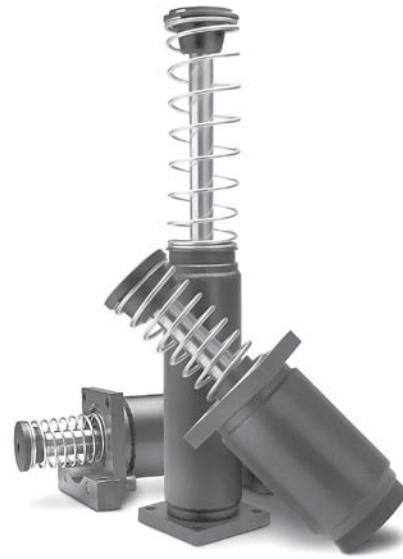
Heavy Industrial Shock Absorbers A 2 and A 3
Adjustable

A2 and A3 Series adjustable shock absorbers are capable of decelerating heavy duty loads. These reliable units replace the former 2" and 3" large bore adjustable shock absorbers.

Energy capacity ratings are 228% of former models. In addition, effective weight ranges have increased dramatically, resulting in the capability of handling a wider range of applications and increases in velocity. The units are easily adjusted by means of a 5/16 inch (8 mm) hex socket adjuster located at the bottom of the outer body. These dependable shock absorbers are maintenance free and are available self-contained or for use with an external air/oil tank.

Features include a considerably reduced outer diameter, internal accumulator and threaded mounting brackets, easily adaptable to the front or rear of the outer body.

Applications include: foundry, steel, marine, lumber, and other heavy equipment industries.



B

Shocks
 Actuator Products

Technical data

Impact velocity range: 0.33 to 16.5 ft/sec (0.1 to 5 m/sec)
 Operating temperature: 10° to 150°F (-12° to 66°C)

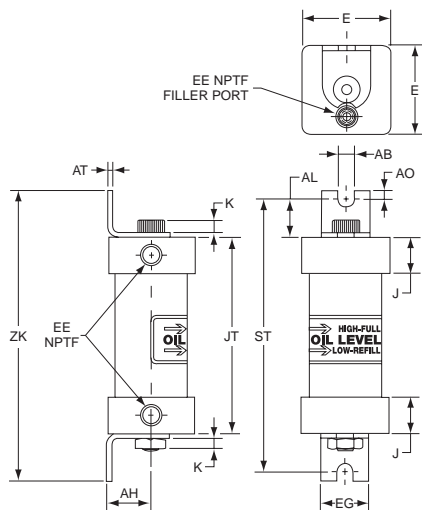
Ordering information – A 2 & A3 Series, Adjustable

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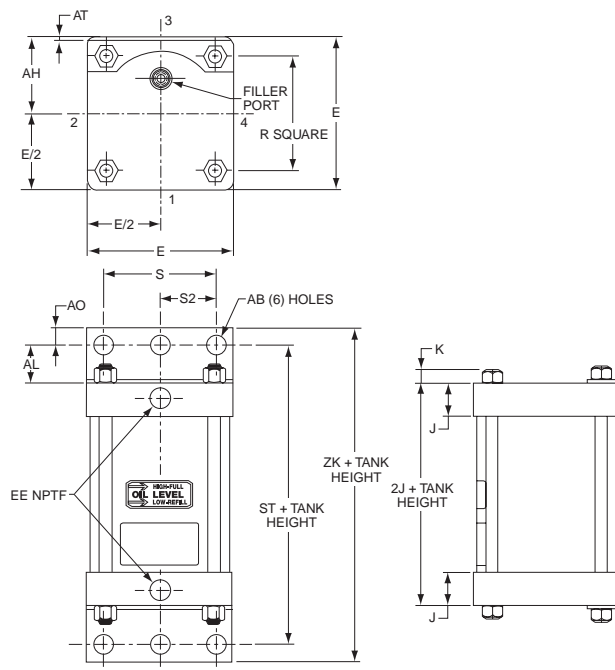
Note: A no button option is available on the 3" Bore only as a special.

Air-Oil tanks

1-1/4" Bore



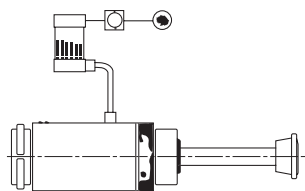
3-1/4" to 8" Bores



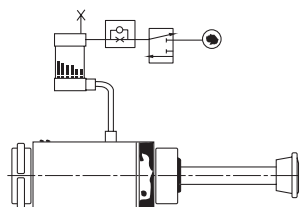
Dimensions Inches

Bore size	E	J	K	R	S	AB	AH	AL	AO	AT	EE	ST	ZK	EG	JT
1-1/4	1-27/32	3/4	1/4	-	-	11/32	29/32	25.32	3/16	31/32	1/8	5-5/8	6	1	4-1/16
3-1/4	3-3/4	1-3/16	3/16	2.76	2-3/4	9/16	1-15/16	1-1/4	1/2	1/8	1/2	5	-	-	-
6	6-1/2	1.41	7/16	4.88	5-1/4	13/16	3-1/4	1-3/8	5/8	3/16	3/4	5-3/4	7	-	-
8	8-1/2	1.44	9/16	6.44	7-1/8	13/16	4-1/4	1-13/16	11/16	1/4	3/4	6-5/8	8	-	-

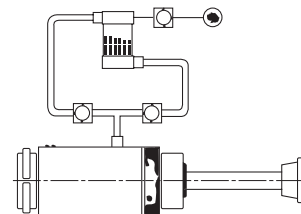
Mounting and circuits



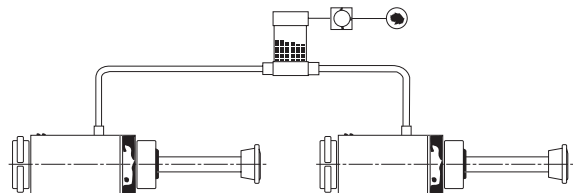
1. The piston rod is immediately returned to its extended position after completing the stroke.



2. The piston rod remains in its retracted position until it is signaled to return. Special bleed-down type check valve is required for this circuit.



3. A recirculating cooling circuit allows warm oil to return to the tank while cool oil refills the shock absorber. A recirculating cooling circuit substantially increases the shock absorber's hourly energy capacity.

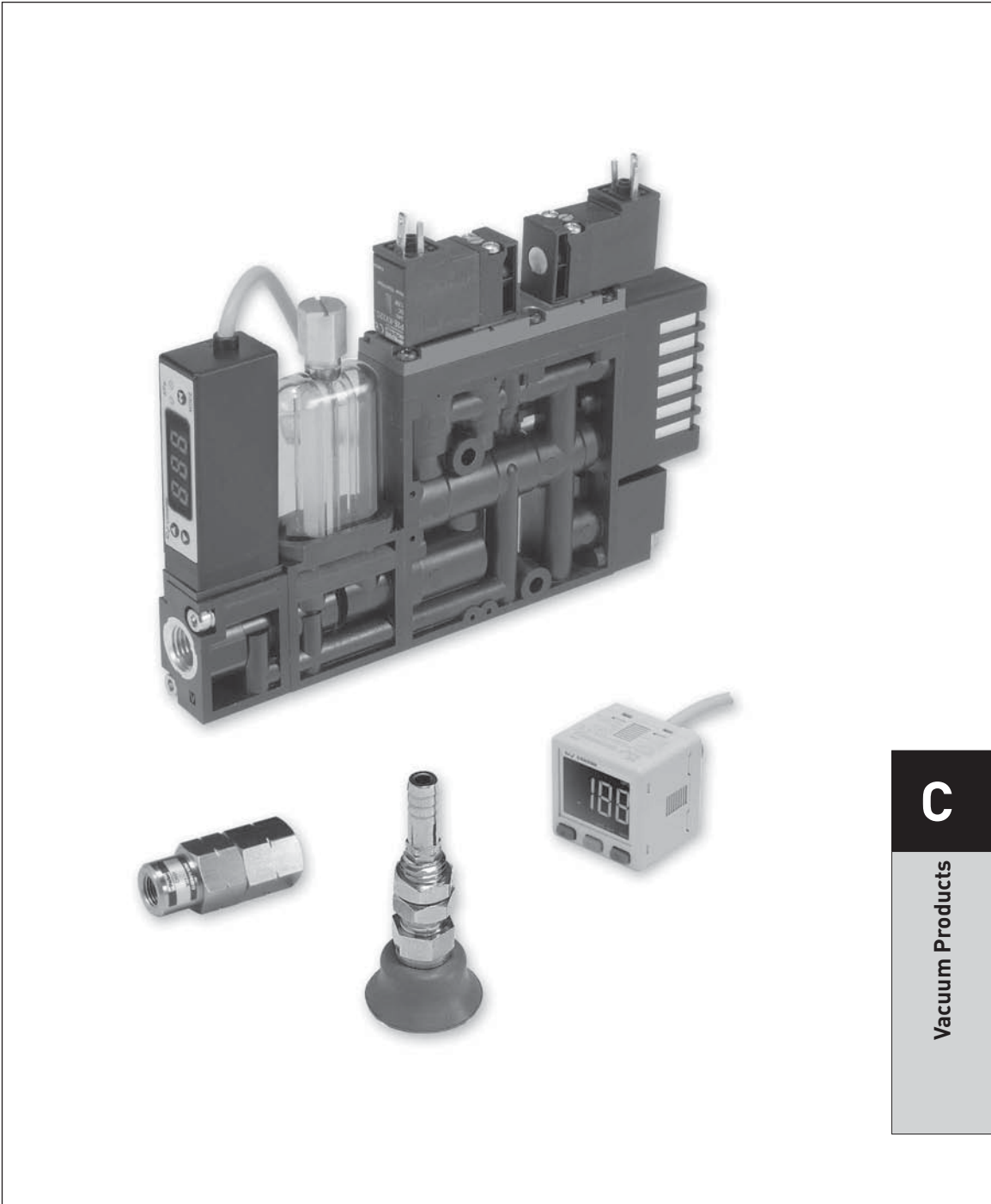
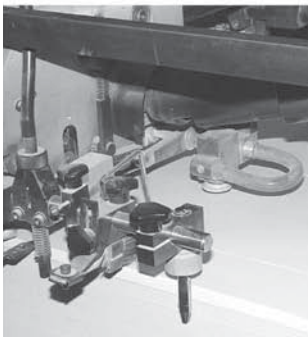
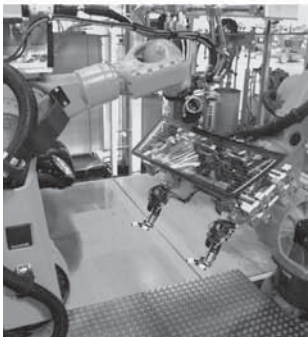
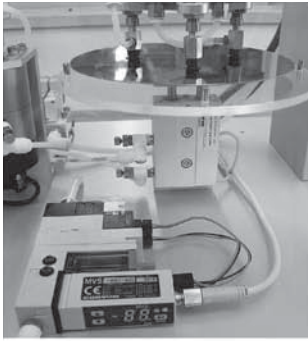


4. When connecting more than one shock absorber to an Air-Oil Tank, use caution in selecting the proper reservoir capacity. For two shock absorbers, the next largest Air-Oil Tank Size is usually adequate.

Capacity (maximum)

Model	Oil temp (°F)	Max. pressure (PSIG)	Capacity (cubic inches)	Recommended shock absorber size
1.25CB3TKU x 2.00	200	100	2.4	MC 3325 MC 3350
3.25CB3TKU x 5.00	200	100	41.4	MC 4525 MC 64150
6.00CB3TKU x 9.00	200	100	254.5	1-1/2 x 5 - 3 x 12
8.00CB3TKU x 15.00	200	100	754	4 x 6 - 4 x 16
8.00 CB3TKUS x 15.00	200	100	754	4 x 6 - 4 x 16

S = 1 1/2 NPTF ports in cap face



C
Vacuum Products

Vacuum Products

Vacuum Cups

PBG Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products
- Cup sizes: 10mm to 150mm

C17

PCG Multiple Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces
- 2-1/2 bellows design minimizes contact pressure applied to products
- Cup sizes: 5mm to 90mm

C42

PFG Flat Cups



- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Low profile design makes flat pads ideal for fast response.
- Cup Sizes: 1.5mm to 200mm

C4

PJG Short Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products
- Shorter stroke provides fast response
- Cup sizes: 6mm to 80mm

C30

PUGB Flat Swivel Cups



- 30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products
- Rigid stem or level compensator provides good stability for horizontal lift
- Cup Sizes: 60mm to 100mm

C50

P5V-CFS Flat Cups

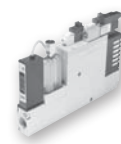


- Precision molded double lip flat cup for slightly curved surfaces
- Double lip for additional security. If outside lip bends and loses its seal, the inner lip remains sealed.
- Outer ribs prevent the cup lip from being cut
- Cup Sizes: 50mm to 150mm

C29

Vacuum Generators

CEK Integrated Generators



- Air-economizing functions with emergency stop logic that maintains degree of vacuum with loss of output power
- Includes vacuum and blow-off solenoids, check valve, vacuum filter and optional MPS-23 pressure sensor
- Inline versions can be mounted in manifolds up to 5 stations

C64

CHF Inline Generators



- CHF- High Flow Series is a multistage vacuum generator
- Intended for high flow vacuum applications
- Ideal for porous applications
- Standard with flow thru exhaust mufflers to reduce clogging in dirty environments

C56

CVCEK Integrated Generators



- Basic 2 station CEK generator manifold with additional electrical capabilities
- Integrates MPS-23 sensor for on board air-economizing programming
- M12 electrical wiring package with optional 18-pin single connection

C67

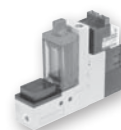
MCA, CV, CV-CK Inline Generators



- MCA: Light weight vacuum generator
- CV: Basic aluminum body vacuum generator
- CV-CK: Basic aluminum body vacuum generator with mechanical switch for part present confirmation

C54

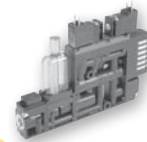
MC22 Integrated Generators



- Compact vacuum generator includes vacuum and blow-off solenoids and vacuum filters
- Optional check valve and MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 8 stations

C58

MC72 Integrated Generators




- Light weight vacuum generator includes vacuum and blow-off solenoids.
- Includes check valve, vacuum filter and optional MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 5 stations

C61



Vacuum Generator Accessories


CH01 One Way Check Valve



- Poppet design
- Low leakage
- Low cracking pressure

C74


Convum Vacuum Silencers



- Pressure up to 128 PSIG
- Temperature 41°F to 132°F (5°C to 55.5°C)
- Silencing effect 20 dB

C77


FSV Metered Flow Sensing Valve



- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter

C73


MPS-23 Integrated Generator Sensors



- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C69


MVS-201 Integrated Generator Sensors



- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C71


VF & VL Vacuum Filters



- Filters the vacuum system to protect the components from damaging particles absorbed from the environment
- Elements easily replaced

C75

VFP Vacuum Filters




- Provides easy monitoring, economy and safety
- 10 micron porous plastic element prolongs element life
- Shatterproof and airtight
- Replaceable filter element

C76

Pressure Sensors


Cables



- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: swivel straight or angled
- IP67 swivel connector

C85


MPS-33 Pressure Sensors



- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C78


MPS-34 Pressure Sensors



- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C80


SCPSD Pressure Sensors



- CV-CK is a Venturi Generator with adjustable open contact mechanical switch for vacuum confirmation.
- Great for low cost vacuum confirmation.

C83

SCP01 Pressure Sensor



- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

C82

Exceptional for any smooth flat or surface that will benefit from stability and fast response of the cup design. This is a multi-versatile and multi-industry cup. Typical applications could be chip mounting, electrical components, semiconductor chips, glass, injection mold, sheet metal, press transfer, fixtures, woodworking.

Features

- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Universal flat design for most smooth surface applications
- Stable vertical / horizontal lift
- Strong low profile design for fast response needed for short cycles
- 5mm to 200mm diameters
- Bottom cleats on 60 to 200mm diameters



Styles

- PFTM series male thread connector
- PFTF series female thread connector
- PFTK series barbed bulkhead
- PFYK series 90° barbed adapter
- PFTYS series bulkhead level compensator

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	NBR	NBRE	SI	SIE	U
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°	-30° to +120°
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000	—

* ESD: Electric Static Dissipative Material

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PFTM-20B-NBR-G1 becomes PFTM-20B-U-G1. Inquire with factory for availability.

Application guide

Flat - Smooth surface



Ø 120/200 only

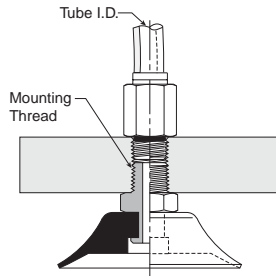
Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Metal sheet handling	Corrugated sheet handling	High lifting force	Vertical lift
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PFTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
 Fitting material: aluminum.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PFTM-5A-NBR-M5	PFG-5A-NBR	PFTM-5A-SI-M5	PFG-5A-SI	FTM-5A-M5H
5	1/8 BSPP	PFTM-5A-NBR-G1	PFG-5A-NBR	PFTM-5A-SI-G1	PFG-5A-SI	FTM-5A-G1
6	M5	PFTM-6A-NBR-M5	PFG-6A-NBR	PFTM-6A-SI-M5	PFG-6A-SI	FTM-5A-M5H
6	1/8 BSPP	PFTM-6A-NBR-G1	PFG-6A-NBR	PFTM-6A-SI-G1	PFG-6A-SI	FTM-5A-G1
8	M5	PFTM-8A-NBR-M5	PFG-8A-NBR	PFTM-8A-SI-M5	PFG-8A-SI	FTM-5A-M5H
8	1/8 BSPP	PFTM-8A-NBR-G1	PFG-8A-NBR	PFTM-8A-SI-G1	PFG-8A-SI	FTM-5A-G1
10	M5	PFTM-10A-NBR-M5	PFG-10A-NBR	PFTM-10A-SI-M5	PFG-10A-SI	FTM-5A-M5H
10	1/8 BSPP	PFTM-10A-NBR-G1	PFG-10A-NBR	PFTM-10A-SI-G1	PFG-10A-SI	FTM-5A-G1
15	M5	PFTM-15A-NBR-M5	PFG-15A-NBR	PFTM-15A-SI-M5	PFG-15A-SI	FTM-5A-M5H
15	1/8 BSPP	PFTM-15A-NBR-G1	PFG-15A-NBR	PFTM-15A-SI-G1	PFG-15A-SI	FTM-5A-G1
20	1/8 BSPP	PFTM-20B-NBR-G1	PFG-20B-NBR	PFTM-20B-SI-G1	PFG-20B-SI	FTM-20B-G1H
20	1/4 BSPP	PFTM-20B-NBR-G2	PFG-20B-NBR	PFTM-20B-SI-G2	PFG-20B-SI	FTM-20B-G2
20	M10	PFTM-20B-NBR-M10	PFG-20B-NBR	PFTM-20B-SI-M10	PFG-20B-SI	FTM-20B-M10
20	1/8 NPT	PFTM-20B-NBR-N1	PFG-20B-NBR	PFTM-20B-SI-N1	PFG-20B-SI	FTM-20B-N1
30	1/8 BSPP	PFTM-30-NBR-G1	PFG-30-NBR	PFTM-30-SI-G1	PFG-30-SI	FTM-20B-G1H
30	1/4 BSPP	PFTM-30-NBR-G2	PFG-30-NBR	PFTM-30-SI-G2	PFG-30-SI	FTM-20B-G2
30	M10	PFTM-30-NBR-M10	PFG-30-NBR	PFTM-30-SI-M10	PFG-30-SI	FTM-20B-M10
30	1/8 NPT	PFTM-30-NBR-N1	PFG-30-NBR	PFTM-30-SI-N1	PFG-30-SI	FTM-20B-N1
40	1/8 BSPP	PFTM-40-NBR-G1	PFG-40-NBR	PFTM-40-SI-G1	PFG-40-SI	FTM-20B-G1H
40	1/4 BSPP	PFTM-40-NBR-G2	PFG-40-NBR	PFTM-40-SI-G2	PFG-40-SI	FTM-20B-G2
40	M10	PFTM-40-NBR-M10	PFG-40-NBR	PFTM-40-SI-M10	PFG-40-SI	FTM-20B-M10
40	1/8 NPT	PFTM-40-NBR-N1	PFG-40-NBR	PFTM-40-SI-N1	PFG-40-SI	FTM-20B-N1
50	1/8 BSPP	PFTM-50-NBR-G1	PFG-50-NBR	PFTM-50-SI-G1	PFG-50-SI	FTM-50-G1H
50	1/4 BSPP	PFTM-50-NBR-G2	PFG-50-NBR	PFTM-50-SI-G2	PFG-50-SI	FTM-50-G2
50	1/8 NPT	PFTM-50-NBR-N1	PFG-50-NBR	PFTM-50-SI-N1	PFG-50-SI	FTM-50-N1
60	1/4 BSPP	PFTM-60-NBR-G2	PFG-60-NBR	PFTM-60-SI-G2	PFG-60-SI	FTM-60-G2
60	M10	PFTM-60-NBR-M10	PFG-60-NBR	PFTM-60-SI-M10	PFG-60-SI	FTM-60-M10
60	1/4 NPT	PFTM-60-NBR-N2	PFG-60-NBR	PFTM-60-SI-N2	PFG-60-SI	FTM-60-N2
80	1/4 BSPP	PFTM-80-NBR-G2	PFG-80-NBR	PFTM-80-SI-G2	PFG-80-SI	FTM-60-G2
80	M10	PFTM-80-NBR-M10	PFG-80-NBR	PFTM-80-SI-M10	PFG-80-SI	FTM-60-M10
80	1/4 NPT	PFTM-80-NBR-N2	PFG-80-NBR	PFTM-80-SI-N2	PFG-80-SI	FTM-60-N2
95	1/4 BSPP	PFTM-95-NBR-G2	PFG-95-NBR	PFTM-95-SI-G2	PFG-95-SI	FTM-60-G2
95	M10	PFTM-95-NBR-M10	PFG-95-NBR	PFTM-95-SI-M10	PFG-95-SI	FTM-60-M10
95	1/4 NPT	PFTM-95-NBR-N2	PFG-95-NBR	PFTM-95-SI-N2	PFG-95-SI	FTM-60-N2

Most popular.

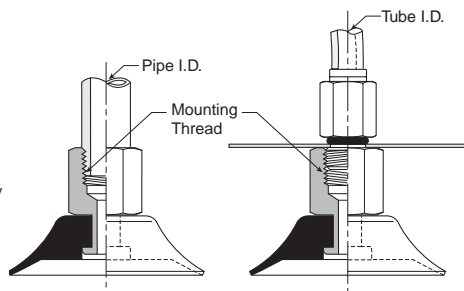
C
 Vacuum Cups
 Vacuum Products

PFTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads. Fitting material: aluminum.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PFTF-5A-NBR-M5	PFG-5A-NBR	PFTF-5A-SI-M5	PFG-5A-SI	FTF-5A-M5
5	1/8 BSPP	PFTF-5A-NBR-G1	PFG-5A-NBR	PFTF-5A-SI-G1	PFG-5A-SI	FTF-5A-G1
6	M5	PFTF-6A-NBR-M5	PFG-6A-NBR	PFTF-6A-SI-M5	PFG-6A-SI	FTF-5A-M5
6	1/8 BSPP	PFTF-6A-NBR-G1	PFG-6A-NBR	PFTF-6A-SI-G1	PFG-6A-SI	FTF-5A-G1
8	M5	PFTF-8A-NBR-M5	PFG-8A-NBR	PFTF-8A-SI-M5	PFG-8A-SI	FTF-5A-M5
8	1/8 BSPP	PFTF-8A-NBR-G1	PFG-8A-NBR	PFTF-8A-SI-G1	PFG-8A-SI	FTF-5A-G1
10	1/8 BSPP	PFTF-10A-NBR-G1	PFG-10A-NBR	PFTF-10A-SI-G1	PFG-10A-SI	FTF-5A-G1
10	M5	PFTF-10A-NBR-M5	PFG-10A-NBR	PFTF-10A-SI-M5	PFG-10A-SI	FTF-5A-M5
15	1/8 BSPP	PFTF-15A-NBR-G1	PFG-15A-NBR	PFTF-15A-SI-G1	PFG-15A-SI	FTF-5A-G1
15	M5	PFTF-15A-NBR-M5	PFG-15A-NBR	PFTF-15A-SI-M5	PFG-15A-SI	FTF-5A-M5
20	1/8 BSPP	PFTF-20B-NBR-G1	PFG-20B-NBR	PFTF-20B-SI-G1	PFG-20B-SI	FTF-20B-G1
30	1/8 BSPP	PFTF-30-NBR-G1	PFG-30-NBR	PFTF-30-SI-G1	PFG-30-SI	FTF-20B-G1
30	1/4 BSPP	PFTF-30-NBR-G2	PFG-30-NBR	PFTF-30-SI-G2	PFG-30-SI	FTF-20B-G2
40	1/8 BSPP	PFTF-40-NBR-G1	PFG-40-NBR	PFTF-40-SI-G1	PFG-40-SI	FTF-20B-G1
40	1/4 BSPP	PFTF-40-NBR-G2	PFG-40-NBR	PFTF-40-SI-G2	PFG-40-SI	FTF-20B-G2
50	1/8 BSPP	PFTF-50-NBR-G1	PFG-50-NBR	PFTF-50-SI-G1	PFG-50-SI	FTF-50-G1
50	1/4 BSPP	PFTF-50-NBR-G2	PFG-50-NBR	PFTF-50-SI-G2	PFG-50-SI	FTF-50-G2
60	1/4 BSPP	PFTF-60-NBR-G2	PFG-60-NBR	PFTF-60-SI-G2	PFG-60-SI	FTF-60-G2
60	1/4 NPT	PFTF-60-NBR-N2	PFG-60-NBR	PFTF-60-SI-N2	PFG-60-SI	FTF-60-N2
80	1/4 BSPP	PFTF-80-NBR-G2	PFG-80-NBR	PFTF-80-SI-G2	PFG-80-SI	FTF-60-G2
80	1/4 NPT	PFTF-80-NBR-N2	PFG-80-NBR	PFTF-80-SI-N2	PFG-80-SI	FTF-60-N2
95	1/4 NPT	PFTF-95-NBR-N2	PFG-95-NBR	PFTF-95-SI-N2	PFG-95-SI	FTF-60-N2
95	1/4 BSPP	PFTF-95-NBR-G2	PFG-95-NBR	PFTF-95-SI-G2	PFG-95-SI	FTF-60-G2
120	1/2 BSPP	PFTF-120-NBR-G4	PFG-120-NBR	PFTF-120-SI-G4	PFG-120-SI	FTF-120-G4
120	1/2 NPT	PFTF-120-NBR-N4	PFG-120-NBR	PFTF-120-SI-N4	PFG-120-SI	FTF-120-N4
150	1/2 NPT	PFTF-150-NBR-G4	PFG-150-NBR	PFTF-150-SI-G4	PFG-150-SI	FTF-120-G4
150	1/2 NPT	PFTF-150-NBR-N4	PFG-150-NBR	PFTF-150-SI-N4	PFG-150-SI	FTF-120-N4
200	1/2 BSPP	PFTF-200-NBR-G4	PFG-200-NBR	PFTF-200-SI-G4	PFG-200-SI	FTF-120-G4
200	1/2 NPT	PFTF-200-NBR-N4	PFG-200-NBR	PFTF-200-SI-N4	PFG-200-SI	FTF-120-N4

Most popular.

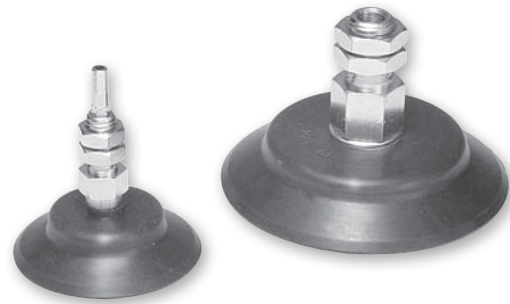
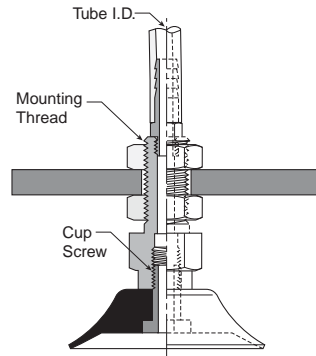
C
 Vacuum Cups
 Vacuum Products

PFTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PFTK-5A-NBR	PFG-5A-NBR	PFTK-5A-SI	PFG-5A-SI	FTK-5A
6	Barb	PFTK-6A-NBR	PFG-6A-NBR	PFTK-6A-SI	PFG-6A-SI	FTK-5A
8	Barb	PFTK-8A-NBR	PFG-8A-NBR	PFTK-8A-SI	PFG-8A-SI	FTK-5A
10	Barb	PFTK-10A-NBR	PFG-10A-NBR	PFTK-10A-SI	PFG-10A-SI	FTK-5A
15	Barb	PFTK-15-NBR	PFG-15-NBR	PFTK-15-SI	PFG-15-SI	FTK-15
20	Barb	PFTK-20-NBR	PFG-20-NBR	PFTK-20-SI	PFG-20-SI	FTK-20
30	Barb	PFTK-30-NBR	PFG-30-NBR	PFTK-30-SI	PFG-30-SI	FTK-25
40	Barb	PFTK-40-NBR	PFG-40-NBR	PFTK-40-SI	PFG-40-SI	FTK-25
50	Barb	PFTK-50-NBR	PFG-50-NBR	PFTK-50-SI	PFG-50-SI	FTK-50
60	1/8 BSPP	PFTK-60-NBR-G1	PFG-60-NBR	PFTK-60-SI-G1	PFG-60-SI	FTK-60-G1
60	1/8 NPT	PFTK-60-NBR-N1	PFG-60-NBR	PFTK-60-SI-N1	PFG-60-SI	FTK-60-N1
80	1/8 BSPP	PFTK-80-NBR-G1	PFG-80-NBR	PFTK-80-SI-G1	PFG-80-SI	FTK-60-G1
80	1/8 NPT	PFTK-80-NBR-N1	PFG-80-NBR	PFTK-80-SI-N1	PFG-80-SI	FTK-60-N1
95	1/8 BSPP	PFTK-95-NBR-G1	PFG-95-NBR	PFTK-95-SI-G1	PFG-95-SI	FTK-60-G1
95	1/8 NPT	PFTK-95-NBR-N1	PFG-95-NBR	PFTK-95-SI-N1	PFG-95-SI	FTK-60-N1

Most popular.

C
 Vacuum Cups
 Vacuum Products

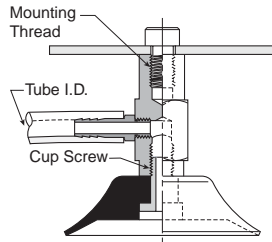
PFYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt thru a plate or "L" bracket to allow the tube connection from the side port. Fitting material: plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PFYK-5A-NBR	PFG-5A-NBR	PFYK-5A-SI	PFG-5A-SI	FYK-5A
6	Barb	PFYK-6A-NBR	PFG-6A-NBR	PFYK-6A-SI	PFG-6A-SI	FYK-5A
8	Barb	PFYK-8A-NBR	PFG-8A-NBR	PFYK-8A-SI-M5	PFG-8A-SI	FYK-5A
10	Barb	PFYK-10A-NBR	PFG-10A-NBR	PFYK-10A-SI	PFG-10A-SI	FYK-5A
15	Barb	PFYK-15-NBR	PFG-15-NBR	PFYK-15-SI	PFG-15-SI	FYK-15
20	Barb	PFYK-20-NBR	PFG-20-NBR	PFYK-20-SI	PFG-20-SI	FYK-20
30	Barb	PFYK-30-NBR	PFG-30-NBR	PFYK-30-SI	PFG-30-SI	FYK-25
40	Barb	PFYK-40-NBR	PFG-40-NBR	PFYK-40-SI	PFG-40-SI	FYK-25
50	Barb	PFYK-50-NBR	PFG-50-NBR	PFYK-50-SI	PFG-50-SI	FYK-50
60	1/8 BSPP	PFYK-60-NBR-G1	PFG-60-NBR	PFYK-60-SI-G1	PFG-60-SI	FYK-60-G1
60	1/8 NPT	PFYK-60-NBR-N1	PFG-60-NBR	PFYK-60-SI-N1	PFG-60-SI	FYK-60-N1
80	1/8 BSPP	PFYK-80-NBR-G1	PFG-80-NBR	PFYK-80-SI-G1	PFG-80-SI	FYK-60-G1
80	1/8 NPT	PFYK-80-NBR-N1	PFG-80-NBR	PFYK-80-SI-N1	PFG-80-SI	FYK-60-N1
95	1/8 BSPP	PFYK-95-NBR-G1	PFG-95-NBR	PFYK-95-SI-G1	PFG-95-SI	FYK-60-G1
95	1/8 NPT	PFYK-95-NBR-N1	PFG-95-NBR	PFYK-95-SI-N1	PFG-95-SI	FYK-60-N1
120	1/8 BSPP	PFYK-120-NBR-G1	PFG-120-NBR	PFYK-120-SI-G1	PFG-120-SI	FYK-120-G1
120	1/8 NPT	PFYK-120-NBR-N1	PFG-120-NBR	PFYK-120-SI-N1	PFG-120-SI	FYK-120-N1
150	1/8 BSPP	PFYK-150-NBR-G1	PFG-150-NBR	PFYK-150-SI-G1	PFG-150-SI	FYK-120-G1
150	1/8 NPT	PFYK-150-NBR-N1	PFG-150-NBR	PFYK-150-SI-N1	PFG-150-SI	FYK-120-N1
200	1/8 BSPP	PFYK-200-NBR-G1	PFG-200-NBR	PFYK-200-SI-G1	PFG-200-SI	FYK-120-G1
200	1/8 NPT	PFYK-200-NBR-N1	PFG-200-NBR	PFYK-200-SI-N1	PFG-200-SI	FYK-120-N1

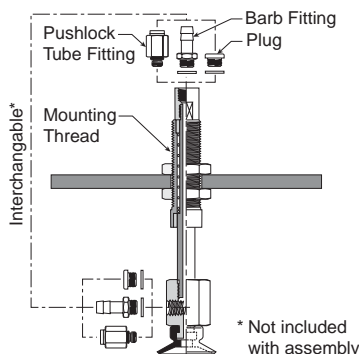
Most popular.

PFTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



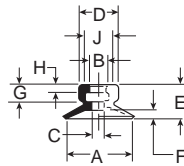
Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N)		Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
			0%	100%					
5	M5	10	.14 (.61)	.26 (1.17)	PFTYS5A10NBRM5	PFG-5A-NBR	PFTYS5A10SIM5	PFG-5A-SI	TYS-5A-10
5	M5	15	.15 (.64)	.26 (1.17)	PFTYS5A15NBRM5	PFG-5A-NBR	PFTYS5A15SIM5	PFG-5A-SI	TYS-5A-15
6	M5	10	.14 (.61)	.26 (1.17)	PFTYS6A10NBRM5	PFG-6A-NBR	PFTYS6A10SIM5	PFG-6A-SI	TYS-5A-10
6	M5	15	.15 (.64)	.26 (1.17)	PFTYS6A15NBRM5	PFG-6A-NBR	PFTYS6A15SIM5	PFG-6A-SI	TYS-5A-15
8	M5	10	.14 (.61)	.26 (1.17)	PFTYS8A10NBRM5	PFG-8A-NBR	PFTYS8A10SIM5	PFG-8A-SI	TYS-5A-10
8	M5	15	.15 (.64)	.26 (1.17)	PFTYS8A15NBRM5	PFG-8A-NBR	PFTYS8A15SIM5	PFG-8A-SI	TYS-5A-15
10	M5	10	.11 (.49)	.13 (.59)	PFTYS10A10NBRM5	PFG-10A-NBR	PFTYS10A10SIM5	PFG-10A-SI	TYS-5A-10
10	M5	15	.11 (.49)	.13 (.59)	PFTYS10A15NBRM5	PFG-10A-NBR	PFTYS10A15SIM5	PFG-10A-SI	TYS-5A-15
15	M5	10	.11 (.49)	.13 (.59)	PFTYS15A10NBRM5	PFG-15A-NBR	PFTYS15A10SIM5	PFG-15A-SI	TYS-5A-10
15	M5	15	.11 (.49)	.13 (.59)	PFTYS15A15NBRM5	PFG-15A-NBR	PFTYS15A15SIM5	PFG-15A-SI	TYS-5A-15
20	M5	15	.56 (2.5)	.79 (3.4)	PFTYS20B15NBRM5	PFG-20B-NBR	PFTYS20B15SIM5	PFG-20B-SI	TYS-20B-15
20	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS20B30NBRM5	PFG-20B-NBR	PFTYS20B30SIM5	PFG-20B-SI	TYS-20B-30
30	M5	15	.56 (2.5)	.79 (3.4)	PFTYS3015NBRM5	PFG-30-NBR	PFTYS3015SIM5	PFG-30-SI	TYS-20B-15
30	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS3030NBRM5	PFG-30-NBR	PFTYS3030SIM5	PFG-30-SI	TYS-20B-30
40	M5	15	.56 (2.5)	.79 (3.4)	PFTYS4015NBRM5	PFG-40-NBR	PFTYS4015SIM5	PFG-40-SI	TYS-20B-15
40	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS4030NBRM5	PFG-40-NBR	PFTYS4030SIM5	PFG-40-SI	TYS-20B-30
50	M5	15	.56 (2.5)	1.2 (4.9)	PFTYS5015NBRM5	PFG-50-NBR	PFTYS5015SIM5	PFG-50-SI	TYS-50-15
50	M5	30	.67 (2.9)	1.4 (5.9)	PFTYS5030NBRM5	PFG-50-NBR	PFTYS5030SIM5	PFG-50-SI	TYS-50-30
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PFTYS6030NBRN1	PFG-60-NBR	PFTYS6030SIN1	PFG-60-SI	TYS-60-30
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PFTYS6050NBRN1	PFG-60-NBR	PFTYS6050SIN1	PFG-60-SI	TYS-60-50
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PFTYS8030NBRN1	PFG-80-NBR	PFTYS8030SIN1	PFG-80-SI	TYS-60-30
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PFTYS8050NBRN1	PFG-80-NBR	PFTYS8050SIN1	PFG-80-SI	TYS-60-50
95	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PFTYS9530NBRN1	PFG-95-NBR	PFTYS9530SIN1	PFG-95-SI	TYS-60-30
95	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PFTYS9550NBRN1	PFG-95-NBR	PFTYS9550SIN1	PFG-95-SI	TYS-60-50
120	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PFTYS12020NBRN2	PFG-120-NBR	PFTYS12020SIN2	PFG-120-SI	TYS-120-20
120	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PFTYS12070NBRN2	PFG-120-NBR	PFTYS12070SIN2	PFG-120-SI	TYS-120-70
150	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PFTYS15020NBRN2	PFG-150-NBR	PFTYS15020SIN2	PFG-150-SI	TYS-120-20
150	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PFTYS15070NBRN2	PFG-150-NBR	PFTYS15070SIN2	PFG-150-SI	TYS-120-70
200	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PFTYS20020NBRN2	PFG-200-NBR	PFTYS20020SIN2	PFG-200-SI	TYS-120-20
200	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PFTYS20070NBRN2	PFG-200-NBR	PFTYS20070SIN2	PFG-200-SI	TYS-120-70

☐ Most popular.

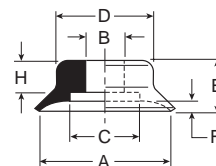
C
 Vacuum Cups
 Vacuum Products

PFG Series Replacement Cup Dimensions

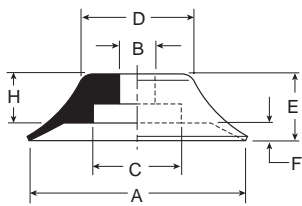
**PFG-5A
PFG-15A**



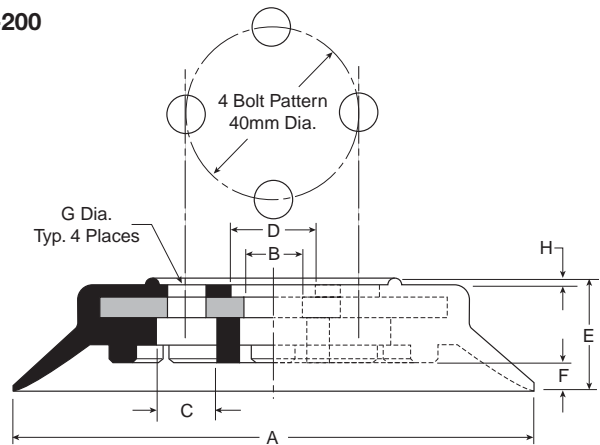
**PFG-15 thru
PFG-40**



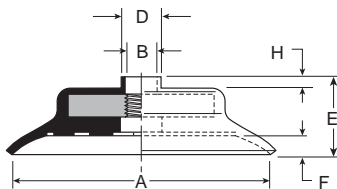
PFG-50



**PFG-120 thru
PFG-200**



**PFG-60 thru
PFG-95**



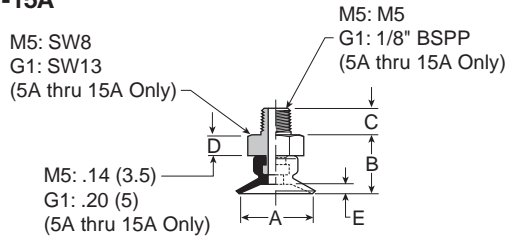
C
**Vacuum Cups
Vacuum Products**

Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PFG-5A-*	.20 (5)	.16 (4)	.06 (1.4)	.30 (7.5)	.26 (6.5)	.03 (.8)	.16 (4)	.08 (2)	.24 (6)
PFG-6A-*	.24 (6)	.16 (4)	.08 (2)	.30 (7.5)	.26 (6.5)	.03 (.8)	.16 (4)	.08 (2)	.24 (6)
PFG-8A-*	.31 (8)	.16 (4)	.08 (2)	.31 (8)	.28 (7)	.05 (1.2)	.16 (4)	.08 (2)	.24 (6)
PFG-10A-*	.39 (10)	.16 (4)	.08 (2)	.33 (8.5)	.30 (7.5)	.06 (1.5)	.16 (4)	.08 (2)	.24 (6)
PFG-15-*	.59 (15)	—	.31 (7.8)	.47 (12)	.31 (8)	.07 (1.9)	—	—	—
PFG-15A-*	.59 (15)	.16 (4)	.08 (2)	.35 (9)	.31 (8)	.08 (2)	.16 (4)	.08 (2)	.24 (6)
PFG-20-*	.79 (20)	.18 (4.6)	.43 (11)	.59 (15)	.39 (10)	.09 (2.3)	—	.18 (4.5)	—
PFG-20B-*	.79 (20)	.24 (6)	.43 (11)	.59 (15)	.49 (12.5)	.09 (2.3)	—	.28 (7)	—
PFG-30-*	1.18 (30)	.24 (6)	.43 (11)	.55 (14)	.47 (12)	.08 (2)	—	.28 (7)	—
PFG-40-*	1.57 (40)	.24 (6)	.43 (11)	.94 (24)	.55 (14)	.16 (4)	—	.28 (7)	—
PFG-50-*	1.97 (50)	.31 (8)	.79 (20)	1.06 (27)	.59 (15)	.14 (3.5)	—	.28 (7)	—
PFG-60-*	2.36 (60)	M10x1.25	—	.79 (12.5)	.73 (18.5)	.20 (5)	—	.10 (2.5)	—
PFG-80-*	3.15 (80)	M10x1.25	—	.79 (12.5)	.81 (20.5)	.24 (6)	—	.10 (2.5)	—
PFG-95-*	3.74 (95)	M10x1.25	—	.79 (12.5)	.83 (21)	.24 (6)	—	.10 (2.5)	—
PFG-120-*	4.72 (120)	.55 (14)	.55 (14)	.79 (20)	1.00 (25.5)	.24 (6)	4xØ8.7xØ40	.059 (1.5)	—
PFG-150-*	5.91 (150)	.51 (13)	.55 (14)	.79 (20)	1.28 (32.5)	.35 (9)	4xØ8.7xØ40	.059 (1.5)	—
PFG-200-*	7.87 (200)	.51 (13)	.47 (12)	.79 (20)	1.48 (37.5)	.51 (13)	4xØ8.7xØ40	.059 (1.5)	—

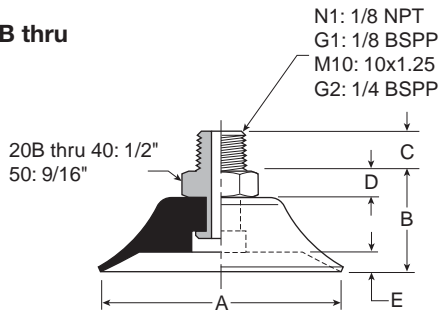
Inches (mm)
* Cup material

Dimensions

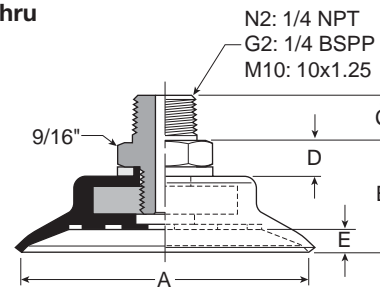
**PFTM-5A thru
PFTM-15A**



**PFTM-20B thru
PFTM-50**

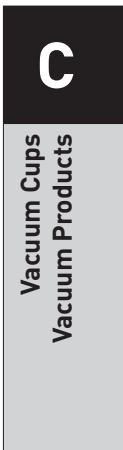


**PFTM-60 thru
PFTM-95**



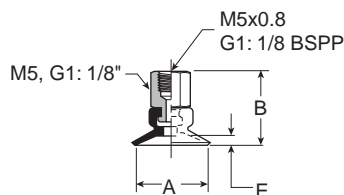
Model number	ØA	B	C (M3)	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PFTM-5A-* [†]	.20 (5)	.39 (10)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.31 (8)
PFTM-6A-* [†]	.24 (6)	.39 (10)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.31 (8)
PFTM-8A-* [†]	.31 (8)	.41 (10.5)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.05 (1.2)
PFTM-10A-* [†]	.39 (10)	.43 (11)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.06 (1.5)
PFTM-15A-* [†]	.59 (15)	.45 (11.5)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.08 (2)
PFTM-20B-* [†]	.79 (20)	.69 (17.5)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.10 (2.5)
PFTM-30-* [†]	1.18 (30)	.67 (17)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.08 (2)
PFTM-40-* [†]	1.57 (40)	.75 (19)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.14 (3.5)
PFTM-50-* [†]	1.97 (50)	.79 (20)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.16 (4)
PFTM-60-* [†]	2.36 (60)	.90 (23)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.20 (5)
PFTM-80-* [†]	3.15 (80)	.98 (25)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.24 (6)
PFTM-95-* [†]	3.74 (95)	1.00 (25.5)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.24 (6)

Inches (mm)
* Cup material
[†] Thread size

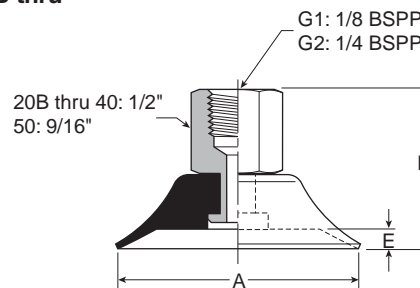


Dimensions

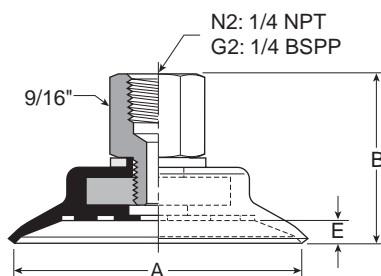
**PFTF-5A thru
PFTF-15A**



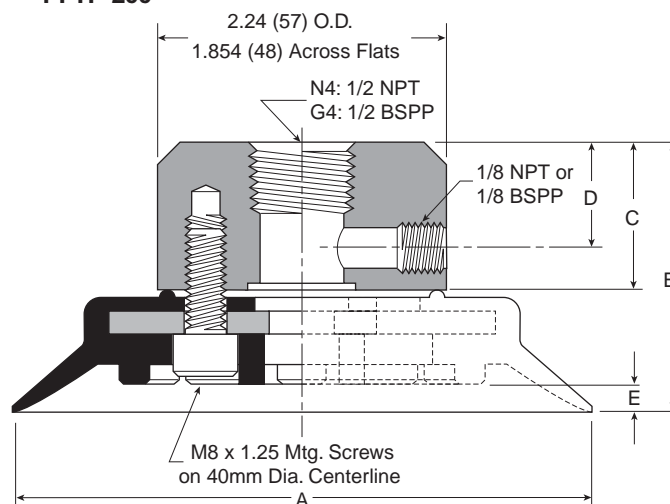
**PFTF-20B thru
PFTF-50**



**PFTF-60 thru
PFTF-95**



**PFTF-120 thru
PFTF-200**

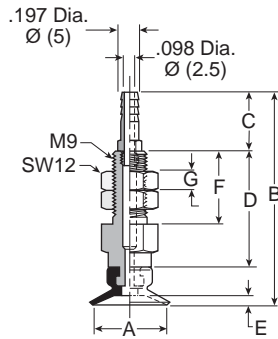


Model number	ØA	B	B (M5)	C	D	E
PFTF-5A-*†	.20 (5)	.57 (14.5)	.81 (20.5)	—	—	.03 (.8)
PFTF-6A-*†	.24 (6)	.57 (14.5)	.81 (20.5)	—	—	.03 (.8)
PFTF-8A-*†	.31 (8)	.59 (15)	.83 (21)	—	—	.05 (1.2)
PFTF-10A-*†	.39 (10)	.57 (14.5)	.81 (20.5)	—	—	.06 (1.5)
PFTF-15A-*†	.59 (15)	.63 (16)	.87 (22)	—	—	.08 (2)
PFTF-20B-*†	.79 (20)	1.04 (26.5)	—	—	—	.10 (2.5)
PFTF-30-*†	1.18 (30)	1.02 (26)	—	—	—	.08 (2)
PFTF-40-*†	1.57 (40)	1.10 (28)	—	—	—	.16 (4)
PFTF-50-*†	1.97 (50)	1.14 (29)	—	—	—	.16 (4)
PFTF-60-*†	2.36 (60)	1.40 (35.5)	—	—	—	.20 (5)
PFTF-80-*†	3.15 (80)	1.48 (37.5)	—	—	—	.24 (6)
PFTF-95-*†	3.74 (95)	1.50 (38)	—	—	—	.24 (6)
PFTF-120-*†	4.72 (120)	1.83 (46.5)	—	.94 (24)	.51 (13)	.24 (6)
PFTF-150-*†	5.91 (150)	2.11 (53.5)	—	.94 (24)	.51 (13)	.35 (9)
PFTF-200-*†	7.87 (200)	2.30 (58.5)	—	.94 (24)	.51 (13)	.51 (13)

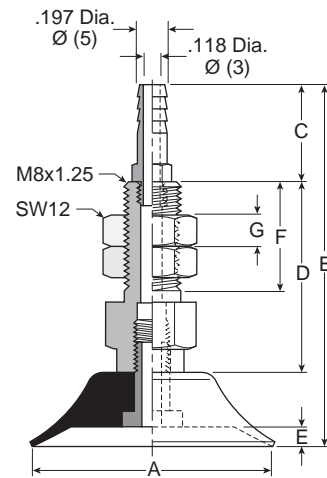
Inches (mm)
* Cup material
† Thread size

Dimensions

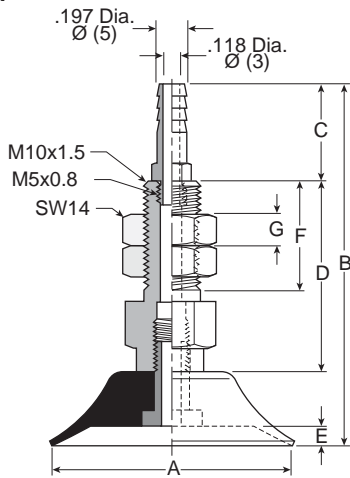
**PFTK-5A thru
PFTK-10A**



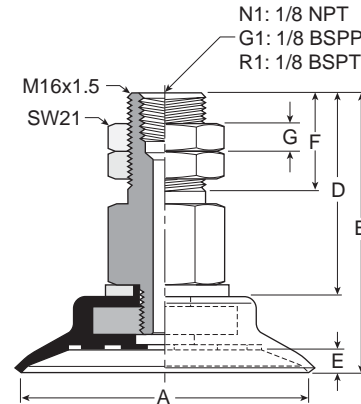
**PFTK-15 thru
PFTK-20**



**PFTK-30 thru
PFTK-50**



**PFTK-60 thru
PFTK-95**

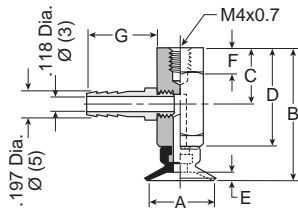


Model number	ØA	B	C	D	E	F	G	Wt oz. (g)
PFTK-5A-*	.20 (5)	1.20 (30.5)	.39 (10)	.55 (14)	.03 (.8)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-6A-*	.24 (6)	1.20 (30.5)	.39 (10)	.55 (14)	.03 (.8)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-8A-*	.31 (8)	1.22 (31)	.39 (10)	.55 (14)	.05 (1.2)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-10A-*	.39 (10)	1.81 (46)	.63 (16)	.88 (22.5)	.06 (1.5)	.61 (15.5)	.12 (3)	.53 (15)
PFTK-15-*	.59 (15)	1.81 (46)	.63 (16)	.86 (22)	.07 (1.9)	.59 (15)	.12 (3)	.71 (20)
PFTK-20-*	.79 (20)	1.89 (48)	.63 (16)	.86 (22)	.09 (2.3)	.59 (15)	.20 (5)	.71 (20)
PFTK-30-*	1.18 (30)	2.36 (60)	.63 (16)	1.26 (32)	.08 (2)	.71 (20)	.20 (5)	1.41 (40)
PFTK-40-*	1.57 (40)	2.44 (62)	.63 (16)	1.26 (32)	.14 (3.5)	.71 (20)	.20 (5)	1.41 (40)
PFTK-50-*	1.97 (50)	2.48 (63)	.63 (16)	1.26 (32)	.16 (4)	.71 (20)	.20 (5)	1.77 (50)
PFTK-60-*,†	2.36 (60)	2.30 (58.5)	—	1.67 (42.5)	.20 (5)	.79 (20)	.24 (6)	4.59 (130)
PFTK-80-*,†	3.15 (80)	2.38 (60.5)	—	1.67 (42.5)	.24 (6)	.79 (20)	.24 (6)	6.00 (170)
PFTK-95-*,†	3.74 (95)	2.40 (61)	—	1.67 (42.5)	.24 (6)	.79 (20)	.24 (6)	7.77 (220)

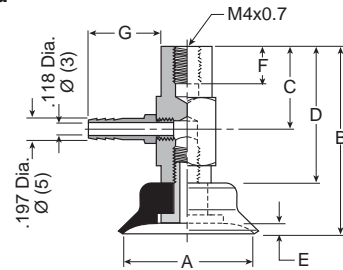
Inches (mm)
* Cup material
† Vacuum port

Dimensions

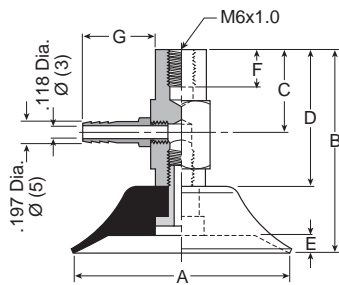
**PFYK-5A thru
 PFYK-10A**



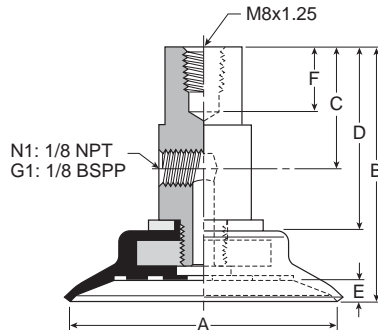
**PFYK-15 thru
 PFYK-20**



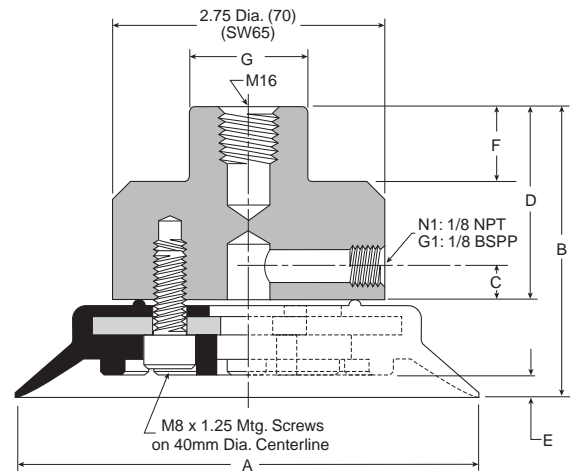
**PFYK-30 thru
 PFYK-50**



**PFYK-60 thru
 PFYK-95**



**PFYK-120 thru
 PFYK-200**



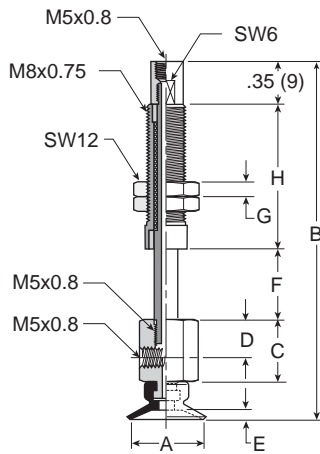
Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PFYK-5A-*	.20 (5)	1.14 (29)	.51 (13)	.89 (22.5)	.03 (.8)	.24 (6)	.63 (16)	.56 (16)
PFYK-6A-*	.24 (6)	1.14 (29)	.51 (13)	.89 (22.5)	.03 (.8)	.24 (6)	.63 (16)	.56 (16)
PFYK-8A-*	.31 (8)	1.16 (29.5)	.51 (13)	.89 (22.5)	.05 (1.2)	.24 (6)	.63 (16)	.56 (16)
PFYK-10A-*	.39 (10)	1.18 (30)	.51 (13)	.89 (22.5)	.06 (1.5)	.24 (6)	.63 (16)	.56 (16)
PFYK-15-*	.59 (15)	1.18 (30)	.55 (14)	.87 (22)	.07 (1.9)	.24 (6)	.63 (16)	.71 (20)
PFYK-20-*	.79 (20)	1.26 (32)	.55 (14)	.87 (22)	.09 (2.3)	.24 (6)	.63 (16)	.71 (20)
PFYK-30-*	1.18 (30)	1.73 (44)	.79 (20)	1.26 (32)	.08 (2)	.31 (8)	.63 (16)	1.41 (40)
PFYK-40-*	1.57 (40)	1.81 (46)	.79 (20)	1.26 (32)	.14 (3.5)	.31 (8)	.63 (16)	1.77 (50)
PFYK-50-*	1.97 (50)	1.85 (47)	.79 (20)	1.26 (32)	.16 (4)	.31 (8)	.63 (16)	1.94 (55)
PFYK-60-*.†	2.36 (60)	2.30 (58.5)	1.10 (28)	1.57 (40)	.20 (5)	.43 (11)	—	4.24 (120)
PFYK-80-*.†	3.15 (80)	2.38 (60.5)	1.10 (28)	1.57 (40)	.24 (6)	.43 (11)	—	5.65 (160)
PFYK-95-*.†	3.74 (95)	2.40 (61)	1.10 (28)	1.57 (40)	.24 (6)	.43 (11)	—	7.42 (210)
PFYK-120-*.†	4.72 (120)	2.94 (75.5)	.47 (12)	1.97 (50)	.24 (6)	.79 (20)	1.18 Dia. (30)	22.6 (640)
PFYK-150-*.†	5.91 (150)	3.25 (82.5)	.47 (12)	1.97 (50)	.35 (9)	.79 (20)	1.18 Dia. (30)	32.1 (910)
PFYK-200-*.†	7.87 (200)	3.44 (87.5)	.47 (12)	1.97 (50)	.51 (13)	.79 (20)	1.18 Dia. (30)	42.4 (1200)

Inches (mm)
 * Cup material
 † Vacuum port

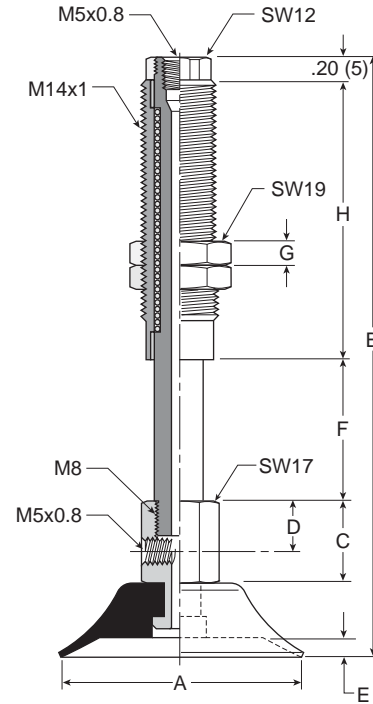
**Vacuum Cups
 Vacuum Products**

Dimensions

**PFTYS5A thru
PFTYS15A**



**PFTYS20B thru
PFTYS50**



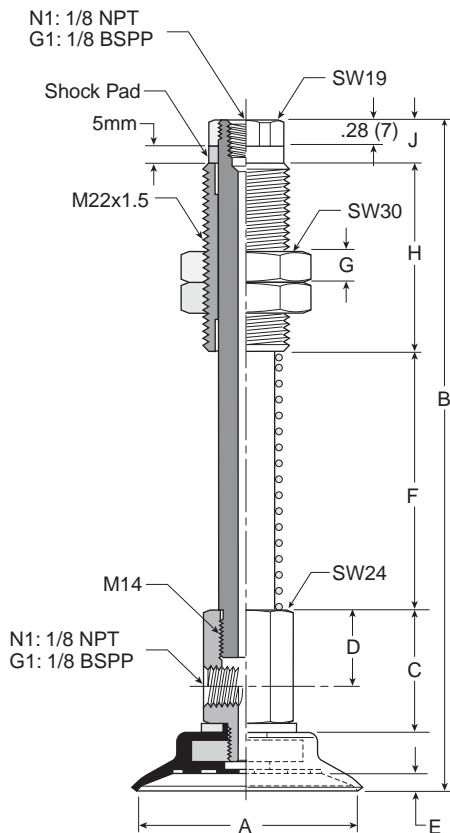
Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PFTYS5A10**	.20 (5)	2.42 (61.5)	.51 (13)	.31 (8)	.03 (.8)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS5A15**	.20 (5)	2.91 (74)	.51 (13)	.31 (8)	.03 (.8)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS6A10**	.24 (6)	2.42 (61.5)	.51 (13)	.31 (8)	.03 (.8)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS6A15**	.24 (6)	2.91 (74)	.51 (13)	.31 (8)	.03 (.8)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS8A10**	.31 (8)	2.44 (62)	.51 (13)	.31 (8)	.05 (1.2)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS8A15**	.31 (8)	2.93 (74.5)	.51 (13)	.31 (8)	.05 (1.2)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS10A10**	.39 (10)	2.48 (63)	.51 (13)	.31 (8)	.06 (1.5)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS10A15**	.39 (10)	2.95 (75)	.51 (13)	.31 (8)	.06 (1.5)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS15A10**	.59 (15)	2.50 (63.5)	.51 (13)	.31 (8)	.08 (2)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS15A15**	.59 (15)	2.97 (75.5)	.51 (13)	.31 (8)	.08 (2)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS20B15**	.79 (20)	3.37 (85.5)	.67 (17)	.39 (10)	.09 (2.3)	.59 (15)	.20 (5)	1.42 (36)	2.5 (71)
PFTYS20B30**	.79 (20)	4.82 (122.5)	.67 (17)	.39 (10)	.09 (2.3)	1.18 (30)	.20 (5)	2.28 (58)	3.4 (96)
PFTYS3015**	1.18 (30)	3.35 (85)	.67 (17)	.39 (10)	.08 (2)	.59 (15)	.20 (5)	1.42 (36)	2.5 (72)
PFTYS3030**	1.18 (30)	4.80 (122)	.67 (17)	.39 (10)	.08 (2)	1.18 (30)	.20 (5)	2.28 (58)	3.5 (97)
PFTYS4015**	1.57 (40)	3.43 (87)	.67 (17)	.39 (10)	.14 (3.5)	.59 (15)	.20 (5)	1.42 (36)	2.7 (76)
PFTYS4030**	1.57 (40)	4.88 (124)	.67 (17)	.39 (10)	.14 (3.5)	1.18 (30)	.20 (5)	2.28 (58)	3.6 (101)
PFTYS5015**	1.97 (50)	3.46 (88)	.67 (17)	.39 (10)	.16 (4)	.59 (15)	.20 (5)	1.42 (36)	3.0 (85)
PFTYS5030**	1.97 (50)	4.92 (125)	.67 (17)	.39 (10)	.16 (4)	1.18 (30)	.20 (5)	2.28 (58)	3.9 (110)

Inches (mm)
* Cup material
† Vacuum port

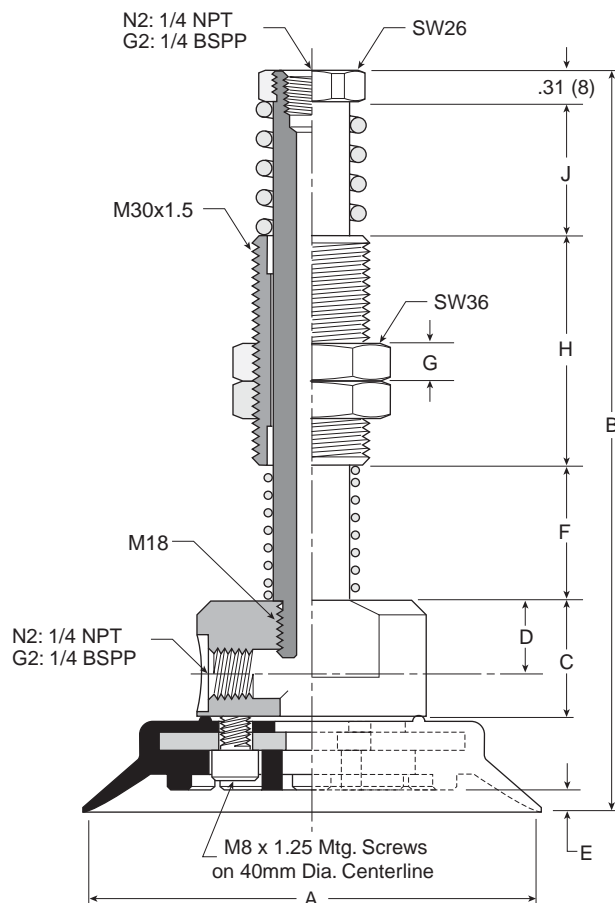
C
Vacuum Cups
Vacuum Products

Dimensions

**PFTYS60 thru
PFTYS95**



**PFTYS120 thru
PFTYS200**



**Vacuum Cups
Vacuum Products**

Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PFTYS6030*†	2.36 (60)	6.02 (153)	1.28 (32.5)	.78 (20)	.20 (5)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	9.7 (282)
PFTYS6050*†	2.36 (60)	7.01 (178)	1.28 (32.5)	.78 (20)	.20 (5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	11.2 (316)
PFTYS8030*†	3.15 (80)	6.10 (155)	1.28 (32.5)	.78 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	11 (310)
PFTYS8050*†	3.15 (80)	7.09 (180)	1.28 (32.5)	.78 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	12.2 (344)
PFTYS9530*†	3.74 (95)	6.12 (156)	1.28 (32.5)	.78 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	12.4 (350)
PFTYS9550*†	3.74 (95)	7.11 (181)	1.28 (32.5)	.78 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13.6 (384)
PFTYS12020*†	4.72 (120)	7.56 (192)	1.28 (32.5)	.71 (18)	.24 (6)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	41.2 (1165)
PFTYS12070*†	4.72 (120)	10.12 (257)	1.28 (32.5)	.71 (18)	.24 (6)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	44 (1246)
PFTYS15020*†	5.91 (150)	7.83 (199)	1.28 (32.5)	.71 (18)	.35 (9)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	49 (1389)
PFTYS15070*†	5.91 (150)	10.39 (264)	1.28 (32.5)	.71 (18)	.35 (9)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	52 (1471)
PFTYS20020*†	7.87 (200)	8.03 (204)	1.28 (32.5)	.71 (18)	.51 (13)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	62 (1755)
PFTYS20070*†	7.87 (200)	10.59 (269)	1.28 (32.5)	.71 (18)	.51 (13)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	64.9 (1836)

Inches (mm)
* Cup material
† Vacuum port

These cups are for curved, corrugated, lightly textured surfaces and flexible product. Under vacuum, the bellows cup will collapse on contact and lift the product for a short distance. This inherent performance facilitates lifting and destack operations by breaking the vacuum between stacked product. The bellows style adds level compensation for applications that have inconsistent stack heights or uneven surfaces. The inclusive 30-degree rotation of the bellows helps maintain the vacuum seal when lifting sheet products that flex. Because of its shape however the bellows suction cup is not very well suitable for applications involving lifting vertical surfaces.



Features

- Bellows design for level compensation within restricted clearances
- Sheet separation for flexible and stacked products
- Soft seal lip for flexible products
- 10mm to 150mm diameters

Styles

- PBTM series male thread connector
- PBTF series female thread connector
- PBTK series barbed bulkhead
- PBYK series 90° barbed adapter
- PBTYS series bulkhead level compensator

Specifications

Cup material	Nitrile	Silicon	Urethane
Material code	NBR	SI	U
Operating temperature (°C)	-20° to +120°	-60° to +250°	-30° to +120°
Color	Black	White	Blue
Hardness, shore A (°Sh)	55 ±5	55 ±5	55 ±5

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PBTM-20B-NBR-G1 becomes PBTM-20B-U-G1. Inquire with factory for availability.

Application guide

Bellows



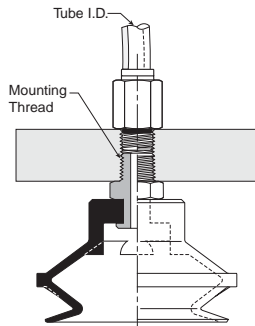
Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, thin section	Bowed surface, any section	Soft porous material, any section	Differences in heights and levels	Corrugated sheet handling	Not for vertical lift	Metal sheet handling
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PBTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
 Fitting material: aluminum.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	M5	PBTM-10A-NBR-M5	PBG-10A-NBR	PBTM-10A-SI-M5	PBG-10A-SI	FTM-5A-M5H
10	1/8 BSPP	PBTM-10A-NBR-G1	PBG-10A-NBR	PBTM-10A-SI-G1	PBG-10A-SI	FTM-5A-G1
15	M5	PBTM-15A-NBR-M5	PBG-15A-NBR	PBTM-15A-SI-M5	PBG-15A-SI	FTM-5A-M5H
15	1/8 BSPP	PBTM-15A-NBR-G1	PBG-15A-NBR	PBTM-15A-SI-G1	PBG-15A-SI	FTM-5A-G1
20	1/8 BSPP	PBTM-20B-NBR-G1	PBG-20B-NBR	PBTM-20B-SI-G1	PBG-20B-SI	FTM-20B-G1H
20	1/4 BSPP	PBTM-20B-NBR-G2	PBG-20B-NBR	PBTM-20B-SI-G2	PBG-20B-SI	FTM-20B-G2
20	M10	PBTM-20B-NBR-M10	PBG-20B-NBR	PBTM-20B-SI-M10	PBG-20B-SI	FTM-20B-M10
20	1/8 NPT	PBTM-20B-NBR-N1	PBG-20B-NBR	PBTM-20B-SI-N1	PBG-20B-SI	FTM-20B-N1
30	1/8 BSPP	PBTM-30-NBR-G1	PBG-30-NBR	PBTM-30-SI-G1	PBG-30-SI	FTM-20B-G1H
30	1/4 BSPP	PBTM-30-NBR-G2	PBG-30-NBR	PBTM-30-SI-G2	PBG-30-SI	FTM-20B-G2
30	M10	PBTM-30-NBR-M10	PBG-30-NBR	PBTM-30-SI-M10	PBG-30-SI	FTM-20B-M10
30	1/8 NPT	PBTM-30-NBR-N1	PBG-30-NBR	PBTM-30-SI-N1	PBG-30-SI	FTM-20B-N1
40	1/8 BSPP	PBTM-40-NBR-G1	PBG-40-NBR	PBTM-40-SI-G1	PBG-40-SI	FTM-20B-G1H
40	1/4 BSPP	PBTM-40-NBR-G2	PBG-40-NBR	PBTM-40-SI-G2	PBG-40-SI	FTM-20B-G2
40	M10	PBTM-40-NBR-M10	PBG-40-NBR	PBTM-40-SI-M10	PBG-40-SI	FTM-20B-M10
40	1/8 NPT	PBTM-40-NBR-N1	PBG-40-NBR	PBTM-40-SI-N1	PBG-40-SI	FTM-20B-N1
50	1/8 BSPP	PBTM-50-NBR-G1	PBG-50-NBR	PBTM-50-SI-G1	PBG-50-SI	FTM-50-G1H
50	1/4 BSPP	PBTM-50-NBR-G2	PBG-50-NBR	PBTM-50-SI-G2	PBG-50-SI	FTM-50-G2
50	1/8 NPT	PBTM-50-NBR-N1	PBG-50-NBR	PBTM-50-SI-N1	PBG-50-SI	FTM-50-N1
75	1/4 BSPP	PBTM-75-NBR-G2	PBG-75-NBR	PBTM-75-SI-G2	PBG-75-SI	FTM-60-G2
75	M10	PBTM-75-NBR-M10	PBG-75-NBR	PBTM-75-SI-M10	PBG-75-SI	FTM-60-M10
75	1/4 NPT	PBTM-75-NBR-N2	PBG-75-NBR	PBTM-75-SI-N2	PBG-75-SI	FTM-60-N2

Most popular.

Vacuum Cups
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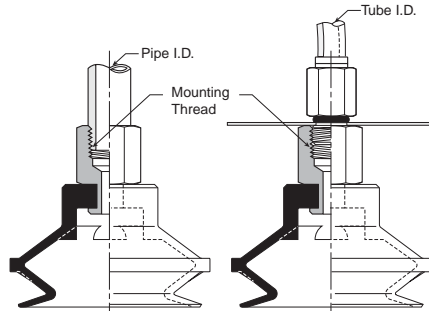
PBTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
 Fitting material: aluminum.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Replacement cup Silicon (SI)	Replacement cup fitting
10	1/8 BSPP	PBTF-10A-NBR-G1	PBG-10A-NBR	PBG-10A-SI	FTF-5A-G1
10	M5	PBTF-10A-NBR-M5	PBG-10A-NBR	PBG-10A-SI	FTF-5A-M5
15	1/8 BSPP	PBTF-15A-NBR-G1	PBG-15A-NBR	PBG-15A-SI	FTF-5A-G1
15	M5	PBTF-15A-NBR-M5	PBG-15A-NBR	PBG-15A-SI	FTF-5A-M5
20	1/8 BSPP	PBTF-20B-NBR-G1	PBG-20B-NBR	PBG-20B-SI	FTF-20B-G1
30	1/8 BSPP	PBTF-30-NBR-G1	PBG-30-NBR	PBG-30-SI	FTF-20B-G1
30	1/4 BSPP	PBTF-30-NBR-G2	PBG-30-NBR	PBG-30-SI	FTF-20B-G2
40	1/8 BSPP	PBTF-40-NBR-G1	PBG-40-NBR	PBG-40-SI	FTF-20B-G1
40	1/4 BSPP	PBTF-40-NBR-G2	PBG-40-NBR	PBG-40-SI	FTF-20B-G2
50	1/8 BSPP	PBTF-50-NBR-G1	PBG-50-NBR	PBG-50-SI	FTF-50-G1
50	1/4 BSPP	PBTF-50-NBR-G2	PBG-50-NBR	PBG-50-SI	FTF-50-G2
75	1/4 BSPP	PBTF-75-NBR-G2	PBG-75-NBR	PBG-75-SI	FTF-60-G2
75	1/4 NPT	PBTF-75-NBR-N2	PBG-75-NBR	PBG-75-SI	FTF-60-N2
110	1/2 BSPP	PBTF-110-NBR-G4	PBG-110-NBR	PBG-110-SI	FTF-120-G4
110	1/2 NPT	PBTF-110-NBR-N4	PBG-110-NBR	PBG-110-SI	FTF-120-N4
150	1/2 BSPP	PBTF-150-NBR-G4	PBG-150-NBR	PBG-150-SI	FTF-120-G4
150	1/2 NPT	PBTF-150-NBR-N4	PBG-150-NBR	PBG-150-SI	FTF-120-N4

Most popular.

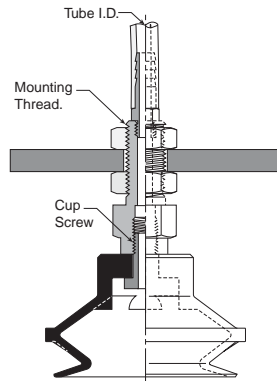
C
 Vacuum Cups
 Vacuum Products

PBTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	Barb	PBTK-10A-NBR	PBG-10A-NBR	PBTK-10A-SI	PBG-10A-SI	FTK-5A
15	Barb	PBTK-15A-NBR	PBG-15A-NBR	PBTK-15A-SI	PBG-15-SI	FTK-5A
20	Barb	PBTK-20-NBR	PBG-20-NBR	PBTK-20-SI	PBG-20-SI	FTK-20
30	Barb	PBTK-30-NBR	PBG-30-NBR	PBTK-30-SI	PBG-30-SI	FTK-25
40	Barb	PBTK-40-NBR	PBG-40-NBR	PBTK-40-SI	PBG-40-SI	FTK-25
50	Barb	PBTK-50-NBR	PBG-50-NBR	PBTK-50-SI	PBG-50-SI	FTK-50
75	1/8 BSPP	PBTK-75-NBR-G1	PBG-75-NBR	PBTK-75-SI-G1	PBG-75-SI	FTK-60-G1
75	1/8 NPT	PBTK-75-NBR-N1	PBG-75-NBR	PBTK-75-SI-N1	PBG-75-SI	FTK-60-N1



Vacuum Cups
 Vacuum Products

Most popular.

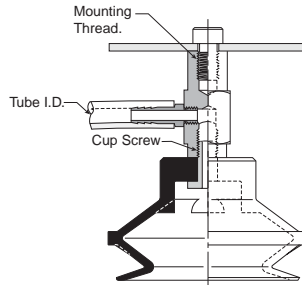
PBYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting material: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	Barb	PBYK-10A-NBR	PBG-10A-NBR	PBYK-10A-SI	PBG-10A-SI	FYK-5A
15	Barb	PBYK-15A-NBR	PBG-15A-NBR	PBYK-15A-SI	PBG-15A-SI	FYK-15
20	Barb	PBYK-20-NBR	PBG-20-NBR	PBYK-20-SI	PBG-20-SI	FYK-20
30	Barb	PBYK-30-NBR	PBG-30-NBR	PBYK-30-SI	PBG-30-SI	FYK-25
40	Barb	PBYK-40-NBR	PBG-40-NBR	PBYK-40-SI	PBG-40-SI	FYK-25
50	Barb	PBYK-50-NBR	PBG-50-NBR	PBYK-50-SI	PBG-50-SI	FYK-50
75	1/8 BSPP	PBYK-75-NBR-G1	PBG-75-NBR	PBYK-75-SI-G1	PBG-75-SI	FYK-60-G1
75	1/8 NPT	PBYK-75-NBR-N1	PBG-75-NBR	PBYK-75-SI-N1	PBG-75-SI	FYK-60-N1
110	1/8 BSPP	PBYK-110-NBR-G1	PBG-110-NBR	PBYK-110-SI-G1	PBG-110-SI	FYK-120-G1
110	1/8 NPT	PBYK-110-NBR-N1	PBG-110-NBR	PBYK-110-SI-N1	PBG-110-SI	FYK-120-N1
150	1/8 BSPP	PBYK-150-NBR-G1	PBG-150-NBR	PBYK-150-SI-G1	PBG-150-SI	FYK-120-G1
150	1/8 NPT	PBYK-150-NBR-N1	PBG-150-NBR	PBYK-150-SI-N1	PBG-150-SI	FYK-120-N1

Most popular.

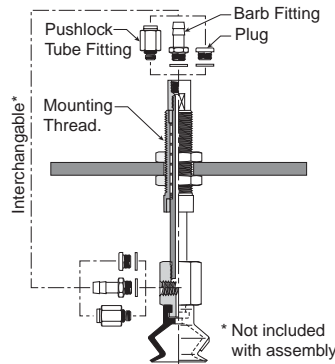
PBTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.

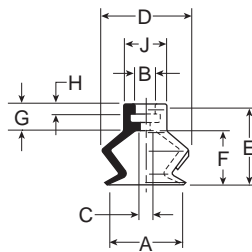


Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N)		Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
			0%	100%					
10	M5	10	.11 (.49)	.13 (.59)	PBTYS10A10NBRM5	PBG-10A-NBR	PBTYS10A10SIM5	PBG-10A-SI	TYS-5A-10
10	M5	15	.11 (.49)	.13 (.59)	PBTYS10A15NBRM5	PBG-10A-NBR	PBTYS10A15SIM5	PBG-10A-SI	TYS-5A-15
15	M5	10	.11 (.49)	.13 (.59)	PBTYS15A10NBRM5	PBG-15A-NBR	PBTYS15A10SIM5	PBG-15A-SI	TYS-5A-10
15	M5	15	.11 (.49)	.13 (.59)	PBTYS15A15NBRM5	PBG-15A-NBR	PBTYS15A15SIM5	PBG-15A-SI	TYS-5A-15
20	M5	15	.56 (2.5)	.79 (3.4)	PBTYS20B15NBRM5	PBG-20B-NBR	PBTYS20B15SIM5	PBG-20B-SI	TYS-20B-15
20	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS20B30NBRM5	PBG-20B-NBR	PBTYS20B30SIM5	PBG-20B-SI	TYS-20B-30
30	M5	15	.56 (2.5)	.79 (3.4)	PBTYS3015NBRM5	PBG-30-NBR	PBTYS3015SIM5	PBG-30-SI	TYS-20B-15
30	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS3030NBRM5	PBG-30-NBR	PBTYS3030SIM5	PBG-30-SI	TYS-20B-30
40	M5	15	.56 (2.5)	.79 (3.4)	PBTYS4015NBRM5	PBG-40-NBR	PBTYS4015SIM5	PBG-40-SI	TYS-20B-15
40	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS4030NBRM5	PBG-40-NBR	PBTYS4030SIM5	PBG-40-SI	TYS-20B-30
50	M5	15	.56 (2.5)	1.2 (4.9)	PBTYS5015NBRM5	PBG-50-NBR	PBTYS5015SIM5	PBG-50-SI	TYS-50-15
50	M5	30	.67 (2.9)	1.4 (5.9)	PBTYS5030NBRM5	PBG-50-NBR	PBTYS5030SIM5	PBG-50-SI	TYS-50-30
75	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PBTYS7530NBRN1	PBG-75-NBR	PBTYS7530SIN1	PBG-75-SI	TYS-60-30
75	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PBTYS7550NBRN1	PBG-75-NBR	PBTYS7550SIN1	PBG-75-SI	TYS-60-50
110	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PBTYS12020NBRN2	PBG-110-NBR	PBTYS11020SIN2	PBG-110-SI	TYS-120-20
110	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PBTYS12070NBRN2	PBG-110-NBR	PBTYS11070SIN2	PBG-110-SI	TYS-120-70
150	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PBTYS15020NBRN2	PBG-150-NBR	PBTYS15020SIN2	PBG-150-SI	TYS-120-20
150	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PBTYS15070NBRN2	PBG-150-NBR	PBTYS15070SIN2	PBG-150-SI	TYS-120-70

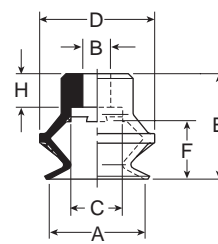
Most popular.

PBG Series Replacement Cup Dimensions

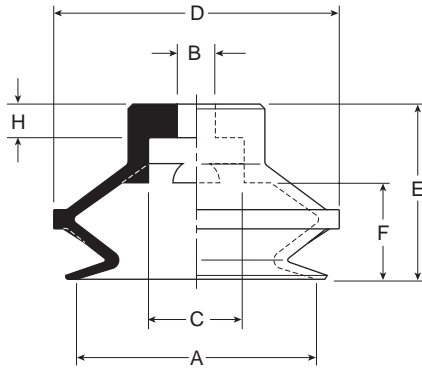
**PBG-10A and
 PBG-20B**



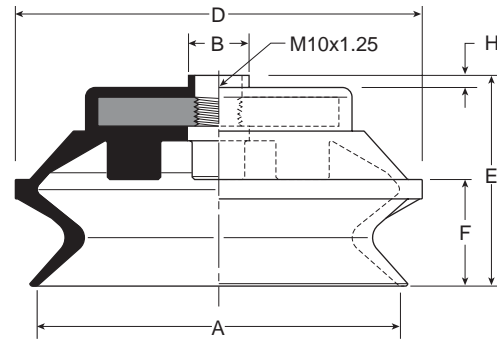
**PBG-20 thru
 PBG-40**



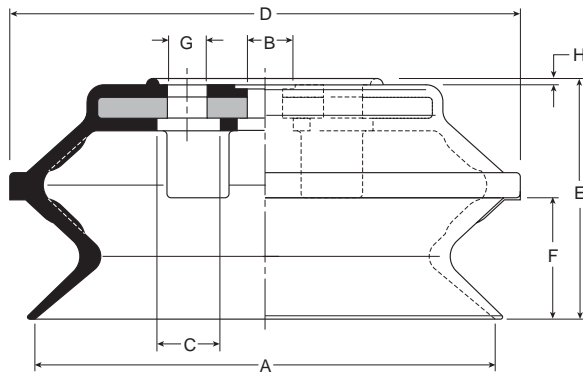
PBG-50



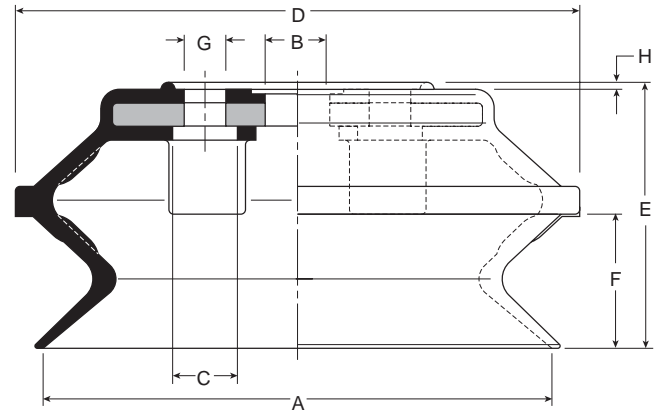
PBG-75



PBG-110

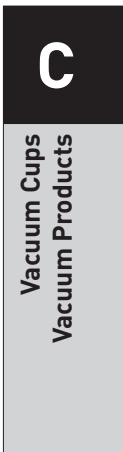


PBG-150



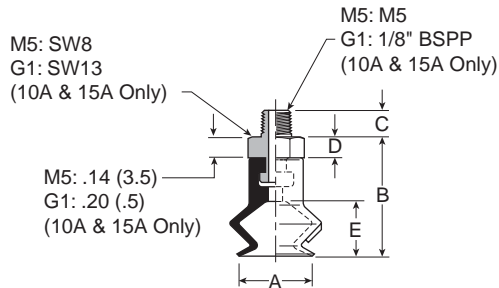
Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PBG-10A-*	.42 (10.6)	.16 (4)	.08 (2)	.49 (12.4)	.53 (13.5)	.30 (7.5)	.24 (6)	.08 (2)	.24 (6)
PBG-15A-*	.59 (15)	.16 (4)	.16 (4)	.67 (17)	.63 (16)	.39 (10)	.24 (6)	.08 (2)	.24 (6)
PBG-20B-*	.79 (20)	.24 (6)	.43 (10.8)	.94 (24)	.87 (22)	.47 (12)	—	.28 (7)	—
PBG-20-*	.79 (20)	.18 (4.6)	.43 (10.8)	.94 (24)	.77 (19.5)	.47 (12)	—	.18 (4.5)	—
PBG-30-*	1.18 (30)	.23 (5.8)	.43 (10.8)	1.42 (36)	1.20 (30.5)	.67 (17)	—	.28 (7)	—
PBG-40-*	1.57 (40)	.23 (5.8)	.43 (10.8)	1.81 (46)	1.20 (30.5)	.61 (15.5)	—	.28 (7)	—
PBG-50-*	1.97(50)	.31 (7.8)	.78 (19.8)	2.34 (59.5)	1.44 (36.5)	.79 (20)	—	.28 (7)	—
PBG-75-*	2.95 (75)	.49 (12.5)	—	3.31 (84)	1.71 (43.5)	.87 (22)	—	.10 (2.5)	—
PBG-110-*	4.33 (110)	.55 (14)	.55 (14)	4.80 (122)	2.26 (57.5)	1.14 (29)	—	.059 (1.5)	—
PBG-150-*	5.91 (150)	.79 (20)	.55 (14)	6.57 (167)	3.01 (76.5)	1.50 (38)	4xØ9xØ40	.059 (1.5)	—

Inches (mm)
 * Cup material

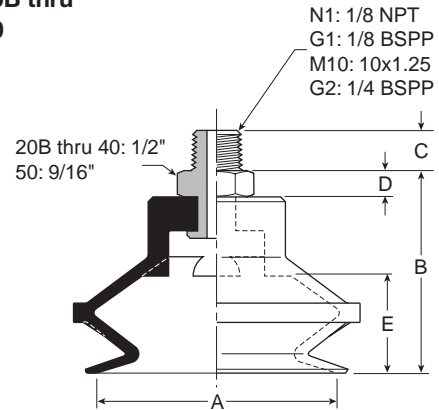


Dimensions

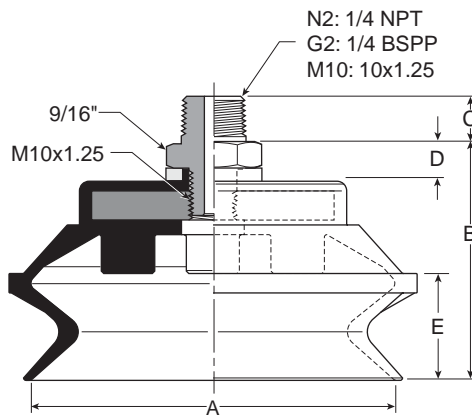
**PBTM-10A thru
PBTM-15**



**PBTM-20B thru
PBTM-50**



PBTM-75



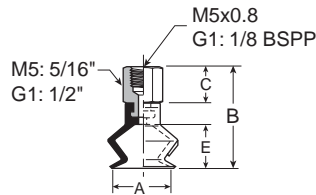
C
**Vacuum Cups
Vacuum Products**

Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PBTM-10A-*†	.39 (10)	.67 (17)	.18 (4.5)	.31 (8)	—	—	See Dwg.	.30 (7.5)
PBTM-15A-*†	.59 (15)	.77 (19.5)	.18 (4.5)	.31 (8)	—	—	See Dwg.	.39 (10)
PBTM-20B-*†	.79 (20)	1.06 (27)	—	.31 (8)	.39 (10)	—	.20 (5)	.47 (12)
PBTM-30-*†	1.18 (30)	1.40 (35.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.67 (17)
PBTM-40-*†	1.57 (40)	1.40 (35.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.61 (15.5)
PBTM-50-*†	1.97 (50)	1.63 (41.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.79 (20)
PBTM-75-*†	3.74 (95)	1.99 (50.5)	—	—	.39 (10)	.59 (15)	.28 (7)	.87 (22)

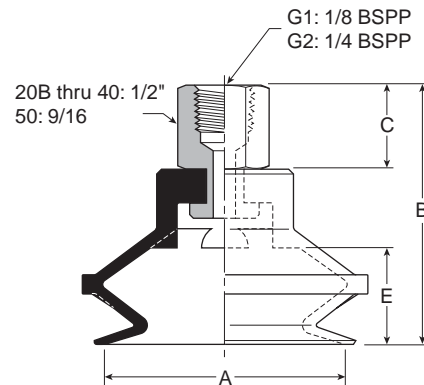
Inches (mm)
* Cup material
† Thread size

Dimensions

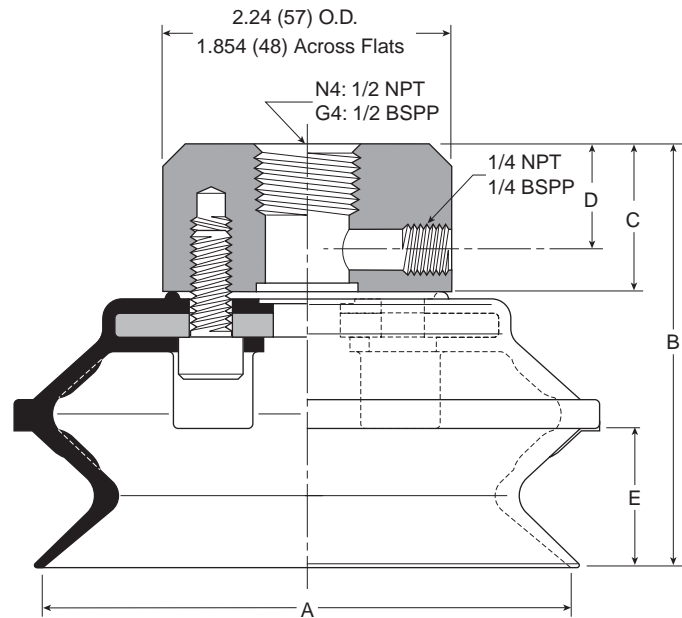
**PBTF-10A thru
 PBTF-15A**



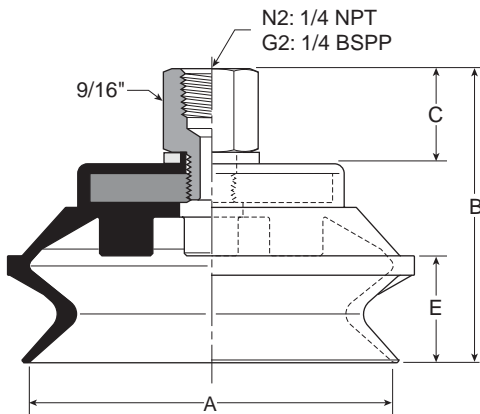
**PBTF-20B thru
 PBTF 50**



**PBTF-110 thru
 PBTF-150**

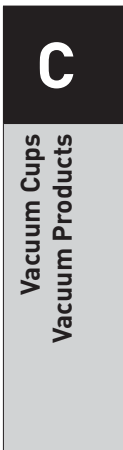


PBTF-75



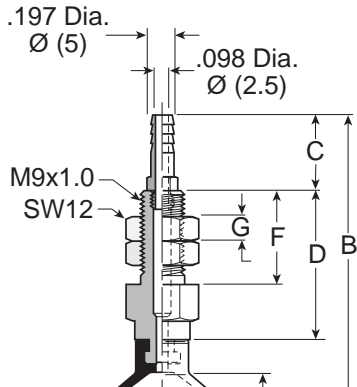
Model number	ØA	B	B (M5)	C	C (M5)	D	E
PBTF-10A-*†	.39 (10)	.85 (21.5)	1.08 (27.5)	.31 (8)	.55 (14)	—	.30 (7.5)
PBTF-15A-*†	.59 (15)	.94 (24)	1.18 (30)	.31 (8)	.55 (14)	—	.39 (10)
PBTF-20B-*†	.79 (20)	1.42 (36)	—	.55 (14)	—	—	.47 (12)
PBTF-30-*†	1.18 (30)	1.75 (44.5)	—	.55 (14)	—	—	.70 (17)
PBTF-40-*†	1.57 (40)	1.75 (44.5)	—	.55 (14)	—	—	.61 (15.5)
PBTF-50-*†	1.97 (50)	1.99 (50.5)	—	.55 (14)	—	—	.79 (20)
PBTF-75-*†	3.74 (95)	2.38 (60.5)	—	.77 (19.5)	—	—	.87 (22)
PBTF-110-*†	4.72 (120)	3.07 (78)	—	.94 (24)	—	.51 (13)	1.14 (29)
PBTF-150-*†	5.91 (150)	3.82 (97)	—	.94 (24)	—	.51 (13)	1.50 (38)

Inches (mm)
 * Cup material
 † Thread size

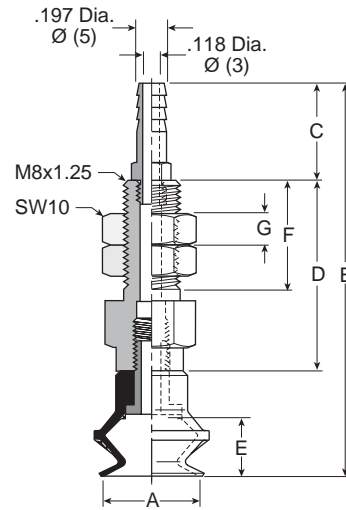


Dimensions

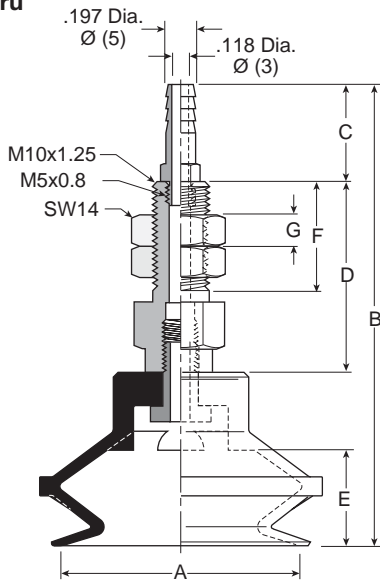
**PBTK-10A thru
 PBTK-15A**



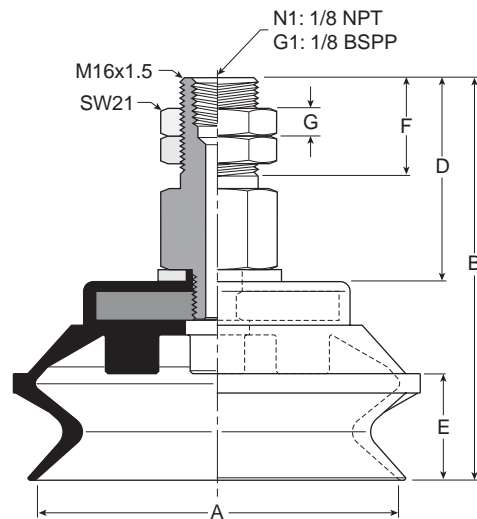
PBTK-20



**PBTK-30 thru
 PBTK-50**



PBTK-75



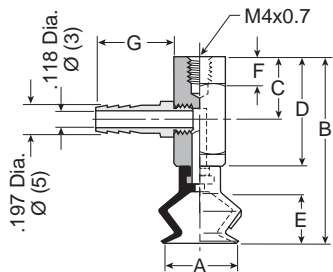
C
 Vacuum Cups
 Vacuum Products

Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PBTK-10A-*	.39 (10)	2.05 (52)	.39 (10)	.89 (22.5)	.30 (7.5)	.24 (6)	.61 (15.5)	.5 (15)
PBTK-15A-*	.59 (15)	2.15 (54.5)	.39 (10)	.89 (22.5)	.39 (10)	.24 (6)	.61 (15.5)	.5 (15)
PBTK-20-*	.79 (20)	2.26 (57.5)	.63 (16)	.87 (22)	.47 (12)	.24 (6)	.59 (15)	.7 (21)
PBTK-30-*	1.18 (30)	3.09 (78.5)	.63 (16)	1.26 (32)	.67 (17)	.24 (6)	.79 (20)	1.6 (45)
PBTK-40-*	1.57 (40)	3.09 (78.5)	.63 (16)	1.26 (32)	.61 (15.5)	.24 (6)	.79 (20)	1.7 (48)
PBTK-50-*	1.97 (50)	3.33 (84.5)	.63 (16)	1.26 (32)	.79 (20)	.24 (6)	.79 (20)	2.2 (62)
PBTK-75-*,†	3.74 (95)	3.29 (83.5)	—	1.67 (42.5)	.87 (22)	.43 (11)	—	6.5 (186)

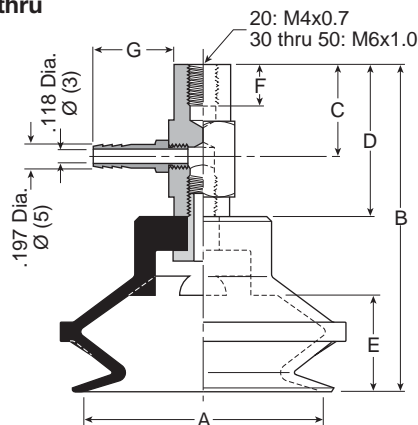
Inches (mm)
 * Cup material
 † Vacuum port

Dimensions

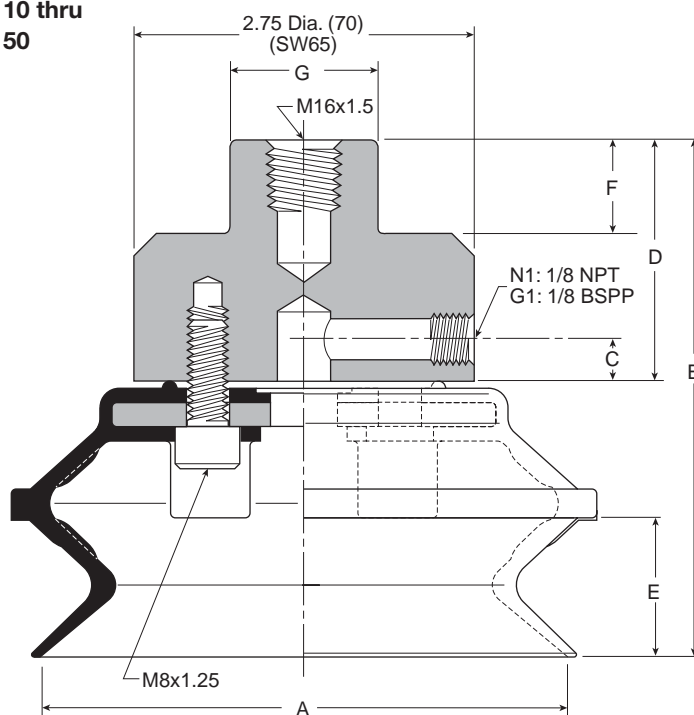
**PBYK-10A thru
PBYK-15A**



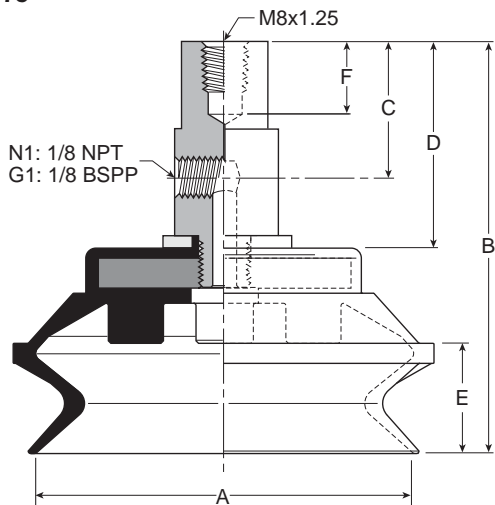
**PBYK-20 thru
PBYK-50**



**PBYK-110 thru
PBYK-150**

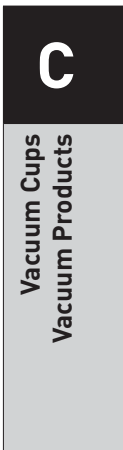


PBYK-75



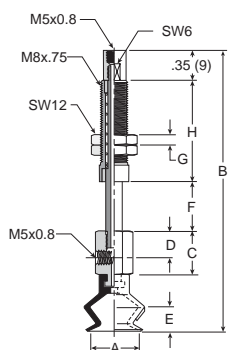
Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PBYK-10A-*	.39 (10)	1.42 (36)	.51 (13)	.89 (22.5)	.29 (7.5)	.24 (6)	.63 (16)	.6 (16)
PBYK-15A-*	.59 (15)	1.52 (38.5)	.51 (13)	.89 (22.5)	.39 (10)	.24 (6)	.63 (16)	.6 (16)
PBYK-20-*	.79 (20)	1.63 (41.5)	.55 (14)	.87 (22)	.47 (12)	.24 (6)	.63 (16)	.7 (21)
PBYK-30-*	1.18 (30)	2.46 (62.5)	.79 (20)	1.26 (32)	.67 (17)	.24 (6)	.63 (16)	1.6 (45)
PBYK-40-*	1.57 (40)	2.46 (62.5)	.79 (20)	1.26 (32)	.61 (15.5)	.24 (6)	.63 (16)	2.0 (58)
PBYK-50-*	1.97 (50)	2.70 (68.5)	.79 (20)	1.26 (32)	.78 (20)	.24 (6)	.63 (16)	2.4 (67)
PBYK-75-*,†	3.74 (95)	3.29 (83.5)	1.10 (28)	1.67 (42.5)	.86 (22)	.43 (11)	—	6.9 (176)
PBYK-110-*,†	4.72 (120)	4.17 (106)	.47 (12)	1.97 (50)	1.14 (29)	.79 (20)	1.18 Dia. (30)	26.4 (670)
PBYK-150-*,†	5.91 (150)	4.92 (125)	.47 (12)	1.97 (50)	1.50 (38)	.79 (20)	1.18 Dia. (30)	46.5 (1180)

Inches (mm)
* Cup material
† Vacuum port

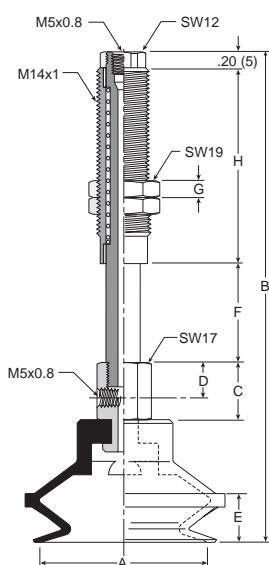


Dimensions

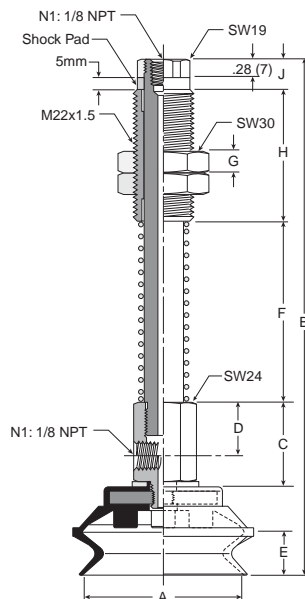
**PBTYS10A thru
PBTYS15A1**



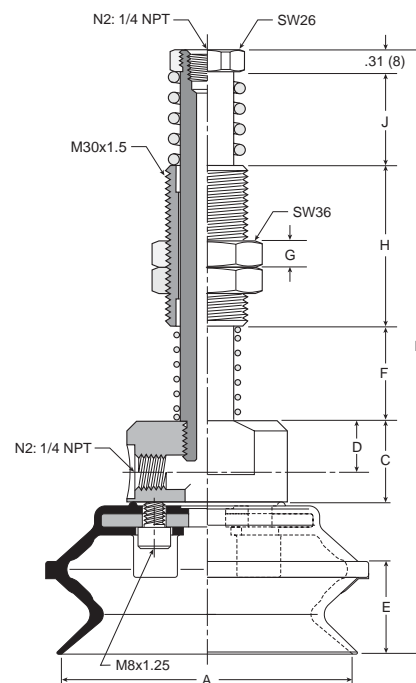
**PBTYS20B thru
PBTYS50**



PBTYS75



**PBTYS110 thru
PBTYS150**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PBTYS10A10*	.39 (10)	2.70 (68.5)	.51 (13)	.31 (8)	.30 (7.5)	.39 (10)	.12 (3)	.91 (23)	—	.65 (18.5)
PBTYS10A15*	.39 (10)	3.19 (81)	.51 (13)	.31 (8)	.30 (7.5)	.59 (15)	.12 (3)	1.20 (30.5)	—	.7 (21)
PBTYS15A10*	.59 (15)	2.80 (71)	.51 (13)	.31 (8)	.39 (10)	.39 (10)	.12 (3)	.91 (23)	—	.65 (18.5)
PBTYS15A15*	.59 (15)	3.29 (83.5)	.51 (13)	.31 (8)	.39 (10)	.59 (15)	.12 (3)	1.20 (30.5)	—	.7 (21)
PBTYS20B15*	.79 (20)	3.90 (99)	.67 (17)	.39 (10)	.47 (12)	.59 (15)	.20 (5)	1.42 (36)	—	2.5 (72)
PBTYS20B30*	.79 (20)	5.36 (136)	.67 (17)	.39 (10)	.47 (12)	1.18 (30)	.20 (5)	2.28 (58)	—	3.4 (97)
PBTYS3015†	1.18 (30)	4.07 (103.5)	.67 (17)	.39 (10)	.67 (17)	.59 (15)	.20 (5)	1.42 (36)	—	3.4 (97)
PBTYS3030†	1.18 (30)	5.53 (140.5)	.67 (17)	.39 (10)	.67 (17)	1.18 (30)	.20 (5)	2.28 (58)	—	3.6 (102)
PBTYS4015†	1.57 (40)	4.07 (103.5)	.67 (17)	.39 (10)	.61 (15.5)	.59 (15)	.20 (5)	1.42 (36)	—	2.9 (83)
PBTYS4030†	1.57 (40)	5.53 (140.5)	.67 (17)	.39 (10)	.61 (15.5)	1.18 (30)	.20 (5)	2.28 (58)	—	3.8 (108)
PBTYS5015†	1.97 (50)	4.31 (109.5)	.67 (17)	.39 (10)	.78 (20)	.59 (15)	.20 (5)	1.42 (36)	—	3.4 (97)
PBTYS5030†	1.97 (50)	5.77 (146.5)	.67 (17)	.39 (10)	.78 (20)	1.18 (30)	.20 (5)	2.28 (58)	—	4.3 (122)
PBTYS7530†	2.95 (75)	7.01 (178)	1.28 (32.5)	.78 (20)	.87 (22)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	12 (339)
PBTYS7550†	2.95 (75)	7.99 (203)	1.28 (32.5)	.78 (20)	.87 (22)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13 (373)
PBTYS11020†	4.33 (110)	8.82 (224)	1.18 (30)	.71 (18)	1.14 (29)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	42 (1194)
PBTYS11070†	4.33 (110)	11.38 (289)	1.18 (30)	.71 (18)	1.14 (29)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	45 (1276)
PBTYS15020†	5.91 (150)	9.57 (243)	1.18 (30)	.71 (18)	1.50 (38)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	60 (1704)
PBTYS15070†	5.91 (150)	12.13 (308)	1.18 (30)	.71 (18)	1.50 (38)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	63 (1786)

Inches (mm)
* Cup material
† Vacuum port

Features

- Double sealing lips for flexible sheet handling
- Vacuum cup grooves on underside increase holding area
- Resists acceleration and deceleration shear forces
- Strong low profile for fast response
- Metal insert fitting for stable vertical and horizontal lifts

Applications

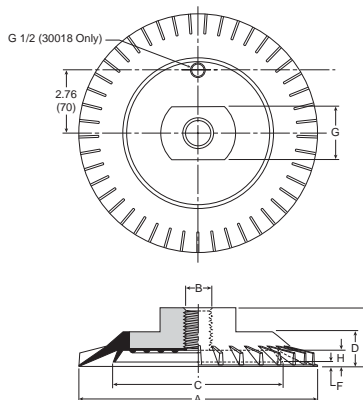
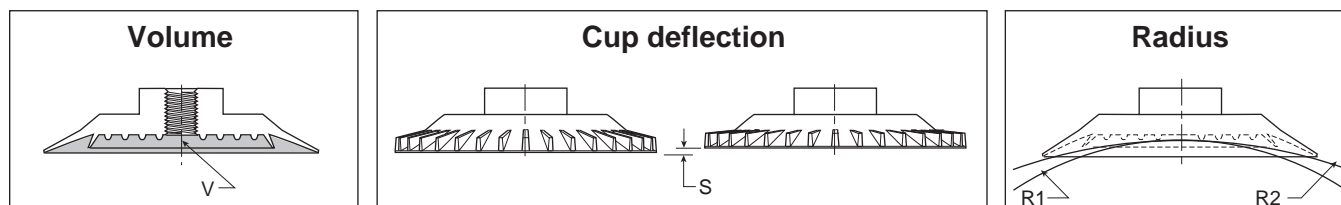
These suction cups are ideal for applications where the product may flex when being lifted. All cups have a double sealing lip and cleats to increase holding capacity. The top of the cup has a ribbed outer lip to prevent it from rolling over the surface to be lifted.

Dual sealing lips provide 2 seals for vacuum. As the product flexes, the outer lip seal may break, but the inner lip seal will hold the degree of vacuum for continued lifting capacity. In these types of applications, sizing should be done on the inner diameter cup dimension.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Area*** cm ²	Cup volume (V) liters	Deflection (S) (mm)	Radius R (mm)	
						R1*	R2**
50	1/8 BSPP	P5V-CFS05011N	19.6	.001	.16 (4)	3.86 (98)	3.15 (80)
100	3/8 BSPP	P5V-CFS10013N	78.5	.0667	.30 (8)	10.00 (254)	6.34 (161)
150	1/2 BSPP	P5V-CFS15014N	176.7	.2083	.43 (11)	12.17 (309)	9.92 (252)

* Minimum permissible radius for lifting using inner lip.
 ** Minimum permissible radius for lifting using outer lip.
 *** Area based on Outer Cup Diameter



Dimensions

Model number	ØA	B	ØC	D	E	F	G	H
P5V-CFS50*	1.97 (50)	G1/8	1.38 (35)	0.43 (11)	0.71 (18)	0.087 (2.2)	0.51 (13)	0.146 (3.7)
P5V-CFS100*	3.94 (100)	G3/8	2.83 (72)	0.71 (18)	1.10 (28)	0.197 (5)	0.87 (22)	0.295 (7.5)
P5V-CFS150*	5.91 (150)	G1/2	4.17 (106)	1.02 (26)	1.65 (42)	0.276 (7)	1.06 (27)	0.43 (11)

Inches (mm)
 * Cup material

 Most popular.

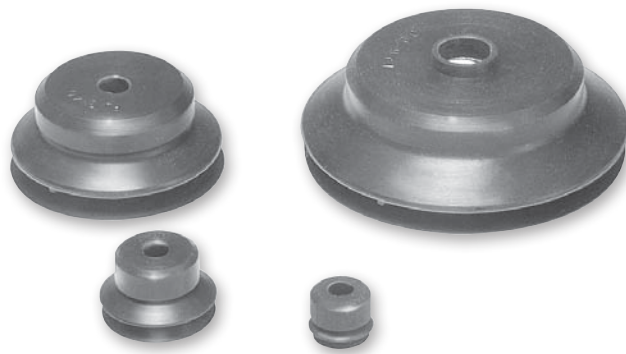
C
 Vacuum Cups
 Vacuum Products

Versatile bellow cup design provides increased sealing lip and level compensation for products with irregular, smooth, curved surfaces, or flexible sheets.

The short stroke bellow suction cup has an extra thin sealing edge and shorter stroke versus the traditional bellows for faster response. The cups are good for corrugated and smooth surfaces.

Features

- Short bellows for fast response
- More lip seal contact for corrugated, textured surfaces
- Soft sealing lip
- 6mm to 80mm



Styles

- PJTM series male thread connector
- PJTF series female thread connector
- PJTK series barbed bulkhead
- PJYK series 90° barbed adapter
- PJTYS series bulkhead level compensator

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*
Material code	NBR	NBRE	SI	SIE
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°
Color	Black	Black / Blue Dot	White	Black / Red Dot
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000

* ESD: Electric Static Dissipative Material

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with silicon ESD (SIE), replace (NBR) with (SIE) in the part number. PJTM-20B-NBR-G1 becomes PJTM-20B-SIE-G1. Inquire with factory for availability.

Application guide

Short Bellows



Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, thin section	Soft porous material, thin section	Soft porous material, any section	Metal sheet handling	Corrugated sheet handling	Not for vertical lift
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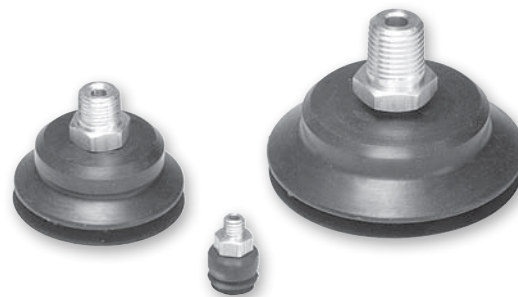
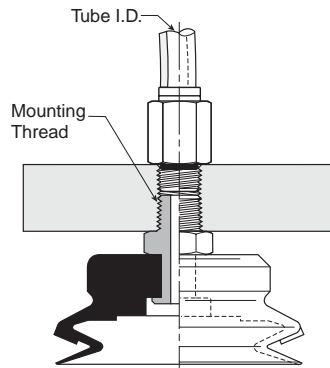
PJTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
 Fitting material: aluminum.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	M5	PJTM-6-NBR-M5	PJG-6-NBR	PJTM-6-SI-M5	PJG-6-SI	FTM-5A-M5H
6	1/8 BSPP	PJTM-6-NBR-G1	PJG-6-NBR	PJTM-6-SI-G1	PJG-6-SI	FTM-5A-G1
8	M5	PJTM-8-NBR-M5	PJG-8-NBR	PJTM-8-SI-M5	PJG-8-SI	FTM-5A-M5H
8	1/8 BSPP	PJTM-8-NBR-G1	PJG-8-NBR	PJTM-8-SI-G1	PJG-8-SI	FTM-5A-G1
10	M5	PJTM-10-NBR-M5	PJG-10-NBR	PJTM-10-SI-M5	PJG-10-SI	TN-PF-15-M5
15	M5	PJTM-15-NBR-M5	PJG-15-NBR	PJTM-15-SI-M5	PJG-15-SI	TN-PF-15-M5
20	M5	PJTM-20-NBR-M5	PJG-20-NBR	PJTM-20-SI-M5	PJG-20-SI	TN-PF-20-M5
30	1/8 BSPP	PJTM-30-NBR-G1	PJG-30-NBR	PJTM-30-SI-G1	PJG-30-SI	FTM-20B-G1H
30	1/4 BSPP	PJTM-30-NBR-G2	PJG-30-NBR	PJTM-30-SI-G2	PJG-30-SI	FTM-20B-G2
30	M10	PJTM-30-NBR-M10	PJG-30-NBR	PJTM-30-SI-M10	PJG-30-SI	FTM-20B-M10
30	1/8 NPT	PJTM-30-NBR-N1	PJG-30-NBR	PJTM-30-SI-N1	PJG-30-SI	FTM-20B-N1
40	1/8 BSPP	PJTM-40-NBR-G1	PJG-40-NBR	PJTM-40-SI-G1	PJG-40-SI	FTM-20B-G1H
40	1/4 BSPP	PJTM-40-NBR-G2	PJG-40-NBR	PJTM-40-SI-G2	PJG-40-SI	FTM-20B-G2
40	M10	PJTM-40-NBR-M10	PJG-40-NBR	PJTM-40-SI-M10	PJG-40-SI	FTM-20B-M10
40	1/8 NPT	PJTM-40-NBR-N1	PJG-40-NBR	PJTM-40-SI-N1	PJG-40-SI	FTM-20B-N1
50	1/8 BSPP	PJTM-50-NBR-G1	PJG-50-NBR	PJTM-50-SI-G1	PJG-50-SI	FTM-50-G1H
50	1/4 BSPP	PJTM-50-NBR-G2	PJG-50-NBR	PJTM-50-SI-G2	PJG-50-SI	FTM-50-G2
50	1/8 NPT	PJTM-50-NBR-N1	PJG-50-NBR	PJTM-50-SI-N1	PJG-50-SI	FTM-50-N1
60	1/4 BSPP	PJTM-60-NBR-G2	PJG-60-NBR	PJTM-60-SI-G2	PJG-60-SI	FTM-60-G2
60	M10	PJTM-60-NBR-M10	PJG-60-NBR	PJTM-60-SI-M10	PJG-60-SI	FTM-60-M10
60	1/4 NPT	PJTM-60-NBR-N2	PJG-60-NBR	PJTM-60-SI-N2	PJG-60-SI	FTM-60-N2
80	1/4 BSPP	PJTM-80-NBR-G2	PJG-80-NBR	PJTM-80-SI-G2	PJG-80-SI	FTM-60-G2
80	M10	PJTM-80-NBR-M10	PJG-80-NBR	PJTM-80-SI-M10	PJG-80-SI	FTM-60-M10
80	1/4 NPT	PJTM-80-NBR-N2	PJG-80-NBR	PJTM-80-SI-N2	PJG-80-SI	FTM-60-N2

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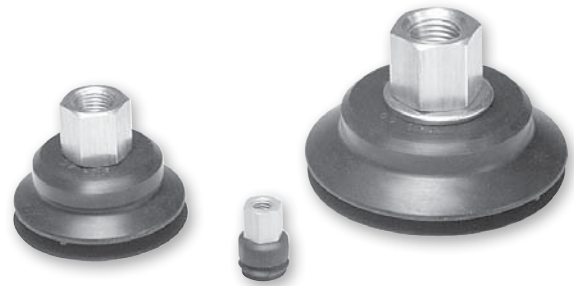
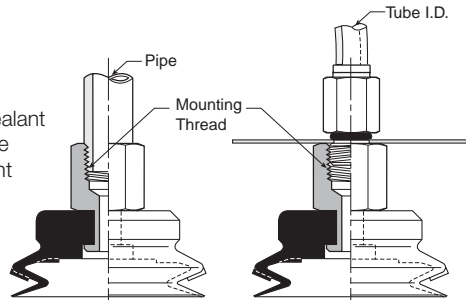
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 Vacuum Products

PJTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
 Fitting material: aluminum.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	M5	PJTF-6-NBR-M5	PJG-6-NBR	PJTF-6-SI-M5	PJG-6-SI	FTF-5A-M5
6	1/8 BSPP	PJTF-6-NBR-G1	PJG-6-NBR	PJTF-6-SI-G1	PJG-6-SI	FTF-5A-G1
8	M5	PJTF-8-NBR-M5	PJG-8-NBR	PJTF--8-SI-M5	PJG-8-SI	FTF-5A-M5
8	1/8 BSPP	PJTF-8-NBR-G1	PJG-8-NBR	PJTF--8-SI-G1	PJG-8-SI	FTF-5A-G1
10	M5	PJTF-10-NBR-M5	PJG-10-NBR	PJTF-10-SI-M5	PJG-10-SI	FTF-5A-M5
10	1/8 BSPP	PJTF-10-NBR-G1	PJG-10-NBR	PJTF-10-SI-G1	PJG-10-SI	FTF-5A-G1
15	M5	PJTF-15-NBR-M5	PJG-15-NBR	PJTF-15-SI-M5	PJG-15-SI	FTF-5A-M5
15	1/8 BSPP	PJTF-15-NBR-G1	PJG-15-NBR	PJTF-15-SI-G1	PJG-15-SI	FTF-5A-G1
30	1/8 BSPP	PJTF-30-NBR-G1	PJG-30-NBR	PJTF-30-SI-G1	PJG-30-SI	FTF-20B-G1
30	1/4 BSPP	PJTF-30-NBR-G2	PJG-30-NBR	PJTF-30-SI-G2	PJG-30-SI	FTF-20B-G2
40	1/8 BSPP	PJTF-40-NBR-G1	PJG-40-NBR	PJTF-40-SI-G1	PJG-40-SI	FTF-20B-G1
40	1/4 BSPP	PJTF-40-NBR-G2	PJG-40-NBR	PJTF-40-SI-G2	PJG-40-SI	FTF-20B-G2
50	1/8 BSPP	PJTF-50-NBR-G1	PJG-50-NBR	PJTF-50-SI-G1	PJG-50-SI	FTF-50-G1
50	1/4 BSPP	PJTF-50-NBR-G2	PJG-50-NBR	PJTF-50-SI-G2	PJG-50-SI	FTF-50-G2
60	1/4 BSPP	PJTF-60-NBR-G2	PJG-60-NBR	PJTF-60-SI-G2	PJG-60-SI	FTF-60-G2
60	1/4 NPT	PJTF-60-NBR-N2	PJG-60-NBR	PJTF-60-SI-N2	PJG-60-SI	FTF-60-N2
80	1/4 BSPP	PJTF-80-NBR-G2	PJG-80-NBR	PJTF-80-SI-G2	PJG-80-SI	FTF-60-G2
80	1/4 NPT	PJTF-80-NBR-N2	PJG-80-NBR	PJTF-80-SI-N2	PJG-80-SI	FTF-60-N2

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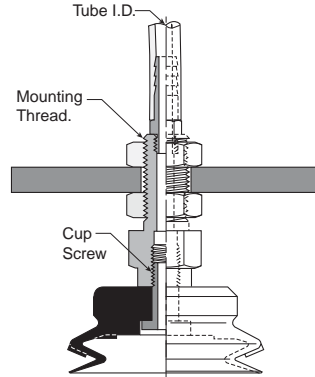
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PJTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting materials: nickel plated brass.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	Barb	PJTK-6-NBR	PJG-6-NBR	PJTK-6-SI	PJG-6-SI	FTK-5A
8	Barb	PJTK-8-NBR	PJG-8-NBR	PJTK-8-SI	PJG-8-SI	FTK-5A
10	Barb	PJTK-10-NBR	PJG-10-NBR	PJTK-10-SI	PJG-10-SI	FTK-15
15	Barb	PJTK-15-NBR	PJG-15-NBR	PJTK-15-SI	PJG-15-SI	FTK-15
20	Barb	PJTK-20-NBR	PJG-20-NBR	PJTK-20-SI	PJG-20-SI	FTK-20
30	Barb	PJTK-30-NBR	PJG-30-NBR	PJTK-30-SI	PJG-30-SI	FTK-25
40	Barb	PJTK-40-NBR	PJG-40-NBR	PJTK-40-SI	PJG-40-SI	FTK-25
50	Barb	PJTK-50-NBR	PJG-50-NBR	PJTK-50-SI	PJG-50-SI	FTK-50
60	1/8 BSPP	PJTK-60-NBR-G1	PJG-60-NBR	PJTK-60-SI-G1	PJG-60-SI	FTK-60-G1
60	1/8 NPT	PJTK-60-NBR-N1	PJG-60-NBR	PJTK-60-SI-N1	PJG-60-SI	FTK-60-N1
80	1/8 BSPP	PJTK-80-NBR-G1	PJG-80-NBR	PJTK-80-SI-G1	PJG-80-SI	FTK-60-G1
80	1/8 NPT	PJTK-80-NBR-N1	PJG-80-NBR	PJTK-80-SI-N1	PJG-80-SI	FTK-60-N1

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 Vacuum Products

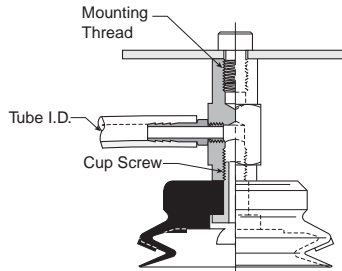
PJYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting materials: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	Barb	PJYK-6-NBR	PJG-6-NBR	PJYK-6-SI	PJG-6-SI	FYK-5A
8	Barb	PJYK-8-NBR	PJG-8-NBR	PJYK-8-SI	PJG-8-SI	FYK-5A
10	Barb	PJYK-10-NBR	PJG-10-NBR	PJYK-10-SI	PJG-10-SI	FYK-15
15	Barb	PJYK-15-NBR	PJG-15-NBR	PJYK-15-SI	PJG-15-SI	FYK-15
20	Barb	PJYK-20-NBR	PJG-20-NBR	PJYK-20-SI	PJG-20-SI	FYK-20
30	Barb	PJYK-30-NBR	PJG-30-NBR	PJYK-30-SI	PJG-30-SI	FYK-25
40	Barb	PJYK-40-NBR	PJG-40-NBR	PJYK-40-SI	PJG-40-SI	FYK-25
50	Barb	PJYK-50-NBR	PJG-50-NBR	PJYK-50-SI	PJG-50-SI	FYK-50
60	1/8 BSPP	PJYK-60-NBR-G1	PJG-60-NBR	PJYK-60-SI-G1	PJG-60-SI	FYK-60-G1
60	1/8 NPT	PJYK-60-NBR-N1	PJG-60-NBR	PJYK-60-SI-N1	PJG-60-SI	FYK-60-N1
80	1/8 BSPP	PJYK-80-NBR-G1	PJG-80-NBR	PJYK-80-SI-G1	PJG-80-SI	FYK-60-G1
80	1/8 NPT	PJYK-80-NBR-N1	PJG-80-NBR	PJYK-80-SI-N1	PJG-80-SI	FYK-60-N1


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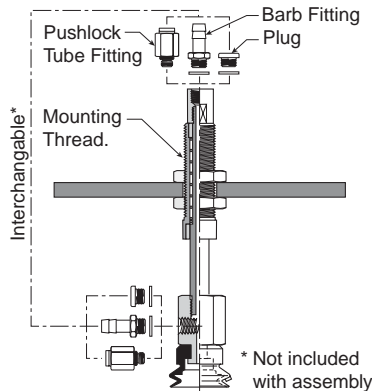
PJTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.



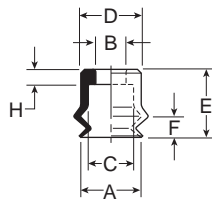
Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N)		Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
			0%	100%					
10	M5	10	.56 (2.5)	1.2 (4.9)	PJTYS1010NBRM5	PJG-10-NBR	PJTYS1010SIM5	PJG-10-SI	JTYS-10-10
10	M5	15	.67 (2.5)	1.4 (5.9)	PJTYS1015NBRM5	PJG-10-NBR	PJTYS1015SIM5	PJG-10-SI	JTYS-10-15
15	M5	10	.56 (2.5)	1.2 (4.9)	PJTYS15A10NBRM5	PJG-15A-NBR	PJTYS15A10SIM5	PJG-15A-SI	JTYS-10-10
15	M5	15	.67 (2.5)	1.4 (5.9)	PJTYS15A15NBRM5	PJG-15A-NBR	PJTYS15A15SIM5	PJG-15A-SI	JTYS-10-15
30	M5	15	.56 (2.5)	.79 (3.4)	PJTYS3015NBRM5	PJG-30-NBR	PJTYS3015SIM5	PJG-30-SI	TYS-20B-15
30	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS3030NBRM5	PJG-30-NBR	PJTYS3030SIM5	PJG-30-SI	TYS-20B-30
40	M5	15	.56 (2.5)	.79 (3.4)	PJTYS4015NBRM5	PJG-40-NBR	PJTYS4015SIM5	PJG-40-SI	TYS-20B-15
40	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS4030NBRM5	PJG-40-NBR	PJTYS4030SIM5	PJG-40-SI	TYS-20B-30
50	M5	15	.56 (.25)	1.2 (4.9)	PJTYS5015NBRM5	PJG-50-NBR	PJTYS5015SIM5	PJG-50-SI	TYS-50-15
50	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS5030NBRM5	PJG-50-NBR	PJTYS5030SIM5	PJG-50-SI	TYS-50-30
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PJTYS6030NBRN1	PJG-60-NBR	PJTYS6030SIN1	PJG-60-SI	TYS-60-30
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PJTYS6050NBRN1	PJG-60-NBR	PJTYS6050SIN1	PJG-60-SI	TYS-60-50
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PJTYS8030NBRN1	PJG-80-NBR	PJTYS8030SIN1	PJG-80-SI	TYS-60-30
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PJTYS8050NBRN1	PJG-80-NBR	PJTYS8050SIN1	PJG-80-SI	TYS-60-50

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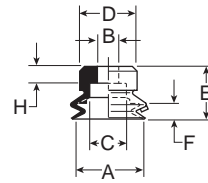
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PJG Series Replacement Cup Dimensions

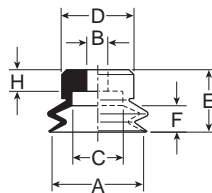
**PJG-6 and
 PJG-8**



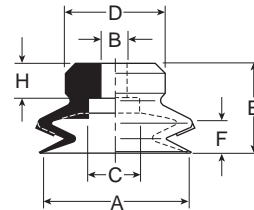
**PJG-10 and
 PJG-15**



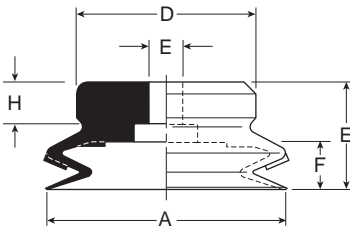
PJG-20



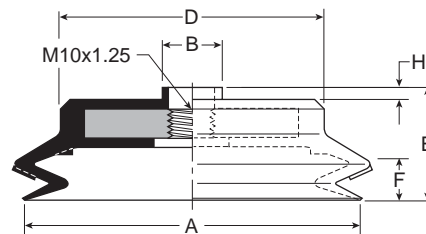
**PJG-30 thru
 PJG-40**



PJG-50



**PJG-60 thru
 PJG-80**



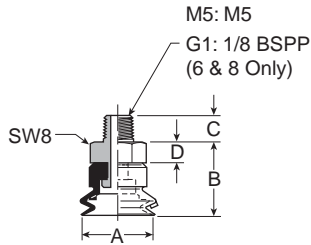
Vacuum Cups
 Vacuum Products

Model number	ØA	ØB	ØC	ØD	E	F	H
PJG-6-*	.24 (6)	.16 (4)	.24 (6)	.30 (7.5)	.35 (9)	.17 (4.2)	.08 (2)
PJG-8-*	.31 (8)	.16 (4)	.24 (6)	.31 (8)	.35 (9)	.16 (4)	.08 (2)
PJG-10-*	.39 (10)	.18 (4.6)	.31 (7.8)	.43 (11)	.37 (9.5)	.12 (3)	.14 (3.5)
PJG-15-*	.59 (15)	.18 (4.6)	.31 (7.8)	.47 (12)	.43 (11)	.13 (3.3)	.14 (3.5)
PJG-20-*	.79 (20)	.18 (4.6)	.43 (10.8)	.59 (15)	.51 (13)	.22 (5.5)	.18 (4.5)
PJG-30-*	1.18 (30)	.23 (5.8)	.43 (10.8)	.78 (20)	.71 (18)	.28 (7)	.28 (7)
PJG-35-*	1.38 (35)	.23 (5.8)	.43 (10.8)	.98 (25)	.71 (18)	.28 (7)	.28 (7)
PJG-40-*	1.57 (40)	.23 (5.8)	.43 (10.8)	1.18 (30)	.71 (18)	.28 (7.2)	.28 (7)
PJG-50-*	1.97 (50)	.31 (7.8)	.78 (19.8)	1.57 (40)	.79 (20)	.35 (9)	.28 (7)
PJG-60-*	2.36 (60)	.49 (12.5)	—	1.77 (45)	.89 (22.5)	.31 (8)	.10 (2.5)
PJG-70-*	2.75 (70)	.49 (12.5)	—	2.17 (55)	.93 (23.5)	.37 (9.5)	.10 (2.5)
PJG-80-*	3.15 (80)	.49 (12.5)	—	2.68 (68)	.93 (23.5)	.37 (9.5)	.10 (2.5)

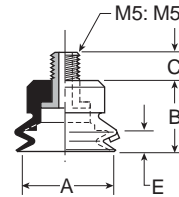
Inches (mm)
 * Cup material

Dimensions

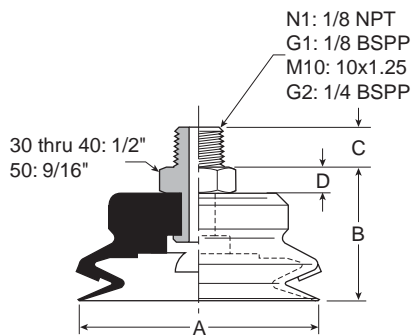
**PJTM-6 and
 PJTM-8**



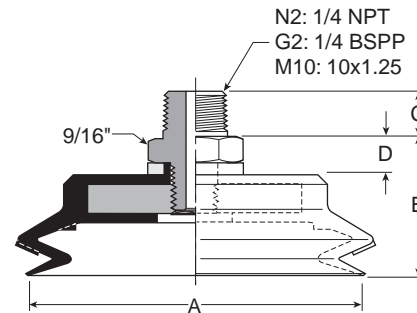
**PJTM-10 thru
 PJTM-20**



**PJTM-30 thru
 PJTM-50**

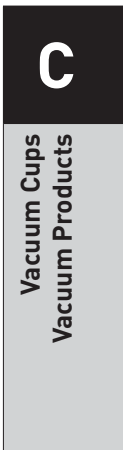


**PJTM-60 thru
 PJTM-80**



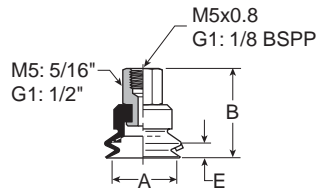
Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D
PJTM-6-*†	.24 (6)	.49 (12.5)	.18 (4.5)	.31 (8)	—	—	.14 (3.5)
PJTM-8-*†	.31 (8)	.49 (12.5)	.18 (4.5)	.31 (8)	—	—	.14 (3.5)
PJTM-10-*†	.39 (10)	.37 (9.5)	.20 (5)	—	—	—	—
PJTM-15-*†	.59 (15)	.43 (11)	.20 (5)	—	—	—	—
PJTM-20-*†	.79 (20)	.51 (13)	.20 (5)	—	—	—	—
PJTM-30-*†	1.18 (30)	.91 (23)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-40-*†	1.57 (40)	.91 (23)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-50-*†	1.97 (50)	.98 (25)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-60-*†	2.36 (60)	1.06 (27)	—	—	.39 (10)	.59 (15)	.28 (7)
PJTM-80-*†	3.15 (80)	1.10 (28)	—	—	.39 (10)	.59 (15)	.28 (7)

Inches (mm)
 * Cup material
 † Thread size

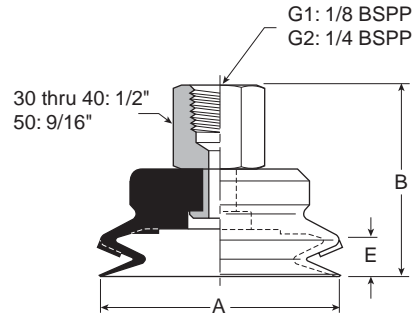


Dimensions

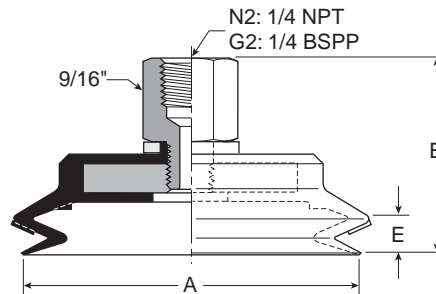
**PJTF-6 and
 PJTF-8**



**PJTF-30 thru
 PJTF-50**



**PJTF-60 thru
 PJTF-80**

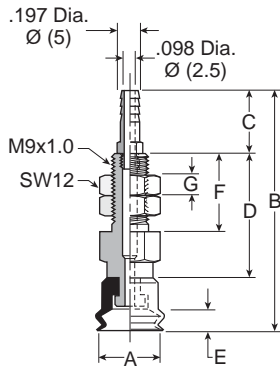


Model number	ØA	B	B (M5)	E
PJTF-6-*†	.24 (6)	.79 (20)	.55 (14)	.16 (4)
PJTF-8-*†	.31 (8)	.79 (20)	.55 (14)	.16 (4)
PJTF-10-*†	.39 (10)	.79 (20)	.55 (14)	.12 (3)
PJTF-15-*†	.59 (15)	.79 (20)	.55 (14)	.13 (3.3)
PJTF-30-*†	1.18 (30)	1.25 (32)	—	.28 (7)
PJTF-40-*†	1.57 (40)	1.25(32)	—	.28 (7.2)
PJTF-50-*†	1.97 (50)	1.34 (34)	—	.35 (9)
PJTF-60-*†	2.36 (60)	1.56 (39.5)	—	.31 (8)
PJTF-80-*†	3.15 (80)	1.59 (40.5)	—	.37 (9.5)

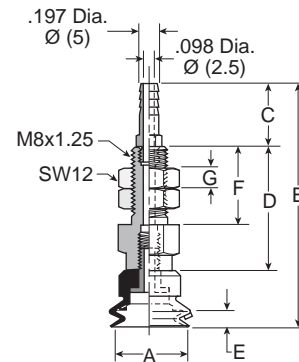
Inches (mm)
 * Cup material
 † Thread size

Dimensions

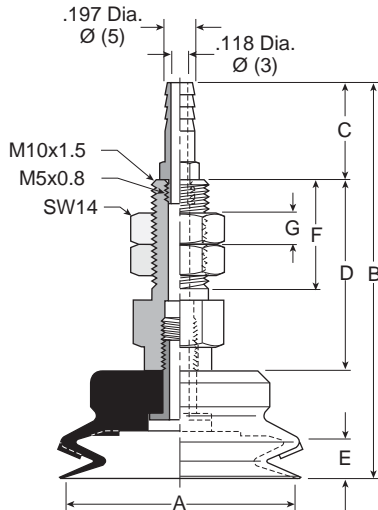
**PJTK-6 and
 PJTK-8**



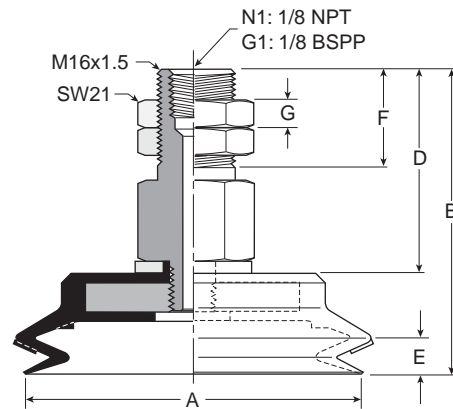
**PJTK-10 thru
 PJTK-20**



**PJTK-30 thru
 PJTK-50**

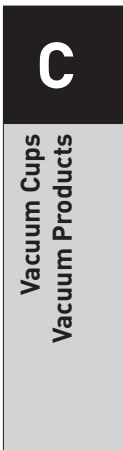


**PJTK-60 thru
 PJTK-80**



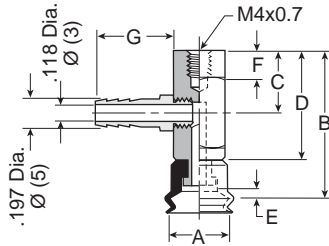
Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PJTK-6-*	.24 (6)	1.30 (33)	.39 (10)	.55 (14)	.17 (4.2)	.47 (12)	.12 (3)	.4 (11)
PJTK-8-*	.31 (8)	1.30 (33)	.39 (10)	.55 (14)	.16 (4)	.47 (12)	.12 (3)	.4 (11)
PJTK-10-*	.39 (10)	1.87 (47.5)	.63 (16)	.87 (22)	.12 (3)	.59 (15)	.12 (3)	.5 (14)
PJTK-15-*	.59 (15)	1.93 (49)	.63 (16)	.87 (22)	.13 (3.3)	.59 (15)	.12 (3)	.5 (15)
PJTK-20-*	.79 (20)	2.01 (51)	.63 (16)	.87 (22)	.22 (5.5)	.59 (15)	.20 (5)	.6 (17)
PJTK-30-*	1.18 (30)	2.60 (66)	.63 (16)	1.26 (32)	.28 (7)	.79 (20)	.20 (5)	1.5 (42)
PJTK-40-*	1.57 (40)	2.60 (66)	.63 (16)	1.26 (32)	.28 (7.2)	.79 (20)	.20 (5)	1.6 (44)
PJTK-50-*	1.97 (50)	2.68 (68)	.63 (16)	1.26 (32)	.35 (9)	.79 (20)	.20 (5)	25.0 (58)
PJTK-60-*.†	2.36 (60)	2.46 (62.5)	—	1.67 (42.5)	.31 (8)	.79 (20)	.24 (6)	5.1 (144)
PJTK-80-*.†	3.15 (80)	2.50 (63.5)	—	1.67 (42.5)	.37 (9.5)	.79 (20)	.24 (6)	6.7 (190)

Inches (mm)
 * Cup material
 † Vacuum port

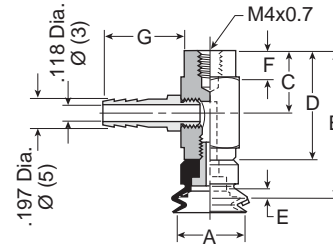


Dimensions

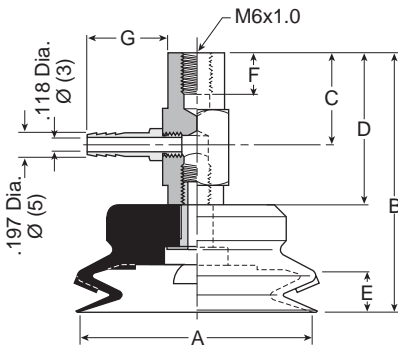
**PJK-6 and
PJK-8**



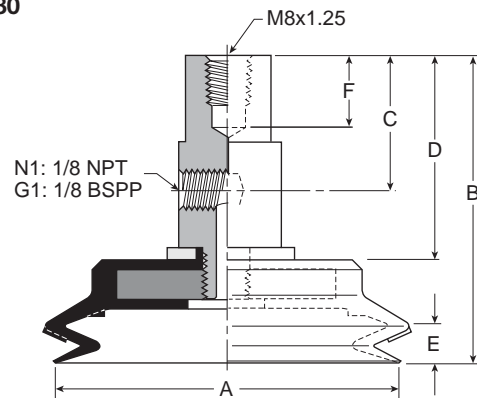
**PJK-10 thru
PJK-20**



**PJK-25 thru
PJK-50**



**PJK-60 thru
PJK-80**



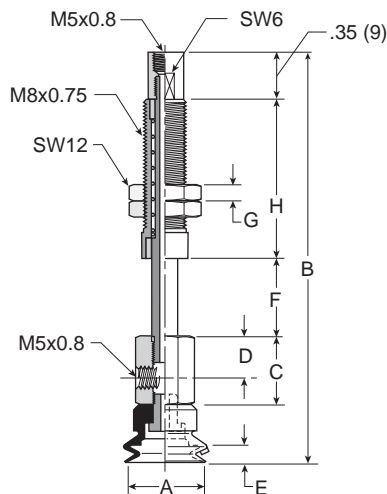
**Vacuum Cups
Vacuum Products**

Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PJK-6-*	.24 (6)	1.24 (31.5)	.51 (13)	.89 (22.5)	.17 (4.2)	.24 (6)	.63 (16)	.56 (16)
PJK-8-*	.31 (8)	1.24 (31.5)	.51 (13)	.89 (22.5)	.17 (4.2)	.24 (6)	.63 (16)	.56 (16)
PJK-10-*	.39 (10)	1.24 (31.5)	.55 (14)	.87 (22)	.12 (3)	.24 (6)	.63 (16)	.59 (17)
PJK-15-*	.59 (15)	1.30 (33)	.55 (14)	.87 (22)	.13 (3.3)	.24 (6)	.63 (16)	.63 (18)
PJK-20-*	.79 (20)	1.38 (35)	.55 (14)	.87 (22)	.22 (5.5)	.24 (6)	.63 (16)	.7 (20)
PJK-30-*	1.18 (30)	1.97 (50)	.79 (20)	1.26 (32)	.28 (7)	.31 (8)	.63 (16)	1.6 (46)
PJK-40-*	1.57 (40)	1.97 (50)	.79 (20)	1.26 (32)	.28 (7.2)	.31 (8)	.63 (16)	1.7 (48)
PJK-50-*	1.97 (50)	2.05 (52)	.79 (20)	1.26 (32)	.35 (9)	.31 (8)	.63 (16)	2.2 (62)
PJK-60-*,†	2.36 (60)	2.46 (62.5)	1.10 (28)	1.67 (42.5)	.31 (8)	.43 (11)	—	4.9 (139)
PJK-80-*,†	3.15 (80)	2.50 (63.5)	1.10 (28)	1.67 (42.5)	.37 (9.5)	.43 (11)	—	6.5 (185)

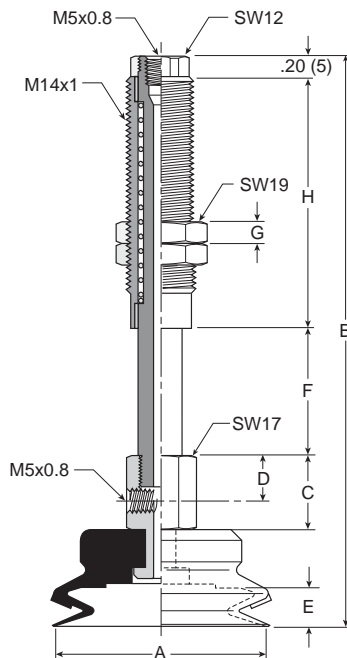
Inches (mm)
* Cup material
† Vacuum port

Dimensions

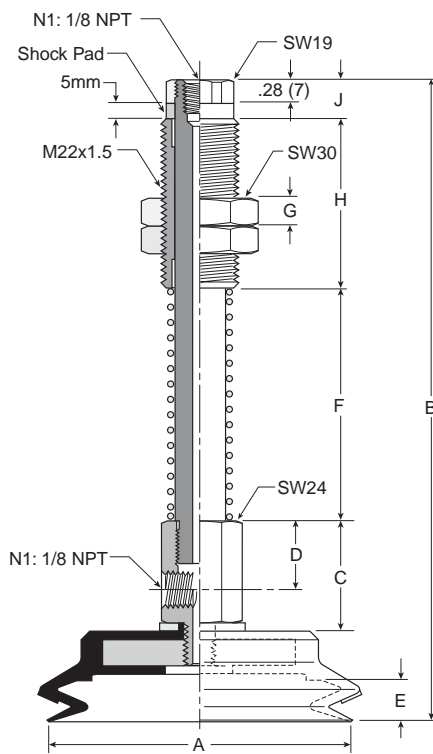
**PJTYS10 thru
PJTYS20**



**PJTYS30 thru
PJTYS50**

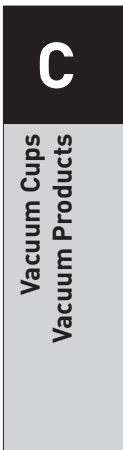


**PJTYS60 thru
PJTYS80**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PJTYS1010**†	.39 (10)	2.52 (64)	.51 (13)	.31 (8)	.12 (3)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (31)
PJTYS1015**†	.39 (10)	3.01 (76.5)	.51 (13)	.31 (8)	.12 (3)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.2 (33.5)
PJTYS1510**†	.59 (15)	2.60 (66)	.51 (13)	.31 (8)	.13 (3.3)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (32)
PJTYS1515**†	.59 (15)	3.07 (78)	.51 (13)	.31 (8)	.13 (3.3)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.3 (34.5)
PJTYS2010**†	.79 (20)	2.83 (72)	.51 (13)	.31 (8)	.22 (5.5)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (32)
PJTYS2015**†	.79 (20)	4.29 (109)	.51 (13)	.31 (8)	.22 (5.5)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.3 (34.5)
PJTYS3015**†	1.18 (30)	3.58 (91)	.67 (17)	.39 (10)	.28 (7)	.59 (15)	.20 (5)	1.42 (36)	—	2.6 (74)
PJTYS3030**†	1.18 (30)	5.04 (128)	.67 (17)	.39 (10)	.28 (7)	1.18 (30)	.20 (5)	2.28 (58)	—	3.5 (99)
PJTYS3515**†	1.38 (35)	3.58 (91)	.67 (17)	.39 (10)	.28 (7)	.59 (15)	.20 (5)	1.42 (36)	—	2.7 (76.5)
PJTYS3530**†	1.38 (35)	5.04 (128)	.67 (17)	.39 (10)	.28 (7)	1.18 (30)	.20 (5)	2.28 (58)	—	3.6 (101.5)
PJTYS4015**†	1.57 (40)	3.58 (91)	.67 (17)	.39 (10)	.28 (7.2)	.59 (15)	.20 (5)	1.42 (36)	—	2.8 (78.5)
PJTYS4030**†	1.57 (40)	5.04 (128)	.67 (17)	.39 (10)	.28 (7.2)	1.18 (30)	.20 (5)	2.28 (58)	—	3.7 (103.5)
PJTYS5015**†	1.97 (50)	3.66 (93)	.67 (17)	.39 (10)	.35 (9)	.59 (15)	.20 (5)	1.42 (36)	—	3.3 (94)
PJTYS5030**†	1.97 (50)	5.12 (130)	.67 (17)	.39 (10)	.35 (9)	1.18 (30)	.20 (5)	2.28 (58)	—	4.2 (119)
PJTYS6030**†	2.36 (60)	6.18 (157)	1.18 (30)	.79 (20)	.31 (8)	1.18 (45)	.39 (10)	1.97 (50)	.47 (12)	10.4 (294)
PJTYS6050**†	2.36 (60)	7.17 (182)	1.18 (30)	.79 (20)	.31 (8)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	11.6 (328)
PJTYS8030**†	3.15 (80)	6.22 (158)	1.18 (30)	.79 (20)	.37 (9.5)	1.18 (45)	.39 (10)	1.97 (50)	.47 (12)	11.9 (338)
PJTYS8050**†	3.15 (80)	7.20 (183)	1.18 (30)	.79 (20)	.37 (9.5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13.1 (372)

Inches (mm)
** Cup material
† Vacuum port



2-1/2 bellows design minimizes contact pressure applied to the product. The soft seal lip and touch allows the cup to conform to the product's surface to make a vacuum seal.

These multiple bellow cups are designed for applications that require additional level compensation, more flexibility, or minimum back pressure for a "soft touch". The multiple bellow has a soft sealing edge good for a variety of sensitive applications; such as food packaging, CD / DVD, medical packaging, and highly irregular curved surfaces. Cups can also be used to assist with sheet separation in destack operations.



Features

- Soft touch
- Extra level compensation
- Flexible sealing lip for irregular curved surfaces
- 5mm to 90mm in diameter

Styles

- PCTM series male thread connector
- PCTF series female thread Connector
- PCTK series barbed bulkhead

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	NBR	NBRE	SI	SIE	U
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°	-30° to +120°
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000	—

* ESD: Electric Static Dissipative Material

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PCTM-20B-NBR-G1 becomes PCTM-20B-U-G1. Inquire with factory for availability.

Application guide

2-1/2 Bellows



- | | | | | | | | | |
|---------------------------|-----------------------------|-------------------------------------|----------------------------|---------------|----------------------|---------------------------|-----------------------------------|-----------------------|
| Flat surface, any section | Bowed surface, thin section | Slightly bowed surface, any section | Bowed surface, any section | Soft material | Metal sheet handling | Corrugated sheet handling | Differences in heights and levels | Not for vertical lift |
|---------------------------|-----------------------------|-------------------------------------|----------------------------|---------------|----------------------|---------------------------|-----------------------------------|-----------------------|

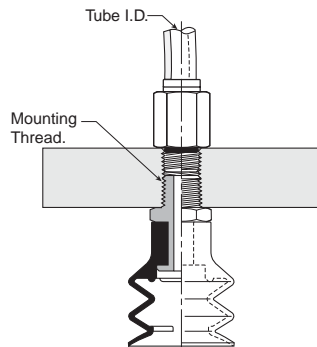
PCTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
 Fitting material: aluminum.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PCTM-5-NBR-M5	PCG-5-NBR	PCTM-5-SI-M5	PCG-5-SI	FTM-5A-M5H
7	M5	PCTM-7-NBR-M5	PCG-7-NBR	PCTM-7-SI-M5	PCG-7-SI	FTM-5A-M5H
10	M5	PCTM-10-NBR-M5	PCG-10-NBR	PCTM-10-SI-M5	PCG-10-SI	CTM-10-M5H
10	G1	PCTM-10-NBR-G1	PCG-10-NBR	PCTM-10-SI-G1	PCG-10-SI	CTM-10-G1H
15	M5	PCTM-15-NBR-M5	PCG-15-NBR	PCTM-15-SI-M5	PCG-15-SI	CTM-10-M5H
15	G1	PCTM-15-NBR-G1	PCG-15-NBR	PCTM-15-SI-G1	PCG-15-SI	CTM-10-G1H
20	M5	PCTM-20-NBR-M5	PCG-20-NBR	PCTM-20-SI-M5	PCG-20-SI	CTM-10-M5H
20	G1	PCTM-20-NBR-G1	PCG-20-NBR	PCTM-20-SI-G1	PCG-20-SI	CTM-10-G1H
30	G1	PCTM-30-NBR-G1	PCG-30-NBR	PCTM-30-SI-G1	PCG-30-SI	CTM-30-G1H
30	G2	PCTM-30-NBR-G2	PCG-30-NBR	PCTM-30-SI-G2	PCG-30-SI	CTM-30-G2
30	N1	PCTM-30-NBR-N1	PCG-30-NBR	PCTM-30-SI-N1	PCG-30-SI	CTM-30-N1
40	G1	PCTM-40-NBR-G1	PCG-40-NBR	PCTM-40-SI-G1	PCG-40-SI	CTM-30-G1H
40	G2	PCTM-40-NBR-G2	PCG-40-NBR	PCTM-40-SI-G2	PCG-40-SI	CTM-30-G2
40	N1	PCTM-40-NBR-N1	PCG-40-NBR	PCTM-40-SI-N1	PCG-40-SI	CTM-30-N1
60	G1	PCTM-60-NBR-G1	PCG-60-NBR	PCTM-60-SI-G1	PCG-60-SI	CTM-30-G1H
60	N1	PCTM-60-NBR-N1	PCG-60-NBR	PCTM-60-SI-N1	PCG-60-SI	CTM-30-N1
90	G2	PCTM-90-NBR-G2	PCG-90-NBR	PCTM-90-SI-G2	PCG-90-SI	CTM-90-G2
90	N2	PCTM-90-NBR-N2	PCG-90-NBR	PCTM-90-SI-N2	PCG-90-SI	CTM-90-N2

Most popular.

C
 Vacuum Cups
 Vacuum Products

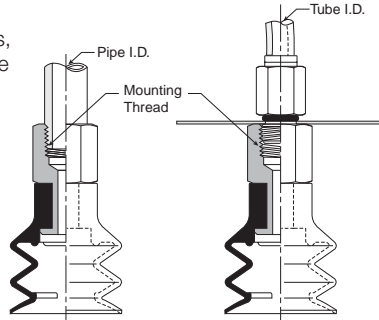
PCTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
 Fitting material: aluminum.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PCTF-5-NBR-M5	PCG-5-NBR	PCTF-5-SI-M5	PCG-5-SI	FTF-5A-M5
7	M5	PCTF-7-NBR-M5	PCG-7-NBR	PCTF-7-SI-M5	PCG-7-SI	FTF-5A-M5
10	1/8 BSPP	PCTF-10-NBR-G1	PCG-10-NBR	PCTF-10-SI-G1	PCG-10-SI	CTF-10-G1
15	1/8 BSPP	PCTF-15-NBR-G1	PCG-15-NBR	PCTF-15-SI-G1	PCG-15-SI	CTF-10-G1
20	1/8 BSPP	PCTF-20-NBR-G1	PCG-20-NBR	PCTF-20-SI-G1	PCG-20-SI	CTF-10-G1
30	1/8 BSPP	PCTF-30-NBR-G1	PCG-30-NBR	PCTF-30-SI-G1	PCG-30-SI	CTF-30-G1
30	1/8 NPT	PCTF-30-NBR-N1	PCG-30-NBR	PCTF-30-SI-N1	PCG-30-SI	CTF-30-N1
40	1/8 BSPP	PCTF-40-NBR-G1	PCG-40-NBR	PCTF-40-SI-G1	PCG-40-SI	CTF-30-G1
40	1/8 NPT	PCTF-40-NBR-N1	PCG-40-NBR	PCTF-40-SI-N1	PCG-40-SI	CTF-30-N1
60	1/8 NPT	PCTF-60-NBR-N1	PCG-60-NBR	PCTF-60-SI-N1	PCG-60-SI	CTF-30-G1
60	1/4 NPT	PCTF-60-NBR-N1	PCG-60-NBR	PCTF-60-SI-N1	PCG-60-SI	CTF-30-N1
90	1/4 BSPP	PCTF-90-NBR-G2	PCG-90-NBR	PCTF-90-SI-G2	PCG-90-SI	CTF-90-G2
90	1/4 NPT	PCTF-90-NBR-N2	PCG-90-NBR	PCTF-90-SI-N2	PCG-90-SI	CTF-90-N2

Most popular.

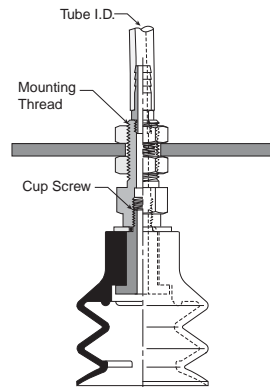

 Vacuum Cups
 Vacuum Products

PCTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: Nickel plated brass.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



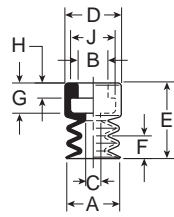
Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PCTK-5-NBR	PCG-5-NBR	PCTK-5-SI	PCG-5-SI	FTK-5A
7	Barb	PCTK-7-NBR	PCG-7-NBR	PCTK-7-SI	PCG-7-SI	FTK-5A
10	Barb	PCTK-10-NBR	PCG-10-NBR	PCTK-10-SI	PCG-10-SI	CTK-10
15	Barb	PCTK-15-NBR	PCG-15-NBR	PCTK-15-SI	PCG-15-SI	CTK-10
20	Barb	PCTK-20-NBR	PCG-20-NBR	PCTK-20-SI	PCG-20-SI	CTK-10
30	Barb	PCTK-30-NBR	PCG-30-NBR	PCTK-30-SI	PCG-30-SI	CTK-30
40	Barb	PCTK-40-NBR	PCG-40-NBR	PCTK-40-SI	PCG-40-SI	CTK-30
60	Barb	PCTK-60-NBR	PCG-60-NBR	PCTK-60-SI	PCG-60-SI	CTK-30
90	NPT	PCTK-90-NBR-N1	PCG-90-NBR	PCTK-90-SI-N1	PCG-90-SI	CTK-90-N1
90	BSPP	PCTK-90-NBR-G1	PCG-90-NBR	PCTK-90-SI-G1	PCG-90-SI	CTK-90-G1

Most popular.

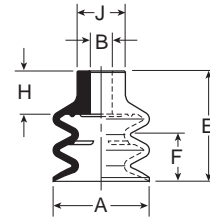
C
 Vacuum Cups
 Vacuum Products

PCG Series Replacement Cup Dimensions

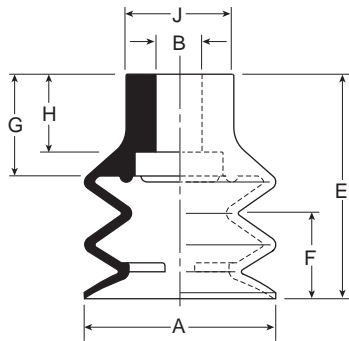
**PCG-5 and
 PCG-7**



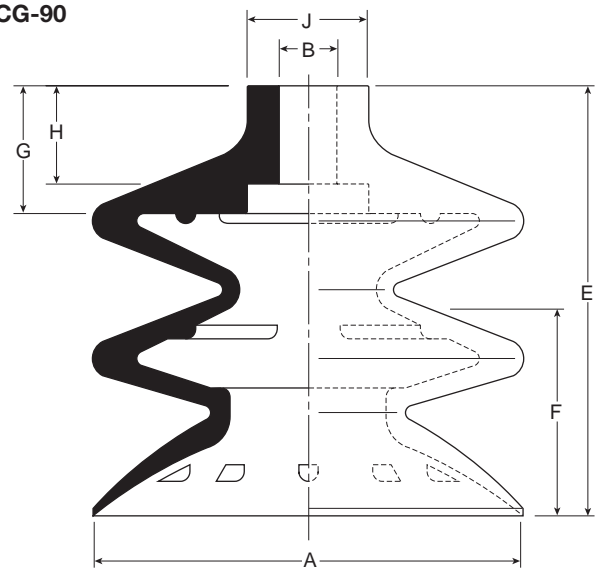
**PCG-10 thru
 PCG-20**



**PCG-30 thru
 PCG-60**



PCG-90



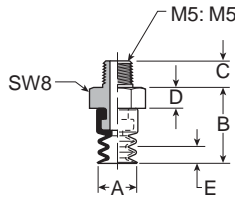
**Vacuum Cups
 Vacuum Products**

Model number	ØA	ØB	ØC	ØD	E	F	G	H	J
PCG-5-*	.20 (5)	.16 (4)	.08 (2)	.30 (7.5)	.37 (9.5)	.12 (3)	.16 (4)	.08 (2)	.24 (6)
PCG-7-*	.28 (7)	.16 (4)	.08 (2)	.30 (7.5)	.39 (10)	.12 (3)	.16 (4)	.08 (2)	.24 (6)
PCG-10-*	.35 (9)	.20 (5)	—	—	.59 (15)	.12 (3)	.28 (7)	—	.35 (9)
PCG-15-*	.60 (15.2)	.20 (5)	—	—	.90 (22)	.39 (10)	.35 (9)	—	.39 (10)
PCG-20-*	.79 (20)	.20 (5)	—	—	.91 (23)	.39 (10)	.35 (9)	—	.39 (10)
PCG-30-*	1.26 (32)	.31 (8)	—	—	1.48 (37.5)	.57 (14.5)	.67 (17)	.51 (13)	.71 (18)
PCG-40-*	1.65 (42)	.31 (8)	—	—	1.81 (46)	.87 (22)	.67 (17)	.51 (13)	.79 (20)
PCG-60-*	2.44 (62)	.31 (8)	—	—	2.17 (55)	1.06 (27)	.71 (18)	.51 (13)	.85 (21.5)
PCG-90-*	3.46 (88)	.47 (12)	—	—	3.44 (87.5)	1.65 (42)	1.02 (26)	.79 (20)	.98 (25)

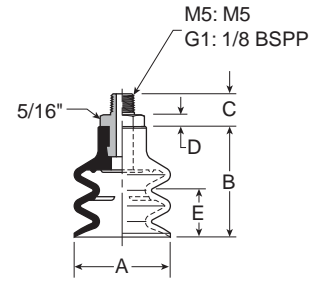
Inches (mm)
 * Cup material

Dimensions

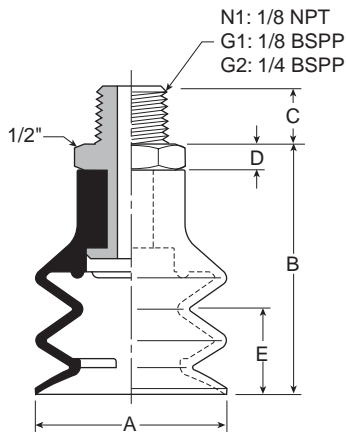
**PCTM-5 and
PCTM-7**



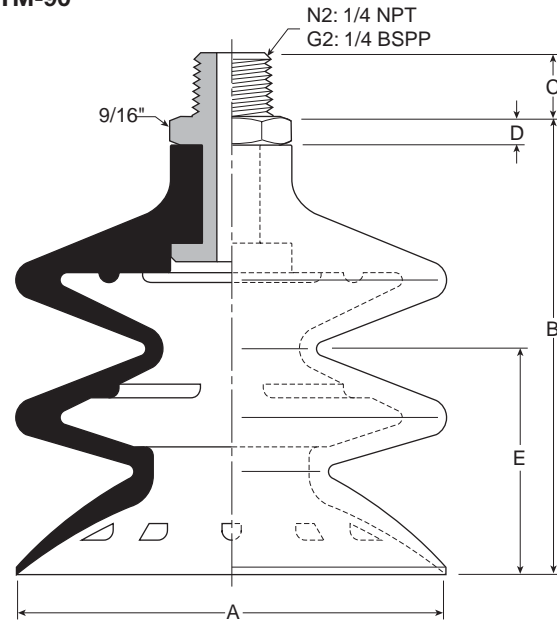
**PCTM-10 thru
PCTM-20**



**PCTM-30 thru
PCTM-60**



PCTM-90



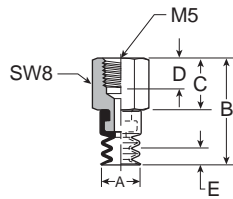
Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PCTM-5-*†	.20 (5)	.51 (13)	.18 (4.5)	—	—	—	.14 (3.5)	.12 (3)
PCTM-7-*†	.28 (7)	.53 (13.5)	.18 (4.5)	—	—	—	.14 (3.5)	.12 (3)
PCTM-10-*†	.35 (9)	.69 (17.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.12 (3)
PCTM-15-*†	.60 (15.2)	1.04 (25.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.39 (10)
PCTM-20-*†	.79 (20)	1.04 (25.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.39 (10)
PCTM-30-*†	1.26 (32)	1.67 (42.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.57 (14.5)
PCTM-40-*†	1.65 (42)	2.01 (51)	—	.31 (8)	.39 (10)	—	.20 (5)	.87 (22)
PCTM-60-*†	2.44 (62)	2.36 (60)	—	.31 (8)	.39 (10)	—	.20 (5)	1.06 (27)
PCTM-90-*†	3.46 (88)	3.64 (92.5)	—	—	.39 (10)	.59 (15)	.20 (5)	1.65 (42)

Inches (mm)
* Cup material
† Thread size

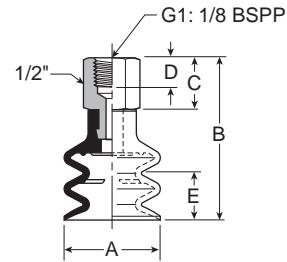
C
Vacuum Cups
Vacuum Products

Dimensions

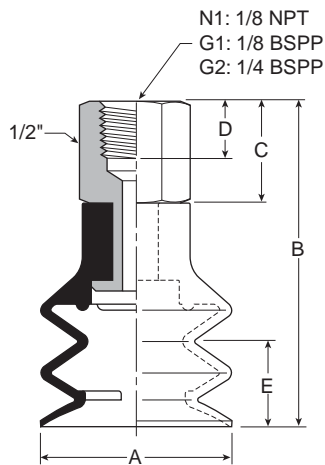
PCTF-5 and PCTF-7



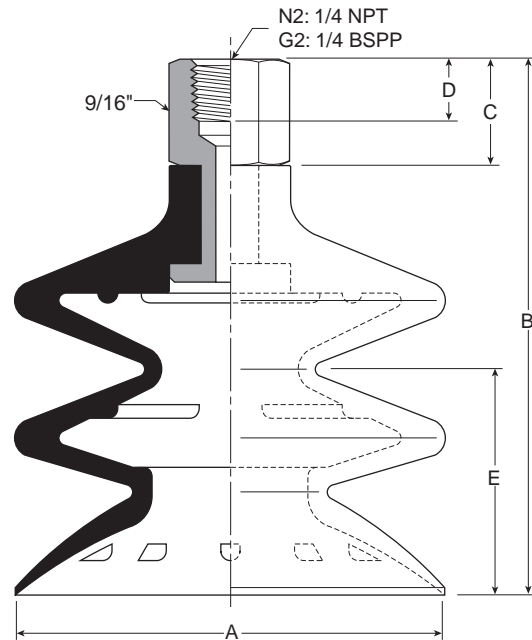
PCTF-10 thru PCTF-20



PCTF-30 thru PCTF-60



PCTF-90



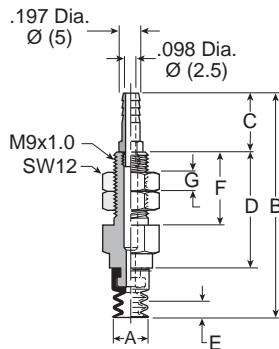
**Vacuum Cups
 Vacuum Products**

Model number	ØA	B	C	D	E
PCTF-5*†	.20 (5)	.85 (21.5)	.47 (12)	.31 (8)	.12 (3)
PCTF-7*†	.28 (7)	.87 (22)	.47 (12)	.31 (8)	.12 (3)
PCTF-10*†	.35 (9)	1.06 (27)	.47 (12)	.31 (8)	.12 (3)
PCTF-15*†	.60 (15.2)	1.38 (35)	.47 (12)	.31 (8)	.39 (10)
PCTF-20*†	.79 (20)	1.38 (35)	.47 (12)	.31 (8)	.39 (10)
PCTF-30*†	1.26 (32)	2.03 (51.5)	.55 (14)	.31 (8)	.57 (14.5)
PCTF-40*†	1.65 (42)	2.36 (60)	.55 (14)	.31 (8)	.87 (22)
PCTF-60*†	2.44 (62)	2.72 (69)	.55 (14)	.31 (8)	1.06 (27)
PCTF-90*†	3.46 (88)	4.13 (105)	.69 (17.5)	.39 (10)	1.65 (42)

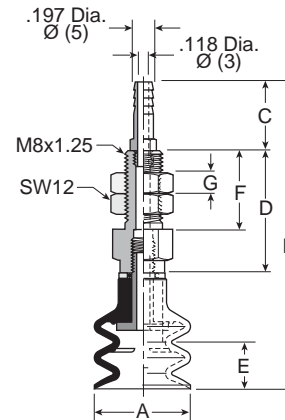
Inches (mm)
 * Cup material
 † Thread size

Dimensions

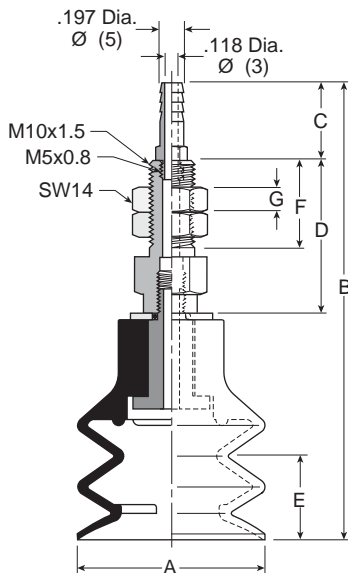
PCTK-5 and PCTK-7



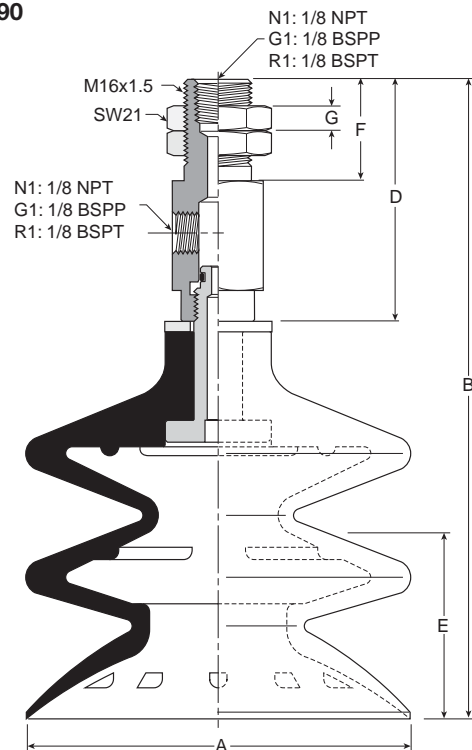
PCTK-10 thru PCTK-20



PCTK-30 thru PCTK-60



PCTK-90



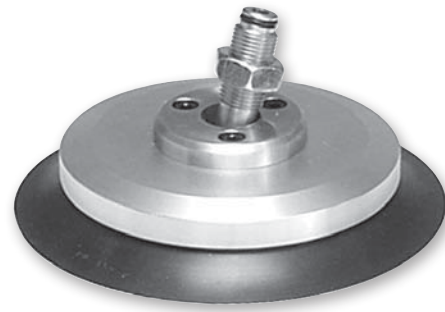
Model number	ØA	B	C	D	E	F	G	Wt oz. (g)
PCTK-5-*	.20 (5)	1.32 (33.5)	.39 (10)	.55 (14)	.12 (3)	.47 (12)	.12 (3)	.56 (11)
PCTK-7-*	.28 (7)	1.34 (34)	.39 (10)	.55 (14)	.12 (3)	.47 (12)	.12 (3)	.56 (11)
PCTK-10-*	.35 (9)	2.21 (56.2)	.63 (16)	.88 (22.5)	.12 (3)	.59 (15)	.16 (4)	.78 (22)
PCTK-15-*	.60 (15.2)	2.53 (64.2)	.63 (16)	.86 (22)	.39 (10)	.59 (15)	.16 (4)	.78 (22)
PCTK-20-*	.79 (20)	2.53 (64.2)	.63 (16)	.86 (22)	.39 (10)	.59 (15)	.16 (4)	.78 (22)
PCTK-30-*	1.26 (32)	3.42 (86.8)	.63 (16)	1.26 (32)	.57 (14.5)	.79 (20)	.20 (5)	1.62 (46)
PCTK-40-*	1.65 (42)	3.75 (95.3)	.63 (16)	1.26 (32)	.86 (22)	.79 (20)	.20 (5)	1.94 (55)
PCTK-60-*	2.44 (62)	4.11 (104.3)	.63 (16)	1.26 (32)	1.06 (27)	.79 (20)	.20 (5)	3.00 (85)
PCYK-90-*	3.46 (88)	5.70 (144.8)	.91 (23)	2.17 (55)	1.65 (42)	.43 (11)	—	10.58 (300)

Inches (mm)
 * Cup material
 † Vacuum port



30° inclusive swivel, single lip cup for smooth, slightly curved surfaces and flexible products. Rigid construction provides good stability against acceleration and deceleration forces during product transfer.

The single edge swivel cup is for smooth surfaces with slightly curved surfaces or flexible sheets with substantial weights. Typically, lift capacities and break away forces are higher for flat cups which may be necessary for good stability during lift and transfer. The position of the internal swivel joint minimizes moments during lift and transfer. The swivel joint compensates for load and angular misalignment instead of the cup material, prolonging cup life. Maintenance costs are minimized by replacing only the cup portion of the assembly.



Features

- Internal swivel joint design
- 30° Inclusive angle for flexible products
- Increased stability for horizontal lifts
- Lower maintenance costs
- 60mm to 100mm diameters

Styles

- PUTK series barbed bulkhead
- PUTYS series bulkhead level compensator

Specifications

Suction cup material	Nitrile (NBR)	Silicon (SI)
Operating temperature (°C)	-20° to +120°	-60° to +250°
Color	Black	White
Hardness, shore A (°Sh)	55 ±5	55 ±5

Application guide

Swivel Bellows



Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Metal sheet handling	Not for vertical lift
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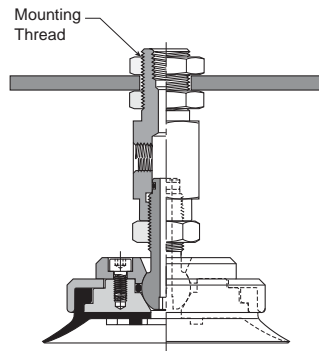
PUTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup size	Vacum port	Cup material Nitrile assembly (NBR)	Replacement PUGB swivel with cup only	Replacement cup only (NBR)	Cup fitting
60	1/8 NPT	PUTK-60-NBR-N1	PUGB-60-NBR	PUG-60-NBR	UTK-60-N1
80	1/8 NPT	PUTK-80-NBR-N1	PUGB-80-NBR	PUG-80-NBR	UTK-60-N1
100	1/8 NPT	PUTK-100-NBR-N1	PUGB-100-NBR	PUG-100-NBR	UTK-60-N1

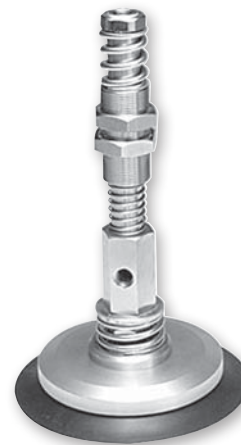
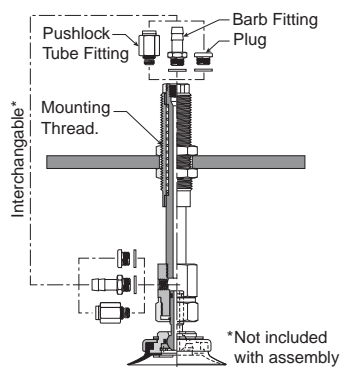
PUTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.



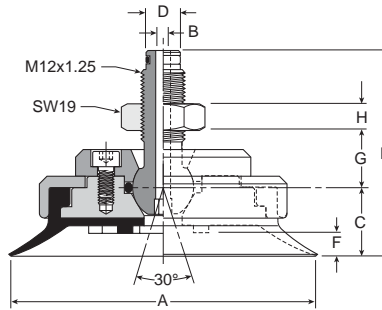
Cup diameter (mm)	Vacum port	Stroke (mm)	Spring compression Force lbf (N)		PUTYS assembly (NBR)	Replacement PUGB swivel with cup only	Replacement cup only NBR	Level compensator P/N
			0%	100%				
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PUTYS6030NBRN1	PUGB-60-NBR	PUG-60-NBR	UTYS-60-30
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PUTYS6050NBRN1	PUGB-60-NBR	PUG-60-NBR	UTYS-60-50
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PUTYS8030NBRN1	PUGB-80-NBR	PUG-80-NBR	UTYS-60-30
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PUTYS8050NBRN1	PUGB-80-NBR	PUG-80-NBR	UTYS-60-50
100	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PUTYS10030NBRN1	PUGB-100-NBR	PUG-100-NBR	UTYS-60-30
100	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PUTYS10050NBRN1	PUGB-100-NBR	PUG-100-NBR	UTYS-60-50

Most popular.

C
 Vacuum Cups
 Vacuum Products

PUGB Series Barbed Bulkhead Dimensions

**PUGB-60 thru
PUGB-100**



Model number	ØA	ØB	C	ØD	E	F	G	H
PUGB-60-*	2.36 (60)	.15 (3.9)	.63 (16)	.35 (9)	2.05 (52)	.20 (5)	.59 (15)	.28 (7)
PUGB-80-*	3.15 (80)	.15 (3.9)	.71 (18)	.35 (9)	2.13 (54)	.24 (6)	.59 (15)	.28 (7)
PUGB-100-*	3.94 (100)	.15 (3.9)	.71 (18)	.35 (9)	2.13 (54)	.24 (6)	.59 (15)	.28 (7)

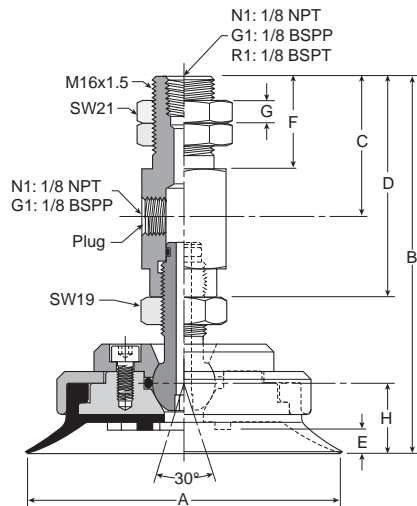
Inches (mm)
* Cup material



Vacuum Cups
Vacuum Products

PUTK Series Barbed Bulkhead Dimensions

**PUTK-60 thru
PUTK-100**

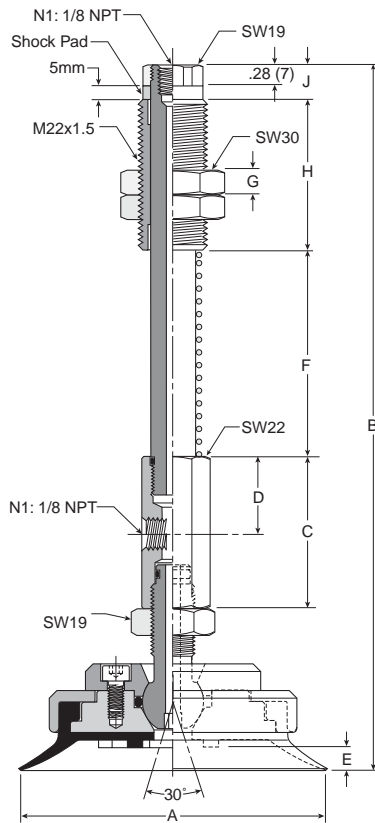


Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PUTK-60-*	2.36 (60)	3.66 (93)	.63 (16)	1.89 (48)	.20 (5)	.91 (23)	.24 (6)	.63 (16)	12.4 (352)
PUTK-80-*	3.15 (80)	3.74 (95)	1.38 (35)	2.16 (55)	.24 (6)	.91 (23)	.24 (6)	.71 (18)	15.7 (444)
PUTK-100-*	3.94 (100)	3.74 (95)	1.38 (35)	2.16 (55)	.24 (6)	.91 (23)	.24 (6)	.71 (18)	20.0 (568)

Inches (mm)
* Cup material

Dimensions

**PUTYS60 thru
 PUTYS100**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PUTYS6030*	2.36 (60)	7.28 (185)	1.57 (40)	.79 (20)	.20 (5)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	17.2 (487)
PUTYS6050*	2.36 (60)	8.27 (210)	1.57 (40)	.79 (20)	.20 (5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	18.4 (521)
PUTYS8030*	3.15 (80)	7.36 (187)	1.57 (40)	.79 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	19.7 (559)
PUTYS8050*	3.15 (80)	8.35 (212)	1.57 (40)	.79 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	20.1 (595)
PUTYS10030*	1.18 (30)	7.36 (187)	1.57 (40)	.79 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	25.7 (729)
PUTYS10050*	1.18 (30)	8.35 (212)	1.57 (40)	.79 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	26.7 (756)

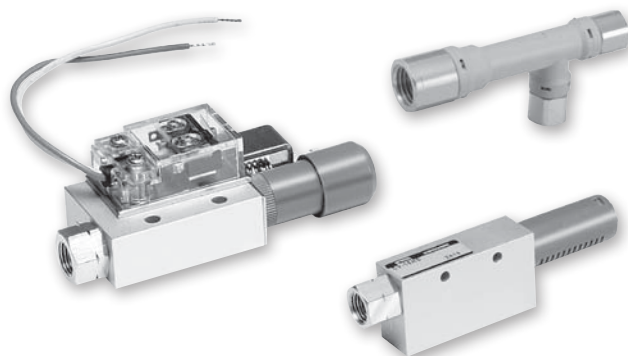
Inches (mm)
 * Cup material

C
 Vacuum Cups
 Vacuum Products

Parker Inline Single Stage Vacuum Generators is a compact design offering multiple vacuum flow ranges in 3 styles. These Generators are meant to be mounted near the vacuum application for improved vacuum response time. A Normally Open or Normally Closed 3 way valve can be used to control the supply pressure to obtain up to a 27 Inhg degree of vacuum.

Features

- **MCA:**
 - light weight vacuum generator
 - vacuum flow rates to 1.26 SCFM
- **CV:**
 - basic aluminum body generator with exhaust muffler
 - vacuum flow rates to 12.36 SCFM
 - degree of vacuum to 27 inHg
- **CV-CK**
 - basic aluminum body generator with mechanical vacuum switch
 - vacuum flow rates to 5.85 SCFM
 - degree of vacuum to 27 inHg



Specifications

Media	Non-lubricated air, non-corrosive gases
Operating pressure	14 to 114 PSI
Operating temperature	32° to 120°F (MCA, CV); 32 to 140°F (CV-CK)
Material	Polycarbonate, Aluminum fittings (MCA) Body: Aluminum (CV, CV-CK) Nozzle: Nickel plated brass (CV, CV-CK) Setting range: 5.9 to 15.7 inHg, accuracy ± 1.57 inHg
CV-CK Switch	Hysteresis: 1.1 to 3.9 inHg Switch output: N.O., AC125V; 5A, AC250V: 3A, DC250V: 0.2A

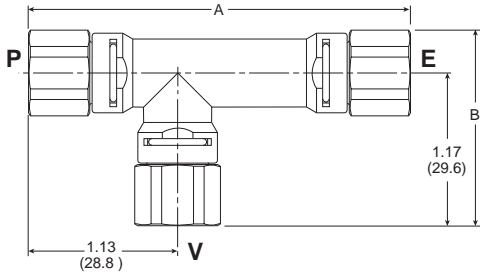
MCA, CV, CV-CK Vacuum Generators

Symbol	Port size			Max. vacuum flow SCFM	Air consumption SCFM	Max. degree of vacuum inHg	Part number	
	Pressure	Vacuum	Exhaust				NPT	BSPP
MCA Series								
	1/8	1/8	1/4	1.68	1.68	24	MCA10HSN1N1N2	MCA10HSG1G1N2
	1/4	1/4	1/4	2.81	2.81	24	MCA13HSN1N1N2	MCA13HSG1G1G2
CV Series								
	1/8	1/8	Muffler	0.21	0.46	27	CV05HSN	CV05HSG
	1/8	1/8	Muffler	0.32	0.46	17	CV05LSN	CV05LSG
	1/8	1/8	Muffler	0.95	1.55	27	CV10HSN	CV10HSG
	1/8	1/8	Muffler	1.27	1.55	17	CV10LSN	CV10LSG
	1/4	3/8	Muffler	2.22	3.53	27	CV15HSN	CV15HSG
	1/4	3/8	Muffler	3.35	3.53	17	CV15LSN	CV15LSG
	1/4	3/8	Muffler	3.88	6.36	27	CV20HSN	CV20HSG
	1/4	1/2	Muffler	5.85	6.36	17	CV20LSN	CV20LSG
	3/8	1/2	Muffler	5.65	9.36	27	CV25HSN	CV25HSG
	3/8	1/2	Muffler	8.83	9.36	17	CV25LSN	CV25LSG
	1/2	3/4	Muffler	7.94	13.60	27	CV30AHSN	CV30AHSG
	1/2	3/4	Muffler	12.36	13.60	17	CV30ALSN	CV30ALSG
CV-CK Series								
	1/8	1/8	—	0.95	1.55	27	CV10HSCKN	CV10HSCKG
	1/4	1/4	—	2.22	3.53	27	CV15HSCKN	CV15HSCKG
	1/4	3/8	—	3.88	6.36	27	CV20HSCKN	CV20HSCKG

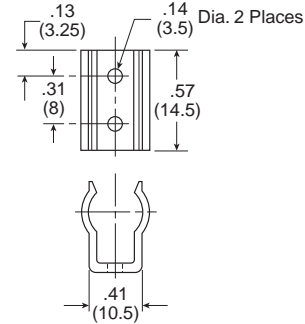
Most popular.

Dimensions

MCA



MCA Mounting bracket: MCA-B

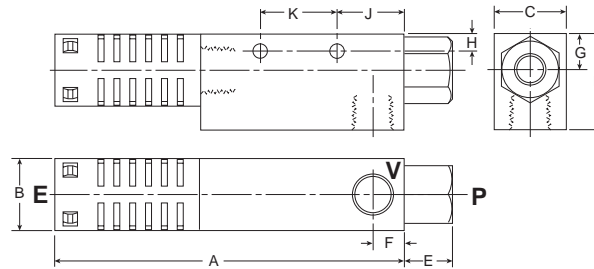


MCA**N1N1N2**

Part number	A	B
MCA10HS*****	2.76 (70)	1.16 (29.5)
MCA13HS*****	2.76 (70)	1.16 (29.5)

Inches (mm)

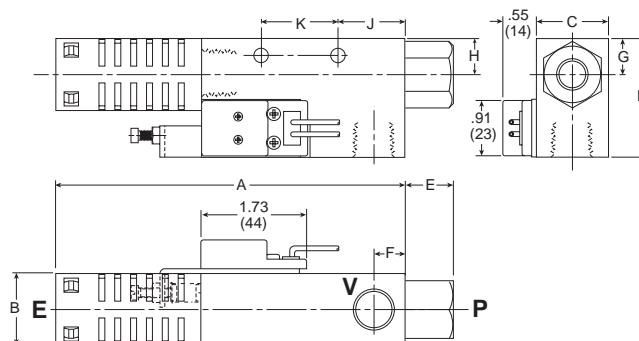
CV



Part number	A	B	C	D	E	F	G	H	J	K
CV05HS/LS	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	.55 (14)	.79 (20)
CV10HS/LS	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	.55 (14)	.79 (20)
CV15HS/LS	4.27 (108.5)	.79 (20)	.79 (20)	1.38 (35)	.59 (15)	.39 (10)	.43 (11)	.20 (5)	.79 (20)	.98 (25)
CV20HS/LS	5.73 (145.5)	1.18 (30)	1.18 (30)	1.57 (40)	.79 (20)	.51 (13)	.59 (15)	.28 (7)	1.10 (28)	1.26 (32)
CV25HS/LS	7.72 (196)	1.57 (40)	1.57 (40)	2.36 (60)	.67 (17)	.63 (16)	.79 (20)	.22 (5.5)	.79 (20)	1.97 (50)
CV30AHS/ALS	8.43 (214)	1.57 (40)	1.57 (40)	2.36 (60)	.79 (20)	.79 (20)	.79 (20)	.22 (5.5)	1.30 (33)	1.97 (50)

Inches (mm)

CV-CK



Part number	A	B	C	D	E	F	G	H	J	K
CV10HS/LSCK	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	17 (4.2)	.79 (20)
CV15HS/LSCK	4.27 (108.5)	.79 (20)	.79 (20)	1.38 (35)	.59 (15)	.39 (10)	.43 (11)	.20 (5)	.18 (4.5)	.98 (25)
CV20HS/LSCK	5.73 (145.5)	1.18 (30)	1.18 (30)	1.57 (40)	.79 (20)	.51 (13)	.59 (15)	.28 (7)	.24 (6)	1.26 (32)

Inches (mm)

C
 Vacuum Generators
 Vacuum Products

CHF- High Flow Series is a multistage vacuum generator. CHF unit is ideal for porous applications.

4 bolt mounting pattern with gauge opposite of vacuum and pressure inlet ports enables this generator to be panel mounted.

CHF Series comes standard with flow thru exhaust mufflers to reduce clogging in dirty environments. Additional Pneumatic Control Valve is required to create vacuum flow.



Features

- Classic multi-stage venturi
- Anodized aluminum body
- Aluminum body includes exhaust muffler
- Maximum vacuum level, 27.3 inHg
- Vacuum flow rates from 12.5 to 31.8 SCFM
- Mounting brackets included

Specifications

Media	Non-lubricated air, non-corrosive gases
Operating pressure	80 PSI
Operating temperature	32°F to 120°F
Material	Body: Aluminum Nozzle & Diffuser: Polymer Seals: BUNA N

CHF High Flow Vacuum Generators

Symbol	Port size			Max. vacuum flow SCFM	Air consumption SCFM	Max. degree of vacuum inHg	Part number NPT
	Pressure	Vacuum	Exhaust				
	1/4	3/8	Muffler	20.9	6.5	27	CHF-20ZNE
	1/4	3/8	Muffler	26.3	9.6	27	CHF-30ZNE
	1/4	3/8	Muffler	31.8	14.0	27	CHF-40ZNE

Accessories

Port size	Description	Part number
3/8	Filter with 10 micron element	VFP2CFC01
1/2	Filter with 10 micron element	VFP3CFC01
3/8	Filter with 10 micron element and 2 replacement elements	VFP2CFC03
1/2	Filter with 10 micron element and 2 replacement elements	VFP3CFC03

See Accessories Section for more options

VFP Series filter

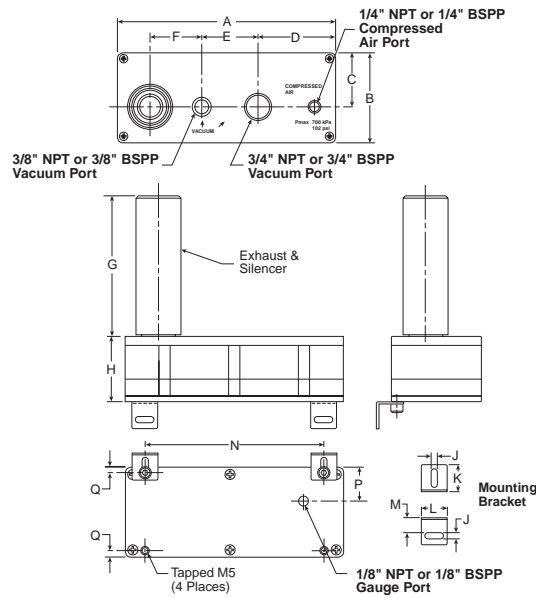


Replacement components

Description	Part number
CHF- Repair kit	SFCHF90NN
0 to 30 inHg gauge	266298A
Bracket kit (Includes 4 brackets & 4 M5 x 15 screws)	SFBW15
Silencer (flow thru)	SIS-001

Most popular.

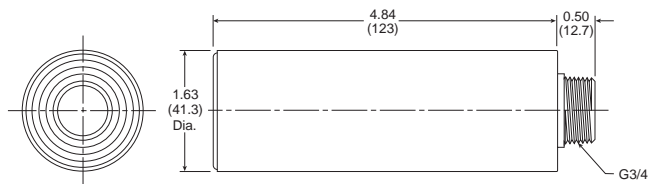
Dimensions



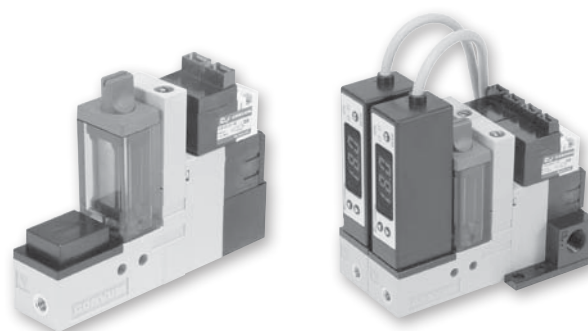
Part number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	Weight (grams)
CHF-20	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	1.69 (43)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	875
CHF-30	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	1.69 (43)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	885
CHF-40	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	2.28 (58)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	965

Inches (mm)

SIS-001 silencer dimensions



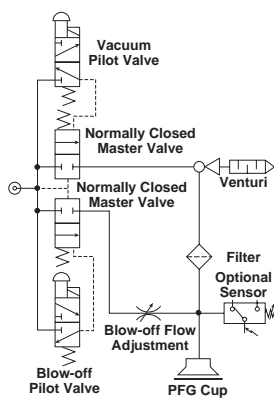
The MC22 is a complete package for factory automation. The MC22 has integrated vacuum generating and blow-off release pilot valves to minimize the response time to achieve vacuum. The small foot print and lightweight body allows the unit to be located close to the suction cup for maximum performance. The MC22 has additional features; regulating blow-off needle, 37 micron mesh filter, and a sensor platform for vacuum confirmation. The MC22 can be assembled into a maximum 8 station manifold. The unit can be ordered normally open or normally closed, with or without MPS-23 or MVS-201 pressure sensors.



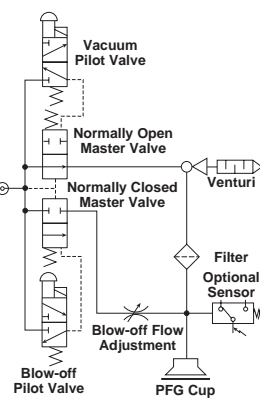
Add-A-Fold Manifold

Features

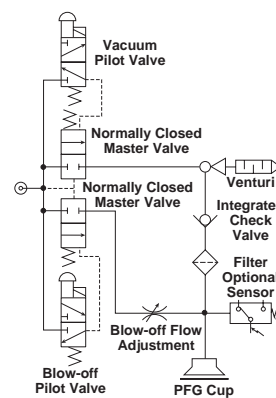
- Vacuum generating pilot valve
- Vacuum blow-off pilot valve
- Vacuum sensor - filter - silencer available
- Regulating blow-off adjustment
- Manifold system
- Short cycle times for high speed pick and place
- Vacuum flow rates to 1.55 SCFM



MC22, Normally Closed Vacuum Valve



MC22, Normally Open Vacuum Valve



MC22, Normally Closed Vacuum Valve with Integrated Check Valve

Specifications

Media	Non-lubricated compressed air, non-corrosive gases
Operating pressure	21 to 84 PSI (1.5 to 6 kgf/cm ²)
Optimum operating pressure	70 PSI (5 kgf/cm ²)
Humidity	35 to 85%
Pressure port	N: 1/8 NPT female, G: 1/8 BSPP female
Vacuum port	M5 female
Operating temperature	41 to 132°F (5 to 50°C)
Material	Aluminum, Polyamide, NBR
Vacuum generating and blow-off release pilot	
Type of control valve	Pilot valve, includes 300mm clip wire connector
Manual operation	Non-locking manual override
Electrical connection	Clip type connector with LED and surge protection
Power supply	24VDC ± 10%
Power consumption	1W
Pressure range	21 to 84 PSI (1.5 to 6 kgf/cm ²)
Pilot valve air supply	Normally closed
Generator weight	4.1 oz. (117G) without sensor
Manifold weight	2-Station: 1.4 oz. (40g), 3-Station: 2 oz. (54g), 4-Station: 2.4 oz. (68g), 5-Station: 2.8 oz. (82g) 6-Station: 3.4 oz. (96g), 7-Station: 3.8 oz. (110g), 8-Station: 4.4 oz. (124g)

MC2 Unit Without Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/8	M5	Muffler	1.55	24	None	MC22S10HSZL4BLN	MC22S10HSZL4BLG
1/8	M5	Muffler	1.55	24	MPS-V23C-PC, PNP	MC22S10HS42L4BLN	MC22S10HS42L4BLG
1/8	M5	Muffler	1.55	24	MVS-201-PCP, PNP	MC22S10HS06L4BLN	MC22S10HS06L4BLG
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	MC22S10HS41L4BLN	MC22S10HS41L4BLG
1/8	M5	Muffler	1.55	24	MVS-201-NC, NPN	MC22S10HS01L4BLN	MC22S10HS01L4BLG

MC2 Unit Without Integrated Check Valve, Normally Open Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/8	M5	Muffler	1.55	24	None	MC22S10HSZL4ALN	MC22S10HSZL4ALG
1/8	M5	Muffler	1.55	24	MPS-V23C-PC, PNP	MC22S10HS42L4ALN	MC22S10HS42L4ALG
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	MC22S10HS41L4ALN	MC22S10HS41L4ALG

MC2 Unit With Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/8	M5	Muffler	1.55	24	None	MC22S10HSZLC4BLN	MC22S10HSZLC4BLG
1/8	M5	Muffler	1.55	24	MPS-V23C-PC, PNP	MC22S10HS42LC4BLN	MC22S10HS42LC4BLG
1/8	M5	Muffler	1.55	24	MVS-201-PCP, PNP	MC22S10HS06LC4BLN	MC22S10HS06LC4BLG
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	MC22S10HS41LC4BLN	MC22S10HS41LC4BLG
1/8	M5	Muffler	1.55	24	MVS-201-NC, NPN	MC22S10HS01LC4BLN	MC22S10HS01LC4BLG



Example 1: Application requires a 2-Station MC22 manifold with NPT supply ports.

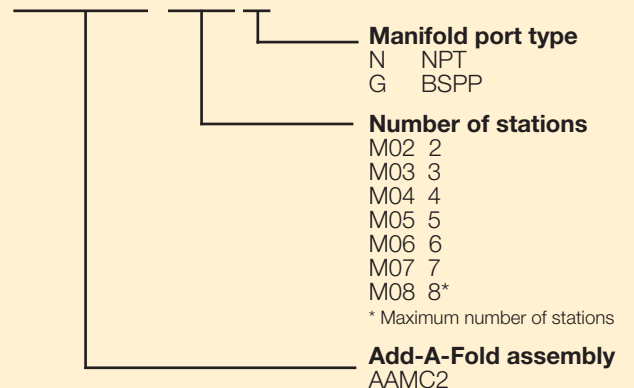
Qty.	Part number	Comment
1	AAMC2-M02N	Add-A-Fold
1	MC22S10HS42L4BLN.....	Station #1
1	MC22S10HS42L4BLN.....	Station #2
Alternative Method		
1	AAMC2-M02N	Add-A-Fold
2	MC22S10HS42L4BLN.....	Station #1-2

Most popular.

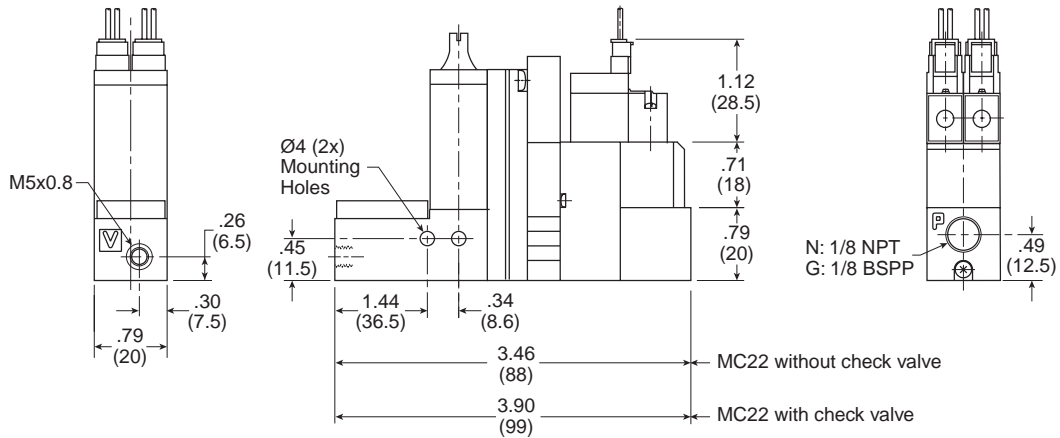
How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the MC22 Generator or a blank plate for each station of the manifold.
6. See model number index code for MC22 Generator number and MC22 accessories for blank plate part numbers.

AAMC2-M08N

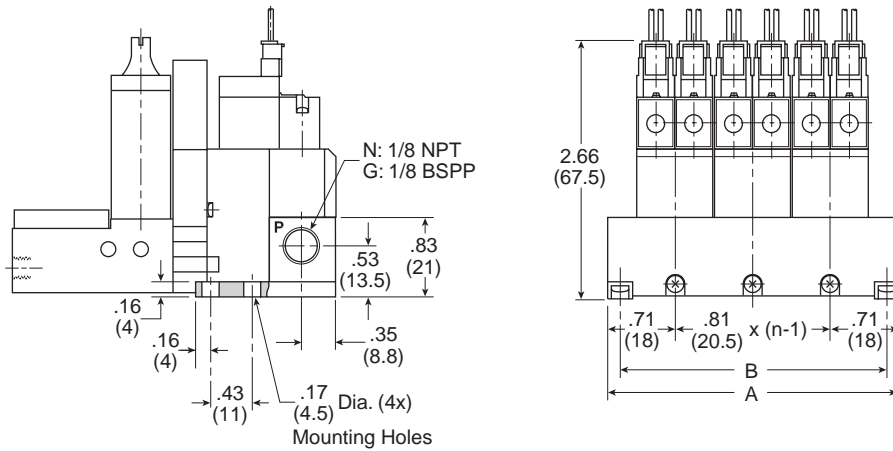


Dimensions



Manifold

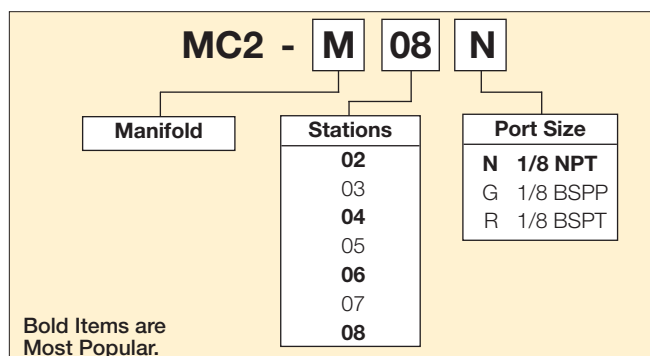
3-Station manifold without check valve shown



n	2	3	4	5	6	7	8
A	2.22 (56.5)	3.03 (77)	3.84 (97.5)	4.65 (118)	5.45 (138.5)	6.26 (159)	7.07 (179.5)
B	1.91 (48.5)	2.72 (69.0)	3.52 (89.5)	4.33 (110)	5.14 (130.5)	5.95 (151)	6.75 (171.5)

Inches (mm)
 n = Number of stations

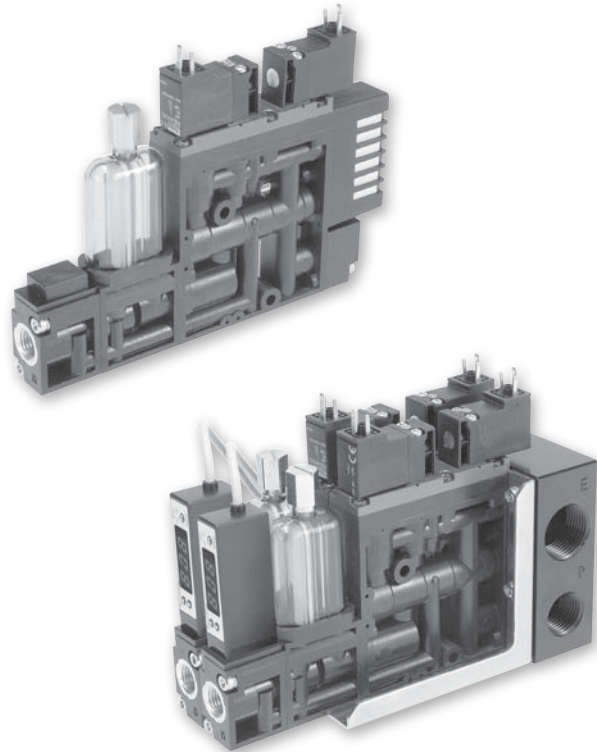
Manifold part number



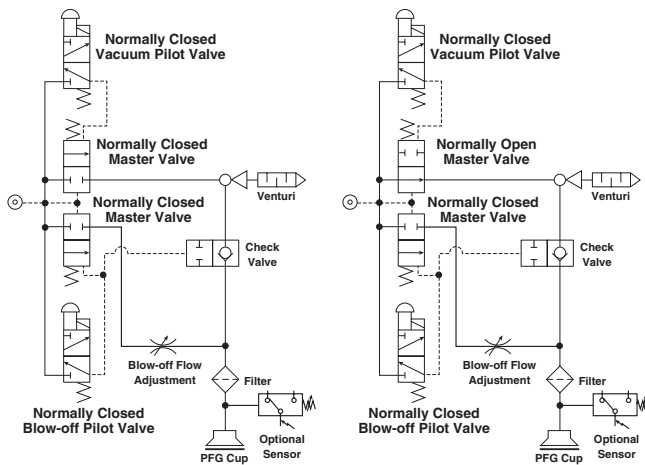
The MC72 Series vacuum generator provides a complete solution for factory automation. The MC72 is perfect for non-porous applications such as material handling, critical applications involving glass, or general transfer applications. The MC72 has integrated vacuum pilot and blow-off release pilot valves to minimize response times. The MC72 has additional features; regulating blow-off needle, 130 micron filter, optional check valve, and a sensor platform for vacuum confirmation. The MC72 can be assembled into a maximum 5 station manifold. The unit can be ordered normally open or normally closed.

Features

- Vacuum generating pilot valve
- Vacuum release pilot valve option
- Vacuum sensor - filter - silencer available
- Regulating blow-off
- Check valve option
- Air-economizing controls
- Manifold system
- Vacuum flow rates from 2.1 to 5.5 SCFM
- 3-Pin, EN175301-803, 15mm, 8mm 3-Pin



Add-A-Fold assembly (Silencer included)



Specifications

Media	Non-lubricated compressed air, non-corrosive gases
Optimum operating pressure	70 PSI (5 kgf/cm ²)
Humidity	35 to 85%
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female
Vacuum port	N: 1/4 NPT female, G: 1/4 BSPP female
Operating temperature	41 to 132°F (5 to 50°C)
Material	Body (PA and PBT) with other internal components (Brass, Al,NBR, SUS, FKM), filter elements (PVF)
Manual operation	Non-locking manual override
Electrical connection	DIN connector with LED and surge protection, connectors included
Power supply	24VDC ± 10%
Power consumption	1.8W
Operating pressure	70 PSI (5 kgf/cm ²)
Pilot valve air supply	Normally closed
Generator weight	12.0 oz. (340g)
Manifold weight	2-Station: 24 oz. (680g), 3-Station: 31 oz. (880g), 4-Station: 38 oz. (1080g), 5-Station: 45 oz. (1280g)

C
Vacuum Generators
Vacuum Products

MC72 Unit With Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/4	1/4	Muffler	2.20	24	No sensor	MC72S15HSZSC4BPN	MC72S15HSZSC4BPG
1/4	1/4	Muffler	2.20	24	MPS-V23C-PC, PNP	MC72S15HS42C4BPN	MC72S15HS42C4BPG
1/4	1/4	Muffler	2.20	24	MVS-201-PCP, PNP	MC72S15HS06C4BPN	MC72S15HS06C4BPG
1/4	1/4	Muffler	2.20	24	MPS-V23C-NC, NPN	MC72S15HS41C4BPN	MC72S15HS41C4BPG
1/4	1/4	Muffler	2.20	24	MVS-201-NC, NPN	MC72S15HS01C4BPN	MC72S15HS01C4BPG
1/4	1/4	Muffler	3.67	24	No sensor	MC72S20HSZSC4BPN	MC72S20HSZSC4BPG
1/4	1/4	Muffler	3.67	24	MPS-V23C-PC, PNP	MC72S20HS42C4BPN	MC72S20HS42C4BPG
1/4	1/4	Muffler	3.67	24	MVS-201-PCP, PNP	MC72S20HS06C4BPN	MC72S20HS06C4BPG
1/4	1/4	Muffler	3.67	24	MPS-V23C-NC, NPN	MC72S20HS41C4BPN	MC72S20HS41C4BPG
1/4	1/4	Muffler	3.67	24	MVS-201-NC, NPN	MC72S20HS01C4BPN	MC72S20HS01C4BPG
1/4	1/4	Muffler	5.20	24	No sensor	MC72S25HSZSC4BPN	MC72S25HSZSC4BPG
1/4	1/4	Muffler	5.20	24	MPS-V23C-PC, PNP	MC72S25HS42C4BPN	MC72S25HS42C4BPG
1/4	1/4	Muffler	5.20	24	MVS-201-PCP, PNP	MC72S25HS06C4BPN	MC72S25HS06C4BPG
1/4	1/4	Muffler	5.20	24	MPS-V23C-NC, NPN	MC72S25HS41C4BPN	MC72S25HS41C4BPG
1/4	1/4	Muffler	5.20	24	MVS-201-NC, NPN	MC72S25HS01C4BPN	MC72S25HS01C4BPG

MC72 Unit With Integrated Check Valve, Normally Open Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/4	1/4	Muffler	2.20	24	No sensor	MC72S15HSZSC4APN	MC72S15HSZSC4APG
1/4	1/4	Muffler	2.20	24	MPS-V23C-PC, PNP	MC72S15HS42C4APN	MC72S15HS42C4APG
1/4	1/4	Muffler	2.20	24	MPS-V23C-NC, NPN	MC72S15HS41C4APN	MC72S15HS41C4APG
1/4	1/4	Muffler	3.67	24	No sensor	MC72S20HSZSC4APN	MC72S20HSZSC4APG
1/4	1/4	Muffler	3.67	24	MPS-V23C-PC, PNP	MC72S20HS42C4APN	MC72S20HS42C4APG
1/4	1/4	Muffler	3.67	24	MPS-V23C-NC, NPN	MC72S20HS41C4APN	MC72S20HS41C4APG
1/4	1/4	Muffler	5.20	24	No sensor	MC72S25HSZSC4APN	MC72S25HSZSC4APG
1/4	1/4	Muffler	5.20	24	MPS-V23C-PC, PNP	MC72S25HS42C4APN	MC72S25HS42C4APG
1/4	1/4	Muffler	5.20	24	MPS-V23C-NC, NPN	MC72S25HS41C4APN	MC72S25HS41C4APG

Add-A-Fold assembly ordering information



How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the manifold type generator or a blank plate for each station of the manifold.
6. See model number index code for MC72 Generator number and accessories for blank plate part numbers.

Most popular.

Example 1: Shown above is a 2-Station MC72 manifold with sensors and NPT Ports.

Qty.	Part number	Comment
1	AAMC72-M02N.....	Add-A-Fold
1	MC72SHS42C4BPN.....	Station #1
1	MC72SHS42C4BPN.....	Station #1
Alternative Method		
1	AAMC72-M02N.....	Add-A-Fold
2	MC72SHS42C4BPN.....	Station #1-2

AAMC72-M02N

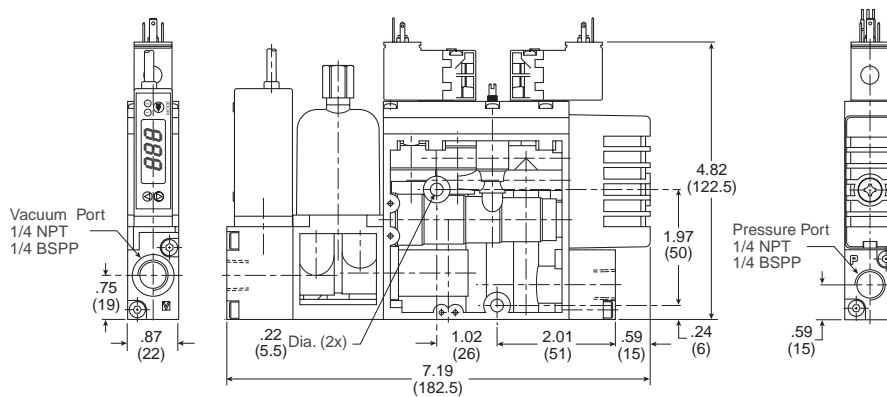
Port type
 N NPT
 G BSPP

Number of stations
 M02 2
 M03 3
 M04 4
 M05 5*

* Maximum number of stations

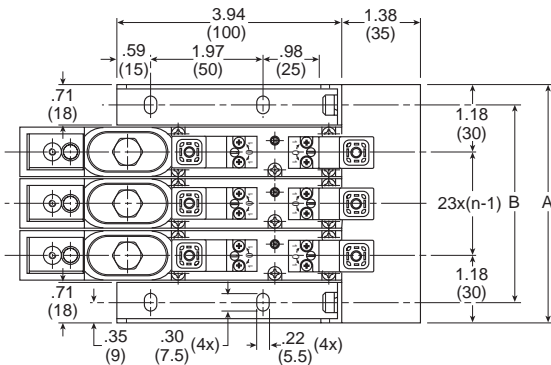
Add-A-Fold assembly
 AAMC72

Dimensions



Manifold

3-Station manifold shown



Manifold part number

MC72 - M 05 N

Manifold

02
03
04
05

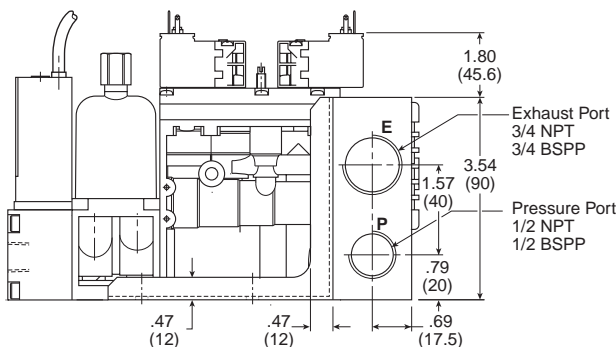
Stations

02
03
04
05

Port Size

N 1/8 NPT
 G 1/8 BSPP
 R 1/8 BSPT

Bold Items are Most Popular.



n	2	3	4	5
A	3.27 (83)	4.17 (106)	5.08 (129)	5.98 (152)
B	2.56 (65)	3.46 (88)	4.37 (111)	5.28 (134)

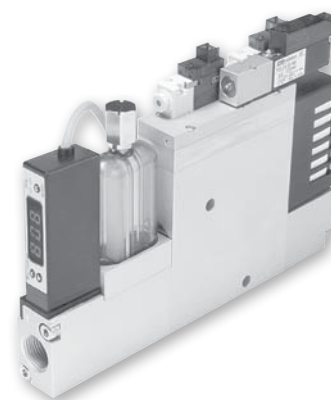
Inches (mm)
 n = Number of Stations

C
 Vacuum Generators
 Vacuum Products

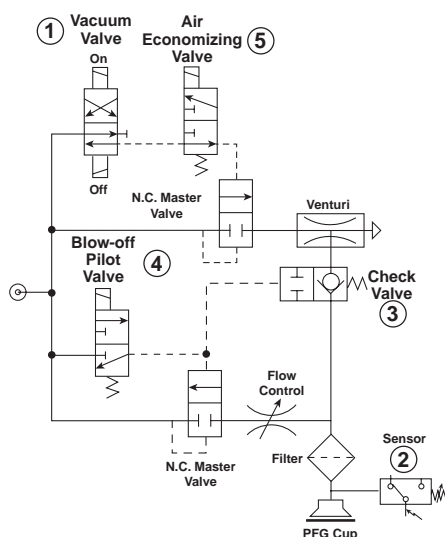
The CEK is a Normally Closed Vacuum On / Off valve that maintains the last state of air during an emergency stop or power loss. In addition to this, an air-economizing valve has been added to interrupt the air supply by connecting the output signal from the sensor to minimize air consumption.

This unit is ideal for non-porous applications that require fast response of large vacuum and blow-off release flow.

Typically, with a normally closed air circuit, the user controls vacuum with a command signal. During an Emergency Stop Event or power failure event, the vacuum command signal is lost, but, the Vacuum valve (1) remains in the current operating position due to the construction of the valve. The air-economizing valve (5), in a Normally Open configuration, passes the air supply from the Vacuum On / Off valve (1). The Sensor (2) output activates the air-economizing valve (5) closing the air supply to the Normally Closed master valve. The Check Valve (3) maintains the achieved vacuum level until the hysteresis value of the Sensor (2) is reached or when the Vacuum valve (1) has been returned to the closed position to stop the vacuum operation.



Valve controlled emergency stop circuit



Features

- Integrated double solenoid for last state
- Integrated vacuum pilot
- Integrated blow-off pilot
- Integrated filter, silencer
- Air economizing capabilities
- Manifolds for up to 5 units



Vacuum Generators
 Vacuum Products

CEK Emergency Stop Vacuum Generators

Nozzle size	Maximum degree of vacuum	Sensor option	Valve option	Part number
1.5mm	27 inHg	No Sensor	24 VDC, PNP	CEK15HSZC24PBLN
		MPS-V23 (NPN)	24 VDC, NPN	CEK15HS41C24NBLN
		MPS-V23 (PNP)	24 VDC, PNP	CEK15HS42C24PBLN
2.0mm	27 inHg	No Sensor	24 VDC, PNP	CEK20HSZC24PBLN
		MPS-V23 (NPN)	24 VDC, NPN	CEK20HS41C24NBLN
		MPS-V23 (PNP)	24 VDC, PNP	CEK20HS42C24PBLN
2.7mm	27 inHg	No Sensor	24 VDC, PNP	CEK27HSZC24PBLN
		MPS-V23 (NPN)	24 VDC, NPN	CEK27HS41C24NBLN
		MPS-V23 (PNP)	24 VDC, PNP	CEK27HS42C24PBLN

Most popular.

Specifications

Media	Non-lubricated compressed air, non-corrosive gases	
Operating pressure	70 PSI (5 kgf/cm ²)	
Humidity	35 to 85%	
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female	
Vacuum port	N: 3/8 NPT female, G: 3/8 BSPP female	
Operating temperature	41 to 132°F (5 to 50°C)	
Material	Aluminum, Brass, NBR	
Air-economizing valve and blow-off release pilot		Emergency stop valve
Type of control valve	Pilot valve	Double solenoid
Manual operation	Manual override	Manual overrides
Electrical connection	Clip connector with LED and surge	Clip connector with LED and surge
Power supply	24VDC ± 10%	24VDC ± 10%
Power consumption	0.9W	0.9W
Operating pressure	70 PSI (5 kgf/cm ²)	70 PSI (5 kgf/cm ²)
Air supply	Normally closed	Normally closed
Generator weight	26.3 oz. (750g)	
Manifold weight	2-Station: 24 oz. (680g), 3-Station: 31 oz. (880g), 4-Station: 38 oz. (1080g), 5-Station: 45 oz. (1280g)	

Add-A-Fold assembly ordering information



Station 1 Station 2 Station 3 Station 4 Station 5

Example 1: Shown above is a 5-Station CVK manifold with sensors and NPT Ports.

Qty.	Part number	Comment
1	AACEK-M04N.....	Add-A-Fold
1	CEK15HS21C24NBLN	Station #1
1	CEK15HS21C24NBLN	Station #2
1	CEK20HS21C24NBLN	Station #3
1	CEK20HS21C24NBLN	Station #4
1	CEK27HS21C24NBLN	Station #5
	<i>Alternative Method</i>	
1	AACEK-M04N.....	Add-A-Fold
2	CEK15HS21C24NBLN	Station #1-2
2	CEK20HS21C24NBLN	Station #3-4
1	CEK27HS21C24NBLN	Station #5

How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the manifold type generator or a blank plate for each station of the manifold.
6. See model number index code for CEK Generator number and accessories for blank plate part numbers.

AACEK-M05N

Port Type
 N NPT
 R BSP
 G BSPP

Number of Stations
 M02 2
 M03 3
 M04 4
 M05 5*
 * Maximum Number of Stations

Add-A-Fold Assembly
 AACEK

Manifold part number

CVK - M 05 N

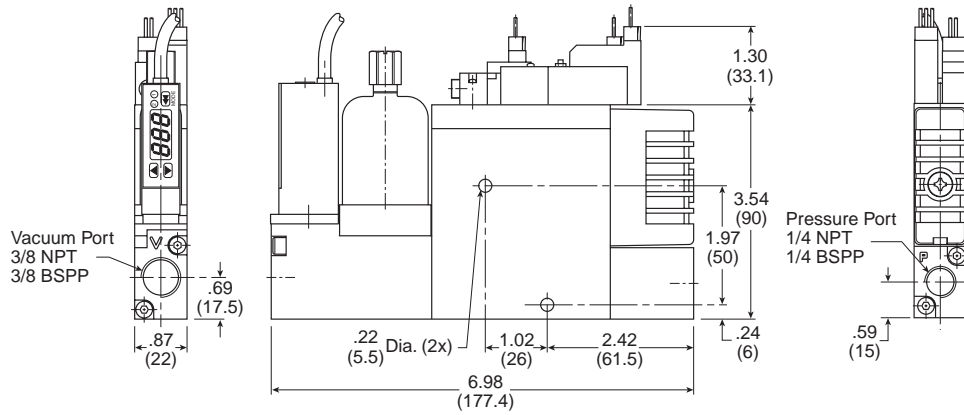
Manifold

Stations
 02
 03
04
 05

Port Size
N 1/8 NPT
 G 1/8 BSPP
 R 1/8 BSPT

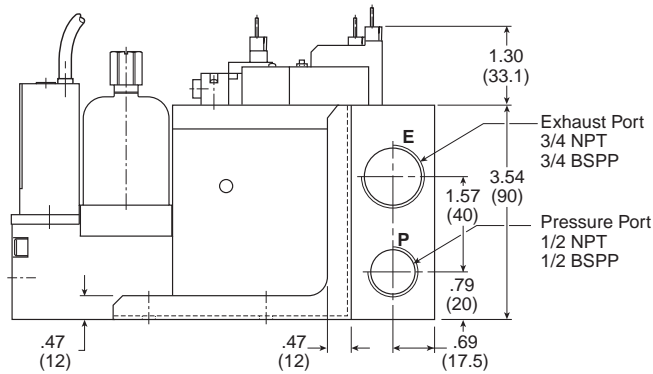
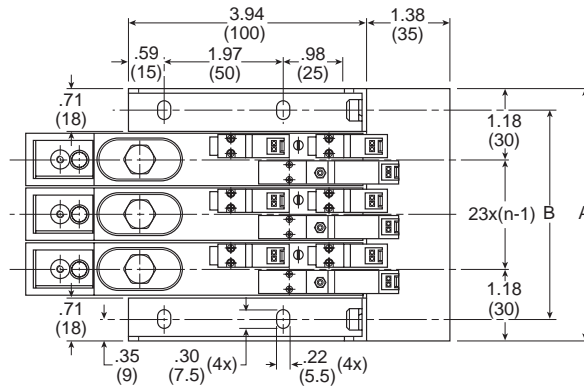
Bold Items are Most Popular.

Dimensions



Manifold

3-Station manifold shown



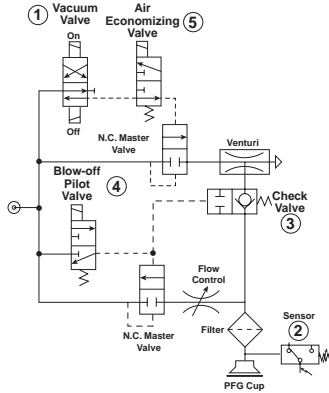
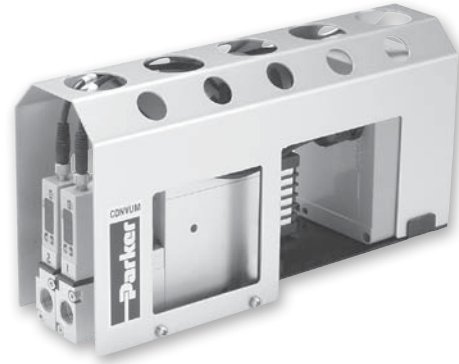
n	2	3	4	5
A	3.27 (83)	4.17 (106)	5.08 (129)	5.98 (152)
B	2.56 (65)	3.46 (88)	4.37 (111)	5.28 (134)

Inches (mm)
 n = Number of stations

C
 Vacuum Generators
 Vacuum Products

The CVXCEK vacuum generator creates vacuum and blow-off pressure in a vacuum system and has additional Air-economizing and emergency operating system functions.

Each CVXCEK unit consists of 2 independent vacuum generators labeled channel 1 and channel 2. Each vacuum generator has a vacuum ON / OFF solenoid pilot valve, blow-off solenoid pilot valve, Air-Economizing valve, blow-off needle control valve, pressure sensor, vacuum check valve, vacuum filter, and exhaust filter. Each Vacuum Generator is mounted to a 2-Station bar manifold with an optional electrical mounting kit. The pressure provided with inlet port of the bar manifold is common to both vacuum generators.



Features

- Integrated double solenoid for hold last state conditions
- Integrated vacuum pilot
- Integrated blow-off pilot
- Integrated filter, silencer
- Air economizing capabilities
- Manifolds for up to 5 units

General operation of CVXCEK vacuum units

A vacuum generator is a single stage Venturi that creates vacuum pressure using compressed air. In principle, compressed air is throttled as the air exits the nozzle and is discharged into the diffuser. This increased velocity of air lowers the pressure in the diffusion chamber. The volume of air within the closed vacuum system flows into the low-pressure area of the diffusion chamber and is exhausted thru the diffuser. This effect increases the vacuum level and evacuates most of the air within the closed vacuum. The vacuum generator will produce the specified degrees of vacuum as cataloged if the vacuum system is closed, inlet pressure is to design pressure, and there are no major restrictions in the exhaust flow.

Vacuum is created when the unit receives a momentary or maintained command vacuum "ON" signal, (high signal is sent

to Vacuum Pilot Valve (1). Once a preset vacuum degree (H-1) of the pressure sensor (2) is achieved, the Air-Economizing Valve is enabled to conserve compressed air. The vacuum level will be maintained by the Check Valve (3) until the hysteresis switch point (H-1 minus h-1) of Sensor (2). At this point vacuum is turned back "ON" until the switch point (H-1) is achieved again. This cycle, which is called Air-economizing, will repeat until a blow-off signal is sent to the unit. When the Blow-off Pilot Valve (4) is activated to decay the vacuum pressure, the unit will release the part. Command vacuum "ON" should be turned "OFF" when command blow-off is turned "ON". The Emergency Stop operating system provides Air-Economizing or maximum degree of vacuum at the time of disruption of Input and Output Power.

Model Number Index

CVXCEK					27	D3	2	49	N	A
Nozzle Diameter	Electrical Enclosure				Number of Channels		Voltage		Engineering Level	
27 27HS 2.7mm	D1 M12, 110VAC D3 M12, 24VDC, PNP D4 M12, 110VAC, w/ Mtg. Plate D6 M12, 24VDC, PNP w/ Mtg. Plate N1 M18, 110VAC N3 M18, 24VDC, PNP N4 M18, 110VAC, w/ Mtg. Plate N6 M18, 24VDC, PNP w/ Mtg. Plate				1 Generator w/ Blanking Plate 2 Generators		49 24VDC 53 110VAC		A Current	
Port Threads										
N NPT G BSPP										
Bold Items are Most popular.										

Specifications

Media	Non-lubricated compressed air, non-corrosive gases		
Operating pressure	70 PSI		
Humidity	35 to 85%		
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female, R: 1/4 BSPT female		
Vacuum port	N: 3/8 NPT female, G: 3/8 BSPP female, R: 3/8 BSPT female		
Operating temperature	41 to 132°F (5 to 50°C)		
Material	Aluminum, Brass, NBR		
Air-economizing valve and blow-off release pilot	Vacuum pilot valve	Sensors	
Type of control	Single solenoid	Double solenoid	MPS-2 Pressure Sensor
Manual operation	Manual override	Manual overrides	N/A
Electrical connection	Clip connector	Clip connector	M8, 4-pin
Power supply*	24VDC ± 10%	24VDC ± 10%	10.8 to 30VDC
Solenoid power consumption	0.6W with LED and surge	2.0W with LED and surge	125mA
Operating pressure	70 PSI	70 PSI	-14.7 PSI to 72.5 PSI
Air supply	Normally closed	Normally closed	N/A
Manifold weight	1-Station: 62 oz. (1758g), 2-Station: 88 oz. (2495g)		

* 110VAC units use 24VDC solenoids and sensors.

Performance

Series / nozzle diameter	Nozzle diameter (mm)	Vacuum degree at 70 PSI (inHg)	Vacuum flow per channel (SCFM)	Air consumption per channel (SCFM)
CVXCEK27	2.7	27	5.75	10.41

Evacuation time

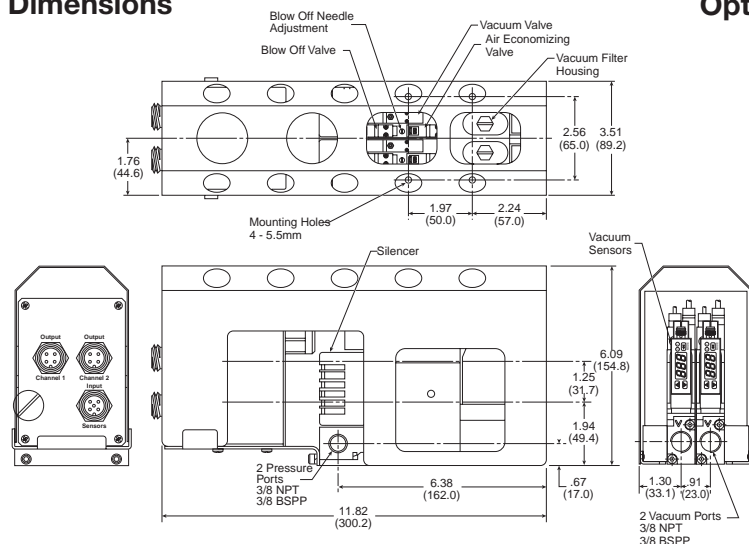
Series / nozzle diameter	Air supply pressure PSI	Air consumption per channel SCFM	Evacuation time per channel in sec / ft ³ * to reach different vacuum levels (inHg)								
			3	6	9	12	15	18	21	24	27
CVXCEK27	70	10.42	0.6	2.0	3.0	5.6	8.5	13.3	21.2	42.1	—

* 1 ft³ = 28.31 liters

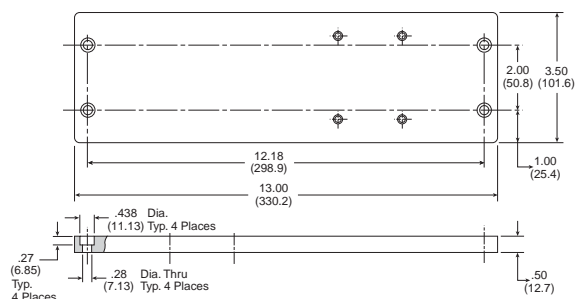
Vacuum flow (SCFM)

Nozzle Dia.	inHg										
	0	3	6	9	12	15	18	21	24	27	30
27HS	5.75	5.09	4.43	3.77	3.11	2.45	1.80	1.15	.50	—	—

Dimensions

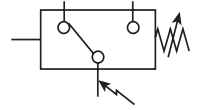


Optional mounting plate



Features

- Pressure range:
 Vacuum pressure: 0 to -30 inHg
- Sensor output:
 2 NPN or PNP open collector
 Transistor output, 30VDC, 125mA
- Switch Point and Window Comparator Mode
- Selectable units of measure
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Error message



MPS-23 Sensor Only Ordering Numbers

Pressure range	Port thread	Electrical output	Electrical connection	Part number
0-30 inHg	Ejector mount	(2) PNP	M8 on 1M cable, 4-Pin	MPS-V23C-PC
0-30 inHg	Ejector mount	(2) NPN	M8 on 1M cable, 4-Pin	MPS-V23C-NC

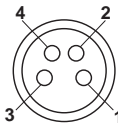
MPS-23 Accessories

M8, 4-Pin, 2 meter cable	CB-M8-4P-2M-PUR
M8, 4-Pin, 5 meter cable	CB-M8-4P-5M-PUR

Sensor pin out

Pin #

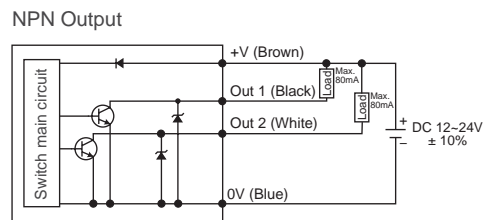
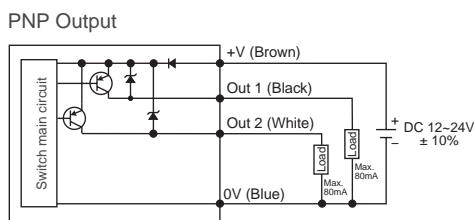
- 1 Brown: 24VDC
- 2 White: PNP/NPN Open Collector Output 2
- 3 Blue: 0VDC
- 4 Black: PNP/NPN Open Collector Output 1



Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Window comparator mode	✓
Auto teach mode	✓
Output response time	✓
Lockout option	✓
Password lockout	—
Max. value display	✓
Min. value display	✓
Zero reset	✓
Error output mode	✓

Internal circuit for open collector and analog output wiring



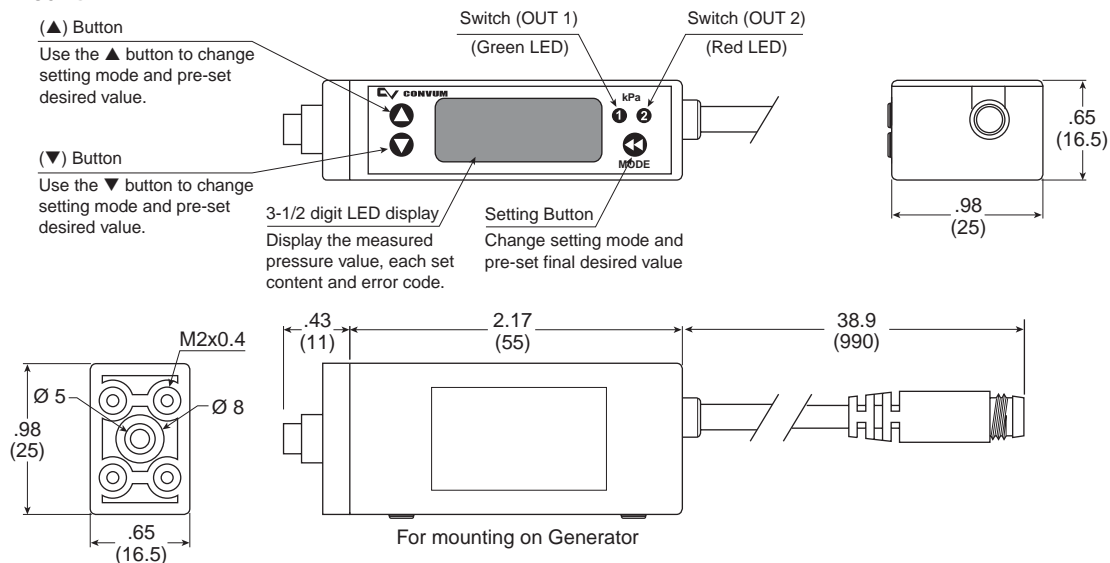
Most popular.

Specifications

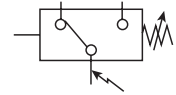
Pressure range	-101.3 - 0 kPa (-14.5 to 0 PSI)
Proof pressure	0.3 Mpa (44 PSI)
Display resolution, Units of measure	0.1, kPa
	0.001, kgf/cm ²
	0.001, bar
	0.01, PSI
	0.1, inHg
	1, mmHg
	0.1, mmH ₂ O
Media	Air & non-corrosive gases, incombustible gases
Pressure port	Generator mount only
Operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	-4 to 140°F (-20 to 60°C)
Humidity	40 - 85% RH (no condensation)
Electrical connection	(C) 4-pin, M8 connector on 1M lead wire
Power supply	12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less
Display	3 + 1/2 digit, 1 color, 7-segment RED LED
Display refresh	.1 to 3.0 Seconds, Variable (factory set at 0.1)
Control output	NPN (Sinking), PNP (Sourcing), Open collector, max 80mA, 2 output
Switch output	Output signal, NPN or PNP, Normally open or closed, LED indicator
Output indicator	Green LED (OUT1), Red LED (OUT2)
Output modes	Hysteresis or Window Comparator
Response time	≤ 2.5ms (chattering-proof function: 24ms, 192ms, 786m selections)
Repeatability	± 0.2% of F.S. ± 1 digit or less
Thermal error	≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)
General protection	IP40, CE marked, EMC-EN61000-6-2: 2001
Current consumption	<55mA
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.
Shock resistance	980 m/s ² (about 10G), 3 times/each directions X, Y, Z
Noise resistance	Vp-p400V, 10 ms, 0.5µs noise simulator
Material	Housing: ABS (black) , Pressure port: Zinc die-cast, Diaphragm: Silicon
Mass	2 oz. (65g) (including 1m cable)

Dimensions

Generator mount



The MVS-201 is a winning combination with the MC2, CVR-2, and CVK vacuum generators. The MVS-201 automatically provides an output signal for the blow-off function without the need of an additional output from the PLC. Begin the vacuum cycle with an output signal from the PLC to the "201" sensor. The "201" sensor has one NPN or PNP output for vacuum confirmation and a control output that interfaces directly with the blow-off release pilot valve. With programmable time control features and a special chip driver, the sensor automatically activates the blow-off release when the NPN or PNP vacuum signal from the PLC is discontinued. This eliminates, THE PREVIOUSLY REQUIRED, PLC output to activate the blow-off release. This technology eliminates PLC output requirements by 50% and reduces installation to a simple 4 wire system by wiring the sensor only. There are 3 modes of operation for various applications. The output response time of the sensor is less than 2.5 msec. Peak limit prevention maintenance feature is automatically recorded internally.



For use with MC22 / MC72 generators

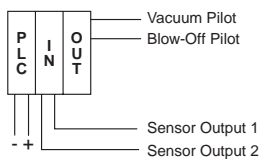
Features

- Time controlled sensor
- Intelligent simple 4-wire system
- Eliminate I/O for release valve
- 2 functions with one rung of code
- Automatic timer (0-9.9 Sec.) function by sensor control driver for vacuum generating and release valves
- Peak value preventative maintenance confirmation
- Response time less than 2 milliseconds

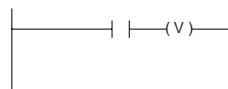
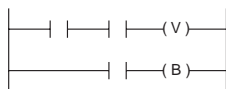
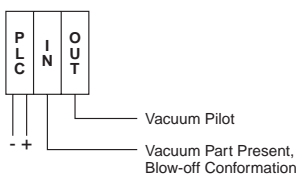
Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Lockout option	✓
Zero reset	✓
Energy savings mode	✓
Air conservation / blow-off timer	✓
Vacuum timer option	✓
Signal controlled vacuum	✓
Blow-off activation timer	✓
Blow-off timer	✓
Vacuum confirmation signal	✓
Blow-off confirmation signal	✓
Peak vacuum error message	✓
Vacuum response error message	✓
Blow-off time error message	✓

Basic PLC System



PLC System with 201 Sensor



MVS-201 Ordering Numbers

Pressure range	Output circuit	Input circuit	Electrical connector *	Part number
-14.7 to 72.5 PSI	PNP sourcing	PNP sourcing	4 Pin, M8	MVS-201-PCP
	NPN sinking	NPN sinking		MVS-201-NC

* Requires sensor to valve electrical connector

Note:

Output Circuit provides vacuum and blow-off confirmation signal (Input Signal to PLC).
 Input Circuit controls vacuum solenoid valve (Output Signal from PLC).

Sensor to valve electrical connector

Generator series	Sensor connection	Valve connection	Part number
MC22	5 Pin Clip Type	2 with clip type	MC22-C201G
MC72		2 wire leads	CVK-D201G

☐ Most popular.

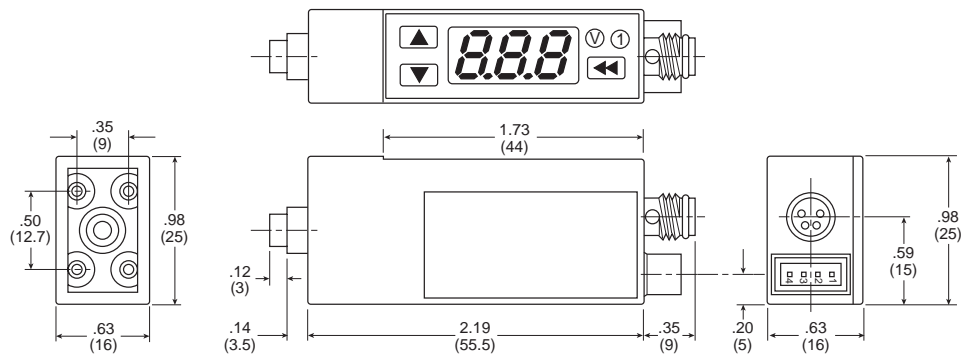
Specifications

Pressure range	Compound pressure: -14.7 to 72.5 PSI bar: 0.01
Units of measure	kPa: 1
Display resolution	kgf/cm ² : 0.01 PSI: 0.1
Media	Non-lubricated air and non-corrosive gases
Proof pressure	116.0 PSI
Operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	14 to 140°F (-10 to 60°C)
Humidity	35 to 85% RH
Electrical connection	4-Pin, M8 connector
Power supply	10.8 to 30VDC, Ripple Vp-p 10% Max., Reverse voltage protection
Display	3-Digit, 7-Segment LED
Display frequency	5Hz
Circuit	NPN (Sinking), PNP (Sourcing) open collector transistor
Digital output	Individually selectable N.O. or N.C., max 125mA, 30V, with overcurrent protection
Mode	OP1, OP2, OP3 hysteresis: 0 to 100% of switch point
Response time	< 2ms
Repeatability	± 0.3% F.S.
Thermal error	±0.2% F.S. in temperature range: 32 to 122°F (0 to 50°C)
General protection	IP40, CE marked, EMC-EN55011 Class B, EN50082-1
Current consumption	< 45mA, < 25mA when utilizing screen saver option
Spike protection	350 Vp, 1, μs
Dielectric strength	1000 VAC 1 min.
Insulation resistance	> 100M ohms at 500VDC
Vibration resistance	10 to 55Hz, 1.5mm, XYZ, 2 hrs.
Shock resistance	10 G, XYZ
Material	Body: Polycarbonate
Mass	1.7 oz. (45g)



Dimensions

M8, 4-Pin



Maintaining an acceptable level of vacuum is critical to the performance of vacuum systems that have a single source vacuum generator with multiple cups. The Parker Flow Sensing Valve assists in maintaining an acceptable vacuum level if the vacuum cup does not make a proper seal. The valve will automatically close if the cup loses the seal with the product during a pick and place motion.

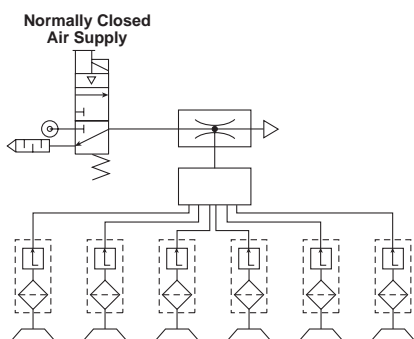
The Parker Flow Sensing Valve is a normally open valve that switches to a closed state when the vacuum flow rate from the cup side to the generator side is greater than the switching flow rate of the flow sensing valve. The Flow Sensing Valve “Checks” the vacuum flow. The vacuum flow rate of the generator must be more than the switching flow rate of the Flow Sensing Valve or it will not switch to a “Checked” position.

When using multiple Flow Sensing Valves per generator, the flow rate of the generator must be more than the combined switching flow rates of the flow valves and any other leak path. For example, a CV20-HSN has a maximum flow rate of 3.88 SCFM and a 1/8 Flow Sensing Valve has a switching flow rate of 0.28 SCFM. Therefore 13 Flow Sensing Valves can be connected in parallel to a CV20-HSN.

Once a Flow Sensing Valve is “Checked”, a small amount of by-pass flow occurs. This leakage allows a generator to be turned on prior to the cup being in place on a product and is the flow path used to evacuate the cup volume. The by-pass flow will decrease the maximum degree of vacuum in a system, and is considered a leak path when the cup is not sealed on a product. Blow off functions will still operate by forcing the Flow Sensing Valve to a full open position, allowing the part to be blown off.

Features

- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter



FSV Series Ordering Information

Description	Part number
1/8" BSPP	FSV-G1
1/4" BSPP	FSV-G2
3/8" BSPP	FSV-G3

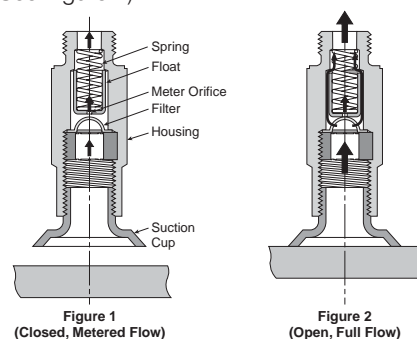
 Most popular.



Operation

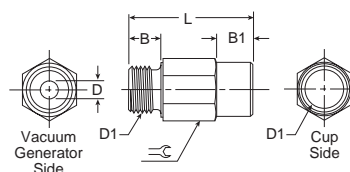
When the flow of air from the cup side to the generator side is greater than the switching flow rate of the valve, the float is drawn back against the spring and seals on the housing. In this state, flow passes through an orifice on the float. Vacuum flow is “Checked”. (See Figure 1).

When the cup comes in contact and seals on a product, flow is reduced and the spring forces the float towards the cup side inlet. This breaks the seal at the float and the full open state is restored. (See Figure 2).



Specifications

Description	FSV-G1	FSV-G2	FSV-G3
Switching flow rate	0.28 SCFM		0.875 SCFM
Nominal size	4mm		
Housing material	Anodized aluminum		
Filter material	Al-Niro mesh		
Temperature range	14°F to 140°F (-10°C to 60°C)		
Maximum pressure	145 PSI		115 PSI
Media	Atmospheric air		
Weight (grams)	0.009	0.016	0.029



Dimensions

	B	B1	D	D1	L	±
FSV-G1	0.26 (6.5)	0.43 (11)	0.16 (4)	G	1.42 (36)	0.51 (13)
FSV-G2	0.33 (8.5)	0.43 (11)	0.16 (4)	G1/4	1.50 (38)	0.67 (17)
FSV-G3	0.47 (12)	0.51 (13)	0.16 (4)	G3/8	1.65 (42)	0.87 (22)

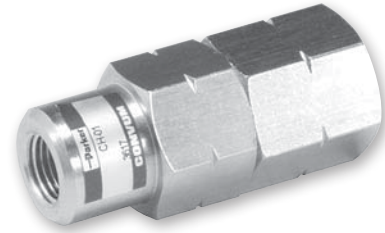
inches (mm)

The CH Check valve is used to hold a degree of vacuum downstream from the check valve when the vacuum generator upstream from the check valve is turned off. A separate blow-off connection downstream from the CH check valve is required to destroy the vacuum pressure and blow off the part.

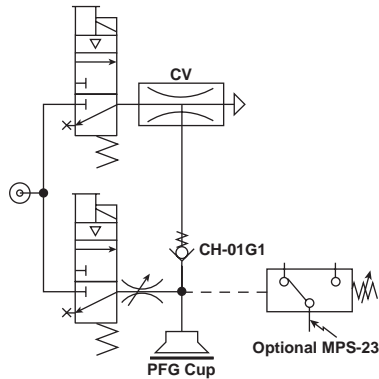
This check valve is an open or passing flow path when there is a differential pressure from the pad side to the generator side.

Features

- Poppet design
- Low leakage
- Low cracking pressure



Normally Closed Air Supply with Blow-off & Optional Sensor



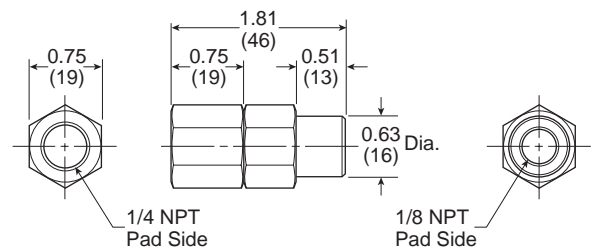
Specifications

Temperature range	32°F to 140°F (0° to 60°C)
Operating vacuum	-4.25 to -13.89 PSIG (-8.7 to -28.3 inHg)
Port size	Pad side = 1/4", Generator side = 1/8"
Leakage rate	0.2 PSI / minute (0.4 inHg / minute)
Cracking pressure	2.9 PSIG (5.9 inHg)

Materials

Valve body / Fittings	Brass / Aluminum
Seals	BUNA
Spring	SUS

Dimensions



CH01 Series Ordering Information

Description	Part number
BSPP Ports	CH-01G1
NPT Ports	CH-01N1

Most popular.

Always filtrate the vacuum system to protect the components from damaging particles absorbed from the environment. Elements should be replaced periodically to prevent slower response and overall performance of the system.

Specifications

Media	Non-corrosive air
Operating vacuum	0 to 28 inHg
Maximum pressure	60 PSI
Operating temperature	32 to 140°F
Filtration	120 µm (VF-2), 130 µm (VF-3, VF-5, VF-6, VFL-44, 66, 88)



VF & VL Series Ordering Information

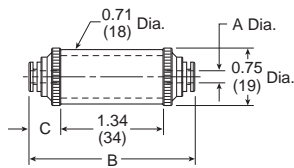
Application	Male connection	Replacement elements	Replacement cover, o-ring	Part number
CV-05, CV-10	G1/8"	VF-2E	—	VF-2G
CV-05, CV-10	G1/8"	VF-3E	VF-3K	VF-3G
CV-15, MCA-10/13	G1/4"	VF-5E	VF-3K	VF-5G
CV-20/25/30	G3/8"	VF-6E	VF-3K	VF-6G
General use	4mm - Tube	VFL-E	VFL-44K	VFL-44
General use	6mm - Tube	VFL-E	VFL-66K	VFL-66
General use	8mm - Tube	VFL-88E	VFL-88K	VFL-88

Materials

Part number	Material housing	Material element	Weight (oz.)
VF-2G	Aluminum	Acrylic, Stainless steel	1.54
VF-3G	Aluminum	PC, Polyvinyl	3.10
VF-5G	Aluminum	PC, Polyvinyl	5.15
VF-6G	Aluminum	PC, Polyvinyl	8.25
VFL-44	Poly-carbonate	PC, Polyvinyl	0.67
VFL-66	Poly-carbonate	PC, Polyvinyl	0.74
VFL-88	Poly-carbonate	PC, Polyvinyl	0.81

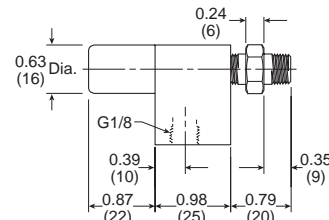
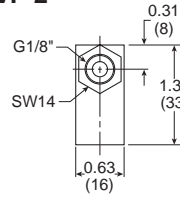
Dimensions

VFL Series

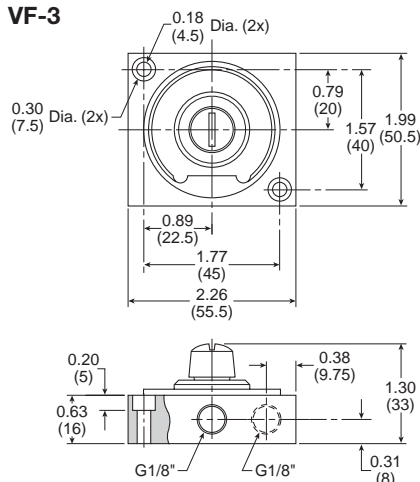


Part number	A	B	C
VFL-44	0.16 (4)	2.17 (55)	0.41 (10.5)
VFL-66	0.24 (6)	2.28 (58)	0.47 (12)
VFL-88	0.31 (8)	2.44 (62)	0.55 (14)

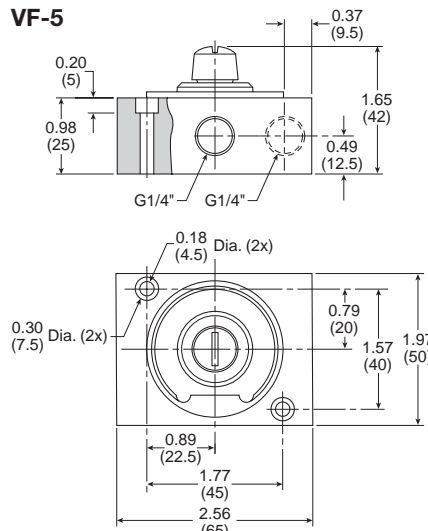
VF-2



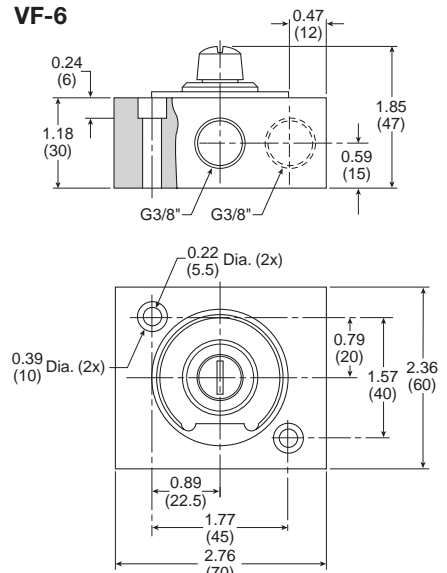
VF-3



VF-5



VF-6



Most popular.

Parker plastic in-line filters provide easy monitoring, economy and safety. These shatterproof filters are airtight and can withstand high pressures.

A 10 micron porous plastic element prolongs element life under the most adverse environmental conditions.

Features

- To filter dust and other small particles from the vacuum flow
- Reduces the risk of operation breakdown or stoppage in the vacuum pump
- Replaceable filter element
- Made in the U.S.A.

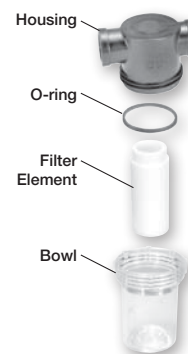
Specifications

Media	Non-corrosive air	
Operating vacuum range	-14.5 to 0 PSI (0 to 28 inHg)	
	Housing	Polypropylene (PP)
Material	Bowl	Polyamide nylon (PA)
	Filter element	Polyethylene (PE)
Temperature range	-4°F to 176°F (-20°C to 80°C)	
Removal efficiency	10 µm	
Maximum pressure	150 PSI	



Replacement components

Part number	Size	Part number
Clear Bowl Kit (Includes O-ring)	1/8, 1/4, 3/8	PS577601
	1/2, 3/4	PS577602
	1, 1-1/2	PS577603
BUNA O-ring	1/8, 1/4, 3/8	PS577701
	1/2, 3/4	PS577702
	1, 1-1/2	PS577703
Filter Element Kit*	1/8, 1/4	PS577801
	3/8	PS577801
	1/2, 3/4	PS577802
	1	PS577803
	1-1/2	PS577804



* All Filter Elements are sold as a 3-pack.

VFP Series Ordering information

Port size	Flow SCFM*	Weight (oz)	Internal Volume in ³	Filter area in ²	Basic filter with element		Basic filter with 2 spare elements	
					NPT	BSPP	NPT	BSPP
1/8	25	1.7	2.10	4.9	VFP0CFC01	VFP0CFC11	VFP0CFC03	VFP0CFC13
1/4	35	1.98	2.4	4.9	VFP1CFC01	VFP1CFC11	VFP1CFC03	VFP1CFC13
3/8	45	2.47	2.7	4.9	VFP2CFC01	VFP2CFC11	VFP2CFC03	VFP2CFC13
1/2	130	6.61	11.9	16.0	VFP3CFC01	VFP3CFC11	VFP3CFC03	VFP3CFC13
3/4	175	6.42	12.5	16.0	VFP4CFC01	VFP4CFC11	VFP4CFC03	VFP4CFC13
1	290	15	30.2	29.5	VFP5CFC01	VFP5CFC11	VFP5CFC03	VFP5CFC13
1-1/2	430	18.80	41.2	35.0	VFP6CFC01	VFP6CFC11	VFP6CFC03	VFP6CFC13

* 90 PSIG inlet and 5 PSIG pressure drop

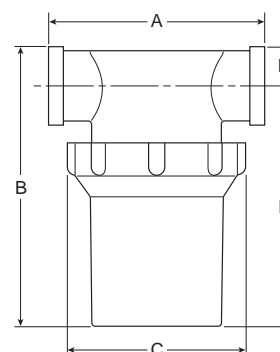
Dimensions

Part number	A	B	C	D	E
VFP0CFC*1, VFP1CFC*1, VFP2CFC*1	3.1 (78.7)	2.4 (61)	1.9 (48.3)	2.0 (50.8)	0.4 (10.2)
VFP3CFC*1	3.6 (91.4)	5.1 (129.5)	2.9 (73.6)	4.4 (111.6)	0.7 (17.8)
VFP4CFC*1	3.6 (91.4)	5.1 (129.5)	2.9 (73.6)	4.6 (116.9)	0.5 (12.7)
VFP5CFC*1	4.9 (124.5)	6.4 (162.6)	4.0 (101.6)	5.6 (142.2)	0.8 (20.3)
VFP6CFC*1	5.2 (132.1)	8.1 (209.9)	4.0 (101.6)	6.9 (175.3)	1.2 (30.5)

inches (mm)

* 0 (NPT), 1 (BSPP)

 Most popular.



Protect the environment against harmful noise levels with quality silencers.



Silencer Ordering Information

For generator series	Male connection	Part number
CV-05, CV-10	G1/8"	MSS-01
CV-05, CV-10	G1/8"	MSS-02
CV-15, MCA-10/13	G1/4"	MSM-01
CV-20	G1/2"	MSL-02
CV-25, CV-30	G3/4"	MS6-01

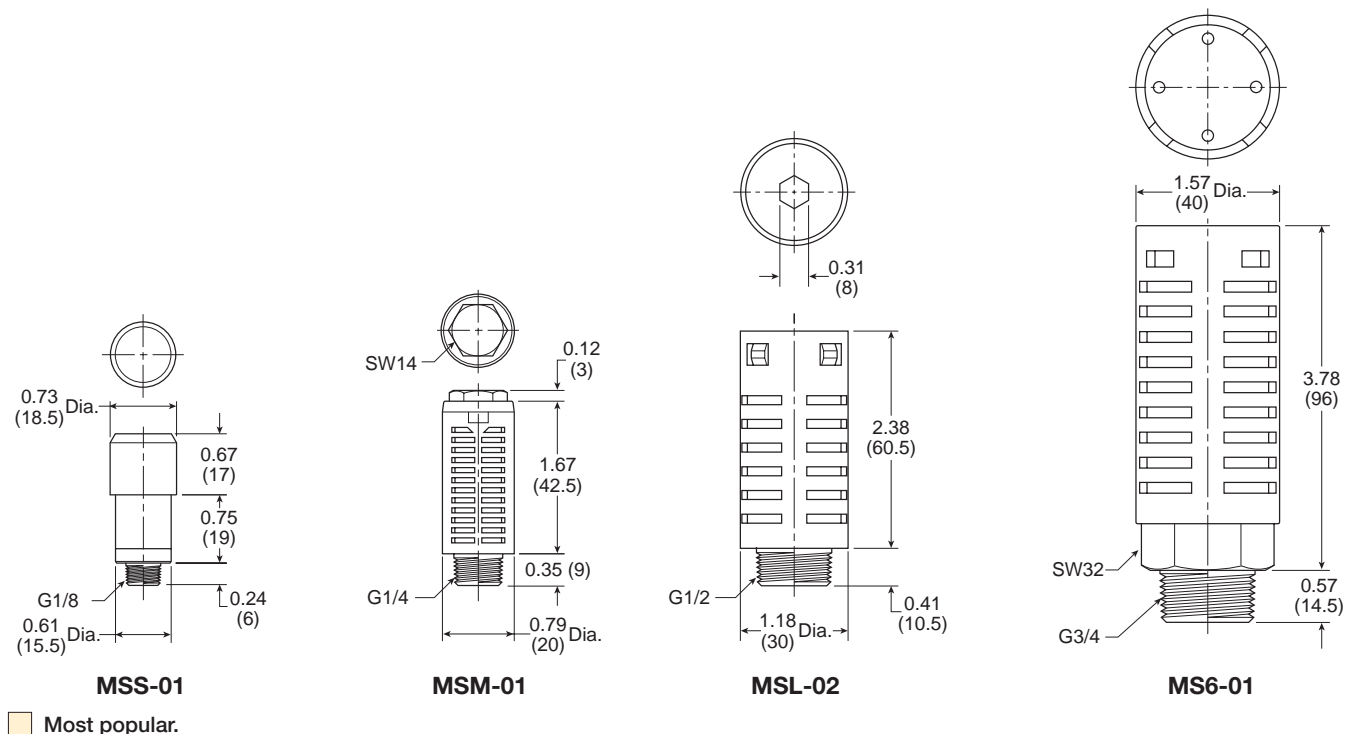
Specifications

Media	Non-corrosive air
Maximum pressure	128 PSI
Operating temperature	41°F to 132°F (5°C to 55.5°C)
Silencing effect	20 dB

Materials

Part number	Material housing	Material element	Media	Weight (oz.)
MSS-01	Polyacetal	Felt, Urethane	Air	0.17
MSS-02	Polyacetal	Stainless steel	Oil	0.17
MSM-01	Polyurethane	Felt	Air	0.24
MSL-02	Nylon	Vinyl	Air	0.88
MS6-01	Nylon	Polyvinyl Forma	Air	2.01

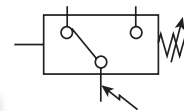
Dimensions



C
 Generator Accessories
 Vacuum Products

Features

- Sensor output:
 - 2 NPN or PNP open collector
 - Transistor output, 30VDC, 125mA with
 - Analog output, 1 to 5VDC
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases



Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Window comparator mode	✓
Auto teach mode	✓
Output response time	✓
Lockout option	✓
Password lockout	—
Max. value display	✓
Min. value display	✓
Zero reset	✓
Red / Green LED display options	—
Error output mode	✓

MPS-33 Sensor Only Ordering Numbers

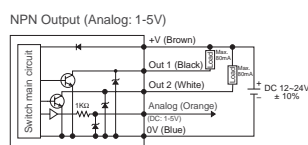
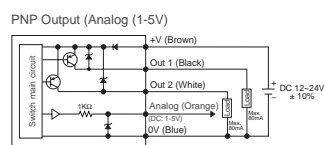
Pressure range	Electrical output	Electrical connection	Part number	
			1/8 NPSF Female	1/8 BSPP Female
0-30 inHg	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	MPS-V33N-PGAT	MPS-V33G-PGAT
0-30 inHg	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	MPS-V33N-NGAT	MPS-V33G-NGAT
-14.5 to 72 PSI	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	MPS-R33N-PGAT	MPS-R33G-PGAT
-14.5 to 72 PSI	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	MPS-R33N-NGAT	MPS-R33G-NGAT
0-145 PSI	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	MPS-P33N-PGAT	MPS-P33G-PGAT
0-145 PSI	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	MPS-P33N-NGAT	MPS-P33G-NGAT

MPS-33 Accessories

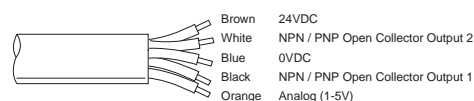
Description	Part Number
Panel mounting bracket Note : Add "H" in suffix of Sensor Only Part Number to include with sensor	MPS-ACCH8
Surface mounting bracket Note : Add "K" in suffix of Sensor Only Part Number to include with sensor	MPS-ACCK8

Example: MPS-P33N-PGAT**K**, includes sensor MPS-P33N-PGA with bracket MPS-ACCK8

Internal circuit for open collector and analog output wiring



Lead Wiring



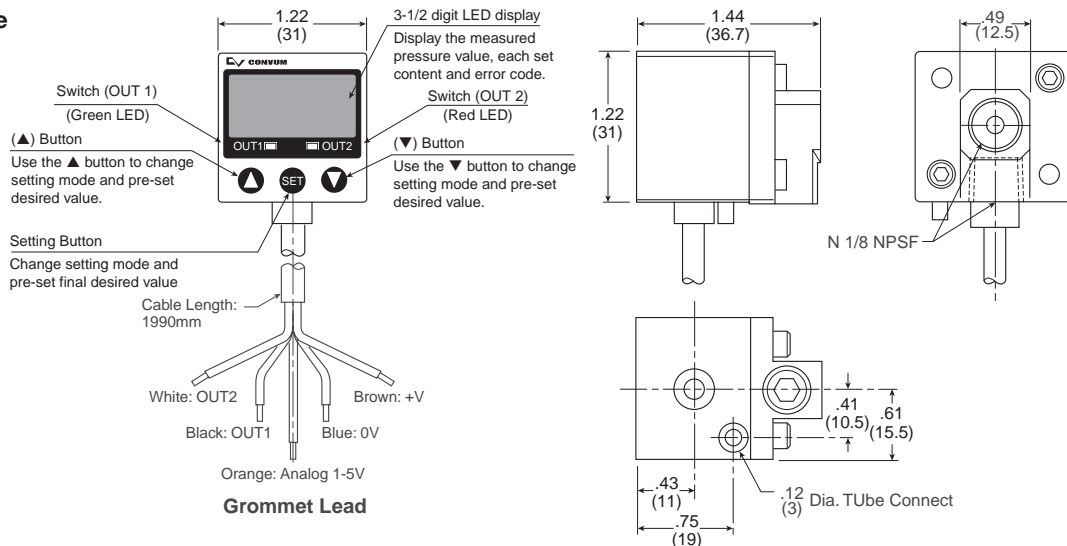
Most popular.

Specifications

	Vacuum (V)	Compound (R)	Positive (P)
Pressure range	-101.3 - 0 kPa (-14.5 to 0 PSI)	0 - 500 kPa (0 to 72 PSI)	-0.1 - 1 Mpa (0 to 145 PSI)
Proof pressure	0.3 Mpa (44 PSI)	0.8 Mpa (116 PSI)	1.5 Mpa (218 PSI)
Display resolution, Units of measure	0.1, kPa	1, kPa	0.001, Mpa
	0.001, kgf/cm ²	0.01, kgf/cm ²	0.01, kgf/cm ²
	0.001, bar	0.01, bar	0.01, bar
	0.01, PSI	0.1, PSI	0.1, PSI
	0.1, inHg	—	—
	1, mmHg	—	—
	0.1, mmH ₂ O	—	—
Media	Air & non-corrosive gases, incombustible gases		
Pressure port	(N) 1/8" NPSF, (G) 1/8" BSPP female		
Operating temperature	32 to 122°F (0 to 50°C)		
Storage temperature	-4 to 140°F (-20 to 60°C)		
Humidity	40 - 85% RH (no condensation)		
Electrical connection	(G) Grommet open lead, 5 wire (0.15mm ²)		
Power supply	12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less		
Display	3 + 1/2 digit, 1 color, 7-segment RED LED		
Display refresh	.1 to 3.0 Seconds, Variable (factory set at 0.1)		
Control output	NPN (Sinking), PNP (Sourcing), Open collector, max 80mA, 2 output		
Analog output	1 to 5VDC ≤ ±2.5% F.S. Linearity ≤1% of F.S.;		
Switch output	Output signal, NPN or PNP, Normally open or closed, LED indicator		
Output indicator	Green LED (OUT1), Red LED (OUT2)		
Output modes	Hysteresis or Window Comparator		
Response time	≤ 2.5ms (chattering-proof function: 24ms, 192ms, 786m selections)		
Repeatability	± 0.2% of F.S. ± 1 digit or less		
Thermal error	≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)		
General protection	IP65, CE marked, EMC-EN61000-6-2: 2001, with dust tube connection		
Current consumption	<55mA		
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.		
Shock resistance	980 m/s ² (about 10G), 3 times/each directions X, Y, Z		
Noise resistance	Vp-p400V, 10 ms, 0.5µs noise simulator		
Material	Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicon		
Mass	3.3 oz. (105g) (including cable)		

Dimensions

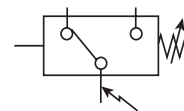
1/8" Female



C
Vacuum Sensors
Vacuum Products

Features

- Sensor output:
 PNP Open collector
 Transistor output, 30VDC, 125mA with
 Analog output, 4 to 20mA
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Sensor face includes icons to show sensor programming status



Red ↔ Green Display

Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Window comparator mode	✓
Auto teach mode	✓
Output response time	✓
Lockout option	✓
Password lockout	—
Max. value display	✓
Min. value display	✓
Zero reset	✓
Red / Green LED display options	✓
Error output mode	✓

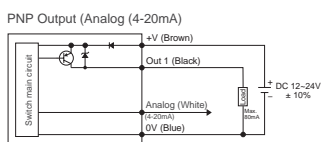
MPS-34 Sensor Only Ordering Numbers

Pressure range	Electrical output	Electrical connection	Part number	
			1/8 NPSF male	1/8 BSPP male
0-30 inHg	(1) PNP with (1) 4-20ma	M8, 4 Pin	MPS-V34N-PCI	MPS-V34G-PCI
0-145 PSI	(1) PNP with (1) 4-20ma	M8, 4 Pin	MPS-P34N-PCI	MPS-P34G-PCI

MPS-34 Accessories

Description	Part number
Panel mounting bracket Note : Add "H" in suffix of Sensor Only Part Number to include with sensor	MPS-ACCH9
Surface mounting bracket Note : Add "K" in suffix of Sensor Only Part Number to include with sensor	MPS-ACCK10
Example: MPS-P34N-PCI K , includes sensor MPS-P34N-PCI with bracket MPS-ACCK10	
M8, 4-Pin, 2 meter cable	CB-M8-4P-2M-PUR
M8, 4-Pin, 5 meter cable	CB-M8-4P-5M-PUR

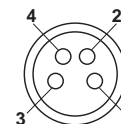
Internal circuit for open collector and analog output wiring



Sensor pin out with analog output

Pin #

- 1 Brown: 24VDC
- 2 White: 4 to 20mA
- 3 Blue: 0VDC
- 4 Black: PNP Open Collector Output 1



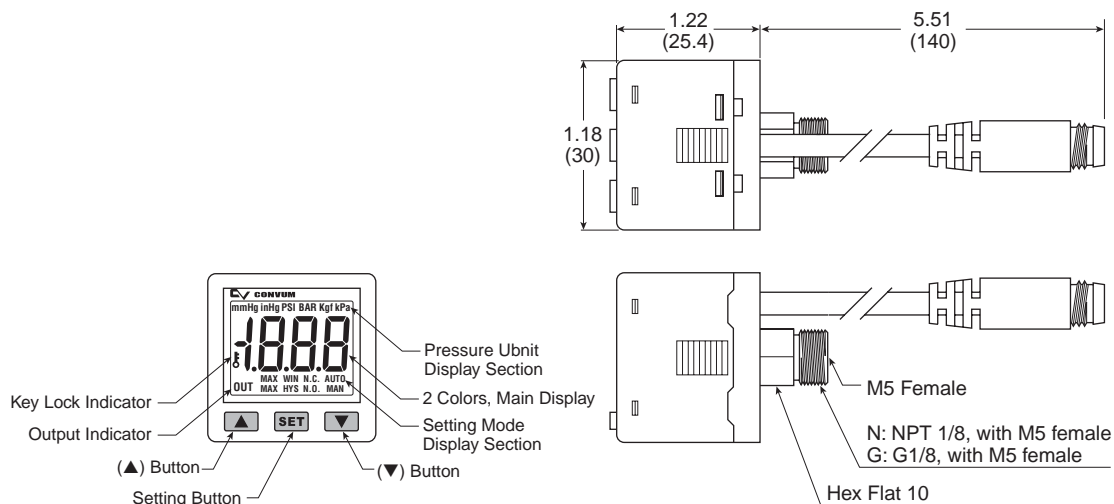
Most popular.

Specifications

	Vacuum (V)	Positive (P)
Pressure range	-101.3 to 0 kPa (-14.5 to 0 PSI)	-0.1 to 1 Mpa (0 to 145 PSI)
Proof pressure	0.3 Mpa (44PSI)	1.5 Mpa (218 PSI)
Display resolution , Units of measure	0.1, kPa	1, kPa
	0.001, kgf/cm ²	0.01, kgf/cm ²
	0.001, bar	0.01, bar
	0.01, PSI	0.1, PSI
	0.01, inHg	-
	1, mmHg	-
Media	Air & non-corrosive gases	
Pressure port	(N) 1/8" NPT male, (G) 1/8 BSPP male both with M5 female port	
Operating temperature	32 to 122°F (0 to 50°C)	
Storage temperature	-4 to 140°F (-20 to 60°C)	
Humidity	35 to 85% RH (no condensation)	
Electrical connection	(C) 4-pin, M8 connector on 150mm lead wire	
Power supply	12 to 24VDC ±10%, Ripple (P-P) 10% or less	
Display	3 + 1/2 digit, 2 color, 7-segment RED / GREEN LED	
Display refresh	Timing update : 0.1 ~ 3 sec. (Factory Set Unit: 0.1 sec.)	
Switch output	Output signal, PNP, Normally open or closed, LED indicator, 125 mA max. output load	
Output modes	Hysteresis or Window Comparator	
Response time	≤ 2.5ms (chattering-proof function: 24ms, 250ms, 500ms, 1000ms and 1500ms selections)	
Repeatability	± 0.2% of F.S. ± 1 digit	
Output current	Output current 4 to 20mA; Linearity ±1.0% of F.S.; Maximum load impedance 300Ω at power supply of 12V; 600Ω at power supply of 12V; Minimum load impedance 50Ω	
Thermal error	32 to 122°F (0 to 50°C) 25°C (77°C) + 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)	
General protection	IP40, CE marked, EMC-EN61000-6-2: 2001	
Current consumption	45mA (with no load)	
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.	
Shock resistance	980 m/s ² (about 10G), 3 times/each directions X, Y, Z	
Noise Resistance	Vp-p400V, 10 ms, 0.5μs noise simulator	
Material	Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicon	
Mass	1.45 oz. (45g) with M8 connector	

Dimensions

1/8" Male



SCP01 Pressure Sensors are industrial pressure sensors offering long-term stability, resistance to interference and rugged construction. They are available in a wide range of standard and configured to order versions to meet your application needs.

These sensors are manufactured with the highest quality standards for reliable and repeatable measurements.



Features:

- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

Applications include:

- Test and measurement
- Hydraulic power units
- Power generation
- Mobile hydraulics

SCP01 Ordering Numbers

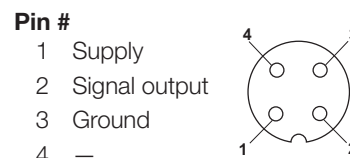
Pressure range (psi)	Electrical output	Electrical connection	Part number	
			1/4 NPT male	7/16-20UNF-2A, male SAE-4 with o-ring
-14.5 to 250	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-0250P-25-07	SCP01-0250P-27-07
0 to 1000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-1000P-25-07	SCP01-1000P-27-07
0 to 3000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-3000P-25-07	SCP01-3000P-27-07
0 to 5000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-5000P-25-07	SCP01-5000P-27-07
0 to 9000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-9000P-25-07	N/A

Specifications

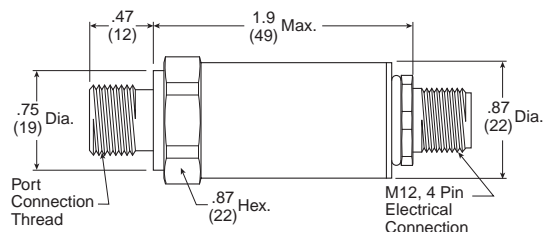
Overload pressure	200% FS
Burst pressure	250% FS
Accuracy	+/- 0.5% FS
Protection class	IP67
Response time	< 1ms
Long term stability	< 0.1% FS/a
Load reversals	> 20 M
Electrical protection	Short circuit, reverse polarity, overload protection
Supply voltage	9-30VDC
Temperature range:	
Environmental	-40°F to 185°F
Media, storage	-40°F to 257°F
Compensated	-4°F to 185°F
Temperature coefficient	< +/- 0.3% FS/10K
Vibration resistance	Meets IEC 60068-2-29
Shock resistance	Meets IEC 60068 2-32
EMI compatibility	DIN EN 61000-6-3, DIN EN 61000-6-2
Material - housing	304 SS
Material - fitting	630 SS
Material - seal	Fluorocarbon
Sensing element	Thin film (poly Si on SiO ₂)
Pressure bore	0.024 in.
Long term stability	< 0.1% FS/a
Load reversals	> 20 M

Most popular.

Sensor pin out with analog output

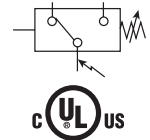


Dimensions



Features

- Stainless steel or ceramic diaphragms
- UL listed and CE marked
- Sensor outputs
 - 2 PNP Open collector transistor
 - Output, 30 VDC, 100mA
- Optional additional current, 4 to 20mA
- Output response time less than 5.0ms
- Polarity protected
- Short circuit protected
- 4 digit LED
- Display head swivels 290°



SCPSD-1000P-1727 SCPSD-600-14-15

SCPSD Ordering Numbers

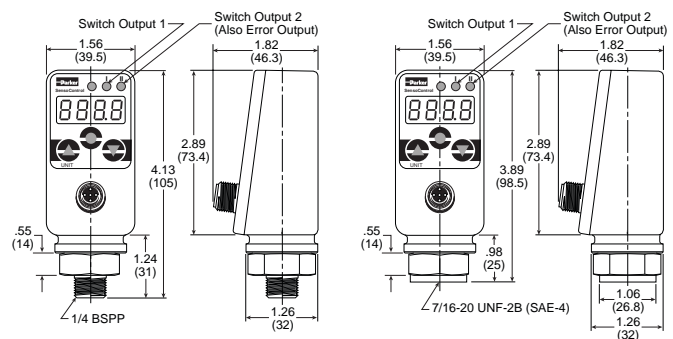
Pressure range	Port size	Electrical output	Electrical connection	Part number
-14.7 to 250 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	SCPSD-0250P-0727
-14.7 to 250 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	SCPSD-0250P-1727
0 to 1000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	SCPSD-1000P-1725
0 to 1000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	SCPSD-1000P-1727
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	SCPSD-3000P-0727
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	SCPSD-3000P-1727
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	SCPSD-3000P-1725
0 to 5000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	SCPSD-5000P-1727
0 to 5000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	SCPSD-5000P-1725
0 to 9000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	SCPSD-9000P-0727
0 to 9000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 4 Pin	SCPSD-9000P-1725
-1 to 16 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-016-04-17
-1 to 16 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-016-14-15
0 to 250 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-250-04-17
0 to 250 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-250-14-15
0 to 600 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-600-04-17
0 to 600 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-600-14-15

Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Window comparator mode	✓
Auto teach mode	—
Output response time	✓
Lockout option	—
Password lockout	✓
Max. value display	—
Min. value display	—
Zero reset	✓
Red / Green LED display options	—
Error output mode	✓
Setting of decimal point	✓

Most popular.

Dimensions

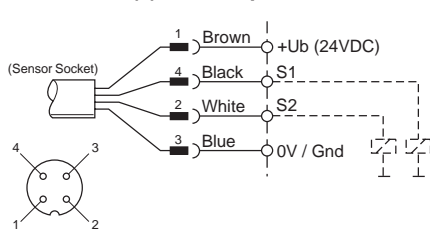


Specifications

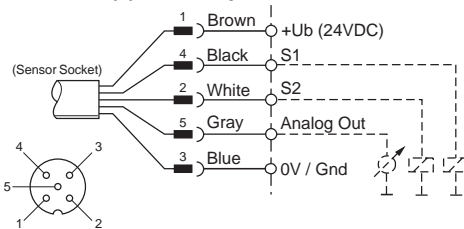
Pressure code	0250	016	1000	3000	5000	9000	250	600
Measure range PSI, (bar)	-14.7 to 250	(-1 to 16)	0 to 1000	0 to 3000	0 to 5000	0 to 9000	(0 to 250)	(0 to 600)
Overload pressure PSI, (bar)	725	(40)	2900	7250	11600	21750	(500)	(1200)
Burst pressure PSI, (bar)	725	(50)	11600	17400	24650	31900	(1200)	(2200)
Sensing element	Ceramic			Stainless steel				
Parts in contact with media	Stainless steel 1.4404			Stainless steel 1.4404, 1.4542, NBR*				
	Ceramic AL203, NBR*							
	*FPDM, EPDM special request							
Units of measure	PSI, bar, MPA							
Switch cycles	>100 million							
Output response time	< 10ms							
Power supply	15 to 30VDC, Class 2 power supply							
Short circuit protection	Yes, 2.4 amp / open collector output							
Reverse polarity protection	Yes							
Overload protection	Yes							
Current consumption	< 100mA							
Output circuit	2 PNP (Sourcing) open collector transistor							
Analog output	0/4...20mA, Programmable, freely scaleable							
Output functions	Hysteresis, Window comparator							
Switching voltage	-1.5VDC							
Maximum current output	1A with 2 open collector outputs, .5A per output							
Accuracy	± 0.5% F.S. Typ., ± 1% Max.							
Repeatability	± 0.25% F.S.							
Display accuracy	± 0.5% F.S. Typ., ± 1 Digit							
Thermal error max.	±0.03% F.S. at -4 to 185°F (-20 to 85°C)							
Material	Pressure Die-cast zinc Z 410: Surface-finishing							
Display material	Polyester							
General protection	IP 67, EN60529, UL, CE Marked, EMC-EN50082-2 Class B, EN 50081-2							
Temperature range of media	-4 to 185°F (-20 to 85°C)							
Ambient temperature range	-4 to 185°F (-20 to 85°C)							
Storage temperature	-40 to 212°F (-40 to 100°C)							
Display	4-Digit, 7-Segment LED, Red, 9mm height							
Tightening torque	35Nm							
Vibration resistance	20G, 10 to 500Hz, IEC60068-2-6							
Shock resistance	50 G, XYZ, 11ms, IEC60068-2-29							
Mass	10.6 oz. (300g)							

Internal circuit

M12, 4-Pin, (2) PNP Outputs

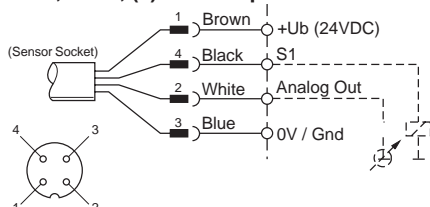


M12, 5-Pin, (2) PNP Outputs with 4 to 20mA Analog



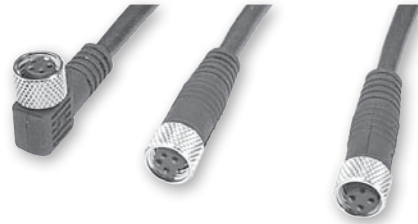
Note: M12, 5-Pin Female Cable Connector will fit on both M12, 4-Pin and 5-Pin Male Sensor Connector.

M12, 4-Pin, (1) PNP Output with 4 to 20mA Analog



Features

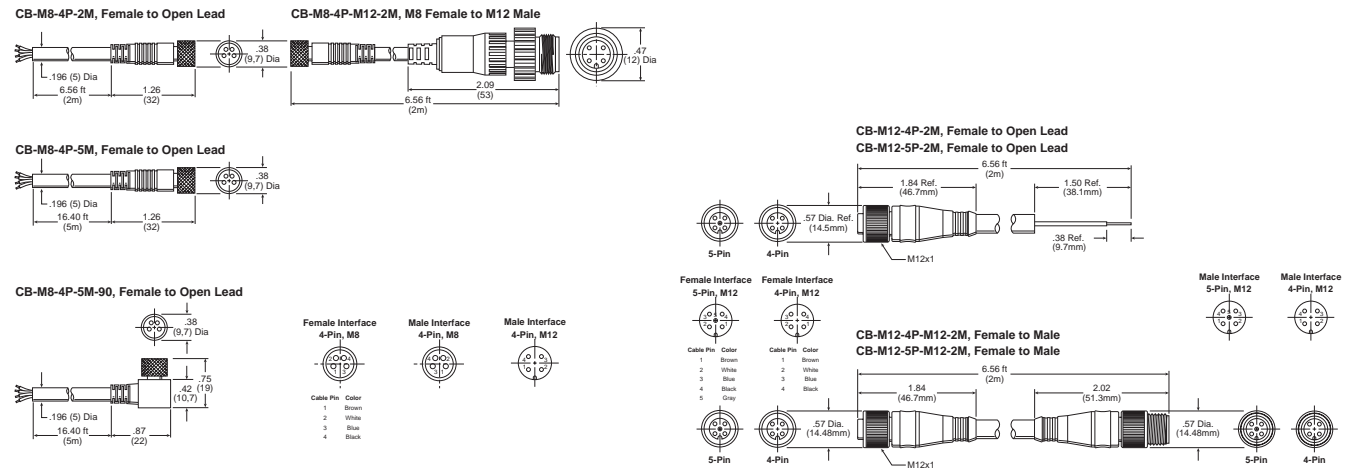
- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: Swivel straight or angled
- IP67 swivel connector



Common Part Numbers

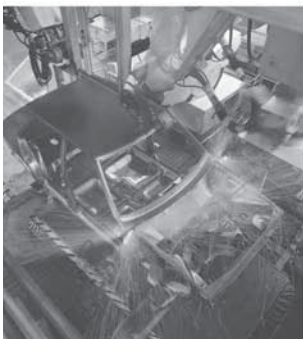
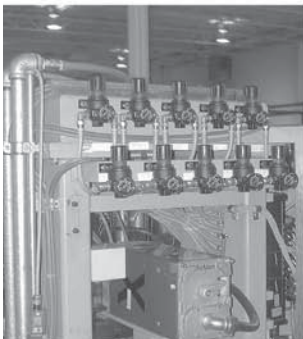
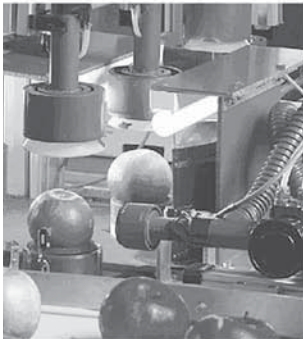
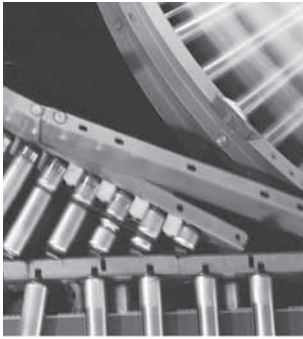
Connector	Contacts	Length	Cover	Part number
M8 female	4	2m	PUR	CB-M8-4P-2M-PUR
M8 female	4	5m	PUR	CB-M8-4P-5M-PUR
M8 angled female	4	5m	PUR	CB-M8-4P-5M-90-PUR
M8 female to M12 male	4	2m	PVC	CB-M8-4P-M12-2M
M12 female	4	2m	PVC	CB-M12-4P-2M
M12 female	5	2m	PVC	CB-M12-5P-2M
M12 female to M12 male	4	2m	PVC	CB-M12-4P-M12-2M
M12 female to M12 male	5	2m	PVC	CB-M12-5P-M12-2M

Dimensions



Most popular.

C
 Cables
 Vacuum Products



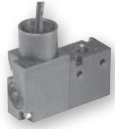
Valve Products

D

Valve Products

Direct Acting Valves

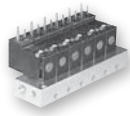
XM Series - Direct Acting



D4

- Inline or stacking
- 1/8 inch ports
- Pressures 0 to 125 PSIG
- Temperatures 32°F to 125°F
- Flow - .15 Cv

15mm Series - Direct Acting



D8

- Subbase or manifold
- 1/8 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 140°F
- Flow - .033 to .05 Cv

Inline Valves

ADEX Series - Inline



D43

- Inline, subbase or bar manifold
- M3, M5, 1/8 inch ports
- Pressures VAC to 100 PSIG
- Temperatures 32°F to 122°F
- Flow - .1 to .47 Cv

B Series - Inline



D11

- Inline, subbase or bar manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .75 to 7.0 Cv

N Series - Inline Poppet



D53

- Inline mounted
- 3/8 through 1-1/2 inch ports
- Pressures 30 to 250 PSIG
- Temperatures 0°F to 200°F
- Flow - 3.6 to 29.9 Cv

Inline – continued

Viking Xtreme Series - Inline

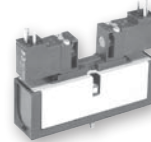


D33

- Inline or bar manifold
- 1/8 through 1/2 inch ports
- Pressures VAC to 232 PSIG
- Temperatures -40°F to 158°F
- Flow - .7 to 2.7 Cv

Subbase & Manifold Valves

DX ISOMAX Series



D147

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 14°F to 140°F
- Flow - .55 to 4.15 Cv

Fieldbus Series



D128

- Fieldbus interface for Isys and Moduflex valves
- Up to 256 inputs
- Up to 256 outputs
- Digital or analog

Isys ISO Series



D95

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .55 to 6.0 Cv

Isys Micro Series - Subbase



D84


- Subbase or manifold
- 4mm through 1/4 tube
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .35 Cv

D

Index
 Valve Products

Subbase & Manifold – continued **Manual / Mechanical – continued**


Moduflex Series Valves



- Inline or stacking
- 4mm tube, 1/4, 3/8 inch ports
- Pressures VAC to 120 PSIG
- Temperatures 5°F to 140°F
- Flow - .18 to .80 Cv

D60

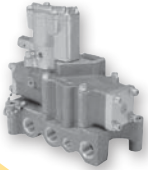
M0 Series - Inline



- Air Pilot, Manual / mechanical
- 1/4 and 1 inch ports
- Pressures VAC to 225 PSIG
- Temperatures -15°F to 200°F
- Flow - .5 to 1.25 Cv

D184


Valvair II Series - Plug-in



- Subbase or manifold
- 3/8 through 1-1/2 inch ports
- Pressures VAC to 225 PSIG
- Temperatures 0°F to 200°F
- Flow - 1.9 to 12.0 Cv

D160

Viking Xtreme Lever Series - Inline




- Manual / mechanical
- 1/8, 1/4 and 3/8 inch ports
- Pressures:
 - Type A & B - VAC to 232 PSIG
 - Type C & D - VAC to 174 Psig
- Temperatures -40°F to 140°F
- Flow - .5 to 2.7 Cv

D179

Manual / Mechanical Valves


Brass Poppet, Sliding Seal



- 4-way, 3-position rotary disc, direct air operated valves
- Pressures 0 to 150 PSIG
- Temperatures 18°F to 200°F
- Flow - 2.5 to 6.2 Cv

D189

42 Series - Inline

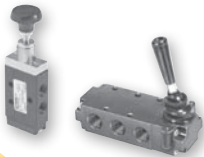


- Manual / mechanical
- 1/4 and 3/8 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 0°F to 140°F
- Flow - 1.3 to 2.9 Cv

D177

Valve Accessories


Directair 2 & 4 Series - Inline



- Manual / mechanical
- 1/8 and 1/4 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 32°F to 175°F
- Flow - .20 to .84 Cv

D168


Control Panel Products



- A wide variety of push buttons and selector switches
- Visual indicators
- Foot pedal switches
- Modular pneumatic / electric push buttons

D192


LV / EZ Lockout Valves



- Port sizes 3/8 through 1-1/4 inch
- Max. supply pressure 300 PSIG
- Max. operating temperature 175°F
- Cv from 3.7 to 14

D188

Sensing / Limit Switches



- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleen or blocking for detection

D196

XM series is a 1/8 inch ported, 3-way and 4-way, 2-position, spring return, normally open or normally closed, general purpose air valve.

Ports

- 1/8" NPT

Mounting

- Inline
- IEM bar manifold
- Subbase valve manifold

Solenoids

- Continuous duty rated
- 24" grommet
- 15mm 3-pin (9.4mm pin spacing)
- 1/2" conduit
- 12VDC to 240VAC

Balanced Poppet

- 3-way N.O. & N.C.
- Diverter
- Selector
- Vacuum option

ROHS Compliant

Materials

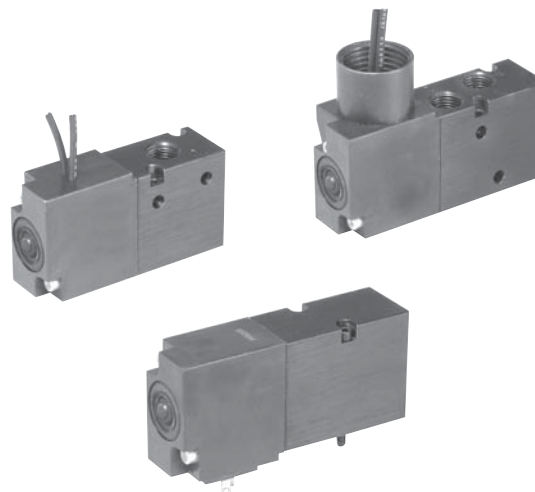
Body	Aluminum
Center post and armature	Stainless steel
Stem	Brass
Spring	Stainless steel
Seals	Buna N
Center post sleeve	Acetal
Coil	General purpose Class B, encapsulated

Performance Information

Code	Voltage			Power consumption (W / VA)	Holding current (Amps)	Flow	
	AC	DC				Cv chart	
						3-way	4-way
	60Hz	50Hz					
42	24	22	—	4.8VA	.200	.15	.15
45*	—	—	12	4.5W	.375	.15	.15
49*	—	—	24	4.5W	.188	.15	.15
53	120	110	—	4.32VA	.036	.15	.15
57	240	220	—	4.32VA	.018	.15	.15

* Mobile voltage, +25/-30%
 Note: Voltage tolerance: +10 / -15%
 Cv tested per ANSI / (NFPA) T3.21.3

Most popular. For technical information see CD



Operating information

3-way, N operating pressure:	0 to 125 PSIG
3-way, V* operating pressure:	0.28" Hg to 125 PSIG
4-way, N operating pressure:	0.28" Hg to 125 PSIG
Temperature range:	32°F to 125°F (0°C to 50°C)

* For vacuum service







Response Time

Code	Voltage	0 Cu. in. test chamber		12 Cu. in. test chamber	
		Fill	Exhaust	Fill	Exhaust
49	24VDC	.011	.007	.240	.384
53	120VAC	.011	.020	.240	.384

Average Fill Time (Seconds): With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 PSIG to 10 PSIG is measured from instant of energizing, or de-energizing solenoid. Times shown are average.






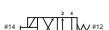
Tested per ANSI / (NFPA) T3.21.8.

3-way Inline Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Inline	4 oz	XM30NBG49A
		1/8"	.15	24" Grommet, 120VAC	Inline	(.11 Kg)	XM30NBG53A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Inline	4 oz	XM30NB549A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Inline	(.11 Kg)	XM30NB553A
		1/8"	.15	1/2" Conduit / 24" leads, 24VDC	Inline	5 oz	XM30NBH549A
		1/8"	.15	1/2" Conduit / 24" leads, 120VAC	Inline	(.14 Kg)	XM30NBH53A


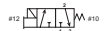

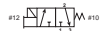
Note: All units with non-locking flush override. Can be used as N.O / N.C. / Diverter / Selector function.

4-way Inline Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Inline	4.3 oz	XM40NBG49A
		1/8"	.15	24" Grommet, 120VAC	Inline	(.12 Kg)	XM40NBG53A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Inline	4.3 oz	XM40NB549A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Inline	(.12 Kg)	XM40NB553A
		1/8"	.15	1/2" Conduit / 24" leads, 24VDC	Inline	5.3 oz	XM40NBH549A
		1/8"	.15	1/2" Conduit / 24" leads, 120VAC	Inline	(.15 Kg)	XM40NBH53A




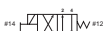
Note: All units with non-locking flush override.

3-way Subbase Mount Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Subbase mount	4 oz	XM3VNBG49A
		1/8"	.15	24" Grommet, 120VAC	Subbase mount	(.11 Kg)	XM3VNBG53A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Subbase mount	4 oz	XM3VNB549A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Subbase mount	(.11 Kg)	XM3VNB553A

Note: All units with non-locking flush override. Can be used as N.O / N.C. / Diverter / Selector function.

4-way Subbase Mount Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Subbase mount	4.3 oz	XM4VNBG49A
		1/8"	.15	24" Grommet, 120VAC	Subbase mount	(.12 Kg)	XM4VNBG53A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Subbase mount	4.3 oz	XM4VNB549A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Subbase mount	(.12 Kg)	XM4VNB553A

Note: All units with non-locking flush override.

D
Direct Acting Valve Products

Manifold



Description	Part number
IEM bar manifold (NPT)	PSMXN##NP

- stations 02 to 12 (04 Shown)

Subbase



Description	Part number
Manifold subbase kit (NPT)	PSXM530CP

Plug-in Electrical Connectors - 9.4mm



Description	Indication	Voltage	Part number
Unwired Plug	None	N/A	PESC10
	LED & Suppression	12/24V 120VAC	PESC2020B PESC2001F



Plug with 6" lead	None	N/A	PESC12
	LED & Suppression	12/24V 120VAC	PESC2220B PESC2201F

Accessories



Description	Part number
End plate kit (NPT)	PSXM1010P



Description	Part number
Blanking plate kit	PSXM8310P
Subbase Kit includes: (1) Plate, (3) Screws, (4) Gaskets Fits subbase or IEM type manifold.	



Description	Part number
Mounting Bracket - Inline valve	PSXM8288P



Description	Part number
Isolator plugs - Subbase manifold	PSXM40900P



Description	Part number
IEM valve / manifold o-ring kit	PSXM2186P

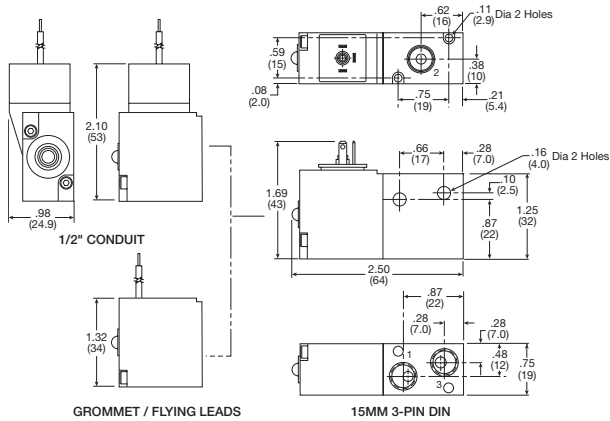


Description	Part number
Subbase valve / manifold bolt kit	PSXM8100P

D

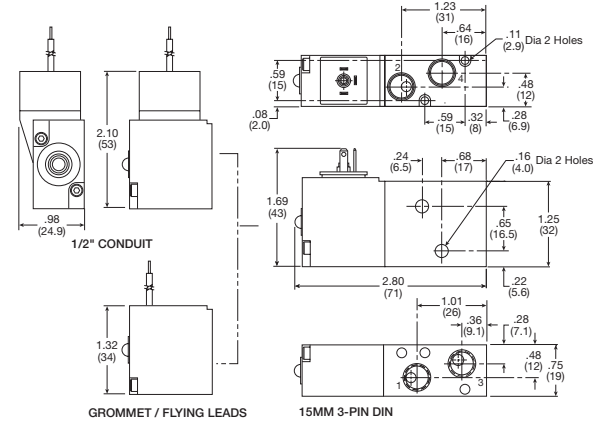
Direct Acting
 Valve Products

XM 3-way Inline



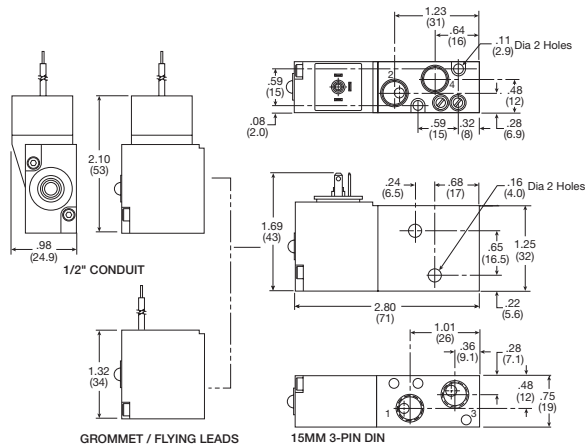
Inches (mm)
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

XM 4-way Inline



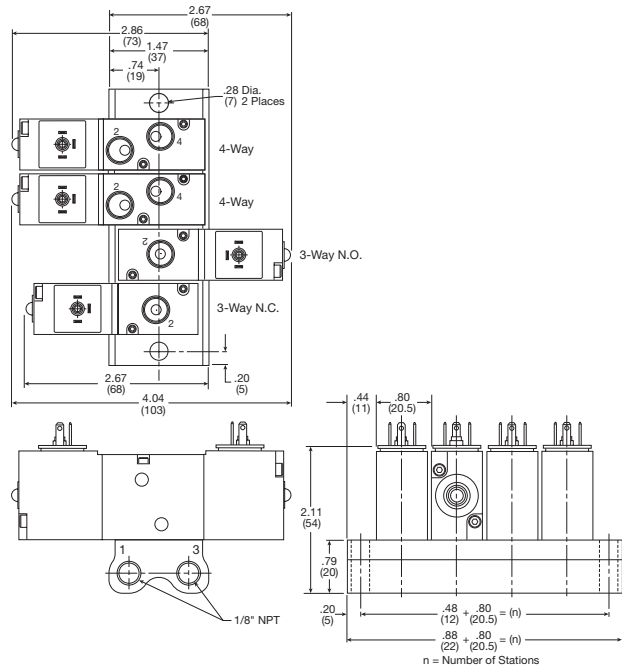
Inches (mm)
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

XM 4-way Inline with Flow Controls

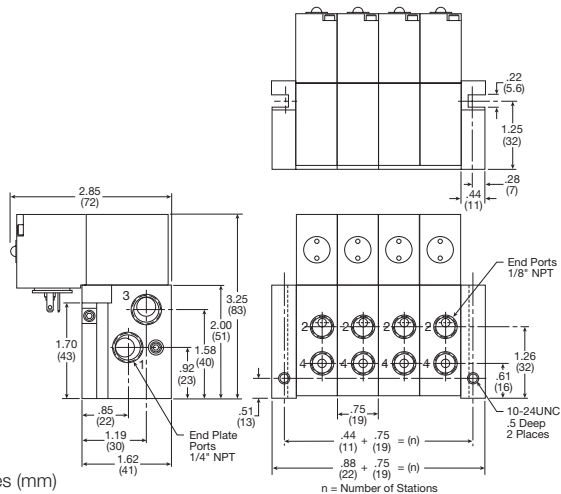


Inches (mm)
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

XM IEM Manifold



XM IEM Subbase



Inches (mm)

D
 Direct Acting
 Valve Products

A compact 15mm, 3-way subbase or manifold mounted valve. Ideally suited for use in stationary or mobile equipment applications, where flow rates and low temperatures are a key consideration.

Features

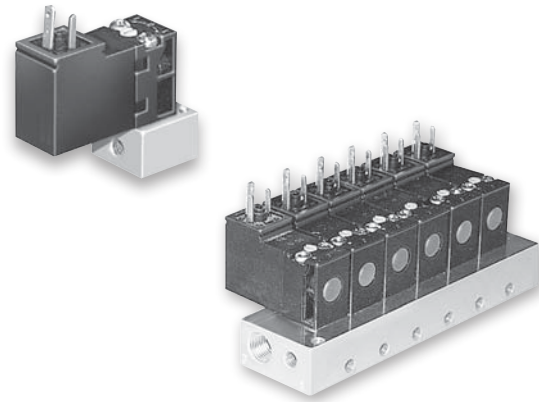
- Compact and simple design
- Utilizes 15mm solenoid operators
- Manifold allows mounting of normally open and normally closed operators simultaneously
- Up to 20 stations available

Solenoids

- 15mm low watt solenoids are UL certified and approved to be CE marked
- Wide range of voltages available

Applications

- Piloting for process control valves
 - pharmaceutical equipment
 - waste water treatment systems
 - food processing
 - chemical batching
- Industrial laundry equipment
- Paint spray & dyeing equipment
- Textile winding applications
- Vacuum and conveyor applications



Operating information

Operating pressure:	Vacuum to 145 PSIG (Vacuum to 10 bar)
Operating temperature:	
Standard Flow:	5°F to 140°F (-15°C to 60°C)
High Flow:	5°F to 122°F (-15°C to 50°C)
Mobile Applications (47 & 48 Voltage Options):	-40°F to 158°F (-40°C to 70°C)
Storage temperature:	
All applications:	-40°F to 158°F (-40°C to 70°C)

Materials

Body	Glass filled polyamide
Internal metal parts	Steel
Screws	Steel
Bottom plug	Thermoplastic
Poppet seals	Nitrile for standard, fluorocarbon for mobile

Technical Data

Electrical interface per:	Din 43650 Form C (EN175301-803C)
Pneumatic interface per:	Afnor E 0652 110 N
Protection:	IP65 (Washdown)
Air flow:	Standard flow 0.033 Cv (33 Lpm) (1.2W) (1.6VA)
Voltage tolerance:	All voltages except 47 & 48: Rated voltage +10% / -15% options 47 & 48: Rated voltage +25% / -30%

Most popular. For technical information see CD

D

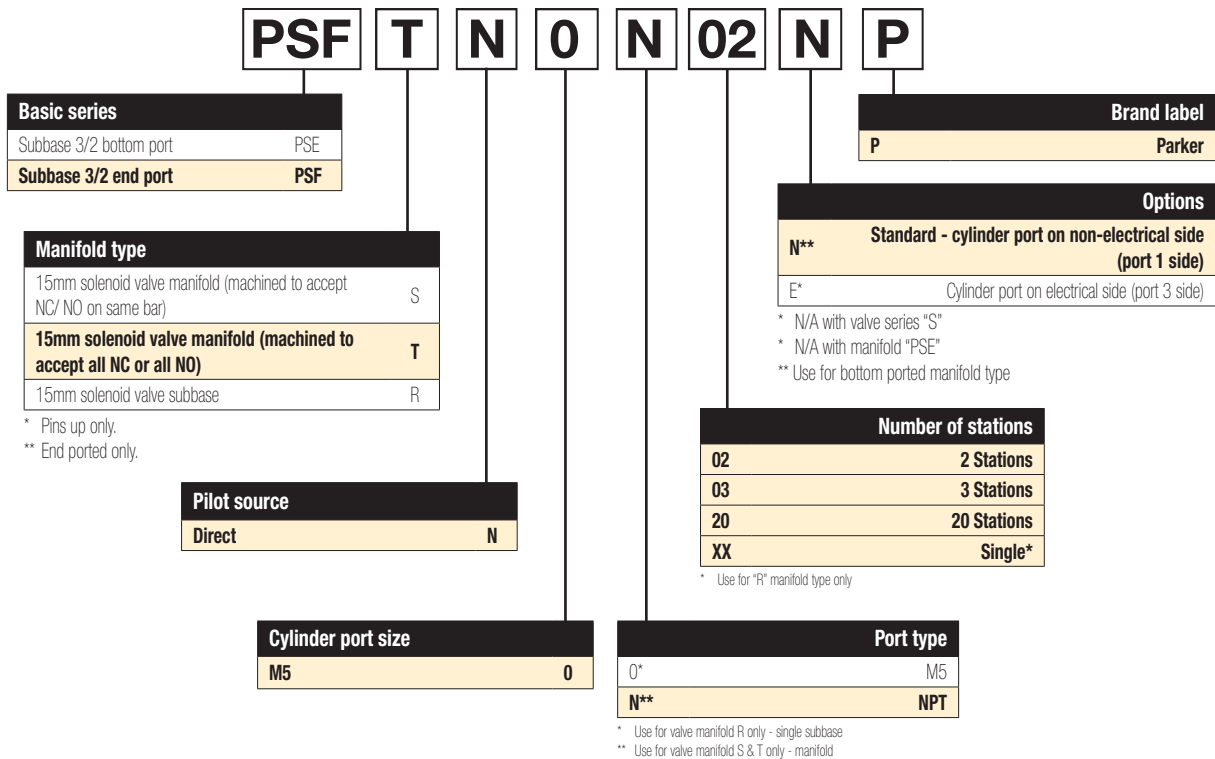
Direct Acting
 Valve Products

NC (NNP) Solenoids / Kits

* Override	## Voltage (S = Standard, O = Optional, — = N/A)					Kit No.
	42 (24VAC)	45 (12VDC)	49 (24VDC)	53 (120VAC)	57 (230VAC)	
B (Non-lock, Flush)	O	O	S	S	O	PS2982*##P Pins: UP NC / NNP 1.2W / 1.6VA
C (Lock, Flush)	O	O	S	S	O	
D (Non-lock, Ext)	—	—	O	O	—	
B (Non-lock, Flush)	O	O	S	S	—	PS3541*##P Pins: DOWN NC / NNP 1.8W / 2.4VA
C (Lock, Flush)	O	O	S	S	—	
D (Non-lock, Ext)	—	—	O	O	—	
E (Lock, Ext)	—	—	O	O	—	
B (Non-lock, Flush)	O	O	O	O	O	PS3441*##P Pins: DOWN NC / NNP 1.2W / 1.6VA
C (Lock, Flush)	O	O	O	O	O	
B (Non-lock, Flush)	O	O	S	S	—	PS3202*##P Pins: UP NO / NP 1.2W / 1.6VA

* Override
 ## Voltage

Model Number Index



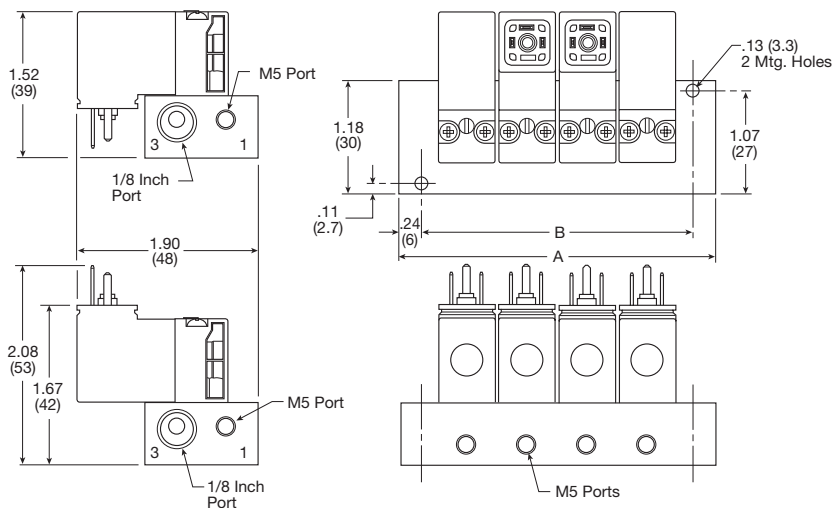
Examples:

PSFTN0N16EP - End port manifold - Cyl ports and electrical on same side
 PSESN0N10NP - Bottom port manifold - N/C and N/O can be interchanged
 PSFTN0N10NP - End port manifold - Cyl ports and electrical are opposite

BOLD OPTIONS ARE MOST POPULAR.

Manifold Dimensions

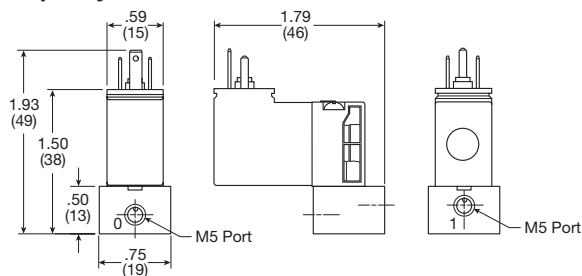
Special mounting considerations must be made for connector assembly clearance when mounting solenoid valves with pins down.



Number of stations	Dim. A	Dim. B
2	2.04 (52)	1.57 (40)
3	2.68 (68)	2.20 (56)
4	3.31 (84)	2.83 (72)
5	3.94 (100)	3.46 (88)
6	4.57 (116)	4.09 (104)
7	5.20 (132)	4.72 (120)
8	5.83 (148)	5.35 (136)
9	6.46 (164)	5.98 (152)
10	7.09 (180)	6.61 (168)
11	7.72 (196)	7.24 (184)
12	8.35 (212)	7.87 (200)
13	8.98 (228)	8.50 (216)
14	9.61 (244)	9.13 (232)
15	10.23 (260)	9.76 (248)
16	10.87 (276)	10.39 (264)
17	11.50 (292)	11.02 (280)
18	12.13 (308)	11.65 (296)
19	12.76 (324)	12.28 (312)
20	13.39 (340)	12.91 (328)

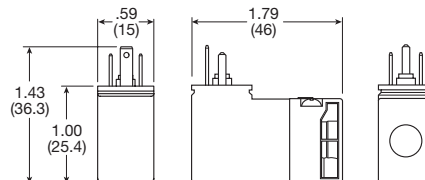
Subbase Dimensions

Pins up only.



15mm Solenoid Dimensions

Pins up only.



Female Electrical Connectors

15mm 3-Pin DIN 43650C (Use with enclosure "5")

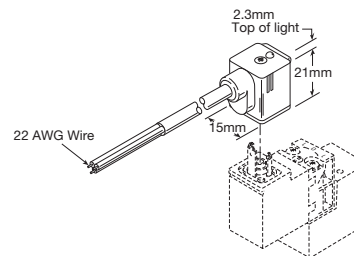
Description		Connector	Connector with Cord
Unlighted	18 Inches	PS2932BP	PS2932HBP
Unlighted	6 Feet	PS2932BP	PS2932JBP
Light - 12VAC or DC	6 Feet	PS294675BP	PS2946J75BP*
Light - 24VAC or DC	6 Feet	PS294679BP	PS2946J79BP*
Light - 110/120VAC	6 Feet	PS294683BP	PS2946J83BP*
Light - 240/230VAC		PS294687BP	N/A

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord.
 IP65 rated when properly installed.

Engineering Data:

- Conductors: 2 poles plus ground
- Cable range (Connector only): 4 to 6mm (0.16 to 0.24 Inch)
- Contact spacing: 8mm



Molded 6'
 Cord Shown

D

Direct Acting
 Valve Products

B Series, an exceptional performing industrial valve in a compact size with an enhanced flow range.

Available in solenoid pilot operated and remote air pilot models. The B series features Parker's proven WCS (Wear Compensating Seal) system ensuring long life and fast response, making it ideally suited for OEM applications.

Ports

- B3: 1/8, 1/4 inch
- B5: 1/4, 3/8 inch
- B6: 3/8 inch
- B7: 1/2 inch
- B8: 3/4 inch

Mounting

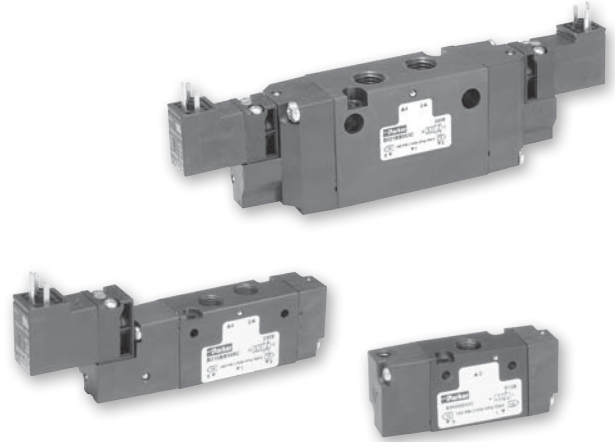
- Inline
- Subbase
- IEM stackable base
- IEM aluminum bar
- 5-port subbase aluminum bar

Solenoids

- 1.2 W – 15mm, 3-pin EN175301-803
- 2.5 to 7.3 watt - conduit, grommet, 22mm & 30mm, 3-pin DIN (433650)
- 12VDC to 240VAC
- Female DIN electrical connectors

Certification / Approval

- Approved to be CE marked
- IP65 rated
- CSA, C/US



Operating information	
Operating pressure:	Vacuum to 145 PSIG (Vacuum to 10 bar)
Minimum:	See chart
Operating temperature:	5°F to 120°F (-15°C to 49°C)

Materials

Body	Anodized aluminum
End caps	Nylon polymer - 33% glass filled
Seals	Nitrile
Solenoid	Polyamide
Spool	Aluminum

Minimum Operating Pressure

Operator / function	Internal pilot	Minimum PSIG (kPa)				
		B3	B5	B6	B7	B8
1. G. H	Single solenoid - air return					
2. A. J. S	Double solenoid	20 (138)	20 (138)	20 (138)	35 (241)	35 (241)
3. K. L	Single remote pilot - air return					
4. M	Double remote pilot	Vacuum				
N. P. Q	Double solenoid - dual 3/2	40 (275)	—	—	—	—
5. 6. 7	Double solenoid - APB, CE, PC	30 (207)	30 (207)	30 (207)	45 (310)	45 (310)
8. 9. 0	Double remote pilot - APB, CE, PC	Vacuum				
E. V. W	Single solenoid - air return / spring assist	35 (241)	35 (241)	35 (241)	35 (241)	35 (241)
F. X. Y	Single remote pilot - air return / spring assist					
	External pilot*†					
All	"B" series	Vacuum				

* External Pilot Pressure / Remote Pilot Signal 35-145 PSIG (241-1000 kPa).

† External Pilot Not Available with B3 Dual 3/2.

Note: For CSA-NRTL/C approved solenoid valves – insert an 'L' at the end of the valve part number.

B3: Maximum pressure - 120 PSI

B5: Maximum pressure - 145 PSI*§

B6: Maximum pressure - 145 PSI*§

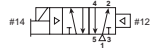
B7: Maximum pressure - 145 PSI*†

B8: Maximum pressure - 145 PSI*†

 Most popular. For technical information see CD

Single Solenoid, 4-way, 2-Position

B3 Shown



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	B310BB553C B310BB549C
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	B511BB553C B511BB549C
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	B512BB553C B512BB549C
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	B612BB553A B612BB549A
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	B713BB553A B713BB549A
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	B814BB553A B814BB549A
	Less Base	0.65 Cv	120VAC 24VDC	B3 Subbase	B31VBB553C B31VBB549C

Double Solenoid, 4-way, 2-Position

B5 Shown



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	B320BB553C B320BB549C
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	B521BB553C B521BB549C
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	B522BB553C B522BB549C
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	B622BB553A B622BB549A
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	B723BB553A B723BB549A
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	B824BB553A B824BB549A
	Less Base	0.65 Cv	120VAC 24VDC	B3 Subbase	B32VBB553C B32VBB549C

Single Solenoid, 3-way, 2-Position, NC

B5 Shown




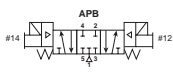
Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	B3G0BB553C B3G0BB549C
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	B5G1BB553C B5G1BB549C
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	B5G2BB553C B5G2BB549C
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	B6V2BB553A B6V2BB549A
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	B7V3BB553A B7V3BB549A
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	B8V4BB553A B8V4BB549A

3-Pin DIN 43650C Electrical Connection.
 Non-Locking Flush Override.

D



Inline
 Valve Products

Double Solenoid, 4-way, 3-Position, APB

Symbol	Port size	Cv	Voltage	Valve type	Part number
 	1/8"	0.60 Cv	120VAC 24VDC	B3 Inline	B350BB553C B350BB549C
	1/4"	1.1 Cv	120VAC 24VDC	B5 Inline	B551BB553C B551BB549C
	3/8"	1.1 Cv	120VAC 24VDC	B5 Inline	B552BB553C B552BB549C
	3/8"	2.1 Cv	120VAC 24VDC	B6 Inline	B652BB553A B652BB549A
	1/2"	5.7 Cv	120VAC 24VDC	B7 Inline	B753BB553A B753BB549A
	3/4"	6.6 Cv	120VAC 24VDC	B8 Inline	B854BB553A B854BB549A
	Less Base	0.50 Cv	120VAC 24VDC	B3 Subbase	B35VBB553C B35VBB549C



B5 Shown

Single Remote Pilot, 4-way, 2-Position

Symbol	Port size	Cv	Valve type	Part number
 	1/8"	0.75 Cv	B3 Inline, remote pilot	B330000XXC
	1/4"	1.4 Cv	B5 Inline, remote pilot	B531000XXC
	3/8"	1.4 Cv	B5 Inline, remote pilot	B532000XXC
	3/8"	2.7 Cv	B6 Inline, remote pilot	B632000XXA
	1/2"	5.9 Cv	B7 Inline, remote pilot	B733000XXA
	3/4"	7.0 Cv	B8 Inline, remote pilot	B834000XXA
	Less Base	0.65 Cv	B3 Subbase, remote pilot	B33V000XXC


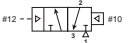
B5 Shown

Double Remote Pilot, 4-way, 2-Position

Symbol	Port size	Cv	Valve type	Part number
 	1/8"	0.75 Cv	B3 Inline, remote pilot	B340000XXC
	1/4"	1.4 Cv	B5 Inline, remote pilot	B541000XXC
	3/8"	1.4 Cv	B5 Inline, remote pilot	B542000XXC
	3/8"	2.7 Cv	B6 Inline, remote pilot	B642000XXA
	1/2"	5.9 Cv	B7 Inline, remote pilot	B743000XXA
	3/4"	7.0 Cv	B8 Inline, remote pilot	B844000XXA
	Less Base	0.65 Cv	B3 Subbase, remote pilot	B34V000XXC

B5 Shown

Single Remote Pilot, 2-way, 2-Position, NC

Symbol	Port size	Cv	Valve type	Part number
 	1/8"	0.75 Cv	B3 Inline, remote pilot	B3K0000XXC
	1/4"	1.4 Cv	B5 Inline, remote pilot	B5K1000XXC
	3/8"	1.4 Cv	B5 Inline, remote pilot	B5K2000XXC
	3/8"	2.7 Cv	B6 Inline, remote pilot	B6X2000XXA
	1/2"	5.9 Cv	B7 Inline, remote pilot	B7X3000XXA
	3/4"	7.0 Cv	B8 Inline, remote pilot	B8X4000XXA

B3 Shown

D
Inline Valve Products

Double Remote Pilot, 4-way, 3-Position, APB



B5 Shown

Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.60 Cv	B3 Inline, remote pilot	B38000XXC
	1/4"	1.1 Cv	B5 Inline, remote pilot	B581000XXC
	3/8"	1.1 Cv	B5 Inline, remote pilot	B582000XXC
	3/8"	2.1 Cv	B6 Inline, remote pilot	B682000XXA
	1/2"	5.7 Cv	B7 Inline, remote pilot	B783000XXA
	3/4"	6.6 Cv	B8 Inline, remote pilot	B884000XXA
	Less Base	0.50 Cv	B3 Subbase, remote pilot	B38V000XXC

IEM Stackable Manifolds

Series	Type	Kit number	
		Standard	Flow control
B3	4-way	PS2917P	PS2918P
B5	4-way	PS2817P	PS2818P

- Individual Manifold Bases stack together to form lightweight custom length manifold system.
- Easy-to-connect male / female tie rods for modular assembly.
- Utilizes B3 and B5 4-way Inline Valves.
- Low-cost built-in Flow Controls with heavy-duty brass adjusting needles to control meter-out exhaust flow.
- Accessories include Isolator Plugs for pressure isolation and Universal Blanking Plates for auxiliary inlet and exhaust supply and future valve additions.
- Kit includes: (1) Manifold Base, (2) Hold-down Bolts, Tie-rods, Gaskets and O-rings.

Isolator Plugs

Series	Description	Kit number
B3	4-way, IEM stackable	PS2919P
B5	4-way, IEM stackable	PS2819P

Used to isolate the #1, #3 or #5 gallery between two manifold bases. (IEM stackable only)
 Kit includes: (3) plugs and (6) o-rings

End Plate Kits

Series	Type	Kit number
B3	4-way, NPT	PS2915P
B5	4-way, NPT	PS2815P*

Kit includes: right and left end plate, o-rings, socket head cap screws, flat washers and lockwashers.
 * B5 4-way use the same kit.

Subbase

Series	Type	Kit number
B3	4-way, 1/4" NPT	PS2934P
B5	4-way, 3/8" NPT	PS2834P

Kit includes: (1) subbase.
 (Hold down bolts & gasket are included with valve.)

Blanking Plate

		IEM universal		IEM	Subbase
		NPT	BSPP "G"	Blank	Blank
B3	3-way	PS2966P	PS2967P	PS2968P	—
	4-way	PS2920P	PS2921P	PS2969P	PS2994P
B5	3-way	PS2866P	PS2867P	PS2868P	—
	4-way	PS2820P	—	PS2869P	—
B6	3-way	PS2620P	—	—	—
	4-way	PS2620P	—	—	—
B7-B8	4-way	PS2520P	—	PS2569P	—

Kit includes: (1) plate, (2) screws, seal / gaskets

DIN Rail

Valve type	Length	Part number
B3	6 Feet	AM1DE200

DIN Rail Hardware Kit

Valve type	IEM bar	Part number
B3	(2) Screws, (2) Nuts, (2) Clamps	PS2991P

B3 Series

B3 1 0 B B 5 49 - C

Basic series	
B3 series	B3

Engineering level	
C	Current

Operator Function	
3-way	
Single solenoid, 2-position NC - air return	G
Single solenoid, 2-position NO - air return	H
Double solenoid, 2-position	J
Single remote pilot, 2-position NC - air return	K
Single remote pilot, 2-position NO - air return	L
Double remote pilot, 2-position	M
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Single remote pilot, 2-position - air return	3
Double remote pilot, 2-position	4
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	8
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PC	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

Options	
Blank	None
02	Solenoid rotated 180° - pins down

Voltage [§]			
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			24
53	120	110	
57	240	230	
XX	Remote pilot - M5 or valve less 15mm solenoid		
YY	Remote pilot - 5/32" (4mm) tube		

Enclosure / lead length	
0	None, remote pilot valve
5	15mm 3-pin DIN 43650C (male only)
X	Valve less 15mm solenoid

Overrides [§]	
0	None, remote pilot valve
B	Flush - non-locking
C	Flush - locking
D	Extended - non-locking
E	Extended - locking
X	Valve less 15mm solenoid

Port size / thread type	
3-way	
1/8" NPT inline	0*
1/8" BSPP "G" inline	5*
Dual 3-way & 4-way	
1/8" NPT inline	0*
1/8" BSPP "G" inline	5*
1/4" NPT subbase	H†
1/8" NPT face mount	T**
Subbase valve less base	V‡

* Available for use on IEM Manifolds.
 ** 4-way only.
 ‡ Subbase valves available for 4-way valves only.

Pilot source / pilot exhaust	
0	None, remote pilot valve
B†	Internal - port #1 / vented
E*	Dual pressure - port #3 / vented
K†	External - body / tapped M5
X‡	External - manifold / vented

* Not available for 3-way Valves.
 † Not available for Remote Pilot Valves.
 ‡ See Pilot Source Note below.

§ Enclosure '5'
 - Override / Voltage Availability

S - Standard
 O - Option

Voltage code	Override code Standard			
	B	C	D	E
42	O	O	-	-
45	O	O	-	-
49	S	S	O	O
53	S	S	O	O
57	O	O	-	-

Voltage code	"02" Option			
	B	C	D	E
42	O	O	-	-
45	O	O	-	-
49	S	S	O	O
53	S	S	O	O
57	O	O	-	-

D
 Inline Valve Products

Pilot Source 'X'
 External-Manifold / Vented

INLINE & SUBBASE Valves -
 Only used IF an IEM or 5-Ported Subbase Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications OR when used with Sandwich Regulators.

Most popular. For technical information see CD

B5 Series

B5 1 1 B B 5 49 - C

Basic series
 B5 series **B5**

Engineering level
C Current

Operator function	
3-way	
Single solenoid, 2-position NC - air return	G
Single solenoid, 2-position NO - air return	H
Double solenoid, 2-position	J
Single remote pilot, 2-position NC - air return	K*
Single remote pilot, 2-position NO - air return	L*
Double remote pilot, 2-position	M*
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X*
Single remote pilot, 2-position NO - air return / spring assist	Y*
4-way	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Single remote pilot, 2-position - air return	3*
Double remote pilot, 2-position	4*
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	8*
Double remote pilot, 3-position - CE	9*
Double remote pilot, 3-position - PC	0*
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F*

Options	
Blank	None
02	Solenoid rotated 180° - pins down
MD††	Manual detent
VO*	Fluorocarbon seals

* Not available with enclosure "0", "5", "X", "E" or "F".
 †† Only available with operator function 1 & 3 and eEnclosure "N", "X" or mobile voltages upon request.

	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			24
53	120	110	
57	240	230	
XX	Remote pilot - M5 or valve less solenoid		
YY	Remote pilot - 5/32" (4mm) tube		

* Pilot source/pilot exhaust, override, and enclosure must be "0".

Port Size / Thread Type	
3-way	
1/4" NPT inline	1*
3/8" NPT inline	2*
1/4" BSPP "G" inline	6*
3/8" BSPP "G" inline	7*
4-way	
1/4" NPT inline	1*
3/8" NPT inline	2*
1/4" BSPP "G" inline	6*
3/8" BSPP "G" inline	7*
3/8" NPT subbase	J†
1/4" NPT NAMUR mount	T††
Subbase valve less base - NPT	V‡
1/4" BSPP "G" NAMUR mount	W††

Pilot Source / Pilot Exhaust	
Enclosures "0, 5 & X"	
None, remote pilot valve	0
Internal - port #1 / tapped M5	A†
Internal - port #1 / vented	B†
Dual pressure - port #3 / vented	E*
External - body / tapped M5	K†
External - manifold / vented	X†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - port #1 / tapped M5	A†
Internal - port #1 / vented	B†
Dual pressure - port #3 / tapped M5	D††
External - body / tapped 1/8"	K†

Enclosure / lead length	
0	None, remote pilot valve
5	15mm 3-pin DIN 43650C (male only)
A	30mm square 3-pin - ISO 4400 form A (male only)
B	22mm rectangular 3-pin - type B industrial (male only)
C	3-pin automotive - mini
D	5-pin automotive - mini
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	Grommet - 18" leads
H	1/2" NPT conduit - 18" leads
N	Valve less "A-R" coil
Q	Grommet - 72" leads
R	1/2" NPT conduit - 72" leads
X	Valve less 15mm solenoid

* 24 VDC & override "A" oOnly.
 ** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

* Available for use on IEM manifolds.
 † 4-way only.
 ‡ Available with pilot source "0", "A", and "B" only.

* Not available for 3-way valves.
 † Not available for remote pilot valves.
 ‡ See pilot source note below.

Pilot Source 'X'
 External-Manifold / Vented or Tapped M5

INLINE & SUBBASE Valves -
 Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

Overrides§	
None. Remote pilot valve	0
No override	A†
Flush - non-locking	B*
Flush - locking	C
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with encl. "5".
 † Only available with encl. "E".

Note: for mobile voltages, contact the application team.

§ Enclosure '5' - Override / Voltage Availability

S - Standard
 O - Option

Voltage code	Override code Standard				Voltage code	Override code "02" Option			
	B	C	D	E		B	C	D	E
42	O	O	-	-	42	O	O	-	-
45	O	O	-	-	45	O	O	-	-
49	S	S	O	O	49	S	S	O	O
53	S	S	O	O	53	S	S	O	O
57	O	O	-	-	57	O	O	-	-

Most popular. For technical information see CD

D
 Inline Valve Products

B6 Series

B6 1 2 B B 5 49 - A

Basic series	
B6 series	B6

Engineering level	
A	Current

Operator function	
3-way	
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Single remote pilot, 2-position - air return	3
Double remote pilot, 2-position	4
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	8
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PC	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

Options	
Blank	None
02	Solenoid rotated 180° - pins down
42*	Series cylinder mount replacement

* Only available with port size "T" and "0", "A", "B", and "L" pilot source.

	Voltage [§]		
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			24
53	120	110	
57	240	230	
XX	Remote pilot - M5 or valve less 15mm solenoid		
YY	Remote pilot - 5/32" (4mm) tube		

Port size / thread type	
3-way / 4-way	
3/8" NPT inline	2*
3/8" BSPP "G" inline	7*
3/8" NPT NAMUR mount	T†

* Available for use on IEM manifolds.

† 4-way only. Available with pilot source "0", "A", "B" and "L" only.

Pilot source / pilot exhaust	
Enclosures "0, 5 & X"	
None. Remote pilot valve	0
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	B†
Dual pressure - port #5 / vented	H
External - Body / tapped M5	K†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	B†
External - Body / tapped 1/8"	K†

* Not available for 3-way valves.

† Not available for remote pilot valves.

Overrides [§]	
None, remote pilot valve	0
No override	A†
Flush - non-locking	B*
Flush - locking	C
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with encl. "5".

† Only available with encl. "E".

Enclosure / lead length	
0	None, remote pilot valve
5	15mm 3-pin DIN 43650C (male only)
A	30mm square 3-pin - ISO 4400 form A (male only)
B	22mm rectangular 3-pin - Type B industrial (male only)
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	Grommet - 18" leads
H	1/2" NPT conduit - 18" leads
N	Valve less "A - R" coil
Q	Grommet - 72" leads
R	1/2" NPT conduit - 72" leads
X	Valve less 15mm solenoid

* 24 VDC & override "A" only.

** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

§ Enclosure '5' - Override / Voltage Availability

S - Standard

O - Option

Voltage code	Override code Standard				Voltage code	Override code "02" Option			
	B	C	D	E		B	C	D	E
42	O	O	-	-	42	O	O	-	-
45	O	O	-	-	45	O	O	-	-
49	S	S	O	O	49	S	S	O	O
53	S	S	O	O	53	S	S	O	O
57	O	O	-	-	57	O	O	-	-

INLINE Valves -
 Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

Most popular. For technical information see CD

B7 & B8 Series

B7 1 3 A B G 53 - A

Basic series	
B7 series	B7
B8 series	B8

Engineering level	
A	Current

Options	
Blank	None

Operator function	
3-way	
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Single remote pilot, 2-position - air return	3
Double remote pilot, 2-position	4
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	8
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PCc	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

	Voltage [§]		
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			24
53	120	110	
57	240	230	
XX	Remote pilot - M5 or valve less solenoid		
YY	Remote pilot - 5/32" (4mm) tube		

Port size / thread type	
B7 series	
1/2" NPT inline	3*
1/2" BSPP "G" inline	8*
B8 series	
3/4" NPT inline	4*
3/4" BSPP "G" inline	9*

* Available for use on IEM manifolds.

Enclosure / lead length	
0	None, remote pilot valve
5	15mm 3-pin DIN 43650C (male only)
A	30mm square 3-pin - ISO 4400 form A (male only)
B	22mm rectangular 3-pin - Type B industrial (male only)
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	Grommet - 18" leads
H	1/2" NPT conduit - 18" leads
N	Valve less "A - R" coil
R	1/2" NPT conduit - 72" leads
X	Valve less 15mm solenoid

* 24 VDC & Override "A" Only.

** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

Pilot source / pilot exhaust	
Enclosures "0, 5 & X"	
None. Remote pilot valve	0
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	B†
External - Body / tapped M5	K†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	B†
External - Body / tapped 1/8"	K†

† Not available for remote pilot valves.

Overrides [§]	
None, remote pilot valve	0
No override	A†
Flush - non-locking	B*
Flush - locking	C
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with encl. "5".

† Only available with encl. "E".

§ Enclosure '5' - Override / Voltage Availability

S - Standard

O - Option

Voltage code	Override code			
	B	C	D	E
42	O	O	-	-
45	O	O	-	-
49	S	S	O	O
53	S	S	O	O
57	O	O	-	-

D

Inline Valve Products

INLINE Valves -

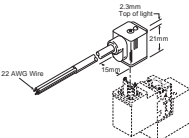
Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

Voltage		Enclosure "5"			Voltage		Enclosure "A"			Enclosure "B" to "R"		
AC		Power consumption	Holding (Amps)	Code	AC		Power consumption	Holding (Amps)	Power consumption	Holding (Amps)	Code	
60Hz	50Hz				60Hz	50Hz						
42	24	22	1.6VA	.065	42	24	22	3.9VA	.136	7.3VA	.309	
45		12	1.2W	.098	45		12	2.6W	.208	4.6W	.365	
47*		12	0.91W	.074	47*		12	—	—	4.9W	.298	
48*		24	0.91W	.033	48*		24	—	—	4.8W	.142	
49		24	1.2W	.049	49		24	2.7W	.112	4.8W	.200	
53	120	110	1.6W	.013	53	120	110	4.1VA	.033	6.3VA	.047	
57	240	230	1.6W	.007	57	240	230	3.7VA	.017	6.4VA	.026	

Note: For enclosure "5" with "02" Option, solenoid wattage is 1.8W (2.4VA). Response time is 10% faster. Voltage rated +10 / -15%.

* 47 and 48 code are mobile voltages. voltage +25 / -30%.

15mm 3-Pin DIN 43650C



Unlighted	Cord length	Connector	Connector with cord
Unlighted	18 Inches	PS2932BP	PS2932HBP
Unlighted	6 Feet	PS2932BP	PS2932JBP
Light – 12VAC or DC	6 Feet	PS294675BP	PS2946J75BP*
Light – 24VAC or DC	6 Feet	PS294679BP	PS2946J79BP*
Light – 110/120VAC	6 Feet	PS294683BP	PS2946J83BP*
Light – 240/230VAC		PS294687BP	N/A

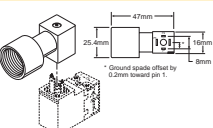
* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

- Conductors: 2 poles plus ground
- Cable range (connector only): 4 to 6mm (0.16 To 0.24 Inch)
- Contact spacing: 8mm

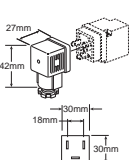
15mm 3-Pin DIN 43650C to 1/2" Conduit



Description	Connector
1/2" NPTF conduit – Unlighted with 3' (1m) leads 20 AWG wire	PS2998P

Note: Rated up to 250VAC or VDC; 6 amps IP65 rated when properly installed.

30mm Square 3-Pin – ISO 4400, DIN 43650A (Use with Enclosure "A")



Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	PS2028BP
Light – 6-48V, 50/60Hz, 6-48VDC	PS2032J79CP*	PS203279BP
Light – 120V/60Hz	PS2032J83CP*	PS203283BP
Light – 240V/60Hz	N/A	PS203283BP

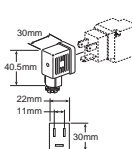
* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

- Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm

22mm Rectangular 3-Pin – Type B Industrial (Use with Enclosure "B")



Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2429JBP	PS2429BP
Light – 24V60Hz, 24VDC	PS2430J79BP*	PS243079BP
Light – 120V/60Hz	PS2430J83BP*	PS243083BP
Light – 240V/60Hz	N/A	PS243087BP

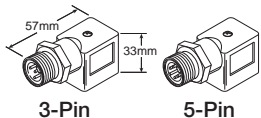
* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering Data:

- Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 6 to 8mm (0.24 to 0.31 Inch); Contact Spacing: 11mm

3-Pin / 5-Pin Male Automotive Connectors (Use on 22mm Rectangular 3-Pin Solenoid)



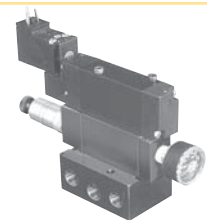
Description	3-Pin	5-Pin
Unlighted	PS2893CP	PS2893DP
Lighted - Voltage	PS2893C##P	PS2893D##P

– 79 = 6 to 48VAC/VDC

83 = 100 to 240VAC/48 to 120 VDC

Sandwich Regulators

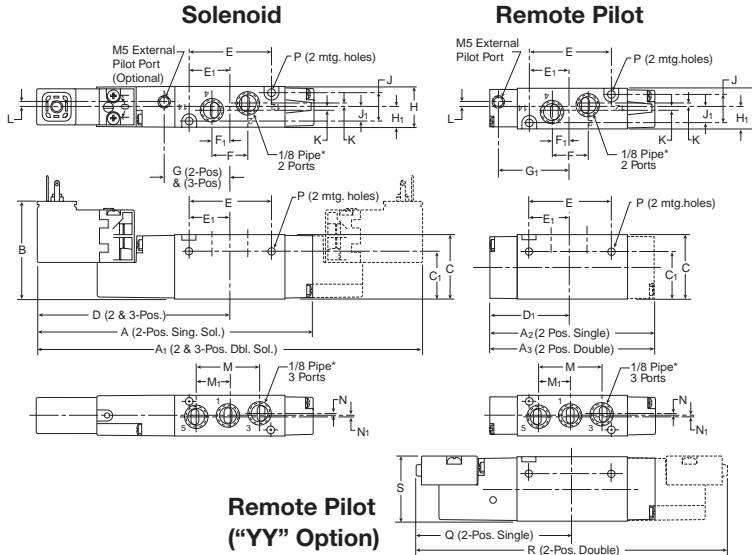
- Use with B3 subbase valves on 5-ported subbase bar manifolds.
- Common port or dual port regulation control.
- Unregulated pressure supplied to valve pilot - use pilot source - 'X'.
- Easy adjust knob control.



Pressure range	Cv	Common port with gauge *	Dual port without gauge
5-125 PSI	.33	PS2930166P	PS2930233P

* Gauge is 160 PSI. Gauge shipped unassembled. For different gauge mounting configuration, use brass adapters listed at bottom of page.

B3 Single & Double Operators – 4-way Inline

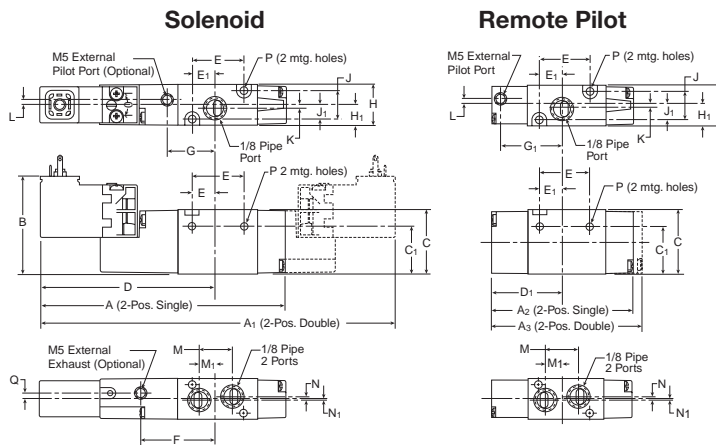


B3 4-way Inline

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	1.66 (42)
C	C1	D	D1	E
1.13 (39)	.84 (21)	3.22 (82)	1.66 (42)	1.47 (37)
E1	F	F1	G	G1
.74 (19)	.63 (16)	.32 (8)	1.13 (29)	1.50 (38)
H	H1	J	J1	K
.71 (18)	.36 (9)	.51 (13)	.26 (7)	.06 (2)
L	M	M1	N	N1
.11 (3)	1.12 (28)	.56 (14)	.05 (1)	.05 (1)
P	Q	R	S	
∅ .13 (3.3)	2.69 (68)	5.37 (136)	1.16 (29)	

Inches (mm)

B3 Single & Double Operators – 3-way Inline

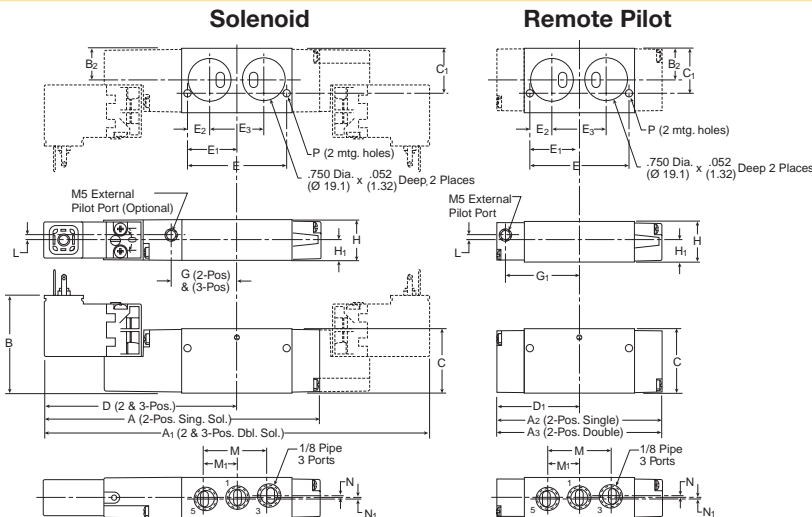


B3 3-way Inline

A	A1	A2	A3	B
4.20 (107)	5.96 (151)	2.65 (67)	2.86 (73)	1.66 (42)
C	C1	D	D1	E
1.13 (39)	.84 (21)	2.93 (74)	1.38 (35)	.98 (25)
E1	F	G	G1	H
.44 (11)	1.32 (34)	.85 (22)	1.22 (31)	.71 (18)
H1	J	J1	K	L
.36 (9)	.51 (13)	.26 (7)	.06 (2)	.11 (3)
M	M1	N	N1	P
.63 (16)	.27 (7)	.12 (3)	.06 (2)	∅ .13 (3.3)
Q				
.08 (2)				

Inches (mm)

B3 Single & Double Operators – 4-way Face Mount



B3 4-way Face Mount

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	1.66 (42)
B2	C	C1	D	D1
.58 (15)	1.13 (29)	.81 (21)	3.22 (82)	1.66 (42)
E	E1	E2	E3	G
1.74 (44)	.87 (22)	.39 (10)	.95 (24)	1.13 (29)
G1	H	H1	L	M
1.50 (38)	.71 (18)	.36 (9)	.11 (3)	1.12 (28)
M1	N	N1	P	
.56 (14)	.05 (1)	.05 (1)	∅ .13 (3.3)	

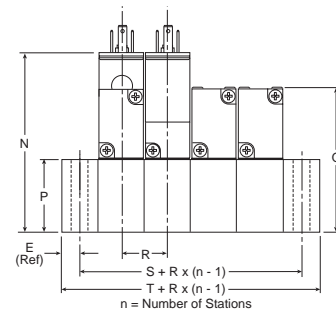
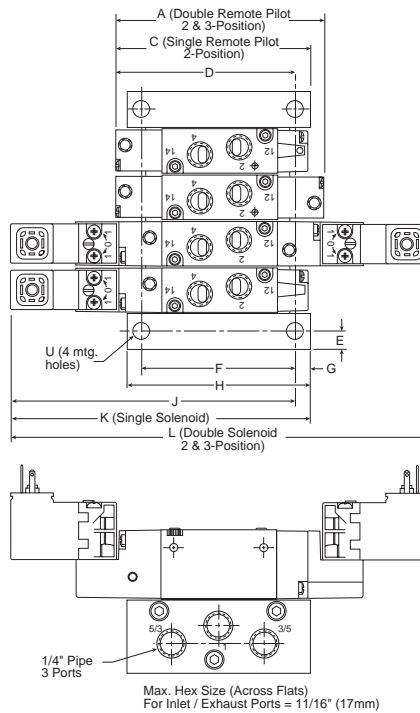
Inches (mm)

B3 Single & Double Operators – 4-way IEM Stackable

B3 4-way IEM Stackable

A	C	D	E	F
3.33	3.12	2.91	.30	2.49
(84.6)	(79.2)	(73.9)	(7.6)	(63.3)
G	H	J	K	L
.25	3.00	4.46	4.67	6.43
(6.4)	(76.2)	(113.3)	(118.6)	(163.3)
N	P	Q	R	
2.91	1.25	2.38	.74 ±.01	
(73.9)	(31.8)	(60.5)	(18.8) ± .3	
S	T	U		
1.34	1.94	Ø .28		
(34.0)	(49.3)	Ø (7.1)		

Inches (mm)

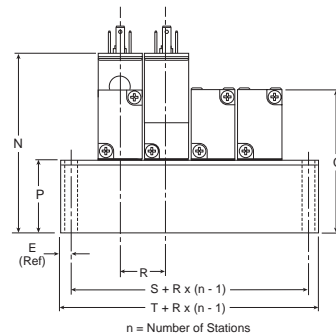
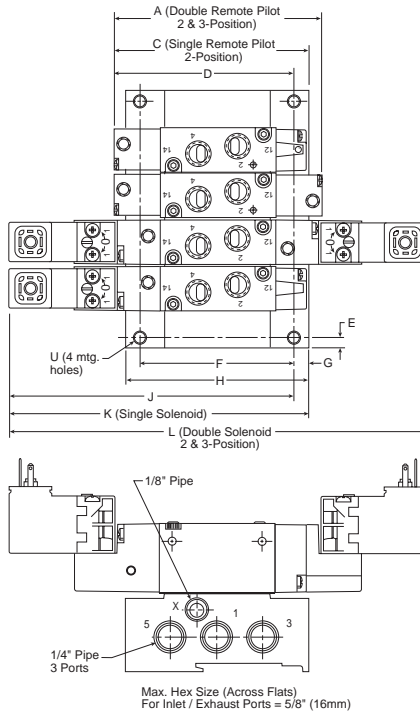


B3 Single & Double Operators – 4-way IEM Aluminum Bar

B3 4-way IEM Aluminum Bar Manifold

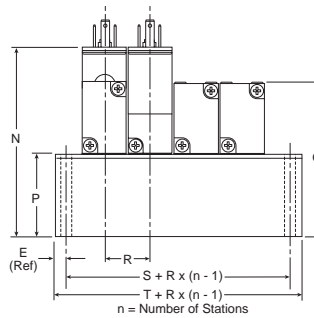
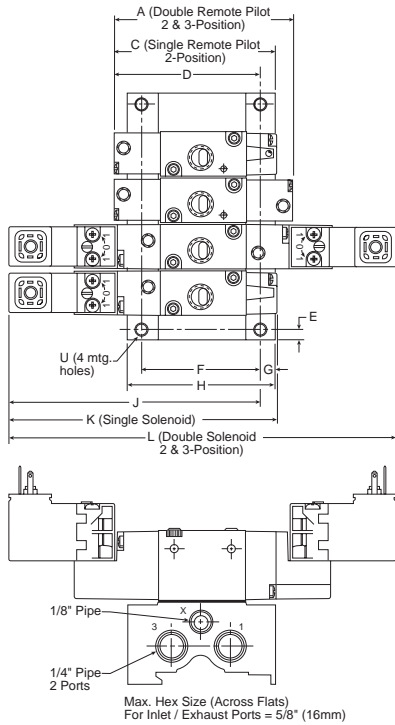
A	C	D	E	F
3.33	3.17	2.94	.25	2.54
(84.6)	(80.5)	(74.7)	(6.4)	(64.5)
G	H	J	K	L
.23	3.00	4.50	4.73	6.43
(5.9)	(76.2)	(114.2)	(120.1)	(163.3)
N	P	Q	R	S
2.94	1.28	2.41	.81	1.13
(74.7)	(32.5)	(61.2)	(20.5)	(28.8)
T	U			
1.64	Ø .23			
(41.6)	Ø (5.8)			

Inches (mm)



D
 Inline
 Valve Products

B3 Single & Double Operators – 3-way IEM Aluminum Bar

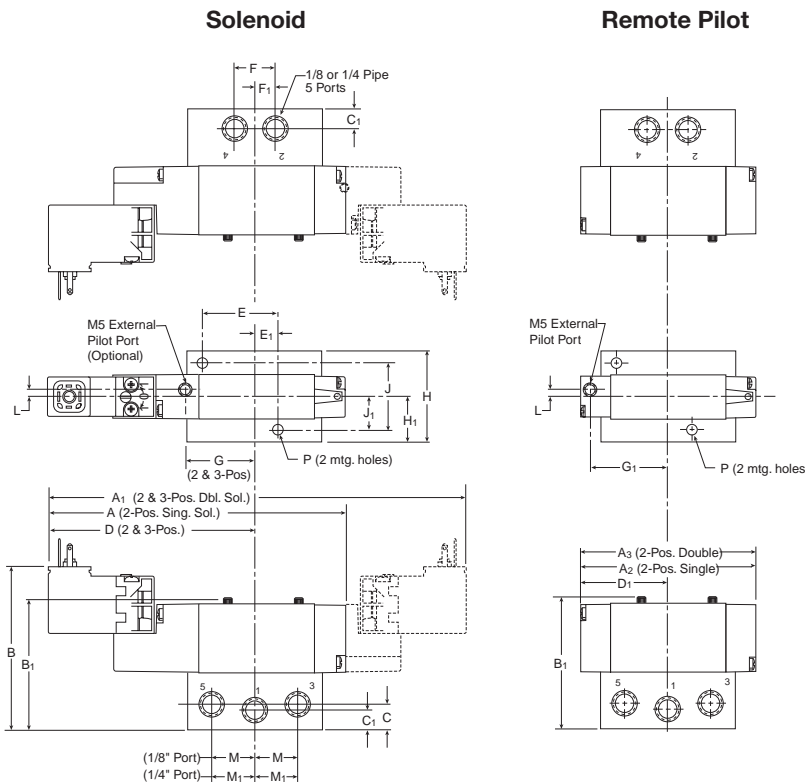


B3 4-way IEM Aluminum Bar Manifold

A	C	D	E	F
2.86 (72.6)	2.65 (67.3)	2.33 (59.2)	.25 (6.4)	1.80 (45.7)
G	H	J	K	L
.23 (5.9)	2.25 (57.2)	3.88 (98.6)	4.20 (106.7)	5.96 (151.4)
N	P	Q	R	S
2.93 (74.5)	1.27 (32.4)	2.40 (61.1)	.81 (20.5)	1.13 (28.8)
T	U			
1.64 (41.6)	Ø .23 Ø (5.8)			

Inches (mm)

B3 Single & Double Operators – 4-way Single Subbase



B3 4-way Single Subbase

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	2.63 (67)
B1	C	C1	D	D1
2.21 (56)	.47 (12)	.37 (9)	3.22 (82)	1.66 (42)
E	E1	F	F1	G
1.25 (32)	.38 (10)	.69 (18)	.34 (9)	1.13 (29)
G1	H	H1	J	J1
1.50 (38)	1.50 (38)	.75 (19)	1.12 (28)	.56 (14)
L	M	M1	P	
.11 (3)	.71 (18)	.76 (19)	Ø .18 Ø (4)	

Inches (mm)

B3 Single & Double Operators – 5-Port Subbase Bar Manifold

B3 5-Port Subbase Bar Manifold

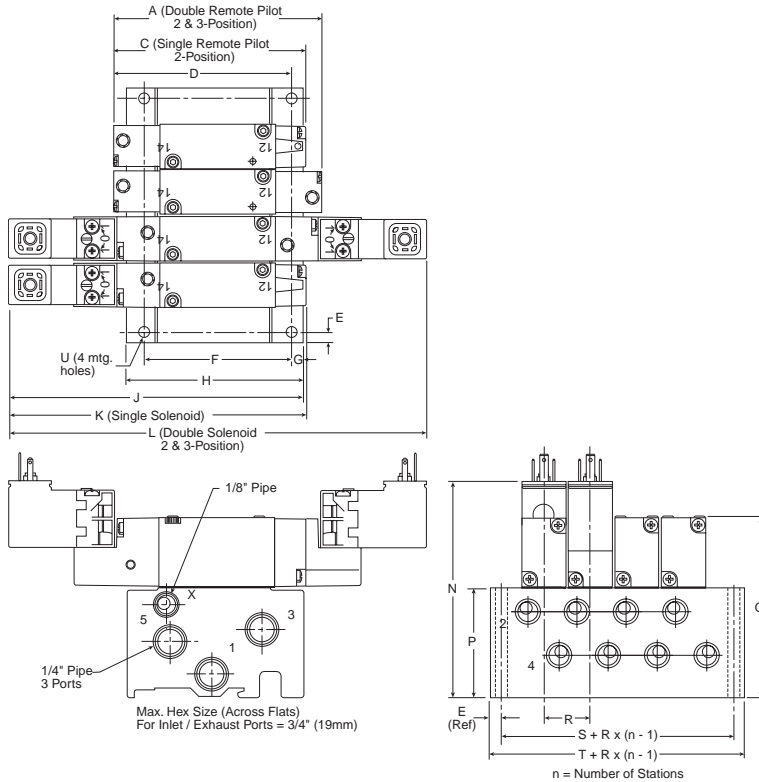
A	C	D	E	F
3.33 (84.6)	3.12 (79.2)	2.88 (73.2)	.25 (6.3)	2.43 (61.7)

G	H	J	K	L
.22 (5.5)	2.93 (74.5)	4.66 (118.3)	4.67 (118.6)	6.43 (166.3)

N	P	Q	R	S
3.47 (88.2)	1.81 (46.0)	2.94 (74.7)	.81 (20.5)	1.39 (35.4)

T	U
1.89 (48.0)	∅ .22 ∅ (5.6)

Inches (mm)



B5 Single & Double Operators – 4-way Inline

B5 4-way Inline

A	A1	A2	A3	A4
5.78 (147)	7.51 (191)	8.45 (215)	4.37 (110)	4.70 (119)

A5	B	C	C1	D
5.64 (143)	2.06 (52)	1.18 (30)	.59 (15)	3.76 (96)

D1	D2	D3	E	E1
4.23 (107)	2.35 (60)	2.82 (72)	1.89 (48)	.95 (24)

F	F1	G	G1	H
2.01 (51)	2.47 (63)	1.00 (25)	.50 (13)	.87 (22)

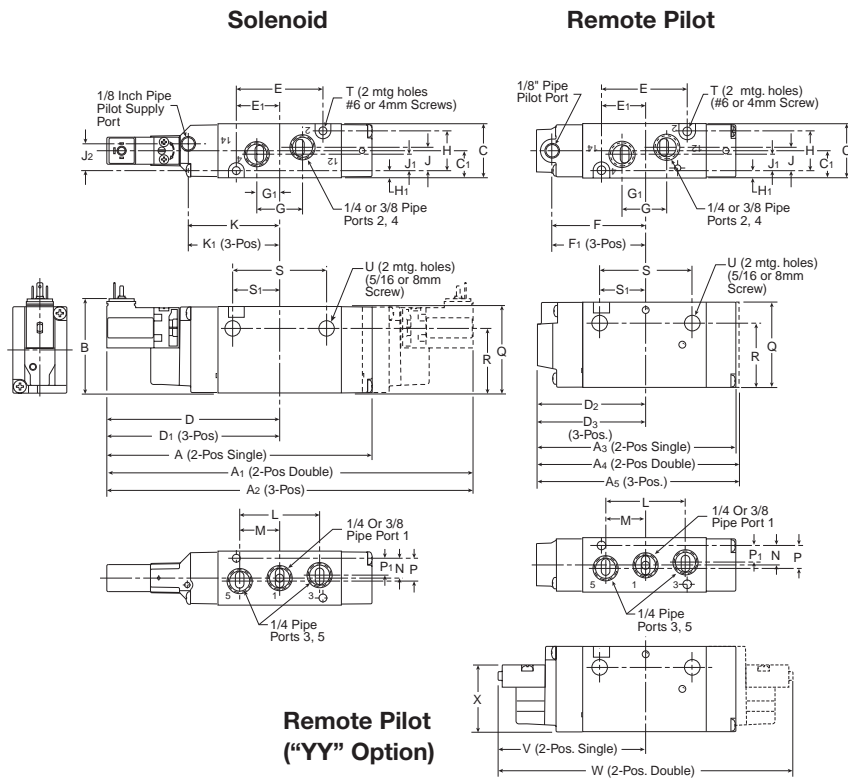
H1	J	J1	J	K
.16 (4)	.51 (13)	.36 (9)	.58 (15)	2.00 (51)

K1	L	M	N	P
2.47 (63)	1.75 (44)	.88 (22)	.43 (48)	.50 (13)

P1	Q	R	S	S1
.37 (92)	1.89 (48)	1.41 (36)	2.05 (52)	1.03 (26)

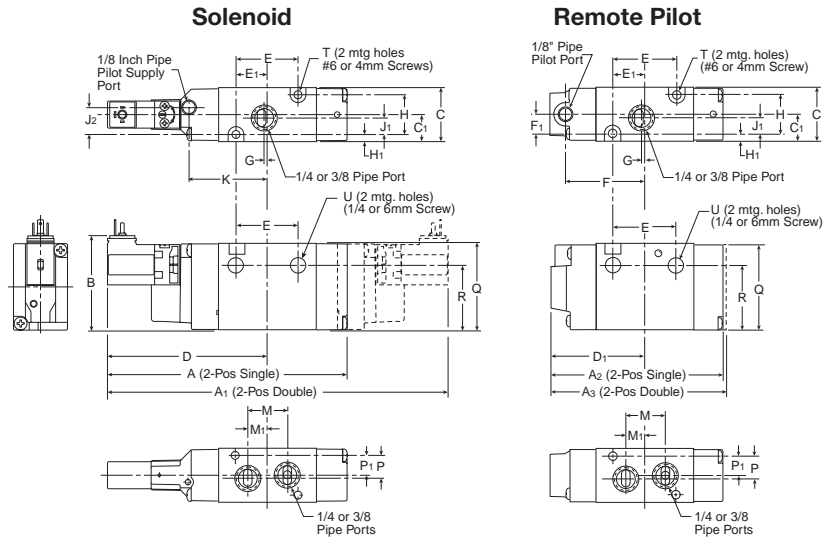
T	U	V	W	X
∅ .177 ∅ (4.5)	∅ .34 ∅ (9)	3.24 (82)	6.48 (165)	1.50 (383)

Inches (mm)



D
 Inline Valve Products

B5 Single & Double Operators – 3-way Inline

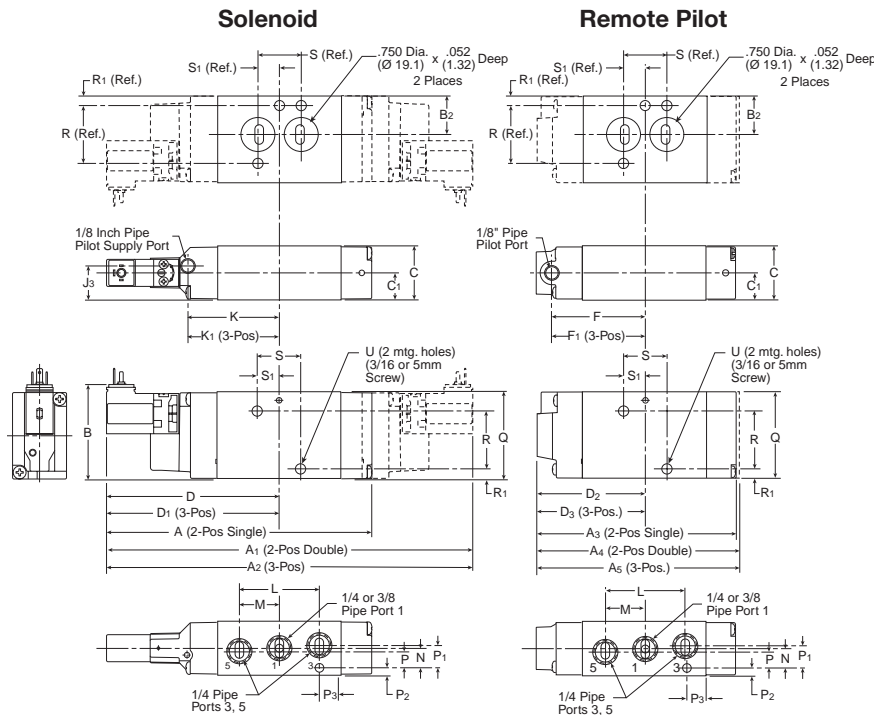


B5 3-way Inline

A 5.29 (134)	A₁ 7.03 (179)	A₂ 3.88 (99)	A₃ 4.21 (107)	B 2.06 (52)
C 1.18 (30)	C₁ .59 (15)	D 3.43 (87)	D₁ 2.11 (54)	E 1.40 (36)
E₁ .70 (18)	F 1.77 (45)	F₁ .43 (11)	G .06 (2)	H .87 (22)
H₁ .16 (4)	J₁ .36 (9)	J₂ .58 (15)	K 1.67 (42)	M .88 (22)
M₁ .44 (11)	P .50 (13)	P₁ .37 (9)	Q 1.89 (48)	R 1.41 (36)
T Ø .177 Ø (4.5)	U Ø .26 Ø (6.6)			

Inches (mm)

B5 Single & Double Operators – 4-way NAMUR Mount

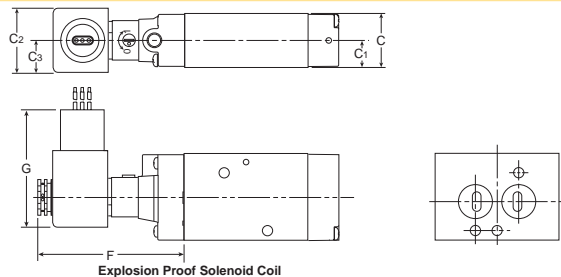


B5 4-way NAMUR Mount

A 5.78 (147)	A₁ 7.51 (191)	A₂ 8.45 (215)	A₃ 4.37 (110)	A₄ 4.70 (119)
A₅ 5.64 (143)	B 2.06 (52)	B₂ .84 (21)	C 1.18 (30)	C₁ .59 (15)
D 3.76 (96)	D₁ 4.23 (107)	D₂ 2.35 (60)	D₃ 2.82 (72)	F 2.01 (51)
F₁ 2.47 (63)	J₃ .74 (19)	K 2.00 (51)	K₁ 2.47 (63)	L 1.75 (44)
M .88 (22)	N .44 (11)	P .37 (9.4)	P₁ .50 (13)	P₂ .16 (4)
P₃ .40 (10)	Q 1.89 (48)	R 1.26 (32)	R₁ .21 (5)	S .94 (24)
S₁ .47 (12)	U Ø .224 Ø (5.7)			

Inches (mm)

B5 Alternative Electrical Enclosure Option F



B5 4-way NAMUR Mount with Option F Enclosure

C 1.18 (30)	C₁ .59 (15)	C₂ 1.42 (36)	C₃ .71 (18)	F 3.15 (80)
G 2.60 (66)				

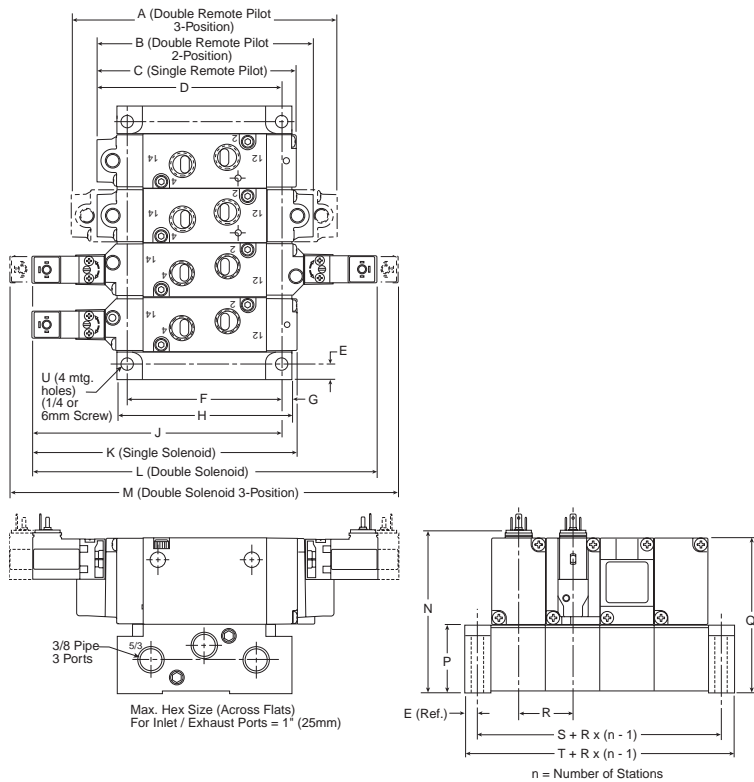
Inches (mm)

B5 Single & Double Operators – 4-way IEM Stackable

B5 4-way IEM Stackable

A	B	C	D	E
5.64 (143.3)	4.70 (119.4)	4.37 (110.0)	4.29 (109.0)	.29 (7.4)
F	G	H	J	K
3.44 (87.4)	.24 (6.1)	3.92 (99.6)	5.48 (139.2)	5.78 (146.8)
L	M	N	P	Q
7.52 (191.0)	8.46 (214.9)	3.56 (90.4)	1.50 (38.1)	3.42 (86.9)
R	S	T	U	
1.21 ± .01 (30.7) ± (.3)	1.79 (45.5)	2.37 (60.2)	Ø .28 Ø (7.1)	

Inches (mm)

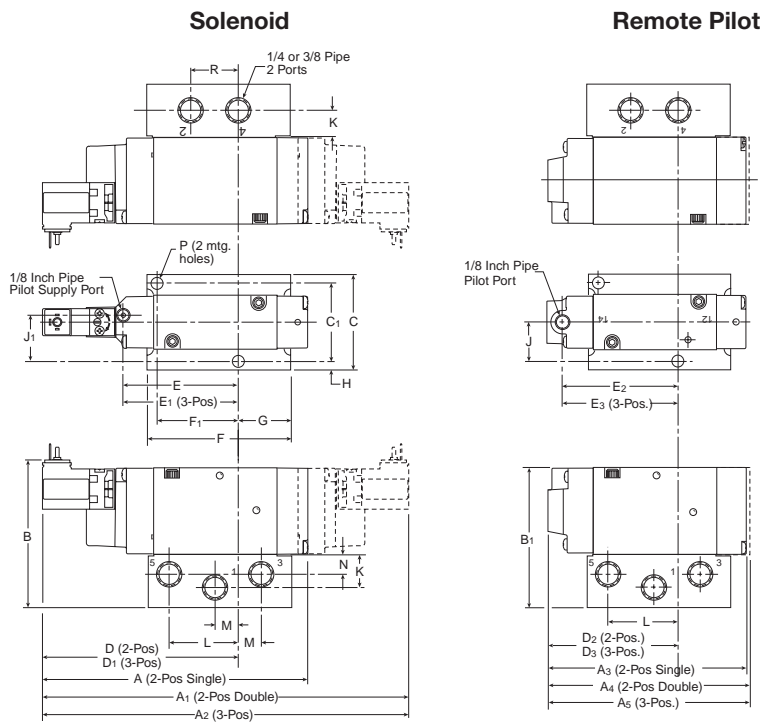


B5 Single & Double Operators – 4-way Single Subbase

B5 4-way Subbase

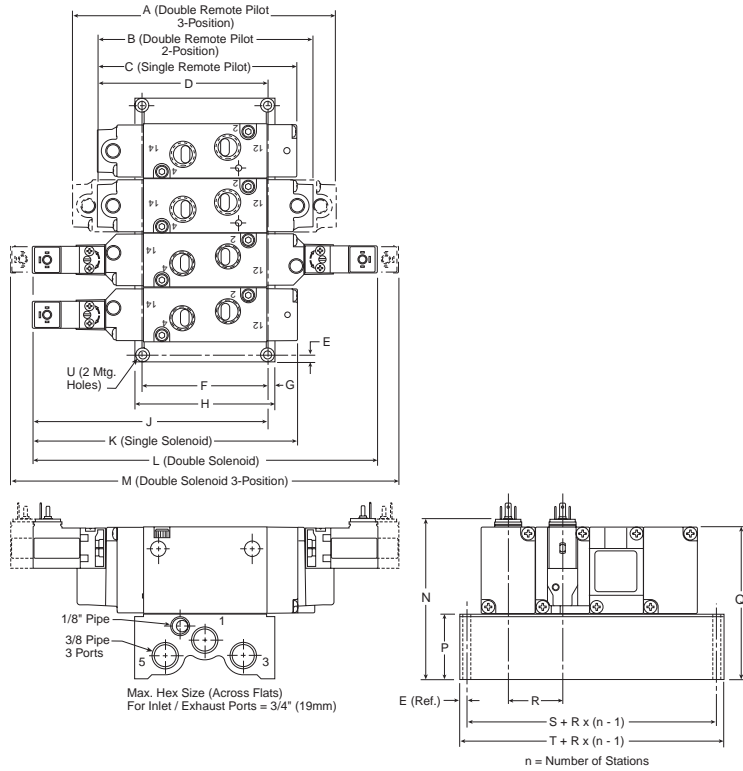
A	A₁	A₂	A₃	A₄
5.78 (147)	7.52 (191)	8.46 (215)	4.37 (110)	4.70 (119)
A₅	B	B₁	C	C₁
5.64 (143)	3.21 (82)	3.03 (77)	2.12 (54)	1.69 (43)
D	D₁	D₂	D₃	E
4.26 (108)	4.73 (120)	2.85 (72)	3.32 (40)	2.51 (65)
E₁	E₂	E₃	F	F₁
2.98 (76)	2.60 (66)	3.07 (80)	2.90 (74)	1.69 (43)
G	H	J	J₁	K
.95 (24)	.22 (5)	.84 (21)	.99 (25)	.71 (18)
L	M	N	P	R
1.50 (38)	.50 (13)	.46 (12)	Ø .27 Ø (7)	1.00 (25)

Inches (mm)



D
 Inline
 Valve Products

B5 Single & Double Operators – 4-way IEM Aluminum Bar

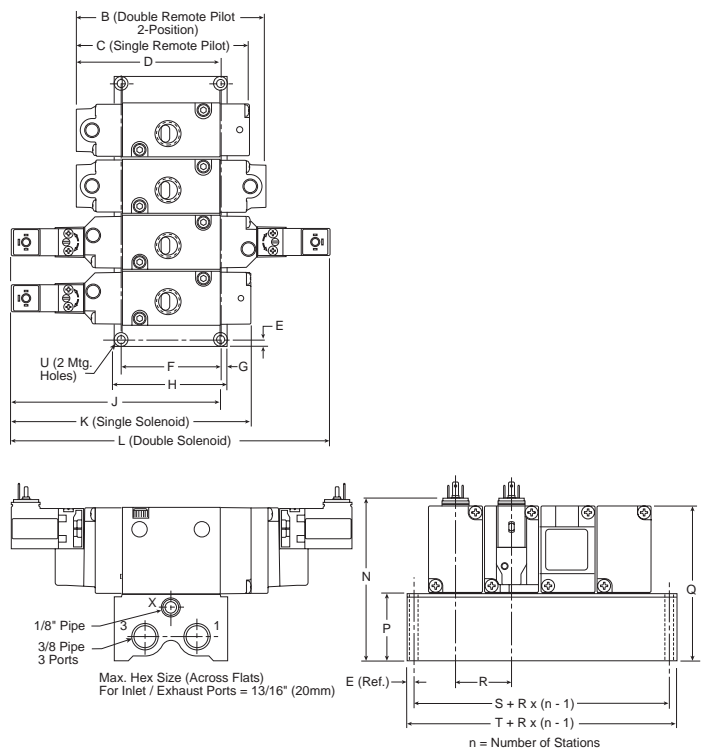


B5 4-way IEM Aluminum Bar Manifold

A	B	C	D	E
5.64 (143.3)	4.70 (119.4)	4.37 (110.0)	3.74 (95.0)	.18 (4.6)
F	G	H	J	K
2.78 (70.6)	.17 (4.3)	3.12 (79.2)	5.15 (130.8)	5.78 (146.8)
L	M	N	P	Q
7.52 (191.0)	8.46 (214.9)	3.50 (89.0)	1.44 (36.6)	3.36 (85.3)
R	S	T	U	
1.26 (32.0)	1.78 (45.2)	2.14 (54.4)	Ø .22 Ø (5.5)	

Inches (mm)

B5 Single & Double Operators – 3-way IEM Aluminum Bar



B5 3-way IEM Aluminum Bar Manifold

B	C	D	E	F
4.21 (106.9)	3.88 (98.6)	3.41 (86.6)	.18 (4.6)	2.12 (53.8)
G	H	J	K	L
.17 (4.3)	2.46 (62.5)	4.82 (122.4)	5.29 (134.4)	7.03 (178.6)
N	P	Q	R	S
3.50 (89.0)	1.44 (36.6)	3.36 (85.3)	1.26 (32.0)	1.76 (44.7)
T	U			
2.12 (53.8)	Ø .18 Ø (4.6)			

Inches (mm)

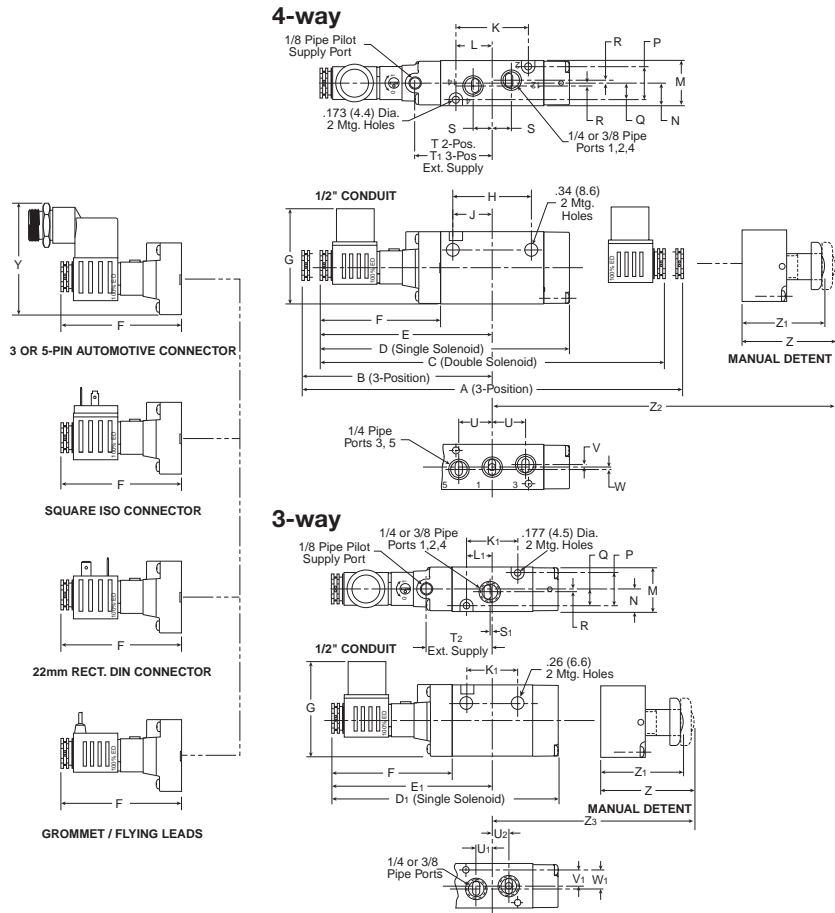
D
 Inline Valve Products

B5 3 & 4-way Alternative Electrical Enclosures

B5 Alternative – Electrical Enclosures

A	A1	B	C	D
9.94 (252.5)	.872 (221.4)	4.97 (126.2)	9.00 (228.6)	6.52 (165.6)
D1	E	E1	F	G
6.02 (152.9)	4.50 (114.3)	4.26 (108.1)	3.15 (80.0)	2.47 (62.8)
H	J	K	K1	L
2.05 (52.1)	1.03 (26.2)	1.89 (48.0)	1.40 (35.5)	.95 (24.1)
L1	M	N	P	Q
.70 (17.8)	1.18 (30.0)	.59 (15.0)	.87 (22.1)	.43 (10.9)
R	S	S1	T	T1
.08 (2.0)	.50 (12.7)	.06 (1.5)	2.01 (51.1)	2.47 (62.7)
T2	U	U1	U2	V
1.76 (44.8)	.87 (22.1)	.43 (10.9)	.45 (11.3)	.06 (1.5)
V1	W	W1	Y	Z
.37 (9.3)	.07 (1.8)	.50 (13)	2.90 (73.6)	2.40 (60.9)
Z1	Z2	Z3		
2.12 (53.8)	3.75 (95.2)	4.17 (105.8)		

Inches (mm)

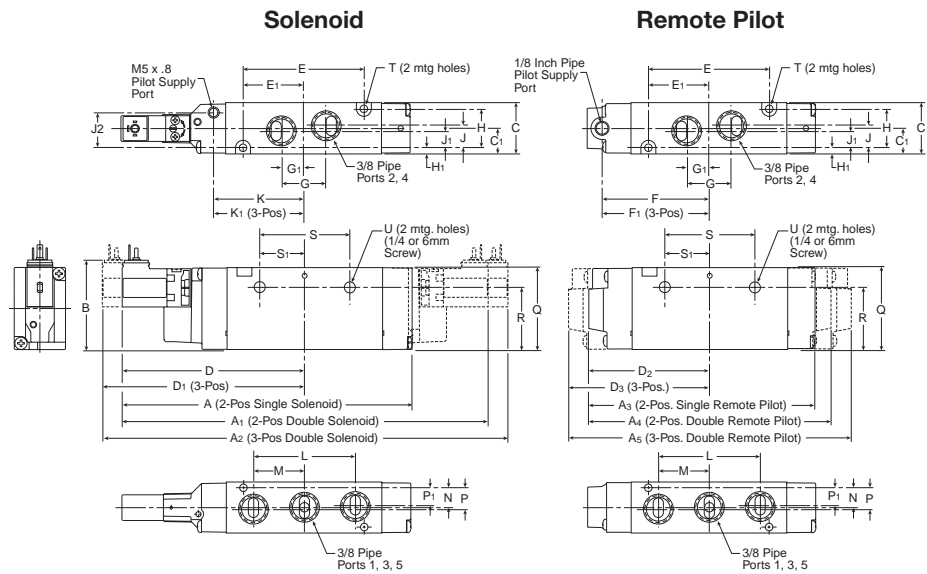


B6 Single & Double Operators – 4-way Inline

B6 4-way Inline

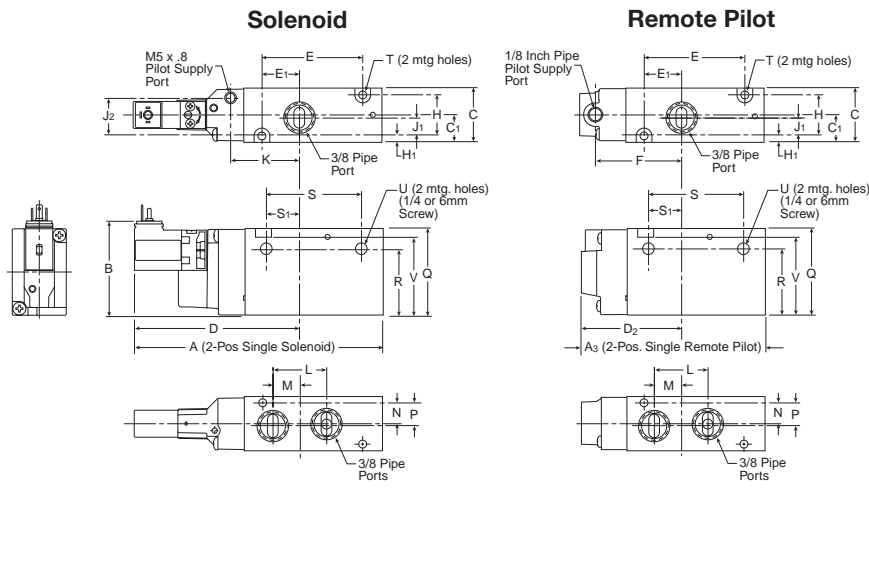
A	A1	A2	A3	A4
6.67 (169.5)	8.41 (213.7)	9.35 (237.6)	5.26 (133.7)	5.59 (142.1)
A5	B	C	C1	D
6.54 (166)	2.06 (52)	1.18 (30.0)	.59 (15)	4.21 (106.8)
D1	D2	D3	E	E1
4.68 (118.8)	2.80 (71)	3.27 (83.0)	2.79 (70.8)	1.39 (35.4)
F	F1	G	G1	H
2.45 (62.3)	2.92 (74.3)	1.03 (26.1)	.51 (13.1)	.91 (23)
H1	J	J1	J2	K
.14 (3.5)	.51 (13.1)	.39 (10)	.81 (20.6)	2.09 (53)
K1	L	M	N	P
2.56 (64.9)	2.34 (59.4)	1.17 (29.7)	.45 (11.5)	.49 (12.5)
P1	Q	R	S	S1
.41 (10.5)	1.89 (48)	1.45 (36.8)	2.09 (53)	1.04 (26.5)
T	U			
Ø .17 Ø (4.4)	Ø .27 Ø (6.9)			

Inches (mm)



D
 Inline
 Valve Products

B6 Single Operators – 3-way Inline

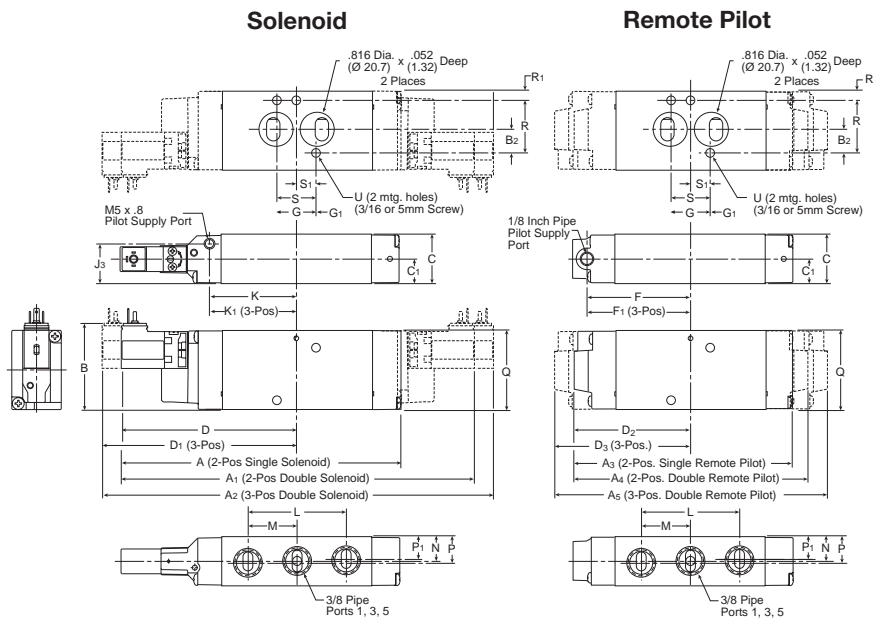


B6 3-way Inline

A 5.42 (137.7)	A₃ 4.01 (101.9)	B 2.06 (52)	C 1.18 (30.0)	C₁ .59 (15.0)
D 3.63 (92.1)	D₂ 2.22 (56.3)	E 2.19 (55.6)	E₁ 0.82 (20.7)	F 1.87 (47.6)
H .91 (23.0)	H₁ .14 (3.5)	J₁ .39 (10.0)	J₂ .81 (20.6)	K 1.51 (38.3)
L 1.17 (29.7)	M .59 (15.0)	N .45 (11.5)	P .49 (12.5)	Q 1.89 (48.0)
R 1.45 (36.8)	S 2.09 (53.0)	S₁ 0.76 (19.4)	T Ø .17 Ø (4.4)	U Ø .27 Ø (6.9)
V 1.69 (43.0)				

Inches (mm)

B6 Single & Double Operators – 4-way NAMUR Mount

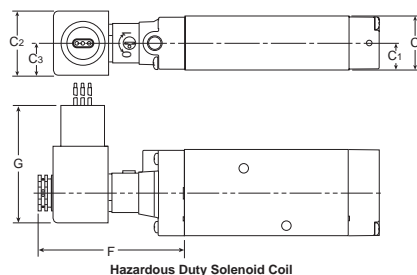


B6 4-way NAMUR Mount

A 6.67 (169.5)	A₁ 8.41 (213.7)	A₂ 9.35 (237.6)	A₃ 5.26 (133.7)	A₄ 5.59 (142.1)
A₅ 6.54 (166.0)	B 2.06 (52)	B₂ .57 (14.4)	C 1.18 (30.0)	C₁ .59 (15)
D 4.21 (106.8)	D₁ 4.68 (118.8)	D₂ 2.80 (71.0)	D₃ 3.27 (83.0)	F 2.45 (62.3)
F₁ 2.92 (74.3)	G .95 (24.2)	G₁ .02 (0.53)	J₃ .95 (24.1)	K 2.09 (53.0)
K₁ 2.56 (64.9)	L 2.34 (59.4)	M 1.17 (29.7)	N .59 (15)	P .63 (16)
P₁ .55 (14)	Q 1.89 (48.0)	R 1.26 (32)	R₁ .22 (5.5)	S .94 (24)
S₁ .47 (12)	T Ø .17 Ø (4.4)	U Ø .27 Ø (6.9)		

Inches (mm)

B6 Alternative Electrical Enclosure Option F



B6 4-way NAMUR Mount with Option F Enclosure

C 1.18 (30)	C₁ .59 (15)	C₂ 1.42 (36)	C₃ .71 (18)	F 3.15 (80)
G 2.60 (66)				

Inches (mm)

B6 Single & Double Operators – 4-way IEM Aluminum Bar

B6 4-way IEM Aluminum Bar Manifold

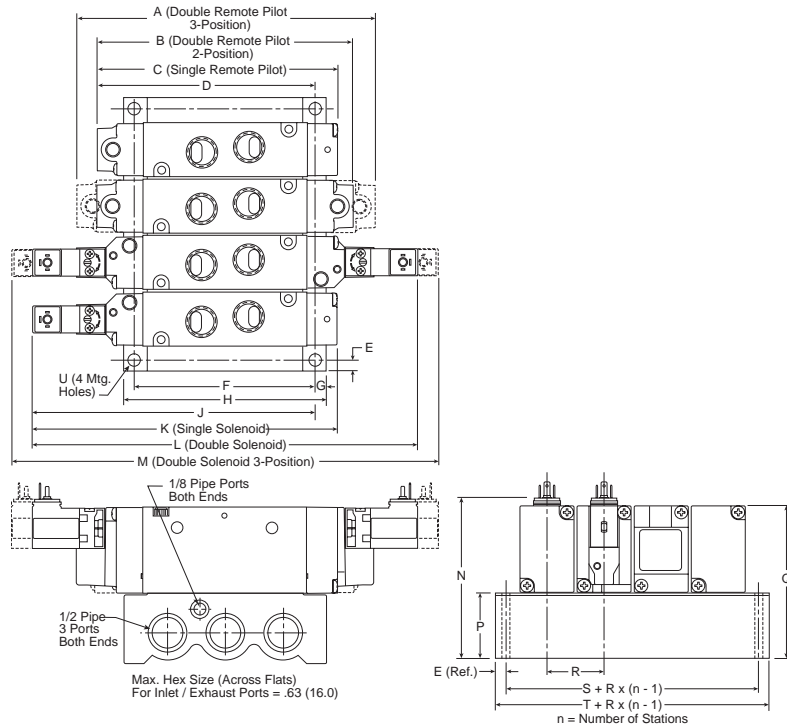
A	B	C	D	E
6.54	5.59	5.26	4.76	.24
(166.0)	(142.1)	(133.7)	(121.0)	(6.0)

F	G	H	J	K
3.94	.24	4.41	6.17	6.67
(100.0)	(6.0)	(112.0)	(156.8)	(169.5)

L	M	N	P	Q
8.41	9.35	3.60	1.54	3.43
(213.7)	(237.6)	(91.3)	(39.0)	(87.0)

R	S	T	U
1.24	1.77	2.24	∅ .26
(31.5)	(45.0)	(57.0)	∅ (6.5)

Inches (mm)



B6 Single Operators – 3-way IEM Aluminum Bar

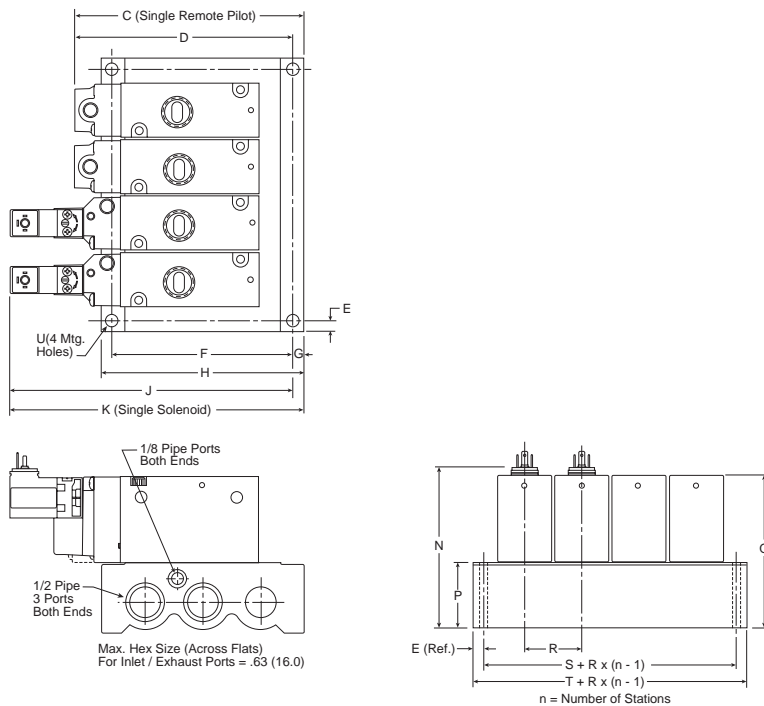
B6 3-way IEM Aluminum Bar Manifold

C	D	E	F	G
5.00	4.76	.24	3.94	.24
(127.0)	(121.0)	(6.0)	(100.0)	(6.0)

H	J	K	N	P
4.41	6.17	6.41	3.60	1.54
(112.0)	(156.8)	(162.8)	(91.3)	(39.0)

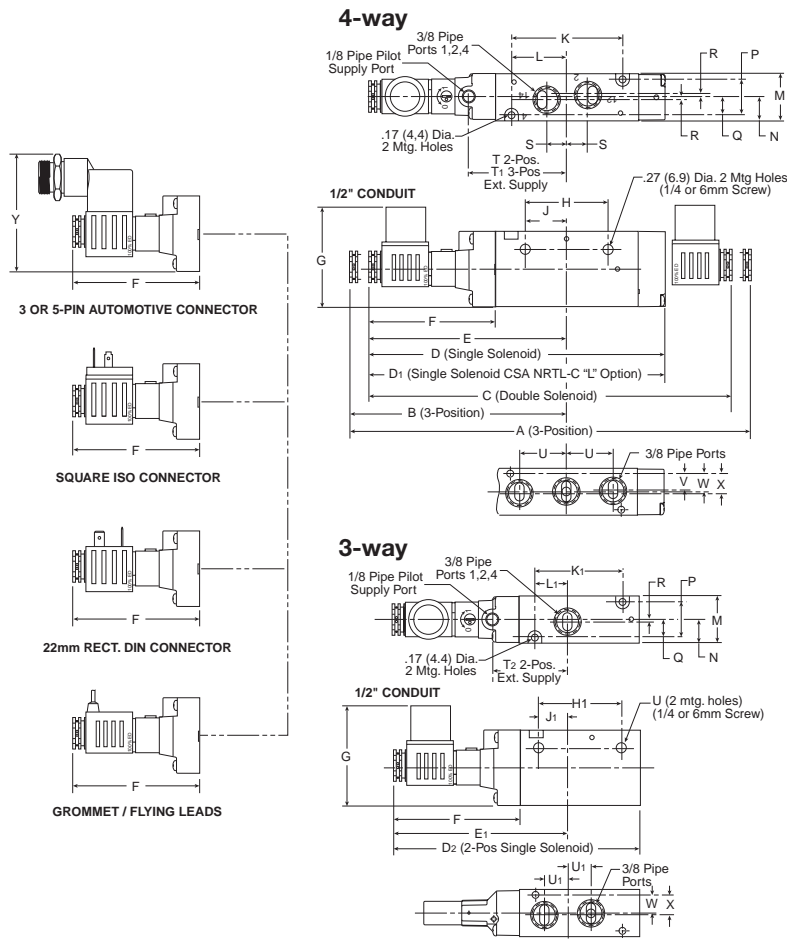
Q	R	S	T	U
3.43	1.24	1.77	2.24	∅ .26
(87.0)	(31.5)	(45.0)	(57.0)	∅ (6.5)

Inches (mm)



D
 Inline
 Valve Products

B6 3 & 4-way Alternative Electrical Enclosures

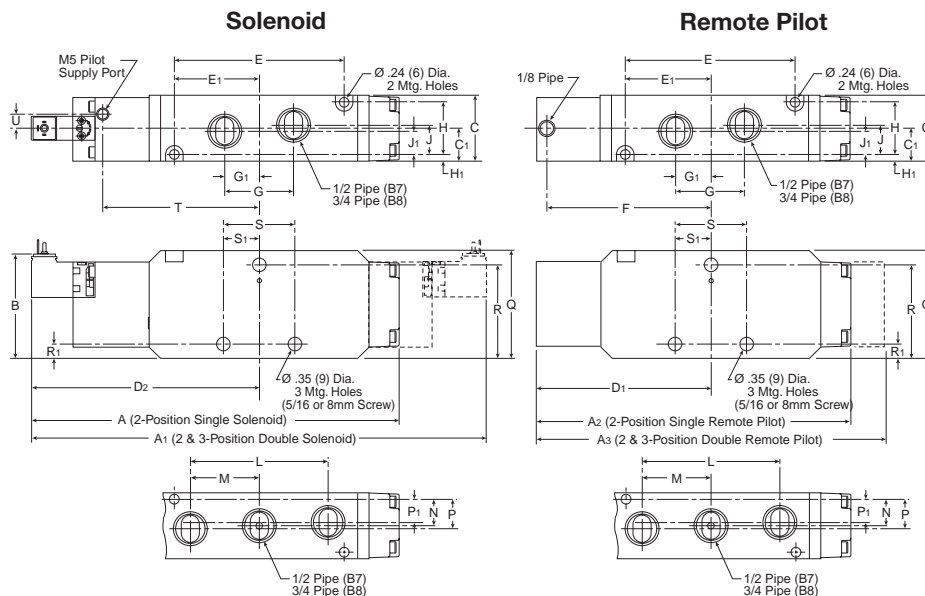


B6 Alternative – Electrical Enclosures

A	B	C	D	D1
10.84 (275.3)	5.41 (137.5)	9.89 (251.3)	7.41 (188.2)	7.74 (196.6)
D2	E	E2	F	G
6.17 (156.6)	4.94 (125.6)	4.37 (111.0)	3.15 (80.0)	2.47 (62.8)
H	H1	J	J1	K
2.09 (53.0)	2.09 (53.0)	1.04 (26.5)	0.76 (19.4)	2.79 (70.8)
K1	L	L1	M	N
2.19 (55.6)	1.39 (35.4)	.82 (20.7)	1.18 (30.0)	.59 (15.0)
P	Q	R	S	T
.91 (23.0)	.45 (11.5)	.06 (1.6)	.51 (13.1)	2.45 (62.3)
T1	T2	U	U1	V
2.93 (29.7)	1.89 (48.0)	.59 (15.0)	.59 (15.0)	.41 (10.5)
W	X	Y		
.45 (11.5)	.49 (12.5)	2.90 (73.6)		

Inches (mm)

B7& B8 Single & Double Operators – 4-way Inline



B7 & B8 4-way Inline

A	A1	A2	A3	B
9.13 (232)	11.29 (287)	7.79 (198)	8.62 (219)	2.59 (66)
C	C1	D1	D2	E
1.65 (42)	.83 (21)	4.29 (109)	5.63 (143)	4.21 (107)
E1	F	G	G1	H
2.13 (54)	4.06 (103)	1.73 (44)	.87 (22)	1.29 (33)
H1	J	J1	L	M
.16 (4)	.75 (19)	.59 (15)	3.39 (86)	1.69 (43)
N	P	P1	Q	R
.67 (17)	.75 (19)	.59 (15)	2.68 (68)	2.32 (59)
R1	S	S1	T	U
.35 (9)	1.81 (46)	.90 (23)	3.94 (100)	.35 (9)

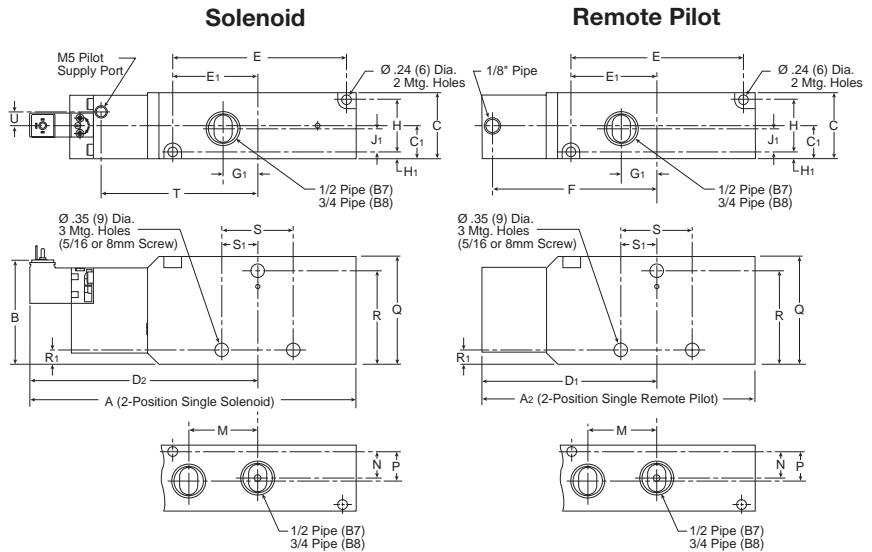
Inches (mm)

B7 & B8 Single Operators – 3-way Inline

B7 & B8 3-way Inline

A 7.99 (203)	A₂ 6.65 (169)	B 2.59 (66)	C 1.65 (42)	C₁ .83 (21)
D₁ 4.29 (109)	D₂ 5.63 (143)	E 4.21 (107)	E₁ 2.13 (54)	F 4.06 (103)
G₁ .86 (22)	H 1.29 (33)	H₁ .16 (4)	J₁ .59 (15)	M 1.69 (43)
N .67 (17)	P .75 (19)	Q 2.68 (68)	R 2.32 (59)	R₁ .35 (9)
S 1.81 (46)	S₁ .90 (23)	T 3.94 (100)	U .35 (9)	

Inches (mm)

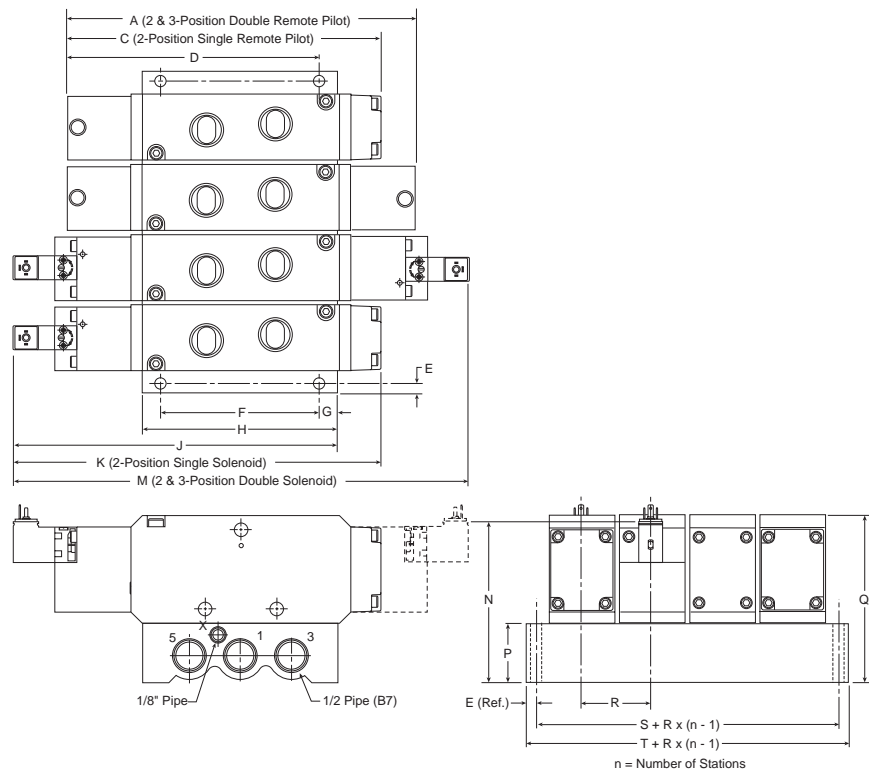


B7 & B8 Single & Double Operators – 4-way IEM Aluminum Bar

B7 & B8 4-way IEM Aluminum Bar Manifold

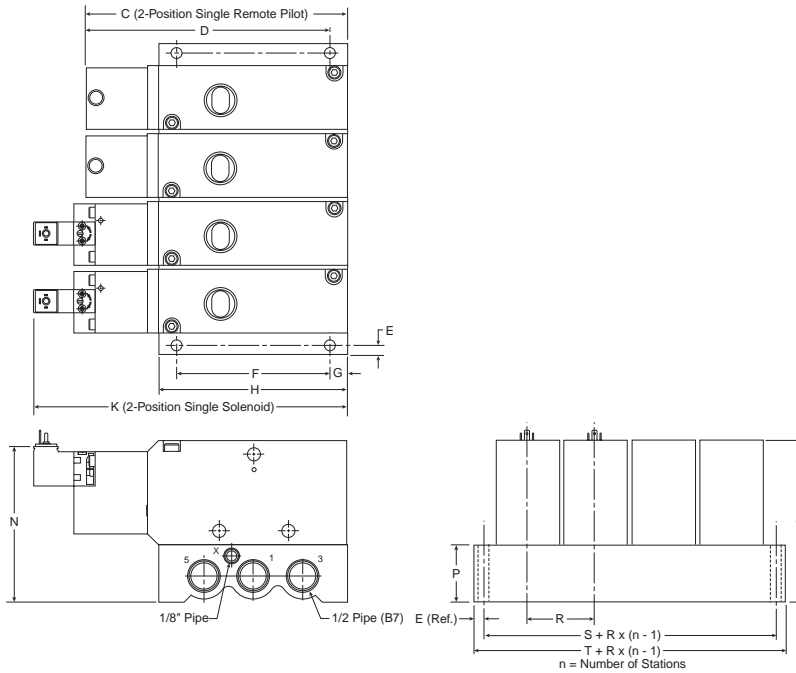
A 7.79 (198)	C 8.62 (219)	D 6.26 (159)	E .24 (6)	F 3.94 (100)
G .45 (11.5)	H 4.84 (123)	J 8.07 (205)	K 9.13 (232)	M 11.29 (287)
N 4.00 (101.5)	P 1.48 (37.5)	Q 4.15 (105.5)	R 1.77 (45)	S 2.24 (57)
T 2.72 (69)				

Inches (mm)



D
 Inline
 Valve Products

B7 & B8 Single Operators – 3-way IEM Aluminum Bar

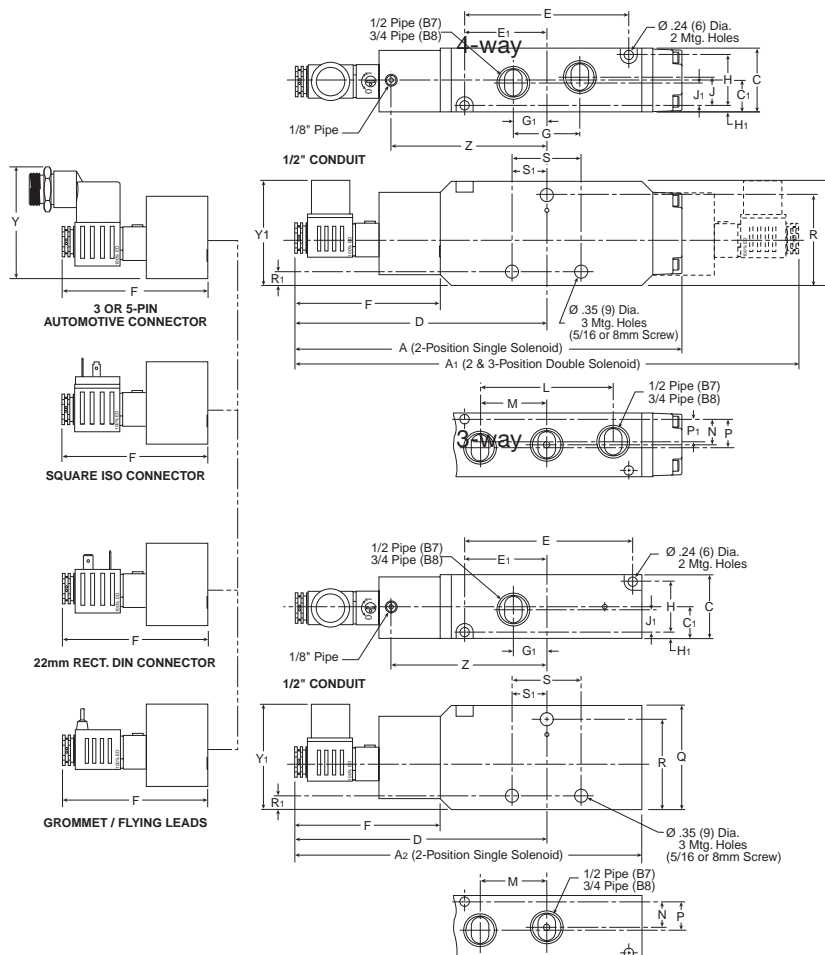


**B7 & B8 3-way IEM
 Aluminum Bar Manifold**

C	D	E	F	G
6.65 (169)	4.92 (124.9)	.24 (6)	3.94 (100)	.45 (11.5)
H	K	N	P	Q
4.84 (123)	7.99 (203)	4.00 (101.5)	1.48 (37.5)	4.15 (105.5)
R	S	T		
1.77 (45)	2.24 (57)	2.72 (69)		

Inches (mm)

B7 & B8 3 & 4-way Alternative Electrical Enclosures



**B7 & B8 3 & 4-way Alternative
 Electrical Enclosures**

A	A1	A2	C	C1
9.92 (252)	12.91 (328)	8.78 (223)	1.65 (42)	.83 (21)
D	E	E1	F	G
6.46 (164)	4.21 (107)	2.13 (54)	3.74 (95)	1.73 (44)
G1	H	H1	J	J1
.86 (22)	1.29 (33)	.16 (4)	.75 (19)	.59 (15)
L	M	N	P	P1
3.39 (86)	1.69 (43)	.67 (17)	.75 (19)	.59 (15)
Q	R	R1	S	S1
2.68 (68)	2.32 (59)	.35 (9)	1.81 (46)	.90 (23)
Y	Y1	Z		
2.87 (73)	2.71 (69)	3.98 (101)		

Inches (mm)

D

Inline
 Valve Products

The Viking Xtreme valve range is robust, versatile and combines high performance with compact installation dimensions. Large flow capacity, short change-over times and low change-over pressure are important characteristics of this valve range.

Ports

- P2LAX: 1/8 inch NPT & BSPP
- P2LBX: 1/4 inch NPT & BSPP
- P2LCX: 3/8 inch NPT & BSPP
- P2LDX: 1/2 inch & BSPP

Mounting

- Inline
- IEM aluminum bar

Solenoids

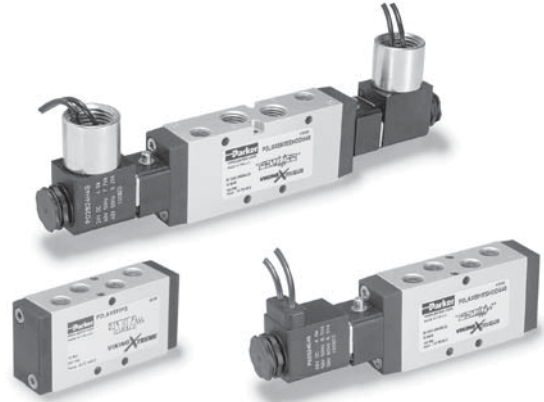
- 2.5 W to 7.3 watts
 - Conduit
 - Grommet
 - 22mm & 30mm 3-pin (DIN 43650)
- 12VDC to 240VAC W Option Available

Certification / Approval

- IP65 Rated
- ATEX option available

Mobile Applications

- Viking Xtreme tested to +5g shock and vibration
- Solenoids operate with wide voltage tolerance bands
- Corrosion resistant design



Operating information

Operating pressure:	
Normal	Vacuum to 145 PSIG (Vacuum to 10 bar)
Xtreme	Vacuum to 232 PSIG (Vacuum to 16 bar)
	Minimum: See chart
Operating temperature:	
Normal	14°F to 122°F (-10°C to 50°C)
Xtreme	-40°F to 158°F (-40°C to 70°C)

Materials

Body	Anodized aluminum
End caps	Anodized aluminum
Coils	Thermoplastic
Fasteners	Stainless Steel
Spool	Aluminum and nitrile rubber

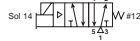
Minimum Operating Pressure

Valve type - Internal pilot	Minimum PSIG (bar)			
	P2LAX	P2LBX	P2LCX	P2LDX
Single solenoid - spring return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Single remote pilot - spring return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Double solenoid - 2-position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double remote pilot - 2-position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double solenoid - 3-position (APB, PC, CE)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)
Double remote pilot - 3-position (APB, PC, CE)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)

Most popular. For technical information see CD

D
 Inline
 Valve Products

Single Solenoid, 2-Position, Extreme Operating Pressure / Temperature



P2LAX Shown

Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.7 Cv	12VDC	P2LAX	P2LAX591ESHDDDB47 P2LAX591ESHDDG47
	1/8"	0.7 Cv	24VDC	P2LAX	P2LAX591ESHDDDB48 P2LAX591ESHDDG48
	1/4"	1.3 Cv	12VDC	P2LBX	P2LBX592ESHDDDB47 P2LBX592ESHDDG47
	1/4"	1.3 Cv	24VDC	P2LBX	P2LBX592ESHDDDB48 P2LBX592ESHDDG48
	3/8"	2.5 Cv	12VDC	P2LCX	P2LCX593ESHDDDB47 P2LCX593ESHDDG47
	3/8"	2.5 Cv	24VDC	P2LCX	P2LCX593ESHDDDB48 P2LCX593ESHDDG48
	1/2"	2.7 Cv	12VDC	P2LDX	P2LDX594ESHDDDB47 P2LDX594ESHDDG47
	1/2"	2.7 Cv	24VDC	P2LDX	P2LDX594ESHDDDB48 P2LDX594ESHDDG48

Double Solenoid, 2-Position, Extreme Operating Pressure / Temperature



P2LBX Shown

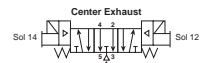
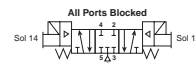
Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.7 Cv	12VDC	P2LAX	P2LAX591EEHDDDB47 P2LAX591EEHDDG47
	1/8"	0.7 Cv	24VDC	P2LAX	P2LAX591EEHDDDB48 P2LAX591EEHDDG48
	1/4"	1.3 Cv	12VDC	P2LBX	P2LBX592EEHDDDB47 P2LBX592EEHDDG47
	1/4"	1.3 Cv	24VDC	P2LBX	P2LBX592EEHDDDB48 P2LBX592EEHDDG48
	3/8"	2.5 Cv	12VDC	P2LCX	P2LCX593EEHDDDB47 P2LCX593EEHDDG47
	3/8"	2.5 Cv	24VDC	P2LCX	P2LCX593EEHDDDB48 P2LCX593EEHDDG48
	1/2"	2.7 Cv	12VDC	P2LDX	P2LDX594EEHDDDB47 P2LDX594EEHDDG47
	1/2"	2.7 Cv	24VDC	P2LDX	P2LDX594EEHDDDB48 P2LDX594EEHDDG48

Double Solenoid, 3-Position All Ports Blocked, 3-Position Center Exhaust, Extreme Operating Pressure / Temperature



P2LBX Shown

Part number



Port size	Cv	Voltage	Valve type	All ports blocked	Center exhaust
1/8"	0.5 Cv	12VDC	P2LAX	P2LAX691EEHDDG47 P2LAX691EEHDDG48	P2LAX891EEHDDG47 P2LAX891EEHDDG48
1/4"	0.9 Cv	12VDC	P2LBX	P2LBX692EEHDDG47 P2LBX692EEHDDG48	P2LBX892EEHDDG47 P2LBX892EEHDDG48
3/8"	1.8 Cv	12VDC	P2LCX	P2LCX693EEHDDG47 P2LCX693EEHDDG48	P2LCX893EEHDDG47 P2LCX893EEHDDG48
1/2"	1.9 Cv	24VDC	P2LDX	P2LDX694EEHDDG47 P2LDX694EEHDDG48	P2LDX894EEHDDG47 P2LDX894EEHDDG48

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Inline
Valve Products

Single Remote Pilot, 2-Position, Extreme Operating Pressure / Temperature



P2LAX Shown

Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.7 Cv	P2LAX	P2LAX591PS
	1/4"	1.3 Cv	P2LBX	P2LBX592PS
	3/8"	2.5 Cv	P2LCX	P2LCX593PS
	1/2"	2.7 Cv	P2LDX	P2LDX594PS

Double Remote Pilot, 2-Position, Extreme Operating Pressure / Temperature



P2LBX Shown

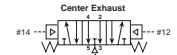
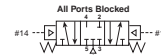
Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.7 Cv	P2LAX	P2LAX591PP
	1/4"	1.3 Cv	P2LBX	P2LBX592PP
	3/8"	2.5 Cv	P2LCX	P2LCX593PP
	1/2"	2.7 Cv	P2LDX	P2LDX594PP

Double Remote Pilot, 3-Position All Ports Blocked, 3-Position Center Exhaust, Extreme Operating Pressure / Temperature

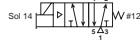


P2LBX Shown

Port size	Cv	Valve type	Part number	
			All ports blocked	Center exhaust
1/8"	0.5 Cv	P2LAX	P2LAX691PP	P2LAX891PP
1/4"	0.9 Cv	P2LBX	P2LBX692PP	P2LBX892PP
3/8"	1.8 Cv	P2LCX	P2LCX693PP	P2LCX893PP
1/2"	1.9 Cv	P2LDX	P2LDX694PP	P2LDX894PP



Single Solenoid, 2-Position, Normal Operating Pressure / Temperature



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.7 Cv	24VDC	P2LAX	P2LAX591ESNDDDB49 P2LAX591ESNDDG49
	1/8"	0.7 Cv	120VAC	P2LAX	P2LAX591ESNDDDB53 P2LAX591ESNDDG53
	1/4"	1.3 Cv	24VDC	P2LBX	P2LBX592ESNDDDB49 P2LBX592ESNDDG49
	1/4"	1.3 Cv	120VAC	P2LBX	P2LBX592ESNDDDB53 P2LBX592ESNDDG53
	3/8"	2.5 Cv	24VDC	P2LCX	P2LCX593ESNDDDB49 P2LCX593ESNDDG49
	3/8"	2.5 Cv	120VAC	P2LCX	P2LCX593ESNDDDB53 P2LCX593ESNDDG53
	1/2"	2.7 Cv	24VDC	P2LDX	P2LDX594ESNDDDB49 P2LDX594ESNDDG49
	1/2"	2.7 Cv	120VAC	P2LDX	P2LDX594ESNDDDB53 P2LDX594ESNDDG53

P2LAX Shown

Double Solenoid, 2-Position, Normal Operating Pressure / Temperature



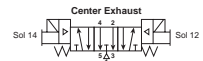
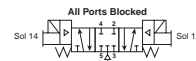
Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.7 Cv	24VDC	P2LAX	P2LAX591EENDDDB49 P2LAX591EENDDG49
	1/8"	0.7 Cv	120VAC	P2LAX	P2LAX591EENDDDB53 P2LAX591EENDDG53
	1/4"	1.3 Cv	24VDC	P2LBX	P2LBX592EENDDDB49 P2LBX592EENDDG49
	1/4"	1.3 Cv	120VAC	P2LBX	P2LBX592EENDDDB53 P2LBX592EENDDG53
	3/8"	2.5 Cv	24VDC	P2LCX	P2LCX593EENDDDB49 P2LCX593EENDDG49
	3/8"	2.5 Cv	120VAC	P2LCX	P2LCX593EENDDDB53 P2LCX593EENDDG53
	1/2"	2.7 Cv	24VDC	P2LDX	P2LDX594EENDDDB49 P2LDX594EENDDG49
	1/2"	2.7 Cv	120VAC	P2LDX	P2LDX594EENDDDB53 P2LDX594EENDDG53

P2LBX Shown

Double Solenoid, 3-Position All Ports Blocked, 3-Position Center Exhaust, Normal Operating Pressure / Temperature



Part number



Port size	Cv	Voltage	Valve type	All ports blocked	Center exhaust
1/8"	0.5 Cv	24VDC 120VAC	P2LAX	P2LAX691EENDDG49 P2LAX691EENDDG53	P2LAX891EENDDG49 P2LAX891EENDDG53
1/4"	0.9 Cv	24VDC 120VAC	P2LBX	P2LBX692EENDDG49 P2LBX692EENDDG53	P2LBX892EENDDG49 P2LBX892EENDDG53
3/8"	1.8 Cv	24VDC 120VAC	P2LCX	P2LCX693EENDDG49 P2LCX693EENDDG53	P2LCX893EENDDG49 P2LCX893EENDDG53
1/2"	1.9 Cv	24VDC 120VAC	P2LDX	P2LDX694EENDDG49 P2LDX694EENDDG53	P2LDX894EENDDG49 P2LDX894EENDDG53

P2LBX Shown

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Inline
Valve Products

IEM Bar Manifolds

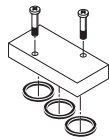


Valve type	## – Stations	Manifold only	Manifold assembly
P2LAX	02 to 12	P2LAXMAXN##NP	AAP2LAXMAXN##NP
P2LBX	02 to 12	P2LBXMAXN##NP	AAP2LBXMAXN##NP
P2LCX	02 to 12	P2LCXMAXN##NP	AAP2LCXMAXN##NP

- Utilizes Inline mount Viking Xtreme Series valves.
- **Kits include:** (1) Manifold, (2) Valve Hold Down Bolts per Station, (3) O-rings per Station.

Note: All IEM bar manifolds are 4-way only with internal pilot air supply. External pilot supply thru a common “X” port not available.

Blanking Plate



Type	Kit number
P2LAX	P2LAXK20P
P2LBX	P2LBXK20P
P2LCX	P2LCXK20P

Kit includes: (1) Plate, (2) Screws, (3) O-rings

Manifold Bolts

Type	Qty.	Kit number
P2LAX	12	P2LAXK87P
P2LBX	12	P2LBXK87P
P2LCX	12	P2LCXK87P

Manifold O-rings

Type	Qty.	Kit number
P2LAX	30	P2LAXK84P
P2LBX	18	P2LBXK84P
P2LCX	12	P2LCXK84P

**30mm Square 3-Pin – ISO 4400, DIN 43650A
 (Use with Enclosure “A”)**

Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	PS2028BP
Light – 6-48V. 50/60Hz. 6-48VDC	PS2032J79CP*	PS203279BP
Light – 120V/60Hz	PS2032J83CP*	PS203283BP
Light – 240V/60Hz	N/A	PS203283BP

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm

**22mm Rectangular 3-Pin – Type B Industrial
 (Use with Enclosure “B”)**

Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2429JBP	PS2429BP
Light – 24V/60Hz. 24VDC	PS2430J79BP*	PS243079BP
Light – 120V/60Hz	PS2430J83BP*	PS243083BP
Light – 240V/60Hz	N/A	PS243087BP

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering Data:

Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 6 to 8mm (0.24 to 0.31 Inch); Contact Spacing: 11mm

Exhaust Mufflers

Pipe thread	Part number
M5	P6M-PAC5
1/8" NPT	EM12
1/4" NPT	EM25
3/8" NPT	EM37
1/2" NPT	EM50

P6M - Plastic; EM - Sintered Bronze

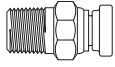
Plastic Silencers



Thread size	Part number	
	NPT	BSPT
M5	AS-5	
1/8"	ASN-6	AS-6
1/4"	ASN-8	AS-8
3/8"	ASN-10	AS-10
1/2"	ASN-15	AS-15

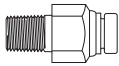
68PM Male Connector

Tube Size	Pipe thread (NPTF)	Part number
1/8	1/16	68PM-2-1
1/8	1/8	68PM-2-2
5/32	1/16	68PM-5/32-1
5/32	1/8	68PM-5/32-2
5/32	1/4	68PM-5/32-4
3/16	1/16	68PM-3-1
3/16	1/8	68PM-3-2
3/16	1/4	68PM-3-4



68PMT Male Connector

Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	68PMT-4-2
1/4	1/4	68PMT-4-4
1/4	3/8	68PMT-4-6
3/8	1/8	68PMT-6-2
3/8	1/4	68PMT-6-4
3/8	3/8	68PMT-6-6
3/8	1/2	68PMT-6-8
1/2	1/4	68PMT-8-4
1/2	3/8	68PMT-8-6
1/2	1/2	68PMT-8-8
5/8	3/8	68PMT-10-6
5/8	1/2	68PMT-10-8
3/4	1/2	68PMT-12-8



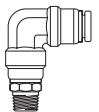
169PMNS Male Elbow Non-Swivel 90°

Tube size	Pipe thread (NPTF)	Part number
1/8	1/8	169PMNS-2-2
5/32	1/8	169PMNS-5/32-2
3/16	1/8	169PMNS-3-2
3/16	1/4	169PMNS-3-4



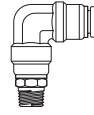
169PMT Male Elbow Swivel 90°

Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	169PMT-4-2
1/4	1/4	169PMT-4-4
1/4	3/8	169PMT-4-6
3/8	1/8	169PMT-6-2
3/8	1/4	169PMT-6-4
3/8	3/8	169PMT-6-6
3/8	1/2	169PMT-6-8
1/2	1/4	169PMT-8-4
1/2	3/8	169PMT-8-6
1/2	1/2	169PMT-8-8
5/8	3/8	169PMT-10-6
5/8	1/2	169PMT-10-8



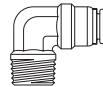
169PMTL Male Elbow Long Non-Swivel 90°

Tube Size	Pipe thread (NPTF)	Part number
3/8	1/4	169PMTL-6-4
3/8	3/8	169PMTL-6-6
3/8	1/2	169PMTL-6-8
1/2	1/2	169PMTL-8-8
5/8	1/2	169PMTL-10-8



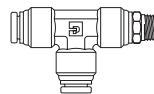
169PMTNS Male Elbow Non-Swivel 90°

Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	169PMTNS-4-2
1/4	1/4	169PMTNS-4-4
1/4	3/8	169PMTNS-4-6
3/8	1/8	169PMTNS-6-2
3/8	1/4	169PMTNS-6-4
3/8	3/8	169PMTNS-6-6
3/8	1/2	169PMTNS-6-8
1/2	1/4	169PMTNS-8-4
1/2	3/8	169PMTNS-8-6
1/2	1/2	169PMTNS-8-8
5/8	3/8	169PMTNS-10-6
5/8	1/2	169PMTNS-10-8
3/4	1/2	169PMTNS-12-8



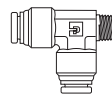
171PMT Male Run Tee Swivel

Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	171PMT-4-2
1/4	1/4	171PMT-4-4
1/4	3/8	171PMT-4-6
3/8	1/4	171PMT-6-4
3/8	3/8	171PMT-6-6
1/2	1/4	171PMT-8-4
1/2	3/8	171PMT-8-6
1/2	1/2	171PMT-8-8



171PMTNS Male Run Tee Non-Swivel

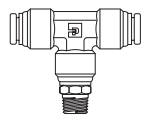
Tube 1 Size	Tube 2 Size	Part number
1/4	1/4	171PMTNS-4-4
1/4	3/8	171PMTNS-4-6-4
3/8	3/8	171PMTNS-6-4
3/8	1/4	171PMTNS-6-4-4
3/8	1/4	171PMTNS-6-4-6
1/2	3/8	171PMTNS-6-6
1/2	3/8	171PMTNS-6-8
1/2	1/2	171PMTNS-8-4



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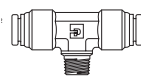
Inline
 Valve Products

172PMT Male Branch Tee Swivel



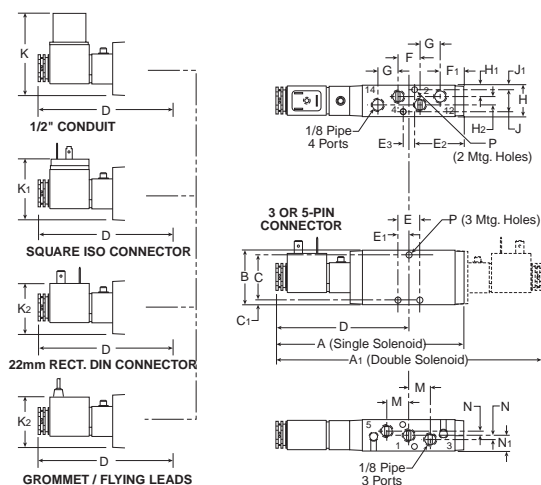
Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	172PMT-4-2
1/4	1/4	172PMT-4-4
3/8	1/8	172PMT-6-2
3/8	1/4	172PMT-6-4
3/8	3/8	172PMT-6-6
1/2	1/4	172PMT-8-4
1/2	3/8	172PMT-8-6
1/2	1/2	172PMT-8-8

172PMTNS Male Branch Tee Non-Swivel



Tube 1 Size	Tube 2 Size	Pipe thread (NPTF)	Part number
1/4	1/4	1/8	172PMTNS-4-2
3/8	3/8	1/4	172PMTNS-6-4
3/8	1/4	1/4	172PMTNS-6-4-4
3/8	3/8	3/8	172PMTNS-6-6
3/8	3/8	1/2	172PMTNS-6-8
1/2	1/2	3/8	172PMTNS-8-6
1/2	3/8	1/2	172PMTNS-8-6-8
1/2	1/2	1/2	172PMTNS-8-8

P2LAX Single & Double Operators – Solenoid

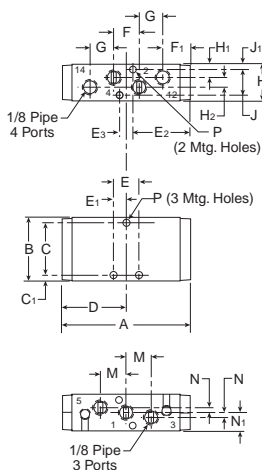


P2LAX (Solenoid)

A	A1	B	C	C1
5.31 (135)	7.72 (196)	1.57 (40)	1.30 (33)	.14 (3.5)
D	E	E1	E2	E3
3.86 (98)	.63 (16)	.31 (8)	1.42 (36)	.33 (8.5)
F	G	H	H1	H2
.63 (16)	.59 (15)	.87 (22)	.31 (8)	.24 (6)
J	J1	K	K1	K2
.63 (16)	.12 (3)	2.36 (60)	1.61 (41)	1.50 (38)
M	N	N1	P	
.63 (16)	.12 (3)	.43 (11)	Ø .16 Ø (4.1)	

Inches (mm)

P2LAX Single & Double Operators – Remote Pilot



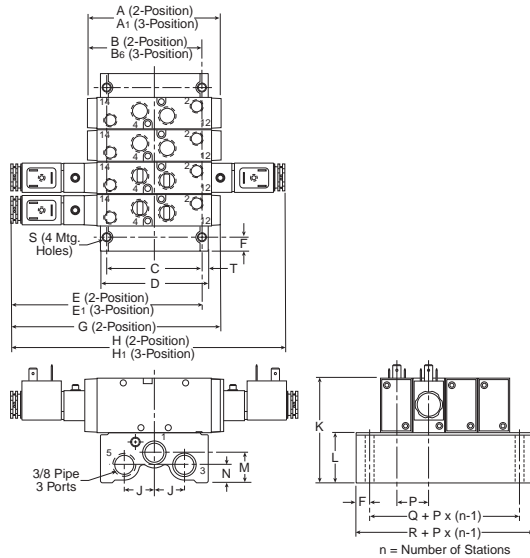
P2LAX (Remote)

A	B	C	C1	D
3.19 (81)	1.57 (40)	1.30 (33)	.14 (3.5)	1.57 (40)
E	E1	E2	E3	E3
1.47 (16)	.31 (8)	1.42 (36)	.33 (8.5)	.33 (8.5)
F	F1	G	H	H1
.63 (16)	.67 (17)	.59 (15)	.87 (22)	.31 (8)
H2	J	J1	M	N
.24 (6)	.63 (16)	.12 (3)	.63 (16)	.12 (3)
N1	P			
.43 (11)	Ø .16 Ø (4.1)			

Inches (mm)

D
 Inline Valve Products

P2LAX Single & Double Operators – IEM Aluminum Bar Manifold

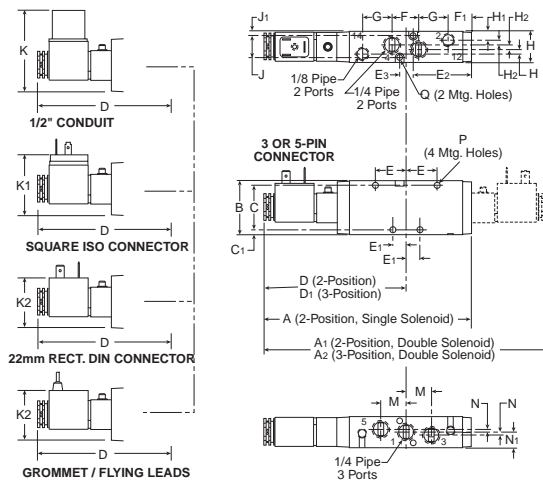


IEM Aluminum Bar Manifold

A	B	C	D	E
3.19 (81)	2.95 (75)	2.76 (70)	3.12 (79)	5.24 (133)
F	G	H	J	K
41 (10.5)	5.31 (135)	7.72 (196)	.87 (22)	3.11 (79)
L	N	P	Q	R
1.54 (39)	.52 (13.2)	.93 (23.5)	1.56 (39.5)	2.36 (60)
S	T			
Ø .22 Ø (5.5)	.18 (4.6)			

Inches (mm)

P2LBX Single & Double Operators – Solenoid

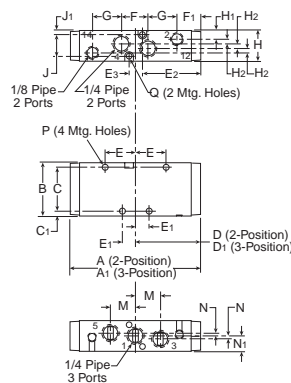


P2LBX (Solenoid)

A	A ₁	A ₂	B	C
6.14 (156)	8.39 (213)	9.06 (230)	1.57 (40)	1.26 (32)
C ₁	D	D ₁	E	E ₁
.16 (4)	4.21 (107)	4.55 (116)	.91 (23)	.39 (10)
E ₂	E ₃	F	F ₁	G
1.73 (44)	.39 (10)	.79 (20)	.67 (17)	.87 (22)
H	H ₁	H ₂	J	J ₁
.87 (22)	.26 (6.6)	.12 (3)	.65 (16.5)	.11 (2.8)
K	K ₁	K ₂	M	N
2.36 (60)	1.61 (41)	1.50 (38)	.79 (20)	.08 (2)
N ₁	P	Q		
.43 (11)	Ø .17 Ø (4.3)	Ø .12 Ø (3.1)		

Inches (mm)

P2LBX Single & Double Operators – Remote Pilot



P2LBX (Remote)

A	A ₁	B	C	C ₁
3.95 (100)	4.61 (117)	1.57 (40)	1.26 (32)	.16 (4)
D	D ₁	E	E ₁	E ₂
1.93 (49)	2.28 (58)	.91 (23)	.39 (10)	1.73 (44)
E ₃	F	F ₁	G	H
.39 (10)	.79 (20)	.67 (17)	.87 (22)	.87 (22)
H ₁	H ₂	J	J ₁	K
.26 (6.6)	.12 (3)	.65 (16.5)	.11 (2.8)	2.90 (74)
M	N	N ₁	P	
.79 (20)	.08 (2)	.43 (11)	Ø .17 Ø (4.3)	

Inches (mm)

D

Inline
 Valve Products

P2LBX Single & Double Operators – IEM Aluminum Bar Manifold

IEM Aluminum Bar Manifold

A	A ₁	B	B ₁	C
3.95 (100)	4.61 (117)	3.42 (87)	3.76 (96)	2.76 (70)

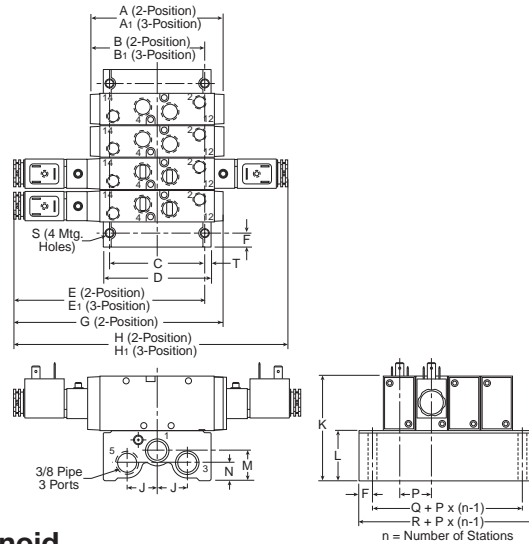
D	E	E ₁	F	G
3.12 (79)	5.47 (139)	5.81 (148)	.40 (10.2)	6.10 (155)

H	H ₁	J	K	L
8.39 (213)	9.06 (230)	.87 (22)	3.11 (79)	1.47 (37)

M	N	P	Q	R
.87 (22)	.52 (13.2)	.93 (23.5)	1.56 (39.5)	2.36 (60)

S	T
Ø .22	.18
Ø (5.5)	(4.6)

Inches (mm)



P2LCX Single & Double Operators – Solenoid

P2LCX (Solenoid)

A	A ₁	A ₂	B	C
7.64 (194)	9.84 (250)	10.71 (272)	1.89 (48)	.44 (11.2)

D	D ₁	E	E ₁	F
4.92 (125)	5.35 (136)	1.04 (26.5)	1.39 (35.4)	1.06 (27)

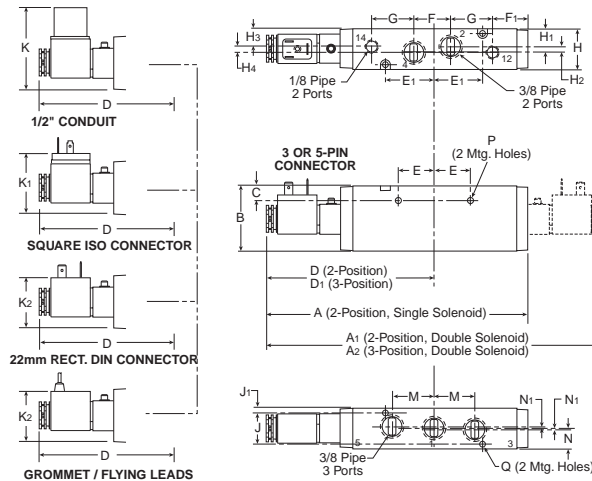
F ₁	G	H	H ₁	H ₂
1.02 (26)	1.22 (31)	1.18 (30)	.53 (13.5)	.12 (3)

H ₃	H ₄	J	J ₁	K
.51 (13)	.16 (4)	.91 (23)	.14 (3.5)	2.52 (64)

K ₁	K ₂	M	N	N ₁
1.77 (45)	1.65 (42)	1.18 (30)	.59 (15)	.04 (1)

P	Q
Ø .27	Ø .17
Ø (6.9)	Ø (4.4)

Inches (mm)



Single & Double Operators – Remote Pilot

P2LCX (Remote)

A	A ₁	B	C	D
5.51 (140)	6.38 (162)	1.89 (48)	.44 (11.2)	2.76 (70)

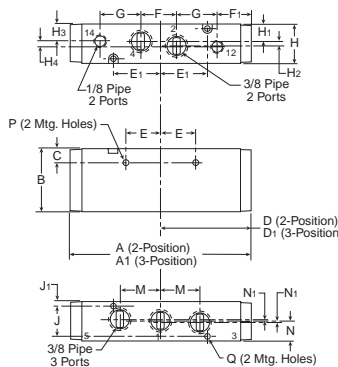
D ₁	E	E ₁	F	F ₁
3.18 (81)	1.04 (26.5)	1.39 (35.4)	1.06 (27)	1.02 (26)

G	H	H ₁	H ₂	H ₃
1.22 (31)	1.18 (30)	.53 (13.5)	.12 (3)	.51 (13)

H ₄	J	J ₁	K	M
.16 (4)	.91 (23)	.14 (3.5)	2.47 (62.8)	1.18 (30)

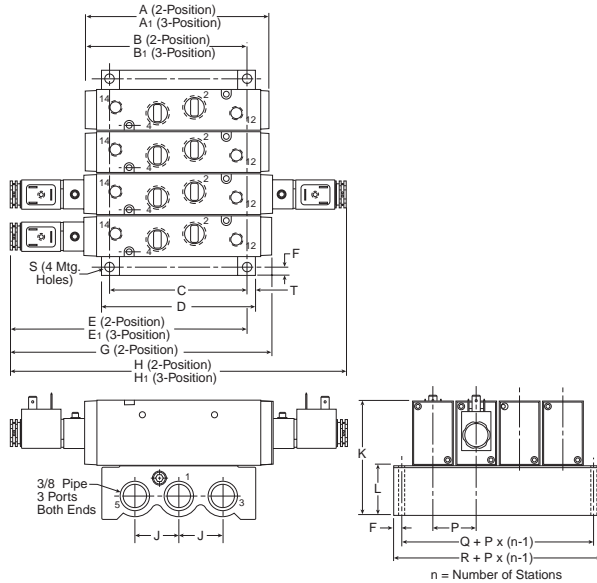
N	N ₁	P	Q
.59 (15)	.04 (1)	Ø .27 (6.9)	Ø .17 (4.4)

Inches (mm)



D
 Inline
 Valve Products

P2LCX Single & Double Operators – IEM Aluminum Bar Manifold

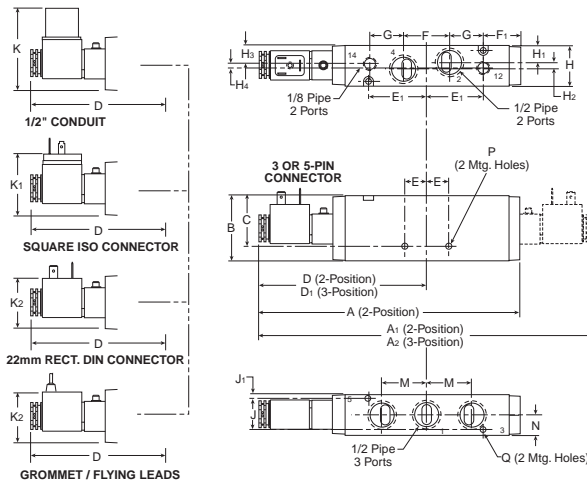


IEM Aluminum Bar Manifold

A	A1	B	B1	C
5.51	6.38	4.72	5.16	3.94
(140)	(162)	(120)	(131)	(100)
D	E	E1	F	G
4.41	6.89	7.13	.24	7.68
(112)	(170)	(181)	(6)	(195)
H	H1	J	K	L
9.84	10.71	1.26	3.43	1.54
(250)	(272)	(32)	(87)	(39)
P	R	S		
1.24	2.24	Ø .26		
(31.5)	(57)	Ø (6.5)		

Inches (mm)

P2LDX Single & Double Operators – Solenoid

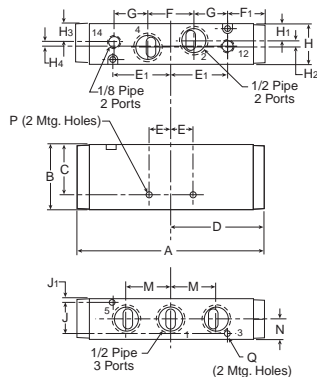


P2LDX (Solenoid)

A	A1	A2	B	C
7.64	9.84	10.70	1.89	1.59
(194)	(250)	(273)	(48)	(40.5)
D	D1	E	E1	F
4.92	5.83	.67	1.65	1.34
(125)	(148)	(17)	(42)	(34)
F1	G	H	H1	H2
1.08	.98	1.18	.49	.20
(27.5)	(25)	(30)	(12.5)	(5)
H3	H4	J	J1	K
.51	.16	.91	.14	2.52
(13)	(4)	(23)	(3.5)	(64)
K1	K2	M	N	P
1.77	1.65	1.29	.59	Ø .26
(45)	(42)	(32.7)	(15)	Ø (6.6)
Q				
Ø .17				
Ø (4.4)				

Inches (mm)

P2LDX Single & Double Operators – Remote Pilot



P2LDX (Remote)

A	B	C	D	E
5.47	1.89	1.59	2.63	.67
(139)	(48)	(40.5)	(67)	(17)
E1	F	F1	G	H
1.65	1.34	1.08	.98	1.18
(42)	(34)	(27.5)	(25)	(30)
H1	H2	H3	H4	J
.49	.20	.51	.16	.91
(12.5)	(5)	(13)	(4)	(23)
J1	P	M	N	Q
.14	Ø .26	1.29	.59	Ø .17
(3.5)	Ø (6.6)	(32.7)	(15)	Ø (4.4)

Inches (mm)

D

Inline
Valve Products

The Viking Xtreme valve range is robust, versatile and combines high performance with compact installation dimensions. Large flow capacity, short change-over times and low change-over pressure are important characteristics of this valve range.

ADEX Series is a miniature low power consumption solenoid valves, ideal for powering small to mid-sized pneumatic actuators used in automation and process applications. ADEX's versatility is further enhanced through its three mounting styles and electronic connectivity options.

Features

- Two Sizes: M5, 1/8"
- Compact body size
- Fast response < 10ms

Ports

- A00: M3
- A05: M5
- A12: 1/8 inch

Mounting

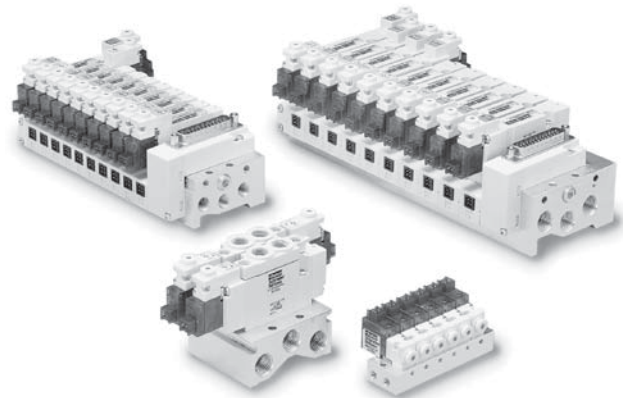
- Inline
- Subbase mount

Solenoids

- 0.6 W
- 5VDC, 12VDC, 24VDC and 110/220VAC
- LED and surge suppression

Materials

Body	Anodized aluminum
End caps	Anodized aluminum
Coils	Thermoplastic
Fasteners	Stainless Steel
Spool	Aluminum and nitrile rubber



Operating information	
Operating pressure: A00S (NO)	Vacuum to 100 PSIG (Vacuum to 6.8 bar) Vacuum to 70 PSIG (Vacuum to 4.8 bar) Minimum: See chart
Operating temperature: Intermittent Duty (AC & DC Voltage):	32°F to 122°F (0°C to 50°C) Voltage Rated +10 / -10%
Continuous Duty (DC Voltage Only):	32°F to 104°F (0°C to 40°C) Voltage Rated +0 / -10%



Minimum Operating Pressure

Description	Internal pilot		External pilot	
	PSIG	kPa	PSIG	kPa
Single Solenoid	22	152	Vacuum	
			36	248
4-way Double Solenoid – 2-Position	15	104	Vacuum	
			36	248
4-way Double Solenoid – 3-Position	30	207	Vacuum	
			36	248
3-way A00 Series	Vacuum			



* When using vacuum and pressure on ports 1 & 3 – 85 PSIG (586 kPa) NC; 58 PSIG (400 kPa) NO (see page D100).

Most popular. For technical information see CD



Single Solenoid, 4-way, 2-Position

Symbol	Port size	Cv	Voltage	Valve type	Part number
	M5	.17 Cv	24VDC	A05 inline	A05RS251PM5MF
	M5	.17 Cv	12VDC	A05 inline	A05RS252PM5MF
	1/8"	.47 Cv	24VDC	A12 inline	A12RS251PN1MF
	1/8"	.47 Cv	12VDC	A12 inline	A12RS252PN1MF
	Less base	.18 Cv	24VDC	A06 subbase	A05PS251P
	Less base	.18 Cv	12VDC	A06 subbase	A05PS252P
	Less base	.44 Cv	24VDC	A12 subbase	A12PS251P
	Less base	.44 Cv	12VDC	A12 subbase	A12PS252P

Double Solenoid, 4-way, 2-Position

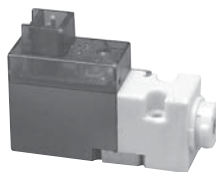
Symbol	Port size	Cv	Voltage	Valve type	Part number
	M5	.17 Cv	24VDC	A05 inline	A05RD251PM5MF
	M5	.17 Cv	12VDC	A05 inline	A05RD252PM5MF
	1/8"	.47 Cv	24VDC	A12 inline	A12RD251PN1MF
	1/8"	.47 Cv	12VDC	A12 inline	A12RD252PN1MF
	Less base	.18 Cv	24VDC	A06 subbase	A05PD251P
	Less base	.18 Cv	12VDC	A06 subbase	A05PD252P
	Less base	.44 Cv	24VDC	A12 subbase	A12PD251P
	Less base	.44 Cv	12VDC	A12 subbase	A12PD252P

Double Solenoid, 4-way, 3-Position, APB

Symbol	Port size	Cv	Voltage	Valve type	Part number
	M5	.16 Cv	24VDC	A05 inline	A05RD351PM5MF
	M5	.16 Cv	12VDC	A05 inline	A05RD352PM5MF
	1/8"	.43 Cv	24VDC	A12 inline	A12RD351PN1MF
	1/8"	.43 Cv	12VDC	A12 inline	A12RD352PN1MF
	Less base	.16 Cv	24VDC	A06 subbase	A05PD351P
	Less base	.16 Cv	12VDC	A06 subbase	A05PD352P
	Less base	.40 Cv	24VDC	A12 subbase	A12PD351P
	Less base	.40 Cv	12VDC	A12 subbase	A12PD352P

Locking flush override. Mounting screws and gaskets included with valve.

A00 Valve Only – Single Solenoid, 3-way, 2-Position*



A00SC231P Shown

* Screwdriver-Operated, Locking Manual Override (LMOR).

A00S	C23	—	1	P
Function Single solenoid normally open 023 Single solenoid normally closed C23				Connector Position P With indicator light & surge suppression
Flow Standard type Blank Large flow type J			Voltage 1 24VDC 2 12VDC 4* 5VDC 8* 110/50 VAC 9 120/60 VAC	

* Special Order

D

Inline Valve Products

A00 Valve Subbase

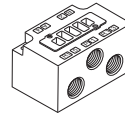
Valve type	All Ports	Part number
A00	M3	A00SBM3



Mounting screws and gaskets included with valve.

A05 & A12 Subbases

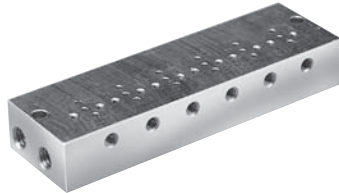
Size	Port size	Part number
A05	1/8" NPT	A05PBN1
	1/8" BSPP "G"	A05PBG1
A12	1/4" NPT	A12PBN2
	1/4" BSPP "G"	A12PBG2



A05PB

Kit Includes: (1) Subbase (Holddown bolts and gasket are included with valve)

A00 Valve Manifold*



MMFS6A00M3 Shown

* Normally closed valves (A00SC23•P) and Normally open valves (A00S023•P) cannot be mounted on the same manifold simultaneously.

MMFS	2	A00	M5
Number of stations		Port size	
2 Stations	2	M3	
3 Stations	3	M5	
4 Stations	4		
•	•		
•	•		
20 Stations	20		

A05 Valve IEM Bar Manifold



MMFU10A05F Shown

4-way, NPTF (Individual wiring type)	MMFU##A05F
4-way, NPTF (Collective wiring type)	MMCU##A05F

– stations 2 to 20
 ## – stations 2 to 12
 (Even numbers only)

A12 Valve IEM Bar Manifold



MMFU10A12F Shown

4-way, NPTF (Individual wiring type)	MMFU##A12F
4-way, NPTF (Collective wiring type)	MMCU##A12F

– stations 2 to 20
 ## – stations 2 to 12
 (Even numbers only)

A05 Valve Subbase Bar Manifold (5-Ported)



4-way, M5 (Individual Wiring Type)	MMFS##A05FM5
4-way, M5 (Collective Wiring Type)	MMCS##A05FM5

– stations 2 to 20
 ## – stations 2 to 12
 (Even numbers only)

A12 Valve Subbase Bar Manifold (5-Ported)

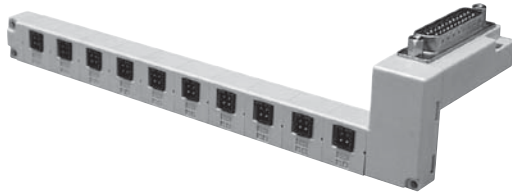


4-way, 1/8" NPTF (Individual Wiring Type)	MMFS##A12FF1
4-way, 1/8" NPTF (Collective Wiring Type)	MMCS##A12FF1

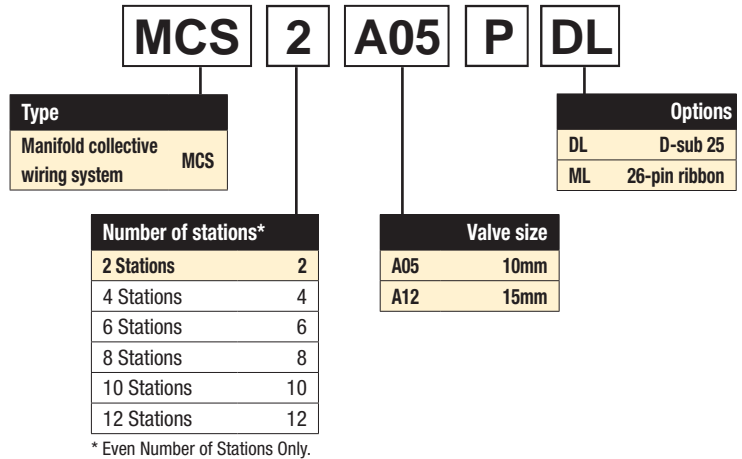
– stations 2 to 20
 ## – stations 2 to 12
 (Even numbers only)

D
 Inline Valve Products

Collective Wiring



MCS10A05PDL Shown



Individual Wired Connectors P / R Type

	Size	Voltage	Length	Part number
	A00	DC	.5 meter	A05PDCCL5
			1 meter	A05PDCCL10
			3 meter	A05PDCCL30
	A12	AC	.5 meter	A05PACCL5
			1 meter	A05PACCL10

A05PDCCL##
 DC Voltage: Positive "+" (Red Wire)
 Negative "-" (Black Wire)
 AC Voltage: Both Wires are Blue (Polarity Neutral)

Collective Wired Connectors P / R Type

		Part number	
Size		PNP	NPN
A05	Single	A05PSCCM	A05PSCC
A12	Double	A05PDCCM	A05PDCC

A05PDCC

PNP = SOURCING = "Negative Common" = Yellow Wires
 NPN = SINKING = "Positive Common" = Red Wires

Wired Connectors with Protective Cover - P / R Type

	Size	Length	Part number
	A00	1 meter	A05PDCCB10
	A05		
	A12		

The cover is made of chloroprene rubber for electrical use, assuring excellent weather and insulation resistance. However, be careful not to place it under splash of cutting oil.

Cable with Female D-Sub, 25-Pin Connector

Description	Part number
25-Pin, D-Sub cable, 1 meter (3.3 ft.)	DSS25FB1K

Note: For use with ADEX MCS system only.
 Connection to control system is through 25 colored wires AWG 24. Includes (2) M2.5 mm screws.

D

Inline Valve Products

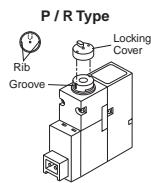
Blanking Plate

Size	Type	Part number
A00	Subbase	A00SBP
A05	Body ported	A05RGBP
	Subbase	A05PGBP
A12	Body ported	A12RGBP
	Subbase	A12PGBP

A00SBP A05RGBP A05PGBP

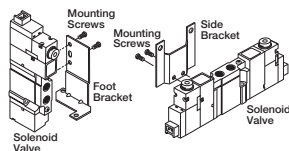
* Outlet pin cover used with collective wiring system only.

Extended Override Cover



Size	Orange: for 14 side solenoid	Green: for 12 side solenoid
A00	A05PLA	A05PLB
A05		
A12		

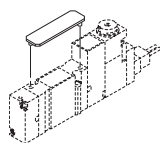
Mounting Bracket



Size	Type	Part number
A05	Side	A05RBS
	Foot	A05RBF
A12	Side	A12RBS
	Foot	A12RBF

Kit Includes: (1) Bracket, (2) Screws

Labeling Tag



Size	Description	Part number
A05	White Label Tag	A05PN
A12		

Exhaust Mufflers



Pipe thread	Part number
M5	P6M-PAC5
1/8" NPT	EM12
1/4" NPT	EM25

P6M - Plastic; EM - Sintered Bronze

Valve Products

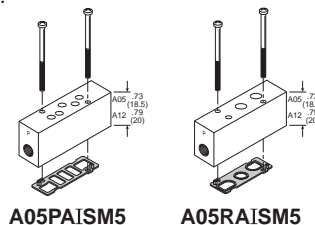
ADEX Series Valve Accessories

Plastic Silencers

Thread size	Part number	
	NPT	BSPT
M5	AS-5	N/A
1/8"	ASN-6	AS-6
1/4"	ASN-8	AS-8

Individual Air Supply Spacer

Mounts between valve and manifold. Supply from the manifold is blocked and only the valve mounted on the spacer receives the individual supply.



Size	Type	Port size	Internal pilot part number	External pilot* part number
A05	Inline	M5	A05RAISM5	A05RAXISM5
	Subbase	M5	A05PAISM5	A05PAXISM5
A12	Inline	1/8" NPT	A12RAISN1	A12RAXISN1
	Subbase	1/8" NPT	A12PAISN1	A12PAXISN1

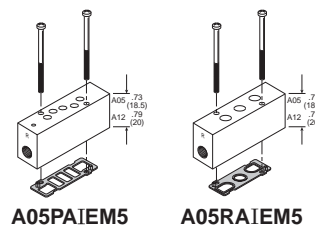
Can only be used on Collective wiring type manifolds.

* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket

Individual Air Exhaust Spacer

Mounts between valve and manifold. Exhaust from the manifold is blocked and only the valve mounted on the spacer has the individual exhaust.







Size	Type	Port size	Internal pilot part number	External pilot* part number
A05	Inline	M5	A05RAIEM5	A05RAXIEM5
	Subbase	M5	A05PAIEM5	A05PAXIEM5
A12	Inline	1/8" NPT	A12RAIEN1	A12RAXIEN1
	Subbase	1/8" NPT	A12PAIEN1	A12PAXIEN1

Can only be used on Collective wiring type manifolds.

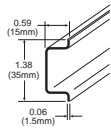
* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket

M3 & M5 Fittings

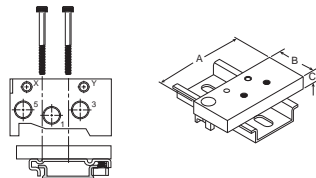
	Description	Part number
	M5 Plug Fitting	N220-1900J
	M3 to 3mm Barb	BC03M3
	M3 to 4mm Barb	BC04M3
	M5 to 3mm Barb	BC03M5

DIN Rail



Length	Part number
6 Feet	AM1DE200

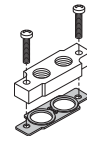
DIN Rail Hardware Kit



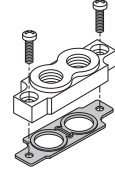
Size	Type	Dimensions			Part number
		A	B	C	
A05	IEM	2.24	1.00	.31	MFUA05DB
	Subbase	(57)	(25)	(8)	MFSA05DB
A12	IEM	2.91	1.00	.39	MFUA12DB
	Subbase	(74)	(25)	(10)	MFSA12DB

Kit includes: (2) Screws, (2) Clamps

Replacement Cylinder Port Plate Kits



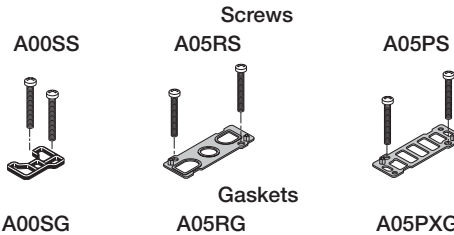
A05RABM5



A12RABN1

Size	Fitting	Part number
A05	M5	A05RABM5
A12	1/8" NPT	A12RABN1
	1/8" BSPP "G"	A12RABG1

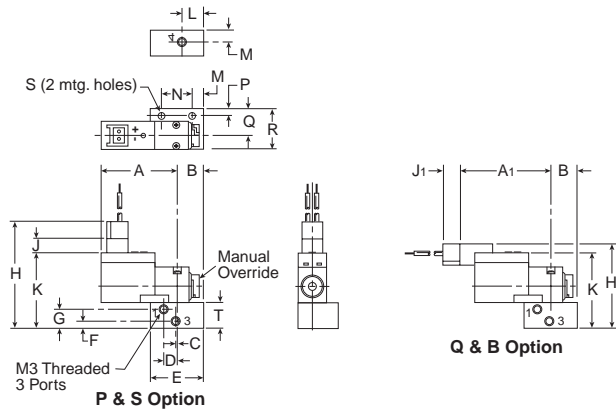
Replacement Base Gasket Kits



Size	Type	Gasket only	Screw
A00	Subbase	A00SG	A00SS
	Body Ported	A05RG	A05RS
A05	Subbase Int.	A05PG	A05PS
	Subbase Ext.	A05PXG	A05PS
A12	Body Ported	A12RG	A12RS
	Subbase Int.	A12PG	A12PS
	Subbase Ext.	A12PXG	A12PS

These are spare parts, mounting screws and gaskets included with valves.

A00 Subbase

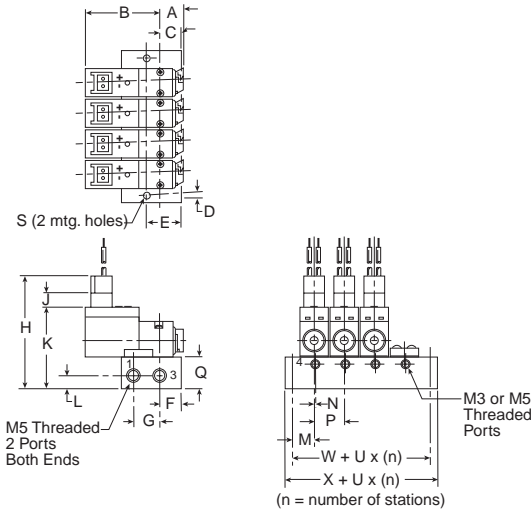


A00 - Subbase

A	A1	B	C	D
1.00 (25)	1.18 (30)	.41 (11)	.015 (.4)	.17 (4)
E	F	G	H	H1
.79 (20)	.12 (3)	.28 (7)	1.54 (39)	1.38 (34)
J	J1	K	L	M
.24 (6)	.20 (5)	1.11 (28)	.32 (8)	.18 (5)
N	P	Q	R	S
.47 (12)	.10 (3)	.39 (10)	.59 (15)	.106 (2.7)
T	.38 (10)			

Inches (mm)

A00 Manifold

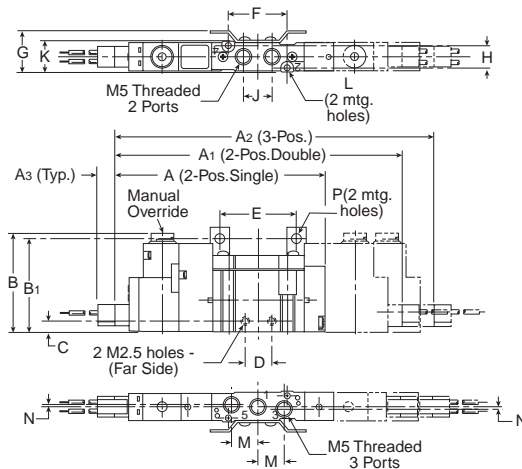


A00 - Manifold

A	B	C	D	E	
.36 (9)	1.00 (25)	.31 (8)	.10 (3)	.51 (13)	
F	G	H	J	K	
.31 (8)	.39 (10)	1.63 (42)	.20 (5)	1.22 (31)	
L	M	N	P	Q	
.20 (5)	.33 (9)	.02 (.6)	.41 (10.5)	.47 (12)	
S	U	X	W		
.125 (3.2)	.41 (10.5)	.45 (11.5)	.26 (6.5)		

Inches (mm)

A05R Single & Double Operators – Inline



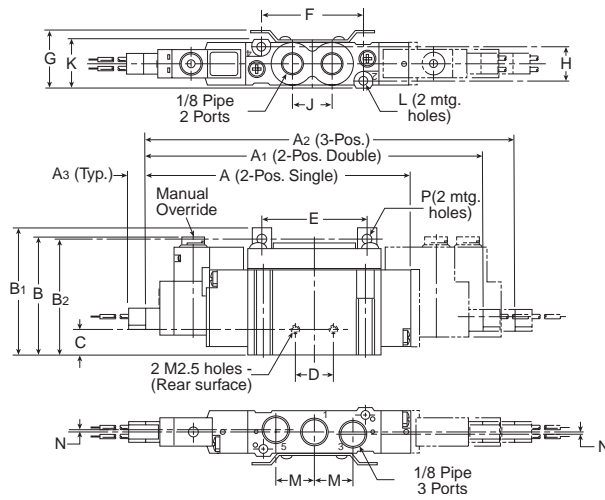
A05R – Inline

A	A1	A2	A3	B
2.91 (74)	3.94 (100)	4.25 (108)	.24 (6)	1.38 (35)
B1	C	D	E	F
1.30 (33)	.16 (4)	.38 (10)	1.06 (27)	.83 (21)
G	H	J	K	L
.57 (15)	.33 (9)	.40 (10)	.45 (11.4)	Ø .08 Ø (2.1)
M	N	P		
.37 (10)	.04 (1)	Ø .14 Ø (3.5)		

Inches (mm)

D
 Inline
 Valve Products

A12R Single & Double Operators – Inline

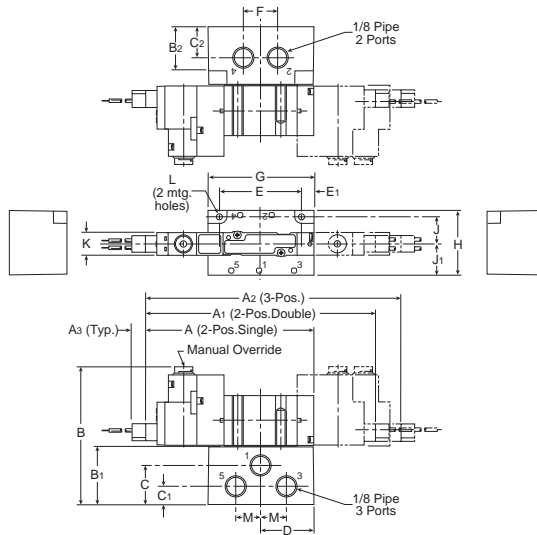


A12R – Inline

A	A1	A2	A3	B
3.68 (94)	4.69 (119)	5.12 (130)	.24 (6)	1.64 (42)
B1	B2	C	D	E
1.77 (45)	1.70 (43)	.35 (9)	.51 (13)	1.46 (37)
F	G	H	J	K
1.42 (36)	.80 (20)	.47 (12)	.55 (14)	.68 (17)
L	M	N	P	
Ø .12 Ø (3.1)	.55 (14)	.03 (0.8)	Ø .14 Ø (3.5)	

Inches (mm)

A05P Single & Double Operators – Subbase

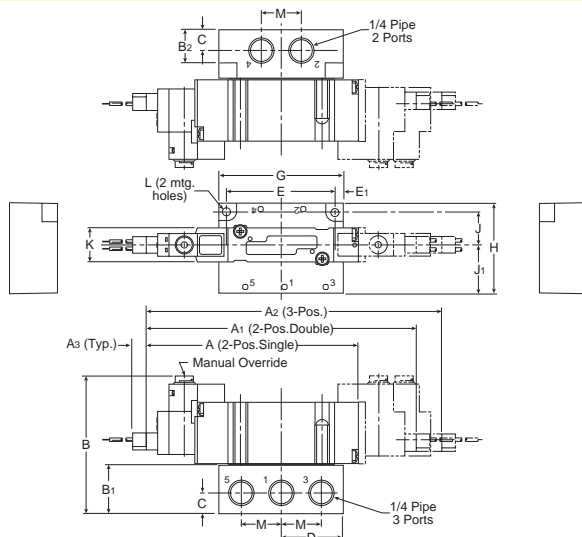


A05P – Subbase

A	A1	A2	A3	B
2.91 (74)	3.94 (100)	4.25 (108)	.24 (6)	2.35 (60)
B1	B2	C	C1	C2
.96 (25)	.75 (19)	.65 (17)	.30 (8)	.53 (14)
D	E	E1	F	G
.89 (23)	1.38 (35)	.20 (5)	.57 (15)	1.77 (45)
H	J	J1	K	L
.08 (28)	.45 (11.5)	.51 (13)	.39 (10)	Ø .13 Ø (3.2)
M				
.45 (12)				

Inches (mm)

A12P Single & Double Operators – Subbase

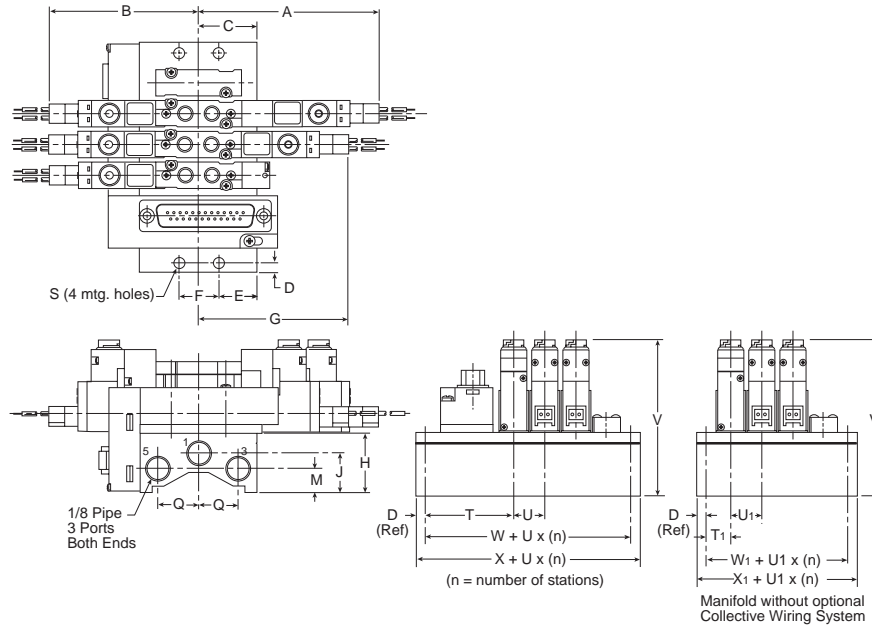


A12P – Subbase

A	A1	A2	A3	B
3.68 (94)	4.69 (119)	5.12 (130)	.24 (6)	2.41 (61)
B1	B2	C	D	E
.87 (22)	.75 (19)	.37 (10)	1.10 (28)	1.89 (48)
E1	G	H	J	J1
.16 (4)	2.20 (56)	1.59 (41)	.57 (14.5)	.87 (22)
K	L	M		
.59 (15)	Ø .17 Ø (4.3)	.71 (18)		

Inches (mm)

A05R Manifold – Valve Inline

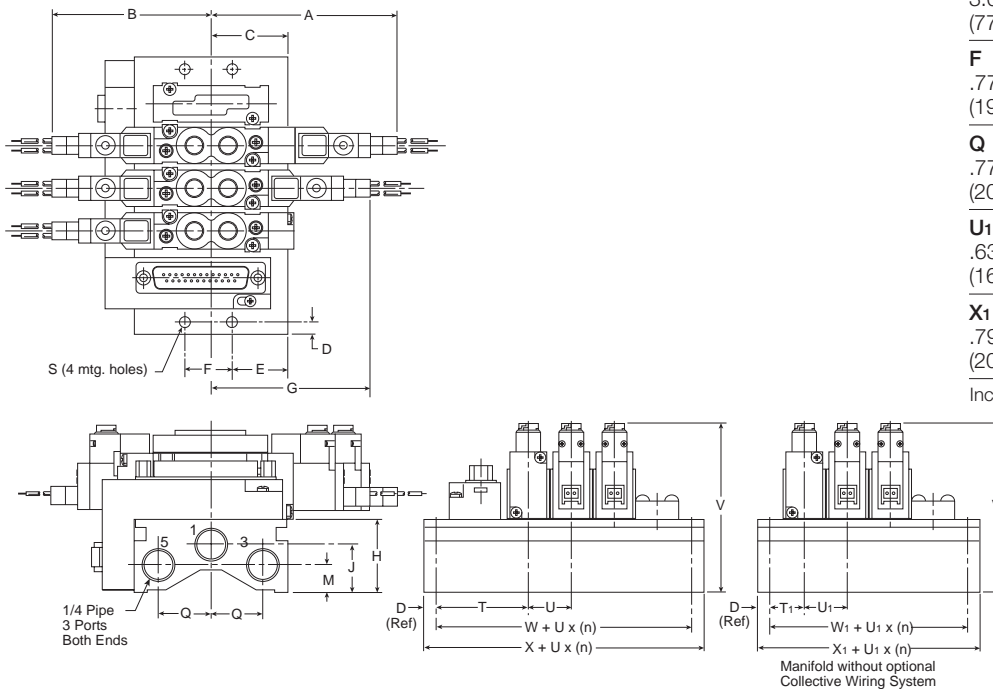


A05R - Manifold, Valve Inline

A	B	C	D	E
2.52 (64)	2.21 (56)	.94 (24)	.16 (4)	.61 (16)
F	G	H	J	M
.63 (16)	2.21 (56)	.94 (24)	.61 (16)	.37 (10)
Q	S	T	T₁	U
.63 (16)	Ø .18 Ø (4.5)	1.34 (34)	.51 (13)	.49 (12.5)
U₁	V	W	W₁	X
.41 (10.5)	2.32 (59)	1.36 (35)	.37 (9.5)	.167 (43)
X₁				
.68 (17.5)				

Inches (mm)

A12R Manifold – Valve Inline



A12R - Manifold, Valve Inline

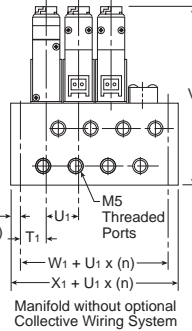
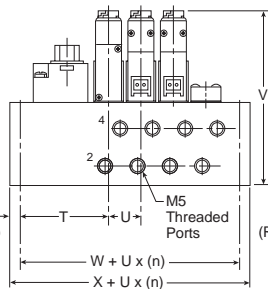
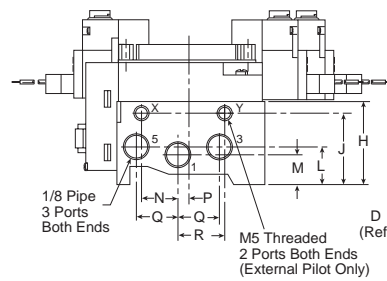
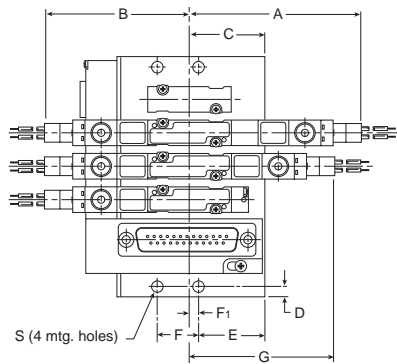
A	B	C	D	E
3.01 (77)	2.58 (66)	1.14 (29)	.20 (5)	.76 (19)
F	G	H	J	M
.77 (19.6)	2.58 (66)	1.08 (28)	.71 (18)	.41 (11)
Q	S	T	T₁	U
.77 (20)	Ø .18 Ø (4.5)	1.48 (38)	.51 (13)	.69 (17.5)
U₁	V	W	W₁	X
.63 (16)	2.74 (70)	1.34 (34)	.39 (10)	1.73 (44)
X₁				
.79 (20)				

Inches (mm)

D

Inline
 Valve Products

A05P Manifold – Side Ports

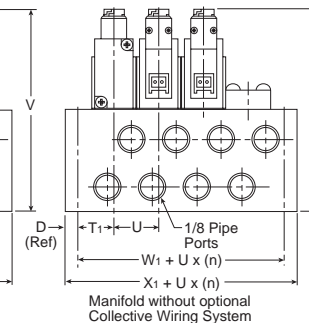
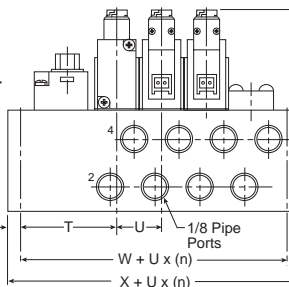
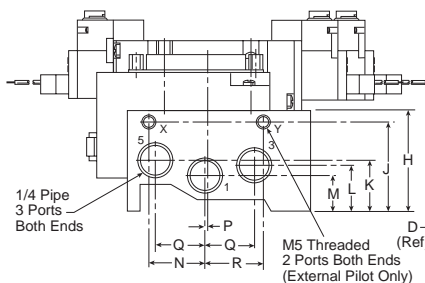
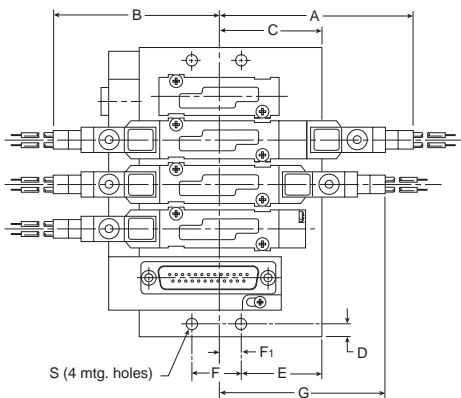


A05P – Manifold, Side Ports

A	B	C	D	E
2.52 (64)	2.21 (56)	1.12 (29)	.16 (4)	1.00 (26)
F	F1	G	H	J
.63 (16)	.19 (5)	2.21 (56)	1.26 (32)	1.08 (28)
L	M	N	P	Q
.59 (15)	.45 (11.5)	.55 (14)	.13 (3)	.63 (16)
R	S	T	T1	U
.71 (18)	∅ .18 ∅ (4.5)	1.34 (34)	.39 (10)	.49 (12.5)
U1	V	W	W1	X
.41 (10.5)	2.64 (67)	1.32 (34)	.37 (10)	1.65 (42)
X1				
.67 (18)				

Inches (mm)

A12P Manifold – Side Ports



A12P – Manifold, Side Ports

A	B	C	D	E	F
3.01 (77)	2.58 (66)	1.59 (40)	.20 (5)	1.25 (32)	.77 (20)
F	G	H	J	K	L
.34 (9)	2.58 (66)	1.57 (40)	1.38 (35)	.79 (20)	.71 (18)
M	N	P	Q	R	S
.55 (14)	.87 (22)	.04 (1)	.77 (20)	.91 (23)	∅ .18 ∅ (4.5)
T	T1	U	V	W	W1
1.48 (38)	.59 (13)	.69 (17.5)	3.09 (79)	1.34 (34)	.33 (9)
X	X1				
1.73 (44)	.73 (19)				

Inches (mm)

D

Inline
 Valve Products

For decades Parker Pneumatics and Heavy Industrial have been synonymous with durability and long life. High flow-speed N Series poppet valves have been operating in foundries, steel mills, and automotive casting & stamping plants without fail.

Features

- Continuous Duty Rated Option
- Non-Lube Service
- Hi-Flow, Short Stroke Poppet
- Indicator Lights Available

Specifications

- 2-way NC
- 3-way NO & NC
- Selector Function

Ports

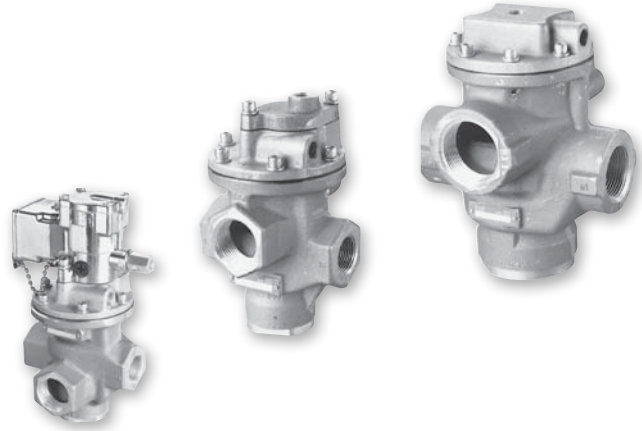
- 3/8" Body – 3/8", 1/2" NPT
- 3/4" Body – 1/2", 3/4", 1" NPT
- 1-1/4" Body – 1", 1-1/4", 1-1/2" NPT
- BSPP "G" Threads Available

Certification / Approval

- Approved to be CE Marked (Standard L-Pilot & P-Pilot)
- NEMA 4 Option
- Hazardous Duty Option IP 65 Rating / NEMA 4

Materials

Body	Cast Aluminum
Poppet assembly	Aluminum and Stainless Steel
Pilot Valve	Zinc, Stainless Steel, Brass, Copper, Zinc Plated Steel
Seals	Nitrile



Operating information

Operating pressure:

Solenoid valves - internal pilot

3/8" Basic	3/4" Basic
20 to 140 PSIG (standard)	25 to 140 PSIG (200 PSIG option available)

Solenoid valves - external supply

Air pressure thru valve (PSI)	External pilot pressure required (PSI)*	
	3/8" Basic	3/4" Basic
25 PSI	35-200	35-200
50 PSI	45-200	40-200
75 PSI	55-200	50-200
100 PSI	65-200	65-200

Vacuum up to 1" HG, less than a perfect vacuum.

* With 200 PSI option. Do not exceed 140 PSI with standard pilots.

Internal pilot - remote pilot valve

Air pressure thru valve (PSI)	Remote pilot pressure (PSI)		
	3/8" Basic	3/4" Basic	1-1/4" Basic
25 PSI	30-250	30-250	30-250
50 PSI	50-250	50-250	50-250
75 PSI	70-250	75-250	70-250
100 PSI	95-250	95-250	90-250
150 PSI	140-250	145-250	130-250
200 PSI	175-250	185-250	175-250
250 PSI	215-250	230-250	205-250

Operating temperature:


Operator type	Duty cycle*	Minimum ambient temperature	Maximum ambient temperature
		0°F (-18°C)	125°F (52°C)
Standard service	Intermittent	0°F (-18°C)	125°F (52°C)
Solenoid	Continuous	0°F (-18°C)	100°F (38°C)
Special service	Intermittent	0°F (-18°C)	125°F (52°C)
Solenoid	Continuous	0°F (-18°C)	125°F (52°C)
Remote pilot	Not applicable	0°F (-18°C)	200°F (93°C)

* Applications with pilot valves energized for ten (10) minutes or longer with a duty cycle greater than 70% are considered to be continuously energized.

$$\text{Duty cycle} = \frac{\text{Time energized}}{\text{Time energized} + \text{time off}} \times 100\% = \% \text{ Duty Cycle}$$


 Most popular. For technical information see CD

Single Solenoid

		Body Size	Cv	In / Cyl Ports	Exh. Port	2-way, 2-Position Normally Closed	3-way, 2-Position Normally Closed	3-way, 2-Position Normally Open
 <p>Normally Closed Normally Open</p>	3/8"	3.0 to 4.4	3/8"	1/2"	N315 39 045 53	N355 39 045 53	N375 39 045 53	
			1/2"	1/2"	N315 49 045 53	N355 49 045 53	N375 49 045 53	
			1/2"	3/4"	N315 59 045 53	N355 59 045 53	N375 59 045 53	
	3/4"	9.0 to 11.0	3/4"	1"	N315 69 045 53	N355 69 045 53	N375 69 045 53	
			1"	1"	N315 79 045 53	N355 79 045 53	N375 79 045 53	

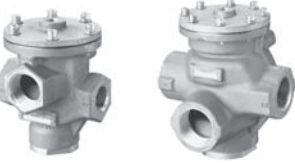
Locking Manual Override, Internal "P" Pilot 140 PSI, Standard Service, Junction Box w/ Light, 120VAC.

Single Solenoid

		Body Size	Cv	In / Cyl Ports	Exh. Port	2-way, 2-Position Normally Closed	3-way, 2-Position Normally Closed	3-way, 2-Position Normally Open
 <p>Normally Closed Normally Open</p>	1-1/4"	20.0 to 30.0	1"	1-1/4"	N325 79 047 53	N365 79 047 53	N385 79 047 53	
			1-1/4"	1-1/2"	N325 89 047 53	N365 89 047 53	N385 89 047 53	
			1-1/2"	1-1/2"	N325 99 047 53	N365 99 047 53	N385 99 047 53	

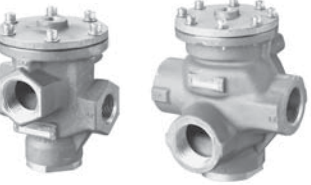
Locking Manual Override, Internal "P" Pilot 125 PSI, Standard Service, P-Pilot Junction Box w/ Light, 120VAC.

Single Remote Pilot

		Body Size	Cv	In / Cyl Ports	Exh. Port	2-way, 2-Position Normally Closed	3-way, 2-Position Normally Closed	3-way, 2-Position Normally Open
 <p>Normally Closed Normally Open</p>	3/8"	3.0 to 4.4	3/8"	1/2"	N314 31 091	N354 31 091	N374 31 091	
			1/2"	1/2"	N314 41 091	N354 41 091	N374 41 091	
			1/2"	3/4"	N314 51 091	N354 51 091	N374 51 091	
	3/4"	9.0 to 11.0	3/4"	1"	N314 61 091	N354 61 091	N374 61 091	
			1"	1"	N314 71 091	N354 71 091	N374 71 091	

1/4" NPT Remote Pilot Port with Internal Pilot Return.

Single Remote Pilot

		Body Size	Cv	In / Cyl Ports	Exh. Port	2-way, 2-Position Normally Closed	3-way, 2-Position Normally Closed	3-way, 2-Position Normally Open
 <p>Normally Closed Normally Open</p>	1-1/4"	20.0 to 30.0	1"	1-1/4"	N324 71 091	N364 71 091	N384 71 091	
			1-1/4"	1-1/2"	N324 81 091	N364 81 091	N384 81 091	
			1-1/2"	1-1/2"	N324 91 091	N364 91 091	N384 91 091	

1/4" NPT Remote Pilot Port with Internal Pilot Return.

D

Inline
 Valve Products

“N” Series 3/8", 3/4" & 1-1/4" Body Sizes - Solenoid ‘L’ Pilot

N 315 3 9 0 45 53

Valve function - solenoid	
3/8" & 3/4" Body	
2-way, normally closed	315
3-way, normally closed	355
3-way, normally open	375
1-1/4" Body	
2-way, normally closed	325
3-way, normally closed	365
3-way, normally open	385

Port size / thread type	
3/8" Body size	
3/8" Inlet & cyl - 1/2" exhaust - NPT	3
1/2" inlet & cyl - 1/2" exhaust - NPT	4
1/2" inlet & cyl - 1/2" exhaust - BSPP	N
3/4" body size	
1/2" inlet & cyl - 3/4" exhaust - NPT	5
3/4" inlet & cyl - 1" exhaust - NPT	6
3/4" inlet & cyl - 1" exhaust - BSPP	Q
1" inlet & cyl - 1" exhaust - NPT	7
1-1/4" body size	
1" inlet & cyl - 1 1/4" exhaust - NPT	7
1-1/4" inlet & cyl - 1-1/2" exhaust - NPT	8
1-1/4" inlet & cyl - 1-1/2" exhaust - BSPP	S*
1-1/2" inlet & cyl - 1-1/2" exhaust - NPT	9
1-1/2" inlet & cyl - 1-1/2" exhaust - BSPP	T*

* Not available with valve function 325.

Note: BSPP is to the ISO 228 standard, and requires an R-BSPT male fitting.

Code	Voltage			“L” pilot code		
	AC 60hz	AC 50hz	DC	Solenoid enclosure options		
				Standard duty (01, 45)	Cont. duty (04, 48)	200 PSI (46)
49			24	1, 2, 3, 5, 6, 8, 9, W	6, 8, 9	9
53	120	110		1, 2, 3, 5, 6, 8, 9, E, N, W	1, 6, 8, 9, N	8, 9, E
57	240	220		1, 3, W		

“L” pilot configuration	
01*	External pilot, std service, 140 PSI
04*	External pilot, cont duty, 140 PSI
45	Internal pilot, std service, 140 PSI
48	Internal pilot, cont duty, 140 PSI

* Not available with valve function 325, 365, and 385 (1-1/4" body).

Solenoid type	
0	Standard

Solenoid enclosure	
1	Basic pilot
2	Basic pilot NLMO
3	Basic pilot LMO
5	Junction box NLMO
6	Junction box LMO
8	Junction box NLMO w/ light
9	Junction box LMO w/ light
W	Basic pilot ext. LMO

“N” Series 1-1/4" Body Sizes - Solenoid Hi-Flow ‘P’ Pilot

N 365 8 9 0 47 53

Valve function - solenoid	
1-1/4" body	
2-Way, normally closed	325
3-Way, normally closed	365
3-Way, normally open	385

Port size / thread type	
1-1/4" body size	
1" inlet & cyl - 1 1/4" exhaust - NPT	7
1-1/4" inlet & cyl - 1-1/2" exhaust - NPT	8
1-1/4" inlet & cyl - 1-1/2" exhaust - BSPP	S
1-1/2" inlet & cyl - 1-1/2" exhaust - NPT	9
1-1/2" inlet & cyl - 1-1/2" exhaust - BSPP	T

Note: BSPP is to the ISO 228 standard, and requires an R-BSPT male fitting.

Code	Voltage			“P” pilot code	
	AC 60hz	AC 50hz	DC	Enclosure options	
				Standard duty	
49			24	5, 6	
53	120	110		5, 6, 8, 9	

“P” pilot configuration	
02	External pilot, std service, 125 PSI
47	Internal pilot, std service, 125 PSI

Solenoid type	
0	Standard

Solenoid enclosure	
5	Junction box NLMO
6	Junction box LMO
8	Junction box NLMO w/ light
9	Junction box LMO w/ light

D

Inline
Valve Products

Replacement Pilots



Description	Standard L-pilot		Continuous duty L-pilot	
	Locking	Non-locking	Locking	Non-locking
Override type	Locking	Non-locking	Locking	Non-locking
Basic with override	K065 3035**	K065 2035**	K085 3025**	K085 2025**
JIC with junction box & override	K065 6035**	K065 5035**	K085 6025**	K085 5025**
JIC pilot with junction box & override & indicator lights (120VAC only)	K065 9035**	K065 8035**	K085 9025**	K085 8025**

** Voltage code - (reference model index for availability)

Replacement Pilots



Description	Hazardous duty L-pilot		NEMA 4 L-pilot	
	Locking	Non-Locking		
Hazardous duty L-pilot - UL & CSA	K045 1025**	—		
Override type	Locking	Non-Locking		
Hazardous duty with override	K045 3025**	K045 2025**		
NEMA 4 with override			K255 3025**	K255 202549

** Voltage code - 49 & 53

Replacement Pilots

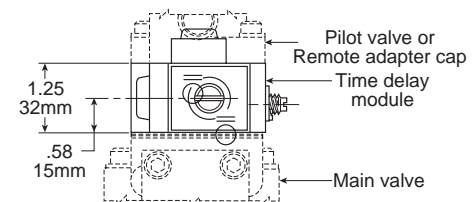
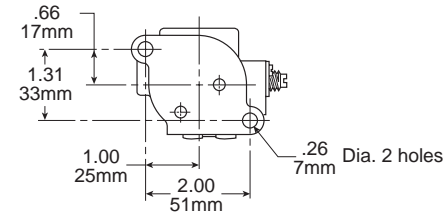



Description	Heavy duty P-Pilot		
	No override	Non-locking	Locking
Override type	No override	Non-locking	Locking
Basic with Override	K135 1045**	N/A	N/A
JIC with Junction Box & Override	N/A	K135 5045**	K135 6045**
JIC Pilot with Junction Box & Override & Indicator Lights (120VAC Only)	N/A	K135 804553	K135 904553

** Voltage code - 49 & 53

Time Delay Modules

- Delay of valve action upon application of control signal, removal of control signal or both application and removal of control signal.
- Delay intervals from 0-6, 5-12 or 10-30 seconds . . . up to several minutes with the addition of a small external reservoir.
- Repeatability within 10%, using clean filtered air.
- Change of function without disassembly . . . with line pressure on the valve.

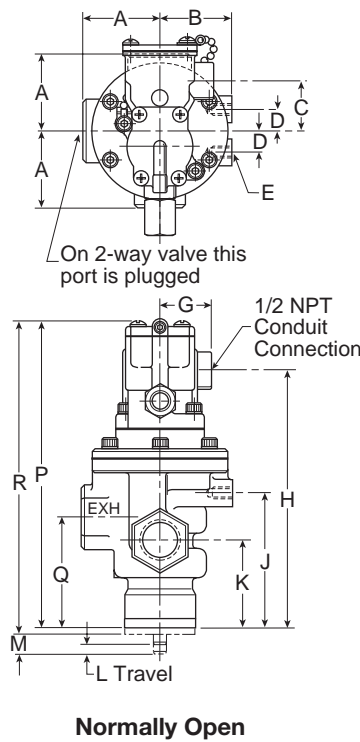
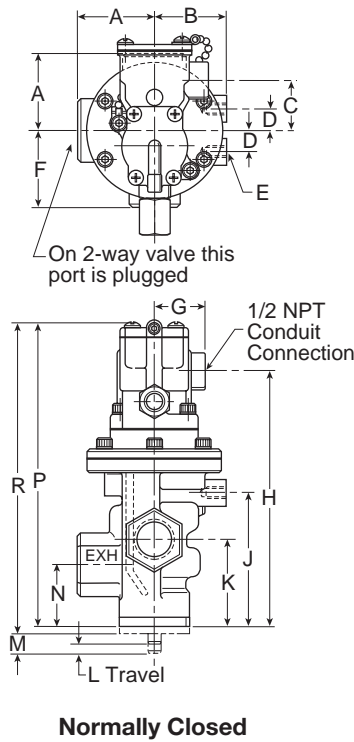


	Delay interval	Module kit number
	0-6 Seconds	K705 1001
	5-12 Seconds	K705 1002
	10-30 Seconds	K705 1003

D

Inline
 Valve Products

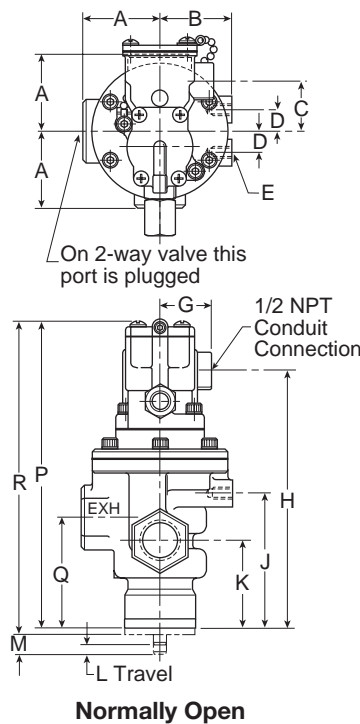
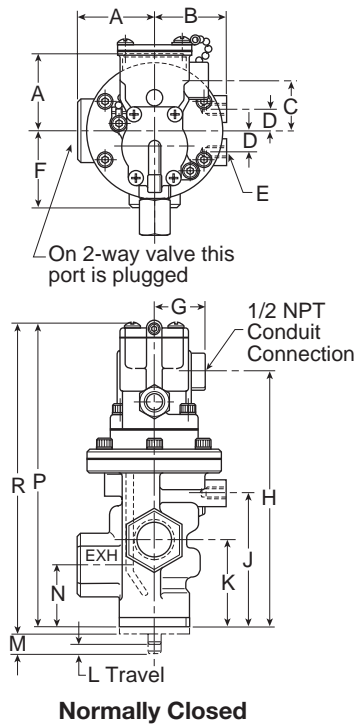
Internal Pilot - 3/8" & 3/4" Basic Body



Internal Pilot - 3/8" & 3/4" Basic Body

Key	3/8" Body		3/4" Body	
	Inch	mm	Inch	mm
A	1.56	40	2.13	54
B	1.50	38	1.94	49
C	1.81	46	1.34	34
D	.56	14	.56	14
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep	
F	1.75	44	2.25	57
G	1.50	38	1.50	38
H	5.92	150	7.14	181
J	3.19	81	3.75	95
K	1.88	47	2.44	62
L	.11	3	.16	4
M	.50	13	.50	13
N	1.44	37	1.78	45
P	7.36	196	8.58	218
Q	2.31	59	3.09	84
R	7.92	201	8.83	224

External Pilot - 3/8" & 3/4" Basic Body

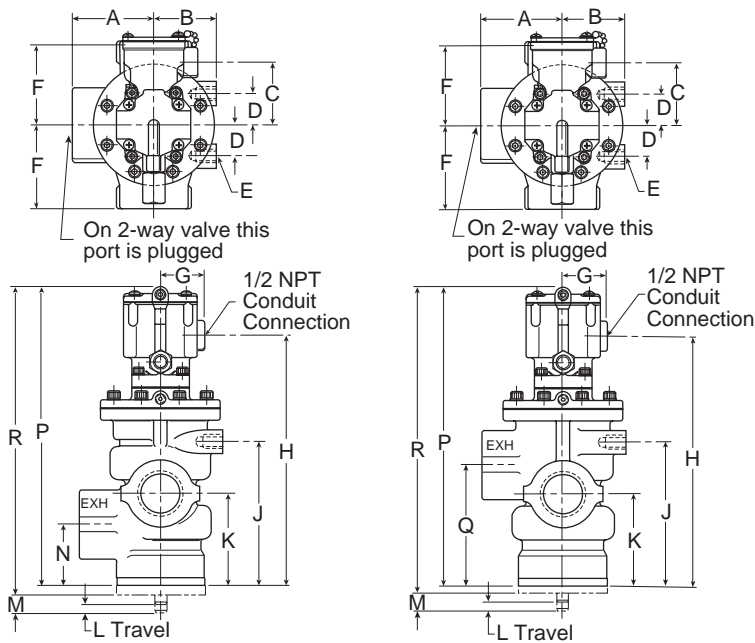


External Pilot - 3/8" & 3/4" Basic Body

Key	3/8" Body		3/4" Body	
	Inch	mm	Inch	mm
A	1.56	40	2.13	54
B	1.50	38	1.94	49
C	1.81	46	1.34	34
D	.56	14	.56	14
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep	
F	1.75	44	2.25	57
G	1.50	38	1.50	38
H	6.42	163	7.45	189
J	3.19	81	3.75	95
K	1.88	47	2.44	62
N	1.44	37	1.78	45
P	7.86	200	8.89	226
Q	2.31	59	3.09	84
R	4.34	110	5.38	137

D
 Inline Valve Products

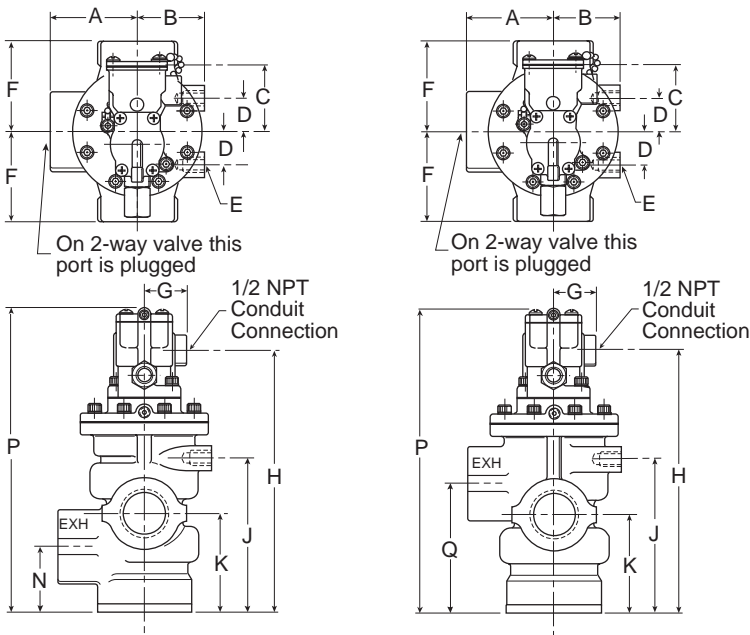
Internal Pilot - 1-1/4" Basic Body



Internal Pilot - 1-1/4" Basic Body

Key	1-1/4" Body	
	Inch	mm
A	3.00	76
B	2.25	57
C	1.34	34
D	1.19	30
E	1/2-13 UNC 3/4 Deep	
F	3.13	80
G	1.50	38
H	9.30	236
J	5.34	136
K	3.44	87
L	.25	6
M	.50	13
N	2.31	59
P	11.14	283
Q	4.56	116
R	11.48	292

Continuous Duty Pilot - 1-1/4" Basic Body



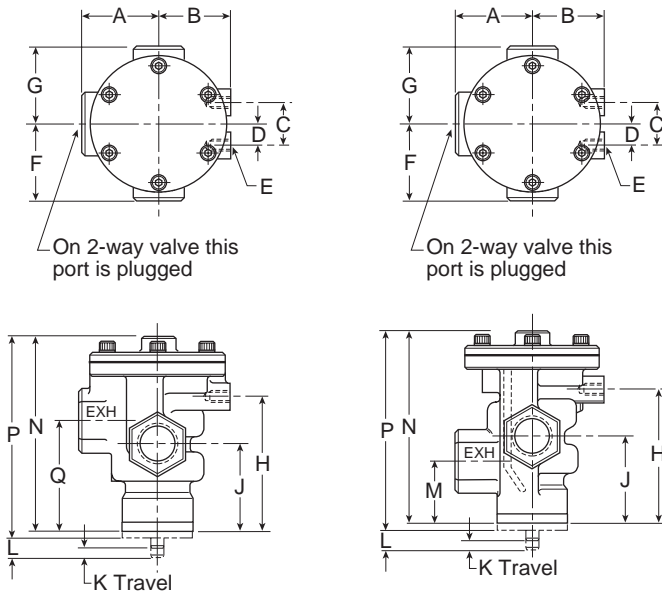
Continuous Duty Pilot - 1-1/4" Basic Body

Key	1-1/4" Body	
	Inch	mm
A	3.00	76
B	2.25	57
C	1.34	34
D	1.19	30
E	1/2-13 UNC 3/4 Deep	
F	3.13	80
G	1.50	38
H	9.02	229
J	5.34	136
K	3.44	87
N	2.31	59
P	10.45	265
Q	4.56	116

D

Inline
 Valve Products

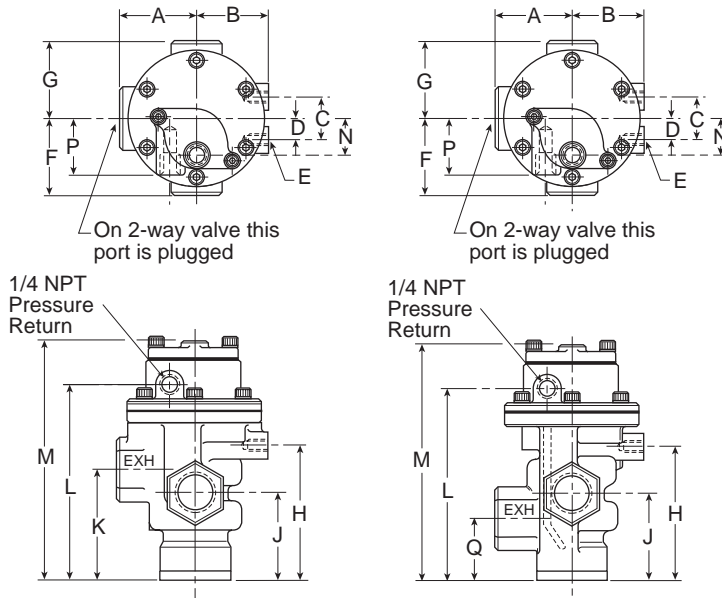
Internal Return - 3/8" & 3/4" Basic Body



**Internal Return -
 3/8" & 3/4" Basic Body**

Key	3/8" Body		3/4" Body		1-1/4" Body	
	Inch	mm	Inch	mm	Inch	mm
A	1.56	40	2.13	54	3.00	76
B	1.50	38	1.94	49	2.25	57
C	1.13	29	1.13	29	2.38	60
D	.56	14	.56	14	1.19	30
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep		1/2-13UNC 3/4" deep	
F	1.75	44	2.25	57	3.13	79
G	1.56	40	2.13	54	3.13	79
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
K	.50	13	.50	13	.50	13
L	.11	3	.16	4	.25	6
M	1.44	37	1.78	45	2.66	67
N	4.22	107	5.31	135	7.19	183
P	4.78	121	5.56	141	7.53	191
Q	2.31	59	3.09	78	4.56	116

External Return - 3/8" & 3/4" Basic Body



**Internal Return -
 3/8" & 3/4" Basic Body**

Key	3/8" Body		3/4" Body		1-1/4" Body	
	Inch	mm	Inch	mm	Inch	mm
A	1.56	40	2.13	54	3.00	76
B	1.50	38	1.94	49	2.25	57
C	1.13	29	1.13	29	2.38	60
D	.56	14	.56	14	1.19	30
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep		1/2-13UNC 3/4" deep	
F	1.75	44	2.25	57	3.13	79
G	1.56	40	2.13	54	3.13	79
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
K	2.31	59	3.09	78	4.56	116
L	4.34	110	5.38	137	7.31	186
M	5.31	135	6.34	161	7.88	200
N	Left of center .53 13		On center 1.00 25			
Q	1.44	37	1.78	45	2.31	59

D
 Inline
 Valve Products

The Moduflex Valve System redefines flexibility for pneumatic users. Whether configured from basic components or ordered as a pre-assembled and tested valve manifold, Moduflex flexibility is unmatched in the market place.

Ports

- Size 1: Push-in connectors for 5/32, 1/4 inch, 4, 6mm OD tube
- Size 2: Push-in connectors for 1/4, 3/8, 1/2 inch, 6, 8, 10, 12 mm OD tube

Mounting

- S Series – Individual subbase
- T Series – Manifold Mount with individual connectors
- V Series – Manifold Mount with collective wiring or fieldbus

Fieldbus Options

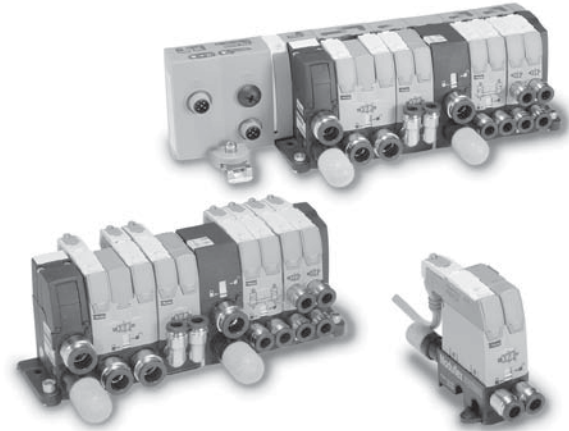
- DeviceNet, Profibus, CANopen, AS-i, Interbus-S

Solenoids

- 1.0 Watt
- 24 VDC
- Compatible with PNP or NPN outputs

Certification / Approval

- IP65 rated
- CE, as marked

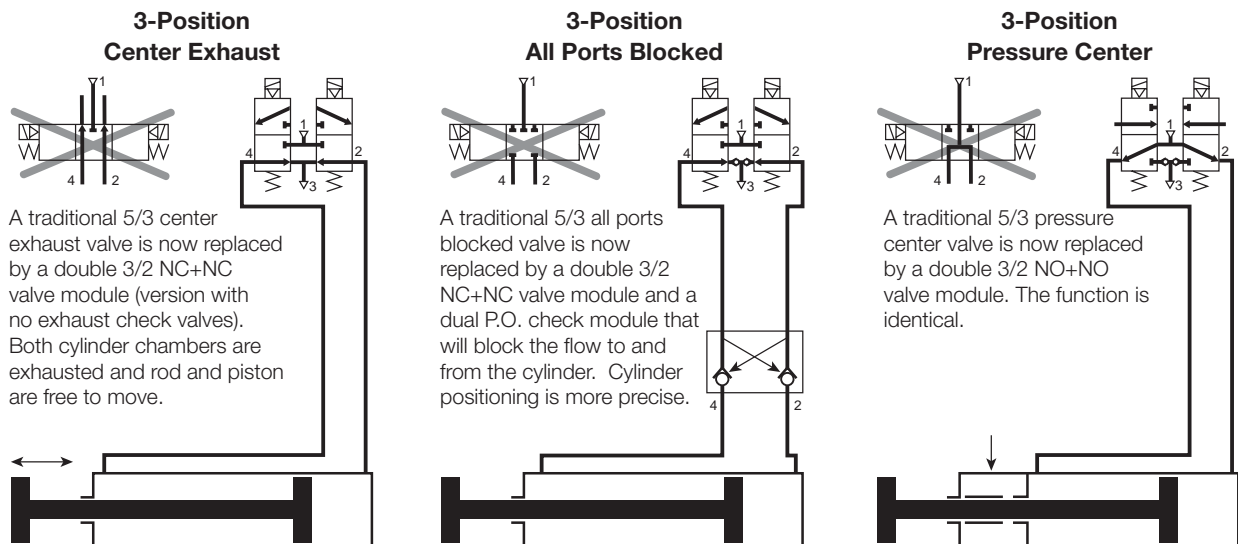


Operating information	
Operating pressure:	Vacuum to 123 PSIG (Vacuum to 8.3 bar)
Operating temperature:	5°F to 140°F (-15°C to 60°C)
Fieldbus operating temperature:	32°F to 130°F (0°C to 55°C)

Materials

Valve body	Plastic
Spool	Aluminum and nitrile rubber or ceramic plate
Subbase or manifold	Plastic
End plates (T and V series)	Plastic
Fasteners	Nickel plated steel















Dual 3/2 Valves Replace All 3-Position Valves for a Better Performance














Most popular. For technical information see CD

D
 Subbase & Manifold
 Valve Products













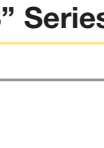

“S” Series Individual Subbase Valves Size 1 (Valve & Base without Pneumatic Connectors)

	Symbol	Type	Cv	Operator	Part number
 Single Solenoid		4-way, 2-position	0.32	Single solenoid	P2M1S4ES2C
				Single air pilot	P2M1S4PS
 Single Air Pilot		4-way, 2-position	0.32	Double solenoid	P2M1S4EE2C
				Double air pilot	P2M1S4PP
 Double Solenoid		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	P2M1SDEE2C
				Double air pilot	P2M1SDPP
 Double Air Pilot		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	P2M1SCEE2C
				Double air pilot	P2M1SCPP
 Double Solenoid		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	P2M1SEEE2C
				Double air pilot	P2M1SDEE2C
 Double Air Pilot		3-way, 2-position, NC w/ exhaust check	0.22	Single solenoid	P2M1S3ES2C
				Single air pilot	P2M1S3PS
 Double Solenoid		3-way, 2-position, dual valve, NC/NC	0.22	Double solenoid	P2M1SGEE2C
				Double air pilot	P2M1SDPP

















“S” Series Size 1 Accessories

	Description	Tube Size	Option	Part number
 	Size 1 push to connect fitting	5/32"	Elbow	CMD04-1
			Straight	FMD04-1
 	Size 1 push to connect fitting	1/4"	Elbow	CMD07-1B
			Straight	FMD07-1B
 	Size 1 push to connect fitting	6mm	Elbow	CMD06-1
			Straight	FMD06-1
	Muffler for exhaust port			MMDVA1
	Plug			PMDYY1
	Double male union		Connecting peripheral modules	HMDXX1
	M8 female connector to flying lead - IP67 LED and surge protection		2m Cable	P8LS08L226C
			5m Cable	P8LS08L526C
			9m Cable	P8LS08L926C
	Field wireable connector		M8 Connector	P8CS0803J
			M12 Connector	P8CS1204J

“S” Series Individual Subbase Valves Size 2 (Valve & Base without Pneumatic Connectors)

	Symbol	Type	Cv	Operator	Part number
 Single Solenoid		4-way, 2-position	0.8	Single solenoid	P2M2S4ES2C
				Single air pilot	P2M2S4PS
 Single Air Pilot		4-way, 2-position	0.8	Double solenoid	P2M2S4EE2C
				Double air pilot	P2M2S4PP
 Double Solenoid		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	P2M2SDEE2C
				Double air pilot	P2M2SDPP
 Double Air Pilot		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	P2M2SCEE2C
				Double air pilot	P2M2SCPP
 Double Solenoid		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	P2M2SEEE2C
				Double air pilot	P2M2S3ES2C
 Double Air Pilot		3-way, 2-position, NC w/ exhaust check	0.44	Single solenoid	P2M2S3ES2C
				Single air pilot	P2M2S3PS
 Double Solenoid		3-way, 2-position, dual valve, NC/NC	0.44	Double solenoid	P2M2SGEE2C

“S” Series Size 2 Accessories

	Description	Tube Size	Option	Part number
	Size 2 push to connect fitting	1/4" OD tube	Elbow	CMD07-2B
			Straight	FMD07-2B
	Size 2 push to connect fitting	3/8" OD tube	Elbow	CMD09-2B
			Straight	FMD09-2B
	Size 2 push to connect fitting	1/2" OD tube	Straight	FMD13-2B
				6mm OD tube
	Size 2 push to connect fitting	8mm OD tube		
				8mm OD tube
	Size 2 push to connect fitting	10mm OD tube		
				10mm OD tube
	Size 2 push to connect fitting	12mm OD tube		
				12mm OD tube
	Size 2 push to connect fitting	12mm OD tube		
				Muffler for exhaust port
	Plug			
				Double male union
	M8 female connector to flying lead - IP67 LED and surge protection			
			5m Cable	P8LS08L526C
			9m Cable	P8LS08L926C
	Field wireable connector		M8 Connector	P8CS0803J
			M12 Connector	P8CS1204J

D

Subbase & Manifold
 Valve Products

“S” Series Individual Subbase Valve
(Complete with Pneumatic and Electrical Connectors)

	P2M	1	S	4ES	2C	00	A	F4
--	------------	----------	----------	------------	-----------	-----------	----------	-----------

Basic Series	
Moduflex	P2M

Size	
Size 1	1
Size 2	2

Valve series	
Individual subbase	S

Valve type / function	
3-Way / 2-position	
Single solenoid, NC spring return	3ES
Single air pilot, NC spring return	3PS
4-Way / 2-position	
Single solenoid, spring return	4ES
Single air pilot, spring return	4PS
Double solenoid	4EE
Double air pilot	4PP
Dual 3-way, 2-position, spring return	
Solenoid, NC / NC + PO check (4/3 APB)	BEE*
Air pilot, NC / NC + PO check (4/3 APB)	BPP*
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE
Air pilot NO / NO (4/3 Pressure Ctr.)	CPP
Solenoid, NC / NC with exhaust echeck	DEE
Air pilot, NC / NC with exhaust check	DPP
Solenoid, NO / NC with exhaust check	EEE
Solenoid, NC / NC without Ccheck (4/3 Exh. Ctr.)	GEE

Operator voltage	
24VDC	2C
Remote pilot - 5/32" (4mm) Tube	00

Ports (all ports)	
C0*	10mm elbow fitting
C2*	12mm elbow fitting
C4	5/32" (4mm) elbow fitting
C6	6mm elbow fitting
C7	1/4" Elbow fitting
C8*	8mm elbow fitting
C9*	3/8" Elbow fitting
F0*	10mm elbow fitting
F2*	12mm elbow fitting
F3*	1/2" Straight fitting
F4	5/32" (4mm) straight fitting
F6	6mm straight fitting
F7	1/4" Straight fitting
F8*	8mm straight fitting
F9*	3/8" Straight fitting

* Only available with size 2 valves.

Fitting Configuration	
A*	Straight fittings
B*	Elbow fittings
C*†	Straight fitting & muffler
D*†	Elbow fitting & muffler

* Ports 1 & 3 fittings sizes are same as ports 2 & 4 (see example at left.)
 † Fitting in port 1, muffler in port 3.

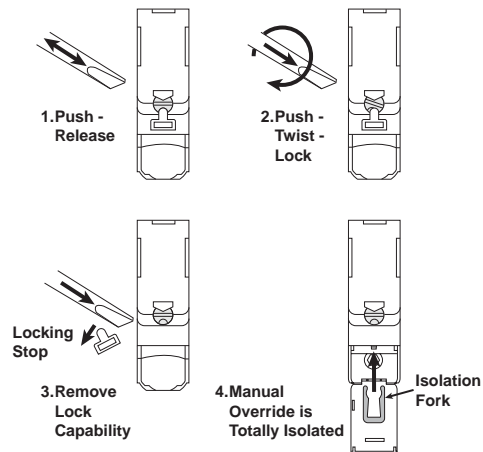
LED / Cable	
00	No cable, no LED, no surge suppression
V2	2 Meter cable with LED and surge suppression
V5	5 Meter cable with LED and surge suppression
V9	9 Meter cable with LED and surge suppression

Example for fitting configuration:	
Size 1	
CF7	Ports 1 & 3 1/4" straight fitting & muffler Ports 2 & 4 1/4" straight fittings
Size 2	
AC0	Ports 1 & 3 10mm elbow fittings Ports 2 & 4 10mm elbow fittings

With only one universal solenoid pilot for all configurations















24VDC is now a global standard for all machines.
 The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-function adaptable manual override












D
 Subbase & Manifold Valve Products

“T” Series Manifold Valves with Individual Connectors Size 1

	Symbol	Type	Cv	Operator	Part number
 Single Solenoid		4-way, 2-position	0.32	Single solenoid	P2M1T4ES2C
				Single air pilot	P2M1T4PS
 Single Air Pilot		4-way, 2-position	0.32	Double solenoid	P2M1T4EE2C
				Double air pilot	P2M1T4PP
 Double Solenoid		4-way, 2-position, dual valve w/ exhaust check	0.18	Double solenoid	P2M1TJEE2C
				Double air pilot	P2M1TJPP
 Double Air Pilot		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	P2M1TDDEE2C
				Double air pilot	P2M1TDPP
		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	P2M1TCEE2C
				Double air pilot	P2M1TCPP
		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	P2M1TEEE2C
				Single solenoid	P2M1T3ES2C
		3-way, 2-position, dual valve, NC/NC	0.22	Single air pilot	P2M1T3PS
				Double solenoid	P2M1TGEE2C

“T” Series Size 1 Accessories

	Description	Tube Size	Option	Part number
	Size 1 push to connect fitting	5/32" or 4mm	Elbow	CMD04-1
			Straight	FMD04-1
	Size 1 push to connect fitting	1/4"	Elbow	CMD07-1B
			Straight	FMD07-1B
	Size 1 push to connect fitting	6mm	Elbow	CMD06-1
			Straight	FMD06-1
	Muffler for exhaust port			MMDVA1
	Plug			PMDYY1
	Double male union		Connecting peripheral modules	HMDXX1
	M8 female connector to flying lead - IP67 LED and surge protection		2M cable	P8LS08L226C
			5M cable	P8LS08L526C
			9M cable	P8LS08L926C
	Field wireable connector		M8 connector	P8CS0803J
			M12 connector	P8CS1204J
	Torx screwdriver			P2M1K0TASD

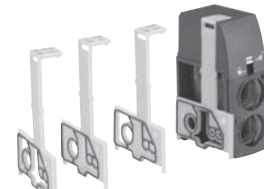
Manifold Options

Module	Part number
Pneumatic end plate kit	P2M2HXT01*
Pneumatic end plate kit with torx screwdriver	P2M2HXT0T*
Intermediate supply module (Includes 4 configuration plates)	P2M2BXT0A*

* Use Fittings for Size 2 Modules Only



P2M2HXT01
















P2M2BXT0A


















D

Subbase & Manifold
 Valve Products

“T” Series Manifold Valves with Individual Connectors Size 2

	Symbol	Type	Cv	Operator	Part number
 Single Solenoid		4-way, 2-position	0.8	Single solenoid	P2M2T4ES2C
				Single air pilot	P2M2T4PS
 Single Air Pilot		4-way, 2-position	0.8	Double solenoid	P2M2T4EE2C
				Double air pilot	P2M2T4PP
 Double Solenoid		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	P2M2TDEE2C
				Double air pilot	P2M2TDPP
 Double Air Pilot		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	P2M2TCEE2C
				Double air pilot	P2M2TCPP
		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	P2M2TEEE2C
					Single solenoid
		3-way, 2-position, dual valve, NC/NC	0.44	Single air pilot	P2M2T3PS
				Double solenoid	P2M2TGEE2C

“T” Series Size 2 Accessories

	Description	Tube size	Option	Part number
	Size 2 push to connect fitting	1/4"	Elbow	CMD07-2B
			Straight	FMD07-2B
	Size 2 push to connect fitting	3/8"	Elbow	CMD09-2B
			Straight	FMD09-2B
	Size 2 push to connect fitting	1/2"	Straight	FMD13-2B
				Elbow
	Size 2 push to connect fitting	6mm	Straight	FMD06-2
				Elbow
	Size 2 push to connect fitting	8mm	Straight	FMD08-2
				Elbow
	Size 2 push to connect fitting	10mm	Straight	FMD10-2
				Elbow
	Size 2 Push to connect fitting	12mm	Straight	FMD12-2
				Muffler for exhaust port
	Plug			PMDYY2
	Double male union		Connecting peripheral modules	HMDXX2
	M8 female connector to flying lead - IP67 LED and surge protection		2M cable	P8LS08L226C
			5M cable	P8LS08L526C
			9M cable	P8LS08L926C
	Field wireable connector		M8 connector	P8CS0803J
			M12 connector	P8CS1204J
	Torx screwdriver			P2M1K0TASD

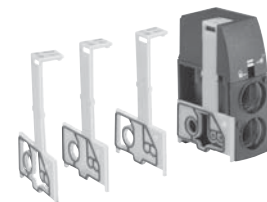
Manifold Options

Module	Part number
Pneumatic end plate kit	P2M2HXT01*
Pneumatic end plate kit with torx screwdriver	P2M2HXT0T*
Intermediate supply module (Includes 4 configuration plates)	P2M2BXT0A*

* Use Fittings for Size 2 Modules Only



P2M2HXT01



P2M2BXT0A

"T" Series Valve Manifold with Individual Connectors
(Complete with Pneumatic and Electrical Connectors)

P2M 1 T 4ES 2C 00 0 F4

Basic series	
Valvetronic modules	P2M

Size	
Size 1	1
Size 2	2

Valve series	
Individual wire	T

Valve type / function	
3-Way / 2-position	
Single solenoid, NC spring return	3ES
Single air pilot, NC spring return	3PS
4-Way / 2-position	
Single solenoid, spring return	4ES
Single air pilot, spring return	4PS
Double solenoid	4EE
Double air pilot	4PP
Dual 3-way, 2-position, spring return	
Solenoid, NC / NC + PO check (4/3 APB)	BEE*
Air pilot, NC / NC + PO check (4/3 APB)	BPP*
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE
Air pilot NO / NO (4/3 Pressure Ctr.)	CPP
Solenoid, NC / NC with exhaust check	DEE
Air pilot, NC / NC with exhaust check	DPP
Solenoid, NO / NC with exhaust check	EEE
Solenoid, NC / NC without check (4/3 Exh. Ctr.)	GEE
Dual 4-Way, 2-Position, Spring Return	
Solenoid	JEE**
Air pilot	JPP**

Ports 2 & 4	
C0*	10mm elbow fitting
C2*	12mm elbow fitting
C4	5/32" (4mm) elbow fitting
C6	6mm elbow fitting
C7	1/4" Elbow fitting
C8*	8mm elbow fitting
C9*	3/8" Elbow fitting
F0*	10mm elbow fitting
F2*	12mm elbow fitting
F3*	1/2" Straight fitting
F4	5/32" (4mm) straight fitting
F6	6mm straight fitting
F7	1/4" Straight fitting
F8*	8mm straight fitting
F9*	3/8" Straight fitting

* Only available with size 2 valves.

Ports 1 & 3	
0	None

Led / cable	
00	No cable, no led, no surge suppression
V2	2 Meter cable with led and surge suppression
V5	5 Meter cable with led and surge suppression
V9	9 Meter cable with led and surge suppression

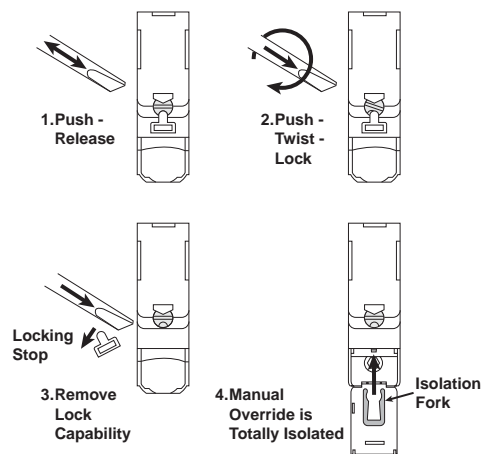
Operator Voltage	
2C	24VDC
00	Remote pilot - 5/32" (4mm) tube

* Valve includes peripheral P. O. check valve and union fittings.
 ** Size 1 only.

With only one universal solenoid pilot for all configurations

24VDC is now a global standard for all machines. The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.










Multi-function adaptable manual override















D

Subbase & Manifold
 Valve Products

“V” Series Manifold Valves with Collective Wiring Size 1

	Symbol	Type	Cv	Operator	Part number
 <p>Single Solenoid</p>  <p>Double Solenoid</p>		4-way, 2-position	0.32	Single solenoid	P2M1V4ES2CV
		4-way, 2-position	0.32	Double solenoid	P2M1V4EE2CV
		4-way, 2-position, dual valve, w/ exhaust check	0.18		P2M1VJEE2CV
		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	P2M1VDEE2CV
		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	P2M1VCEE2CV
		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	P2M1VEEE2CV
		3-way, 2-position, NC w/ exhaust check	0.22	Single solenoid	P2M1V3ES2CV
		3-way, 2-position, dual valve, NC/NC	0.22	Double solenoid	P2M1VGEE2CV

“V” Series Size 1 Accessories

	Description	Tube size	Option	Part number
 	Size 1 push to connect fitting	5/32"	Elbow	CMD04-1
			Straight	FMD04-1
 	Size 1 push to connect fitting	1/4"	Elbow	CMD07-1B
			Straight	FMD07-1B
 	Size 1 push to connect fitting	6mm	Elbow	CMD06-1
			Straight	FMD06-1
	Muffler for exhaust port			MMDVA1
	Plug			PMDYY1
	Double male union		Connecting peripheral modules	HMDXX1
	Electrical 20-Pin multi-connector cable with flying leads	IP65 rated	2M cable	P8LMH20M2A
			5M cable	P8LMH20M5A
			9M cable	P8LMH20M9A
	Electrical 25-Pin D-sub cable	IP20 rated	3M cable	P8LMH25M3A
			9M cable	SCD259D
		IP65 rated	3M cable	SCD253W
			9M cable	SCD259WE
	Field wireable connector for power supply	Female	M12 - A code	P8CS1205AA
		Profibus DP	M12 type B	P8BPA00MB
	Line termination resistor	Devicenet or Canopen	M12 type A	P8BPA00MA
	AS-i M12 cable with jack for addressing		1M cable	P8LS12JACK
	Torx screwdriver			P2M1K0TASD

D
 Subbase & Manifold
 Valve Products

Electrical Connections

Description	Part number
20-Pin, Multi-connector electrical head module	P2M2HEV0A
25-Pin, D-sub, electrical head module	P2M2HEV0D

Fieldbus Connections

Description	Part number	
Profibus DP	P2M2HBVP21600	
DeviceNet	P2M2HBVD21600	
CANopen	P2M2HBVC21600	
Interbus S	P2M2HBVS11600	
AS-i	0 inputs and 8 solenoid outputs	P2M2HBVA10800
AS-i	8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	P2M2HBVA10808A
AS-i	8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	P2M2HBVA10808B
AS-i Version 2.1 ProtocolAS-i	0 inputs and 6 solenoid outputs	P2M2HBVA20600
AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	P2M2HBVA20608A
AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	P2M2HBVA20608B

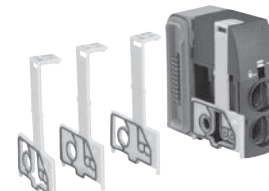
Manifold Options

Module	Part number
Pneumatic end plate kit	P2M2HXT01*
Pneumatic end plate kit with torx screwdriver	P2M2HXT0T*
Intermediate supply module (Includes 4 configuration plates)	P2M2BXV0A*

* Use Fittings for Size 2 Modules Only












P2M2HXT01











P2M2BXV0A

“V” Series Manifold Valves with Collective Wiring Size 2

	Symbol	Type	Cv	Operator	Part number
 <p>Single Solenoid</p>  <p>Double Solenoid</p>		4-way, 2-position	0.8	Single solenoid	P2M2V4ES2CV
		4-way, 2-position	0.8	Double solenoid	P2M2V4EE2CV
		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	P2M2VDEE2CV
		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	P2M2VCEE2CV
		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	P2M2VEEE2CV
		3-way, 2-position, dual valve, NC w/ exhaust check	0.44	Single solenoid	P2M2V3ES2CV
		3-way, 2-position, dual valve, NC/NC	0.44	Double solenoid	P2M2VGEE2CV

“V” Series Size 2 Accessories

	Description	Tube size	Option	Part number
 	Size 2 push to connect fitting	1/4" OD tube	Elbow	CMD07-2B
			Straight	FMD07-2B
	Size 2 push to connect fitting	3/8" OD tube	Elbow	CMD09-2B
			Straight	FMD09-2B
	Size 2 push to connect fitting	1/2" OD tube	Straight	FMD13-2B
			Size 2 push to connect fitting	6mm OD tube
	Straight	FMD06-2		
	Size 2 push to connect fitting	8mm OD tube	Elbow	CMD08-2
			Straight	FMD08-2
	Size 2 push to connect fitting	10mm OD tube	Elbow	CMD10-2
			Straight	FMD10-2
	Size 2 push to connect fitting	12mm OD tube	Elbow	CMD12-2
Straight			FMD12-2	
	Muffler for exhaust port			MMDVA2
	Plug			PMDYY2
	Double Male Union		Connecting peripheral modules	HMDXX2
	Electrical 20-Pin multi-connector cable with flying leads	IP65 rated	2M cable	P8LMH20M2A
			5M cable	P8LMH20M5A
			9M cable	P8LMH20M9A
	Electrical 25-Pin D-sub cable	IP20 rated	3M cable	P8LMH25M3A
			9M cable	SCD259D
		IP65 rated	3M cable	SCD253W
			9M cable	SCD259WE
	Torx screwdriver			P2M1K0TASD

D
 Subbase & Manifold
 Valve Products

Electrical Connections

Description	Part number
20-Pin, Multi-connector electrical head module	P2M2HEV0A
25-Pin, D-sub, electrical head module	P2M2HEV0D

Fieldbus Connections

Description	Part number	
Profibus DP	P2M2HBVP21600	
DeviceNet	P2M2HBVD21600	
CANopen	P2M2HBVC21600	
Interbus S	P2M2HBVS11600	
AS-i	0 inputs and 8 solenoid outputs	P2M2HBVA10800
AS-i	8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	P2M2HBVA10808A
AS-i	8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	P2M2HBVA10808B
AS-i Version 2.1 ProtocolAS-i	0 inputs and 6 solenoid outputs	P2M2HBVA20600
AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	P2M2HBVA20608A
AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	P2M2HBVA20608B

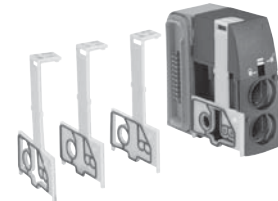
Manifold Options

Module	Part number
Pneumatic end plate kit	P2M2HXT01*
Pneumatic end plate kit with torx screwdriver	P2M2HXT0T*
Intermediate supply module (Includes 4 configuration plates)	P2M2BXV0A*

* Use Fittings for Size 2 Modules Only

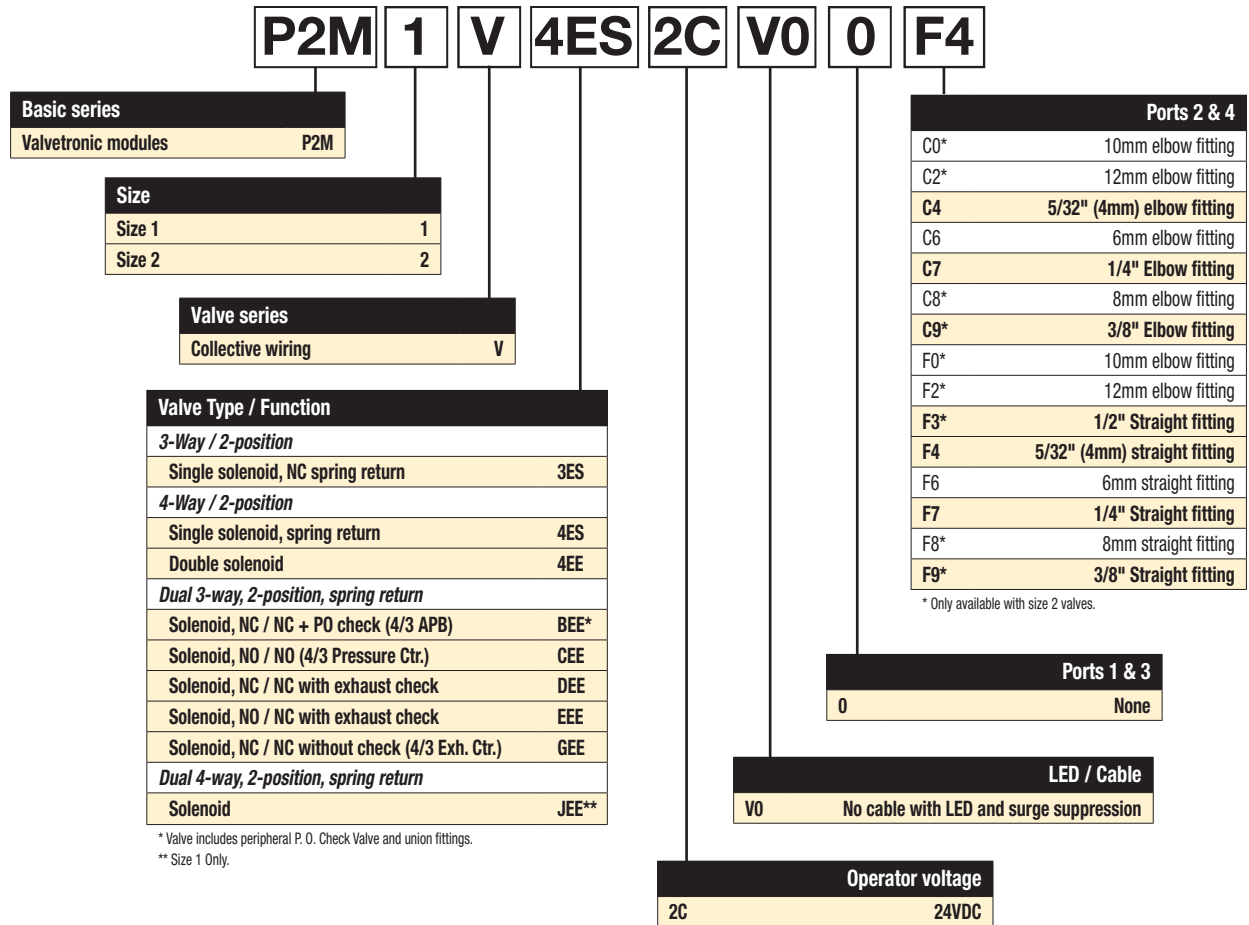


P2M2HXT01



P2M2BXV0A

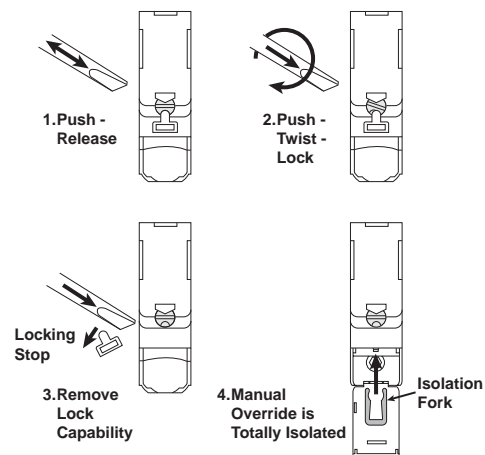
“V” Series Valve Manifold with Collective Wiring
(Complete with Pneumatic Connectors)



With only one universal solenoid pilot for all configurations













24VDC is now a global standard for all machines.
 The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-function adaptable manual override

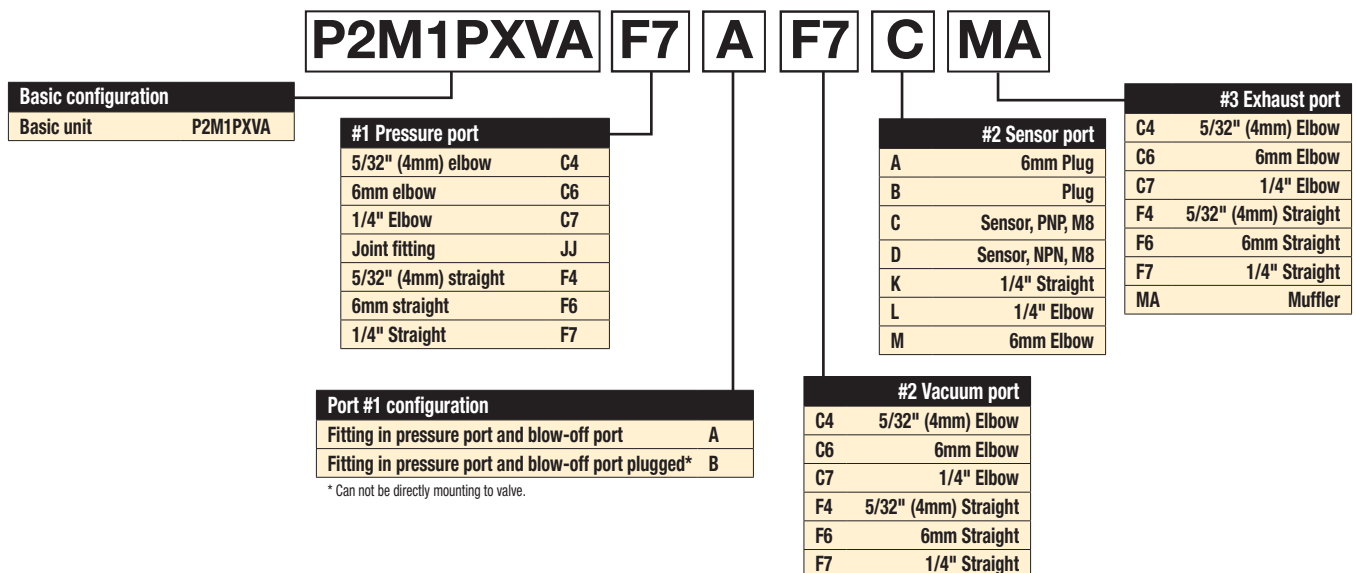


D
 Subbase & Manifold
 Valve Products

Peripheral Modules Size 1

Accessories	Description	Option	Part number
	Pressure regulator without gauge	0 to 30 PSI	P2M1PXST
		0 to 60 PSI	P2M1PXSL
		0 to 120 PSI	P2M1PXSN
	Pressure regulator with gauge	0 to 30 PSI	P2M1PXSR
		0 to 60 PSI	P2M1PXSM
		0 to 120 PSI	P2M1PXSG
	Gauge	0 to 30 PSI	P2M1K0GT
		0 to 60 PSI	P2M1K0GL
		0 to 120 PSI	P2M1K0GN
	Dual P.O. Check valve		P2M1PXCA
	Dual flow control		P2M1PXFA
	Vacuum generator		P2M1PXVA
	Size 1 push to connect fitting	5/32" or 4mm OD tube	Elbow CMD04-1
			Straight FMD04-1
	Size 1 push to connect fitting	1/4" OD tube	Elbow CMD07-1B
			Straight FMD07-1B
	Size 1 push to connect fitting	6mm OD tube	Elbow CMD06-1
			Straight FMD06-1
	Double male union	Connecting peripheral modules	HMDXX1
	Muffler for vacuum exhaust port		MMDVA1
	Plug		PMDYY1










Vacuum Generator Model Number Index



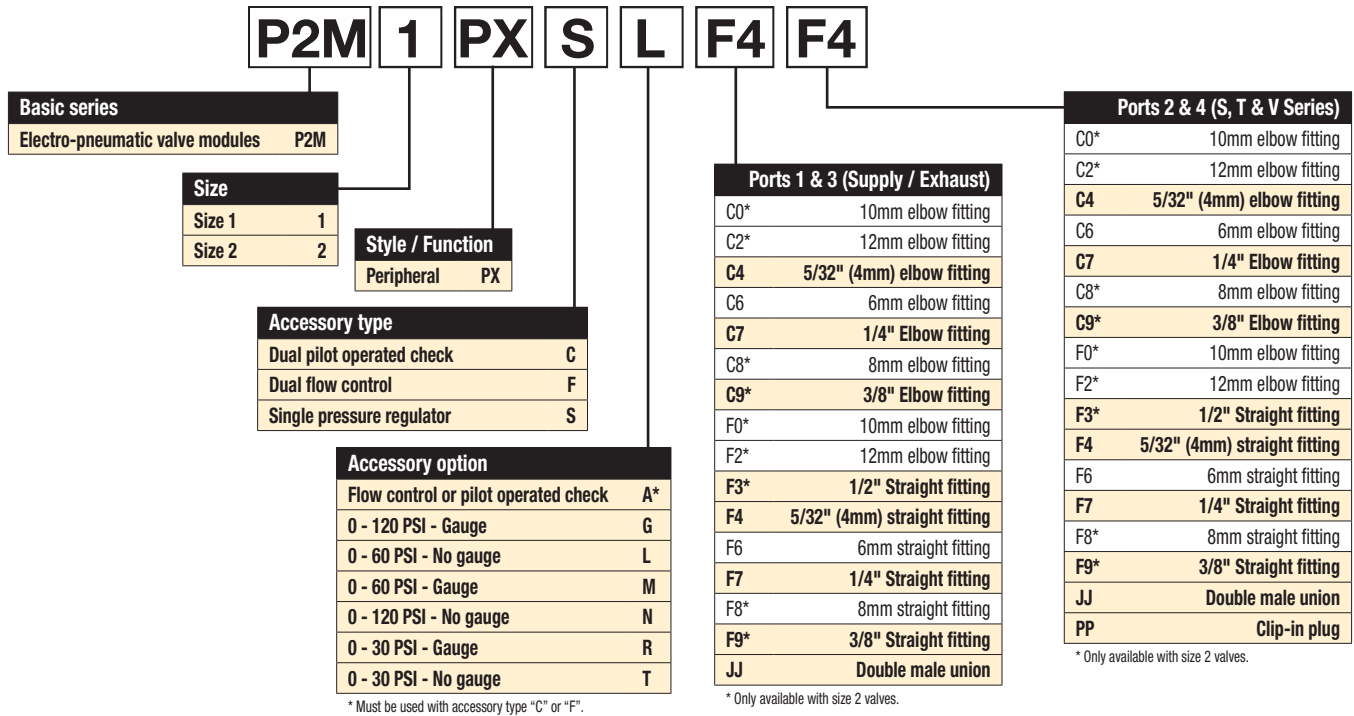
D

Subbase & Manifold
 Valve Products

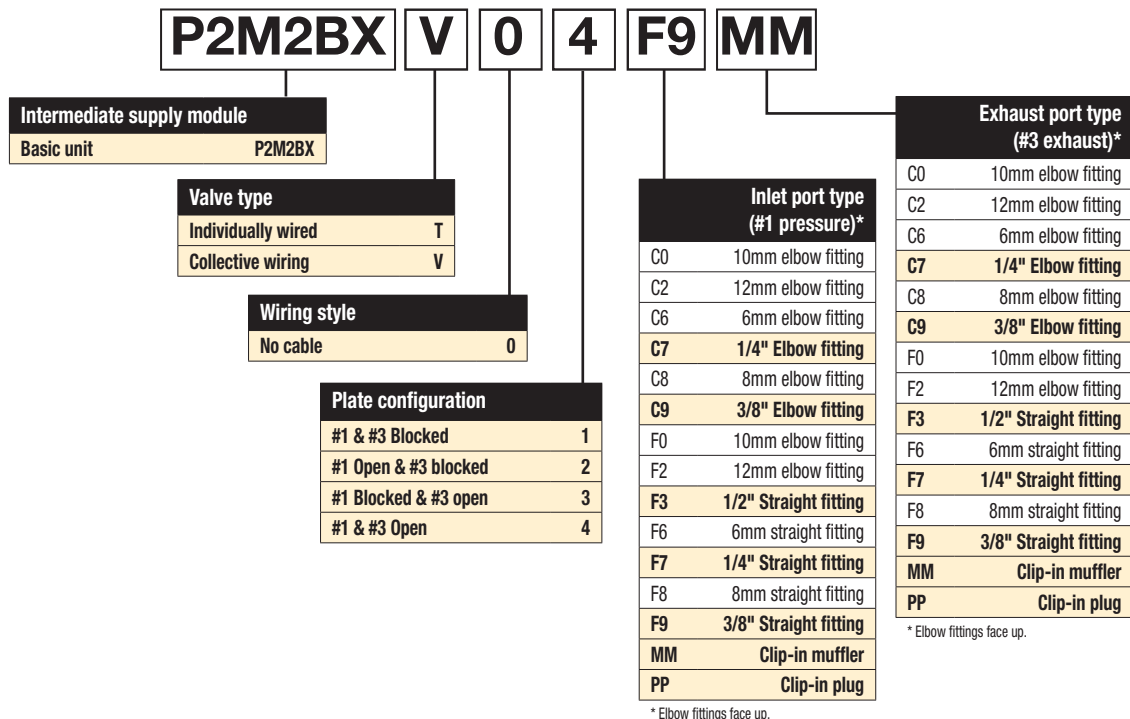
Peripheral Modules Size 2

	Acessories	Description	Option	Part number
	Pressure regulator without gauge		0 to 30 PSI	P2M1PXST
			0 to 60 PSI	P2M1PXSL
			0 to 120 PSI	P2M1PXSN
	Pressure regulator with gauge		0 to 30 PSI	P2M1PXSR
			0 to 60 PSI	P2M1PXSM
			0 to 120 PSI	P2M1PXSG
	Gauge		0 to 30 PSI	P2M1K0GT
			0 to 60 PSI	P2M1K0GL
			0 to 120 PSI	P2M1K0GN
	Dual P.O. Check valve			P2M1PXCA
	Dual flow control			P2M1PXFA
	Size 2 push to connect fitting	1/4" OD tube	Elbow	CMD07-2B
			Straight	FMD07-2B
	Size 2 push to connect fitting	3/8" OD tube	Elbow	CMD09-2B
			Straight	FMD09-2B
	Size 2 push to connect fitting	1/2" OD tube	Straight	FMD13-2B
			Size 2 push to connect fitting	6mm OD tube
	Size 2 push to connect fitting	8mm OD tube	Straight	FMD06-2
			Size 2 push to connect fitting	8mm OD tube
	Size 2 push to connect fitting	10mm OD tube	Straight	FMD08-2
			Size 2 push to connect fitting	10mm OD tube
	Size 2 push to connect fitting	12mm OD tube	Straight	FMD10-2
			Size 2 push to connect fitting	12mm OD tube
	Size 2 push to connect fitting	12mm OD tube	Straight	FMD12-2
	Muffler for exhaust port			MMDVA2
	Plug			PMDYY2
	Double Male Union		Connecting peripheral modules	HMDXX2

“P” Series Peripheral Modules Model Number Index
(Complete with Pneumatic Connectors)



Intermediate Supply Module Model Number Index



D

Subbase & Manifold
 Valve Products

Moduflex Add-A-Fold Assembly Model Number Index
(Complete with Pneumatic and Electrical Connectors)

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List valves and manifolds. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

P2MA V 0 1 C9 C9 ##

Moduflex island assembly	
Add-A-Fold	P2MA*

*Includes pneumatic H & T end plate kit.

Style	
Individually wired	T
Collective wiring	V*

* Includes 20-pin multi-connector or 25-pin, D-sub electrical head module.

Wiring / bus protocol	
No cable (20-pin multi-connector T series)	0
2 Meter cable (20-pin)	2
5 Meter cable (20-pin)	5
9 Meter cable (20-pin)	9
Bus	B*
No cable (25-pin, D-sub)	D
3 Meter cable (25-pin, D-sub)	F

* Order bus module as a separate line item.
 † Default to option "0" for T series.

Pilot source	
Internal supply / internal exhaust	1
Internal supply / external exhaust	2
External supply / internal exhaust	3
External supply / external exhaust	4

Number of stations†	
01 - 19*	V-Type
01 - 30	T-Type

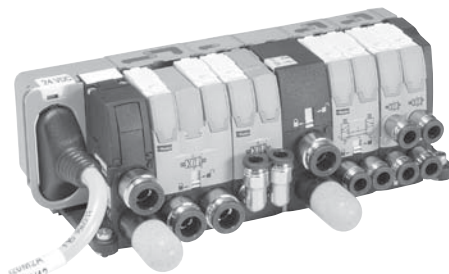
* Max. Number of Addresses for V type is 19. Single Solenoid Valves equal one address. Double Solenoid Valves equal two addresses. Maximum address may depend upon choice of bus protocol.
 † Intermediate Modules are considered Stations, but do not count against maximum number of addresses for manifold.

Exhaust Port Type (#3 Exhaust)*	
C0	10mm elbow fitting
C2	12mm elbow fitting
C6	6mm elbow fitting
C7	1/4" Elbow fitting
C8	8mm elbow fitting
C9	3/8" Elbow fitting
F0	10mm elbow fitting
F2	12mm elbow fitting
F3	1/2" Straight fitting
F6	6mm straight fitting
F7	1/4" Straight fitting
F8	8mm straight fitting
F9	3/8" Straight fitting
MM	Clip-in muffler
PP	Clip-in plug

* Elbow fittings face up.

Inlet port type (#1 pressure)*	
C0	10mm elbow fitting
C2	12mm elbow fitting
C6	6mm elbow fitting
C7	1/4" Elbow fitting
C8	8mm elbow fitting
C9	3/8" Elbow fitting
F0	10mm elbow fitting
F2	12mm elbow fitting
F3	1/2" Straight fitting
F6	6mm straight fitting
F7	1/4" Straight fitting
F8	8mm straight fitting
F9	3/8" Straight fitting
MM	Clip-in muffler
PP	Clip-in plug

* Elbow fittings face up.



"V" Series with 20-Pin Connector



"V" Series with Field Bus Connection

D
 Subbase & Manifold
 Valve Products

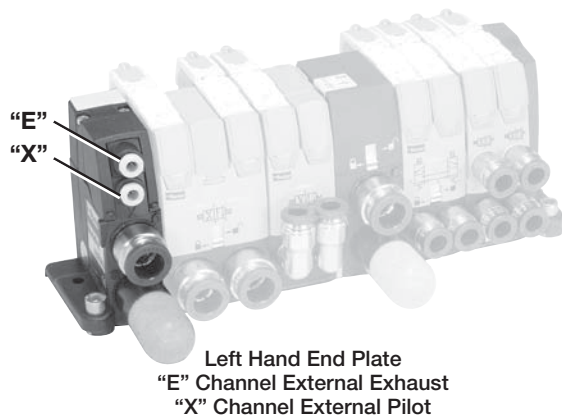
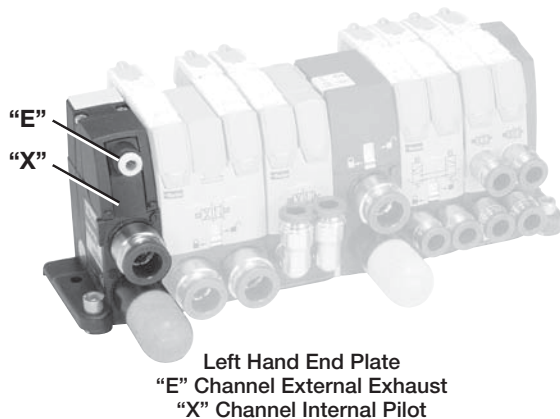
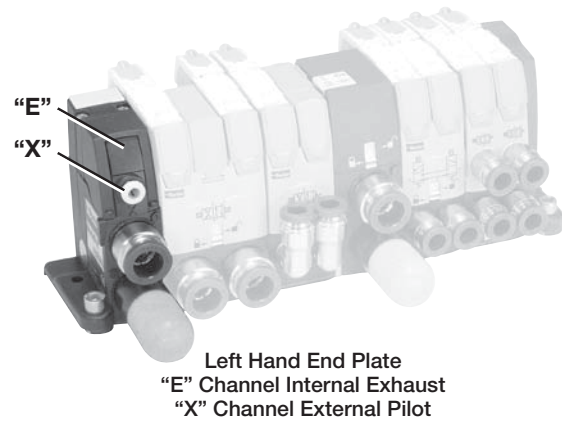
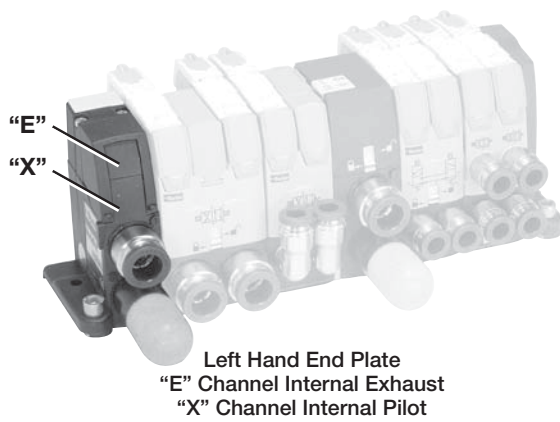
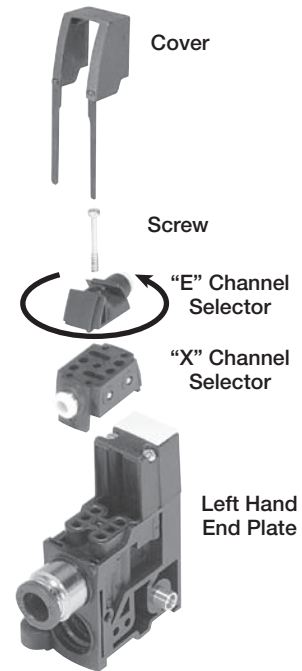
Internal and External Pilot Supply Options

All T and V Series Valve bases incorporate an auxiliary channel "X" to supply pressure to the solenoid pilots. The "X" galley is pressurized from the left hand end plate. Depending on the configuration of the left hand end plate, this pressure is either supplied from the #1 port in the left hand end plate or supplied externally through a 4mm OD tube fitting in the left hand end plate. This fitting is supplied in all left hand end plates and can be converted in the field.

Internal and External Solenoid Pilot Exhaust Options

All T and V Series Valve bases incorporate an auxiliary channel "E" which is used to exhaust the solenoid pilot pressure from each solenoid valve. The "E" galley is connected to the left hand end plate. Depending on the configuration of the left hand end plate, this exhaust is either connected to the #3 exhaust port or is connected to a 4mm OD Tube fitting in the left hand end plate. This fitting is supplied in all left hand end plates and can be converted in the field.

To configure the left hand end plate, with pressure off, remove head cover to expose the selector section. Loosen selector section and rotate "X" or "E" channel selector to desired position. Tighten selector section and assemble cover.



D

Subbase & Manifold
 Valve Products

Solenoid Pilot 24VDC

Description	Part number
Solenoid Pilot (Without Plug-in Electrical Connector)	P2D8V32C5
Air Pilot with 5/32" (4mm) Tube Fitting	P2M2K0PA



P2D8V32C5



P2M2K0PA

**Size 1 Valve
 Without Solenoid Pilot
 and Without Subbase
 4-Way / 2-Position / Single Valve**



P2M1X4EE

Solenoid	Part number
Single solenoid (Monostable)	P2M1X4ES
Double solenoid (Bistable)	P2M1X4EE

4-Way / 2-Position / Dual Valve

Solenoid	Part number
Solenoid spring with exhaust check	P2M1XJEE

3-Way / 2-Position / Dual Valve

Solenoid	Part number
Double solenoid NC + NC with exhaust check	P2M1XDDEE
Double solenoid NO + NO with exhaust check	P2M1XCDEE
Double solenoid NC + NO with exhaust check	P2M1XEDEE
Single solenoid NC with exhaust check	P2M1X3DES

**Size 2 Valve
 Without Solenoid Pilot
 and Without Subbase
 4-Way / 2-Position / Dual Valve**



P2M2X4EE

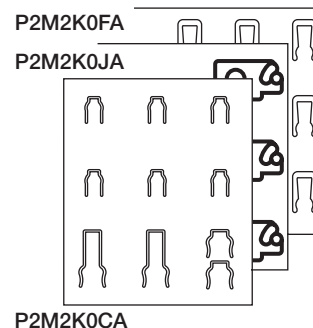
Solenoid	Part number
Single solenoid (Monostable)	P2M2X4ES
Double solenoid (Bistable)	P2M2X4EE

3-Way / 2-Position / Dual Valve

Solenoid	Part number
Double solenoid NC + NC with exhaust check	P2M2XDDEE
Double solenoid NO + NO with exhaust check	P2M2XCDEE
Double solenoid NC + NO with exhaust check	P2M2XEDEE
Single solenoid NC with exhaust check	P2M2X3DES

Set of Maintenance Parts

Description	Part number
Clips Set of 10 clips: 6 for size 1 valves, 2 for size 2 valves, 2 for end plate and intermediate modules	P2M2K0CA
Seals Set of 10 seals: 3 for manifold to manifold seals, 3 under solenoid pilot seals, 4 under valve seals (two size 1 seals, two size 2 seals)	P2M2K0JA
Forks Set of 10 isolation forks for solenoid pilot manual override	P2M2K0FA



D
 Subbase & Manifold
 Valve Products

“S” Series Individual Subbase Valve Dimensions and Mounting

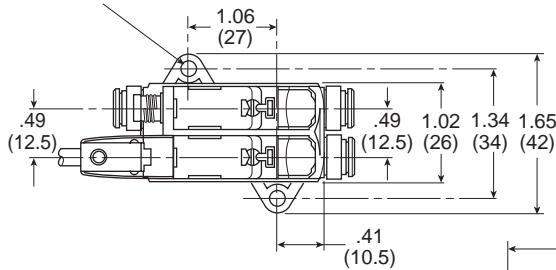
Subbase Valve Size 1



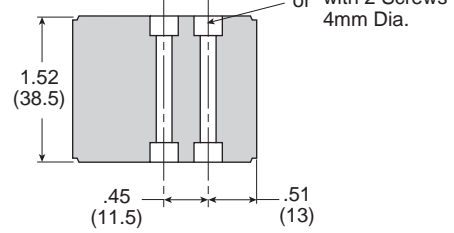
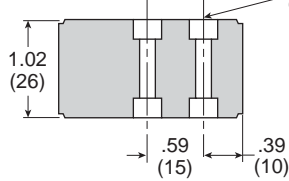
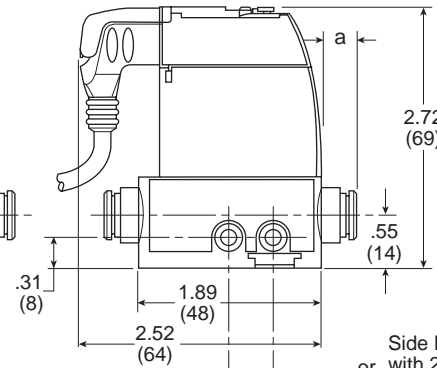
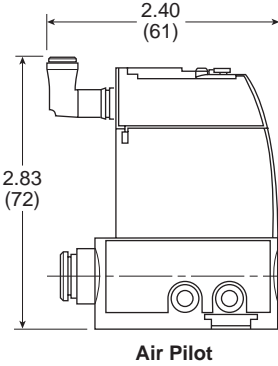
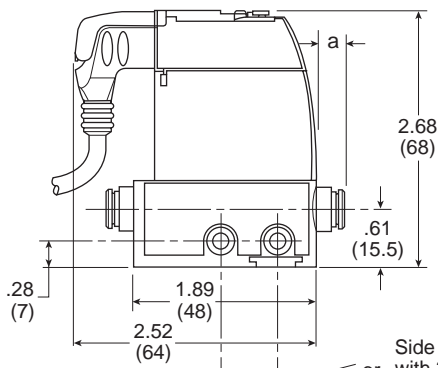
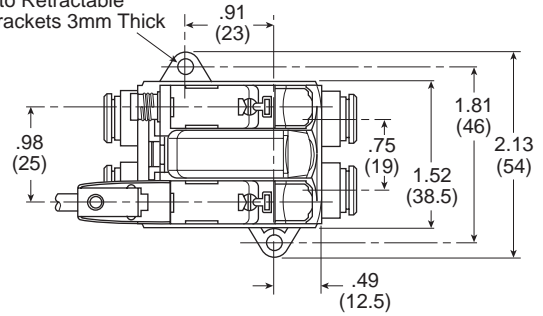
Subbase Valve Size 2



Surface Mounting with Screws 4 mm Dia. into Retractable Brackets 3mm Thick



Surface Mounting with Screws 4 mm Dia. into Retractable Brackets 3mm Thick

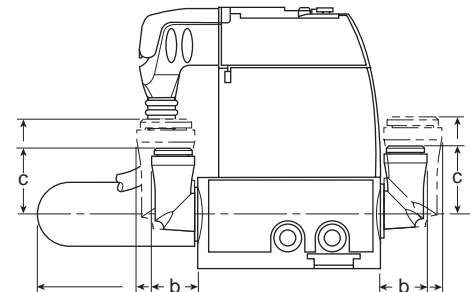


Size 1

Size 2

	OD Tube Ext.	a	b	c
Size 1 Valves	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
	Muffler		31	
Size 2 Valves	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22
	Muffler		40	

Special Case: 4/3 all ports blocked. Add the dual P.O. check valve that has been plugged in the basic valve.



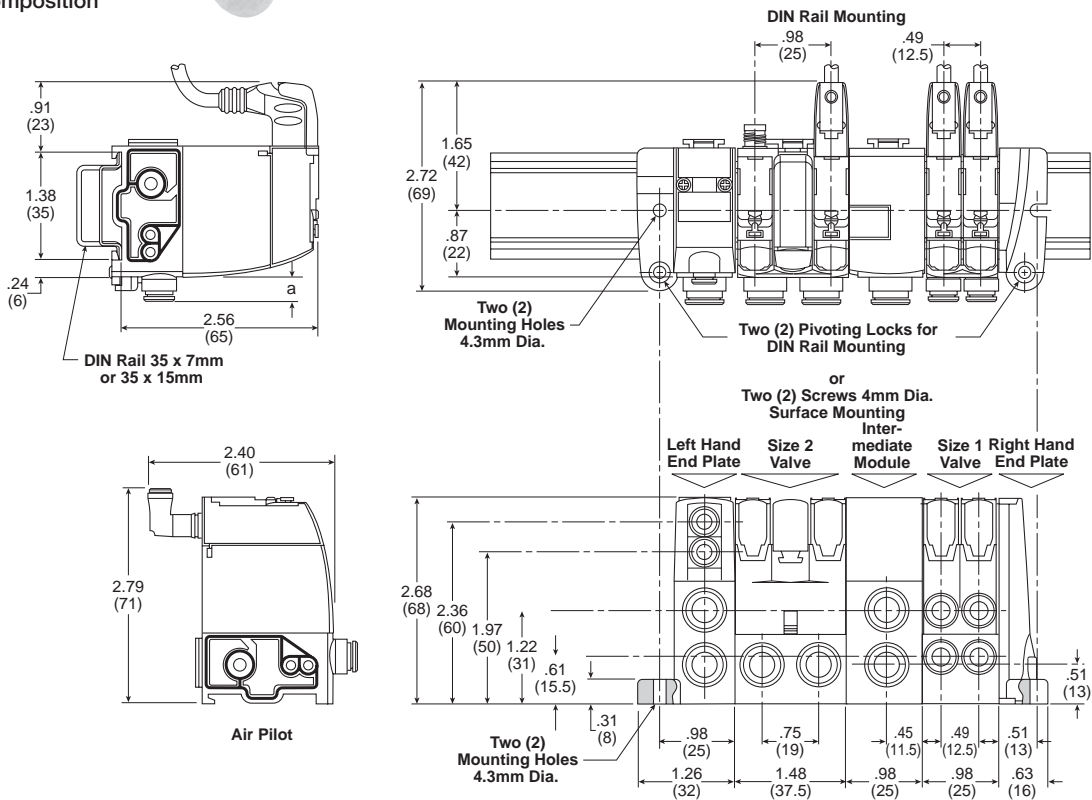
D

Subbase & Manifold Valve Products

“T” Series Manifold Dimensions and Mounting



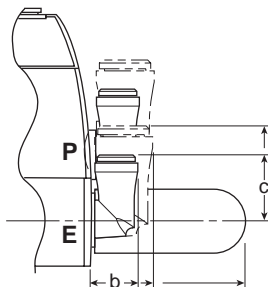
Total Width Depends on Valve Composition



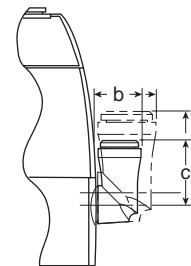
Special Case: 4/3 all ports blocked function within island version, add the dimensions of the dual P.O. check valve plugged into the island.

End Plate and Intermediate Modules

	a	b	c
6 mm Tube OD	8	13	16
1/4" Tube OD	12	18	22
8 mm Tube OD	9	16	19
3/8" Tube OD	16	23	26
10 mm Tube OD	13	18	25
12 mm Tube OD	13	19	25
1/2" Tube OD	13		
Muffler	40		

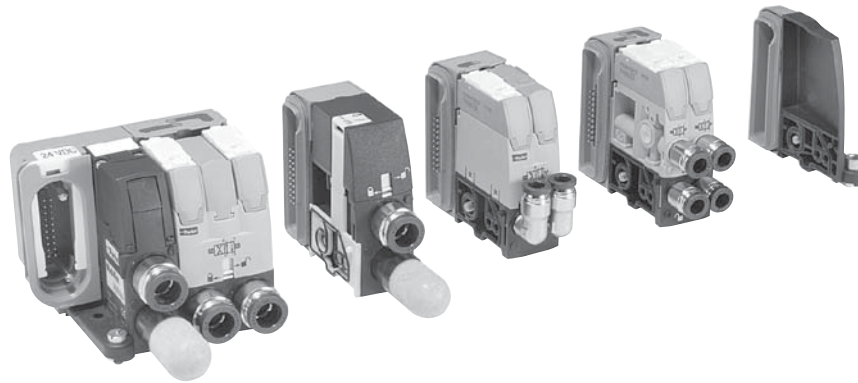


OD Tube	Ext.	a	b	c
Size 1 Valves	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
Size 2 Valves	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22

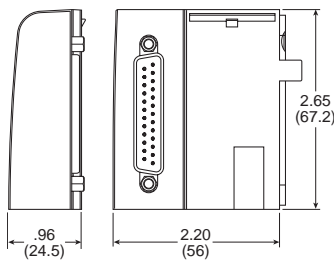
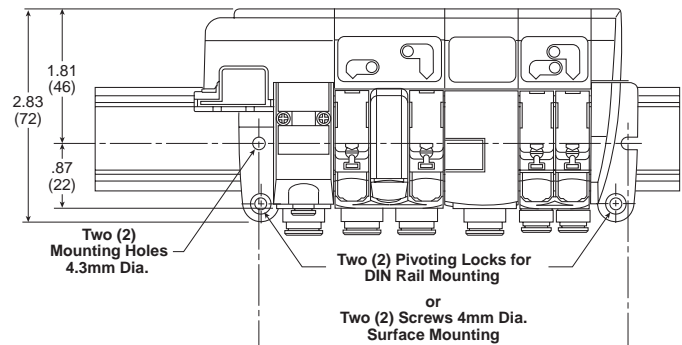
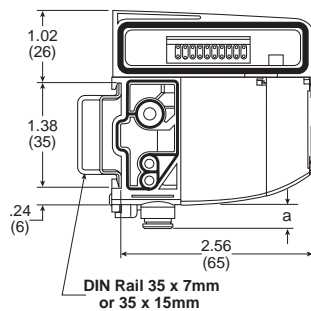


D
 Subbase & Manifold Valve Products

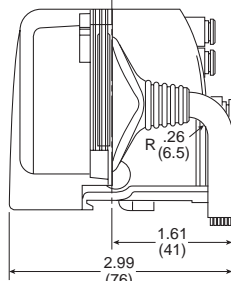
“V” Series Manifold Dimensions and Mounting
 20-Pin, Multi-Connector Valve Manifold



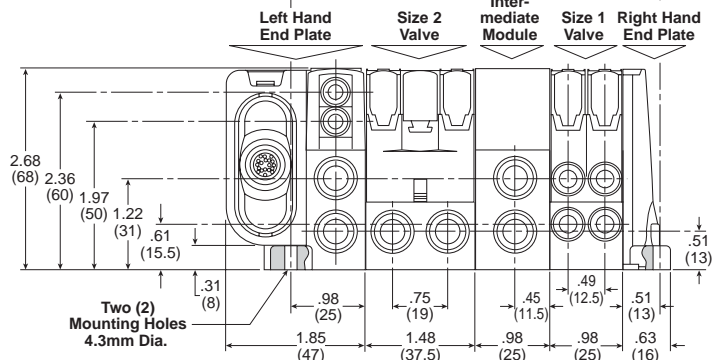
Total Width Depends on Valve Composition



25-Pin, D-Sub

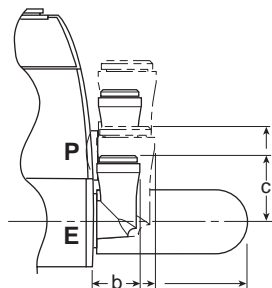


20-Pin, Multi-Connector

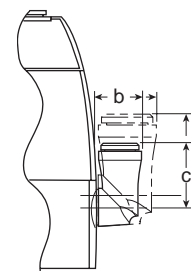


End Plate and Intermediate Modules

	a	b	c
6 mm Tube OD	8	13	16
1/4" Tube OD	12	18	22
8 mm Tube OD	9	16	19
3/8" Tube OD	16	23	26
10 mm Tube OD	13	18	25
12 mm Tube OD	13	19	25
1/2" Tube OD	13		
Muffler	40		



OD Tube	Ext.	a	b	c
Size 1 Modules	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
	1/4"	12	18	22
Size 2 Modules	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22

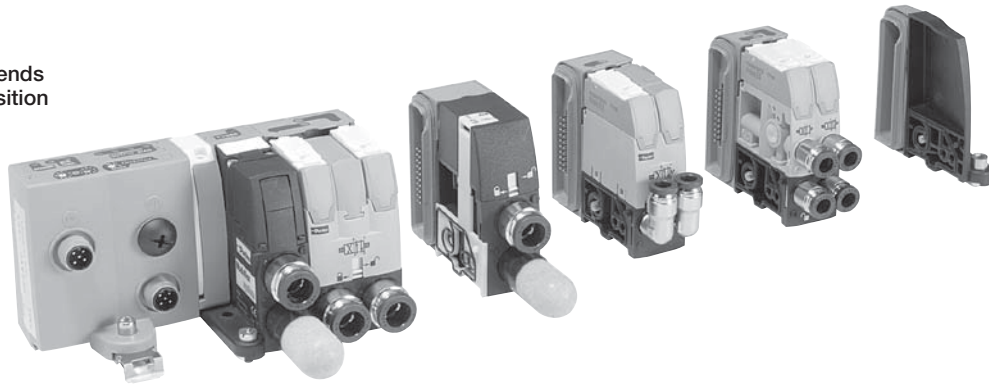


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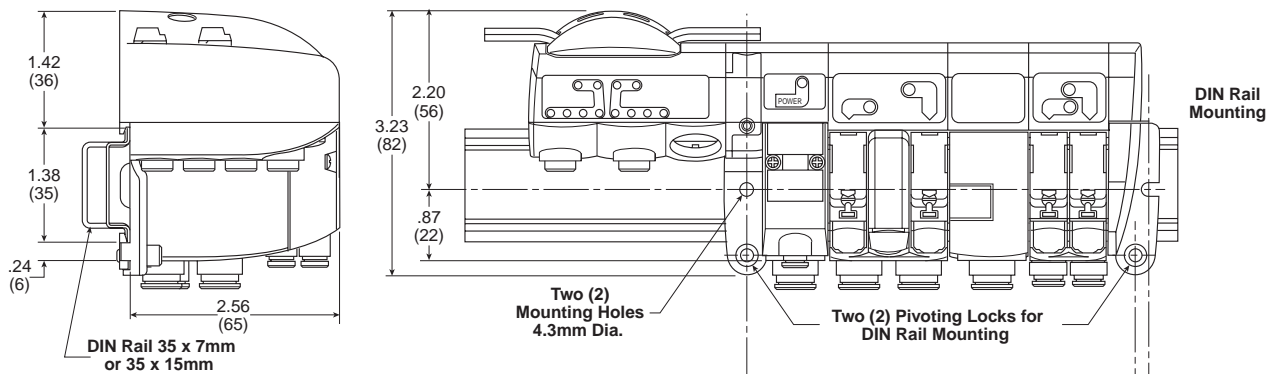
Subbase & Manifold
 Valve Products

“V” Series Manifold Dimensions and Mounting
 Fieldbus Connected Manifolds

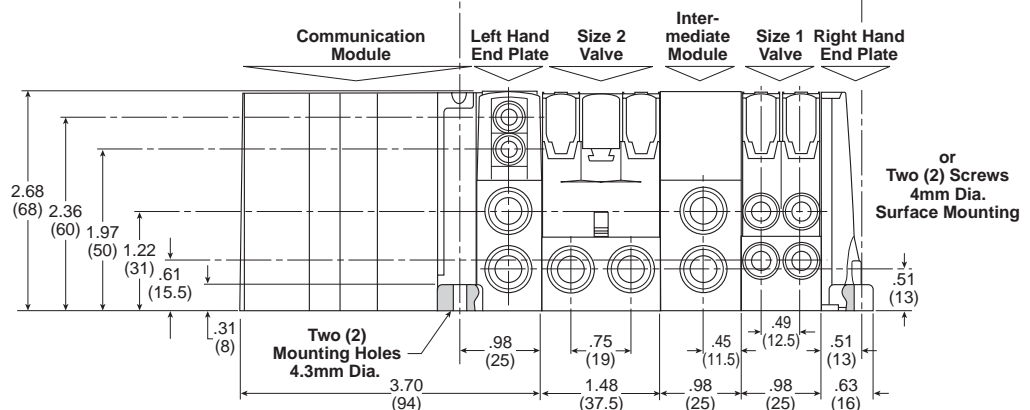
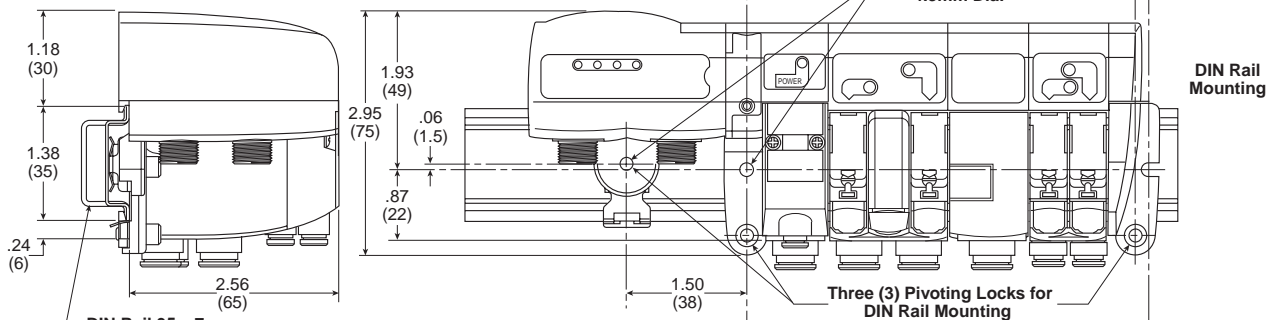
Total Width Depends
 on Valve Composition



AS-i Bus Islands



Device Bus Islands

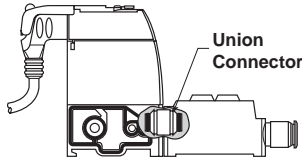


D
 Subbase & Manifold
 Valve Products

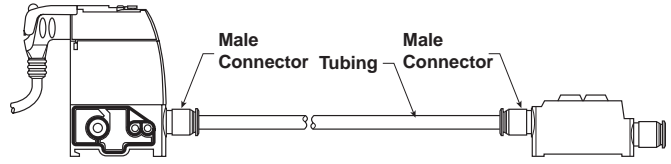
“P” Series Peripheral Modules Dimensions and Mounting

Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

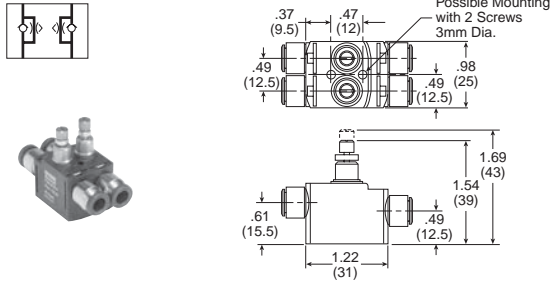
**Peripheral Module
 Plugged in a Valve**



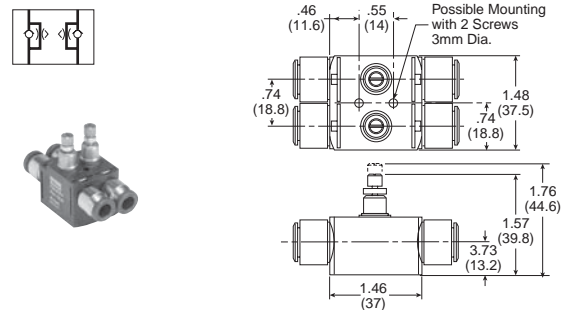
**In-Line Peripheral Modules:
 Mounting is Required**



Dual Flow Control Size 1

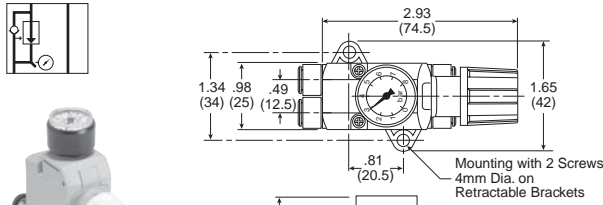


Dual Flow Control Size 2



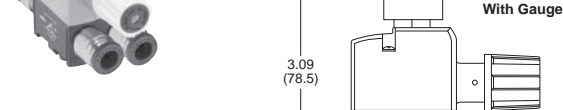
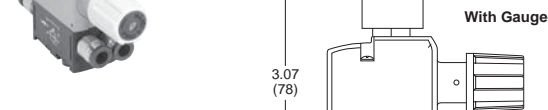
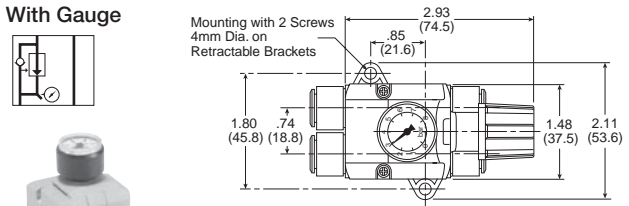
Pressure Regulator Size 1

With Gauge

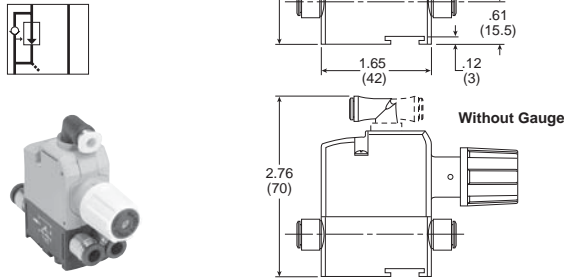


Pressure Regulator Size 2

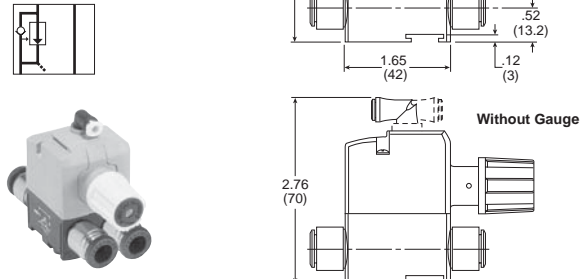
With Gauge



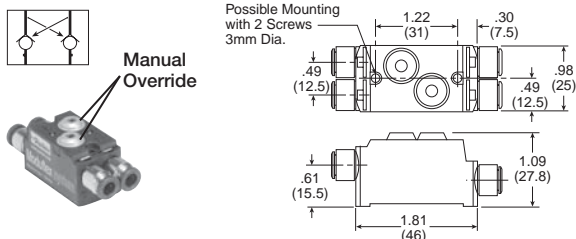
Without Gauge



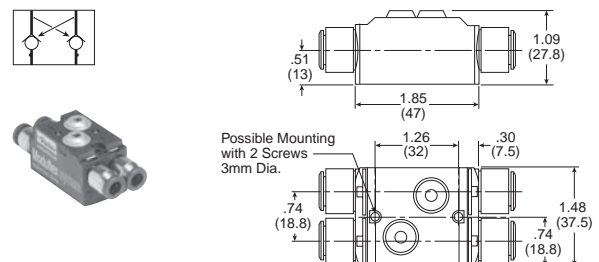
Without Gauge



Dual P.O. Check Valve Size 1



Dual P.O. Check Valve Size 2



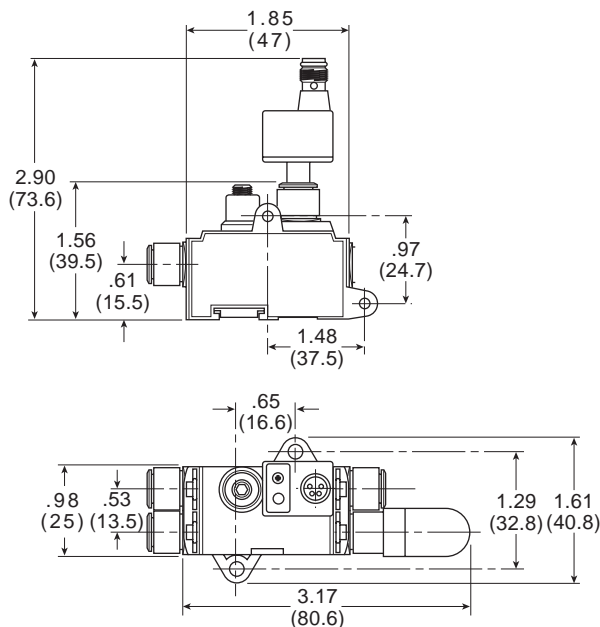
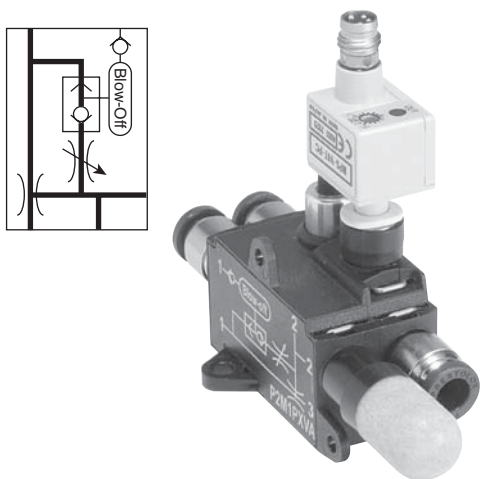
D

**Subbase & Manifold
 Valve Products**

“P” Series Peripheral Modules Dimensions and Mounting

Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

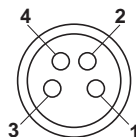
Vacuum Generator Size 1



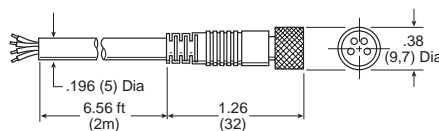
Sensor Pin Out

Pin #

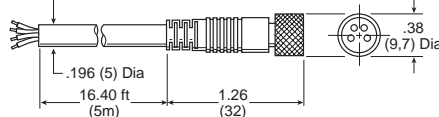
- 1 Brown: 24VDC
- 2 White: NPN / PNP Open Collector Output
- 3 Blue: 0VDC
- 4 Black: NPN / PNP Open Collector Output



CB-M8-4P-2M, Female to Open Lead



CB-M8-4P-5M, Female to Open Lead



Sensor Specifications

Media	Air and Non-Corrosives Gases
Proof Pressure	(M) 72.5 PSI
Operating Temperature	32 to 122°F (0 to 50°C)
Storage Temperature	14 to 140°F (-10 to 60°C)
Humidity	35 to 85% RH
Electrical Connection	(C) 4-Pin, M8 Connector
Power Supply	10.8 to 30 VDC, Ripple Vp-p 10% max., Reverse Voltage Protection
Switch Output	1 Output Signal Open and Closed, NPN or PNP, 30VDC, 125mA
Linear Output	Analog Output 1 to 5 VDC
Switch Point Setting	2/3 Turn Trimmer
Hysteresis Setting	< 2% of F.S.
Output Response Time	<1ms
Repeatability	<0.2% F.S.
Shock Resistance	100 G, XYZ
Material	Housing: Polycarbonate, Pressure Port: Zinc Die-cast
Mass	T Port: 0.25 oz. (7g)

The Isys Micro Valve System incorporates a space saving back to back valve mounting design, and achieves flow rates of 0.35 Cv per valve with 4 valves having a combined width of 42mm. This plug-in valve solution simplifies wiring with the use of 25 pin connectors or fieldbus systems.

Ports

- M7 on manifolds
- 3/8 Inch on end plates

Mounting

- Manifold

Solenoids

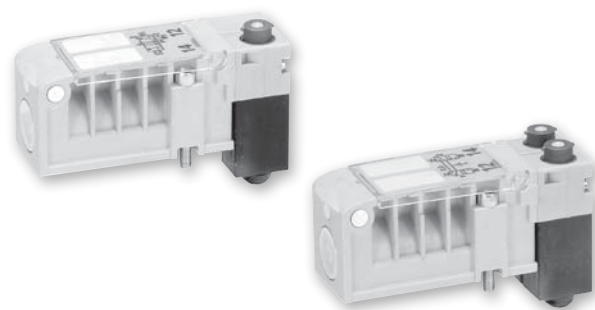
- 24 VDC, 1.0 watt

Certification / Approval

- IP65 rated
- EMC / CE Mark: According to EN 61 000-6-2

Materials

Body	Polyamide reinforced fiberglass
End plates	Aluminum
Fasteners	Zinc plated steel
Manifolds	Aluminum
Spool	Brass and nitrile rubber
Spool enclosure	Brass



Operating information

Operating pressure: Vacuum to 145 PSIG (Vacuum to 10 bar)

Pilot pressure requirements:

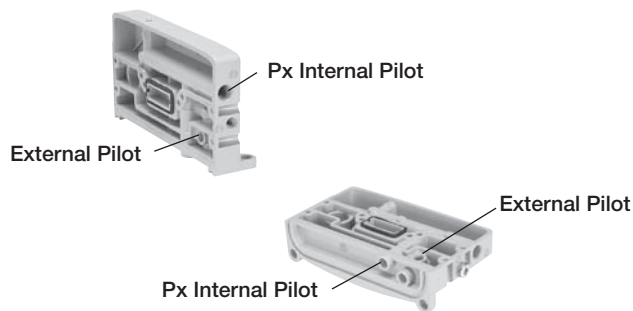
Valve number	Minimum pilot pressure	Maximum pilot pressure
HMEVX2049A	40 PSI	120 PSI
HM2VX2049A	25 PSI	120 PSI
HM5VX2049A	45 PSI	120 PSI
HMN VX2049A	40 PSI	120 PSI
HMPVX2049A	40 PSI	120 PSI
HMQVX2049A	40 PSI	120 PSI

Temperature range: 5°F to 120°F (-15°C to 49°C)

Pilot Configuration

Manifolds can be configured for either internal or external pilot in the field. Side ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the front of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.

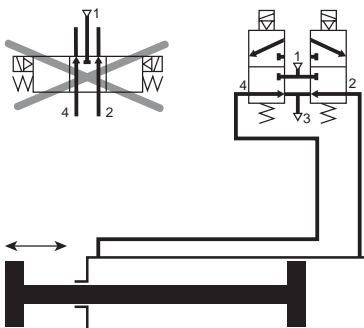
Bottom ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the bottom of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.



Dual 3/2 Valves Replace 3-Position Valves for Better Performance

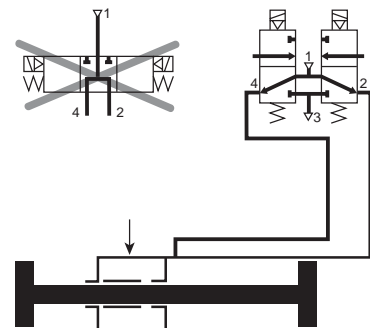
3-Position Center Exhaust

A traditional 5/3 center exhaust valve is now replaced by a double 3/2 NC+NC valve module. Both cylinder chambers are exhausted and rod and piston are free to move.





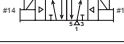
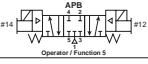

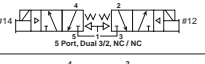
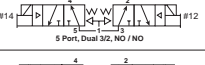
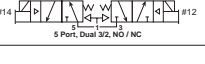
3-Position Pressure Center

A traditional 5/3 pressure center valve is now replaced by a double 3/2 NO+NO valve module. The function is identical.



Most popular. For technical information see CD

Isys Micro Valves









	Symbol	Type	Cv	Operator	Part number
		4-way, 2-position	0.35	Single solenoid	HMEVX2049A
		4-way, 2-position	0.35	Double solenoid	HM2VX2049A
		4-way, 3-position, all ports blocked	0.3	Double solenoid	HM5VX2049A
		3-way, 2-position, dual valve, NC/NC	0.35	Double solenoid	HMNVX2049A
		3-way, 2-position, dual valve, NO/NO	0.35	Double solenoid	HMPVX2049A
		3-way, 2-position, dual valve, NO/NC	0.35	Double solenoid	HMQVX2049A

Manifold Bases

	Part numbers
Plug-in valve manifolds	Side port / Bottom port
Single solenoid outputs only	PSM21JAP / PSM22JAP
Double or single solenoid outputs	PSM21MAP / PSM22MAP



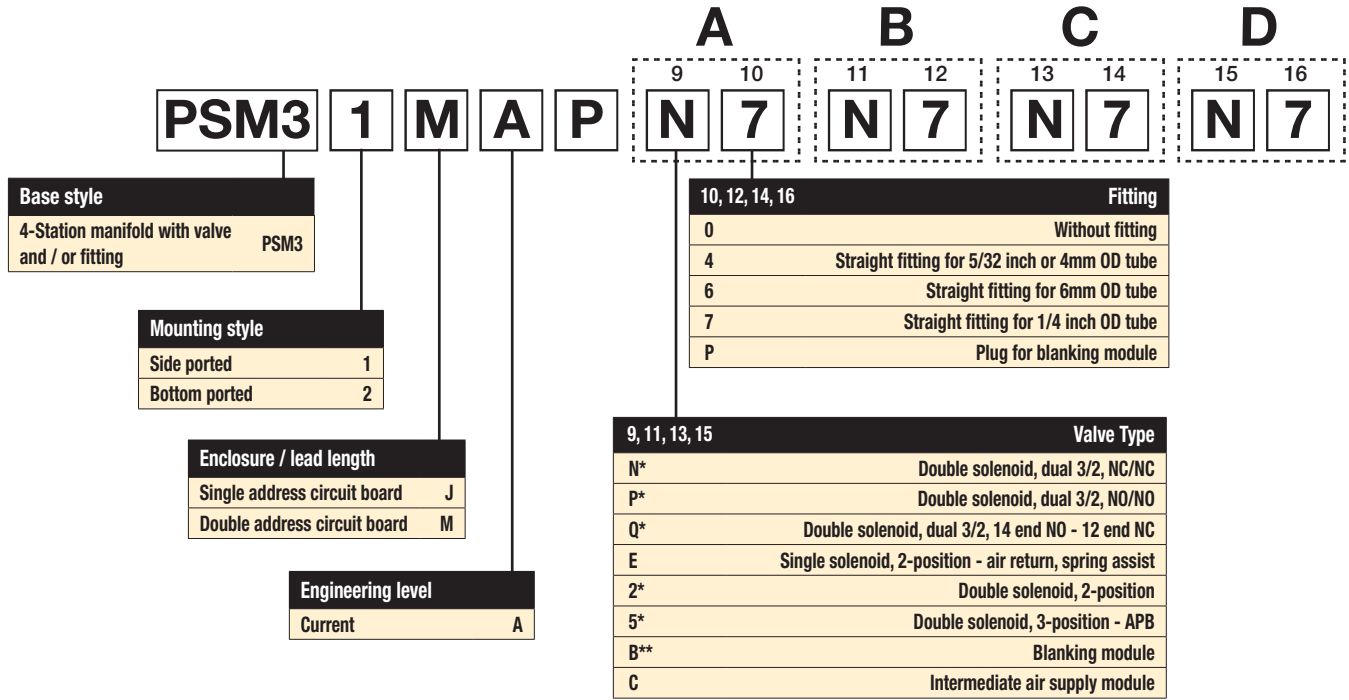
Internal Pilot End Plate Kits

	Electrical option	Porting	Side port	Bottom port
	25-pin, D-sub	NPT / BSPP	PSML25AP / PSML21AP	PSML26AP / PSML22AP
	Turck fieldbus with valve driver module - 16 outputs	NPT / BSPP	PSMT15AP / PSMT11AP	PSMT16AP / PSMT12AP
	Turck fieldbus with valve driver module - 32 outputs	NPT / BSPP	PSMT25AP / PSMT21AP	PSMT26AP / PSMT22AP
	Moduflex 16 outputs	NPT / BSPP	PSMM45AP / PSMM41AP	PSMM46AP / PSMM42AP
	Isysnet with valve driver module	NPT / BSPP	PSML65AP / PSML61AP	PSML66AP / PSML62AP
	Isysnet with valve driver module and bus extension connector	NPT / BSPP	PSMM55AP / PSMM51AP	PSMM56AP / PSMM52AP
	Isysnet with valve driver module and 24VDC connector	NPT / BSPP	PSMM65AP / PSMM61AP	PSMM66AP / PSMM62AP
	Isysnet with valve driver module, bus extension connector and 24VDC connector	NPT / BSPP	PSMM75AP / PSMM71AP	PSMM76AP / PSMM72AP

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 Valve Products

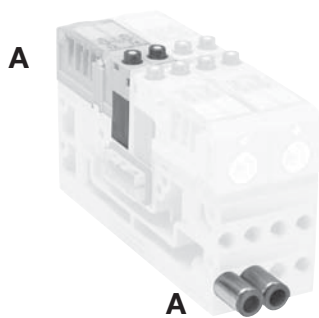
Simple Manifold Assemblies

Includes a valve manifold with 4 valves and fittings installed.
 End Plates must be ordered separately.

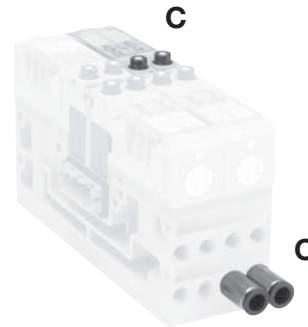


BOLD OPTIONS ARE MOST POPULAR.

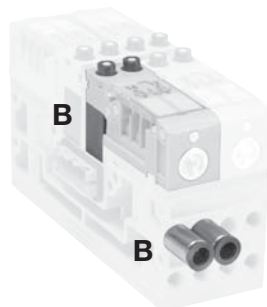
* Requires double address circuit board, enclosure "M".
 ** Requires fitting "P".



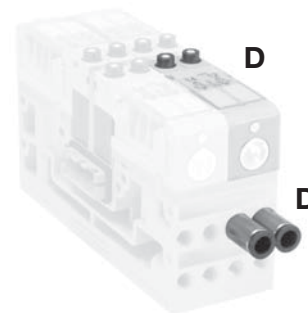
Valve Position A - Character 9
 Fitting Position A - Character 10



Valve Position C - Character 13
 Fitting Position C - Character 14



Valve Position B - Character 11
 Fitting Position B - Character 12



Valve Position D - Character 15
 Fitting Position D - Character 16

D

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 Valve Products

How To Order Plug-in Add-A-Fold Assemblies

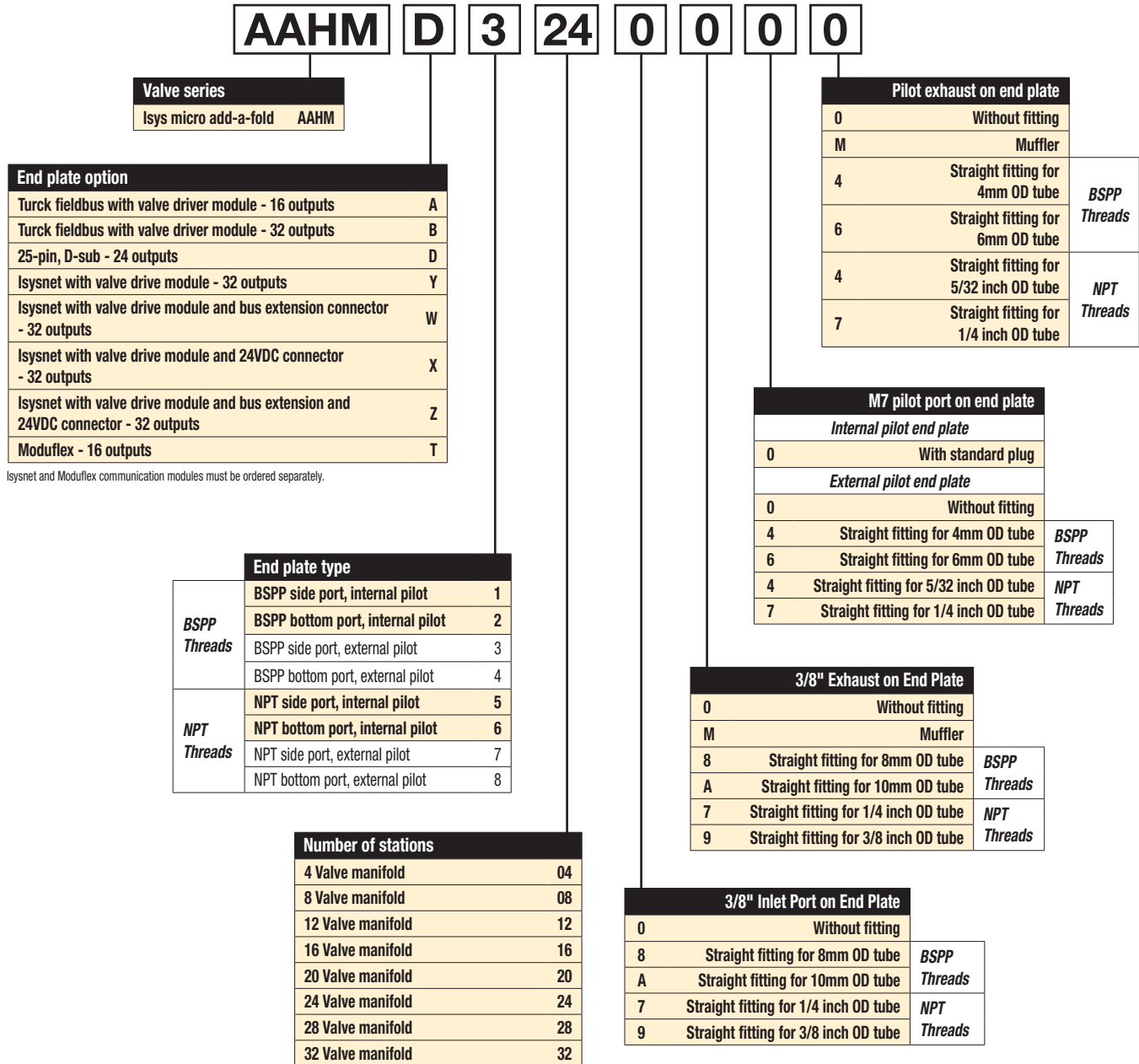
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List Simple Manifold Assemblies. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

**Maximum Number of Solenoids
(Maximum Energized Simultaneously)**

	25-pin D-sub	Moduflex	Isysnet*	Turck	
				16 Outputs	32 Outputs
24VDC	24 (24)	16 (16)	32 (32)	16 (16)	32 (32)

* Maximum of 32 solenoids per manifold. With Bus Extension functionality, 4 manifolds with up to 32 solenoids each can be connected on the same network.

Add-A-Fold Assembly Model Number



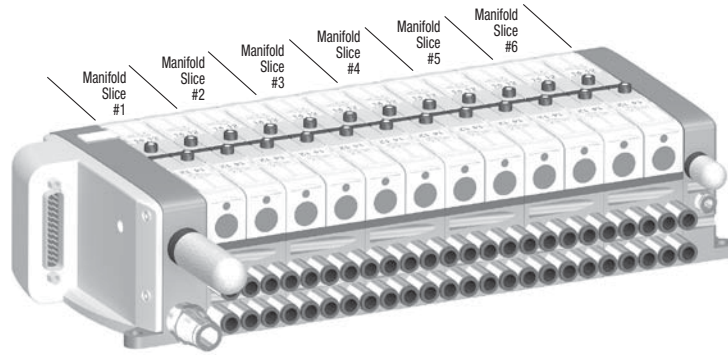
Isysnet and Moduflex communication modules must be ordered separately.

Note:
BSPP fittings can only be used with BSPP Manifolds.
NPT fittings can only be used with NPT Manifolds.

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Valve Products

25-Pin, D-Sub Manifolds

24 Single Solenoid Valves



Add-A-Fold


Manifold is factory assembled and tested for pneumatic leaks and electrical continuity.

Item	Qty	Description	Part number
01	1	24 valve Add-A-Fold with end plates	AAHMD5249M0M
02	6	4 valve simple manifold slices #1-6	PSM31JAPE7E7E7E7

Component Level

Item	Qty	Description	Part number
01	1	25-pin, D-sub, end plate	PSML25AP
02	24	Single solenoid valve	HMEVX2049A
03	6	Manifold, side ported, single address	PSM21JAP
04	50	1/4" Tube fittings (in box quantity)	PS567925
05	10	3/8" Tube fittings (in box quantity)	PS568338
06	1	3/8" Exhaust muffler	P6M-PAB3
07	1	1/8" Exhaust muffler	P6M-PAB1




Sandwich Regulator

Description	Kit number
 Common port regulator, 5 to 125 PSI with gauge	PSMRAX6AP


Note: Cv values are reduced when using a sandwich regulator to 0.20 for 2-Position and Dual 3/2 valves, and 0.17 for 3-Position APB valves.

Note: The sandwich regulator passes full pilot pressure from the manifold, allowing the regulated pressure to adjusted down to 5 PSI without affecting valve functionality.


Mufflers

Description	Part number
 1/8" pilot exhaust – BSPP or NPT	P6M-PAB1
 3/8" main exhaust – BSPP or NPT	P6M-PAB3
 M7 bottom port pilot exhaust (must be ordered in multiples of 10)	PS568800




Flow Controls

Description	Kit number
 4mm to 4mm or 5/32" to 5/32" OD tube	FC800-5/32
1/4" to 1/4" O.D. tube	FC800-4

25-Pin, D-Sub Cable (Female)

Description	Length	Part number
 25-pin, D-sub cable, IP20	3 meters	P8LMH25M3A
25-pin, D-sub cable, IP20	9 meters	SCD259D
25-pin, D-sub cable, IP65	3 meters	SCD253W
25-pin, D-sub cable, IP65	9 meters	SCD259WE

Fittings – Must be ordered in multiples of 10

Thread	Tube O.D.	Part number
Manifold or pilot supply ports – straight		
 M7	4mm or 5/32"	PS567904
M7	6mm	PS567906
M7	1/4"	PS567925
Main inlet or exhaust ports		
 3/8" NPT	1/4"	PS568325
3/8" NPT	3/8"	PS568338
3/8" BSPP	8mm	PS568308
3/8" BSPP	10mm	PS568310
Pilot exhaust ports		
 1/8" NPT	5/32"	PS568215
1/8" NPT	1/4"	PS568225
1/8" BSPP	4mm	PS568204
1/8" BSPP	6mm	PS568206

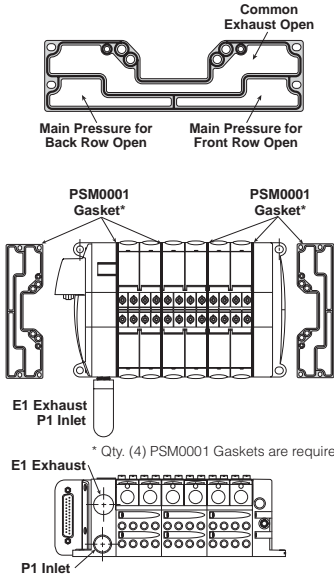
D

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 Valve Products

Multiple Pressure Zones

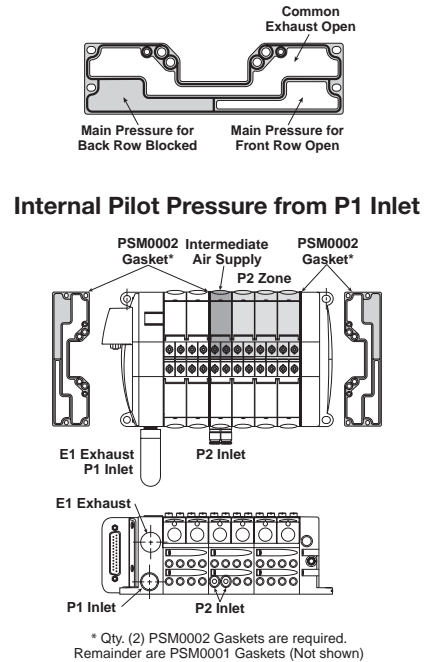
PSM0001 –

All ports open. Common pressure for front and rear manifold.
 Common exhausts.
 Standard gasket included with each manifold and end plate.



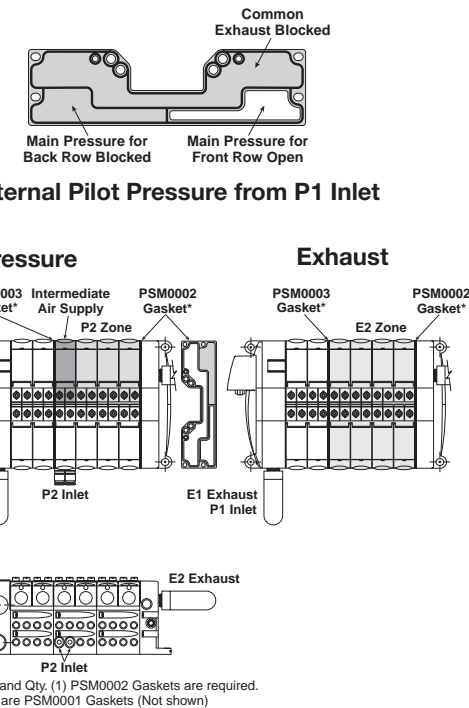
PSM0002 –

Rear manifold blocked for separate pressure supply.
 Common exhausts.
 Flip gasket to block front of manifold.



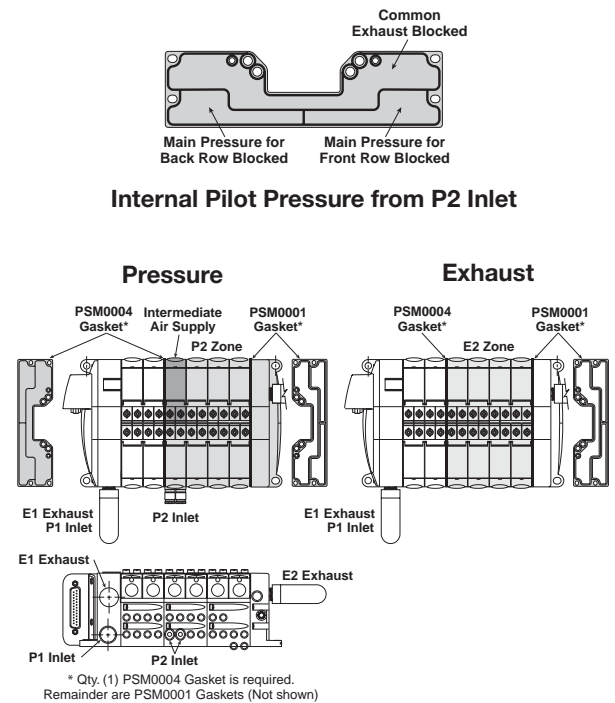
PSM0003 –

Rear manifold blocked for separate pressure supply.
 Exhaust blocked also.
 Flip gasket to block front of manifold.
 If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.





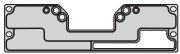

PSM0004 –

All galleys blocked.
 Two pressure zones and two exhaust zones.
 If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.




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 Valve Products

Manifold to Manifold Gaskets*


	Description	Part number
	All galleys passing	PSM0001
	Main pressure to rear or front valves blocked, exhaust passing	PSM0002
	Main pressure to rear or front valves blocked, exhaust blocked	PSM0003
	All galleys blocked	PSM0004

* Includes 1 Gasket


Replacement Solenoid Kit

	Description	Part number
	24VDC solenoid kit with screws	PSM0010


Replacement Override Caps

	Description	Part number
	Set of 10 manual override caps	PSM0011

Replacement Gaskets and Valve Screws

	Description	Part number
	Set of 5 valve to manifold gaskets and 10 screws	PSM0012

Replacement Plugs


	Description	Part number
	Set of 10 M7 plugs (Part No. PS567900) for auxiliary and pilot pressure ports	PSM0013

Valve Labels*


Description	Part number
Single solenoid diagram	PSM002E
Double solenoid diagram	PSM0022
Double solenoid diagram – APB	PSM0025
Double solenoid diagram – Dual 3/2 NC/NC	PSM002N
Double solenoid diagram – Dual 3/2 NO/NO	PSM002P
Double solenoid diagram – Dual 3/2, 14 end NO, 12 end NC	PSM002Q

*Includes 10 Labels.


Replacement Screws

	Description	Part number
	Set of 10 manifold to manifold M3 screws	PSM0014

Replacement Regulator Gauge

	Description	Part number
	5 to 125 PSI Gauge	P0566202

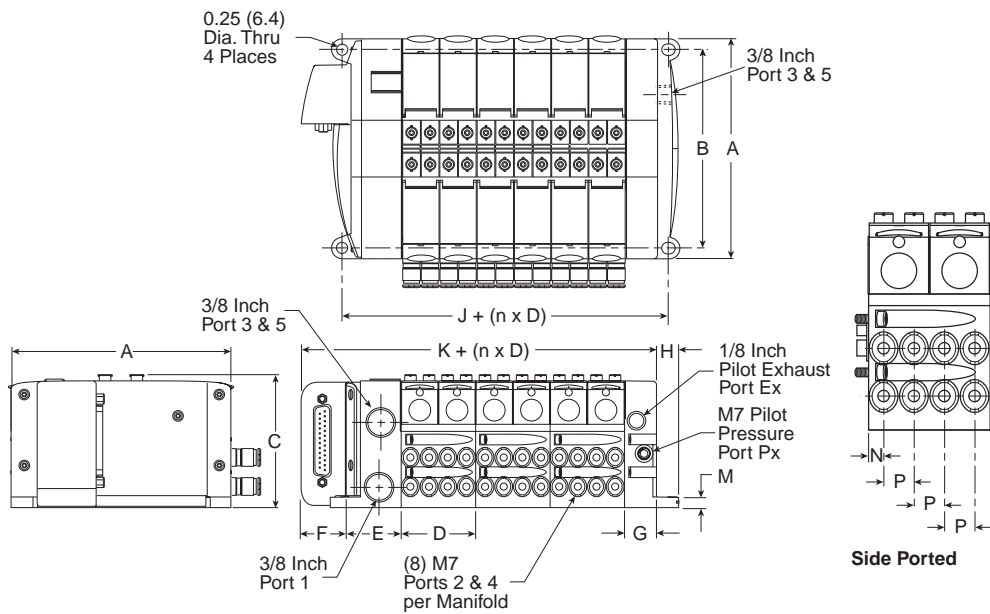
Replacement Protective Cover

	Description	Part number
	Protective Polyester Cover Set of 10	PS5706

D

Subbase & Manifold
 Valve Products

25-Pin, D-Sub with Isys Micro Valves, Side Ported



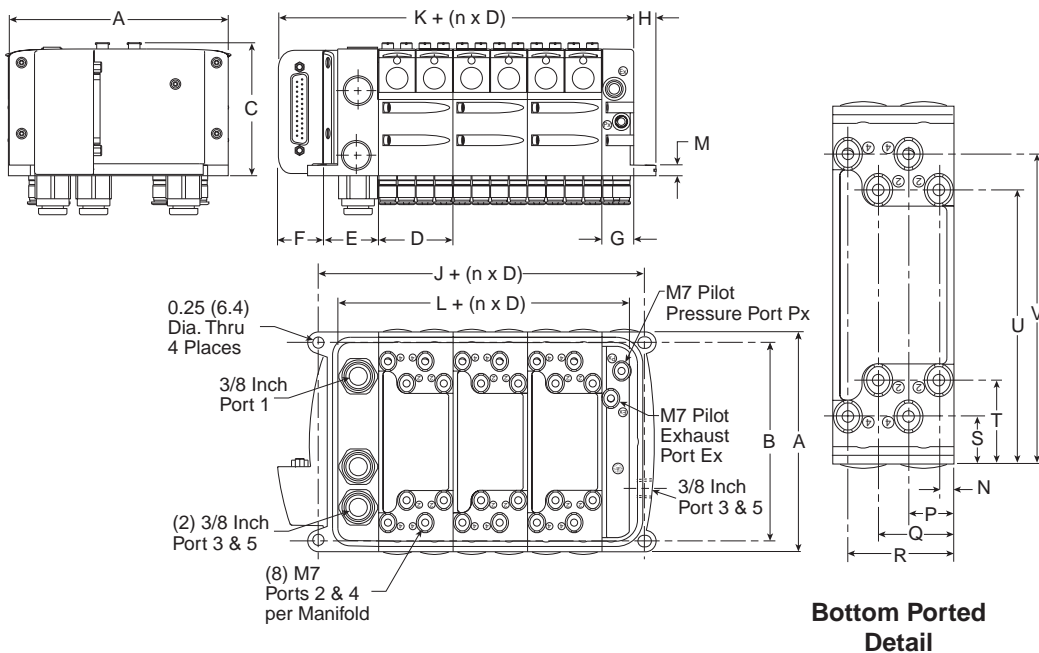
Dimensions

A	B	C	D
4.88	4.41	2.95	1.65
(124.0)	(112.0)	(75.0)	(42.0)
E	F	G	H
1.22	1.02	0.71	0.49
(31.0)	(26.0)	(18.0)	(12.5)
J	K	M	N
2.28	3.44	0.24	0.21
(58.0)	(87.5)	(6.1)	(5.2)
P	0.41		
(10.5)			

Inches (mm)
 n = Number of manifolds

Side Ported

25-Pin, D-Sub with Isys Micro Valves, Bottom Ported



Dimensions

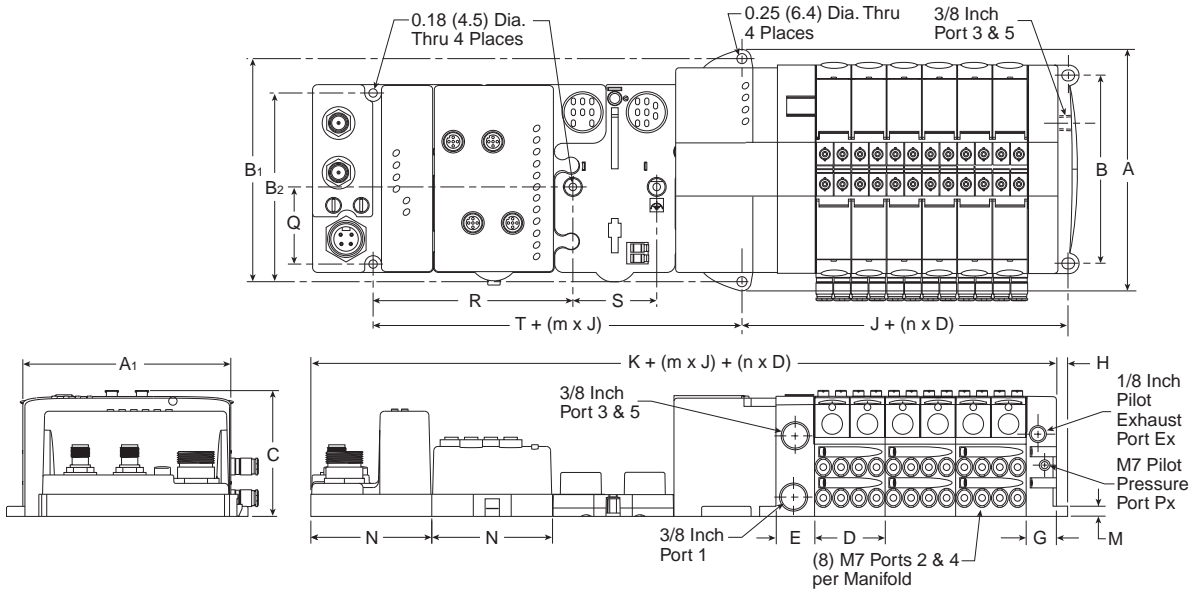
A	B	C	D
4.88	4.41	2.95	1.65
(124.0)	(112.0)	(75.0)	(42.0)
E	F	G	H
1.22	1.02	0.71	0.49
(31.0)	(26.0)	(18.0)	(12.5)
J	K	L	M
2.28	3.44	1.69	0.24
(58.0)	(87.5)	(43.0)	(6.1)
N	P	Q	R
0.21	0.62	1.03	1.45
(5.3)	(15.8)	(26.3)	(36.8)
S	T	U	V
0.64	1.14	3.73	4.23
(16.40)	(29.0)	(94.9)	(107.4)

Inches (mm)
 n = Number of manifolds

Bottom Ported Detail

D
 Subbase & Manifold
 Valve Products

Isysnet with Isys Micro Valves, Side Ported

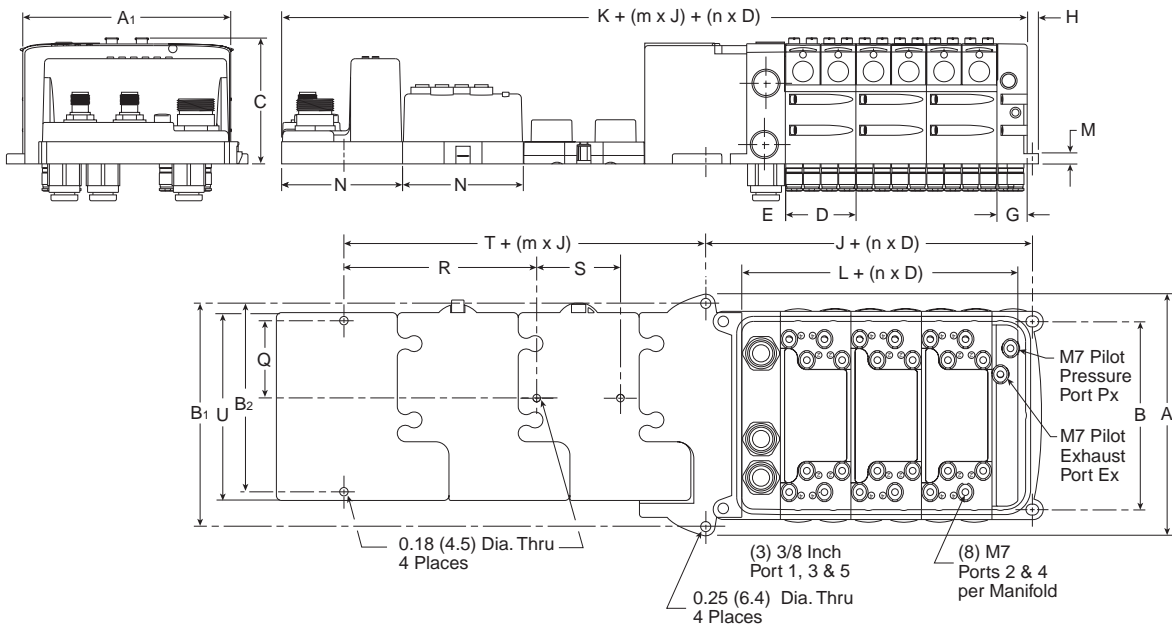


Dimensions

A	A₁	B	B₁	B₂	C	D	E	G
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	0.71 (18.0)
H	J	K	M	N	Q	R	S	T
0.49 (12.5)	2.72 (69.0)	7.32 (186.0)	0.24 (6.1)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)

Inches (mm)
 n = Number of Manifolds
 m = Number of Modules

Isysnet with Isys Micro Valves, Bottom Ported



Dimensions

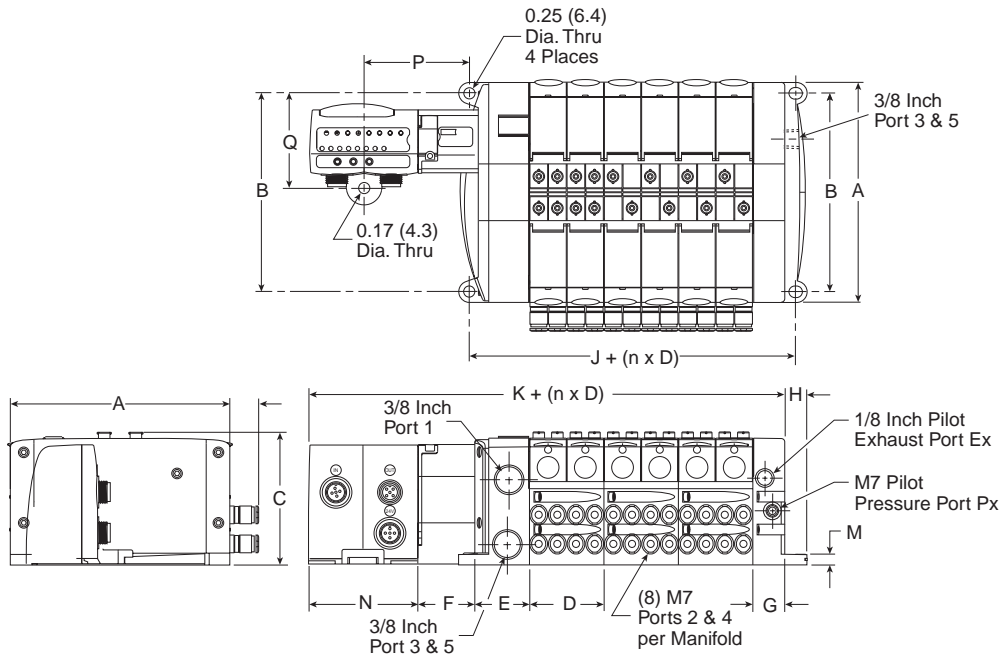
A	A₁	B	B₁	B₂	C	D	E	G	H
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	0.71 (18.0)	0.49 (12.5)
J	K	L	M	N	Q	R	S	T	U
2.72 (69.0)	7.32 (186.0)	1.69 (43.0)	0.24 (6.1)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)	4.41 (112)

Inches (mm)
 n = Number of Manifolds
 m = Number of Modules

D

Subbase & Manifold
 Valve Products

Moduflex with Isys Micro Valves, Side Ported

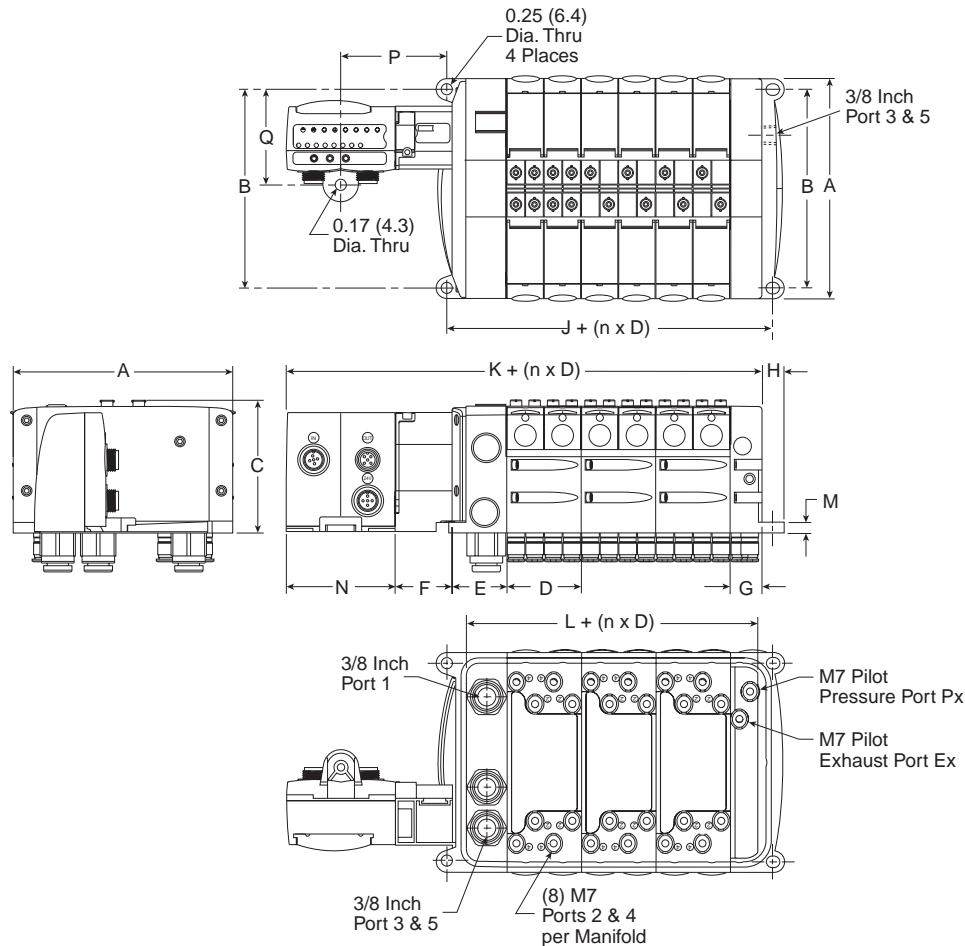


Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)
E	F	G	H
1.22 (31.0)	1.28 (32.5)	0.71 (18.0)	0.49 (12.5)
J	K	M	N
2.28 (58.0)	6.10 (155.0)	0.24 (6.1)	2.40 (61.0)
P	Q		
2.36 (60.0)	2.07 (52.55)		

Inches (mm)
 n = Number of manifolds

Moduflex with Isys Micro Valves, Bottom Ported



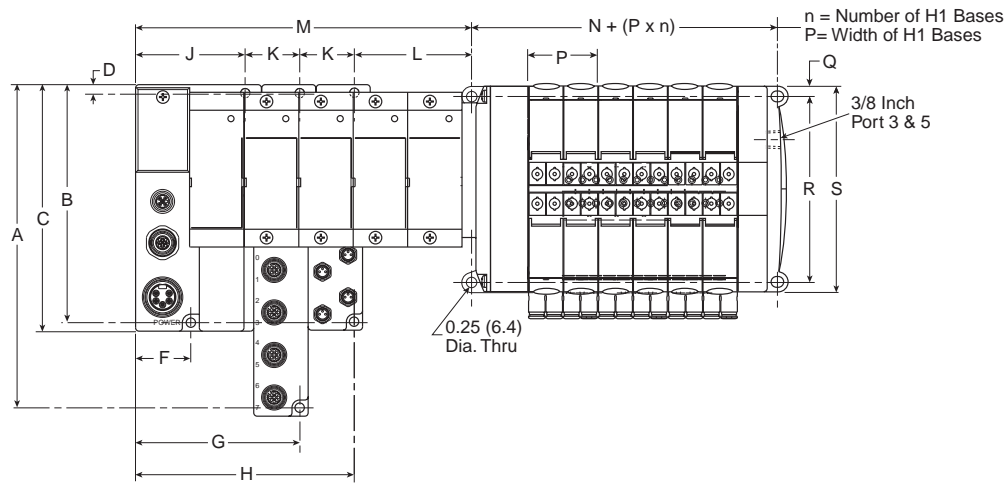
Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)
E	F	G	H
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)
J	K	L	M
2.28 (58.0)	6.10 (155.0)	1.69 (43.0)	0.24 (6.1)
N	P	Q	
2.40 (61.0)	2.36 (60.0)	2.07 (52.55)	

Inches (mm)
 n = Number of manifolds

D
 Subbase & Manifold
 Valve Products

Turck with Isys Micro Valves, Side Ported



Dimensions

A	B	C	D
7.48 (190)	5.51 (140)	5.71 (145)	0.20 (5)
F	G	H	J
1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)
K	L	M	N
1.26 (32)	2.54 (64)	See note 1	2.28 (58)
P	Q	R	S
1.65 (42)	.19 (4.9)	4.41 (112)	4.88 (124)

Note 1: $M = J + L + n_2 \times K$, where n_2
 = Number of Turck input / output
 modules
 Inches (mm)

D

Subbase & Manifold
 Valve Products

The Isys ISO valve conforms to international standards 15407 and 5599, providing maximum flexibility for end users. As Parker's premier manifold mount product offering, Isys ISO offers machine builds a complete offering with a wide variety of accessories and options in a valve family with flow ranges from 0.55 Cv up to 6.0 Cv. Individual wiring is available with DIN or central connectors, and collective solutions offer installation time savings with either multi-pin connectors or fieldbus solutions.

Ports

- HB: 1/8 inch
- HA: 1/4 inch
- H1: 3/8 inch
- H2: 1/2 inch
- H3: 3/4 inch

Mounting

- Manifold or Subbase

Solenoids

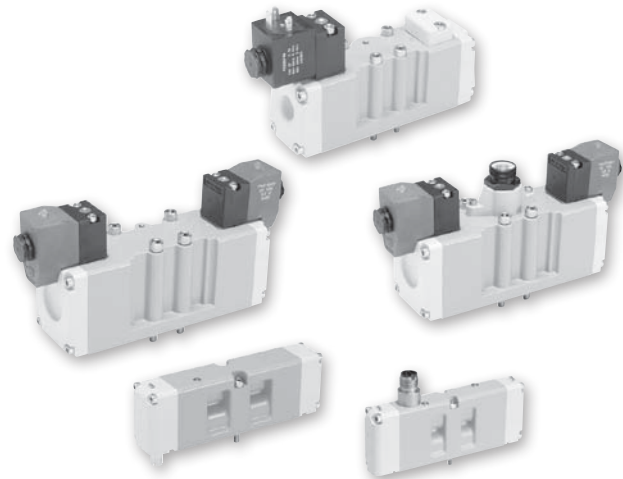
- HB and HA 24 VDC, 1.0 Watt, and 120 VAC, 1.0 VA
- H1, H2, and H3 24 VDC, 3.2 Watt, and 120VAC, 4.5 VA

Certification / Approval

- IP65 rated
- CSA / C-US Approved

Materials

Body	Aluminum
End caps	PBT
End plates	Aluminum
Fasteners	Zinc plated steel
Manifolds	Aluminum
Seals	Nitrile
Spool	Aluminum



Operating information

Operating pressure:	Vacuum to 145 PSIG (Vacuum to 10 bar)
Pilot pressure:	See chart
Temperature range:	5°F to 120°F (-15°C to 49°C)

Operating Pressure

Maximum: 145 PSIG (1000 kPa)

Minimum:

Operator / function	Internal pilot	PSIG (Min. kPa) HB	PSIG (Min. kPa) HA	PSIG (Min. kPa) H1	PSIG (Min. kPa) H2	PSIG (Min. kPa) H3
1	Single solenoid - 2-position	30 (207)	25 (173)	25 (173)	25 (173)	35 (241)
2	Double solenoid- 2-position					
3	Single remote pilot - 2-position **	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
4	Double remote pilot - 2-position**	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
5, 6, 7	Double solenoid - 3-position APB, CE, PC	35 (241)	35 (241)	35 (241)	50 (345)	50 (345)
8, 9, 0	Double remote pilot - 3-position** APB, CE, PC	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
E	Single solenoid pilot - 2-position					
	Air return / spring assist	30 (207)	30 (207)	35 (241)	45 (310)	45 (310)
F	Single remote pilot - 2-position**					
	Air return / spring assist					
N, P, Q	Double solenoid - dual 3/2	30 (207)	N/A	N/A	N/A	N/A
	External pilot *	*	*	*	*	*
All	Isys	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum

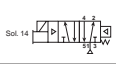
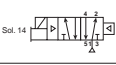
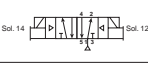
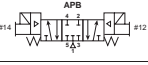
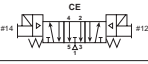
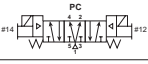
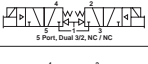
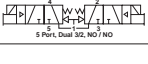
* External Pilot Pressure / Remote Pilot Supply - Must meet or exceed minimum pilot pressure for internal pilot option. Not available on Operator / Function N, P, or Q.

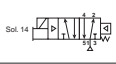
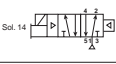
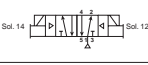
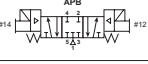
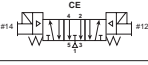
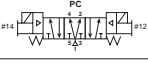
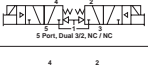

** Must be equal to or greater than operating pressure.

Most popular. For technical information see CD



D
 Subbase & Manifold
 Valve Products

15407-2, Plug-in, Size 18mm (HB)

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	0.55	Single solenoid	24 VDC	Internal	HBEVXBG0G9A	HBEVXBH0G9A
					External	HBEVXLG0G9A	HBEVXLH0G9A
	4-way, 2-position, air return	0.55	Single solenoid	24 VDC	Internal	HB1VXBG0G9A	HB1VXBH0G9A
					External	HB1VXLG0G9A	HB1VXLH0G9A
	4-way, 2-position	0.55	Double solenoid	24 VDC	Internal	HB2VXBG0G9A	HB2VXBH0G9A
					External	HB2VXLG0G9A	HB2VXLH0G9A
	4-way, 3-position, all ports blocked	0.5	Double solenoid	24 VDC	Internal	HB5VXBG0G9A	HB5VXBH0G9A
					External	HB5VXLG0G9A	HB5VXLH0G9A
	4-way, 3-position, center exhaust	0.5	Double solenoid	24 VDC	Internal	HB6VXBG0G9A	HB6VXBH0G9A
					External	HB6VXLG0G9A	HB6VXLH0G9A
	4-way, 3-position, pressure center	0.5	Double solenoid	24 VDC	Internal	HB7VXBG0G9A	HB7VXBH0G9A
					External	HB7VXLG0G9A	HB7VXLH0G9A
	3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	24 VDC	Internal	HBNVXBG0G9A	HBNVXBH0G9A
					External	HBNVXLG0G9A	HBNVXLH0G9A
	3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	24 VDC	Internal	HBPVXBG0G9A	HBPVXBH0G9A

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	0.55	Single solenoid	120 VAC	Internal	HBEVXBG023A	HBEVXBH023A
					External	HBEVXLG023A	HBEVXLH023A
	4-way, 2-position, air return	0.55	Single solenoid	120 VAC	Internal	HB1VXBG023A	HB1VXBH023A
					External	HB1VXLG023A	HB1VXLH023A
	4-way, 2-position	0.55	Double solenoid	120 VAC	Internal	HB2VXBG023A	HB2VXBH023A
					External	HB2VXLG023A	HB2VXLH023A
	4-way, 3-position, all ports blocked	0.5	Double solenoid	120 VAC	Internal	HB5VXBG023A	HB5VXBH023A
					External	HB5VXLG023A	HB5VXLH023A
	4-way, 3-position, center exhaust	0.5	Double solenoid	120 VAC	Internal	HB6VXBG023A	HB6VXBH023A
					External	HB6VXLG023A	HB6VXLH023A
	4-way, 3-position, pressure center	0.5	Double solenoid	120 VAC	Internal	HB7VXBG023A	HB7VXBH023A
					External	HB7VXLG023A	HB7VXLH023A
	3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	120 VAC	Internal	HBNVXBG023A	HBNVXBH023A
					External	HBNVXLG023A	HBNVXLH023A
	3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	120 VAC	Internal	HBPVXBG023A	HBPVXBH023A






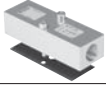

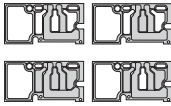
15407-2, Plug-in, Size 18mm (HB), 2-Station Manifold Bases

End ported bases	Enclosure / Lead length	Solenoid addresses	1/8" NPT	1/8" BSPP
	Circuit board	Single solenoid - 1 address	PS561151JP	PS561152JP
	Circuit board	Double solenoid - 2 addresses	PS561151MP	PS561152MP
	Circuit board with 32 output expansion	Single solenoid - 1 address	PS561151NP	PS561152NP
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	PS561151PP	PS561152PP
Bottom / end ported bases				
	Circuit board	Single solenoid - 1 address	PS561161JP	PS561162JP
	Circuit board	Double solenoid - 2 addresses	PS561161MP	PS561162MP
	Circuit board with 32 output expansion	Single solenoid - 1 address	PS561161NP	PS561162NP
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	PS561161PP	PS561162PP







D







Subbase & Manifold
 Valve Products

15407-2, Plug-in, Size 26mm (HB) Accessories


Accessories	Description	Part number
 Sandwich regulator	Common pressure	2-60 PSIG w/ gauge PS5638155P
	Common pressure	5-125 PSIG w/ gauge PS5638166P
	Independent pressure	2-60 PSIG w/ gauge PS5638255P
	Independent pressure	5-125 PSIG w/ gauge PS5638266P
 Gauge adapter kit	Includes 1/8" coupling and long nipple	PS5651160P
 Blanking plate kit		PS5634P
 Sandwich supply module	1/8" NPT	PS561600P
	1/8" BSPP	PS561601P
 Sandwich exhaust module	1/8" NPT	PS561700P
	1/8" BSPP	PS561701P
 Intermediate air supply module	1/8" NPT	D02P-01-80
 Sandwich flow control		PS5635P
 Manifold to manifold gasket kits	Standard	PS561AP
	Blocked #1 port	PS561BP
	Blocked #1, 3, 5, ports	PS561CP
	Blocked #3, 5 ports	PS561DP

15407-2, Plug-in, Size 26mm (HA)



Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	1.1	Single solenoid	24 VDC	Internal	HAEVXBG0G9A	HAEVXBH0G9A
					External	HAEVXLG0G9A	HAEVXLH0G9A
 Sol. 13	4-way, 2-position, air return	1.1	Single solenoid	24 VDC	Internal	HA1VXBG0G9A	HA1VXBH0G9A
					External	HA1VXLG0G9A	HA1VXLH0G9A
 Sol. 14	4-way, 2-position	1.1	Double solenoid	24 VDC	Internal	HA2VXBG0G9A	HA2VXBH0G9A
					External	HA2VXLG0G9A	HA2VXLH0G9A
 Sol. 12	4-way, 3-position, all ports blocked	1.0	Double solenoid	24 VDC	Internal	HA5VXBG0G9A	HA5VXBH0G9A
					External	HA5VXLG0G9A	HA5VXLH0G9A
 Sol. 12	4-way, 3-position, center exhaust	1.0	Double solenoid	24 VDC	Internal	HA6VXBG0G9A	HA6VXBH0G9A
					External	HA6VXLG0G9A	HA6VXLH0G9A
 Sol. 12	4-way, 3-position, pressure center	1.0	Double solenoid	24 VDC	Internal	HA7VXBG0G9A	HA7VXBH0G9A
					External	HA7VXLG0G9A	HA7VXLH0G9A

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	1.1	Single solenoid	120 VAC	Internal	HAEVXBG023A	HAEVXBH023A
					External	HAEVXLG023A	HAEVXLH023A
 Sol. 13	4-way, 2-position, air return	1.1	Single solenoid	120 VAC	Internal	HA1VXBG023A	HA1VXBH023A
					External	HA1VXLG023A	HA1VXLH023A
 Sol. 14	4-way, 2-position	1.1	Double solenoid	120 VAC	Internal	HA2VXBG023A	HA2VXBH023A
					External	HA2VXLG023A	HA2VXLH023A
 Sol. 12	4-way, 3-position, all ports blocked	1.0	Double solenoid	120 VAC	Internal	HA5VXBG023A	HA5VXBH023A
					External	HA5VXLG023A	HA5VXLH023A
 Sol. 12	4-way, 3-position, center exhaust	1.0	Double solenoid	120 VAC	Internal	HA6VXBG023A	HA6VXBH023A
					External	HA6VXLG023A	HA6VXLH023A
 Sol. 12	4-way, 3-position, pressure center	1.0	Double solenoid	120 VAC	Internal	HA7VXBG023A	HA7VXBH023A
					External	HA7VXLG023A	HA7VXLH023A

15407-2, Plug-in, Size 26mm (HA), Single Subbase

Enclosure / Lead length	Solenoid addresses	1/4" NPT	1/4" BSPP
 Terminal strip in the base	Double solenoid - 2 addresses	PS55113CP	PS55114CP








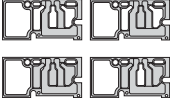
15407-2, Plug-in, Size 26mm (HA), 2-Station Manifold Bases

End ported bases	Enclosure / Lead length	Solenoid addresses	1/4" NPT	1/4" BSPP
	Circuit board	Single solenoid - 1 address	PS551153JP	PS551154JP
	Circuit board	Double solenoid - 2 addresses	PS551153MP	PS551154MP
	Circuit board with 32 output expansion	Single solenoid - 1 address	PS551153NP	PS551154NP
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	PS551153PP	PS551154PP
	Terminal strip in the base	Double solenoid - 2 addresses	PS551153CP	PS551154CP
Bottom / end ported bases				
	Circuit board	Single solenoid - 1 address	PS551163JP	PS551164JP
	Circuit board	Double solenoid - 2 addresses	PS551163MP	PS551164MP
	Circuit board with 32 output expansion	Single solenoid - 1 address	PS551163NP	PS551164NP
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	PS551163PP	PS551164PP
	Terminal strip in the base	Double solenoid - 2 addresses	PS551163CP	PS551164CP

D

Subbase & Manifold
 Valve Products








15407-2, Plug-in, Size 18mm (HA) Accessories

Accessories	Description	Part number
 Sandwich regulator	Common pressure	2-60 PSIG w/ gauge PS5538155P
	Common pressure	5-125 PSIG w/ gauge PS5538166P
	Independent pressure	2-60 PSIG w/ gauge PS5538255P
	Independent pressure	5-125 PSIG w/ gauge PS5538266P
 Gauge adapter kit	Includes 1/8" coupling and long nipple	PS5551160P
 Blanking plate kit		PS5534P
 Sandwich supply module	1/4" NPT	PS551600P
	1/4" BSPP	PS551601P
 Sandwich exhaust module	1/4" NPT	PS551700P
	1/4" BSPP	PS551701P
 Intermediate air supply module	1/4" NPT	D01P-02-80
 Sandwich flow control		PS5535P
 Manifold to manifold gasket kits	Standard	PS561AP
	Blocked #1 port	PS561BP
	Blocked #1, 3, 5, ports	PS561CP
	Blocked #3, 5 ports	PS561DP


D

Subbase & Manifold
 Valve Products

15407-2, Plug-in, Size 18mm & 26mm End Plate Kits

	Electrical option	NPT port	BSPP port
	No connector - use with terminal strip in base	PS5631010P	PS5631011P
	25-pin, D-Sub	PS5620L20P	PS5620L21P
	19-pin, round, Brad Harrison	PS5620L30P	PS5620L31P
	12-pin, M23	PS5620L40P	PS5620L41P
	16-point terminal strip	PS5620L50P	PS5620L51P
	19-pin, M23	PS5620M20P	PS5620M21P
	Moduflex fieldbus	PS5620M40P	PS5620M41P
	Isysnet, with valve driver module	PS5620L60P	PS5620L61P
	Turck fieldbus with valve driver module - 16 outputs	PS5620T10P	PS5620T11P
	Turck fieldbus with valve driver module - 32 outputs	PS5620T20P	PS5620T21P

15407-2 End Plate Kits with Transition to H2

	Electrical option	NPT port	BSPP port
	25-pin, D-sub	PS5624L20P	PS5624L21P
	19-pin, round, Brad Harrison	PS5624L30P	PS5624L31P
	12-pin, M23	PS5624L40P	PS5624L41P
	16-point terminal strip	PS5624L50P	PS5624L51P
	19-pin, M23	PS5624M20P	PS5624M21P
	Moduflex fieldbus	PS5624M40P	PS5624M41P
	Isysnet, with valve driver module	PS5624L60P	PS5624L61P
	Turck fieldbus with valve driver module - 16 outputs	PS5624T10P	PS5624T11P
	Turck fieldbus with valve driver module - 32 outputs	PS5624T20P	PS5624T21P

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

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Subbase & Manifold
 Valve Products

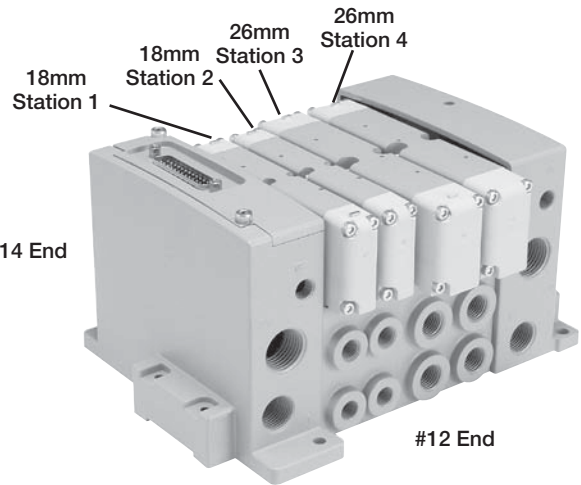
How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Number of Solenoids (Maximum Energized Simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or		12-pin M23	Moduflex	Isysnet	Turck	
			Brad Harrison	8 (8)				16	32
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	32 (32)	16 (16)	32 (32)	
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A	

* Not CSA certified for 25-Pin, D-Sub option.



Example:
 4-Station Manifold with (2) 18mm and (2) 26mm Valves on Manifold Bases

Add-A-Fold Assembly Model Number

AA HB D 0 04

Valve series	Right & left end plate 15407-2 (plug-in, HB 18mm & HA 26mm)	HB*
End plate type	Turck fieldbus with valve driver module - 16 outputs	A*
Turck fieldbus with valve driver module - 32 outputs	B*	
25-pin, D-sub	D	
19-pin, Brad Harrison	E	
16 Point terminal strip	F	
12-pin, M23	G	
19-pin, M23	H	
Moduflex fieldbus	T*	
Isysnet, with valve driver module	Y*	

Number of stations*	02
04	
•	
24	
•	
32	

* Must be ordered in multiples of (2) unless using the HB / HA to H2 Transition Plate.

Thread type	0 NPT
1* BSPP "G"	

* BSPP conforms to ISO 1179-1 with 228-1 threads.

*Must order communication modules separately.

Example

Application requires a 4-Station manifold.
 (Two 18mm + Two 26mm Stations)

Item	Qty.	Part No.	Location
01	1	AAHBD004	
02	1	HB1VXBG0G9A	Station 1
03	1	HB2VXLG0G9A	Station 2
04	1	PS561151MP	Station 1 & 2
05	2	HA1VXBG0G9A	Station 3 & 4
06	1	PS551151MP	Station 3 & 4

NOTE: Construct manifold assemblies from left to right while looking at the ports. Valves must be ordered as External Pilot when using Sandwich Regulator.

When using an HA or HB manifold base with the "N" Enclosure / Lead Length option:

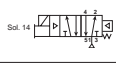
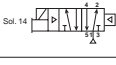

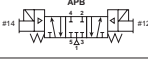
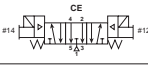
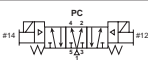
- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 26 are a single address base. Use a base with "N" Enclosure / Lead Length option (this is a single address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 27 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.

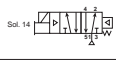
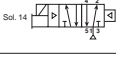
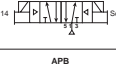
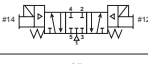
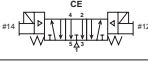
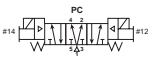
When using an HA or HB manifold base with the "P" Enclosure / Lead Length option:

- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 28 are a double address base. Use a base with "P" Enclosure / Lead Length option (this is a double address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 29 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.


D
 Subbase & Manifold Valve Products

5599-2, Plug-in, Size 1 (H1)



Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	Internal	H1EVXBG0B9C	H1EVXBH0B9C
					External	H1EVXXG0B9C	H1EVXXH0B9C
	4-way, 2-position, air return	1.5	Single solenoid	24 VDC	Internal	H11VXBG0B9C	H11VXBH0B9C
					External	H11VXXG0B9C	H11VXXH0B9C
	4-way, 2-position	1.5	Double solenoid	24 VDC	Internal	H12VXBG0B9C	H12VXBH0B9C
					External	H12VXXG0B9C	H12VXXH0B9C
	4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	Internal	H15VXBG0B9C	H15VXBH0B9C
					External	H15VXXG0B9C	H15VXXH0B9C
	4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	Internal	H16VXBG0B9C	H16VXBH0B9C
					External	H16VXXG0B9C	H16VXXH0B9C
	4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	Internal	H17VXBG0B9C	H17VXBH0B9C
					External	H17VXXG0B9C	H17VXXH0B9C

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	Internal	H1EVXBG023C	H1EVXBH023C
					External	H1EVXXG023C	H1EVXXH023C
	4-way, 2-position, air return	1.5	Single solenoid	120 VAC	Internal	H11VXBG023C	H11VXBH023C
					External	H11VXXG023C	H11VXXH023C
	4-way, 2-position	1.5	Double solenoid	120 VAC	Internal	H12VXBG023C	H12VXBH023C
					External	H12VXXG023C	H12VXXH023C
	4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	Internal	H15VXBG023C	H15VXBH023C
					External	H15VXXG023C	H15VXXH023C
	4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	Internal	H16VXBG023C	H16VXBH023C
					External	H16VXXG023C	H16VXXH023C
	4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	Internal	H17VXBG023C	H17VXBH023C
					External	H17VXXG023C	H17VXXH023C

5599-2, Plug-in Single Subbase, Size 1 (H1)

Side ported	Enclosure / Lead length	Solenoid addresses	3/8" NPT	3/8" BSPP
	Terminal strip in base	Double solenoid - 2 address	PS401115CCP	PS401116CCP
	6" flying leads	Double solenoid - 2 addresses	PS401115ACP	PS401116ACP
	4-pin, M12 micro connector in base, SAE / Ford wiring	Double solenoid - 2 addresses	PS4011158FCP	PS4011168FCP


5599-2, Plug-in Manifold Bases, Size 1 (H1)

End ported	Enclosure / Lead length	Solenoid addresses	3/8" NPT	3/8" BSPP
	Circuit board	Single solenoid - 1 address	PS401155JCP	PS401156JCP
	Circuit board	Double solenoid - 2 addresses	PS401155MCP	PS401156MCP
	Terminal strip in base	Double solenoid - 2 address	PS401155CCP	PS401156CCP
	6" flying leads	Double solenoid - 2 addresses	PS401155ACP	PS401156ACP
	4-pin, M12 micro connector in base, SAE / Ford wiring	Double solenoid - 2 addresses	PS4011558FCP	PS4011568FCP
Bottom / End	Enclosure / Lead length	Solenoid addresses	3/8" NPT	3/8" BSPP
	Circuit board	Single solenoid - 1 address	PS401165JCP	PS401166JCP
	Circuit board	Double solenoid - 2 addresses	PS401165MCP	PS401166MCP
	Terminal strip in base	Double solenoid - 2 address	PS401165CCP	PS401166CCP
	6" flying leads	Double solenoid - 2 addresses	PS401165ACP	PS401166ACP
	4-pin, M12 micro connector in base, SAE / Ford wiring	Double solenoid - 2 addresses	PS4011658FCP	PS4011668FCP

D

Subbase & Manifold
 Valve Products

5599-2, Size 1 (H1) Accessories

Accessory	Description	Part number
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4038166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4038266CP
Blanking plate kit		PS4034CP
Sandwich flow control		PS4035CP
Manifold to manifold gasket kits		PS4013P
Manifold port isolation kit	Main galley (1, 3, 5)	PS4032CP
	Pilot galley	PS4033CP
Auxiliary access plate kit	1/4" & 3/8" NPT	PS403000CP
		BSPP

Plug-in, 5599-2 End Plate Kits, Size 1 (H1)

Electrical option	NPT port	BSPP port
No connector - use with individually wired base	PS4031010CP	PS4031011CP
25-pin, D-sub	PS4020L20CP	PS4020L21CP
19-pin, round, Brad Harrison	PS4020L30CP	PS4020L31CP
12-pin, M23	PS4020L40CP	PS4020L41CP
19-pin, M23	PS4020M20CP	PS4020M21CP
Moduflex fieldbus	PS4020M40CP	PS4020M41CP
Isysnet, with valve driver module	PS4020L60CP	PS4020L61CP
Turck fieldbus with valve driver module - 16 outputs	PS4020T10CP	PS4020T11CP
Turck fieldbus with valve driver module - 32 outputs	PS4020T20CP	PS4020T21CP

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

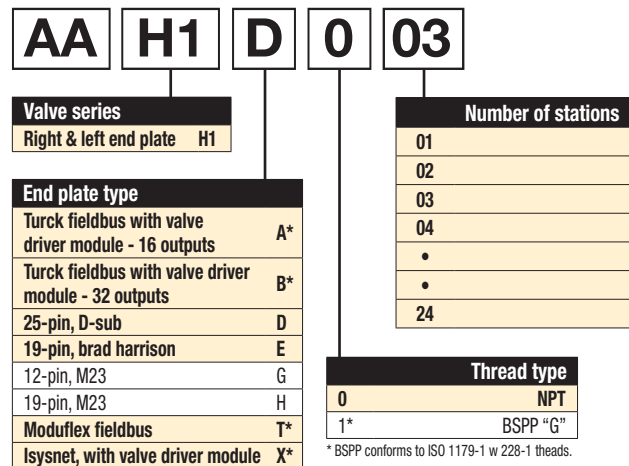
- List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
- List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Number of Solenoids (Maximum Energized Simultaneously)

Voltage	Voltage code	19-pin		12-pin M23	Moduflex	Isysnet	Turck	
		25-pin D-sub	Brad Harrison				16 Outputs	32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-Pin, D-Sub option.


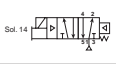



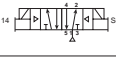
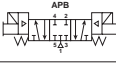
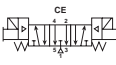
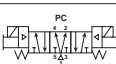
Add-A-Fold Assembly Model Numbers


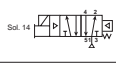

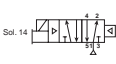

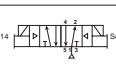

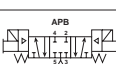
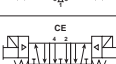


* Must order communication modules separately.


* BSPP conforms to ISO 1179-1 w 228-1 threads.

5599-2, Plug-in, Size 2 (H2)


Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14 	4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	Internal	H2EVXBG0B9C	H2EVXBH0B9C
					External	H2EVXXG0B9C	H2EVXXH0B9C
 Sol. 14 	4-way, 2-position, air return	3.0	Single solenoid	24 VDC	Internal	H21VXBG0B9C	H21VXBH0B9C
					External	H21VXXG0B9C	H21VXXH0B9C
 Sol. 14  #14  #12  #12 	4-way, 2-position	3.0	Double solenoid	24 VDC	Internal	H22VXBG0B9C	H22VXBH0B9C
					External	H22VXXG0B9C	H22VXXH0B9C
	4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	Internal	H25VXBG0B9C	H25VXBH0B9C
					External	H25VXXG0B9C	H25VXXH0B9C
	4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	Internal	H26VXBG0B9C	H26VXBH0B9C
					External	H26VXXG0B9C	H26VXXH0B9C
	4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	Internal	H27VXBG0B9C	H27VXBH0B9C
					External	H27VXXG0B9C	H27VXXH0B9C

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14 	4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	Internal	H2EVXBG023C	H2EVXBH023C
					External	H2EVXXG023C	H2EVXXH023C
 Sol. 14 	4-way, 2-position, air return	3.0	Single solenoid	120 VAC	Internal	H21VXBG023C	H21VXBH023C
					External	H21VXXG023C	H21VXXH023C
 Sol. 14 	4-way, 2-position	3.0	Double solenoid	120 VAC	Internal	H22VXBG023C	H22VXBH023C
					External	H22VXXG023C	H22VXXH023C
 #14  #12 	4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	Internal	H25VXBG023C	H25VXBH023C
					External	H25VXXG023C	H25VXXH023C
	4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	Internal	H26VXBG023C	H26VXBH023C
					External	H26VXXG023C	H26VXXH023C
	4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	Internal	H27VXBG023C	H27VXBH023C
					External	H27VXXG023C	H27VXXH023C

5599-2, Plug-in Single Subbase, Size 2 (H2)

Side ported base	Enclosure / Lead length	Solenoid addresses	1/2" NPT	1/2" BSPP
	Terminal strip in base	Double solenoid - 2 address	PS411117CCP	PS411118CCP
	6" flying leads	Double solenoid - 2 addresses	PS411117ACP	PS411118ACP


5599-2, Plug-in Manifold Bases, Size 2 (H2)

Bottom / End ported bases	Enclosure / Lead length	Solenoid addresses	1/2" NPT	1/2" BSPP
	Circuit board	Single solenoid - 1 address	PS411167JCP	PS411168JCP
	Circuit board	Double solenoid - 2 addresses	PS411167MCP	PS411168MCP
	Terminal strip in base	Double solenoid - 2 address	PS411167CCP	PS411168CCP
	6" flying leads	Double solenoid - 2 addresses	PS411167ACP	PS411168ACP

D

Subbase & Manifold
 Valve Products

5599-2, Size 2 (H2) Accessories

Accessory	Description	Part number
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4138166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4138266CP
Blanking plate kit		PS4134CP
Sandwich flow control		PS4135CP
Manifold to manifold gasket kits		PS4113P
Manifold port isolation kit	Main galley (1, 3, 5)	PS4132CP
	Pilot galley	PS4033CP

Plug-in, 5599-2 End Plate Kits, Size 2 (H2)

Electrical option	NPT port	BSPP port
No connector - use with individually wired base	PS4131010CP	PS4131011CP
25-pin, D-sub	PS4120L20CP	PS4120L21CP
19-pin, round, Brad Harrison	PS4120L30CP	PS4120L31CP
12-pin, M23	PS4120L40CP	PS4120L41CP
19-pin, M23	PS4120M20CP	PS4120M21CP
Moduflex fieldbus	PS4120M40CP	PS4120M41CP
Isysnet, with valve driver module	PS4120L60CP	PS4120L61CP
Turck fieldbus with valve driver module - 16 outputs	PS4120T10CP	PS4120T11CP
Turck fieldbus with valve driver module - 32 outputs	PS4120T20CP	PS4120T21CP

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

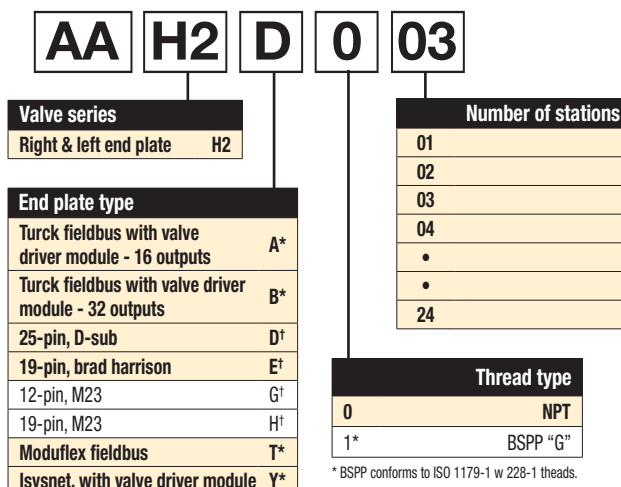
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2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Number of Solenoids (Maximum Energized Simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or Brad Harrison		12-pin M23 Moduflex	Isysnet	Turck	
			8 (8)	16 (16)			16	32
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-Pin, D-Sub option.

Add-A-Fold Assembly Model Numbers




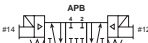

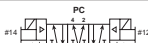




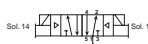
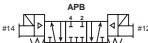

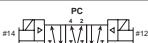
* Must order communication modules separately.
 † Collective wiring module included.

* BSPP conforms to ISO 1179-1 w 228-1 threads.


D
 Subbase & Manifold Valve Products

5599-2, Plug-in, Size 3 (H3)


Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	Internal	H3EVXBG0B9C	H3EVXBH0B9C
					External	H3EVXXG0B9C	H3EVXXH0B9C
	4-way, 2-position, air return	6.0	Single solenoid	24 VDC	Internal	H31VXBG0B9C	H31VXBH0B9C
					External	H31VXXG0B9C	H31VXXH0B9C
	4-way, 2-position	6.0	Double solenoid	24 VDC	Internal	H32VXBG0B9C	H32VXBH0B9C
					External	H32VXXG0B9C	H32VXXH0B9C
	4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	Internal	H35VXBG0B9C	H35VXBH0B9C
					External	H35VXXG0B9C	H35VXXH0B9C
	4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	Internal	H36VXBG0B9C	H36VXBH0B9C
					External	H36VXXG0B9C	H36VXXH0B9C
	4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	Internal	H37VXBG0B9C	H37VXBH0B9C
					External	H37VXXG0B9C	H37VXXH0B9C

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	Internal	H3EVXBG023C	H3EVXBH023C
					External	H3EVXXG023C	H3EVXXH023C
	4-way, 2-position, air return	6.0	Single solenoid	120 VAC	Internal	H31VXBG023C	H31VXBH023C
					External	H31VXXG023C	H31VXXH023C
	4-way, 2-position	6.0	Double solenoid	120 VAC	Internal	H32VXBG023C	H32VXBH023C
					External	H32VXXG023C	H32VXXH023C
	4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	Internal	H35VXBG023C	H35VXBH023C
					External	H35VXXG023C	H35VXXH023C
	4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	Internal	H36VXBG023C	H36VXBH023C
					External	H36VXXG023C	H36VXXH023C
	4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	Internal	H37VXBG023C	H37VXBH023C
					External	H37VXXG023C	H37VXXH023C

5599-2, Plug-in Single Subbase, Size 3 (H3)

Side ported base	Enclosure / Lead length	Solenoid addresses	3/4" NPT	3/4" BSPP
	Terminal strip in base	Double solenoid - 2 address	PS421119CCP	PS401110CCP
	6" flying leads	Double solenoid - 2 addresses	PS421119ACP	PS421110ACP

5599-2, Plug-in Manifold Bases, Size 3 (H3)

Bottom / End ported bases	Enclosure / Lead length	Solenoid addresses	3/4" NPT	3/4" BSPP
	Circuit board	Single solenoid - 1 address	PS421169JCP	PS421160JCP
	Circuit board	Double solenoid - 2 addresses	PS421169MCP	PS421160MCP
	Terminal strip in base	Double solenoid - 2 address	PS421169CCP	PS421160CCP
	6" flying leads	Double solenoid - 2 addresses	PS421169ACP	PS421160ACP

5599-2, Size 3 (H3) Accessories

Accessory	Description	Part number
Sandwich regulator	Common pressure	PS4238166CP
	Independent pressure	PS4238266CP
Blanking plate kit		PS4234CP
Sandwich flow control		PS4235CP
Manifold to manifold gasket kits		PS4213P
Manifold port isolation kit	Main galley (1, 3, 5)	PS4232CP
	Pilot galley	PS4033CP

D

Subbase & Manifold
 Valve Products

Plug-in, 5599-2 End Plate Kits, Size 3 (H3)

Electrical option	NPT port	BSPP port
No connector - use with individually wired base	PS4231010CP	PS4231011CP
25-pin, D-sub	PS4220L20CP	PS4220L21CP
19-pin, round, Brad Harrison	PS4220L30CP	PS4220L31CP
12-pin, M23	PS4220L40CP	PS4220L41CP
19-pin, M23	PS4220M20CP	PS4220M21CP
Moduflex fieldbus	PS4220M40CP	PS4220M41CP
Isysnet, with valve driver module	PS4220L60CP	PS4220L61CP
Turck fieldbus with valve driver module - 16 outputs	PS4220T10CP	PS4220T11CP
Turck fieldbus with valve driver module - 32 outputs	PS4220T20CP	PS4220T21CP

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Number of Solenoids (Maximum Energized Simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or Brad Harrison		12-pin M23 Moduflex	Isysnet	Turck	
			16 (16)	8 (8)			16 (16)	32 (21)
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-Pin, D-Sub option.

Add-A-Fold Assembly Model Numbers

AA H3 D 0 03

Valve series	Right & left end plate H3
End plate type	Turck fieldbus with valve driver module - 16 outputs A* Turck fieldbus with valve driver module - 32 outputs B* 25-pin, D-sub D† 19-pin, brad harrison E‡ 12-pin, M23 G‡ 19-pin, M23 H‡ Moduflex fieldbus T* Isysnet, with valve driver module Y*
Number of stations	01 02 03 04 • • 24
Thread type	0 NPT 1* BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Threads.

* Must order communication modules separately.
 † Collective wiring module included.

Plug-in, 5599-2 Transition Plate Kits

PS4026 L2 0 C P

Transition plate type*	
H1 to H2 to H3	PS4025
H1 to H3	PS4026
H1 to H2	PS4027
H2 to H3	PS4028

* Includes Left Hand and Right Hand End Plates

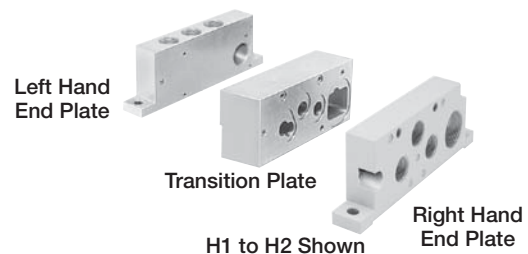
Engineering level	
C	Basic series PS40

Thread type	
0	NPT
1*	BSPP "G"

* BSPP conforms to ISO 1179-1 w 228-1 threads.


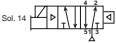



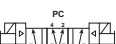
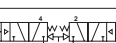

Options	
25-pin, D-sub	L2
19-pin, round, brad harrison	L3
12-pin, M23	L4
19-pin, M23	M2
Moduflex fieldbus	M4*
Isysnet, with valve driver module	L6*
Turck fieldbus with valve driver module - 16 outputs	T1
Turck fieldbus with valve driver module - 32 outputs	T2

* Must order communication module separately.
 turck, isysnet, and moduflex communication modules must be ordered separately.
 See fieldbus section for more information.




D
 Subbase & Manifold Valve Products


15407-1, Non Plug-in, Size 18mm (HB)

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	0.55	Single solenoid	24 VDC	Internal	HBEXXBG2G9000FA	HBEXXBH2G9000FA
					External	HBEXXLG2G9000FA	HBEXXLH2G9000FA
	4-way, 2-position, air return	0.55	Single solenoid	24 VDC	Internal	HB1WXBG2G9000FA	HB1WXBH2G9000FA
					External	HB1WXLG2G9000FA	HB1WXLH2G9000FA
	4-way, 2-position	0.55	Double solenoid	24 VDC	Internal	HB2WXBG2G9000FA	HB2WXBH2G9000FA
					External	HB2WXLG2G9000FA	HB2WXLH2G9000FA
	4-way, 3-position, all ports blocked	0.5	Double solenoid	24 VDC	Internal	HB5WXBG2G9000FA	HB5WXBH2G9000FA
					External	HB5WXLG2G9000FA	HB5WXLH2G9000FA
	4-way, 3-position, center exhaust	0.5	Double solenoid	24 VDC	Internal	HB6WXBG2G9000FA	HB6WXBH2G9000FA
					External	HB6WXLG2G9000FA	HB6WXLH2G9000FA
	4-way, 3-position, pressure center	0.5	Double solenoid	24 VDC	Internal	HB7WXBG2G9000FA	HB7WXBH2G9000FA
					External	HB7WXLG2G9000FA	HB7WXLH2G9000FA
	3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	24 VDC	Internal	HBNWXBG2G9000FA	HBNWXBH2G9000FA
					External	HBNWXLG2G9000FA	HBNWXLH2G9000FA
	3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	24 VDC	Internal	HBPWXBG2G9000FA	HBPWXBH2G9000FA
					External	HBPWXLG2G9000FA	HBPWXLH2G9000FA

15407-1, Non Plug-in, Size 18mm (HB)

Single subbase	Description	1/8" NPT	1/8" BSPP
	Side ported base	PL02-01-80	PL02-01-70
	End ported bases	1/8" NPT PS5611510P	1/8" BSPP PS5611520P
End plate kit		3/8" NPT Port PS5631010P	3/8" BSPP Port PS5631011P

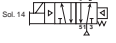
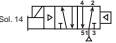

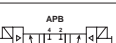
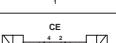
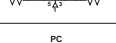
15407-1, Non Plug-in, Size 18mm (HB) Accessories

Accessory	Description	Part number
	Common pressure	2-60 PSIG w/ gauge PS5637155P
	Common pressure	5-125 PSIG w/ gauge PS5637166P
	Independent pressure	2-60 PSIG w/ gauge PS5637255P
	Independent pressure	5-125 PSIG w/ gauge PS5637266P
Gauge adapter kit	Includes 1/8" coupling and long nipple	PS5651160P
Blanking plate kit		PS5634P
Sandwich supply module	1/8" NPT	PS562600P
	1/8" BSPP	PS562601P
Sandwich exhaust module	1/8" NPT	PS562700P
	1/8" BSPP	PS562701P
Intermediate air supply module	1/8" NPT	D02P-01-80
Sandwich flow control		PS5642P
	Standard	PS561AP
Manifold to manifold gasket kits	Blocked #1 port	PS561BP
	Blocked #1, 3, 5, ports	PS561CP
	Blocked #3, 5 ports	PS561DP




D

Subbase & Manifold
 Valve Products


15407-1, Non Plug-in, Size 26mm (HA)

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	1.1	Single solenoid	24 VDC	Internal	HAEWXBG2G9000FA	HAEWXBH2G9000FA
					External	HAEWXLG2G9000FA	HAEWXLH2G9000FA
	4-way, 2-position, air return	1.1	Single solenoid	24 VDC	Internal	HA1WXBG2G9000FA	HA1WXBH2G9000FA
					External	HA1WXLG2G9000FA	HA1WXLH2G9000FA
	4-way, 2-position	1.1	Double solenoid	24 VDC	Internal	HA2WXBG2G9000FA	HA2WXBH2G9000FA
					External	HA2WXLG2G9000FA	HA2WXLH2G9000FA
	4-way, 3-position, all ports blocked	1.0	Double solenoid	24 VDC	Internal	HA5WXBG2G9000FA	HA5WXBH2G9000FA
					External	HA5WXLG2G9000FA	HA5WXLH2G9000FA
	4-way, 3-position, center exhaust	1.0	Double solenoid	24 VDC	Internal	HA6WXBG2G9000FA	HA6WXBH2G9000FA
					External	HA6WXLG2G9000FA	HA6WXLH2G9000FA
	4-way, 3-position, pressure center	1.0	Double solenoid	24 VDC	Internal	HA7WXBG2G9000FA	HA7WXBH2G9000FA
					External	HA7WXLG2G9000FA	HA7WXLH2G9000FA

15407-1, Non Plug-in, Size 26mm (HA)

Single subbase	Description	1/4" NPT	1/4" BSPP
	Side ported base	PL01-02-80	PL01-02-70
2 Station manifold bases	End ported bases	1/4" NPT	1/4" BSPP
		PS5511530P	PS5511540P
End plate kit		3/8" NPT port	3/8" BSPP port
		PS5631010P	PS5631011P

15407-1, Non Plug-in, Size 26mm (HA) Accessories

Accessory	Description	Part number
	Common pressure	2-60 PSIG w/ gauge PS5637155P
	Common pressure	5-125 PSIG w/ gauge PS5637166P
	Independent pressure	2-60 PSIG w/ gauge PS5637255P
	Independent pressure	5-125 PSIG w/ gauge PS5637266P
Gauge adapter kit	Includes 1/8" coupling and long nipple	PS5651160P
Blanking plate kit		PS5634P
Sandwich supply module	1/8" NPT	PS562600P
	1/8" BSPP	PS562601P
Sandwich exhaust module	1/8" NPT	PS562700P
	1/8" BSPP	PS562701P
Intermediate air supply module	1/8" NPT	D02P-01-80
Sandwich flow control		PS5642P
	Standard	PS561AP
Manifold to manifold gasket kits	Blocked #1 port	PS561BP
	Blocked #1, 3, 5, ports	PS561CP
	Blocked #3, 5 ports	PS561DP

D
 Subbase & Manifold
 Valve Products

How To Order 15407-1 Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Add-A-Fold Assembly Model Number

AA	HBS	0	04
-----------	------------	----------	-----------

Valve series

Right & left end plate
 15407-1 (HB 18mm &
 HA 26mm)

HBS†

Number of stations*

02

04

•

24

•

32


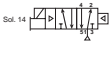
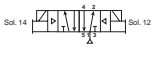
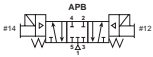
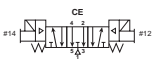
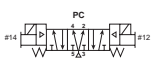
Thread type	
NPT	0
BSPG "G"	1*

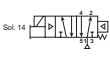
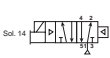

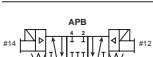
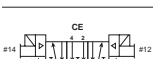
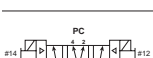
† For use with PS5511 and PS5611 manifolds.

* BSPP conforms to ISO 1179-1 w 228-1 threads for end plate Type "S".

* Must be ordered in multiples of (2) unless using the HB/HA to H2 transition plate.

5599-1, Non Plug-in, Size 1 with Central Connectors

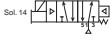
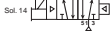
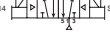

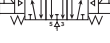
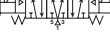
Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
	4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H1EWXBG2B9000FC	H1EWWXH2B9000FC
						External	H1EWXXG2B9000FC	H1EWXXH2B9000FC
	4-way, 2-position, air return	1.5	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H11WXBG2B9000FC	H11WXBH2B9000FC
						External	H11WXXG2B9000FC	H11WXXH2B9000FC
	4-way, 2-position	1.5	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H12WXBG2B9000FC	H12WXBH2B9000FC
						External	H12WXXG2B9000FC	H12WXXH2B9000FC
	4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H15WXBG2B9000FC	H15WXBH2B9000FC
						External	H15WXXG2B9000FC	H15WXXH2B9000FC
	4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H16WXBG2B9000FC	H16WXBH2B9000FC
						External	H16WXXG2B9000FC	H16WXXH2B9000FC
	4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H17WXBG2B9000FC	H17WXBH2B9000FC
						External	H17WXXG2B9000FC	H17WXXH2B9000FC

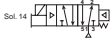
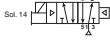


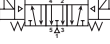

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking	
	4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H1EWXBG323000FC	H1EWWXH323000FC
					External	H1EWXXG323000FC	H1EWXXH323000FC	
	4-way, 2-position, air return	1.5	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H11WXBG323000FC	H11WXBH323000FC
					External	H11WXXG323000FC	H11WXXH323000FC	
	4-way, 2-position	1.5	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H12WXBG323000FC	H12WXBH323000FC
					External	H12WXXG323000FC	H12WXXH323000FC	
	4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H15WXBG323000FC	H15WXBH323000FC
					External	H15WXXG323000FC	H15WXXH323000FC	
	4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H16WXBG323000FC	H16WXBH323000FC
					External	H16WXXG323000FC	H16WXXH323000FC	
	4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H17WXBG323000FC	H17WXBH323000FC
					External	H17WXXG323000FC	H17WXXH323000FC	

D




Subbase & Manifold
Valve Products

5599-1, Non Plug-in, Size 1 with 3-Pin DIN Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
	4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H1EWXBBL49C	H1EWXBCL49C
						External	H1EWXXBL49C	H1EWXXCL49C
	4-way, 2-position, air return	1.5	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H11WXBBL49C	H11WXBCL49C
						External	H11WXXBL49C	H11WXXCL49C
	4-way, 2-position	1.5	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H12WXBBL49C	H12WXBCL49C
						External	H12WXXBL49C	H12WXXCL49C
	4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H15WXBBL49C	H15WXBCL49C
						External	H15WXXBL49C	H15WXXCL49C
	4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H16WXBBL49C	H16WXBCL49C
						External	H16WXXBL49C	H16WXXCL49C
	4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H17WXBBL49C	H17WXBCL49C
						External	H17WXXBL49C	H17WXXCL49C


Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking	
	4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H1EWXBBL53C	H1EWXBCL53C
						External	H1EWXXBL53C	H1EWXXCL53C
	4-way, 2-position, air return	1.5	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H11WXBBL53C	H11WXBCL53C
						External	H11WXXBL53C	H11WXXCL53C
	4-way, 2-position	1.5	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H12WXBBL53C	H12WXBCL53C
						External	H12WXXBL53C	H12WXXCL53C
	4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H15WXBBL53C	H15WXBCL53C
						External	H15WXXBL53C	H15WXXCL53C
	4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H16WXBBL53C	H16WXBCL53C
						External	H16WXXBL53C	H16WXXCL53C
	4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H17WXBBL53C	H17WXBCL53C
						External	H17WXXBL53C	H17WXXCL53C

5599-1, Non Plug-in, Size 1

Single subbase	Description	3/8" NPT	3/8" BSPP
	Side ported base	PS4011150CP	PS4011160CP
Manifold bases		3/8" NPT	3/8" BSPP
	End ported bases	PS4011550CP	PS4011560CP
	Bottom / End ported bases	PS4011650CP	PS4011660CP
End plate kits		NPT port	BSPP port
	H1 Non-collective wiring end plates	PS4031010CP	PS4031011CP

D
 Subbase & Manifold Valve Products

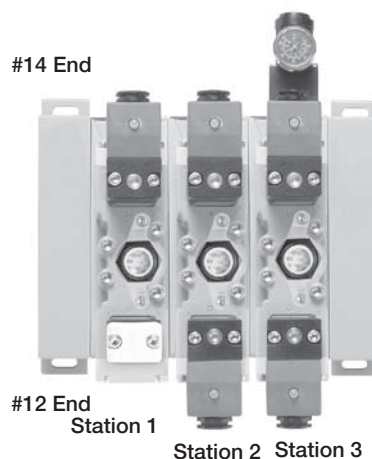
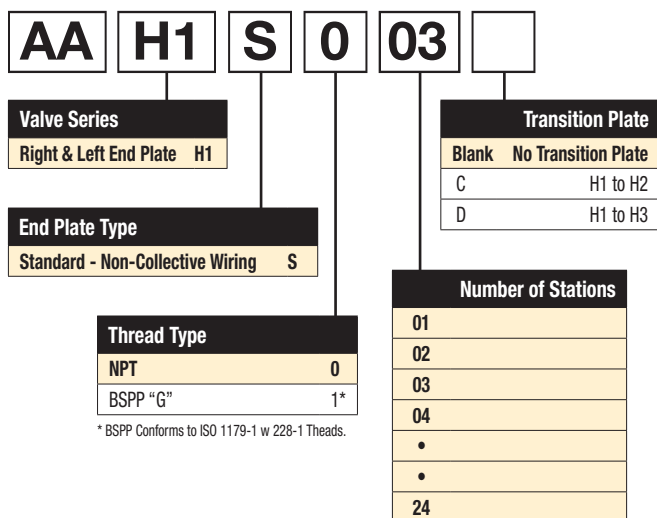
5599-1, Non Plug-in, Size 1 Accessories

Accessories	Description	Part number	
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4037166CP	
	Independent pressure 5-125 PSIG w/ gauge	PS4037266CP	
Blanking plate kit		PS4034CP	
Sandwich flow control		PS4042CP	
Manifold to manifold gasket kit		PS4013P	
Manifold port isolation kits	Main galley (1, 3, 5)	PS4032CP	
Manifold port isolation kits	Pilot galley	PS4033CP	
Auxiliary access plate kit	1/4" & 3/8"	NPT	PS403000CP
		BSPP	PS403001CP

How To Order Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Add-A-Fold Assembly Model Number



Example:
 3-Station Manifold with (3) H1 Valves
 On Manifold Bases
 and Regulator at Station 3

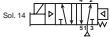
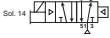

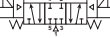


Example

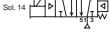
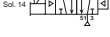
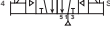



Application requires a 3-Station manifold with a valve, regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH1S003	
02	1	H11WXBG3B9000FC	Station 1
03	1	PS4011550CP	Station 1
04	1	H12WXBG3B9000FC	Station 2
05	1	PS4011550CP	Station 2
06	1	H12WXXG3B9000FC	Station 3
07	1	PS4037166CP	Station 3
08	1	PS4011550CP	Station 3

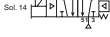
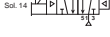
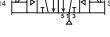

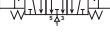
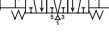
NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
 Valves must be ordered as External Pilot when using Sandwich Regulator.

5599-1, Non Plug-in, Size 2 with Central Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
 Sol. 14	4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H2EWXBG2B9000FC	H2EWXBH2B9000FC
						External	H2EWXXG2B9000FC	H2EWXXH2B9000FC
 Sol. 14	4-way, 2-position, air return	3.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H21WXBG2B9000FC	H21WXBH2B9000FC
						External	H21WXXG2B9000FC	H21WXXH2B9000FC
 Sol. 14 Sol. 12	4-way, 2-position	3.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H22WXBG2B9000FC	H22WXBH2B9000FC
						External	H22WXXG2B9000FC	H22WXXH2B9000FC
 #14 #12	4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H25WXBG2B9000FC	H25WXBH2B9000FC
						External	H25WXXG2B9000FC	H25WXXH2B9000FC
 #14 #12	4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H26WXBG2B9000FC	H26WXBH2B9000FC
						External	H26WXXG2B9000FC	H26WXXH2B9000FC
 #14 #12	4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H27WXBG2B9000FC	H27WXBH2B9000FC
						External	H27WXXG2B9000FC	H27WXXH2B9000FC


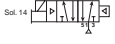
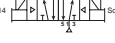
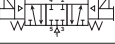


Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H2EWXBG323000FC	H2EWXBH323000FC
						External	H2EWXXG323000FC	H2EWXXH323000FC
 Sol. 14	4-way, 2-position, air return	3.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H21WXBG323000FC	H21WXBH323000FC
						External	H21WXXG323000FC	H21WXXH323000FC
 Sol. 14 Sol. 12	4-way, 2-position	3.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H22WXBG323000FC	H22WXBH323000FC
						External	H22WXXG323000FC	H22WXXH323000FC
 #14 #12	4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H25WXBG323000FC	H25WXBH323000FC
						External	H25WXXG323000FC	H25WXXH323000FC
 #14 #12	4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H26WXBG323000FC	H26WXBH323000FC
						External	H26WXXG323000FC	H26WXXH323000FC
 #14 #12	4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H27WXBG323000FC	H27WXBH323000FC
						External	H27WXXG323000FC	H27WXXH323000FC

5599-1, Non Plug-in, Size 2 with 3-Pin DIN Connectors




Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
 Sol. 14	4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H2EWXBBL49C	H2EWXBCL49C
						External	H2EWXXBL49C	H2EWXXCL49C
 Sol. 14	4-way, 2-position, air return	3.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H21WXBBL49C	H21WXBCL49C
						External	H21WXXBL49C	H21WXXCL49C
 Sol. 14 Sol. 12	4-way, 2-position	3.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H22WXBBL49C	H22WXBCL49C
						External	H22WXXBL49C	H22WXXCL49C
 #14 #12	4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H25WXBBL49C	H25WXBCL49C
						External	H25WXXBL49C	H25WXXCL49C
 #14 #12	4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H26WXBBL49C	H26WXBCL49C
						External	H26WXXBL49C	H26WXXCL49C
 #14 #12	4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H27WXBBL49C	H27WXBCL49C
						External	H27WXXBL49C	H27WXXCL49C

D
Subbase & Manifold Valve Products


5599-1, Non Plug-in, Size 2 with 3-Pin DIN Connectors

Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
	4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H2EWXBBL53C	H2EWXBCL53C
						External	H2EWXXBL53C	H2EWXXCL53C
	4-way, 2-position, air return	3.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H21WXBBL53C	H21WXBCL53C
						External	H21WXXBL53C	H21WXXCL53C
	4-way, 2-position	3.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H22WXBBL53C	H22WXBCL53C
						External	H22WXXBL53C	H22WXXCL53C
	4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H25WXBBL53C	H25WXBCL53C
						External	H25WXXBL53C	H25WXXCL53C
	4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H26WXBBL53C	H26WXBCL53C
						External	H26WXXBL53C	H26WXXCL53C
	4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H27WXBBL53C	H27WXBCL53C
						External	H27WXXBL53C	H27WXXCL53C

5599-1, Non Plug-in, Size 2

Single subbase	Description	1/2" NPT	1/2" BSPP
	Side ported base	PS4111170CP	PS4111180CP
Manifold bases		1/2" NPT	1/2" BSPP
	Bottom / End ported bases Note: Manifolds include 2 pipe plugs	PS4111670CP	PS4111680CP
End plate kits		NPT port	BSPP port
	H2 Non-collective wiring end plates	PS4131010CP	PS4131011CP

5599-1, Non Plug-in, Size 2 Accessories

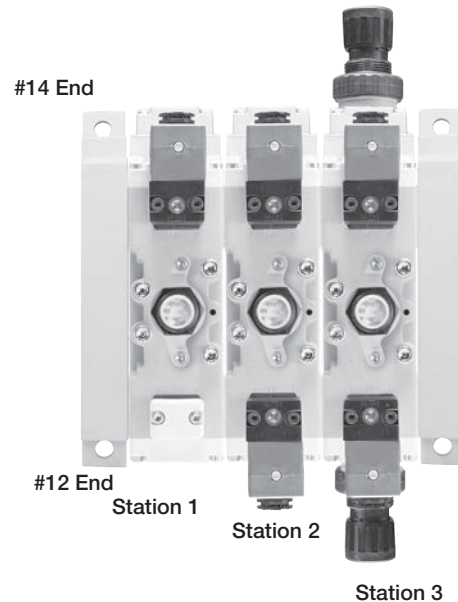
Accessories	Description	Part number
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4137166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4137266CP
Blanking plate kit		PS4134CP
Sandwich flow control		PS4142CP
Manifold to manifold gasket kit		PS4113P
Manifold port isolation kits	Main galley (1, 3, 5)	PS4132CP
Manifold port isolation kits	Pilot galley	PS4033CP

D

Subbase & Manifold
 Valve Products

How To Order Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blanking plate part number and the individual manifold number in the station specified.)



Example:
**3-Station Manifold with (3) H2 Valves
 On Manifold Bases
 and Regulator at Station 3**

Add-A-Fold Assembly Model Number

AA	H2	S	0	03
-----------	-----------	----------	----------	-----------

Valve Series
Right & Left End Plate H2

End Plate Type
Standard - Non-Collective Wiring S

Thread Type
NPT 0
BSPP "G" 1*

* BSPP Conforms to ISO 1179-1 w 228-1 Threads.

Number of Stations

01
02
03
04
•
•
24

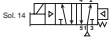
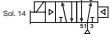

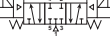


Example

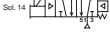
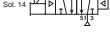
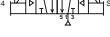



Application requires a 3-Station manifold with a valve and regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH2S003	
02	1	H21WXBG3B9000C	Station 1
03	1	PS4111570CP	Station 1
04	1	H22WXBG3B9000C	Station 2
05	1	PS4111570CP	Station 2
06	1	H22WXXG3B9000C	Station 3
07	1	PS4137166CP	Station 3
08	1	PS4111570CP	Station 3

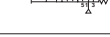

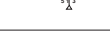
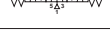
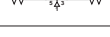
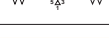
NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
 Valves must be ordered as External Pilot when using Sandwich Regulator.

5599-1, Non Plug-in, Size 3 with Central Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
 Sol. 14	4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H3EWWXBG2B9000FC	H3EWWXBH2B9000FC
						External	H3EWWXXG2B9000FC	H3EWWXXH2B9000FC
 Sol. 14	4-way, 2-position, air return	6.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H31WXBG2B9000FC	H31WXBH2B9000FC
						External	H31WXXG2B9000FC	H31WXXH2B9000FC
 Sol. 14 Sol. 12	4-way, 2-position	6.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H32WXBG2B9000FC	H32WXBH2B9000FC
						External	H32WXXG2B9000FC	H32WXXH2B9000FC
 #14 #12	4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H35WXBG2B9000FC	H35WXBH2B9000FC
						External	H35WXXG2B9000FC	H35WXXH2B9000FC
 #14 #12	4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H36WXBG2B9000FC	H36WXBH2B9000FC
						External	H36WXXG2B9000FC	H36WXXH2B9000FC
 #14 #12	4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H37WXBG2B9000FC	H37WXBH2B9000FC
						External	H37WXXG2B9000FC	H37WXXH2B9000FC

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H3EWWXBG323000FC	H3EWWXBH323000FC
						External	H3EWWXXG323000FC	H3EWWXXH323000FC
 Sol. 14	4-way, 2-position, air return	6.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H31WXBG323000FC	H31WXBH323000FC
						External	H31WXXG323000FC	H31WXXH323000FC
 Sol. 14 Sol. 12	4-way, 2-position	6.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H32WXBG323000FC	H32WXBH323000FC
						External	H32WXXG323000FC	H32WXXH323000FC
 #14 #12	4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H35WXBG323000FC	H35WXBH323000FC
						External	H35WXXG323000FC	H35WXXH323000FC
 #14 #12	4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H36WXBG323000FC	H36WXBH323000FC
						External	H36WXXG323000FC	H36WXXH323000FC
 #14 #12	4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H37WXBG323000FC	H37WXBH323000FC
						External	H37WXXG323000FC	H37WXXH323000FC


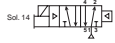
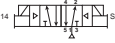



5599-1, Non Plug-in, Size 3 with 3-Pin DIN Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
 Sol. 14	4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H3EWWBBL49C	H3EWWBCL49C
						External	H3EWWXBL49C	H3EWWXCCL49C
 Sol. 14	4-way, 2-position, air return	6.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H31WXBBL49C	H31WXBCL49C
						External	H31WXXBL49C	H31WXXCCL49C
 Sol. 14 Sol. 12	4-way, 2-position	6.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H32WXBBL49C	H32WXBCL49C
						External	H32WXXBL49C	H32WXXCCL49C
 #14 #12	4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H35WXBBL49C	H35WXBCL49C
						External	H35WXXBL49C	H35WXXCCL49C
 #14 #12	4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H36WXBBL49C	H36WXBCL49C
						External	H36WXXBL49C	H36WXXCCL49C
 #14 #12	4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H37WXBBL49C	H37WXBCL49C
						External	H37WXXBL49C	H37WXXCCL49C




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Subbase & Manifold
 Valve Products


5599-1, Non Plug-in, Size 3 with 3-Pin DIN Connectors

Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
	4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H3EWXBBL53C	H3EWXBCL53C
						External	H3EWXXBL53C	H3EWXXCL53C
	4-way, 2-position, air return	6.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H31WXBBL53C	H31WXBCL53C
						External	H31WXXBL53C	H31WXXCL53C
	4-way, 2-position	6.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H32WXBBL53C	H32WXBCL53C
						External	H32WXXBL53C	H32WXXCL53C
	4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H35WXBBL53C	H35WXBCL53C
						External	H35WXXBL53C	H35WXXCL53C
	4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H36WXBBL53C	H36WXBCL53C
						External	H36WXXBL53C	H36WXXCL53C
	4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H37WXBBL53C	H37WXBCL53C
						External	H37WXXBL53C	H37WXXCL53C

5599-1, Non Plug-in, Size 3

Single subbase	Description	3/4" NPT	3/4" BSPP
	Side ported base	PS4211170CP	PS4211180CP
Manifold bases	Description	3/4" NPT	3/4" BSPP
	Bottom / End ported bases Note: Manifolds include 2 pipe plugs	PS4211690CP	PS4211600CP
End plate kits	Description	NPT port	BSPP port
	H3 Non-collective wiring end plates	PS4231010CP	PS4231011CP

5599-1, Non Plug-in, Size 3 Accessories

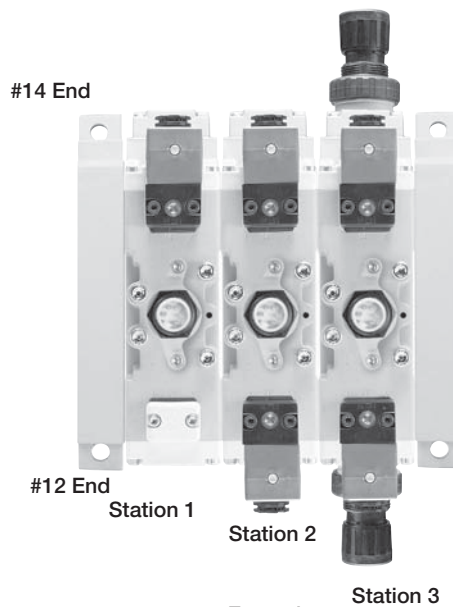
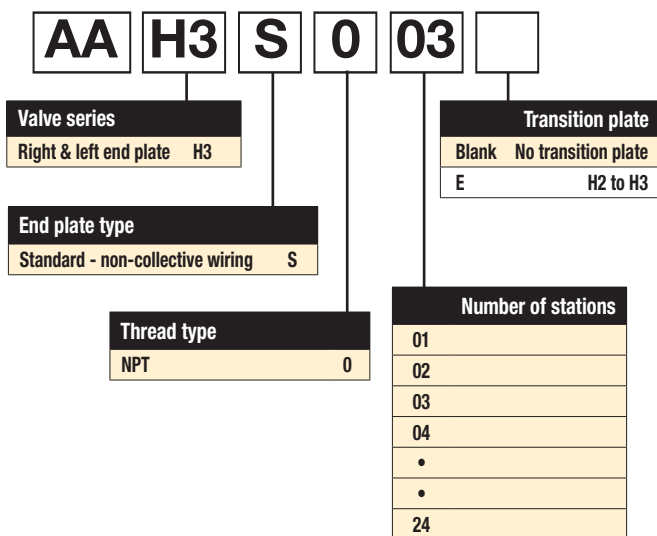
Accessories	Description	Part number
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4237166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4237266CP
Blanking plate kit		PS4234CP
Sandwich flow control		PS4242CP
Manifold to manifold gasket kit		PS4213P
Manifold port isolation kits	Main galley (1, 3, 5)	PS4232CP
Manifold port isolation kits	Pilot galley	PS4033CP

D
 Subbase & Manifold
 Valve Products

How To Order Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Add-A-Fold Assembly Model Number



Example:
 3-Station Manifold with (3) H3 Valves
 On Manifold Bases and Regulator at Station 3

Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH3S003	
02	1	H31WXBG3B9000C	Station 1
03	1	PS4211590CP	Station 1
04	1	H32WXBG3B9000C	Station 2
05	1	PS4211590CP	Station 2
06	1	H32WXXG3B9000C	Station 3
07	1	PS4237166CP	Station 3
08	1	PS4211590CP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
 Valves must be ordered as External Pilot when using Sandwich Regulator.

5599-1 Non Plug-in Transition Plate Kits



Transition plate Type*	Engineering level
H1 to H2 to H3 PS402501	C Current
H1 to H3 PS402601	
H1 to H2 PS402701	
H2 to H3 PS402801	
	Thread type
	0 NPT
	1* BSPP "G"

* Includes left hand and right hand end plates.
 Use with PS4... series manifolds only.

* BSPP conforms to ISO 1179-1
 w 228-1 threads.



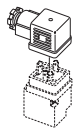
**Maximum Number of Solenoids
(Maximum Energized Simultaneously)**

HA & HB	Voltage code	25-Pin D-sub	19-Pin		12-Pin M23	19-Pin M23	Moduflex	Isysnet	Turck	
			Brad Harrison	Harrison					16 Outputs	32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	16 (16)	32 (32)	16 (16)	32 (32)	
120VAC*	23	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A	

H1, H2 & H3	Voltage code	25-Pin D-sub	19-Pin		12-Pin M23	19-Pin M23	Moduflex	Isysnet	Turck	
			Brad Harrison	Harrison					16 Outputs	32 Outputs
12VDC	45	24 (13)	16 (13)	8 (8)	16 (13)	N/A	N/A	N/A	N/A	
24VAC*	42	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A	
24VDC	B9	24 (20)	16 (16)	8 (8)	16 (16)	16 (16)	24 (21)	16 (16)	24 (21)	
120VAC*	23	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A	

* Not CSA certified for 25-Pin, D-sub option.

Female Electrical Connectors (IP65 Rated) 30mm, 3-Pin ISO 4400, (DIN 43650A)



Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	PS2028BP
Light – 6-48V, 50/60Hz; 6-48VDC	PS2032J79CP*	PS203279BP
Light – 120V/60Hz	PS2032J83CP*	PS203283BP
Light – 240V/60Hz	N/A	PS203283BP

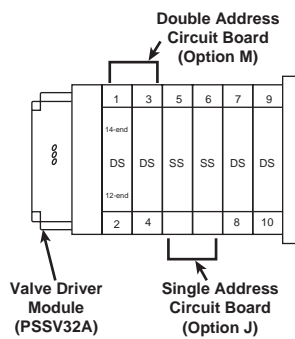
* With surge suppression.

Engineering data:

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 inch); Contact spacing: 18mm

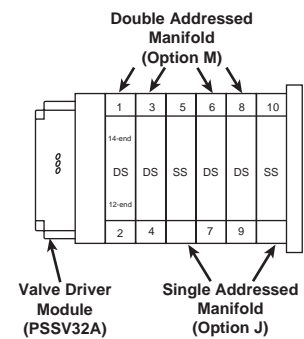
I/O Addressing Examples

**HB & HA Example
Two Station Manifold Bases**



Notes: SS = Single Solenoid Valve
DS = Double Solenoid Valve
First output address the #14 end of the valve closest to the valve driver module.

**H1, H2 & H3 Example:
Single Station Manifold Bases**



5599-2 & 5599-1 AUTO Solenoid Kits

Valve size	Voltage code	Coil kit number
	42 (24VAC)	PS404142P
	45 (12VDC)	PS404145P
	H1, H2 & H3	PS4041B9P
	23 (120VAC)	PS404123P
	57 (240VAC)	PS404157P

Quantity 1

5599-1 CNOMO Solenoid Kits

Voltage code	3-pin, 30mm 'L' coil kit	2-pin, M12 Euro '6' coil kit
19	—	PS2828619P
42	P2FCA442	—
45	P2FCA445	—
49	P2FCA449	—
53	P2FCA453	—
57	P2FCA457	—

Quantity 1

Pilot Operator - CNOMO

Valve size		Kit number
H1, H2 & H3	Locking	PS4052CP
	Non-locking	PS4053CP

Manifold Hardware Kits – PS Series

Valve size	Kit number
HA & HB	PS5612P
	PS5512P
	PS4012P
H1, H2 & H3	PS4112P
	PS4212P

Quantity 12

Valve Bolt Kits

Valve size	Kit number
HA & HB	PS5687P
	PS5587P
	PS4087CP
H1, H2 & H3	PS4187CP
	PS4287CP

Quantity 12

Valve to Base Gasket Kits

Valve size	Standard	Remote pilot	Dual pressure #3	Dual pressure #5
HA & HB	PS5605P*	—	—	—
	PS5505P*	—	—	—
H1, H2 & H3	PS4005CP	PS4006CP	PS40D3CP	—
	PS4105CP	PS4106CP	PS41D3CP	PS41D5CP
	PS4205CP	PS4206CP	PS42D3CP	PS42D5CP

Quantity 1
 * Quantity 10

Body Service Kits




Valve size	2-position	3-position		
		APB	CE	PC
HA & HB	PS5601P	PS5602P	PS5603P	PS5604P
	PS5501P	PS5502P	PS5503P	PS5504P
H1, H2 & H3	PS4001CP	PS4002CP	PS4003CP	PS4004CP
	PS4101CP	PS4102CP	PS4103CP	PS4104CP
	PS4201CP	PS4202CP	PS4203CP	PS4204CP

HB / HA Kit Includes: Spool assembly with seals.

H1, H2, H3 Kit Includes: Spool assembly with seals, all piston seals, return spring, pilot selector gasket, coil to end cap gasket.

Quantity 1

Pilot Select Gasket Kits

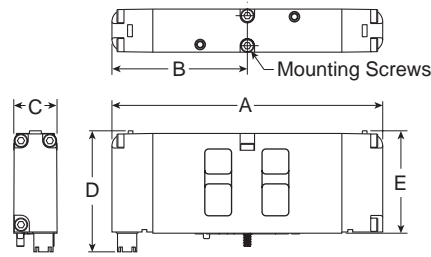
	Valve size	Kit number
	HB	PS5605P
	HA	PS5505P
	H1, H2 & H3	PS4007P

Quantity 10

D

Subbase & Manifold
 Valve Products

Isys ISO 15407-2, Plug-in, Size 18mm (HB)



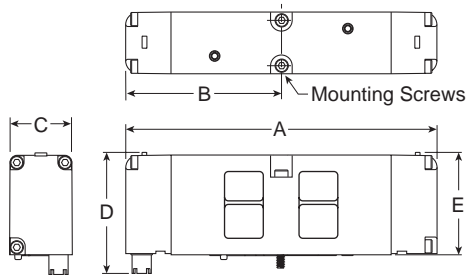
18mm Dimensions

A	B	C	D
4.43	2.22	.72	1.98
(113)	(56)	(18)	(50)

E
 1.68
 (43)

Inches (mm)

Isys ISO 15407-2, Plug-in, Size 26mm (HA)



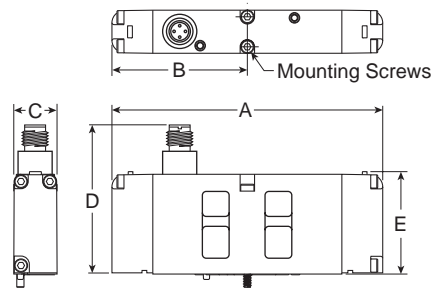
26mm Dimensions

A	B	C	D
5.10	2.55	1.02	1.98
(130)	(65)	(26)	(50)

E
 1.66
 (42)

Inches (mm)

Isys ISO 15407-1, Plug-in, Size 18mm (HB)



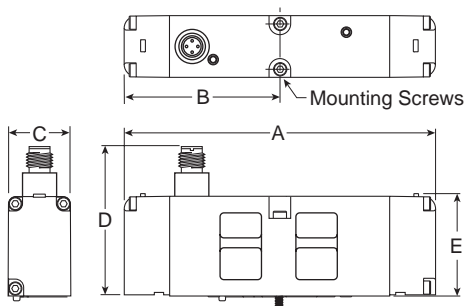
18mm Dimensions

A	B	C	D
4.43	2.22	.72	2.40
(113)	(56)	(18)	(61)

E
 1.68
 (43)

Inches (mm)

Isys ISO 15407-1, Plug-in, Size 26mm (HA)



26mm Dimensions

A	B	C	D
5.10	2.55	1.02	2.40
(130)	(65)	(26)	(61)

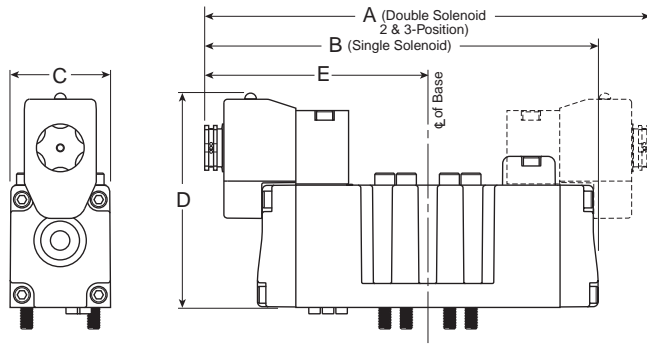
E
 1.66
 (42)

Inches (mm)

D

Subbase & Manifold
 Valve Products

Isys ISO 5599-2



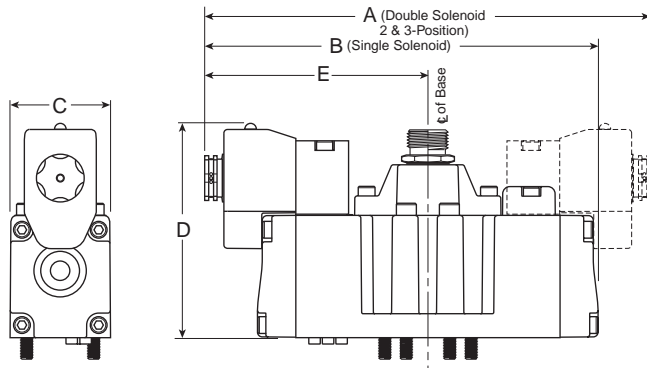
H1 Valve Dimensions Shown

H1 Dimensions

A	A1	B	C
7.32 (186)	5.59 (142)	6.46 (164)	1.65 (42)
D	D1	D2	D3
3.54 (90)	4.29 (109)	4.29 (109)	2.50 (63.5)
D4	E	E1	
2.48 (63)	3.66 (93)	2.80 (71)	

Inches (mm)

Isys ISO 5599-1 Auto

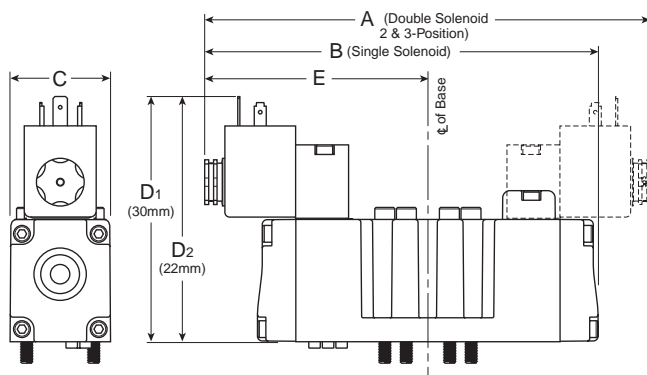


H2 Dimensions

A	A1	B	C
8.35 (212)	6.62 (168)	7.48 (190)	2.17 (55)
D	D1	D2	D3
4.05 (103)	4.80 (122)	4.57 (116)	2.99 (76)
E	E1		
4.17 (106)	3.31 (84)		

Inches (mm)

Isys ISO 5599-1 CNOMO

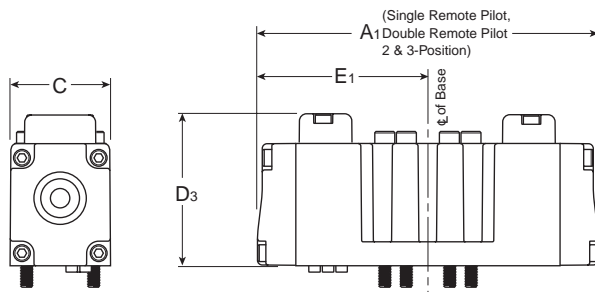


H3 Dimensions

A	A1	B	C
9.49 (241)	6.98 (177)	8.23 (209)	2.17 (55)
D	D1	D2	D3
4.05 (103)	4.80 (122)	4.57 (116)	2.99 (76)
E	E1		
4.74 (121)	3.49 (89)		

Inches (mm)

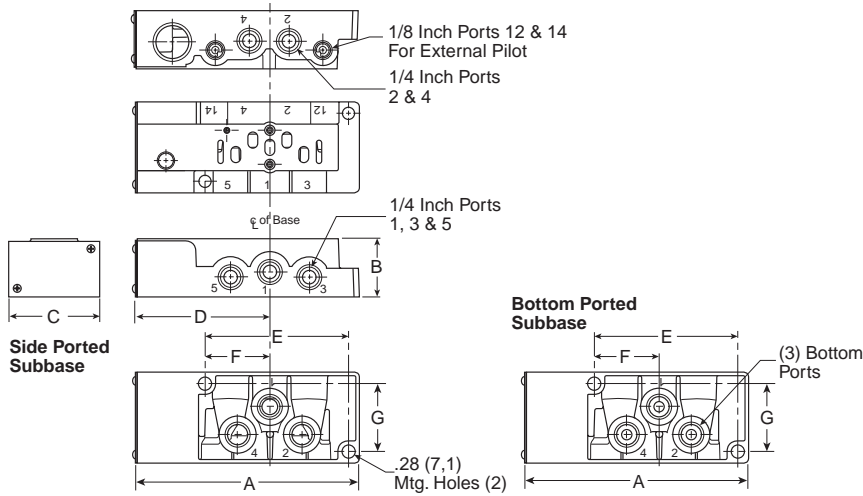
Isys ISO 5599-2 / 5599-1 Remote Pilot



D

Subbase & Manifold
 Valve Products

Isys ISO 15407-2 & 15407-1 Size 18mm (HA), PS511 Subbases

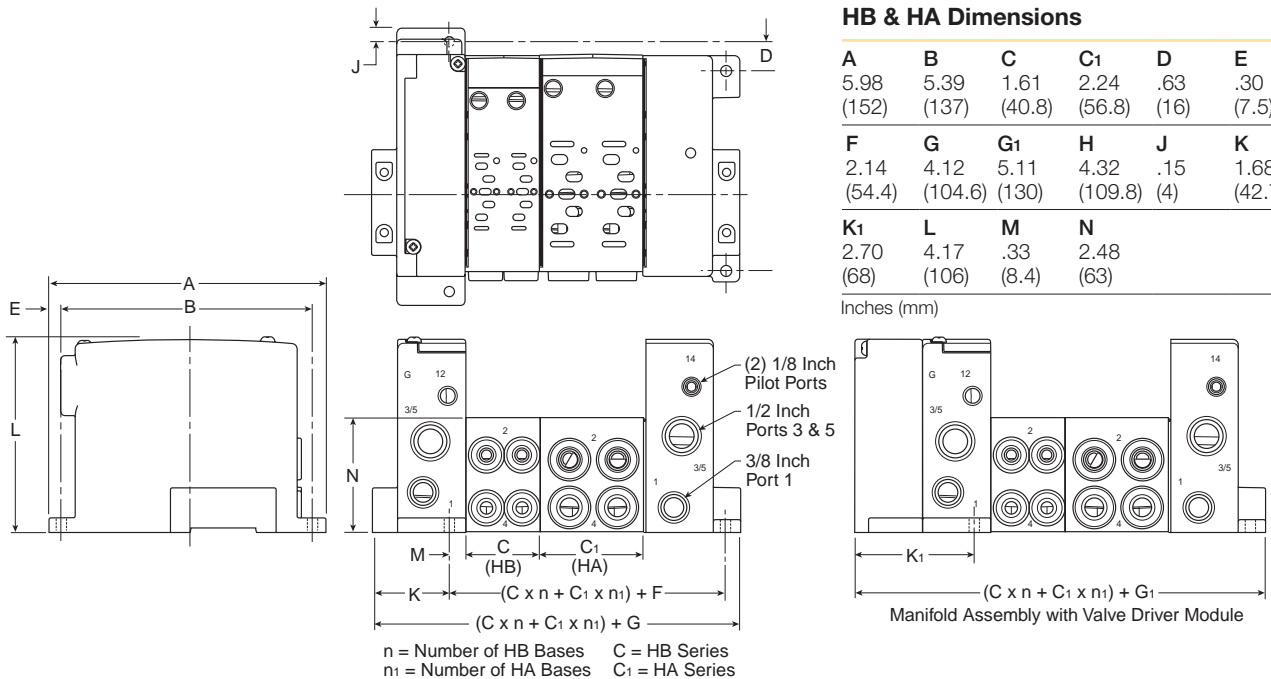


HA Dimensions

A	B	C	D
4.88 (124)	1.28 (32.5)	2.00 (50.8)	2.91 (74)
E	F	G	
1.43 (36.2)	3.16 (80.2)	1.49 (37.9)	

Inches (mm)

Isys ISO 15407-2 & 15407-1 Size 26mm (HB) & 18mm (HA), PS5611 & PS5511 Manifolds

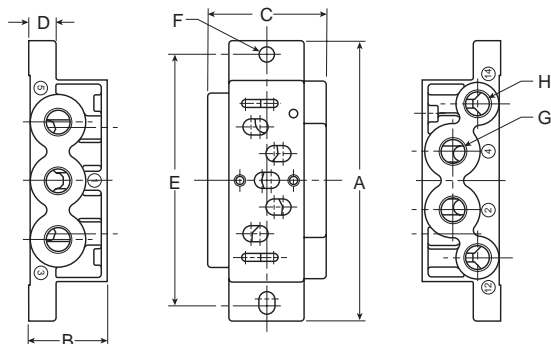


HB & HA Dimensions

A	B	C	C1	D	E
5.98 (152)	5.39 (137)	1.61 (40.8)	2.24 (56.8)	.63 (16)	.30 (7.5)
F	G	G1	H	J	K
2.14 (54.4)	4.12 (104.6)	5.11 (130)	4.32 (109.8)	.15 (4)	1.68 (42.7)
K1	L	M	N		
2.70 (68)	4.17 (106)	.33 (8.4)	2.48 (63)		

Inches (mm)

Isys ISO Size 26mm (HB) & 18mm (HA), Individual Subbase

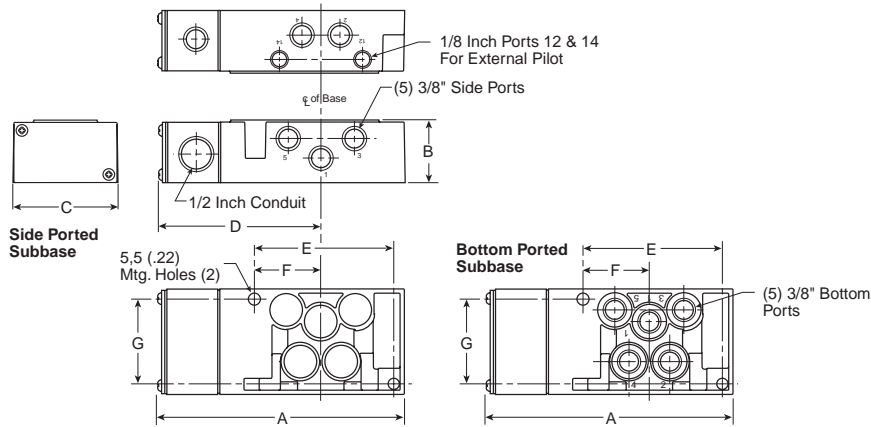


Series	Part number	A	B	C	D	E	F	G	H
HB	PL02	3.15 (80)	.87 (22)	1.06 (27)	.31 (8)	2.76 (70)	.216 Dia. (Ø 5.5)	1/8	M5
HA	PL01	3.94 (100)	1.10 (28)	1.65 (42)	.39 (10)	3.54 (90)	.216 Dia. (Ø 5.5)	1/4	1/8

Inches (mm)

D
 Subbase & Manifold
 Valve Products

Isys ISO 5599-1 Size H1, PS4011 Subbase



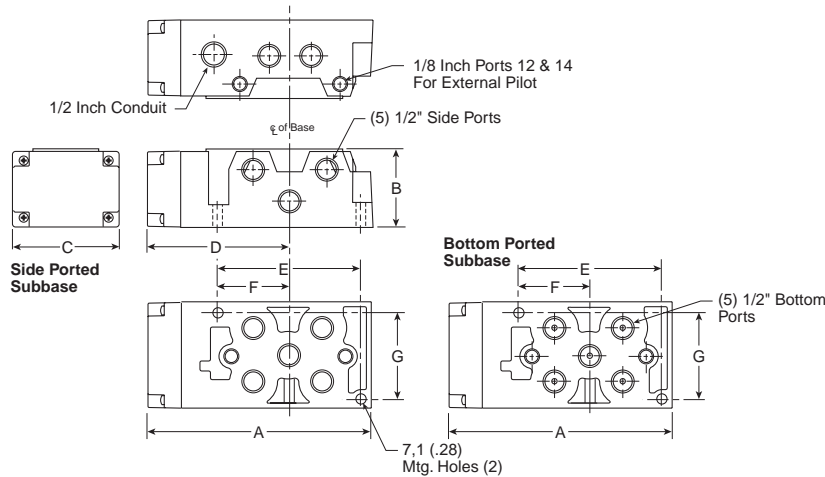
PS4011 Subbase Dimensions

A	B	C	D
5.83	1.48	2.50	3.86
(148)	(38)	(64)	(98)

E	F	G
3.29	1.57	2.00
(84)	(40)	(51)

Inches (mm)

Isys ISO 5599-1 Size H2, PS4111 Subbase



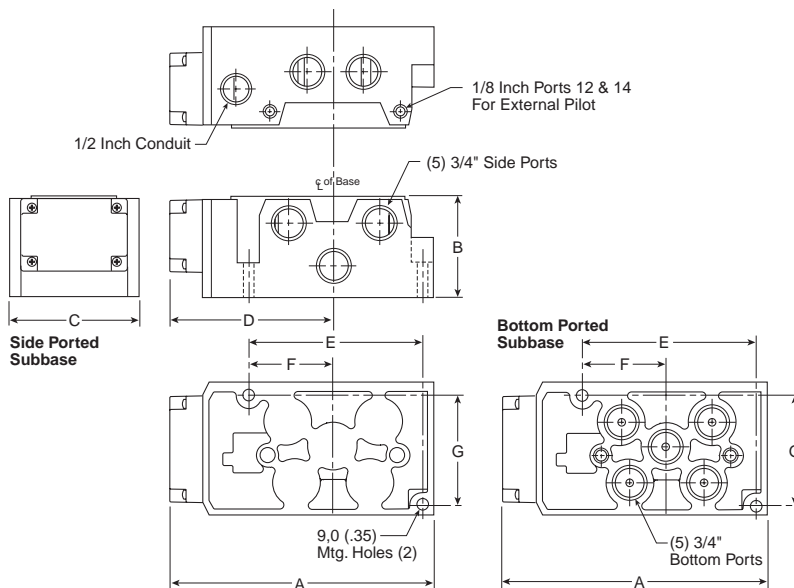
PS4111 Subbase Dimensions

A	B	C	D
6.69	2.33	3.15	4.25
(170)	(59)	(80)	(108)

E	F	G
4.21	2.07	2.56
(107)	(52)	(65)

Inches (mm)

Isys ISO 5599-1 Size H3, PS4211 Subbase



PS4211 Subbase Dimensions

A	B	C	D
7.90	2.96	3.90	4.92
(201)	(75)	(99)	(125)

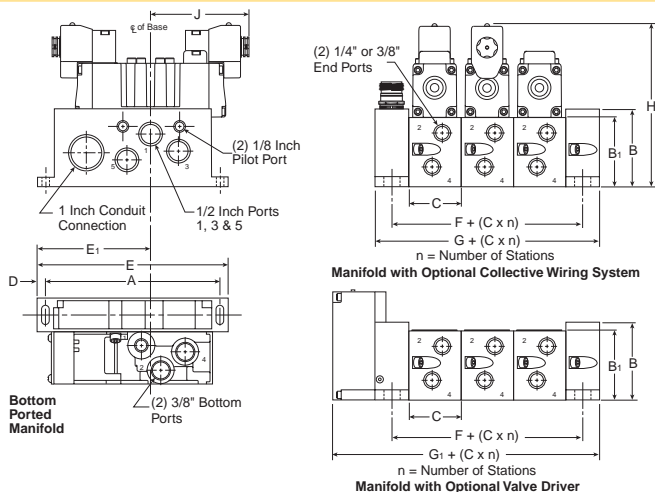
E	F	G
5.14	2.50	3.24
(131)	(64)	(82)

Inches (mm)

D

Subbase & Manifold
 Valve Products

Isys ISO 5599 Size H1, PS4011 Manifold

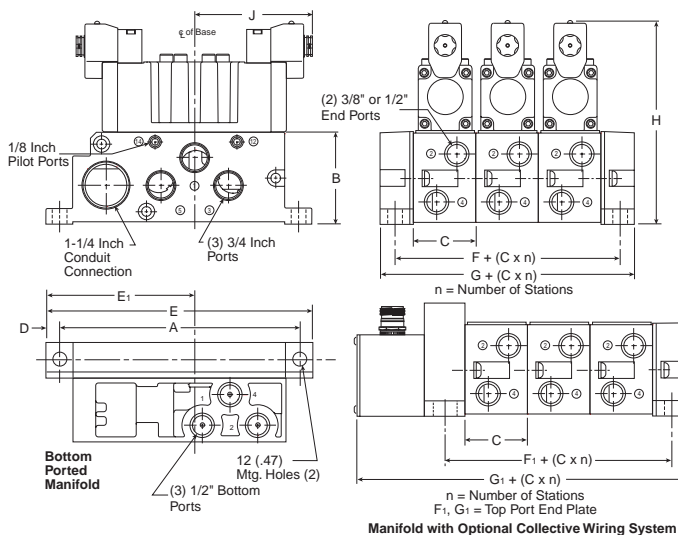


PS4011 Manifold Dimensions

A	B	B ₁	C	D
6.50 (165)	2.87 (73)	2.64 (67)	1.96 (50)	.33 (8)
E	E ₁	F	G	G ₁
7.15 (182)	4.25 (108)	1.25 (32)	2.50 (63.5)	4.06 (86)
H	J			
6.18 (157)	3.66 (93)			

Inches (mm)

Isys ISO 5599 Size H2, PS4111 Manifold



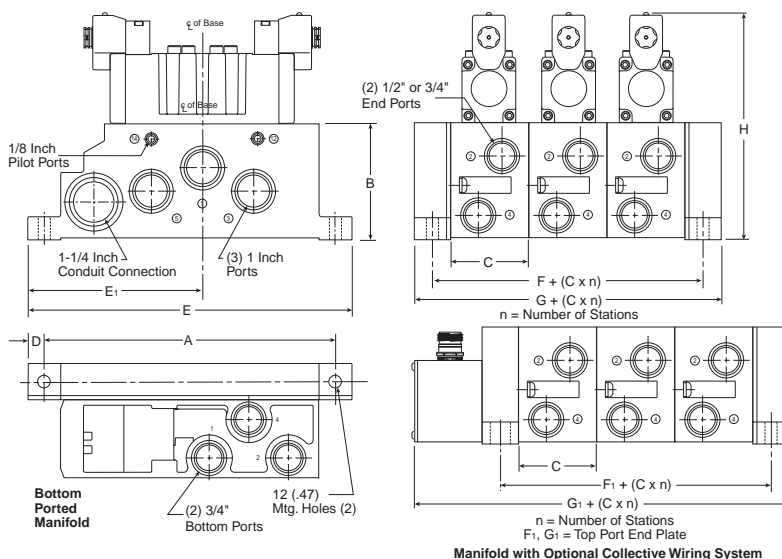
PS4111 Manifold Dimensions

A	B	C	D	E
8.46 (215)	3.35 (85)	2.20 (56)	.47 (12)	9.41 (239)
E ₁	F	F ₁	G	G ₁ *
5.28 (134)	1.18 (30)	1.30 (33)	2.36 (60)	3.78 (96)
H	J			
7.40 (188)	4.17 (106)			

Inches (mm)

* For Isysnet End Plate, add 0.39" (10mm) to the G₁ dimensions.
 For 19-Pin Round Connector Module, add 1.08" (27.5mm) to the G₁ dimensions.

Isys ISO 5599 Size H3, PS4211 Manifold



PS4211 Manifold Dimensions

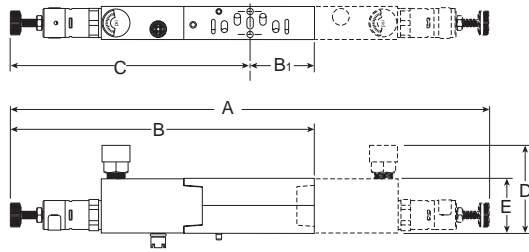
A	B	C	D	E
10.41 (265)	4.13 (105)	2.80 (71)	.59 (15)	11.61 (295)
E ₁	F	F ₁	G	G ₁ *
6.26 (159)	1.30 (33)	1.60 (41)	2.60 (63)	4.37 (111)
H	J			
8.19 (208)				

Inches (mm)

* For Isysnet End Plate, add 0.39" (10mm) to the G₁ dimensions.
 For 19-Pin Round Connector Module, add 1.08" (27.5mm) to the G₁ dimensions.

D
 Subbase & Manifold
 Valve Products

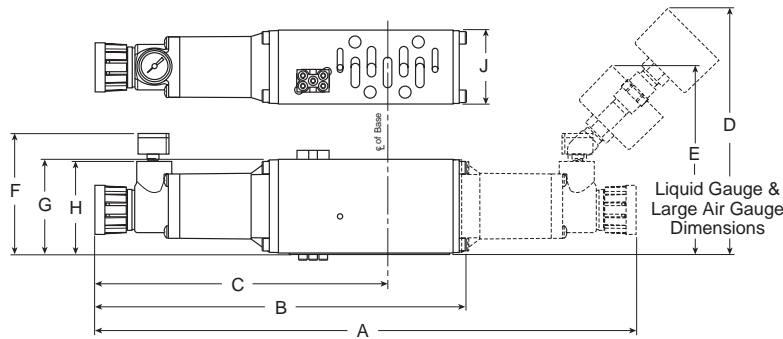
Isys ISO 15407 Sandwich Regulator



Series	Part number	A	B	B1	C	D	E
HB	PS5637	10.28 (261)	6.14 (156)	1.02 (26)	5.13 (130)	2.60 (66)	1.18 (30)
HA	PS5537	10.00 (254)	6.42 (163)	1.42 (36)	5.00 (127)	2.72 (69)	1.18 (30)

Inches (mm)

Isys ISO 5599, Size H1 Sandwich Regulator

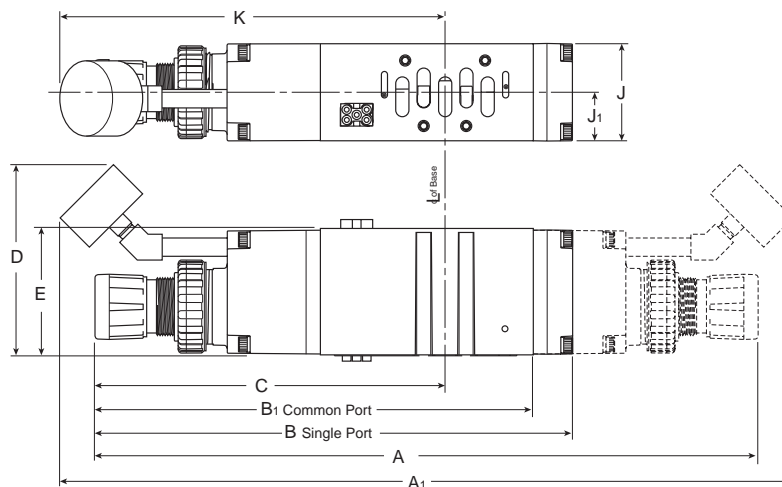


Series	Part number	A	B	C	D	E	F	G	H	J
H1	PS4037	11.84 (301)	8.13 (207)	6.40 (163)	5.45 (138)	4.25 (108)	2.85 (72)	2.09 (53)	2.05 (52)	1.63 (41)
	PS4038									

Inches (mm)

Isys ISO 5599, Size H2 & H3 Sandwich Regulator

H2 Sandwich Regulator Shown



Series	Part number	A	A1	B	B1	C	D	E	J	J1	K
H2	PS4137	14.65 (372)	16.18 (411)	10.56 (268)	9.84 (250)	7.71 (196)	4.20 (107)	2.80 (71)	2.15 (55)	1.07 (27)	8.50 (216)
	PS4138										
H3	PS4237	15.67 (398)	17.15 (436)	11.53 (293)	10.67 (271)	8.37 (213)	4.20 (107)	2.93 (75)	2.50 (64)	1.25 (32)	9.10 (231)
	PS4238										

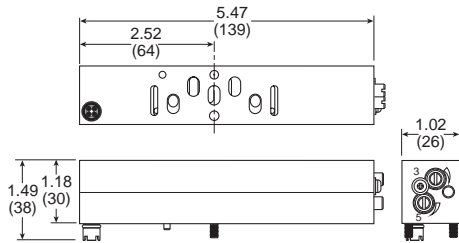
Inches (mm)

D

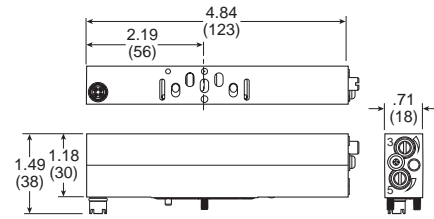
Subbase & Manifold
 Valve Products

Isys ISO 15407, Size 26mm (HB) & 18mm (HA), Flow Control

HA Flow Control

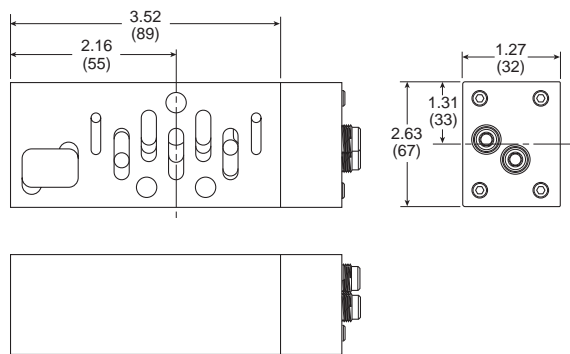


HB Flow Control

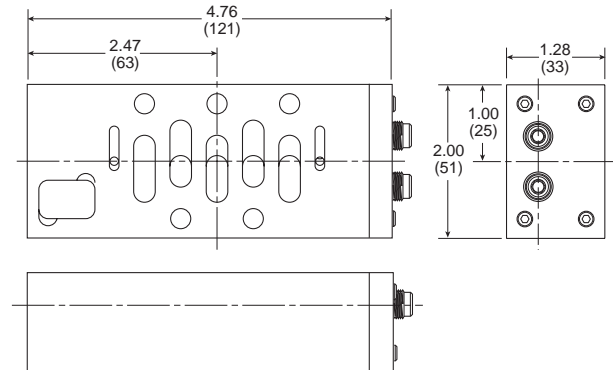


Isys ISO 5599, Size H1, H2 & H3, Flow Control

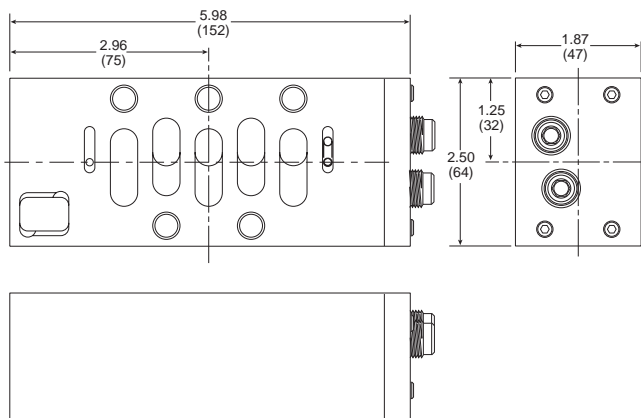
H1 Flow Control



H2 Flow Control



H3 Flow Control



D
 Subbase & Manifold
 Valve Products

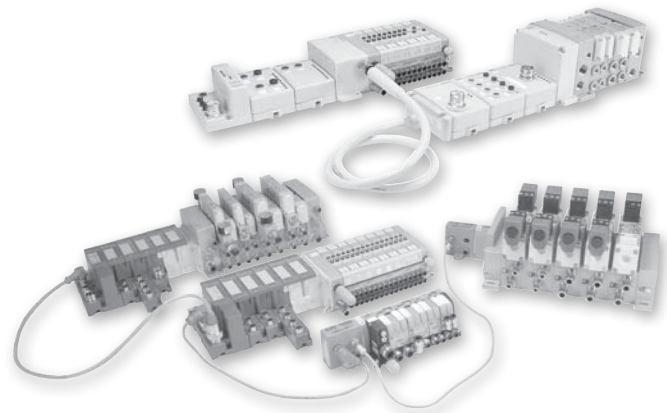
Fieldbus Offering

Valve series	Moduflex	Isysnet	Turck
Moduflex	X		
Isys Micro	X	X	X
Isys ISO	X	X	X

Protocol	Moduflex	Isysnet	Turck
DeviceNet	X	X	X
Ethernet/IP		X	X
Profibus-DP	X	X	X
Profinet			X
Modbus/TCP			X
AS-i	X		
CANopen	X		X
Interbus-S	X		
ControlNet		X	

Options	Moduflex	Isysnet	Turck
Digital inputs / outputs*		X	X
Analog inputs / outputs		X	X
16 Solenoid control*	X		X
32 Solenoid control		X	X
Short circuit protection on inputs			X
Current sensing outputs			X
Bus expansion		X	
DeviceNet subnet			X
Programmable comm modules			X
Power over DeviceNet / CANopen			X
Preferred connectivity		X	
CANopen expansion			X

* Moduflex AS-i modules are available with 6 or 8 inputs and 6 or 8 solenoid outputs



	Turck fieldbus	Isysnet	Moduflex
Solenoid control	Up to 32 solenoids on main valve manifold. Devicenet Subnet Allows an additional 32 solenoids per node 63 nodes maximum. CANopen expansion Allows an additional 64 solenoids per expansion 5 expansions maximum.	Up to 32 solenoids on main valve manifold Isys Micro Bus Expansion Allows an additional 32 solenoids per expansion 3 expansions maximum 1 meter fixed cable length per expansion	Up to 16 solenoids on main valve manifold
I/O capabilities	256 maximum inputs and outputs directly connected to communication module. Devicenet Subnet Allows an additional 256 I/O per node 63 nodes maximum Third party DeviceNet modules can be used CANopen expansion Allows an additional 64 I/O per expansion 5 expansions maximum Third party CANopen modules can be used	Maximum of 256 inputs and 256 outputs directly connected to the communication module, including Isys Micro Bus Expansion.	8 Inputs available on AS-i communication only.
Short circuit protection	SXG and diagnostic electronic modules have each point isolated. All other electronic modules are isolated from the backplane.	Devices must be fused between input / output and electronic module.	

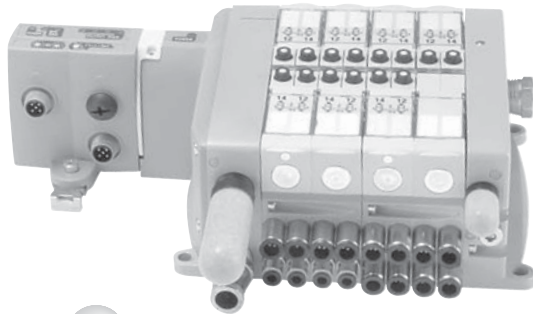
Most popular. For technical information see CD

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Subbase & Manifold
 Valve Products

The Moduflex Fieldbus System

Moduflex communication modules directly attach to the end plate. It offers a compact and low cost fieldbus solution.



CANopen

INTERBUS-S

Moduflex Features

- Small, compact product design
- Broad protocol offering, including DeviceNet, Profibus, AS-i, CANopen, and Interbus
- Channel-level diagnostics (LED and Electronic)
- Inputs available with AS-i modules
- Horizontal and vertical mounting without derating
- 5g vibration
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- CE certification

Protocol	Part number
Profibus DP	P2M2HBVP21600
DeviceNet	P2M2HBVD21600
CANopen	P2M2HBVC21600
InterBus-S	P2M2HBVS11600

Fieldbus Accessories

	Protocol	Connector type	Part number
Power Supply Field Wireable Connector	Profibus DP / InterBus-S / DeviceNet / CANopen	M12 type A Female	P8CS1205AA
Line Termination Resistor	Profibus DP	M12 type B	P8BPA00MB
	DeviceNet / CANopen	M12 type A	P8BPA00MA



P2M2HBVA10808A



P2M2HBVA10808B

Standard AS-i Protocol (up to 31 nodes)
Communication module for 8 solenoids max.
(2 nodes per module, 4 inputs, 4 solenoids per node)

Input / Output capability	Weight (oz)	Part number
0 inputs and 8 solenoid outputs	5.29	P2M2HBVA10800
8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	7.05	P2M2HBVA10808A
8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	7.05	P2M2HBVA10808B

AS-i Version 2.1 Protocol (up to 62 nodes)
Communication module for 6 solenoids max.
(2 nodes per module, 4 inputs, 3 solenoids per node)

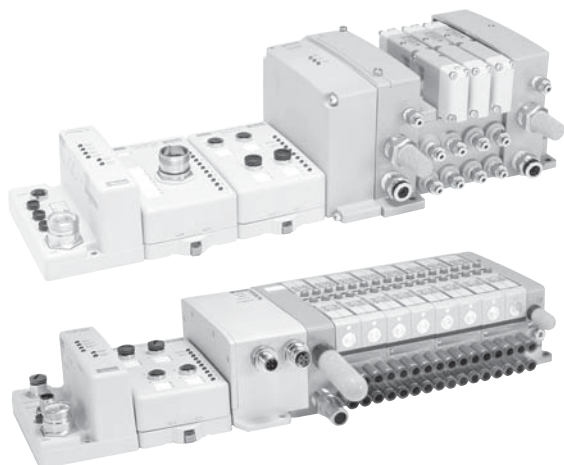
Input / Output capability	Weight (oz)	Part number
0 inputs and 6 solenoid outputs	5.29	P2M2HBVA20600
8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	7.05	P2M2HBVA20608A
8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	7.05	P2M2HBVA20608B

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 Subbase & Manifold Valve Products

The Isysnet System

Isysnet has four major components:

- Valve driver module provide control for 32 solenoids on a manifold, with bus extension providing connectivity to 3 more manifolds
- I/O modules provide the field interface, system-interface circuitry, and bases for mounting
- Communication modules provide the network-interface circuitry
- Power distribution module provide 5 additional power inputs to the Isysnet system



Isysnet Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Parameter-level explicit messaging
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, C-UL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

Communications Module



PSSCENA

All Modules IP67 Certified
 EDS and GSD files located at www.parker.com/pneu/Isysnet

Protocol	Part number
DeviceNet™	PSSCDM18PA (7/8" Mini) or PSSCDM12A (M12)
ControlNet™	PSSCCNA
EtherNet I/P™	PSSCENA
Profibus-DP®	PSSCPBA

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 Valve Products

Digital Inputs






PSSN16M12A



PSSN8M8A


I/O modules	Voltage	Part number
16 digital inputs M12, 5-pin used with PNP sourcing input device	10 to 28.8VDC	PSSN16M12A
8 digital inputs M12, 5-pin used with PNP sourcing input device	10 to 28.8VDC	PSSN8M12A
8 digital inputs M12, 5-pin used with NPN sinking input device	10 to 28.8VDC	PSSP8M12A
8 digital inputs M8, 3-pin used with PNP sourcing input device	10 to 28.8VDC	PSSN8M8A
8 digital inputs M8, 3-pin used with NPN sinking input device	10 to 28.8VDC	PSSP8M8A
8 digital inputs M23, 12-pin used with NPN sinking input device	10 to 28.8VDC	PSSP8M23A
8 digital inputs M23, 12-pin used with PNP sourcing input device	10 to 28.8VDC	PSSN8M23A

Digital Outputs

	I/O modules	Voltage	Part number
 PSST16D25A	16 digital outputs M23, 19-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST16M23A
	16 digital outputs D-sub, 25-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST16D25A
	16 digital outputs M12, 5-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST16M12A
 PSST16M12A	8 digital outputs M12, 5-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST8M12A
	8 digital outputs M8, 3-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST8M8A
 PSSTR4M12A	4 digital output, high watt relay M12, 5-pin used with PNP sourcing outputs (2 Amp)	24VDC	PSSTR4M12A
	8 digital outputs M23, 12-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST8M23A


All modules IP67 certified
 See www.parker.com/pneu/lsysnet

Analog Inputs

	I/O modules	Voltage	Part number
 PSSNAVM12A	2 Analog inputs voltage M12, 5-pin	-10 to 10VDC or 0 to 10VDC	PSSNAVM12A
	2 Analog inputs current M12, 5-pin	4 to 20mA or 0 to 20mA	PSSNACM12A


All modules IP67 certified
 See www.parker.com/pneu/lsysnet

Analog Outputs

	I/O modules	Voltage	Part number
 PSSTAVM12A	2 Analog outputs voltage M12, 5-pin	0 to 10V ± 10V	PSSTAVM12A
	2 Analog outputs current M12, 5-pin	4 to 20mA or 0 to 20mA	PSSTACM12A

All modules IP67 certified
 See www.parker.com/pneu/lsysnet

Terminating Base Module

	Base module	Part number
 PSSTERM	Termination base for stand alone units	PSSTERM

Used as the last terminating module for a stand alone isysnet assembly.


Power Extender Module

	Extender module	Part number
 PSSSE24A	24VDC field power module	PSSSE24A

A Power Extender Module must be used on every 14th Module in an Isysnet assembly. See www.parker.com/pneu/lsysnet


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 Valve Products

Bus Extender Cable

	Description	Voltage	Part number
	1 Meter Cable*	24VDC	PSSEXT1
	3 Meter Cable*	24VDC	PSSEXT3

* Requires a PSSSE24 Power Extender Module
 IP67 certified
 See www.parker.com/pneu/lsysnet

Isys Micro Bus Extender Cable

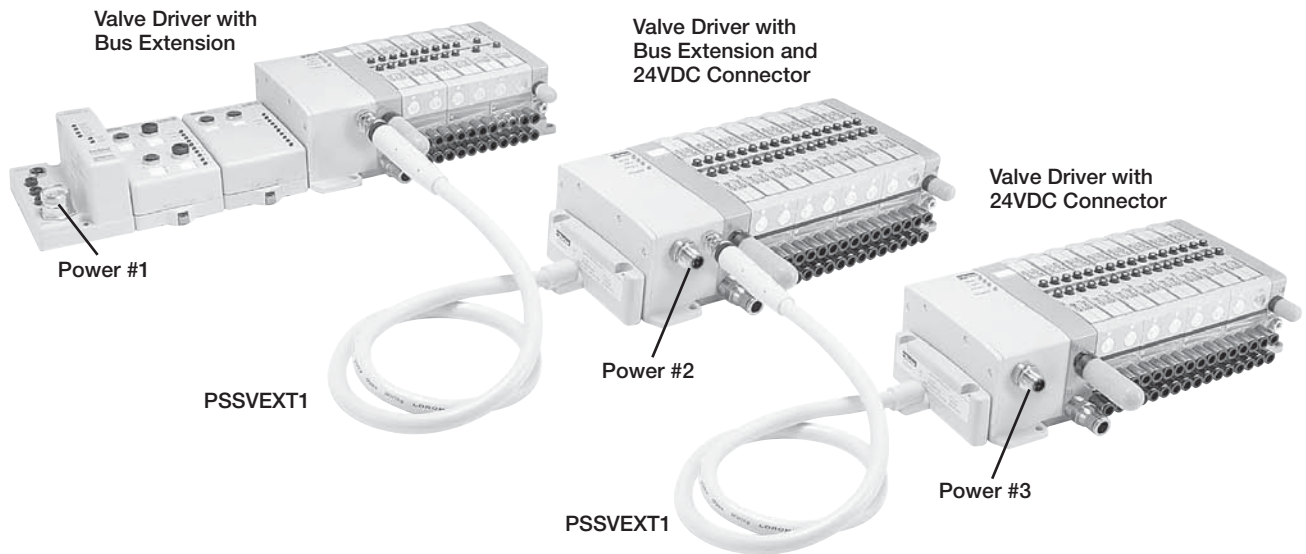
	Description	Voltage	Part number
	1 Meter Cable*	24VDC	PSSVEXT1

* IP67 certified.

Example

Isys Micro with Bus Extension on Valve Driver Module – No additional I/O at the Extension

- Add up to three additional valve manifolds without adding another communication module.
- No PSSSE24A is needed on the Extension when the Valve Driver Module with 24VDC Connector is used.
- Commonly used when many valves are required.
- Bus expansion only available with Isys Micro valves.



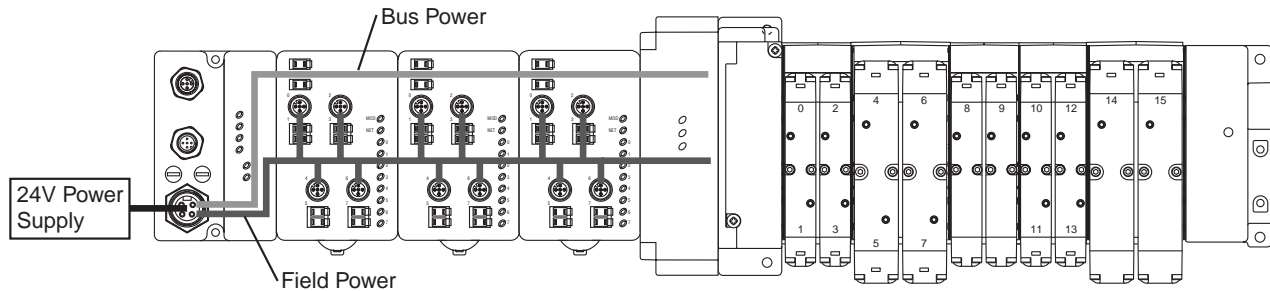
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Power Distribution Options for Isys ISO

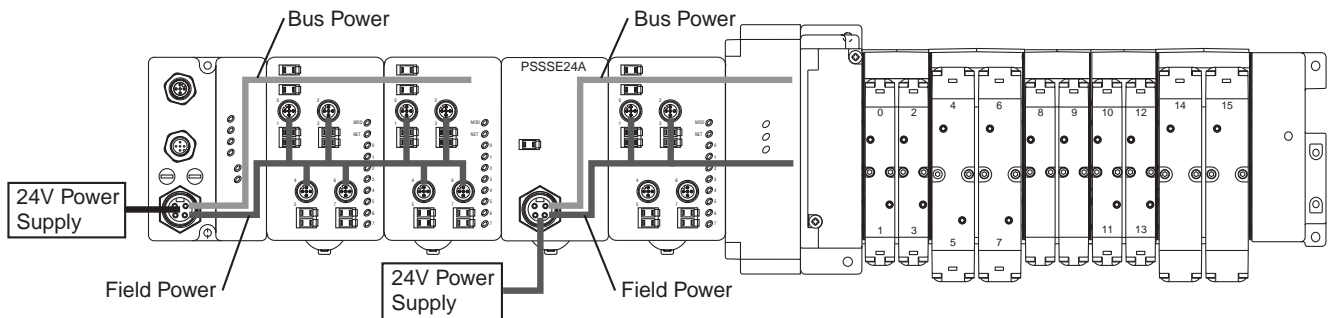
Isysnet Communication and I/O Modules

An auxiliary 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 I/O modules with a maximum of 10 A field power, using the auxiliary power.



Isysnet System with 24VDC Expansion Power Unit (PSSSE24A)

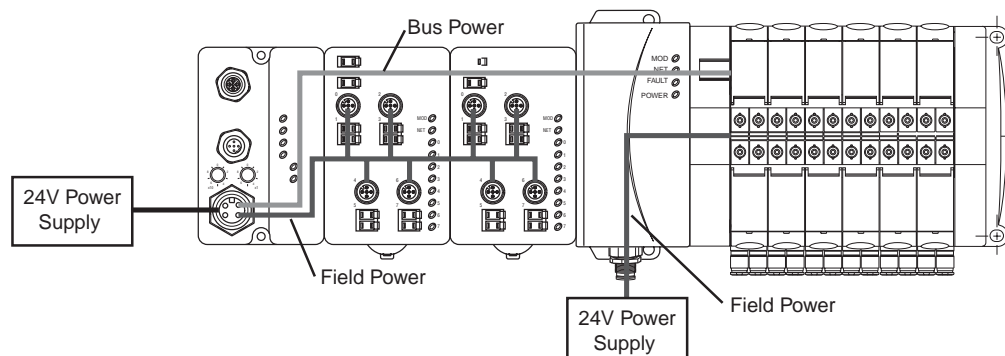
The auxiliary power from the communication module supports up to 13 I/O modules with a maximum of 10 A field power. The 24VDC Power Extender Module (PSSSE24A) extends the backplane bus power and I/O Module field power to support up to 13 more I/O modules. Connect additional Power Extender Modules to expand the I/O assembly up to the maximum of 63 I/O modules. This secondary 24VDC connector on the PSSSE24A can be wired into an Emergency Stop circuit.



Additional Power Distribution Options for Isys Micro

Isysnet Communication Module and Valve Driver Module with 24VDC Connector

The 24VDC power supply from the Communication Adaptor provides power to the backplane bus power and I/O module field power for up to 13 modules and an adapter with a maximum of 10 A Field Power. In this configuration, backplane bus power and I/O module field power are supplied to the input and output modules. The communication module only supplies backplane bus power to the Valve Driver Module, as the Isys Micro with 24VDC Connector separates the field power from the rest of the network. This secondary 24VDC Connector on the Valve Driver Module supplies Field Power to the valves, and can be wired into an Emergency Stop Circuit.

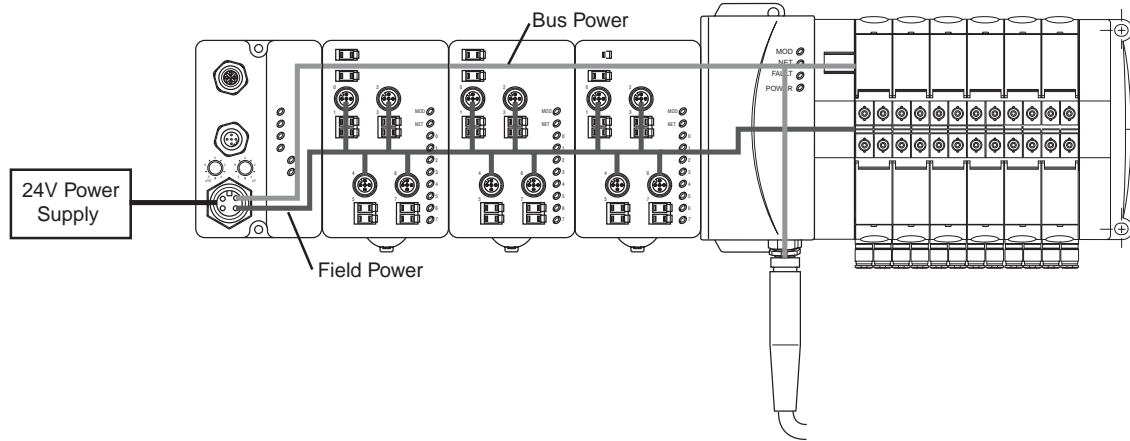


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Power Distribution Options for Isys Micro (Continued)

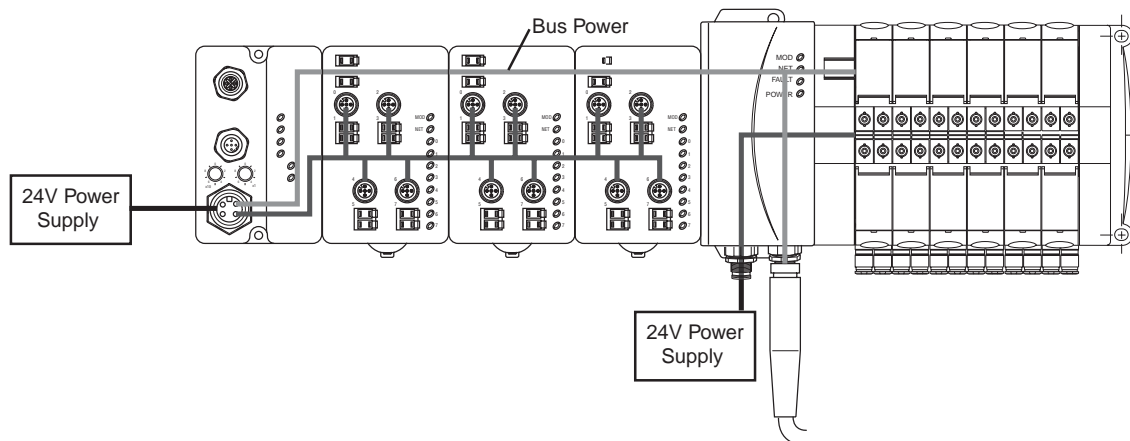
Isysnet Communication Module with Bus Extension Connector and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 modules and an adapter with a maximum of 10 A field power, using this power source. The Isys Micro with Bus Extension Connector carries backplane bus power and communication down to another Isysnet Assembly through the PSSVEXT1 cable. If additional Isysnet Input and Output Modules or Isys ISO valve manifold is used on this extension, a PSSSE24A Power Extender Module is required to provide Field Power. If the extension is attached directly to an Isys Micro Manifold, Field Power can be supplied directly by using the 24VDC Connector option.



Isysnet Communication Module with 24VDC and Bus Extension Connectors and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. In this configuration, bus power and field power are supplied to the input and output modules. The communication module only supplies bus power to the Valve Driver Module, as the 24VDC Connector separates the Field Power from the rest of the network. This secondary 24VDC connector on the Valve Driver Module supplies field power to the valves, and can be wired into an Emergency Stop Circuit. The Bus Extension Connector carries bus power and communication down to another Isysnet Assembly through the PSSVEXT1 cable. If additional Isysnet input and output modules or Isys ISO valve manifold is used on this extension, a PSSSE24A Power Extender Module is required to provide field power. If the extension is attached directly to an Isys Micro Manifold with 24VDC Connector, field power can be supplied directly by using the 24VDC Connector option.



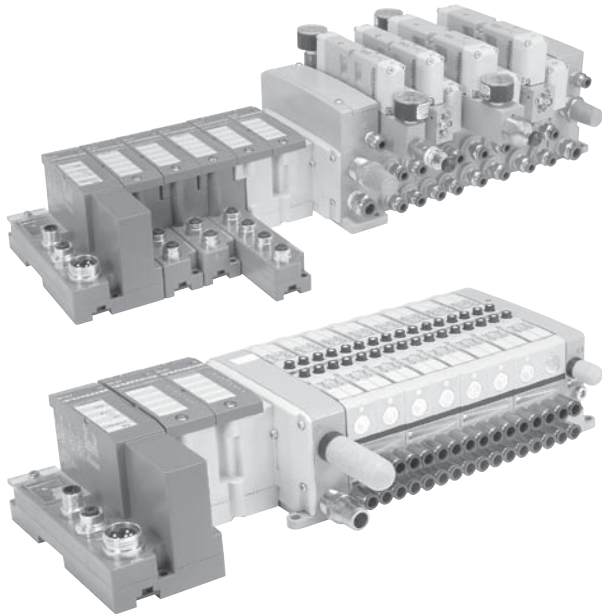
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Subbase & Manifold
 Valve Products

The Turck Fieldbus System

Isysnet has four major components:

- **Valve driver module** provide control for either 16 or 32 solenoids on a manifold
- **I/O modules** provide the field interface and system-interface circuitry
- **Communication modules** provide the network-interface circuitry
- **Power distribution module** provide 5 additional power inputs to the Turck system



Turck Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED and electronic)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Channel-level short-circuit detection with electronic feedback
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, C-UL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

Communication Modules


CANopen	BL67-GW-CO
CANopen with power over network	BL67-GW-CO-T
DeviceNet with power over network	BL67-GW-DN
Profibus DP	BL67-GW-DPV1
Modbus / TCP communication module	BL67-GW-EN
Ethernet / IP communication module	BL67-GW-EN-IP
Profinet communication module	BL67-GW-EN-PN
Modbus / TCP communication module with DeviceNet subnet	BL67-GW-EN-DN
Ethernet / IP communication module with DeviceNet subnet	BL67-GW-EN-IP-DN





Programmable Communication Modules

Profibus DP	BL67-PG-DP
Modbus / TCP communication module	BL67-PG-EN
Ethernet / IP communication module	BL67-PG-EN-IP
Modbus / TCP communication module with DeviceNet subnet	BL67-PG-EN-DN
Ethernet / IP communication module with DeviceNet subnet	BL67-PG-EN-IP-DN






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Subbase & Manifold Valve Products

Digital Input Modules


I/O modules	Voltage	Part number
 8 PNP input module	7 to 30 VDC	BL67-8DI-P
8 PNP input module, with diagnostics	7 to 30 VDC	BL67-8DI-PD
8 NPN input module	24 VDC	BL67-8DI-N





Base module	Part number
 8 x M8, 3 pole, female	BL67-B-8M8
 4 x M12, 5 pole, female, A-code	BL67-B-4M12
 4 x M12, 5 pole, female, A-code	BL67-B-4M12-P
 1 x M23, 12 pole, female	BL67-B-1M23

I/O modules	Voltage	Part number
4 PNP input module	7 to 30 VDC	BL67-4DI-P
4 PNP input module, with diagnostics	7 to 30 VDC	BL67-4DI-PD
4 NPN input module	24 VDC	BL67-4DI-N






Base module	Part number
 4 x M8, 3 pole, female	BL67-B-4M8
 2 x M12, 5 pole, female, A-code	BL67-B-2M12
 2 x M12, 5 pole, female, A-code	BL67-B-2M12-P
 4 x M12, 5 pole, female, A-code	BL67-B-4M12
 1 x M23, 12 pole, female	BL67-B-1M23

Digital Output Modules

I/O modules	Output current	Part number
 8 PNP output module	0.5 amps per channel	BL67-8DO-0.5A-P
8 NPN output module	0.5 amps per channel	BL67-8DO-0.5A-N

Base module	Part number
 8 x M8, 3 pole, female	BL67-B-8M8
 4 x M12, 5 pole, female, A-code	BL67-B-4M12
 4 x M12, 5 pole, female, A-code	BL67-B-4M12-P
 1 x M23, 12 pole, female	BL67-B-1M23

I/O modules	Output Current	Part number
4 PNP output module	0.5 amps per channel	BL67-4DO-0.5A-P
4 PNP output module	2 amps per channel	BL67-4DO-2A-P
4 PNP output module	4 amps per channel	BL67-4DO-4A-P
4 NPN output module	2 amps per channel	BL67-4DO-2A-N


Base module	Part number
 4 x M8, 3 pole, female	BL67-B-4M8
 2 x M12, 5 pole, female, A-code	BL67-B-2M12
 2 x M12, 5 pole, female, A-code	BL67-B-2M12-P
 4 x M12, 5 pole, female, A-code	BL67-B-4M12
 1 x M23, 12 pole, female	BL67-B-1M23

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 Valve Products


Digital Output Modules

I/O modules	Output current	Part number
16 PNP output module	0.14 amps per channel	BL67-16DO-0.1A-P

Base module	Part number
 1 x M23, 19 pole, female	BL67-B-1M23-19


Relay Output Modules

I/O modules	Output current	Part number
8 normally open relays	0.14 amps per channel	BL67-8DO-R-NO


Base module	Part number
 4 x M12, 5 pole, female, A-code	BL67-B-4M12-P

Analog Input Modules

I/O modules	Input type	Part number
4 configurable current or voltage analog input module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	BL67-4AI-V/I


Base module	Part number
 4 x M12, 5 pole, female, A-code	BL67-B-4M12


I/O modules	Input type	Part number
2 Current analog input module	4 to 20 mA or 0 to 20 mA	BL67-2AI-I
2 Voltage analog input module	-10 to +10 VDC or 0 to +10 VDC	BL67-2AI-V
2 Temperature analog input module	PT100, PT200, PT500, PT1000, Ni100, Ni1000	BL67-2AI-PT
2 Temperature analog input module	Type B, E, J, K, N, R, S, T	BL67-2AI-TC


Base module	Part number
 2 x M12, 5 pole, female, A-code	BL67-B-2M12

Combination Input / Output Modules

I/O modules	Input voltage & output current	Part number
4 PNP output 4 PNP input module, with diagnostics	7 to 30 VDC 0.5 Amps	BL67-4DI4DO-PD
8 PNP configurable input or output module, with diagnostics	7 to 30 VDC 0.5 Amps	BL67-8XSG-PD


Base module	Part number
 8 x M8, 3 pole, female	BL67-B-8M8

Base module	Part number
 4 x M12, 5 pole, female, A-code	BL67-B-4M12


Base module	Part number
 4 x M12, 5 pole, female, A-code	BL67-B-4M12P

Analog Output Modules

I/O modules	Input type	Part number
4 Voltage analog output module	-10 to +10 VDC or 0 to +10 VDC	BL67-4AO-V




Base module	Part number
 4 x M12, 5 pole, female, A-code	BL67-B-4M12

I/O modules	Input type	Part number
2 Current analog output module	4 to 20 mA or 0 to 20 mA	BL67-2AO-I
2 Voltage analog output module	-10 to +10 VDC or 0 to +10 VDC	BL67-2AO-V

Base module	Part number
 2 x M12, 5 pole, female, A-code	BL67-B-2M12


Combination Analog Input / Output Modules

I/O modules	Output current	Part number
4 configurable input and 4 configurable output current or voltage analog module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	BL67-4AI4AO-V/I

Base module	Part number
 8 x M8, 3 pole, female	BL67-B-8M8
 4 x M12, 5 pole, female, A-code	BL67-B-4M12
 2 x M12, 5 pole, female, A-code	BL67-B-2M12-8-P




CANopen Subnet Module

Extender module	Capacity	Part number
1 CANopen connection	64 bits of inputs or outputs	BL67-1CVI




Base module	Part number
 1 x M12, 5 pole, female, A-code	BL67-B-1M12

Power Extender Module

Extender module	Current capacity	Part number
24 VDC field power module	10 amps input	BL67-PF-24VDC




Base module	Part number
 5 Pole mini connector to supply bus power and field power	BL67-B-1RSM
 5 Pole mini connector to field power only	BL67-B-1RSM-VO
 4 Pole mini connector to supply bus power and field power	BL67-B-1RSM-4

I/O modules	Output current	Part number
2 onfigurable input and 2 configurable output current or voltage analog module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	BL67-2AI2AO-V/I

Base module	Part number
 8 x M8, 3 pole, female	BL67-B-8M8
 2 x M12, 8 pole, female, A-code	BL67-B-2M12-8
 2 x M12, 5 pole, female, A-code	BL67-B-2M12-8-P



Serial Interface Module

Extender module	Capacity	Part number
1 RS232 serial interface	300 to 115200 bps	BL67-1RS232
1 RS485 or 422 serial interface	300 to 115200 bps	BL67-1RS485/422

Base module	Part number
 1 x M12, 5 pole, female, A-code	BL67-B-1M12
 1 x M12, 8 pole, female, A-code	BL67-B-1M12-8
 1 x M23, 12 pole, female	BL67-B-1M23

SSI and Counting Modules

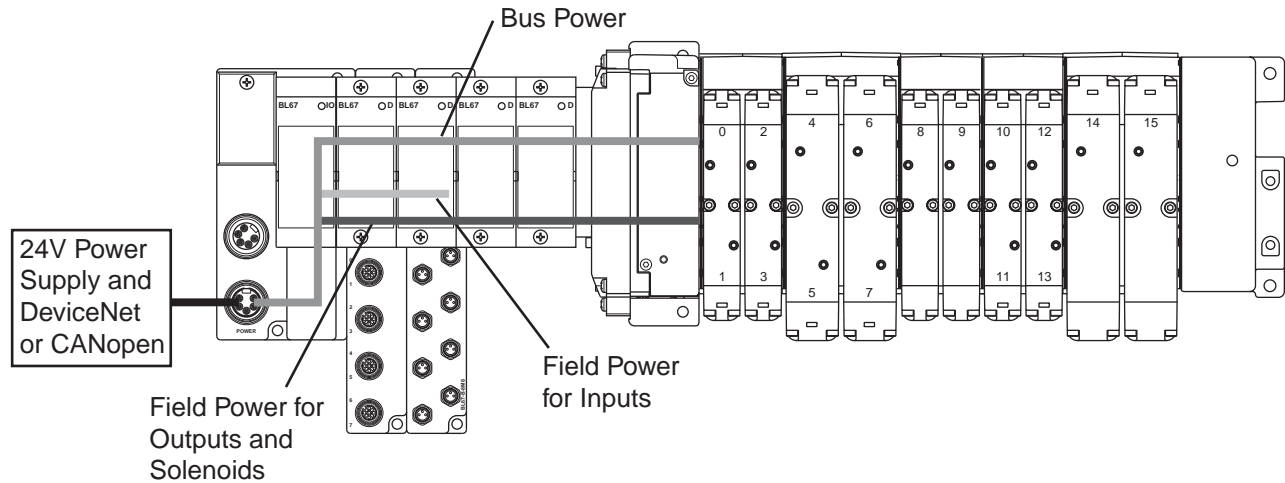
Extender module	Capacity	Part number
1 SSI sensor interface	65 kbps up to 1 Mbps	BL67-1SSI
1 counter interface	Up to 250 kHz	BL67-1CNT/ENC

Base module	Part number
 1 x M12, 8 pole, female, A-code	BL67-B-1M12-8
 1 x M23, 12 pole, female	BL67-B-1M23

Power Distribution Options for Turck Fieldbus

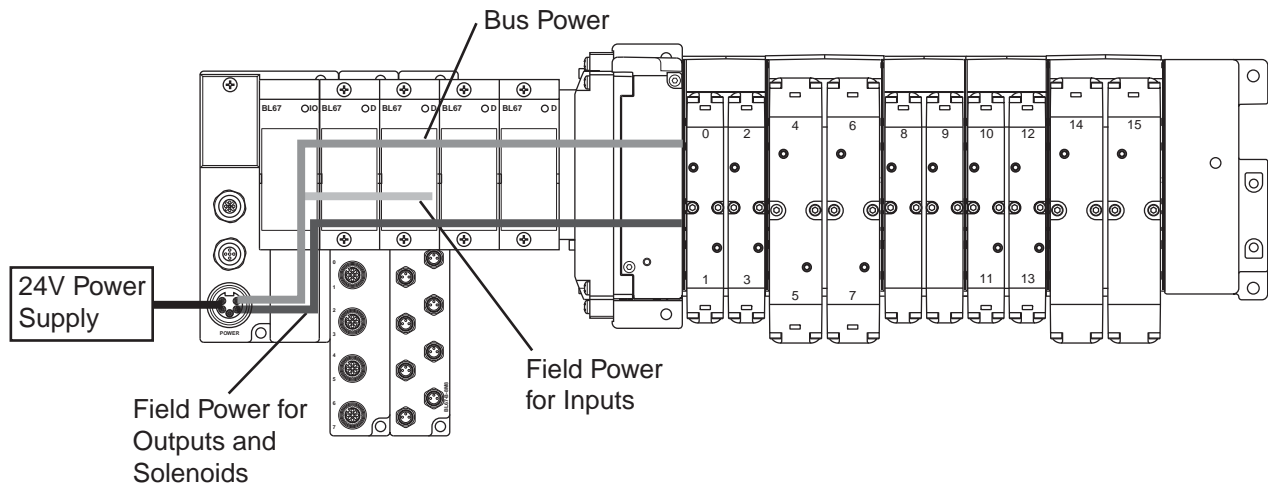
Turck Communication and I/O Modules - DeviceNet and CANopen, Power over Network

The 24VDC power supply pins from the DeviceNet or CANopen network connection on the communication module provides a single power circuit. This circuit provides 1.5 A bus power, 4 A field power for inputs and 8A field power for outputs.



Turck Communication and I/O Modules - Ethernet/IP, Modbus/TCP, Profinet, Profibus, and CANopen

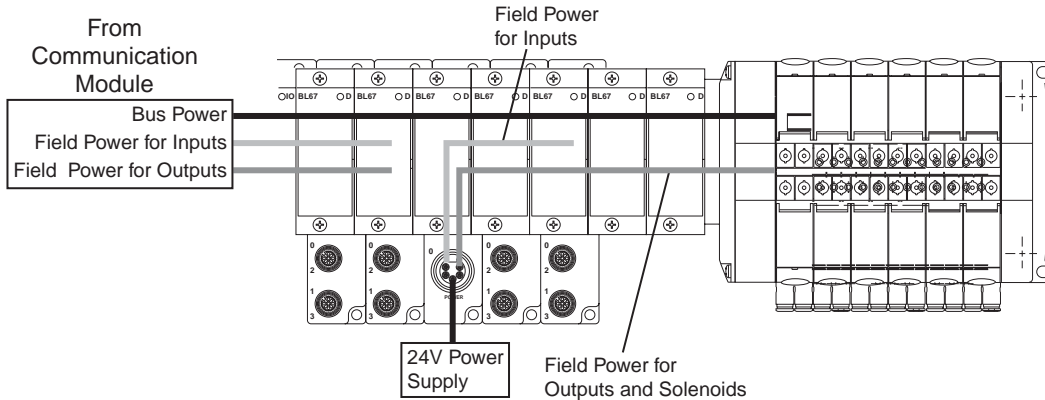
An auxiliary 24VDC power supply from the communication module provides power across two separate circuits. The first circuit provides 1.5 A bus power and 4 A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs.



Power Distribution Options for Turck Fieldbus

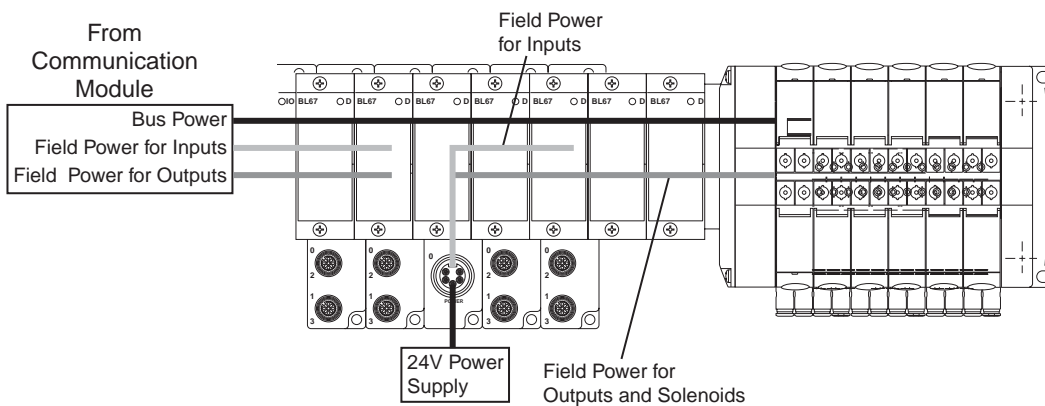
24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM

This configuration creates an auxiliary 24VDC power supply and provides power across two separate circuits, regardless of the communication module used. The first circuit provides 4 A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5 A bus power is uninterrupted, and is still supplied from the communication module.



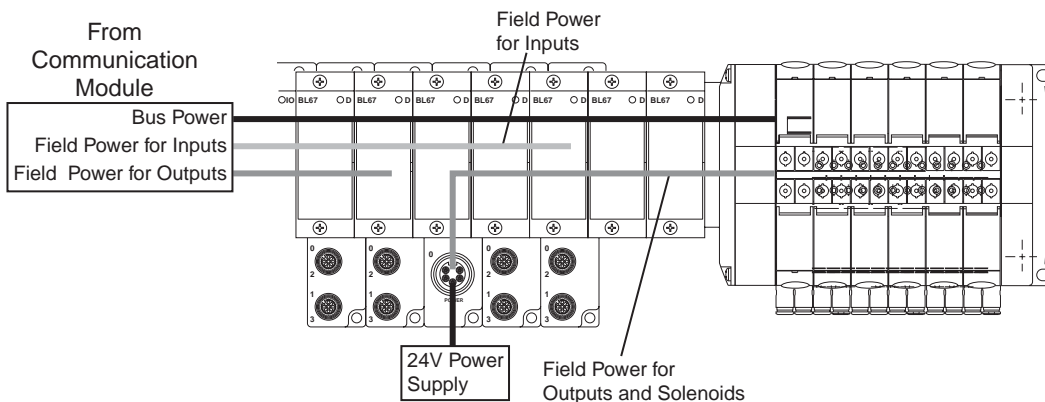
24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-4

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 4 A field power for inputs and 10A field power for outputs. The 1.5 A bus power is uninterrupted, and is still supplied from the communication module.



24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-VO

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5 A bus power and 4 A field power for inputs are uninterrupted, and are still supplied from the communication module.



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 Valve Products

7/8" Mini Power Cables

Description	Part number
4 pin female to flying lead cable, TPE	RKM 46-xM/S1587
5 pin female to flying lead cable, TPE	RKM 56-xM/S1587
4 pin male to female cable, TPE	RSM RKM 46-x/S1587
5 pin male to female cable, TPE	RSM RKM 56-x/S1587
4 pin right angle female to flying lead cable, TPE	WKM 46-xM/S1587
5 pin right angle female to flying lead cable, TPE	WKM 56-xM/S1587

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

Power Tee

Description	Part number
4 pin Male to 2 female sockets	RSM-2RKM 40
5 pin Male to 2 female sockets	RSM-2RKM 50

M12 A-code Cables

Description	Part number
4 pin female to flying lead cable, PVC	RKC 4.4T-*
4 pin male to flying lead cable, PVC	RSC 4.4T-*
4 pin male to female cable, PVC	RKC 4.4T-*/RSC 4.4T
5 pin female to flying lead cable, TPE	RKC 4.5T-*/S1587
5 pin male to flying lead cable, TPE	RSC 4.5T-*/S1587
5 pin male to female cable, TPE	RKC 4.5T-*/RSC 4.5T/S1587

Where * = 1, 2, 3, 4 meter standard lengths

M8 Cables

Description	Part number
3 pin female to flying lead cable, PUR	PKG 3M-*/M/S90
3 pin male to flying lead cable, PUR	PSG 3M-*/M/S90
3 pin male to female cable, PUR	PKG 3M-*/M-PSG 3M/S90

Where * = 1, 2, 3, 4 meter standard lengths

M23 Cables

Description	Part number
12 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for isysnet fieldbus.	CSCM CKCM 12-11-x/S90
19 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for isysnet fieldbus.	CSM CKM 19-19-x/S90
19 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for turck fieldbus.	CSWM CKWM 19-19-x/CS12852

Where x = 1, 2, 3, 4 meter standard lengths

Profibus Cables

Description	Part number
M12 Male to M12 Female, PUR	RSSW RKSX 455-xM

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

M12 A-code Cables

Description	Part number
4 pin female to flying lead cable, PVC	RKC 4.4T-*
4 pin male to flying lead cable, PVC	RSC 4.4T-*
4 pin male to female cable, PVC	RKC 4.4T-*/RSC 4.4T
5 pin female to flying lead cable, TPE	RKC 4.5T-*/S1587
5 pin male to flying lead cable, TPE	RSC 4.5T-*/S1587
5 pin male to female cable, TPE	RKC 4.5T-*/RSC 4.5T/S1587

Where * = 1, 2, 3, 4 meter standard lengths

Profibus Terminating Resistor

Description	Part number
M12 male pin terminating resistor	P8BPA00MB

Ethernet Cables

Description	Part number
M12 female to M12 male, PUR	RSSD RKSD 443-xM
RJ45 to M12 male, PUR	RSSD RJ45S 443-xM

Where x = 2, 5, 10, 15, 20, 30 meter standard lengths

DeviceNet and CANopen Cables

Description	Part number
7/8" mini male to 7/8" mini female, PUR	RSM RKM 5711-xM
7/8" mini male to M12 female, PUR	RSM RKC 5711-xM
M12 male to M12 female, PUR	RSC RKC 5711-xM
M12 male to 7/8" mini female, PUR	RSC RKM 5711-xM

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

Bus Power Tee

Description	Part number
Bus power tee	RSM RKM 57 WSM 40 PST

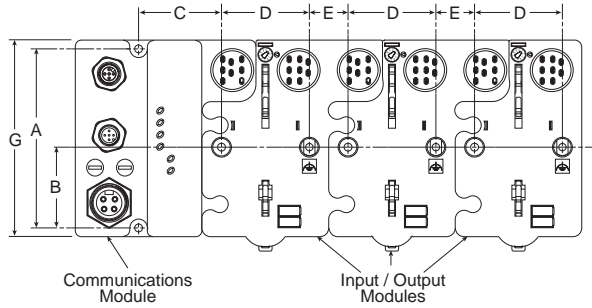
For systems not equipped with Power over network, combines separate network and power feeds into the communication module. Includes reverse current protection

DeviceNet and CANopen Terminating Resistor

Description	Part number
7/8" Mini Male Pin Terminating Resistor	RSM 57-TR2
M12 Male Pin Terminating Resistor	P8BPA00MA

D
 Subbase & Manifold
 Valve Products

Isysnet with Isys ISO Valves

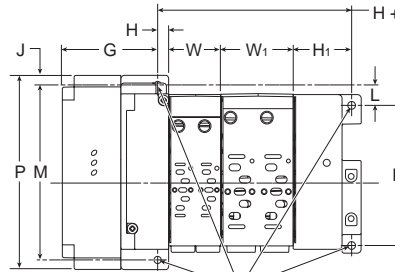
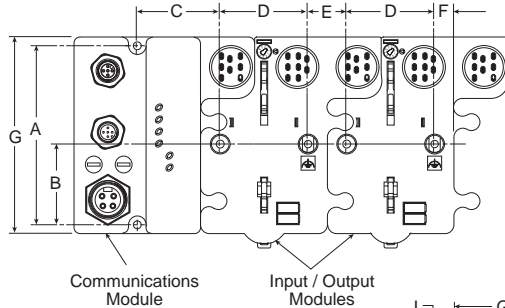


Dimensions

A	B	C	D
4.00 (102)	1.80 (46)	1.90 (48)	2.00 (50)

E	F	G
.87 (22)	.43 (11)	4.41 (112)

Inches (mm)



$H + H_1 + (W \times n + W_1 \times n_1)$
 n = Number of 18mm HB Bases
 n1 = Number of 26mm HA Bases
 W = Width of 18mm HB Bases
 W1 = Width of 26mm HA Bases

HB - HA Manifold Assembly

HB - HA Dimensions

G	H	H ₁	J	K
2.68 (68)	.33 (8.4)	1.80 (45.8)	.15 (4)	4.32 (110)

L	M	P	W	W ₁
.63 (16)	5.39 (137)	5.98 (152)	1.61 (40.8)	2.24 (56.8)

Inches (mm)

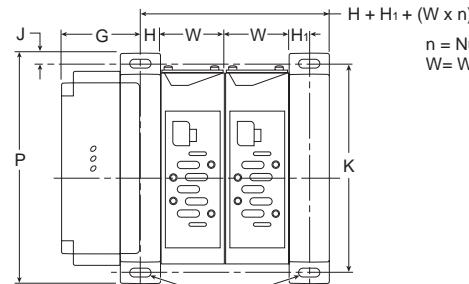
Holes for M6 (or 1/4")
 Screws 4 Places

H1 Dimensions

G	H	H ₁	J	K
2.20 (56)	.63 (15.9)	.63 (15.9)	.33 (8.5)	6.50 (165)

P	W
7.17 (182)	1.93 (49)

Inches (mm)



$H + H_1 + (W \times n)$
 n = Number of H1 Bases
 W = Width of H1 Bases

H1 Manifold Assembly

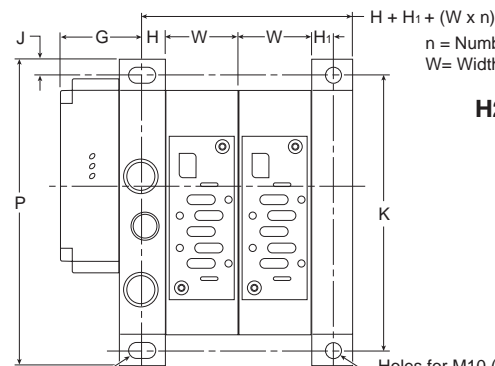
Slots for M6 (or 1/4")
 Screws 4 Places

H2 Dimensions

G	H	H ₁	J	K
2.28 (58)	.71 (18)	.59 (15)	.47 (12)	8.46 (215)

P	W
9.41 (239)	2.20 (56)

Inches (mm)



$H + H_1 + (W \times n)$
 n = Number of H2 / H3 Bases
 W = Width of H2 / H3 Bases

H2 - H3 Manifold Assembly

Slots for M10 (or 7/16")
 Screws 2 Places

Holes for M10 (or 7/16")
 Screws 2 Places

H3 Dimensions

G	H	H ₁	J	K
2.52 (64)	.94 (24)	.65 (16.5)	.59 (15)	10.43 (265)

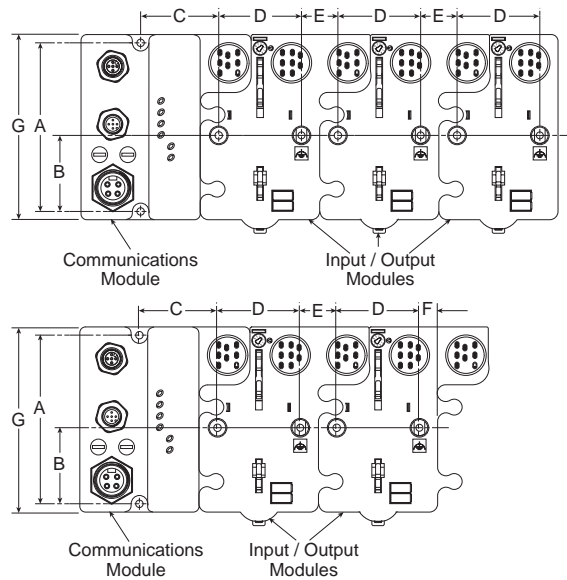
P	W
11.61 (295)	2.80 (71)

Inches (mm)

D

Subbase & Manifold
 Valve Products

Isysnet with Isys Micro Valves

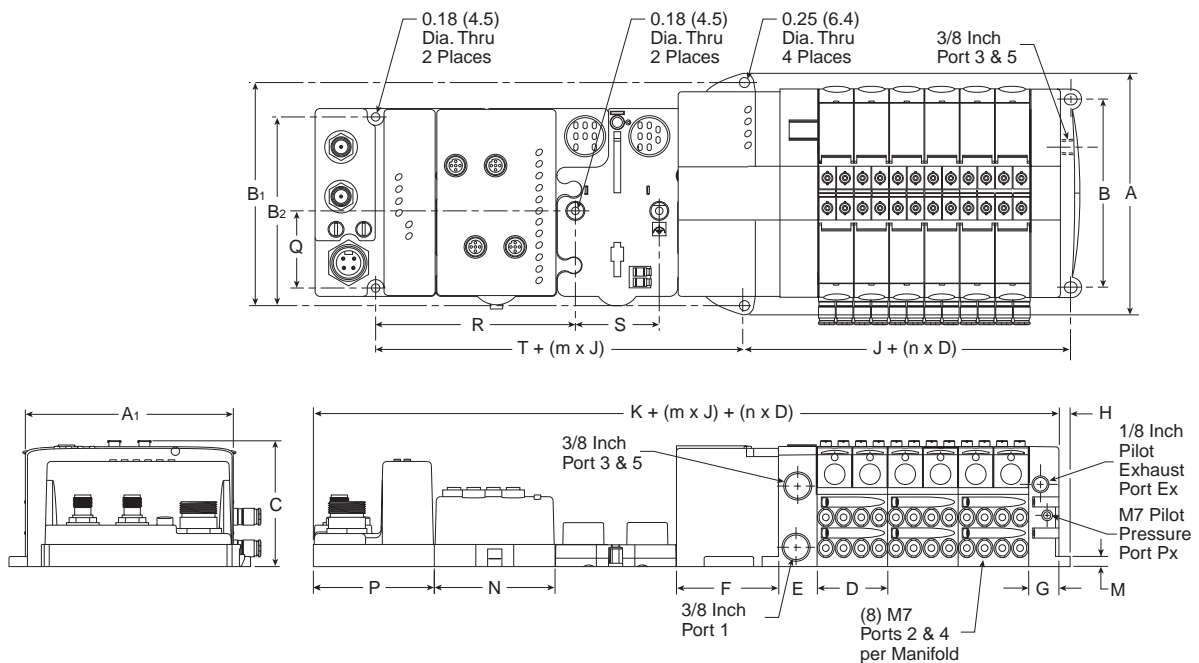


Dimensions

A	B	C	D
4.00 (102)	1.80 (46)	1.90 (48)	2.00 (50)
E	F	G	
.87 (22)	.43 (11)	4.41 (112)	

Inches (mm)

Isys Micro Manifold Assembly



Dimensions

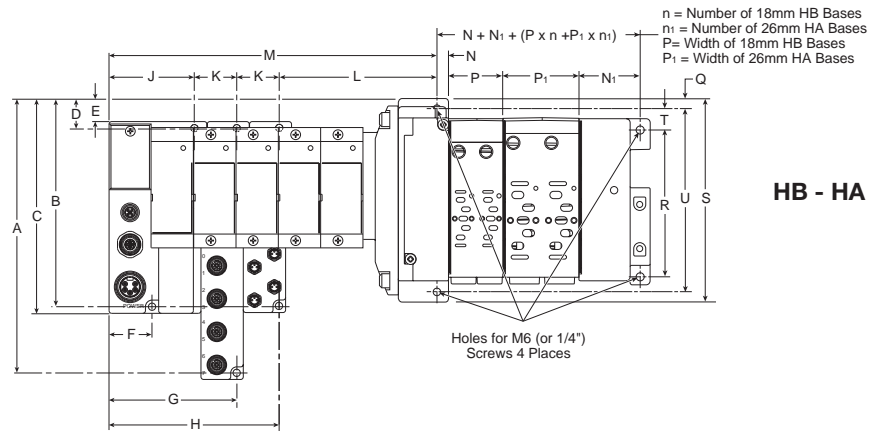
A	A ₁	B	B ₁	B ₂	C	D	E	F	G
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	2.40 (61.0)	0.71 (18.0)
H	J	K	M	N	P	Q	R	S	T
0.49 (12.5)	2.72 (69.0)	7.32 (186.0)	0.24 (6.1)	2.83 (72.0)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)

Inches (mm)

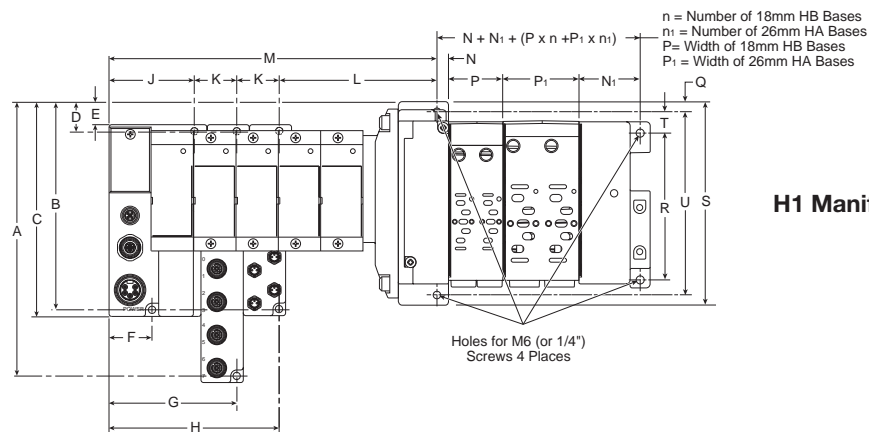
n = Number of Manifolds
 m = Number of Modules

D
 Subbase & Manifold
 Valve Products

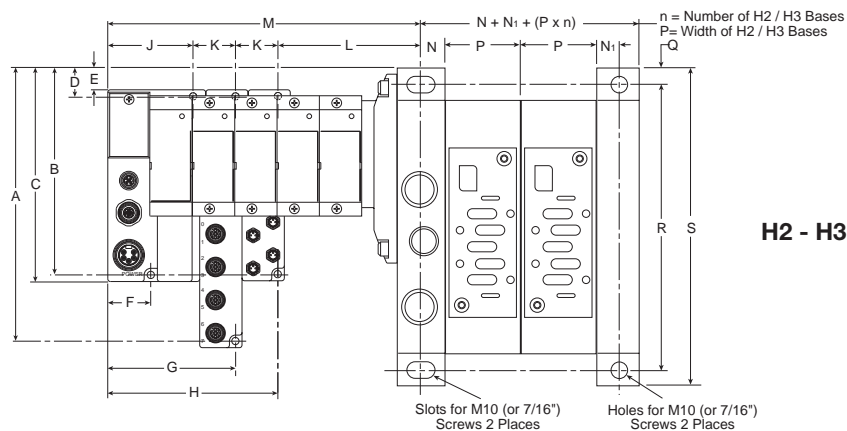
Turck with Isys ISO Valves



HB - HA Manifold Assembly



H1 Manifold Assembly



H2 - H3 Manifold Assembly

Dimensions

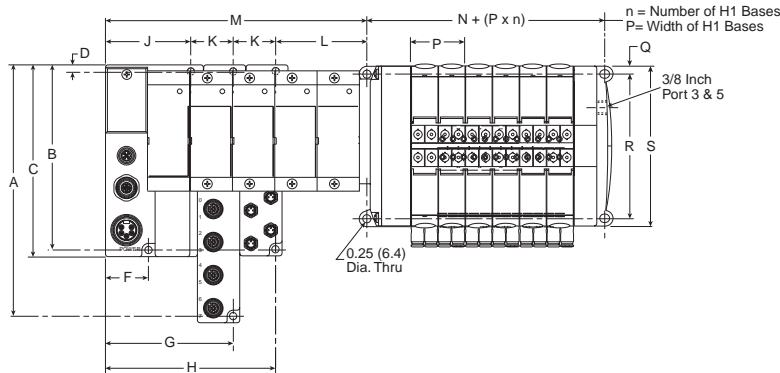
	A	B	C	D	E	F	G	H	J	K	L	M	N	N ₁	P	P ₁	Q	R	S	T	U
HA / HB	8.05 (204.5)	6.08 (154.5)	6.28 (159.5)	0.75 (19.5)	0.57 (14.5)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.75 (120.8)	See note 1	.33 (8.4)	1.80 (45.8)	1.61 (40.8)	2.24 (56.8)	.15 (4)	4.32 (110)	5.98 (152)	.63 (16)	5.39 (137)
H1	8.53 (216.7)	6.56 (166.7)	6.76 (171.7)	1.25 (31.7)	1.05 (26.7)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.27 (108.5)	See note 1	.63 (15.9)	.63 (15.9)	1.93 (49)	—	.33 (8.5)	6.50 (165)	7.17 (182)	—	—
H2	8.38 (212.9)	6.41 (162.9)	6.61 (167.9)	1.10 (27.9)	.90 (22.9)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.26 (108.6)	See note 1	.71 (18)	.59 (15)	2.20 (56)	—	.47 (12)	8.46 (215)	9.41 (239)	—	—
H3	8.62 (218.9)	6.65 (168.9)	6.85 (173.9)	1.33 (33.9)	1.14 (28.9)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.59 (116.6)	See note 1	.94 (24)	.65 (16.5)	2.80 (71)	—	.59 (15)	10.43 (265)	11.61 (295)	—	—

Note 1: $M = J + L + n_2 \times K$, where n_2 = Number of Turck input / output modules
 Inches (mm)

D

Subbase & Manifold
 Valve Products

Turck with Isys Micro Valves

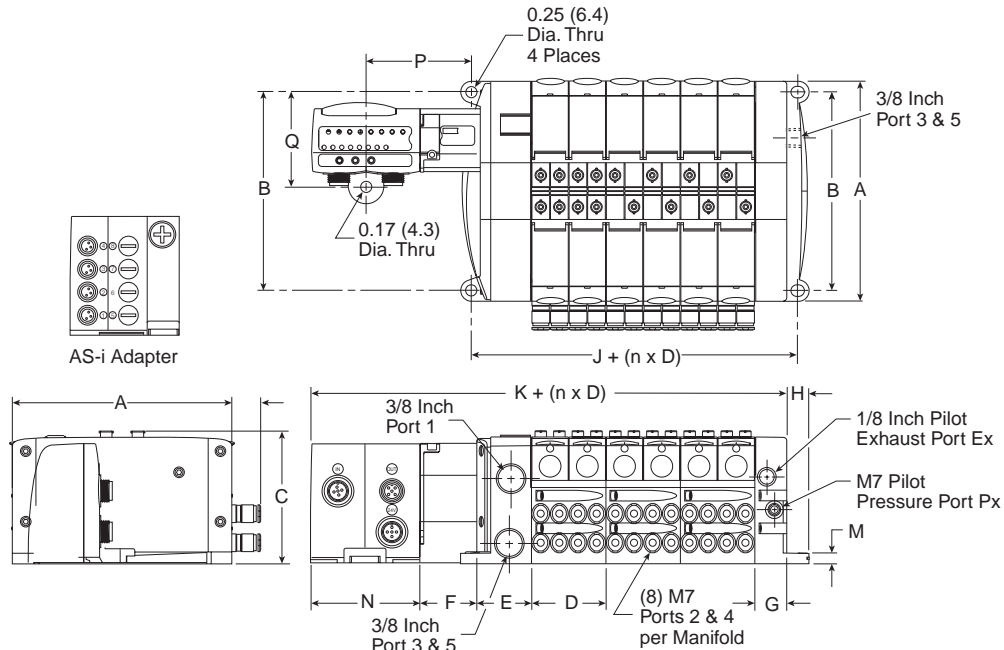


Dimensions

A	B	C	D	F	G	H	J	K	L	M	N	P	Q	R	S
7.48	5.51	5.71	0.20	1.28	3.79	5.06	2.53	1.26	2.54	See note 1	2.28	1.65	.19	4.41	4.88
(190)	(140)	(145)	(5)	(32.5)	(96.5)	(128.5)	(64.5)	(32)	(64)		(58)	(42)	(4.9)	(112)	(124)

Note 1: $M = J + L + n_2 \times K$, where n_2 = Number of Turck input / output modules
 Inches (mm)

Moduflex Adapter, Side Ported



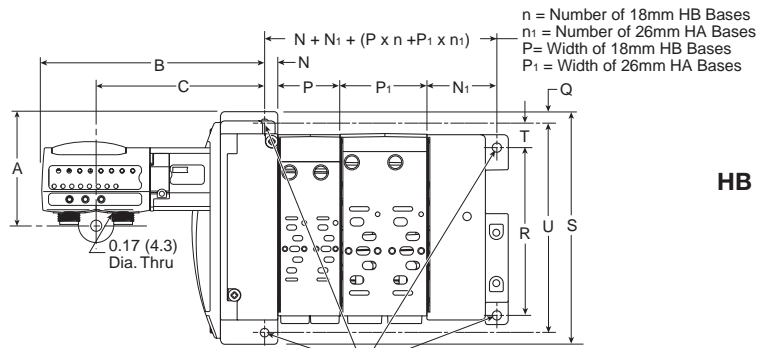
Dimensions

A	B	C	D	E	F	G	H	J	K	M	N	P	Q
4.88	4.41	2.95	1.65	1.22	1.28	0.71	0.49	2.28	6.10	0.24	2.40	2.36	2.07
(124.0)	(112.0)	(75.0)	(42.0)	(31.0)	(32.5)	(18.0)	(12.5)	(58.0)	(155.0)	(6.1)	(61.0)	(60.0)	(52.5)

Inches (mm)

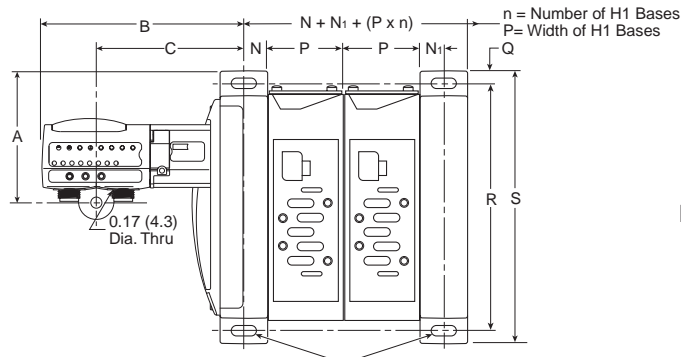
D
 Subbase & Manifold
 Valve Products

Moduflex with Isys ISO Valves



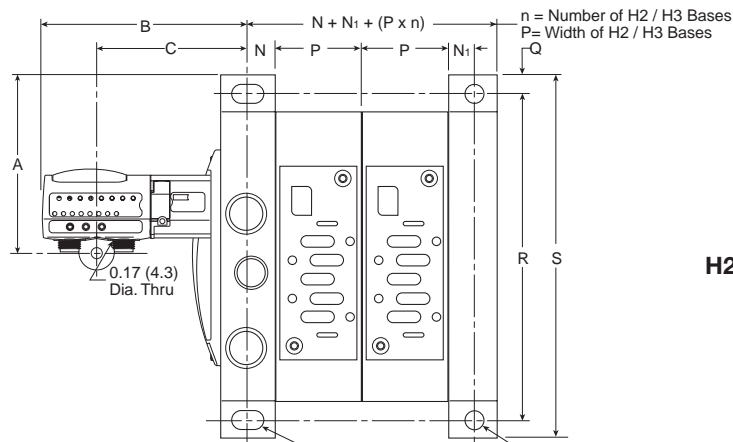
HB - HA Manifold Assembly

Holes for M6 (or 1/4")
 Screws 4 Places



H1 Manifold Assembly

Slots for M6 (or 1/4")
 Screws 4 Places



H2 - H3 Manifold Assembly

Slots for M10 (or 7/16")
 Screws 2 Places

Holes for M10 (or 7/16")
 Screws 2 Places

Dimensions

	A	B	C	N	N ₁	P	P ₁	Q	R	S	T	U
HA / HB	2.75 (69.8)	5.61 (142.5)	4.40 (111.8)	.33 (8.4)	1.80 (45.8)	1.61 (40.8)	2.24 (56.8)	.15 (4)	4.32 (110)	5.98 (152)	.63 (16)	5.39 (137)
H1	3.23 (82)	5.13 (130.2)	6.33 (160.9)	.63 (15.9)	.63 (15.9)	1.93 (49)	—	.33 (8.5)	6.50 (165)	7.17 (182)	—	—
H2	3.08 (78.2)	5.13 (130.3)	6.34 (161)	.71 (18)	.59 (15)	2.20 (56)	—	.47 (12)	8.46 (215)	9.41 (239)	—	—
H3	3.31 (84.2)	5.44 (138.2)	6.65 (168.9)	.94 (24)	.65 (16.5)	2.80 (71)	—	.59 (15)	10.43 (265)	11.61 (295)	—	—

Inches (mm)

D

Subbase & Manifold
 Valve Products

The ISOMAX range of directional control valves complies with ISO 15407-1 and VDMA 24563 for sizes 02 and 01 and ISO 5599-1 for sizes 1, 2 and 3. ISOMAX provides flows from 0.55 Cv to 4.15 Cv.

The ISOMAX range includes valves for pneumatic and electrical actuation with a wide choice of subbases and manifolds to suit different application needs.

All ISOMAX products use high-tech ceramic switching technology providing:

Excellent reliability

- Long life in excess of 100 million operations*
- Operates with lubricated or non-lubricated air
- Low sensitivity to air quality changes

High performance

- Slide valve concept allows high flow / size ratio and short response time due to short slide stroke and low friction

Stable long lasting performances

- Low friction switching: minimum wear of the valve member / seal assembly

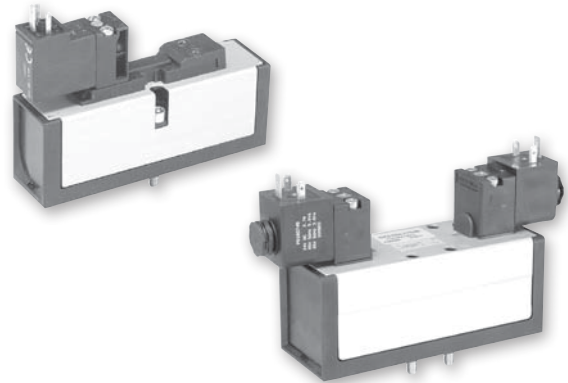
Valves fitted with switchable selector to give internal or external pilot supply

Corrosion free and modern design

Vacuum operation

Dual pressure

* Refer to our warranty conditions.



Operating information

Operating Pressure: Vacuum to 145 PSIG (10 bar)

Function		M.O.P (PSIG)
20, 21, 22, 23	2-Position, spring return	36
50, 51, 53, 54	2-Position, air return	30
04, 05, 06, 08	2-Position	15
09, 11, 12, 27	3-Position, CE	45
16, 18, 19, 25	3-Position, APB	45

Working temperatures: -10°C to 60°C (14°F to 140°F)

Storage temperatures: -20°C to 70°C (-4°F to 158°F)

Materials

Valve members	Self lubricating acetal
Seat	Ceramic
Body	Polyamide reinforced fiberglass
Casing	Anodized aluminum
End plates	Painted zinc plated steel
Valve plate	Zinc
Seals	Nitrile
Springs	Stainless steel
Screws	Zinc plated steel
Function selector	Polyamide reinforced fiberglass
Top cover seals	Polyester

 Most popular. For technical information see CD

DX02 ISO Valves

Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	0.55	Single solenoid	Internal	Non-locking	DX02-621-951M	DX02-621-951J
	4-way, 2-position, air return	0.55	Single solenoid	Internal	Non-locking	DX02-651-951M	DX02-651-951J
	4-way, 2-position	0.55	Double solenoid	Internal	Non-locking	DX02-606-951M	DX02-606-951J
	4-way, 3-position, all ports blocked	0.4	Double solenoid	Internal	Non-locking	DX02-611-951M	DX02-611-951J
	4-way, 3-position, center exhaust	0.4	Double solenoid	Internal	Non-locking	DX02-616-951M	DX02-616-951J

Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	0.55	Single remote pilot	Remote	DX02-421-60
	4-way, 2-position, air return	0.55	Single remote pilot	Remote	DX02-451-60
	4-way, 2-position	0.55	Double remote pilot	Remote	DX02-406-60
	4-way, 3-position, all ports blocked	0.4	Double remote pilot	Remote	DX02-411-60
	4-way, 3-position, center exhaust	0.4	Double remote pilot	Remote	DX02-416-60

DX02 Series Subbase & Manifolds

Single subbase	1/8" NPT	1/8" BSPP
Side ported base	PL02-01-80	PL02-01-70
2 Station manifold bases	1/8" NPT	1/8" BSPP
End ported bases	PJLP02-201-80	PJLP02-201-70
End plate kit	1/8" NPT port	1/8" BSPP port
End plate kit	PEJ02-02-80	PEJ02-02-70

Add-A-Fold Assembly Model Number

AA 02U 0 04

Valve series	Number of stations*
Right & left end plate DX02	02
	04
	•
	24
	•
	32

* For use with PJLP02 Manifolds.

Thread type	
NPT	0
BSPP "G"	1

* Must be ordered in multiples of (2)

DX02 Series Accessories

Accessory	Description	Part number
Sandwich regulator	Common pressure	2-60 PSIG w/ gauge PS5637155P
	Common pressure	5-125 PSIG w/ gauge PS5637166P
	Independent pressure	2-60 PSIG w/ gauge PS5637255P
	Independent pressure	5-125 PSIG w/ gauge PS5637266P
Gauge adapter kit	Includes 1/8" coupling and long nipple	PS5651160P
Blanking plate kit		PS5634P
Sandwich supply module	1/8" NPT	PS562600P
	1/8" BSPP	PS562601P
Sandwich exhaust module	1/8" NPT	PS562700P
	1/8" BSPP	PS562701P
Intermediate air supply module	1/8" NPT	D02P-01-80
Sandwich flow control		PS5642P
Manifold to manifold gasket kits	Used with manifold PJLP02	DX02M2MGSKT
Manifold port isolation kits (main galley 1, 3, & 5)	For use on PJLP and PJL series manifolds. Kit includes: plugs with o-rings.	D02BD0
Manifold hardware kit	Includes 10 bolts, 10 washers, 10 nuts	Dx02m2mb

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Subbase & Manifold
 Valve Products

DX01 ISO Valves

Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	0.75	Single solenoid	Internal	Non-locking	DX01-621-951M	DX01-621-951J
	4-way, 2-position, air return	0.75	Single solenoid	Internal	Non-locking	DX01-651-951M	DX01-651-951J
	4-way, 2-position	0.75	Double solenoid	Internal	Non-locking	DX01-606-951M	DX01-606-951J
	4-way, 3-position, all ports blocked	0.5	Double solenoid	Internal	Non-locking	DX01-611-951M	DX01-611-951J
	4-way, 3-position, center exhaust	0.5	Double solenoid	Internal	Non-locking	DX01-616-951M	DX01-616-951J

Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	0.75	Single remote pilot	Remote	DX01-421-60
	4-way, 2-position, air return	0.75	Single remote pilot	Remote	DX01-451-60
	4-way, 2-position	0.75	Double remote pilot	Remote	DX01-406-60
	4-way, 3-position, all ports blocked	0.5	Double remote pilot	Remote	DX01-411-60
	4-way, 3-position, center exhaust	0.5	Double remote pilot	Remote	DX01-416-60

DX01 Series Subbase & Manifolds

Single subbase	1/4" NPT	1/4" BSPP
Side ported base	PL01-02-80	PL01-02-70
2 Station manifold bases	1/4" NPT	1/4" BSPP
End ported bases	PJLP01-202-80	PJLP01-202-70
End plate kit	1/4" NPT port	1/4" BSPP port
End plate kit	PEJ01-03-80	PEJ01-03-70

Add-A-Fold Assembly Model Number

AA 01U 0 04

Valve series	Number of stations*
Right & left end plate DX01	02
	04
	•
	24
	•
	32

Thread type	
NPT	0
BSPP "G"	1


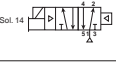
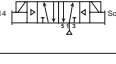
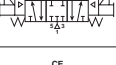

* For use with PJLP01 or PJL01 Manifolds.
 * Must be ordered in multiples of (2)

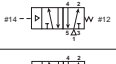
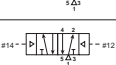
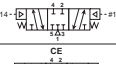
DX01 Series Accessories

Accessory	Description	Part number
Sandwich regulator	Common pressure	2-60 PSIG w/ gauge PS5537155P
	Common pressure	5-125 PSIG w/ gauge PS5537166P
	Independent pressure	2-60 PSIG w/ gauge PS5537255P
	Independent pressure	5-125 PSIG w/ gauge PS5537266P
	Gauge adapter kit	Includes 1/8" coupling and long nipple PS5651160P
Remote pilot access plate kit	1/4" NPT	PS551500P
	1/4" BSPP	PS551501P
Blanking plate kit		PS5534P
Sandwich supply module	1/4" NPT	PS552600P
	1/4" BSPP	PS552601P
Sandwich exhaust module	1/4" NPT	PS552700P
	1/4" BSPP	PS552701P
Intermediate air supply module	1/4" NPT	D01P-02-80
Sandwich flow control		PS5542P
Manifold to manifold gasket kits	Used with manifold PJLP02	DX01M2MGSKT
Manifold port isolation kits (main galley 1, 3, & 5)	For use on PJLP and PJL series manifolds. Kit includes: plugs with o-rings.	D01BD0
Manifold hardware kit	Includes 10 bolts, 10 washers, 10 nuts	DX02M2MB




D
 Subbase & Manifold
 Valve Products

DX1 ISO Valves


Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	1.15	Single solenoid	Internal	Non-locking	DX1-621-BL49	DX1-621-BL53
					Locking	DX1-621-CL49	DX1-621-CL53
	4-way, 2-position, air return	1.15	Single solenoid	Internal	Non-locking	DX1-651-BL49	DX1-651-BL53
					Locking	DX1-651-CL49	DX1-651-CL53
	4-way, 2-position	1.15	Double solenoid	Internal	Non-locking	DX1-606-BL49	DX1-606-BL53
					Locking	DX1-606-CL49	DX1-606-CL53
	4-way, 3-position, all ports blocked	0.75	Double solenoid	Internal	Non-locking	DX1-611-BL49	DX1-611-BL53
					Locking	DX1-611-CL49	DX1-611-CL53
	4-way, 3-position, center exhaust	0.75	Double solenoid	Internal	Non-locking	DX1-616-BL49	DX1-616-BL53
					Locking	DX1-616-CL49	DX1-616-CL53

Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	1.15	Single remote pilot	Remote	DX1-421-60
				Remote	DX1-451-60
	4-way, 2-position	1.15	Double remote pilot	Remote	DX1-406-60
				Remote	DX1-411-60
	4-way, 3-position, center exhaust	0.75	Double remote pilot	Remote	DX1-416-60

DX1 Series Subbase & Manifolds

Single subbase	Description	3/8" NPT	3/8" BSPP
	Side ported base	PS4011150CP	PS4011160CP
Manifold bases		3/8" NPT	3/8" BSPP
	End ported bases	PS4011550CP	PS4011560CP
	Bottom / End ported bases	PS4011650CP	PS4011660CP
End plate kits		NPT port	BSPP port
	DX1 non-collective wiring end plates	PS4031010CP	PS4031011CP

5599-1, DX1 Accessories

Accessories	Description	Part number
	Common pressure	5-125 PSIG w/ gauge PS4037166CP
	Independent pressure	5-125 PSIG w/ gauge PS4037266CP
Remote pilot access plate kit	1/8" NPT 1/8" BSPP	PS401500CP PS401501CP
Blanking plate kit		PS4034CP
Sandwich flow control		PS4042CP
Manifold to manifold gasket kit		PS4013P
Manifold port isolation kits	Main galley (1, 3, 5)	PS4032CP
Manifold port isolation kits	Pilot galley	PS4033CP
Auxiliary access plate kit	1/4" & 3/8"	NPT PS403000CP
		BSPP PS403001CP

D

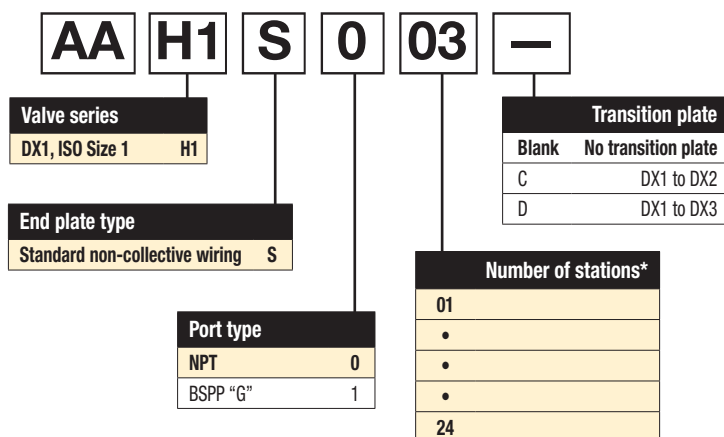
Subbase & Manifold
 Valve Products

How To Order Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.
 (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Example: Application requires a 3-Station manifold.

Qty.	Part No.	
1	AAH1S003	
1	DX1-621-BL49.....	Valve Station 1
1	PS4011550CP.....	Base Station 1
1	DX1-616-BL49.....	Valve Station 2
1	PS4011550CP.....	Base Station 2
1	DX1-611-BL49.....	Valve Station 3
1	PS4011550CP.....	Base Station 3






DX2 ISO Valves

Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	2.5	Single solenoid	Internal	Non-locking	DX2-621-BL49	DX2-621-BL53
					Locking	DX2-621-CL49	DX2-621-CL53
	4-way, 2-position, air return	2.5	Single solenoid	Internal	Non-locking	DX2-651-BL49	DX2-651-BL53
					Locking	DX2-651-CL49	DX2-651-CL53
	4-way, 2-position	2.5	Double solenoid	Internal	Non-locking	DX2-606-BL49	DX2-606-BL53
					Locking	DX2-606-CL49	DX2-606-CL53
	4-way, 3-position, all ports blocked	2.4	Double solenoid	Internal	Non-locking	DX2-611-BL49	DX2-611-BL53
					Locking	DX2-611-CL49	DX2-611-CL53
	4-way, 3-position, center exhaust	2.4	Double solenoid	Internal	Non-locking	DX2-616-BL49	DX2-616-BL53
					Locking	DX2-616-CL49	DX2-616-CL53


Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	2.5	Single remote pilot	Remote	DX2-421-60
					DX2-451-60
	4-way, 2-position, air return	2.5	Single remote pilot	Remote	DX2-406-60
					DX2-411-60
	4-way, 3-position, all ports blocked	2.4	Double remote pilot	Remote	DX2-416-60
					DX2-416-60

D
 Subbase & Manifold
 Valve Products

DX2 Series Subbase & Manifolds

Single subbase	Description	1/2" NPT	1/2" BSPP
	Side ported base	PS4111170CP	PS4111180CP
Manifold bases		1/2" NPT	1/2" BSPP
	Bottom / End ported bases Note: Manifolds include 2 pipe plugs	PS4111670CP	PS4111680CP
End plate kits		NPT port	BSPP port
	H2 Non-collective wiring end plates	PS4131010CP	PS4131011CP

5599-1, DX2 Accessories

Accessories	Description	Part number
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4137166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4137266CP
Remote pilot access plate kit	1/8" NPT	PS411500CP
	1/8" BSPP	PS411501CP
Blanking plate kit		PS4134CP
Sandwich flow control		PS4142CP
Manifold to manifold gasket kit		PS4113P
Manifold port isolation kits	Main galley (1, 3, 5)	PS4132CP
Manifold port isolation kits	Pilot galley	PS4033CP

How To Order Add-A-Fold Assemblies

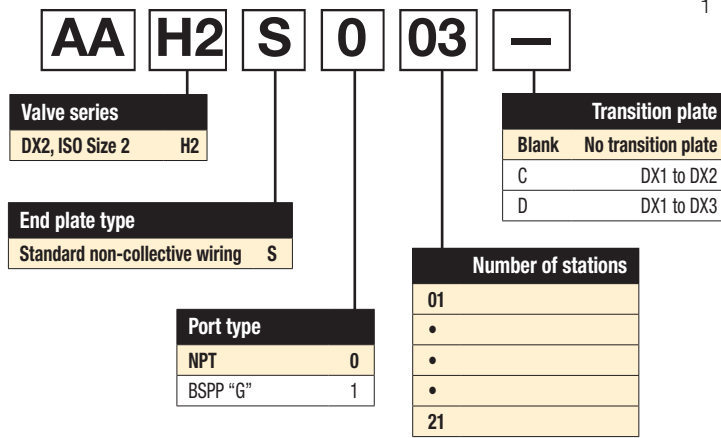
- List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
- List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.
(If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Example: Application requires a 3-Station manifold.

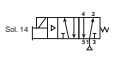
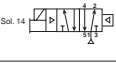
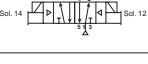
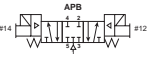
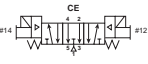
Qty.	Part No.
1	AAH2S003
1	DX2-621-BL49..... Valve Station 1
1	PS4111570CP.....Base Station 1
1	DX2-616-BL49 Valve Station 2
1	PS4111570CP.....Base Station 2
1	DX2-611-BL49 Valve Station 3
1	PS4111570CP.....Base Station 3

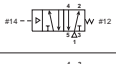
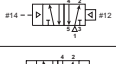
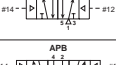
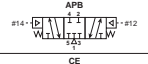
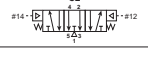
D

Subbase & Manifold
 Valve Products






DX3 ISO Valves


Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	4.15	Single solenoid	Internal	Non-locking	DX3-621-BL49	DX3-621-BL53
					Locking	DX3-621-CL49	DX3-621-CL53
	4-way, 2-position, air return	4.15	Single solenoid	Internal	Non-locking	DX3-651-BL49	DX3-651-BL53
					Locking	DX3-651-CL49	DX3-651-CL53
	4-way, 2-position	4.15	Double solenoid	Internal	Non-locking	DX3-606-BL49	DX3-606-BL53
					Locking	DX3-606-CL49	DX3-606-CL53
	4-way, 3-position, all ports blocked	4.0	Double solenoid	Internal	Non-locking	DX3-611-BL49	DX3-611-BL53
					Locking	DX3-611-CL49	DX3-611-CL53
	4-way, 3-position, center exhaust	4.0	Double solenoid	Internal	Non-locking	DX3-616-BL49	DX3-616-BL53
					Locking	DX3-616-CL49	DX3-616-CL53

Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	4.15	Single remote pilot	Remote	DX3-421-60
					DX3-451-60
	4-way, 2-position, air return	4.15	Single remote pilot	Remote	DX3-406-60
					DX3-411-60
	4-way, 2-position	4.15	Double remote pilot	Remote	DX3-416-60
					DX3-416-60
	4-way, 3-position, all ports blocked	4.0	Double remote pilot	Remote	DX3-421-60
					DX3-416-60
	4-way, 3-position, center exhaust	4.0	Double remote pilot	Remote	DX3-416-60
					DX3-416-60

DX3 Series Subbase & Manifolds

Single subbase	Description	3/4" NPT	3/4" BSPP
	Side ported base	PS4211170CP	PS4211180CP
Manifold bases	Description	3/4" NPT	3/4" BSPP
	Bottom / End ported bases Note: Manifolds include 2 pipe plugs	PS4211690CP	PS4211600CP
End plate kits	Description	NPT port	BSPP port
	H3 Non-collective wiring end plates	PS4231010CP	PS4231011CP

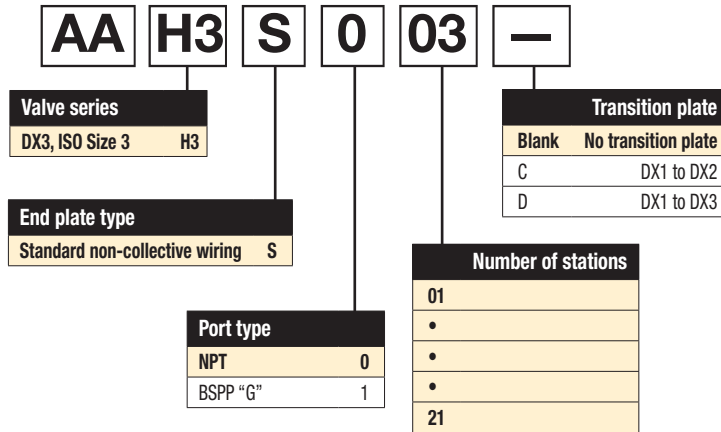
5599-1, DX3 Accessories

Accessories	Description	Part number
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4237166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4237266CP
Remote pilot access plate kit	1/8" NPT	PS421500CP
	1/8" BSPP	PS421501CP
Blanking plate kit		PS4134CP
Sandwich flow control		PS4242CP
Manifold to manifold gasket kit		PS4213P
Manifold port isolation kits	Main galley (1, 3, 5)	PS4232CP
Manifold port isolation kits	Pilot galley	PS4033CP

D
 Subbase & Manifold
 Valve Products

How To Order Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.
 (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



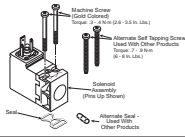
Example: Application requires a 3-Station manifold.

Qty.	Part No.
1	AAH3S003
1	DX3-621-BL49..... Valve Station 1
1	PS4111590CPBase Station 1
1	DX3-616-BL49 Valve Station 2
1	PS4111590CPBase Station 2
1	DX3-611-BL49 Valve Station 3
1	PS4111590CPBase Station 3

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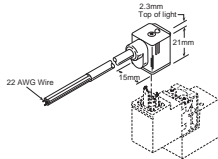
Subbase & Manifold
 Valve Products

15mm 3-Pin DIN 43650C Replacement Solenoid Kits



Voltage	Non-locking	Locking
24VDC	PS2982B49P	PS2982C49P
110/50, 120/60	PS2982B53P	PS2982C53P

15mm 3-Pin DIN 43650C Connectors



Description	Connector with 6' (2m) Cord	Connector
No Circuit Board	PS2932JBP	PS2932BP
Light – 24DC	PS2946J79BP*	PS294679BP
Light – 110/120VAC	PS2946J83BP*	PS294683BP

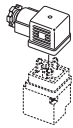
* LED with surge suppression.

Note: Max. ø6.5mm cable size required for connector without 6' (2m) cord.
 IP65 rated when properly installed.

Engineering Data:

Conductors: 2 Poles Plus Ground
 Cable Range (Connector Only): 4 to 6mm (0.16 to 0.24 Inch)
 Contact Spacing: 8mm

Female Electrical Connectors (IP65 Rated) 30mm, 3-Pin ISO 4400, (DIN 43650A)



Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	PS2028BP
Light – 6-48V, 50/60Hz; 6-48VDC	PS2032J79CP*	PS203279BP
Light – 120V/60Hz	PS2032J83CP*	PS203283BP
Light – 240V/60Hz	N/A	PS203283BP

* With surge suppression.

Engineering data:

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 inch); Contact spacing: 18mm

5599-1 CNOMO Solenoid Kits

Voltage code	3-pin, 30mm 'L' coil kit	2-pin, M12 Euro '6' coil kit
19	—	PS2828619P
42	P2FCA442	—
45	P2FCA445	—
49	P2FCA449	—
53	P2FCA453	—
57	P2FCA457	—

Quantity 1

CNOMO Operator Adapter

Description	Kit number
Operator Adapter	PS2855P

Manifold to Manifold Gasket Kits

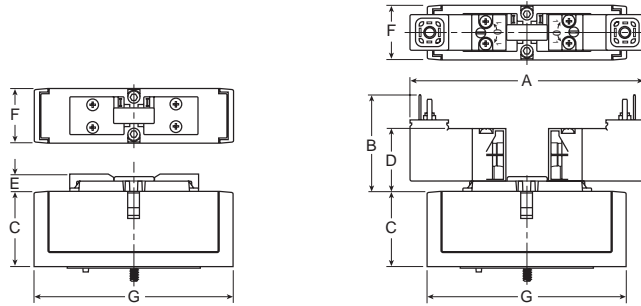
Size	Part number
DX02*	DX02M2MGSKT (PJLP02)
DX01*	DX01M2MGSKT (PJLP01)

* Gaskets used with PS5611 & PS5511 Manifolds.

Pilot Operator - CNOMO

Valve size	Kit number
DX1, DX2 & DX3	Locking PS4052CP
	Non-locking PS4053CP

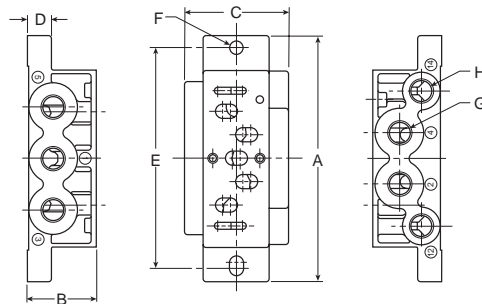
DX01 & DX02 Valve Dimensions



Series	A	B	C	D	E	F	G
DX02	4.06 (103)	1.61 (41)	1.41 (36)	1.06 (27)	.31 (8)	.71 (18)	3.15 (80)
DX01	4.06 (103)	1.61 (41)	1.41 (36)	1.06 (27)	.31 (8)	1.02 (26)	3.94 (100)

Inches (mm)

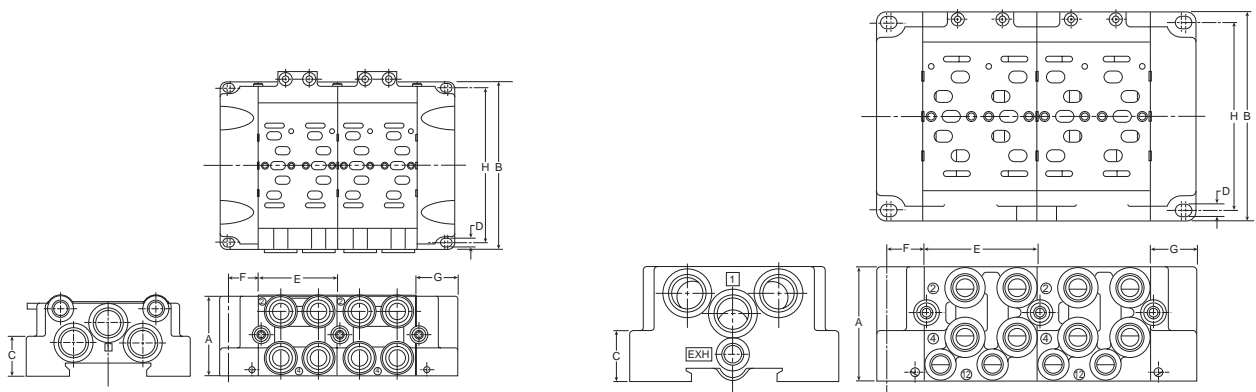
DX01 & DX02 Individual Subbase Dimensions



Series	Part number	A	B	C	D	E	F	G	H
DX02	PL02	3.15 (80)	.87 (22)	1.06 (27)	.31 (8)	2.76 (70)	.216 Dia. (Ø 5.5)	1/8	M5
DX01	PL01	3.94 (100)	1.10 (28)	1.65 (42)	.39 (10)	3.54 (90)	.216 Dia. (Ø 5.5)	1/4	1/8

Inches (mm)

DX01 & DX02 2-Station Manifold Base Dimensions



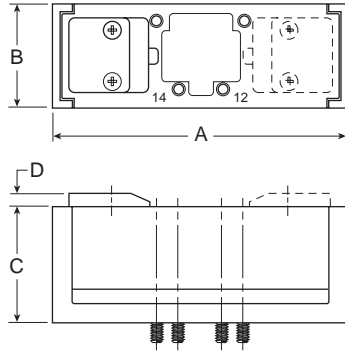
Series	Part number	A	B	C	D	E	F	G	H
DX02	PJLP02 / PEJ02	1.52 (38.5)	3.15 (80)	.47 (12)	.165 Dia. (Ø 4.2)	1.50 (38)	.55 (14)	.71 (18)	2.83 (72)
DX01	PJL01 / PJLP01 / PEJ01	2.17 (55)	3.94 (100)	.94 (24)	.216 Dia. (Ø 5.5)	2.13 (54)	.67 (17)	.87 (22)	3.54 (90)

Inches (mm)

D

Subbase & Manifold
 Valve Products

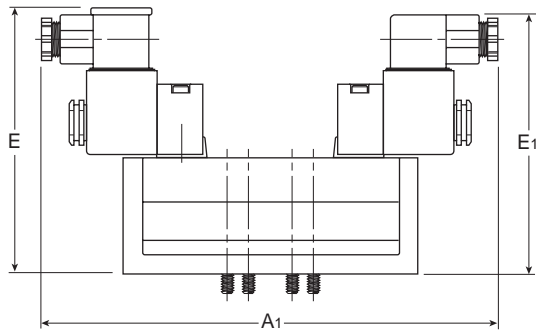
DX1, DX2 & DX3 Air Operated Valve Dimensions



Series	A	B	C	D
DX1	4.72 (120)	1.65 (42)	1.85 (47)	.20 (5)
DX2	5.51 (140)	2.13 (54)	2.30 (58.5)	.20 (5)
DX3	6.69 (170)	2.68 (68)	2.80 (71)	.20 (5)

Inches (mm)

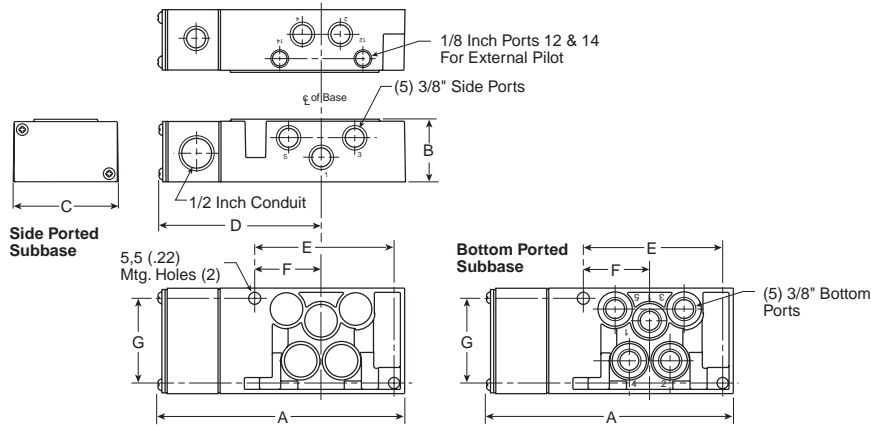
DX1, DX2 & DX3 Solenoid Operated Valve Dimensions



Series	A1	E	E1	E2
DX1	7.97 (202.5)	4.43 (112.5)	4.69 (119)	4.53 (115)
DX2	8.58 (218)	4.86 (123.5)	5.12 (130)	4.98 (126.5)
DX3	9.27 (235.5)	5.35 (136)	5.61 (142.5)	5.47 (139)

Inches (mm)

DX1 Subbase Dimensions

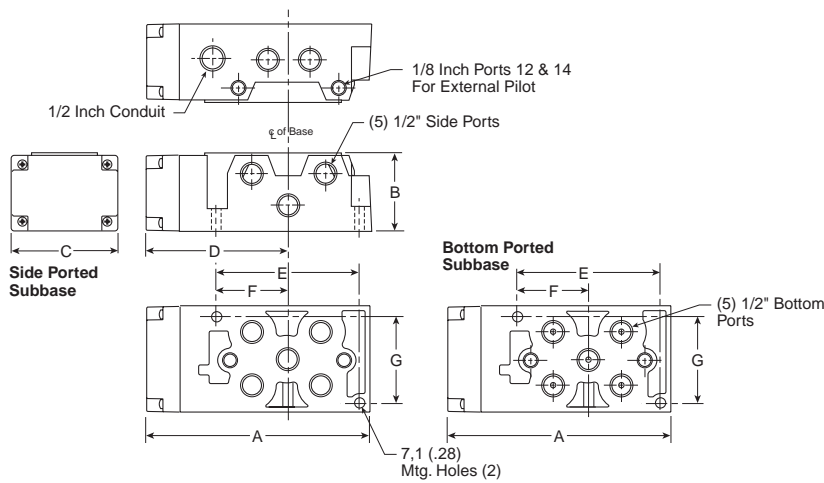


PS4011 Subbase

A	B	C	D
5.83 (148)	1.48 (38)	2.50 (64)	3.86 (98)
E	F	G	
3.29 (84)	1.57 (40)	2.00 (51)	

Inches (mm)

DX2 Subbase Dimensions

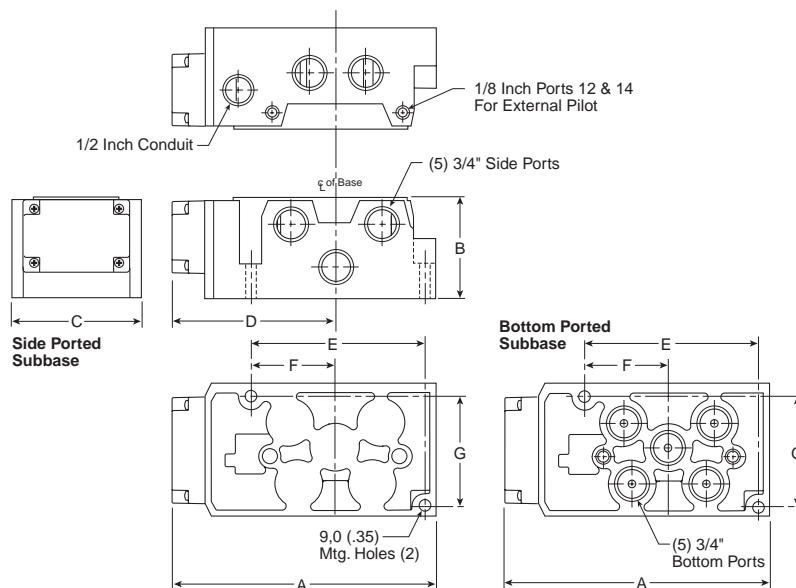


PS4111 Subbase

A	B	C	D
6.69 (170)	2.33 (59)	3.15 (80)	4.25 (108)
E	F	G	
4.21 (107)	2.07 (52)	2.56 (65)	

Inches (mm)

DX3 Subbase Dimensions



PS4211 Subbase

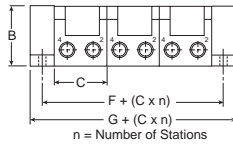
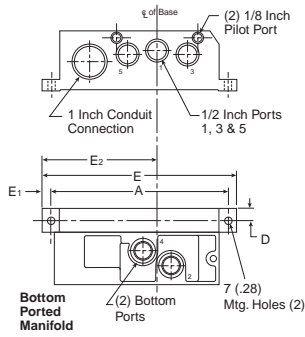
A	B	C	D
7.90 (201)	2.96 (75)	3.90 (990)	4.92 (125)
E	F	G	
5.14 (131)	2.50 (64)	3.24 (82)	

Inches (mm)

D

Subbase & Manifold
 Valve Products

DX1 Manifold Dimensions

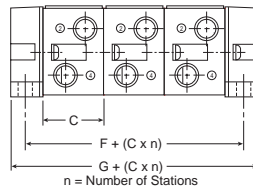
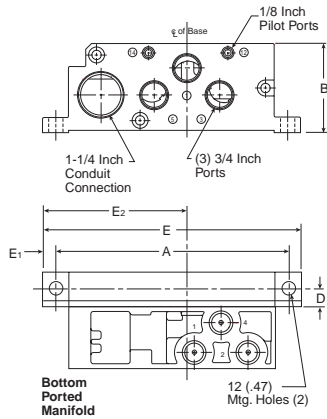


PS4011 Manifold

A	B	C	D	E
6.50 (165)	2.20 (56)	1.93 (49)	.44 (11)	7.15 (182)
E1	E2	F	G	
.33 (8)	4.25 (108)	.87 (22)	1.80 (46)	

Inches (mm)

DX2 Manifold Dimensions

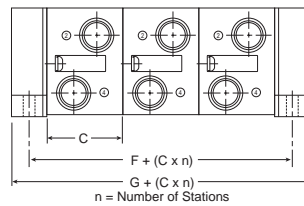
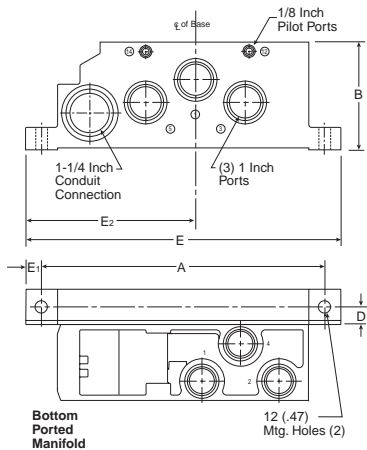


PS4111 Manifold

A	B	C	D	E
8.46 (215)	3.35 (85)	2.20 (56)	.59 (15)	9.41 (239)
E1	E2	F	G	
.47 (12)	5.28 (134)	1.18 (30)	2.36 (60)	

Inches (mm)

DX3 Manifold Dimensions



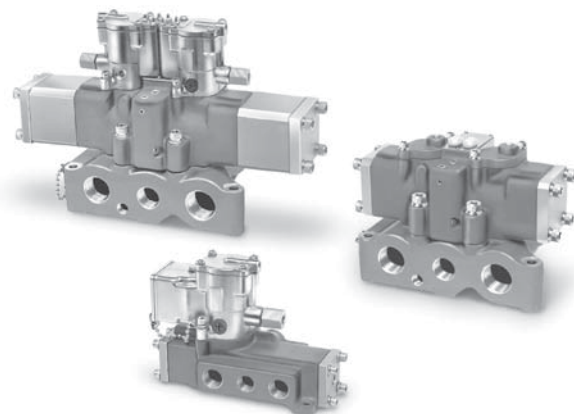
PS4211 Manifold

A	B	C	D	E
10.41 (265)	4.13 (105)	2.80 (71)	.65 (175)	11.61 (295)
E1	E2	F	G	
.59 (15)	6.26 (159)	1.30 (33)	2.60 (63)	

Inches (mm)

D
 Subbase & Manifold
 Valve Products

- Full air operation for fastest response.
- “Plug-In” option simplifies maintenance and installation. Reduces downtime. No wiring or plumbing to disturb.
- “Direct pipe” design for economy and performance.
- Variety of operators available; direct conduit, (JIC) junction box, NEMA 4, hazardous duty, (UL, CSA), and remote air pilot.
- Synthetic rubber o-ring seals are specially compounded for minimum compression and friction for superior wear and abrasion resistance.
- Precision ground spool “floats” on o-ring seals. Closed center cross-over design saves air.
- General Purpose Approvals
 - CSA - Canadian Standards Association
File number 42024
- Hazardous Duty Approvals
 - UL - Underwriters Laboratories, Inc.
File number E42542 Category Y107
 - CSA - Canadian Standards Association
File number 24349



Materials

Valve bodies	Aluminum alloy
Valve spool	Aluminum alloy with special coating on 3/8" basic valves
	Hard chrome plated AISI type 416 stainless steel on 1/4" & 1/2" basic valves.
Resilient seals: in valve body	
Dynamic	Polyurethane base on 3/8" basic valves*
Static / dynamic	Nitrile base w / 12% Molybdenum Disulphide on 1/4" & 1/2" basic valves
Other seals	Nitrile
Shock pads	Polyurethane
Valve spacers	Brass
Manifolds & subbases	Aluminum alloy
Solenoid bodies	Plated zinc alloy
Internal components	Corrosion resistant steel
Resilient seals	Standard Service Nitrile Special Service Fluorocarbon & Silicone (continuous duty)
Other seals	Nitrile
Coil	Class “B” epoxy encapsulated (Class “H” also available on some models, consult supplier)

* These materials are specially designed for valves used on non-lubricated service

Operating information

Pressure range for solenoid operated valves

Media	Internal pilot supply		External pilot supply				
	1/4"	3/8"	1/2"	1/4"	3/8"	1/2"	1"
Air	35-140* PSIG			N.A.	Main 0-250 PSIG Pilot 35-140* PSIG		
Vacuum	do not use			N.A.	Main within 1 Hg of perfect Pilot 35-140* PSIG		
Other	Consult supplier						

* 200 PSIG Solenoid Is Optional (consult supplier).

Pressure range for remote pilot operated valves

Media		Valve type	
		Single	Double & 3-position
Air	Main	35-250 PSIG	0-250 PSIG
	Pilot	35-200 PSIG	35-200 PSIG
Vacuum	Main	Do not use	Within 1" Hg of perfect
	Pilot	Do not use	35-200 PSIG
Other	Consult supplier		

Ambient temperature – standard service solenoid operator

Minimum	Maximum	
	Intermittent duty	Continuous duty
0°F	125°F	100°F

Special service (continuous duty) solenoid operator

0°F	125°F	125°F
-----	-------	-------

Ambient temperature – remote pilot operated valves



0°F	200°F
-----	-------



As the above chart indicates, Standard Duty Solenoids may be used on continuous duty but ambient temperature is de-rated. In some cases, Special Service Solenoids may be rated for higher ambient temperatures (consult supplier).

Caution:
 If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage and unpredictable behavior.


Most popular. For technical information see CD


4-Way, 5-Port, 2-Position, Plug-in

L675 (3/8" basic valve) Single solenoid	L655 (3/8" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (Side ports)	Manifold† (End & bottom ports)	Voltage	Valve only						
							Single solenoid	Double solenoid					
		4.8	3/8"	K022 090	K142 230	120V 60Hz	L675 39 102 53	L655 39 102 53					
							4.8	1/2"	K022 091	K142 231	110V 50Hz	L675 33 102 49	L655 33 102 49
							4.8	3/4"	K022 101	K142 270	24VDC	L675 33 102 49	L655 33 102 49



L675 (1" basic valve) Single solenoid	L655 (1" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (Side ports)	Manifold† (End & bottom ports)	Voltage	Valve only						
							Single solenoid	Double solenoid					
		11.3	1"	K022 095	K142 230	120V 60Hz	L675 89 102 53	L655 89 102 53					
							11.3	1"	K022 095	K142 231	110V 50Hz	L675 83 102 49	L655 83 102 49
							11.3	1"	K022 095	K142 270	24VDC	L675 83 102 49	L655 83 102 49



4-Way, 5-Port, 3-Position, Plug-in

L665 (3/8" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (side ports)	Manifold † (end & bottom ports)	Voltage	Valve only						
						Double solenoid						
	4.8	3/8"	K022 090	K142 230	120V 60Hz	L665 39 211 53						
						4.8	1/2"	K022 091	K142 231	110V 50Hz	L665 33 211 49	
						4.8	3/4"	K022 101	K142 270	24VDC	L665 33 211 49	



L665 (1" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (side ports)	Manifold † (end & bottom ports)	Voltage	Valve only						
						Double solenoid						
	11.3	1"	K022 095	K142 230	120V 60Hz	L665 89 211 53						
						11.3	1"	K022 095	K142 231	110V 50Hz	L665 83 211 49	
						11.3	1"	K022 095	K142 270	24VDC	L665 83 211 49	

4-Way, 5-Port, 2-Position, Direct Pipe Ported

L705 (3/8" basic valve) single solenoid	L685 (3/8" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				Single solenoid	Double solenoid
		3/8"	1/2"	4.8	120V 60Hz	Junction box	L705 39 102 53	L685 39 102 53
							L705 49 102 53	L685 49 102 53
		3/8"	1/2"	4.8	24VDC	Junction box	L705 36 102 49	L685 36 102 49
							L705 46 102 49	L685 46 102 49
		3/8"	1/2"	4.8	120V 60Hz	Basic	L705 33 102 53	L685 33 102 53
							L705 43 102 53	L685 43 102 53
L705 33 102 53	L685 33 102 53							

L705 (1" basic valve) single solenoid	L685 (1" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				Single solenoid	Double solenoid
		1"	1-1/4"	12.0	120V 60Hz	Junction box	L705 89 102 53	L685 89 102 53
							L705 99 102 53	L685 99 102 53
		1"	1-1/4"	12.0	24VDC	Junction box	L705 86 102 49	L685 86 102 49
							L705 96 102 49	L685 96 102 49

4-Way, 5-Port, 3-Position, Direct Pipe Ported

L695 (3/8" basic valve) double solenoid	L695 (1" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				3/8" basic size	1" basic size
		3/8"	1/2"	4.5	120V 60Hz	Junction box	L695 39 211 53	—
							L695 49 211 53	—
		1"	1-1/4"	12.0	110V 50Hz	Junction box	—	L695 89 211 53
							—	L695 99 211 53

† Manifolds include mounting hardware, except for port adapters.

D
 Subbase & Manifold
 Valve Products

Plug-in Pilot



With indicator light

Description	Standard service		Special service	
	Locking	Non-locking	Locking	Non-locking
With override (120VAC)	K175 9035 53	K175 8035 53	K185 9025 53	K185 8025 53
With override (Other than 120VAC)	K175 3035**	—	K185 3025**	—

** Voltage code - (reference model index for availability)

NEMA 1 & 12



Basic Pilot



JIC Pilot

Description	Standard service		Special service	
	Locking	Non-locking	Locking	Non-locking
Basic with override	K065 3035**	—	K085 3025**	—
JIC with junction box & override	K065 6035**	K065 5035**	K085 6025**	K085 5025**
JIC pilot with junction box & override & indicator lights (120VAC Only)	K065 9035**	K065 8035**	K085 9025**	K085 8025**

** Voltage code - (reference model index for availability)

NEMA 4, 7 & 9



Hazardous Duty



NEMA 4 Pilot

Description	Standard service		Special service	
	Locking	Non-locking	Locking	Non-locking
Hazardous duty pilot - UL & CSA	K025 1035** †	—	K045 1025** †	—
NEMA 4 pilot	K235 1035** †	—	—	—
Hazardous duty with override	K025 3035** †	K025 2035** †	K045 3025** †	K045 2025** †
NEMA 4 with override	—	K235 3035** †	K235 2035** †	—

† 49 / 53 only ** Voltage code - (reference model index for availability)

D

Subbase & Manifold
 Valve Products

Blank Station Covers

Manifold assembly	Blank cover kit
—	K060 20007
K142 230	—
K142 231	K060 20003
K142 270	—
K142 233	K060 20009
K142 236	K060 20004

Flush Type Hex Drive Pipe Plugs for Port Isolation

Size (NPTF)	Part number
1/8"	K21R02012L
1/4"	K21R02025L
3/8"	K21R02037L
1/2"	K21R02050L
3/4"	K21R02075L

Service Kits

Basic valve	Series (prefix)	Solenoid operated *				Remote pilot operated	
		Standard service (intermittent duty)		Special service ** (continuous duty)		Single	Double 2 & 3-position
Size		Single	Double 2 & 3-position	Single	Double 2 & 3-position	Single	Double 2 & 3-position
3/8"	L65	-	K352 126	-	K352 127	-	K352 355
	L66	-	K352 126	-	K352 127	-	K352 355
	L67	K352 124	-	K352 125	-	K352 362	-
	L68	-	K352 126	-	K352 127	-	K352 355
	L69	-	K352 126	-	K352 127	-	K352 355
	L70	K352 124	-	K352 125	-	K352 362	-
1"	L65	-	K352 130	-	K352 131	-	K352 360
	L66	-	K352 130	-	K352 131	-	K352 360
	L67	K352 128	-	K352 129	-	K352 359	-
	L68	-	K352 130	-	K352 131	-	K352 360
	L69	-	K352 130	-	K352 131	-	K352 360
	L70	K352 128	-	K352 129	-	K352 359	-

Notes:

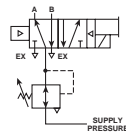
* Kits for solenoid operated valves include solenoid service kits.

** Special service (continuous duty) solenoids may be identified as having gold colored solenoid tops.

Common Port Regulator

Pressure Adjustment	Pressure Range PSIG	Part number	
		Assembly "A"	Assembly "B"
Manual	1 - 60	L554 02 308C	L554 08 302C
	2 - 125	L554 03 308C	L554 08 303C
Remote	0 - 140	L554 11 308C	L554 08 311C

* Assembly "A" places the regulator on the end opposite the electrical junction box. Assembly "B" places the regulator over the electrical junction box.

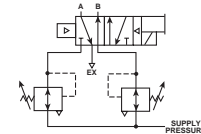
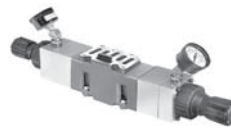


Regulated Pressure at Both "A" & "B"

Independent Port Regulator

Pressure adjustment	Cylinder port "A" PSIG	Part number	
		Cylinder port "B"	
Manual	1 - 60	L554 05 305C	-
Remote	0 - 140	-	L554 14 314C†

† Remote operator units 0-140 PSIG



Independently Regulated Pressure at Both "A" & "B"

Interchangeable Manual Override Assemblies for Solenoid Operators

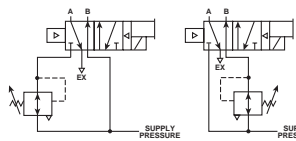


Non-locking type	Locking type
K162 001	K152 003

Single Port Regulator

Pressure adjustment	Pressure range PSIG	Part number	
		Cyl. port "A"	Cyl. port "B"
Manual	1 - 60	L554 05 307C	L554 07 305C
	2 - 125	L554 06 307C	L554 07 306C
Remote	0 - 140	L554 14 307C	L554 07 314C

* Assembly "A" places the regulator on the end opposite the electrical junction box. Assembly "B" places the regulator over the electrical junction box.



Supply Pressure at "B" & Regulated at "A" Supply Pressure at "A" & Regulated at "B"

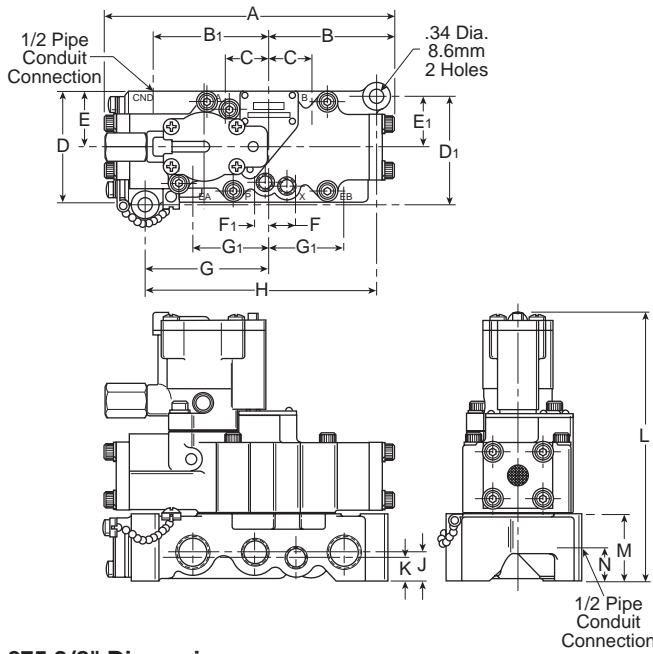
Conversion Kits: Lubricated to Non-Lubricated Operation

Basic size	Operators (solenoid or remote pilot)	
	Single	Double (2-position)
3/8"	K322 012	K322 013

Electrical Connectors Single or Double Solenoid Valves

Basic size	Valve body		Subbase / manifold	
	Single solenoid	Double solenoid	19" leads	72" leads
3/8"	H027 23	H027 22	H027 13	H027 89
1"				

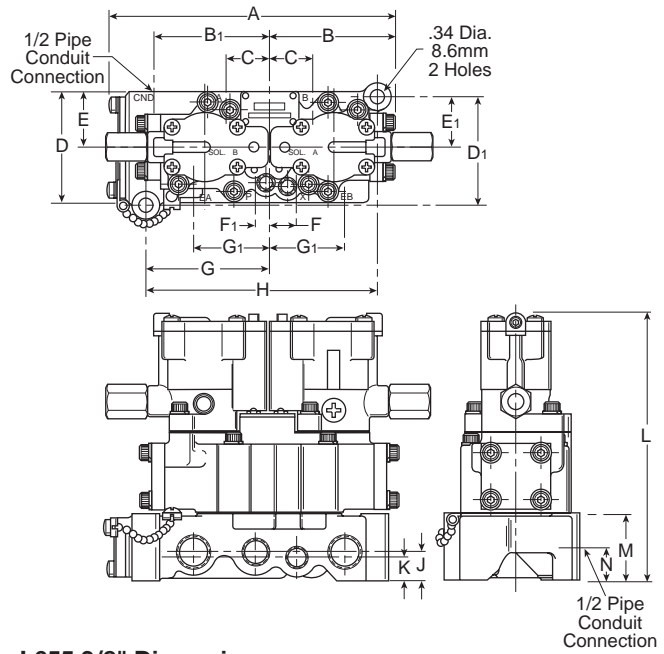
D
 Subbase & Manifold Valve Products



L675 3/8" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
7.56 (192)	3.32 (84.3)	2.94 (74.7)	1.12 (28.4)	2.88 (73.2)	2.84 (72.1)	1.44 (36.6)	1.34 (34)	.75 (19.1)
F ₁	G	G ₁	H	J	K	L	M	N
.38 (9.7)	3.16 (80.3)	2.00 (50.8)	6.03 (153.2)	.75 (19.1)	.62 (15.7)	6.93 (176)	1.75 (44.5)	1.00 (25.4)

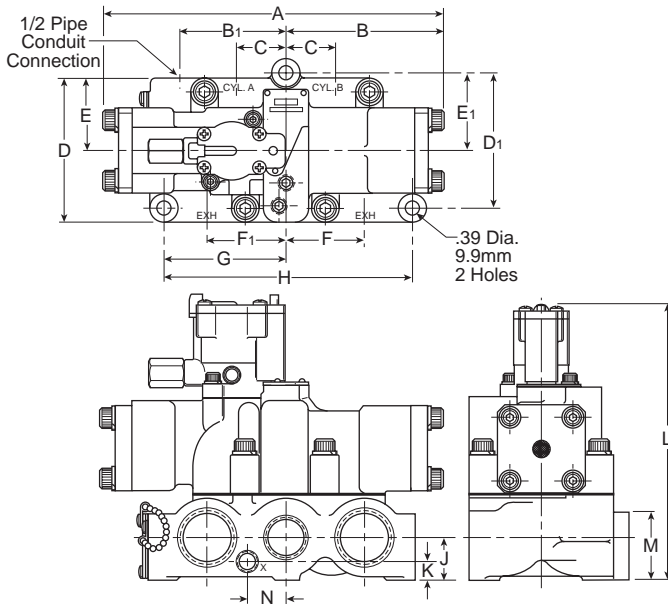
Inches (mm)



L655 3/8" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
7.38 (187.5)	3.32 (84.3)	2.94 (74.7)	1.12 (28.4)	2.88 (73.2)	2.84 (72.1)	1.44 (36.6)	1.34 (34)	.75 (19.1)
F ₁	G	G ₁	H	J	K	L	M	N
.38 (9.7)	3.16 (80.3)	2.00 (50.8)	6.03 (153.2)	.75 (19.1)	.62 (15.7)	6.93 (176)	1.75 (44.5)	1.00 (25.4)

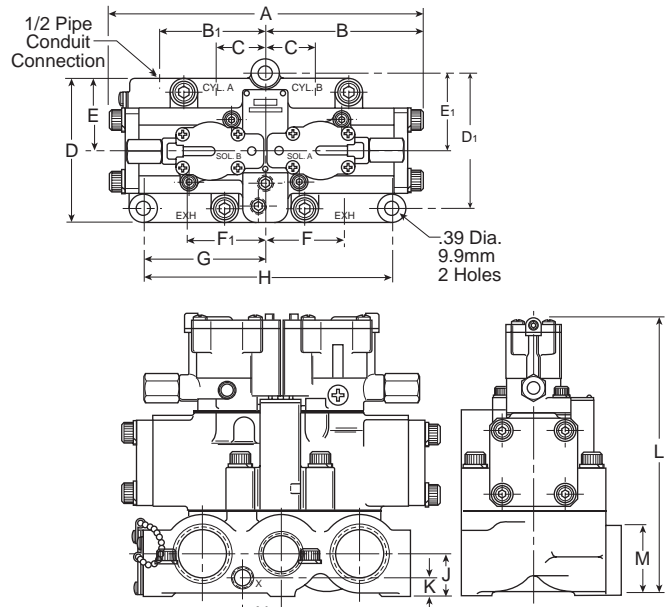
Inches (mm)



L675 1" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
10.46 (265.7)	4.75 (120.6)	2.94 (74.7)	3.38 (85.8)	4.56 (115.8)	4.28 (108.7)	2.28 (57.9)	2.44 (62)	2.45 (62.2)
F ₁	G	H	J	K	L	M	N	
2.46 (62.5)	3.81 (96.8)	7.62 (193.5)	1.31 (33.3)	.59 (15)	8.74 (222)	2.09 (53.1)	1.22 (31)	

Inches (mm)



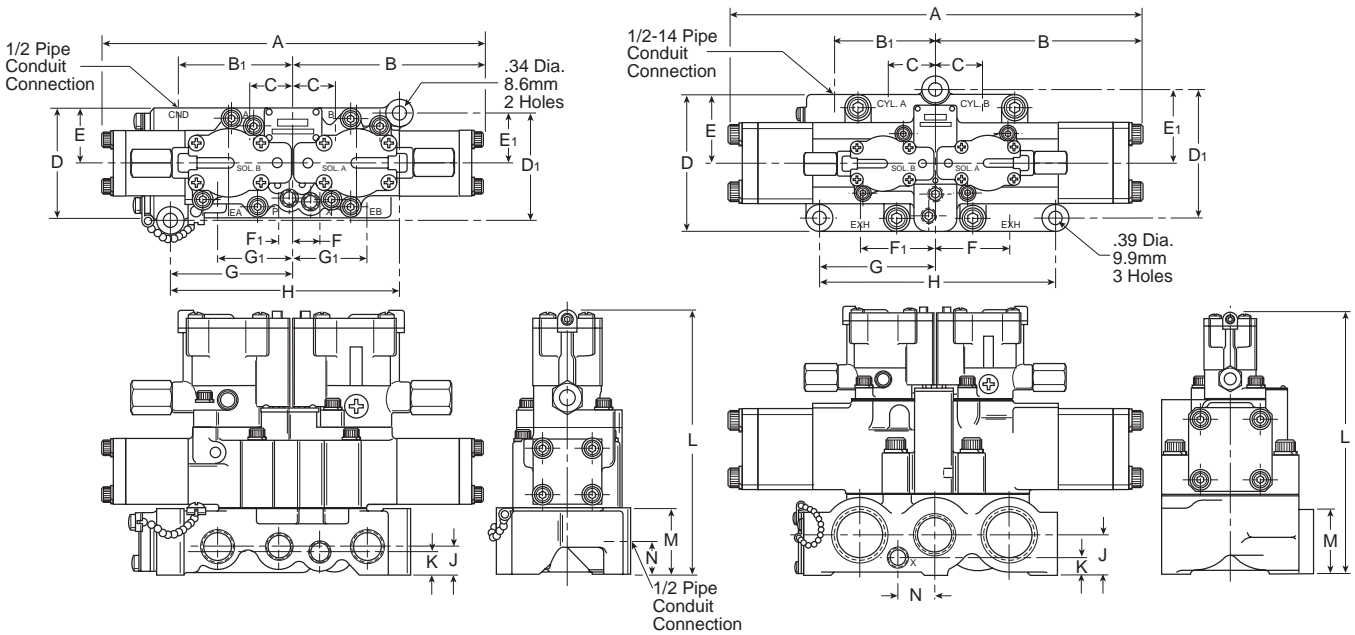
L655 1" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
9.50 (241.3)	4.75 (120.6)	3.38 (85.8)	1.53 (38.9)	4.56 (115.8)	4.28 (108.7)	2.28 (57.9)	2.44 (62)	2.45 (62.2)
F ₁	G	H	J	K	L	M	N	
2.46 (62.5)	3.81 (96.8)	7.62 (193.5)	1.31 (33.3)	.59 (15)	8.74 (222)	2.09 (53.1)	1.22 (31)	

Inches (mm)

D

Subbase & Manifold
 Valve Products



L665 3/8" Dimensions

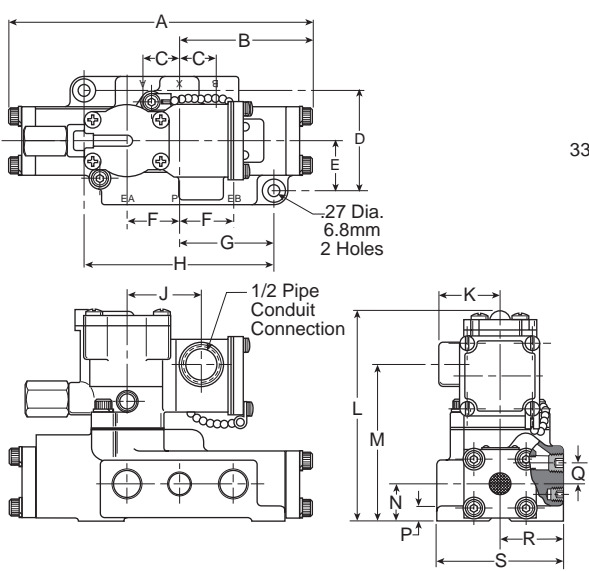
A	B	B ₁	C	D	D ₁	E	E ₁	F
9.64	4.82	2.94	1.12	2.88	2.84	1.44	1.34	.75
(244.8)	(122.4)	(74.7)	(28.4)	(73.2)	(72.1)	(36.6)	(34)	(19.1)
F ₁	G	G ₁	H	J	K	L	M	
.38	3.16	2.00	6.03	.75	.62	6.93	1.00	
(9.7)	(80.3)	(50.8)	(153.2)	(19.1)	(15.7)	176)	(25.4)	

Inches (mm)

L665 1" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
13.62	6.81	3.38	1.53	4.56	4.28	2.28	2.44	2.45
(345.9)	(173)	(85.8)	(38.9)	(115.8)	(108.7)	(57.9)	(62)	(62.2)
F ₁	G	H	J	K	L	M	N	
2.46	3.81	7.62	1.31	.59	8.74	2.09	1.22	
(62.5)	(96.8)	(193.5)	(33.3)	(15)	(222)	(53.1)	(31)	

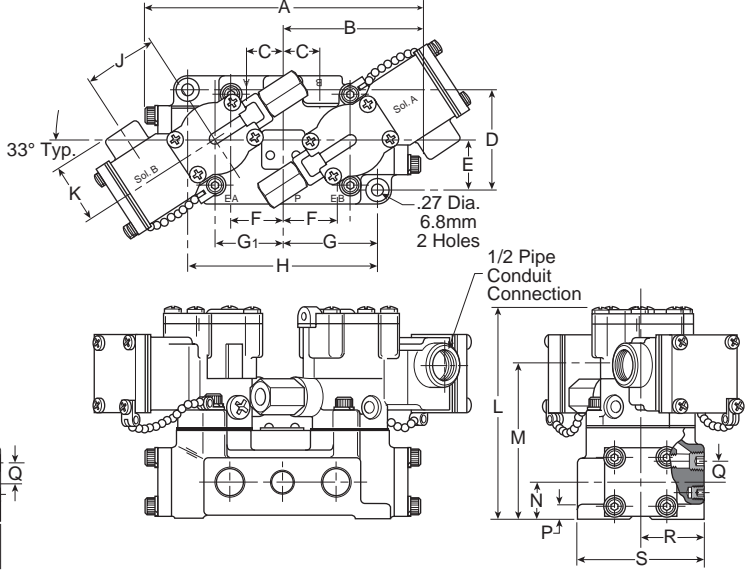
Inches (mm)



L705 3/8" Dimensions

A	B	C	D	E	F	G	H	J
7.56	3.32	.90	2.56	1.28	1.33	2.34	4.69	1.82
(192)	(84.3)	(22.9)	(65)	(32.5)	(33.8)	(59.4)	(119.1)	(46.2)
K	L	M	N	P	Q	R	S	
1.50	5.35	3.91	.94	.38	.53	1.62	3.25	
(38.1)	(135.9)	(99.3)	(23.9)	(9.7)	(13.5)	(41.1)	(82.6)	

Inches (mm)

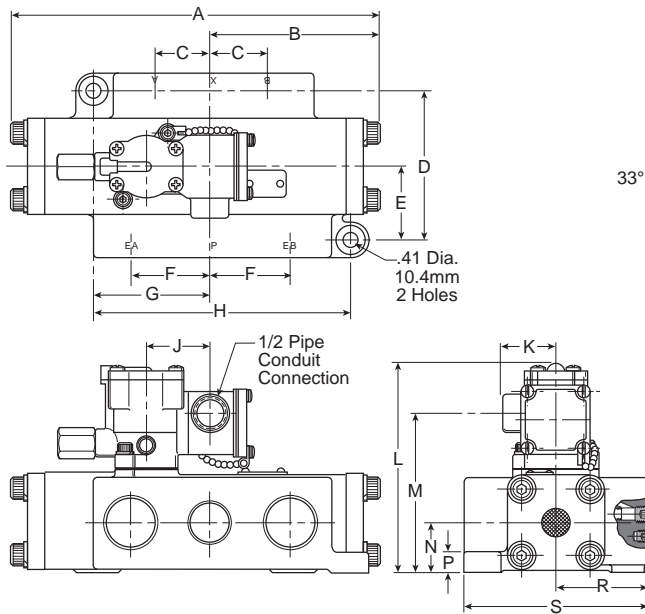


L685 3/8" Dimensions

A	B	C	D	E	F	G	G ₁	H
7.56	3.32	.90	2.56	1.28	1.33	2.34	1.66	4.69
(192)	(84.3)	(22.9)	(65)	(32.5)	(33.8)	(59.4)	(42.4)	(119.1)
J	K	L	M	N	P	Q	R	S
1.82	1.50	5.35	3.91	.94	.38	.53	1.62	3.25
(46.2)	(38.1)	(135.9)	(99.3)	(23.9)	(9.7)	(13.5)	(41.1)	(82.6)

Inches (mm)

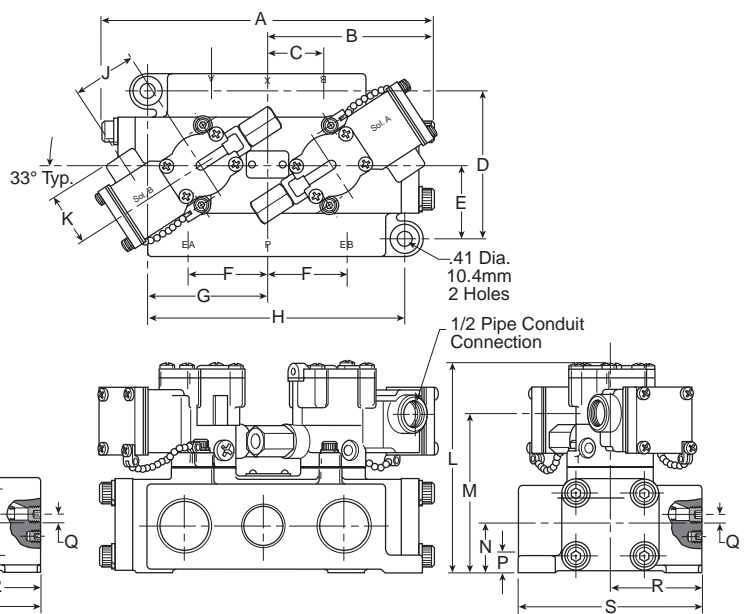
D
 Subbase & Manifold
 Valve Products



L705 1" Dimensions

A	B	C	D	E	F	G	H	J
10.46	4.75	1.62	4.25	2.12	2.19	3.44	7.44	1.82
(265.7)	(120.6)	(41.1)	(108)	(53.8)	(55.6)	(87.4)	(189)	(46.2)
K	L	M	N	P	Q	R	S	
1.50	6.44	4.95	1.50	.69	.20	2.62	5.25	
(38.1)	(163.6)	(125.7)	(38.1)	(17.5)	(5.1)	(66.5)	(133.4)	

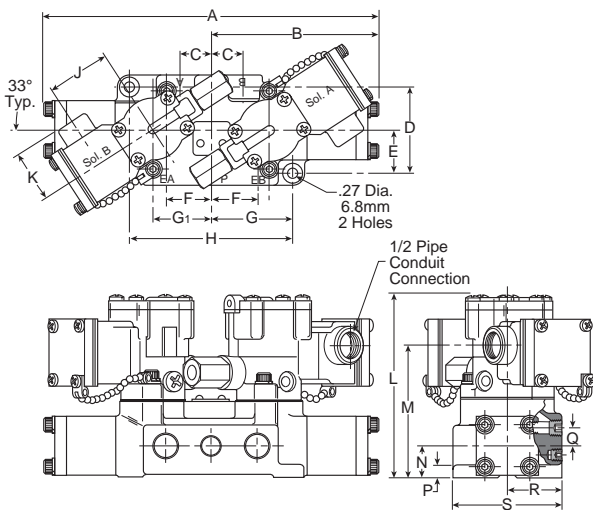
Inches (mm)



L685 1" Dimensions

A	B	C	D	E	F	G	H	J
9.50	4.75	1.62	4.25	2.12	2.19	3.44	7.44	1.82
(241.3)	(120.6)	(41.1)	(108)	(53.8)	(55.6)	(87.4)	(189)	(46.2)
K	L	M	N	P	Q	R	S	
1.50	6.44	4.95	1.50	.69	.20	2.62	5.25	
(38.1)	(163.6)	(125.7)	(38.1)	(17.5)	(5.1)	(66.5)	(133.4)	

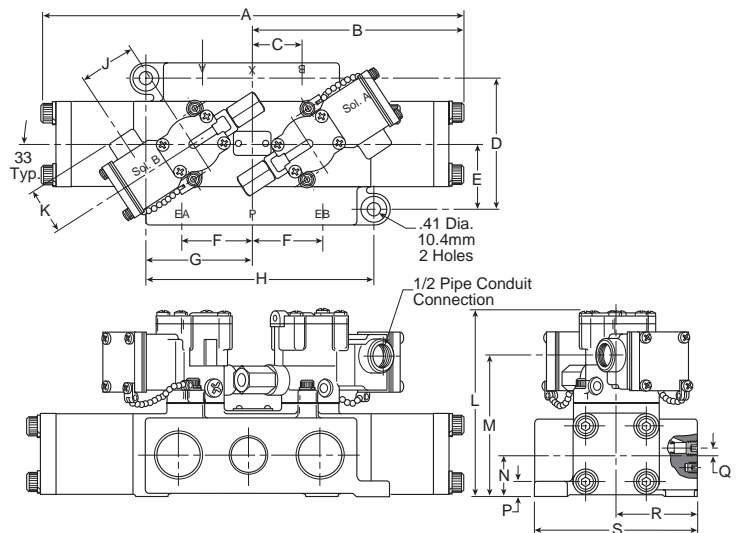
Inches (mm)



L695 3/8" Dimensions

A	B	C	D	E	F	G	G1	H
9.64	4.82	.90	2.56	1.28	1.33	2.34	1.66	4.69
(244.8)	(122.4)	(22.9)	(65)	(32.5)	(33.8)	(59.4)	(42.4)	(119.1)
J	K	L	M	N	P	Q	R	S
1.82	1.50	5.35	3.91	.94	.38	.53	1.62	3.25
(46.2)	(38.1)	(135.9)	(99.3)	(23.9)	(9.7)	(13.5)	(41.1)	(82.6)

Inches (mm)



L695 1" Dimensions

A	B	C	D	E	F	G	H	J
13.63	6.81	1.62	4.25	2.12	2.19	3.44	7.44	1.82
(346.2)	(173)	(41.1)	(108)	(53.8)	(55.6)	(87.4)	(189)	(46.2)
K	L	M	N	P	Q	R	S	
1.50	6.44	4.95	1.50	.69	.20	2.62	5.25	
(38.1)	(163.6)	(125.7)	(38.1)	(17.5)	(5.1)	(66.5)	(133.4)	

Inches (mm)

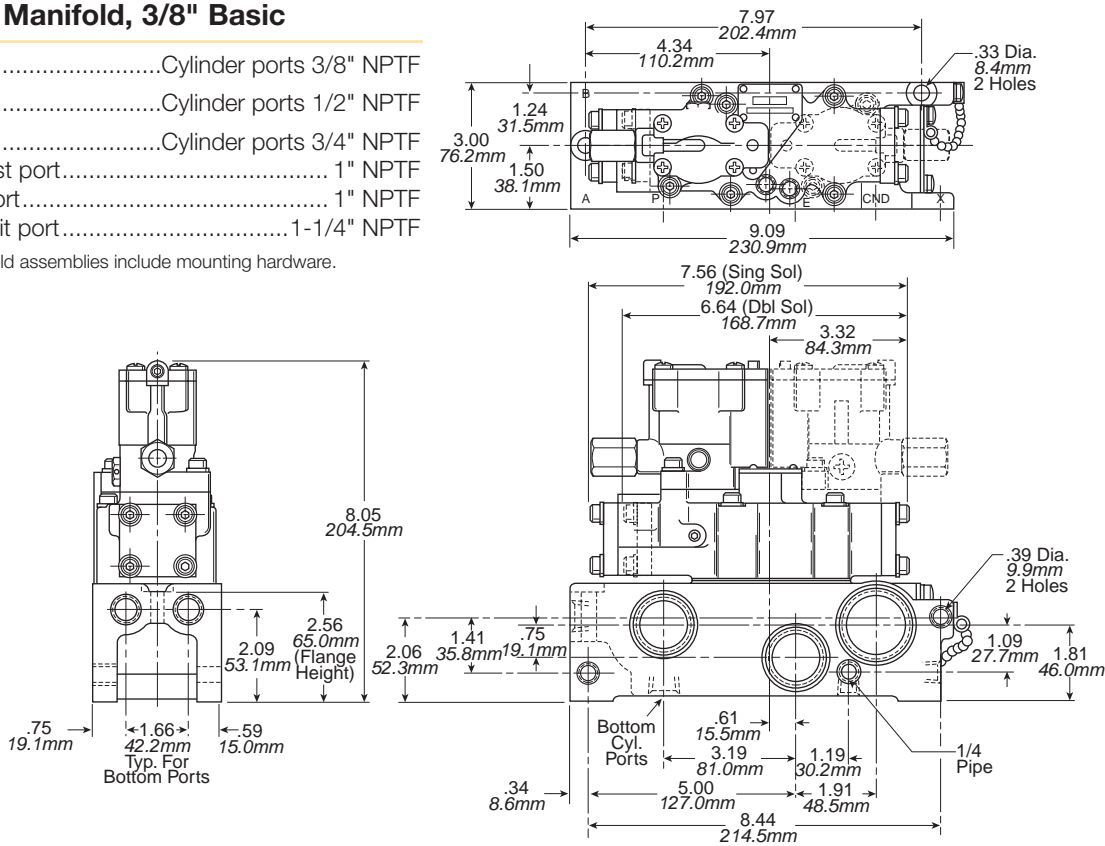
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Subbase & Manifold
 Valve Products

Plug-in Manifold, 3/8" Basic

- K142 230Cylinder ports 3/8" NPTF
- K142 231Cylinder ports 1/2" NPTF
- K142 270Cylinder ports 3/4" NPTF
- Exhaust port..... 1" NPTF
- Inlet port..... 1" NPTF
- Conduit port..... 1-1/4" NPTF

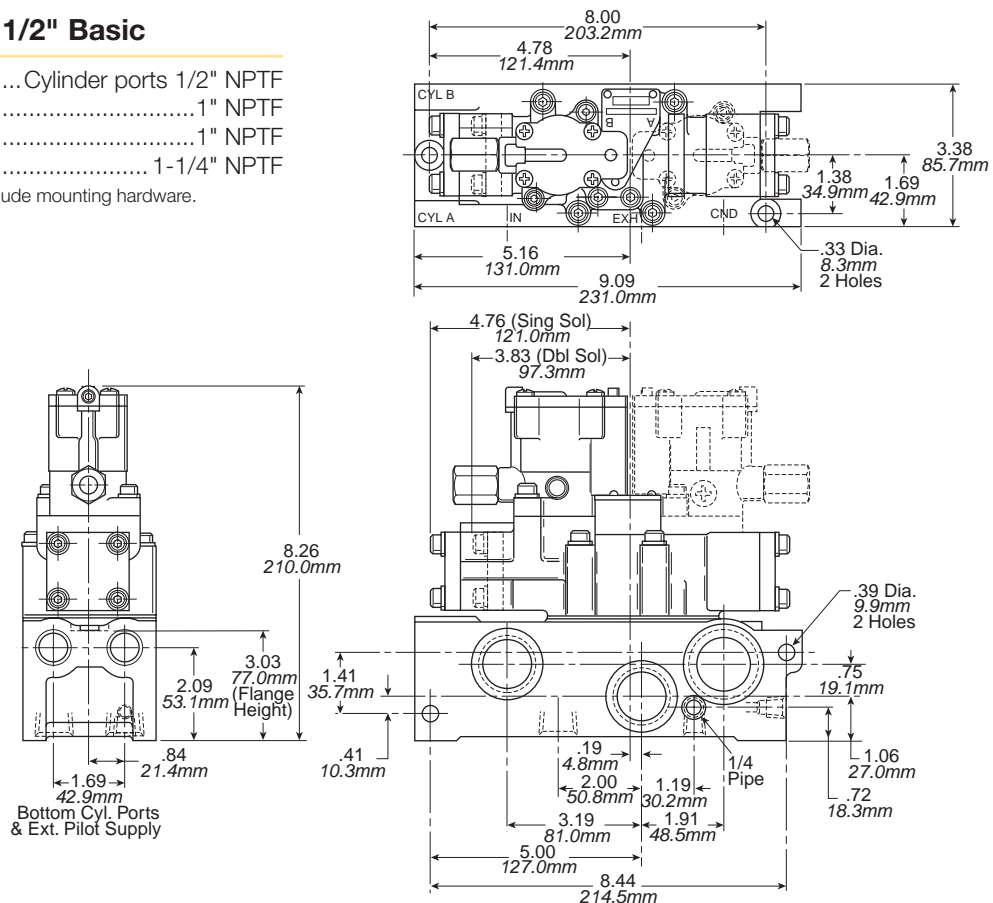
Note: Manifold assemblies include mounting hardware.



Plug-in Manifold, 1/2" Basic

- K142 233Cylinder ports 1/2" NPTF
- Exhaust port..... 1" NPTF
- Inlet port..... 1" NPTF
- Conduit port..... 1-1/4" NPTF

Note: Manifold assemblies include mounting hardware.



D
 Subbase & Manifold
 Valve Products

Features

Direct Air 2, 1/8" valves

Poppet style – .17 Cv

- Economical
- 3-way normally closed function

Direct Air 2, 1/8" valves

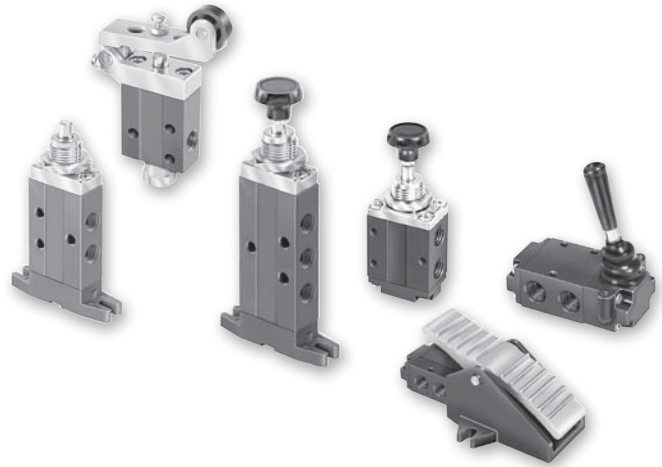
Packed bore style – .20 Cv

- Stainless steel spool
- Fluorocarbon o-rings
- 3-way & 4-way

Direct Air 4, 1/4" valves

Packed bore style – .83 Cv

- Stainless steel spool
- Fluorocarbon o-rings
- 3-way & 4-way



Operating information

Operating pressure	150 PSI (28 inHg to 1035 kPa)*
Temperature range	32°F to 175°F (0°C to 80°C)

Materials

Body and operator housings	Aluminum extrusion
Spool	Stainless steel
Bushings and pilot piston	Brass
Spacers - Direct Air 2	Aluminum
Spacers - Direct Air 4	Zinc die cast
Dynamic seals	Fluorocarbon
O-rings	Buna (nitrile)
Poppet ball	Nylon

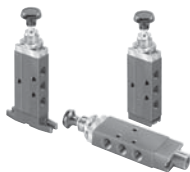
D

Manual / Mechanical
 Valve Products

Most popular. For technical information see CD



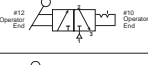
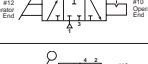



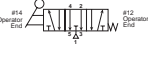
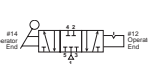

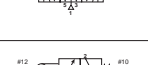
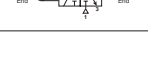

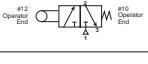

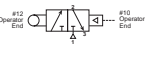
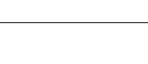

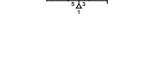

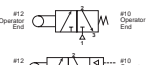
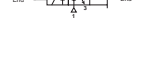
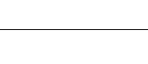

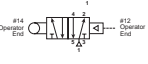



3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number
Button operated		1/8"	.17	3-way, spring return	Poppet	404411000
		1/8"	.20	3-way, spring return	Spool	414411000
		1/8"	.20	3-way, spring return, foot mounted	Spool	414421000
		1/8"	.20	3-way, pilot return	Spool	414451000
		1/8"	.20	3-way, manual return	Spool	414931000
		1/8"	.20	3-way, manual return, foot mounted	Spool	414941000
		1/8"	.20	3-way, manual or pilot return	Spool	414951000
		1/4"	.83	3-way, spring return	Spool	524411000
		1/4"	.83	3-way, pilot return	Spool	524451000
		1/4"	.83	3-way, Manual return	Spool	524431000
		1/8"	.20	4-way, spring return	Spool	410411000
		1/8"	.20	4-way, spring return, foot mounted	Spool	410421000
		1/8"	.20	4-way, pilot return	Spool	410451000
		1/8"	.20	4-way, manual return	Spool	410931000
		1/8"	.20	4-way, manual return, foot mounted	Spool	410941000
	1/8"	.20	4-way, manual or pilot return	Spool	410951000	
	1/4"	.83	4-way, spring return	Spool	520411000	
	1/4"	.83	4-way, pilot return	Spool	520451000	
	1/4"	.83	4-way, manual return	Spool	520431000	
Toggle operated, detented		1/8"	.17	3-way, spring return	Poppet	404811000
		1/8"	.20	3-way, spring return	Spool	414811000
		1/8"	.20	3-way, spring return, foot mounted	Spool	414821000
		1/8"	.20	4-way, spring return	Spool	410811000
		1/8"	.20	4-way, spring return, foot mounted	Spool	410821000



D
Manual / Mechanical Valve Products



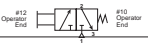
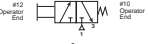
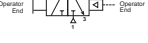
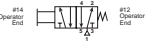
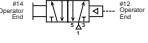


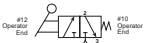
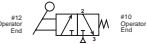
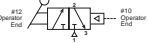
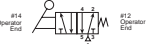
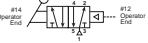


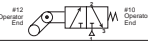
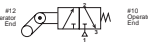
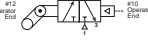






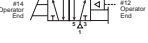

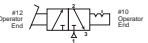
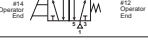
3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number
Lever operated 		1/4"	.83	3-way, spring return	Spool	524811000
		1/4"	.83	3-way, manual return	Spool	524831000
		1/4"	.83	3-way, 3-Position detented, all ports blocked	Spool	523831000
		1/4"	.83	4-way, spring return	Spool	520811000
		1/4"	.83	4-way, manual return	Spool	520831000
		1/4"	.83	4-way, spring centered, closed center	Spool	521811000
		1/4"	.83	4-way, spring centered, pressure center	Spool	522811000
		1/4"	.83	4-way, spring centered, exhaust center	Spool	529811000
		1/4"	.83	4-way, detented, closed center	Spool	521831000
		1/4"	.83	4-way, detented, pressure center	Spool	522831000
	1/4"	.83	4-way, detented, exhaust center	Spool	529831000	
Roller operated 		1/8"	.20	3-way, spring return	Poppet	404211000
		1/8"	.20	3-way, spring return	Spool	414211000
		1/8"	.20	3-way, spring return, foot mounted	Spool	414221000
		1/8"	.20	3-way, pilot return	Spool	414251000
		1/8"	.20	4-way, spring return	Spool	410211000
		1/8"	.20	4-way, spring return, foot mounted	Spool	410221000
		1/8"	.20	4-way, pilot return	Spool	410251000
		1/4"	.83	3-way, spring return, delrin roller	Spool	524211000
		1/4"	.83	3-way, pilot return, delrin roller	Spool	524251000
		1/4"	.83	3-way, spring return, steel roller	Spool	524A11000
		1/4"	.83	3-way, pilot return, steel roller	Spool	524A51000
		1/4"	.83	4-way, spring return, delrin roller	Spool	520211000
		1/4"	.83	4-way pilot return, delrin roller	Spool	520251000
		1/4"	.83	4-way, spring return, steel roller	Spool	520A11000
		1/4"	.83	4-way, pilot return, steel roller	Spool	520A51000

D

Manual / Mechanical
 Valve Products

3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number	
Plunger operated  		1/8"	.17	3-way, spring return	Poppet	404111000	
		1/8"	.20	3-way, spring return	Spool	414111000	
		1/8"	.20	3-way, spring return, foot mounted	Spool	414121000	
		1/8"	.20	3-way, pilot return	Spool	414151000	
		1/8"	.17	4-way, spring return	Spool	410111000	
		1/8"	.20	4-way, spring return, foot mounted	Spool	410121000	
		1/8"	.20	4-way, pilot return	Spool	410151000	
	Hand lever operated  		1/8"	.17	3-way, spring return	Poppet	404711000
			1/8"	.20	3-way, spring return	Spool	414711000
		1/8"	.20	3-way, spring return, foot mounted	Spool	414721000	
		1/8"	.20	3-way, pilot return	Spool	414751000	
		1/8"	.20	4-way, spring return	Spool	410711000	
		1/8"	.20	4-way, spring return, foot mounted	Spool	410721000	
		1/8"	.20	4-way, pilot return	Spool	410751000	
One way tripper operated  			1/8"	.17	3-way, spring return	Poppet	404311000
			1/8"	.20	3-way, spring return	Spool	414311000
		1/8"	.20	3-way, spring return, foot mounted	Spool	414321000	
		1/8"	.20	3-way, pilot return	Spool	414351000	
		1/8"	.20	4-way, spring return	Spool	414311000	
		1/8"	.20	4-way, spring return, foot mounted	Spool	414321000	
		1/8"	.20	4-way, pilot return	Spool	414351000	
	Pedal operated 		1/4"	.83	3-way, spring return	Spool	524711000
			1/4"	.83	3-way, pilot return	Spool	524751000
		1/4"	.83	4-way, spring return	Spool	520711000	
		1/4"	.83	4-way, pilot return	Spool	520751000	
Treadle operated 			1/4"	.83	3-way, treadle operated, detented	Spool	524931000
		1/4"	.83	4-way, treadle operated, detented	Spool	520931000	

CAUTION:

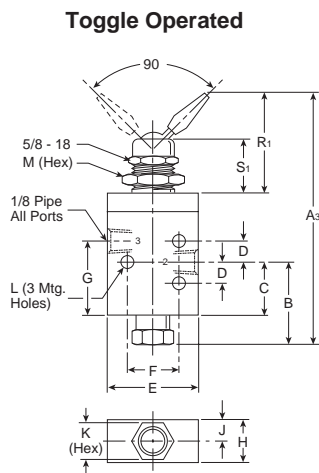
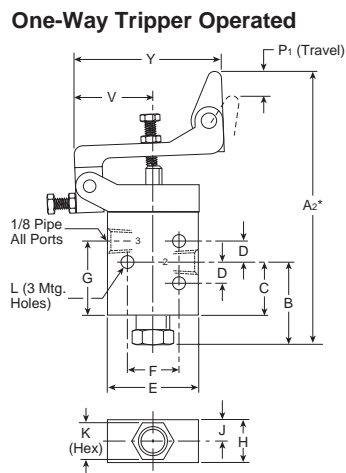
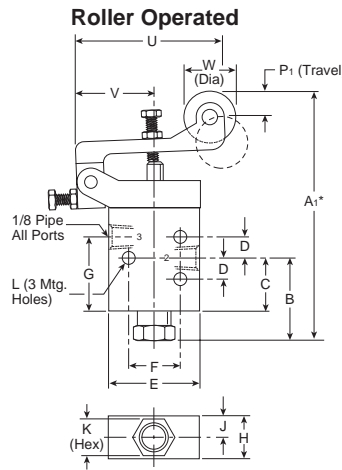
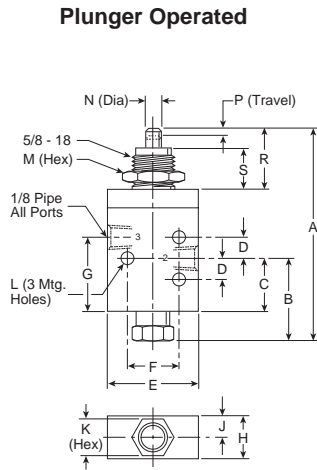
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

CAUTION:

This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

D
Manual / Mechanical Valve Products

Plunger, Roller, One-way Tripper & Toggle Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

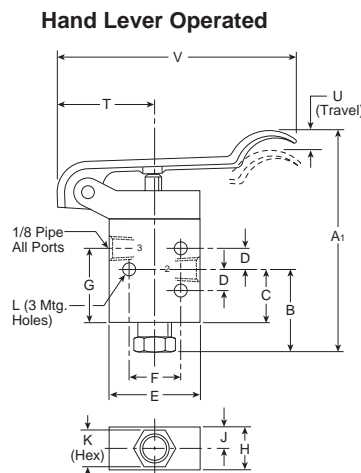
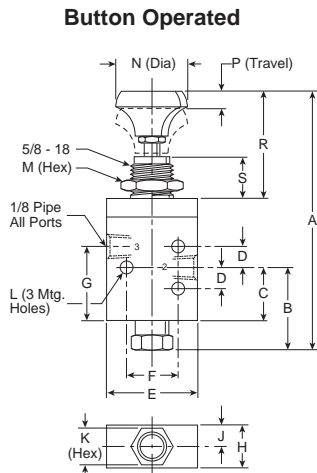


3-Way, 3-Port, 2-Position

A	A₁*	A₂*	A₃	B
3.37 (86)	4.21 (107)	4.46 (113)	3.99 (101)	1.03 (26)
C	D	E	F	G
.55 (14)	.31 (8)	1.31 (33)	.75 (19)	.90 (23)
H	J	K	L	M
.62 (16)	.31 (8)	.56 (14)	.19 (5)	.88 (22)
N	P	P₁	R	R₁
.25 (6)	.17 (4)	.38 (10)	.91 (23)	1.53 (39)
S	S₁	U	V	W
.62 (16)	.78 (20)	2.28 (58)	1.19 (30)	.75 (19)
X	Y			
.19 (5)	2.19 (56)			

* Dimensions may be reduced .44" using adjusting screw.
 Inches (mm)

Button & Hand Lever Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports



3-Way, 3-Port, 2-Position

A	A₁	B	C	D
4.13 (105)	3.34 (85)	1.03 (26)	.55 (14)	.31 (8)
E	F	G	H	J
1.31 (33)	.75 (19)	.90 (23)	.62 (16)	.31 (8)
K	L	M	N	P
.56 (14)	.19 (5)	.88 (22)	1.06 (27)	.17 (4)
R	S	T	U	V
1.67 (42)	.63 (16)	1.19 (30)	.53 (13)	3.38 (86)

Inches (mm)

D

Manual / Mechanical
 Valve Products

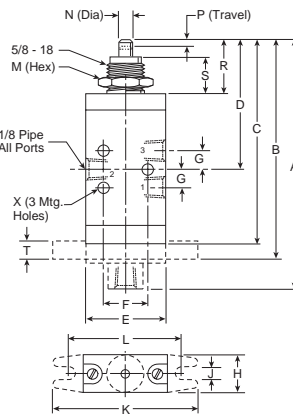
Plunger, Roller, One-way Tripper & Toggle Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

3-Way, 3-Port, 2-Position

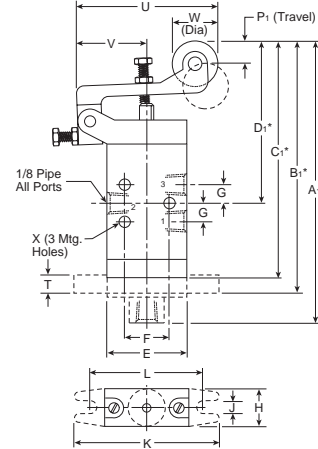
A	A₁*	A₂*	A₃	B
4.14 (105)	4.98 (126)	5.23 (133)	4.23 (107)	3.61 (92)
B₁	B₂	B₃	C	C₁
4.45 (113)	4.70 (119)	4.00 (102)	3.38 (86)	4.22 (107)
C₂	C₃	D	D₁	D₂
4.47 (113)	2.75 (70)	2.05 (52)	2.98 (76)	3.22 (82)
E	F	G	H	J
1.31 (33)	.75 (19)	.31 (8)	.62 (16)	.20 (5)
K	L	M	N	P
2.38 (60)	1.88 (48)	.88 (22)	.25 (6)	.17 (4)
P₁	R	R₁	S	S₁
.38 (10)	.91 (23)	1.53 (39)	.62 (16)	.78 (20)
T	U	V	W	X
.25 (6)	2.28 (58)	1.19 (30)	.75 (19)	.19 (5)
Y				
2.19 (56)				

* Dimensions may be reduced .44" using adjusting screw.
 Inches (mm)

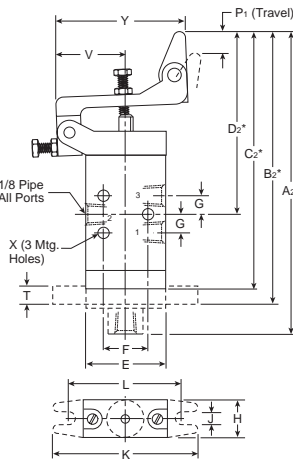
Plunger Operated



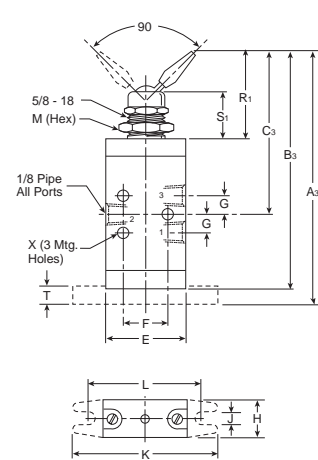
Roller Operated



One-Way Tripper Operated



Toggle Operated



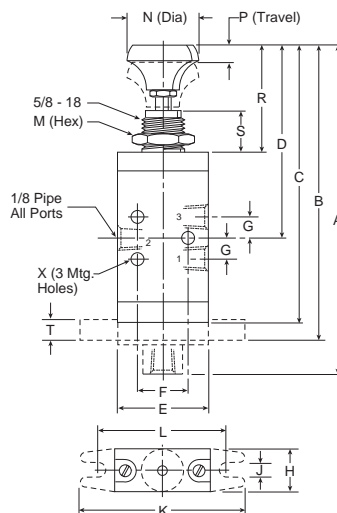
Button, Hand Lever Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

3-Way, 3-Port, 2-Position

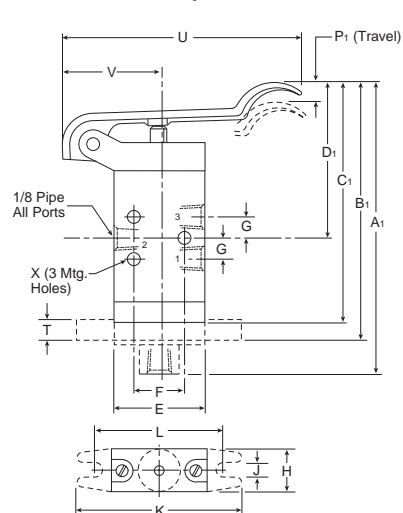
A	A₁	B	B₁	C
5.08 (129)	4.29 (109)	4.55 (115)	3.77 (96)	4.31 (109)
C₁	D	D₁	E	F
3.53 (90)	3.08 (78)	2.29 (58)	1.31 (33)	.75 (19)
G	H	J	K	L
.31 (8)	.62 (16)	.20 (5)	2.38 (60)	1.88 (48)
M	N	P	P₁	R
.88 (22)	1.06 (27)	.17 (4)	.53 (13)	1.67 (42)
S	T	U	V	X
.63 (16)	.25 (6)	3.38 (86)	1.19 (30)	.19 (5)
Y				
.59 (15)				

Inches (mm)

Button Operated



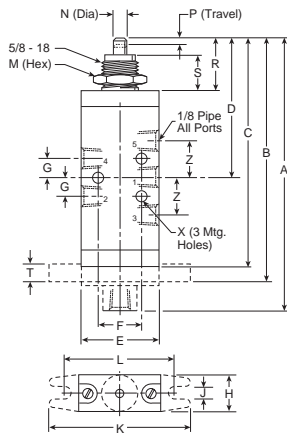
Hand Lever Operated



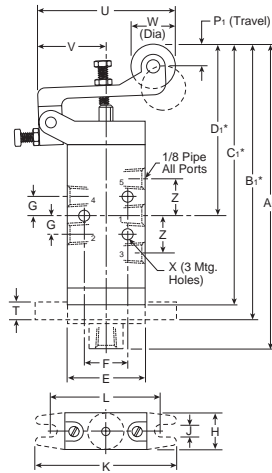
D
 Manual / Mechanical
 Valve Products

Plunger, Roller, One-way Tripper & Toggle Operated — 4-Way, 5-Port, 2-Position – 1/8" Ports

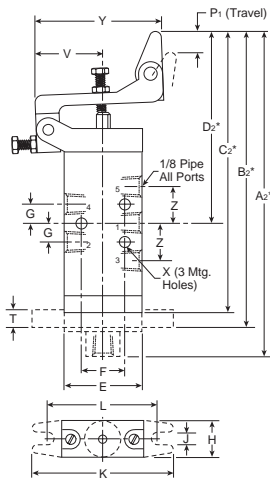
Plunger Operated



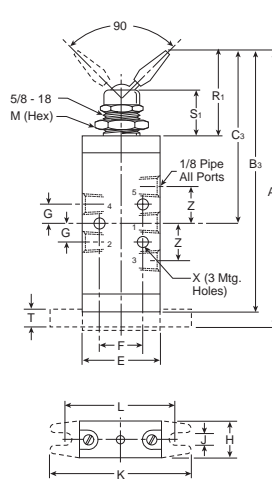
Roller Operated



One-Way Tripper Operated



Toggle Operated



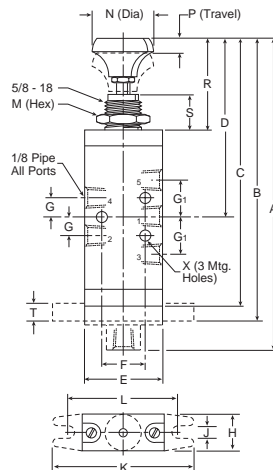
4-Way, 5-Port, 2-Position

A	A1*	A2*	A3	B
4.75 (121)	5.59 (142)	5.84 (148)	4.84 (123)	4.22 (107)
B1*	B2*	B3	C	C1*
5.06 (128)	5.31 (135)	4.61 (117)	3.99 (102)	4.83 (123)
C2*	C3	D	D1*	D2*
5.08 (129)	3.06 (78)	2.44 (62)	3.28 (83)	3.53 (90)
E	F	G	H	J
1.31 (33)	.75 (19)	.31 (8)	.62 (16)	.20 (5)
K	L	M	N	P
2.38 (60)	1.88 (48)	.88 (22)	.25 (6)	.17 (4)
P1	R	R1	S	S1
.38 (10)	.91 (23)	1.53 (39)	.62 (16)	.78 (20)
T	U	V	W	X
.25 (6)	2.28 (58)	1.19 (30)	.75 (19)	.19 (5)
Y	Z			
2.19 (56)	.62 (16)			

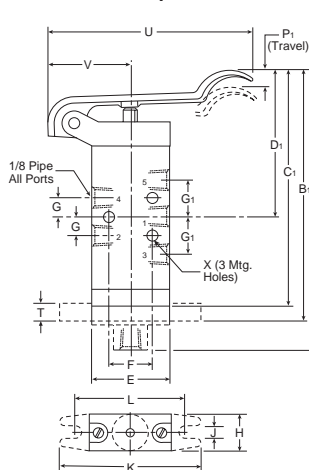
* Dimensions may be reduced .44" using adjusting screw.
 Inches (mm)

Button & Hand Lever Operated — 4-Way, 5-Port, 2-Position – 1/8" Ports

Button Operated



Hand Lever Operated



4-Way, 5-Port, 2-Position

A	A1	B	B1	C
5.69 (144)	4.90 (124)	5.16 (131)	4.38 (111)	4.92 (125)
C1	D	D1	E	F
4.14 (105)	3.67 (93)	2.90 (74)	1.31 (33)	.75 (19)
G	G1	H	J	K
.31 (8)	.63 (16)	.62 (16)	.20 (5)	2.38 (60)
L	M	N	P	P1
1.88 (48)	.88 (22)	1.06 (27)	.17 (4)	.53 (13)
R	S	T	U	V
1.67 (42)	.63 (16)	.25 (6)	3.38 (86)	1.19 (30)
X	Y			
.19 (5)	.59 (15)			

Inches (mm)

D

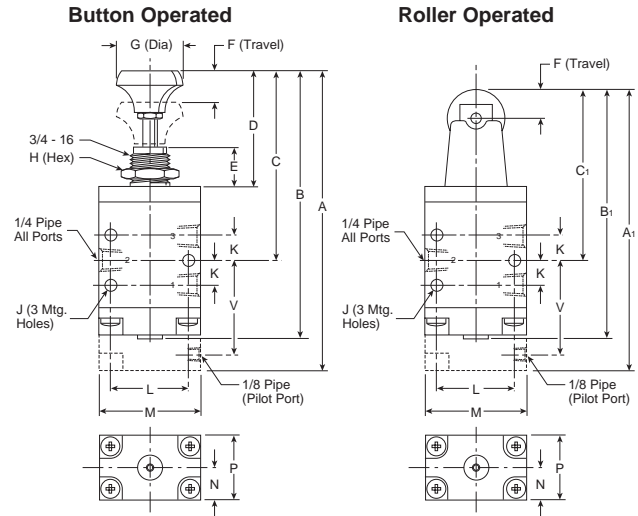
Manual / Mechanical
 Valve Products

Button & Roller Operated — 3-Way, 3-Port, 2-Position

3-Way, 3-Port, 2-Position

A	A₁	B	B₁	C
4.91 (125)	4.25 (108)	4.44 (113)	3.78 (96)	3.10 (79)
C₁	D	E	F	G
2.44 (62)	2.00 (51)	.63 (16)	.32 (8)	1.05 (27)
H	J	K	L	M
1.00 (25)	.19 (5)	.41 (10)	1.25 (32)	1.63 (42)
N	P	V		
.53 (14)	1.06 (27)	1.52 (39)		

Inches (mm)

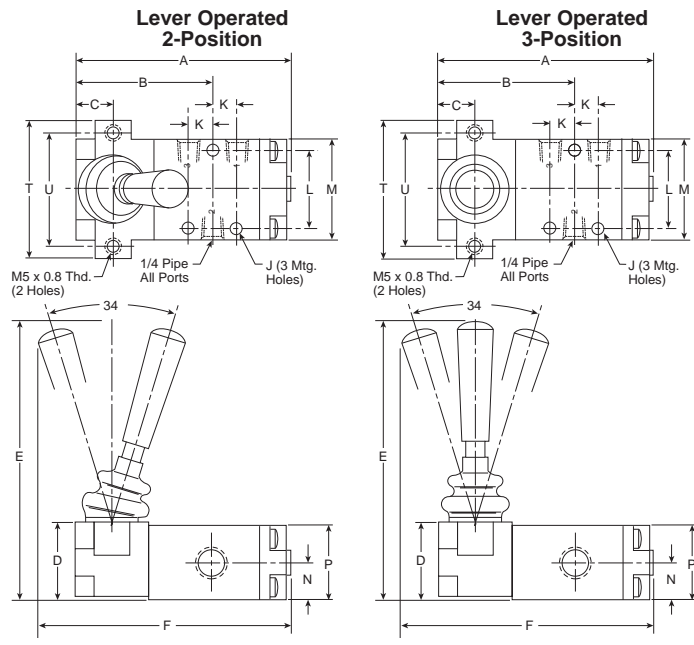


Lever & Pedal Operated — 3-Way, 3-Port, 2 & 3-Position

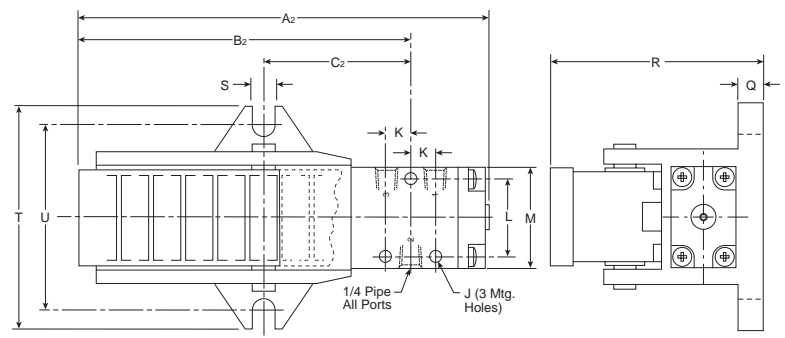
3-Way, 3-Port, 2 & 3-Position

A	A₁	B	B₁	C
3.31 (84)	6.55 (166)	1.97 (50)	5.20 (132)	.53 (14)
C₁	D	E	F	J
2.19 (56)	1.12 (28)	4.06 (103)	3.90 (99)	.19 (5)
K	L	M	N	P
.41 (10)	1.25 (32)	1.63 (42)	.53 (14)	1.06 (27)
Q	R	S	T	T₁
.37 (10)	2.40 (61)	.34 (9)	2.13 (54)	3.50 (89)
U	U₁			
1.75 (44)	3.00 (76)			

Inches (mm)



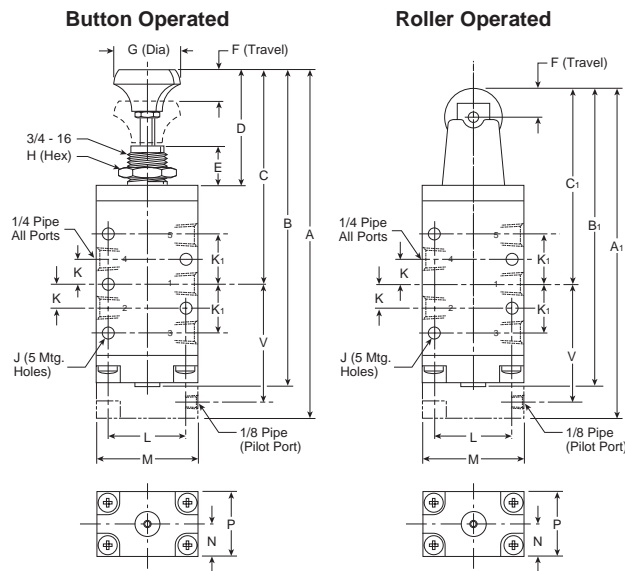
Pedal / Treadle Operated



CAUTION:
 This valve shall not be used to actuate a punch press.
 Do not use this valve on punch presses or press brakes.
 See OSHA 1910.217.

D
 Manual / Mechanical
 Valve Products

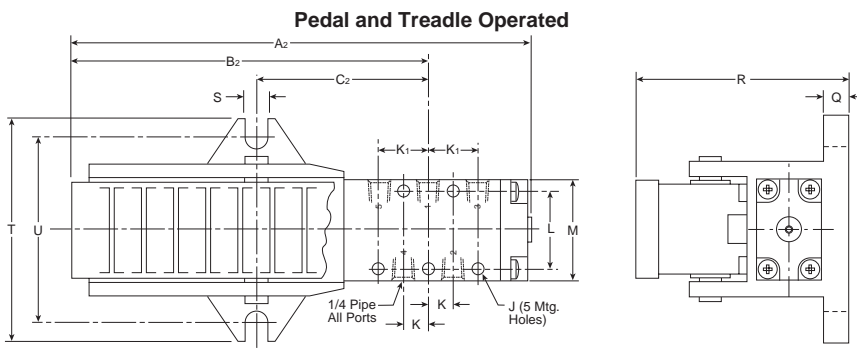
Button, Roller, Pedal & Treadle, Lever Operated — 4-Way, 5-Port, 2-Position



4-Way, 5-Port, 2-Position

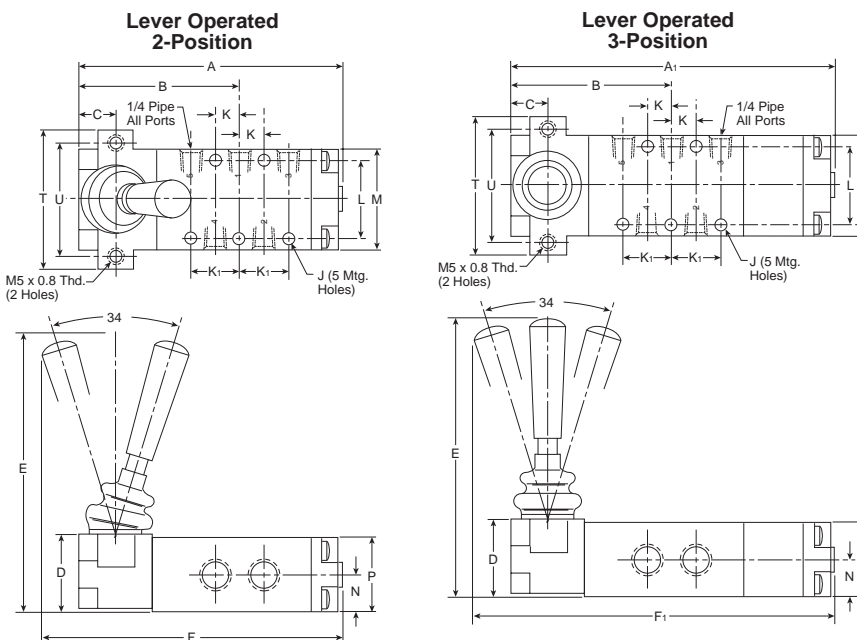
A	A₁	A₂	B	B₁
5.75 (146)	5.13 (130)	7.41 (189)	5.28 (134)	4.66 (118)
B₂	C	C₁	C₂	D
5.63 (143)	3.50 (89)	2.88 (73)	2.64 (67)	2.00 (51)
E	F	G	H	J
.63 (16)	.32 (8)	1.05 (27)	1.00 (25)	.19 (5)
K	K₁	L	M	N
.44 (11)	.84 (21)	1.25 (32)	1.63 (41)	.53 (14)
P	Q	R	S	T
1.06 (27)	.37 (10)	2.40 (61)	.34 (9)	3.50 (89)
U	V			
3.00 (76)	1.96 (50)			

Inches (mm)



CAUTION:

This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.



4-Way, 5-Port, 2 & 3-Position

A	A₁	B	C	D
4.19 (106)	5.09 (129)	2.41 (61)	.53 (14)	1.12 (28)
E	F	F₁	J	K
4.06 (103)	4.78 (121)	5.78 (147)	.19 (5)	.44 (11)
K₁	L	M	N	P
.84 (21)	1.25 (32)	1.63 (42)	.53 (14)	1.06 (27)
T	U			
2.13 (54)	1.75 (44)			

Inches (mm)

D

Manual / Mechanical
 Valve Products

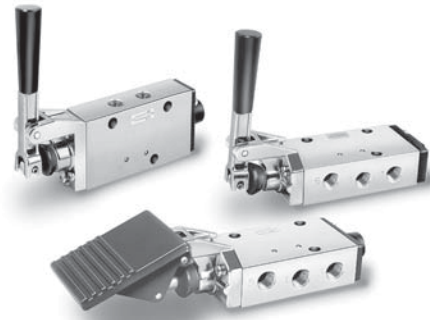
Features

Heavy Duty Lever

- Parallel Mount
- Perpendicular Mount

Heavy Duty Foot Pedal

- Inline Valve
 - 1/4" Port – 1.3 to 2.2 Cv
 - 3/8" Port – 1.3 to 2.9 Cv
- 2-Position
- 3-Position
 - All Ports Blocked
 - Center Exhaust



Operating information

Operating pressure: Vacuum to 150 PSI (710 mmHg to 1035 kPa)
 Temperature range: 0°F to 140°F (-18°C to 60°C)

Lever Valve - 2-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	2.2	Inline, parallel	2-Position, Spring return	422CS011K
		3/8"	2.9	Inline, parallel	2-Position, Spring return	422CS021K
		1/4"	2.2	Inline, parallel	2-Position, Detent	422CS011W
		3/8"	2.9	Inline, parallel	2-Position, Detent	422CS021W
		1/4"	2.2	Inline, perpendicular	2-Position, Spring return	422CR011K
		3/8"	2.9	Inline, perpendicular	2-Position, Spring return	422CR021K
		1/4"	2.2	Inline, perpendicular	2-Position, Detent	422CR011W
		3/8"	2.9	Inline, perpendicular	2-Position, Detent	422CR021W

Lever Valve - 3-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	1.3	Inline, parallel	3-Position APB	422CS013W
		3/8"	1.3	Inline, parallel	3-Position, APB	422CS023W
		1/4"	1.3	Inline, parallel	3-Position, CE	422CS014W
		3/8"	1.3	Inline, parallel	3-Position, CE	422CS024W
		1/4"	1.3	Inline, perpendicular	3-Position, APB	422CR013W
		3/8"	1.3	Inline, perpendicular	3-Position, APB	422CR023W
		1/4"	1.3	Inline, perpendicular	3-Position, CE	422CR014W
		3/8"	1.3	Inline, perpendicular	3-Position, CE	422CR024W

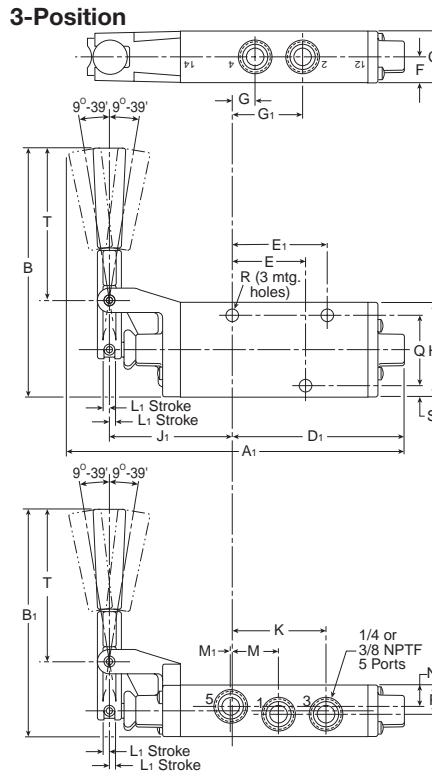
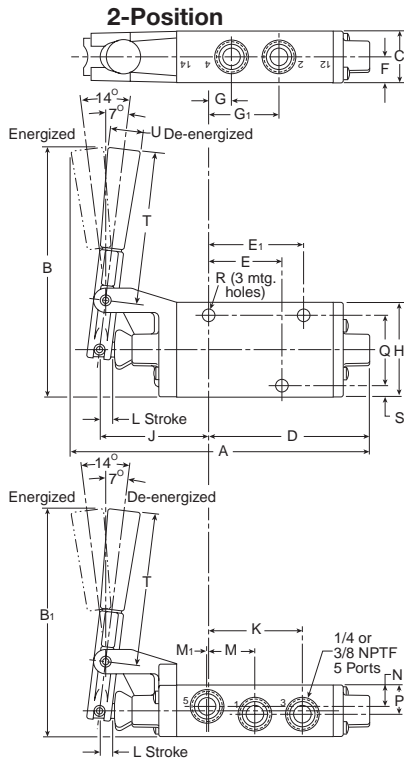
Foot Pedal Valve - 2-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	2.2	Foot pedal	2-Position, Spring return	422CT011K
		3/8"	2.9	Foot pedal	2-Position, Spring return	422CT021K
				Foot pedal guard		FS043P

CAUTION: This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

Most popular. For technical information see CD

D
 Manual / Mechanical
 Valve Products



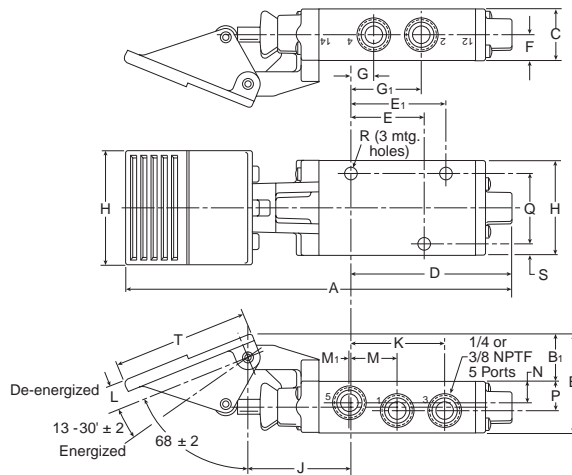
Lever Valve

A	A ₁	B	B ₁	C		
6.70 (170)	7.58 (193)	5.55 (141)	5.05 (128)	1.15 (29)		
D	D ₁	E	E ₁	F		
3.59 (91)	3.83 (97)	1.58 (40)	2.06 (52)	.57 (14)		
G NPT	G ₁ NPT	H				
1/4" .51 (13) 3/8" .55 (14)	1/4" 1.56 (40) 3/8" 1.51 (38)	2.13 (54)				
J	J ₁	K NPT	L			
2.44 (62)	2.80 (71)	1/4" 2.08 (53) 3/8" 2.13 (54)	.25 (6)			
L ₁	M	M ₁ NPT	N			
.18 (5)	1.03 (36)	1/4" .02 (.5) 3/8" .06 (2)	.50 (13)			
P	Q	R	S	T		
.65 (17)	1.58 (40)	.33 (8)	.27 (7)	3.42 (87)		

U Dia

.75
(19)

Inches (mm)



Foot Pedal Valve

A	B	B ₁	C	D	
8.64 (220)	2.18 (55)	1.03 (26)	1.15 (29)	3.59 (91)	
E	E ₁	F	G NPT		
1.58 (40)	2.06 (52)	.57 (14)	1/4" .51 (13) 3/8" .55 (14)		
G ₁ NPT	H	H ₁	J		
1/4" 1.56 (40) 3/8" 1.51 (38)	2.13 (54)	2.50 (64)	2.32 (59)		
K NPT	L	M			
1/4" 2.08 (53) 3/8" 2.13 (54)	.60 (15)	1.03 (26)			
M ₁ NPT	N	P	Q		
1/4" .02 (.5) 3/8" .06 (2)	.50 (13)	.65 (17)	1.58 (40)		
R	S	T	U		
.33 (8)	.27 (7)	3.00 (76)	.48 (11)		

Inches (mm)

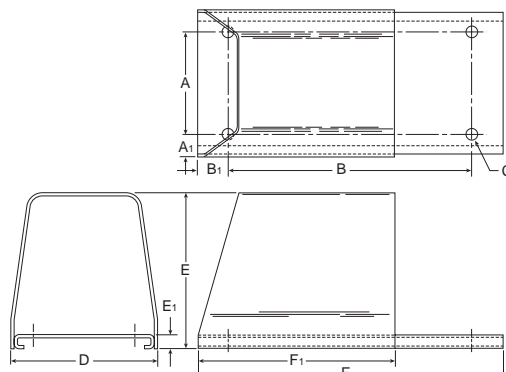
Foot Valve Guard

A	A ₁	B	B ₁	C
4.50 (114)	.75 (19)	10.50 (267)	1.25 (32)	.48 (11)
D	E	E ₁	F	F ₁
6.00 (152)	7.13 (181)	.50 (13)	13.00 (330)	8.38 (213)

Inches (mm)

CAUTION:

This valve shall not be used to actuate a punch press.
 Do not use this valve on punch presses or press brakes. See OSHA 1910.217.



D

Manual / Mechanical
 Valve Products

Features

- Heavy duty lever
- Inline valve
 - 1/8", 1/4", 3/8", 1/2" NPT
- 2-Position models
- 3-Position models
 - all ports blocked
 - pressure center
 - center exhaust



Operating information



Operating pressure: Type A & B: Vacuum to 232 PSIG (Vacuum to 16 bar Max.)
 Type C & D: Vacuum to 174 PSIG (Vacuum to 12 bar Max.)
 Temperature range: Extreme: -40°F to 140°F (-40°C to 60°C)

NOTE: P2LCX and P2LDX Manual & Remote Air Pilot Valves have a maximum pressure rating of 175 PSIG (12 bar).


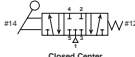

Materials

Valve body	Anodized aluminum
End covers	Anodized aluminum
Lever housing	Acetal plastic
Spool	Aluminum & nitrile rubber
Piston	Acetal plastic / anodized aluminum
Seals	Nitrile rubber
Screws	Stainless steel
Springs	Dacromet - processed steel, stainless steel
Lever	Reinforced polyamide plastic

Lever Valve - 2-Position

Symbol	Port size	Cv	Description	Valve type	Part number
 	1/8"	0.7	P2LAX Inline	2-Position, Spring return	P2LAX591VS
	1/8"	0.7	P2LAX Inline	2-Position, Detent	P2LAX591VV

Lever Valve - 3-Position

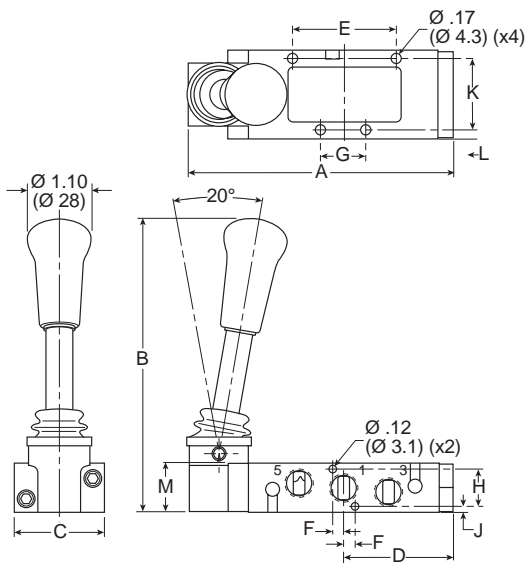
Symbol	Port size	Cv	Description	Valve type	Part number
  Closed Center  Center Exhaust	1/8"	0.5	P2LAX Inline	APB, Spring centered	P2LAX69111
	1/8"	0.5	P2LAX Inline	APB, Detent	P2LAX69122
	1/8"	0.5	P2LAX Inline	CE, Spring centered	P2LAX89111
	1/8"	0.5	P2LAX Inline	CE, Detent	P2LAX89122

Most popular. For technical information see CD

D
 Manual / Mechanical
 Valve Products

Lever Valve - 3-Position

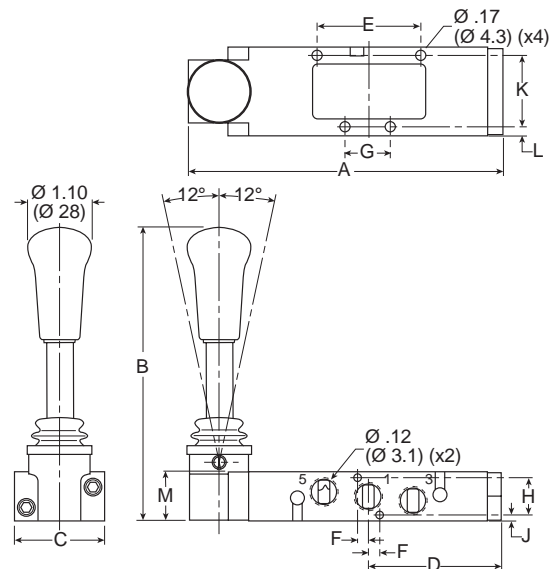
Symbol	Port size	Cv	Description	Valve type	Part number
<p>Closed Center</p>	1/4"	1.3	P2LBX Inline	Lever - APB	P2LBX69222
	1/4"	1.3	P2LBX Inline	Spring - APB	P2LBX69211
	3/8"	2.5	P2LCX Inline	Lever - APB	P2LCX69322
	3/8"	2.5	P2LCX Inline	Spring - APB	P2LCX69311
	1/2"	2.7	P2LDX Inline	Lever - APB	P2LDX69422
	1/2"	2.7	P2LDX Inline	Spring - APB	P2LDX69411
<p>Pressure Center</p>	1/4"	1.3	P2LBX Inline	Lever - PC	P2LBX79222
	1/4"	1.3	P2LBX Inline	Spring - PC	P2LBX79211
	3/8"	2.5	P2LCX Inline	Lever - PC	P2LCX79322
	3/8"	2.5	P2LCX Inline	Spring - PC	P2LCX79311
	1/2"	2.7	P2LDX Inline	Lever - PC	P2LDX79422
	1/2"	2.7	P2LDX Inline	Spring - PC	P2LDX79411
<p>Center Exhaust</p>	1/4"	1.3	P2LBX Inline	Lever - CE	P2LBX89222
	1/4"	1.3	P2LBX Inline	Spring - CE	P2LBX89211
	3/8"	2.5	P2LCX Inline	Lever - CE	P2LCX89322
	3/8"	2.5	P2LCX Inline	Spring - CE	P2LCX89311
	1/2"	2.7	P2LDX Inline	Lever - CE	P2LDX89422
	1/2"	2.7	P2LDX Inline	Spring - CE	P2LDX89411



P2LBX 2-Position Hand Lever

A	B	C	D	E	F
4.67 (118.5)	5.19 (131.8)	1.57 (40)	1.93 (49)	1.81 (46)	.20 (5)
G	H	J	K	L	M
.79 (20)	.65 (16.5)	.11 (2.85)	1.26 (32)	.16 (4)	.87 (22.2)

Inches (mm)



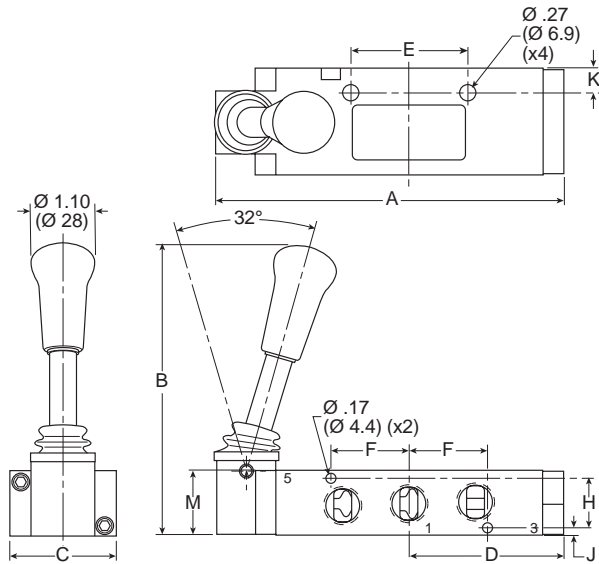
P2LBX 3-Position Hand Lever

A	B	C	D	E	F
5.51 (140)	5.19 (131.8)	1.57 (40)	2.35 (59.8)	1.81 (46)	.20 (5)
G	H	J	K	L	M
.79 (20)	.65 (16.5)	.11 (2.85)	1.26 (32)	.16 (4)	.87 (22.2)

Inches (mm)

D

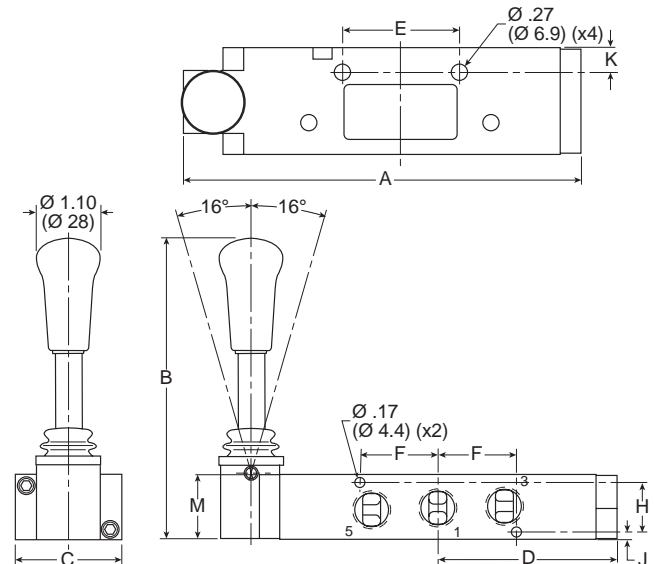
Manual / Mechanical
 Valve Products



P2LCX 2-Position Hand Lever

A	B	C	D	E	F
6.20 (157.5)	5.24 (133)	1.89 (48)	2.76 (70)	2.09 (53)	1.40 (35.5)
H	J	K	M		
.91 (23)	.14 (3.5)	.43 (11)	1.18 (30)		

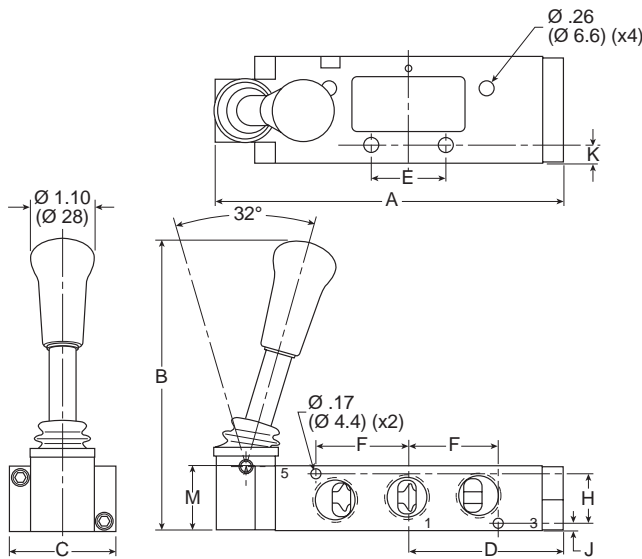
Inches (mm)



P2LCX 3-Position Hand Lever

A	B	C	D	E	F
7.07 (179.5)	5.36 (136.3)	1.89 (48)	3.19 (81)	2.09 (53)	1.40 (35.5)
H	J	K	M		
.91 (23)	.14 (3.5)	.43 (11)	1.18 (30)		

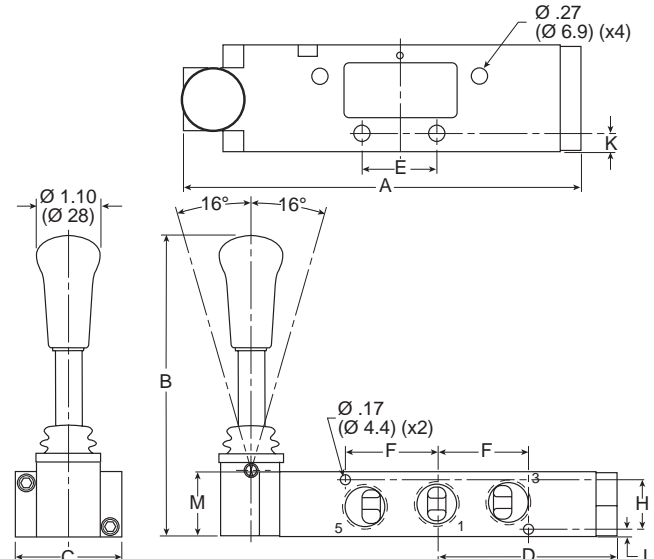
Inches (mm)



P2LDX 2-Position Hand Lever

A	B	C	D	E	F
6.20 (157.5)	5.24 (133)	1.89 (48)	2.76 (70)	1.34 (34)	1.65 (42)
H	J	K	M		
.91 (23)	.14 (3.5)	.30 (7.5)	1.18 (30)		

Inches (mm)




P2LDX 3-Position Hand Lever

A	B	C	D	E	F
7.07 (179.5)	5.36 (136.3)	1.89 (48)	3.19 (81)	1.34 (34)	1.65 (42)
H	J	K	M		
.91 (23)	.14 (3.5)	.30 (7.5)	1.18 (30)		

Inches (mm)


D
 Manual / Mechanical
 Valve Products

Exhaust Mufflers

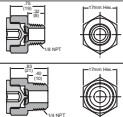
 Bronze	Pipe thread	Part number
	M5	P6M-PAC5
	1/8" NPT	EM12
	1/4" NPT	EM25
	3/8" NPT	EM37
	1/2" NPT	EM50

P6M - Plastic; EM - Sintered Bronze

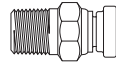
Plastic Silencers

	Part number	
Thread size	NPT	BSPT
M5	AS-5	AS-5
1/8"	ASN-6	AS-6
1/4"	ASN-8	AS-8
3/8"	ASN-10	AS-10
1/2"	ASN-15	AS-15

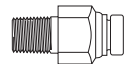
Exhaust Protector

	Size	Part number
	1/8"	E90016
	1/4"	E90017

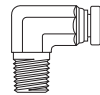
68PM Male Connector

	Tube size	Pipe thread (NPTF)	Part number
	1/8	1/16	68PM-2-1
	1/8	1/8	68PM-2-2
	5/32	1/16	68PM-5/32-1
	5/32	1/8	68PM-5/32-2
	5/32	1/4	68PM-5/32-4
	3/16	1/16	68PM-3-1
	3/16	1/8	68PM-3-2
	3/16	1/4	68PM-3-4

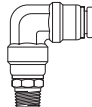
68PMT Male Connector

	Tube size	Pipe thread (NPTF)	Part number
	1/4	1/8	68PMT-4-2
	1/4	1/4	68PMT-4-4
	1/4	3/8	68PMT-4-6
	3/8	1/8	68PMT-6-2
	3/8	1/4	68PMT-6-4
	3/8	3/8	68PMT-6-6
	3/8	1/2	68PMT-6-8
	1/2	1/4	68PMT-8-4
	1/2	3/8	68PMT-8-6
	1/2	1/2	68PMT-8-8
	5/8	3/8	68PMT-10-6
	5/8	1/2	68PMT-10-8
	3/4	1/2	68PMT-12-8

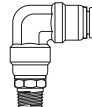
169PMNS Male Elbow Non-Swivel 90°

	Tube size	Pipe thread (NPTF)	Part number
	1/8	1/8	169PMNS-2-2
	5/32	1/8	169PMNS-5/32-2
	3/16	1/8	169PMNS-3-2
	3/16	1/4	169PMNS-3-4


169PMT Male Elbow Swivel 90°

	Tube size	Pipe thread (NPTF)	Part number
	1/4	1/8	169PMT-4-2
	1/4	1/4	169PMT-4-4
	1/4	3/8	169PMT-4-6
	3/8	1/8	169PMT-6-2
	3/8	1/4	169PMT-6-4
	3/8	3/8	169PMT-6-6
	3/8	1/2	169PMT-6-8
	1/2	1/4	169PMT-8-4
	1/2	3/8	169PMT-8-6
	1/2	1/2	169PMT-8-8
	5/8	3/8	169PMT-10-6
	5/8	1/2	169PMT-10-8

169PMTL Male Elbow Long Non-Swivel 90°

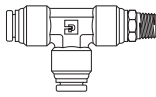
	Tube size	Pipe thread (NPTF)	Part number
	3/8	1/4	169PMTL-6-4
	3/8	3/8	169PMTL-6-6
	3/8	1/2	169PMTL-6-8
	1/2	1/2	169PMTL-8-8
	5/8	1/2	169PMTL-10-8

169PMTNS Male Elbow Non-Swivel 90°

	Tube size	Pipe thread (NPTF)	Part number
	1/4	1/8	169PMTNS-4-2
	1/4	1/4	169PMTNS-4-4
	1/4	3/8	169PMTNS-4-6
	3/8	1/8	169PMTNS-6-2
	3/8	1/4	169PMTNS-6-4
	3/8	3/8	169PMTNS-6-6
	3/8	1/2	169PMTNS-6-8
	1/2	1/4	169PMTNS-8-4
	1/2	3/8	169PMTNS-8-6
	1/2	1/2	169PMTNS-8-8
	5/8	3/8	169PMTNS-10-6
	5/8	1/2	169PMTNS-10-8
	3/4	1/2	169PMTNS-12-8

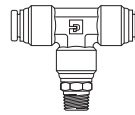
171PMT Male Run Tee Swivel

Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	171PMT-4-2
1/4	1/4	171PMT-4-4
1/4	3/8	171PMT-4-6
3/8	1/4	171PMT-6-4
3/8	3/8	171PMT-6-6
1/2	1/4	171PMT-8-4
1/2	3/8	171PMT-8-6
1/2	1/2	171PMT-8-8



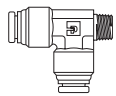
172PMT Male Branch Tee Swivel

Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	172PMT-4-2
1/4	1/4	172PMT-4-4
3/8	1/8	172PMT-6-2
3/8	1/4	172PMT-6-4
3/8	3/8	172PMT-6-6
1/2	1/4	172PMT-8-4
1/2	3/8	172PMT-8-6
1/2	1/2	172PMT-8-8



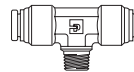
171PMTNS Male Run Tee Non-Swivel

Tube size	Pipe thread (NPTF)	Part number
1/4	1/4	171PMTNS-4-4
1/4	3/8	171PMTNS-4-6-4
3/8	3/8	171PMTNS-6-4
3/8	1/4	171PMTNS-6-4-4
3/8	1/4	171PMTNS-6-4-6
1/2	3/8	171PMTNS-6-6
1/2	3/8	171PMTNS-6-8
1/2	1/2	171PMTNS-8-4

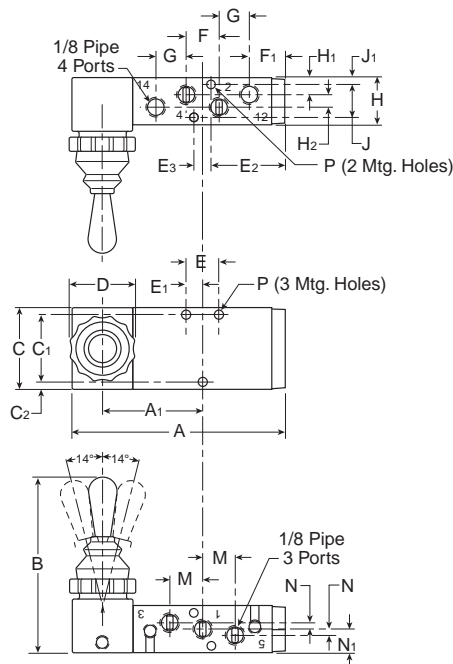


172PMTNS Male Branch Tee Non-Swivel

Tube size	Pipe thread (NPTF)	Part number
1/4	1/4	172PMTNS-4-2
3/8	3/8	172PMTNS-6-4
3/8	1/4	172PMTNS-6-4-4
3/8	3/8	172PMTNS-6-6
3/8	3/8	172PMTNS-6-8
1/2	1/2	172PMTNS-8-6
1/2	3/8	172PMTNS-8-6-8
1/2	1/2	172PMTNS-8-8



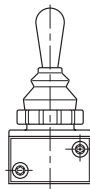
P2LAX Hand Lever Operated



P2LAX Hand Lever

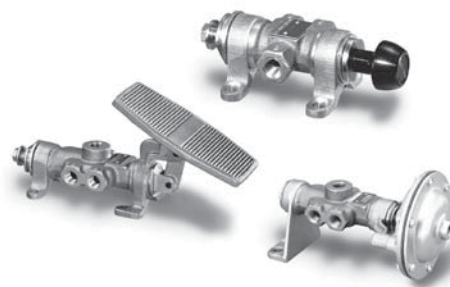
A	A1	B	C	C1
4.02 (102)	1.89 (48)	3.23 (82)	1.57 (40)	1.30 (33)
C2	D	E2	E3	F
.14 (3.5)	1.18 (30)	1.42 (36)	.33 (8.5)	.63 (16)
F1	G	H	H1	H2
.67 (17)	.59 (15)	.87 (22)	.31 (8)	.24 (6)
J	J1	M	N	N1
.63 (16)	.12 (3)	.63 (16)	.12 (3)	.43 (11)

P
 Ø .16
 Ø (4.1)
 Inches (mm)



Features

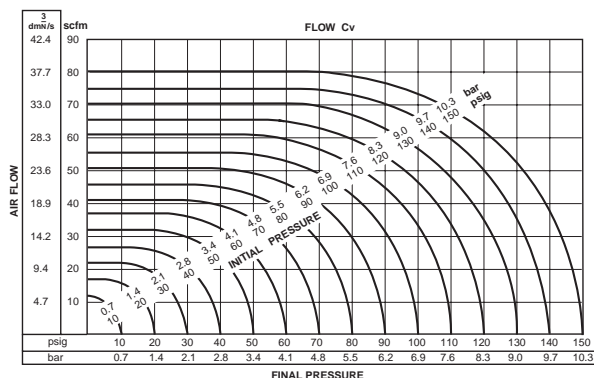
- 1/4" to 3/4" NPTF ports
- Standard operators listed. Consult factor for variations in orientation
- Standard 2 position 3-way and 4-way valves listed. Consult factory for 2-way and 3 position valves
- Corrosion resistant bronze body
- High flow brass spacers position o-ring, permit reverse piping and vacuum service
- Specially compounded o-rings suitable for non-lube air service and low pressure oil service
- Floating stem of hard chrome plated stainless steel; no metal to metal contact
- Closed at crossover design for air savings
- Piped exhaust convenient for muffling
- Interchangeable operators
- Interchangeable end sections
- Service without disturbing plumbing
- Dual mounting brackets on most models



Flow Cv ratings

Valve type	Port size	Port 1 to 2	Port 1 to 3	Port 2 to 3	Port 2 to 4	Port 3 to 4
3-way 2-position	1/4	2.4	—	2.4	—	—
	3/8	3.2	—	3.4	—	—
	1/2	5.0	—	5.1	—	—
	3/4	9.5	—	9.8	—	—
4-way 2-position	1/4	2.4	2.4	—	2.0	2.2
	3/8	3.4	3.2	—	3.0	3.1
	1/2	5.2	5.3	—	4.7	4.7
	3/4	8.7	9.2	—	7.9	8.0

Flow Cv



Flow capacities

The capacity curves shown in the chart are for a theoretical valve having a Cv = 1.0 for air at standard conditions. Flow rating determined in accordance with NFPA recommended standard NFPA/T3.21.3 - 1974.

Operating information

Pressure limitations knob (manual and spring return) and palm operators (manual and spring return)

Media	Port size	PSI (kPa)	
		3-way	4-way
Air and Hydraulic ‡	1/4	200 (1380)	180 (1240)
	3/8	175 (1210)	170 (1170)
	1/2	160 (1100)	150 (1030)
	3/4	150 (1030)	150 (1030)
Vacuum	All	Within 1" Hg of perfect	
Other	Consult factory		

Pressure limitations knob (detent), lever, pedal, treadle, clevis, cam air operated diaphragm and cylinder

Media	Port size	PSI (kPa)	
		3-way	4-way
Air and Hydraulic ‡	1/4	225 (1550)	225 (1550)
	3/8	225 (1550)	225 (1550)
	1/2	215 (1480)	215 (1480)
	3/4	200 (1380)	200 (1380)
Vacuum	All	Within 1" Hg of perfect	
Other	Consult factory		

Temperature range: -15°F to 200°F (-26° to 93°C)

Lubrication: For best results and service life use clean, moisture free lubricated air.

‡ For technical information see CD




































Materials

Body	High pressure valve bronze
Knobs and palm buttons	Anodized aluminum
Operators	Iron castings; steel rod, bar and tube, and plated for corrosion resistance
O-rings	Buna-N and impregnated with Molybdenum Disulfide
Spacers and end bearings	Brass bar stock
Springs	high quality steel and plated for corrosion resistance
Stem	Stainless steel and hard chrome plated

Warnings









- ⚠ Install guards on all hand operated valves if accidental operation can cause personal injury.
- ⚠ Foot operated valves must be protected against inadvertent operation that can cause serious bodily injury. Use of a guard is strongly recommended as it will reduce the likelihood of inadvertent operation.

M0 Series Air Pilot, Manual & Mechanically Actuated Valves

3-way and 4-way knob operated	Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
	 3-way, detent ball, foot bracket	M05422448	M05432448	M05442448	M05462448
	 3-way, detent ball, panel mount with nut	M05822451	M05832451	M05842451	M05862451
	 3-way, N.C., manual, foot bracket	M08521848	M08531848	M08541848	M08561848
	 3-way, N.C., manual, panel nut	M08521851	M08531851	M08541851	M08561851
	 3-way, N.C., pull to operate, spring return, foot bracket	M09721848	M09731848	M09741848	M09761848
	 3-way, N.C., pull to operate, spring return, panel mount with nut	M06421851	M06431851	M06441851	M06461851
	 3-way, N.C., push to operate, spring return, foot bracket	M09821848	M09831848	M09841848	M09861848
	 3-way, N.C., push to operate, spring return, panel mount with nut	M06521851	M06531851	M06541851	M06561851
	 4-way, detent ball, foot bracket	M05425448	M05435448	M05445448	M05465448
	 4-way, detent ball, panel mount with nut	M05825451	M05835451	M05845451	M05865451
	 4-way, manual, foot bracket	M08524648	M08534648	M08544648	M08564648
	 4-way, manual, panel nut	M08524651	M08534651	M08544651	M08564651
	 4-way, pull to operate, spring return, foot bracket	M09724648	M09734648	M09744648	M09764648
	 4-way, pull to operate, spring return, panel mount with nut	M06424651	M06434651	M06444651	M06464651
	 4-way, push to operate, spring return, foot bracket	M09824648	M09834648	M09844648	M09864648
	 4-way, push to operate, spring return, panel mount with nut	M06524651	M06534651	M06544651	M06564651
3-way and 4-way palm button operated					
	 3-way, N.C., pull palm button to operate, spring return, panel mount with nut	M06421859	M06431859	M06441859	M06461859
	 3-way, N.C., push palm button to operate, spring return, panel mount with nut	M06521859	M06531859	M06541859	M06561859
	 4-way, pull palm button to operate, spring return panel mount with nut	M06424659	M06434659	M06444659	M06464659
	 4-way, push palm button to operate, spring return, panel mount with nut	M06524659	M06534659	M06544659	M06564659
3-way and 4-way lever operated					
	 3-way, detent ball, foot bracket	M05422443	M05432443	M05442443	M05462443
	 3-way, manual, foot bracket	M08521843	M08531843	M08541843	M08561843
	 3-way, N.C., pull lever to operate, spring return, foot bracket	M09621843	M09631843	M09641843	M09661843
	 3-way, N.C., push lever to operate, spring return, foot bracket	M09521843	M09531843	M09541843	M09561843
	 4-way, detent ball, foot bracket	M05425443	M05435443	M05445443	M05465443
	 4-way, manual, foot bracket	M08524643	M08534643	M08544643	M08564643
	 4-way, pull lever to operate, spring return, foot bracket	M09624643	M09634643	M09644643	M09664643
	 4-way, push lever to operate, spring return, foot bracket	M09524643	M09534643	M09544643	M09564643











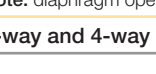





 Most popular. For technical information see CD

M0 Series Air Pilot, Manual & Mechanically Actuated Valves

3-way and 4-way, foot operated: treadle / pedel type	Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
	 3-way, treadle operated, detent ball, foot bracket	M05422488	M05432488	M05442488	—
	 3-way, treadle operated, manual return, foot bracket	M08521888	M08531888	M08541888	—
	 3-way, N.C., spring return, pedel operated, foot bracket	M06221840	M06231840	M06241840	—
	 4-way, treadle operated, detent ball, foot bracket	M05425488	M05435488	M05445488	—
	 4-way, treadle operated, manual return, foot bracket	M08524688	M08534688	M08544688	—
	 4-way, spring return, pedel operated, foot bracket	M06224640	M06234640	M06244640	—







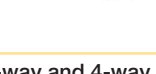


CAUTION: This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

3-way and 4-way air operated : diaphragm or cylinder




	 3-way, N.C., single air diaphragm, air signal to actuate, spring return foot bracket	M08421830	M08431830	M08441830	—
	 3-way, single air cylinder signal to actuate, spring return foot bracket	M08521826	M08531826	M08541826	M08561826
	 3-way, double air diaphragm	M03321833	M03331833	M03341833	—
	 3-way, double air cylinder foot bracket	M01921819	M01931819	M01941819	M01961819
	 4-way, single air diaphragm, air signal to actuate, spring return foot bracket	M08424630	M08434630	M08444630	—
	 4-way, single air cylinder signal to actuate, spring return foot bracket	M08524626	M08534626	M08544626	M08564626
	 4-way, double air diaphragm	M03324633	M03334633	M03344633	—
	 4-way, double air cylinder foot bracket	M01924619	M01934619	M01944619	M01964619

Note: diaphragm operators : pilot signal pressures from 20 to 60 psi. Cylinder operators : pilot signal pressures from 20 to 250 psi.

3-way and 4-way clevis operated

	 3-way, manual, foot bracket	M08521805	M08531805	M08541805	M08561805
	 3-way, N.C., pull to operate, spring return foot bracket	M09621805	M09631805	M09641805	M09661805
	 3-way, N.C., push to operate, spring return, foot bracket	M09521805	M09531805	M09541805	M09561805
	 4-way, manual, foot bracket	M08524605	M08534605	M08544605	M08564605
	 4-way, pull clevis to operate, spring return, foot bracket	M09624605	M09634605	M09644605	M09664605
	 4-way, push clevis to operate, spring return, foot bracket	M09524605	M09534605	M09544605	M09564605

3-way and 4-way cam operated

	 3-way, N.C., spring return, cam operated, foot bracket	M09521803	M09531803	M09541803	M09561803
	 4-way, spring return, cam operated, foot bracket	M09524603	M09534603	M09544603	M09564603

D

Manual / Mechanical
 Valve Products

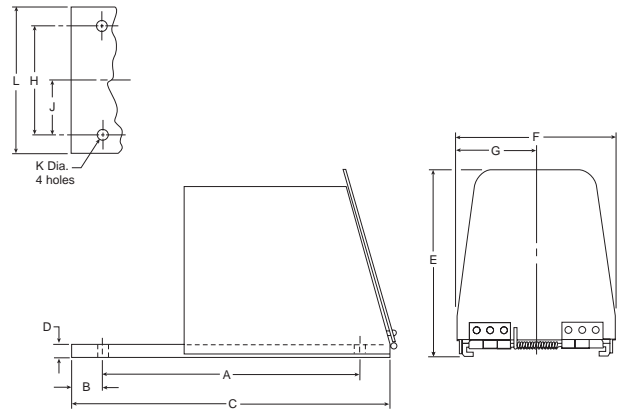
Pedal Guard
(Fits all pedal operated valves)

Description	Model number
Guard with door	M232 001
Guard without door	M232 002
Guard with door for 1/4 and 3/8 valve	M232 003*
Guard without door for 1/4 and 3/8 valve	M232 004*
Guard with door for 1/2 and 3/4	M232 005*
Guard without door for 1/2 and 3/4	M232 006*

* Includes mounting hardware.

CAUTION:

Foot valves utilizing this guard shall not be used to actuate a punch presse. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.



Dimensions

A	B	C	D	E	F	G
10.50	1.25	13.00	.50	7.38	6.36	3.18
266.7	31.8	330.2	12.7	187.4	161.5	80.8
H	J	K	L			
4.50	2.25	.44	6.00			
114.3	57.2	11.2	152.4			

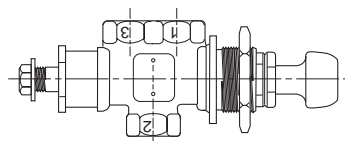
M0 valve 9 digit part number dissection

The M0 Valve Series has with wide variety of operating and return ends which can be ordered either on the left or right hand side of the valve body. Common part numbers on the previous pages can be ordered with the left and right hand ends swapped. Swapping operator and return end sections does not change the spool function, but can reverse the

expected function of the valve. For example, a 3-way, normally closed, "NC", spring return valve will become a 3-way normally open, "NO", valve when the operator and return section is swapped. There are other non-cataloged options available and this part number dissection will enable you to discuss your valve part number with the factory for options.

3-way

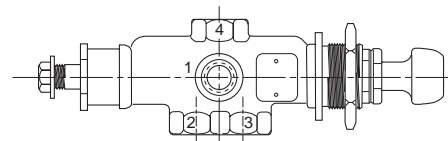
Series name	Left end	Port size	Body function	Right end
M0	XX	X	XX	XX



Left End Section in relation to port #2 ← → Right End Section in relation to port #2

4-way

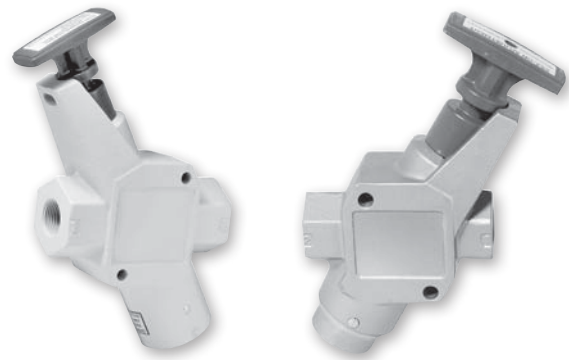
Series name	Left end	Port size	Body function	Right end
M0	XX	X	XX	XX



Left End Section in relation to port #2 ← → Right End Section in relation to port #3

Lockout valves are installed in pneumatic drop legs, or individual pneumatic control lines. In accordance with OSHA procedures, lockout valves are used during maintenance and service procedures of pneumatically (air) operated equipment.

- Used in systems for compliance with OSHA standard 29 CFR part 1910
- 3/8 Inch to 1-1/4 inch pipe sizes
- 3/4 and 1-1/4 inch exhaust ports available
- Rugged cast aluminum alloy body
- Inline or surface mountable
- Exhaust port threaded for installation of silencer or line for remote exhausting



Material specification

Description	
Body:	Cast Aluminum Alloy
Handle:	Plastic
Spool:	Aluminum
Seals:	Carboxylated Nitrile
Detent Spring:	Stainless Steel
Grease:	Magnalube G [†]

[†] Trademark Magnalube

Operating information

	LV	EZ
Max operating pressure	300 PSIG	150 PSIG
Max operating temperature	175°F	175°F
Cv	6 to 14	3.7 to 13.7

For technical information see CD

Lockout Valves



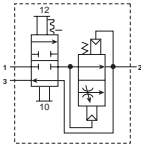
Port size inlet & outlet (port 1 & 2)

Port size exhaust (port 3)

Part number 0 to 125 PSIG

LV Series

3/8	3/4	LV3N6B
1/2	3/4	LV4N6B
3/4	3/4	LV6N6B
3/4	1-1/4	LV6NAB
1	1-1/4	LV8NAB
1-1/4	1-1/4	LVANAB

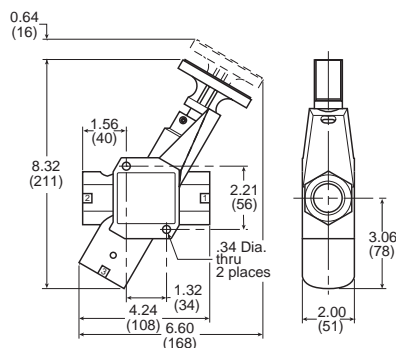


EZ Series

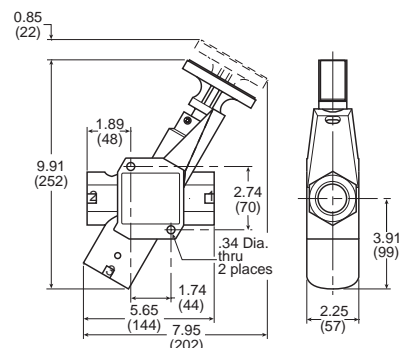
3/8	3/4	EZ03NB6
1/2	3/4	EZ04NB6
3/4	1-1/4	EZ06NBA
1	1-1/4	EZ08NBA
1-1/4	1-1/4	EZ0ANBA

Dimensions

3/4 Exhaust port



1-1/4 Exhaust port



Most popular. For technical information see CD

D

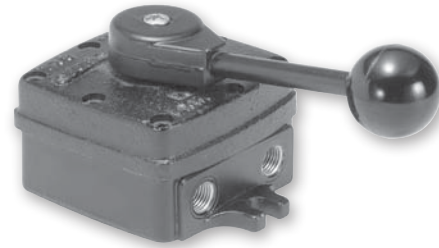
Manual / Mechanical
 Valve Products

These are 4-Way, 3-Position, rotary disc, direct-operated air valves. Two different types of control are offered. The forged bronze disc and the cast iron surface upon which the disc works are ground and lapped to provide a leak-proof seal. Air pressure from the inlet port is confined beneath the disc, making the seal tighter as the pressure increases, yet friction between the lapped surfaces is so low that only 15 pounds of force is required to move the lever at 100 PSI line pressure. The need for packing to seal around the stem is eliminated.

Valve can be furnished for gasketing to a manifold on customer's machine or with an adaptor for tapped bottom porting.

Valves are detented.

Operating handles may be installed in any of four positions.

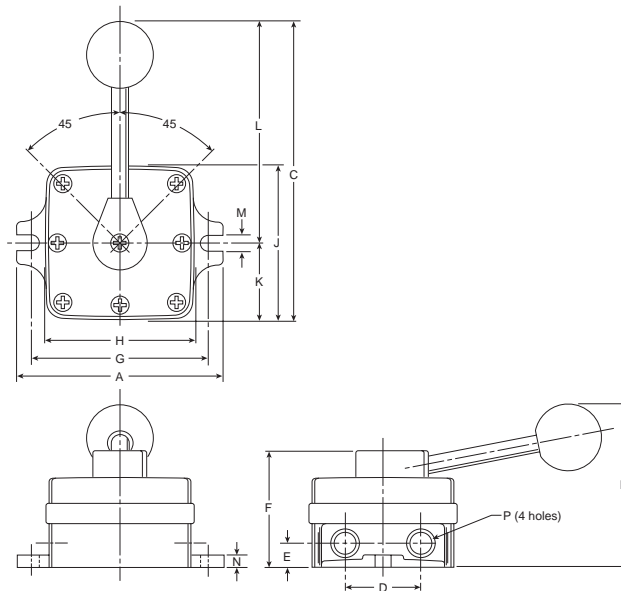


Operating information

Operating pressure: 0 to 150 PSI (0 to 1035 kPa)
 Temperature range: 18°F to 200°F (-8°C to 93°C)
 Lubrication: Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

PL-VL Series Valves

Symbol	Port Size	Description	Cv	Part number
	1/4" NPT	4-way, 3-position, detent, closed center	2.5	PL25
	3/8" NPT	4-way, 3-position, detent, closed center	3.0	PL37
	1/2" NPT	4-way, 3-position, detent, closed center	6.2	PL50
	1/4" NPT	4-way, 3-position, detent, exhaust center	2.5	VL25
	3/8" NPT	4-way, 3-position, detent, exhaust center	3.0	VL37
	1/2" NPT	4-way, 3-position, detent, exhaust center	6.2	VL50



PL-VL Dimensions

	A	B	C	D	E	F	G	H	J	K	L	M	N	P
PL-25	4.75	3.81	6.81	1.69	.56	2.75	4.12	3.50	3.50	1.69	5.06	.34	.28	1/4
VL-25	(121)	(97)	(173)	(43)	(14)	(70)	(105)	(89)	(89)	(43)	(129)	(9)	(7)	NPT
PL-37	4.75	3.81	6.81	1.69	.56	.56	4.12	3.50	3.50	1.69	5.06	.34	.28	3/8
VL-37	(121)	(97)	(173)	(43)	(14)	(14)	(105)	(89)	(89)	(43)	(129)	(9)	(7)	NPT
PL-50	5.62	4.44	8.94	2.12	.66	3.25	5.00	4.38	4.38	2.12	6.75	.34	.34	1/2
VL-50	(143)	(113)	(227)	(54)	(17)	(83)	(127)	(111)	(111)	(54)	(171)	(9)	(9)	NPT

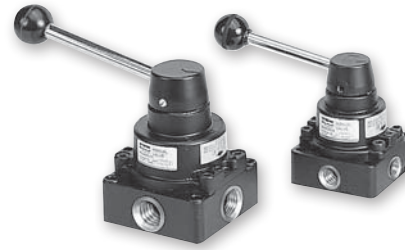
inches (mm)

Most popular. For technical information see CD

D
 Manual / Mechanical
 Valve Products

Features

- Compact and simple design
- Rotary disc, direct operated valves
- Side porting
- Detent action smooth lever actuation
- General pneumatic applications



Operating information

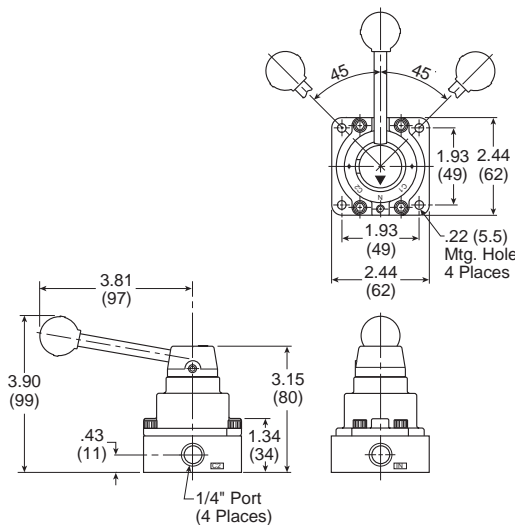
Operating pressure: 0 to 150 PSI (0 to 10 bar)
 Temperature range: 32°F to 166°F (0°C to 60°C)
 Lubrication: Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

Materials

Cover	Zinc
Body	Aluminum
Seals	Polyurethane

HV Valve Series

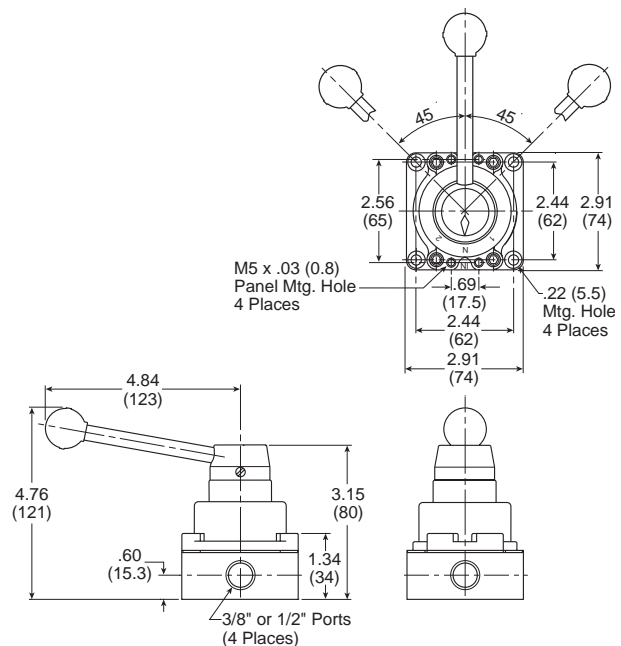
Symbol	Port size	Description	Cv (ANSI)	Cv (JIS)	Part number
	1/4" NPT	4-way, 3-position	0.5	0.4	HVN4200-8
	3/8" NPT	4-way, 3-position	1.4	2.72	HVN4400-10
	1/2" NPT	4-way, 3-position	1.5	3.26	HVN4400-15



HVN4200-8

Most popular.

For technical information see CD



HVN4400-10, 15

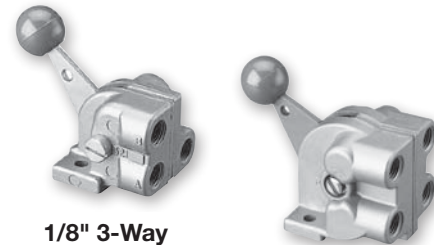
D

Manual / Mechanical
 Valve Products

Sliding seal valves provide 3 or 4-Way directional control in a compact body size. Comfortable hand lever is easy to operate and maintains set position. Disc type valve has minimum number of moving parts. Valves should be used with filtered and lubricated air.

! CAUTION:

Install guards on all hand operated valves. Accidental operation can cause personal injury.



1/8" 3-Way

1/4" 4-Way

Materials

Internal components	Brass, stainless steel
Body	Die cast zinc
Seals	Buna N

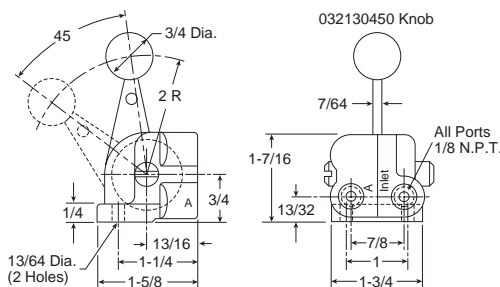
Operating information

Operating pressure: Max. 200 PSIG air only
 Min. 26" Hg vacuum
 Temperature range: -40°F to 212°F (-40°C to 100°C)
 If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.

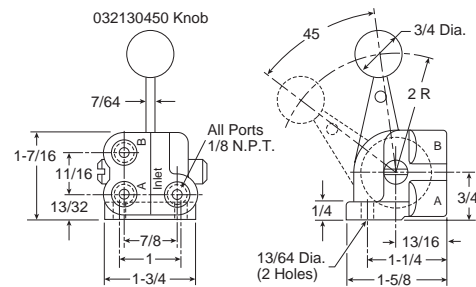
Hand Operated Sliding Seal Valve

Symbol	Port size	Function	Cv (Avg)	Part number
	1/8"	3-way, 2-position, detented	0.54	032130599
	1/8"	4-way, 2-position, detented	0.54	032140299
	1/4"	3-way, 2-position, detented	1.25	008230109
	1/4"	4-way, 3-position, detented, center blocked	1.25	008240109

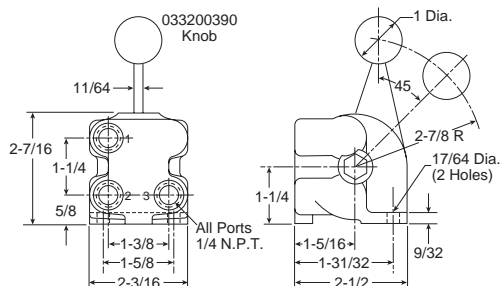
Note: 3-Way exhaust passage is through an untapped hole in bottom side of valve.



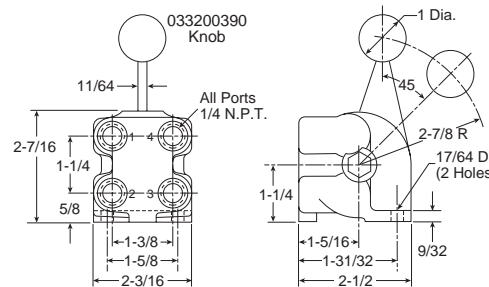
1/8" 3-Way (model no. 032130599)



1/8" 4-Way (model no. 032140299)



1/4" 3-Way (model no. 008230109)

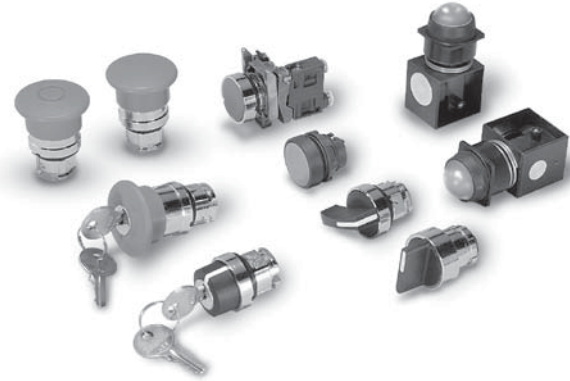


1/4" 4-Way (model no. 008240109)

Most popular. For technical information see CD



D
 Manual / Mechanical
 Valve Products

HUMAN-MACHINE DIALOG requires devices such as push buttons and selector switches to provide command inputs. A wide variety of these devices are available to meet most application needs; in both pneumatic and electrical switch bodies. All of these devices use the 22 mm (7/8") mounting standard.





**Complete Assemblies—
 3/2 Valve Bodies with 5/32" Instant Straight Connections**

Flush Push Buttons

	Color	Function	Type of switching*	Part number
	Black			PXBB3111BA2
	Green	Spring return	NNP	PXBB3111BA3
	Red			PXBB3111BA4
	Black	Spring return	NNP+NP	PXBB3251BA2
	Black			PXBB4131BA2
	Green	Spring return	Single universal 3-way	PXBB4131BA3
	Red			PXBB4131BA4
	Black	Spring return	Dual universal 3-way	PXBB4231BA2


* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.
Note: Mount up to three valves on mounting ring.

Mushroom Head Push Buttons (40mm Diameter)

	Color	Function	Type of switching*	Part number
	Black	Spring return	NNP	PXBB3111BC2
	Red	Push-pull	NNP	PXBB3111BT4
	Red	Push-pull	NP	PXBB3121BT4
	Black	Spring return	Single universal 3-way	PXBB4131BC2
	Red	Push-pull	3-way	PXBB4131BT4

* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.
Note: Mount up to three valves on mounting ring.

Selector Switches





	Color	Function	Type of switching*	Part number
	Black	2 maintained positions with std. handle	NNP	PXBB3111BD2
	Black		NNP+NP	PXBB3211BD2
	Black		NNP+NP	PXBB3251BD2
	Black	3 maintained positions with std. handle	NNP+NP	PXBB3211BD3
	Black		NNP+NP	PXBB3251BD3
	Black	3 positions, spring return to center with long handle	NNP+NP	PXBB3211BJ5
	Black	2 maintained positions with std. Handle	Single universal 3-way	PXBB4131BD2
	Black	2 maintained positions with std. handle	Dual universal 3-way	PXBB4231BD2
	Black	3 maintained positions with std. handle	Dual universal 3-way	PXBB4231BD3
	Black	3 maintained positions with long handle	Dual universal 3-way	PXBB4231BJ5

* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

 Most popular. For technical information see CD



For Use With PXBB Valve Bodies and ZBE Electrical Switch Bodies

Push Buttons

	Color	Function	Type	Part number	Plastic head**	Metal head*
	Black	Spring return	Flush	ZB5AA2	ZB4BA2	
	Green			ZB5AA3	ZB4BA3	
	Red			ZB5AA4	ZB4BA4	
	Yellow			—	ZB4BA5	
	Blue			—	ZB4BA6	
	Black			ZB5AL2	ZB4BL2	
	Green	Spring return	Extended	ZB5AL3	ZB4BL3	
	Red			ZB5AL4	ZB4BL4	
	Yellow			—	ZB4BL5	
	Black	Spring return	Booted	—	ZB4BP2	
	Green			—	ZB4BP3	
	Red			—	ZB4BP4	
	Black	Detent 2 position	Flush	—	ZB4BH02	
	Green			—	ZB4BH03	
	Red			—	ZB4BH04	

* ZB4*** model numbers are metal head operators
 ** ZB5*** model numbers are plastic head operators



Mushroom Head Push Buttons

	Color	Function	Description	Part number*
	Black	Spring return	Ø 40mm head	ZB4BC2
	Green			ZB4BC3
	Red			ZB4BC4
	Black	Latching push-pull		ZB4BT2
	Green			ZB4BT3
	Red			ZB4BT4
	Black	Spring return	Ø 60mm head	ZB4BR2
	Green			ZB4BR3
	Red			ZB4BR4

* ZB4*** model numbers are metal head operators



For Push Buttons and Visual Indicators

Mounting Ring for Valve Bodies, Switch Bodies and Operating Heads

Description	Part number
 Metal mounting ring	ZB4BZ009
 Plastic mounting ring	ZB5AZ009


Note: To release push button from mounting ring, pull lever on top of mounting ring up and remove push button operator. To assemble push button operator to mounting ring, align arrows and snap into place.

Selector Switches

Standard black handle				
	Description	Function	Part number*	
	Maintained	2 positions	ZB4BD2	
	Spring return from right to left		ZB4BD4	
	Maintained	3 positions	ZB4BD3	
	Spring return to center from left and right		ZB4BD5	
	Maintained right spring return from left to center	3 positions	ZB4BD7	
	Maintained left spring return from right to center	3 positions	ZB4BD8	
	Long Black Handle			
		Maintained	2 positions	ZB4BJ2
Spring return from right to left		ZB4BJ4		
Maintained		3 positions	ZB4BJ3	
Spring return to center from left and right			ZB4BJ5	


* ZB4*** model numbers are metal head operators

Key Operated Selectors

	Key withdrawal	Function	Part number*
	Left	2 maintained positions	ZB4BG2
	Left and right		ZB4BG4
	Center	3 maintained positions	ZB4BG3
	Left and right		ZB4BG5
	Center	3 positions	ZB4BG7
	Center	2 spring return to center	

* ZB4*** Model numbers are metal head operators

Mushroom Head Push Buttons with Key Select

	Color	Function	Description	Part number*	
	Red	Latching turn to release	Ø 40mm head	ZB4BS54	
	Red			Key latching	ZB4BS14
	Red	Latching turn to release		Ø 60mm head	ZB4BS64
	Red				Key latching

* ZB4*** model numbers are metal head operators

For Use With 2B4* Metal Operating Heads**

3/2 Valve Bodies with Mounting Ring



Connections	Function	Type of switching*	Part number
5/32" Instant	3/2	NNP	PXBB3111B
5/32" Instant	3/2	NP	PXBB3121B
5/32" Instant	3/2	Universal 3 way	PXBB4131B

* NNP: Normally non-passing.
 Note: Mount up to 3 valves on mounting ring for push buttons.
 Mount up to 2 valves on mounting ring for selector switches, valves cannot be mounted in center position.

Additional Valve Bodies



Connections	Function	Type of switching*	Part number
5/32" instant straight	3/2	NNP	PXBB3911
5/32" instant swivel			PXBB3912
5/32" instant straight	3/2	NP	PXBB3921
5/32" instant swivel			PXBB3922
5/32" instant straight	3/2	Universal	PXBB4931
5/32" instant swivel			3 way

* NNP: Normally non-passing.

For Push Buttons and Visual Indicators

Legend Plates for PXBB Devices (22mm)

Description	Part number		
Without text for customer engraving			
Black / red background (white letters)	ZBY2101		
Yellow / white background (black letters)	ZBY4101		
With text for push buttons			
Start	ZBY2303		
Stop	ZBY2304		
Forward	ZBY2305		
Reverse	ZBY2306		
Up	ZBY2307		
Down	ZBY2308		
Right	ZBY2309		
Left	ZBY2310		
On	ZBY2311		
Off	ZBY2312		
Open	ZBY2313		
Close	ZBY2314		
Inch	ZBY2321		
Reset	ZBY2323		
Power On	ZBY2326		
Slow	ZBY2327		
Fast	ZBY2328		
Emergency stop	ZBY2330		
Run	ZBY2334		
With text for 2 position selectors			
Off	On	ZBY2367	
With text for 3 position selectors			
Hand	Off	Auto	ZBY2387



Blank Legend Plates for Inscription

For PXBB devices (2 lines of 11 characters maximum)

Please indicate the required text when ordering.
 (Allow 3 weeks for delivery)

Description	Part number
Black background / White letters	ZBY2002

For 22mm Visual Indicators Only

2 lines of 11 characters maximum

Please indicate the required text when ordering.
 (Allow 3 weeks for delivery)

Description	Part number
Black background / white letters	ZB2BY2002

Electrical Switch Bodies


When combined with pneumatic valves, these contact blocks allow different forms of power to be provided from a single push button. Can be mounted with both types of valves PXBB3 / PXBB4.

Type of contact	Part number
Normally open (NO)	ZBE101
Normally closed (NC)	ZBE102

Note: Plastic mounting ring ZB5AZ009 to be used with ZB5 plastic operating heads. Metal mounting ring ZB4BZ009 to be used with ZB4 metal operating heads.

Electrical specification: 240V, 10Amp

**With 5/32" Instant Connections
 22mm Visual Indicators**


Black Plastic Bezel	Color	Part number "ON" indicator	Part number "OFF" indicator
	Green	PXVF131	PXVF1213
	Red	PXVF141	PXVF1214
	Yellow	PXVF151	PXVF1215
	Blue	PXVF161	PXVF1216
	White	PXVF111	PXVF1211

Notes: The Pneumatic Indicators are black in one position and colored in the other. The colored position corresponds either to the presence of a pressure ("ON" Indicator) or the absence of pressure ("OFF" Indicator).

With 5/32" Instant Connections, 1/16" I.D. Internal Orifice

Rotary Selector Switches, 22mm (7/8")


Without mechanical stop, 4-positions, 4-outputs 3/2

Operating head	Type of switching*	Part number
 Black handle with 2.5" X 2.5" (64 X 64 mm) legend plate, red or black background	NNP	PXBDD104

* NNP: Normally non-passing.

Rotary Selector Switches, 22mm (7/8")

Without mechanical stop, 8-positions, 8-outputs 3/2

Operating head	Type of switching*	Part number
 Black handle with 2.5" X 2.5" (64 X 64 mm) legend plate, red or black background	NNP	PXBDD508

* NNP: Normally non-passing.

With 5/32" Instant Connections, 1/16" I.D. Internal Orifice

Joystick Operators, 22mm (7/8")

2-Position Unit



PXBGA8211

4-Position Unit



PXBGA8411


Position	Function	Type of switching*	Operating head	Part number
2	Maintained position in each direction	NNP	Chrome plated lever with protective bellows 1.6" X 2.5"	PXBGA8211
4				PXBGA8411
2	Spring return in each direction	NNP	(40 X 64 mm) legend plate red or black background	PXBGA8221
4				PXBGA8421

* NNP: Normally non-passing.


Note: These joystick operators come assembled with switch type PXBB1911, but will accept all switch bodies shown later in this Section.

Standard Duty 1/6" I.D. Valves with 5/32" Instant Connections

Protective Guard


Function	Material	Part number
 High resistance protective guard, with interlock mechanism to prevent accidental operation by a falling object.	Metal	PXPEM510

Foot Switches Without Protective Guard

Function	Material	Type of switching*	Part number
 Spring Return	Plastic	NNP	PXPEA110
Spring Return	Metal	NNP	PXPEM110

* NNP: Normally non-passing.


Two-Hand Controls

Connections	Part number
 5/32" Instant	PXPC111


Mounting Accessories

Color	Description	Part number
—	Plastic head (ZB5) mounting nut tightening tool	ZB5AZ905
Black plastic	Guard for 40mm	ZBZ1602

Two-Hand Control Module

Connections	Part number
 5/32" Instant	PXPA11

Two-Hand Control Module Guard

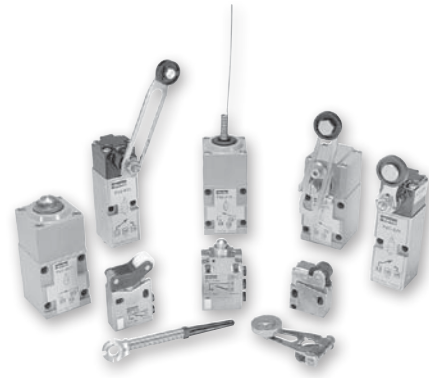
Base component	Part number
 PXPC111	PPRL15

D
 Accessories
 Valve Products

To achieve the sensing or feedback function, pneumatic sensors can be:

- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleed or blocking for detection.

A wide variety of pneumatic sensors are available to suit any application requirement.



Materials

Body	Zinc Alloy
Poppets	Polyurethane
Seals	Nitrile (Buna N)

Operating information

Operating pressure:	40 to 115 PSIG (3 to 8 bar)
Operating temperature:	
Operating	32°F to 122°F (0°C to 50°C)
Storage	-22°F to 140°F (-30°C to 60°C)

3/2 Miniature Direct Acting Limit Switches
1/16" I.D. Internal Orifice

	Actuator	Type of switching*	Flow SCFM (NI/min)	Nominal bore	Connection	Part number
	Steel plunger operating levers available	NNP	2.2 (60)	1/16" (1.5mm)	5/32" instant	PXCM111
					10-32 UNF	PXCM115
	Plastic roller	NNP	3.0 (85)		5/32" instant	PXCM121
					10-32 UNF	PXCM125

7/64" I.D. Internal Orifice

	Plastic roller	NNP			5/32" instant	PXCM521
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Actuators For Steel Plunger (Use with PXCM11*)

	Plastic roller lever					PXCZ11
	Plastic roller lever, one way trip					PXCZ12

3/2 Compact Pilot Operated Limit Switches
7/64" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port

	Actuator	Type of switching*	Flow SCFM (NI/min)	Nominal bore	Connection	Part number
	Steel plunger operating levers available					PXCM601A110
	Steel roller plunger	NNP	8.8 (250)	7/64" (2.5mm)	5/32" instant	PXCM601A102
	90° Steel roller plunger					PXCM601A103

* NNP: Normally non-passing.

Most popular. For technical information see CD





D

Accessories
 Valve Products

Standard Duty Limit Switches – “K” Series



Plunger Operated Limit Switches

1/8" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port


	Actuator	Type of switching*	Flow SCFM (NI/min)	Nominal bore	Connection	Part number
	Steel plunger	NNP	7.4 (210)	1/8" (3mm)	5/32" instant	PXCK21101
		NP				PXCK22101
	Steel roller plunger	NNP				PXCK21102
		NP				PXCK22102
	Plastic roller plunger	NNP				PXCK21121
		NP				PXCK22121
	Cats whisker	NNP				PXCK21106
		NP				PXCK22106

Roller Operated Limit Switches


1/8" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port



	Actuator	Type of switching*	Flow SCFM (NI/min)	Nominal bore	Connection	Part number
	Fixed delrin roller lever multi-function head actuates: - from right and left - from right - from left	NNP	7.4 (210)	1/8" (3mm)	5/32" instant	PXCK2110031
		NP				PXCK2210031
	Adjustable delrin roller lever multi-function head actuates: - from right and left - from right - from left	NNP				PXCK2110041
		NP				PXCK2210041

Separate Pneumatic Switch Bodies

	Actuator	Type of switching*	Part number
	For use with ZCK series operating heads	NNP	PXCK211
		NP	PXCK221

Pneumatic Switch Bodies with Rotary Heads

	Actuator	Type of switching*	Part number
	Multi-function head actuates: - from right and left - from right - from left	NNP	PXCK21100
		NP	PXCK22100


* NNP: Normally non-passing. 
 NNP: Normally passing. 

D
 Accessories
 Valve Products

Standard Duty Limit Switches – “K” Series









Operating Heads

For Use With PXCK Switch Bodies

Actuator	Description	Part number
Rotary operated		
	Die cast zinc	ZCKG00
Plunger operated		
Roller plunger	Plunger operated	ZCKD02
Whisker		ZCKD06
Rod plunger		ZCKD10
Delrin roller lever on plunger		ZCKD21
Steel roller lever on plunger		ZCKD23


Operating Levers for Rotary Heads

For Use With Rotary Head ZCKG00


Actuator	Description	Part number
	Steel 1/8" square	ZCKY51
	Fiberglass 1/8" dia. round	ZCKY52
	Plastic spring rod lever	ZCKY81
	Metal spring rod lever	ZCKY91
	Delrin roller lever	ZCKY11
	Steel roller lever	ZCKY13
	Adjust. delrin roller lever	ZCKY41
	Adjust. steel roller lever	ZCKY43

Heavy Duty Limit Switches – “J” Series

Switch Bodies Only











	Type of switching*	Part number
	NNP	PXCJ117
	NP	PXCJ127

Separate Pneumatic Switch Bodies

	Direction of actuator	Type of switching*	Part number
	Right & left, spring return	NNP	PXCJ11701
	Right or left, spring return		PXCJ11705
	Right & left, spring return	NP	PXCJ12701
	Right or left, spring return		PXCJ12705








Operating Levers for Rotary Heads



Die Cast Zinc. For Use With PXCJ Switch Bodies

Operator	Description	Part number
	Delrin roller	ZC2JY11
	Steel roller	ZC2JY13
	Offset delrin roller	ZC2JY21
	Plastic spring rod	ZC2JY81
	Metal spring rod	ZC2JY91
	Adjustable delrin roller	ZC2JY31
	Offset delrin roller	ZC2JY41
	Rod lever	ZC2JY51
	Single track, delrin roller	ZC2JY71
	Double track, delrin rollers	ZC2JY61

Top Plunger & Rotary Operating Heads

Die Cast Zinc. For Use With PXCJ Switch Bodies

Operation	Description	Part number
Top Plunger Type		
	Top push	ZC2JE61
	Top roller push	ZC2JE62
	Side push	ZC2JE63
	Cat's whisker	ZC2JE70
Rotary Type		
	From left & right	ZC2JE01
	Counterclockwise from right	ZC2JE02
	Clockwise from left	ZC2JE03
	From left or right	ZC2JE05
	Maintained positions	ZC2JE09

* NNP: Normally non-passing. 
 NNP: Normally passing. 

D

Accessories
 Valve Products

The blocking valve is a single acting spring return 2/2 valve in a fitting format. The device requires a pneumatic pilot signal to open, which allows free flow of air, gas or liquid to pass. As long as a pilot signal is present, the device will remain open. When the pilot signal is removed, the internal spring will close the blocking valve, bubble tight. The blocking valve is oil serviceable and rated to 150 PSI.

These devices have two primary design uses: (1) to prevent unwanted gravity induced motion in cylinders during shut down procedures or during periods of lost supply pressure and (2) freezing the cylinder position by using a blocking valve at each end of the cylinder. Application needs such as tool or work piece protection, horizontal indexing or inspection stops are often satisfied by these devices.





Materials

Body Zinc alloy



Operating information

Operating pressure: 0 to 150 PSIG (0 to 10.3 bar)
 Operating temperature:
 Operating 5°F to 140°F (-15°C to 60°C)
 Storage -40°F to 160°F (-40°C to 70°C)

For Cylinder Mounting (Can also be mounted in Threshold Sensor Banjo) With Instant Tube Fittings

BSPP				NPT				
Symbol	Connection for pilot	Cylinder port thread (male)	Connection for tube	Part number	Connection for pilot	Cylinder port thread (male)	Connection for tube	Part number
  PWBA3469	4mm Tube	1/8"	6mm	PWBA1468	5/32" Tube	1/8"	1/4"	PWBA3468
		1/4"	6mm	PWBA1469		1/4"	1/4"	PWBA3469
		1/4"	8mm	PWBA1489		3/8"	3/8"	PWBA3493
		3/8"	8mm	PWBA1483		1/2"	1/2"	PWBA3412
		3/8"	10mm	PWBA1493				
		1/2"	12mm	PWBA1412				

With Threaded Connections and Tube Pilot Port

BSPP				NPT				
Symbol	Connection for pilot	Cylinder port thread (male)	Connection from valve (female)	Part number	Connection for pilot	Cylinder port thread (male)	Connection from valve (female)	Part number
  PWBA3833	4mm Tube	1/8"	1/4"	PWBA1898	5/32" * Tube	1/8"	1/8"	PWBA3888
		1/4"	1/4"	PWBA1899		1/4"	1/4"	PWBA3899
	M5 Female	3/8"	3/8"	PWBA1833		3/8"	3/8"	PWBA3833
		1/2"	1/2"	PWBA1822		1/2"	1/2"	PWBA3822

* Instant fitting

With Threaded Connections and Threaded Pilot Port

NPT			
Connection for pilot	Cylinder port thread (male)	Connection from valve	Part number
1/8" pipe	1/8"	1/8"	PWBA38887
	1/4"	1/4"	PWBA38997
	3/8"	3/8"	PWBA38337
	1/2"	1/2"	PWBA38227

The plug-in threshold sensors provide feedback information on pneumatic cylinder status in either pneumatic or electrical outputs. Mounted into the cylinder port, these devices monitor the back pressure of the cylinder's exhaust. When the cylinder's piston stops, the back pressure rapidly drops and the threshold sensor provides the desired output. Ideal for variable stroke applications such as robotics where other sensor type devices such as limit switches are impractical, these devices provide a signal whenever the cylinder stops motion.

The threshold sensor consists of two complementary sub assemblies (1) the banjo fitting and (2) the plug-in sensor element. In all cases, the sensor is easily plugged into the banjo fitting and locked in place with a spring clip. The banjo fitting is designed to accept (piggy backed) other functional fittings such as flow controls or blocking valves. Simply select the sensor based on the type feedback signal that best fits the application.




Materials

Body	Thermoplastic
Mounting screw	Brass



Operating information

Operating pressure:	0 to 150 PSIG (0 to 10.3 bar)
Operating temperature:	
Operating	5°F to 140°F (-15°C to 60°C)
Storage	-40°F to 160°F (-40°C to 70°C)

Banjo Sockets (with Sensor Clip)

	Port size	Wrench	Part number
	10-32	5/16" Hex	PWSB1557
	1/8"	3/16" Allen	PWSB1887
	1/4"	5/16" Allen	PWSB1997
	3/8"	3/8" Allen	PWSB1337
	1/2"	1/2" Allen	PWSB1227

Plug-in Sensors

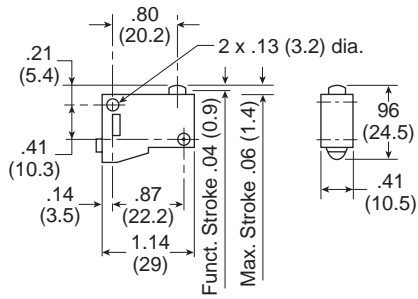
	Output	Connection	Part number
	Pneumatic	5/32" push-in	PWSP111
	Electrical	3-wire cable (6 ft)	PWSM1012

D

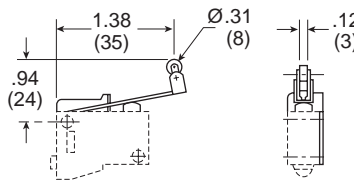
Accessories
 Valve Products

Miniature Limit Switches

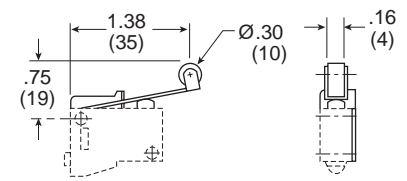
PXCM111



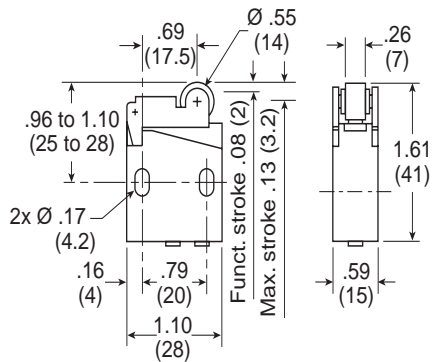
PXCZ12



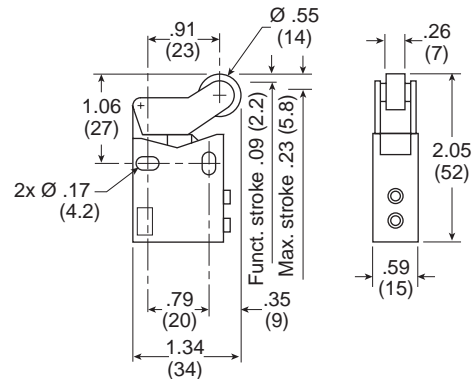
PXCZ11



PXCM121, PXCM131

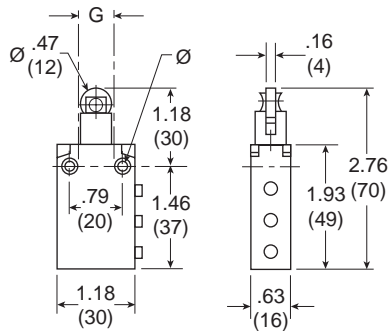


PXCM521

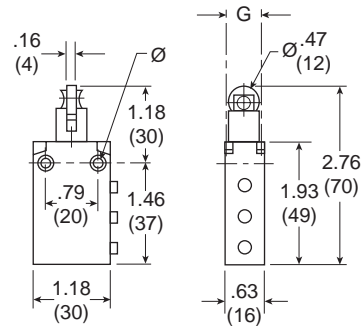


Compact Limit Switches

PXCM601A102

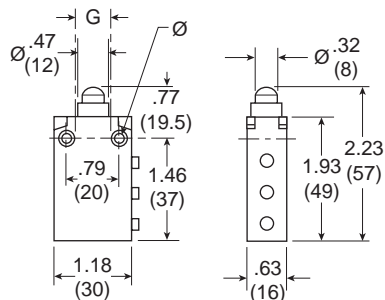


PXCM601A103



Ø:
 2 mounting holes Ø .17" (4.3)
 2 countersunk Ø .32" (8.2)
 depth 4 mm

PXCM601A110

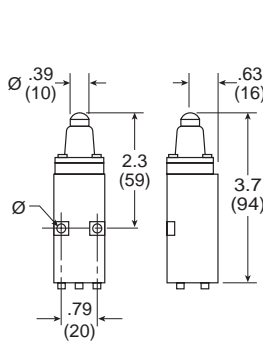


G:
 top mounting holes, 2 x M5
 .71" (18 mm) centers

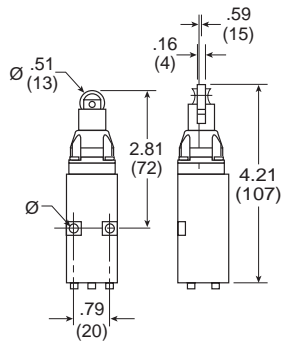
D
 Accessories
 Valve Products

K Series

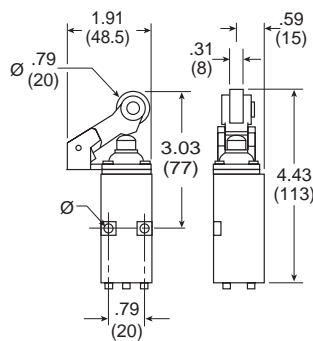
PXCK21101, PXCK22101



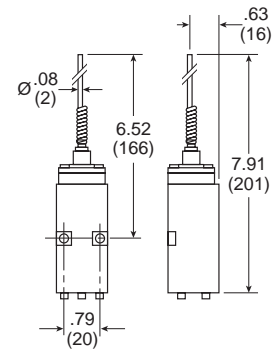
PXCK21102, PXCK22102



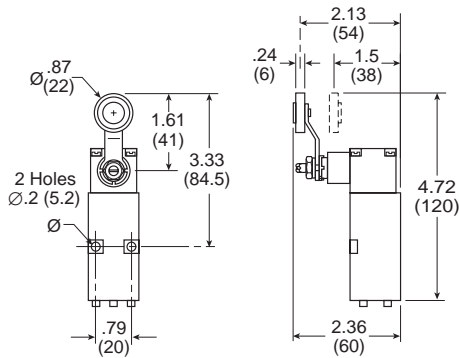
PXCK21121, PXCK22121



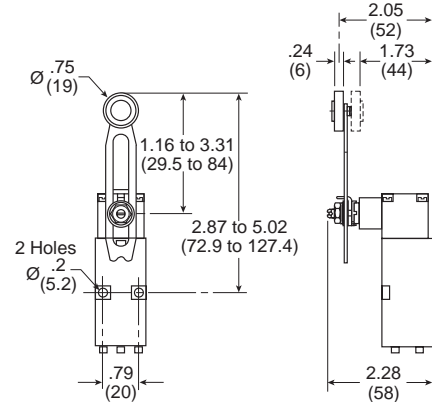
PXCK21106, PXCK22106



PXCK2110031, PXCK2210031

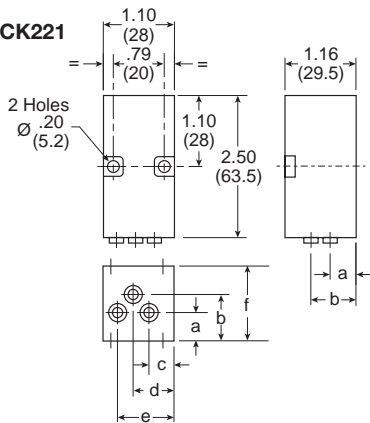


PXCK2110041, PXCK2210041



Pneumatic Switch Bodies

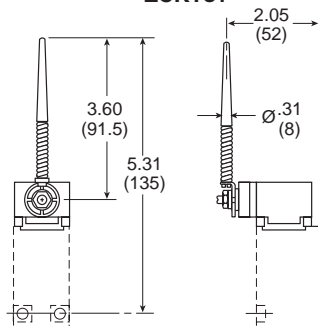
PXCK211, PXCK221



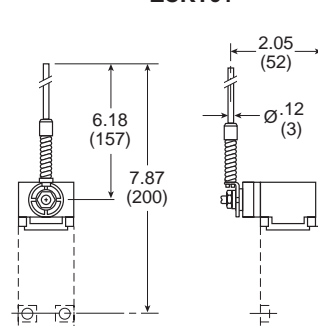
	inch	mm
a	.39	10
b	.77	19.5
c	.35	9
d	.61	15.5
e	.87	22
r	1.66	29.5

Rotary Heads with Operating Levers

ZCKY81



ZCKY91

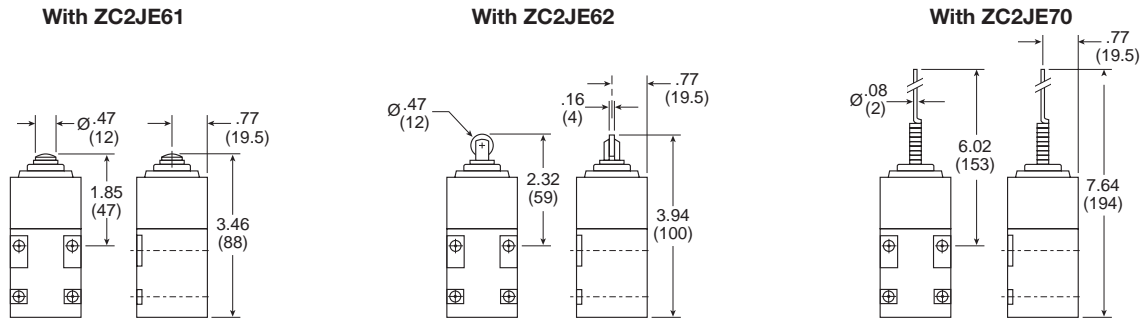


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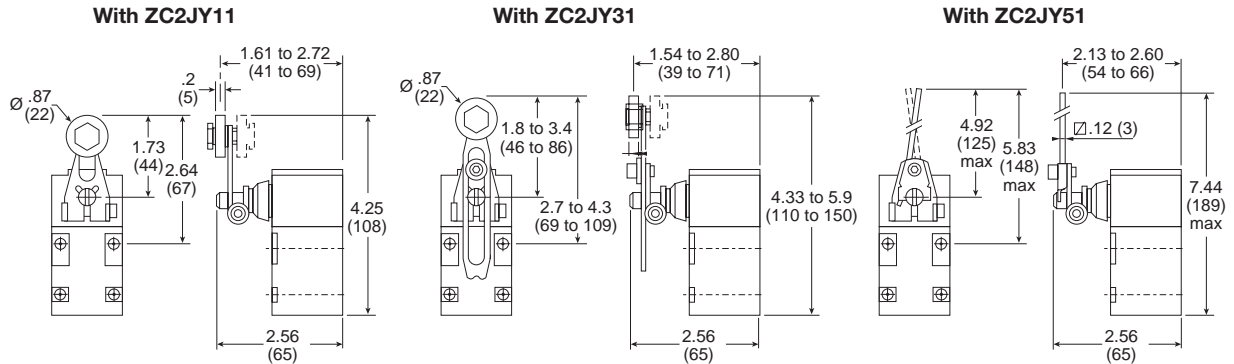
Accessories
 Valve Products

J Series

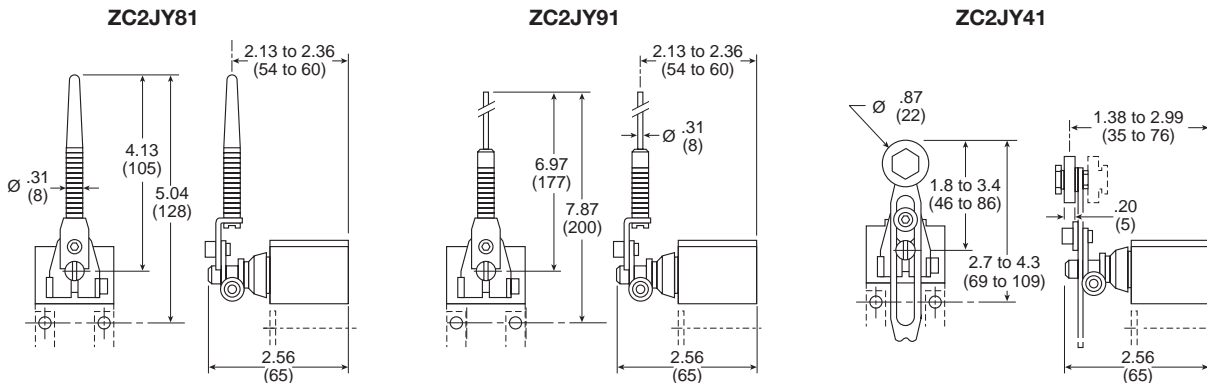
Switch Body With Plunger Heads



Switch Body With Rotary Heads and Operating Levers

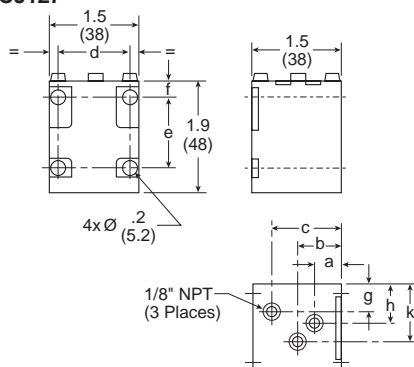


Rotary Heads With Operating Levers



Pneumatic Switch Bodies

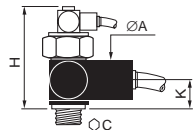
PXCJ117, PXCJ127



	inch	mm
a	.47	12
b	.75	19
c	1.16	29.5
d	1.14 to 1.18	29 to 30
e	1.18	30
f	.28	7
g	.43	11
h	.51	13
k	.94	24

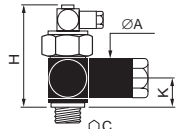
Blocking Valves

PWBA14/34

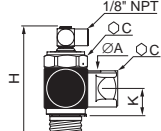


ØA	B	C	K	H	L	Flow*	Part number
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.32" (59)	1.54" (39)	14.8	PWBA1468/3468
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.09" (53)	1.54" (39)	19.4	PWBA1469/3469 PWBA1489
1.06" (27)	1.10" (28)	0.94" (24)	0.55" (14)	2.09" (53)	1.98" (50)	45.9	PWBA1483 PWBA1493/3493
1.22" (31)	1.30" (33)	1.30" (33)	0.94" (24)	2.59" (66)	2.59" (66)	81.2	PWBA1412/3412
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.32" (59)	1.71" (43.5)	14.8	PWBA1898/3888
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.09" (53)	1.71" (43.5)	19.4	PWBA1899/3899
1.06" (27)	1.10" (28)	0.94" (24)	0.55" (14)	2.09" (53)	2.18" (55)	45.9	PWBA1833/3833
1.22" (31)	1.30" (33)	1.30" (33)	0.94" (24)	2.59" (66)	2.47" (63)	81.2	PWBA1822/3822
0.75" (19)	0.87" (22)	0.83" (21)	0.67" (17)	2.20" (56)	1.73" (44)	14.8	PWBA38887
0.75" (19)	0.87" (22)	0.83" (21)	0.67" (17)	2.20" (56)	1.73" (44)	19.4	PWBA38997
1.06" (27)	1.18" (30)	1.06" (27)	0.91" (23)	2.64" (67)	1.42" (36)	45.9	PWBA38337
1.06" (27)	1.18" (30)	1.06" (27)	0.91" (23)	2.64" (67)	1.42" (36)	81.2	PWBA38227

PWBA18/38

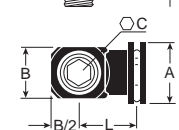


PWBA38



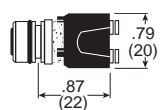
Threshold Sensors

Banjo Socket

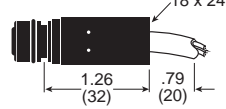


A	B	C	H	K	L	Part number
.98 (25)	.43 (11)	5/16" Hex	.79 (20)	.40 (10)	.67 (17)	PWSB1557
.98 (25)	.63 (16)	3/16" Allen	.71 (18)	.40 (10)	.79 (20)	PWSB1887
.98 (25)	.83 (21)	5/16" Allen	.71 (18)	.40 (10)	.87 (22)	PWSB1997
.98 (25)	1.10 (28)	3/8" Allen	.79 (20)	.47 (12)	.98 (25)	PWSB1337
.98 (25)	1.30 (33)	1/2" Allen	.93 (24)	.55 (14)	1.02 (26)	PWSB1227

PWSP111

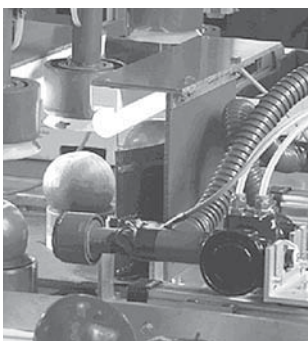


PWSM1012



D

Accessories
 Valve Products



Air Preparation Products

Modular Air Preparation Products

Global FRL's



- Port size: 1/4 through 3/4 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -13°F through 150°F
- Flows to 212 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

E3

Dryer Products

Dryer Products



- Refrigeration (10-2400 SCFM)
- Inline desiccant (15-60 SCFM)
- Regenerative desiccant (3-800 SCFM)
- Zero loss & timer drains
- Environmentally friendly refrigerant

E101

General Industrial Air Preparation Products

Miniature, Compact, Standard, Hi-Flow



- Port size: 1/8 through 3 inch
- Maximum supply pressure: 250 PSIG
- Operating temperature: -14°F through 176°F
- Flows to 2900 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

E27

Stainless Steel Air Preparation Products

Stainless Steel FRL's



- Port sizes: 1/4 and 1/2 inch
- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- Filters, regulators, filter / regulators, and lubricators

E82

Precision / Proportional Regulator Products

Precision / Proportional Regulators



- Port sizes: 1/4 through 2 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -40°F through 200°F
- Flows to 1600 SCFM
- Electronic proportional

E89

- Integral 1/4", 3/8", 1/2", or 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting



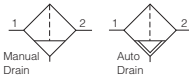
E
Modular
Air Preparation Products

Operating information

	P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max)			
Plastic Bowl	10 bar (150 PSIG)	10 bar (150 PSIG)	10 bar (150 PSIG)
Metal Bowl	17 bar (250 PSIG)	17 bar (250 PSIG)	17 bar (250 PSIG)
Operating temperature			
Plastic Bowl	-10°C to 52°C (14°F to 25°F)	-25°C to 52°C (-13°F to 25°F)	-25°C to 52°C (-13°F to 25°F)
Metal Bowl	-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Standard filtration	5 micron	5 micron	5 micron
Flow Capacity*			
1/4	12 dm ³ /s (25 SCFM)	18 dm ³ /s (38 SCFM)	—
3/8	—	30 dm ³ /s (64 SCFM)	—
1/2	—	38 dm ³ /s (80 SCFM)	40 dm ³ /s (85 SCFM)
3/4	—	—	48 dm ³ /s (102 SCFM)

*Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.34 bar (4.9 PSIG).

For technical information see CD



Particulate Filters

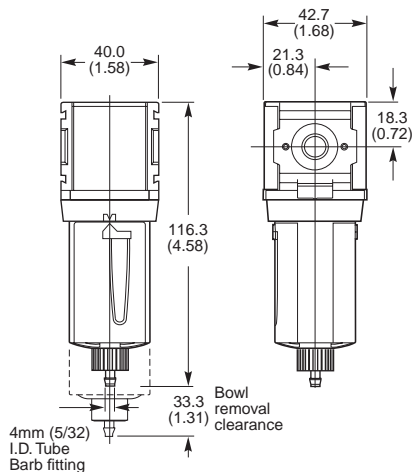
Port size	Bowl type	Drain type	Element type	Part number		
				P31	P32	P33
1/4"	Poly	Manual	5 micron	P31F*92EGMN	P32F*92EGMN	
1/4"	Poly	Pulse	5 micron	P31F*92EGBN		
1/4"	Poly	Auto	5 micron		P32F*92EGAN	
1/4"	Metal	Manual	5 micron	P31F*92EMMN	P32F*92ESMN	
1/4"	Metal	Pulse	5 micron	P31F*92EMBN		
1/4"	Metal	Auto	5 micron		P32F*92ESAN	
3/8"	Poly	Manual	5 micron		P32F*93EGMN	
3/8"	Poly	Auto	5 micron		P32F*93EGAN	
3/8"	Metal	Manual	5 micron		P32F*93ESMN	
3/8"	Metal	Auto	5 micron		P32F*93ESAN	
1/2"	Poly	Manual	5 micron		P32F*94EGMN	P33F*94EGMN
1/2"	Poly	Auto	5 micron		P32F*94EGAN	P33F*94EGAN
1/2"	Metal	Manual	5 micron		P32F*94ESMN	P33F*94ESMN
1/2"	Metal	Auto	5 micron		P32F*94ESAN	P33F*94ESAN
3/4"	Poly	Manual	5 micron			P33F*96EGMN
3/4"	Poly	Auto	5 micron			P33F*96EGAN
3/4"	Metal	Manual	5 micron			P33F*96ESMN
3/4"	Metal	Auto	5 micron			P33F*96ESAN

Most popular.

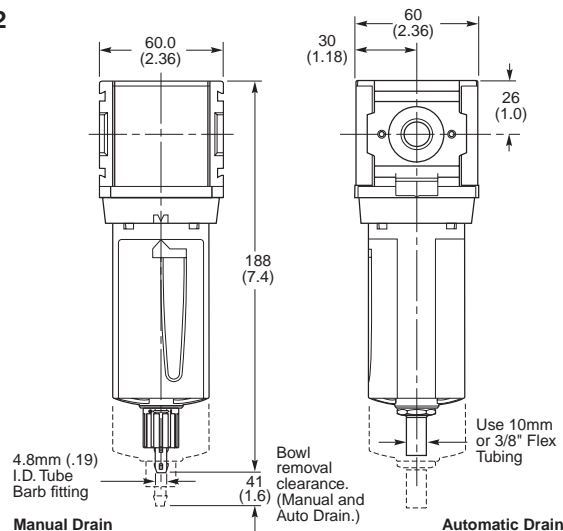
* Engineering Level will be entered at factory.



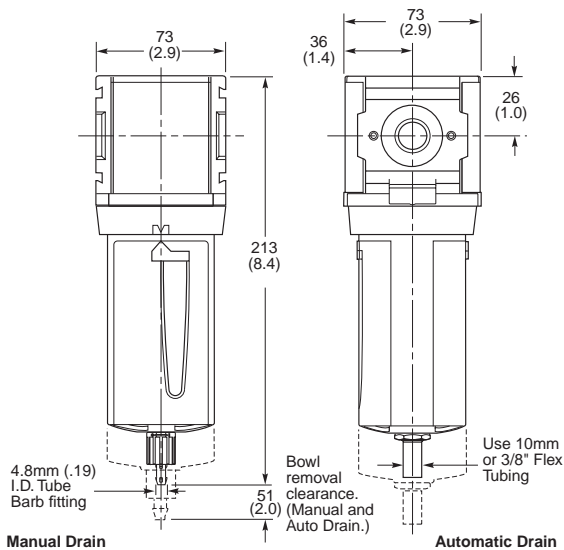
P31



P32



P33



Material specification

Body	Aluminum	
Body cap	ABS	
Bowls	Plastic	Polycarbonate
	Metal	Aluminum
Bowl guard	Nylon	
Deflector	(P32 and P33) Polypropylene	
Element retainer/baffle	Acetal	
Filter element	Sintered polyethylene	
Adsorber	Activated carbon	
Seals	Nitrile	
Sight gauge	(P32 and P33) Polycarbonate	

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	P31KA00BGM	P32KA00BGM	P33KA00BGM
	Pulse drain	P31KA00BGB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl w/o sight gauge	Manual drain	P31KA00BMM		
	Pulse drain	P31KA00BMB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl / sight gauge	Manual drain		P32KA00BSM	P33KA00BSM
	Auto drain		P32KA00DA	P32KA00DA
Filter element	5µ particulate	P31KA00ESE	P32KA00ESE	P33KA00ESE
C-bracket	Fits to body	P31KA00MW		
L-bracket	Fits to body		P32KA00ML	P33KA00ML
T-bracket	Fits to body connector		P32KA00MB	P32KA00MB
	With body connector	P31KA00MT	P32KA00MT	P33KA00MT
Body connector		P31KA00CB	P32KA00CB	P32KA00CB
Differential pressure indicator (replacement)			P32KA00DM	P32KA00DM

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Removes liquid aerosols and sub micron particles
- Oil free air for critical applications, such as air gauging, pneumatic instrumentation and control
- Positive bayonet latch to ensure correct & safe fitting
- Adsorbing activated carbon element removes oil vapors and most hydrocarbons

Note: To optimize the life of coalescing element, it is advisable to install a pre-filter with a 5 micron element upstream of the coalescing filter. To optimize the life of an Adsorber it is advisable to install a Coalescing Filter upstream of the Adsorber. Adsorber element should be replaced approximately every 1000 hours of service.



Operating information

	P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max)			
Plastic Bowl	10 bar (150 PSIG)	10 bar (150 PSIG)	10 bar (150 PSIG)
Metal Bowl	17 bar (250 PSIG)	17 bar (250 PSIG)	17 bar (250 PSIG)
Operating temperature			
Plastic Bowl	-10°C to 52°C (14°F to 125°F)	-25°C to 52°C (-13°F to 125°F)	-25°C to 52°C (-13°F to 125°F)
Metal Bowl	-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Standard filtration	1.0 and 0.01 micron	1.0 and 0.01 micron	1.0 and 0.01 micron
Flow Capacity			
1.0 Micron Coalescing			
Energy Efficient Flow*	3.8 dm³/s (8 SCFM)	17 dm³/s (36 SCFM)	32 dm³/s (68 SCFM)
Maximum Flow**	6 dm³/s (13 SCFM)	27 dm³/s (57 SCFM)	44 dm³/s (93 SCFM)
0.01 Micron Coalescing			
Energy Efficient Flow*	2 dm³/s (4.2 SCFM)	11 dm³/s (23 SCFM)	20 dm³/s (42 SCFM)
Maximum Flow**	3.8 dm³/s (8 SCFM)	28 dm³/s (38 SCFM)	34 dm³/s (72 SCFM)
Activated Carbon Adsorber			
Rated Flow*	6 dm³/s (13 SCFM)	27 dm³/s (57 SCFM)	44 dm³/s (93 SCFM)

* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.2 bar (3 PSIG) saturated element.
 ** Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.4 bar (6 PSIG) saturated element.

For technical information see CD

Coalescing and Adsorber Filters, (1 micron and absorber elements available)

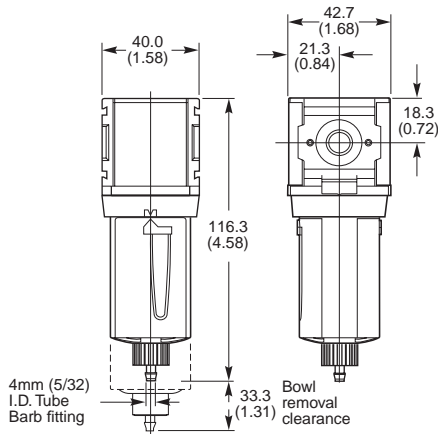
	Port size	Bowl type	Drain type	Element type	Part number		
					P31	P32	P33
	1/4"	Poly	Manual	0.01 micron	P31F*92CGMN	P32F*92DGMN	
	1/4"	Poly	Pulse	0.01 micron	P31F*92CGBN		
	1/4"	Poly	Auto	0.01 micron		P32F*92DGAN	
	1/4"	Metal	Manual	0.01 micron	P31F*92CMMN	P32F*92DSMN	
	1/4"	Metal	Pulse	0.01 micron	P31F*92CMBN		
	1/4"	Metal	Auto	0.01 micron		P32F*92DSAN	
	3/8"	Poly	Manual	0.01 micron		P32F*93DGMN	
	3/8"	Poly	Auto	0.01 micron		P32F*93DGAN	
	3/8"	Metal	Manual	0.01 micron		P32F*93DSMN	
	3/8"	Metal	Auto	0.01 micron		P32F*93DSAN	
	1/2"	Poly	Manual	0.01 micron		P32F*94DGMN	P33F*94DGMN
	1/2"	Poly	Auto	0.01 micron		P32F*94DGAN	P33F*94DGAN
	1/2"	Metal	Manual	0.01 micron		P32F*94DSMN	P33F*94DSMN
	1/2"	Metal	Auto	0.01 micron		P32F*94DSAN	P33F*94DSAN
	3/4"	Poly	Manual	0.01 micron			P33F*96DGMN
	3/4"	Poly	Auto	0.01 micron			P33F*96DGAN
3/4"	Metal	Manual	0.01 micron			P33F*96DSMN	
3/4"	Metal	Auto	0.01 micron			P33F*96DSAN	

Most popular.

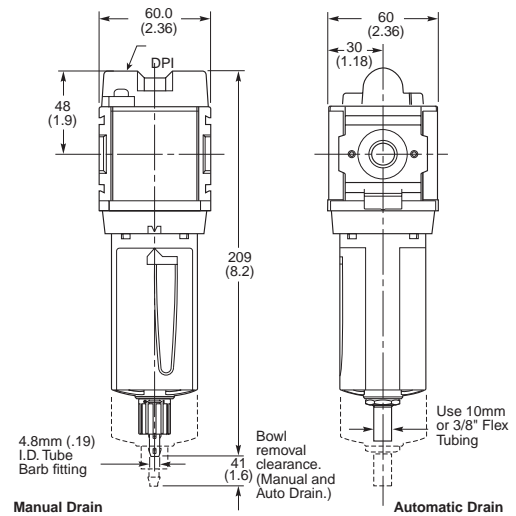
* Engineering Level will be entered at factory.



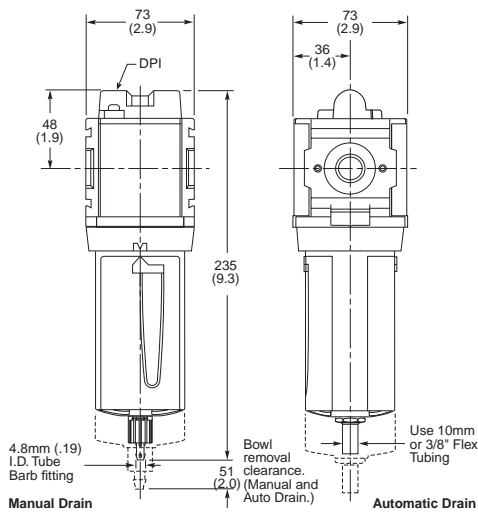
P31



P32



P33



Material specification

Body	Aluminum	
Body cap	ABS	
Bowls	Plastic	Polycarbonate
	Metal	Aluminum
Bowl guard	Nylon	
Filter element	Borosilicate cloth, 1.0 and .01 micron	
Adsorber	Activated carbon	
Seals	Nitrile	
Sight gauge	Polycarbonate	

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	P31KA00BGM	P32KA00BGM	P33KA00BGM
	Pulse drain	P31KA00BGB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl w/o sight gauge	Manual drain	P31KA00BMM		
	Pulse drain	P31KA00BMB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl / sight gauge	Manual drain		P32KA00BSM	P33KA00BSM
	Auto drain		P32KA00DA	P32KA00DA
Filter element	1µ coalescing	P31KA00ES9	P32KA00ES9	P33KA00ES9
	0.01µ coalescing	P31KA00ESC	P32KA00ESC	P33KA00ESC
	Activated carbon adsorber	P31KA00ESA	P32KA00ESA	P33KA00ESA
C-bracket	Fits to body	P31KA00MW		
L-bracket	Fits to body		P32KA00ML	P33KA00ML
T-bracket	Fits to body connector		P32KA00MB	P32KA00MB
	With body connector	P31KA00MT	P32KA00MT	P32KA00MT
Body connector		P31KA00CB	P32KA00CB	P32KA00CB
Differential pressure indicator (replacement)			P32KA00RQ	P32KA00RQ

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Robust but lightweight aluminum construction
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation.
- Relieving & Non-relieving types
- Non-rising knob



⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information				
	P31 (Mini)	P32 (Compact)	P33 (Standard)	
Supply pressure (max)	20 bar (300 PSIG)	20 bar (300 PSIG)	20 bar (300 PSIG)	
Operating temperature	-20°C to 65.5°C (-4°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	
Units with square gauges	-15°C to 65.5°C (5°F to 150°F)			
Flow Capacity*	1/4	30 dm ³ /s (64 SCFM)	41 dm ³ /s (81 SCFM)	—
	3/8	—	65 dm ³ /s (138 SCFM)	—
	1/2	—	67 dm ³ /s (142 SCFM)	100 dm ³ /s (212 SCFM)
	3/4	—	—	100 dm ³ /s (212 SCFM)

*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).
 For technical information see CD

Regulators



Port size	Pressure (relieving)	Gauge	Part number		
			P31	P32	P33
1/4"	8 bar (125 PSIG)	—	P31R*92BNNP	P32R*92BNNP	
1/4"	8 bar (125 PSIG)	Round	P31R*92BN5P	P32R*92BNGP	
3/8"	8 bar (125 PSIG)	—		P32R*93BNNP	
3/8"	8 bar (125 PSIG)	Round		P32R*93BNGP	
1/2"	8 bar (125 PSIG)	—		P32R*94BNNP	P33R*94BNNP
1/2"	8 bar (125 PSIG)	Round		P32R*94BNGP	P33R*94BNGP
3/4"	8 bar (125 PSIG)	—			P33R*96BNNP
3/4"	8 bar (125 PSIG)	Round			P33R*96BNGP

* Engineering Level will be entered at factory.

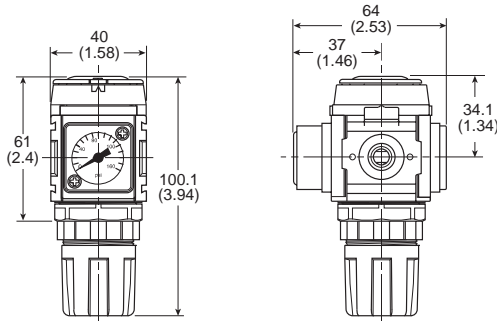
Material specifications

Description	P31	P32	P33
Body	Aluminum	Aluminum	Aluminum
Adjustment knob	Acetal	Acetal	Acetal
Body cap	ABS	ABS	ABS
Bonnet	PBT	33% glass-filled nylon	33% glass-filled nylon
Diaphragm assembly	Brass/nitrile	Nitrile/zinc	Nitrile/zinc
Bottom plug	33% glass-filled nylon	33% glass-filled nylon	—
Valve assembly	Brass/nitrile	Brass/nitrile	Brass/nitrile/acetal
Springs	Steel	Steel S.S. (main regulating valve)	Steel S.S. (main regulating valve)
Seals	Nitrile	Nitrile	Nitrile
Panel nut	Acetal	Acetal	Acetal

Most popular.

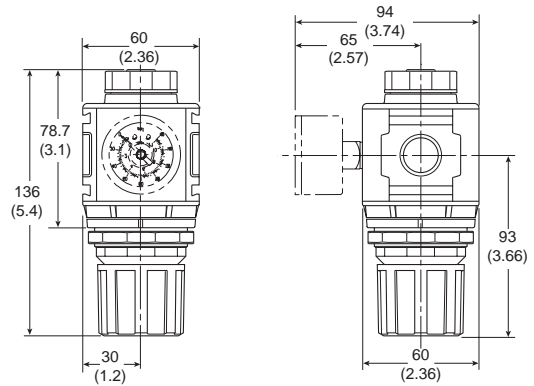


P31



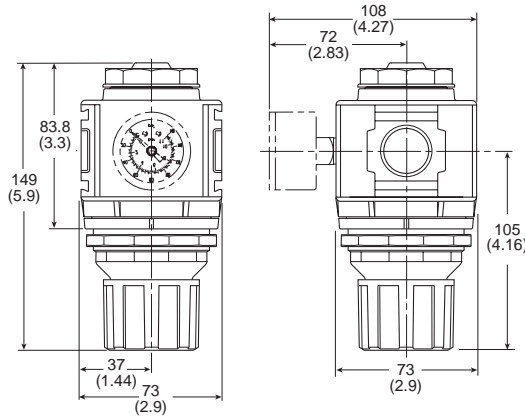
NOTE: 31.7 mm (1.25 in.) hole required for panel nut mounting.

P32



NOTE: 51 mm (2.00 in.) hole required for panel nut mounting.

P33

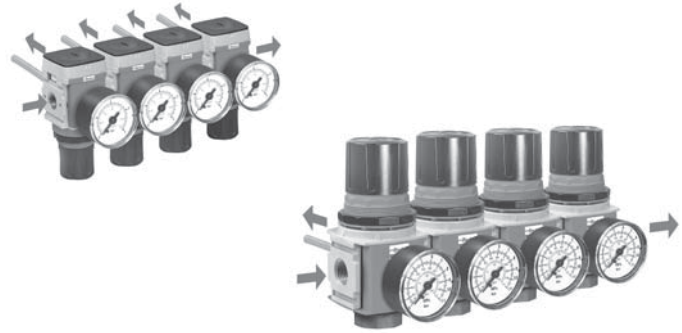


NOTE: 61 mm (2.40 in.) hole required for panel nut mounting.

Service kits

Description		P31	P32	P33
Regulator repair kit	Relieving	P31KA00RC	P32KA00RC	P33KA00RC
	Non-relieving	P31KA00RH	P32KA00RH	P33KA00RH
Panel mount nut	Aluminum	P31KA00MM	P32KA00MM	P33KA00MM
	Plastic	P31KA00MP	P32KA00MP	P33KA00MP
Angle bracket	Uses panel mount threads	P31KA00MR	P32KA00MR	P33KA00MR
C-bracket	Fits to body	P31KA00MW		
T-Bracket	With body connector	P31KA00MT	P32KA00MT	P32KA00MT
T-Bracket				P32KA00MB
Body connector		P31KA00CB	P32KA00CB	P32KA00CB
Gauges - square flush mount gauge	0-4 bar	K4511SCR04B		
	0-10 bar	K4511SCR11B		
	0-60 PSIG	K4511SCR060		
	0-150 PSIG	K4511SCR150		
1.00" round 1/8" center back mount	0-60 PSIG/0-4 bar	K4510N18060		
	0-160 PSIG/0-11 bar	K4510N18160		
40mm round 1/8" center back mount	0-30 PSIG/0-2 bar	K4515N18030		
	0-60 PSIG/0-4 bar	K4515N18060		
	0-160 PSIG/0-11 bar	K4515N18160		
50mm (2") round 1/4" center back mount	0-30 PSIG/0-2 bar/0-0.2 MPa		K4520N14030	K4520N14030
	0-60 PSIG/0-4 bar/0-0.4 MPa		K4520N14060	K4520N14060
	0-160 PSIG/0-11 bar/0-1.1 MPa		K4520N14160	K4520N14160
	0-300 PSIG/0-20 bar/0-2 MPa		K4520N14300	K4520N14300

- Manifold style regulator with line pressure on both sides.
- Pressure output is at front or rear.
- Integral 1/4", 3/8" or 1/2" ports (NPT, BSPP & BSPT)
- Robust construction
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG), 0-17 bar (0-250 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Relieving & Non-relieving types
- Non-rising knob



⚠ WARNING

**Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.**

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	P31 (Mini)	P32 (Compact)
Supply pressure (max)	20 bar (300 PSIG)	20 bar (300 PSIG)
Operating temperature	-20°C to 65.5°C (-4°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Flow Capacity*	1/4 18 dm ³ /s (38 SCFM)	28 dm ³ /s (59 SCFM)
	3/8 –	28 dm ³ /s (59 SCFM)
	1/2 –	28 dm ³ /s (59 SCFM)

*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).
 For technical information see CD

Regulators



Port size	Pressure	Part number	
		P31	P32
1/4"	8 bar (125 PSIG) relieving	P31H*92BNNP	P32H*92BNNP
3/8"	8 bar (125 PSIG) relieving		P32H*93BNNP
1/2"	8 bar (125 PSIG) relieving		P32H*94BNNP

* Engineering Level will be entered at factory.

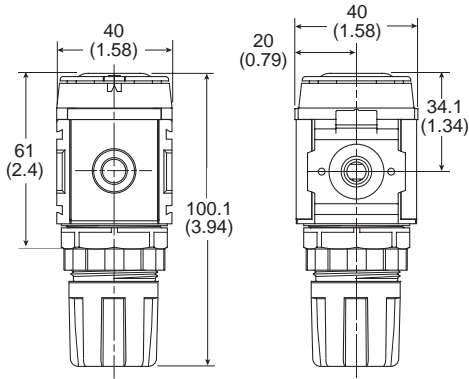
Material specifications

Description	P31	P32
Body	Zinc	Zinc
Adjustment knob	Acetal	Acetal
Body cap	ABS	ABS
Bonnet	33% Glass-filled PBT	33% Glass-Filled Nylon
Diaphragm assembly	Brass/Nitrile	Nitrile/Zinc
Bottom plug	33% Glass-Filled Nylon	33% Glass-Filled Nylon
Valve assembly	Brass/nitrile	Brass/nitrile
Springs		Steel S.S. (main regulating valve)
Seals		Nitrile
Panel nut		Acetal

 Most popular.

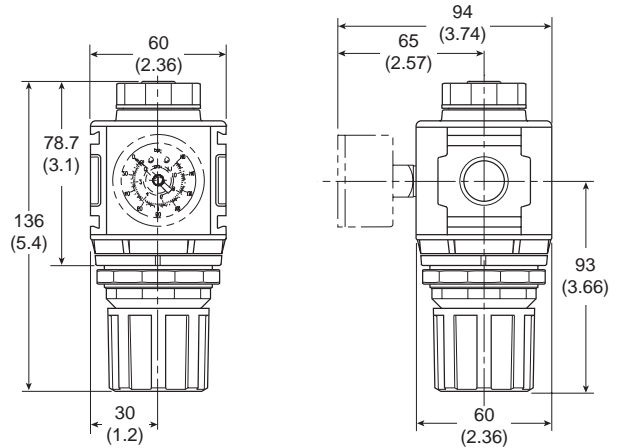


P31



NOTE: 31.7 mm (1.25 in.) hole required for panel nut mounting.

P32



NOTE: 51 mm (2.00 in.) hole required for panel nut mounting.

Service kits

Description		P31	P32	
Regulator repair kit	Relieving	P31KA00RC	P32KA00RC	
	Non-relieving	P31KA00RH	P32KA00RH	
Panel mount nut	Aluminum	P31KA00MM	P32KA00MM	
	Plastic	P31KA00MP	P32KA00MP	
Angle Bracket (uses panel mount threads)		P31KA00MR	P32KA00MR	
T-bracket	With body connector	P31KA00MT	P32KA00MT	
	Fits to body connector	P31KA00MB	P32KA00MB	
Body connector		P31KA00CB	P32KA00CB	
Gauges	1.00" round 1/8" center back mount	0-60 PSIG/0-4 bar	K4510N18060	
		0-160 PSIG/0-11 bar	K4510N18160	
	50mm (2") round 1/4" center back mount	0-30 PSIG/0-2 bar/0-0.2 MPa		K4520N14030
		0-60 PSIG/0-4 bar/0-0.4 MPa		K4520N14060
		0-160 PSIG/0-11 bar/0-1.1 MPa		K4520N14160
		0-300 PSIG/0-20 bar/0-2 MPa		K4520N14300

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG), 0-17 bar (0-250 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation

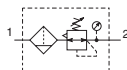


⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.



Operating information

	P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max)			
Plastic Bowl	10 bar (150 PSIG)	10 bar (150 PSIG)	10 bar (150 PSIG)
Metal Bowl	17 bar (250 PSIG)	17 bar (250 PSIG)	17 bar (250 PSIG)
Operating temperature			
Plastic Bowl	-10°C to 52°C (14°F to 125°F)	-25°C to 52°C (-13°F to 125°F)	-25°C to 52°C (-13°F to 125°F)
Metal Bowl	-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Units with square gauges	-15°C to 65.5°C (5°F to 150°F)		
Standard filtration	5 micron	5 micron	5 micron
Flow Capacity*			
1/4	14 dm³/s (30 SCFM)	42 dm³/s (89 SCFM)	–
3/8	–	58 dm³/s (123 SCFM)	–
1/2	–	64 dm³/s (136 SCFM)	90 (191 SCFM)
3/4	–	–	98 dm³/s (208 SCFM)

*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).
 For technical information see CD

Filter / Regulator

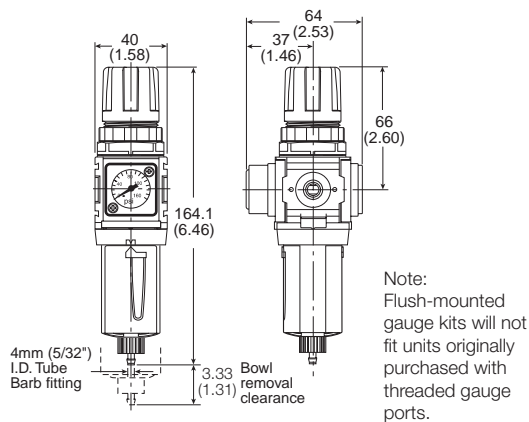
	Port size	Pressure (relieving)	Bowl type	Drain type	Part number		
					P31	P32	P33
	1/4"	8 bar (125 PSIG)	Poly	Manual	P31E*92EGMBN5P	P32E*92EGMBNGP	
	1/4"	8 bar (125 PSIG)	Poly	Pulse	P31E*92EGBBN5P		
	1/4"	8 bar (125 PSIG)	Poly	Auto		P32E*92EGMBNGP	
	1/4"	8 bar (125 PSIG)	Metal	Manual	P31E*92EMMBN5P	P32E*92ESMBNGP	
	1/4"	8 bar (125 PSIG)	Metal	Pulse	P31E*92EMBBN5P		
	1/4"	8 bar (125 PSIG)	Metal	Auto		P32E*92ESABNGP	
	3/8"	8 bar (125 PSIG)	Poly	Manual		P32E*93EGMBNGP	
	3/8"	8 bar (125 PSIG)	Poly	Auto		P32E*93EGABNGP	
	3/8"	8 bar (125 PSIG)	Metal	Manual		P32E*93ESMBNGP	
	3/8"	8 bar (125 PSIG)	Metal	Auto		P32E*93ESABNGP	
	1/2"	8 bar (125 PSIG)	Poly	Manual		P32E*94EGMBNGP	P33E*94EGMBNGP
	1/2"	8 bar (125 PSIG)	Poly	Auto		P32E*94EGABNGP	P33E*94EGABNGP
	1/2"	8 bar (125 PSIG)	Metal	Manual		P32E*94ESMBNGP	P33E*94ESMBNGP
	1/2"	8 bar (125 PSIG)	Metal	Auto		P32E*94ESABNGP	P33E*94ESABNGP
	3/4"	8 bar (125 PSIG)	Poly	Manual			P33E*96EGMBNGP
	3/4"	8 bar (125 PSIG)	Poly	Auto			P33E*96EGABNGP
	3/4"	8 bar (125 PSIG)	Metal	Manual			P33E*96ESMBNGP
	3/4"	8 bar (125 PSIG)	Metal	Auto			P33E*96ESABNGP

Most popular.

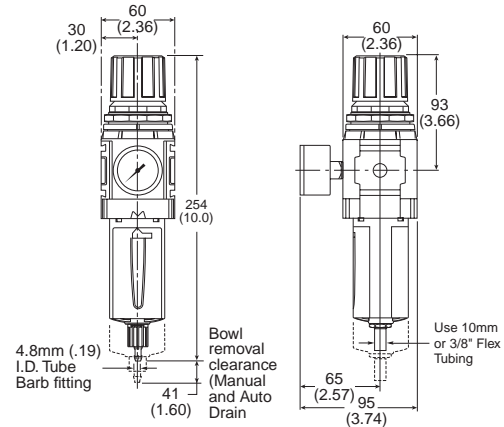
* Engineering Level will be entered at factory.



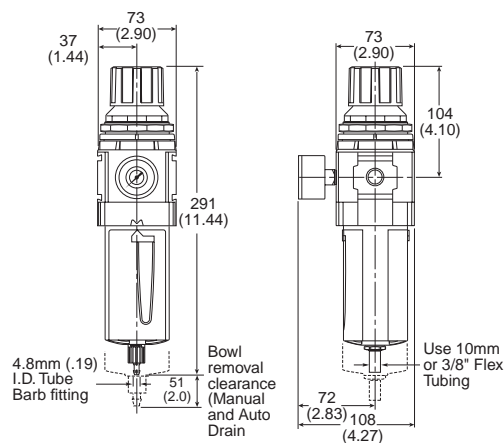
P31



P32



P33



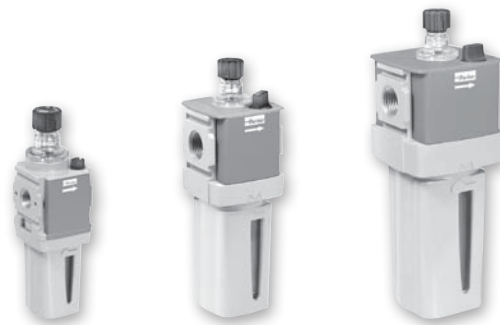
Material Specifications

Body	Aluminum
Adjustment knob	Acetal
Body cap	ABS
Bonnet	(P31) PBT
Element retainer/baffle	Acetal
Bowl	Plastic Polycarbonate Metal (P31 and P33) Aluminum, (P32) Zinc
Bowl guard	Nylon
Filter element	Polyethylene
Seals	Nitrile
Springs	Steel
Valve assembly	Brass/nitrile
Diaphragm assembly	(P31) Brass/nitrile (P32 and P33) Nitrile/zinc
Panel nut	Acetal
Sight gauge	Polycarbonate

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	P31KA00BGM	P32KA00BGM	P33KA00BGM
	Pulse drain	P31KA00BGB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl w/o sight gauge	Manual drain	P31KA00BMM		
	Pulse drain	P31KA00BMB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl / sight gauge	Manual drain		P32KA00BSM	P33KA00BSM
	Auto drain		P32KA00DA	P32KA00DA
Filter element	5µ particulate	P31KA00ESE	P32KA00ESE	P33KA00ESE
Regulator repair kit	Relieving	P31KA00RC	P32KA00RC	P33KA00RC
	Non-relieving	P31KA00RH	P32KA00RH	P33KA00RH
	Aluminum	P31KA00MM	P32KA00MM	P33KA00MM
Panel mount nut	Plastic	P31KA00MP	P32KA00MP	P33KA00MP
	Aluminum	P31KA00MR	P32KA00MR	P33KA00MR
Angle bracket (uses panel mount threads)		P31KA00MR	P32KA00MR	P33KA00MR
C-bracket	Fits to body	P31KA00MW		
T-bracket	Fits to body connector		P32KA00MB	P32KA00MB
	With body connector	P31KA00MT	P32KA00MT	P32KA00MT
Body connector		P31KA00CB	P32KA00CB	P32KA00CB
Gauges - square flush mount gauge	0-4 bar	K4511SCR04B		
	0-10 bar	K4511SCR11B		
	0-60 PSIG	K4511SCR060		
	0-150 PSIG	K4511SCR150		
	50mm (2") round 1/4" center back mount	0-30 PSIG/0-2 bar/0-0.2 MPa		K4520N14030
	0-60 PSIG/0-4 bar/0-0.4 MPa		K4520N14060	K4520N14060
	0-160 PSIG/0-11 bar/0-1.1 MPa		K4520N14160	K4520N14160
	0-300 PSIG/0-20 bar/0-2 MPa		K4520N14300	K4520N14300

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Robust but lightweight aluminum construction
- Proportional oil delivery over a wide range of air flows
- Finger tip ratchet control for precise oil drip rate adjustment



Operating information

Supply pressure (max)	Plastic Bowl Metal Bowl	10 bar (150 PSIG) 17 bar (250 PSIG)
Operating temperature	Plastic Bowl Metal Bowl	-10°C to 52°C (14°F to 125°F) -10°C to 65.5°C (14°F to 150°F)
Standard filtration	5 micron	

		P31 (Mini)	P32 (Compact)	P33 (Standard)
Flow Capacity*	1/4	13 dm ³ /s (28 SCFM)	18 dm ³ /s (38 SCFM)	–
	3/8	–	32 dm ³ /s (68 SCFM)	–
	1/2	–	47 dm ³ /s (100 SCFM)	48 (102 SCFM)
	3/4	–	–	68 dm ³ /s (144 SCFM)

* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.34 bar (4.9 PSIG).

For technical information see CD



Lubricators



Port size	Bowl type	Type	Part number		
			P31	P32	P33
1/4"	Poly / no drain	Mist	P31L*92LGNN	P32L*92LGNN	
1/4"	Metal / no drain	Mist / sight gauge	P31L*92LMNN	P32L*92LSNN	
3/8"	Poly / no drain	Mist		P32L*93LGNN	
3/8"	Metal / no drain	Mist / sight gauge		P32L*93LSNN	
1/2"	Poly / no drain	Mist		P32L*94LGNN	P33L*94LGNN
1/2"	Metal / no drain	Mist / sight gauge		P32L*94LSNN	P33L*94LSNN
3/4"	Poly / no drain	Mist			P33L*96LGNN
3/4"	Metal / no drain	Mist / sight gauge			P33L*96LSNN

* Engineering Level will be entered at factory.

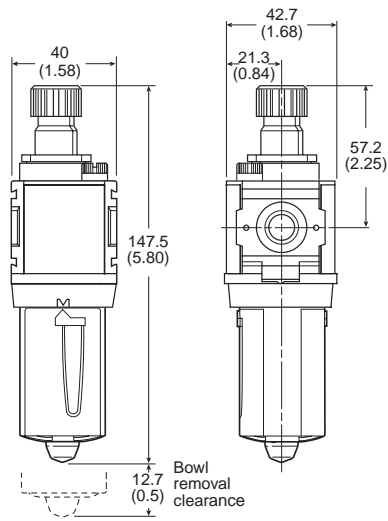
Material specifications

Body	Aluminum	
Body cap	ABS	
Bowl	Plastic	Polycarbonate
	Metal	Aluminum
Bowl guard	Nylon	
Seals	Nitrile	
Sight dome	Polycarbonate	
Sight gauge	(P32 and P33) Polycarbonate	
Suggested lubricant	ISO/ASTM VG 32	
Pick-up filter	Sintered Bronze	

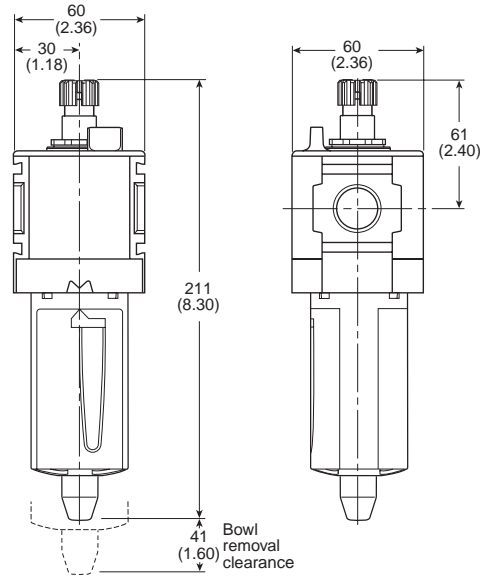
Most popular.



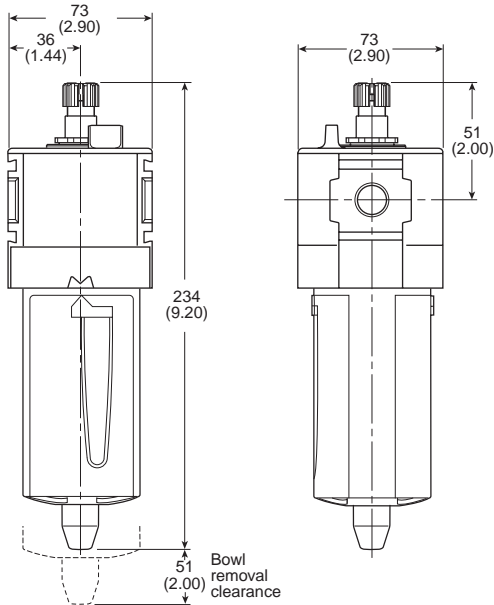
P31



P32



P33



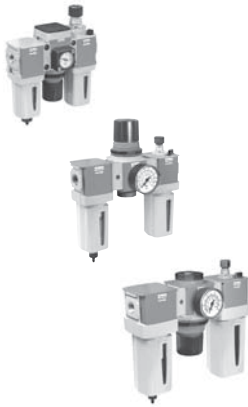
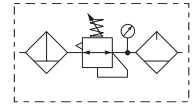
Service kits

Description	P31	P32	P33
Plastic bowl / bowl guard / no drain	P31KA00BGN	P32KA00BGN	P33KA00BGN
Drip control assembly	P32KA00PG	P32KA00PG	P32KA00PG
Fill plug	P31KA00PL	P32KA00PL	P32KA00PL
C-bracket	Fits to body P31KA00MW		
L-bracket		P32KA00ML	P33KA00ML
T-bracket	Fits to body connector With body connector P31KA00MT	P32KA00MB P32KA00MT	P32KA00MB P32KA00MT
Body connector	P31KA00CB	P32KA00CB	P32KA00CB
Lubricant*	F442	F442	F442

* Petroleum based oil of 100 to 200 SUS viscosity at 38°C (100°F) and an aniline point greater than 93°C (200°F). DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

Filter + Regulator + Lubricator Combinations + Poly Bowl

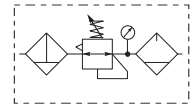
5 micron element, 8 bar (116 PSIG) Regulator + Gauge and Wall Mounting Brackets
 Inlet pressure 10 bar (145 PSIG), Secondary pressure 6.3 bar (91.3 PSIG),
 1 bar (14.5 PSIG) pressure drop.



Port size	Drain type	Part number		
		P31 Series	P32 Series	P33 Series
1/4"	Manual	P31CB92GEMN5LNW	P32CB92GEMNGLNW	
1/4"	Pulse	P31CB92GEBN5LNW		
1/4"	Auto		P32CB92GEANGLNW	
3/8"	Manual		P32CB93GEMNGLNW	
3/8"	Auto		P32CB93GEANGLNW	
1/2"	Manual		P32CB94GEMNGLNW	P33CB94GEMNGLNW
1/2"	Auto		P32CB94GEANGLNW	P33CB94GEANGLNW
3/4"	Manual			P33CB96GEMNGLNW
3/4"	Auto			P33CB96GEANGLNW

Filter / Regulator + Lubricator Combinations + Poly Bowl

5 micron element, 8 bar (116 PSIG) Regulator + Gauge and Wall Mounting Brackets
 Inlet pressure 10 bar (145 PSIG), Secondary pressure 6.3 bar (91.3 PSIG),
 1 bar (14.5 PSIG) pressure drop.



Port size	Drain type	Part number		
		P31 Series	P32 Series	P33 Series
1/4"	Manual	P31CA92GEMN5LNW	P32CA92GEMNGLNW	
1/4"	Pulse	P31CA92GEBN5LNW		
1/4"	Auto		P32CA92GEANGLNW	
3/8"	Manual		P32CA93GEMNGLNW	
3/8"	Auto		P32CA93GEANGLNW	
1/2"	Manual		P32CA94GEMNGLNW	P33CA94GEMNGLNW
1/2"	Auto		P32CA94GEANGLNW	P33CA94GEANGLNW
3/4"	Manual			P33CA96GEMNGLNW
3/4"	Auto			P33CA96GEANGLNW

⚠ WARNING
Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.

CAUTION:

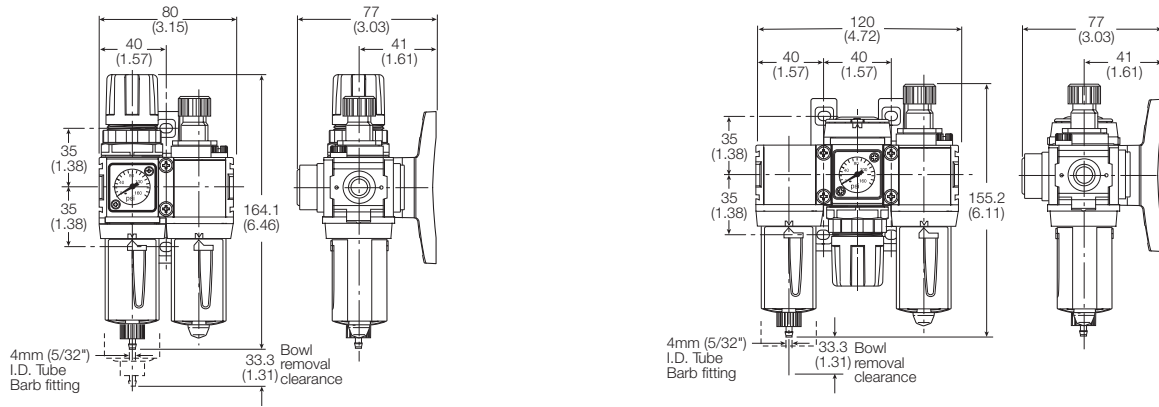
REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.

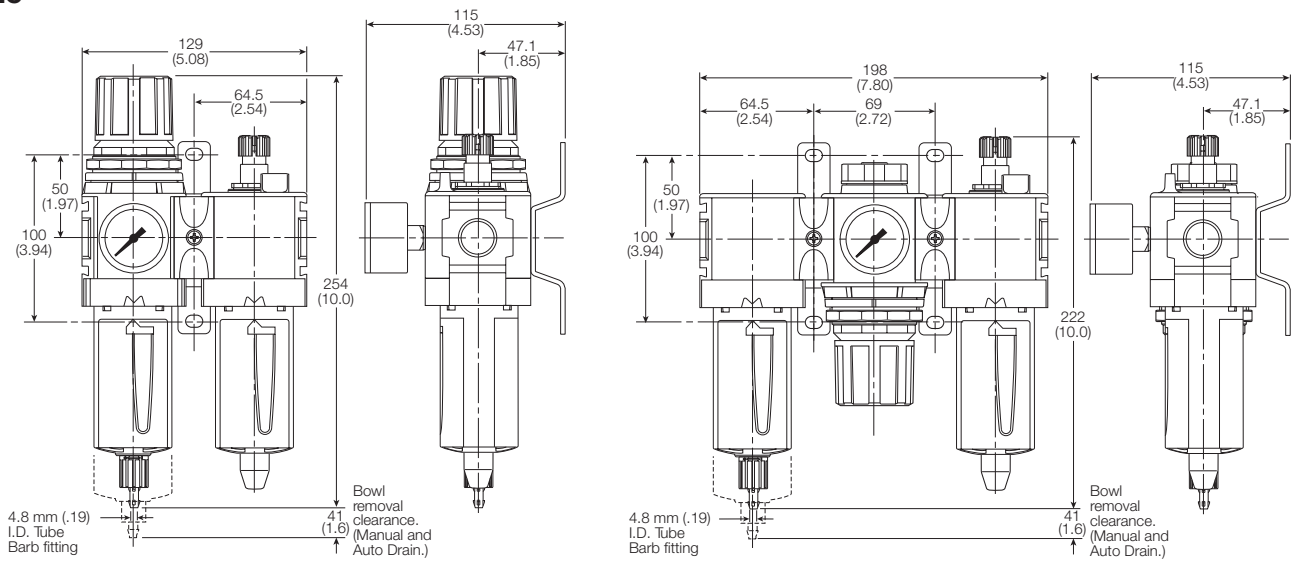
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

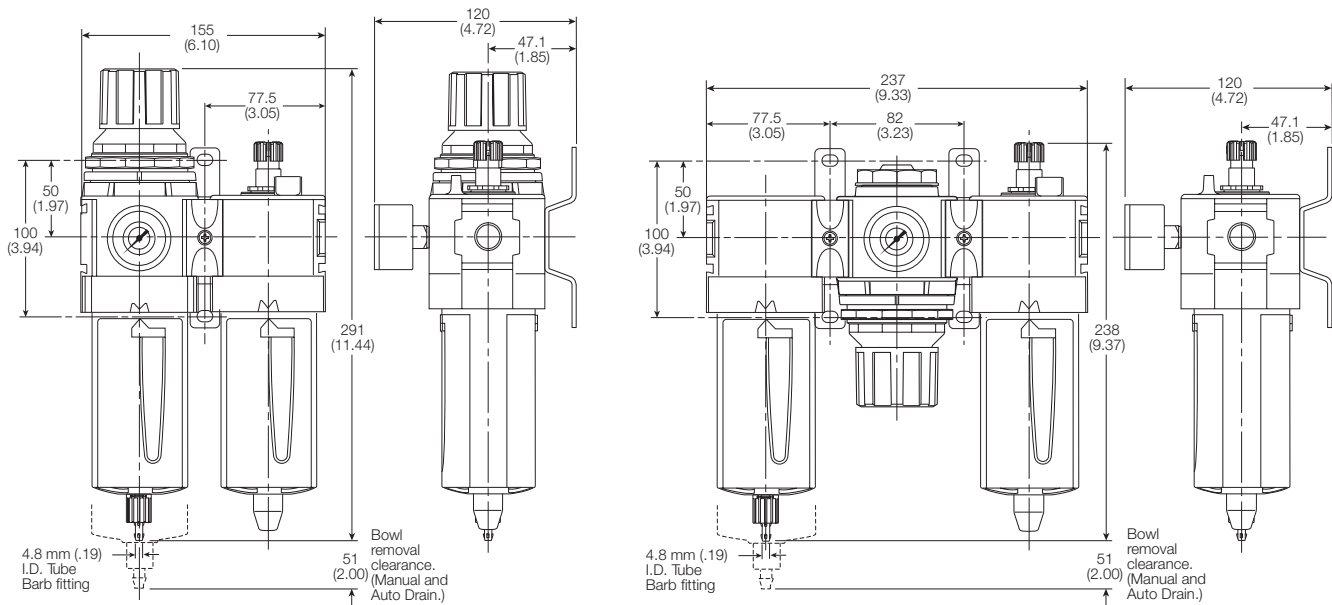
P31C



P32C



P33C



- Very fast response times
- Accurate output pressure
- Micro parameter settings
- Selectable I/O parameters
- Quick, full flow exhaust
- LED display indicates output pressure
- No air consumption in steady state
- Multiple mounting options
- Protection to IP65
- P31P flows to 19 dm³/s (40 scfm)
- P32P flows to 57 dm³/s (120 scfm)



P31P Series
Bottom exhaust



P32P Series
Bottom exhaust

Ordering information

P 3	P *	1	A
------------	------------	----------	----------

Body size	
Modular mini (1/4")	1
Modular compact (1/2")	2

Thread type	
BSPP	1
BSPT	2
NPT	9

Port size	
Modular mini (1/4")	2
Modular compact (1/2")	4

Version	
Bottom ported exhaust (NC)	A
Bottom ported forced exhaust (NO) [†]	E

Pressure range	
0 - 2 bar (0-29 PSIG)	Z
0 - 10 bar (0-145 PSIG)	D

Power supply	
24 Volts	2

Control signal	
0-10 V [‡] s	V

Output signal	
Digital, PNP	D
PNP or 0-10V	P
NPN or 0-10V	N
4-20mA fixed	M

D) Digital PNP output only, no analog output selectable
P) Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V)
N) Digital NPN and analogue 0-10V outputs selectable by means of parameter 6. (Factory default 0-10V)
M) Analog 4-20mA output only.
Note: On all analog outputs the F.S. value can be adjusted by means of parameter 8

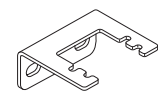
Input connector	
M12 (4-pin)	1

[†] When the supply voltage is lost the unit will automatically exhaust the regulated pressure to 0 bar (atmospheric pressure)

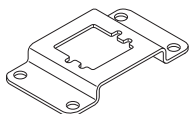
[‡] Factory setting is 0-10 V control signal. 4-20 mA control signal available via parameter 4 on keypad.

* Engineering Level will be entered at factory.

P31P mounting brackets



L-bracket



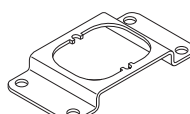
Foot bracket

Part number	Description
P3HKA00ML	L-bracket mounting kit
P3HKA00MC	Foot bracket mounting kit

P32P mounting brackets



L-bracket



Foot bracket

Part number	Description
P3KKA00ML	L-bracket mounting kit
P3KKA00MC	Foot bracket mounting kit

Note: These brackets fit both Proportional Regulators and Combined Soft Start & Dump Valves.

Cables

Part number	Description
CB-M12-4P-2M	2 mtr. cable with moulded straight M12x1 connector

Most popular.

Technical information

Working medium

Compressed air or inert gasses, filtered to 40µ.

Supply pressure

Max. Operating Pressure:

2 bar unit: 3 bar (43.5 PSIG)
 10 bar unit: 10.5 bar (152 PSIG)
 Min. Operating Pressure P2 Pressure + 0.5 bar (7.3 PSIG)

Pressure control range

Available in three pressure ranges, 0-2 bar (0-29 PSIG), 0-7 bar (0-101.5 PSIG) or 0-10 bar (0-145 PSIG). Pressure range can be changed through the software at all times. (parameter 19)

Temperature range

0°C up to +50°C (32°F up to 122°F)

Weights:

P31P = 0.291 kg (0.64 lbs)
 P32P = 0.645 kg (1.42 lbs)

Air consumption

No consumption in stable regulated situation.

Display

The regulator is provided with a digital display, indicating the output pressure, either in bar or PSIG.

The factory setting is as indicated on the label, can be changed through to software at all times (parameter 14)

Supply voltage

24 VDC +/- 10%

Power consumption

Max. 1.1W with unloaded signal outputs

Control signals

The electronic pressure regulator can be externally controlled through an analogue control signal of either 0-10V or 4-20mA. (parameter 4).

Output signals

As soon as the output pressure is within the signal band a signal is given of 24VDC, PNP Ri = 1 kOhm
 Outside the signal band this connection is 0V.

Connections

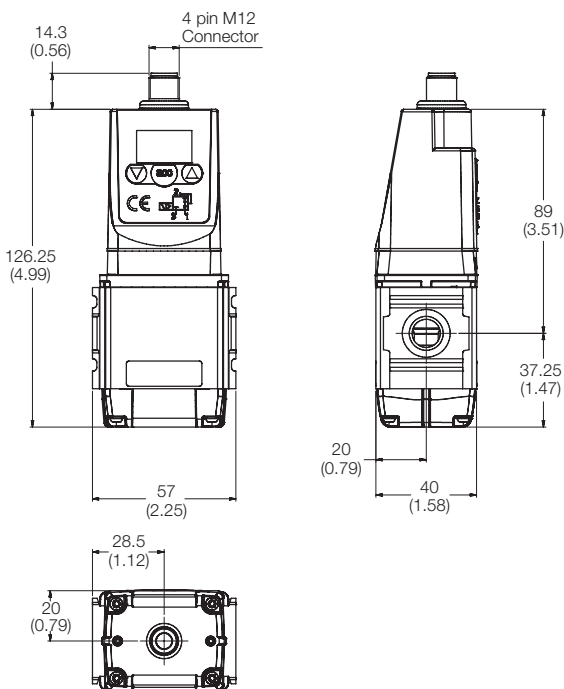
(In case of output signal (Option D)

Central M12 connector 4-pole

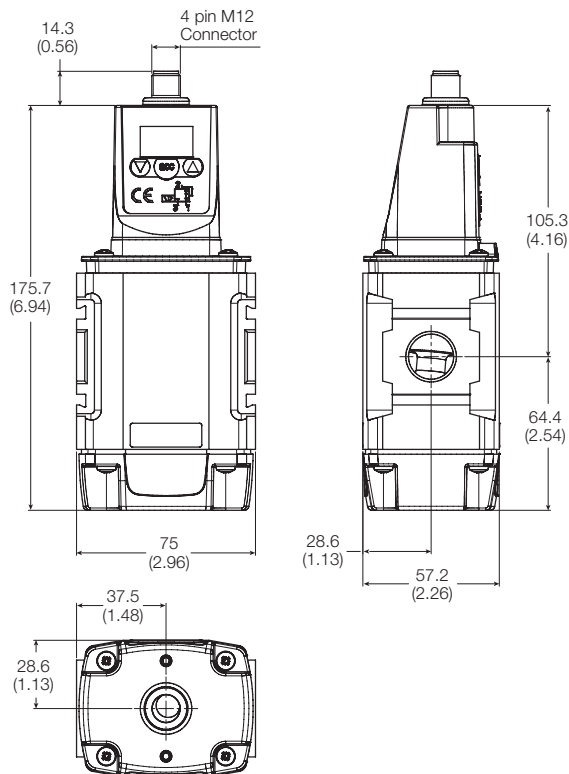
The electrical connections are as follows:

Pin number	Function	Color	
1	24 V	Supply	Brown
2	0 to 10 V	Control signal Ri = 100k W	White
	4 to 20mA	Control signal Ri = 500k W	
3	0 V (GND)	Supply	Blue
4	24 V	Alarm output signal	Black

P31P



P32P



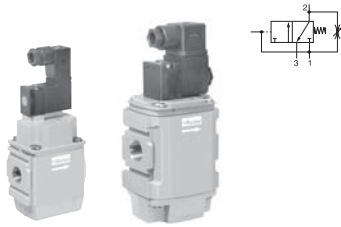
- Modular design with 1/4" or 1/2" integral ports (NPT, BSPP & BSPT)
- The 3-way, 2-position function automatically dumps downstream pressure on the loss of pilot signal
- Adjustable slow start
- Solenoid or air pilot options
- High flow & exhaust capability
- Silencer included

Operating information

Operating pressure (max)	Solenoid	10 bar (150 PSIG)
	Air pilot	17 bar (250 PSIG)
Operating pressure (min)		3 bar (44 PSIG)
Operating temperature (max)	Solenoid	50°C (122°F)
	Air pilot	80°C (176°F)
Flow Capacity*	P31 Series	17 dm ³ /s (36 SCFM)
	P32 Series	48 dm ³ /s (97 SCFM)

*Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 1 bar (14.5 PSIG).
 For technical information see CD

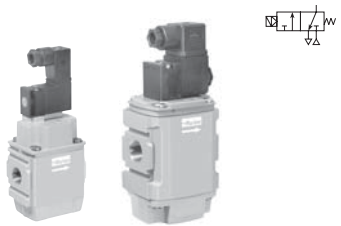
Combined Soft Start / Dump Valves (P31T / P32T)



Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	P31T*92SGNC1FN
1/4"	24VDC Solenoid & cable plug	P31T*92SGNC2CN
1/4"	External air pilot operated	P31T*92PPN
1/2"	120VAC 30mm coil & cable plug included	P32T*94SCNA3GN
1/2"	24VDC 30mm coil & cable plug included	P32T*94SCNA2CN
1/2"	External air pilot operated	P32T*94PPN

* Includes exhaust silencer. Flow with 6.3 bar (91.3) PSIG inlet and 1 bar (14.5 PSIG) pressure drop.

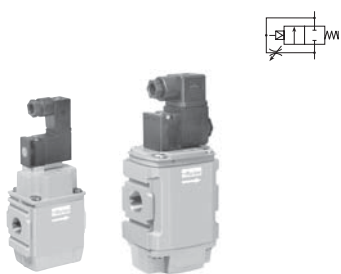
Dump Valves (P31D / P32D)



Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	P31D*92SGNC1FN
1/4"	24VDC Solenoid & cable plug	P31D*92SGNC2CN
1/4"	External air pilot operated	P31D*92PPN
1/2"	120VAC 30mm coil & cable plug included	P32D*94SCNA3GN
1/2"	24VDC 30mm coil & cable plug included	P32D*94SCNA2CN
1/2"	External air pilot operated	P32D*94PPN

* Includes exhaust silencer.

Soft Starts (P31S / P32S)



Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	P31S*92SGNC1FN
1/4"	24VDC Solenoid & cable plug	P31S*92SGNC2CN
1/4"	Internal air pilot operated	P31S*92Y0N
1/4"	External air pilot operated	P31S*92PPN
1/2"	120VAC 30mm coil & cable plug included	P32S*94SCNA3GN
1/2"	Internal air pilot operated	P32S*92Y0N
1/2"	24VDC 30mm coil & cable plug included	P32S*94SCNA2CN
1/2"	External air pilot operated	P32S*94PPN

Material specifications

Body	Aluminum
Body cover	Polyester
Seals	Nitrile NBR

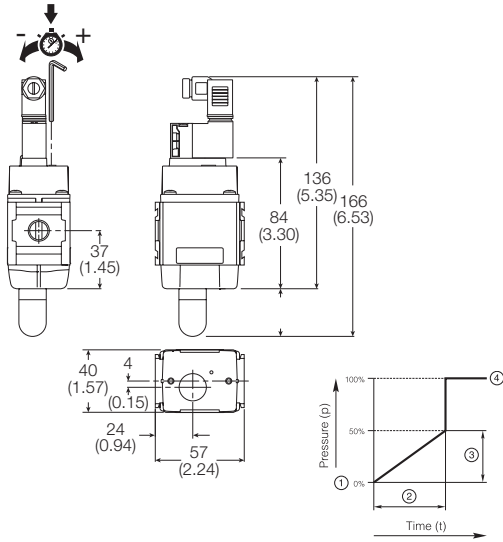
Most popular.

Mounting brackets

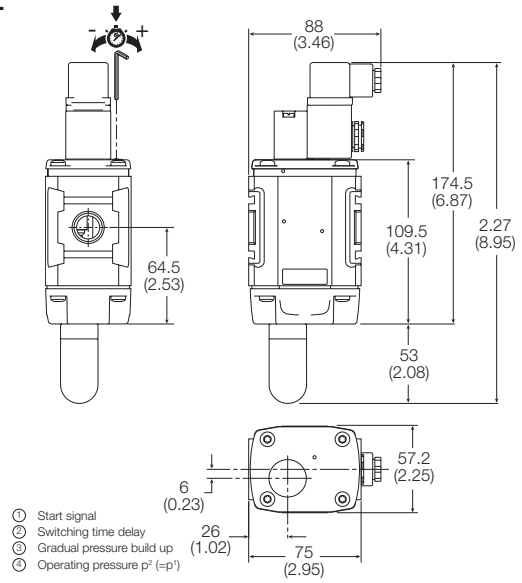
Description	P31 Series	P32 Series
L-bracket mounting kit	P3HKA00ML	P3KKA00ML
Foot bracket mounting kit	P3HKA00MC	P3KKA00MC

Note:
 For solenoid operators and cable plugs (connectors) see pages E21 to E22.

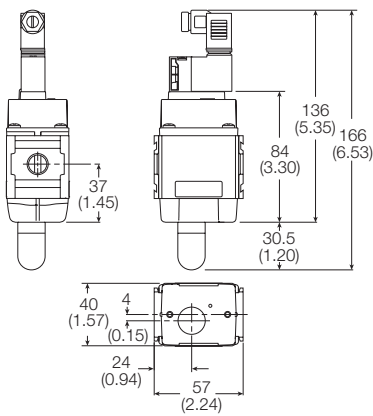
P31T



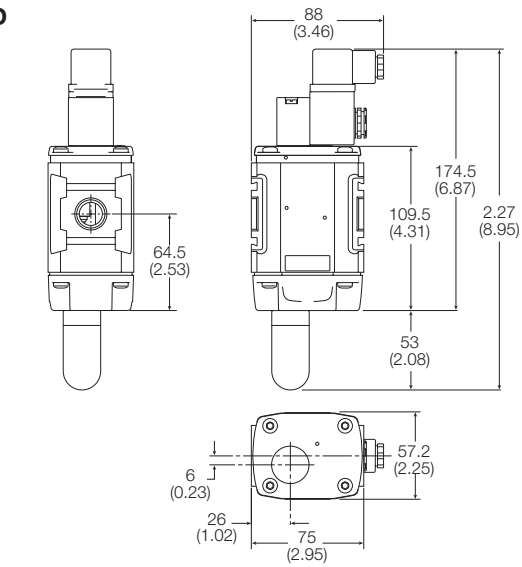
P32T



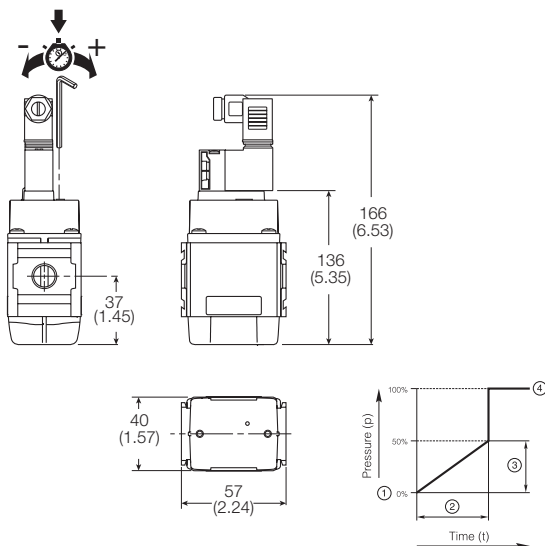
P31D



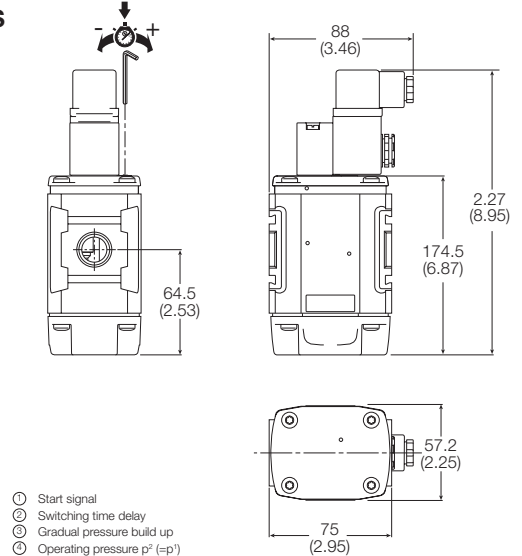
P32D



P31S



P32S



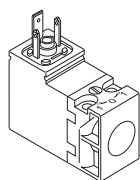
Solenoid Operators - CNOMO

Technical data - Solenoid operators, coil combinations

	NC Normal Operator with 15mm standard coil	NC Normal Operator with 22 x 30 standard coil	NC Normal Operator with 30 x 30 standard coil
Working pressure	0 to 10 bar	0 to 10 bar	0 to 10 bar
Ambient temperature	-15°C to 60°C *	-10°C to 60°C *	-10°C to 60°C *
Power (DC)	1.2W	4.8W	2.7W
Power (AC)	1.6VA	8.5VA	4.9VA
Voltage tolerance	+10%/-15%	+/-10%	+/-10%
Duty cycle	100%	100%	100%
Insulation class	F	F	F
Electric connection	ISO 15217	B Industrial	DIN 43650A
Protection	IP65	IP65	IP65
Approval	UL/CSA		UL/CSA
Working media	All neutral media such as compressed air and inert gases.		

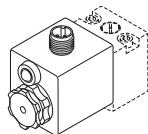
* Limited to 50°C if use with 100% duty cycle

P31 Series only - Solenoid coils 15mm NC



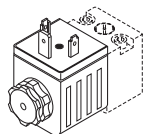
Voltage	Order code Override, blue, non-locking flush	Weight (Kg)
24VDC	PS2982B49P	0.038
115VAC 50Hz / 120VAC 60Hz	PS2982B53P	0.038

Solenoid coils with M12 connection



Voltage	Order code	Weight (Kg)
Direct current		
24VDC	P2FC6449	0.065

Solenoid coils with Din A or Industrial B connection



Voltage	22mm x 30mm Order code B industrial standard	Weight (Kg)	30mm x 30mm Order code DIN 43650A standard	Weight (Kg)
Direct current				
24VDC	P2FCB449	0.093	P2FCA449	0.105
Alternative current				
110V 50Hz, 120V 60Hz	P2FCB453	0.093	P2FCA453	0.105

 Most popular.

Transients

Interrupting the current through the solenoid coil produces momentary voltage peaks which, under unfavourable conditions, can amount to several hundred times the rated operating voltage. Normally, these transients do not cause problems, but to achieve the Maximum life of relays in the circuit (and particularly of transistors, thyristors and integrated circuits) it is desirable to provide protection by means of voltage-dependent resistors (varistors). All connectors/cable plugs EN175301-803 with LED's include this type of circuit protection.

Materials

Pilot Valve

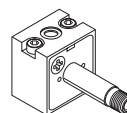
Body:	Polyamide
Armature tube:	Brass
Plunger & core:	Corrosion resistant Cr-Ni steel
Seals:	Fluorocarbon
Screws:	Stainless steel

Coil

Encapsulation material:	Thermoplastic as standard Duroplast for M12 connection
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Spare solenoid operators

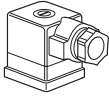
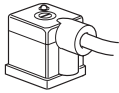
Base Solenoid pilot operator CNOMO NC



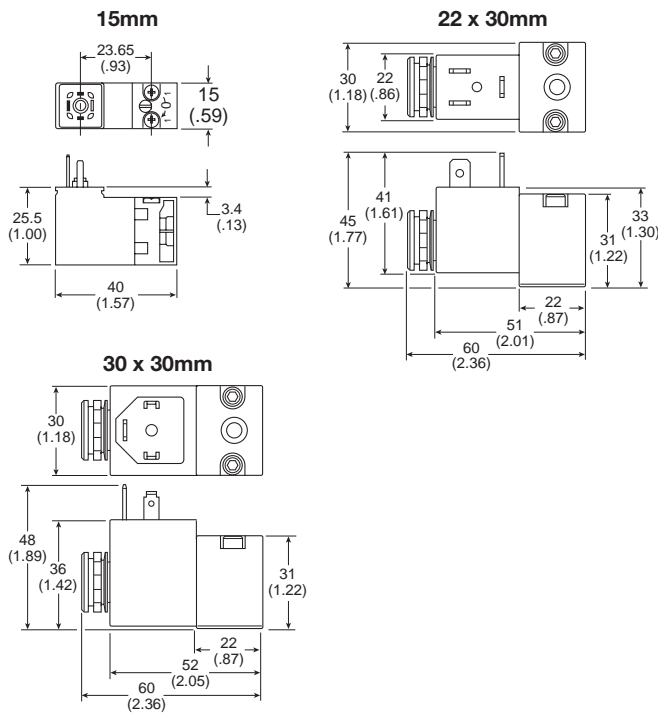
Description	Order code non-lock manual override	Weight (Kg)
Standard Duty	P2FP23N4B	0.065
No Override	P2FP23N4A	0.065

Note: Solenoid pilot operators are fitted to the Global range. Order the above part numbers for spares. The operators are supplied with mounting screws and interface 'O' rings. Coils and connectors must be ordered separately.

Solenoid connectors / Cable plugs EN175301-803

	Description	Order code 15mm Form C ISO15217	Order code 22mm Form B Industrial	Order code 30mm Form A DIN 43650A
With standard screw 	Standard IP65 without flying lead	PS2932BP	PS2429BP	PS2028BP
	With LED and protection 24VAC/DC	PS294679BP	PS243079BP	PS203279BP
	With LED and protection 110VAC	PS294683BP	PS243083BP	PS203283BP
With cable 	Standard with 2m cable IP65	PS2932JBP	PS2429JBP	PS2028JBP
	24VAC/DC, 2m cable LED and protection IP65	PS2946J79BP	PS2430J79BP	PS2032J79BP
	110VAC/DC, 2m cable LED and protection IP65	PS2946J83BP	PS2430J83BP	PS2032J83BP

Solenoid coil
Dimensions mm (inches)



Electrical schematics

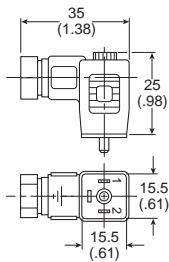


PS2028BP	PS243079BP	PS203279BP
PS2028JBP	PS2430J79BP	PS2032J79BP
PS2429BP	PS243083BP	PS293283BP
PS2429JBP	PS2430J83BP	PS2932J83BP
PS2932BP	PS294679BP	PS294683BP
PS2932JBP	PS2946J79BP	PS2946J83BP

Cable plug dimensions mm (inches)

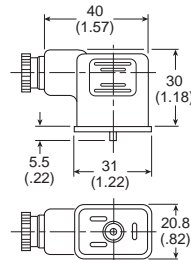
15mm ISO 15217
 Cable plugs

PS2932BP
PS294679BP



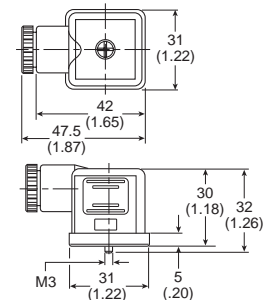
22mm Form B Industrial
 Cable plugs

PS2429BP






30mm DIN 43650A
 Cable plugs

PS2028BP






 Most popular.

Safety Lockout Valves

	Model type	Port size	Thread type	Flow dm ³ /s (scfm)	Part number Flow from left to right	Part number Flow from right to left
	P31	1/4"	NPT	47.2 (100)	P31V*92LSAN	
	P32	1/4"	NPT	66.5 (141)	P32V*92LSAN	P32V*92LSBN
		3/8"	NPT	101.9 (216)	P32V*93LSAN	P32V*93LSBN
		1/2"	NPT	128.4 (272)	P32V*94LSAN	P32V*94LSBN
	P33	1/2"	NPT	136.9 (290)	P33V*94LSAN	P33V*94LSBN
		3/4"	NPT	141.6 (300)	P33V*96LSAN	P33V*96LSBN




For thread type: BSPP 1, BSPT 2, NPT 9

Modular Ball Valve

	Model type	Port size	Thread type	Flow dm ³ /s (scfm)	Part number Flow from left to right
	P31	1/4"	NPT	20 (42.4)	P31V*92LBNN
	P32	3/8"	NPT	90 (190.7)	P32V*93LBNN
		1/2"	NPT	122 (258.5)	P32V*94LBNN
	P33	1/2"	NPT	265 (561.5)	P33V*94LBNN
		3/4"	NPT	320 (678)	P33V*96LBNN

For thread type: BSPP 1, BSPT 2, NPT 9







Manifold Blocks

	Model type	In / Out port size	Auxiliary port size top	Auxiliary port size bottom	Thread type	Part number
	P31	1/4"	1/4"	1/4"	NPT	P31M*92022N
	P32	1/2"	1/4"	1/2"	NPT	P32M*94024N
	P33	3/4"	1/4"	1/2"	NPT	P33M*96024N



For thread type: BSPP 1, BSPT 2, NPT 9

 Most popular. For technical information see CD





P31 Series Accessories

Description	Port size	Part number
 C-bracket (Fits to filter and lubricator body)	—	P31KA00MW
 T-bracket w/ body connector	—	P31KA00MT
 Body connector	—	P31KA00CB
 Port block kit	1/8 NPT	P31KA91CP
	1/4 NPT	P31KA92CP
	3/8 NPT	P31KA93CP
	1/8 BSPP	P31KA11CP
	1/4 BSPP	P31KA12CP
	3/8 BSPP	P31KA13CP
	1/8 BSPT	P31KA21CP
	1/4 BSPT	P31KA22CP
	3/8 BSPT	P31KA23CP
	 Port block kit with T-bracket	1/8 NPT
1/4 NPT		P31KA92CN
3/8 NPT		P31KA93CN
1/8 BSPP		P31KA11CN
1/4 BSPP		P31KA12CN
3/8 BSPP		P31KA13CN
1/8 BSPT		P31KA21CN
1/4 BSPT		P31KA22CN
3/8 BSPT	P31KA23CN	
 Angle bracket (Fits to regulator and filter / regulator body)	—	P31KA00MR



P32 Series Accessories

Description	Part number
 Angle bracket (Fits to regulator and filter / regulator body)	P32KA00MR
 L-bracket (Fits to filter and lubricator body)	P32KA00ML

P32 & P33 Series Accessories

Description	Port size	Part number
 T-bracket with body connector	—	P32KA00MT
 Body connector	—	P32KA00CB
 Port block kit	1/4 NPT	P32KA92CP
	3/8 NPT	P32KA93CP
	1/2 NPT	P32KA94CP
	3/4 NPT	P32KA96CP
	1/4 BSPP	P32KA12CP
	3/8 BSPP	P32KA13CP
	1/2 BSPP	P32KA14CP
	3/4 BSPP	P32KA16CP
	1/4 BSPT	P32KA22CP
	3/8 BSPT	P32KA23CP
1/2 BSPT	P32KA24CP	
3/4 BSPT	P32KA26CP	
 T-bracket (fits to body connector or port block)	—	P32KA00MB

P33 Series Accessories

Description	Part number
 Angle bracket (Fits to regulator and filter / regulator body)	P33KA00MR
 L-bracket (Fits to regulator and filter / regulator body)	P33KA00ML

 Most popular. For technical information see CD






Kits

	Description	P31	P32	P33
	Panel mount (plastic)	P31KA00MP	P32KA00MP	P33KA00MP
	Panel mount nut (aluminum)	P31KA00MM	P32KA00MM	P33KA00MM
	5µ element kit	P31KA00ESE	P32KA00ESE	P33KA00ESE
	1µ element kit	P31KA00ES9	P32KA00ES9	P33KA00ES9
	0.01µ element kit	P31KA00ESC	P32KA00ESC	P33KA00ESC
	Adsorber element kit	P31KA00ESA	P32KA00ESA	P33KA00ESA
	Auto drain kit		P32KA00DA	P32KA00DA
	Differential pressure indicator kit		P32KA00RQ	P32KA00RQ
	Fill plug kit	P31KA00PL	P32KA00PL	P32KA00PL
	Drip control assembly kit	P32KA00PG	P32KA00PG	P32KA00PG
	Plastic bowl w/ bowl guard & manual drain	P31KA00BGM	P32KA00BGM	P33KA00BGM
	pulse drain	P31KA00BGB		
	auto drain		P32KA00BGA	P33KA00BGA
	Lubricator no drain	P31KA00BGN	P32KA00BGN	P33KA00BGN
	Metal bowl w/o sight gauge & manual drain	P31KA00BMM	P32KA00BMM	P33KA00BMM
		pulse drain	P31KA00BMB	
	auto drain		P32KA00BMA	P33KA00BMA
	Lubricator no drain	P31KA00BMN		
	Metal bowl w/ sight gauge & manual drain		P32KA00BSM	P33KA00BSM
		auto drain		P32KA00BSA
	Lubricator no drain		P32KA00BSN	P33KA00BSN

Most popular. For technical information see CD



Kits

Port size	Description	P31	P32	P33		
	Regulator - relieving repair kit	P31KA00RB	P32KA00RB	P33KA00RB		
	Regulator - non relieving repair kit	P31KA00RC	P32KA00RC	P33KA00RC		
	Regulator - main adjusting spring 0-2 bar (0-30 PSIG) kit	P31KA00PR	P32KA00PR	P33KA00PR		
	Regulator - main adjusting spring 0-4.1 bar (0-60 PSIG) kit	P31KA00PS	P32KA00PS	P33KA00PS		
	Regulator - main adjusting spring 0-8.6 bar (0-125 PSIG) kit	P31KA00PT	P32KA00PT	P33KA00PT		
	Regulator - main adjusting spring 0-17 bar (0-250 PSIG) kit		P32KA00PV	P33KA00PV		
	1/8"	Square flush mount gauge kit	0-4 bar	K4511SCR04B		
	1/8"		0-10 bar	K4511SCR11B		
	1/8"		0-60 PSIG	K4511SCR060		
	1/8"		0-150 PSIG	K4511SCR150		
	1/8"	1.00" round gauge	0-60 PSIG / 0-4.1 bar	K4510N18060		
	1/8"		0-160 PSIG / 0-10 bar	K4510N18160		
	1/8"	40mm round gauge	0-30 PSIG / 0-2 bar	K4515N18030		
	1/8"	(Not for use with common port regulators)	0-60 PSIG / 0-4.1 bar	K4515N18060		
	1/8"		0-160 PSIG / 0-10 bar	K4515N18160		
	1/4"	50mm round gauge	0-30 PSIG / 0-2 bar	K4520N14030	K4520N14030	
	1/4"		0-60 PSIG / 0-4.1 bar	K4520N14060	K4520N14060	
	1/4"		0-160 PSIG / 0-10 bar	K4520N14160	K4520N14160	
	1/4"		0-300 PSIG / 0-20 bar	K4520N14300	K4520N14300	
		Body connector o-ring (spares kit) (pack of 4)		P31KA02CY	P32KA04CY	P33KA04CY

 Most popular. For technical information see CD



- Tested in accordance with ISO 8573.9
- High liquid removal efficiencies at all flow conditions
- Low pressure losses for low operational costs
- Multiple port sizes for a given flow rate provides increased flexibility during installation
- Suitable for variable flow compressors
- Works with all types of compressor and compressor condensate
- Low maintenance
- Lightweight cast aluminum housing with 1/4" to 3" ports
- External surface epoxy painted for maximum corrosion resistance

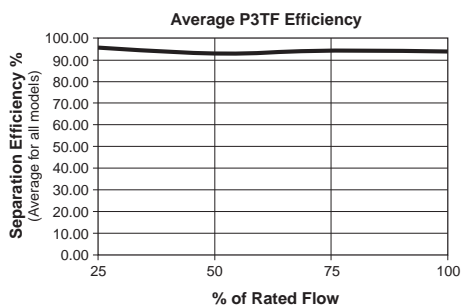


Applications

- Bulk liquid removal at any point in a compressed air system
- Protection of refrigeration and heatless regenerative desiccant dryers
- Liquid removal from compressor Inter-coolers / after-coolers
- Liquid separation within refrigeration dryers
- Pre-filtration

Operating information

	P3TF (Bulk Liquid Separator)
Operating pressure	232 PSIG (16 bar) Max
Operating temperature	35°F to 176°F (1.5°C to 80°C)
For technical information see CD	



Material specifications

Description	P3TF (Bulk Liquid Separator)
Auto float drain	Plastic
Housing / bowl	Aluminum
Seals	Fluorocarbon

Service kits

Drain	EFI
-------	------------

P3TF Bulk Liquid Separator

	Pipe size	Flow SCFM (L/s)	Weight lb. (kg)	Part number (NPT)
P3TF	1/4"	21 (10)	0.9 (0.4)	P3TFA92WAAN
	3/8"	85 (40)	2.2 (1.0)	P3TFA93WBAN
	1/2"	85 (40)	2.2 (1.0)	P3TFA94WCAN
	3/4"	233 (110)	4.8 (2.2)	P3TFA96WDAN
	1"	233 (110)	2.6 (5.7)	P3TFA98WEAN
	1-1/2"	742 (350)	5.3 (11.6)	P3TFA9BWHAN
	2"	742 (350)	5.3 (11.6)	P3TFA9CWHAN
	3"	1695 (800)	12.0 (26.4)	P3TFA9EWKAN



Pressure Differential at Rated Flow ... 1.0 PSID (0.07 bar)

Stated flows are for operation at 102 PSIG (7 bar) with reference to 20°C, 1 bar (a), 0% relative water vapor pressure.

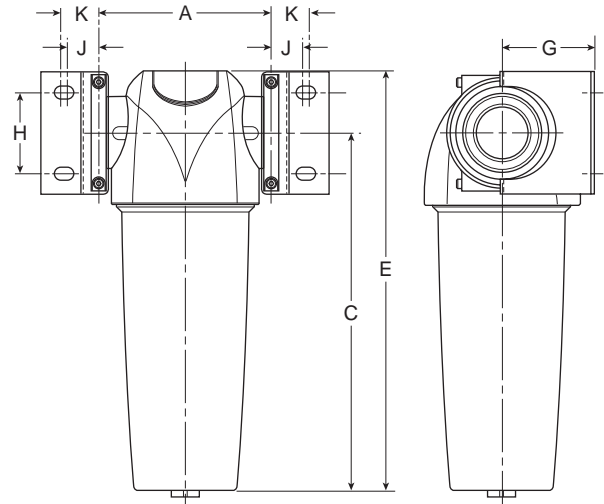
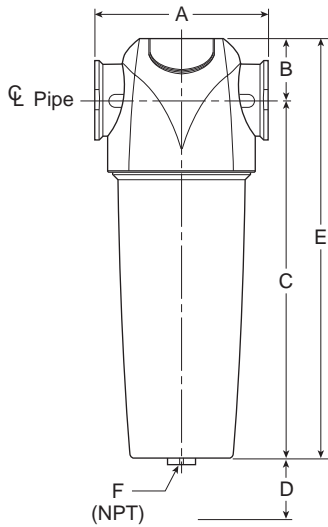
Note: BSPT threads available upon request.

Most popular.



General Industrial
 Air Preparation Products

P3TF (Bulk Liquid Separator)



Dimensions

Part number	Pipe size	A	B	C	D	E	NPT F	G	H	J	K	Wall mounting bracket kit
P3TFA92WAAN	1/4"	3.00 (76)	1.12 (28.5)	6.02 (153)	1.58 (40)	7.15 (181.5)	1/2	2.05 (50)	1.18 (30)	0.71 (18)	0.96 (24.5)	P3TKA00MWA
P3TFA93WBAN	3/8"	3.83 (97.5)	1.34 (34)	7.91 (201)	1.97 (50)	9.25 (235)	1/2	2.36 (60)	1.57 (40)	0.81 (20.5)	1.00 (25.5)	P3TKA00MWB
P3TFA94WCAN	1/2"	3.83 (97.5)	1.34 (34)	7.91 (201)	1.97 (50)	9.25 (235)	1/2	2.36 (60)	1.57 (40)	0.81 (20.5)	1.00 (25.5)	P3TKA00MWB
P3TFA96WDAN	3/4"	5.07 (129)	1.67 (42.5)	13.09 (232.5)	2.76 (70)	10.80 (275)	1/2	2.68 (68)	2.36 (60)	0.91 (23)	1.10 (28)	P3TKA00MWD
P3TFA98WEAN	1	5.07 (129)	1.67 (42.5)	12.68 (322)	2.76 (70)	14.35 (364.5)	1/2	2.68 (68)	2.36 (60)	0.91 (23)	1.10 (28)	P3TKA00MWD
P3TFA9BWWAN	1-1/2"	6.70 (170)	1.97 (50)	18.68 (474.5)	3.94 (100)	20.64 (524.5)	1/2	3.62 (92)	3.31 (84)	1.26 (32)	1.54 (39)	P3TKA00MWF
P3TFA9CWHAN	2"	6.70 (170)	1.97 (50)	18.68 (474.5)	3.94 (100)	20.64 (524.5)	1/2	3.62 (92)	3.31 (84)	1.26 (32)	1.54 (39)	P3TKA00MWF
P3TFA9EWKAN	3"	8.07 (205)	2.36 (60)	30.39 (772)	4.72 (120)	32.76 (832)	1/2	5.31 (135)	3.94 (100)	1.40 (35.5)	1.67 (42.5)	P3TKA00MWJ

Inches (mm)



Wall Mounting Bracket Kit

Mounting brackets provide additional support to filters installed in flexible piping systems or OEM equipment.

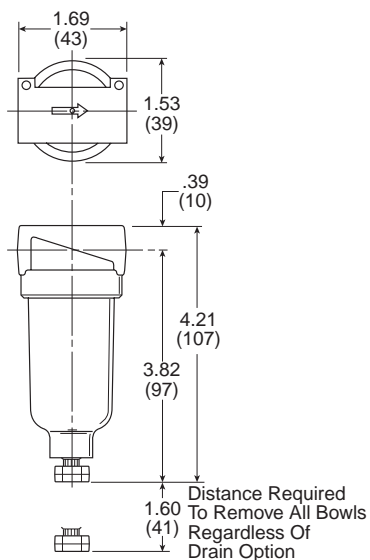
- Excellent water removal efficiency
- 5 micron element standard on 14F
- Integral 1/8", 1/4" ports (NPT, BSPP & BSPT)

Material specifications

Description	14F (Mini)	
Body	Zinc	
Bowl	Polycarbonate	
Deflector, element holder, baffle	Plastic	
Drains – Twist	Body & stem	Plastic
	Seals	Nitrile
Drains – Auto pulse	Piston & seals	Nitrile
	Stem, seat, adapter & washers	Aluminum
Filter element –	5 micron (Standard)	Plastic
	40 micron (Optional)	Plastic
	Adsorber (Optional)	Activated charcoal
Seals	Nitrile	



14F



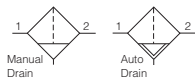
Operating information


		14F
Operating pressure	Poly bowl	0 to 150 PSIG (0 to 10.3 bar)
	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto pulse drain	10 to 250 PSIG (0.7 to 17.2 bar)
Operating temperature	Poly bowl	32°F to 125°F (0°C to 52°C)
	Metal bowl	32°F to 175°F (0°C to 80°C)
	Auto pulse drain	125°F (52°C) or less
For technical information see CD		

Service kits

Description	14F (Mini)		
Bowl Kits	Poly bowl –	Auto pulse drain	PS408BP
		Twist drain	PS404P
	Metal bowl –	Auto drain	PS451BP
		Twist drain	PS447BP
Filter element kit –	40 micron	PS401P	
	5 micron	PS403P	
	Adsorber	PS452P	
Mounting bracket kit	PS417BP		

14F Particulate Filters



	Port size	Bowl type	Sight gauge	Flow SCFM	Part number (NPT)	
					Twist drain	Automatic pulse drain
14F 	1/8"	Poly	No	22	14F01B*	14F05B*
	1/8"	Metal	No	22	14F03B*	14F07B*
	1/4"	Poly	No	24	14F11B*	14F15B*
	1/4"	Metal	No	24	14F13B*	14F17B*

* Engineering level will be added at factory.

 Most popular.



- Excellent water removal efficiency
- Unique deflector plate and shroud creates a swirling of the air stream ensuring maximum water and dirt separation
- Large filter element surface guarantees low pressure drop and increased element life
- Optional automatic float drain available
- 06F: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07F: 1/2" & 3/4" ports (NPT & BSPP)



06F



07F

Material specifications

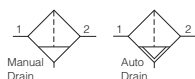
Body	Zinc
Bowls	Transparent polycarbonate or Metal (zinc) with or without sight gauge
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Deflector, shroud & baffle	Plastic
Drains –	
Twist drain – body & nut	Plastic
Automatic float drain –	
Housing, float	Plastic
Seals	Nitrile
Springs, push rod	Stainless steel
Filter elements –	
40 Micron (standard)	Plastic
5 Micron (optional)	Plastic
Seals	Nitrile
Sight gauge	Polyamide



Operating information

06F & 07F		
Operating pressure	Poly bowl	0 to 150 PSIG (0 to 10.3 bar)
	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Auto float drain	Poly bowl	15 to 250 PSIG (1.0 to 17.2 bar)
	Metal bowl	
Operating temperature	Poly bowl	32°F to 125°F (0°C to 52°C)
	Metal bowl	32°F to 175°F (0°C to 80°C)

For technical information see CD

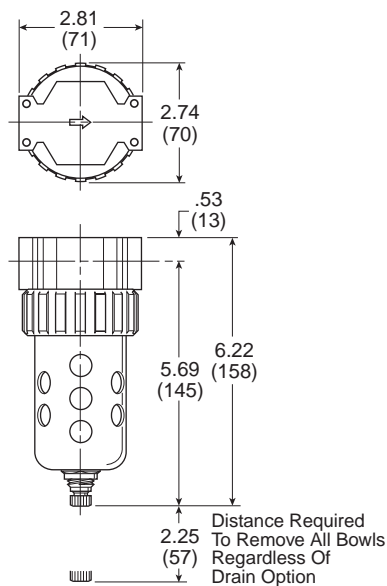
06F, 07F Particulate Filters



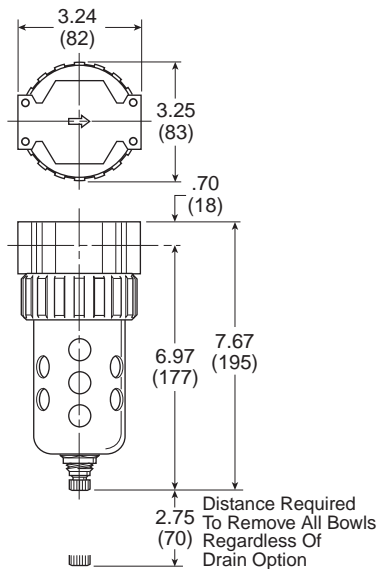
	Port size	Bowl type	Flow SCFM		Part number (NPT)	
			Grade 6 element	Grade 10 element	Twist drain	Automatic float drain
06F 	1/4"	Poly bowl / Metal guard	53	60	06F12A*	06F16A*
	1/4"	Metal bowl / Sight gauge	53	60	06F14A*	06F18A*
	3/8"	Poly bowl / Metal guard	80	72	06F22A*	06F26A*
	3/8"	Metal bowl / Sight gauge	80	72	06F24A*	06F28A*
	1/2"	Poly bowl / Metal guard	85	95	06F32A*	06F36A*
	1/2"	Metal bowl / Sight gauge	85	95	06F34A*	06F38A*
07F 	1/2"	Poly bowl / Metal guard	75	125	07F32A*	07F36A*
	1/2"	Metal bowl / Sight gauge	75	125	07F34A*	07F38A*
	3/4"	Poly bowl / Metal guard	80	160	07F42A*	07F46A*
	3/4"	Metal bowl / Sight gauge	80	160	07F44A*	07F48A*

 Most popular.

06F (Compact)



07F (Standard)



**General Industrial
 Air Preparation Products**

Service kits

Description	06F (Compact)	07F (Standard)
Bowl guard kit	PS705P	PS805P
Bowl Kits –		
Poly bowl –		
Auto float drain	PS722P	PS822P
Twist drain	PS732P	PS832P
Metal bowl –		
Auto float drain	PS726P	PS826P
Twist drain	PS734P	PS834P
Sight gauge / automatic float drain	PS723P	PS823P
Sight gauge / twist drain	PS735P	PS835P
DPI replacement kit	PS781P	PS781P
Drain kits –		
Auto float drain	PS506P	PS506P
Semi-auto drain	PS511P	PS511P
Twist drain	PS512P	PS512P
Push 'N' Drain	PS513P	PS513P
Filter element kit –		
40 micron	PS701P	PS801P
5 micron	PS702P	PS802P
Adsorber	PS731P	PS831P
Mounting bracket kit	PS743P	PS843P
Sight gauge kit	PS914P	PS914P

☐ Most popular.

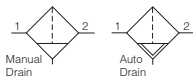
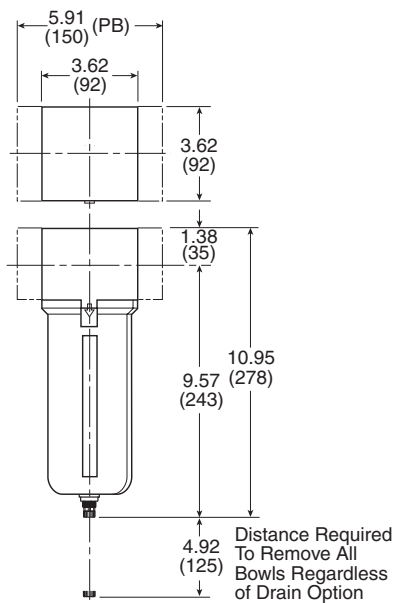


- Excellent water removal efficiency
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- 40 micron element standard
- Metal bowl with sight gauge standard
- 3/4", 1", & 1-1/2" ports (NPT, BSPP & BSPT)

Material specifications

Description	P3NF (Hi-Flow)	
Body	Aluminum	
Bowl	Aluminum	
Deflector	Plastic	
Drain	Plastic	
Filter element	5 micron	Plastic
	40 micron	Plastic
	Adsorber	Activated charcoal
Seals	Nitrile	
Sight gauge	Polyamide (Nylon)	

P3NF (Hi-Flow)



P3NF Particulate Filters

	Port size	Bowl type	Sight gauge	Flow	Part number (NPT)	
					Twist drain	Automatic float drain
 P3NF	3/4"	Metal	Yes	270 SCFM	P3NFA96GSM	P3NFA96GSA
	1"	Metal	Yes	300 SCFM	P3NFA98GSM	P3NFA98GSA
	1-1/2" #	Metal	Yes	310 SCFM	P3NFA9PGSM	P3NFA9PGSA
	# 1" port body with 1-1/2" port block					

Most popular.



Operating information

		P3NF (Hi-Flow)
Operating pressure	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature	Metal bowl	32°F to 175°F (0°C to 80°C)
For technical information see CD		

Service kits

Description	P3NF (Hi-Flow)	
Bowl Kits –	Sight gauge / auto float	P3NKA00BSA
	Sight gauge / twist drain	P3NKA00BSM
	Sight gauge / push 'n' drain	P3NKA00BSP
Bowl latch kit	C11A33	
DPI replacement kit	PS781P	
Drain kit –	Auto drain	PS506P
	Twist drain	PS512P
Filter element kit –	40 micron	P3NKA00ESG
	5 micron	P3NKA00ESE
	Adsorber	P3NKA00ESA
Mounting bracket kit	P3NKA00MW	
Sight gauge kit	P3NKA00PE	

- Excellent water removal efficiency
- For heavy duty applications with minimum pressure drop requirement
- Unique deflector plate that creates swirling of the air stream ensuring maximum water and dirt separation
- Large filter element surface guarantees low pressure drop and increased element life
- 40 micron filter element standard, 5 micron available
- Metal bowl with sight gauge standard
- Twist drain as standard, optional auto drain
- Large bowl capacity
- Optional high capacity bowl(s) available



3/4" & 1"



1-1/4" & 1-1/2"

Material specifications

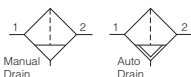
Description		(Hi-Flow)	(Hi-Flow)
		F602-06W F602-08W F602-06E F602-08E	F602-10W F602-12W F602-10E F602-12E
Body		Zinc	Zinc
Bowl	(E) 32 oz	Aluminum	Aluminum
	(W) 16 oz	Zinc	Zinc
Drains	Housing R	Acetal	Acetal
	Housing Q	Bronze	Bronze
Drains - Twist	Body & stem	Brass	Brass
Filter element	5 micron	Polypropylene	Polypropylene
	40 micron	Polypropylene	Polypropylene
Seals		Nitrile	Nitrile
Sight gauge		Nylon	Nylon



Operating information

		F602 (Hi-Flow)
Operating pressure	Aluminum bowl (E) 32 oz.	0 to 300 PSIG (0 to 20.4 bar)
	Zinc (W) 16 oz.	0 to 250 PSIG (0 to 17.2 bar)
	With internal auto drain (R)	20 to 175 PSIG (1.4 to 11.9 bar)
	With external auto drain (Q)	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature	Aluminum bowl (E) 32 oz.	40°F to 150°F (4.4°C to 65.6°C)
	Zinc (W) 16 oz.	40°F to 150°F (4.4°C to 65.6°C)
	With internal auto drain (R)	40°F to 125°F (4.4°C to 52°C)
	With external auto drain (Q)	40°F to 150°F (4.4°C to 65.6°C)

For technical information see CD

Particulate Filters

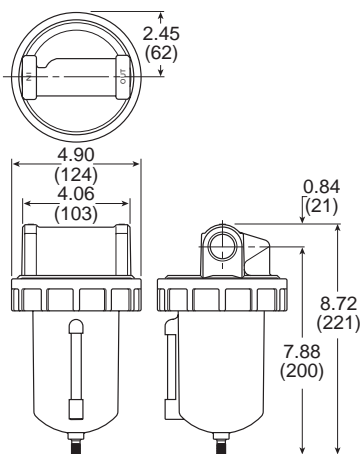


	Port size	Bowl type	Bowl size	Flow SCFM	Part number (NPT)	
					Twist drain	Automatic float drain
	3/4"	Metal / Sight gauge	16 oz	270	F602-06WJ	F602-06WJR
	3/4"	Metal / Without sight gauge	32 oz	270	F602-06EJ	F602-06EJR
	1"	Metal / Sight gauge	16 oz	300	F602-08WJ	F602-08WJR
	1"	Metal / Without sight gauge	32 oz	300	F602-08EJ	F602-08EJR
	1-1/4"	Metal / Sight gauge	16 oz	380	F602-10WJ	F602-10WJR
	1-1/4"	Metal / Without sight gauge	32 oz	380	F602-10EJ	F602-10EJR
	1-1/2"	Metal / Sight gauge	16 oz	450	F602-12WJ	F602-12WJR
	1-1/2"	Metal / Without sight gauge	32 oz	450	F602-12EJ	F602-12EJR

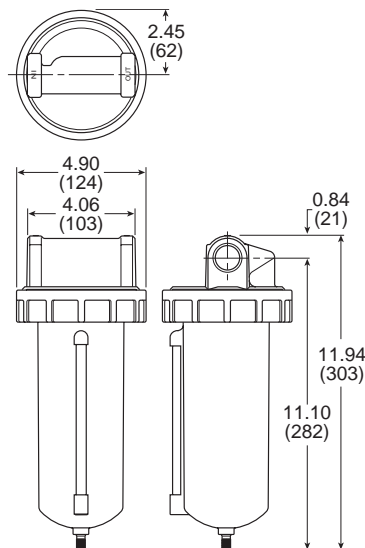
 Most popular.



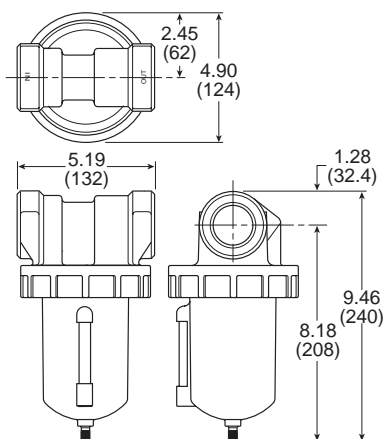
F602-06W, F602-08W (Hi-Flow)



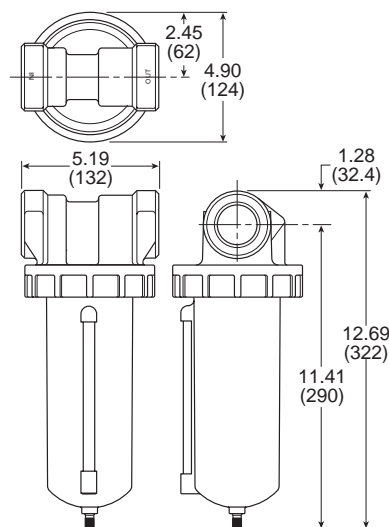
F602-06E, F602-08E (Hi-Flow)



F602-10W, F602-12W (Hi-Flow)



F602-10E, F602-12E (Hi-Flow)



Service kits

Description		(Hi-Flow) F602-06W, F602-08W, F602-06E, F602-08E	(Hi-Flow) F602-10W, F602-12W, F602-10E, F602-12E
Bowl kits –	Aluminum (E) 32 oz	BK603B	BK603B
	Zinc / sight gauge (W) 16 oz	BK605WB	BK605WB
Drain kits –	Internal auto	SA602MD	SA602MD
	Manual	SA600Y7-1	SA600Y7-1
Filter element kits –	40 micron	EK602B	EK602B
	5 micron	EK602VB	EK602VB
Mounting bracket kits –	3/4" unit	SA200AW57	
	1" unit	SA200CW57	
Repair kits –	Deflector, baffle assy, & retaining rod	RK602B	RK602B
	External auto drain	RK602D	RK602D
	Internal auto drain	RK602MD	RK602MD
	Metal bowl / sight gauge	RKB605WB	RKB605WB

- Heavy-duty cast aluminum housings to withstand operating pressures up to 250 PSIG
- Differential pressure indicator to eliminate the guesswork of element replacement
- Unique drain mounting plate design offers a trouble-free method for interchanging and installing external drains



35F



43F

Material specifications



Description	35F, 43F (Hi-Flow)
Baffle	Plated steel
Body	Aluminum
Bowl	Aluminum
Deflector	Plated steel
Filter element	Polyethylene
Seals	Fluorocarbon
Stud	Plated steel

Operating information

		35F (Hi-Flow)	43F (Hi-Flow)
Operating pressure	With DP gauge & without DPI	250 PSIG (17.2 bar)	250 PSIG (17.2 bar)
	With DPI	150 PSIG (10.3 bar)	150 PSIG (10.3 bar)
Operating temperature		32°F to 150°F (0°C to 65.5°C)	32°F to 150°F (0°C to 65.5°C)
	For technical information see CD		

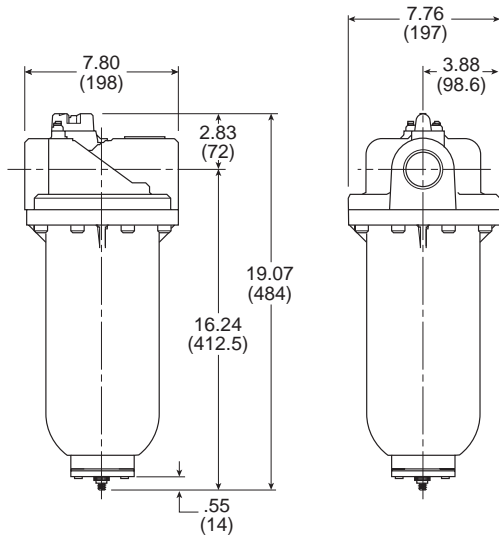
Particulate Filters



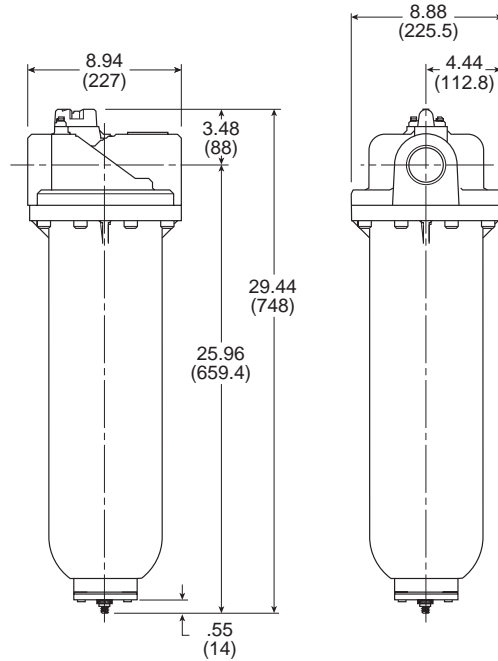
	Port size	Bowl type	Flow SCFM	Element type	Part number (NPT)
					Automatic drain
35F 	1-1/2	Metal	1280	5 micron	35F77BAP
	2	Metal	1400	5 micron	35F87BAP
43F 	3	Metal	2900	5 micron	43FN7BAP

 Most popular.

35F (Hi-Flow)



43F (Hi-Flow)



Service kits

Description		35F (Hi-Flow)	43F (Hi-Flow)
DPI replacement kit		DP2-02-001	DP2-02-001
DPI cap	Pressures over 150 PSIG	GRP-95-022	GRP-95-022
DP gauge		DP3-01-000	DP3-01-000
Automatic float drain kit	Auto internal drain 1/8"	P32KA00DA	P32KA00DA
Manual drain kit	with 1/2" drain plate	GRP-95-392	GRP-95-392
Drain plate kit	1/2 NPT tapped port	GRP-95-393	GRP-95-393
Filter element kit	5 micron	FRP-95-505	FRP-95-508

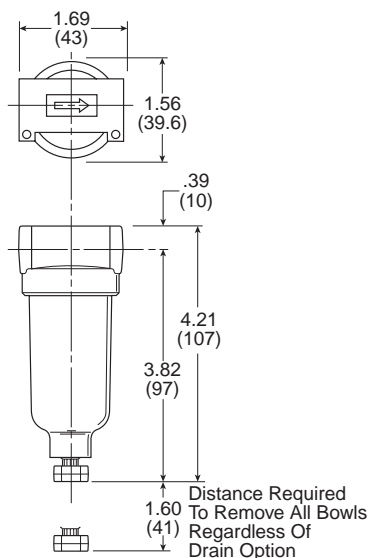
- Removes liquid aerosols and sub-micron particles
- 0.01 micron element standard
- Integral 1/8", 1/4" ports (NPT, BSPP & BSPT)

Material specifications

Description		10F (Mini)
Body		Zinc
Bowl		Polycarbonate
Drains – Twist	Body & stem	Plastic
	Seals	Nitrile
Drains – Auto Pulse	Piston & seals	Nitrile
	Stem, seat, adapter & washers	Aluminum
Element holder		Plastic
Filter element	1.0 micron	Borosilicate & felt glass fibers
	0.01 micron	
Seals		Nitrile



10F



Coalescing Filters

	Port size	Bowl type	Sight gauge	Flow SCFM	Element type	Part number (NPT)	
						Twist drain	Automatic pulse drain
10F	1/8"	Poly	No	17	0.01 micron	10F01E*	10F05E*
	1/8"	Poly	No	19	1.0 micron	10F01H*	10F05H*
	1/8"	Metal	No	17	0.01 micron	10F03E*	10F07E*
	1/8"	Metal	No	19	1.0 micron	10F03H*	10F07H*
	1/4"	Poly	No	20	0.01 micron	10F11E*	10F15E*
	1/4"	Poly	No	24	1.0 micron	10F11H*	10F15H*
	1/4"	Metal	No	20	0.01 micron	10F13E*	10F17E*
	1/4"	Metal	No	24	1.0 micron	10F13H*	10F17H*



* Engineering level will be added at factory.

Most popular.

Operating information

10F		
Operating pressure	Poly bowl	0 to 150 PSIG (0 to 10.3 bar)
	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto pulse drain	10 to 250 PSIG (0.7 to 17.2 bar)
Operating temperature	Poly bowl	32°F to 125°F (0°C to 52°C)
	Metal bowl	32°F to 175°F (0°C to 80°C)
	Auto pulse drain	125°F (52°C) or less
For technical information see CD		

Service kits

Description			10F (Mini)
Bowl Kits	Poly bowl –	Auto pulse drain	PS408BP
		Twist drain	PS404P
	Metal bowl	Auto drain	PS451BP
		Twist drain	PS447BP
Filter element kit –	Grade 6 (standard)	PS446P	
	Grade 10 (optional)	PS456P	
Mounting bracket kit			PS417BP



- Removes liquid aerosols and sub-micron particles
- Liquids gravitate to the bottom of the element and will not re-enter the airstream
- Oil free air for critical applications, such as air gauging and pneumatic instrumentation and controls
- Interchangeable twist and automatic float drains
- Differential pressure indicator standard
- 11F: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 12F: 1/2" & 3/4" ports (NPT & BSPP)

Material specifications

Body	Zinc
Bowls	Transparent polycarbonate or Metal (zinc) with or without sight gauge
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Drains –	
Twist drain – body & nut	Plastic
Automatic float drain –	
Housing, float	Plastic
Seals	Nitrile
Springs, push rod	Stainless steel
Filter element –	
Borosilicate & felt glass fibers 99.97% DOP efficiency	0.01 Micron
Largest Aerosol Particle Passed (Grade 6)	
Largest Solid Particle Passed (Grade 6)	0.30 Micron
Seals	Nitrile
Sight gauge	Polyamide



11F

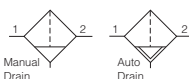


12F



Operating information

11F & 12F		
Operating pressure	Poly bowl	0 to 150 PSIG (0 to 10.3 bar)
	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Auto float drain	Poly bowl	15 to 250 PSIG (1.0 to 17.2 bar)
	Metal bowl	
Operating temperature	Poly bowl	32°F to 125°F (0°C to 52°C)
	Metal bowl	32°F to 175°F (0°C to 80°C)

For technical information see CD

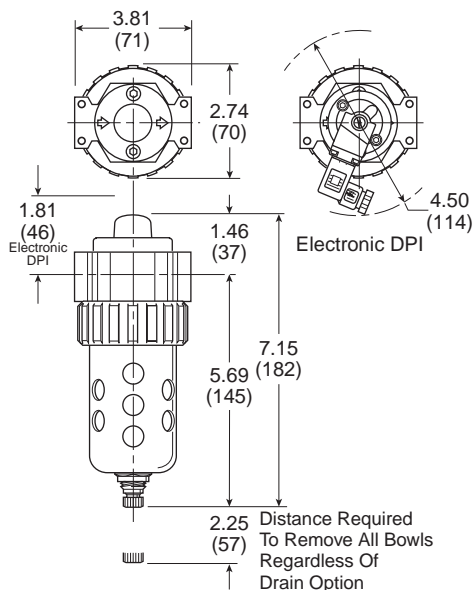


Coalescing Filters

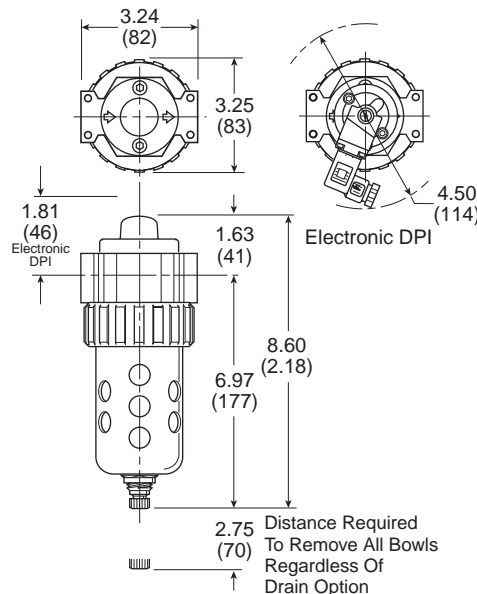
	Port size	Bowl type	Flow SCFM		Part number (NPT)	
			Grade 6 element	Grade 10 element	Twist drain	Automatic float drain
11F 	1/4"	Poly bowl / Metal guard	45	60	11F12E*	11F16E*
	1/4"	Metal bowl / Sight gauge	45	60	11F14E*	11F18E*
	3/8"	Poly bowl / Metal guard	48	72	11F22E*	11F26E*
	3/8"	Metal bowl / Sight gauge	48	72	11F24E*	11F28E*
	1/2"	Poly bowl / Metal guard	65	95	11F32E*	11F36E*
	1/2"	Metal bowl / Sight gauge	65	95	11F34E*	11F38E*
12F 	1/2"	Poly bowl / Metal guard	75	125	12F32E*	12F36E*
	1/2"	Metal bowl / Sight gauge	75	125	12F34E*	12F38E*
	3/4"	Poly bowl / Metal guard	80	160	12F42E*	12F46E*
	3/4"	Metal bowl / Sight gauge	80	160	12F44E*	12F48E*

 Most popular.

11F (Compact)



12F (Standard)



Service kits

Description	11F (Compact)	12F (Standard)
Bowl guard kit	PS705P	PS805P
Bowl Kits –		
Poly bowl –		
Auto float drain	PS722P	PS822P
Twist drain	PS732P	PS832P
Metal bowl –		
Auto float drain	PS726P	PS826P
Twist drain	PS734P	PS834P
Sight gauge / automatic float drain	PS723P	PS823P
Sight gauge / twist drain	PS735P	PS835P
DPI replacement kit	PS781P	PS781P
Drain kits –		
Auto float drain	PS506P	PS506P
Semi-auto drain	PS511P	PS511P
Twist drain	PS512P	PS512P
Push 'N' Drain	PS513P	PS513P
Electronic DPI replacement kit	PS764	PS764
Electrical connector - 15mm, 3-pin DIN, 6 Ft. Cord	PS2932JBP	PS2932JBP
Filter element kit –		
Grade 6 (Standard)	PS701P	PS824P
Grade 10 (Optional)	PS702P	PS830P
Mounting bracket kit	PS743P	PS843P
Sight gauge kit	PS914P	PS914P

Most popular.

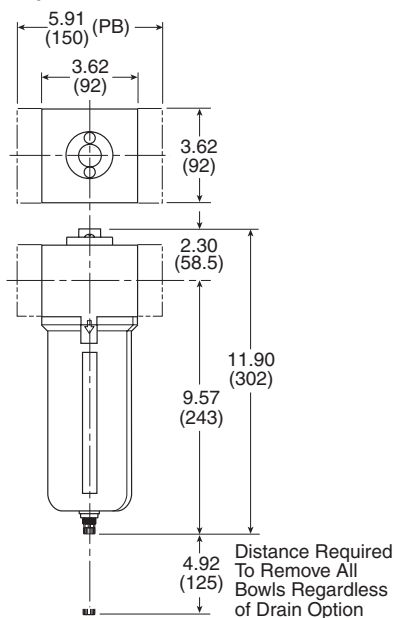


- Removes liquid aerosols and sub-micron particles
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- 0.01 micron element standard
- Metal bowl with sight gauge standard
- 3/4", 1", & 1-1/2" ports (NPT, BSPP & BSPT)


Material specifications

Description	P3NF (Hi-Flow)	
Body	Aluminum	
Bowl	Aluminum	
Deflector	Plastic	
Drain	Plastic	
Filter element –	1.0 micron	Borosilicate & felt glass fibers
	0.01 micron	
Seals	Nitrile	
Sight gauge	Polyamide (Nylon)	

P3NF (Hi-Flow)



Coalescing Filters

	Port size	Bowl type	Sight gauge	Flow SCFM	Element type	Part number (NPT)	
						Twist drain	Automatic float drain
 P3NF	3/4"	Metal	Yes	130	0.01 micron	P3NFA96DSM	P3NFA96DSA
	3/4"	Metal	Yes	195	1.0 micron	P3NFA96QSM	P3NFA96QSA
	1"	Metal	Yes	140	0.01 micron	P3NFA98DSM	P3NFA98DSA
	1"	Metal	Yes	215	1.0 micron	P3NFA98QSM	P3NFA98QSA
	1-1/2" #	Metal	Yes	225	0.01 micron	P3NFA9PDSM	P3NFA9PDSA
	1-1/2" #	Metal	Yes	150	1.0 micron	P3NFA9PQSM	P3NFA9PQSA

1" port body with 1-1/2" port block

 Most popular.



Operating information

		P3NF (Hi-Flow)
Operating pressure	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature	Metal bowl	32°F to 175°F (0°C to 80°C)
For technical information see CD		

Service kits

Description	P3NF (Hi-Flow)	
Bowl Kits –	Sight gauge / auto float	P3NKA00BSA
	Sight gauge / twist drain	P3NKA00BSM
	Sight gauge / push 'n' drain	P3NKA00BSP
Bowl latch kit	C11A33	
DPI replacement kit	PS781P	
Drain kit –	Auto drain	PS506P
	Twist drain	PS512P
Filter element kit –	Grade 6 (standard)	P3NKA00ESCB
	Grade 10 (optional)	P3NKA00ES9
Mounting bracket kit	P3NKA00MW	
Sight gauge kit	P3NKA00PE	

- Removes liquid aerosols and sub-micron particles
- Protects pneumatic systems from contamination that standard particulate filters will not catch
- Two different grade elements available
- Differential pressure indicator (pop-up) standard
- Differential pressure gauge optional
- High flow design



Material specifications


Description	F701 (Hi-Flow)	
Body & flange ring	Zinc	
Bowl	(E) 32 oz	Aluminum
	(L) 100 oz	Aluminum
Drains	Housing R	Acetal
	Housing Q	Bronze
	Manual	Brass
Element end cap	Urethane	
Filter element	0.01 micron	Borosilicate fibers & felt
	1.0 micron	
Seals & float	Buna N	
Springs	Stainless steel	

Operating information

	F701 (Hi-Flow)	
Maximum pressure	"R" drain	175 PSIG (12.4 bar)
	"T" drain	250 PSIG (17.2 bar)
	"Q" drain	250 PSIG (17.2 bar)
Maximum temperature	32°F to 150°F (0°C to 65.6°C)	
	Maximum temperature with "T", "R" or "Q" drains 125°F (52°C)	
Minimum rated flow	20% or rated flow	
For technical information see CD		

Coalescing Filters

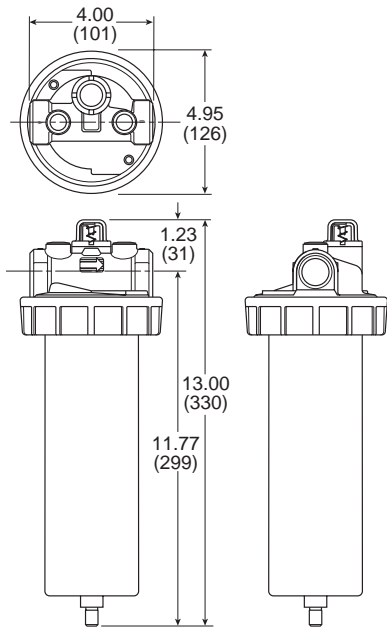


	Port size	Bowl type	Bowl size	Flow SCFM	Element type	Part number
F701 	3/4"	Metal	32 oz	95	0.01 micron	F701-06E3P
	3/4"	Metal	32 oz	158	1.0 micron	F701-06E7P
	3/4"	Metal	100 oz	170	0.01 micron	F701-06L3P
	3/4"	Metal	100 oz	285	1.0 micron	F701-06L7P
	1"	Metal	32 oz	95	0.01 micron	F701-08E3P
	1"	Metal	32 oz	158	1.0 micron	F701-08E7P
	1"	Metal	100 oz	170	0.01 micron	F701-08L3P
	1"	Metal	100 oz	285	1.0 micron	F701-08L7P

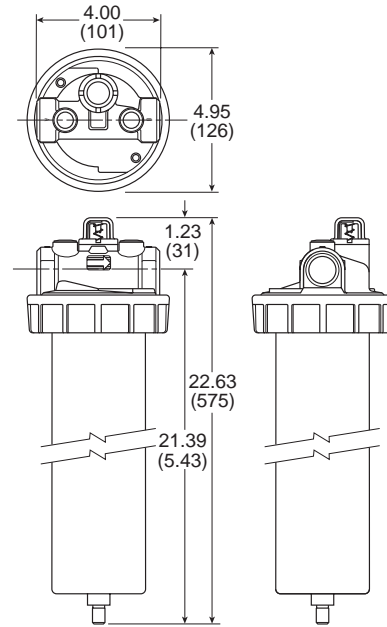
 Most popular.



F701 - 32 oz. bowl (Hi-Flow)



F701 - 100 oz. bowl (Hi-Flow)



Service kits

Description		F701 (Hi-Flow)
Bowl kits	3/4, 1 inch (E) 32 oz	BK603B
	3/4, 1 inch (L) 100 oz	BK603C
DPI repair kit		RK701P
Drain kits –	Internal auto	SA702MD
	Manual	SA600Y7-1
Filter element kits –	0.01 micron, 3/4, 1 inch (E) 32 oz	F701-C3-0773
	0.01 micron, 3/4, 1 inch (E) 100 oz	F701-C3-0774
	1.0 micron, 3/4, 1 inch (E) 32 oz	F701-C7-0773
	1.0 micron, 3/4, 1 inch (E) 100 oz	F701-C7-0773
Mounting bracket kits –	3/4" unit	SA200AW57
	1" unit	SA200CW57

- Heavy-duty cast aluminum housings to withstand operating pressures up to 250 PSIG
- Differential pressure indicator to eliminate the guesswork of element replacement
- Unique drain mounting plate design offers a trouble-free method for interchanging and installing external drains
- 35F: 1-1/2" & 2" ports (NPT & BSPP)
- 43F: 3" ports (NPT & BSPP)



35F

43F

Material specifications

Description		35F, 43F (Hi-Flow)
Baffle		Plated steel
Body		Aluminum
Bowl		Aluminum
Deflector		Plated steel
Filter element	0.01 & 1.0 micron	Borosilicate cloth
	Adsorber	Activated carbon
Seals		Fluorocarbon
Stud		Plated steel



Operating information

		35F (Hi-Flow)	43F (Hi-Flow)
Operating pressure	With DP gauge & without DPI	250 PSIG (17.2 bar)	250 PSIG (17.2 bar)
	With DPI	150 PSIG (10.3 bar)	150 PSIG (10.3 bar)
Operating temperature		32°F to 150°F (0°C to 65.5°C)	32°F to 150°F (0°C to 65.5°C)

For technical information see CD

Coalescing Filters



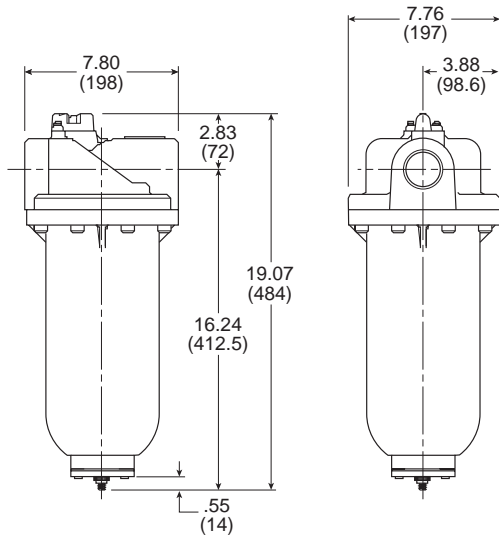
	Port size	Bowl type	Flow SCFM	Element type	Part number (NPT)
					Automatic drain
35F 	1-1/2	Metal	710	0.01 micron	35F77EAP
	1-1/2	Metal	710	1.0 micron	35F77HAP
	1-1/2	Metal	710	Adsorber	35F77ZAP
	2	Metal	710	0.01 micron	35F87EAP
	2	Metal	710	1.0 micron	35F87HAP
	2	Metal	710	Adsorber	35F87ZAP
43F 	3	Metal	1770	0.01 micron	43FN7EAP
	3	Metal	1770	1.0 micron	43FN7HAP
	3	Metal	1770	Adsorber	43FN7ZAP

 Most popular.

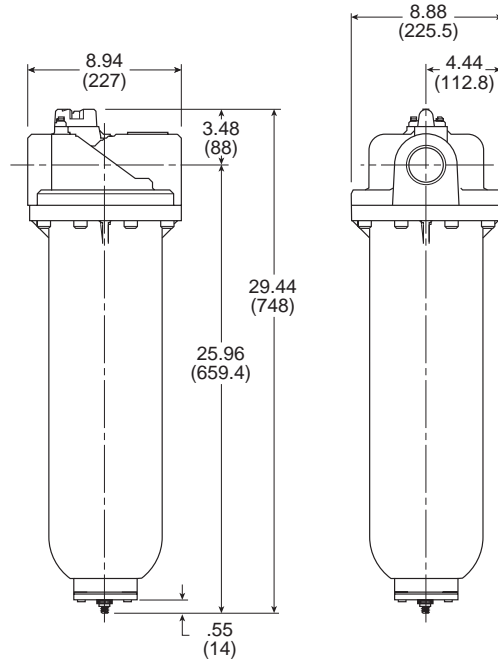


General Industrial
 Air Preparation Products

35F (Hi-Flow)



43F (Hi-Flow)



Service kits

Description		35F (Hi-Flow)	43F (Hi-Flow)
DPI replacement kit		DP2-02-001	DP2-02-001
DPI cap	Pressures over 150 PSIG	GRP-95-022	GRP-95-022
DP gauge		DP3-01-000	DP3-01-000
Automatic float drain kit	Auto internal drain 1/8"	P32KA00DA	P32KA00DA
Manual drain kit	with 1/2" drain plate	GRP-95-392	GRP-95-392
Drain plate kit	1/2 NPT tapped port	GRP-95-393	GRP-95-393
Filter element kit –	0.01 micron	MTP-95-502	MTP-95-562
	1.0 micron	MSP-95-502	MSP-95-876
	Adsorber	MXP-95-502	MXP-95-565

- Unbalanced poppet standard
- Solid control piston with lip seal for extended life
- Non-rising adjusting knob
- Compact, 2.88 inch (73,2mm) high by 1.65 inch (42mm) wide
- Easily serviced
- 14R: 1/8" & 1/4" ports (NPT, BSPP & BSPT)
- 15R: 1/4" & 3/8" ports (NPT, BSPP & BSPT)



14R



15R

Material specifications



Adjusting nut	Brass
Adjusting stem & spring	Steel
Body	Zinc
Bonnet, seat, piston & valve poppet	Plastic
Seals	Nitrile

Operating information

	14R (Mini), 15R (Economy)
Pressure rating	0 to 300 PSIG (0 to 20.4 bar)
Temperature rating	32°F to 125°F (0°C to 52°C)
Low temperature	-4°F to 125°F (-20°C to 52°C)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
Medium pressure	1 to 30 PSIG (0 to 2.1 bar)
Low pressure	1 to 15 PSIG (0 to 1 bar)
For technical information see CD	

Regulators



	Port size	Pressure range	Flow SCFM	Part number (NPT)	
				Without gauge	With gauge
 14R	1/8"	30 PSIG	13	14R010F*	14R015F*
	1/8"	60 PSIG	13	14R011F*	14R016F*
	1/8"	125 PSIG	13	14R013F*	14R018F*
	1/4"	30 PSIG	15	14R110F*	14R115F*
	1/4"	60 PSIG	15	14R111F*	14R116F*
	1/4"	125 PSIG	15	14R113F*	14R118F*
 15R	1/4"	30 PSIG	21	15R110F*	15R115F*
	1/4"	60 PSIG	21	15R111F*	15R116F*
	1/4"	125 PSIG	21	15R113F*	15R118F*
	3/8"	30 PSIG	28	15R210F*	15R216F*
	3/8"	60 PSIG	28	15R211F*	15R215F*
	3/8"	125 PSIG	28	15R213F*	15R218F*

* Engineering level will be added at factory.

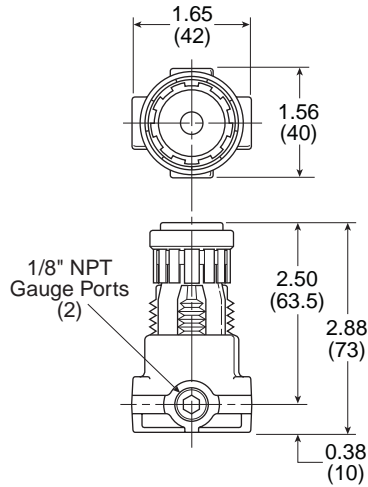
WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

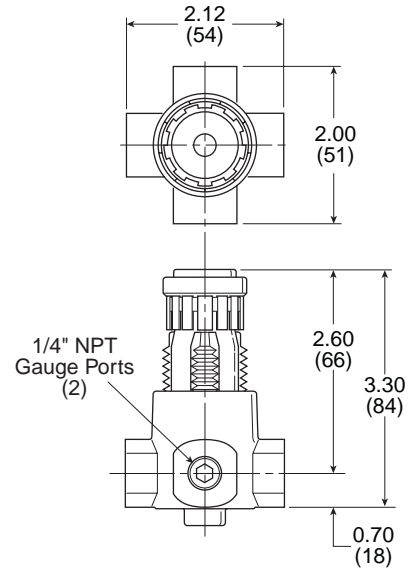
Most popular.



14R (Mini)



15R (Economy)



Service kits

Description		14R (Mini)	15R (Economy)
Body service kit – unbalanced			PS424BP
Bonnet assembly kit		L01369	L01369
Bonnet tamperproof kit		P01265	
Gauges –	30 PSIG, 1/8" NPT (0 to 2.1 bar)	K4515N18030	K4515N18030
	60 PSIG, 1/8" NPT (0 to 4.1 bar)	K4515N18060	K4515N18060
	160 PSIG, 1/8" NPT (0 to 11.0 bar)	K4515N18160	K4515N18160
	60 PSIG, 1/4" NPT (0 to 4.1 bar)	K4520N14060	K4520N14060
	160 PSIG, 1/4" NPT (0 to 11.0 bar)	K4520N14160	K4520N14160
Mounting bracket kit (includes panel mount nut)		PS417BP	PS417BP
Panel mount nuts –	Plastic	P78652	P78652
	Metal	P01531	P01531
Poppet / piston kits –	Unbalanced, non-relieving	PS428P	
	Unbalanced, relieving	PS426P	
Seal kit	Unbalanced		PS454B
Springs –	1-15 PSIG range (Yellow)	P01176	P01176
	1-30 PSIG range (Black)	P01175	P01175
	1-60 PSIG range (White)	P01174	P01174
	2-125 PSIG range (Gold)	P01173	P01173

- Diaphragm operated for fast operation
- Large Diaphragm to valve area ratio for precise regulation and high flow capacity
- Balanced valve design for precise regulation
- Available in 2 or 4 port design
- Available with a manifold mount to minimize plumbing
- Suitable for low temperature applications
- Non-rising adjusting knob
- 1/8" & 1/4" ports (NPT & BSPP)

Material specifications

Description	R34 (Mini)
Body	Aluminum
Bonnet	Acetal
Diaphragm & seals	Nitrile
Springs	Steel
Panel nut	Acetal
Valve assembly	Brass



R342/R344

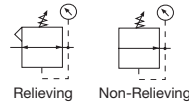


R342-0MC

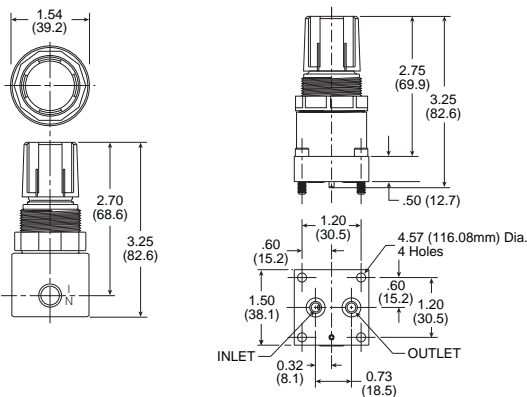
Operating information

	R34 (Mini)
Supply pressure	300 PSIG (20.4 bar) max
Temperature rating	-40°F to 150°F (-40°C to 65.5°C)
For technical information see CD	

R34 Regulator, relieving



Port size	Pressure range	Flow SCFM	Part number	
			Without gauge	With gauge
1/8"	0 to 30 PSIG (0 to 2.1 bar)	17	R344-01A	R344-01AG
1/8"	0 to 60 PSIG (0 to 4.1 bar)	17	R344-01B	R344-01BG
1/8"	0 to 125 PSIG (0 to 8.6 bar)	17	R344-01C	R344-01CG
1/4"	0 to 30 PSIG (0 to 2.1 bar)	19	R344-02A	R344-02AG
1/4"	0 to 60 PSIG (0 to 4.1 bar)	19	R344-02B	R344-02BG
1/4"	0 to 125 PSIG (0 to 8.6 bar)	19	R344-02C	R344-02CG
Manifold Mount			R342-0MA	
Manifold Mount			R342-0MB	
Manifold Mount			R342-0MC	



Service kits

Diagram assembly	Non-relieving	GRP-96-726
	Relieving	GRP-96-725
Gauges -	60 PSIG, 1/8" NPT (0 to 4.1 bar)	K4515N18060
	160 PSIG, 1/8" NPT (0 to 11.0 bar)	K4515N18160
Mounting bracket kit (includes panel mount nut)		SA161x57
Panel mount nuts	Plastic	R05x51-P
	Aluminum	R05x51-A
Springs -	0 to 30 PSIG (0 to 2.1 bar)	GRP-95-111
	0 to 60 PSIG (0 to 4.1 bar)	GRP-96-718
	0 to 125 PSIG (0 to 8.6 bar)	GRP-96-717

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT -
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Most popular.

- 20R: Rugged brass body for water service
- R24/R25, R45/R46: Constructed with a combination of N.S.F. and F.D.A. Approved materials
- Unbalanced poppet standard
- Non-rising, push-to-lock adjusting knob
- Diaphragm operated
- 20R: 1/8" & 1/4" ports (NPT & BSPP)
- R24/R25: 1/8" & 1/4" ports (NPT & BSPP)
- R45/R46: 1/4" & 3/8" ports (NPT & BSPP)

Material specifications

	20R	R25/R45	R24/R46
Adjusting screw	Steel	Steel	Steel
Body		Acetal	Acetal
Body, bottom plug, diaphragm button	Brass		
Bonnet & seat	Plastic	Acetal	Acetal
Diaphragm		Buna N	EPDM
Seals	Buna N	Buna N	EPDM
Springs	Steel	Stainless	Stainless
Valve poppet	Brass	Buna N	EPDM



20R



R24/R25



R45/R46




Operating information

	20R	
Pressure rating	0 to 300 PSIG (0 to 20.4 bar)	
Secondary pressure ranges		
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)	
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)	
Medium pressure	1 to 25 PSIG (0 to 2.1 bar)	
Temperature rating	32°F to 125°F (0°C to 52°C)	
	R24/R25	R45/R46
Pressure rating	0 to 150 PSIG (0 to 10 bar)	
Temperature rating	40°F to 125°F (4°C to 52°C)	

For technical information see CD

Regulators



	Port size	Pressure range	Flow SCFM	Part number (NPT)	
				Air service, relieving	Water service, non-relieving
 R24/R25	1/8"	25 PSIG		R25-01A	R24-01AK
	1/8"	60 PSIG		R25-01B	R24-01BK
	1/8"	125 PSIG		R25-01C	R24-01CK
	1/4"	25 PSIG		R25-02A	R24-02AK
	1/4"	60 PSIG		R25-02B	R24-02BK
	1/4"	125 PSIG		R25-02C	R24-02CK
 R45/R46	1/4"	25 PSIG		R45-02A	R46-02AK
	1/4"	60 PSIG		R45-02B	R46-02BK
	1/4"	125 PSIG		R45-02C	R46-02CK
	3/8"	25 PSIG		R45-03A	R46-03AK
	3/8"	60 PSIG		R45-03B	R46-03BK
	3/8"	125 PSIG		R45-03C	R46-03CK
 20R	1/8"	25 PSIG	1.25	20R011F*	20R011G*
	1/8"	60 PSIG	1.25	20R061F*	20R061G*
	1/8"	125 PSIG	1.25	20R013F*	20R013G*
	1/4"	25 PSIG	1.25	20R111F*	20R111G*
	1/4"	60 PSIG	1.25	20R161F*	20R161G*
	1/4"	125 PSIG	1.25	20R113F*	20R113G*

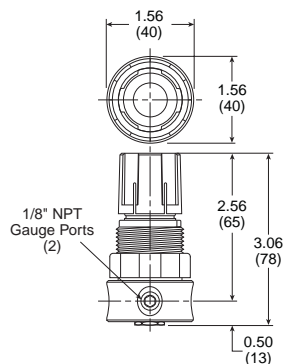
NOTE: 1.25 Dia. (32mm) hole required for panel mounting.
 * Engineering level will be added at factory.

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

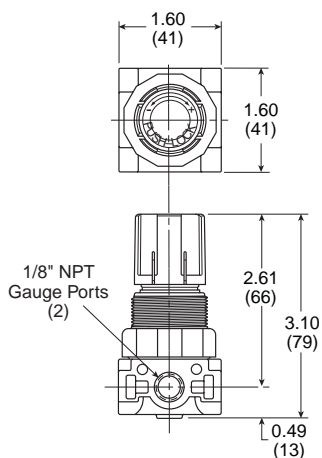
CAUTION:
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 Most popular.

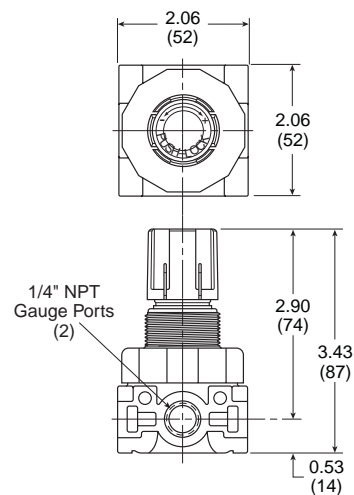
20R



R24/R25



R45/R46



Service kits

Description		20R	R24	R25	R45	R46
Bonnet kit		PCKR364Y				
Bonnet tamperproof kit		PCKR364T				
Mounting bracket kit (includes panel mount nut)		SA161x57	SA161X57	SA161X57	SA161X57	SA161X57
Panel mount nuts –	Plastic	R05x51-P	R05X51-P	R05X51-P	R05X51-P	R05X51-P
	Aluminum	R05x51-A	R05X51-A	R05X51-A	R05X51-A	R05X51-A
Repair kits –	Non-relieving	PRKR163Y	RKR24KY	RKR25KY	RKR45KY	RKR45KY
	Relieving	PRKR164Y	RKR24Y	RKR25Y	RKR45Y	RKR45Y
Springs –	0 to 25 PSIG (0 to 1.7 bar)		SPR-375-1	SPR-375-1	SPR-46	SPR-46
	0 to 60 PSIG (0 to 4.1 bar)		SPR-376	SPR-376	SPR-47	SPR-47
	0 to 125 PSIG (0 to 8.6 bar)		SPR-377	SPR-377	SPR-48	SPR-48

Most popular.

- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Rolling diaphragm for extended life
- Two high flow 1/4" gauge ports can be used as additional outlets
- Easily serviced
- Removable non-rising knob for panel mounting and tamper resistance
- 06R: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07R: 1/2" & 3/4" ports (NPT & BSPP)

Material specifications

Adjusting Stem	Steel
Body	Zinc
Bonnet, piston stem, valve poppet & cap	Plastic
Collar, knob	Plastic
Diaphragm	Nitrile
Seals	Nitrile
Springs – Poppet Control	Stainless Steel



06R





07R

Operating information

	06R (Compact), 07R (Standard)
Pressure rating	250 PSIG (17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)
For technical information see CD	

Regulators



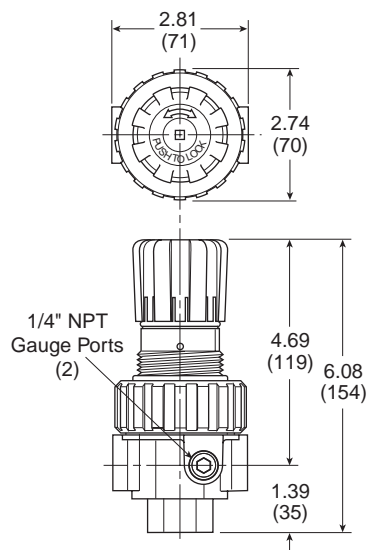
	Port size	Pressure range	Flow SCFM	Part number (NPT)	
				Without gauge	With 160 PSI gauge
06R 	1/4"	125 PSIG	53	06R113A*	06R118A*
	3/8"	125 PSIG	60	06R213A*	06R218A*
	1/2"	125 PSIG	75	06R313A*	06R318A*
07R 	1/2"	125 PSIG	90	07R313A*	07R318A*
	3/4"	125 PSIG	90	07R413A*	07R418A*

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

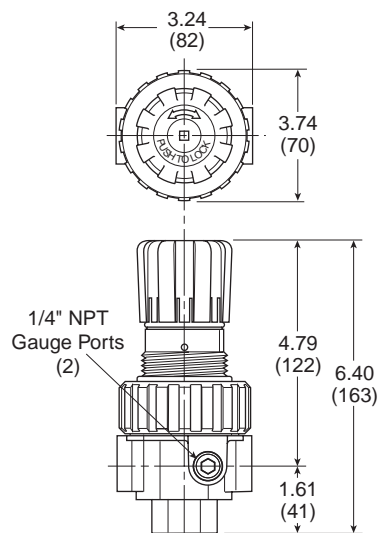
CAUTION:
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 Most popular.

06R (Compact)



07R (Standard)



Service kits

Description	06R (Compact)	07R (Standard)
Bonnet assembly	PS715P	PS715P
Control knob	P04069B	P04069B
Gauges –		
60 PSIG (0 to 4.1 bar)	K4520N14060	K4520N14060
160 PSIG (0 to 11.0 bar)	K4520N14160	K4520N14160
300 PSIG (0 to 20.0 bar)	K4520N14300	K4520N14300
Mounting bracket kit (Includes panel mount nut)	PS707P	PS807P
Panel mount nut –		
Plastic	P04082	P04079B
Metal	P04082	P04079B
Reverse Flow Service Conversion Kit – Relieving	PS708RP	PS808RP
Springs –		
1-30 PSIG range	P01698	P01698
1-60 PSIG range	P04062	P04062
2-125 PSIG range	P04063	P04063
5-250 PSIG range	P04064	P04064
Tamperproof kit	PS737P	PS7373P

☐ Most popular.



P3N

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life

R119

- High flow performance featuring rugged design for the most demanding applications
- Diaphragm operated design with balanced poppet design for quick and accurate regulation
- Heavy duty tee handle adjustment
- Reverse flow version available

09R

- Piston design for reduced downtime
- High flow
- Balanced poppet for quick and accurate regulation
- Self relieving piston standard



P3N



R119



09R

Operating information			
	P3NR	R119	09R
Pressure rating, maximum	250 PSIG (17.2 bar)	300 PSIG (20.4 bar)	300 PSIG (20.4 bar)
Secondary pressure range			10 to 125 PSIG (0.7 to 8.6 bar) 10 to 180 PSIG (0.7 to 12.4 bar)
Reduced pressure range		2 to 125 PSIG (0.15 to 8.5 bar)	
Temperature rating	32°F to 175°F (0°C to 80°C)	40°F to 125°F (4.4°C to 52°C)	32°F to 150°F (0°C to 66°C)
For technical information see CD			

P3NR, R119, 09R Hi-Flow Regulators



Port size	Gauge	Flow (SCFM)			Part number (NPT), Relieving		
		P3NR	R119	09R	P3NR	R119	09R
3/4"	No	200	300		P3NRA96BNN	R119-06C	
1"	No	300	400		P3NRA98BNN	R119-08C	
1-1/4"	No		500			R119-10C	
1-1/2"	No	300	500		P3NRA9PBNN	R119-12C	
2"	No			1000			09R813B*
3/4"	125 PSI	200	300		P3NRA96BNG	R119-06CG	
1"	125 PSI	300	400		P3NRA98BNG	R119-08CG	
1-1/4"	125 PSI		500			R119-10CG	
1-1/2"	125 PSI	300	500		P3NRA9PBNG	R119-12CG	

* Engineering level will be added at factory.

Material specifications

	P3NR	R119	09R
Adjusting screw	Steel	Steel	Steel
Body	Aluminum	Zinc	Zinc
Bonnet	Aluminum		Aluminum
Bottom plug, inner valve		Brass	
Knob	Plastic		
Piston	Plastic		Plastic
Piston stem			Aluminum
Poppet assembly	Brass		Aluminum
Seals	Nitrile	Buna N	Nitrile
Springs – poppet & control	Steel	Steels	Stainless

 Most popular.

⚠ WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

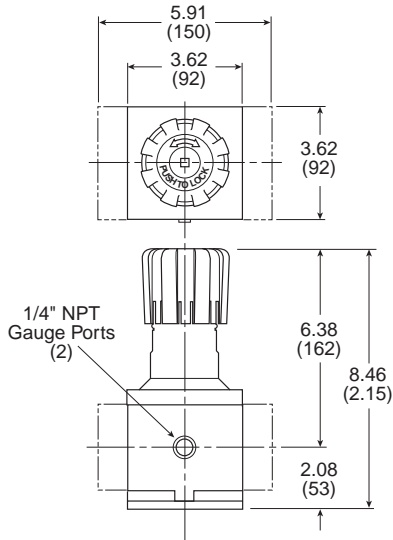
CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

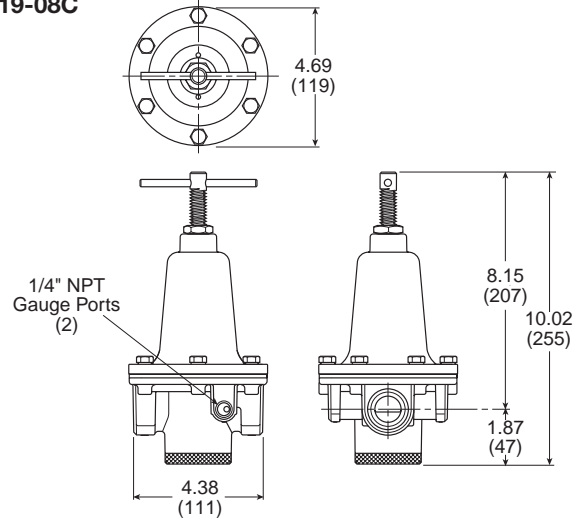
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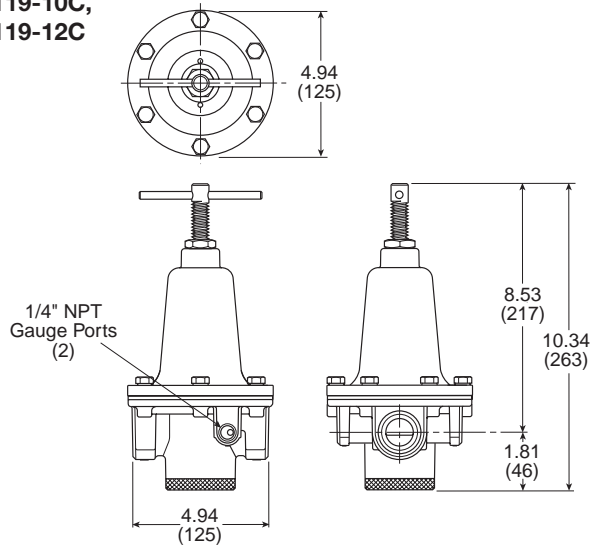
P3NR



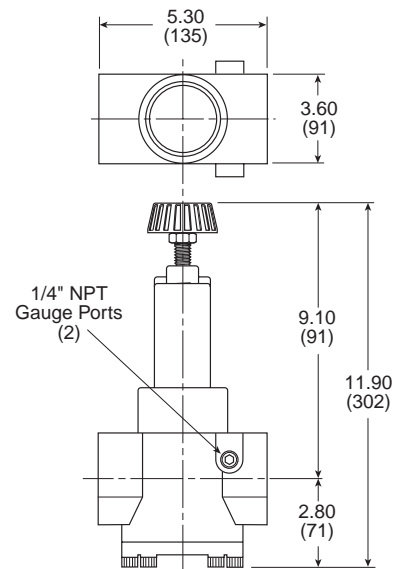
**R119-06C,
 R119-08C**



**R119-10C,
 R119-12C**



09R



Service kits

	P3NR	R119	09R
Body service kit			PS603P
Control knob	P3NKA00PN		
Gauges –	60 PSIG (0 to 4.1 bar)	K4520N14060	K4520N14060
	160 PSIG (0 to 11.0 bar)	K4520N14160	K4520N14160
	300 PSIG (0 to 20.0 bar)	K4520N14300	K4520N14300
Mounting bracket kit	P3NKA00MW	18B57	PS605P
Repair kits –	Non-relieving		PS604P
	Non-relieving (1-1/4", 1-1/2")	RK118B	
	Relieving	P3NKA00RR	PS626P
	Relieving (3/4", 1")	RK119B	
	Relieving (1-1/4", 1-1/2")	RK119D	
Springs –	1-60 PSIG	C10A1304	
	0 to 125 PSIG		PS602P
	2 to 125 PSIG	SPR-47	
	0 to 180 PSIG		PS627
	5 to 250 PSIG	SPR-48	



- Balanced poppet provides quick response and accurate pressure regulation
- Pilot controlled regulators can be mounted "out of reach" with pilot regulator installed in a convenient location
- Solid control piston for extended life



11R



12R

Operating information

	11R	12R
Pressure rating	0 to 250 PSIG (0 to 17.2 bar)	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)	32°F to 175°F (0°C to 80°C)
Flow capacity SCFM	1/4": 85 3/8": 95 1/2": 95	1/2": 140 3/4": 140

For technical information see CD

11R, 12R Pilot Controlled Regulators



Port size	Gauge	Part number (NPT), Relieving	
		11R	12R
1/4"	No	11R115P*	
3/8"	No	11R215P*	
1/2"	No	11R315P*	12R315P*
3/4"	No		12R415P*
1/4"	160 PSI	11R121P*	
3/8"	160 PSI	11R221P*	
1/2"	160 PSI	11R321P*	12R321P*
3/4"	160 PSI		12R421P*

* Engineering level will be added at factory.

Material specifications

	11R	12R
Body	Zinc	Zinc
Bottom plug	-	-
Innervalve	-	-
Pilot cap	Zinc	Zinc
Piston & poppet	Plastic	Plastic
Seals	Nitrile	Nitrile
Springs – poppet	Steel	Steel

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

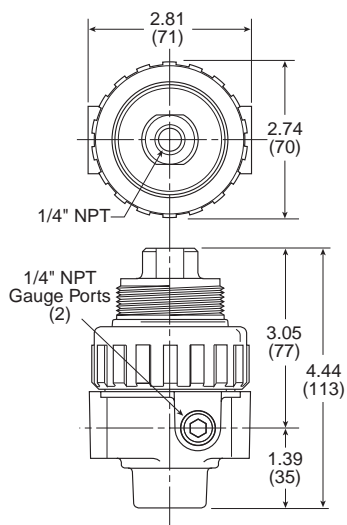
CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

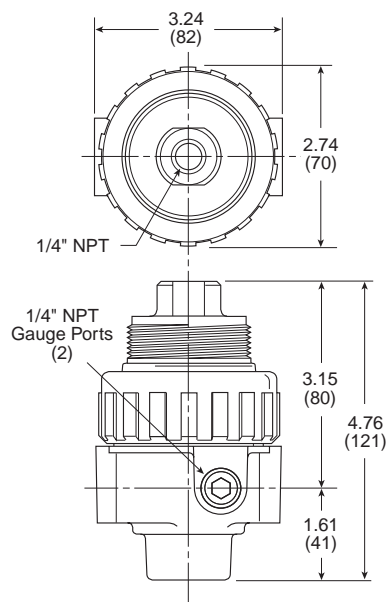
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

11R



12R



Service kits

			11R	12R
Body service kit			PS713P	PS813P
Gauges	1-1/2" Dial face –	30 PSIG (0 to 2.1 bar)		
		60 PSIG (0 to 4.1 bar)	K4520N14060	K4520N14060
		160 PSIG (0 to 11.0 bar)	K4520N14160	K4520N14160
		300 PSIG (0 to 20.0 bar)	K4520N14300	K4520N14300
		2" Dial face –		
		60 PSIG (0 to 4.1 bar)		
		160 PSIG (0 to 11.0 bar)		
		300 PSIG (0 to 20.0 bar)		
Mounting bracket kit			PS707P	PS807P
Panel mount nut –	Metal		P04079B	P04079B
	Plastic		P04082	P04082
Pilot conversion kit			PS745P	PS745P
Repair kits –	Non-relieving		PS747P	PS847P
	Relieving		PS749P	PS849P



P3NR

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life

R119

- Adapted for control by a remote or distant small pilot regulator. Ideal for maximum capacity requirements in applications where units are not readily accessible
- High flow performance featuring rugged design for the most demanding applications
- Ideal for those installations calling for constant pressure with wide variation in flow



P3NR



R119 (06-12)



R119 (16-20)

Operating information

	P3NR	R119-06J R119-08J R119-10J R119-12J	R119-16J R119-20J
Pressure rating, maximum	250 PSIG (17.2 bar)	300 PSIG (17.2 bar)	300 PSIG (17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)	40°F to 125°F (4.4°C to 52°C)	40°F to 120°F (4.4°C to 48.9°C)
Flow capacity SCFM	3/4"; 300 1"; 300 1-1/2"; 350	3/4"; 300 1"; 300 1-1/4"; 500 1-1/2"; 500	2"; 1800 2-1/2"; 1800

For technical information see CD

P3NR, R119 Pilot Operated Regulators



Part number (NPT), relieving

Port size	Gauge	P3NR	R119-06J, R119-08J, R119-10J, R119-12J 0-125 PSIG reduced pressure	R119-16J, R119-20J
3/4"	No	P3NRA96BPP	R119-06J	
1"	No	P3NRA98BPP	R119-08J	
1-1/4"	No		R119-10J	
1-1/2"	No	P3NRA9PBPP	R119-12J	
2"	No			R119-16J
2-1/2"	No			R119-20J
3/4"	160 PSI	P3NRA96BPG		
1"	160 PSI	P3NRA98BPG		
1-1/2"	160 PSI	P3NRA9PBPG		

Material specifications

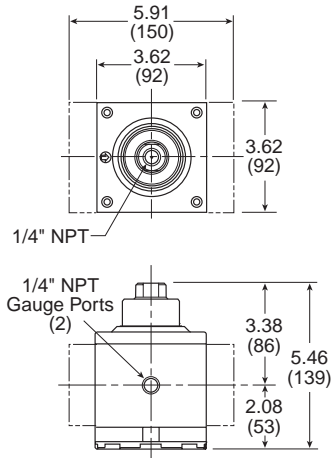
	P3NR	R119-06J, R119-08J, R119-10J, R119-12J	R119-16J, R119-20J
Adjusting stem	Steel		
Body	Aluminum		Aluminum
Body, ring, top plate		Zinc	
Bonnet	Aluminum		
Bottom plug, inner valve		Brass	Brass & Stainless
Piston	Plastic		Aluminum
Poppet assembly	Brass		
Seals	Nitrile	Buna N	Buna N
Springs – poppet	Steel		

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

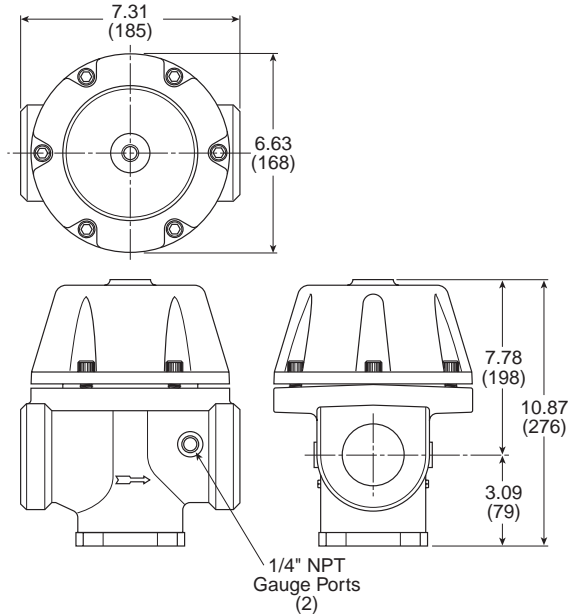
CAUTION: REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

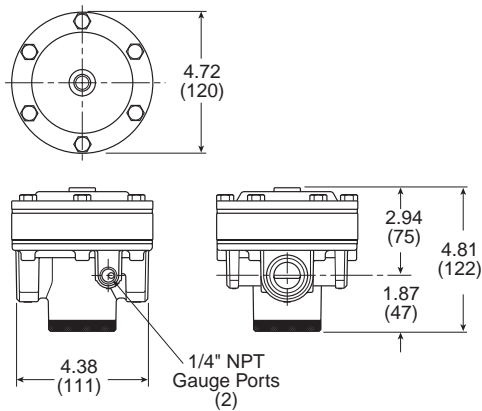
P3NR



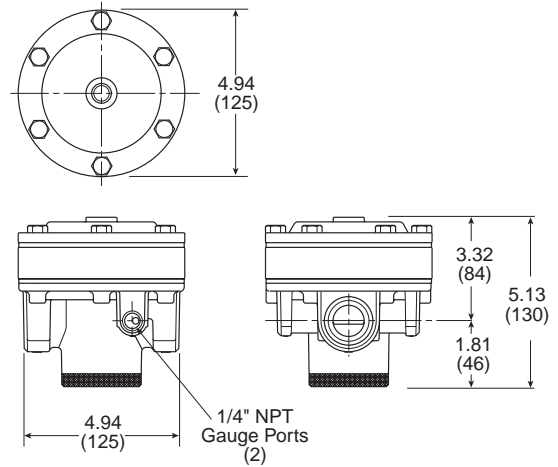
R119-16J, R119-20J



R119-06J, R119-08J



R119-10J, R119-12J



Service kits

		P3NR	R119-06J, R119-08J, R119-10J, R119-12J	R119-16J, R119-20J
Gauges 2" Dial face –	60 PSIG (0 to 4.1 bar)	K4520N14060	K4520N14060	K4520N14060
	160 PSIG (0 to 11.0 bar)	K4520N14160	K4520N14160	K4520N14160
	300 PSIG (0 to 20.0 bar)	K4520N14300	K4520N14300	K4520N14300
Mounting bracket kit		P3NKA00MW		
Repair kits	Piston type regulation (2", 2-1/2")			RK119G
Non-relieving diaphragm –	Valve assembly (3/4", 1")		RK118X20B	
	Valve assembly (1-1/4", 1-1/2")		RK118X20D	
Relieving diaphragm –	Valve assembly (3/4", 1")		RK119X20B	
	Valve assembly (1-1/4", 1-1/2")		RK119X20D	
Repair kits	Relieving	P3NKA00PD		



14E

- Excellent water removal efficiency
- Unbalanced poppet standard
- Solid control piston for extended life
- Space saving package offers both filter and regulator features in one integral unit
- Non-rising adjustment knob
- Two full flow 1/8" gauge ports

B34

- Excellent water removal efficiency diaphragm operated for fast operation
- Large diaphragm to valve area for precise regulation and high flow capacity
- Balanced valve design for precise regulation
- Space saving package offers both filter and regulator features in one integral unit
- Non-rising adjustment knob



14E

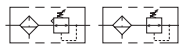


B34

Operating information

	14E	B34
Pressure rating		
Polycarbonate bowl	0 to 150 PSIG (0 to 10.3 bar)	0 to 150 PSIG (0 to 10.3 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)	0 to 300 PSIG (0 to 17.2 bar)
Secondary pressure ranges	Standard pressure 2 to 125 PSIG (0 to 8.6 bar) Medium pressure 1 to 30 PSIG (0 to 2.1 bar) Medium pressure 1 to 60 PSIG (0 to 4.1 bar) Low pressure 1 to 15 PSIG (0 to 1 bar)	Reduced pressure ranges 0 to 25 PSIG (0 to 1.7 bar) 1 to 60 PSIG (0 to 4.1 bar) 2 to 125 PSIG (0.15 to 8.5 bar)
Temperature rating		
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)	40°F to 125°F (4.4°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)	40°F to 125°F (4.4°C to 52°C)
For technical information see CD		

Miniature Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT)		
						Pressure range		
						30 PSIG	60 PSIG	125 PSIG
 14E	1/8"	Poly	Twist	16	5 micron	14E01B10F*	14E01B11F*	14E01B13F*
	1/8"	Poly	Auto pulse	16	5 micron	14E05B10F*	14E05B11F*	14E05B13F*
	1/8"	Metal	Twist	16	5 micron	14E03B10F*	14E03B11F*	14E03B13F*
	1/8"	Metal	Auto pulse	16	5 micron	14E07B10F*	14E07B11F*	14E07B13F*
	1/4"	Poly	Twist	18	5 micron	14E11B10F*	14E11B11F*	14E11B13F*
	1/4"	Poly	Auto pulse	18	5 micron	14E15B10F*	14E15B11F*	14E15B13F*
	1/4"	Metal	Twist	18	5 micron	14E13B10F*	14E13B11F*	14E13B13F*
	1/4"	Metal	Auto pulse	18	5 micron	14E17B10F*	14E17B11F*	14E17B13F*
 B34	1/8"	Poly	Twist		5 micron			B344-01AGC
	1/8"	Metal	Twist		5 micron			B344-01DGC
	1/4"	Poly	Twist		5 micron			B344-02AGC
	1/4"	Metal	Twist		5 micron			B344-02DGC

* Engineering level will be added at factory.

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

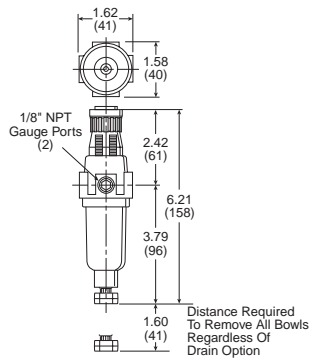
CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

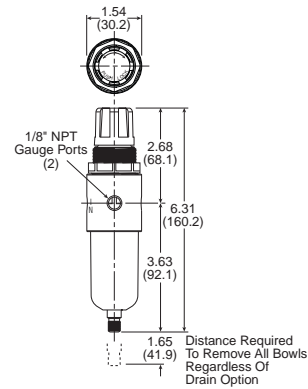
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 Most popular.

14E



B34



Material specifications

Description	14E (Mini)	B34
Adjusting nut	Brass	
Adjusting stem & spring	Steel	
Body	Zinc	Aluminum
Bonnet, knob, seat, piston, holder & deflector	Plastic	
Bowls	Transparent Metal	Polycarbonate Zinc
Drains	Manual – twist Automatic – pulse	Body & stem Seals Nitrile Piston & seals Nitrile Stem, seat, adapter & washers Aluminum
Elastomers		Buna N
Filter elements	5 Micron (standard) 40 Micron (optional) Adsorber (optional)	Plastic Plastic Activated charcoal
Filter retainer, vane plate		Acetal
Innervalve, diaphragm, button, drain		Brass
Seals	Nitrile	

Service kits

Adjusting knob		RRP-16-005-000
Bonnet tamperproof kit	P01265	
Bowl kits	Poly bowl – Automatic pulse drain Twist drain Metal bowl – Automatic drain Twist drain	PS408BP PS404P PS451BP PS447BP BK504SY BK504Y BK505SY BK505Y
Drain kits	Automatic pulse drain	RK504SY
Filter element kits –	5 Micron 40 Micron Adsorber	PS403P PS401P PS452P FRP-96-729
Gauges –	30 PSIG (0 to 2.1 bar) 60 PSIG (0 to 4.1 bar) 160 PSIG (0 to 11.0 bar)	K4515N18030 K4515N18060 K4515N18160 K4515N18060 K4515N18160
Mounting bracket kit* (includes panel mount nut)	PS417BP	SA161X57
Panel mount nuts –	Plastic Aluminum	P78652 R05X51-P R05X51-A
Poppet / piston kits –	Unbalanced, non-relieving Unbalanced, relieving	PS428P PS426P
Repair kits –	Non-relieving, diaphragm, valve assembly Relieving, diaphragm, valve assembly	GRP-96-726 GRP-96-725
Springs –	15 PSIG 30 PSIG 60 PSIG 125 PSIG	P01176 (yellow) P01175 (black) P01174 (white) P01173 (gold) GRP-95-111 GRP-96-718 (black) GRP-96-717

Most popular.



- Space saving package offers both filter and regulator features for optimal performance.
- Excellent water removal efficiency.
- Rolling diaphragm for extended life.
- Quick response, and accurate pressure regulation regardless of changing flow or inlet pressure.
- Two high flow 1/4" gauge ports can be used as additional outlets.

Material specifications

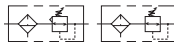
Adjusting stem		Steel	
Body		Zinc	
Bonnet, internal parts		Plastic	
Bowls	Transparent	Polycarbonate	
	Metal	Zinc	
Bowl guard		Steel	
Collar		Plastic	
Diaphragm		Nitrile	
Drains	Manual twist drain standard	Body & nut	Plastic
		Automatic float drain optional	Float housing
		Seals	Nitrile
		Springs, push rod	Stainless steel
Filter elements	40 Micron (standard)	Plastic	
	5 Micron (optional)	Plastic	
Knob		Plastic	
Seals		Nitrile	
Sight gauge		Polyamide	
Springs -	Poppet	Stainless	
	Control	Steel	



Operating information

Pressure rating	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Automatic float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges -	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)
For technical information see CD	

06E Compact Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT)	
						Pressure range (Without gauge)	
						60 PSIG	125 PSIG
06E	1/4"	Poly / Metal guard	Twist	46	5 micron	06E12A11A*	06E12A13A*
	1/4"	Poly / Metal guard	Auto float	46	5 micron	06E16A11A*	06E16A13A*
	3/8"	Poly / Metal guard	Twist	55	5 micron	06E22A11A*	06E22A13A*
	3/8"	Poly / Metal guard	Auto float	55	5 micron	06E26A11A*	06E26A13A*
	1/2"	Poly / Metal guard	Twist	61	5 micron	06E32A11A*	06E32A13A*
	1/2"	Poly / Metal guard	Auto float	61	5 micron	06E36A11A*	06E36A13A*
	1/4"	Metal / Sight gauge	Twist	46	5 micron	06E14A11A*	06E14A13A*
	1/4"	Metal / Sight gauge	Auto float	46	5 micron	06E18A11A*	06E18A13A*
	3/8"	Metal / Sight gauge	Twist	55	5 micron	06E24A11A*	06E24A13A*
	3/8"	Metal / Sight gauge	Auto float	55	5 micron	06E28A11A*	06E28A13A*
	1/2"	Metal / Sight gauge	Twist	61	5 micron	06E34A11A*	06E34A13A*
	1/2"	Metal / Sight gauge	Auto float	61	5 micron	06E38A11A*	06E38A13A*

* Engineering level will be added at factory.

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

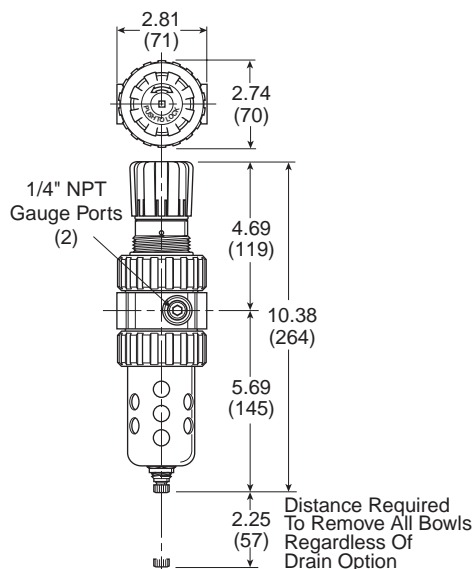
CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

06E



E
 General Industrial
 Air Preparation Products

Service kits

Description	06E	
Bonnet assembly kit	PS715P	
Bowl guard kit	PS705P	
Bowl kits	Poly bowl – Automatic float drain	PS722P
	Twist drain	PS732P
Metal bowl –	Automatic float drain	PS726P
	Semi-auto drain	PS794P
	Twist drain	PS734P
	Sight gauge / Automatic drain	PS723P
	Sight gauge / Twist drain	PS735P
Control knob	P04069B	
Drain kits –	Automatic float drain	PS506P
	Semi-auto drain	PS511P
	Twist drain	PS512P
	Push 'N' Drain	PS513P
Filter element kits –	40 Micron	PS701P
	5 Micron	PS702P
	Adsorber	PS731P
Gauges –	60 PSIG (0 to 4.1 bar)	K4520N14060
	160 PSIG (0 to 11.0 bar)	K4520N14160
	300 PSIG (0 to 20.0 bar)	K4520N14300
Mounting bracket kit (includes panel mount nut)	PS707P	
Panel mount nut	P04082	
Service kits –	Non-relieving (includes poppet)	PS711P
	Relieving (includes poppet)	PS710P
Seat insert kit	PS713P	
Springs –	1- 30 PSIG range	P01698
	1- 60 PSIG range	P04062
	2- 125 PSIG range	P04063
	5- 250 PSIG range	P04064
Tamperproof kit (key lock)	PS737P	

Most popular.



- Space saving package offers both filter and regulator features for optimal performance.
- Excellent water removal efficiency.
- Rolling diaphragm for extended life.
- Quick response, and accurate pressure regulation regardless of changing flow or inlet pressure.
- Two high flow 1/4" gauge ports can be used as additional outlets.

Material specifications

Adjusting stem		Steel	
Body		Zinc	
Bonnet, internal parts		Plastic	
Bowls	Transparent	Polycarbonate	
	Metal	Zinc	
Bowl guard		Steel	
Collar		Plastic or metal	
Diaphragm		Nitrile	
Drains	Manual twist drain standard	Body & nut	Plastic
		Automatic float drain optional	Float housing
		Seals	Nitrile
		Springs, push rod	Stainless steel
Filter elements	40 Micron (standard)	Plastic	
	5 Micron (optional)	Plastic	
Knob		Plastic	
Seals		Nitrile	
Sight gauge		Polyamide	
Springs -	Poppet	Stainless	
	Control	Steel	



Operating information

Pressure rating	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Automatic float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges -	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)
For technical information see CD	

07E Standard Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT)	
						Pressure range (Without gauge)	
						60 PSIG	125 PSIG
07E	1/2"	Poly / Metal guard	Twist	90	5 micron	07E32A11A*	07E32A13A*
	1/2"	Poly / Metal guard	Auto float	90	5 micron	07E36A11A*	07E36A13A*
	3/4"	Poly / Metal guard	Twist	90	5 micron	07E42A11A*	07E42A13A*
	3/4"	Poly / Metal guard	Auto float	90	5 micron	07E46A11A*	07E46A13A*
	1/2"	Metal / Sight gauge	Twist	90	5 micron	07E34A11A*	07E34A13A*
	1/2"	Metal / Sight gauge	Auto float	90	5 micron	07E38A11A*	07E38A13A*
	3/4"	Metal / Sight gauge	Twist	90	5 micron	07E44A11A*	07E44A13A*
	3/4"	Metal / Sight gauge	Auto float	90	5 micron	07E48A11A*	07E48A13A*



* Engineering level will be added at factory.

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

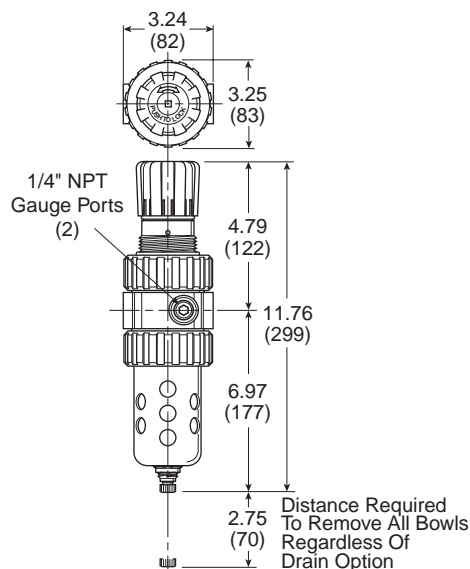
CAUTION:

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Most popular.

07E



Service kits

Description			07E
Bonnet assembly kit			PS715P
Bowl guard kit			PS805P
Bowl kits	Poly bowl –	Automatic float drain	PS822P
		Twist drain	PS832P
Metal bowl –		Automatic float drain	PS826P
		Semi-auto drain	PS894P
		Twist drain	PS834P
		Sight gauge / Automatic drain	PS823P
		Sight gauge / Twist drain	PS835P
Control knob			P04069B
Drain kits –	Automatic float drain		PS506P
	Semi-auto drain		PS511P
	Twist drain		PS512P
	Push 'N' Drain		PS513P
Filter element kits –	40 Micron		PS801P
	5 Micron		PS802P
	Adsorber		PS831P
Gauges –	60 PSIG (0 to 4.1 bar)		K4520N14060
	160 PSIG (0 to 11.0 bar)		K4520N14160
	300 PSIG (0 to 20.0 bar)		K4520N14300
Mounting bracket kit (includes panel mount nut)			PS807P
Panel mount nut			P04082
Service kits –	Non-relieving (includes poppet)		PS811P
	Relieving (includes poppet)		PS810P
Seat insert kit			PS813P
Springs –	1- 30 PSIG range		P01698
	1- 60 PSIG range		P04062
	2- 125 PSIG range		P04063
	5- 250 PSIG range		P04064
Tamperproof kit (key lock)			PS737P

Most popular.

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Excellent water removal efficiency
- Metal bowl with sight gauge
- Large filter element surface guarantees low pressure drop and increased element life
- Twist drain as standard, optional auto drain
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life



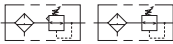
Material specifications

Adjusting stem		Steel
Body, bonnet, bowl		Aluminum
Drain		Plastic
Filter elements	5 micron (standard)	Plastic
	40 micron (optional)	Plastic
	Adsorber (optional)	Activated charcoal
Knob		Plastic
Piston		Plastic
Polyamide (Nylon)		Polyamide (nylon)
Springs – poppet & control		Steel

Operating information

Pressure ratings	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)
For technical information see CD	

P3NE Hi-Flow Filter / Regulators



Port size	Bowl type	Drain type	Flow SCFM	Part number (NPT)
3/4"	Metal / Sight gauge	Twist	250	P3NEA96GSMBNN
3/4"	Metal / Sight gauge	Auto float	250	P3NEA96GSABNN
1"	Metal / Sight gauge	Twist	250	P3NEA98GSMBNN
1"	Metal / Sight gauge	Auto float	250	P3NEA98GSABNN
1-1/2" #	Metal / Sight gauge	Twist	250	P3NEA9PGSMBNN
1-1/2" #	Metal / Sight gauge	Auto float	250	P3NEA9PGSABNN

1" port body with 1-1/2" port block

WARNING
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 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

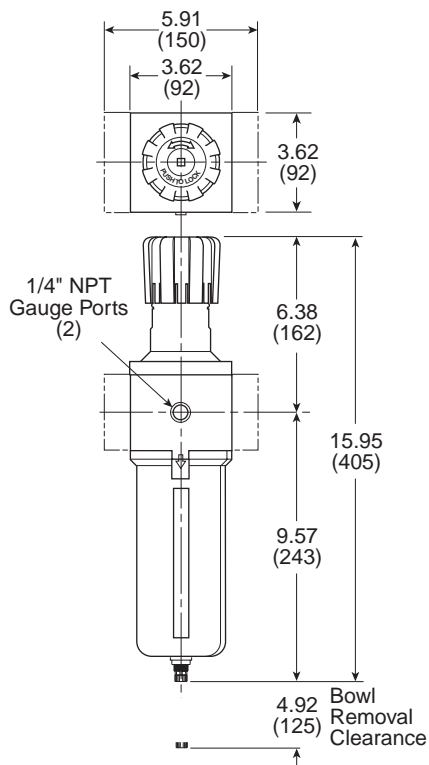
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Most popular.

P3NE



Service kits

Description		P3NE
Bowl kits: Metal bowl –	Automatic drain	P3NKA00BSA
	Twist drain	P3NKA00BSM
	Push 'N' Drain	P3NKA00BSP
Bowl latch kit		C11A33
Control knob		P3NKA00PN
Drain kits –	Automatic float drain	PS506P
	Semi-auto drain	PS511P
	Twist drain	PS512P
	Push 'N' Drain	PS513P
Filter element kits –	40 Micron	P3NKA00ESG
	5 Micron	P3NKA00ESE
	Adsorber	P3NKA00ESA
Gauges –	60 PSIG (0 to 4.1 bar)	K4520N14060
	160 PSIG (0 to 11.0 bar)	K4520N14160
	300 PSIG (0 to 17.2 bar)	K4520N14300
Mounting bracket kit* (includes panel mount nut)		P3NKA00MW
Service kits –	Non-relieving	P3NKA00RN
	Relieving	P3NKA00RR
Sight gauge kit		P3NKA00PE
Springs –	1- 60 PSIG rang)	C10A1304
	2- 125 PSIG range	C10A1308
	5-250 PSIG range (white)	C10A1317



- Proportional oil delivery over a wide range of air flows
- Generates oil particles of 5 micron or smaller downstream to lubricate systems having complex piping arrangements
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Ideal for low and high flow applications with changing air flow
- Transparent sight dome for 360° visibility
- Yellow fill cap identifies Micro-Mist Lubricator
- 16L: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 17L: 1/2" & 3/4" ports (NPT & BSPP)



16L



17L

Material specifications

Body	Zinc
Bowls –	
Transparent	Polycarbonate
Metal	Zinc
Bowl guards	Steel
Collar	Plastic (16, 17) or metal (17)
Drains –	
Twist drain – body & nut	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

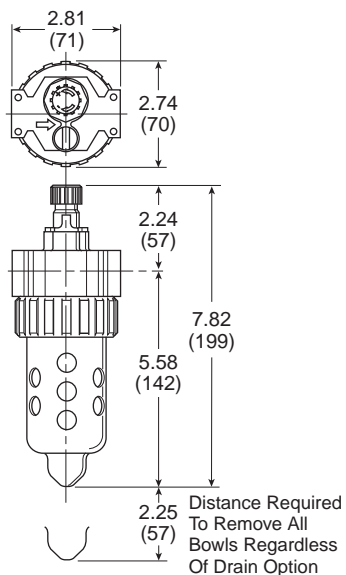
Pressure rating	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Minimum flow for lubrication	1 SCFM at 100 PSIG
Suggested lubricant	F442 oil
Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)	
(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)	
For technical information see CD	

Compact & Standard Lubricators

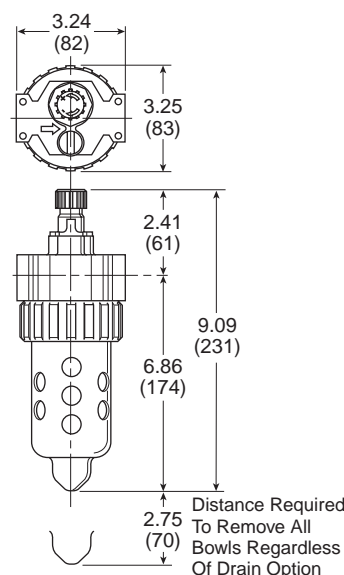


	Port size	Bowl type	Flow SCFM	Part number (NPT)	
				Twist drain	No drain
 16L	1/4"	Poly / Metal guard	40	–	16L12B*
	1/4"	Metal / Sight gauge	40	16L14B*	–
	3/8"	Poly / Metal guard	60	–	16L22B*
	3/8"	Metal / Sight gauge	60	16L24B*	–
	1/2"	Poly / Metal guard	90	–	16L32B*
	1/2"	Metal / Sight gauge	90	16L34B*	–
 17L	1/2"	Poly / Metal guard	90	–	17L32B*
	1/2"	Metal / Sight gauge	90	17L34B*	–
	3/4"	Poly / Metal guard	90	–	17L42B*
	3/4"	Metal / Sight gauge	90	17L44B*	–

16L



17L



Service kits

Description	16L (Compact)	17L (Standard)	
Adjustment knob	P04121	P04121	
Bowl guard kit	PS705P	PS805P	
Bowl Kits:	Poly bowl – No drain	PS746P	PS846P
	Twist drain	PS717P	PS817P
	Pressure fill	PS719P	PS819P
	Remote fill	PS728P	PS828P
	Metal bowl – Sight gauge / Twist drain	PS729P	PS829P
	Sight gauge / Pressure fill	PS720P	PS820P
Drain kit	Twist drain	PS512P	PS512P
Fill cap kit		PS742P	PS742P
Lubricator service kit		PS748P	PS748P
Mounting bracket kit		PS743P	PS843P
Oil –	1 Gal	F442002	F442002
	12 Quart case	F442003	F442003
	4 Gal case	F442005	F442005
Pressure fill adapter kit		PS716P	PS716P
Pressure fill button		P11912	P11912
Remote auto-fill device		PS505CP	PS505CP
Sight dome / Fill cap kit		PS739P	PS739P
Sight dome kit		PS740P	PS740P
Nylon sight dome kit		PS740N	PS740N

- Proportional oil delivery over a wide range of air flows
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Ideal for low and high flow applications with changing air flow
- Transparent sight dome for 360° visibility



Material specifications

Body		Zinc
Bowls	Transparent	Polycarbonate
	Metal	Zinc
Drains, twist / body & nut		Plastic
Seals		Nitrile
Sight Dome		Polycarbonate

Operating information

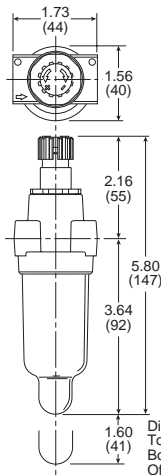
Pressure ratings	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.3 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Minimum flow for lubrication	0.5 SCFM at 100 PSIG
For technical information see CD	

04L Miniature Lubricators



Port size	Bowl type	Drain type	Flow SCFM	Part number (NPT)
1/8"	Poly	None	20	04L00G*
1/8"	Metal without sight gauge	Twist	20	04L03G*
1/4"	Poly	None	20	04L10G*
1/4"	Metal without sight gauge	Twist	20	04L13G*

* Engineering level will be added at factory.



Service kits

			04L (Mini)
Bowl kits	Poly bowl	No drain	PS421P
		Twist drain	PS420P
	Metal bowl	Twist drain	PS447BP
Mounting bracket kit			PS4197
Oil	1 Quart		F442001
	12 Quart case		F442003
	4 Gallon case		F442005

- Proportional oil delivery over a wide range of air flows
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Bowl can be filled while air line is under pressure
- Transparent sight dome for 360° visibility
- 06L: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07L: 1/2" & 3/4" ports (NPT & BSPP)



06L

07L

Material specifications



Body	Zinc
Bowls –	
Transparent	Polycarbonate
Metal	Zinc
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Drains –	
Twist drain – body & nut	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

Pressure rating	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Minimum flow for lubrication	.5 SCFM at 100 PSIG
Suggested lubricant	F442 oil
Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)	
(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)	
For technical information see CD	

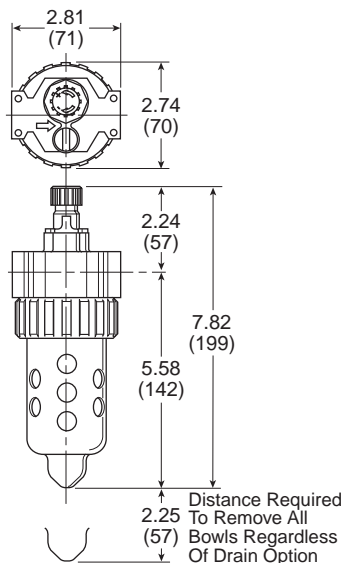
Compact & Standard Lubricators



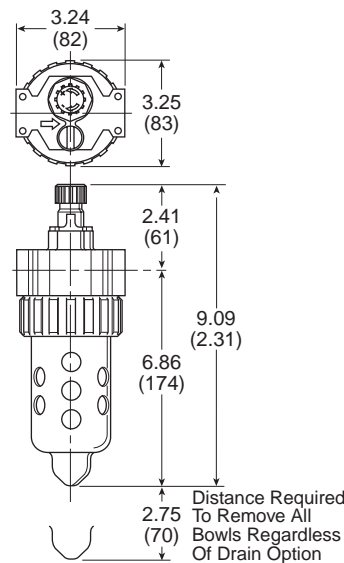
	Port size	Bowl type	Flow SCFM	Part number (NPT)	
				Twist drain	No drain
06L 	1/4"	Poly / Metal guard	40		06L12B*
	1/4"	Metal / Sight gauge	40	06L14B*	
	3/8"	Poly / Metal guard	60		06L22B*
	3/8"	Metal / Sight gauge	60	06L24B*	
	1/2"	Poly / Metal guard	90		06L32B*
	1/2"	Metal / Sight gauge	90	06L34B*	
07L 	1/2"	Poly / Metal guard	90		07L32B*
	1/2"	Metal / Sight gauge	90	07L34B*	
	3/4"	Poly / Metal guard	90		07L42B*
	3/4"	Metal / Sight gauge	90	07L44B*	



06L



07L



Service kits

Description	06L (Compact)	07L (Standard)
Adjustment knob	P04121	P04121
Bowl guard kit	PS705P	PS805P
Bowl Kits – Poly bowl –	No drain	PS746P
	Twist drain	PS717P
	Pressure fill	PS719P
	Remote fill	PS728P
Metal bowl –	Sight gauge / Twist drain	PS729P
	Sight gauge / Pressure fill	PS720P
Drain kit	Twist drain	PS512P
Fill cap kit	PS741P	PS741P
Lubricator service kit	PS718P	PS718P
Mounting bracket kit	PS743P	PS843P
Oil –	1 Gal	F442002
	12 Quart case	F442003
	4 Gal case	F442005
Pressure fill adapter kit	PS716P	PS716P
Pressure fill button	P11912	P11912
Remote auto-fill device	PS505CP	PS505CP
Sight dome / fill cap kit	PS738P	PS738P
Sight dome kit	PS740P	PS740P
Nylon sight dome kit	PS740N	PS740N

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Proportional oil delivery over a wide range of air flows
- Bowl can be filled while air line is under pressure
- Transparent sight dome for 360° visibility
- 3/4", 1" & 1-1/2" ports (NPT, BSPP & BSPT)



Material specifications

Body	Aluminum
Bowls	Aluminum
Drains – twist (optional)	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

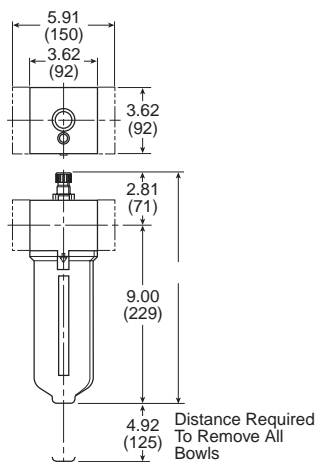
Pressure ratings	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)
Flow capacity	3/4" – 240 SCFM 1" – 250 SCFM 1-1/2" – 260 SCFM
Minimum Flow for Lubrication	6.6 SCFM at 100 PSIG
Suggested lubricant	F442 oil
Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)	
(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)	
For technical information see CD	

P3NL Hi-Flow Lubricators



Port size	Bowl type	Drain type	Flow SCFM	Part number (NPT)
3/4"	Metal / Sight gauge	None	240	P3NLA96LSN
1"	Metal / Sight gauge	None	250	P3NLA98LSN
1-1/2" #	Metal / Sight gauge	None	260	P3NLA9PLSN

1" port body with 1-1/2" port block



Most popular.

Service kits

		P3NL
Adjustment knob		P04121
Bowl kits: Metal bowl –	No drain	P3NKA00BSN
	Twist drain	P3NKA00BSM
Bowl latch kit		C11A33
Drain kit	Twist drain	PS512P
Fill cap kit		P3NKA00PL
Mounting bracket kit		P3NKA00MW
Oil –	1 Quart	F442001
	12 Quart case	F442003
	4 Gallon case	F442005
Pressure fill adapter kit		P3NKA00PK
Service kit		P3NKA00RL
Sight dome kits –	Polycarbonate	PS740P
	Nylon	PS740N
Sight gauge kit		P3NKA00PE



- Metal bowl with sight gauge - standard
- Polycarbonate sight dome
- Bowl can be filled while air line is under pressure
- Proportional oil delivery over a wide range of air flows
- Large capacity bowl
- Optional high capacity bowl(s) available
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- 3/4", 1", 1-1/4" & 1-1/2" ports (NPT & BSPP)



L606 3/4" & 1"



L606 1-1/4" & 1-1/2"

Material specifications

Body	Zinc	
Bowl	(E) 32 oz	Aluminum
	(G) 64 oz.	Aluminum with polycarbonate sight gauge
	(W) 16 oz	Zinc with nylon sight gauge
Seals	Buna N	

Operating information

Operating pressure	Aluminum bowl (E) 32 oz.	0 to 300 PSIG (0 to 20.4 bar)
	Aluminum (G) 64 oz.	0 to 150 PSIG (0 to 10.2 bar)
	Zinc (W) 16 oz.	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature	Aluminum bowl (E) 32 oz.	40°F to 150°F (4.4°C to 65.6°C)
	Aluminum (G) 64 oz.	40°F to 125°F (4.4°C to 52°C)
	Zinc (W) 16 oz.	40°F to 150°F (4.4°C to 65.6°C)
Suggested lubricant		F442 oil
Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)		
(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)		

For technical information see CD

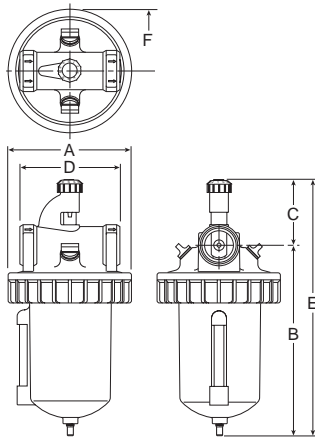
L606 Lubricators



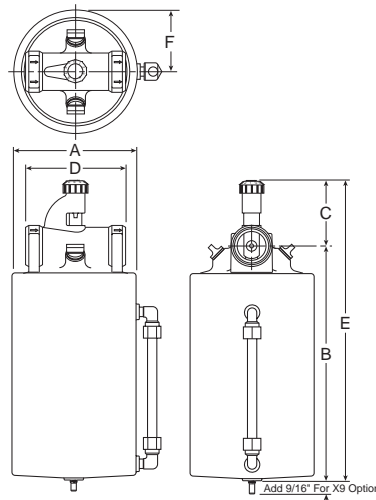
Port size	Bowl type	Bowl capacity	Drain	Flow SCFM	Part number	
					NPT	BSPP
3/4"	Zinc / Sight gauge	16 oz	Yes	325	L606-06W	L606G06W
3/4"	Aluminum	32 oz	Yes	325	L606-06E	L606G06E
3/4"	Aluminum / Sight gauge	64 oz	None	325	L606-06G	L606G06G
1"	Zinc / Sight gauge	16 oz	Yes	350	L606-08W	L606G08W
1"	Aluminum	32 oz	Yes	350	L606-08E	L606G08E
1"	Aluminum / Sight gauge	64 oz	None	350	L606-08G	L606G08G
1-1/4"	Zinc / Sight gauge	16 oz	Yes	325	L606-10W	L606G10W
1-1/4"	Aluminum	32 oz	Yes	325	L606-10E	L606G10E
1-1/4"	Aluminum / Sight gauge	64 oz	None	325	L606-10G	L606G10G
1-1/2"	Zinc / Sight gauge	16 oz	Yes	400	L606-12W	L606G12W
1-1/2"	Aluminum	32 oz	Yes	400	L606-12E	L606G12E
1-1/2"	Aluminum / Sight gauge	64 oz	None	400	L606-12G	L606G12G

Most popular.

L606 - 3/4" and 1"



W & E size bowl

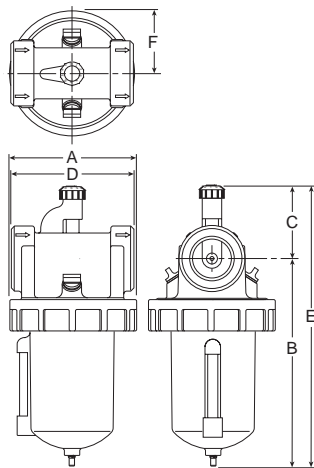


G size bowl

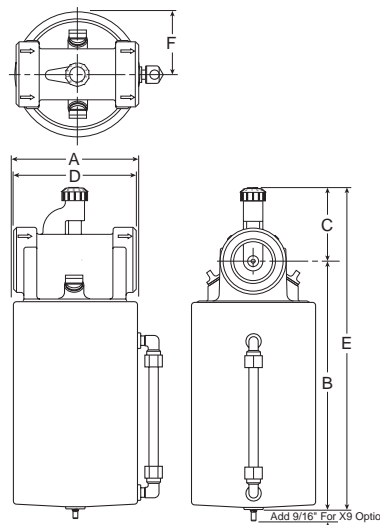
A	B	C	D	E	F
L606-06W, L606-08W					
4.97 (126)	7.25 (184)	2.63 (66.7)	4.06 (103)	9.88 (251)	2.48 (63.1)
L606-06E, L606-08E					
4.97 (126)	10.75 (273)	2.63 (66.7)	4.06 (103)	13.38 (340)	2.48 (63.1)
L606-06G, L606-08G					
5.00 (127)	9.40 (239)	2.62 (66)	4.06 (103)	12.02 (305)	2.50 (64)

inches (mm)

L606 - 1-1/4" and 1-1/2"



W & E size bowl



G size bowl

A	B	C	D	E	F
L606-10W, L606-12W					
4.97 (126)	7.63 (194)	2.84 (72.2)	4.81 (122)	10.47 (266)	2.48 (63.1)
L606-10E, L606-12E					
4.97 (126)	11.13 (283)	2.84 (72.2)	4.81 (122)	13.97 (355)	2.48 (63.1)
L606-10G, L606-12G					
5.00 (127)	7.99 (203)	2.84 (72.2)	4.81 (122)	12.80 (325)	2.50 (64)

inches (mm)

Service kits

Description	L606
Adjusting knob	606Y72
Bowl kits -	Aluminum (e) 32 oz BK603B Aluminum (g) 64 oz BK606X30B Zinc / sight gauge (w) 16 oz BK609WB
Button head fill fitting (m14 male thread)	L606C14
Dip tube kit	DTK606
Drip spout kit	RK606SY
Mounting brackets -	3/4 Inch units (2 required per unit) SA200AW57 1 Inch units (2 required per unit) SA200CW57
Oil -	1 Quart F442001 2 Quart case F442003 4 Gallon case F442005
Repair kits -	Needle valve assembly (all) RK606Y Sight gauge bowl repair kit (w) RKB605WB Sight gauge bowl repair kit (g) RKB606X30B



- Metal bowl with sight gauge and manual drain – standard
- Transparent sight dome for 360° visibility
- Bowl can be filled while air line is under pressure
- Proportional oil delivery over a wide range of air flows



Material specifications

Body Zinc alloy, die cast

Operating information

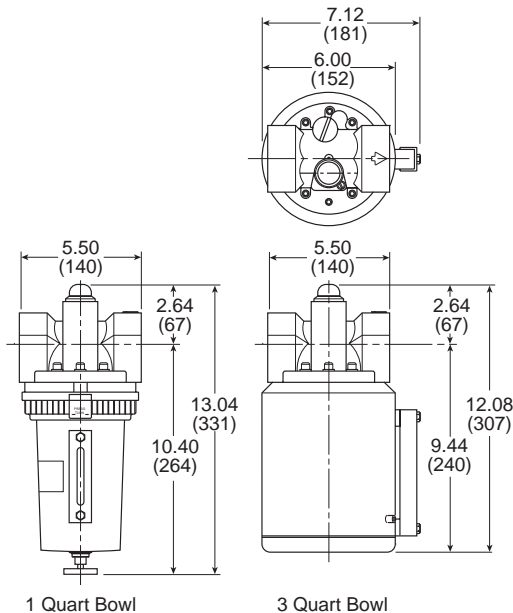
Pressure rating 0 to 150 PSIG (0 to 10.3 bar)
 Temperature rating 32°F to 150°F (0°C to 66°C)
 Suggested lubricant F442 oil
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)
 For technical information see CD

09L Lubricator



Port size	Bowl type	Bowl capacity	Flow SCFM	Part number (NPT)
2"	Metal / Sight gauge	1 quart	1000	09L84B*
2"	Metal / Sight gauge	3 quart	1000	09L8PB*

* Engineering level will be added at factory.



Service kits

Bowl kit	Metal bowl, sight gauge / twist drain	PS612P*
Fill cap kit		PS610P
Lubricator service kit		PS607P
Oil	1 Quart	F442001
	12 Quart case	F442003
	4 Gallon case	F442005
Sight dome kit		PS613P

* 1 quart bowl.

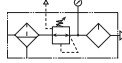
Most popular.



Close Nipped Combinations – 14 Miniature Series

- Regulator can be mounted with knob in up or down position
- 5 micron filter element standard, 40 micron optional
- Manual twist drain
- Relieving regulator



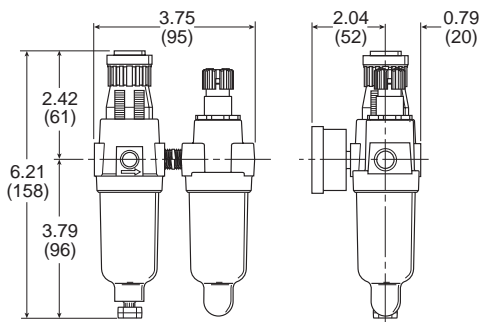
Close Nipped Combinations



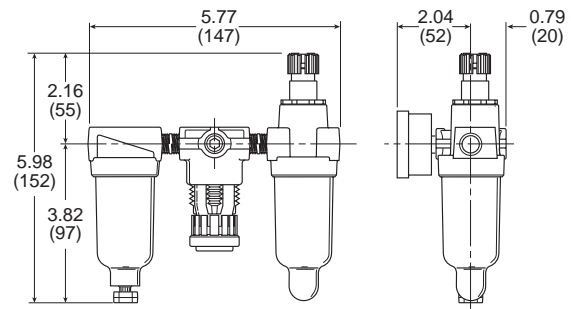
	Port size	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Part number (NPT)
14G 	1/8"	Poly	5 micron	Twist	Relieving	None	14G01B13F0G*
	1/4"	Poly	5 micron	Twist	Relieving	None	14G11B13F0G*
14A 	1/8"	Poly	5 micron	Twist	Relieving	None	14A01B13F0G*
	1/4"	Poly	5 micron	Twist	Relieving	None	14A11B13F0G*

* Engineering level will be added at factory.

14G (Close nipped 2-unit)



14A (Close nipped 3-unit)



Service kits

Mounting bracket kits –	14E, 14F, 14R	PS417BP
	04L	PS419

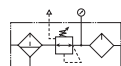
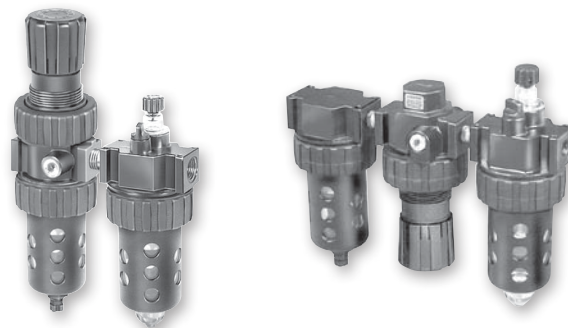
WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.


 Most popular. For technical information see CD

Close Nippled Combinations – 06 Compact & 07 Standard Series

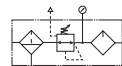
- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator




06G, 16G, 07G, 17G 2-Unit Close Nippled Combinations

	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06G Shown 	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None	06G	06G12A13A2B*	16G	16G12A13A2B*
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None		06G22A13A2B*		16G22A13A2B*
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None		06G32A13A2B*		16G32A13A2B*
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07G	07G32A13A2B*	17G	17G32A13A2B*
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07G42A13A2B*		17G42A13A2B*

06A, 16A, 07A, 17A 3-Unit Close Nippled Combinations



	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06A Shown 	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None	06A	06A12A13A2B*	16A	16A12A13A2B*
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None		06A22A13A2B*		16A22A13A2B*
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None		06A32A13A2B*		16A32A13A2B*
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07A	07A32A13A2B*	17A	17A32A13A2B*
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07A42A13A2B*		17A42A13A2B*

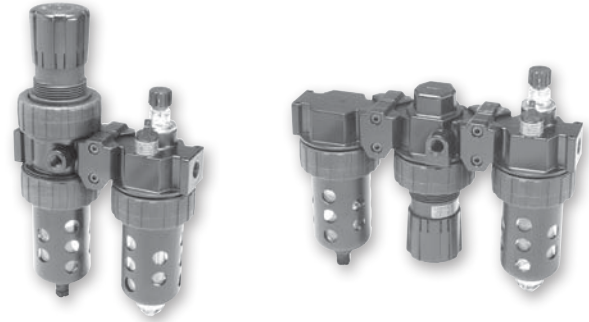
WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

 Most popular. For technical information see CD

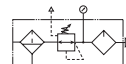
Modular Combinations – 06 Compact & 07 Standard Series

- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator




WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

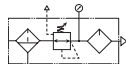
CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
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06H, 16H, 07H, 17H 2-Unit Modular Combinations

	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06H Shown 	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		06H12A13A2B*		16H12A13A2B*
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None	06H	06H22A13A2B*	16H	16H22A13A2B*
	1/2" *	Poly / Metal guard	40 micron	Twist	Relieving	None		06H32A13A2B*G		16H32A13A2B*G
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07H	07H32A13A2B*	17H	17H32A13A2B*
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07H42A13A2B*		17H42A13A2B*

* 06 / 16 Available with port blocks only.



06B, 16B, 07B, 17B 3-Unit Modular Combinations

	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06B Shown 	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		06B12A13A2B*		16B12A13A2B*
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None	06B	06B22A13A2B*	16B	16B22A13A2B*
	1/2" *	Poly / Metal guard	40 micron	Twist	Relieving	None		06B32A13A2B*G		16B32A13A2B*G
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07B	07B32A13A2B*	17B	17B32A13A2B*
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07B42A13A2B*		17B42A13A2B*

* 06 / 16 available with port blocks only.

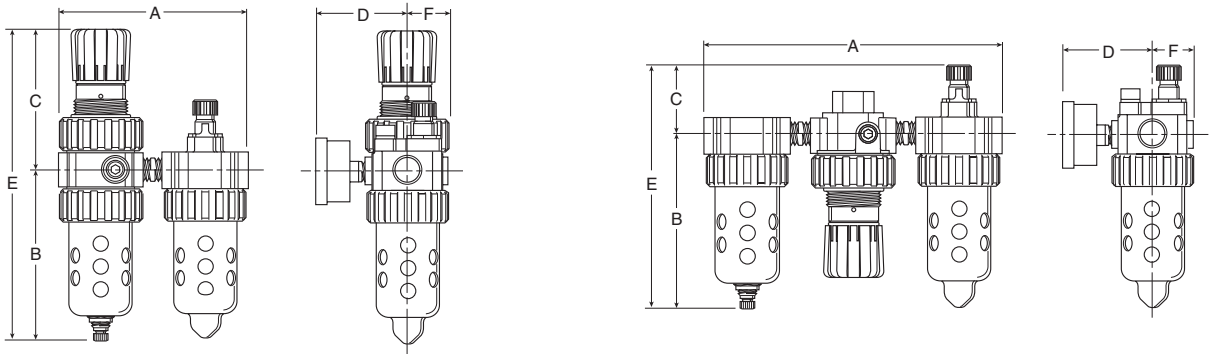
Modular service kits

Description	06 Series	07 Series	Description	Series	Size	NPT	BSP	BSPT
Body connectors	PS754P	PS854P	Port block connector kits	06 Series –	1/4"	PS750P	PS765P†	PS761P
Lockout valves	PS756P	PS856P			3/8"	PS751P	PS766P†	PS762P
Modular manifold block	PS757P	PS857P			1/2"	PS752P*	PS767P*†	PS799P*
Wall mounting kit	PS755P	PS755P		07 Series –	1/4"	PS850P	PS865P	PS861P
					3/8"	PS851P	PS866P	PS862P
					1/2"	PS852P	PS867P‡	PS863P
				3/4"	PS853P	PS860P	PS864P	

Use 1/4 or 3/8 ported bodies. † 1/4, 3/8 & 1/2 inch meet ISO 1179-1 Standard. ‡ 1/2 inch meets ISO 1179-1 Standard.

Most popular. For technical information see CD

Combination Dimensions – 06 Compact & 07 Standard Series



06G, 16G Series

A	B	C	D	E	F
6.13	5.69	4.69	3.18	10.38	1.37
(156)	(145)	(119)	(81)	(264)	(35)

07G, 17G Series

A	B	C	D	E	F
6.99	6.97	4.79	3.44	11.76	1.63
(178)	(177)	(122)	(87)	(299)	(41)

Inches (mm)

• All dimensions nominal.

06A, 16A Series

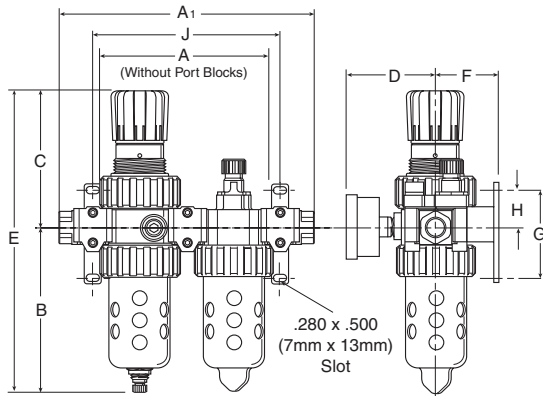
A	B	C	D	E	F
9.45	5.69	2.24	3.18	7.93	1.37
(240)	(145)	(57)	(81)	(201)	(35)

07A, 17A Series

A	B	C	D	E	F
10.74	6.97	2.41	3.44	9.38	1.63
(2738)	(177)	(61)	(87)	(238)	(41)

Inches (mm)

• All dimensions nominal.



06H, 16H Series

A	A1	B	C	D	E
6.10	9.04	5.69	4.69	3.18	10.38
(155)	(230)	(145)	(119)	(81)	(264)

F	G	H	J
2.00	3.58	1.40	6.65
(51)	(91)	(36)	(169)

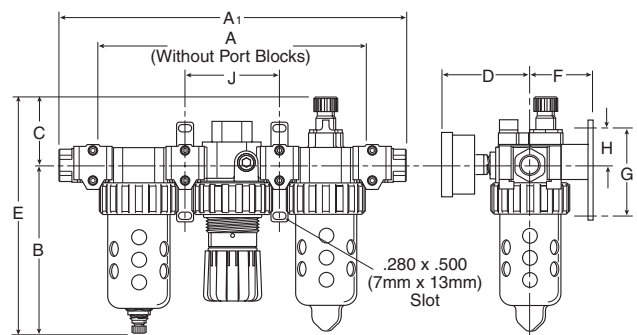
07H, 17H Series

A	A1	B	C	D	E
7.00	10.28	6.97	4.79	3.44	11.76
(178)	(261)	(177)	(122)	(87)	(299)

F	G	H	J
2.09	3.58	1.40	7.51
(53)	(91)	(36)	(191)

Inches (mm)

• All dimensions nominal.



06B, 16B Series

A	A1	B	C	D	E
9.46	12.39	5.69	2.24	3.18	7.93
(240)	(315)	(145)	(57)	(81)	(202)

F	G	H	J
2.00	3.58	1.40	3.33
(51)	(91)	(36)	(85)

07B, 17B Series

A	A1	B	C	D	E
10.75	14.03	6.97	2.41	3.44	9.38
(273)	(356)	(177)	(61)	(87)	(238)

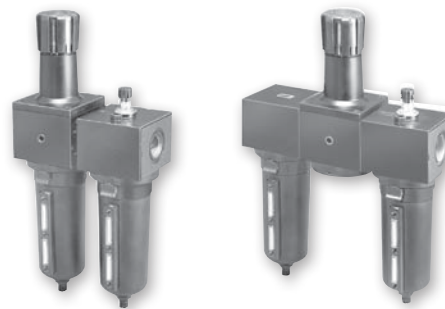
F	G	H	J
2.18	3.58	1.40	3.76
(55)	(91)	(36)	(95)

Inches (mm)

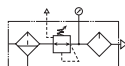
• All dimensions nominal.



Combinations – P3N Hi-Flow Series

- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator



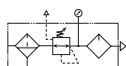
Close Nipped Combinations





	Port size	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Part number (NPT)
P3N3A 	3/4"	Metal	40 micron	Twist	Relieving	None	P3N3A96SGMNNLNA
	1"	Metal	40 micron	Twist	Relieving	None	P3N3A98SGMNNLNA
	1-1/2" #	Metal	40 micron	Twist	Relieving	None	P3N3A9PSGMNNLNA
P3N3B 	3/4"	Metal	40 micron	Twist	Relieving	None	P3N3B96SGMNNLNA
	1"	Metal	40 micron	Twist	Relieving	None	P3N3B98SGMNNLNA
	1-1/2" #	Metal	40 micron	Twist	Relieving	None	P3N3B9PSGMNNLNA

Notes: All combo part numbers are with regulator knob in up position.
 # 1" Port body with 1-1/2" port block.

Modular Combinations



	Port size	Bowl type	Element type	Filter drain type	Pressure range	Relief type	Lubricator drain type	Part number (NPT)
P3NCA 	3/4"	Metal	40 micron	Twist	0-125	Relieving	None	P3NCA96SGMNNLNA
	1"	Metal	40 micron	Twist	0-125	Relieving	None	P3NCA98SGMNNLNA
	1-1/2" #	Metal	40 micron	Twist	0-125	Relieving	None	P3NCA9PSGMNNLNA
P3NCB 	3/4"	Metal	40 micron	Twist	0-125	Relieving	None	P3NCB96SGMNNLNA
	1"	Metal	40 micron	Twist	0-125	Relieving	None	P3NCB98SGMNNLNA
	1-1/2" #	Metal	40 micron	Twist	0-125	Relieving	None	P3NCB9PSGMNNLNA

Notes: All combo part numbers are with regulator knob in up position.
 # 1" Port body with 1-1/2" port block.

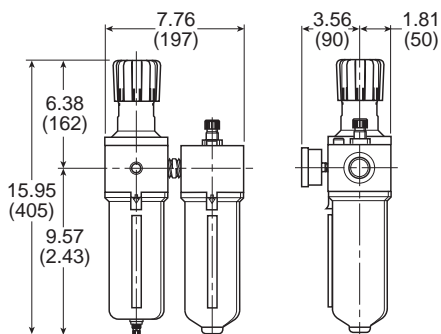
⚠ WARNING
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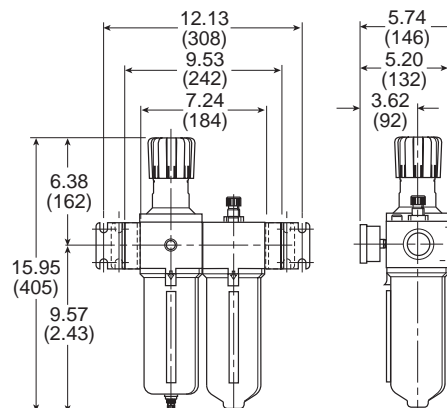
Most popular. For technical information see CD



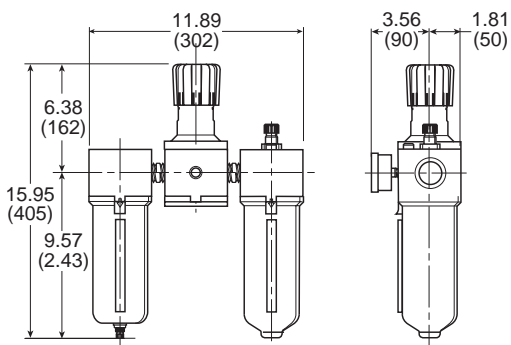
P3N3A (Close nipped 2-unit)



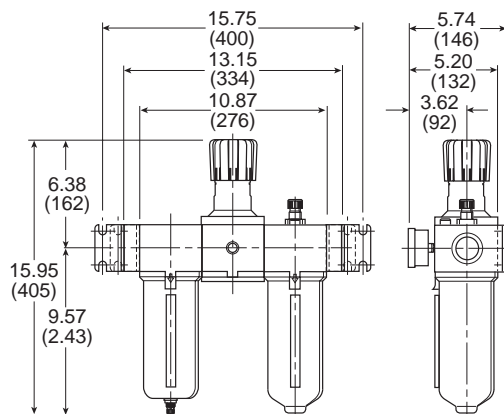
P3NCA (Modular 2-unit)



P3N3B (Close nipped 3-unit)



P3N3CB (Modular 3-unit)



Service kits

Mounting bracket kit	P3NKA00MW
Replacement body cover	P3NKA00PM

Port block kits	3/4"	1"	1-1/2"
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Individual filters, individual regulators and 2-piece filter and regulator assemblies:

NPT	P3NKB96CP	P3NKB98CP	P3NKB9BCP
BSPP	P3NKB16CP	P3NKB18CP	P3NKB1BCP

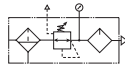
2 and 3 piece combinations including a lubricator (FR/L & FRL), individual lubricators, individual coalescing filters and 2-piece filter and coalescer assemblies:

NPT	P3NKB96CL	P3NKB98CL	P3NKB9BCL
BSPP	P3NKB16CL	P3NKB18CL	P3NKB1BCL

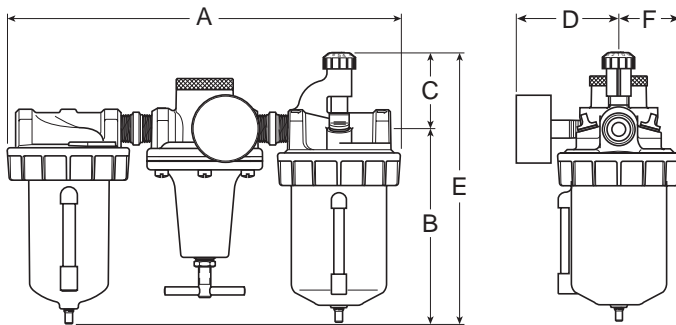
- Regulator can be mounted with knob in up or down position
- 40 micron filter element
- Gauges included on combinations
- Manual twist drain
- Relieving regulator



C628 Standard Combinations



Port size	Bowl type	Bowl capacity	Element type	Part number
3/4"	Metal / Sight gauge	16 oz	40 micron	C628-06FRLWJCW
3/4"	Metal / Without sight gauge	32 oz	40 micron	C628-06FRLEJCE
1"	Metal / Sight gauge	16 oz	40 micron	C628-08FRLWJCW
1"	Metal / Without sight gauge	32 oz	40 micron	C628-08FRLEJCE
1-1/4"	Metal / Sight gauge	16 oz	40 micron	C628-10FRLWJCW
1-1/4"	Metal / Without sight gauge	32 oz	40 micron	C628-10FRLEJCE
1-1/2"	Metal / Sight gauge	16 oz	40 micron	C628-12FRLWJCW
1-1/2"	Metal / Without sight gauge	32 oz	40 micron	C628-12FRLEJCE



A	B	C	D	E	F
C628-06FRL, C628-08FRL					
15.75 (400)	7.75 (197)	5.25 (133)	3.52 (89)	13.00 (330)	2.48 (63)
C628-10FRL, C628-12FRL					
16.50 (419)	8.13 (206)	6.00 (152)	3.86 (98)	14.13 (359)	2.64 (67)

Inches (mm)
 • All dimensions nominal.

WARNING
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CAUTION:
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Most popular. For technical information see CD



The range of Stainless Steel FRLs are ideal for use in the food industry, the petrochemical or process industries or any application in a particularly harsh or aggressive environment.

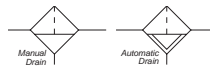
- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- 1/8" female threaded drain



Operating information

		PF504	PF10	PF501	PF11
Operating pressure	Twist drain	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)
	Auto drain	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)
Operating temperature	Twist drain	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)
	Auto drain	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)
Flow / SCFM (dm ³ /s)		23 (10.85)	70 (33.04)	16 (7.55)	45 (21.24)

For technical information see CD



Particulate Filters



Port Size	Flow SCFM (dm ³ /s)	Standard filtration	Part number manual drain	Part number auto drain
1/4	23 (10.85)	20 μ	PF504-02DHSS	PF504-02DHRSS
1/2	70 (33.04)	40 μ	PF10-04WJSS	PF10-04WJRSS

Coalescing Filters



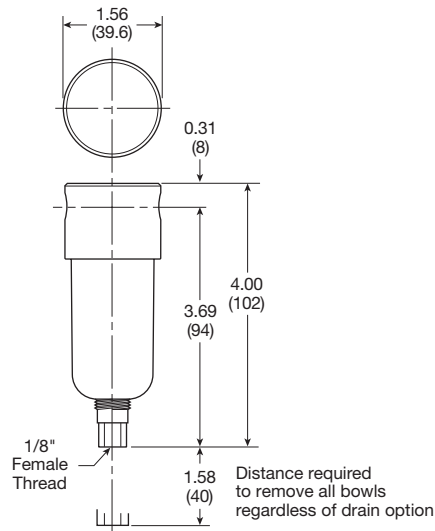
1/4	16 (7.55)	.3 μ	PF501-02DHSS	PF501-02DHRSS
1/2	45 (21.24)	.01 μ	PF11-04WJSS	PF11-04WJRSS

Service kits

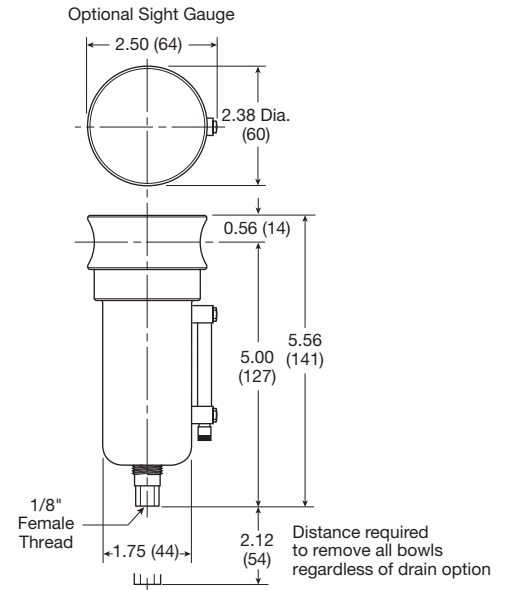
Description	PF504	PF10	PF501	PF11
Drain kit -	automatic pulse	RK504SY-SS		RK504SY-SS
	automatic float		SA10MDSS	SA10MDSS
	manual twist, small (old)	SA600Y7-1SS	SA600Y7-1SS	SA600Y7-1SS
	manual twist, large (new)	SAP05481	SAP05481	SAP05481
Filter element -	5 micron (particulate)	EK504VY	EK55J	
	20 micron (particulate)	EK504Y		
	40 micron (particulate)		EK55G	
	0.3 micron (coalescing)			EK501H
	0.01 micron (coalescing)			
Pipe nipple	616Y28-SS	616A28-SS	616Y28-SS	616A28-SS

 Most popular.

PF504 / PF501



PF10 / PF11



Stainless Steel
Air Preparation Products

Specifications

Description	PF504	PF10	PF501	PF11
Filter rating	20 micron	40 micron	0.3 micron	0.01 micron
Port threads	1/4	1/2	1/4	1/2
Weight	0.6 lb. (0.27 kg)	1.9 lb. (0.85 kg)	0.6 lb. (0.27 kg)	1.9 lb. (0.85 kg)

Material specification

Description	PF504	PF10	PF501	PF11
Body	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bowls	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Deflector	Acetal	Acetal		
Drain	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Element holder	Acetal	Acetal	Acetal	Acetal
Filter element	Polyethylene	Polyethylene	Borosilicate fiber	Borosilicate fiber
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon
Sight gauge		Isoplast		Isoplast

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- Stainless steel construction handles most corrosive environments
- Large diaphragm to valve area ratio for precise regulation and high flow capacity
- Meets NACE specifications MR-01-75/ISO 15156



⚠ WARNING

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CAUTION:

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Operating information

	PR354 & PR11	PR364 & PR10
Operating pressure	300 PSIG Max (20.7 bar)	300 PSIG Max (20.7 bar)
Operating temperature	0°F to 180°F (-18°C to 82°C)	0°F to 150°F (-18°C to 66°C)
Flow / SCFM (dm ³ /s)	12 (5.66)	80 (37.76)

For technical information see CD

Regulators



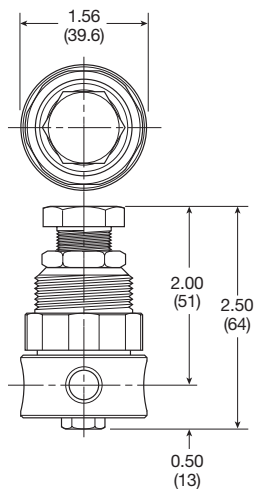
Port size	Adjustment type	Flow SCFM (dm ³ /s)	Part number 0 to 125 PSIG
1/4	Knob version	12 (5.66)	PR364-02CSS
1/4	All metal version	12 (5.66)	PR354-02CSS
1/2	Knob version	80 (37.76)	PR10-04CSS
1/2	T-handle version	80 (37.76)	PR11-04CSS

Service kits

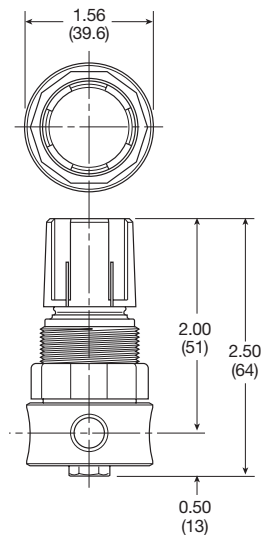
Description		PR354	PR364	PR10	PR11
Bonnet Kit		CKR354YSS	CKR364YSS	CKR10YSS	CKR11YSS
Gauge, stainless – 160 PSIG (0 to 1100 kPa)	1-1/2" Face	K4515N14160SS	K4515N14160SS		
	2" Face			K4520N14160SS	K4520N14160SS
Panel mount bracket (stainless)		161X57-SS	161X57-SS	R10Y57-SS	R10Y57-SS
Panel mount nut –	stainless	R05X51-SS	R05X51-SS	R10X51-SS	R10X51-SS
	plastic	R05X51-P	R05X51-P	R10X51-P	R10X51-P
Pipe nipple, 316 stainless steel		616Y28-SS	616Y28-SS	616A28-SS	616A28-SS
Service Kit –	relieving	RKR364YSS	RKR364YSS	RKR10YSS	RKR10YSS
	non-relieving	RKR364KYSS	RKR364KYSS	RKR10KYSS	RKR10KYSS
Springs –	0-25 PSIG range	SPR-375-2-SS	SPR-375-2-SS	SPR-388-1-SS	SPR-388-1-SS
	0-60 PSIG range	SPR-376-1-SS	SPR-376-1-SS	SPR-389-1-SS	SPR-389-1-SS
	0-125 PSIG range	SPR-377-1-SS	SPR-377-1-SS	SPR-390-1-SS	SPR-390-1-SS

Most popular.

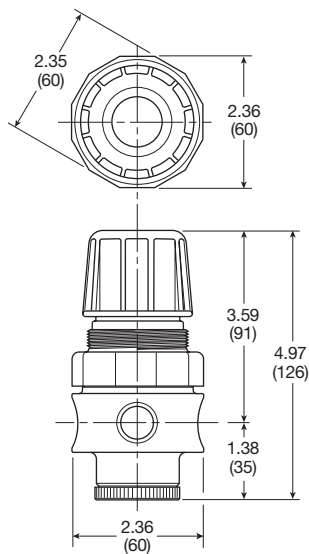
PR354



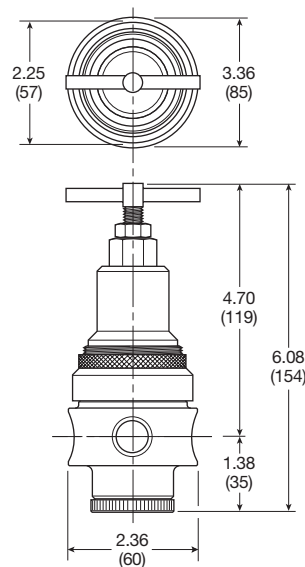
PR364



PR10



PR11



Specifications

Description	PR354	PR364	PR10	PR11
Gauge port	1/4	1/4	1/4	1/4
Operation	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm
Port threads	1/4	1/4	1/2	1/2
Weight	0.5 lb. (0.23 kg)	0.5 lb. (0.23 kg)	1.79 lb. (0.81 kg)	1.79 lb. (0.81 kg)

Material specification

Description	PR354	PR364	PR10	PR11
Adjustment mechanism / springs:	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Adjusting knob	316 stainless steel	Polypropylene		
Body / poppet	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bonnet	316 stainless steel	Acetal	Acetal	316 stainless steel
Bottom plug	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon



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CAUTION:

REGULATOR PRESSURE ADJUSTMENT –

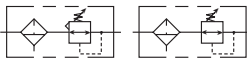
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	PB548 & PB558	PB11 & PB12
Operating pressure	300 PSIG max (20.7 bar)	300 PSIG max (20.7 bar)
Operating temperature	PB548: 0°F to 150°F (-18°C to 66°C) PB558: 0°F to 180°F (-18°C to 82°C)	PB11: 0°F to 150°F (-18°C to 66°C) PB12: 0°F to 180°F (-18°C to 82°C)
Flow / SCFM (dm ³ /s)	12 (5.66)	72 (33.98)
For technical information see CD		

Filter / Regulators



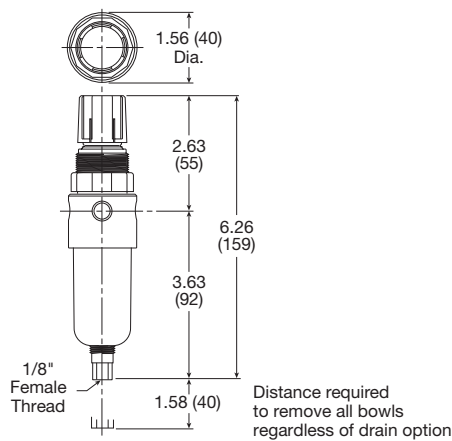
	Port size	Adjustment type	Drain type	Flow SCFM (dm ³ /s) ft ³ /min@100 PSI	Part number 0 to 125 PSIG
	1/4	Knob version	Manual twist	12 (5.66)	PB548-02DHCSS
	1/4	All metal version	Manual twist	12 (5.66)	PB558-02DHCSS
	1/2	Knob version	Manual twist	72 (33.98)	PB11-04WJCSS
	1/2	Knob version	Auto float	72 (33.98)	PB11-04WJCRSS
	1/2	T-handle version	Manual twist	72 (33.98)	PB12-04WJCSS
	1/2	T-handle version	Auto float	72 (33.98)	PB12-04WJCRSS

Service kits

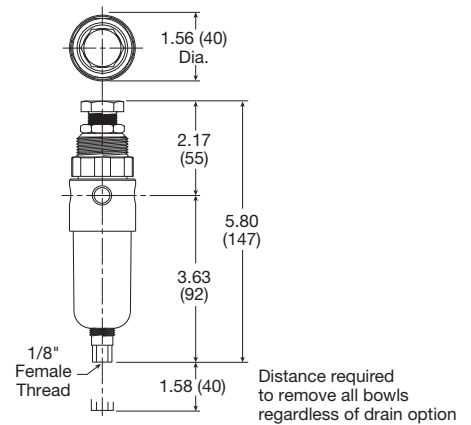
Description		PB548	PB558	PB11	PB12
Bonnet kit		CKR364YSS	CKR354YSS	CKR10YSS	CKR11YSS
Drain kit -	automatic pulse	RK504SY-SS	RK504SY-SS		
	automatic float			SA10MDSS	SA10MDSS
	manual twist, small (old)	SA600Y7-1SS	SA600Y7-1SS	SA600Y7-1SS	SA600Y7-1SS
	manual twist, large (new)	SAP05481	SAP05481	SAP05481	SAP05481
Filter element kits particulate	5 micron	EK504VY	EK504VY	EKF10VY	EKF10VY
	20 micron	EK504Y	EK504Y		
	40 micron			EKF10Y	EKF10Y
Gauge, stainless 160 PSIG (0 to 1100 kPa)	1-1/2" Face	K4515N14160SS	K4515N14160SS		
	2" Face			K4520N14160SS	K4520N14160SS
Panel mount bracket (stainless)		161X57-SS	161X57-SS	R10Y57-SS	R10Y57-SS
Panel mount nut –	stainless	R05X51-SS	R05X51-SS	R10X51-SS	R10X51-SS
	plastic	R05X51-P	R05X51-P	R10X51-P	R10X51-P
Pipe nipple, 316 stainless steel		616Y28-SS	616Y28-SS	616A28-SS	616A28-SS
Service kit –	relieving	RK549YSS	RK549YSS	RKR10YSS	RKR10YSS
	non-relieving	RK548YSS	RK548YSS	RKR10KYSS	RKR10KYSS
Springs –	0-25 PSIG range	SPR-375-2-SS	SPR-375-2-SS		
	0-60 PSIG range	SPR-376-1-SS	SPR-376-1-SS	SPR-388-1-SS	SPR-388-1-SS
	0-125 PSIG range	SPR-377-1-SS	SPR-377-1-SS	SPR-389-1-SS	SPR-389-1-SS
	0-250 PSIG range			SPR-390-1-SS	SPR-390-1-SS

Most popular.

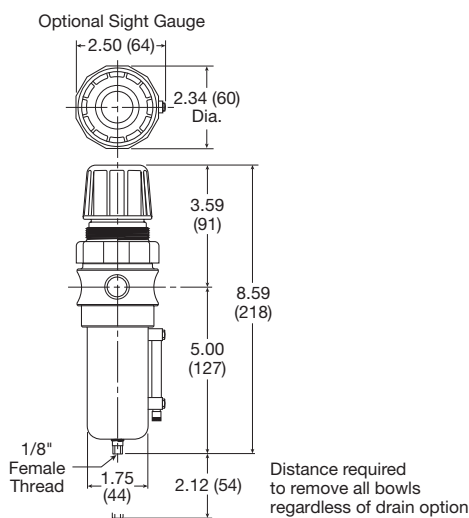
PB548



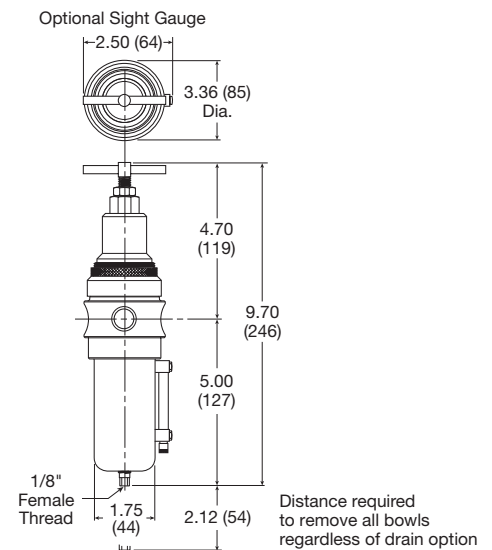
PB588



PB11



PB12



Specifications

Description	PB548	PB588	PB11	PB12
Filter rating	20 micron	20 micron	40 micron	40 micron
Gauge port	1/4	1/4	1/4	1/4
Operation	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm
Port threads	1/4	1/4	1/2	1/2
Weight	0.6 lb. (0.27 kg)	0.6 lb. (0.27 kg)	2.42 lb. (1.09 kg)	2.42 lb. (1.09 kg)

Material specification

Description	PB548	PB588	PB11	PB12
Adjustment mechanism / springs	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Adjusting knob	Polypropylene	316 stainless steel	Acetal	316 stainless steel
Body / poppet	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bonnet	Acetal	316 stainless steel	Acetal	316 stainless steel
Bottom plug	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon
Sight gauge			Isoplast	Isoplast



The range of Stainless Steel FRLs are ideal for use in the food industry, the petrochemical or process industries or any application in a particularly harsh or aggressive environment.

- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- 1/8" female threaded drain
- Fillable under pressure



Operating information

Operating pressure	
no sight gauge	0 to 300 PSIG (0 to 20.7 bar)
with sight gauge	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature	
	0°F to 150°F (-18°C to 66°C)
Flow / SCFM (dm ³ /s)	
	100 (47.19)
For technical information see CD	

Lubricators



Port size	Flow SCFM (dm ³ /s)	Part number metal bowl with sight gauge
1/2	100 (47.19)	PL10-04WSS

Service kits

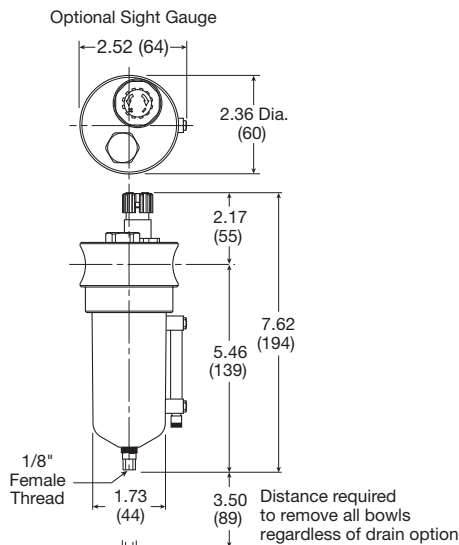
Description	Part number
Drain kit - manual twist drain, small (old)	SA600Y7-1SS
	large (new)
Pipe nipple, 316 Stainless Steel	616A28-SS
Sight dome kit - old	RKL10SS
	new

Specifications

Description	PL10
Bowl capacity	4.0 ounces
Port threads	1/2
Weight	1.9 lb. (0.85 kg)

Material specification

Description	PL10
Body	316 stainless steel
Bowls	316 stainless steel
Dip tube / drain / fill plug	316 stainless steel
Seals	Fluorocarbon
Sight dome	Nylon
Sight gauge	Isoplast



Most popular.

Highly accurate units, suitable for applications such as instrumentation where precision regulations is required.

- Fine adjustment sensitivity
- Good repeatability and minimal pressure drop
- High flow capacity
- Two 1/4" gauge ports
- Brass Poppet for long life
- Modular with 05 Series FRL
- Non-rising, removable knob



⚠ WARNING

**Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.**

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.

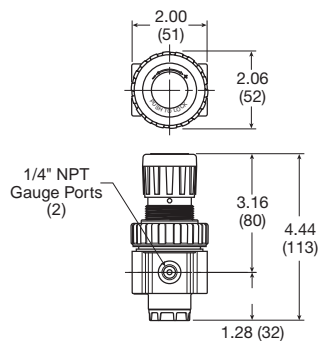
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.



Precision Regulator



Port size	Pressure	Weight	Part number
1/4	15 PSIG	1.0 lb. (0.45 kg)	27R112A
1/4	30 PSIG	1.0 lb. (0.45 kg)	27R110A
1/4	60 PSIG	1.0 lb. (0.45 kg)	27R114A
1/4	125 PSIG	1.0 lb. (0.45 kg)	27R113A



NOTE: 1.53 dia. (39mm) hole required for panel mounting. Maximum panel thickness 1/4".

Material specification

Description	
Poppet	Brass
Bonnet	Plastic
Body	Zinc
Collar, knob	Plastic
Diaphragm	Nitrile
Bottom cap	Plastic
Seals	Nitrile
Springs – poppet & control	Steel

 Most popular.

Operating information

Inlet pressure	250 PSIG (17.2 bar) maximum
Temperature rating	32°F to 175°F (0°C to 80°C)
Relief capacity	0.5 SCFM (0.24 dm ³ /s) @ 5 PSIG (0.4) increase in P ²
Flow capacity	25 SCFM (13.2 dm ³ /s) @ 100 PSIG (6.9) P ¹ and 20 PSIG (1.4 bar) P ²
Bleed Rate	2.0 SCFH
Effect of supply pressure variation	0.5 PSIG (0.04 bar) for 25 PSIG (1.7 bar) change in P ¹
Relief Flow	5.0 SCFM
Repeatability	± .5 PSIG (± 0.034 bar)
Response	Valve will open to full flow and fill a volume of 100 in ³

For technical information see CD

Service kits

Description	Part number
Bonnet Assembly Kit	PS910P
Control Knob	P0442001
Gauges – 1-1/2" dial face	
30 PSIG (0 to 2.1 bar)	K4515N14030
60 PSIG (0 to 4.1 bar)	K4515N14060
160 PSIG (0 to 11.0 bar)	K4515N14160
300 PSIG (0 to 20.0 bar)	K4515N14300
2" Dial Face	
60 PSIG (0 to 4.1 bar)	K4520N14060
160 PSIG (0 to 11.0 bar)	K4520N14160
300 PSIG (0 to 20.0 bar)	K4520N14300
Mounting bracket kit	PS963P
Panel mount nut – Metal	PS964P
Pressure sensor – MPS-32	
Service kit	PS907P
Springs – 1-30 PSIG range	P04427
1-15 PSIG range	P04428
0-60 PSIG range	P04426
2-125 PSIG range	P04425

51R

- Pressure reference indicating dial face
- Non-rising, pressure-adjustment dial
- Self-relieving
- Full pressure adjustment in less than one full turn
- Recommended for pilot-air applications

52R, 53R, 54R

- Balanced poppet design
- Non-rising, pressure-adjusting dial
- High-relief flow (3/16" relief orifice)
- Two 1/4" gauge ports
- Piston operated



Operating information

Adjusting range pressure	2 to 40 PSIG (0 to 2.8 bar) 5 to 160 PSIG (0 to 11.0 bar)
Max supply pressure	300 PSIG (20.7 bar)
Max operating temperature	150°F (65.5°C)

For technical information see CD

Dial Regulators, relieving



Port size	Flow capacity* SCFM (dm ³ /s)	Part number	
		Low pressure 2 to 40 PSIG (0.14 to 3 bar)	Standard pressure 5 to 160 PSIG (0.34 to 11 bar)
1/4	0.7 (.3)	51R125R	51R126R
1/4	117 (55)	52R125R	52R126R
3/8	180 (85)	52R225R	52R226R
1/2	195 (92)	52R325R	52R326R
3/4	220 (104)	52R425R	52R426R
3/4	400 (189)	53R425R	53R426R
1	650 (307)	53R525R	53R526R
1-1/4	700 (330)	53R625R	53R626R
1-1/2	1,600 (755)	54R725R	54R726R
2	1,600 (755)	54R825R	54R826R

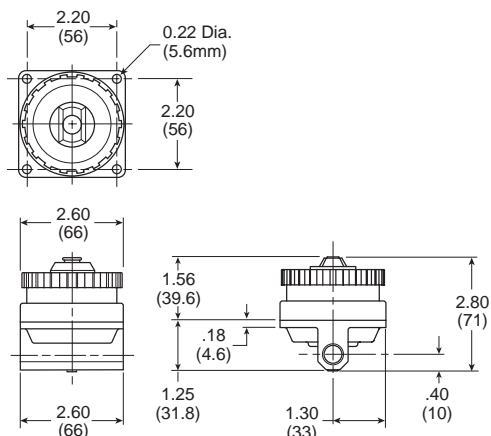
* SCFM = Standard cubic feet per minute at 100 PSIG (6.9 bar) inlet, 90 PSIG (6.2 bar) no-flow secondary setting and 25 PSIG pressure drop.

Service kits

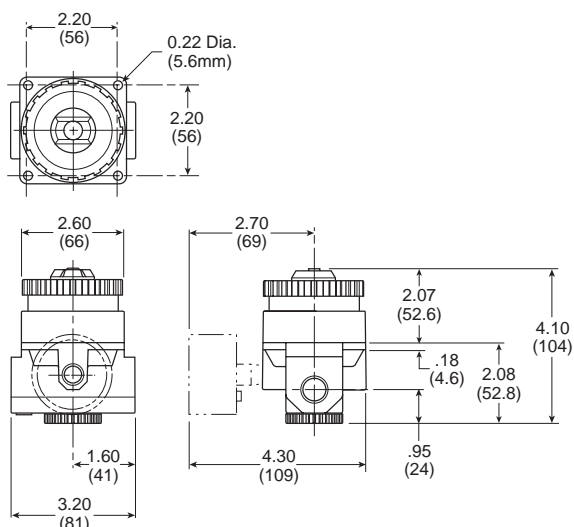
Description	51R	52R	53R	54R
Adjustment dial knob	RRP-16-024	RRP-16-024	RRP-16-024	RRP-16-024
O-ring, repair kit	GRP-95-260	GRP-95-260	GRP-95-261	GRP-95-262
Piston and bonnet repair kit	RRP-95-765	RRP-95-766	RRP-95-766	RRP-95-766
Piston bottom and o-ring seal		RRP-95-192	RRP-95-192	RRP-95-192
Spring, regulation, Belleville washer –				
2 to 40 PSIG (2.8 bar)	RRP-95-906	RRP-95-906	RRP-95-906	RRP-95-906
5 to 160 PSIG (11.0 bar)	RRP-95-905	RRP-95-905	RRP-95-905	RRP-95-905
Spring, main valve				RRP-95-024
Tamper resistant kit	RRP-95-585	RRP-95-585	RRP-95-585	RRP-95-585
Valve, main with u-cup seal & bottom plug		RRP-95-914		
Valve, main with u-cup seal		RRP-95-151		
Valve, main with o-ring seal			RRP-95-152	RRP-95-153
Valve, pilot with o-ring and valve spring	RRP-96-934	RRP-96-934	RRP-96-935	RRP-96-935

Most popular.

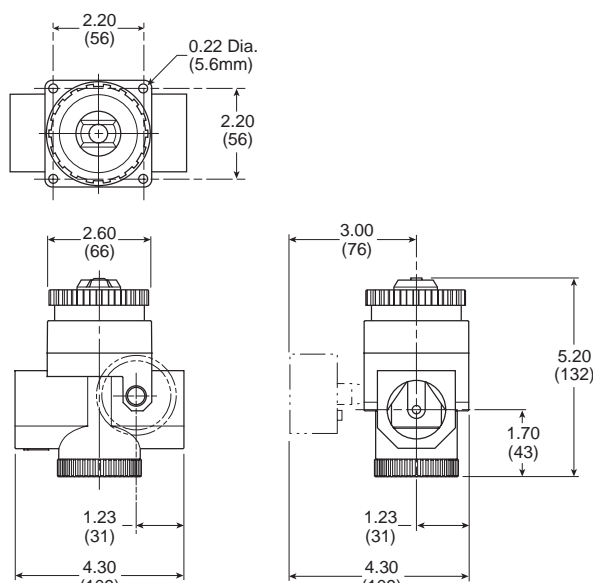
51R



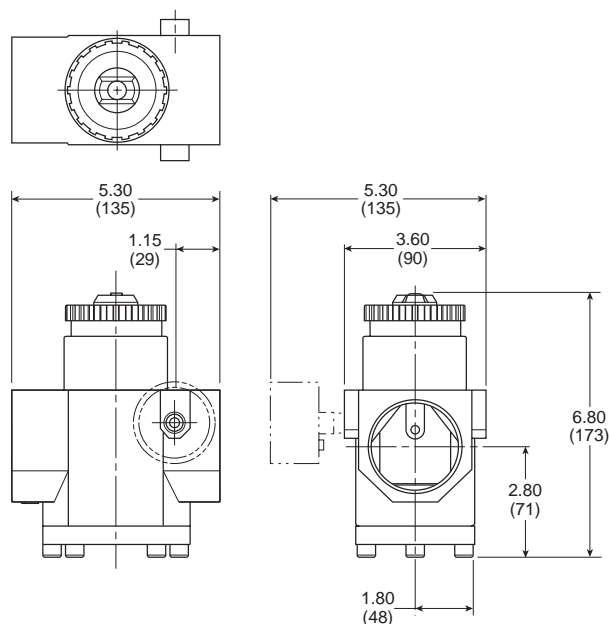
52R



53R



54R



Specifications

Description	51R	52R	53R	54R
Bleed rate	0.05 SCFM	0.05 SCFM	0.05 SCFM	0.05 SCFM
Gauge port	—	Two ports 1/4	Two ports 1/4	Two ports 1/4
Port threads	1/4	1/4, 3/8, 1/2, 3/4	3/4, 1, 1-1/4	1-1/2, 2
Weight	1.3 lb. (0.5 kg)	2.3 lb. (1.04 kg)	4.0 lb. (1.8 kg)	9 lb. (4.1 kg)

Material specification

Description	
Body	Zinc
Bonnet	Zinc / brass
Piston	Acetal
Seals	Nitrile
Springs	Steel
Valve assembly	Brass / nitrile / acetal

⚠ WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT -
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

- The no-brass construction is well suited to harsh environments
- Internal and external epoxy finish for superior corrosion resistance
- Non-bleed design to reduce consumption
- Integral relief valve
- A gauge port provides convenient pressure gauge mounting
- The standard 5-micron filter minimizes internal contamination
- The filter dripwell contains a drain plug to easily drain trapped liquids
- Standard tapped exhaust
- Soft relief seat minimizes air loss



P3EA632 Series

Operating information

Supply pressure	250 PSIG (17.2 bar), (1700 kPa) max
Temperature range	-40°F to 160°F (-40°C to 71°C)
Sensitivity	1.0" (.036 PSIG) (2.54 cm) water column
Flow capacity	25 SCFM (42.5 m ³ /HR) @ 100 PSIG, (7 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust capacity	0.8 (1.36 m ³ /HR) where downstream pressure is 5 PSIG, (.35 bar) (35 kPa) above 20 PSIG (1.5 bar), (150 kPa) setpoint (0.8 SCFM for 120 # unit)
Consumption	Undetectable
Supply pressure effect	Less than 1.25 PSIG, (.09 bar), (9 kPa) change for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure (1.90 PSIG for 120 # unit)
For technical information see CD	

**P3EA632
 Precision Filter / Regulator**



Port size	Spring	Part number
1/4"	1 to 60 PSIG	P3EA63242NS
1/4"	2 to 120 PSIG	P3EA63252NS

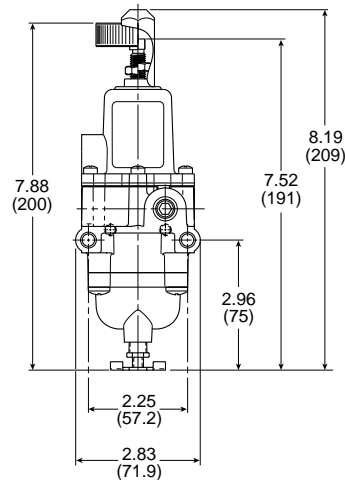
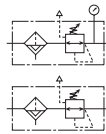
Note: Other spring ranges, port sizes, and options available. Please consult factory.

Service kits

Service kit	1 to 60, 2 to 120 PSIG	PS19968-NR
Tamper resistant kit		PS12165

Material specification

Body and housing	Epoxy coated aluminum
Elastomers	Nitrile
Trim	Stainless steel, nickel plated steel



WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT -
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

- The P3BA208 uses a pneumatic input signal to accurately control output pressure based on a predetermined ratio
- A balanced supply valve minimizes the effects of supply pressure variation
- An aspirator tube compensates downstream pressure droop under flowing conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction allows servicing without removal



P3BA208 Series
 1/4" port size

Operating information	Signal : Output	1:1	1:2	1:3
Output pressure, maximum		150 PSIG (10 bar)	150 PSIG (10 bar)	150 PSIG (10 bar)
Supply pressure, maximum		250 PSIG (17 bar)	250 PSIG (17 bar)	250 PSIG (17 bar)
Flow capacity		45 SCFM (76.5 m ³ /HR)	45 SCFM (76.5 m ³ /HR)	45 SCFM (76.5 m ³ /HR)
100 PSIG, (7 bar), supply 20 PSIG, (1.5 bar) output				
Exhaust capacity		11 SCFM (18.7 m ³ /HR)	11 SCFM (18.7 m ³ /HR)	11 SCFM (18.7 m ³ /HR)
Downstream pressure 5 PSIG (.35 bar) above 20 PSIG (1.5 bar) setpoint				
Sensitivity, water column		.250" (.64 cm)	.500" (1.27 cm)	.750" (1.9 cm)
Ratio accuracy				
% of 100 PSIG (7 bar) output span		1.0	1.0	1.0
% of output span with 100 PSIG (7 bar) input span		—	—	—
Supply pressure effect for change of 100 PSIG (7 bar)		0.10 PSIG (.007 bar)	0.20 PSIG (.014 bar)	0.30 PSIG (.021 bar)
Ambient temperature		-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)
For technical information see CD				

P3BA208
Precision Pneumatic Input Signal Amplifier



Port size	Pilot ratio	Part number
1/4"	1:1	P3BA20812
1/4"	1:2	P3BA20822
1/4"	1:3	P3BA20823

Note: Other spring ranges, port sizes, and options available. Please consult factory.

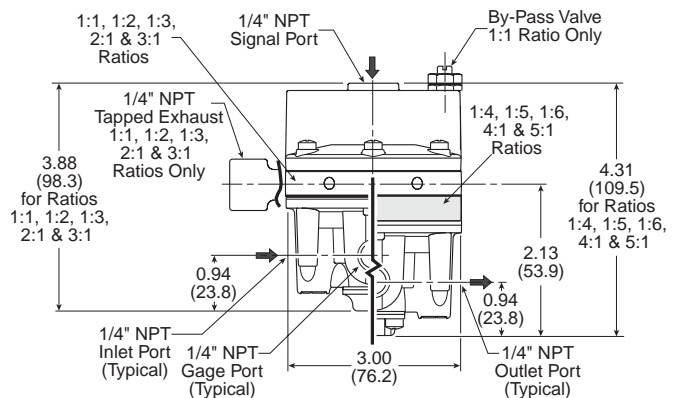
Service kits

1:1 ratio	PS19513-11
1:1 ratio w/ by-pass valve	PS19513-11I
1:2 ratio	PS19513-12
1:3 ration	PS19513-13
Mounting bracket	PS09921

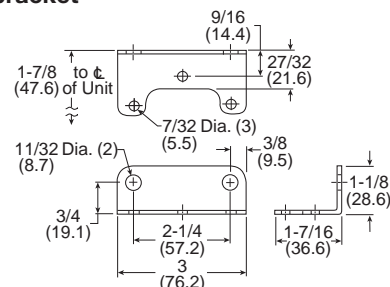
Material specification

Body and housing	Aluminum
Elastomers	Nitrile on dacron fabric
Trim	Zinc plated steel, brass

Most popular.



Mounting bracket



- Five signal to output ratios meet most control element requirements
- Control sensitivity of water column allows use in precision applications
- Large supply and exhaust Valves provide high forward and exhaust flows
- Soft supply and exhaust Valve seats minimize air consumption
- A balanced supply valve minimizes the effect of supply pressure variation
- An aspirator tube compensates downstream pressure droop under flow conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service the P3BA45 without removing it from the line



P3BA45 Series
 1/2" & 3/4" port size

Operating information	Signal : Output	1:1	1:2	1:3
Output pressure, maximum		150 PSIG (10 bar)	150 PSIG (10 bar)	150 PSIG (10 bar)
Supply pressure, maximum		250 PSIG (17 bar)	250 PSIG (17 bar)	250 PSIG (17 bar)
Flow capacity 100 PSIG, (7 bar), supply 20 PSIG, (1.5 bar) output		150 SCFM (255 m ³ /HR)	150 SCFM (255 m ³ /HR)	150 SCFM (255 m ³ /HR)
Exhaust capacity Downstream pressure 5 PSIG (.35 bar) above 20 PSIG (1.5 bar) setpoint		40 SCFM (62.5 m ³ /HR)	40 SCFM (62.5 m ³ /HR)	40 SCFM (62.5 m ³ /HR)
Sensitivity, water column		1.0" (2.54 cm)	2.0" (5.08 cm)	3.0" (7.62 cm)
Ratio Accuracy % of 100 PSIG (7 bar) output span % of output span with 100 PSIG (7 bar) input span		3.0 —	3.0 —	3.0 —
Supply pressure effect for change of 100 PSIG (7 bar)		0.10 PSIG (.007 bar)	0.20 PSIG (.014 bar)	0.30 PSIG (.021 bar)
Ambient temperature		-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)
Hazardous locations		Acceptable for use in zones 1 and 2 for gas atmospheres; Groups IIA and IIB and zones 21 and 22 for dust atmospheres.		
For technical information see CD				

P3BA45
Precision Pneumatic Input Signal Amplifier



Port size	Pilot ratio	Part number
1/2"	1:1	P3BA4514A
1/2"	1:2	P3BA4524A
1/2"	1:3	P3BA4534A
3/4"	1:1	P3BA4516A
3/4"	1:2	P3BA4526A
3/4"	1:3	P3BA4536A

Note: Other spring ranges, port sizes, and options available. Please consult factory.

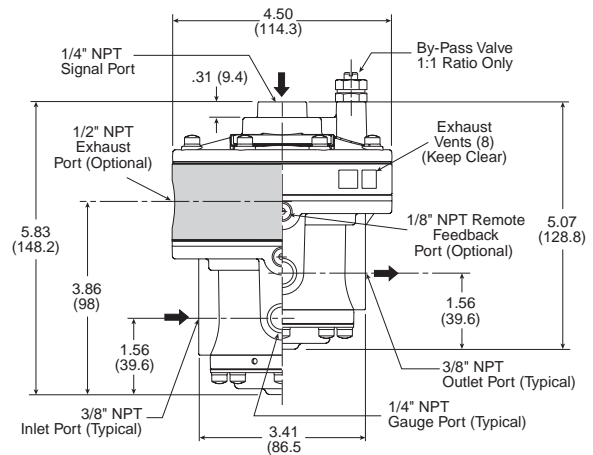
Service kits

1:1 ratio	PS19549-1
1:1 ratio w/ tapped exhaust	PS19549-1E
1:2 ratio	PS19549-2
1:3 ratio	PS19549-3
1:1 w/ tapped exhaust, I option	PS19549-20E

 Most popular.

Material specification

Body and housing	Aluminum
Diaphragm	Nitrile on dacron fabric
Trim	Zinc plated steel, brass



- Control sensitivity of .250" (.010 PSIG) (.64 cm) water column variation allows use in precision applications
- A compensating diaphragm lets the regulator remain unaffected by supply pressure changes
- Flow of up to 40 SCFM with 100 PSIG supply allows use in applications with high flow requirements
- An aspirator tube compensates downstream pressure droop under flow conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service the regulator without removing it from the line



P3RA302 Series

Operating information

Supply pressure	250 PSIG (17.2 bar), (1700 kPa) max
Ambient temperature	-40°F to 200°F (-40°C to 93°C)
Sensitivity	.250" (.010 PSIG) (.64 cm) water column
Flow capacity	40 SCFM (68 m ³ /HR) @ 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust capacity	2.0 SCFM (3.4 m ³ /HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint
Supply pressure effect	Less than 0.2 PSIG, (.014 bar), (.14 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure
Hazardous locations	Acceptable for use in zones 1 and 2 for gas atmosphere: Groups IIA and IIB and zones 21 and 22 for dust atmospheres
For technical information see CD	

P3RA302
Compact High Precision Regulator



Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	P3RA30232
1/4"	1 to 60 PSIG	P3RA30242
1/4"	2 to 100 PSIG	P3RA30252

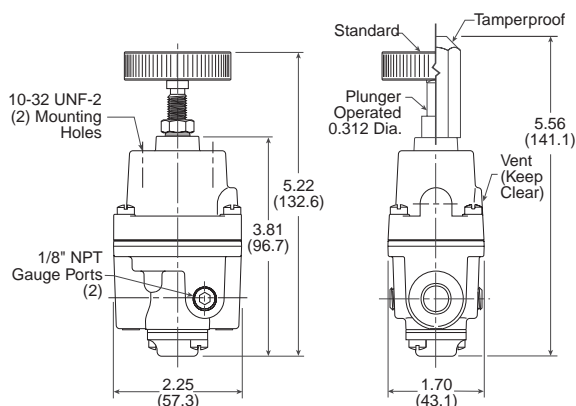
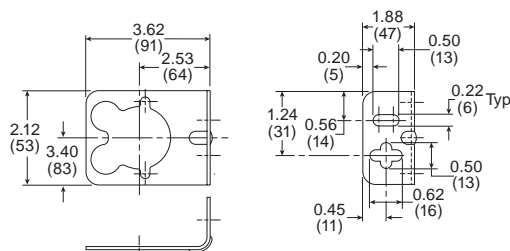
Service kits

Service kit	Nitrile, standard	PS16116-13
	Nitrile, non-relieving	PS16116-14
Tamper resistant kit		PS12163
Mounting bracket kit		PS417BP

Material specification

Body and housing	Aluminum
Diaphragms	Nitrile on dacron
Trim	Brass

Mounting bracket



WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT -
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision processes
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Optional check valve permits dumping of downstream pressure when supply is opened to atmosphere
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop under flow conditions



P3RA102 Series

Operating information

Supply pressure	500 PSIG (35 bar), (3500 kPa) max
Ambient temperature	-40°F to 200°F (-40°C to 93°C)
Sensitivity	.125" (.005 PSIG) (.32 cm) water column
Flow capacity	40 SCFM (68 m ³ /HR) @ 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust Capacity	5.5 SCFM (9.35 m ³ /HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint
Supply Pressure Effect	Less than 0.1 PSIG, (.007 bar), (.7 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure
Hazardous Locations	Acceptable for use in zones 1 and 2 for gas atmosphere: Groups IIA and IIB and zones 21 and 22 for dust atmospheres
For technical information see CD	

**P3RA102
 Standard High Precision Regulator**



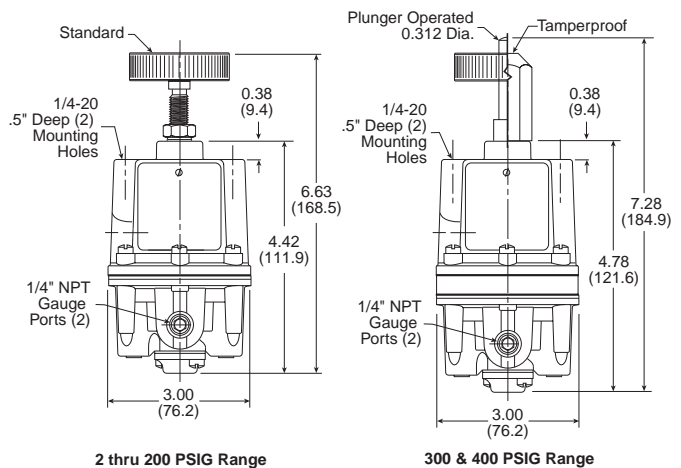
Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	P3RA10232
1/4"	1 to 60 PSIG	P3RA10242
1/4"	2 to 150 PSIG	P3RA10262

Service kits

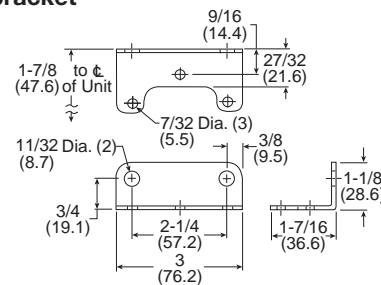
Service kit	0 to 200 PSIG, relieving	PS12125-1
	0 to 200 PSIG, non-relieving	PS12125-4
Tamper resistant kit		PS12165
Mounting bracket kit, zinc plated steel		PS09921

Material specification

Body and housing	Aluminum
Diaphragms (standard unit only)	Buna N on dacron
Trim	Brass, zinc plated steel



Mounting bracket



WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

Most popular.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT -
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision applications
- A separate control chamber and Aspirator Tube isolate the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service without removing it from the line
- Mounting bracket is available



P3RA102BP Series

Operating information

Setpoint range	System pressure (maximum)
2 to 200 PSIG (0.15 to 14 bar) (15 to 1400 kPa)	300 PSIG (21 bar), (2100 kPa) max
300 to 400 PSIG (21 to 28 bar) (2100 to 2800 kPa)	500 PSIG (35 bar), (3500 kPa) max
Ambient temperature	-40°F to 200°F (-40°C to 93°C)
Sensitivity	.125" (.005 PSIG) (.32 cm) water column
Flow capacity	40 SCFM (68 m ³ /HR) @ 100 PSIG, (7.0 bar), (700 kPa) system pressure
For technical information see CD	

**P3RA102BP
 High Precision Relief Valve**



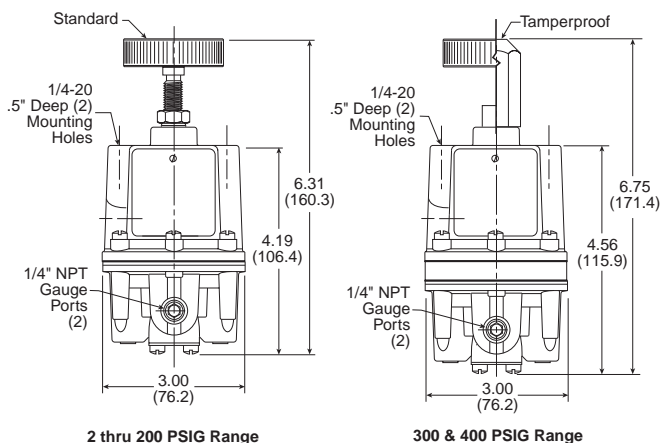
Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	P3RA10232BP
1/4"	1 to 60 PSIG	P3RA10242BP
1/4"	2 to 150 PSIG	P3RA10262BP

Service kits

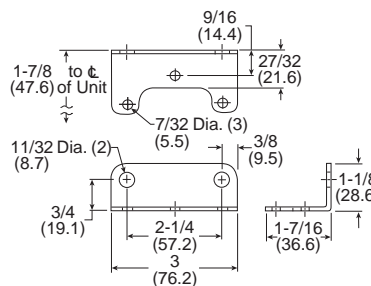
Service kit	0 to 200 PSIG, standard	PS12127-1
Tamper resistant kit		PS12165
Mounting bracket kit, zinc plated steel		PS09921

Material specification

Body and housing	Aluminum
Nozzle	Nitrile on dacron
Trim	Zinc plated steel, brass



Mounting bracket



WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT -
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision applications
- Balanced supply valve minimizes effects of vacuum variation
- Aspirator tube compensates for downstream pressure droop under flow conditions
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Construction allows servicing without removing from the line



P3RA171 Series

Operating information

Vacuum supply	29.92 Hg (760 torr) max
Ambient temperature	-40°F to 200°F (-40°C to 93°C)
Sensitivity	.125" (.005 PSIG) (.32 cm) water column
Flow capacity	3 SCFM @ 650 torr supply, 250 torr setpoint
Vacuum supply effect	Less than 1 torr for 100 torr (.04 Hg for 3.94 Hg) change in vacuum supply
For technical information see CD	

**P3RA171
 High Precision Vacuum Regulator**



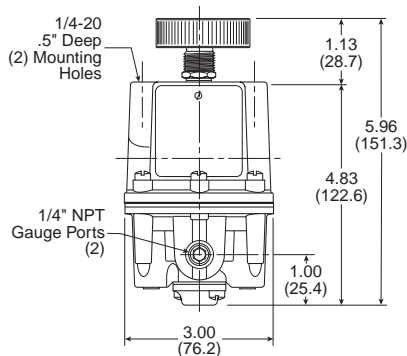
Port size	Spring	Part number
1/4"	0 to 30 Hg	P3RA17132NNKN

Service kits

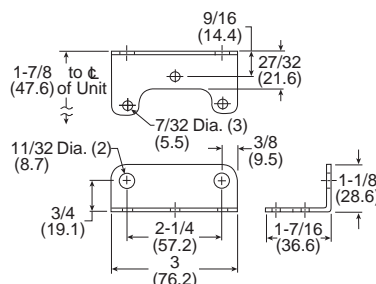
Service kit	Includes diaphragm, valve, seat assemblies and gasket	PS20966-9
Tamper resistant kit		PS20967-1
Mounting bracket kit, zinc plated steel		PS09921

Material specification

Body and housing	Aluminum
Elastomers	Nitrile
Trim	Zinc plated steel, brass



Mounting bracket



WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT -
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

- Very fast response times
- Accurate output pressure
- Micro parameter settings
- Selectable I/O parameters
- Quick, full flow exhaust
- LED display indicates output pressure
- No air consumption in steady state
- Multiple mounting options
- Protection to IP65
- P31P flows to 19 dm³/s (40 scfm)
- P32P flows to 57 dm³/s (120 scfm)



P31P Series
Bottom exhaust



P32P Series
Bottom exhaust



Precision / Proportional
Regulator Products

Ordering information

P 3	P A	1	A
------------	------------	----------	----------

Body size	
Modular mini (1/4")	1
Modular compact (1/2")	2

Thread type	
BSPP	1
BSPT	2
NPT	9

Port size	
Modular mini (1/4")	2
Modular compact (1/2")	4

Version	
Bottom ported exhaust (NC)	A
Bottom ported forced exhaust (NO)*	E

Pressure range	
0 - 2 bar (0-29 PSIG)	Z
0 - 10 bar (0-145 PSIG)	D

Power supply	
24 volts	2

Control signal	
0-10 V†	V

† Factory setting is 0-10 V control signal. 4-20 mA control signal available via parameter 4 on keypad.

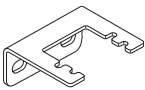
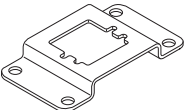
Output signal	
Digital, PNP	D
PNP or 0-10V	P
NPN or 0-10V	N
4-20mA fixed	M

D) Digital PNP output only, no analog output selectable
P) Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V)
N) Digital NPN and analog 0-10 V outputs selectable by means of parameter 6. (Factory default 0-10V)
M) Analog 4-20mA output only.
Note: On all analog outputs the F.S. value can be adjusted by means of parameter 8

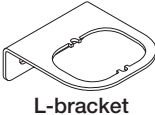
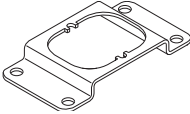
Input connector	
M12 (4 pin)	1

* When the supply voltage is lost the unit will automatically exhaust the regulated pressure to 0 bar (atmospheric pressure)

P31P mounting brackets

	Part number	Description
	P3HKA00ML	L-bracket mounting kit
	P3HKA00MC	Foot bracket mounting kit

P32P mounting brackets

	Part number	Description
	P3KKA00ML	L-bracket mounting kit
	P3KKA00MC	Foot bracket mounting kit

Note: These brackets fit both proportional regulators and combined soft start & dump valves.

Cables

Part number	Description
CB-M12-4P-2M	2 mtr. cable with moulded straight M12x1 connector

Technical information

Working medium

Compressed air or inert gasses, filtered to 40µ.

Supply pressure

Max. operating pressure:

2 bar unit: 3 bar (43.5 PSIG)
 10 bar unit: 10.5 bar (152 PSIG)
 Min. Operating Pressure P2 pressure + 0.5 bar (7.3 PSIG)

Pressure control range

Available in three pressure ranges, 0-2 bar (0-29 PSIG), 0-7 bar (0-101.5 PSIG) or 0-10 bar (0-145 PSIG). Pressure range can be changed through the software at all times. (parameter 19)

Temperature range

0°C up to +50°C (32°F up to 122°F)

Weights:

P31P = 0.291 kg (0.64 lbs)

P32P = 0.645 kg (1.42 lbs)

Air consumption

No consumption in stable regulated situation.

Display

The regulator is provided with a digital display, indicating the output pressure, either in bar or PSIG.

The factory setting is as indicated on the label, can be changed through to software at all times (parameter 14)

Supply voltage

24 VDC +/- 10%

Power consumption

Max. 1.1W with unloaded signal outputs

Control signals

The electronic pressure regulator can be externally controlled through an analogue control signal of either 0-10V or 4-20mA. (parameter 4).

Output signals

As soon as the output pressure is within the signal band a signal is given of 24VDC, PNP Ri = 1 kOhm
 Outside the signal band this connection is 0V.

Connections

(In case of output signal (Option D))

Central M12 connector 4-pole

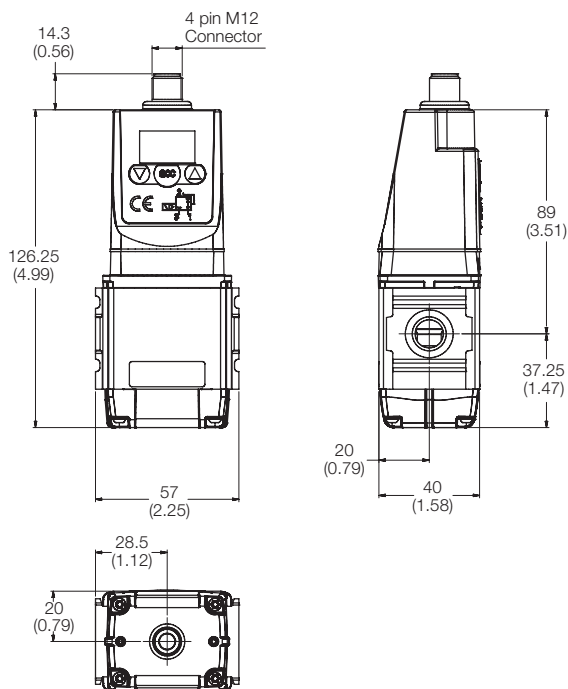
The electrical connections are as follows:

Pin No.	Function	Color	
1	24 V	Supply	Brown
2	0 to 10 V	Control Signal Ri = 100k W	White
	4 to 20mA	Control Signal Ri = 500k W	
3	0 V (GND)	Supply	Blue
4	24 V	Alarm Output Signal	Black

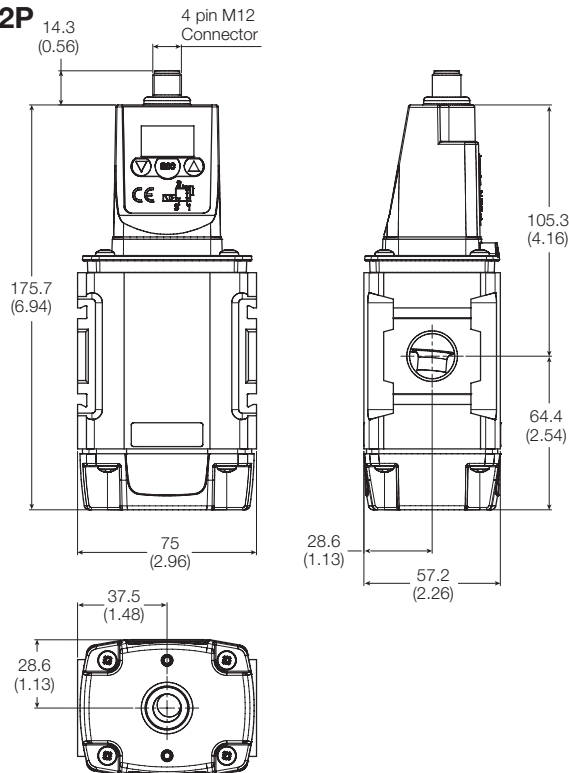
⚠ WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

P31P



P32P





PDRD10 - PDRD250

- “Plug & Play” design for easy installation and operation (PDRD10 - PDRD125)
- Small space saving design
- Oversized demister separator resulting in excellent liquid removal over all operating conditions
- Low pressure differential across the dryer (1.45 PSIG average)
- Environmentally friendly refrigerant
- Oversized condenser to operate in ambients to 122°F (50°C)
- All models incorporate a dewpoint indicator

PDRD325 - PDRD2400

- Optimum dewpoint levels for highest system performance
- Advanced patented design solutions
- Environmentally friendly refrigerant
- High reliability, easy to use and maintain
- Unique 4-in-1 SmartPack heat exchanger
- Integral drain
- Extremely low pressure drop design
- SmartControl energy saving function
- Excellent dewpoint performances
- Advanced compliant scroll compressor

PDRD Series

Nominal flow				Recommended filtration			
SCFM	Nm³/hr	Primary voltage	Part number	Pipe size	Bulk separator	Pre-filter (5µ particulate)*	Post-filter (.01µ coalescing)
10	17	115V/1ph/60Hz	PDRD10-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94FSAN	P32FA94DSAN
15	26	115V/1ph/60Hz	PDRD15-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94FSAN	P32FA94DSAN
25	43	115V/1ph/60Hz	PDRD25-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94FSAN	P32FA94DSAN
35	60	115V/1ph/60Hz	PDRD35-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94FSAN	P32FA94DSAN
50	85	115V/1ph/60Hz	PDRD50-115160	3/4" NPT-F	P3TFA96WDAN	P33FA96FSAN	P33FA96DSAN
75	127	115V/1ph/60Hz	PDRD75-115160	3/4" NPT-F	P3TFA96WDAN	P33FA96FSAN	P33FA96DSAN
100	170	115V/1ph/60Hz	PDRD100-115160	3/4" NPT-F	P3TFA96WDAN	P3NFA96FSA	P3NFA96DSA
125	212	115V/1ph/60Hz & 230V/1ph/60Hz	PDRD125-115160 PDRD125-230160	1-1/2" NPT-F	P3TFA9BWGAN	P3NFA9PFSA	P3NFA9DFSA
150	255	115V/1ph/60Hz & 230V/1ph/60Hz	PDRD150-115160 PDRD150-230160	1-1/2" NPT-F	P3TFA9BWGAN	P3NFA9PFSA	P3NFA9DFSA
175	297	115V/1ph/60Hz	PDRD175-230160	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
200	425	230V/1ph/60Hz	PDRD200-230160	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
250	425	230V/3ph/60Hz & 460V/3ph/60Hz	PDRD250-230360 PDRD250-460360	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
325	552	230V/3ph/60Hz & 460V/3ph/60Hz	PDRD325-230360 PDRD325-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
400	680	230V/3ph/60Hz & 460V/3ph/60Hz	PDRD400-230360 PDRD400-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
500	849	230V/3ph/60Hz & 460V/3ph/60Hz	PDRD500-230360 PDRD500-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
700	1189	230V/3ph/60Hz & 460V/3ph/60Hz	PDRD700-230360 PDRD700-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
800	1359	230V/3ph/60Hz & 460V/3ph/60Hz	PDRD800-230360 PDRD800-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1000	1700	460V/3ph/60Hz	PDRD1000-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1200	2039	460V/3ph/60Hz	PDRD1200-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1600	2718	460V/3ph/60Hz	PDRD1600-460360	4" Flg.	P3TFAFFW2AN	P3TFAFFQ2AN*	P3TFAFFD2AN
2000	3400	460V/3ph/60Hz	PDRD2000-460360	6" Flg.	P3TFAFGW3AN	P3TFAFGQ3AN*	P3TFAFGD3AN
2400	4078	460V/3ph/60Hz	PDRD2400-460360	6" Flg.	P3TFAFGW3AN	P3TFAFGQ3AN*	P3TFAFGD3AN

Most popular.

* 1µ coalescing

Operating information

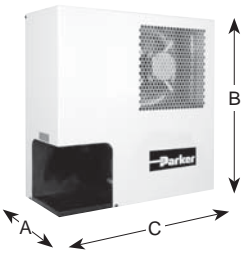
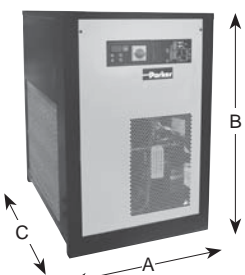
		PDRD10-PDRD175	PDRD200-PDRD250	PDRD325-PDRD2400
Temperature	Ambient (maximum)	122°F (50°C)	122°F (50°C)	122°F (50°C)
	Ambient (minimum)	41°F (5°C)	41°F (5°C)	41°F (5°C)
	Inlet (maximum)	149°F (65°C)	140°F (60°C)	140°F (60°C)
Pressure (maximum)		232 PSIG (16 bar)	203 PSIG (14 bar)	203 PSIG (14 bar)
Refrigerant		R134a	R407C	R407C
For technical information see CD				

Flow correction factors Capacities are based upon:
 Ambient temperature - 100°F (38°C); Inlet temperature - 100°F (38°C);
 and Working pressure - 100 PSIG (7 bar g).

To obtain dryer capacity at new conditions, multiply nominal capacity x C1 x C2 x C3

PDRD10 - PDRD175								PDRD200 - PDRD250								PDRD325 - PDRD2400							
Ambient temperature (C1)																							
°F	60	70	80	89	100	110	120		70	80	90	100	110	120	122	90	100	110	120	122			
°C	16	21	27	32	38	43	49		21	27	32	38	43	49	50	32	38	43	49	50			
Factor	1.34	1.26	1.17	1.09	1.00	0.91	0.82		1.22	1.15	1.05	1.00	0.94	0.79	0.71	1.05	1.00	0.94	0.79	0.71			
Inlet temperature (C2)																							
°F	90	100	110	120	140	149		90	100	110	120	130	140		90	100	110	120	130	140			
°C	32	38	43	49	60	65		32	38	43	49	54	60		32	38	43	49	54	60			
Factor	1.24	1.00	0.81	0.67	0.45	0.43		1.24	1.00	0.82	0.68	0.56	0.40		1.22	1.00	0.82	0.68	0.56	0.46			
Inlet pressure (C3)																							
PSIG	60	80	100	125	150	175	200	230	50	80	100	125	150	174	203	50	80	100	125	150	174	203	
bar	4	6	7	9	10	12	14	16	3	6	7	9	10	12	14	3	6	7	9	10	12	14	
Factor	0.83	0.93	1.00	1.07	1.12	1.16	1.19	1.22	0.77	0.93	1.00	1.07	1.12	1.15	1.18	0.77	0.93	1.00	1.07	1.12	1.15	1.18	

Dimensions

	Model number	A	B	C	Weight (kg)
PDRD10-PDRD250 	PDRD10	8.3 (210)	17 (430)	17.7 (450)	42 (19)
	PDRD15	8.3 (210)	17 (430)	17.7 (450)	42 (19)
	PDRD25	8.3 (210)	19.9 (505)	19.7 (500)	52 (24)
	PDRD35	8.3 (210)	19.9 (505)	19.7 (500)	52 (24)
	PDRD50	8.9 (225)	22.3 (565)	20.5 (520)	58 (27)
	PDRD75	8.9 (225)	22.3 (565)	20.5 (520)	68 (31)
	PDRD100	8.9 (225)	22.3 (565)	20.5 (520)	77 (35)
	PDRD125	16.7 (425)	23.8 (605)	21.8 (555)	115 (52)
	PDRD150	16.7 (425)	23.8 (605)	21.8 (555)	128 (58)
	PDRD175	16.7 (425)	23.8 (605)	21.8 (555)	132 (60)
	PDRD200	28.0 (711)	37.0 (940)	22.0 (559)	183 (83)
	PDRD250	28.0 (711)	42.0 (1067)	41.0 (1041)	287 (130)
	PDRD325-PDRD2400 	PDRD325	28.0 (711)	42.0 (1067)	41.0 (1041)
PDRD400		28.0 (711)	42.0 (1067)	41.0 (1041)	320 (145)
PDRD500		28.0 (711)	42.0 (1067)	41.0 (1041)	342 (155)
PDRD700		32.0 (813)	52.0 (1321)	46.0 (1168)	529 (240)
PDRD800		32.0 (813)	52.0 (1321)	46.0 (1168)	529 (240)
PDRD1000		32.0 (813)	52.0 (1321)	46.0 (1168)	551 (250)
PDRD1200		40.0 (1016)	67.0 (1702)	43.0 (1092)	816 (370)
PDRD1600		40.0 (1016)	68.0 (1727)	71.0 (1803)	1279 (580)
PDRD2000		40.0 (1016)	68.0 (1727)	71.0 (1803)	1477 (670)
PDRD2400		40.0 (1016)	68.0 (1727)	71.0 (1803)	1521 (690)

Inches (mm)

Inline Desiccant Dryer – DD15, DD30, DD60

- Inline desiccant dryers are a convenient and cost effective means of ensuring your sensitive intermittent pneumatic applications are never exposed to damaging moisture
- Compact size for point-of-use applications
- Drying efficiency down to -40°F pressure dew point
- Easily and quickly serviced
- Sightglass in bowl to monitor desiccant
- Built-in particulate after filter prevents downstream dust
- No electricity needed
- Low pressure drop
- No purge air lost as with other dryer types
- Check valve required on inlet
- Desiccant must be ordered separately



Operating information

Optimum working temperature	Below 100°F
Operating temperature	32°F to 180°F (0°C to 82°C)
Operating pressure	0 to 300 PSIG Max (21 bar)

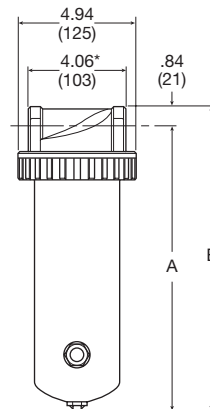
For technical information see CD

Inline Desiccant Dryers

Port size	Part number SCFM / Desiccant Capacity ¹		
	15 SCFM / 2.5 lb.	30 SCFM / 5 lbs.	60 SCFM / 10 lbs.
1/4 ²	DD15-02		
3/8 ²	DD15-03		
1/2 ²	DD15-04	DD30-04	DD60-04
3/4	DD15-06	DD30-06	DD60-06
1		DD30-08	DD60-08

Notes:

1. Desiccant must be ordered separately.
2. These units supplied with reducer bushings.



	A	B
DD15	12.69 (322)	13.5 (343)
DD30	22.44 (570)	23.25 (591)
DD60	29.44 (748)	30.25 (768)

* Dimension does not include reducer bushings for 1/4", 3/8", 1/2" versions.

Inches (mm)

Service kits

Description	Part number
Desiccant - environmentally friendly silica gel	
DD15	DRP-14-447/003
DD30	DRP-14-447/006
DD60	DRP-14-447/012
Mounting brackets (pair of pipe mounted brackets)	
1 inch Pipe Size	SA200CW57

Specifications

Description	
Desiccant Capacity (Desiccant must be ordered separately)	
DD15	2.5 lb. (1.1 kg)
DD30	5 lb. (2.3 kg)
DD60	10 lb. (4.5 kg)

Most popular.

Materials

Description		
Bowl	DD15	Aluminum
	DD30	Aluminum
	DD60	Steel
Flow tube		CPVC
Filter element		Sintered bronze
Head & flange ring		Zinc
Other hardware		Brass
Seals		Buna-N
Sight glass		Glass & steel

Regenerative Desiccant Dryer – P3TJA

- Point of use application bringing clean dry air just where you need it.
- Approved to international standards designed in accordance with ASME VIII Div.1, approved to CSA/UL/CRN and fully CE Marked (PED, EMC, LVD) as standard.
- Simple to install - flexible installation utilising the multiple in-line inlet & outlet connection ports.
- Compact and lightweight - can be floor, bench or wall / canopy mounted.
- Very quiet operation - noise level less than 70dB(A).
- Can be installed almost anywhere, IP66 / NEMA 4 protection as standard.
- Audible alarm - indicating service interval for optimal performance.
- Simple & easy to maintain - due to the quick release top cap arrangement, which does NOT require the inlet / outlet ports to be disconnected as with traditional systems, maintenance can be achieved in under 15 minutes.

The P3TJA is the reliable, cost effective and flexible way to provide clean dry air exactly where needed.



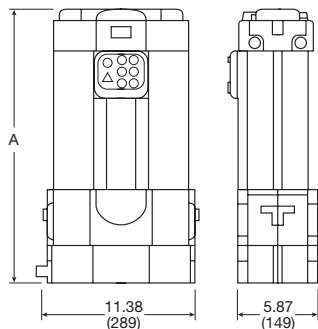
Operating information

Operating temperature	35°F (1.5°C) max.
Inlet temperature	122°F (50°C) max.
Operating pressure	58 to 175 PSIG (4 to 21 bar)
Flow range	3 SCFM to 20 SCFM @ 100 PSIG (85 L/min to 567 L/min @ 7 bar)
Noise level (Average)	70dB(A)
Pressure dewpoint – Standard	-40°F (-40°C) pdp
Standard electrical supply	115/1ph/60Hz (Tolerance +/- 10%)
Controls	Electronic control timer
Connections	3/8 NPT

For technical information see CD

Regenerative Desiccant Dryer

	A	Weight (kg)	SCFM	Part number	Maintenance kit
P3TJA	16.6 (422)	24.2 (11)	3	P3TJA93A1JN	P3TKA00JA1
	19.7 (500)	28.7 (13)	5	P3TJA93A2JN	P3TKA00JA2
	24.2 (616)	35.3 (16)	8	P3TJA93A3JN	P3TKA00JA3
	27.2 (692)	39.7 (18)	10	P3TJA93A4JN	P3TKA00JA4
	33.3 (847)	44.1 (20)	13	P3TJA93A5JN	P3TKA00JA5
	35.7 (906)	50.7 (23)	15	P3TJA93A6JN	P3TKA00JA6
	43.2 (1098)	61.7 (28)	20	P3TJA93A7JN	P3TKA00JA7



Inches (mm)

Service kits

Description	Part number
Mounting Bracket	
Fixed Wall	P3TKA00MJ
45° Tilt Wall	P3TKA00MK

Sizing Chart (correction)

Minimum inlet pressure										
PSIG	58	73	87	100	116	135	145	160	175	
bar g	4	5	6	7	8	9	10	11	12	
Maximum inlet temperature										
95°F (35°C)	0.63	0.75	0.88	1.00	0.97	1.08	1.18	1.29	1.40	
104°F (40°C)	0.61	0.73	0.85	0.97	0.94	1.05	1.14	1.25	1.36	
113°F (45°C)	0.55	0.66	0.77	0.88	0.85	0.95	1.04	1.14	1.23	
122°F (50°C)	0.46	0.55	0.64	0.73	0.71	0.79	0.86	0.94	1.02	

Most popular.

Heatless Desiccant Air Dryer – PTW Series

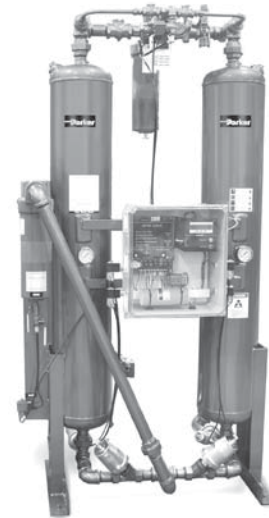
Parker PTW Series Heatless Desiccant Air Dryers remove water vapor from compresses air through a process known as pressure swing adsorption. Pressure dewpoints ranging from -40°F (-40°C) to -100°F (-70°C) are attained by directing the flow of saturated compressed air over a bed of desiccant.

• Features

- Pre-filter and after filters included with dryers
- Solid state controller
- CycleLoc™ demand control
- Variable cycle control (models PTW75 - PTW800 SCFM)
- Purge Flow indicator
- Purge flow regulator (models PTW75 - PTW800 SCFM)
- Repressurization circuit (models PTW75 - PTW800 SCFM)
- Control air filter (models PTW75 - PTW800 SCFM)
- Safety valves
- Pressure equalization
- 150 PSIG design standard
- Moisture indicator (models PTW75 - PTW800 SCFM)

• Options

- DDS Light / DDS (dewpoint dependent switching)



Operating information

Inlet or ambient air temperature	120°F (49°C) maximum
Operating pressure	50 PSIG (3.5 bar) minimum
Working pressure	150 PSIG (10.5 bar) maximum
Pressure drop at rated flow	less than 5 PSI (0.34 bar)

For technical information see CD

Heatless Desiccant Air Dryers

Capacity SCFM @ 100 PSIG (Nm³/min @ 6.9 bar)	Approximate purge SCFM (Nm³/min)	Primary voltage	Part number	Port size	Filtration package included with dryer		
					Pre-filter (5µ)	Pre-filter (.01µ)	After-filter (1µ)
25 (.70)	4 (.11)	• 120V/1ph/60Hz	PTW25*	1/2	P32FA94FSAN	P32FA94DSAN	P32FA94QSAN
42 (1.19)	6 (.19)	• 120V/1ph/60Hz	PTW40*	1/2	P33FA94FSAN	P33FA94DSAN	P33FA94QSAN
60 (1.70)	9 (.25)	• 120V/1ph/60Hz	PTW55*	3/4	P33FA94FSAN	P33FA94DSAN	P33FA94QSAN
75 (2.13)	11 (.31)	• 120V/1ph/60Hz	PTW75*	3/4	P3NFA96FSA	P3NFA96DSA	P3NFA96QSA
107 (3.03)	16 (.45)	• 120V/1ph/60Hz	PTW100*	1	P3NFA98FSA	P3NFA98DSA	P3NFA98QSA
135 (3.82)	20 (.56)	• 120V/1ph/60Hz	PTW130*	1	P3NFA98FSA	P3NFA98DSA	P3NFA98QSA
200 (5.66)	30 (.84)	• 120V/1ph/60Hz	PTW200*	1-1/2	35F77BAP	35F77EAP	35F77HAP
250 (7.07)	38 (1.07)	• 120V/1ph/60Hz	PTW250*	1/1/2	35F77BAP	35F77EAP	35F77HAP
300 (8.49)	45 (1.27)	• 120V/1ph/60Hz	PTW300*	1-1/2	35F77BAP	35F77EAP	35F77HAP
400 (11.32)	60 (1.69)	• 120V/1ph/60Hz	PTW400*	2	35F87BAP	35F87EAP	35F87HAP
500 (14.44)	77 (2.18)	• 120V/1ph/60Hz	PTW500*	2	35F87BAP	35F87EAP	35F87HAP
600 (18.40)	98 (2.77)	• 120V/1ph/60Hz	PTW600*	2	35F87BAP	35F87EAP	35F87HAP
800 (22.65)	120 (3.39)	• 120V/1ph/60Hz	PTW800*	2	35F87BAP	35F87EAP	35F87HAP

* Options: Dewpoint dependent switching (DDS).

DDS Light includes: energy saving purge cycle control with high humidity alarm and indicator light. When ordering use -DL as suffix.

DDS includes: energy saving purge cycle control with high humidity alarm and digital dewpoint display. When ordering use -DS as suffix

Most popular.

Flow Correction Factors

Capacities are based upon:

- Pressure drop at rated flow less than 5 PSI (0.34 bar)
- Maximum inlet air or ambient air temperature 120°F (49°C)
- Maximum working pressure: 150 PSIG (10.5 bar g) standard units for high maximum working pressure are available
- Minimum operating pressure: 50 PSIG (3.5 bar g)

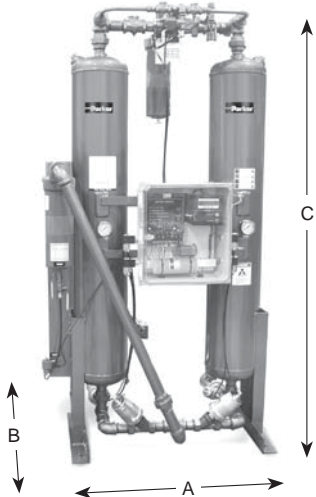
Inlet air pressure correction

PSI	50	60	70	80	90	100	110	120	130	140	150
BAR	3.5	4.1	4.9	5.5	6.2	6.9	7.6	8.3	9.0	9.7	10.3
Factor	.56	.65	.74	.83	.91	1.00	1.09	1.18	1.27	1.37	1.43

Inlet air temperature correction

°F	90	95	100	105	110	115	120
°C	32	35	38	41	43	46	49
Factor	1.35	1.16	1.00	.85	.74	.64	.56

Heatless Desiccant Air Dryers

	Part number	A (length)	B (width)	C (height)	Weight lbs. (kg)
	PTW25	19 (483)	16 (406)	64 (1626)	156 (71)
	PTW40	21 (533)	17 (432)	48 (1219)	190 (86)
	PTW55	21 (533)	20 (508)	67 (1702)	230 (104)
	PTW75	35 (889)	27 (686)	80 (2032)	384 (174)
	PTW100	35 (889)	27 (686)	80 (2032)	468 (212)
	PTW130	35 (899)	21 (533)	70 (1778)	496 (225)
	PTW200	44 (1118)	28 (711)	78 (1981)	692 (314)
	PTW250	44 (1118)	30 (762)	78 (1981)	776 (352)
	PTW300	44 (1118)	30 (762)	78 (1981)	796 (361)
	PTW400	74 (1880)	41 (1041)	84 (2134)	1626 (738)
	PTW500	74 (1880)	41 (1041)	85 (2159)	1735 (787)
	PTW600	74 (1880)	41 (1041)	86 (2184)	1740 (789)
	PTW800	74 (1880)	41 (1041)	91 (2311)	2120 (962)

Inch (mm)

Service kits

Element kits

	5μ	0.01μ	1.0μ
P32	P32KA00ESE	P32KA00ESC	P32KA00ES9
P33	P33KA00ESE	P33KA00ESC	P33KA00ES9
P3NF	P3NKA00ESE	P3NKA00ESCB	P3NKA00ES9
35F	FRP-95-505	MTP-95-502	MSP-95-502

Most popular.

Zero Air Loss Condensate Drains

Zero air loss condensate drains are designed for economical removal of unwanted water, oil emulsions, and other liquids. These drains will only open when liquid is present and will not allow any compressed air to escape from the system.



Operating information

Maximum pressure	232 PSIG (16 bar)
Ambient operating temperature	35°F to 140°F (1.6°C to 60°C)
Voltages	NPT 115/50-60Hz, standard
Optional:	BSP ports 230/50-60Hz & 24VDC
For technical information see CD	

Zero Air Loss Condensate Drains

Port size (NPT)	Compressor aftercooler (SCFM)*	Capacity refrigeration dryer (SCFM)**	Filter (SCFM)	Drain capacity per day (gal/liter)	Model number	Service kit
1 @ 3/8 (in), 1 @ 3/8 (out)	—	—	424	6 (22.7)	ED3002N115-K	SKED3000N115
1 @ 1/2 (in), 1 @ 3/8 (out)	141	282	1,413	13 (49.2)	ED3004N115-K	SKED3000N115
2 @ 1/2 (in), 1 @ 3/8 (out)	247	494	2,472	23 (87.1)	ED3007N115-K	SKED3000N115
2 @ 1/2 (in), 1 @ 3/8 (out)	1,059	2,119	10,594	100 (378.5)	ED3030N115-K	SKED3000N115
2 @ 1/2 (in), 1 @ 3/8 (out)	3,532	7,063	35,315	330 (1,249.2)	ED3100N115-K	SKED3000N115

* Based on 100 PSI working pressure, air compressor inlet at 77°F (25°C) at 60% RH, air discharge temperature of 95°F (35°C) following the aftercooler, pressure dewpoint of 37°F (2.8°C) after the refrigerated dryer.

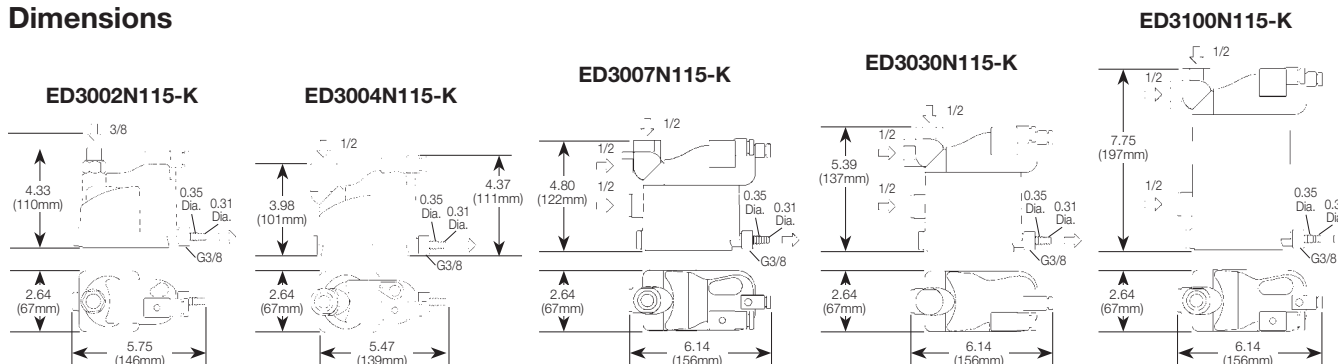
** Condensate from aftercooler or refrigerated dryer to be drained upstream – only for residual oil content or small quantities of condensate.

Note: A 6 ft. line cord will be included with each drain.

Where Are Condensate Drains Used?

Compressor with Aftercooler	Receiver Tank	Filter	Air Dryer	Drip Leg
Removes the condensate that is collected after the air cools in the aftercooler	Removes the condensate that is collected when the air cools inside of the receiver tank	Removes the condensate that is collected in the filter bowl	Removes the condensate that is collected in the air dryer	Point-of-use applications: removes the condensate from compressed air pipes in a plant

Dimensions



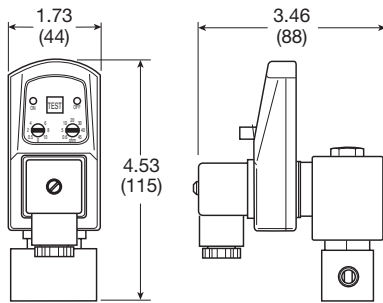
Most popular.

Automatic Electrical Drain Valve – WDV3-G

The WDV3 Electrical Drain is designed to remove condensate from compressors, compressed air dryers and receivers up to any size, type or manufacturer.

Benefits

- Does not air-lock during operation
- Compressed air systems up to any size
- The direct acting valve is serviceable
- Suitable for all types of compressors
- Test (micro-switch) feature
- High time cycle accuracy
- Large (4.5mm) valve orifice



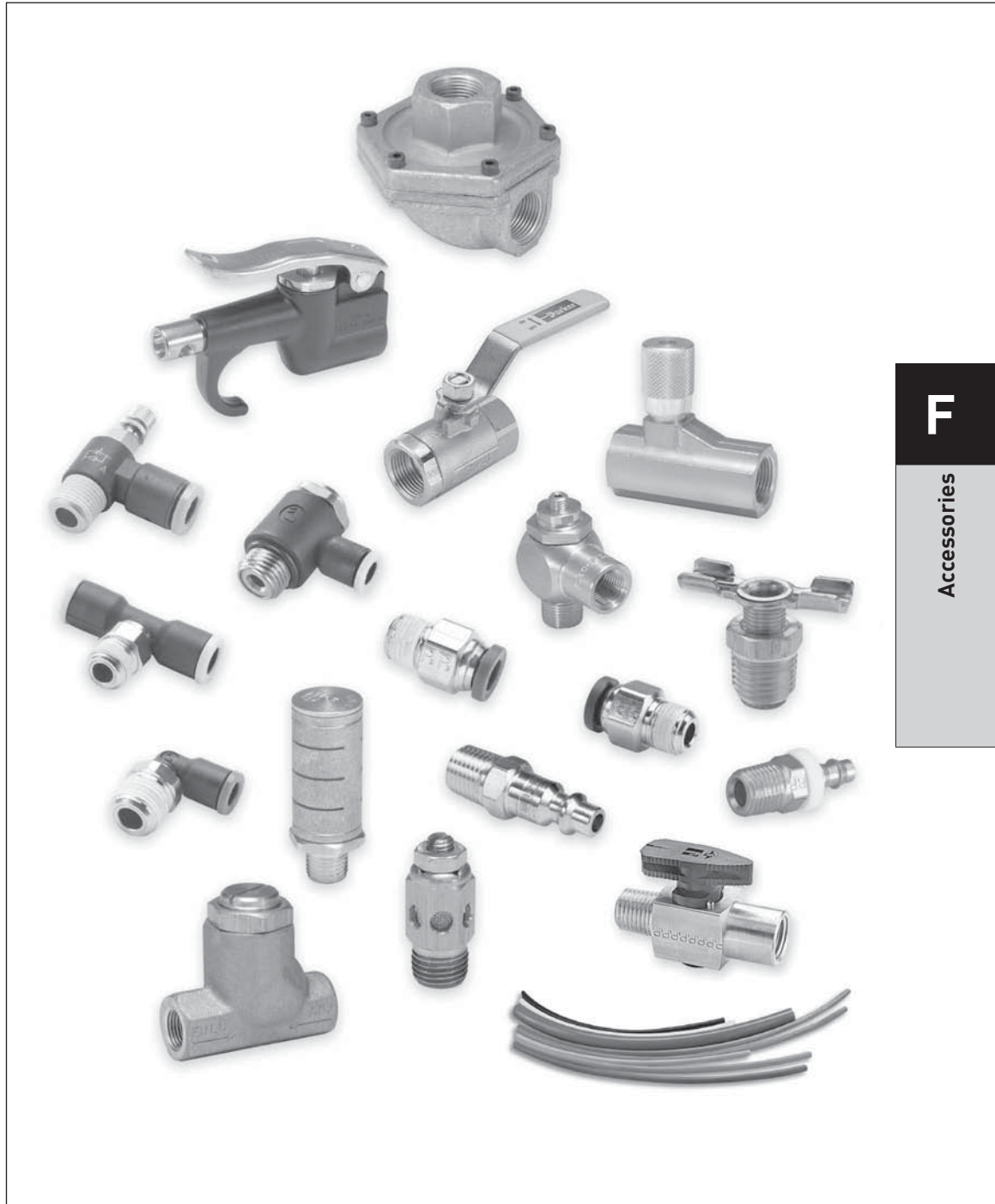
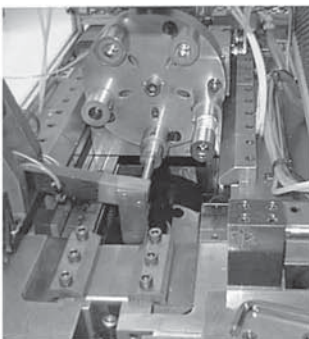
Operating information	
Operating pressure	230 PSIG (16 bar)
Ambient operating temperature	34°F to 130°F (1.1°C to 54°C)
Voltages	115VAC, 230/50-60Hz, 24VDC
Coil Insulation	Class H, 340°F (171.1°C)
Current Rating	4mA maximum
Timer open time	.5 to 10 sec., adjustable
cycle time	.5 to 45 min., adjustable
For technical information see CD	

Automatic Electrical Drain Valve

Port size	Primary voltage	Weight (kg)	Model number
1/4	120VAC	1.8 (0.8 kg)	WDV3-G12BL
1/4	230VAC	1.8 (0.8 kg)	WDV3-G22BL
3/8	120VAC	1.8 (0.8 kg)	WDV3-G13BL
3/8	230VAC	1.8 (0.8 kg)	WDV3-G23BL
1/2	120VAC	1.8 (0.8 kg)	WDV3-G14BL
1/2	230VAC	1.8 (0.8 kg)	WDV3-G24BL
1/2	24VDC	1.8 (0.8 kg)	WDV3-G34BL

Materials

Description	
Valve Body	Brass / Stainless Steel
Enclosure (IP65 / NEMA 4)	ABS Plastic
Internal Parts	Brass / Stainless Steel
Valve Seals	FPM (Fluorocarbon)



F
Accessories

Accessories

Accessories

Ball Valves / Plug Valves



F10

- Forged brass, general purpose, industrial ball valves
- Stainless steel, general purpose, industrial ball valves
- One piece extruded brass body plug valves

Accessories – continued

Quick Couplings



F7

- Industrial interchange nipples –1/4" to 3/4" body size
- Sleevematic couplers –1/4" to 1/2" body size
- Safromatic couplers –1/4" to 3/4" body size
- Economatic quick connect couplings –1/4" body size

Flow Controls & Accessories



F5

- Full range of flow controls, mufflers, silencers, drain valves, blow guns, relief, shuttle and quick exhaust valves
- Ports from M5 through 3/4 inch

Tank Valves & Air Chucks



F3

- Maximum operating pressure 185 PSIG
- Temperature range -40°F to 220°F
- N/P finish
- Model No. 05499 0000 ball-foot air chuck, 1/4" female port
- Model No. 06739 0000 ball-foot air chuck with clip, 1/4" female port

Hose & Fittings



F16

- 801 General purpose hose
- Push-on hose barb fittings

Tubing & Fittings



F19

- Push-to-connect, Prestolok composite fittings
- Push-to-connect, Prestolok metal fittings
- Pipe fittings
- DOT Fittings
- E: instrument grade tubing, N: flexible tubing, FRPE: flame resistant tubing, NR: semi-rigid high strength tubing, U: polyether base tubing

Integrated Fittings



F11

- Flow control regulators
- Inline check valves
- Blocking valves
- Threshold sensors

Mufflers & Silencers



F4

- Compact
- Lightweight
- Easy to install
- Excellent noise reduction
- Protects components from contamination
- NPT & BSPT threads available

Parker Pneumatic

09166 0060
1/8" pipe thread, dome shaped cap



Pipe thread	Part number
1/8	09166 0060

Accessories
Tank Valves & Air Chucks

05499 0000
1/4" female port, ball-foot air chuck



Port size	Part number
1/4	05499 0000

00645 0060
1/8" pipe thread at bottom, screwdriver type cap



Pipe thread	Part number
1/8	00645 0060

06739 0000
1/4" port, ball-foot air chuck with clip



Port size	Part number
1/4	00645 0000

01468 0006
1/8" pipe thread part way up the stem, screwdriver type cap



Pipe thread	Part number
1/8	01468 0006

F
 Tank Valves & Air Chucks
 Accessories

Most popular. For technical information see CD

Mufflers / Silencers

EM Sintered Bronze Muffler / Filters



Port size	Part number
1/8	EM12
1/4	EM25
3/8	EM37
1/2	EM50
3/4	EM75
1	EM100
1-1/4	EM125
1-1/2	EM150

ASN Air Line Silencer, Plastic



Thread size	Part number
M5	AS-5
1/8	ASN-6
1/4	ASN-8
3/8	ASN-10
1/2	ASN-15

Muffler / Flow Controls



Port size	Part number
1/8	04502 0002
1/4	04504 0004
3/8	04506 0060
1/2	04508 0080
3/4	04512 0012
1	04516 0016

P6M G Thread, Air Line Silencer, Plastic



Port thread	Part number
M5	P6M-PAC5
G1/8	P6M-PAB1
G1/4	P6M-PAB2
G3/8	P6M-PAB3
G1/2	P6M-PAB4
G3/4	P6M-PAB6
G1	P6M-PAB8

Breather Vents



Pipe thread	Part number
1/8	04702 0002
1/4	04704 0004
3/8	04706 0006
1/2	04708 0008
3/4	04712 0012
1	04716 0016
1-1/4	04720 0020
1-1/2	04724 0024

NOTE: Breather vents should not be used as exhaust mufflers.

ECS Reclassifier, Air Line Muffler



Port thread	Part number
1/2	ECS3
1	ECS5


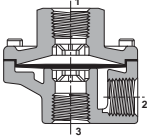
ES Silencer



Pipe thread	Part number
1/8	ES12MC
1/4	ES25MC
3/8	ES37MC
1/2	ES50MC
3/4	ES75MC
1	ES100MC
1-1/4	ES125MC
1-1/2	ES150MC


Most popular. For technical information see CD

Quick Exhaust & Shuttle Valve

Port 1	Port 2	Port 3	Flow (SCFM)	Part number with panel nut
Standard version				
1/4	1/4	3/8	150	OR25NB
1/4	3/8	3/8	240	OR25PB
3/8	3/8	3/8	240	OR37B
1/2	1/2	1/2	450	OR50B
3/4	3/4	3/4	550	OR75B
Nitrile diaphragms				
1/8	1/8	1/8	70	OR12B
1/8	1/8	1/4	70	OR12NB
1/4	1/4	1/4	90	OR25B
1/4	1/4	3/8	90	OR25NFB
3/8	3/8	3/8	240	OR37FB
3/4	3/4	3/4	550	OR75FB
Fluorocarbon diaphragms				
1/8	1/8	1/8	70	OR12VB
1/8	1/8	1/4	70	OR12NVB
1/4	1/4	1/4	90	OR25VB
3/8	3/8	3/8	240	OR37VB
1/2	1/2	1/2	450	OR50VB
3/4	3/4	3/4	550	OR75VB
PTFE diaphragms				
3/8	3/8	3/8	240	OR37TB

Shuttle Valve



Port size	Part number
1/8	N164 1001
1/4	N164 2003
3/8	N164 3003

Relief Valve



Pressure (PSI)	Part number
***	RV01AN***

*** 010 through 200 psi

130 Relief Valve



Spring range	Part number no panel nut	Part number with panel nut
0-15 PSIG	130-02AA	130-02AAP
0-25 PSIG	130-02A	130-02AP
0-50 PSIG	130-02B	130-02BP
0-100 PSIG	130-02C	130-02CP

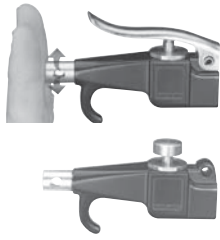
134 Relief Valve



Spring range	Part number no panel nut	Part number with panel nut
0-15 PSIG	134-02AA	134-02AAP
0-25 PSIG	134-02A	134-02AP
0-50 PSIG	134-02B	134-02BP
0-100 PSIG	134-02C	134-02CP

Most popular. For technical information see CD

Brass Nozzle Blow Gun



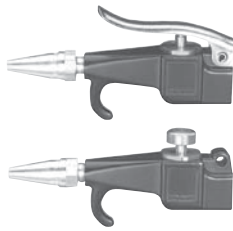
Inlet port	Part number
Lever Operated	
1/4	00475 0010
Button Operated	
1/4	00470 0010

Automatic Drip Leg Drain



Port thread	Part number
1/4	06D1NA
1/2	06D3NA

Brass Nozzle Blow Gun



Inlet port	Part number
Lever Operated	
1/4	00475 0900
Button Operated	
1/4	00470 0900

Self-Regulating Blow Gun



Inlet port	Part number
Lever Operated	
1/4	00475 2900

Pistol Grip Blow Gun



Inlet port	Part number
1/4	BG441-NBL

Brass Nozzle



Part number
00470 7020

FLO-GAIN Nozzle



Part number
W1110 0900

Most popular. For technical information see CD

Industrial Interchange Nipples

Hardened wear points and solid barstock construction provide long service life. Precision machined surfaces and hardened load-bearing areas resist the effects of mechanical shock in the most rugged applications. Industrial interchange nipples conform to MIL-C4109 and are for use with either Sleeveomatic or Saffromatic couplers.

Female Pipe Thread



Body size (inches)	Thread size	Part number Steel
1/4	1/8-27	H1C
1/4	1/4-18	H3C
1/4	3/8-18	H3C-E
3/8	1/4-18	H1E
3/8	3/8-18	H3E
3/8	1/2-14	H3E-F
1/2	3/8-18	H1F
1/2	1/2-14	H3F
1/2	3/4-14	H3F-G
3/4	1/2-14	H3G-F
3/4	3/4-14	H3G
3/4	1-11½	H3G-J

Male Pipe Thread



1/4	1/8-27	H0C
1/4	1/4-18	H2C
1/4	3/8-18	H2C-E
3/8	1/8-27	H00E
3/8	1/4-18	H0E
3/8	3/8-18	H2E
3/8	1/2-14	H2E-F
1/2	3/8-18	H0F
1/2	1/2-14	H2F
1/2	3/4-14	H2F-G
3/4	1/2-14	H2G-F
3/4	3/4-14	H2G
3/4	1-11½	H2G-J

Standard Hose Barb



Body size (inches)	Hose I.D.	Part number Steel
1/4	1/4	H8C
1/4	5/16	H8C-D
1/4	3/8	H9C
3/8	3/8	H5E
3/8	1/2	H6E
1/2	3/8	H4F
1/2	1/2	H5F
1/2	3/4	H5F-G
3/4	1/2	H5G-F
3/4	3/4	H5G
3/4	1	H5G-J

Push-Lok Hose Barb*



1/4	1/4	H8CP
1/4	3/8	H9CP
3/8	1/4	H4EP
3/8	3/8	H5EP
3/8	1/2	H6EP
1/2	3/8	H4FP
1/2	1/2	H5FP
1/2	1/2	H6FP

* Push-Lok hose barbs are designed for use with a push-lok hose and do not require clamps.

Most popular. For technical information see CD

Sleevmatic Couplers

Female Pipe Thread



Body size (inches)	Thread size	Part number	
		Brass	Steel
1/4	1/8-27	B23A	—
1/4	1/4-18	B23	—
1/4	3/8-18	B23E	—
3/8	1/4-18	—	25C
3/8	3/8-18	—	25
3/8	1/2-14	—	25F
1/2	3/8-18	—	17E
1/2	1/2-14	—	17
1/2	3/4-14	—	17G

Male Pipe Thread



Body size (inches)	Thread size	Part number	
		Brass	Steel
1/4	1/4-18	B22	—
1/4	3/8-18	B22E	—
3/8	1/4-18	—	24C
3/8	3/8-18	—	24
3/8	1/2-14	—	24F
1/2	3/8-18	—	16E
1/2	1/2-14	—	16
1/2	3/4-14	—	16G

Standard Hose Barb



Body size (inches)	Hose I.D.	Part number	
		Brass	Steel
1/4	1/4	B20-3B	—
1/4	5/16	B20-4B	—
1/4	3/8	B20-5B	—
3/8	3/8	—	24-5B
3/8	1/2	—	24-6B
1/2	3/8	—	16-5B
1/2	1/2	—	16-6B
1/2	3/4	—	16-7B

Push-Lok Hose Barb*



Body size (inches)	Hose I.D.	Part number	
		Brass	Steel
1/4	3/8	B20-5BP	—
3/8	3/8	—	24-5BP
1/2	3/8	—	16-5BP
1/2	1/2	—	16-6BP

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

Most popular. For technical information see CD

Saflomatic Couplers

Female Pipe Thread



Body size (inches)	Thread size	Part number
		Brass
1/4	1/8-27	B33A
1/4	1/4-18	B33
1/4	3/8-18	B33E
3/8	1/4-18	B35C
3/8	3/8-18	B35
3/8	1/2-14	B35F
1/2	3/8-18	B37E
1/2	1/2-14	B37
1/2	3/4-14	B37G
3/4	1/2-14	B39F
3/4	3/4-14	B39
3/4	1-11½	B39J

Male Pipe Thread



Body size (inches)	Thread size	Part number
		Brass
1/4	1/8-27	B32A
1/4	1/4-18	B32
1/4	3/8-18	B32E
3/8	1/4-18	B34C
3/8	3/8-18	B34
3/8	1/2-14	B34F
1/2	3/8-18	B36E
1/2	1/2-14	B36
1/2	3/4-14	B36G
3/4	3/4-14	B38
3/4	1-11½	B38J

Standard Hose Barb



Body size (inches)	Hose I.D.	Part number
		Brass
1/4	1/4	B30-3B
1/4	5/16	B30-4B
1/4	3/8	B30-5B
3/8	3/8	B34-5B
3/8	1/2	B34-6B
1/2	1/2	B36-6B
1/2	3/4	B36-7B
3/4	3/4	B38-7B
3/4	1	B38-8B

Push-Lok Hose Barb*



Body size (inches)	Thread size	Part number
		Brass
1/4	1/4	B30-3BP
1/4	3/8	B30-5BP
3/8	3/8	B34-5BP
1/2	1/2	B36-6BP

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

Couplers Female Pipe Thread



Body size (inches)	Thread size	Part number Brass
1/4	1/4-18 NPTF	B53
1/4	3/8-18 NPTF	B53E

Couplers Male Pipe Thread



Body size (inches)	Thread size	Part number Brass
1/4	1/4-18	B52
1/4	3/8-18	B52E

Couplers Push-Lok Hose Barb*



Body size (inches)	Hose I.D.	Part number Brass
1/4	1/4	B50-03BP
1/4	3/8	B50-05BP

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

Nipples Female Pipe Thread



Body size (inches)	Thread size	Part number Steel
1/4	1/4-18	A3C

Nipples Male Pipe Thread



Body size (inches)	Thread size	Part number Steel
1/4	1/4-18	A2C

Nipples Standard Hose Barb



Body size (inches)	Hose I.D.	Part number Steel
1/4	1/4	A8C

Nipples Push-Lok Hose Barb*



Body size (inches)	Thread size	Part number Steel
1/4	1/4	A8CP

* Push-Lok barbs are designed for use with push-lok hose and do not require clamps.

Most popular. For technical information see CD

Parker Pneumatic

Female-Female Pipe Ends XV500P



Pipe thread	Flow dia.	Part number
1/4	.375	XV500P-4
3/8	.375	XV500P-6
1/2*	.500	XV500P-8
3/4**	.685	XV500P-12
1**	.875	XV500P-16

Female Pipe Ends, Lever Handle, Mini Ball Valve MV200



Pipe thread	Flow dia.	Part number
1/8	.31	MV200-2
1/4	.31	MV200-4
3/8	.31	MV200-6
1/2	.39	MV200-8

Male-Female Pipe Ends, Compact Handle, Mini Ball Valve MV608



Pipe thread	Flow dia.	Part number
1/8	.20	MV608-2
1/4	.31	MV608-4
3/8	.31	MV608-6
1/2	.39	MV608-8

Female Pipe Ends, Compact Handle, Mini Ball Valve MV609



Pipe thread	Flow dia.	Part number
1/8	.24	MV609-2
1/4	.31	MV609-4
3/8	.31	MV609-6
1/2	.39	MV609-8
3/8x1/4	.31	MV609-6-4

Female Pipe Ends, Panel Mount XV502SS



Pipe thread	Flow dia.	Part number
1/4	.380	XV502SS-4
3/8	.380	XV502SS-6
1/2	.500	XV502SS-8
3/4	.790	XV502SS-12
1	1.000	XV502SS-16
1-1/4	1.250	XV502SS-20
1-1/2	1.500	XV502SS-24
2	2.000	XV502SS-32

Most popular. For technical information see CD

Accessories

Ball and Plug Valves, Drain Cocks

Male Pipe to Male Pipe Plug Valve PV607



Pipe thread	Flow dia.	Part number
1/8	.200	PV607-2
1/4	.200	PV607-4

Female Pipe to Male Pipe Plug Valve PV608



Pipe thread	Flow dia.	Part number
1/8	.200	PV608-2
1/4	.200	PV608-4

Female Pipe to Female Pipe Plug Valve PV609



Pipe thread	Flow dia.	Part number
1/8	.200	PV609-2
1/4	.200	PV609-4

Internal Seal Drain Cock DC602

Temperature Range: -65° to 250°F



Pipe thread	Part number
1/8	DC602-2
1/4	DC602-4

External Seal Drain Cock DC604

Temperature Range: -25° to 250°F



Pipe thread	Part number
1/8	DC604-2*
1/4	DC604-4
3/8	DC604-6*

* When assembled handle wings are down facing

F

Ball Valves, Plug Valves, Drain Cocks

FCC731 Compact Meter Out



Tube size (in)	NPT	Part number
5/32	1/8	FCC731-5/32-2
5/32	1/4	FCC731-5/32-4
1/4	1/8	FCC731-4-2
1/4	1/4	FCC731-4-4
3/8	1/4	FCC731-6-4
3/8	3/8	FCC731-6-6

FC731 Compact Meter Out - BSPP



Tube size (mm)	BSPP	Part number
4	1/8	FC731-4M-2G
6	1/8	FC731-6M-2G
6	1/4	FC731-6M-4G
8	1/8	FC731-8M-2G
8	1/4	FC731-8M-4G
8	3/8	FC731-8M-6G
10	1/4	FC731-10M-4G
10	3/8	FC731-10M-6G
12	3/8	FC731-12M-6G
12	1/2	FC731-12M-8G

FCCB731 Compact Bi-Directional Flow Control



Tube size (in)	NPT	Part number
5/32	1/8	FCCB731-5/32-2
1/4	1/8	FCCB731-4-2
1/4	1/4	FCCB731-4-4

FCCB731 Compact Bi-directional Flow Control - BSPP



Tube size (mm)	BSPP	Part number
4	1/8	FCCB731-4M-2G
6	1/8	FCCB731-6M-2G
6	1/4	FCCB731-6M-4G
8	1/8	FCCB731-8M-2G
8	1/4	FCCB731-8M-4G
8	3/8	FCCB731-8M-6G

FCKC731 Knobless Meter Out Flow Control



Tube size (in)	NPT / UNF	Part number
1/8	10-32	FCKC731-2-0
1/8	1/8	FCKC731-2-2
5/32	10-32	FCKC731-5/32-0
5/32	1/8	FCKC731-5/32-2
1/4	10-32	FCKC731-4-0
1/4	1/8	FCKC731-4-2
1/4	1/4	FCKC731-4-4
5/16	1/8	FCKC731-5-2
5/16	1/4	FCKC731-5-4
3/8	1/4	FCKC731-6-4
3/8	3/8	FCKC731-6-6

FCKC731 Knobless Compact Flow Control - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	FCKC731-4M-M5
4	1/8	FCKC731-4M-2G
6	M5x0.8	FCKC731-6M-M5
6	1/8	FCKC731-6M-2G
6	1/4	FCKC731-6M-4G
8	1/8	FCKC731-8M-2G
8	1/4	FCKC731-8M-4G
8	3/8	FCKC731-8M-6G
10	1/4	FCKC731-10M-4G
10	3/8	FCKC731-10M-6G
10	1/2	FCKC731-10M-8G
12	3/8	FCKC731-12M-6G
12	1/2	FCKC731-12M-8G

FCKCB731 Knobless Bi-directional Flow Control - BSPP



Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	FCKCB731-4M-M5
4	1/8	FCKCB731-4M-2G
6	M5x0.8	FCKCB731-6M-M5
6	1/8	FCKCB731-6M-2G
6	1/4	FCKCB731-6M-4G
8	1/8	FCKCB731-8M-2G
8	1/4	FCKCB731-8M-4G
8	3/8	FCKCB731-8M-6G

FCM731 Miniature Meter Out Flow Control



Tube size (in)	NPT	Part number
1/8	10-32	FCM731-2-0
1/8	1/8	FCM731-2-2
5/32	10-32	FCM731-5/32-0
5/32	1/8	FCM731-5/32-2
1/4	10-32	FCM731-4-0
1/4	1/8	FCM731-4-2
1/4	1/4	FCM731-4-4

FCM731 Miniature Flow Control - BSPP



Tube size (mm)	BSPP	Part number
3	M3x0.5	FCM731-3M-M3
3	M5x0.8	FCM731-3M-M5
4	M3x0.5	FCM731-4M-M3
4	M5x0.8	FCM731-4M-M5
4	1/8	FCM731-4M-2G
6	M5x0.8	FCM731-6M-M5
6	1/8	FCM731-6M-2G
6	1/4	FCM731-6M-4G
8	1/8	FCM731-8M-2G
8	1/4	FCM731-8M-4G
8	3/8	FCM731-8M-6G

Most popular. For technical information see CD

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 Integrated Fittings
 Accessories

FCMB731 Miniature Bi-directional Flow Control - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	FCMB731-4M-M5
4	1/8	FCMB731-4M-2G
6	M5x0.8	FCMB731-6M-M5
6	1/8	FCMB731-6M-2G
6	1/4	FCMB731-6M-4G

FCMK731 Knobless Mini Meter Out Flow Control



Tube size (in)	NPT	Part number
1/8	10-32	FCMK731-2-0
1/8	1/8	FCMK731-2-2
5/32	10-32	FCMK731-5/32-0
5/32	1/8	FCMK731-5/32-2
1/4	10-32	FCMK731-4-0
1/4	1/8	FCMK731-4-2
1/4	1/4	FCMK731-4-4

FCCS731 Compact Swivel Outlet Flow Control



Tube size (in)	NPT	Part number
1/4	1/8	FCCS731-4-2
1/4	1/4	FCCS731-4-4
3/8	1/4	FCCS731-6-4
3/8	3/8	FCCS731-6-6

FCMS731 Mini Swivel Outlet Flow Control



Tube size (in)	NPT	Part number
5/32	10-32	FCMS731-5/32-0
5/32	1/8	FCMS731-5/32-2

FCMS731 Miniature Swivel Outlet - BSPP



Tube size (mm)	NPT	Part number
4	M5x0.8	FCMS731-4M-M5
4	1/8	FCMS731-4M-2G
6	M5x0.8	FCMS731-6M-M5
6	1/8	FCMS731-6M-2G

FCCS731 Compact Swivel Outlet - BSPP



Tube size (mm)	BSPP	Part number
6	1/8	FCCS731-6M-2G
6	1/4	FCCS731-6M-4G
8	1/8	FCCS731-8M-2G
8	1/4	FCCS731-8M-4G
10	3/8	FCCS731-8M-6G
10	1/4	FCCS731-10M-4G
10	3/8	FCCS731-10M-6G
12	3/8	FCCS731-12M-6G
12	1/2	FCCS731-12M-8G

Most popular.

For technical information see CD

Accessories Integrated Fittings

FCMSP731 Plug-In Mini Flow Control



Tube size (in)	Part number
1/8	FCMSP731-2
5/32	FCMSP731-5/32
1/4	FCMSP731-4

FCMSP701 Plug-In Miniature Flow Control



Tube size (mm)	Part number
4	FCMSP701-4M
6	FCMSP701-6M

FCCSP731 Plug-In Compact Flow Control



Tube size (mm)	Part number
6	FCCSP731-6M
8	FCCSP731-8M
10	FCCSP731-10M
12	FCCSP731-12M

FC832 In-Line Flow Control



Tube size (in)	Part number
5/32	FC832-5/32
1/4	FC832-4
5/16	FC832-5
3/8	FC832-6
1/2	FC832-8

FC832 In-Line Flow Control



Tube size (mm)	Part number
4	FC832-4M
6	FC832-6M
8	FC832-8M
10	FC832-10M
12	FC832-12M

FCB832 In-Line Bi-directional Flow Control



Tube size (in)	Part number
5/32	FCB832-5/32
1/4	FCB832-4
5/16	FCB832-5

FCB832 In-Line Bi-directional Flow Control



Tube size (mm)	Part number
4	FCB832-4M
6	FCB832-6M
8	FCB832-8M

Parker Pneumatic

FCPM832 In-Line Panel Mountable Flow Control



Tube size (mm)	Part number
4	FCPM832-4M
6	FCPM832-6M
8	FCPM832-8M
10	FCPM832-10M
12	FCPM832-12M

FC836 Threaded In-Line Flow Control



NPT	Part number
1/8	FC836-2
1/4	FC836-4
3/8	FC836-6
1/2	FC836-8

FC836 Threaded In-Line Flow Control - BSPP



BSPP	Part number
1/8	FC836-2G
1/4	FC836-4G
3/8	FC836-6G
1/2	FC836-8G

337 Micrometer Flow Control Valves



Port size	Part number
1/8"	00337 1000
1/4"	00337 1001
3/8"	00337 1002
1/2"	00337 1003
3/4"	00337 1004

337 Micrometer Flow Control Valves - BSPP



Port size	Part number
1/8"	00337G1000
1/4"	00337G1001

338 Bi-directional Flow Control Valves



Port size	Part number
1/8"	00338 1100
1/4"	00338 1101
3/8"	00338 1102
1/2"	00338 1103
3/4"	00338 1104

**Accessories
Integrated Fittings**

338 Bi-directional Flow Control Valves - BSPP



Port size	Part number
1/8"	00338G1100
1/4"	00338G1101

3250 Flow Control Valves



Port size	Part number
1/8"	03250 0119
1/4"	03250 0219
3/8"	03250 0319
1/2"	03250 0419
3/4"	03250 0519

3250 Flow Control Valves - BSPP



Port size	Part number
1/8"	3250G0119
1/4"	3250G0219
3/8"	3250G0319
1/2"	3250G0419
3/4"	3250G0519

3250 Flow Control Valves



Port size	Part number
1"	3250G1000
1-1/4"	3250G1250
1-1/2"	3250G1500

3250 Flow Control Valves - BSPP



Port size	Part number
1"	03250 1000
1-1/4"	03250 1250
1-1/2"	03250 1500

Most popular. For technical information see CD

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3251 Series Flow Control Valves



Thread (NPT) Male	Thread (NPT) Female	Right angle flow control valves
1/8	1/8	03251 0125
1/4	1/4	03251 0250
3/8	3/8	03251 0375
1/2	1/2	03251 0500



With Prestolok Fittings		
1/8	5/32	03251 1215
1/8	1/4	03251 1225
1/4	1/4	03251 2525
1/4	3/8	03251 2538
3/8	3/8	03251 3838

CAUTION: If it is possible that the ambient temperature may fall below freezing, the medium must be moisture-free to prevent internal damage or unpredictable behavior.

FC705 Push-to-Connect Metal Flow Control



Tube size (in)	NPT	Part number
5/32	1/8	FC705-5/32-2
1/4	1/8	FC705-4-2
1/4	1/4	FC705-4-4
3/8	1/4	FC705-6-4
3/8	3/8	FC705-6-6

FC701 Push-to-Connect Metal Flow Control - BSPP



Tube Size (mm)	BSPP	Part number
4	1/8	FC701-4M-2G
6	1/8	FC701-6M-2G
6	1/4	FC701-6M-4G
8	1/8	FC701-8M-2G
8	1/4	FC701-8M-4G
8	3/8	FC701-8M-6G
10	1/4	FC701-10M-4G
10	3/8	FC701-10M-6G
12	3/8	FC701-12M-6G
12	1/2	FC701-12M-8G
14	1/2	FC701-14M-8G

FC708 Threaded Port Meter Out Flow Control



NPT	Part number
1/8	FC708-2
1/4	FC708-4
3/8	FC708-6
1/2	FC708-8

FC702 Threaded Port Metal Flow Control - BSPP



BSPP	Part number
1/8	FC702-2G
1/4	FC702-4G
3/8	FC702-6G
1/2	FC702-8G

32PLCK In-Line Check Valve



Tube size (in)	Part number
5/32	32PLCK-5/32
1/4	32PLCK-4
5/16	32PLCK-5
3/8	32PLCK-6

32PLCK In-Line Check Valve



Tube size (mm)	Part number
4	32PLCK-4M
6	32PLCK-6M
8	32PLCK-8M
10	32PLCK-10M
12	32PLCK-12M

W68PLCK Male Check Valve



Tube size (in)	NPT / UNF	Part number
5/32	10-32	68PLCK-5/32-0
5/32	1/8	W68PLCK-5/32-2
1/4	1/8	W68PLCK-4-2
1/4	1/4	W68PLCK-4-4
3/8	1/4	W68PLCK-6-4
3/8	3/8	W68PLCK-6-6

W68PLCKI Male Check Valve - Meter In



Tube size (in)	NPT / UNF	Part number
5/32	10-32	68PLCKI-5/32-0
5/32	1/8	W68PLCKI-5/32-2
1/4	1/8	W68PLCKI-4-2
1/4	1/4	W68PLCKI-4-4
3/8	1/4	W68PLCKI-6-4
3/8	3/8	W68PLCKI-6-6

Most popular. For technical information see CD

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 Integrated Fittings
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Parker Pneumatic

68PLCK Male Check Valve Meter Out - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	68PLCK-4M-M5
4	1/8	68PLCK-4M-2G
6	1/8	68PLCK-6M-2G
6	1/4	68PLCK-6M-4G
8	1/8	68PLCK-8M-2G
8	1/4	68PLCK-8M-4G

68PLCKI Male Check Valve Meter In - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	68PLCKI-4M-M5
6	1/8	68PLCKI-6M-2G
8	1/8	68PLCKI-8M-2G
8	1/4	68PLCKI-8M-4G
10	3/8	68PLCKI-10M-6G
12	3/8	68PLCKI-12M-6G
12	1/2	68PLCKI-12M-8G

VC - Check Valve



Tube size (in)	O.D.	Part number
1/4	.66	A4VC4-MG
5/16	.70	A5VC5-MG
3/8	.80	A6VC6-MG

339 Check Valve



Port size	Part number
1/8"	00339 3000
1/4"	00339 3001
3/8"	00339 3002
1/2"	00339 3003
3/4"	00339 3004

339 Check Valve - BSPP



Port size	Part number
1/8"	00339G3000
1/4"	00339G3001

3047 Check Valve



Pipe thread	Part number
1/4"	03047 0099

Accessories
Integrated Fittings

FC601 Push-to-Connect Lock Out Valves



Tube size (in)	NPT	Part number
1/4	1/8	FC601-4-2
1/4	1/4	FC601-4-4
3/8	3/8	FC601-6-6
1/2	1/2	FC601-8-8

FC601 Push-to-Connect Lock-Out Valve - BSPP



Tube size (mm)	BSPP	Part number
6	1/8	FC601-6M-2G
6	1/4	FC601-6M-4G
8	1/4	FC601-8M-4G
8	3/8	FC601-8M-6G
10	3/8	FC601-10M-6G
12	1/2	FC601-12M-8G

FC602 Threaded Port Lock Out Valves



NPT 1	NPT 2	Part number
1/4	1/8	FC602-2
1/4	1/4	FC602-4
3/8	3/8	FC602-6
1/2	1/2	FC602-8

FC608 Threaded Port Lock-Out Valve - BSPP



BSPP 1	BSPP 2	Part number
1/8	1/4	FC608-4G-2G
1/4	1/4	FC608-4G-4G
3/8	3/8	FC608-6G-6G
1/2	1/2	FC608-8G-8G

PSBJ731 Pneumatic Threshold Sensor - 5/32 Pilot



NPT / UNF	Part number
10-32	PSBJ731-0
1/8	PSBJ731-2
1/4	PSBJ731-4
3/8	PSBJ731-6
1/2	PSBJ731-8

PSBJ731 Pneumatic Threshold Sensor - 4mm Pilot



BSPP	Part number
M5x0.8	PSBJ731-M5
1/8	PSBJ731-2G
1/4	PSBJ731-4G
3/8	PSBJ731-6G
1/2	PSBJ731-8G

Most popular. For technical information see CD

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Integrated Fittings
Accessories

PSPJ731 Pneumatic Threshold Sensor - 10-32 Pilot

NPT	Part number
1/8	PSPJ731-2
1/4	PSPJ731-4
3/8	PSPJ731-6



PSBJ708 Pneumatic Threshold Sensor - M5 Pilot

BSPP	Part number
1/8	PSBJ708-2G
1/4	PSBJ708-4G



PSPE701 Pneumatic / Electric Threshold Sensor - BSPP

BSPP	Part number
M5x0.8	PSPE701-M5
1/8	PSPE701-2G
1/4	PSPE701-4G
3/8	PSPE701-6G
1/2	PSPE701-8G



Hose & Fittings

801 General Purpose Hose

Hose I.D. Inch mm	Hose O.D. Inch mm	Reel Length	Part number
1/4 6.3	0.50 12.7	600 feet	801-4-***-RL
3/8 10	0.63 15.9	450 feet	801-6-***-RL
1/2 12.5	0.78 19.8	300 feet	801-8-***-RL
5/8 16	0.91 23.0	250 feet	801-10-***-RL
3/4 19	1.03 26.2	200 feet	801-12-***-RL
1 25	1.28 32.6	200 feet	801-16-***-RL



*** Available Colors
 GRA = gray BLU = blue
 RED = red GRN = green
 YEL = yellow BLK = black

30182 Push-on Hose Barb to Male Pipe

Thread (in)	Hose size (in)	Part number
1/8 x 27	1/4	30182-2-4B
1/4 x 18	1/4	30182-4-4B
1/4 x 18	3/8	30182-4-6B
3/8 x 18	3/8	30182-6-6B
1/2 x 14	3/8	30182-8-6B
3/8 x 18	1/2	30182-6-8B
1/2 x 14	1/2	30182-8-8B
1/2 x 14	5/8	30182-8-10B
3/4 x 14	1/2	30182-12-8B
3/4 x 14	3/4	30182-12-12B



30282 Push-on Hose Barb to Female Pipe

Thread (in)	Hose Size (in)	Part number
1/4 x 18	1/4	30282-4-4B
3/8 x 18	3/8	30282-6-6B
1/2 x 14	1/2	30282-8-8B



Most popular. For technical information see CD

30482 Push-on Hose Barb to Male SAE 45°

Thread (in)	Hose Size (in)	Part number
7/16 x 20	1/4	30482-4-4B
1/2 x 20	1/4	30482-5-4B
5/8 x 18	3/8	30482-6-6B
3/4 x 16	1/2	30482-8-8B



30682 Push-on Hose Barb to Female SAE JIC 37° Swivel

Thread (in)	Hose Size (in)	Part number
7/16 x 20	1/4	30682-4-4B
1/2 x 12	1/4	30682-5-4B
9/16 x 18	1/4	30682-6-6B
3/4 x 16	3/8	30682-8-6B
3/4 x 16	1/2	30682-8-8B
7/8 x 14	1/2	30682-10-8B
7/8 x 14	5/8	30682-10-10B
1-1/16 x 12	3/4	30682-12-12B




30882 Push-on Hose Barb to Female SAE 45° Swivel

Thread (in)	Hose Size (in)	Part number
7/16 x 20	1/4	30882-4-4B
1/2 x 20	1/4	30882-5-4B
5/8 x 18	3/8	30882-6-6B
3/4 x 16	3/8	30882-8-6B
3/4 x 16	1/2	30882-8-8B
7/8 x 14	1/2	30882-10-8B
7/8 x 14	5/8	30882-10-10B
1-1/16 x 14	3/4	30882-12-12B




31382 Push-on Hose Barb to Male Pipe Swivel

	Thread (in)	Hose Size (in)	Part number
	1/4 x 18	1/4	31382-4-4
	3/8 x 18	3/8	31382-6-6
	1/2 x 14	1/2	31382-8-8*


* Steel

38282 Push-on Hose Barb Union

	Hose size (in)	Part number
	1/4	38282-4-4B
	3/8	38282-6-6B
	1/2	38282-8-8B


Tubing

E Instrument Grade Tubing


	O.D.	I.D.	Reel length (feet)	Part number
	1/4	.170	100	E-43-0100
	1/4	.170	500	E-43-0500
	1/4	.170	1000	E-43-1000
	1/4	.170	100	EB-43-0100
	1/4	.170	500	EB-43-0500
	1/4	.170	1000	EB-43-1000
	1/4	.170	100	E-43-R-0100
	1/4	.170	500	E-43-R-0500
	1/4	.170	100	E-43-B-0100
	1/4	.170	500	E-43-B-0500
	1/4	.170	500	E-43-O-0500
	1/4	.170	500	E-43-Y-0500
	1/4	.170	500	E-43-P-0500
	1/4	.170	500	E-43-G-0500
	5/16	.187	500	E-53-0500
	5/16	.187	500	EB-53-0500
	3/8	.250	100	E-64-0100
	3/8	.250	500	E-64-0500
	3/8	.250	100	EB-64-0100
	3/8	.250	500	EB-64-0500
	3/8	.250	500	E-64-R-0500
	3/8	.250	500	E-64-B-0500
	3/8	.250	500	E-64-O-0500
	3/8	.250	500	E-64-Y-0500
	3/8	.250	500	E-64-P-0500
	3/8	.250	500	E-64-G-0500
	1/2	.375	100	E-86-0100
	1/2	.375	100	EB-86-0100
	5/8	.500	100	E-108-0100
	5/8	.500	Coil	EB-108-0100

Most popular. For technical information see CD

37G82 Push-on Hose Barb to Female Pipe (NPSM) Swivel with Gasket


	Thread (in)	Hose size (in)	Gasket	Part number
	1/4- 18	1/4	07G-4	37G82-4-4
	1/4- 18	3/8	07G-4	37G82-4-6
	3/8- 18	3/8	07G-6	37G82-6-6
	1/2- 14	1/2	07G-8	37G82-8-8
	1/2- 14	5/8	07G-8	37G82-8-10
	3/4- 14	3/4	07G-12	37G82-12-12

N Flexible Tubing


	O.D.	I.D.	Reel length (feet)	Part number
	1/8	.093	250	NN-2-016
	1/8	.093	250	NB-2-016
	1/8	.064	250	NN-2-031
	1/8	.064	250	NB-2-031
	5/32	.106	250	NN-2.5-025
	5/32	.106	250	NB-2.5-025
	3/16	.138	250	NN-3-025
	3/16	.138	250	NB-3-025
	3/16	.096	250	NN-3-046
	3/16	.096	250	NB-3-046
	1/4	.180	250	NN-4-035
	1/4	.180	250	NB-4-035
	1/4	.170	250	NN-4-040
	1/4	.170	250	NB-4-040
	1/4	.127	250	NN-4-062
	1/4	.127	250	NB-4-062
	5/16	.233	250	NN-5-040
	5/16	.233	250	NB-5-040
	3/8	.275	250	NN-6-050
	3/8	.275	250	NB-6-050
	3/8	.190	250	NN-6-093
	3/8	.190	250	NB-6-093
	1/2	.375	250	NN-8-062
	1/2	.375	250	NB-8-062
	1/2	.253	250	NN-8-124
	1/2	.253	250	NB-8-124

*Suggested working pressure is 1/4 of burst pressure.

PEFR Flame Resistant Tubing

	O.D.	I.D.	Reel length (feet)	Part number
	5/32	.096	500	PEFR-2.5-0500
	1/4	.170	500	PEFR-4-0500
	1/4	.170	1000	PEFR-4-1000
	3/8	.250	500	PEFR-6-0500
	1/2	.375	250	PEFR-8-0250


U Polyether Base Tubing

	O.D.	I.D.	Reel length (feet)	Part number
	1/8	1/16	500	U-21-0500
			250	U-21-0250
	1/4	1/8	500	U-42-0500
			250	U-42-0250
	3/8	1/4	250	U-64-0250
			100 (coil)	U-64-0100
	1/2	3/8	250	U-86-0250
			100 (coil)	U-86-0100

* Colors: Clear-Blank, Black-BLK, Green-GRN, Red-RED, Yellow-YEL, Blue-BLU, Orange-ORG, Gray-GRA

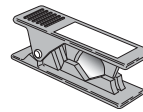
** Based on a full 4:1 safety factor.

NR Semi-rigid High Strength Tubing

	O.D.	I.D.	Reel length (feet)	Part number
	1/8	.091	500	NNR-2-017
	1/8	.091	500	NBR-2-017
	1/8	.073	500	NNR-2-026
	1/8	.073	500	NBR-2-026
	3/16	.140	500	NNR-3-024
	3/16	.140	500	NBR-3-024
	3/16	.110	500	NNR-3-039
	3/16	.110	500	NBR-3-039
	1/4	.180	250	NNR-4-035
	1/4	.180	250	NBR-4-035
	1/4	.150	250	NNR-4-050
	1/4	.150	250	NBR-4-050
	5/16	.233	250	NNR-5-040
	5/16	.233	250	NBR-5-040
	3/8	.279	250	NNR-6-048
	3/8	.279	250	NBR-6-048
	3/8	.225	250	NNR-6-075
	3/8	.225	250	NBR-6-075
	1/2	.376	250	NNR-8-062
	1/2	.376	250	NBR-8-062
1/2	.350	250	NNR-8-075	
1/2	.350	250	NBR-8-075	

*Suggested working pressure is 1/4 of burst pressure.

Plastic Tube Cutter



Part number
PTC-001

Replacement Blades



Part number
PTC-001RB



Hose & Fittings
 Accessories

Most popular. For technical information see CD

W369PLP Male Elbow Swivel 90°



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	369PLP-2-0
1/8	1/16	W369PLP-2-1
1/8	1/8	W369PLP-2-2
1/8	1/4	W369PLP-2-4
5/32	10-32	369PLP-5/32-0
5/32	1/8	W369PLP-5/32-2
5/32	1/4	W369PLP-5/32-4
3/16	1/8	W369PLP-3-2
1/4	10-32	369PLP-4-0
1/4	1/8	W369PLP-4-2
1/4	1/4	W369PLP-4-4
1/4	3/8	W369PLP-4-6
5/16	1/8	W369PLP-5-2
5/16	1/4	W369PLP-5-4
5/16	3/8	W369PLP-5-6
3/8	1/8	W369PLP-6-2
3/8	1/4	W369PLP-6-4
3/8	3/8	W369PLP-6-6
3/8	1/2	W369PLP-6-8
1/2	1/4	W369PLP-8-4
1/2	3/8	W369PLP-8-6
1/2	1/2	W369PLP-8-8

W369PLPX Extended Male Elbow



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	369PLPX-2-0
1/8	1/8	W369PLPX-2-2
1/8	1/4	W369PLPX-2-4
5/32	10-32	369PLPX-5/32-0
5/32	1/8	W369PLPX-5/32-2
5/32	1/4	W369PLPX-5/32-4
1/4	10-32	369PLPX-4-0
1/4	M7	369PLPX-4-M7
1/4	1/8	W369PLPX-4-2
1/4	1/4	W369PLPX-4-4
1/4	3/8	W369PLPX-4-6
5/16	1/8	W369PLPX-5-2
5/16	1/4	W369PLPX-5-4
3/8	1/8	W369PLPX-6-2
3/8	1/4	W369PLPX-6-4
3/8	3/8	W369PLPX-6-6

W379PLP Male Elbow 45°



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	379PLP-2-0
1/8	1/8	W379PLP-2-2
1/4	1/8	W379PLP-4-2
1/4	1/4	W379PLP-4-4
1/4	M7	W379PLP-4-M7
3/8	1/4	W379PLP-6-4
3/8	3/8	W379PLP-6-6

W372PLP Male Branch Tee Swivel



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	372PLP-2-0
1/8	1/16	W372PLP-2-1
1/8	1/8	W372PLP-2-2
1/8	1/4	W372PLP-2-4
5/32	10-32	372PLP-5/32-0
5/32	1/8	W372PLP-5/32-2
5/32	1/4	W372PLP-5/32-4
3/16	1/8	W372PLP-3-2
1/4	1/8	W372PLP-4-2
1/4	1/4	W372PLP-4-4
1/4	3/8	W372PLP-4-6
5/16	1/8	W372PLP-5-2
5/16	1/4	W372PLP-5-4
5/16	3/8	W372PLP-5-6
3/8	1/8	W372PLP-6-2
3/8	1/4	W372PLP-6-4
3/8	3/8	W372PLP-6-6
3/8	1/2	W372PLP-6-8
1/2	1/4	W372PLP-8-4
1/2	3/8	W372PLP-8-6
1/2	1/2	W372PLP-8-8

Most popular. For technical information see CD

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 Tubing & Fittings
 Accessories

W371PLP Male Run Tee Swivel

Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	371PLP-2-0
1/8	1/16	W371PLP-2-1
1/8	1/8	W371PLP-2-2
5/32	10-32	371PLP-5/32-0
5/32	1/8	W371PLP-5/32-2
5/32	1/4	W371PLP-5/32-4
3/16	1/8	W371PLP-3-2
1/4	1/8	W371PLP-4-2
1/4	1/4	W371PLP-4-4
1/4	3/8	W371PLP-4-6
5/16	1/8	W371PLP-5-2
5/16	1/4	W371PLP-5-4
5/16	3/8	W371PLP-5-6
3/8	1/8	W371PLP-6-2
3/8	1/4	W371PLP-6-4
3/8	3/8	W371PLP-6-6
3/8	1/2	W371PLP-6-8
1/2	1/4	W371PLP-8-4
1/2	3/8	W371PLP-8-6
1/2	1/2	W371PLP-8-8



32PLP Equal Union

Tube Size (in.)	Part number
1/8	32PLP-2
5/32	32PLP-5/32
3/16	32PLP-3
1/4	32PLP-4
5/16	32PLP-5
3/8	32PLP-6
1/2	32PLP-8



365PLP Union Elbow

Tube Size (in.)	Part number
1/8	365PLP-2
5/32	365PLP-5/32
3/16	365PLP-3
1/4	365PLP-4
5/16	365PLP-5
3/8	365PLP-6
1/2	365PLP-8



364PLP Union Tee

Tube Size (in.)	Part number
1/8	364PLP-2
5/32	364PLP-5/32
3/16	364PLP-3
1/4	364PLP-4
5/16	364PLP-5
3/8	364PLP-6
1/2	364PLP-8



362PLP Union Y Connector

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	362PLP-2
1/8	1/4	362PLP-2-4
5/32	5/32	362PLP-5/32
5/32	1/4	362PLP-5/32-4
1/4	1/4	362PLP-4
1/4	3/8	362PLP-4-6
5/16	5/16	362PLP-5
3/8	3/8	362PLP-6



W68PLPSP Male Standpipe

Tube size (in.)	Thread NPT / UNF	Part number
5/32	10-32	68PLPSP-5/32-0
5/32	1/8	W68PLPSP-5/32-2
5/32	1/4	W68PLPSP-5/32-4
1/4	1/8	W68PLPSP-4-2
1/4	1/4	W68PLPSP-4-4
5/16	1/8	W68PLPSP-5-2
5/16	1/4	W68PLPSP-5-4
3/8	1/8	W68PLPSP-6-2
3/8	1/4	W68PLPSP-6-4
3/8	3/8	W68PLPSP-6-6
1/2	3/8	W68PLPSP-8-6
1/2	1/2	W68PLPSP-8-8



W368PLP Male Y Connector

Tube size (in.)	Thread NPT / UNF	Part number
5/32	1/8	W368PLP-5/32-2
5/32	1/4	W368PLP-5/32-4
1/4	1/8	W368PLP-4-2
1/4	1/4	W368PLP-4-4
3/8	1/4	W368PLP-6-4
3/8	3/8	W368PLP-6-6



362PLPD Double Y Connector

1 Tube size (in.)	2 Tube size (in.)	Part number
5/32	5/32	362PLPD-5/32
5/32	1/4	362PLPD-5/32-4



Most popular. For technical information see CD

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Tubing & Fittings
 Accessories

24PLP Multiple Tee



1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	5/32	24PLP-4-5/32
1/4	1/4	24PLP-4-4
5/16	5/32	24PLP-5-5/32
3/8	1/4	24PLP-6-4

24PLPD Double Multiple Tee



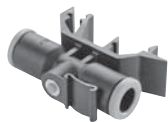
1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	5/32	24PLPD-4-5/32
1/4	1/4	24PLPD-4-4
5/16	5/32	24PLPD-5-5/32
3/8	1/4	24PLPD-6-4

347PLP Equal Cross



Tube Size (in.)	Part number
5/32	347PLP-5/32
1/4	347PLP-4
5/16	347PLP-5

32PLPRC Connector for 2 Tubes



Tube Size (in.)	Part number
5/32	32PLPRC-5/32
1/4	32PLPRC-4
5/16	32PLPRC-5

32PLPDRC Connector for 3 Tubes



Tube Size (in.)	Part number
5/32	32PLPDRC-5/32
5/16	32PLPDRC-5

377PLP Female Branch Tee Swivel



Tube size (in.)	Thread NPT / UNF	Part number
1/8	1/8	377PLP-2-2
5/32	1/8	377PLP-5/32-2
5/32	1/4	377PLP-5/32-4
1/4	1/8	377PLP-4-2
1/4	1/4	377PLP-4-4
5/16	1/8	377PLP-5-2
5/16	1/4	377PLP-5-4
3/8	1/4	377PLP-6-4
1/2	3/8	377PLP-8-6

370PLP Female Elbow Swivel



Tube size (in.)	Thread NPT	Part number
1/8	1/8	370PLP-2-2
5/32	1/8	370PLP-5/32-2
5/32	1/4	370PLP-5/32-4
1/4	1/8	370PLP-4-2
1/4	1/4	370PLP-4-4
5/16	1/8	370PLP-5-2
5/16	1/4	370PLP-5-4
3/8	1/4	370PLP-6-4
1/2	3/8	370PLP-8-6

32PLPBH Bulkhead Union



Tube Size (in.)	Part number
1/8	32PLPBH-2
5/32	32PLPBH-5/32
1/4	32PLPBH-4
5/16	32PLPBH-5
3/8	32PLPBH-6
1/2	32PLPBH-8

365PLPBH Equal Bulkhead Elbow



Tube size (in.)	Thread NPT / UNF	Part number
1/8	13	365PLPBH-2
5/32		365PLPBH-5/32
1/4	18	365PLPBH-4
5/16		365PLPBH-5
3/8	22	365PLPBH-6
1/2	29	365PLPBH-8

369PLPSP Plug-In Elbow



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	369PLPSP-2
5/32	5/32	369PLPSP-5/32
5/32	1/4	369PLPSP-5/32-4
1/4	1/4	369PLPSP-4
1/4	3/8	369PLPSP-4-6
5/16	5/16	369PLPSP-5
3/8	3/8	369PLPSP-6
1/2	1/2	369PLPSP-8

Most popular. For technical information see CD

369PLPSPX Extended Plug-In Elbow



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	369PLPSPX-2
5/32	5/32	369PLPSPX-5/32
1/4	1/4	369PLPSPX-4
5/16	5/16	369PLPSPX-5
3/8	3/8	369PLPSPX-6

379PLPSP 45° Plug-In Elbow



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	379PLPSP-2
5/32	5/32	379PLPSP-5/32
1/4	1/4	379PLPSP-4
5/16	5/16	379PLPSP-5
3/8	3/8	379PLPSP-6

372PLPSP Plug-In Branch Tee



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	372PLPSP-2
5/32	5/32	372PLPSP-5/32
1/4	1/4	372PLPSP-4
5/16	5/16	372PLPSP-5
3/8	3/8	372PLPSP-6
1/2	1/2	372PLPSP-8

371PLPSP Plug-In Run Tee



1 Tube size (in.)	2 Tube size (in.)	Part number
5/32	5/32	371PLPSP-5/32
1/4	1/4	371PLPSP-4
5/16	5/16	371PLPSP-5
3/8	3/8	371PLPSP-6
1/2	1/2	371PLPSP-8

362PLPSP Plug-In Y



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	362PLPSP-2
5/32	5/32	362PLPSP-5/32
1/4	1/4	362PLPSP-4
5/16	5/16	362PLPSP-5
3/8	3/8	362PLPSP-6

67PLP Tube End Reducer



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	5/32	67PLP-2-5/32
1/8	3/16	67PLP-2-3
1/8	1/4	67PLP-2-4
5/32	3/16	67PLP-5/32-3
5/32	1/4	67PLP-5/32-4
5/32	5/16	67PLP-5/32-5
5/32	3/8	67PLP-5/32-6
3/16	5/16	67PLP-3-5
3/16	1/4	67PLP-3-4
1/4	5/16	67PLP-4-5
1/4	3/8	67PLP-4-6
1/4	1/2	67PLP-4-8
5/16	3/8	67PLP-5-6
5/16	1/2	67PLP-5-8
3/8	1/2	67PLP-6-8

32PLPSP Tube Expander



1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	1/8	32PLPSP-4-2
1/4	6M	32PLPSP-4-6M
1/4	5/32	32PLPSP-4-5/32
1/4	3/16	32PLPSP-4-3
3/8	1/4	32PLPSP-6-4

322PLPSP Barbed Connector



OD 1	OD 2	OD 3	Part No.
5/32	0.12	0.20	322PLPSP-2-5/32
5/32	0.20	0.28	322PLPSP-5M-5/32
1/4	3/16		322PLPSP-3-4
5/16	0.25	0.34	322PLPSP-4-5
3/8	0.32	0.39	322PLPSP-5-5
3/8	0.32	0.39	322PLPSP-5-6

63PLP Double Male Union



Tube size (in.)	Part number
5/32	63PLP-5/32
1/4	63PLP-4
5/16	63PLP-5
3/8	63PLP-6
1/2	63PLP-8

Most popular. For technical information see CD

639PLP Plug



Tube size (in.)	Part number
1/8	639PLP-2
5/32	639PLP-5/32
3/16	639PLP-3
1/4	639PLP-4
5/16	639PLP-5
3/8	639PLP-6
1/2	639PLP-8

W369PLP Male Elbow



Tube size (mm)	Thread NPT	Part number
4	1/8	W369PLP-4M-2
4	1/4	W369PLP-4M-4
6	1/8	W369PLP-6M-2
6	1/4	W369PLP-6M-4
8	1/8	W369PLP-8M-2
8	1/4	W369PLP-8M-4
8	3/8	W369PLP-8M-6
10	1/4	W369PLP-10M-4
10	3/8	W369PLP-10M-6
10	1/2	W369PLP-10M-8
12	3/8	W369PLP-12M-6
12	1/2	W369PLP-12M-8

W372PLP Male Branch Tee Swivel



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	372PLP-2-0
1/8	1/16	W372PLP-2-1
1/8	1/8	W372PLP-2-2
1/8	1/4	W372PLP-2-4
5/32	10-32	372PLP-5/32-0
5/32	1/8	W372PLP-5/32-2
5/32	1/4	W372PLP-5/32-4
3/16	1/8	W372PLP-3-2
1/4	1/8	W372PLP-4-2
1/4	1/4	W372PLP-4-4
1/4	3/8	W372PLP-4-6
5/16	1/8	W372PLP-5-2
5/16	1/4	W372PLP-5-4
5/16	3/8	W372PLP-5-6
3/8	1/8	W372PLP-6-2
3/8	1/4	W372PLP-6-4
3/8	3/8	W372PLP-6-6
3/8	1/2	W372PLP-6-8
1/2	1/4	W372PLP-8-4
1/2	3/8	W372PLP-8-6
1/2	1/2	W372PLP-8-8

Most popular. For technical information see CD

32PLP Union



Tube size (mm)	Part number
3	32PLP-3M
4	32PLP-4M
6	32PLP-6M
8	32PLP-8M
10	32PLP-10M
12	32PLP-12M
14	32PLP-14M

365PLP Union Elbow



Tube size (mm)	Part number
4	365PLP-4M
6	365PLP-6M
8	365PLP-8M
10	365PLP-10M
12	365PLP-12M
14	365PLP-14M

364PLP Union Tee



Tube size (mm)	Part number
3	364PLP-3M
4	364PLP-4M
6	364PLP-6M
8	364PLP-8M
10	364PLP-10M
12	364PLP-12M
14	364PLP-14M

362PLP Union Y Connector



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	362PLP-4M
6	6	362PLP-6M
8	8	362PLP-8M
10	10	362PLP-10M
12	12	362PLP-12M
4	6	362PLP-4M-6M
6	8	362PLP-6M-8M
8	10	362PLP-8M-10M
10	12	362PLP-10M-12M

362PLPD Double Y Connector



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	362PLPD-4M
6	6	362PLPD-6M
4	6	362PLPD-4M-6M
6	8	362PLPD-6M-8M

24PLP Multiple Tee



1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	24PLP-6M-4M
8	4	24PLP-8M-4M
8	6	24PLP-8M-6M
10	6	24PLP-10M-6M
10	8	24PLP-10M-8M

24PLPD Double Multiple Tee



1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	24PLPD-6M-4M
8	4	24PLPD-8M-4M
8	6	24PLPD-8M-6M
10	6	24PLPD-10M-6M
10	8	24PLPD-10M-8M

347PLP Equal Cross



Tube size (mm)	Part number
4	347PLP-4M
6	347PLP-6M
8	347PLP-8M

32PLPRC Connector for 2 Tubes



Tube size (mm)	Part number
4	32PLPRC-4M
6	32PLPRC-6M
8	32PLPRC-8M

32PLPDRC Connector for 3 Tubes



Tube size (mm)	Part number
4	32PLPDRC-4M
6	32PLPDRC-6M
8	32PLPDRC-8M

32PLPBH Bulkhead Union



Tube size (mm)	Part number
4	32PLPBH-4M
6	32PLPBH-6M
8	32PLPBH-8M
10	32PLPBH-10M
12	32PLPBH-12M
14	32PLPBH-14M

Most popular. For technical information see CD

365PLPBH Equal Bulkhead Elbow



Tube size (mm)	Part number
4	365PLPBH-4M
6	365PLPBH-6M
8	365PLPBH-8M
10	365PLPBH-10M
12	365PLPBH-12M

370PLP Female Elbow - BSPP



Tube size (mm)	BSPP	Part number
4	1/8	370PLP-4M-2G
4	1/4	370PLP-4M-4G
6	1/8	370PLP-6M-2G
6	1/4	370PLP-6M-4G
8	1/8	370PLP-8M-2G
8	1/4	370PLP-8M-4G
8	3/8	370PLP-8M-6G
10	1/4	370PLP-10M-4G
10	3/8	370PLP-10M-6G
10	1/2	370PLP-10M-8G
12	1/4	370PLP-12M-4G
12	3/8	370PLP-12M-6G
12	1/2	370PLP-12M-8G

369PLP Male Elbow - BSPP



Tube size (mm)	BSPP	Part number
3	M3x0.5	369PLP-3M-M3
3	M5x0.8	369PLP-3M-M5
4	M3x0.5	369PLP-4M-M3
4	M5x0.8	369PLP-4M-M5
4	M7x1	369PLP-4M-M7
4	1/8	369PLP-4M-2G
4	1/4	369PLP-4M-4G
6	M5x0.8	369PLP-6M-M5
6	M7x1	369PLP-6M-M7
6	M10x1	369PLP-6M-M10
6	M12x1.5	369PLP-6M-M12
6	1/8	369PLP-6M-2G
6	1/4	369PLP-6M-4G
6	3/8	369PLP-6M-6G
6	1/2	369PLP-6M-8G
8	M10x1	369PLP-8M-M10
8	M12x1.5	369PLP-8M-M12
8	1/8	369PLP-8M-2G
8	1/4	369PLP-8M-4G
8	3/8	369PLP-8M-6G
8	1/2	369PLP-8M-8G
10	1/4	369PLP-10M-4G
10	3/8	369PLP-10M-6G
10	1/2	369PLP-10M-8G
12	1/4	369PLP-12M-4G
12	3/8	369PLP-12M-6G
12	1/2	369PLP-12M-8G
14	3/8	369PLP-14M-6G
14	1/2	369PLP-14M-8G

369PLPX Male Elbow - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	369PLPX-4M-M5
4	M7x1	369PLPX-4M-M7
4	1/8	369PLPX-4M-2G
4	1/4	369PLPX-4M-4G
6	M5x0.8	369PLPX-6M-M5
6	M7x1	369PLPX-6M-M7
6	1/8	369PLPX-6M-2G
6	1/4	369PLPX-6M-4G
8	1/8	369PLPX-8M-2G
8	1/4	369PLPX-8M-4G
8	3/8	369PLPX-8M-6G
10	1/4	369PLPX-10M-4G
10	3/8	369PLPX-10M-6G
10	1/2	369PLPX-10M-8G
12	1/4	369PLPX-12M-4G
12	3/8	369PLPX-12M-6G
12	1/2	369PLPX-12M-8G
14	3/8	369PLPX-14M-6G
14	1/2	369PLPX-14M-8G

372PLP Male Branch Tee - BSPP



Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	372PLP-4M-M5
4	1/8	372PLP-4M-2G
4	1/4	372PLP-4M-4G
6	M5x0.8	372PLP-6M-M5
6	1/8	372PLP-6M-2G
6	1/4	372PLP-6M-4G
8	1/8	372PLP-8M-2G
8	1/4	372PLP-8M-4G
8	3/8	372PLP-8M-6G
10	1/4	372PLP-10M-4G
10	3/8	372PLP-10M-6G
10	1/2	372PLP-10M-8G
12	1/4	372PLP-12M-4G
12	3/8	372PLP-12M-6G
12	1/2	372PLP-12M-8G
14	3/8	372PLP-14M-6G
14	1/2	372PLP-14M-8G

379PLP 45° Male Elbow - BSPP



Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	379PLP-4M-M5
4	1/8	379PLP-4M-2G
6	M5x0.8	379PLP-6M-M5
6	1/8	379PLP-6M-2G
6	1/4	379PLP-6M-4G
8	1/8	379PLP-8M-2G
8	1/4	379PLP-8M-4G
8	3/8	379PLP-8M-6G
10	1/4	379PLP-10M-4G
10	3/8	379PLP-10M-6G
10	1/2	379PLP-10M-8G
12	1/4	379PLP-12M-4G
12	3/8	379PLP-12M-6G
12	1/2	379PLP-12M-8G

Most popular. For technical information see CD

371PLP Male Run Tee - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	371PLP-4M-M5
4	1/8	371PLP-4M-2G
4	1/4	371PLP-4M-4G
6	M5x0.8	371PLP-6M-M5
6	1/8	371PLP-6M-2G
6	1/4	371PLP-6M-4G
8	1/8	371PLP-8M-2G
8	1/4	371PLP-8M-4G
8	3/8	371PLP-8M-6G
10	1/4	371PLP-10M-4G
10	3/8	371PLP-10M-6G
10	1/2	371PLP-10M-8G
12	1/4	371PLP-12M-4G
12	3/8	371PLP-12M-6G
12	1/2	371PLP-12M-8G
14	3/8	371PLP-14M-6G
14	1/2	371PLP-14M-8G

368PLP Male Y Connector - BSPP



Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	368PLP-4M-M5
4	1/8	368PLP-4M-2G
4	1/4	368PLP-4M-4G
6	M5x0.8	368PLP-6M-M5
6	1/8	368PLP-6M-2G
6	1/4	368PLP-6M-4G
8	1/8	368PLP-8M-2G
8	1/4	368PLP-8M-4G
8	3/8	368PLP-8M-6G
10	1/4	368PLP-10M-4G
10	3/8	368PLP-10M-6G
10	1/2	368PLP-10M-8G
12	3/8	368PLP-12M-6G
12	1/2	368PLP-12M-8G

68PLPSP Male Standpipe - BSPP



Tube size (mm)	BSPT	Part number
4	M5x0.8	68PLPSP-4M-M5
4	1/8	68PLPSP-4M-2G
4	1/4	68PLPSP-4M-4G
6	1/8	68PLPSP-6M-2G
6	1/4	68PLPSP-6M-4G
8	1/8	68PLPSP-8M-2G
8	1/4	68PLPSP-8M-4G
8	3/8	68PLPSP-8M-6G
10	1/4	68PLPSP-10M-4G
10	3/8	68PLPSP-10M-6G
10	1/2	68PLPSP-10M-8G
12	3/8	68PLPSP-12M-6G
12	1/2	68PLPSP-12M-8G
14	3/8	68PLPSP-14M-6G
14	1/2	68PLPSP-14M-8G

368PLPD Double Y Male Connector - BSPP



Tube size (mm)	BSPP	Part number
4	1/8	368PLPD-4M-2G
4	1/4	368PLPD-4M-4G
6	1/8	368PLPD-6M-2G
6	1/4	368PLPD-6M-4G

369PLPSP Plug-In Elbow



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	369PLPSP-4M
6	6	369PLPSP-6M
8	8	369PLPSP-8M
10	10	369PLPSP-10M
12	12	369PLPSP-12M
4	6	369PLPSP-4M-6M
6	4	369PLPSP-6M-4M
6	8	369PLPSP-6M-8M
8	10	369PLPSP-8M-10M
10	12	369PLPSP-10M-12M

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Tubing & Fittings
 Accessories

Most popular.

For technical information see CD

369PLXSP Extended Plug-In Elbow



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	369PLXSP-4M
6	6	369PLXSP-6M
8	8	369PLXSP-8M
10	10	369PLXSP-10M
12	12	369PLXSP-12M
4	6	369PLXSP-4M-6M
6	8	369PLXSP-6M-8M
8	10	369PLXSP-8M-10M
10	12	369PLXSP-10M-12M

362PLPSP Plug-In Y



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	362PLPSP-4M
6	6	362PLPSP-6M
8	8	362PLPSP-8M
10	10	362PLPSP-10M
12	12	362PLPSP-12M
4	6	362PLPSP-4M-6M
6	8	362PLPSP-6M-8M
8	10	362PLPSP-8M-10M
10	12	362PLPSP-10M-12M

379PLPSP 45° Plug-In Elbow



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	379PLPSP-4M
6	6	379PLPSP-6M
8	8	379PLPSP-8M
10	10	379PLPSP-10M
12	12	379PLPSP-12M

362PLPDSP Plug-In Multiple Y



1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	362PLPDSP-6M-4M
8	4	362PLPDSP-8M-4M
8	6	362PLPDSP-8M-6M

372PLPSP Plug-In Branch Tee



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	372PLPSP-4M
6	6	372PLPSP-6M
8	8	372PLPSP-8M
10	10	372PLPSP-10M
12	12	372PLPSP-12M
4	6	372PLPSP-4M-6M
6	8	372PLPSP-6M-8M
8	10	372PLPSP-8M-10M
10	12	372PLPSP-10M-12M

67PLP Tube Reducer



1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	67PLP-6M-4M
8	4	67PLP-8M-4M
8	6	67PLP-8M-6M
10	4	67PLP-10M-4M
10	6	67PLP-10M-6M
10	8	67PLP-10M-8M
12	10	67PLP-12M-10M
12	6	67PLP-12M-6M
12	8	67PLP-12M-8M
14	10	67PLP-14M-10M
14	12	67PLP-14M-12M
14	6	67PLP-14M-6M
14	8	67PLP-14M-8M

371PLPSP Plug-In Run Tee



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	371PLPSP-4M
6	6	371PLPSP-6M
8	8	371PLPSP-8M
10	10	371PLPSP-10M
12	12	371PLPSP-12M
4	6	371PLPSP-4M-6M
6	8	371PLPSP-6M-8M
8	10	371PLPSP-8M-10M
10	12	371PLPSP-10m-12M

32PLPSP Tube Expander



1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	32PLPSP-6M-4M
8	6	32PLPSP-8M-6M
10	8	32PLPSP-10M-8M
12	10	32PLPSP-12M-10M

Most popular. For technical information see CD

322PLPSP Barbed Connector



OD 1	OD 2	OD 3	Part number
4	3.2	5.0	322PLPSP-3M-4M
4	5.0	7.0	322PLPSP-5M-4M
6	5.0	7.0	322PLPSP-5M-6M
8	6.3	8.5	322PLPSP-6M-8M
8	8.0	10.0	322PLPSP-8M-8M
10	6.3	8.0	322PLPSP-6M-10M
10	8.0	10.0	322PLPSP-8M-10M
12	8.0	10.0	322PLPSP-8M-12M
12	10.0	12.0	322PLPSP-1012M
12	12.5	14.5	322PLPSP-1212M
14	12.5	14.5	322PLPSP-1214M
14	14.0	16.0	322PLPSP-1414M

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Tubing & Fittings
 Accessories

Push-to-Connect, Prestolok Metal

W68PLP Male Connector



Tube size (in.)	Pipe thd (NPTF)	Part number
1/8	1/16	W68PLP-2-1
1/8	1/8	W68PLP-2-2
1/8	1/4	W68PLP-2-4
3/16	1/8	W68PLP-3-2
3/16	1/4	W68PLP-3-4
5/32	1/16	W68PLP-5/32-1
5/32	1/8	W68PLP-5/32-2
5/32	1/4	W68PLP-5/32-4
1/4	1/16	W68PLP-4-1
1/4	1/8	W68PLP-4-2
1/4	1/4	W68PLP-4-4
1/4	3/8	W68PLP-4-6
5/16	1/8	W68PLP-5-2
5/16	1/4	W68PLP-5-4
5/16	3/8	W68PLP-5-6
3/8	1/8	W68PLP-6-2
3/8	1/4	W68PLP-6-4
3/8	3/8	W68PLP-6-6
3/8	1/2	W68PLP-6-8
1/2	1/4	W68PLP-8-4
1/2	3/8	W68PLP-8-6
1/2	1/2	W68PLP-8-8
5/32	1/4-28	68PLP-5/32-4LT*

*SAE-LT Threads

W68PLPR Round Body Male Connector



Tube size (in.)	Thread size NPTF	Part number
5/32	1/16	W68PLPR-5/32-1
5/32	1/8	W68PLPR-5/32-2
1/4	1/16	W68PLPR-4-1
1/4	1/8	W68PLPR-4-2
1/4	1/4	W68PLPR-4-4

*10-32 seal is neoprene

W68PW Male Connector (Nickel Plated)



Tube size (in.)	Thread size NPTF	Part number
1/4	1/8	W68PW-4-2
1/4	1/4	W68PW-4-4
1/4	3/8	W68PW-4-6
5/16	1/8	W68PW-5-2
5/16	1/4	W68PW-5-4
5/16	3/8	W68PW-5-6
3/8	1/8	W68PW-6-2
3/8	1/4	W68PW-6-4
3/8	3/8	W68PW-6-6
3/8	1/2	W68PW-6-8
1/2	1/4	W68PW-8-4
1/2	3/8	W68PW-8-6
1/2	1/2	W68PW-8-8

Most popular.

For technical information see CD

W169PLP Male Elbow Swivel 90°



Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/16	W169PLP-2-1
1/8	1/8	W169PLP-2-2
1/8	10-32	169PLP-2-0*
1/8	1/4	W169PLP-2-4
3/16	1/8	W169PLP-3-2
5/32	1/16	W169PLP-5/32-1
5/32	1/8	W169PLP-5/32-2
5/32	1/4	W169PLP-5/32-4
5/32	10-32	169PLP-5/32-0*
1/4	1/16	W169PLP-4-1
1/4	1/8	W169PLP-4-2
1/4	1/4	W169PLP-4-4
1/4	3/8	W169PLP-4-6
1/4	10-32	169PLP-4-0*
5/16	1/8	W169PLP-5-2
5/16	1/4	W169PLP-5-4
3/8	1/8	W169PLP-6-2
3/8	1/4	W169PLP-6-4
3/8	3/8	W169PLP-6-6
3/8	1/2	W169PLP-6-8
1/2	1/4	W169PLP-8-4
1/2	3/8	W169PLP-8-6
1/2	1/2	W169PLP-8-8

*10-32 seal is neoprene

W169PLPNS Male Elbow 90°



Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	W169PLPNS-2-2
5/32	1/8	W169PLPNS5/32-2
5/32	1/4	W169PLPNS5/32-4
1/4	1/8	W169PLPNS-4-2
1/4	1/4	W169PLPNS-4-4
5/16	1/8	W169PLPNS-5-2
5/16	1/4	W169PLPNS-5-4
3/8	1/4	W169PLPNS-6-4
3/8	3/8	W169PLPNS-6-6
3/8	1/2	W169PLPNS-6-8
1/2	3/8	W169PLPNS-8-6
1/2	1/2	W169PLPNS-8-8
5/32	1/4-28	169PLPNS532-4LT*

* SAE-LT Threads

W169PW Male Elbow Swivel 90° (Nickel Plated)



Tube size (in.)	Thread (NPTF)	Part number
1/4	1/8	W169PW-4-2
1/4	1/4	W169PW-4-4
1/4	3/8	W169PW-4-6
5/16	1/8	W169PW-5-2
5/16	1/4	W169PW-5-4
3/8	1/8	W169PW-6-2
3/8	1/4	W169PW-6-4
3/8	3/8	W169PW-6-6
3/8	1/2	W169PW-6-8
1/2	1/4	W169PW-8-4
1/2	3/8	W169PW-8-6
1/2	1/2	W169PW-8-8

W171PLP Male Run Tee Swivel



Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	W171PLP-2-2
5/32	1/8	W171PLP-5/32-2
1/4	1/8	W171PLP-4-2
1/4	1/4	W171PLP-4-4
1/4	3/8	W171PLP-4-6
5/16	1/8	W171PLP-5-2
5/16	1/4	W171PLP-5-4
3/8	1/4	W171PLP-6-4
3/8	3/8	W171PLP-6-6
1/2	3/8	W171PLP-8-6
1/2	1/2	W171PLP-8-8

W171PW Male Run Tee Swivel (Nickel Plated)



Tube size (in.)	Pipe thread (NPTF)	Part number
1/4	1/8	W171PW-4-2
1/4	1/4	W171PW-4-4
1/4	3/8	W171PW-4-6
5/16	1/8	W171PW-5-2
5/16	1/4	W171PW-5-4
3/8	1/4	W171PW-6-4
3/8	3/8	W171PW-6-6
1/2	3/8	W171PW-8-6
1/2	1/2	W171PW-8-8

Most popular. For technical information see CD

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W172PLP Male Branch Tee Swivel



Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	W172PLP-2-2
3/16	1/8	W172PLP-3-2
5/32	1/8	W172PLP-5/32-2
1/4	1/8	W172PLP-4-2
1/4	1/4	W172PLP-4-4
1/4	3/8	W172PLP-4-6
5/16	1/8	W172PLP-5-2
5/16	1/4	W172PLP-5-4
3/8	1/4	W172PLP-6-4
3/8	3/8	W172PLP-6-6
1/2	1/4	W172PLP-8-4
1/2	3/8	W172PLP-8-6
1/2	1/2	W172PLP-8-8

W172PW Male Branch Tee Swivel (Nickel Plated)



Tube size (in.)	Thread (NPTF)	Part number
1/4	1/8	W172PW-4-2
1/4	1/4	W172PW-4-4
1/4	3/8	W172PW-4-6
5/16	1/8	W172PW-5-2
5/16	1/4	W172PW-5-4
3/8	1/4	W172PW-6-4
3/8	3/8	W172PW-6-6
1/2	1/4	W172PW-8-4
1/2	3/8	W172PW-8-6
1/2	1/2	W172PW-8-8

62PLP Union



Tube size (in.)	Part number
1/8	62PLP-2
3/16	62PLP-3
5/32	62PLP-5/32
1/4	62PLP-4
5/16	62PLP-5
3/8	62PLP-6
1/2	62PLP-8

62PW Union (Nickel Plated)



Tube size (in.)	Part number
1/4	62PW-4
5/16	62PW-5
3/8	62PW-6
1/2	62PW-8

164PLP Union Tee



Tube size (in.)	Part number
1/8	164PLP-2
3/16	164PLP-3
5/32	164PLP-5/32
1/4	164PLP-4
5/16	164PLP-5
3/8	164PLP-6
1/2	164PLP-8

164PW Union Tee (Nickel Plated)



Tube size (in.)	Part number
1/4	164PW-4
5/16	164PW-5
3/8	164PW-6
1/2	164PW-8

165PLP Union Elbow



Tube size (in.)	Part number
1/8	165PLP-2
5/32	165PLP-5/32
3/16	165PLP-3
1/4	165PLP-4
5/16	165PLP-5
3/8	165PLP-6
1/2	165PLP-8

165PW Union Elbow (Nickel Plated)



Tube size (in.)	Part number
1/4	165PW-4
5/16	165PW-5
3/8	165PW-6
1/2	165PW-8

Most popular. For technical information see CD

66PLP Female Connector



Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	66PLP-2-2
1/8	1/4	66PLP-2-4
3/16	1/8	66PLP-3-2
5/32	1/8	66PLP-5/32-2
5/32	1/4	66PLP-5/32-4
1/4	1/8	66PLP-4-2
1/4	1/4	66PLP-4-4
5/16	1/8	66PLP-5-2
5/16	1/4	66PLP-5-4
3/8	1/4	66PLP-6-4
3/8	3/8	66PLP-6-6

66PW Female Connector (Nickel Plated)



Tube size (in.)	Pipe thread (NPTF)	Part number
1/4	1/8	66PW-4-2
1/4	1/4	66PW-4-4
5/16	1/8	66PW-5-2
5/16	1/4	66PW-5-4
3/8	1/4	66PW-6-4
3/8	3/8	66PW-6-6

62PLPBH Bulkhead Union



Tube size (in.)	Part number
1/8	62PLPBH-2
5/32	62PLPBH-5/32
1/4	62PLPBH-4
5/16	62PLPBH-5
3/8	62PLPBH-6
1/2	62PLPBH-8

66PLPBH Female Bulkhead



Tube size (in.)	Pipe thd (NPTF)	Part number
5/32	1/4	66PLPBH-5/32-4
1/4	1/4	66PLPBH-4-4
3/8	3/8	66PLPBH-6-6
1/2	3/8	66PLPBH-8-6

62PWBH Bulkhead Union (Nickel Plated)



Tube Size (in.)	Bulkhead Hole Dia. B	Part No.
1/4	9/16	62PWBH-4
5/16	5/8	62PWBH-5
3/8	3/4	62PWBH-6
1/2	7/8	62PWBH-8

66PWBH Female Bulkhead (Nickel Plated)



Tube size (in.)	Thread (NPTF)	Bulkhead hole dia.	Part number
1/4	1/4	9/16	66PWBH-4-4
3/8	3/8	7/8	66PWBH-6-6
1/2	3/8	1	66PWBH-8-6

PLPHBF4-B Male Connector BSPP



Tube size (in.)	Pipe thd BSPP	Part number
3/16	1/8-28	3-1/8PLPHBF4-B
3/16	1/4-19	3-1/4PLPHBF4-B
1/4	1/8-28	4-1/8PLPHBF4-B
1/4	1/4-19	4-1/4PLPHBF4-B
1/4	3/8-19	4-3/8PLPHBF4-B
3/8	1/4-19	6-1/4PLPHBF4-B
3/8	3/8-19	6-3/8PLPHBF4-B
3/8	1/2-14	6-1/2PLPHBF4-B
1/2	3/8-19	8-3/8PLPHBF4-B
1/2	1/2-14	8-1/2PLPHBF4-B

DB Dust / Weld Spatter Boot



Tube size (in.)	Part number
1/4	DB-4
3/8	DB-6
1/2	DB-8

Most popular. For technical information see CD

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FPB Male Connector NPT



Tube size (mm)	NPT	Part number
4	1/8-27	W68PLP-5/32-2
4	1/4-18	W68PLP-5/32-4
6	1/8-27	FPB6-1/8
6	1/4-18	FPB6-1/4
10	1/4-18	FPB10-1/4
10	3/8-18	FPB10-3/8
12	3/8-18	FPB12-3/8

WBMPB Mixed Bulkhead Union



Tube 1 size (mm)	Tube 2 size (mm)	Bulkhead hole dia.	Part number
4	4	8mm	WBMPB4
6	6	10mm	WBMPB6
8	8	12mm	WBMPB8
10	10	14mm	WBMPB10
12	12	16mm	WBMPB12
14	14	18mm	WBMPB14

C6PB Adjustable Male Elbow NPT



Tube size (mm)	NPT	Part number
6	1/4-18	C6PB6-1/4
6	3/8-18	C6PB6-3/8
10	1/4-18	C6PB10-1/4
10	3/8-18	C6PB10-3/8
12	1/2-14	C6PB12-1/2

WPB Bulkhead Union



Tube Size (mm)	Bulkhead hole dia.	Part number
4	11mm	WPB4
6	13mm	WPB6
8	16mm	WPB8
10	18mm	WPB10
12	23mm	WPB12
14	24mm	WPB14

HPB Equal Union



Tube size (mm)	Part number
4	HPB4
5	HPB5
6	HPB6
8	HPB8
10	HPB10
12	HPB12
14	HPB14

Jam nut is supplied loose in box

WE6PB Adjustable Bulkhead Union Elbow



Tube Size (mm)	Bulkhead hole dia.	Part number
4	11mm	WE6PB4
6	13mm	WE6PB6
8	15mm	WE6PB8
10	18mm	WE6PB10
12	23mm	WE6PB12

JPB Union Tee



Tube size (mm)	Part number
4	JPB4
5	JPB5
6	JPB6
8	JPB8
10	JPB10
12	JPB12
14	JPB14

G4PB Female Connector BSPP



Tube size (mm)	BSPP	Part number
4	1/8	G4PB4-1/8
6	1/8	G4PB6-1/8
6	1/4	G4PB6-1/4
8	1/8	G4PB8-1/8
8	1/4	G4PB8-1/4

EPB 90° Union Elbow



Tube size (mm)	Part number
4	EPB4
5	EPB5
6	EPB6
8	EPB8
10	EPB10
12	EPB12
14	EPB14

Most popular. For technical information see CD

WG4PB Bulkhead Union Female BSPP



Tube size (mm)	BSPP	Part number
4	G1/8	WG4PB4-1/8
6	G1/8	WG4PB6-1/8
6	G1/4	WG4PB6-1/4
8	G1/8	WG4PB8-1/8
8	G1/4	WG4PB8-1/4
10	G3/8	WG4PB10-3/8
12	G3/8	WG4PB12-3/8
12	G1/2	WG4PB12-1/2

F4PB Compact Male Connector BSPP



Tube size (mm)	BSPP	Part number
4	1/8	F4PB4-1/8
4	1/4	F4PB4-1/4
6	1/8	F4PB6-1/8
6	1/4	F4PB6-1/4
8	1/4	F4PB8-1/4
8	1/8	F4PB8-1/8
8	3/8	F4PB8-3/8
10	1/4	F4PB10-1/4
10	3/8	F4PB10-3/8
10	1/2	F4PB10-1/2
12	1/4	F4PB12-1/4
12	3/8	F4PB12-3/8
12	1/2	F4PB12-1/2
14	3/8	F4PB14-3/8
14	1/2	F4PB14-1/2

C64PB Adjustable Male Elbow BSPP



Tube size (mm)	BSPP	Part number
4	1/8	C64PB4-1/8
4	1/4	C64PB4-1/4
6	1/8	C64PB6-1/8
6	1/4	C64PB6-1/4
8	1/8	C64PB8-1/8
8	1/4	C64PB8-1/4
8	3/8	C64PB8-3/8
10	1/4	C64PB10-1/4
10	3/8	C64PB10-3/8
12	1/4	C64PB12-1/4
12	3/8	C64PB12-3/8
12	1/2	C64PB12-1/2
14	3/8	C64PB14-3/8
14	1/2	C64PB14-1/2

R64PB Swivel Male Branch Run Tee BSPP



Tube size (mm)	BSPP	Part number
4	1/8	R64PB4-1/8
4	1/4	R64PB4-1/4
6	1/8	R64PB6-1/8
6	1/4	R64PB6-1/4
8	1/8	R64PB8-1/8
8	1/4	R64PB8-1/4
8	3/8	R64PB8-3/8
10	1/4	R64PB10-1/4
10	3/8	R64PB10-3/8
12	1/4	R64PB12-1/4
12	3/8	R64PB12-3/8
14	3/8	R64PB14-3/8
14	1/2	R64PB14-1/2

C64SPB Compact Adjustable Male Elbow BSPP



Tube size (mm)	BSPP	Part number
4	1/8	C64SPB4-1/8
6	1/8	C64SPB6-1/8
6	1/4	C64SPB6-1/4
8	1/8	C64SPB8-1/8
8	1/4	C64SPB8-1/4
8	3/8	C64SPB8-3/8
10	1/4	C64SPB10-1/4
10	3/8	C64SPB10-3/8
12	1/8	C64SPB12-1/4
12	3/8	C64SPB12-3/8
12	1/2	C64SPB12-1/2

Most popular. For technical information see CD

S64PB Swivel Male Branch Tee BSPP



Tube size (mm)	BSPP	Part number
4	1/8	S64PB4-1/8
4	1/4	S64PB4-1/4
6	1/8	S64PB6-1/8
6	1/4	S64PB6-1/4
8	1/8	S64PB8-1/8
8	1/4	S64PB8-1/4
8	3/8	S64PB8-3/8
10	1/4	S64PB10-1/4
10	3/8	S64PB10-3/8
12	1/4	S64PB12-1/4
12	3/8	S64PB12-3/8
14	3/8	S64PB14-3/8
14	1/2	S64PB14-1/2

C68PB Adjustable Male Elbow Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	C68PB4M5
6	M5x0.8	C68PB6M5

C68SPB Compact Adjustable Male Elbow Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	C68SPB4M5
6	M5x0.8	C68SPB6M5

F28PB Male Connector Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	F28PB4M3
4	M5x0.8	F28PB4M5
6	M5x0.8	F28PB6M5

This fitting has been designed for use where space is at a premium. It is assembled using the internal hexagon and an allen key.

F8PB Male Connector Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	F8PB4M5
4	M10x1	F8PB4M10
6	M5x0.8	F8PB6M5
6	M10x1	F8PB6M10
6	M12x1.5	F8PB6M12
8	M12x1.5	F8PB8M12
8	M16x1.5	F8PB8M16
8	M22x1.5	F8PB8M22

Most popular. For technical information see CD

R68PB Adjustable Male Run Tee Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	R68PB4M3
4	M5x0.8	R68PB4M5
6	M5x0.8	R68PB6M5

S68PB Adjustable Male Branch Tee Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	S68PB4M3
4	M5x0.8	S68PB4M5
6	M5x0.8	S68PB6M5

FNPB Plug



Tube size (mm)	Part number
4	FNPB4
6	FNPB6
8	FNPB8
10	FNPB10
12	FNPB12
14	FNPB14

TEPB Tube End Expander




Tube 1 Size (mm)	Tube 2 Size (mm)	Part number
4	6	TEPB4-6

TRPB Tube End Reducer



Tube 1 size (mm)	Tube 2 size (mm)	Part number
6	4	TRPB6-4
8	4	TRPB8-4
8	6	TRPB8-6
10	4	TRPB10-4
10	6	TRPB10-6
10	8	TRPB10-8
12	6	TRPB12-6
12	8	TRPB12-8
12	10	TRPB12-10
14	8	TRPB14-8
14	10	TRPB14-10
14	12	TRPB14-12


207ACBH Anchor Coupling



Female pipe thread	Straight thread	Max. bulkhead	Part number
1/8	5/8-18	.89	207ACBH-2
1/8	5/8-18	.35	207ACBHS-2
1/4	3/4-16	.81	207ACBH-4
1/4	3/4-16	.26	207ACBHS-4
3/8	1-14	.62	207ACBH-6
1/2	1-1/8-14	.75	207ACBH-8
3/4	1-5/16-12	.65	207ACBH-12
1	1-5/8-14	1.00	207ACBH-16*


*Lock Washer not Available

207P Coupling




Pipe thread	C Hex	Part number
1/8	9/16	207P-2
1/4	3/4	207P-4
3/8	7/8	207P-6
1/2	1-1/16	207P-8
3/4	1-3/8	207P-12

208P Reducer Coupling




1 Pipe thread	2 Pipe thread	C Hex	Part number
1/4	1/8	3/4	208P-4-2
3/8	1/4	7/8	208P-6-4
1/2	1/4	1-1/16	208P-8-4
1/2	3/8	1-1/16	208P-8-6
3/4	3/8	1-3/8	208P-12-6
3/4	1/2	1-3/8	208P-12-8

209P Bushing




1 Pipe thread	2 Pipe thread	C Hex	Part number
1/8	1/4	9/16	209P-4-2
1/8	3/8	11/16	209P-6-2
1/4	3/8	3/4	209P-6-4
1/8	1/2	7/8	209P-8-2
1/4	1/2	7/8	209P-8-4
3/8	1/2	7/8	209P-8-6
1/8	3/4	1-1/8	209P-12-2
1/4	3/4	1-1/8	209P-12-4
3/8	3/4	1-1/8	209P-12-6
1/2	3/4	1-1/8	209P-12-8
1/2	1	1-3/8	209P-16-8
3/4	1	1-3/8	209P-16-12

210P Lock Nut




Pipe thread	C Hex	Part number
1/8 NPSL	11/16	210P-2
1/4 NPSL	7/8	210P-4
3/8 NPSL	1	210P-6
1/2 NPSL	1-1/8	210P-8

211P Square-Head Plug




Pipe thread	Part number
1/8	211P-2
1/4	211P-4
3/8	211P-6
1/2	211P-8
3/4	211P-12

212P Union




Pipe thread	C Hex	Part number
1/4	1-3/16	212P-4
3/8	1-1/4	212P-6

213P Cap



Pipe thread	C Hex	Part number
1/8	9/16	213P-2
1/4	11/16	213P-4
3/8	13/16	213P-6
1/2	1-1/16	213P-8
3/4	1-1/4	213P-12

215PN Close Nipple



Pipe thread	Part number
1/8	215PN-2
1/4	215PN-4
3/8	215PN-6
1/2	215PN-8
3/4	215PN-12

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215PNL Long Nipple

Pipe thread	Part number
1/8	215PNL-2-15
1/4	215PNL-4-15
3/8	215PNL-6-15
1/2	215PNL-8-15
1/8	215PNL-2-20
1/4	215PNL-4-20
3/8	215PNL-6-20
1/2	215PNL-8-20
1/8	215PNL-2-25
1/4	215PNL-4-25
3/8	215PNL-6-25
1/2	215PNL-8-25
1/8	215PNL-2-30
1/4	215PNL-4-30
3/8	215PNL-6-30
1/2	215PNL-8-30
1/8	215PNL-2-35
1/4	215PNL-4-35
3/8	215PNL-6-35
1/2	215PNL-8-35



220P Slotted-Head Plug

Pipe thread	Part number
1/8	220P-2
1/4	220P-4
3/8	220P-6



222P Adapter

1 Pipe thread	2 Pipe thread	C Hex	Part number
1/8	1/8	9/16	222P-2-2
1/4	1/8	3/4	222P-4-2
1/4	1/4	3/4	222P-4-4
3/8	1/8	7/8	222P-6-2
3/8	1/4	7/8	222P-6-4
3/8	3/8	7/8	222P-6-6
1/2	1/4	1	222P-8-4
1/2	3/8	1-1/16	222P-8-6
1/2	1/2	1-1/16	222P-8-8
3/4	3/8	1-3/8	222P-12-6
3/4	1/2	1-3/8	222P-12-8
3/4	3/4	1-3/8	222P-12-12



216P Hex Nipple

Pipe thread	C Hex	Part number
1/8	7/16	216P-2
1/4	9/16	216P-4
3/8	11/16	216P-6
1/2	7/8	216P-8
3/4	1-1/16	216P-12



1200P-2200P 90° Union Elbow

Pipe thread	Part number
1/8	1200P-2-2
1/8	2200P-2-2
1/4	1200P-4-4
1/4	2200P-4-4
3/8	1200P-6-6
3/8	2200P-6-6
1/2	2200P-8-8



218P Hex-Head Plug

Pipe thread	C Hex	Part number
1/8	7/16	218P-2
1/4	9/16	218P-4
3/8	11/16	218P-6
1/2	7/8	218P-8
3/4	1-1/16	218P-12



1202P-2202P 90° Street Elbow

1 Pipe thread	2 Pipe thread	Part number
1/8	1/8	1202P-2-2
1/8	1/8	2202P-2-2
1/8	1/8	2202PA-2-2*
1/4	1/8	2202P-4-2
1/4	1/4	1202P-4-4
1/4	1/4	2202P-4-4
1/4	1/4	2202PA-4-4*
1/4	3/8	2202P-4-6
3/8	1/4	1202P-6-4
3/8	3/8	1202P-6-6
3/8	3/8	2202P-6-6
3/8	3/8	2202PA-6-6*



219P Countersunk Hex-Head Plug

Pipe thread	C Hex	Part number
1/8	3/16	219P-2
1/4	1/4	219P-4
3/8	5/16	219P-6
1/2	3/8	219P-8
3/4	9/16	219P-12



Most popular. For technical information see CD

*Meets SAE Dimensions

1203P-2203P Union Tee



Pipe thread	Part number
1/8	1203P-2
1/8	2203P-2
1/4	1203P-4
1/4	2203P-4
3/8	2203P-6
1/2	1203P-8
1/2	2203P-8
3/4	2203P-12

1204P Male Elbow



Pipe thread	Part number
1/8	1204P-2
1/4	1204P-4
3/8	1204P-6
1/2	1204P-8

2224P Male Branch Tee



Pipe thread	Part number
1/8	2224P-2
1/4	2224P-4
3/8	2224P-6
1/2	2224P-8
3/4	2224P-12

2225P Street Tee



Pipe thread	Part number
1/8	2225P-2
1/4	2225P-4
3/8	2225P-6
1/2	2225P-8
3/4	2225P-12

1201P-2201P 45° Female Elbow



1201P



2201P

Pipe thread	Part number
1/8	2201P-2-2
1/2	1201P-8-8

2205P Cross



Pipe thread	Part number
1/8	2205P-2
1/4	2205P-4
3/8	2205P-6
1/2	2205P-8
3/4	2205P-12

2214P 45° Street Elbow



Pipe thread	Part number
1/8	2214P-2-2
1/4	2214P-4-4
3/8	2214P-6-6
1/2	2214P-8-8

Most popular. For technical information see CD

DD44 Pipe 90° Elbow BSPP



BSPP	C Hex	Part number
1/8	14	1/8DD44B
1/4	17	1/4DD44B
3/8	22	3/8DD44B
1/2	27	1/2DD44B

KMMOO4 Pipe Cross BSPP



BSPP	C Hex	Part number
1/8	14	1/8KMMOO4B
1/4	17	1/4KMMOO4B
3/8	22	3/8KMMOO4B
1/2	27	1/2KMMOO4B

FF44 Pipe Nipples BSPP



BSPP	C Hex	Part number
1/8	14	1/8FF44B
1/4	17	1/4FF44B
3/8	22	3/8FF44B
1/2	27	1/2FF44B

MMO444 Pipe Tee BSPP



BSPP	C Hex	Part number
1/8	14	1/8MMO444B
1/4	17	1/4MMO444B
3/8	22	3/8MMO444B
1/2	27	1/2MMO444B
3/4	32	3/4MMO444B
1	40	1MMO444B

FHG4 Adapter Male NPTF BSPP



BSPP 1	NPTF 2	C Hex	Part No.
1/8	1/8	0.562	1/8FHG4-B
1/4	1/4	0.750	1/4FHG4-B
3/8	3/8	0.875	3/8FHG4-B
1/2	1/2	1.062	1/2FHG4-B

WGG44 Bulkhead Female Union BSPP



BSPP	Straight thread	C Hex	Part number
1/8	M16x1.5	19	1/8WGG44B
1/4	M20x1.5	24	1/4WGG44B
3/8	M23x1.5	27	3/8WGG44B
1/2	M27x1.5	32	1/2WGG44B
3/4	M34x1.5	41	3/4WGG44B
1	M45x2	55	1WGG44B

GG44 Pipe Connector BSPP



BSPP	C Hex	Part number
1/8	14	1/8GG44B
1/4	17	1/4GG44B
3/8	22	3/8GG44B
1/2	27	1/2GG44B
3/4	32	3/4GG44B
1	41	1GG44B

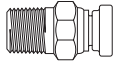
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Tubing & Fittings
 Accessories

Most popular. For technical information see CD

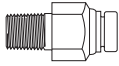
68PM Male Connector

Tube Size	Pipe thread (NPTF)	Part number
1/8	1/16	68PM-2-1
1/8	1/8	68PM-2-2
5/32	1/16	68PM-5/32-1
5/32	1/8	68PM-5/32-2
5/32	1/4	68PM-5/32-4
3/16	1/16	68PM-3-1
3/16	1/8	68PM-3-2
3/16	1/4	68PM-3-4



68PMT Male Connector

Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	68PMT-4-2
1/4	1/4	68PMT-4-4
1/4	3/8	68PMT-4-6
3/8	1/8	68PMT-6-2
3/8	1/4	68PMT-6-4
3/8	3/8	68PMT-6-6
3/8	1/2	68PMT-6-8
1/2	1/4	68PMT-8-4
1/2	3/8	68PMT-8-6
1/2	1/2	68PMT-8-8
5/8	3/8	68PMT-10-6
5/8	1/2	68PMT-10-8
3/4	1/2	68PMT-12-8



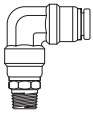
169PMNS Male Elbow Non-Swivel 90°

Tube size	Pipe thread (NPTF)	Part number
1/8	1/8	169PMNS-2-2
5/32	1/8	169PMNS-5/32-2
3/16	1/8	169PMNS-3-2
3/16	1/4	169PMNS-3-4



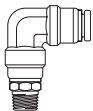
169PMT Male Elbow Swivel 90°

Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	169PMT-4-2
1/4	1/4	169PMT-4-4
1/4	3/8	169PMT-4-6
3/8	1/8	169PMT-6-2
3/8	1/4	169PMT-6-4
3/8	3/8	169PMT-6-6
3/8	1/2	169PMT-6-8
1/2	1/4	169PMT-8-4
1/2	3/8	169PMT-8-6
1/2	1/2	169PMT-8-8
5/8	3/8	169PMT-10-6
5/8	1/2	169PMT-10-8



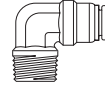
169PMTL Male Elbow Long Non-Swivel 90°

Tube Size	Pipe thread (NPTF)	Part number
3/8	1/4	169PMTL-6-4
3/8	3/8	169PMTL-6-6
3/8	1/2	169PMTL-6-8
1/2	1/2	169PMTL-8-8
5/8	1/2	169PMTL-10-8



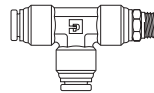
169PMTNS Male Elbow Non-Swivel 90°

Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	169PMTNS-4-2
1/4	1/4	169PMTNS-4-4
1/4	3/8	169PMTNS-4-6
3/8	1/8	169PMTNS-6-2
3/8	1/4	169PMTNS-6-4
3/8	3/8	169PMTNS-6-6
3/8	1/2	169PMTNS-6-8
1/2	1/4	169PMTNS-8-4
1/2	3/8	169PMTNS-8-6
1/2	1/2	169PMTNS-8-8
5/8	3/8	169PMTNS-10-6
5/8	1/2	169PMTNS-10-8
3/4	1/2	169PMTNS-12-8



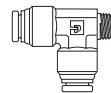
171PMT Male Run Tee Swivel

Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	171PMT-4-2
1/4	1/4	171PMT-4-4
1/4	3/8	171PMT-4-6
3/8	1/4	171PMT-6-4
3/8	3/8	171PMT-6-6
1/2	1/4	171PMT-8-4
1/2	3/8	171PMT-8-6
1/2	1/2	171PMT-8-8



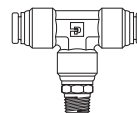
171PMTNS Male Run Tee Non-Swivel

Tube 1 Size	Tube 2 Size	Pipe thread (NPTF)	Part number
1/4	1/4	1/8	171PMTNS-4-4
1/4	3/8	1/8	171PMTNS-4-6-4
3/8	3/8	1/8	171PMTNS-6-4
3/8	1/4	1/8	171PMTNS-6-4-4
3/8	1/4	3/8	171PMTNS-6-4-6
1/2	3/8	1/8	171PMTNS-6-6
1/2	3/8	3/8	171PMTNS-6-8
1/2	1/2	1/8	171PMTNS-8-4



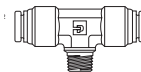
172PMT Male Branch Tee Swivel

Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	172PMT-4-2
1/4	1/4	172PMT-4-4
3/8	1/8	172PMT-6-2
3/8	1/4	172PMT-6-4
3/8	3/8	172PMT-6-6
1/2	1/4	172PMT-8-4
1/2	3/8	172PMT-8-6
1/2	1/2	172PMT-8-8



172PMTNS Male Branch Tee Non-Swivel

Tube 1 Size	Tube 2 Size	Pipe thread (NPTF)	Part number
1/4	1/4	1/8	172PMTNS-4-2
3/8	3/8	1/4	172PMTNS-6-4
3/8	1/4	1/4	172PMTNS-6-4-4
3/8	3/8	3/8	172PMTNS-6-6
3/8	3/8	1/2	172PMTNS-6-8
1/2	1/2	3/8	172PMTNS-8-6
1/2	3/8	1/2	172PMTNS-8-6-8
1/2	1/2	1/2	172PMTNS-8-8



Safety Guide for Selecting and Using Hydraulic, Pneumatic Cylinders and Their Accessories

WARNING: ⚠ FAILURE OF THE CYLINDER, ITS PARTS, ITS MOUNTING, ITS CONNECTIONS TO OTHER OBJECTS, OR ITS CONTROLS CAN RESULT IN:

- Unanticipated or uncontrolled movement of the cylinder or objects connected to it.
- Falling of the cylinder or objects held up by it.
- Fluid escaping from the cylinder, potentially at high velocity.

THESE EVENTS COULD CAUSE DEATH OR PERSONAL INJURY BY, FOR EXAMPLE, PERSONS FALLING FROM HIGH LOCATIONS, BEING CRUSHED OR STRUCK BY HEAVY OR FAST MOVING OBJECTS, BEING PUSHED INTO DANGEROUS EQUIPMENT OR SITUATIONS, OR SLIPPING ON ESCAPED FLUID.

Before selecting or using Parker (The Company) cylinders or related accessories, it is important that you read, understand and follow the following safety information. Training is advised before selecting and using The Company's products.

1.0 General Instructions

1.1 Scope – This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) cylinder products. This safety guide is a supplement to and is to be used with the specific Company publications for the specific cylinder products that are being considered for use.

1.2 Fail Safe – Cylinder products can and do fail without warning for many reasons. All systems and equipment should be designed in a fail-safe mode so that if the failure of a cylinder product occurs people and property won't be endangered.

1.3 Distribution – Provide a free copy of this safety guide to each person responsible for selecting or using cylinder products. Do not select or use The Company's cylinders without thoroughly reading and understanding this safety guide as well as the specific Company publications for the products considered or selected.

1.4 User Responsibility – Due to very wide variety of cylinder applications and cylinder operating conditions, The Company does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to The Company's design guidelines and do not necessarily meet the design guideline of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

1.5 Additional Questions – Call the appropriate Company technical service department if you have any questions or require any additional information. See the Company publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 Cylinder and Accessories Selection

2.1 Seals – Part of the process of selecting a cylinder is the selection of seal compounds. Before making this selection, consult the "seal information page(s)" of the publication for the series of cylinders of interest.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

2.2 Piston Rods – Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Follow the recommendations of the "Piston Rod Selection Chart and Data" in the publication for the series of cylinders of interest. The suggested piston rod diameter in these charts must be followed in order to avoid piston rod buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

On occasion cylinders are ordered with double rods (a piston rod extended from both ends of the cylinder). In some cases a stop is threaded on to one of the piston rods and used as an external stroke adjuster. On occasions spacers are attached to the machine member connected to the piston rod and also used as a stroke adjuster. In both cases the stops will create a pinch point and the user should consider appropriate use of guards. If these external stops are not perpendicular to the mating contact surface, or if debris is trapped between the contact surfaces, a bending moment will be placed on the piston rod, which can lead to piston rod failure. An external stop will also negate the effect of cushioning and will subject the piston rod to impact loading. Those two (2) conditions can cause piston rod failure. Internal stroke adjusters are available with and without cushions. The use of external stroke adjusters should be reviewed with our engineering department.

The piston rod to piston and the stud to piston rod threaded connections are secured with an anaerobic adhesive. The strength of the adhesive decreases with increasing temperature. Cylinders which can be exposed to temperatures above +250°F (+121°C) are to be ordered with a non studded piston rod and a pinned piston to rod joint.

2.3 Cushions – Cushions should be considered for cylinder applications when the piston velocity is expected to be over 4 inches/second.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be reviewed by our engineering department.

2.4 Cylinder Mountings – Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

2.5 Port Fittings – Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

3.0 Cylinder and Accessories Installation and Mounting

3.1 Installation

3.1.1 – Cleanliness is an important consideration, and cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.

3.1.2 – Cylinders operating in an environment where air drying materials are present such as fast-drying chemicals, paint, or weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

3.1.3 – Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear. On fixed mounting cylinders attaching the piston rod while the rod is retracted will help in achieving proper alignment.

3.1.4 – Sometimes it may be necessary to rotate the piston rod in order to thread the piston rod into the machine member. This operation must always be done with zero pressure being applied to either side of the piston. Failure to follow this procedure may result in loosening the piston to rod-threaded connection. In some rare cases the turning of the piston rod may rotate a threaded piston rod gland and loosen it from the cylinder head. Confirm that this condition is not occurring. If it does, re-tighten the piston rod gland firmly against the cylinder head.

For double rod cylinders it is also important that when attaching or detaching the piston rod from the machine member that the torque be applied to the piston rod end of the cylinder that is directly attaching to the machine member with the opposite end unrestrained. If the design of the machine is such that only the rod end of the cylinder opposite to where the rod attaches to the machine member can be rotated, consult the factory for further instructions.

3.2 Mounting Recommendations

3.2.1 – Always mount cylinders using the largest possible high tensile alloy steel socket head screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

3.2.2 – Side-Mounted Cylinders – In addition to the mounting bolts, cylinders of this type should be equipped with thrust keys or dowel pins located so as to resist the major load.

3.2.3 – Tie Rod Mounting – Cylinders with tie rod mountings are recommended for applications where mounting space is limited. The standard tie rod extension is shown as BB in dimension tables. Longer or shorter extensions can be supplied. Nuts used for this mounting style should be torqued to the same value as the tie rods for that bore size.

3.2.4 – Flange Mount Cylinders – The controlled diameter of the rod gland extension on head end flange mount cylinders can be used as a pilot to locate the cylinders in relation to the machine. After alignment has been obtained, the flanges may be drilled for pins or dowels to prevent shifting.

3.2.5 – Trunnion Mountings – Cylinders require lubricated bearing blocks with minimum bearing clearances. Bearing blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end should also be pivoted with the pivot pin in line and parallel to axis of the trunnion pins.

3.2.6 – Clevis Mountings – Cylinders should be pivoted at both ends with centerline of pins parallel to each other. After cylinder is mounted, be sure to check to assure that the cylinder is free to swing through its working arc without interference from other machine parts.

4.0 Cylinder and Accessories Maintenance, Troubleshooting and Replacement

4.1 Storage – At times cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended.

4.1.1 – Store the cylinders in an indoor area which has a dry, clean and noncorrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.

4.1.2 – Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder. This will also minimize seal damage.

4.1.3 – Port protector plugs should be left in the cylinder until the time of installation.

4.1.4 – If a cylinder is stored full of hydraulic fluid, expansion of the fluid due to temperature changes must be considered. Installing a check valve with free flow out of the cylinder is one method.

4.1.5 – When cylinders are mounted on equipment that is stored outside for extended periods, exposed unpainted surfaces, e.g. piston rod, must be coated with a rust-inhibiting compound to prevent corrosion.

4.2 Cylinder Trouble Shooting

4.2.1 – External Leakage

4.2.1.1 – Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for dents, gouges or score

marks, and replace piston rod if surface is rough.

Rod seal leakage could also be traced to gland wear. If clearance is excessive, replace rod bushing and seal. Rod seal leakage can also be traced to seal deterioration. If seals are soft or gummy or brittle, check compatibility of seal material with lubricant used if air cylinder, or operating fluid if hydraulic cylinder. Replace with seal material, which is compatible with these fluids. If the seals are hard or have lost elasticity, it is usually due to exposure to temperatures in excess of 165°F. (+74°C). Shield the cylinder from the heat source to limit temperature to 350°F. (+177°C.) and replace with fluorocarbon seals.

4.2.1.2 – Cylinder body seal leak can generally be traced to loose tie rods. Torque the tie rods to manufacturer's recommendation for that bore size.

Excessive pressure can also result in cylinder body seal leak. Determine maximum pressure to rated limits. Replace seals and retorque tie rods as in paragraph above. Excessive pressure can also result in cylinder body seal leak. Determine if the pressure rating of the cylinder has been exceeded. If so, bring the operating pressure down to the rating of the cylinder and have the tie rods replaced.

Pinched or extruded cylinder body seal will also result in a leak. Replace cylinder body seal and retorque as in paragraph above.

Cylinder body seal leakage due to loss of radial squeeze which shows up in the form of flat spots or due to wear on the O.D. or I.D. – Either of these are symptoms of normal wear due to high cycle rate or length of service. Replace seals as per paragraph above.

4.2.2 – Internal Leakage

4.2.2.1 – Piston seal leak (by-pass) 1 to 3 cubic inches per minute leakage is considered normal for piston ring construction. Virtually no static leak with lipseal type seals on piston should be expected. Piston seal wear is a usual cause of piston seal leakage. Replace seals as required.

4.2.2.2 – With lipseal type piston seals excessive back pressure due to over-adjustment of speed control valves could be a direct cause of rapid seal wear. Contamination in a hydraulic system can result in a scored cylinder bore, resulting in rapid seal wear. In either case, replace piston seals as required.

4.2.2.3 – What appears to be piston seal leak, evidenced by the fact that the cylinder drifts, is not always traceable to the piston. To make sure, it is suggested that one side of the cylinder piston be pressurized and the fluid line at the opposite port be disconnected. Observe leakage. If none is evident, seek the cause of cylinder drift in other component parts in the circuit.

4.2.3 – Cylinder Fails to Move the Load

4.2.3.1 – Pneumatic or hydraulic pressure is too low. Check the pressure at the cylinder to make sure it is to circuit requirements.

4.2.3.2 – Piston Seal Leak – Operate the valve to cycle the cylinder and observe fluid flow at valve exhaust ports at end of cylinder stroke. Replace piston seals if flow is excessive.

4.2.3.3 – Cylinder is undersized for the load – Replace cylinder with one of a larger bore size.

4.3 Erratic or Chatter Operation

4.3.1 – Excessive friction at rod gland or piston bearing due to load misalignment – Correct cylinder-to-load alignment.

4.3.2 – Cylinder sized too close to load requirements – Reduce load or install larger cylinder.

4.3.3 – Erratic operation could be traced to the difference between static and kinetic friction. Install speed control valves to provide a back pressure to control the stroke.

4.4 Cylinder Modifications, Repairs, or Failed Component – Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided with the seal kits.



Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

WARNING:

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS (“PRODUCTS”) CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3 Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
 - Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
 - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
 - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
 - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.
- 1.8. Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
 - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
 - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, ketones, esters or certain alcohols.
 - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

- 2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5
- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
 - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
 - Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.
- 3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.
- 3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.
- 4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.
- 4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
 - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
 - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
 - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
 - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

- 4.5. Routine Maintenance Issues:**
- Remove excessive dirt, grime and clutter from work areas.
 - Make sure all required guards and shields are in place.
- 4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.
- 4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
 - Government and / or industrial standards.
 - When failures could result in unacceptable down time, equipment damage or personal injury risk.
- 4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
 - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
 - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
 - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
 - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
 - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.
- 4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.



The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

- 1. Terms and Conditions.** Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.
- 2. Price Adjustments; Payments.** Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.
- 3. Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.
- 4. Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
- 5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.
- 6. LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. **IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**
- 7. Contingencies.** Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.
- 8. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
- 9. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
- 10. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

- 11. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.
- 12. Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
- 13. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
- 14. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
- 15. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
- 16. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
- 17. Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (b) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (c) an assignment for the benefit of creditors, or (d) the dissolution or liquidation of the Buyer.
- 18. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
- 19. Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
- 20. Taxes.** Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.
- 21. Equal Opportunity Clause.** For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

Safety Guide for Selecting and Using Hydraulic, Pneumatic Cylinders and Their Accessories

WARNING: ⚠ FAILURE OF THE CYLINDER, ITS PARTS, ITS MOUNTING, ITS CONNECTIONS TO OTHER OBJECTS, OR ITS CONTROLS CAN RESULT IN:

- Unanticipated or uncontrolled movement of the cylinder or objects connected to it.
- Falling of the cylinder or objects held up by it.
- Fluid escaping from the cylinder, potentially at high velocity.

THESE EVENTS COULD CAUSE DEATH OR PERSONAL INJURY BY, FOR EXAMPLE, PERSONS FALLING FROM HIGH LOCATIONS, BEING CRUSHED OR STRUCK BY HEAVY OR FAST MOVING OBJECTS, BEING PUSHED INTO DANGEROUS EQUIPMENT OR SITUATIONS, OR SLIPPING ON ESCAPED FLUID.

Before selecting or using Parker (The Company) cylinders or related accessories, it is important that you read, understand and follow the following safety information. Training is advised before selecting and using The Company's products.

1.0 General Instructions

1.1 Scope – This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) cylinder products. This safety guide is a supplement to and is to be used with the specific Company publications for the specific cylinder products that are being considered for use.

1.2 Fail Safe – Cylinder products can and do fail without warning for many reasons. All systems and equipment should be designed in a fail-safe mode so that if the failure of a cylinder product occurs people and property won't be endangered.

1.3 Distribution – Provide a free copy of this safety guide to each person responsible for selecting or using cylinder products. Do not select or use The Company's cylinders without thoroughly reading and understanding this safety guide as well as the specific Company publications for the products considered or selected.

1.4 User Responsibility – Due to very wide variety of cylinder applications and cylinder operating conditions, The Company does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to The Company's design guidelines and do not necessarily meet the design guideline of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

1.5 Additional Questions – Call the appropriate Company technical service department if you have any questions or require any additional information. See the Company publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 Cylinder and Accessories Selection

2.1 Seals – Part of the process of selecting a cylinder is the selection of seal compounds. Before making this selection, consult the "seal information page(s)" of the publication for the series of cylinders of interest.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

2.2 Piston Rods – Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Follow the recommendations of the "Piston Rod Selection Chart and Data" in the publication for the series of cylinders of interest. The suggested piston rod diameter in these charts must be followed in order to avoid piston rod buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

On occasion cylinders are ordered with double rods (a piston rod extended from both ends of the cylinder). In some cases a stop is threaded on to one of the piston rods and used as an external stroke adjuster. On occasions spacers are attached to the machine member connected to the piston rod and also used as a stroke adjuster. In both cases the stops will create a pinch point and the user should consider appropriate use of guards. If these external stops are not perpendicular to the mating contact surface, or if debris is trapped between the contact surfaces, a bending moment will be placed on the piston rod, which can lead to piston rod failure. An external stop will also negate the effect of cushioning and will subject the piston rod to impact loading. Those two (2) conditions can cause piston rod failure. Internal stroke adjusters are available with and without cushions. The use of external stroke adjusters should be reviewed with our engineering department.

The piston rod to piston and the stud to piston rod threaded connections are secured with an anaerobic adhesive. The strength of the adhesive decreases with increasing temperature. Cylinders which can be exposed to temperatures above +250°F (+121°C) are to be ordered with a non studded piston rod and a pinned piston to rod joint.

2.3 Cushions – Cushions should be considered for cylinder applications when the piston velocity is expected to be over 4 inches/second.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be reviewed by our engineering department.

2.4 Cylinder Mountings – Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

2.5 Port Fittings – Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

3.0 Cylinder and Accessories Installation and Mounting

3.1 Installation

3.1.1 – Cleanliness is an important consideration, and cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.

3.1.2 – Cylinders operating in an environment where air drying materials are present such as fast-drying chemicals, paint, or weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

3.1.3 – Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear. On fixed mounting cylinders attaching the piston rod while the rod is retracted will help in achieving proper alignment.

3.1.4 – Sometimes it may be necessary to rotate the piston rod in order to thread the piston rod into the machine member. This operation must always be done with zero pressure being applied to either side of the piston. Failure to follow this procedure may result in loosening the piston to rod-threaded connection. In some rare cases the turning of the piston rod may rotate a threaded piston rod gland and loosen it from the cylinder head. Confirm that this condition is not occurring. If it does, re-tighten the piston rod gland firmly against the cylinder head.

For double rod cylinders it is also important that when attaching or detaching the piston rod from the machine member that the torque be applied to the piston rod end of the cylinder that is directly attaching to the machine member with the opposite end unrestrained. If the design of the machine is such that only the rod end of the cylinder opposite to where the rod attaches to the machine member can be rotated, consult the factory for further instructions.

3.2 Mounting Recommendations

3.2.1 – Always mount cylinders using the largest possible high tensile alloy steel socket head screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

3.2.2 – Side-Mounted Cylinders – In addition to the mounting bolts, cylinders of this type should be equipped with thrust keys or dowel pins located so as to resist the major load.

3.2.3 – Tie Rod Mounting – Cylinders with tie rod mountings are recommended for applications where mounting space is limited. The standard tie rod extension is shown as BB in dimension tables. Longer or shorter extensions can be supplied. Nuts used for this mounting style should be torqued to the same value as the tie rods for that bore size.

3.2.4 – Flange Mount Cylinders – The controlled diameter of the rod gland extension on head end flange mount cylinders can be used as a pilot to locate the cylinders in relation to the machine. After alignment has been obtained, the flanges may be drilled for pins or dowels to prevent shifting.

3.2.5 – Trunnion Mountings – Cylinders require lubricated bearing blocks with minimum bearing clearances. Bearing blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end should also be pivoted with the pivot pin in line and parallel to axis of the trunnion pins.

3.2.6 – Clevis Mountings – Cylinders should be pivoted at both ends with centerline of pins parallel to each other. After cylinder is mounted, be sure to check to assure that the cylinder is free to swing through its working arc without interference from other machine parts.

4.0 Cylinder and Accessories Maintenance, Troubleshooting and Replacement

4.1 Storage – At times cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended.

4.1.1 – Store the cylinders in an indoor area which has a dry, clean and noncorrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.

4.1.2 – Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder. This will also minimize seal damage.

4.1.3 – Port protector plugs should be left in the cylinder until the time of installation.

4.1.4 – If a cylinder is stored full of hydraulic fluid, expansion of the fluid due to temperature changes must be considered. Installing a check valve with free flow out of the cylinder is one method.

4.1.5 – When cylinders are mounted on equipment that is stored outside for extended periods, exposed unpainted surfaces, e.g. piston rod, must be coated with a rust-inhibiting compound to prevent corrosion.

4.2 Cylinder Trouble Shooting

4.2.1 – External Leakage

4.2.1.1 – Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for dents, gouges or score

marks, and replace piston rod if surface is rough.

Rod seal leakage could also be traced to gland wear. If clearance is excessive, replace rod bushing and seal. Rod seal leakage can also be traced to seal deterioration. If seals are soft or gummy or brittle, check compatibility of seal material with lubricant used if air cylinder, or operating fluid if hydraulic cylinder. Replace with seal material, which is compatible with these fluids. If the seals are hard or have lost elasticity, it is usually due to exposure to temperatures in excess of 165°F. (+74°C). Shield the cylinder from the heat source to limit temperature to 350°F. (+177°C.) and replace with fluorocarbon seals.

4.2.1.2 – Cylinder body seal leak can generally be traced to loose tie rods. Torque the tie rods to manufacturer's recommendation for that bore size.

Excessive pressure can also result in cylinder body seal leak. Determine maximum pressure to rated limits. Replace seals and retorque tie rods as in paragraph above. Excessive pressure can also result in cylinder body seal leak. Determine if the pressure rating of the cylinder has been exceeded. If so, bring the operating pressure down to the rating of the cylinder and have the tie rods replaced.

Pinched or extruded cylinder body seal will also result in a leak. Replace cylinder body seal and retorque as in paragraph above.

Cylinder body seal leakage due to loss of radial squeeze which shows up in the form of flat spots or due to wear on the O.D. or I.D. – Either of these are symptoms of normal wear due to high cycle rate or length of service. Replace seals as per paragraph above.

4.2.2 – Internal Leakage

4.2.2.1 – Piston seal leak (by-pass) 1 to 3 cubic inches per minute leakage is considered normal for piston ring construction. Virtually no static leak with lipseal type seals on piston should be expected. Piston seal wear is a usual cause of piston seal leakage. Replace seals as required.

4.2.2.2 – With lipseal type piston seals excessive back pressure due to over-adjustment of speed control valves could be a direct cause of rapid seal wear. Contamination in a hydraulic system can result in a scored cylinder bore, resulting in rapid seal wear. In either case, replace piston seals as required.

4.2.2.3 – What appears to be piston seal leak, evidenced by the fact that the cylinder drifts, is not always traceable to the piston. To make sure, it is suggested that one side of the cylinder piston be pressurized and the fluid line at the opposite port be disconnected. Observe leakage. If none is evident, seek the cause of cylinder drift in other component parts in the circuit.

4.2.3 – Cylinder Fails to Move the Load

4.2.3.1 – Pneumatic or hydraulic pressure is too low. Check the pressure at the cylinder to make sure it is to circuit requirements.

4.2.3.2 – Piston Seal Leak – Operate the valve to cycle the cylinder and observe fluid flow at valve exhaust ports at end of cylinder stroke. Replace piston seals if flow is excessive.

4.2.3.3 – Cylinder is undersized for the load – Replace cylinder with one of a larger bore size.

4.3 Erratic or Chatter Operation

4.3.1 – Excessive friction at rod gland or piston bearing due to load misalignment – Correct cylinder-to-load alignment.

4.3.2 – Cylinder sized too close to load requirements – Reduce load or install larger cylinder.

4.3.3 – Erratic operation could be traced to the difference between static and kinetic friction. Install speed control valves to provide a back pressure to control the stroke.

4.4 Cylinder Modifications, Repairs, or Failed Component – Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided with the seal kits.



Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

WARNING:

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS (“PRODUCTS”) CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3. Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
 - Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
 - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
 - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
 - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.
- 1.8. Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
 - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
 - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, ketones, esters or certain alcohols.
 - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

- 2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5
- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
 - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
 - Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.
- 3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.
- 3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.
- 4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.
- 4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
 - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
 - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
 - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
 - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

- 4.5. Routine Maintenance Issues:**
- Remove excessive dirt, grime and clutter from work areas.
 - Make sure all required guards and shields are in place.
- 4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.
- 4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
 - Government and / or industrial standards.
 - When failures could result in unacceptable down time, equipment damage or personal injury risk.
- 4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
 - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
 - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
 - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
 - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
 - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.
- 4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.



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- 1. Terms and Conditions.** Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.
- 2. Price Adjustments; Payments.** Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.
- 3. Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.
- 4. Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
- 5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.
- 6. LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. **IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**
- 7. Contingencies.** Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.
- 8. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
- 9. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
- 10. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

- 11. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.
- 12. Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
- 13. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
- 14. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
- 15. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
- 16. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
- 17. Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (b) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (c) an assignment for the benefit of creditors, or (d) the dissolution or liquidation of the Buyer.
- 18. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
- 19. Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
- 20. Taxes.** Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.
- 21. Equal Opportunity Clause.** For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

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