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*Sentronic® Proportional Valves, CGT Compact Slides, NR Series Rodless and Air Bellows are limited to orders up to 5.
**A Series Large Bore NFPA, ASP Series Steel Body NFPA and G Series Guide Rail Rodless are limited to orders up to 5.
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Since 1945, Numatics has emerged as the prominent specialist in developing and manufacturing pneumatic and fluid power components for a widely diverse field of automated industry. From idea to implementation, leading engineers choose Numatics as their single source for:

- Quality Fluid Power components
- Technologically advanced design resources
- Quick response time in delivery and service from around the world

Numasizing®

Developed by Numatics, Numasizing® offers a whole new level of fluid power system optimization. Compare large amounts of component and process data against user objectives and industry benchmarks for the best possible size, pneumatic pressure, actuator stroke velocities and other part and process variable determinations.

CAD Modeling

Save critical development time with the most innovative CAD configuration program in the pneumatic component industry. Numatics in 3D eliminates the time consuming process associated with designing components from scratch based on information found in conventional paper catalogs. The models are available in 85 different native CAD formats in 2D drawings and 3D models, including all the popular formats including Catia, I-DEAS, Pro/Engineer, SolidWorks, Unigraphics and more.
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F14, F22, F32, F42 Series

- Four convenient sizes
- 5 micron sintered elements standard
- Can be installed as modular or individual unit
- Includes screws and o-rings for modular connection
- Manual or automatic drain
- Polycarbonate bowl standard
- Optional metal bowl (sight glass available on 22, 32 and 42 Series)
- Bowl seal held captive (22, 32 and 42 Series)

Specifications

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<th>Bowl</th>
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<td>40-120 (4-50)</td>
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<tr>
<td></td>
<td>Max. Pressure PSIG (BAR)</td>
<td>Poly C 150 (10)</td>
<td>150 (10)</td>
<td>150 (10)</td>
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<tr>
<td></td>
<td>Metal</td>
<td>200 (14)</td>
<td>200 (14)</td>
<td>200 (14)</td>
</tr>
<tr>
<td></td>
<td>Weight lbs. (kg)</td>
<td>Poly C 0.60 (0.28)</td>
<td>0.65 (0.30)</td>
<td>1.3 (0.59)</td>
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<tr>
<td></td>
<td>Metal</td>
<td>0.65 (0.30)</td>
<td>1.25 (0.57)</td>
<td>2.5 (1.14)</td>
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<td></td>
<td>Nominal Flow SCFM (L/M)*</td>
<td>32 (906)</td>
<td>65 (1841)</td>
<td>105 (2973)</td>
</tr>
<tr>
<td>Body Material</td>
<td>Zinc</td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
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</table>

*Nominal flow with a 5 micron element at 80 psig (5.5 bar) inlet and 5 psig (0.35 bar) pressure drop

How to Order

2DAY - Particulate Filters

**Model**
- F = Filter

**Series**
- 14 = 1.5 oz. Bowl
- 22 = 3.8 oz. Bowl
- 32 = 8.5 oz. Bowl
- 42 = 8.5 oz. Bowl

**Element**
- B = 5 Micron Element

**Threads**
- = NPTF

**Options**
- A = Auto Drain (22, 32 and 42 Series)
- J = External Pulse Drain (14 Series)
- M = Metal Bowl with Sight Glass
- Q = Metal Manual Drain

**Port Size**
- 02 = 1/4 (14 or 22 Series)
- 03 = 3/8 (22 Series)
- 04 = 1/2 (22 or 32 Series)
- 06 = 3/4 (32 Series)
- 08 = 1 (42 Series)
F14D, F22D, F32D, F42D Series

- Four convenient sizes
- Cartridge element design
- Inner and outer support cores prevent element from crushing in either flow direction
- Optional metal bowl (sight glass available on 22, 32 and 42 Series)
- Manual or automatic drain
- DP indicator standard on 14, 22, 32 and 42 Series

Recommended Uses

D grade element, identified by its green drain layer, is a fine filter for cylinder or valves - especially when the circuit is being run without lubrication ('dry'). Excellent filter for desiccant or regenerative style dryers.

Specifications

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<th>Weight lbs. (kg)</th>
<th>Nominal Flow SCFM (L/M)*</th>
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<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
<td>Zinc, Aluminum</td>
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<tr>
<td>Poly C</td>
<td>150 (10)</td>
<td>150 (10)</td>
<td>150 (10)</td>
<td>150 (10)</td>
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<td>200 (14)</td>
<td>200 (14)</td>
<td>200 (14)</td>
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</tr>
<tr>
<td>Poly C</td>
<td>0.66 (0.28)</td>
<td>0.66 (0.30)</td>
<td>1.42 (0.65)</td>
<td>3.70 (1.68)</td>
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<tr>
<td>Metal</td>
<td>0.70 (0.32)</td>
<td>1.28 (0.65)</td>
<td>2.56 (1.42)</td>
<td>4.80 (2.56)</td>
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<tr>
<td>Nominal Flow SCFM (L/M)*</td>
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<td>18 (510)</td>
<td>48 (1359)</td>
<td>100 (2832)</td>
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*Nominal flow with a 0.3 micron element at 80 psig (5.5 bar) inlet pressure and 1.5 psig (0.1 bar) pressure drop

How to Order

2DAY - Coalescing Filters

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<td>1.5 oz. Bowl</td>
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<tr>
<td>22</td>
<td>3.8 oz. Bowl</td>
</tr>
<tr>
<td>32</td>
<td>8.5 oz. Bowl</td>
</tr>
<tr>
<td>42</td>
<td>8.5 oz. Bowl</td>
</tr>
<tr>
<td>Element</td>
<td>D = 0.3 Micron Fine Coalescer</td>
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<tr>
<td>Threads</td>
<td>= NPTF</td>
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Options

A = Auto Drain (22, 32 and 42 Series)
D = 3 Micron, Internal Pleated Prefilter
J = External Pulse Drain (14 Series)
M = Metal Bowl With Sight Glass
Q = Metal Manual Drain

Port Size

02 = 1/4 (14 or 22 Series)
03 = 3/8 (22 Series)
04 = 1/2 (22 or 32 Series)
06 = 3/4 (32 Series)
08 = 1 (42 Series)
R14, R22, R32, R42 Series

- Four convenient sizes
- High flow in compact size
- Locking non-rising adjustment
- Can be installed as modular or individual unit
- Standard output pressure 0-125 PSIG

Specifications

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<th>32 Series</th>
<th>42 Series</th>
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<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
</tr>
<tr>
<td>Max. Pressure PSIG (BAR)</td>
<td>250 (17)</td>
<td>200 (14)</td>
<td>250 (17)</td>
<td>250 (17)</td>
</tr>
<tr>
<td>Weight lbs. (kg)</td>
<td>0.65 (0.30)</td>
<td>0.69 (0.31)</td>
<td>1.37 (0.62)</td>
<td>4.30 (1.95)</td>
</tr>
<tr>
<td>Body Material</td>
<td>Zinc</td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
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</table>

How to Order

2DAY - Regulators

Model
R = Regulator

Series
14
22
32
42

Style
R = Relieving

Threads
= NPTF

Options
G = Gauge

Port Size
02 = 1/4 (14 or 22 Series)
03 = 3/8 (22 Series)
04 = 1/2 (22 or 32 Series)
06 = 3/4 (32 Series)
08 = 1 (42 Series)
FRLs

FLEXIBLOK®
Particulate Filter/Regulator

P14, P22, P32, P42 Series

• Four convenient sizes
• 5 micron element standard
• Can be installed as individual or modular unit
• Locking non-rising adjustment
• Polycarbonate bowl standard
• Optional metal bowl (sight glass available on 22, 32 and 42 Series)
• Standard output pressure 0-125 PSIG
• Bowl seal held captive (22, 32, and 42 Series)

Specifications

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<th>42 Series</th>
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</tr>
<tr>
<td>Max. Pressure PSIG (BAR)</td>
<td>Poly C 150 (10)</td>
<td>150 (10)</td>
<td>150 (10)</td>
<td>150 (10)</td>
</tr>
<tr>
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<td>Metal 200 (14)</td>
<td>200 (14)</td>
<td>200 (14)</td>
<td>200 (14)</td>
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<tr>
<td>Weight lbs. (kg)</td>
<td>Poly C 0.75 (0.34)</td>
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<td>1.81 (0.82)</td>
<td>5.05 (2.29)</td>
</tr>
<tr>
<td></td>
<td>Metal 0.80 (0.37)</td>
<td>1.50 (0.68)</td>
<td>2.99 (1.34)</td>
<td>6.15 (2.79)</td>
</tr>
<tr>
<td>Nominal Flow SCFM (L/M)*</td>
<td>40 (1133)</td>
<td>60 (1699)</td>
<td>90 (2549)</td>
<td>300 (8496)</td>
</tr>
</tbody>
</table>

Body Material

Zinc
Aluminum
Aluminum
Aluminum

*Nominal flow using a 5 micron element, at 100 psig (6.9 bar) inlet pressure and 80 psig (5.5 bar) set pressure

How to Order

- Particulate Filter/Regulator

Model
P = Particulate Filter/Regulator

Series
14 = 1.5 oz. Bowl
22 = 3.8 oz. Bowl
32 = 8.5 oz. Bowl
42 = 8.5 oz. Bowl

Style
B = 5 Micron Element

Threads
- = NPTF

Options
A = Auto Drain (22, 32, and 42 Series)
G = Gauge
J = External Pulse Drain (14 Series)
M = Metal Bowl with Sight Glass
Q = Metal Manual Drain

Port Size
02 = 1/4 (14 or 22 Series)
03 = 3/8 (22 Series)
04 = 1/2 (22 or 32 Series)
06 = 3/4 (32 Series)
08 = 1 (42 Series)
Coalescing Filter/Regulators

C14D, C22D, C32D, C42D Series

• Four convenient sizes
• Cartridge element design
• Inner/outer support cores prevent element from crushing in either flow direction
• Manual or automatic drain
• Polycarbonate bowl standard
• Optional metal bowl (sight glass available on 22, 32 and 42 Series)
• Standard output pressure 0-125 PSIG

Recommended Uses

D grade element, identified by its green drain layer, is a fine filter for cylinder or valves - especially when the circuit is being run without lubrication ('dry'). Excellent filter for desiccant or regenerative style dryers.

Specifications

<table>
<thead>
<tr>
<th>Bowl</th>
<th>14 Series</th>
<th>22 Series</th>
<th>32 Series</th>
<th>42 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Range °F (°C)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
</tr>
<tr>
<td>Max. Pressure PSIG (BAR)</td>
<td>Poly C 150 (10)</td>
<td>150 (10)</td>
<td>150 (10)</td>
<td>150 (10)</td>
</tr>
<tr>
<td></td>
<td>Metal 200 (14)</td>
<td>200 (14)</td>
<td>200 (14)</td>
<td>200 (14)</td>
</tr>
<tr>
<td></td>
<td>Poly C 0.80 (0.35)</td>
<td>0.92 (0.42)</td>
<td>1.82 (0.83)</td>
<td>5.05 (2.29)</td>
</tr>
<tr>
<td></td>
<td>Metal 0.85 (0.38)</td>
<td>1.60 (0.73)</td>
<td>2.95 (1.34)</td>
<td>6.15 (2.76)</td>
</tr>
<tr>
<td>Weight lbs. (kg)</td>
<td>Nominal Flow SCFM (L/M)*</td>
<td>20 (560)</td>
<td>35 (991)</td>
<td>50 (1416)</td>
</tr>
<tr>
<td>Body Material</td>
<td>Zinc</td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
</tr>
</tbody>
</table>

*Nominal flow using a 0.3 micron element, at 100 psig (6.9 bar) inlet pressure and 80 psig (5.5 bar) set pressure

How to Order

- Coalescing Filter/Regulators

Model
C = Coalescing Filter/Regulators

Series
14 = 1.5 oz. Bowl
22 = 3.8 oz. Bowl
32 = 6.5 oz. Bowl
42 = 8.5 oz. Bowl

Element
D = 0.3 Micron Fine Coalescer

Threads
- = NPTF

Options
A = Auto Drain (22, 32, and 42 Series)
D = 3 Micron, Internal Pleated Prefilter
G = Gauge
J = External Pulse Drain (14 Series)
M = Metal Bowl with Sight Glass
Q = Metal Manual Drain

Port Size
02 = 1/4 (14 or 22 Series)
03 = 3/8 (22 Series)
04 = 1/2 (22 or 32 Series)
06 = 3/4 (32 Series)
08 = 1 (42 Series)
L14, L22, L32, L42 Series

- Four convenient sizes
- Lubrication to begin at 2 SCFM
- Can be filled under pressure (22, 32 and 42 series)
- Tamper-resistant knob standard
- Polycarbonate bowl standard
- Optional metal bowl (sight glass available on 22, 32 and 42 Series)
- Can be mounted as individual or modular unit

Specifications

<table>
<thead>
<tr>
<th></th>
<th>14 Series</th>
<th>22 Series</th>
<th>32 Series</th>
<th>42 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Range °F (°C)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
</tr>
<tr>
<td>Max. Pressure PSIG (BAR)</td>
<td>200 (14)</td>
<td>200 (14)</td>
<td>200 (14)</td>
<td>200 (14)</td>
</tr>
<tr>
<td>Weight lbs. (kg)</td>
<td>0.60 (0.27)</td>
<td>0.69 (0.31)</td>
<td>1.37 (0.62)</td>
<td>4.15 (2.18)</td>
</tr>
<tr>
<td>Body Material</td>
<td>Zinc</td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
</tr>
</tbody>
</table>

How to Order

2DAY - Lubricators

<table>
<thead>
<tr>
<th>Model</th>
<th>L = Lubricator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>14 = 1.5 oz. Bowl</td>
</tr>
<tr>
<td></td>
<td>22 = 3.8 oz. Bowl</td>
</tr>
<tr>
<td></td>
<td>32 = 8.5 oz. Bowl</td>
</tr>
<tr>
<td></td>
<td>42 = 8.5 oz. Bowl</td>
</tr>
<tr>
<td>Style</td>
<td>L = Standard Lubricators</td>
</tr>
<tr>
<td>Threads</td>
<td>= NPTF</td>
</tr>
</tbody>
</table>

Options

M = Metal Bowl with Sight Glass

<table>
<thead>
<tr>
<th>Port Size</th>
<th>02 = 1/4 (14 or 22 Series)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>03 = 3/8 (22 Series)</td>
</tr>
<tr>
<td></td>
<td>04 = 1/2 (22 or 32 Series)</td>
</tr>
<tr>
<td></td>
<td>06 = 3/4 (32 Series)</td>
</tr>
<tr>
<td></td>
<td>09 = 1 (42 Series)</td>
</tr>
</tbody>
</table>
S22C, S32C, S42C Series

- Three convenient sizes
- Lockout feature prevents unauthorized pressurization of system.
- High exhaust capacity for quick depletion of downstream pressure
- High inlet to outlet flow capability
- Connects easily to FlexiBlok® Modular system
- Incorporated metering valve controls how quickly downstream pressure is reached, which controls the slow start feature.

Specifications

<table>
<thead>
<tr>
<th></th>
<th>22 Series</th>
<th>32 Series</th>
<th>42 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust Ports NPTF</td>
<td>1/2</td>
<td>1/2</td>
<td>3/8 (3 exh. ports)</td>
</tr>
<tr>
<td>Gauge Ports NPTF</td>
<td>1/8</td>
<td>1/4</td>
<td>1/4</td>
</tr>
<tr>
<td>Temperature Range °F (°C)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
<td>40-120 (4-50)</td>
</tr>
<tr>
<td>Min. Pressure PSI (BAR)</td>
<td>60 (4)</td>
<td>60 (4)</td>
<td>20 (1.38)</td>
</tr>
<tr>
<td>Max. Pressure PSI (BAR)</td>
<td>150 (10)</td>
<td>150 (10)</td>
<td>150 (10)</td>
</tr>
<tr>
<td>Weight lbs. (kg)</td>
<td>0.94 (0.43)</td>
<td>1.56 (0.71)</td>
<td>4.35 (1.97)</td>
</tr>
<tr>
<td>Body Material</td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
</tr>
</tbody>
</table>

How to Order

2DAY - Solenoid Soft Start Quick Exhaust Valve

Model

S = Solenoid Soft Start

Series

22
32
42

Element

C = Solenoid Soft Start

Threads

= NPTF

Options

E = 110V AC 50/60 Hz
G = Gauge
K = 24V DC Coil
L = Plug with Light
M = Muffler

Revision Level

B

Port Size

02 = 1/4 (22 Series)
03 = 3/8 (22 Series)
04 = 1/2 (22 or 32 Series)
06 = 3/4 (32 Series)
08 = 1 (42 Series)
FRLs

**FLEXIBLOK® Solenoid Quick Exhaust Valve**

**S14E, S22E, S32E, S42E Series**

- Four convenient sizes
- Lockout feature (located in slide valve) prevents unauthorized pressurization of system (22, 32, and 42 Series)
- Standard manual override
- Low-wattage coil
- High exhaust capacity for quick depletion of pressure
- High inlet to outlet flow capability
- Connects easily to Flexiblok® Modular system

**Specifications**

<table>
<thead>
<tr>
<th>Series</th>
<th>Exhaust Ports NPTF</th>
<th>Gauge Ports NPTF</th>
<th>Temperature Range °F (°C)</th>
<th>Min. Pressure PSI (BAR)</th>
<th>Max. Pressure PSI (BAR)</th>
<th>Weight lbs. (kg)</th>
<th>Body Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Series</td>
<td>1/2</td>
<td>1/2</td>
<td>40-120 (4-50)</td>
<td>60 (4)</td>
<td>150 (10)</td>
<td>0.94 (0.43)</td>
<td>Zinc</td>
</tr>
<tr>
<td>22 Series</td>
<td>1/2</td>
<td>1/2</td>
<td>40-120 (4-50)</td>
<td>60 (4)</td>
<td>150 (10)</td>
<td>0.94 (0.43)</td>
<td>Aluminum</td>
</tr>
<tr>
<td>32 Series</td>
<td>1/2</td>
<td>1/4</td>
<td>40-120 (4-50)</td>
<td>60 (4)</td>
<td>150 (10)</td>
<td>1.56 (0.71)</td>
<td>Aluminum</td>
</tr>
<tr>
<td>42 Series</td>
<td>3/8</td>
<td>1/4</td>
<td>40-120 (4-50)</td>
<td>20 (1.38)</td>
<td>150 (10)</td>
<td>4.35 (1.97)</td>
<td>Aluminum</td>
</tr>
</tbody>
</table>

**How to Order**

**2DAY - Solenoid Quick Exhaust Valve**

Model:
- **S** = Solenoid Quick Exhaust

Series:
- **14**
- **22**
- **32**
- **42**

Style:
- **E** = Solenoid Quick Exhaust Valve

Threads:
- **-** = NPTF

**Options**
- **E** = 110V AC 50/60 Hz
- **G** = Gauge
- **K** = 24V DC Coil
- **L** = Plug with Light
- **M** = Muffler

**Revision Level**
- **B**

**Port Size**
- **02** = 1/4 (14 and 22 Series)
- **03** = 3/8 (22 Series)
- **04** = 1/2 (22 or 32 Series)
- **06** = 3/4 (32 Series)
- **08** = 1 (42 Series)
**FRLs**

**2 Day - Shut-Off Valve**

VS14, VS22, VS32, VSL42 Series

The FlexiBlok® Shut-Off Valve is an easy and inexpensive way to add shut off capability to an FRL. The valve includes a lockout feature designed for a padlock to prevent unauthorized downstream pressurization during maintenance. The shut off valve is usually mounted first in the assembly.

Max. inlet pressure: 200 PSI (13.7 bar)

250 PSI (17 bar) - 42 Series

- Relieves downstream pressure when closed
- Lockout feature prevents unauthorized pressurization of system.

<table>
<thead>
<tr>
<th>NPTF</th>
<th>VS14-02</th>
<th>VS22-02</th>
<th>VS22-03</th>
<th>VS22-04</th>
<th>VS32-04</th>
<th>VS32-06</th>
<th>VSL42-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.63 (41)</td>
<td>2.0 (50)</td>
<td>2.0 (50)</td>
<td>2.0 (50)</td>
<td>2.25 (57)</td>
<td>2.25 (57)</td>
<td>3.2 (83)</td>
</tr>
<tr>
<td>B</td>
<td>1.6 (41)</td>
<td>2.16 (55)</td>
<td>2.16 (55)</td>
<td>2.16 (55)</td>
<td>3.0 (76)</td>
<td>3.0 (76)</td>
<td>4.0 (102)</td>
</tr>
<tr>
<td>C</td>
<td>1.6 (41)</td>
<td>1.86 (47)</td>
<td>1.86 (47)</td>
<td>1.86 (47)</td>
<td>2.57 (65)</td>
<td>2.57 (65)</td>
<td>4.8 (122)</td>
</tr>
<tr>
<td>D</td>
<td>3 (76)</td>
<td>3.1 (79)</td>
<td>3.1 (79)</td>
<td>3.1 (79)</td>
<td>4.2 (107)</td>
<td>4.2 (107)</td>
<td>9.3 (236)</td>
</tr>
<tr>
<td>Ports</td>
<td>1/4</td>
<td>1/4</td>
<td>3/8</td>
<td>1/2</td>
<td>1/2</td>
<td>3/4</td>
<td>1</td>
</tr>
</tbody>
</table>

**2 Day - Diverter Block and Gauges**

DK14, DK22, DK32, DK42 Series

Designed to give FlexiBlok® components total versatility, the diverter block mounts directly inline with the FRL combination. Additional components can then be manifold mounted in a compact manner that doesn’t cause excessive pressure drop. There are two available tapped ports per unit.

Max. inlet pressure: 200 PSI (13.7 bar) (14, 22, 32 Series)

250 PSI (17 bar) (42 Series)

<table>
<thead>
<tr>
<th>Series</th>
<th>NPTF</th>
<th>DK14-02</th>
<th>DK22-03</th>
<th>DK32-04</th>
<th>DK42-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.72 (44)</td>
<td>2.16 (55)</td>
<td>3.00 (76)</td>
<td>4.00 (102)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1.54 (39)</td>
<td>2.00 (50)</td>
<td>2.70 (69)</td>
<td>3.40 (87)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.6 (41)</td>
<td>2.16 (55)</td>
<td>3.00 (76)</td>
<td>4.00 (102)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1/8</td>
<td>1/2</td>
<td>3/4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>1/8</td>
<td>3/8</td>
<td>1/2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ports</td>
<td>Tapped 1/4 NPTF In &amp; Out with two 1/8 NPTF branches</td>
<td>Tapped 1/2 NPTF In &amp; Out with two 3/8 NPTF branches</td>
<td>Tapped 3/4 NPTF In &amp; Out with two 1/2 NPTF branches</td>
<td>In &amp; Out and branches 1 with two 1 NPTF branches</td>
<td></td>
</tr>
</tbody>
</table>

**Gauges**

<table>
<thead>
<tr>
<th>Model</th>
<th>Face Diameter</th>
<th>Thread Size</th>
<th>Pressure Range PSI (BAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>214-103</td>
<td>1.5</td>
<td>1/8 NPT</td>
<td>0-160 (0-11)</td>
</tr>
<tr>
<td>201-188</td>
<td>2.0</td>
<td>1/4 NPT</td>
<td>0-160 (0-11)</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
02 Series
5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 0.20

R2 Series
5 Ported, 2 and 3 position, 4-way and dual 3-way, Packed Spool
Cv: 0.25 (4-way) 0.20 (Dual 3-way)
- Solenoid air pilot actuated
- Low wattage plug-in - 0.5 watt for DC application
- Elimination of internal wiring
- Pusher piston – high spool shifting force
- Compact/modular Fieldbus electronics
- Interchangeable Push-In fittings to accommodate various tube sizes

02 Series - Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>9.2 SCFM @ 60 PSIG upstream pressure to atmosphere</td>
<td>197 Nm³ @ 6 bar upstream to 5 bar downstream</td>
</tr>
<tr>
<td>Operating Pressure Range</td>
<td>28&quot; Hg. vacuum to 150 PSIG</td>
<td>Vacuum to 10 bar</td>
</tr>
<tr>
<td>Pilot Pressure Range</td>
<td>35 to 100 PSIG</td>
<td>2.5 to 7 bar</td>
</tr>
<tr>
<td>Temperature Range (Ambient)</td>
<td>-10°F to +115°F</td>
<td>-23°C to +46°C</td>
</tr>
</tbody>
</table>

R2 Series - Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>11.5 SCFM @ 60 PSIG upstream pressure to atmosphere</td>
<td>246 Nm³ @ 6 bar upstream to 5 bar downstream</td>
</tr>
<tr>
<td>Operating Pressure Range: 4 way</td>
<td>28&quot; Hg. vacuum to 100 PSIG</td>
<td>Vacuum to 7 bar</td>
</tr>
<tr>
<td>Dual 3 Way</td>
<td>0 to 100 PSIG</td>
<td>0 to 7 bar</td>
</tr>
<tr>
<td>Pilot Pressure Range</td>
<td>35 to 100 PSIG</td>
<td>2.5 to 7 bar</td>
</tr>
<tr>
<td>Temperature Range (Ambient)</td>
<td>-10°F to +115°F</td>
<td>-23°C to +46°C</td>
</tr>
</tbody>
</table>

02 Series - Operating Data

<table>
<thead>
<tr>
<th>All solenoids are continuous duty rated</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Watts)</td>
<td>0.50</td>
</tr>
<tr>
<td>Holding Current (Amps)</td>
<td>0.02</td>
</tr>
<tr>
<td>Response time in sec.</td>
<td>Energize</td>
</tr>
<tr>
<td>2 - Position, Single, Spring Return</td>
<td>0.014</td>
</tr>
<tr>
<td>2 - Position, Double, Detented</td>
<td>0.010</td>
</tr>
<tr>
<td>3 - Position, Spring Centered</td>
<td>0.009</td>
</tr>
</tbody>
</table>

R2 Series - Operating Data

<table>
<thead>
<tr>
<th>All solenoids are continuous duty rated</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Watts)</td>
<td>0.50</td>
</tr>
<tr>
<td>Holding Current (Amps)</td>
<td>0.02</td>
</tr>
<tr>
<td>Response time in sec.</td>
<td>Energize</td>
</tr>
<tr>
<td>2 - Position, Single, Spring Return</td>
<td>0.017</td>
</tr>
<tr>
<td>2 - Position, Double, Detented</td>
<td>0.010</td>
</tr>
<tr>
<td>3 - Position, Spring Centered</td>
<td>0.009</td>
</tr>
<tr>
<td>Dual 3-way</td>
<td>0.018</td>
</tr>
</tbody>
</table>
How to Order

Valves

Series Identifier
02 = Spool/Sleeve with Body to Base Plug
R2 = Rubber Packed Spool With Body to Base Plug

Port Size
0 = Used for Valve Unit Only, Mounting = 00
2 = 1/4

“A” & “B” Actuator
B = Solenoid Pilot with Flush Non-Locking Override (4th or 4th And 5th Position)
W = Differential Air Return (5th Position Only)
00 = Manifold Block without Valve (Blank Station)

Function
4 = 2 Position, 4-Way
5 = 3 Position, 4-Way, Open Center, Dual Pressure
6 = 3 Position, 4-Way, Closed Center
D = Dual 3-Way, A Normally Closed - B Normally Closed*
P = Indicates Blank Station Plate

Voltage
00 = Blank Station
61 = 24 VDC

Options
000 = No Options

Port Type
K = Push-In Fitting (Manifold Mount Only)
P = Valve Unit Only

Wiring Option
M = Plug-In DC w/Light
O = Blank Station Plate

Mounting
Z4 = Manifold Block, Side Ports Only, Double Solenoid Output
00 = Valve Unit Only

*Valve Functions for use in Pressure Applications only

Manifold Assemblies

Valve Line
6 = 2002 Series

Electrical/Electronics
Type & Location
3 = G3 Electronics
F = Terminal Strip
J = 25 Pin Sub-D

Options
DWM = DIN Rail with MUF

Port Type
L = Push-In

End Plate Port Size
2 = 1/4 (Port type "L" only)

*Number of Valve Stations
B = 2  F = 6
C = 3  G = 7
D = 4  H = 8
E = 5

See How To Order Manifolds (pg. 32-33) for Ordering Details.
2005 Series

5 Ported, 2 and 3 position, 4-way, Spool & Sleeve

Cv: 0.56

Dual 3-Way Pack Spool Cv: 0.56

- Solenoid air pilot actuated
- Low wattage plug-in - 1.0 watt for DC application
- DC solenoids polarity insensitive with surge suppression
- Plug together circuit boards eliminate internal wiring
- Integral recessed gaskets
- Interchangeable Push-In fittings to accommodate various tube sizes
- Simple conversion from internal to external pilot supply
- Modular plug-together Fieldbus electronics
- NEMA 4/IP65

Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>0.56</td>
<td>0.56</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>26 SCFM @ 80 PSIG upstream pressure to atmosphere</td>
<td>552 Ni/m @ 6 bar upstream to 5 bar downstream</td>
</tr>
<tr>
<td>Operating Pressure Range</td>
<td>28° Hg. Vacuum to 150 PSIG</td>
<td>Vacuum to 10 bar</td>
</tr>
<tr>
<td>Operating Pressure Range – 3 Way</td>
<td>22° Hg. Vacuum to 100 PSIG</td>
<td>Vacuum to 7 bar</td>
</tr>
<tr>
<td>Pilot Pressure Range</td>
<td>26 to 120 PSIG</td>
<td>1.8 to 8.2 bar</td>
</tr>
<tr>
<td>Pilot Pressure Range – 3 Way</td>
<td>26 to 100 PSIG</td>
<td>1.8 to 7 bar</td>
</tr>
<tr>
<td>Pilot Pressure Vacuum</td>
<td>50 to 100 PSIG</td>
<td>3.5 to 7 bar</td>
</tr>
<tr>
<td>Temperature Range (Ambient)</td>
<td>-10°F to +115°F</td>
<td>-23°C to +46°C</td>
</tr>
</tbody>
</table>

Operating Data

<table>
<thead>
<tr>
<th>All solenoids are continuous duty rated</th>
<th>24 VDC</th>
<th>110-120 VAC / 50/60 Hz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Watts)</td>
<td>1.35</td>
<td>4.2</td>
</tr>
<tr>
<td>Holding Current (Amps)</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Response time in seconds</td>
<td>Energize</td>
<td>De-energize</td>
</tr>
<tr>
<td>2 - Position, Single, Spring Return</td>
<td>0.014</td>
<td>0.016</td>
</tr>
<tr>
<td>2 - Position, Double, Detented</td>
<td>0.013</td>
<td>N/A</td>
</tr>
<tr>
<td>3 - Position, Spring Centered</td>
<td>0.014</td>
<td>0.016</td>
</tr>
<tr>
<td>Dual 3 Way</td>
<td>0.014</td>
<td>0.016</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
### Valves

**Valve Series & Port Size**
- **051** = 1/8 (Threaded only)
- **052** = 1/4 (Push-In only)
  
  *Use for valve unit only (Mounting = 00)*

**Valve Type**
- **BA** = Single Solenoid Pilot, (Spring Return) w/Flush Non-Locking Override
- **BB** = Double Solenoid Pilot w/Flush Non-Locking Override
- **00** = Blank Station

**Function**
- **4** = 2 Position, 4-way
- **5** = 3 Position, 4-way Open Center
- **6** = 3 Position, 4-way Closed Center
- **D** = Dual 3-way, A Normally Closed - B Normally Closed
- **P** = Indicates Blank Station

**Mounting**
- **00** = Valve Unit only
- **Z2** = Manifold Block w/ Side and Bottom Ports, Double Solenoid Internal Circuit Board
- **3A** = Individual Base, Side Ports, Individual Exhaust (1/4 Ports Only)

---

### Regulators

**Valve Series & Port Size**
- **051** = 1/8
- **052** = 1/4 (Push-In only)
  
  *Use for regulator unit only (Mounting = 00)*

**Regulator Type**
- **RS** = Single Pressure to Port 1(P)
- **RD** = Dual Pressure to Ports 3(EB) & 5(EA)

**Pressure Range**
- **1** = 10-130 PSIG (0.7-9 bar)

**Mounting**
- **00** = Regulator Unit Only
- **Z2** = Manifold Block w/ Side & Bottom Ports, Double Solenoid Internal Circuit Board

---

### Assembly Kit

**Electrical/Electronics**
- **Type & Location**
  - **3** = G3 Electronics
  - **F** = Terminal Strip 1-16
  - **J** = 25 Pin Sub-D

**Valve Series**
- **E** = 2005 Series

**Number of Valve Stations**
- **B** = 2
- **C** = 3
- **D** = 4
- **E** = 5

---

See How To Order Manifolds (pg. 32-33) for Ordering Details.
2012 Series

5 Ported, 2 and 3 position, 4-way, Spool & Sleeve

- Solenoid air pilot actuated
- Low wattage plug-in – 2.5 watt for DC application
- DC solenoids polarity insensitive with surge suppression
- Plug together circuit boards eliminate internal wiring.
- Integral recessed gaskets
- Interchangeable Push-In fittings to accommodate various tube sizes
- Simple conversion from internal to external pilot
- Modular plug-together Fieldbus electronics
- NEMA 4/IP65

Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>1.20</td>
<td>1.20</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>56 SCFM @ 80 PSIG upstream pressure to atmosphere</td>
<td>1180 Nl/m @ 6 bar upstream to 5 bar downstream</td>
</tr>
<tr>
<td>Operating Pressure Range</td>
<td>28”Hg Vacuum to 150 PSIG</td>
<td>Vacuum to 10 bar</td>
</tr>
<tr>
<td>Pilot Pressure Range</td>
<td>26 to 120 PSIG</td>
<td>1.8 to 8.2 bar</td>
</tr>
<tr>
<td>Temperature Range (Ambient)</td>
<td>-10°F to + 115°F</td>
<td>-23°C to +46°C</td>
</tr>
</tbody>
</table>

Operating Data

<table>
<thead>
<tr>
<th>All Solenoids are Continuous Duty Rated</th>
<th>24 VDC</th>
<th>110 - 120 VAC 50/60 Hz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Watts)</td>
<td>2.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Holding Current (Amps.)</td>
<td>0.10</td>
<td>0.05</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Response Time in Seconds</th>
<th>Energize</th>
<th>De-energize</th>
<th>Energize</th>
<th>De-energize</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Position, Single, Spring Return</td>
<td>0.010</td>
<td>0.020</td>
<td>0.010</td>
<td>0.020</td>
</tr>
<tr>
<td>2-Position, Double, Detented</td>
<td>0.010</td>
<td>N/A</td>
<td>0.010</td>
<td>N/A</td>
</tr>
<tr>
<td>3-Position, Spring Centered</td>
<td>0.010</td>
<td>0.020</td>
<td>0.010</td>
<td>0.020</td>
</tr>
</tbody>
</table>
How to Order

**Valves**

**Valve Series & Port Size**
- 122 = 1/4
- 123 = 3/8

*Use for valve unit only (Mounting = 00).

**Valve Type**
- BA = Single Solenoid Pilot, (Spring Return) w/Flush Non-Locking Override
- BB = Double Solenoid Pilot w/Flush Non-Locking Override
- 00 = Blank Station

**Function**
- 4 = 2 Position, 4-way
- 5 = 3 Position, 4-way Open Center
- 6 = 3 Position, 4-way Closed Center
- P = Blank Station Plate

**Mounting**
- 00 = Valve Unit only
- 3A = Individual Base, Side Ports, Individual Exhaust (3/8 Ports Only)
- Z2 = Manifold Block w/Side and Bottom Ports
  Double Solenoid Internal Circuit Board

**Voltage**
- 00 = Blank Station
- 30 = 110-120/50-60 VAC
- 61 = 24 VDC

**Special Options**
- 000 = No Options

**Port Type**
- L = Push-In Fitting
- N = NPTF
- 0 = Valve Unit only

**Wiring Option**
- K = Plug-In AC w/Light
- M = Plug-In DC w/Light
- O = Blank Station

**Regulators**

**Valve Series & Port Size**
- 122 = 1/4
- 123 = 3/8

*Use for regulator unit only (Mounting = 00).

**Regulator Type**
- RS = Single Pressure to Port 1 (P)
- RD = Dual Pressure to Ports 3 (EB) & 5 (EA)

**Pressure Range**
- 1 = 10-130 PSIG (0.7-9 bar)

**Special Options**
- 000 = No Options
- 16W = Top Facing Gauge

**Port Type**
- 0 = Regulator Unit Only
- L = Push-In
- N = NPTF

**Wiring Option**
- J = Plug-In Receptacle Assembly

**Mounting**
- 00 = Regulator Unit Only
- Z2 = Manifold Block w/Side and Bottom Ports
  Double Solenoid Internal Circuit Board

**Assembly Kit**

**Electrical Connection**

<table>
<thead>
<tr>
<th>Type &amp; Location</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 = G3 Electronics</td>
<td></td>
</tr>
<tr>
<td>F = Terminal Strip 1-16</td>
<td></td>
</tr>
<tr>
<td>J = 25 Pin Sub-D</td>
<td></td>
</tr>
</tbody>
</table>

**Valve Series**
- G = 2012 Series

**Number of Valve Stations**
- B = 2
- C = 3
- D = 4
- E = 5

**Options**
- STD = Standard
- MUF = Muffler in End Plates

**Port Type**
- L = Push-In
- N = NPTF

**End Plate Port Size 2012**
- 3 = Port Type L or N
  Port 1 = 3/8
  Port 3/5 = 1/2

See How To Order Manifolds (pg. 32-33) for Ordering Details.
2035 Series

5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 3.5
- Solenoid air pilot actuated
- Low wattage plug-in - 2.5 watt for DC application
- DC solenoids polarity insensitive with surge suppression
- Plug together circuit boards eliminate internal wiring.
- Integral recessed gaskets
- Simple conversion from internal to external pilot supply
- Modular plug-together Fieldbus electronics
- Designed to meet NEMA 4/IP65
- Manifold connection allows disassembly at any station.

Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv*</td>
<td>3.5&quot;</td>
<td>3.5&quot;</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>161 SCFM @ 80 PSIG upstream pressure to atmosphere</td>
<td>3500 Nl/m @ 6 bar upstream pressure to 5 bar atmosphere</td>
</tr>
<tr>
<td>Operating Pressure Range</td>
<td>28&quot; Hg. Vacuum to 145 PSIG</td>
<td>Vacuum to 10 bar</td>
</tr>
<tr>
<td>Pilot Pressure Range</td>
<td>26.1 to 120 PSIG</td>
<td>1.8 to 8.2 bar</td>
</tr>
<tr>
<td>Temperature Range (Ambient)</td>
<td>-10°F to +115°F</td>
<td>-23°C to +46°C</td>
</tr>
</tbody>
</table>

Operating Data

- All solenoids are continuous duty rated

<table>
<thead>
<tr>
<th>All solenoids are continuous duty rated</th>
<th>24 VDC</th>
<th>110-120 VAC / 50/60 Hz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Watts)</td>
<td>2.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Holding Current (Amps)</td>
<td>0.10</td>
<td>0.03</td>
</tr>
<tr>
<td>Response time in seconds**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 - Position, Single, Spring Return</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.021</td>
<td>0.015</td>
</tr>
<tr>
<td>2 - Position, Double, Detented</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.017</td>
<td>0.015</td>
</tr>
<tr>
<td>3 - Position, Spring Centered</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.021</td>
<td>0.018</td>
</tr>
</tbody>
</table>

* Valve on 1/2 NPTF Sub-Plate
** Per ISO12238 Standard
## How to Order

### Valves

**Valve Series & Port Size**
- 353 = 3/8
- 354 = 1/2

*Use for valve unit only (Mounting = 00).

**Valve Type**
- BA = Single Solenoid Pilot, (Spring Return) w/Flush Non-Locking Override
- BB = Double Solenoid Pilot w/Flush Non-Locking Override
- 00 = Blank Station Plate

**Function**
- 4 = 2 Position, 4-way
- 5 = 3 Position, 4-way Open Center
- 6 = 3 Position, 4-way Closed Center
- P = Blank Station Plate

**Mounting**
- 00 = Valve Unit only
- 3A = Individual Base, Side Ports, Individual Exhaust (1/2 Ports Only)
- Z2 = Manifold Block w/Side and Bottom Ports Double Solenoid Internal Circuit Board

### Regulators

**Valve Series & Port Size**
- 353 = 3/8
- 354 = 1/2

*Use for regulator unit only (Mounting = 00).

**Regulator Type**
- RS = Single Pressure to Port 1 (P)
- RD = Dual Pressure to Ports 3 (EB) & 5 (EA)

**Pressure Range**
- 1 = 10-130 PSIG (0.7-9 bar)

### Assembly Kit

**Electrical Connection**
- F = Terminal Strip 1-16
- J = 25 Pin Sub-D
- 3 = G3 Electronics

**Valve Series**
- B = 2035 Series

**Number of Valve Stations**
- B = 2
- C = 3
- D = 4
- E = 5

**Options**
- MUF = Muffler in End Plates

**Port Type**
- N = NPTF

**End Plate Port Size**
- 4 = 1/2

See How To Order Manifolds (pg. 32-33) for Ordering Details.
Mark 3 Series

5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 0.35
- Direct solenoid actuated
- DIN plug-in solenoid with indicator light
- Un lubricated or lubricated service
- Integral regulators available
- NEMA 4/IP65

Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>1/8 NPTF = 0.35 10-32 UNF = 0.18</td>
<td>1/8 = 0.35 M5 = .018</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>16.21 SCFM 8.34 SCFM</td>
<td>345 Nl/m 177 Nl/m</td>
</tr>
<tr>
<td>Upstream pressure to atmosphere @80 PSIG</td>
<td>@ 6 bar upstream/5 bar downstream</td>
<td></td>
</tr>
<tr>
<td>Operating Pressure Range</td>
<td>28” HG. Vacuum to 150 PSIG</td>
<td>Vacuum to 10 Bar</td>
</tr>
<tr>
<td>Temperature Range (ambient)</td>
<td>Direct Solenoid</td>
<td>-10°F to +115°F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-23°C to +46°C</td>
</tr>
</tbody>
</table>

Operating Data - Mark 3

All Solenoids are Continuous Duty Rated
24 VDC 115 VAC 50 Hz. 120 VAC 60 Hz.

**Power (Watts)**
- 6.0 5.5 4.0

**Holding Current (Amps.)**
- 0.250 0.063 0.052

**Inrush Current (Amps.)**
- N/A 0.093 0.090

**Energize in seconds**
- 2-Position, Single, Spring Return 0.012 0.008 0.008
- 2-Position, Double, Detented 0.012 0.008 0.008
- 3-Position, Spring Centered 0.012 0.008 0.008

**De-energize in seconds**
- 2-Position, Single, Spring Return 0.008 0.012 0.012
- 2-Position, Double, Detented N/A N/A N/A
- 3-Position, Spring Centered 0.008 0.012 0.012

Plug Connector Assemblies
Per DIN Spec. NO 43650. Accepts cable diameter 0.240 to 0.310.
11mm Industry Standard DIN Form B

Plug Connector Description

<table>
<thead>
<tr>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray (14 end solenoid) Plug Assembly</td>
</tr>
<tr>
<td>Black (12 end solenoid) Plug Assembly</td>
</tr>
<tr>
<td>Plug Assembly with 24 V Light</td>
</tr>
<tr>
<td>Plug Assembly with 110 V Light</td>
</tr>
</tbody>
</table>
How to Order

Valves

Valve Series & Port Size
031 = 1/8

Valve Type
SA = Single Solenoid, Spring Return
SS = Double Solenoid w/Flush Non-Locking Override
00 = Blank Station

Function
4 = 2 Position, 4-Way
5 = 3 Position, 4-Way Open Center
6 = 3 Position, 4-Way Closed Center
P = Blank Station Plate

Mounting
00 = Valve Unit Only
15 = Manifold Block w/ Side and Bottom Ports
41 = Standard Base, Side Ports, Individual Exhaust

Voltage
30 = 110-120/50-60 VAC
61 = 24 VDC
00 = Blank Station

Special Options
000 = No Options

Port Type
0 = NPTF

Wiring Option
2 = DIN Plug-In AC Solenoid
4 = DIN Plug-In DC Solenoid
O = Blank Station

Regulators

Valve Series & Port Size
031 = 1/8

Regulator Type
RS = Single Pressure to Port 1 (P)
RD = Dual Pressure to Ports 3 (EB) & 5 (EA)

Pressure Range
7 = 0-100 PSI/G (0-6.9 Bar)

Mounting
00 = Regulator Unit Only

Special Options
000 = No Options

Port Type
0 = NPTF

Wiring Option
O = Non Plug-In

Assembly Kit

Electrical/Electronics Type & Location
0 = Standard

Valve Line
C = Mark 3 Series

Number of Valve Stations
B = 2
C = 3
D = 4
E = 5

Options
STD = Standard

Port Type
N = NPTF

End Plate Port Size
2 = 1/4

See How To Order Manifolds (pg. 32-33) for Ordering Details.
Mark 8 Series

5 Ported, 2 and 3 position, 4-way, Spool & Sleeve

- Cv: 0.8 - 1.0
- Direct solenoid actuated
- Plug-in solenoid with indicator light
- Un lubricated or lubricated service
- Integral regulators available
- NEMA 4/IP65

Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>1/8 NPTF = 0.80</td>
<td>1/4 NPTF = 1.0</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>37 SCFM</td>
<td>46 SCFM</td>
</tr>
</tbody>
</table>

- Upstream pressure to atmosphere @6 bar upstream/5 bar downstream

| Operating Pressure Range | 28" Hg. Vacuum to 150 PSIG | Vacuum to 10 Bar |
| Temperature Range (Ambient) | -10°F to +115°F | -23°C to +46°C |

Operating Data

<table>
<thead>
<tr>
<th>All Solenoids are Continuous Duty Rated</th>
<th>24 VDC</th>
<th>115 VAC 50 Hz.</th>
<th>120 VAC 60 Hz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Watts)</td>
<td>6.0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Holding Current (Amps.)</td>
<td>0.25</td>
<td>0.15</td>
<td>0.09</td>
</tr>
<tr>
<td>Inrush Current (Amps.)</td>
<td>N/A</td>
<td>0.41</td>
<td>0.38</td>
</tr>
<tr>
<td>Energize in seconds</td>
<td>0.032</td>
<td>0.011</td>
<td>0.011</td>
</tr>
<tr>
<td>2-Position, Single, Spring Return</td>
<td>0.028</td>
<td>0.012</td>
<td>0.012</td>
</tr>
<tr>
<td>3-Position, Spring Centered</td>
<td>0.028</td>
<td>0.012</td>
<td>0.012</td>
</tr>
<tr>
<td>2-Position, Single, Spring Return</td>
<td>0.010</td>
<td>0.011</td>
<td>0.011</td>
</tr>
<tr>
<td>De-energize in seconds</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3-Position, Spring Centered</td>
<td>0.008</td>
<td>0.018</td>
<td>0.018</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
How to Order

**Valves**

Valve Series & Port Size

<table>
<thead>
<tr>
<th>081*</th>
<th>1/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>082</td>
<td>1/4</td>
</tr>
</tbody>
</table>

*Valve Unit Only

Valve Type

<table>
<thead>
<tr>
<th>SA</th>
<th>Single Direct Solenoid, Spring Return w/Flush Non-Locking Override</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS</td>
<td>Double Direct Solenoid w/Flush Non-Locking Override</td>
</tr>
<tr>
<td>00</td>
<td>Blank Station</td>
</tr>
</tbody>
</table>

Function

<table>
<thead>
<tr>
<th>4</th>
<th>2 Position 4-Way (5/2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3 Position 4-Way (5/3), Open Center, Dual Pressure</td>
</tr>
<tr>
<td>6</td>
<td>3 Position 4-Way (5/3), Blocked Center</td>
</tr>
</tbody>
</table>

Mounting

<table>
<thead>
<tr>
<th>00</th>
<th>Valve Unit, w/o Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Manifold Block, Side &amp; Bottom Cylinder Ports</td>
</tr>
<tr>
<td>3A</td>
<td>Plug-In Base, Individual Exhaust, Side Cylinder Ports (1/4 Ports Only)</td>
</tr>
</tbody>
</table>

Voltage

<table>
<thead>
<tr>
<th>00</th>
<th>Blank Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>110-120 VAC, 50-60 Hz</td>
</tr>
<tr>
<td>61</td>
<td>24 VDC</td>
</tr>
</tbody>
</table>

Options

<table>
<thead>
<tr>
<th>000</th>
<th>No Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>46T</td>
<td>Zinc Plated Solenoid Armature (AC Only)</td>
</tr>
</tbody>
</table>

Port Type

| 0    | NPTF Pressure Ports w/NPTF Conduit Ports or Valve Unit w/o Mounting |

Wiring Option

| J    | Plug-In Receptacle Assembly                                     |

**Regulators**

Regulator Series & Port Size

<table>
<thead>
<tr>
<th>081*</th>
<th>1/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>082</td>
<td>1/4</td>
</tr>
</tbody>
</table>

*Regulator Unit Only

Regulator Type

<table>
<thead>
<tr>
<th>RS</th>
<th>Single Pressure to Port P(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD</td>
<td>Dual Pressure to Ports EB(3) &amp; EA(5)</td>
</tr>
</tbody>
</table>

Pressure Range

| 1    | 10-130 PSIG (0.7-9 Bar)                                         |

Mounting

<table>
<thead>
<tr>
<th>00</th>
<th>Regulator Unit Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Manifold Block w/Side and Bottom Cylinder Ports</td>
</tr>
<tr>
<td>3A</td>
<td>Individual Base, Side Ports, Individual Exhaust (1/4 Ports Only)</td>
</tr>
</tbody>
</table>

Options

| 000  | No Options                                                      |

Port Type

| 0    | NPTF Pressure Ports w/NPTF Conduit Ports                       |

Wiring Option

| J    | Plug-In Receptacle Assembly                                     |

**Assembly Kit**

Electrical/Electronics Type & Location

| 0    | Standard                                                        |

Valve Series

| H    | Mark 8 Series                                                   |

Number of Valve Stations

<table>
<thead>
<tr>
<th>B</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
</tr>
<tr>
<td>E</td>
<td>5</td>
</tr>
</tbody>
</table>

Options

| STD | Standard                                                        |

Port Type

| N    | NPTF Pressure Ports w/ NPTF Conduit Ports                       |

End Plate Port Size

| 3    | 3/8                                                            |

See How To Order Manifolds (pg. 32-33) for Ordering Details.
Mark 15 Series

Mark 15 Series

5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 1.5
- Direct solenoid actuated
- Plug-in solenoid with indicator light
- Un lubricated or lubricated service
- Integral regulators available
- NEMA 4/IP65
- Body to base plug-in

Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric Mark 15 Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>1/4 NPTF = 1.4 3/8 NPTF = 1.5</td>
<td>1/4 G Tap = 1.4 3/8 G Tap = 1.5</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>65 SCFM</td>
<td>69 SCFM</td>
</tr>
<tr>
<td></td>
<td>Upstream pressure to atmosphere @80 PSIG</td>
<td>@6 bar upstream/5 bar downstream</td>
</tr>
<tr>
<td>Operating Pressure Range</td>
<td>28&quot; Hg. Vacuum to 150 PSIG</td>
<td>Vacuum to 10 Bar</td>
</tr>
<tr>
<td>Temperature Range (ambient)</td>
<td>-10°F to +115°F</td>
<td>-23°C to +46°C</td>
</tr>
</tbody>
</table>

Operating Data

<table>
<thead>
<tr>
<th>All Solenoids are Continuous Duty Rated</th>
<th>24 VDC</th>
<th>115 VAC 50 Hz.</th>
<th>120 VAC 60 Hz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Watts)</td>
<td>6.0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Holding Current (Amps.)</td>
<td>0.250</td>
<td>0.110</td>
<td>0.090</td>
</tr>
<tr>
<td>Inrush Current (Amps.)</td>
<td>N/A</td>
<td>0.630</td>
<td>0.580</td>
</tr>
<tr>
<td>Energize in seconds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Position, Single, Spring Return</td>
<td>0.034</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>2-Position, Double, Detented</td>
<td>0.035</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>3-Position, Spring Centered</td>
<td>0.040</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>2-Position, Single, Spring Return</td>
<td>0.011</td>
<td>0.015</td>
</tr>
<tr>
<td>De-energize in seconds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Position, Double, Detented</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>3-Position, Spring Centered</td>
<td>0.010</td>
<td>0.012</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
### How to Order

#### Valves

**Valve Series & Port Size**
- 152* = 1/4
- 153 = 3/8

*Valve unit only

**Valve Type**
- SA = Single Solenoid, Spring Return
- SS = Double Direct Solenoid w/Flush Non-Locking Override (Standard)
- 00 = Blank Station

**Function**
- 4 = 2 Position, 4-Way
- 5 = 3 Position, 4-Way Open Center
- 6 = 3 Position, 4-Way Closed Center
- P = Blank Station Plate

**Mounting**
- 00 = Valve Unit, w/o Mounting
- 15 = Manifold Block, Side and Bottom Cylinder Ports
- 3A = Plug-In Base, Individual Exhaust, Side Cylinder Ports (1/4 Ports Only)

**Voltage**
- 00 = Blank Station
- 30 = 110-120 VAC, 50-60 Hz
- 61 = 24 VDC

**Options**
- 000 = No Options
- 46T = Zinc Plated Solenoid Armature (AC Only)

**Port Type**
- 0 = NPTF Pressure Ports w/NPTF Conduit
- Ports or Valve Unit w/o Mounting

**Wiring Option**
- K = Plug-In, w/ Light, VAC
- M = Plug-In, w/ Light, VDC
- O = Blank Station

#### Regulators

**Valve Series & Port Size**
- 152* = 1/4
- 153 = 3/8

*Regulator unit only

**Regulator Type**
- RS = Single Pressure to Valve P(1)
- RD = Dual Pressure to Valve EB(3) & EA(5)

**Pressure Range**
- 1 = 10-130 PSIG (0.7-9 bar)

**Mounting**
- 00 = Regulator Unit, w/o Mounting
- 15 = Manifold Block, Side and Bottom Cylinder Ports
- 3A = Plug-In Base, Individual Exhaust, Side Ports (1/4 Ports Only)

**Options**
- 000 = No Options

**Port Type**
- 0 = NPTF Pressure Ports w/NPTF Conduit
- Ports or Valve Unit w/o Mounting

**Wiring Option**
- J = Plug-In Receptacle Assembly

#### Assembly Kit

**Electrical/Electronics**
- Type & Location
  - 0 = Standard

**Valve Line**
- J = Mark 15 Series or PA 15 Series

**Number of Valve Stations**
- B = 2
- C = 3
- D = 4
- E = 5
- F = 6
- G = 7
- H = 8

**Options**
- STD = Standard

**Port Type**
- N = NPTF Pressure Ports w/NPTF Conduit
- Ports

**End Plate Port Size**
- 4 = 1/2

See How To Order Manifolds (pg. 32-33) for Ordering Details.

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
L1 Series

5 Ported, 2 and 3 position, 4-way, Spool & Sleeve

- Solenoid pilot or air pilot actuated
- DIN plug-in solenoid and plug connector with indicator light
- Unlubricated or lubricated service
- In-line or manifold mounted

Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>1/8 = 1.0</td>
<td>1/4 = 1.0</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>46 SCFM</td>
<td>985 Nl/m</td>
</tr>
<tr>
<td>Main Valve Operating Pressure Range</td>
<td>28* HG. Vacuum to 150 PSIG</td>
<td>Vacuum to 10 bar</td>
</tr>
<tr>
<td>Pilot Pressure Range: Internal and External</td>
<td>14.5 to 150 PSIG</td>
<td>1 to 10 bar</td>
</tr>
<tr>
<td>Temperature Range: Solenoid Pilot (ambient)</td>
<td>-10°F to +115°F</td>
<td>-23°C to +46°C</td>
</tr>
<tr>
<td>Temperature Range: Air Pilot (ambient)</td>
<td>-10°F to +150°F</td>
<td>-23°C to +66°C</td>
</tr>
</tbody>
</table>

Operating Data

<table>
<thead>
<tr>
<th>All Solenoids are Continuous Duty Rated</th>
<th>24 VDC</th>
<th>115 VAC 50 Hz.</th>
<th>120 VAC 60 Hz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Power (Watts)</td>
<td>3.5</td>
<td>4.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Holding Current (Amps.)</td>
<td>0.15</td>
<td>0.064</td>
<td>0.054</td>
</tr>
<tr>
<td>Inrush Current (Amps.)</td>
<td>N/A</td>
<td>0.087</td>
<td>0.082</td>
</tr>
<tr>
<td>Energize in seconds</td>
<td>2-Position, Single, Spring Return</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>2-Position, Double, Detented</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>3-Position, Spring Centered</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td>De-energize in seconds</td>
<td>2-Position, Single, Spring Return</td>
<td>0.035</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>2-Position, Double, Detented</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>3-Position, Spring Centered</td>
<td>0.035</td>
<td>0.035</td>
</tr>
</tbody>
</table>

*A 1.4 Watt DC solenoid is available. Add "17G" to the model number.

EXAMPLE: L12BA400B017G61.

Maximum pilot pressure is reduced to 116 PSIG (8 bar).
## How to Order

### Valves

<table>
<thead>
<tr>
<th>Valve Series &amp; Port Size</th>
<th>2</th>
<th>4</th>
<th>52</th>
<th>0</th>
<th>000</th>
<th>00</th>
</tr>
</thead>
<tbody>
<tr>
<td>L12 PA 4 52 O 0 000 00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Valve Type**
- BA = Single Solenoid Pilot, Spring Return w/Flush Locking Override
- BB = Double Solenoid Pilot W/Flush Locking Override
- PA = Single Air Pilot w/Spring Return
- PP = Double Air Pilot

**Function**
- 4 = 2 Position, 4-Way
- 5 = 3 Position, 4-Way Open Center
- 6 = 3 Position, 4-Way Closed Center

**Mounting**
- 52 = Line Mounted

**Voltage**
- 30 = 110-120/50-60 VAC
- 61 = 24 VDC
- 00 = N/A (Used with Air Pilot)

**Options**
- 000 = No Options
- 17G = Low Watt Solenoid
- 1.42 Watt

**Port Type**
- 0 = NPTF

**Wiring Option**
- B = DIN Plug-In DC Solenoid
- O = DIN Plug-In AC Solenoid or Air Pilot

### Assembly Kit

<table>
<thead>
<tr>
<th>Electrical/Electronics Type &amp; Location</th>
<th>2</th>
<th>D</th>
<th>0000</th>
<th>N</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK 0 2 D 0000 2 N STD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Options**
- STD = Used with Line Mounted Valves, Includes Adaptor Kits (valve mounting = 52)

**Port Type**
- N = NPTF

**End Plate Port Size**
- 2 = 1/4

**Example order:**
- Assembly Kit: AK02D00002NSTD
- Station 1: L12BB552000030
- Station 2: L12BA452000030
- Station 3: L12PP452000000
- Station 4: L12PA452000000 ASSEMBLED

---

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
L2 Series

5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 1.7
- Solenoid pilot or air pilot actuated
- Hand-lever valves available
- DIN plug-in solenoid and plug connector with indicator light
- Un lubricated or lubricated service
- In-line or manifold mounted

Technical Data

<table>
<thead>
<tr>
<th>Valve Data</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>1/4 = 1.7</td>
<td>3/8 = 1.7</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>79 SCFM @ 80 PSIG upstream pressure to atmosphere</td>
<td>1674 Nl/min @ 6 bar upstream/5 bar downstream</td>
</tr>
<tr>
<td>Main Valve Operating Pressure Range</td>
<td>28&quot; HG. Vacuum to 150 PSIG</td>
<td>Vacuum to 10 bar</td>
</tr>
<tr>
<td>Pilot Pressure Range: Internal and External</td>
<td>14.5 to 150 PSIG</td>
<td>1 to 10 bar</td>
</tr>
<tr>
<td>Temperature Range: Solenoid Pilot (Ambient)</td>
<td>-10°F to +115°F</td>
<td>-23°C to +46°C</td>
</tr>
<tr>
<td>Temperature Range: Air Pilot (Ambient)</td>
<td>-10°F to +150°F</td>
<td>-23°C to +66°C</td>
</tr>
</tbody>
</table>
### Operating Data

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>24 VDC</th>
<th>115 VAC 50 Hz</th>
<th>120 VAC 60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (Watts)*</td>
<td>3.5</td>
<td>4.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Holding Current (Amps.)</td>
<td>0.15</td>
<td>0.064</td>
<td>0.054</td>
</tr>
<tr>
<td>Inrush Current (Amps.)</td>
<td>N/A</td>
<td>0.087</td>
<td>0.082</td>
</tr>
<tr>
<td>Energize in seconds</td>
<td>0.010</td>
<td>0.007</td>
<td>0.007</td>
</tr>
<tr>
<td>De-energize in seconds</td>
<td>0.035</td>
<td>0.035</td>
<td>0.035</td>
</tr>
</tbody>
</table>

* A 1.4 Watt DC solenoid is available. Add "17G" to the model number. **EXAMPLE:** L22B4A4L2B017G61.

### How to Order

#### Valves

**Valve Series & Port Size**
- L22 = 1/4
- L23 = 3/8

**Valve Type**
- BA = Single Solenoid Pilot, Spring Return w/Flush Locking Override
- BB = Double Solenoid Pilot w/Flush Locking Override
- PA = Single Air Pilot Cap w/Spring Return
- PP = Double Air Pilot Cap
- JA = Single Air Pilot w/Flush Non-Locking Override and Spring Return
- JJ = Double Air Pilot w/Flush Non-Locking Override
- LA = Hand Lever w/Spring Return
- LD = Hand Lever w/Detent

**Function**
- 4 = 2 Position, 4-Way
- 5 = 3 Position, 4-Way Open Center
- 6 = 3 Position, 4-Way Closed Center

**Voltage**
- 30 = 110-120/50-60 VAC
- 61 = 24 VDC
- 00 = N/A (Use With Air Pilot or Hand Lever)

**Options**
- 000 = No Options
- 17G = Low Watt Solenoid – 1.42 Watt

**Port Type**
- 0 = NPTF

**Wiring Option**
- B = DIN Plug-In DC Solenoid
- O = DIN Plug-In AC Solenoid or Air Pilot or Hand Lever

**Mounting**
- 52 = Line Mounted

**Plug Connector Assemblies**

Per DIN Spec. NO 43650, Accepts cable diameter 0.240 to 0.310. 11mm Industry Standard DIN Form B

**Assembly Kit**

**Electrical/Electronics Type & Location**
- 0 = Standard
- 3 = L2 Series

**Number of Valve Stations**
- B = 2
- D = 4

**Option**
- STD = Standard (Common Supply and Exhaust)
- N = NPTF

**End Plate Port Size**
- 3 = 3/8

**Part No.**
- Gray (14 end solenoid) Plug Assembly: 230-363
- Black (12 end solenoid) Plug Assembly: 230-364
- Plug Assembly with 24 V Light: 230-365
- Plug Assembly with 110 V Light: 230-366

*For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.*
Manifold Assembly

AKJ 25 Pin Sub-D

- Shaded components described by Assembly Kit (AK) model number designation (See Valve Series Order Charts.)
- Each valve manifold station is listed in sequential order from left to right when facing the port side of the manifold as indicated.

Example order: (2005)
25 Pin Sub-D: AKJED00003NDWM
valve station 1: 051BA4Z2MN00061
valve station 2: 051BA4Z2MN00061
valve station 3: 051BB4Z2MN00061
valve station 4: 051BB6Z2MN00061
ASSEMBLED

AKF 1-16 Terminal Strip

- Ordered using the same method as Sub-D:

Example order: (2005)
valve station 1: AKFED00003LDWM
valve station 2: 052BA4Z2ML00061
valve station 3: 052BB4Z2ML00061
valve station 4: 052BB6Z2ML00061
valve station 5: 052BB8Z2ML00061
valve station 6: 052BB6Z2ML00061
ASSEMBLED
How to Order

Assembly Kit

Fieldbus Protocols
- DN = DeviceNet™
- EP = EtherNet/IP™
- DS2 = Sub-Bus Valve Manifold
- DS3 = Sub-Bus I/O Assembly

Number of Discrete Inputs
- 00 = 0
- 01 = 1
- 02 = 2

Special Options
- STD = Standard
- DRM = DIN Rail Mounting
- E40 = Auto Recovery Module
- G32 = DRM-DIN Rail Mounting
- E-40 Auto Recovery Module

Voltage
- 0 = Initial Release

I/O Type
- D = w/Sub-Bus Out
- R = w/Terminating Resistor

Digital I/O 5-Pin M12 Modules

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 PNP Inputs</td>
<td>240-205</td>
</tr>
<tr>
<td>16 PNP Outputs</td>
<td>240-207</td>
</tr>
<tr>
<td>8 PNP Inputs and 8 PNP Outputs</td>
<td>240-211</td>
</tr>
</tbody>
</table>

When Ordering

AK3 Manifold Assembly Kit with G3 Fieldbus Electronics
2005, 2012 & 2035 Series

- Shaded components described by Assembly Kit (AK) model number designation, with the exception of the communication module are described by Electronic Interface (G3) model number designation.
- Each valve manifold station is listed in sequential order from left to right when facing the port side of the manifold as indicated.
- Input station listed as indicated.

Example Order: (2005)

<table>
<thead>
<tr>
<th>AKCEH00003NDWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>valve station 1</td>
</tr>
<tr>
<td>valve station 2</td>
</tr>
<tr>
<td>valve station 3</td>
</tr>
<tr>
<td>valve station 4</td>
</tr>
<tr>
<td>valve station 5</td>
</tr>
<tr>
<td>valve station 6</td>
</tr>
<tr>
<td>valve station 7</td>
</tr>
<tr>
<td>valve station 8</td>
</tr>
<tr>
<td>G3D3N101ROSTD</td>
</tr>
<tr>
<td>Input Station</td>
</tr>
<tr>
<td>ASSEMBLED</td>
</tr>
</tbody>
</table>
By connecting the Sentronic® to a PC with an RS232 interface, the Data Acquisition Software (DaS) can be used to optimally adjust the valve’s control parameters to a specific application. DaS has an oscilloscope function that allows the user to select and visually see various response characteristics as the valve operates in an application. Control loop parameters can be adjusted using the software without removing the valve from service. This functionality streamlines the application development process. Control parameters can be saved and reloaded at any time.

The DaS software offers the following features:

- Real time display of: command signal, outlet pressure, internal control parameters (e.g. P, I or D), pressure switch signal, etc.
- Parameter setting: command signal, zero offset, span, limitation of output current, ramp function, etc.
- Diagnostics menu for error detection and testing
- Custom adjustment to an application
- Control of Sentronic®

**Advantages**

- Minimum hysteresis
- Quick response times
- Very high sensitivity
- Standard 50 µm filtration
- No constant air consumption
- Analog feedback output
- Easy change of control parameters
- Digital control
- Integrated display
- PC communication

**Specifications**

- **Fluids:** Air or neutral gases
- **Pressure Range:** 0 - 50 psi, 0 - 100 psi, 0 - 150 psi
- **Ports:** 1/4, 3/8 (NPT)
- **Construction:** Poppet Valve
- **Actuation:** Proportional Solenoid
- **Command Signal:** 0 – 10 V, 4 – 20 mA
Sentronic\textsuperscript{D} Pressure Control

Sentronic\textsuperscript{D} Pressure Control

**Features**
- Sentronic\textsuperscript{D} is a highly dynamic 3-way proportional valve with digital control.
- Sentronic\textsuperscript{D} stands for:
  - Digital communication and control
  - Display (integrated)
  - Direct operated valve
- A special feature of the Sentronic\textsuperscript{D} is its DaS software supplied for optimum adjustment via PC and viewing of command and feedback signals.
- Other functions are valve diagnostics, parameter setting and maintenance.
- Sentronic\textsuperscript{D} can be configured for dual loop control of process variables such as flow, force, speed, RPM and temperature.

**General**
- Fluids: Air or neutral gas, filtered at 50 μm, condensate-free, lubricated or un lubricated
- Maximum allowable pressure (MAP): 90 to 190 psi (6 to 13 bar)
- Pressure range: 0-50 psi to 0-150 psi
- Fluid temperature: 32°F - 140°F (0°C - 60°C)
- Ambient temperature: 32°F - 122°F (0°C - 50°C)
- Flow (Qv at 6 bar): 470 to 1300 l/min (ANR)
- Command signal: 0 - 10 V (impedance 100 kΩ)
  - 4 - 20 mA (impedance 250 Ω)
- Hysteresis: < 1% of span
- Linearity: < 0.5% of span
- Repeatability: < 0.5% of span
- Minimum setpoint: 100 mV (4.2mA) with shut-off function
- Minimum outlet pressure: 1% of span

**Construction**
- Body: Aluminum
- Internal parts: POM (polyacetal)
- Seals: NBR (nitrile) and FPM (fluoroplastic)

**Electrical Characteristics**

<table>
<thead>
<tr>
<th>Nominal Diameter DN (mm)</th>
<th>Voltage * (V)</th>
<th>Max. Power (W)</th>
<th>Max. Current (mA)</th>
<th>Insulation Class</th>
<th>Degree of Protection</th>
<th>Electrical Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>24 VDC ±10%</td>
<td>21</td>
<td>850</td>
<td>H</td>
<td>IP 65</td>
<td>5-pin M12 connector (not supplied)</td>
</tr>
<tr>
<td>8</td>
<td>24 VDC ±10%</td>
<td>40</td>
<td>1650</td>
<td>H</td>
<td>IP 65</td>
<td>5-pin M12 connector (not supplied)</td>
</tr>
</tbody>
</table>

* Max. ripple: 10%

**Specifications**

<table>
<thead>
<tr>
<th>Ports</th>
<th>Orifice DN (mm)</th>
<th>( C_v ) Flow Factor (K, Nm(^3)/h)</th>
<th>Flow at 6 Bar (l/min - ANR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8, 1/4 NPT or GTap</td>
<td>4</td>
<td>0.29 (0.25)</td>
<td>470</td>
</tr>
<tr>
<td>1/4, 3/8 NPT or GTap</td>
<td>8</td>
<td>0.81 (0.7)</td>
<td>1300</td>
</tr>
</tbody>
</table>

Test conditions according to ISO 8778: temperature: 20 °C, relative inlet pressure: 6 bar, relative outlet pressure: 5 bar

**How to Order**

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>608 = DN 4mm</th>
<th>609 = DN 8mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version (ports), body</td>
<td>6 = NPT 1/4 (DN 4), NPT 3/8 (DN 8)</td>
<td></td>
</tr>
<tr>
<td>Pressure range, Maximum pressure</td>
<td>A = 0 - 50 psi, 90 psi</td>
<td>B = 0 -100 psi, 140 psi</td>
</tr>
</tbody>
</table>

**Display**
1 = with display

**Digital output**
1 = Pressure switch output
PNP ± 5%

**Feedback**
1 = Feedback output 0 -10 V \(^1\)
3 = Feedback output 0 -20 mA \(^1\)

**Command signal**
0 = 0 - 10 V \(^1\)
2 = 4 - 20 mA \(^1\)

**Notes:**
\(^1\) Command signal and feedback signal type must be the same for Express shipping.
Numatics Express 2Day for Sentronic\textsuperscript{D} applies to order quantities of up to 5 units.

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
The A Series is an aluminum NFPA Interchangeable cylinder line that is designed and built to excel in the most demanding applications. The A Series encompasses many value-added features such as an extra long graphite filled cast iron rod bushing and a standard oversized wear band that is located on the rear of the piston. Additionally, the A Series includes the well-proven “T Seal” piston seal configuration made from carboxilated nitrile with self-lubricating PTFE compound. These are just a sample of the features that make the A Series the superior NFPA Interchangeable air cylinder line.

**Tube**
The tube is hard coat anodized. The hard coating is an electro-chemical process, which produces a very dense surface of aluminum oxide. This surface has extreme hardness (60 Rc), excellent wear and corrosion resistance, and a low coefficient of friction.

**End Caps**
The end caps are accurately machined from (6061-T6) solid aluminum bar stock. They are anodized for corrosion resistance. Additionally, a recess on the piston-mating surface (at both ends) enables the air to work on a larger piston area for effortless breakaway.

**Rod Bushing**
The A Series includes a graphite filled, cast iron rod bushing that is extra long in length. Graphite filled offers the best bearing surface when using a hard chrome plated steel piston rod. Cast iron provides maximum resistance against wear. The added length adds superior alignment and support of the piston rod as well as provides maximum load bearing support.

**Rod Seal**
The carboxilated nitrile with PTFE compound rod seal is self-lubricating and durable. The rounded lip design ensures proper sealing and long life.

**Rod Wiper**
The standard rod wiper construction is a highly durable polyurethane.

**Piston Rod**
High strength steel (100,000 psi minimum yield) piston rod has a ground, polished, and chrome plated surface. This surface provides maximum life for both the rod bushing and the seals.

**Bushing Retainer**
The bushing retainer allows cartridge removal (cylinder repair) without complete disassembly.

**Tie Rods**
The tie rods are 100,000 psi minimum yield steel for maximum holding power. The threads are rolled formed for superior strength and engagement.

**Piston Seal**
The piston seal is a carboxilated nitrile with PTFE compound making it self-lubricating. The “T” seal with back-up ring construction prevents rolling and seals at all pressures.

**Wear Band**
The wear band is a stable, lubricating strip located on the piston. We separated the load bearing points by locating the wear band at the rear of the piston. This maximizes column strength at full extension.

**Piston**
The solid aluminum alloy piston is strong and durable.

**Cushion Seal**
The floating cushion seal design enables rapid stroke reversal by providing instantaneous full flow to the piston. Each cushion has a flush, retained adjustment needle.

**Tube End Seal**
The tube end seals are compression type and reusable.

**Ports**
Our enhanced port design enables the cylinder to work more efficiently. Through the use of precise machining depths and tool shape, we are able to smooth the flow path into and out of the cylinder.

**Standard Specifications**
- Meets NFPA specifications
- Bore sizes from 1-1/2” through 6” (10” through 14” available, but Express Program does not apply)
- Piston rod diameters from 5/8” to 1-3/4”
- Nominal pressure rating is 250 psi air
- Standard temperature -10°F to 165°F (-23°C to 74°C)
- NPTF ports
- Flexible port and cushion location
- Multitude of mounting options
How to Order

Mount
E3 = Head Square Mount (8" Bore Only)
E4 = Cap Square Mount (8" Bore Only)
F1 = Front Flange (Not Available 8" Bore)
F2 = Rear Flange (Not Available 8" Bore)
P1 = Fixed Clevis
P2 = Detachable Clevis
P3 = Fixed Eye
P4 = Detachable Eye
S1 = Angle Mount
S2 = Side Lug Mount
S4 = Bottom Tap
T6 = Head Trunnion
T7 = Cap Trunnion
SN = Sleeve Nut
X0 = Basic No Mount
X1 = Extended Tie Rods Both Ends
X2 = Extended Tie Rod Cap
X3 = Extended Tie Rod Head

Type
A = A Series NFPA Interchangeable

Bore
K = 1-1/2"  R = 4"
L = 2"  T = 5"
M = 2-1/2"  U = 6"
P = 3-1/4"  W = 8"

Full Inches of Stroke
00 = 0" Stroke
01 = 1" Stroke
02 = 2" Stroke
03 = 3" Stroke
99 = 99" Stroke
99* Max. for Fast Ship Program

Fractional Inches of Stroke
A = 0"  I = 1/2"
B = 1/16"  J = 9/16"
C = 1/8"  K = 5/8"
D = 3/16"  L = 11/16"
E = 1/4"  M = 3/4"
F = 5/16"  N = 13/16"
G = 3/8"  Q = 7/8"
H = 7/16"  P = 15/16"

Rod Code
1 = Style #1 Standard Rod Diameter
2 = Style #2 Standard Rod Diameter
3 = Style #3 Standard Rod Diameter
6 = Style #1 Oversize Rod Diameter
7 = Style #2 Oversize Rod Diameter
8 = Style #3 Oversize Rod Diameter

Magnet
0 = No Magnet
2 = Fixed Magnet

Options
AA = No Options
BA** = Bumpers Both Ends
BH** = Bumper Head
DA = Double Rod End
EB = Silencer Bumpers
LB = Low Breakaway Seals
MA = Metallic Rod Scraper
PA = Polypak Rod Seal
SA = Stainless Steel Piston Rod
SS = Stainless Piston Rod and Tie Rod
ST = Stainless Tie Rods
VA = FKM Seals
1A* = Rod Extension
2A* = Thread Extension
12* = Rod and Thread Extension
3A = Studded Rod End
** Specify length.
** Bumpers add .062" to OAL (per bumper).

Cushions
Position 1 2 3 4 Fixed
Head and Cap B C D E Y
Head Only F G H J W
Cap Only K L M N V

Ports
Position 1/8" 1/4" 3/8" 1/2" 3/4"
1 B C D E F
2 H I J K L
3 N O P Q R
4 T U V W X

Cylinder Orientation
Ports are normally located in position 1.
Cushions are normally located in position 2.

Rod Diameters by Bore Size

<table>
<thead>
<tr>
<th>Bore</th>
<th>Standard Dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2&quot;</td>
<td>0.625</td>
</tr>
<tr>
<td>2&quot;</td>
<td>0.625</td>
</tr>
<tr>
<td>2-1/2&quot;</td>
<td>0.625</td>
</tr>
<tr>
<td>3-1/4&quot;</td>
<td>1.000</td>
</tr>
<tr>
<td>4&quot;</td>
<td>1.000</td>
</tr>
<tr>
<td>5&quot;</td>
<td>1.000</td>
</tr>
<tr>
<td>6&quot;</td>
<td>1.375</td>
</tr>
<tr>
<td>8&quot;</td>
<td>1.375</td>
</tr>
</tbody>
</table>

Rod End Styles, Diameters and Threads

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Style #1 Standard Male</th>
<th>Style #2 Optional Male</th>
<th>Style #3 Optional Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.625</td>
<td>7/16-20</td>
<td>1/2-20</td>
<td>7/16-20</td>
</tr>
<tr>
<td>1.000</td>
<td>3/4-16</td>
<td>7/8-14</td>
<td>3/4-16</td>
</tr>
<tr>
<td>1.375</td>
<td>1-14</td>
<td>1 1/4-12</td>
<td>1-14</td>
</tr>
<tr>
<td>1.750</td>
<td>1 1/4-12</td>
<td>1 1/2-12</td>
<td>1 1/4-12</td>
</tr>
</tbody>
</table>

*Switches and Cylinder Mounting Accessories available to ship with Cylinders.
Cylinders (Actuators) Large Bore A Series NFPA Interchangeable

The Large Bore A Series is an NFPA Interchangeable cylinder line that is designed and built to excel in the most demanding applications. The Large Bore A Series encompasses many of the proven design features of the A Series.

Tube
The 10", 12", and 14" Large Bore tubes use a honed, chrome plated steel tube.

End Caps
The end caps are accurately machined from (6061-T6) solid aluminum bar stock. They are anodized for corrosion resistance. Additionally, a recess on the piston-mating surface (at both ends) enables the air to work on a larger piston area for effortless breakaway.

Rod Bushing
All bores are equipped with a bronze bushing that is extra long in length. The added length adds superior alignment and support of the piston rod as well as provides maximum load bearing support. The bronze bushing offers an excellent bearing surface for a hard chrome plated piston rod.

Rod Seal
The carboxilated nitrile with PTFE compound rod seal is self-lubricating and durable. The rounded lip design ensures proper sealing and long life.

Rod Wiper
The standard rod wiper construction is a highly durable polyurethane.

Piston Rod
High strength steel (100,000 psi minimum yield) piston rod has a ground, polished, and chrome plated surface. This surface provides maximum life for both the rod bushing and the seals.

Bushing Retainer
The bushing retainer allows cartridge removal (cylinder repair) without complete disassembly.

Tie Rods
The tie rods are 100,000 psi minimum yield steel for maximum holding power. The threads are roll formed for superior strength and engagement.

Piston Seal
The piston seal is a carboxilated nitrile with PTFE compound making it self-lubricating. A lip seal configuration is used on all bores which prevents rolling and is designed to seal at all pressures.

Wear Band
The wear band is a stable, lubricating strip located on the piston. We separated the load bearing points by locating the wear band at the rear of the piston. This maximizes column strength at full extension.

Piston
The solid aluminum alloy piston is strong and durable. We use a nylon locking insert nut to attach the piston to the piston rod. This enables piston rod disassembly if necessary.

Cushion Seal
The floating cushion seal design enables rapid stroke reversal by providing instantaneous full flow to the piston. Each cushion has a flush, retained adjustment needle.

Tube End Seal
The tube end seals are compression type and reusable.

Ports
Our enhanced port design enables the cylinder to work more efficiently. Through the use of precise machining depths and tool shape, we are able to smooth the flow path into and out of the cylinder.

Standard Specifications
- Meets NFPA specifications
- Bore sizes from 10" through 14"
- Piston rod diameters from 1-3/4" through 2-1/2"
- Maximum pressure rating is 250 psi air
- Standard temperature -10°F to 165°F (-23°C to 74°C)
- NPTF ports
- Flexible port and cushion location
- Multitude of mounting options

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
How to Order

Numatics Express 5Day for A Series Large Bore NFPA applies to order quantities of up to 5 units.

Cylinder Orientation

1

4

2

3

Ports Normally in Position 1

Ports are normally located in position 1.

Cushions are normally located in position 2.

NOTE: Ports -
10* & 12* Bore-standard port size is 1" NPTF, smaller port sizes available.
14* Bore-standard port size is 1 1/4" NPTF, smaller port sizes available.

Rod End Styles, Diameters and Threads

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Style #1 Standard Male</th>
<th>Style #2 Optional Male</th>
<th>Style #3 Optional Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.38</td>
<td>1-14</td>
<td>1 1/4-12</td>
<td>1-14</td>
</tr>
<tr>
<td>1.75</td>
<td>1 1/4-12</td>
<td>1 1/2-12</td>
<td>1 1/4-12</td>
</tr>
<tr>
<td>2.00</td>
<td>1 1/4-12</td>
<td>1 3/4-12</td>
<td>1 1/2-12</td>
</tr>
<tr>
<td>2.50</td>
<td>1 7/8-12</td>
<td>2 1/4-12</td>
<td>1 7/8-12</td>
</tr>
</tbody>
</table>
The **ASP Cylinder Line** is a heavy-duty, steel body cylinder line that is designed and built to exceed all of your strenuous application requirements. The **ASP Series** is an NFPA Steel Body pneumatic cylinder line. The ASP Series encompasses many of the same proven design features as our original NFPA Interchangeable cylinder, the A Series. This includes the extra long graphite filled cast iron rod bushing and a standard oversize wear band (located on the rear of the piston). Additionally, we have also included the proven "T" piston seal configuration with carboxilated nitrile with self-lubricating PTFE compound. These are just a sample of things that make the ASP Series the superior Steel Body air cylinder line.

**Tube**
Our honed tubing is produced using our Suitable To Hone Drawn Over Mandrel (DOM) and Cold Drawn Seamless CDS. This tubing is ready to use for pneumatic or hydraulic cylinders without further ID processing. The honing process involves using abrasive polishing stones and abrasive paper to remove small amounts of material, to produce extremely precise ID dimensions and improved finishes.

**End Caps**
The end caps are accurately machined from precision square steel blocks. They also have a black oxide finish to protect from corrosion. Additionally, a recess on the piston-mating surface (at both ends) enables the air to work on a larger piston area for effortless breakaway (even at low pressures).

**Rod Bushing**
The ASP Series (1-1/2" through 6") includes a graphite filled, cast iron rod bushing that is extra long in length. Graphite filling offers the best bearing surface when using a hard chrome plated piston rod. Cast iron provides maximum resistance against wear. The added length adds superior alignment and support of the piston rod as well as provides maximum load bearing support. Sizes 10" through 14" bores include an extra long bronze rod bushing.

**Rod Seal**
The carboxilated nitrile with PTFE compound rod seal is self-lubricating and durable. The rounded lip design ensures proper sealing and long life.

**Rod Wiper**
The standard rod wiper construction is highly durable polyurethane.

**Piston Rod**
The high strength steel (100,000 psi minimum yield) piston rod has a ground, polished, and chrome plated surface. This surface provides maximum life for both the rod bushing and the seals.

**Bushing Retainer**
The bushing retainer allows cartridge removal (cylinder repair) without complete disassembly (except X1 and X3 mounts). Full-face retainer on 1-1/2" through 2-1/2" bore. Round retainer on 3-1/4" through 6" bore. Both the full-face and round retainer are steel construction.

**Tie-Rods**
The tie-rods are 100,000 psi minimum yield steel for maximum holding power. They are roll formed for superior strength and engagement (up to 5/8").

**Piston Seal**
The piston seal is carboxilated nitrile with PTFE compound for self-lubricating. The "T" seal with back-up rings prevents rolling and seals at all pressures.

**Wear Band**
The wear band is a stable, lubricating strip located on the piston. We separated the load bearing points by locating the wear band at the rear of the piston. This maximizes column strength at full-extension.

**Piston**
The solid aluminum alloy piston is strong and durable.

**Cushion Seal**
The floating cushion seal design enables rapid stroke reversal by providing instantaneous full-flow to the piston. Each cushion has a flush, retained adjustment needle.

**Tube End Seal**
The tube end seals are compression type and reusable.

**Ports**
Our enhanced port design enables the cylinder to work more efficiently. The use of precise machining depths and tool shape allows a smooth flow path into and out of the cylinder.

**Standard Specifications**
- Meets NFPA specifications
- Bore sizes from 1-1/2" through 6"
- Piston rod diameters from 5/8" to 2-1/2"
- Maximum pressure rating is 250 psi air
- Standard temperature -10°F to 165°F (-23°C to 74°C)
- All steel construction, except piston (aluminum)
- NPTF ports
- Flexible port locating

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
Cylinders

ASP Series Steel Body NFPA (Actuators)

How to Order

Cylinder Mounting
F1 = Front Flange
F2 = Rear Flange
P2 = Detachable Clevis
X0 = Basic No Mount
X1 = Extended Tie Rods (Both Ends)
X2 = Cap Extended Tie Rods
X3 = Head Extended Tie Rods

Cylinder Type
ASP = Steel Body NFPA Pneumatic Cylinder Line

Cylinder Bore
K = 1.50 R = 4.00
L = 2.00 T = 5.00
M = 2.50 U = 6.00
P = 3.25

Full Inches of Stroke
00 = 0” Stroke
01 = 1” Stroke
02 = 2” Stroke
03 = 3” Stroke
04 = 4” Stroke
05 = 5” Stroke
99 = 99” Stroke

Fractional Inches of Stroke
A = 0” E = 1/4” I = 1/2” M = 3/4”
B = 1/16” F = 5/16” J = 9/16” N = 13/16”
C = 1/8” G = 3/8” K = 5/8” O = 7/8”
D = 3/16” H = 7/16” L = 11/16” P = 15/16”

Rod Diameter
1 = 0.625”
2 = 1.000”
3 = 1.375”
4 = 1.750”

*Standard and first oversized rod diameter per bore size are available for 5Day Express.

Option
AA = No Options
EB = Silencer Bumpers
KA = Stroke Adjuster
DA = Double Rod End
MA = Metallic Rod Scrapper
LB = Low Breakaway
SA = Stainless Rod
ST = Stainless Tie Rods
SS = Stainless Rod and Tie Rods
VA** = FKM Seals
1A* = Rod Extension
2A* = Thread Extension
3A = Rod Stud
4A* = Stop Tube
4D* = Double Piston Stop Tube
FB = Four Wrench Flats
JN = Jam Nut
PA = PolyPak Rod Seal
PP = PolyPak Piston

* Specify length.
** FKM is not recommended for non-lube service.

Numatics Express 5Day for ASP Series Steel Body NFPA applies to order quantities of up to 5 units.

Rod End Styles, Diameters and Threads

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Style #1</th>
<th>Style #2</th>
<th>Style #3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Male</td>
<td>Optional Male</td>
<td>Optional Female</td>
</tr>
<tr>
<td>0.625</td>
<td>7/16-20</td>
<td>1/2-20</td>
<td>7/16-20</td>
</tr>
<tr>
<td>1.000</td>
<td>3/4-16</td>
<td>7/8-14</td>
<td>3/4-16</td>
</tr>
<tr>
<td>1.375</td>
<td>1-14</td>
<td>1 1/4-12</td>
<td>1-14</td>
</tr>
<tr>
<td>1.750</td>
<td>1 1/4-12</td>
<td>1 1/2-12</td>
<td>1 1/4-12</td>
</tr>
</tbody>
</table>

Rod Diameter by Bore Size

<table>
<thead>
<tr>
<th>Bore</th>
<th>Standard Diameter</th>
<th>1st Oversized</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2*</td>
<td>0.625</td>
<td>1.000</td>
</tr>
<tr>
<td>2*</td>
<td>0.625</td>
<td>1.000</td>
</tr>
<tr>
<td>2-1/2*</td>
<td>0.625</td>
<td>1.000</td>
</tr>
<tr>
<td>3-1/4*</td>
<td>1.000</td>
<td>1.375</td>
</tr>
<tr>
<td>4*</td>
<td>1.000</td>
<td>1.375</td>
</tr>
<tr>
<td>5*</td>
<td>1.000</td>
<td>1.375</td>
</tr>
<tr>
<td>6*</td>
<td>1.375</td>
<td>1.750</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
The **M Series** is a stainless steel body air cylinder line that is the perfect solution for tight design budgets. This cylinder is reliable and is designed and built to maximize performance. It will exceed all of your light-duty cylinder application requirements. The M Series comes standard with a multitude of value-added features such as stainless steel piston rods, roll-formed threads at both ends of the piston rod, and pre-lubed for non-lube added service. These are just a sample of things that make the M Series the superior interchangeable round body air cylinder line.

### Piston Rod
The type 303 stainless steel **piston rod** is ground, polished, and roller burnished for a mirror finish to ensure corrosion-free longevity.

### Rod Thread
Roll-formed **rod threads** (at both ends) ensure a durable customer-end connection as well as piston to rod connection.

### Rod Bushing
Oil impregnated sintered bronze **rod bushing** provides excellent wear resistance and anti-friction qualities for smooth operation and long life.

### End Caps
The **end caps** are made from a high strength aluminum alloy.

### Ports
Unrestricted (full-flow) **ports** in conjunction with rectangular slots on the piston-mating surface (at both ends) enable the air to work on a larger piston area for effortless breakaway (even at low pressures).

### Tube
The type 304 stainless steel **tube**, drawn and polished to a micro-inch finish on the i.d., enables low friction and longevity.

### Crimp
The cylinder body is attached to the end caps using innovative assembly equipment that ensures a consistent and reliable double rolled-in **crimp**.

### Piston
High strength aluminum alloy **piston** with blow-by flats (double acting only) ensure proper and rapid seal inflation. Piston rod connections are threaded (roll-formed threads), sealed with Loctite Threadlocker®, torqued, and staked for a solid, leak-proof connection.

### Piston Seals
Low friction Buna N "U" cup **pistons seals** (optional low and high temperature seals) are wear compensating for millions of maintenance free cycles.

### Magnet
Magnetic band position indication is optional in 9/16" – 3" bore sizes. The **magnet** does not affect the overall length of the cylinder 3/4" – 3" (bore sizes - double acting only) but does add .250" to the overall length of the 9/16" bore cylinders.

### Rod Seal
The low friction Buna N "U" cup **rod seal** (optional low and high temperature seals) is wear compensating to ensure longevity.

### Pre-Lubricated
**Pre-lubricated** with our specially formulated oil-based compound for extensive maintenance free performance. Threadlocker® is a registered trademark of the Loctite Corporation.

### Standard Specifications
- 303 stainless steel piston rods are standard
- 304 stainless steel cylinder tube
- Aluminum head and caps
- Nominal pressure rating is 250 psi air
- Twelve bore sizes – 5/16" – 3"
- Standard temperature -10°F to +165°F
- Single and double acting

### Optional Specifications
- Magnetic pistons
- Delrin® end caps
- Double rods
- High and low temperature seals
- Rod wipers

Delrin® is a registered trademark of DuPont. For detailed information regarding the properties of Delrin, please call 1-800-441-0573.
How to Order

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>D01 - 02</th>
<th>A - 01 - 1A01A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0313</td>
<td>5/16”</td>
<td></td>
</tr>
<tr>
<td>0438</td>
<td>7/16”</td>
<td></td>
</tr>
<tr>
<td>0563</td>
<td>9/16”</td>
<td></td>
</tr>
<tr>
<td>0750</td>
<td>3/4”</td>
<td></td>
</tr>
<tr>
<td>0875</td>
<td>7/8”</td>
<td></td>
</tr>
<tr>
<td>1062</td>
<td>1-1/16”</td>
<td></td>
</tr>
<tr>
<td>1250</td>
<td>1-1/4”</td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>1-1/2”</td>
<td></td>
</tr>
<tr>
<td>1750</td>
<td>1-3/4”</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>2-1/2”</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>3”</td>
<td></td>
</tr>
</tbody>
</table>

Mounting Style
S01 = Single Acting Spring Return Mount
S02 = Single Acting Spring Return Rear Pivot
R01 = Single Acting Spring Extend Nose Mount
R02 = Single Acting Spring Extend Rear Pivot
N01 = Single Acting Spring Return Non-Rotating Nose Mount
N02 = Single Acting Spring Return Non-Rotating Rear Pivot
D01 = Double Acting Nose Mount
D02 = Double Acting Rear Pivot
D03 = Double Acting Through Rod
D04 = Double Acting Double Nose
D05 = Double Acting Front Block
D13 = Interchange Option for 1-1/16” Bore
D12 = Double Acting Through Rod
D13 = Double Acting Through Rod Hollow Rod
D06 = Double Acting Trunnion Mount
D11 = Double Acting Nose Mount 2” Bore, 1” Rod
D12 = Double Acting Rear Pivot 2” Bore, 1” Rod
DC1 = Double Acting Delrin® Nose Mount
DC2 = Double Acting Delrin® Rear Pivot
DC3 = Double Acting Delrin® Through Rod
V01 = Nose Mount Volume Chamber
V02 = Rear Pivot Mount Volume Chamber
DM1 = Nose Mount MRS Interchange
DM2 = Rear Pivot Mount MRS Interchange

Rod and/or Thread Extension
Note: Leave blank if rod and/or thread extension is not required.
1A = Rod Extension (must specify extension)
Example: 1A01A (full and fractional length)
2A = Rod Extension (must specify extension)
Example: 2A01A (full and fractional length)
RT = Rod and Thread Extension (must specify extension)
Example: RT01A01A (full and fractional length)

Options
00 = No Options (or leave blank)
01 = Bumpers*
02 = FKM Seals
03 = Magnet**
04 = Bumpers with Magnet*
05 = Pivot Bushing***
06 = Pivot Bushing with Bumpers*
07 = Pivot Bushing with FKM Seals
08 = Pivot Bushing with Magnet*
09 = Pivot Bushing with Bumper and Magnet**
20 = Port Rotated with No Options
30 = Rod Wiper with No Options
31 = Rod Wiper with Bumpers*
32* = Rod Wiper with FKM Seals
33 = Rod Wiper with Magnet*
34 = Rod Wiper with Bumpers and Magnet*
35 = Rod Wiper with Pivot Bushing
36 = Rod Wiper with Bumpers and Pivot Bushing
37 = Rod Wiper with FKM Seals and Pivot Bushing
38 = Rod Wiper with Magnet and Pivot Bushing
39 = Rod Wiper with Bumpers, Magnet and Pivot Bushing

Fractional Inch Stroke
A = 0” Stroke
B = 1/16” Stroke
C = 1/8” Stroke
D = 3/16” Stroke
E = 1/4” Stroke
F = 5/32” Stroke
G = 3/32” Stroke
H = 7/32” Stroke
I = 1/2” Stroke
J = 9/32” Stroke
K = 5/16” Stroke
L = 11/32” Stroke
M = 3/16” Stroke
N = 13/32” Stroke
O = 7/32” Stroke
P = 15/32” Stroke

Full Inch Stroke
00 = 0” Stroke
01 = 1” Stroke
02 = 2” Stroke
03 = 3” Stroke
32 = 32” Stroke (maximum)

* Bumpers available on 3/4” through 3” Bore Cylinders. See length adder charts for more information. (N/A on DG1 and DG2 types)
** Magnet available on 3/4” Bore. See length adder charts for more information.
*** Pivot Bushing standard on 5/16”, 9/16”, 2”, 2 1/2”, and 3” bore sizes.

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
The **Series 452** is an aluminum body air cylinder line that is designed to meet all international cylinder requirements. The Series 452 meets the following international standards: ISO/DIS 15552 & AFNOR. The combination of robust construction and a multitude of value-added features make the Series 452 the superior ISO 15552 cylinder line on the market.

**General**

Detection: Equipped for magnetic position sensors  
Fluid: Air  
Operating pressure: 10 bar max./150 PSI  
Ambient temperature: −20°C to +70°C (-4°F to 158°F)  
Optimal max. speed: ≤ 1 m/s (for optimal service life)  
Max. speed rate: 2 m/s  
Standards: ISO 15552-AFNOR NF ISO 15552-DIN ISO 15552  
(replace ISO 6431-AFNOR NFE 49003-VDMA 24562)

**Construction**

- Tube: Hard anodized aluminum alloy  
- End Caps: Aluminum alloy  
- Tube/End Cap Connection: Steel sleeve bolts  
- Bearing: Self lubricating steel backed composite  
- Cushioning seals: PUR (polyurethane)  
- Cushioning: Pneumatic, adjustable from both sides with captive screw  
- Rod: Hard chrome plated steel  
- Rod nut: Galvanized steel  
- Piston:  
  - Ø 32 to 80 mm: POM (polyacetal)  
  - Ø 100 mm: light alloy, fitted with an annular permanent magnet  
- Piston seals: PUR (polyurethane)
452 Series ISO Standard Cylinder

How to Order

**Series**
452 Series = Profile Tube

**Version**
1 = ISO 15552

**Cylinder Type**
00 = Single Rod, Cushioned
0A = Double Rod, Cushioned

**Sensor Groove Location**
0 = Position 1
3 = Position 2
6 = Position 3
9 = Position 4

**Bore**
3 = 32mm
4 = 40mm
5 = 50mm
6 = 63mm
8 = 80mm
1 = 100mm

**Options**
- 00D = Cylinder w/o mounting parts and options
- 01A = Rod Extension
- 02A = Thread Extension
- 03A = Stainless Rod
- C01 = Foot Bracket (Outside) Mount
- CV9 = Mid Trunnion
- CF2 = Front Flange Mount
- CF4 = Rear Flange Mount
- CF3 = Rod Clevis Mount
- CD4 = Rod Clevis Mount Both Ends (Double Rod)
- CF5 = Spherical Eye Mount (Front Side)
- CD5 = Spherical Eye Mount (Both Sides - Double Rod)
- C07 = Oscillating Bracket with Lugs
- C08 = Oscillating Bracket with Wide Fork Type Mount
- C13 = Spherical Eye Mount (Back Side)
- C14 = Oscillating Bracket with Narrow Fork Type Mount

Consult factory for combination options.
Specify length.

**Stroke**
- 0015 = 15mm (Minimum Stroke)
- 0400 = 400mm (Maximum Stroke)

---

**Port Chart**

<table>
<thead>
<tr>
<th>Bore</th>
<th>Port Size</th>
<th>Rod Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>32mm</td>
<td>G 1/8</td>
<td>M10 x 1.25</td>
</tr>
<tr>
<td>40mm</td>
<td>G 1/4</td>
<td>M12 x 1.25</td>
</tr>
<tr>
<td>50mm</td>
<td>G 1/4</td>
<td>M16 x 1.25</td>
</tr>
<tr>
<td>63mm</td>
<td>G 3/8</td>
<td>M16 x 1.50</td>
</tr>
<tr>
<td>80mm</td>
<td>G 3/8</td>
<td>M20 x 1.50</td>
</tr>
<tr>
<td>100mm</td>
<td>G 1/2</td>
<td>M20 x 1.50</td>
</tr>
</tbody>
</table>

**Switch/Sensor Position**

---

**Standard Cylinder Mounting Options**

- CF2 - Front Flange
- CR2 - Rear Flange
- C01 - Foot
- C08 - Oscillating Bracket with Wide Fork Type Mount
- C07 = Oscillating Bracket with Lugs
- C14 - Oscillating Bracket with Narrow Fork Type Mount
- CV9 - Mid Trunnion
- CF4 - Front Clevis
- CF5 - Spherical Eye Mount (Front Side)
The **C Series** is a robust compact cylinder line that is designed to fit tight space requirements. The low profile design and variety of mounting options makes this cylinder line extremely popular. Furthermore, its unique style and diversity makes the C Series a one of a kind compact cylinder line.

**Tube**
The tube is hard coat anodized aluminum. The hard coating is an electrochemical process which produces a very dense surface of aluminum oxide. This surface has extreme hardness (60 RC), excellent wear and corrosion resistance, and a low coefficient of friction. Additionally, profile tubing is standard on 3/4” through 2-1/2” bore sizes (3” and 4” bores are the tie rod configuration). The profile tubing has a custom dovetail groove on all sides for trouble-free switch and accessory mounting.

**End Caps**
The end caps are accurately machined from solid aluminum bar stock. They are anodized for corrosion resistance. Additionally, a recess on the piston-mating surface (at both ends) enables the air to work on a larger piston area for effortless breakaway.

**Rod Bushing**
The C Series includes a sintered bronze rod bushing for maximum load bearing support.

**Rod Seal**
The quad ring rod seal ensures proper sealing even at low pressures.

**Piston Rod**
High strength steel (100,000 psi minimum yield) piston rod has a ground, polished, and chrome plated surface. This surface provides maximum life for both the rod bushing and the seals.

**Piston Seal**
The quad ring piston seal ensures proper sealing even at low pressures.

**Piston**
The solid aluminum alloy piston is strong and durable.

**Tie Rods**
The tie rods (3” and 4” only) are 100,000 psi minimum yield steel for maximum holding power. The threads are roll formed for superior strength and engagement.

**Tube End Seal**
The tube end seals are compression type and reusable.

**Ports**
Our enhanced port design enables the cylinder to work more efficiently. Through the use of precise machining depths and tool shape, we are able to smooth the flow path into and out of the cylinder.

**Mounting Holes**
The dual purpose mounting holes allow use of through bolts or threaded-in attachments.

**Standard Specifications:**
- Variety of mounts
- Bore sizes from 3/4” through 4”
- Piston rod diameters from 1/4” to 1”
- Maximum pressure rating is 250 psi air
- Standard temperature -10°F to 165°F (-23°C to 74°C)
- All aluminum construction
- NPTF ports
- Flexible port locating
Cylinders (Actuators)

How to Order

Mount
F1 = Front Flange
F2 = Rear Flange
P1 = Fixed Clevis
P2 = Detachable Clevis
P3 = Fixed Eye
P4 = Detachable Eye
S2 = Foot Mount
*S4 = Bottom Tapped
X0 = Basic-No Mount

*S4 mount is standard on 3/4” and 1 1/8” bore.

Type
C = Compact Cylinder Line

Bore
G = 3/4”
H = 1-1/8”
K = 1-1/2”
L = 2”
M = 2-1/2”
N = 3”
R = 4”

Full Inches of Stroke
00 = 0” Stroke
01 = 1” Stroke
02 = 2” Stroke
03 = 3” Stroke
20 = 20” Stroke

Fractional Inches of Stroke
A = 0” I = 1/2”
B = 1/16” J = 9/16”
C = 1/8” K = 5/8”
D = 3/16” L = 11/16”
E = 1/4” M = 3/4”
F = 5/16” N = 13/16”
G = 3/8” O = 7/8”
H = 7/16” P = 15/16”

Rod End Code
1* = #1 Standard Rod Diameter
2 = #2 Standard Rod Diameter
3 = #3 Standard Rod Diameter
4 = Special Standard Rod Diameter (must specify threads)
5 = Special Oversize Rod Diameter (must specify threads)
6 = #1 Oversize Rod Diameter
7 = #2 Oversize Rod Diameter
8 = #3 Oversize Rod Diameter

NOTE: 1/8” and 1/4” ports can affect OAL of cylinder.
See online PDF for more information.

Cylinder Orientation

P1 C L - 04 A 1 B - A AA 0

Magnet Piston
0 = No Magnet
*2 = Reed Magnet & Wear Band
* Adds to OAL of cylinder, see online PDF.

Options
AA = No Options
**BA = Bumpers Both Ends
KA = Stroke Adjuster (Specify Length)
DA = Double Rod End
SA = Stainless Steel Rod
SS = Stainless Steel Rod and Tie Rods (3 and 4 Bore)
ST = Stainless Steel Tie Rods (3 and 4 Bore)
VA = FKM Seals
1A = Rod Extension (Specify Length)
2A = Thread Extension (Specify Length)
*WA = Wear Band
* Adds to OAL of cylinder, see online PDF.
**Bumpers add .062” to OAL (per bumper).

Cushions
A = No Cushions

Ports
Position # 10-32 1/8” 1/4”
1 A B C
2 G H I
3 M N O
4 S T U

Rod End Styles, diameters and threads

<table>
<thead>
<tr>
<th>Bore</th>
<th>Diameter</th>
<th>Style #1 Standard Male</th>
<th>Style #2 Optional Female</th>
<th>Style #3 Standard Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4”</td>
<td>.250</td>
<td>#8-32</td>
<td>N/A</td>
<td>#8-32</td>
</tr>
<tr>
<td>1 1/8”</td>
<td>.500</td>
<td>1/4-28</td>
<td>5/16-24</td>
<td>1/4-28</td>
</tr>
<tr>
<td>1 1/2”</td>
<td>.750</td>
<td>7/16-20</td>
<td>3/8-24</td>
<td>7/16-20</td>
</tr>
<tr>
<td>2*</td>
<td>.750</td>
<td>1/2-20</td>
<td>N/A</td>
<td>1/2-20</td>
</tr>
<tr>
<td>2 1/2”</td>
<td>.750</td>
<td>7/16-20</td>
<td>N/A</td>
<td>7/16-20</td>
</tr>
<tr>
<td>3*</td>
<td>1.000</td>
<td>3/4-16</td>
<td>5/8-18</td>
<td>3/4-16</td>
</tr>
<tr>
<td>4*</td>
<td>1.000</td>
<td>3/4-16</td>
<td>N/A</td>
<td>3/4-16</td>
</tr>
</tbody>
</table>

*NOTE: Style #1 Male rods are studded female rods.
Numatics, a world leader in air powered products and systems, offers an extensive range of rodless cylinders. Utilizing the most advanced design and production criteria, Numatics provides solutions for automation throughout all sectors of industry.

**Specifications**

Bore Sizes: 25, 32, 40, and 50 mm

Single Barrel Extrusions

Working Pressure: (min) 45 to 145 PSIG (max)

Ambient Temperature Range: -4°F to 175°F (-20°C to 80°C)

Medium: Filtered Air, with or without lubrication

Standard Stroke Lengths: Up to 19.5 ft. (6 meters)

Operating Speed: Up to 9.75 ft./sec. (3m/sec.)

**Supply Port Options**

- 0 = No Supply Port (left end cap only when both chambers are supplied from the right end cap)
- 1 = Side
- 2 = Bottom
- 3 = Rear
- 4 = Both Chambers supplied from one end cap
NR Series How to Order

2 DAY

Series
S1 = Single Barrel

Carriage Type
0 = Standard
2 = Medium
3 = Long
4 = Double Standard
5 = Double Medium
6 = Double Long

Right End-Cap Supply Port
1 = Side Supply Port, NPT
2 = Bottom Supply Port, NPT
3 = Rear Supply Port, NPT
4 = Both Chambers Supplied from Right End-Cap, NPT
5 = Side Supply Port, G Tap
6 = Bottom Supply Port, G Tap
7 = Rear Supply Port, G Tap
8 = Both Chambers Supplied from Right End-Cap, G Tap

Left End-Cap Supply Port
0 = No Supply Port (when both chambers are supplied from right end-cap)
1 = Side Supply Port, NPT
2 = Bottom Supply Port, NPT
3 = Rear Supply Port, NPT
5 = Side Supply Port, G Tap
6 = Bottom Supply Port, G Tap
7 = Rear Supply Port, G Tap

Cylinder Bore Sizes
25 = 25 Millimeters (1/8” Ports)
32 = 32 Millimeters (1/4” Ports)
40 = 40 Millimeters (3/8” Ports)
50 = 50 Millimeters (3/8” Ports)

Barrel Configuration
S1 Series with Single Chamber

Single chamber bore sizes 25 mm to 50 mm in extruded aluminum alloy
Standard stroke length up to 19.5 ft.
Various supply port configurations available
Various carriage sizes
High speed up to 9.75 ft./sec.

Rodless Cylinder Theoretical Force Charts for NR Series

<table>
<thead>
<tr>
<th>Bore Diameter</th>
<th>Piston Area (inches)</th>
<th>20 (1.4)</th>
<th>40 (2.8)</th>
<th>60 (4.1)</th>
<th>80 (5.5)</th>
<th>100 (6.9)</th>
<th>120 (8.3)</th>
<th>145 (10.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25mm</td>
<td>0.76</td>
<td>(19.3)</td>
<td>(1.0)</td>
<td>(2.1)</td>
<td>(3.2)</td>
<td>(4.2)</td>
<td>(5.2)</td>
<td>(6.3)</td>
</tr>
<tr>
<td>32mm</td>
<td>1.25</td>
<td>(31.8)</td>
<td>(1.7)</td>
<td>(3.4)</td>
<td>(5.2)</td>
<td>(6.9)</td>
<td>(8.6)</td>
<td>(10.3)</td>
</tr>
<tr>
<td>40mm</td>
<td>1.95</td>
<td>(49.5)</td>
<td>(2.7)</td>
<td>(5.4)</td>
<td>(8.1)</td>
<td>(10.8)</td>
<td>(13.4)</td>
<td>(16.1)</td>
</tr>
<tr>
<td>50mm</td>
<td>3.04</td>
<td>(77.2)</td>
<td>(4.2)</td>
<td>(8.4)</td>
<td>(12.5)</td>
<td>(16.8)</td>
<td>(21.0)</td>
<td>(25.2)</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
NR & G Series Rodless Cylinders

G Series How to Order

<table>
<thead>
<tr>
<th>Series</th>
<th>Carriage Type</th>
<th>Right End-Cap Supply Port</th>
<th>Left End-Cap Supply Port</th>
<th>Cylinder Bore Size in Millimeters</th>
<th>Sensing Position &amp; Other Options</th>
<th>Sensing Type</th>
<th>Fractional Inches of Stroke</th>
<th>Full Inches or Millimeters of Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>2</td>
<td>0 = No Supply Port</td>
<td>0 = No Supply Port</td>
<td>25</td>
<td>A = Single Position</td>
<td>M = Magnetic</td>
<td>25 = 25 Millimeters</td>
<td>0048 = 48&quot; Stroke</td>
</tr>
<tr>
<td></td>
<td>Medium Carriage</td>
<td>1 = Side Supply Port</td>
<td>1 = Side Supply Port</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>3</td>
<td>2 = Bottom Supply Port, NPT</td>
<td>2 = Bottom Supply Port, NPT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Long Carriage</td>
<td>3 = Rear Supply Port, NPT</td>
<td>3 = Rear Supply Port, NPT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>4 = Both Chambers Supplied from the Right End-Cap, NPT</td>
<td>4 = Both Chambers Supplied from the Left End-Cap, NPT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Double Medium Carriage</td>
<td>5 = Side Supply Port, G Tap</td>
<td>5 = Side Supply Port, G Tap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>6 = Bottom Supply Port, G Tap</td>
<td>6 = Bottom Supply Port, G Tap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Double Long Carriage</td>
<td>7 = Rear Supply Port, G Tap</td>
<td>7 = Rear Supply Port, G Tap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8 = Both Chambers Supplied from the Right End-Cap, G Tap</td>
<td>8 = Both Chambers Supplied from the Left End-Cap, G Tap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Barrel Configurations

**G1 Series**
- Single Rail
- Heavy Duty

**G2 Series**
- Twin Rail
- Super Heavy Duty

Single chamber bore sizes 25mm to 50mm in extruded aluminum alloy
Various supply port configurations available
Medium and long carriage types
High speed up to 9.75 ft./sec.
CGT Series Compact Guide Slide

**A. Body**
Anodized aluminum alloy, lightweight and durable. Multiple mounting options, counterbored holes, drilled and tapped holes and extruded “T” slots.

**B. Tool Plate**
Nickel-plated steel, easy access mounting holes for tooling attachment.

**C. Bearings**
Two choices, recirculating ball for heavy-duty applications and sintered bronze for medium to light duty applications.

**D. Rod Wipers**
Steel reinforced rod wiper assures wiping action on guide shafts to protect bearings from operating environment contamination.

**E. Guide Shafts**
Hardened, ground and polished, oversized diameter for additional load support and rigidity.

**F. Piston**
Internal to body. Magnetic band for position sensing standard on all sizes and strokes.

**G. Sensor Mounting Track**
Extruded directly in body, no external brackets, easy access for Hall effect and Reed switches.

---

**How to Order**

<table>
<thead>
<tr>
<th>CGT 032 050</th>
<th>B 1 6</th>
<th>D X</th>
</tr>
</thead>
</table>

**Bore Diameter**

- 016  =  16 mm (20, 50 mm strokes only)
- 020  =  20 mm (20, 50 mm strokes only)
- 025  =  25 mm (20, 25, 50 mm strokes only)
- 032  =  32 mm (25, 50 mm strokes only)
- 040  =  40 mm (25, 50 mm strokes only)
- 050  =  50 mm (25, 50 mm strokes only)

**Stroke**

- 020  =  20 mm
- 025  =  25 mm
- 050  =  50 mm

**Bearing Option**

- B  =  Bronze Bushing
- L  =  Linear Ball Bearing

**Seal Option**

- 1  =  Polyurethane

**Options**

- X  =  No Options

**Sensing Position**

- A  =  Single Position Extend
- B  =  Single Position Retract
- C  =  Two Position Sensing
- D  =  No Sensing

**Sensing Type**

- Standard Cord Set
  - 1  =  Hall Effect - PNP (Sourcing)
  - 2  =  Hall Effect - NPN (Sinking)
  - 3  =  Reed Switch
  - 6  =  No Sensing

- Quick Connect Cord Set
  - Z  =  Hall Effect - PNP (Sourcing)
  - Y  =  Hall Effect - NPN (Sinking)
  - X  =  Reed Switch

---

**When Ordering Additional Sensors**

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect - PNP (Sourcing)</td>
<td>PNP-FL2-00-U</td>
</tr>
<tr>
<td>Hall Effect - NPN (Sinking)</td>
<td>NPN-FL2-00-U</td>
</tr>
<tr>
<td>Reed Switch</td>
<td>REED-FL2-00S</td>
</tr>
</tbody>
</table>

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For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
The **SH Series** is a robust linear pneumatic slide that is designed to excel in the most strenuous applications. The SH Series encompasses a multitude of desirable features, i.e., adjustable shaft collars, alignment coupler, and NuMate™ universal mounting pattern, just to mention a few. Additionally, the SH Series includes the well-proven Numatics M Series cylinder as the driving mechanism. These are just a sample of the features that make the SH Series the superior pneumatic linear slide line.

**Body:**
The hard coat anodized aluminum body is lightweight yet extremely durable. The body includes standard dowel location holes for precision mounting. Multi-surface mounting holes enable flexible and easy access mounting.

**Air Cylinder:**
The driving mechanism of all SH Series Slides is the proven Numatics M Series air cylinder. The cylinder includes stainless steel end caps and piston rod for corrosion resistance. With the exception of 5/16" bore, all other bore sizes include a cylinder with a magnetic piston for position sensing applications.

**Alignment Coupler:**
The alignment coupler has 360° of rotation. Subsequently, it protects the cylinder piston rod from side loading. This enables maximum cylinder life.

**Tooling Plate:**
The tooling plate includes the NuMate™ universal mounting pattern. NuMate™ is a standardized mounting system that is unique to Numatics. The mounting system eliminates the need for custom transition plates. The holes are drilled, tapped and counter bored from the opposite side which enables mounting the unit to be effortless.

**Guide Shafts:**
Hardened steel (Rc 60 – 65) guide shafts are standard with the Linear Ball Bearing and Sintered Bronze bearing units. Hardened stainless steel (Rc 50 – 55) guide rods are standard with the PTFE bearing units. All guide shafts are precision ground and polished to 15u/RMS for smooth cycling and low breakout. The large diameters enable increased load capacity. The shaft pivot is mounted directly to the tooling plate for maximum rigidity.

**Bearings Options:**
Each SH Series Slide includes 4 bearings. The SH Series is unique because of the 3 bearing options.

**Linear Ball Bearing**
This consists of 4 self-aligning bearings that reduce wear while maximizing load capability. It is sealed with rod wipers that protect against dirt and contamination.

**Sintered Bronze**
This consists of 4 oil impregnated (self-lubricating) sintered bronze sleeves with a high Pv rating that enables long application life.

**PTFE**
This has 4 maintenance free, self-lubricating PTFE bearings that enables long application life and low friction.

**Bumper/Wiper**
All SH Series Slides include a standard polyurethane bumper/wiper combo that is durable and long lasting. The bumper/wiper is integrated into the body of the slide and reduces shock and loading on both the extend and retract stroke. The wiper removes contamination from the guide shafts.

**Adjustable Shaft Collars**
The adjustable shaft collars enable extend stroke adjustment.

**Standard Specifications**
- Bore sizes from 5/16" through 3".
- NuMate™ universal mounting pattern.
- 3 bearing options.
- Nominal pressure rating is 250 psi air.
- Alignment coupler standard on all slides.
- Standard temperature -10°F to +165°F.

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
How to Order

**SH Series (Actuators)**

**Bore Size**
- SH031 = 5/16"
- SH06 = 9/16"
- SH075 = 3/4"
- SH106 = 1-1/16"
- SH150 = 1-1/2"
- SH200 = 2"
- SH250 = 2-1/2"
- SH300 = 3"

**Standard Stroke (inches)**
- SHX5 = 1/2"
- SHX01 = 1"
- SHX09 = 1-1/2"
- SHX02 = 2"
- SHX03 = 3"
- SHX04 = 4"
- SHX05 = 5"
- SHX06 = 6"
- SHX07 = 7"
- SHX08 = 8"
- SHX09 = 9"
- SHX10 = 10"
- SHX11 = 11"
- SHX12 = 12"
- SHX13 = 13"
- SHX14 = 14"
- SHX15 = 15"
- SHX16 = 16"
- SHX17 = 17"
- SHX18 = 18"

**Bearing Option**
- LB = Linear Ball
- TB* = PTFE
- BB = Sintered Bronze
  * Supplied Standard with 440 C Stainless Steel Guide Rods, Stop Collars and Hardware.

**Cylinder Type**
- 1 = Buna-N Seals***
- 2 = FKM Seals (no magnet)
- 4 = FKM Seals with magnet***
  *** Magnet not available on SH031

**Shock Option**
- Shock Hardware Only
  - 1 = Extend
  - 2 = Retract
  - 3 = Extend/Retract
  - 4 = No Shock Hardware

**Hardware & Shocks**
- A = Extend
- B = Retract
- C = Extend/Retract

**Mounting Option**
- S = Std. Mount
- B = Base Mount
- A = Angle Mount

**Sensing Position**
- A = Single Pos. Extend
- B = Single Pos. Retract
- C = Two Position
- D = No Sensing

**Sensing Type**
- Standard Cord Set
  - 1 = Hall Effect PNP (Sourcing)
  - 2 = Hall Effect NPN (Sinking)
  - 3 = Reed Switch
  - 6 = No Sensing
  - 7 = 8mm Threaded Barrel Prox Bracket*

**Quick Disconnect Cord Set**
- Z = Hall Effect PNP (Sourcing)
- Y = Hall Effect NPN (Sinking)
- X = Reed Switch
  * Bracket only - does not include switch
SPS Series Small Power Slide

The SPS Series’ small size makes it the ideal slide for getting into those tight spaces.

A. Body
Hardcoat Anodized, PTFE impregnated inside & out. Lightweight, durable, high strength to weight ratio.

B. Slide
Aluminum Bronze alloy. Heavy cross section T-Slot style to prevent fatigue failure and breakage. Offers superior load bearing capabilities throughout stroke. Payload can be attached to top of slide or tooling plate.

C. Stroke adjustment
Fine adjustments can be made to extend stroke accessible through the tooling plate. Retract stroke can be adjusted from backside of unit. Locking set screws ensure precise repetitive operation.

D. Sensing
Hall effect sensing is available for sensing extend & retract.

E. Bearing
Special engineered material, low friction, long life, maximum rigidity.

How to Order

Bore Sizes
050 = 8 mm
075 = 12 mm

Standard Stroke
X5 = 1/2 Inch
01 = 1 Inch
X9 = 1-1/2 Inches
02 = 2 Inches

Seal Option
1 = Buna-N

Special Options
M = Metric
X = Standard

Stroke Adjustment
A = Single Position Extend
B = Single Position Retract
C = Two Position Sensing
D = No Sensing

Sensing Type
Standard Cord Set
1 = Hall Switch - PNP (Sourcing)
2 = Hall Switch - NPN (Sinking)
6 = No Sensing
Quick Disconnect Cord Set
Z = Hall Switch - PNP (Sourcing) Straight
Y = Hall Switch - NPN (Sinking) Straight
See Sensor section.

When ordering additional switches

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Part No.</th>
<th>Quick Disconnect Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect–PNP (Sourcing)</td>
<td>CS-20TP</td>
<td>CS-18P-QD</td>
</tr>
<tr>
<td>Hall Effect–NPN (Sinking)</td>
<td>CS-20TN</td>
<td>CS-20TN-QD</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
Single/Double/Triple Convoluted and Sleeve Series

Specifications
- Medium: Filtered compressed air with or without lubrication
- Ambient Temperature Range: -40°F to +140°F (-40°C to +70°C)
- Working Pressure: Up to 120 PSIG (8 bar)
- Force: Up to 15,000 lbs.
- Stroke: Up to 16.75 inches

End Cap Styles for Model Numbers Listed Below
Air inlet caps shown. Opposite end does not include a supply port.

How To Order
Depending on your adapter selection, add either a -2 or -3 to the end of bellows part number (ie. ASNS18-3-1-2).

<table>
<thead>
<tr>
<th>Model Number Reference</th>
<th>Adapter Option Code</th>
<th>Bellow Model</th>
<th>AA</th>
<th>AB</th>
<th>AC</th>
<th>DA</th>
<th>DB</th>
<th>DC</th>
<th>HA</th>
<th>HB</th>
<th>MA</th>
<th>PA</th>
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<td></td>
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<tr>
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<td>NA</td>
<td>1.75</td>
<td>N/A</td>
<td>N/A</td>
<td>4.25</td>
<td>5.91</td>
<td>6.50</td>
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<td>3/8*16 UNC</td>
<td>1/4*NPT</td>
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<td>N/A</td>
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<td><strong>Triple Convoluted</strong></td>
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</tbody>
</table>

Numatics Express 2Day for Bellows applies to order quantities of up to 5 units.

Sleeve Type

**Bellow Model**
- ASNC2-1-1*
- ASNC6-1-1*
- ASNC6-2-1*

Reference online PDF for specifications.

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
The **LR Series** rotary actuator is a low profile rack and pinion design. Two independent pistons drive their corresponding racks against the pinion thereby rotating the platform.

**A. Body**
Hardcoated anodized aluminum PTFE impregnated, lightweight, high strength to weight ratio.

**B. Rotary Platform**
Hardcoated anodized aluminum, durable. Supported by two bearings, one on each side of the pinion shaft, providing superior dynamic load capacity.

**C. Stroke Adjustment**
Built-in rotary hard stops protect rotary platform from over travel. External stroke adjust screws with locking set screws provide fine tuned rotary position.

**D. Flow Controls**
Built in design is easily adjustable, provides precise deceleration speed control in both directions.

**E. Position Sensing**
Proximity switch sensors available for rotary position sensing.

**F. Shocks**
LR60, LR125 & LR270 come standard with internal shock absorbers.

---

**How to Order**

**Torque Rating**
- **LR-06**: 6 in-lb
- **LR-20**: 21 in-lb
- **LR-60**: 62.5 in-lb
- **LR-60M**: 62.5 in-lb
- **LR-125**: 125 in-lb
- **LR-125M**: 125 in-lb
- **LR-270**: 270 in-lb

*Manifold option, contact factory.

**Rotation**
- **A**: 90°
- **B**: 180°

**Seal Option**
- **1**: Buna-N

**Special Options**
- **M**: Metric
- **Q**: No Switch Cables
- **X**: Standard

**Shock Absorbers**
- **3**: Clockwise and Counter Clockwise Shock (standard on LR-60, LR-125 & LR-270)
- **4**: No Shocks (Shocks are not available on LR-06 and LR-20.)

**Sensing Position**
- **A**: Single Position Clockwise
- **B**: Single Position Counter Clockwise
- **C**: Two Position
- **D**: No Sensing

**Sensing Type**
- **4**: Prox Switch - PNP (Sourcing)
- **5**: Prox Switch - NPN (Sinking)
- **6**: No Sensing

Quick Disconnect Cord Set
- **W**: Prox Switch - PNP (Sourcing) Straight
- **U**: Prox Switch - PNP (Sourcing) 90 Deg.

Prox switches are 5 mm diameter.

See PDF online.

---

**When ordering additional switches**

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Part No.</th>
<th>Quick Disconnect Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prox Switch - PNP (Sourcing)</td>
<td>PROX-5FL2-P</td>
<td>PROX-5QDS-P</td>
</tr>
<tr>
<td>Prox Switch - NPN (Sinking)</td>
<td>PROX-5FL2-N</td>
<td>Not Available</td>
</tr>
<tr>
<td>Quick Disconnect Cable</td>
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<td>PX CST</td>
</tr>
<tr>
<td>90° 5 meter cable</td>
<td>–</td>
<td>PXC90</td>
</tr>
<tr>
<td>Bronze switch housing for LR &amp; RM Rotaries</td>
<td>–</td>
<td>RSH05</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
Gripper Summary of Operation

**WBG Series** utilizes four independent pistons to power the jaws open and closed. Jaws utilize a rack and pinion for synchronization which are independent from force rods and support rods. Non-Synchronous operation is available.

**A. Body**
High strength, anodized aluminum.
Ultra high gripping force to weight ratio.

**B. Support Rods**
Hardened steel support shafts are guided through the full width of the body. Wiper seals assist in keeping rods free of debris.

**C. Seals**
Piston seals are quad ring type for long service life.
- Pre-lubricated with our specially formulated oil based compound for extensive maintenance free performance.
- Proximity switches are available to monitor open and closed position of the jaws.

How to Order

<table>
<thead>
<tr>
<th>WBG</th>
<th>S</th>
<th>60</th>
<th>S</th>
<th>1</th>
<th>W</th>
<th>C</th>
<th>X</th>
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</thead>
<tbody>
<tr>
<td>Gripper Stroke</td>
<td>S = Short Stroke</td>
<td>L = Long Stroke</td>
<td>X* = Extra Long</td>
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<td></td>
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<tr>
<td>Gripper Model Number</td>
<td>60</td>
<td>90</td>
<td>200</td>
<td>300</td>
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</tr>
<tr>
<td>Gripper Motion</td>
<td>S = Synchronous</td>
<td>C = Compliant</td>
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<td></td>
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</tr>
<tr>
<td>Seal Type</td>
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</tr>
</tbody>
</table>

**Options**
X = Standard

**Sensing Position**
A = Single Position Open
B = Single Position Closed
C = Two Position Sensing
D = No Sensing

**Sensing Type**
Standard Cord Set
4 = Prox Switch - PNP (Sourcing)
5 = Prox Switch - NPN (Sinking)
6 = No Sensing
Quick Disconnect Cord Set
W = Prox Switch - PNP (Sourcing) Straight
V = Prox Switch - NPN (Sinking) Straight
U = Prox Switch - PNP (Sourcing) 90 Deg.
T = Prox Switch - NPN (Sinking) 90 Deg.
Prox switches are 4 mm diameter.

When ordering additional switches

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Part No.</th>
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<tr>
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<td>PROX-4FL2-P</td>
<td>PROX-4QDS-P</td>
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<td>PROX-4FL2-N</td>
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<tr>
<td>Quick disconnect cable straight</td>
<td>–</td>
<td>PXCST</td>
</tr>
<tr>
<td>Quick disconnect cable 90 deg.</td>
<td>–</td>
<td>PXC90</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
**WGS-50 Parallel Gripper Double Guided Wedge**

Gripper summary of operation:
Synchronous motion is achieved with a double acting piston attached via the piston shaft to a double sided wedge. The double sided angles of the wedge convert vertical motion to synchronous horizontal motion of the jaws.

**A. Body**
Hardcoat anodized PTFE impregnated aluminum inside and out. Ultra high gripping force to weight ratio.

**B. Jaws**
Jaws machined from S7 tool steel to prevent jaw breakage.

**C. Switches**
Proximity switches are available to monitor open and closed position of the jaws.

**D. Side Ports**
Additional side mounting holes and side air ports for optional mounting and porting.

**E. Lubrication**
Pre-lubricated with our specially formulated oil based compound for extensive maintenance free performance.

---

**WGL-50 Long Stroke and WGS-90 Short Stroke Parallel Grippers Double Guided Wedge**

Gripper summary of operation:
Synchronous motion is achieved with a double acting piston attached via the piston shaft to a double sided wedge. The double sided angles of the wedge convert vertical motion to synchronous horizontal motion of the jaws.

**A. Body**
Hardcoat anodized PTFE impregnated aluminum inside and out. Ultra high gripping force to weight ratio.

**B. Jaws**
Hardcoat anodized PTFE impregnated aluminum. Lightweight, durable, high strength.

**C. Purge Port**
Unit can be slightly pressurized to prevent debris or coolant from entering. A vacuum can be applied to evacuate contaminants from inside the unit in a clean room environment.

**D. Switches**
Proximity switches are available to monitor open and closed position of the jaws.
How to Order

**WG** S 50 1 4 C X

**Gripper Stroke**
- S = Short Stroke
- L = Long Stroke

**Gripper Series**
- 50
- 90

**Seal Type**
- 1 = Buna-N

**Special Options**
- X = No Options

**Sensing Position**
- A = Single Position Open
- B = Single Position Closed
- C = Two Position Sensing
- D = No Sensing

**Sensing Type**
- Standard Cord Set
  - 4 = Prox Switch - PNP (Sourcing)
  - 5 = Prox Switch - NPN (Sinking)
  - 6 = No Sensing
- Quick Disconnect Cord Set
  - W = Prox Switch - PNP (Sourcing)
  - V = Prox Switch - NPN (Sinking)
  - U = Prox Switch - PNP (Sourcing) 90 Deg.
  - T = Prox Switch - NPN (Sinking) 90 Deg.

Prox switches are 4mm diameter.

When ordering additional switches

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<td>PROX-4QDS-P</td>
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<td>Prox Switch - NPN (Sinking)</td>
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<tr>
<td>Quick disconnect cable straight</td>
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<td>PX CST</td>
</tr>
<tr>
<td>Quick disconnect cable 90 deg.</td>
<td>–</td>
<td>PX C90</td>
</tr>
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</table>
**Gripper Summary of Operation**

**PG Series** has true parallel motion that is generated by a pinion mechanism powered by a double acting piston.

**A. Body**
Hardcoat anodized, PTFE impregnated inside and out. Two different strokes with the same size low profile body.

**B. Jaws**
Jaws are aluminum bronze alloy and T-Slot style to prevent jaw breakage and offers superior load bearing capabilities.

**C. Sensing**
Reed & Hall effect sensing is available to sense open and closed position.

### How to Order

**5DAY**

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<tbody>
<tr>
<td>Gripper Stroke</td>
<td>S = Short Stroke</td>
<td>L = Long Stroke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gripper Series</td>
<td>25</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seal Type</td>
<td>1 = Buna-N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Special Options**

- **X** = Standard

**Sensing Position**

- **A** = Single Position Open
- **B** = Single Position Closed
- **C** = Two Position Sensing
- **D** = No Sensing

**Sensing Type**

- Standard Cord Set
- Quick Disconnect Cord Set
- **1** = Hall Switch - PNP (Sourcing)
- **2** = Hall Switch - NPN (Sinking)
- **6** = No Sensing

**Quick Disconnect Cord Set**

- **Z** = Hall Switch - PNP (Sourcing)
- **Y** = Hall Switch - NPN (Sinking)

See Sensor section.

### When ordering additional switches

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Part No.</th>
<th>Quick Disconnect Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect - PNP (Sourcing)</td>
<td>CS-20TP</td>
<td>CS-18P-QD</td>
</tr>
<tr>
<td>Hall Effect - NPN (Sinking)</td>
<td>CS-20TN</td>
<td>CS-20TN-QD</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
RPG Series Gripper

Gripper Summary of Operation

RPG Series has true parallel motion that is generated by a double acting piston attached to the pinion mechanism with a linkage that is guided in the body for precise centering.

A. Body
Hardcoat anodized, PTFE impregnated inside and out. High force to weight ratio.

B. Jaws
Jaws are aluminum bronze alloy to prevent jaw breakage. T-Slot style jaws offers superior load bearing capabilities.

C. Sensing
Proximity switches available for sensing open and closed positions.

How to Order

RPG Series
25
35
80

Seal Type
1 = Buna-N

Special Options
X = Standard

Sensing Position
A = Single Position Open
B = Single Position Closed
C = Two Position Sensing
D = No Sensing

Sensing Type
Standard Cord Set
4 = Prox Switch - PNP (Sourcing)
5 = Prox Switch - NPN (Sinking)
6 = No Sensing

Prox switches are 4 mm diameter.

When ordering additional switches

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect - PNP (Sourcing)</td>
<td>PROX-4FL2-P</td>
</tr>
<tr>
<td>Hall Effect - NPN (Sinking)</td>
<td>PROX-4FL2-N</td>
</tr>
</tbody>
</table>

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
TJ30 Series 3 Jaw Gripper

**TJ30** 3 jaw gripper provides high grip force in a compact design. Stripper plate option provides 9 lbs. of linear spring force to facilitate part insertion when gripper jaws release part.

**A. Jaws**
Jaws are T-Slot bearing supported to prevent jaw breakage and offer superior load bearing performance.

**B. Flexible Mounting**
Flexible mounting, thru hole for SHCS, tapped from opposite side.

**C. Dowel Holes**
Dowel holes for locating.

**D. Body**
Hardcoated aluminum body.

**E. Sensing Tracks**
Sensing tracks for Hall effect switches sensing.

**F. Stripper Plate**
Optional Stripper Plate.

---

**Specifications**

<table>
<thead>
<tr>
<th>Series</th>
<th>Grip Force Close 100 PSI</th>
<th>Stroke</th>
<th>Weight</th>
<th>Displacement</th>
<th>Maximum Operating Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>TJ30</td>
<td>36 lbs.</td>
<td>0.300</td>
<td>9 oz.</td>
<td>0.35 cu. in.</td>
<td>120 psi</td>
</tr>
</tbody>
</table>

**How To Order**

```
Series  
30

Seal Option  
1 = Buna-N
```

```
TJ 30 1 6 D SP X

TJ = Standard
30 = With Stripper Plate
1 = No Stripper Plate
6 = Single Position Open
D = Single Position Closed
SP = No Sensing
X = Hall Switch – PNP (Sourcing)
```

**Sensing Kits**

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Cord Set Part No.</th>
<th>Quick Disconnect Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect - PNP Sourcing</td>
<td>CS-20TP</td>
<td>CS-18P-QD</td>
</tr>
<tr>
<td>Hall Effect - NPN Sinking</td>
<td>CS-20TN</td>
<td>CS-20TN-QD</td>
</tr>
<tr>
<td>90° 5 Meter Cable</td>
<td>N/A</td>
<td>PXC90</td>
</tr>
<tr>
<td>Straight 5 Meter Cable</td>
<td>N/A</td>
<td>PXCST</td>
</tr>
</tbody>
</table>
TJ200 Series 3 Jaw Gripper

Provides high grip force in a compact design. Shielded design makes the TJ ideal for machine loading and unloading. Compact design to grip force ratio are ideal for confined work areas.

A. Jaws
Jaws are T-Slot bearing supported to prevent Jaw breakage and offer superior load bearing performance.

B. Flexible Mounting
Flexible mounting, thru hole for SHCS, tapped from opposite side.

C. Dowel Holes
Dowel holes for locating.

D. Body
Hardcoated aluminum body.

E. Sensing
Sensing tracks for Hall effect switches sensing.

Specifications

<table>
<thead>
<tr>
<th>Series</th>
<th>Grip Force Close 100 PSI</th>
<th>Stroke</th>
<th>Weight</th>
<th>Maximum Operating Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>TJ200</td>
<td>250 lbs.</td>
<td>0.330</td>
<td>2.3 oz.</td>
<td>120 psi</td>
</tr>
</tbody>
</table>

How To Order

TJ 200 1 6  D  X

X = Standard

Sensing Position
A = Single Position Open
B = Single Position Closed
C = Two Position Sensing
D = No sensing

Sensing Type
CS Series Switch
1 = Hall Switch – PNP (Sourcing)
2 = Hall Switch – NPN (Sinking)
6 = No Sensing
Quick Disconnect Cord Set
Z = Hall Switch – PNP (Sourcing)
Y = Hall Switch – NPN (Sinking)

When ordering additional switches

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Cord Set Part No.</th>
<th>Quick Disconnect Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect - PNP Sourcing</td>
<td>CS-20TP</td>
<td>CS-18P-QD</td>
</tr>
<tr>
<td>Hall Effect - NPN Sinking</td>
<td>CS-20TN</td>
<td>CS-20TN-QD</td>
</tr>
</tbody>
</table>
The **PG6J80 Series** 6 finger gripper design utilizes a dual acting piston to open and close gripper jaws. All six jaws are synchronized for accurate positioning. The included ejectors operate independent of the gripper jaws, providing a convenient method to strip parts from the jaws. An example of this could be expanding an o-ring and pushing it on to the desired part.

**A. Body**
Hardcoat, anodized, PTFE impregnated aluminum, lightweight durable.

**B. Jaws**
T-slot design for superior load bearing support, six jaws in synchronized parallel motion.

**C. Ejectors**
Independent motion from jaws. Single acting, air pressure to extend, spring return. All ejectors extend and retract together.

**D. Stroke adjustment**
Easy access stroke adjustment screw provides precise controllability of jaw travel. Locking jam nut secures adjusted position.

### How to Order

<table>
<thead>
<tr>
<th>Series</th>
<th>PG6J 80 1 6 D X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal Type</td>
<td>1 = Buna-N</td>
</tr>
</tbody>
</table>

**Special Option**
- X = No Options

**Sensing Position**
- A = Single Position Open
- B = Single Position Closed
- C = Ejection Position
- D = All Positions
- E = No Sensing

**Sensing Type**
- Standard Cord Set
- 4 = Prox Switch - PNP (Sourcing)
- 5 = Prox Switch - NPN (Sinking)
- 6 = No Sensing
- Quick Disconnect Cord Set
- W = Prox Switch - PNP (Sourcing) Straight
- V = Prox Switch - NPN (Sinking) Straight
- U = Prox Switch - PNP (Sourcing) 90 Deg.
- T = Prox Switch - NPN (Sinking) 90 Deg.
- Prox switch 6.5 mm diameter

### When ordering additional switches

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Part No.</th>
<th>Quick Disconnect Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prox Switch - PNP (Sourcing)</td>
<td>PROX-65FL2-PN</td>
<td>PROX-65QDS-P</td>
</tr>
<tr>
<td>Prox Switch - NPN (Sinking)</td>
<td>PROX-65FL2-PN</td>
<td>Not Available</td>
</tr>
<tr>
<td>Quick Disconnect Cable</td>
<td>–</td>
<td>PXCST</td>
</tr>
<tr>
<td>90° 5 meter cable</td>
<td>–</td>
<td>PXC90</td>
</tr>
</tbody>
</table>
MPG5 Miniature Parallel Gripper

The MPG5 Gripper is designed for pick & place of small pieces. The cutting edge design of the MPG5 allows for manifold mounting a series of MPG5s in line without the concerns of space for fittings or air lines. Another unique feature of the MPG5 is the dual-purpose purge port that is part of every gripper. This feature facilitates use of the MPG5 in some clean room applications and very dirty environments.

A. Shielded design for long service life. High grip force to weight ratio.

B. Top porting allows units to be manifold mounted eliminating air fittings. Side and Top porting standard.

C. Purge port will evacuate any contaminants from inside for a clean room environment. When pressurized the purge will keep debris from entering unit in dirty environments.

D. Jaws are aluminum bronze alloy and T-Slot style to prevent jaw breakage.

Specifications

<table>
<thead>
<tr>
<th>Grip Force Close 80 PSI</th>
<th>Grip Force Open 80 PSI</th>
<th>Stroke</th>
<th>Weight</th>
<th>Displacement</th>
<th>Maximum Operating Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 lbs.</td>
<td>9 lbs.</td>
<td>0.19</td>
<td>1.7 oz.</td>
<td>0.008 cu. in.</td>
<td>100 psi</td>
</tr>
</tbody>
</table>

How To Order

MPG Series Miniature Parallel Gripper

For detailed dimensional information and technical specifications, please visit www.numatics.com. Information subject to change without notice.
GR90-Series Angular Grippers

The **GR90 Series** has a double acting piston attached to a cross bar by a connecting rod. The linear movement of the piston is transformed into angular movement of the jaws through a double toggle link mechanism.

**A. Body:**
Hardcoat anodized with PTFE for reduced friction and wear. Front and side ports standard.

**B. Jaws:**
Hardened alloy steel.
Keyway slot for tooling location.
180° jaw motion.

**C. Locking Adjustment Screw:**
Jaw rotations can be adjusted from 0-90° to be custom fit to each application.

---

**How to Order**

**5 DAY**

**Seal Type**

<table>
<thead>
<tr>
<th>Seal Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Buna-N Seals</td>
</tr>
</tbody>
</table>

**Sensing Type**

<table>
<thead>
<tr>
<th>Sensing Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Prox Switch – PNP (Sourcing)</td>
</tr>
<tr>
<td>5</td>
<td>Prox Switch – NPN (Sinking)</td>
</tr>
<tr>
<td>6</td>
<td>No Sensing</td>
</tr>
<tr>
<td>W</td>
<td>Prox Switch – PNP (Sourcing) Straight</td>
</tr>
<tr>
<td>V</td>
<td>Prox Switch – NPN (Sinking) Straight</td>
</tr>
<tr>
<td>U</td>
<td>Prox Switch – PNP (Sourcing) 90 Deg.</td>
</tr>
<tr>
<td>T</td>
<td>Prox Switch – NPN (Sinking) 90 Deg.</td>
</tr>
</tbody>
</table>

Prox switches are 4 mm diameter.

**Sensing Position**

<table>
<thead>
<tr>
<th>Sensing Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Single Position Open</td>
</tr>
<tr>
<td>B</td>
<td>Single Position Closed</td>
</tr>
<tr>
<td>C</td>
<td>Two Position Sensing</td>
</tr>
<tr>
<td>D</td>
<td>No Sensing</td>
</tr>
</tbody>
</table>

**Special Options**

<table>
<thead>
<tr>
<th>Special Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Standard</td>
</tr>
</tbody>
</table>

**When ordering additional switches & Seal Kits**

**Sensing Kits**

<table>
<thead>
<tr>
<th>Sensing Kit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect - PNP Sourcing</td>
<td>PROX-4FL2-P</td>
</tr>
<tr>
<td>Hall Effect - NPN Sinking</td>
<td>PROX-4FL2-N</td>
</tr>
</tbody>
</table>

**Sensing Kits Quick Disconnect Cord Set**

<table>
<thead>
<tr>
<th>Sensing Kit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect - PNP Sourcing</td>
<td>PROX-4QDS-P</td>
</tr>
<tr>
<td>Hall Effect - NPN Sinking</td>
<td>Not Available</td>
</tr>
<tr>
<td>90° 5 meter cable</td>
<td>PX090</td>
</tr>
<tr>
<td>Straight 5 meter cable</td>
<td>PX050</td>
</tr>
<tr>
<td>(5m Cables)</td>
<td>PX050</td>
</tr>
</tbody>
</table>
GR1400 – 180° Radial Gripper

The GR1400 has a double acting piston attached to a cross bar by a connecting rod. The linear movement of the piston is transformed into radial movement of the jaws through a double toggle link mechanism.

A. Body
Hardcoat anodized, T-Slot Sensing track for direct mount of the Numatics Global Switch. Side and top mounting standard. Dowel holes for locating.

B. Jaws
Keyway slot for tooling location, 180° Jaw motion.

C. Pivot Pins
Hardened steel, needle bearings reduce friction, reduce wear.

D. Center Toggle
Aluminum bronze guided in body for repeatability to center. Bumper for cushion at full open and noise reduction.

Specifications

<table>
<thead>
<tr>
<th>Grip Force Close 80 PSI</th>
<th>Grip Force Open 80 PSI</th>
<th>Side Play</th>
<th>Weight</th>
<th>Maximum Operating Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>720 lbs.</td>
<td>317 lbs.</td>
<td>±0.001</td>
<td>5.62 lbs.</td>
<td>120 psi</td>
</tr>
</tbody>
</table>

How To Order

Series
GR 1400
1 6 D X

Seal Option
1 = Buna-N

Sensing Position
A = Single Position Open
B = Single Position Closed
C = Two Position Sensing
D = No Sensing

Sensing Type
1 = Hall Effect – PNP (Sourcing)
2 = Hall Effect – NPN (Sinking)
3 = Reed Switch
6 = No Sensing

Sensing Kits

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Standard Cord Set Part No.</th>
<th>Quick Disconnect Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect - PNP Sourcing</td>
<td>PNP-FL2-00-U</td>
<td>PNP-QDS-M8-U</td>
</tr>
<tr>
<td>Hall Effect - NPN Sinking</td>
<td>NPN-FL2-00-U</td>
<td>NPN-QDS-M8-U</td>
</tr>
<tr>
<td>Reed Switch</td>
<td>REED-FL2-00-U</td>
<td>REED-QDS-M8U</td>
</tr>
<tr>
<td>90° 5 Meter Cable</td>
<td>N/A</td>
<td>PXC90</td>
</tr>
<tr>
<td>Straight 5 Meter Cable</td>
<td>N/A</td>
<td>PXCST</td>
</tr>
</tbody>
</table>

GR1400 Series Gripper

Direct Mount
No Bracket Required

Sensor Description

<table>
<thead>
<tr>
<th>Sensor Description</th>
<th>Standard Cord Set</th>
<th>Quick Disconnect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reed Switch</td>
<td>REED-FL2-00-U</td>
<td>REED-QDS-M8U</td>
</tr>
<tr>
<td>Hall PNP</td>
<td>PNP-FL2-00-U</td>
<td>PNP-QDS-M8-U</td>
</tr>
<tr>
<td>Hall NPN</td>
<td>NPN-FL2-00-U</td>
<td>NPN-QDS-M8-U</td>
</tr>
</tbody>
</table>

See online PDF for sensor specifications.
Cylinders
(Actuators)  FE Series

The FE Series design uses two double acting cylinders that are cross-ported and internally sequenced for smooth functioning parts regulation. Internal back pressure cross-port design allows both rods to be retracted with the air off to easily clear jammed parts. A four-way two-position valve is required for operation.

A. Body
High strength hardcoat aluminum.

B. Rods
Ground aluminum, hardcoat anodized, PTFE impregnated non-rotating.

C. Retract Stop Adjustments
Two adjustment screws allow flexibility to adjust the retract stroke on both rods independently.

D. Bronze Bushings
High side load capabilities, self lubricating, long life.

E. Sensing
Hall effect sensors available to sense extend and retract positions.

How to Order

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Sensing Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Standard Cord Set</td>
</tr>
<tr>
<td></td>
<td>1 = Hall Switch - PNP (Sourcing)</td>
</tr>
<tr>
<td></td>
<td>2 = Hall Switch - NPN (Sinking)</td>
</tr>
<tr>
<td></td>
<td>6 = No Sensing</td>
</tr>
</tbody>
</table>

Quick Disconnect Cord Set
| Z = Hall Switch - PNP (Sourcing) Straight |
| Y = Hall Switch - NPN (Sinking) Straight |

Special Options
X = No Options

Sensing Position
1 = Single Position Left Side
2 = Single Position Right Side
5 = Two Position Left and Right Side
6 = No Sensing

When ordering additional switches

<table>
<thead>
<tr>
<th>Switch Description</th>
<th>Part No.</th>
<th>Quick Disconnect Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall Effect PNP (Sourcing)</td>
<td>CS-20TP</td>
<td>CS-18P-QD</td>
</tr>
<tr>
<td>Hall Effect NPN (Sinking)</td>
<td>CS-20TN</td>
<td>CS-20TN-QD</td>
</tr>
</tbody>
</table>
SC Series Swing Clamps

Numatics Motion Control SC Series Swing Clamps combine linear and rotary motions. A specially machined spline internal to the piston rod develops the combined motions. When the clamp is extended, a linear movement first happens. This removes the clamp tooling from the clamped surface so it is not damaged. After completing the linear travel, rotation occurs swinging the clamp arm away from the work holding area. When clamping, the opposite motions occur.

A. Body
Hardcoat anodized aluminum, lightweight, durable PTFE impregnated, lubricated, maximizes seal life.

B. Rod Bushing
Large bearing area provides maximum rod support, side load protected.

C. Piston Rod
Hardened electroless nickel plated, corrosion resistant, durable low wearing surface.

D. Clamp Arm
Taper mounted convenient arm adjustment, 360 degree adjustment.

E. Mounting Surface
Convenient location precision machined to accept standard industrial fasteners.

How to Order

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>SC 025 A 1 6 D X</th>
<th>Special Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>025 = 25 mm</td>
<td></td>
<td>X = No Options</td>
</tr>
<tr>
<td>032 = 32 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>040 = 40 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>050 = 50 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>063 = 63 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arm Rotation</th>
<th></th>
<th>Sensing Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = CW</td>
<td></td>
<td>A = Clamp</td>
</tr>
<tr>
<td>B = CCW</td>
<td></td>
<td>B = Unclamp</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clamp Arm</th>
<th></th>
<th>D = Clamp and Unclamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = Double</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Not available on SC025.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensing Type</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Cord Set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Hall Effect - PNP (Sourcing)</td>
<td>PNP-FL2-00-U</td>
<td></td>
</tr>
<tr>
<td>2 = Hall Effect - NPN (Sinking)</td>
<td>NPN-FL2-00-U</td>
<td></td>
</tr>
<tr>
<td>3 = Reed Switch</td>
<td>REED-FL2-00S</td>
<td></td>
</tr>
<tr>
<td>6 = No Sensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quick Disconnect Cord Set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Hall Effect - PNP (Sourcing)</td>
<td>PNP-QDS-M8-U</td>
<td></td>
</tr>
<tr>
<td>2 = Hall Effect - NPN (Sinking)</td>
<td>NPN-QDS-M8-U</td>
<td></td>
</tr>
<tr>
<td>3 = Reed Switch</td>
<td>REED-QDS-M8S</td>
<td></td>
</tr>
<tr>
<td>90° 5 meter cable</td>
<td>PXC90</td>
<td></td>
</tr>
<tr>
<td>Straight 5 meter cable</td>
<td>PXCST</td>
<td></td>
</tr>
</tbody>
</table>

Sensing Kits

See online PDF.