### Directional Control Valves

#### Port Size

<table>
<thead>
<tr>
<th>Flow Rate/ Factor</th>
<th>Function</th>
<th>Series</th>
<th>Actuators</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-32 &amp; 1/8 NPT Modular</td>
<td>Cv = 0.05 to 0.23</td>
<td>2 Way 3 Way 4 Way, 2 Position</td>
<td>Modular Manifold Solenoid</td>
</tr>
<tr>
<td>1/8 NPT &amp; 1/4 NPT</td>
<td>Cv = 0.05 to 0.23</td>
<td>2 Way 3 Way</td>
<td>Hex Body Solenoid</td>
</tr>
<tr>
<td>1/8 NPT</td>
<td>Cv = 0.27</td>
<td>2 Way 3 Way 4 Way, 2 Position</td>
<td>18 Manual Mechanical Pilot Solenoid</td>
</tr>
<tr>
<td>1/4 NPT Stacking</td>
<td>Cv = 1.0</td>
<td>3 Way 4 Way, 2 Position</td>
<td>M14 Manual Mechanical Pilot Solenoid</td>
</tr>
<tr>
<td>1/2 NPT</td>
<td>Cv = 2.4 to 4.1</td>
<td>3 Way 4 Way, 2 Position 4 Way, 3 Position</td>
<td>12 Manual Pilot Solenoid</td>
</tr>
</tbody>
</table>

**Note:** Operating Temperature references for 18 Series and 14 Series valves described on pages 11.8 and 11.14.

Standard catalog models are suitable for operation in intermittent low temperatures in a range of 0° to +32 °F.

A custom aluminum spool may be substituted when long-term application temperatures are expected to be −40° to +32°F. These should be limited to manual or mechanical actuation, not spring return. Consider that actuation force may exceed catalog specs and that spring return models may not be reliable at these low temperatures. Please consult factory.

For long-term, continuous operation in a range of +150°F to +180°F, the Viton seal option can provide the benefits of reliable leak-free operation and extended durability. For applications exceeding +180°F, please consult factory.
## Section 11 Index

<table>
<thead>
<tr>
<th>Series</th>
<th>Quick Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular Manifold</td>
<td>11.3</td>
</tr>
<tr>
<td>Hex Body</td>
<td>11.5</td>
</tr>
<tr>
<td>18</td>
<td>11.7</td>
</tr>
<tr>
<td>14</td>
<td>11.13</td>
</tr>
<tr>
<td>M14</td>
<td>11.13</td>
</tr>
<tr>
<td>34</td>
<td>11.13</td>
</tr>
<tr>
<td>12A</td>
<td>11.23</td>
</tr>
<tr>
<td>38</td>
<td>11.23</td>
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<td>11.23</td>
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<td>12B</td>
<td>11.23</td>
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</table>

Specifications subject to change without notice or incurring obligation
Miniature 53 STYLE Solenoid Valves
2, 3 or 4 Way - Modular Manifolding
2, 3 or 4 Way - Single Mounting

Time Proven • Space Saving • Reliable 2, 3 and 4 Way Solenoid Valves with 10-32 or 1/8 NPT ports are available in singular or modular manifold versions. Any combination of function and ports can be combined in the same manifold stack to save time, space and plumbing. With pressure manifold plugging, two or more pressure ranges and/or medias can be controlled in the same stack.

For Each Valve Specify:

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Inlet Port</th>
<th>Cylinder Port</th>
<th>Functional Port</th>
<th>Volts &amp; Hertz</th>
</tr>
</thead>
<tbody>
<tr>
<td>103-M</td>
<td>1/8 NPT</td>
<td>1/8 NPT</td>
<td>104-S-120/60</td>
<td>120/60</td>
</tr>
</tbody>
</table>

For Complete Assembled Banks Specify:

- Quality of assembled Banks
- Valve models (start left to right, see photo above)
- Mounting brackets, if desired #101

Example... Using the photo above
1 Bank consisting of:
1 113-M-C-1 120/60
1 103-M-F-1 120/60
1 104-M-G-1 120/60
1 114-M-C-1 120/60
1 Pair #101 Mounting Brackets

Operating Pressures
Applies to all 4 Way 104 and 114 series valves.
See Orifice Information below for pressure ranges of 2 & 3 Way valves.

STANDARD SPRING
40 psi Minimum
150 psi Maximum with #1, 3/64 orifice.
See Orifice Information below for Maximum with other orifices.

OPTIONAL LOW PRESSURE SPRING
20 psi:
20 psi Minimum
25 psi Maximum
25 psi:
25 psi Minimum
60 psi Maximum

CFM – Flow @

<table>
<thead>
<tr>
<th>Available Orifices and Equivalent Maximum Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratings for AC Voltages (DC Ratings Slightly Lower)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Number 0</td>
</tr>
<tr>
<td>Number 1</td>
</tr>
<tr>
<td>Number 2</td>
</tr>
<tr>
<td>Number 3</td>
</tr>
<tr>
<td>Number 4</td>
</tr>
</tbody>
</table>

Accessories
- Mounting Brackets Part # 101.
- SM-10 Muffler, See page 14.1.

OPTION INFORMATION

- Viton Seals for media compatibility specify Option -V
- Coils & Housing, See page 11.29.
- Low Pressure Spring - 4 Way Only - See Operating Pressures.
- Pro-Coat™ (Electroless Nickel Plate) Option -N, See page 1.10.
- Special Bank Assembly (Plugs, Fittings, Wire Terminals) See Pg iii.

ORIFICE INFORMATION

<table>
<thead>
<tr>
<th>Available Orifices and Equivalent Maximum Pressure</th>
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</thead>
<tbody>
<tr>
<td>Ratings for AC Voltages (DC Ratings Slightly Lower)</td>
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<tr>
<td></td>
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<tr>
<td>9.0</td>
</tr>
<tr>
<td>8.0</td>
</tr>
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</table>

Supply pressure can be connected to either or both ends of the stack. Due to the fact that the supply pressure port on all "M" valve bodies is tapped on both sides, the pressure manifold can be plugged at any point within the stack. This allows you to supply the stack with two different pressures or media, one from each end.

For more than two inputs a port block can be provided in midstack. Spacers can be included for applications requiring the larger EXPLOSION PROOF operator. Contact Fabco-Air with your specific requirements.

MODEL 102-S-10 (10-32 Inlet Port)
MODEL 104-S-8 (1/8 NPT Inlet Port)

MODEL 112-S (2-Way), 113-S (3-Way)

MODEL 102-SM (2-Way), 103-SM (3-Way)
### Hex Body 53 STYLE Solenoid Valves

- **Body**: Hex aluminum, black anodized - 3 Different porting styles.
- **Media**: Air, water & other fluids compatible with standard Buna-N seals and aluminum.
- **Power**: See page 11.29

### Specifications
- **Volts & Hertz**: See Solenoid Information Page 11.29
- **EXPLOSION PROOF**: See Solenoid Information Page 11.29
- **PRO-COAT™ (Electroless Nickel Plate)**: See Solenoid Information Page 11.29
- **Spade Electrical Connections**: See Pg. 11.29 & 11.30

### 2 WAY NORMALLY OPEN

<table>
<thead>
<tr>
<th>BODY STYLE 1</th>
<th>SIDE PORT</th>
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<tbody>
<tr>
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<td>10-32</td>
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</thead>
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</tbody>
</table>

### HOW TO ORDER

- **Basic Model Number**: See Model Charts
- **Insert Letter for Housing**: See page 11.29
- **Number for Orifice at**: See Chart, Orifice Information
- **All 3 Way EX Orifices are 1/16**: See Chart, Orifice Information
- **Options**: See Solenoid Information Page 11.29
- **Volts & Hertz**: See page 11.30

### EXAMPLE

- **3 Way N.C., 1/8 NPT Male Bottom Inlet, 1/8 NPT Side Cylinder, Conduit Housing, 3/64 Seat, 120 Volts/60 HZ.**
- **Model Number**: X883-C-1, 120/60


### ORIFICE INFORMATION

<table>
<thead>
<tr>
<th>Number</th>
<th>Cv Factor</th>
<th>2 Way N.O.</th>
<th>2 Way N.C.</th>
<th>3 Way N.O.</th>
<th>3 Way N.C.</th>
<th>100 psi</th>
<th>50 psi</th>
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<tbody>
<tr>
<td>0</td>
<td>1/32</td>
<td>.022</td>
<td>150 psi</td>
<td>500 psi</td>
<td>150 psi</td>
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<td>3/64</td>
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<td>125</td>
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<td>75</td>
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<td>30</td>
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Available Orifices and Equivalent Maximum Pressure Ratings for AC Voltages (DC Ratings Slightly Lower)

CFM – Flow @

- 2 Way N.O.
- 2 Way N.C.
- 3 Way N.O.
- 3 Way N.C.

All 3 way (EX) exhaust orifices are 1/16.

### 3 WAY NORMALLY OPEN

#### BODY STYLE 1

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<thead>
<tr>
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### MALE BOTTOM PORT

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### FEMALE BOTTOM PORT

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### FEMALE BOTTOM PORT

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### SIDE PORTS

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<tr>
<td>10-32</td>
<td>1/8</td>
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</tbody>
</table>

### HEX BODY

1/8 & 1/4 NPT

2 & 3 Way Valves

Specifications subject to change without notice or incurring obligation

See Pg. 11.29 for Housing Details
Directional Control Valves

1/8 NPT
2, 3 & 4 Way

1/8 NPT PORTED, MANUAL, MECHANICAL AND PILOT OPERATED AIR VALVES – “The Finest in Simplicity”

Suitable for Vacuum directional flow applications, but NOT for holding vacuum.

Short stroke of lightweight Delrin® spools provides fast, positive, and reliable response.

Note 1: Specify Normally Open by substituting -20 for -2 & -30 for -3.

Air Pilot
Standard 2 Way & 3 Way spring return are normally closed. For normally open the actuators may be exchanged end for end or by specifying -20 for -2 & -30 for -3.

Minimum pilot pressure:
Standard spring ......... 60 psi
Light spring (Option -L) . . . 40 psi
Double pilot ............ 20 psi

Air Pilot Amplifier
1" Delrin piston in aluminum housing meets low pressure requirements. Standard 2 Way & 3 Way spring return are normally closed. For normally open the actuators may be exchanged end for end or by specifying -20 for -2 & -30 for -3.

Minimum pilot pressure:
Standard spring ......... 10 psi
Light spring (Option -L) .... 7 psi
Against 0 psi pilot ....... 2 psi

Rod Actuator
Stainless steel rod in brass bushing. Standard 2 Way & 3 Way spring return are normally closed. For normally open the actuators may be exchanged end for end or specify by substituting -20 for -2 & -30 for -3.

Force to actuate:
Standard spring ......... 6.5 lb.
Light spring (Option -L) .... 5.0 lb.
Double Rod ............. 1.2 lb.

Roller Cam
Case hardened steel roller and shaft in hard anodized aluminum housing. Standard 2 Way & 3 Way spring return are normally closed. For normally open specify by substituting -20 for -2 & -30 for -3.

Force to actuate:
Standard spring ......... 6.5 lb.
Light spring (Option -L) .... 5.0 lb.
Double Cam .............. 1.2 lb.

Valve Body Dimensions

2 WAY

3 WAY

4 WAY - 5 Port ¶

¶ 4 way - 5 port May be used as either single inlet - dual exhaust or dual inlet - single exhaust.

Specifications subject to change without notice or incurring obligation
Directional Control Valves

FEATURES

- Aluminum bar body
- Anodized black
- Honed & burnished bore
- Pressure balanced spool
- Delrin spool
- Buna-N seals
- Operation to 150 psi
- 4 Way - 5 port may be used as either single inlet - dual exhaust or dual inlet - single exhaust.

- Un-anodized aluminum button with stainless steel rod in brass bushing. Standard 2 Way & 3 Way spring return are normally closed. For normally open the actuators may be exchanged end for end or specify by substituting -20 for -2 & -30 for -3. Force to actuate:
  - Standard spring ............ 6.5 lb.
  - Light spring (Option-L) .... 5.0 lb.
  - Double Button .............. 1.2 lb.

- Red anodized aluminum button with stainless steel rod in brass bushing. Standard 2 Way & 3 Way spring return are normally closed. For normally open the actuators may be exchanged end for end or specify by substituting -20 for -2 & -30 for -3. Force to actuate:
  - Standard spring ............ 6.5 lb.
  - Light spring (Option-L) .... 5.0 lb.
  - Double Button .............. 1.2 lb.

- Phenolic button with plated steel rod in brass bushing: black button standard, red button Option-R. Standard 2 Way and 3 Way assemblies are normally closed with knob in the “out” position. For normally open specify by substituting -20 for -2 and -30 for -3. Force to actuate:
  - Standard spring ............ 6.5 lb.
  - Light spring (Option-L) .... 5.0 lb.
  - Detented .................... 3.0 lb.

- Hardened & plated steel shaft with unique connection to spool results in positive shifting. Standard 2 Way & 3 Way spring return are normally closed. For normally open specify by substituting -20 for -2 & -30 for -3. Force to actuate:
  - Standard spring ............ 4.0 lb.
  - Light spring (Option-L) .... 3.0 lb.
  - Detented .................... 2.0 lb.

- Prefilled with Magnalube®-G Grease
- Interchangeability of Parts
- Cv = 0.27 (14.2 SCFM Free Flow to Atmosphere at 80 psi Supply)
- Operating temperature +32°F to 180°F; Solenoid controlled models +150°F max. See pages 11.9 and 11.11.

OPTIONS

- Light spring – Specify Option -L
- Viton seals – Specify Option -V
- Spools for bleeder pilot
- Multiple stacking with or without common inlet. Consult factory.

Note 1: Specify Normally Open by substituting -20 for -2 & -30 for -3.

OPERATING TEMPERATURE FOOTNOTE SEE PAGE 11.1

Small Palm Button

Large Palm Button

Panel Mount Button

Hand Lever

2 Way 3 Way 4 Way
Single Button - Spring Return
18PS-2 18PS-3 18PS-4
Single Button - Pilot Return
18PS-2 18PSP-3 18PSP-4
Double Button
18PSP-2 18PSP-3 18PSP-4
Replacement spool & seals
1800-902 1800-903 1800-904
Light spring Option -L

2 Way 3 Way 4 Way
Single Button - Spring Return
18PL-2 18PL-3 18PL-4
Single Button - Pilot Return
18PLP-2 18PPL-3 18PPL-4
Double Button
18PPL-2 18PPL-3 18PPL-4
Replacement spool & seals
1800-942† 1800-943† 1800-944†
Light spring Option -L

2 Way 3 Way 4 Way
Spring Return
18PMS-2 18PMS-3 18PMS-4
Pilot Return
18PMP-2 18PMP-3 18PMP-4
Detented (Push Pull)
18PMD-2 18PMD-3 18PMD-4
Replacement spool & seals
1800-932† 1800-933† 1800-934†
† Includes factory assembled spool attachments.

Most threaded-in Operators are interchangeable between ends

Palm Button Assembly
No. 1800-1 Large Button
No. 1800-2 Small Button

Rod Actuator Assembly
No. 1800-3

Spring Housing Assembly
No. 1800-4 Light Spring only (for Option L).
No. 1800-5 Standard Spring only
No. 1800-46 Light Spring & Housing Assy (for Option -L).
No. 1800-56 Standard Spring & Housing Assembly.

Pilot Bushing
No. 1800-10 1/8 NPT Port
No. 1800-18 1/8 NPT Port

Air Pilot Amplifier
1/8 NPT Standard
No. 18 AMP-1 1/8 NPT Port
No. 10 AMP-1 1-32 Port Option -E

Fabco-Air has the expertise and willingness to design, modify and adapt these valves to your necessary and specific job requirements. Please advise us of your needs.

Specifications subject to change without notice or incurring obligation.
Specifications subject to change without notice or incurring obligation

**Directional Control Valves**  
**1/8 NPT**  
**2, 3 & 4 Way**  
**18 Series**

### 1/8 NPT Ported 53 STYLE Solenoid Controlled, Pilot Operated Air Valves  
**2, 3 & 4 Way - 2 Position – Operation to 150 psi Air**

#### Features
- Black anodized aluminum bar stock body
- Honed and burnished bore
- Lightweight Delrin® spool provides fast, positive, reliable response
- Buna N seals • Operation to 150 psi
- Coils & housing information see page 11.29
- Cv = 0.27 • 14.2 SCFM free flow to atmosphere @ 80 psi
- Prelubed with Magnalube®-G grease
- Operating temperature:
  - +32°F (0°C) to +104°F (40°C) ambient.
  - +32°F (0°C) to +150°F (65°C) media.
- Standard catalog models are suitable for operation in intermittent low temperatures in a range of 0° to + 32 °F.
- A custom aluminum spool may be substituted when long-term application temperatures are expected to be 0° to +32°F. These should be limited to double solenoid actuation. Consider that actuation force may exceed catalog specs and that spring return models may not be reliable at these low temperatures. Please consult factory.

#### Options
- Manual Override
  - Locking ............ -MO1
  - Non-Locking .......... -MO4
- External Pilot ............. -X
- Light Spring .............. -L
- Viton Seals for media compatibility .......... -V
- Explosion Proof Operators ........... -EP

#### Operating Range

**Internal Pilot Supply (Standard)**
- Standard Spring ........ 60 to 150 psi
- Light Spring, Option -L ...... 40 to 150 psi
- Pilot Return (0 psi Pilot) .......... 20 to 150 psi

**External Pilot Supply, Option -X**
- Inlet Pressure ............. 0 to 150 psi

**Replacement Spool and Seals**
- 1800-912 1800-9120 1800-913 1800-9130 1800-914

#### SINGLE SOLENOID

**To Order Specify:** Model Number from chart

<table>
<thead>
<tr>
<th>Options</th>
<th>2 WAY</th>
<th>3 WAY</th>
<th>4 WAY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normally Closed</td>
<td>Normally Open</td>
<td>Normally Closed</td>
</tr>
<tr>
<td>Conduit Housing</td>
<td>18CS-2</td>
<td>18CS-20</td>
<td>18CS-3</td>
</tr>
<tr>
<td>Grommet Housing</td>
<td>18GS-2</td>
<td>18GS-20</td>
<td>18GS-3</td>
</tr>
<tr>
<td>Male Mini-DIN Housing</td>
<td>18FS-2</td>
<td>18FS-20</td>
<td>18FS-3</td>
</tr>
<tr>
<td>Replacement Spool and Seals</td>
<td>1800-912</td>
<td>1800-9120</td>
<td>1800-913</td>
</tr>
</tbody>
</table>

#### SINGLE SOLENOID - PILOT RETURN MODELS

A pilot return can be substituted for the standard spring return. It may be used in two manners.

1. For a pulse signal, then pilot return.
2. As a constant, adjustable force, spring.

Supply pilot port with a constant regulated pressure. This will act as a very constant spring against the solenoid controlled pilot signal. The pilot return should be a minimum of 20 psi below the solenoid controlled pressure.

**To Specify** Substitute P for S in the Model Number.

(Example 18CP-3-120/60)

1/8 NPT Pilot Port standard.

10-32 Pilot Port optional, Specify Option -E.

#### DOUBLE SOLENOID

**To Order Specify:** Model Number from chart

<table>
<thead>
<tr>
<th>Options</th>
<th>2 WAY</th>
<th>3 WAY</th>
<th>4 WAY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduit Housing</td>
<td>18CC-2</td>
<td>18CC-3</td>
<td>18CC-4</td>
</tr>
<tr>
<td>Grommet Housing</td>
<td>18GG-2</td>
<td>18GG-3</td>
<td>18GG-4</td>
</tr>
<tr>
<td>Male Mini-DIN Housing</td>
<td>18FF-2</td>
<td>18FF-3</td>
<td>18FF-4</td>
</tr>
<tr>
<td>Replacement Spool and Seals</td>
<td>1800-922</td>
<td>1800-923</td>
<td>1800-924</td>
</tr>
</tbody>
</table>

---

11.9
Directional Control Valves

18 Series

1.25

1.00

.50

1/8 NPT

2, 3 & 4 Way

Standard 53 STYLE Solenoid Operator
The solenoid operator is a 3-way NC valve which, upon receiving an electrical signal, directs a pilot pressure to shift the main valve spool. As standard, the operator is internally supplied with air pressure from the main valve inlet. Also see “External Pilot Supply” below.

53 STYLE Solenoid Operator with External Pilot Supply
Option -X
In the following listed applications, as well as many others, a proper air supply may not be available from the main valve inlet. For these applications, an external pilot supply port is available (Option -X). A proper air supply to this port then supplies the solenoid with air pressure for piloting the main valve spool.

• Dual Inlet - Single Exhaust 4 Way.
• Insufficient pressure at main valve inlet.
• Media, at main valve inlet, other than air.
• Extremely fast cycling.

Option -X is NOT combinable with either Option -MO1 or -MO4

53 STYLE Solenoid Operator with Manual Override
This manual override is a 3-way NC valve that when pushed, directs pilot pressure to shift the main spool. Pressure must be present at main valve inlet for this override to function.

Spring Return Valves End Operator

<table>
<thead>
<tr>
<th>Normally Closed</th>
<th>10</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normally Open</td>
<td>10</td>
<td>Solenoid</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Spring</td>
</tr>
</tbody>
</table>

4 Way - Standard: Single Inlet - Port #1 - Dual Exhaust

Note 1: Optional Flow Path:
Dual Inlet - Ports #3 & #5 - Single Exhaust. Use External Pilot Supply (Option -X).

Spring Return: Standard and Optional Light

Pilot Return: -P
See Page 11.7
1/8 NPT Port Standard – 10-32 Port Specify Option -E
**Features**

- Black anodized aluminum bar stock body
- Honed and burnished bore
- Lightweight Delrin® spool provides fast, positive, reliable response
- Simplicity • Reliability
- Corrosion resistant construction
- Buna N seals • Operation to 150 psi
- Solenoid operator information see page 11.31
- \( Cv = 0.27 \) • 14.2 SCFM Free flow to atmosphere @ 80 psi
- Prelubed with Magnalube®-G grease
- Operating temperature:
  - +32°F (0°C) to +122°F (50°C) ambient.
  - +32°F (0°C) to +122°F (50°C) media.

Standard catalog models are suitable for operation in intermittent low temperatures in a range of 0°F to +32°F. A custom aluminum spool may be substituted when long-term application temperatures are expected to be 0°F to +32°F. These should be limited to double solenoid actuation. Consider that actuation force may exceed catalog specs and that spring return models may not be reliable at these low temperatures. Please consult factory.

**Operating Ranges, psi**

<table>
<thead>
<tr>
<th></th>
<th>#1 Solenoid</th>
<th>#4 Solenoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9 Watts</td>
<td>3.5 Watts</td>
<td></td>
</tr>
<tr>
<td>Internal Pilot Supply (Standard) Inlet Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Spring Return</td>
<td>20 to 130</td>
<td>20 to 145</td>
</tr>
<tr>
<td>Spring Return</td>
<td>60 to 130</td>
<td>60 to 145</td>
</tr>
<tr>
<td>Light Spring Option -L</td>
<td>40 to 130</td>
<td>40 to 145</td>
</tr>
<tr>
<td>External Pilot Supply, Option -X Inlet Pressure</td>
<td>0 to 150</td>
<td></td>
</tr>
<tr>
<td>Non Spring Return</td>
<td>20 to 130</td>
<td>20 to 145</td>
</tr>
<tr>
<td>Spring Return</td>
<td>60 to 130</td>
<td>60 to 145</td>
</tr>
<tr>
<td>Light Spring Option -L</td>
<td>40 to 130</td>
<td>40 to 145</td>
</tr>
</tbody>
</table>

† Viton Seals are available in the main valve only, for media compatibility, and therefore only in conjunction with External Pilot +32°F (0°C) to +122°F (50°C).
58 STYLE Solenoid Valve, Model Number Code

Example: **18FS-4-41100-120/60**
- **1/8 NPT** – Primary Actuator Solenoid with Micro DIN coil; Secondary Actuator, Spring Return – 4 Way Function
- 3.5 Watt Solenoid; Primary Solenoid Upright position with Manual Override in Position #1; Secondary Actuator is not a Solenoid; no Manual Override on Secondary Actuator – No Options – 120 Volt/60 Hertz.

**Upright Solenoid Attitude #1**
(Solenoid centerline 90° to Valve Body centerline)

**Inline Solenoid Attitude #5**
(Solenoid centerline inline with Valve Body centerline)

2, 3 and 4 Way - 2 Position – Operation to 150 psi Air

Suitable for Vacuum directional flow applications, but NOT for holding vacuum.

The short stroke of the lightweight Delrin® spool provides fast, positive, and reliable response.

Note 1: Specify Normally Open by substituting -30 for -3.

Air Pilot

Brass bushing with 1/8 NPT port. Standard 3 Way spring return is normally closed. For normally open the actuators may be exchanged for end or by specifying -30 for -3.

Minimum pilot pressure:

- Standard spring ........ 50 psi
- Light spring (Option-L) .... 10.5 lb.
- Double rod ............. 1.2 lb.

Force to actuate:

- Standard spring .......... 10.5 lb.
- Light spring (Option-L) .... 9.0 lb.
- Double rod ............. 1.2 lb.

Rod Actuator

Stainless steel rod in brass bushing. Standard 3 Way spring return is normally closed. For normally open the actuators may be exchanged for end or specify by substituting -30 for -3.

Force to actuate:

- Standard spring .......... 10.5 lb.
- Light spring (Option-L) .... 9.0 lb.
- Double rod ............. 1.2 lb.

Roller Cam

Case hardened steel roller and shaft in hard anodized aluminum housing. Standard 3 Way spring return is normally closed. For normally open specify by substituting -30 for -3.

Force to actuate:

- Standard spring .......... 10.5 lb.
- Light spring (Option-L) .... 9.0 lb.
- Cam-Pilot return ........ 1.2 lb.

Stacking - Pressure Manifold

Selected models of the 14 Series 1/4" air valves can be stacked and pressure manifolded for space and money savings. The valve bodies are bolted together with 4 through tie bolts and the pressure is manifolded with O-Ring seals between the valves. Inlet pressure can be connected to either or both ends of the stack. Due to the fact that the pressure port, on all valve bodies, is tapped on both sides, the pressure manifold can be plugged at any point within the stack. This allows you to supply the stack with two different pressures, one from each end.


To Order: Specify the Quantity of each model desired, the Order in which they are to be assembled, and Brackets, if desired.

Spring Cap Dimensions

Valve Body Dimensions

Specifications subject to change without notice or incurring obligation
FEATURES
- Aluminum bar body
- Anodized black
- Honed & burnished bore
- Pressure balanced spool
- Delrin spool
- Buna-N seals
- Operation to 150 psi
- 4 Way - 5 port may be used as either single inlet - dual exhaust or dual inlet - single exhaust.
- Prebused with Magnalube®-G Grease
- Interchangeability of Parts
- Cv = 1.0
- 56.2 SCFM Free Flow to Atmosphere at 80 psi Supply
- Operating Temperature +32° to +180°F;
- Solenoid controlled models +150°F max.

OPTIONS
- Light spring – Specify Option -L
- Viton seals – Specify Option -V
- Spools for bleeder pilot – Consult factory.

Note 1: Specify Normally Open by substituting -30 for -3.

OPERATING TEMPERATURE FOOTNOTE SEE PAGE 11.1

Small Palm Button
Un-anodized aluminum button with stainless steel rod in brass bushing. Standard 3 Way spring return is normally closed. For normally open the actuators may be exchanged end for end or specify by substituting -30 for -3.

Force to actuate:
- Standard spring ................. 10.5 lb.
- Light spring (Option -L) ...... 9.0 lb.
- Double Button.................. 1.2 lb.

Large Palm Button
Red anodized aluminum button with stainless steel rod in brass bushing. Standard 3 Way spring return is normally closed. For normally open the actuators may be exchanged end for end or specify by substituting -30 for -3.

Force to actuate:
- Standard spring ................. 10.5 lb.
- Light spring (Option -L) ...... 9.0 lb.
- Double Button.................. 1.2 lb.

Panel Mount Button
Phenolic button with plated steel rod in brass bushing; black button standard, red button Option -R. Standard 3 Way assemblies are normally closed with knob in the "out" position. For normally open specify by substituting -30 for -3.

Force to actuate:
- Standard spring ................. 10.5 lb.
- Light spring (Option -L) ...... 9.0 lb.
- Detented ......................... 3.0 lb.

Hand Lever
Hardened & plated steel shaft with unique connection to spool results in positive shifting. Standard 3 Way spring return is normally closed. For normally open specify by substituting -30 for -3.

Force to actuate:
- Standard spring . . . 10.0 lb.
- Light spring .............. 6.0 lb.
- (Option -L)
- Detented ......................... 3.0 lb.

MOST THREADED-IN OPERATORS ARE INTERCHANGEABLE BETWEEN ENDS

Specifications subject to change without notice or incurring obligation.
Directional Control Valves

1/4 NPT & 3/8 NPT Ported, Manual & Pilot Operated, & Solenoid Controlled Air Valves

New Spools for 14 & 34 Series Air Valves

New 5 Ported, 3-Position 4-Way Operation

4-Way - 5 Ported - 3 Position - Type F

Center position - Inlet blocked and Cylinders open to exhaust
Used to vent both ends of cylinder to allow cylinder to float with a manual or machine movement. Flow controls or exhaust speed controls should not be used.

4-Way - 5 Ported - 3 Position - Type B

Center position - All ports blocked and isolated. Use on conventional block and hold circuits.

1/4 NPT & 3/8 NPT Ported, Pilot Operated Air Valves

5 Ported, 3-Position 4-Way Operation

Operating Range

- Operating pressure............0 to 150 psi
- Minimum pilot pressure........50 psi
- Cv = 1.0 (56.2 SCFM free flow to atmosphere @ 80 psi supply)
- Temperature .................+32° to 180°F
For long-term, continuous operation in a range of +150°F to +180°F, the Viton seal option can provide the benefits of reliable leak-free operation and extended durability.

Options
Viton Seals, Specify Option –V

Features
- Aluminum bar body
- Anodized black
- Honed and burnished bore
- Delrin spool, pressure balanced
- Buna N seals
- May be used as either single inlet-dual exhaust or dual inlet-single exhaust
- Pre-lubed with Magnalube–G® Grease

Model Number Guide: 3-Position, Pilot Operated

<table>
<thead>
<tr>
<th>Spool Type</th>
<th>Spring Centered Spool</th>
<th>Replacement Spool and Seals</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Spool</td>
<td>1/4 NPT Ports 3/8 NPT Ports</td>
<td>1400-904B</td>
</tr>
<tr>
<td>F Spool</td>
<td>14DPF 34DPF</td>
<td>1400-904F</td>
</tr>
</tbody>
</table>

Valve Dimensions
1/4 NPT & 3/8 NPT Ported, Hand Lever Operated Air Valves

5 Ported, 3-Position 4-Way Operation

Operating Range
- Operating pressure: 0 to 150 psi
- \( C_v = 1.0 \) (56.2 SCFM free flow to atmosphere @ 80 psi supply)
- Temperature: +32° to 180°F

Standard catalog models are suitable for operation in intermittent low temperatures in a range of 0° to +32 °F. A custom aluminum spool may be substituted when long-term application temperatures are expected to be –40° to +32°F. These should be limited to manual actuation, not spring centered. Consider that actuation force may exceed catalog specs and that spring return models may not be reliable at these low temperatures. Please consult factory. For long-term, continuous operation in a range of +150°F to +180°F, the Viton seal option can provide the benefits of reliable leak-free operation and extended durability.

Options
Viton Seals, Specify Option –V

Features
Hardened and plated steel shaft with unique connections results in positive shifting
- Aluminum bar body
- Anodized black
- Honed and burnished bore
- Delrin spool, pressure balanced
- Buna N seals
- May be used as either single inlet-dual exhaust or dual inlet-single exhaust
- Pre-lubed with Magnalube–G® Grease

Model Number Guide: 3-Position, Hand Lever Operated

<table>
<thead>
<tr>
<th>Spool Type</th>
<th>Spring Centered Spool</th>
<th>Replacement Spool &amp; Seals</th>
<th>Detented Spool</th>
<th>Replacement Spool &amp; Seals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14HLSB</td>
<td>34HLSB</td>
<td>1400-934SB</td>
<td>14HLB</td>
</tr>
<tr>
<td>F Spool</td>
<td>1/4 NPT Ports</td>
<td>3/8 NPT Ports</td>
<td>1400-934SF</td>
<td>34HLF</td>
</tr>
<tr>
<td></td>
<td>14HLSF</td>
<td>34HLSF</td>
<td>1400-934F</td>
<td>1400-934B</td>
</tr>
</tbody>
</table>

Dimensions – Spring Centered Spool

Dimensions – Detented Spool
1/4 NPT & 3/8 NPT Ported, 53 Style Solenoid Controlled, Pilot Operated Air Valves

5 Ported, 3-Position 4-Way Operation

**Features**
- Aluminum bar body
- Anodized black
- Honed and burnished bore
- Delrin spool
- Buna N seals
- Cv = 1.0 (56.2 SCFM free flow to atmosphere @ 80 psi supply)
- Operation to 150 psi
- Operating Temperature:
  - +32°F (0°C) to +104°F (40°C) ambient.
  - +32°F (0°C) to +150°F (65°C) media.
- Pre-lubed with Magnalube® Grease
- Coils & Housing information see page 11.29.

**Operating Range**
- Internal pilot supply - standard
  - Inlet..........................50 to 150 psi
- External pilot supply Option →X
  - Inlet..........................0 to 150 psi
  - Pilot Supply ................50 to 150 psi

**Ordering**
Choose valve model number from table below and add option suffixes as required and specify voltage/hertz.

---

**Model Number Guide: 4-Way, 3-Position, Spring Centered Double Solenoid Valves**

<table>
<thead>
<tr>
<th>Spool Type</th>
<th>Conduit Housing “C”</th>
<th>Grommet Housing “G”</th>
<th>Male Mini-DIN Housing “F”</th>
<th>Replacement Spool &amp; Seals</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Spool</td>
<td>14-CCB</td>
<td>14-GGB</td>
<td>14-FFF</td>
<td>1400-904B</td>
</tr>
<tr>
<td>F Spool</td>
<td>14-CCF</td>
<td>14-GGF</td>
<td>14-FFF</td>
<td>1400-904F</td>
</tr>
</tbody>
</table>

Specifications subject to change without notice or incurring obligation 1-26-08
53 Style Solenoid Operators

Standard 53 Style Operator
The solenoid operator is a 3-way NC valve which, upon receiving an electrical signal, directs pressure to shift the main valve spool. As standard, the operator is internally supplied with air pressure from the main valve inlet.

53 Style Operator with External Pilot Option –X
In the following listed applications, as well as many others, a proper air supply may not be available from the main valve inlet. For these applications, an external pilot supply port is available (Option –X). A proper air supply to this port then supplies the solenoid with air pressure for piloting the main valve spool.
- Dual inlet, single exhaust
- Insufficient Pressure at main valve inlet
- Media at main valve inlet is other than air
- Extreme fast cycling

Valve Dimensions

Male Mini-DIN Housing "F"
1/4 & 3/8 NPT Ported 53 STYLE Solenoid Controlled, Pilot Operated Air Valves

2, 3 & 4 Way - 2 Position – Operation to 150 psi Air

**Features**
- Black anodized aluminum bar stock body
- Honed and burnished bore
- Lightweight Delrin® spool provides fast, positive, reliable response
- Buna N seals
- Operation to 150 psi
- Coils & housing information see page 11.29
- Cv = 1.0
- 56.2 SCFM free flow to atmosphere @ 80 psi
- Prelubed with Magnalube®-G grease
- Operating temperature:
  - +32°F (0°C) to +104°F (40°C) ambient.
  - +32°F (0°C) to +150°F (65°C) media.

Standard catalog models are suitable for operation in intermittent low temperature ranges in a range of 0° to +32°F. A custom aluminum spool may be substituted when long-term application temperatures are expected to be 0° to +32°F. These should be limited to double solenoid actuation. Consider that actuation force may exceed catalog specs and that spring return models may not be reliable at these low temperatures. Please consult factory.

**Options**
- Manual override
  - Locking -MO1
  - Non-Locking -MO4
- External pilot -X
- Light spring -L
- Viton seals for media compatibility -V
- Explosion proof operators -EP
- See page 11.30

Dual Inlet - Single Exhaust 4 Way
See page 11.20, Note 1: Optional Flow Path.

**SINGLE SOLENOID**

To Order Specify: Model Number from chart
Options
Volts & Hertz (See page 11.29)

<table>
<thead>
<tr>
<th>Conduit Housing</th>
<th>14CS-3</th>
<th>14CS-30</th>
<th>14CS-4</th>
<th>M14CS-4</th>
<th>34CS-3</th>
<th>34CS-30</th>
<th>34CS-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet Housing</td>
<td>14GS-3</td>
<td>14GS-30</td>
<td>14GS-4</td>
<td>M14GS-4</td>
<td>34GS-3</td>
<td>34GS-30</td>
<td>34GS-4</td>
</tr>
<tr>
<td>Male Mini-DIN Housing</td>
<td>14FS-3</td>
<td>14FS-30</td>
<td>14FS-4</td>
<td>M14FS-4</td>
<td>34FS-3</td>
<td>34FS-30</td>
<td>34FS-4</td>
</tr>
<tr>
<td>Replacement Spool &amp; Seals</td>
<td>1400-913</td>
<td>1400-9130</td>
<td>1400-914</td>
<td>1400-904</td>
<td>1400-913</td>
<td>1400-9130</td>
<td>1400-914</td>
</tr>
</tbody>
</table>

**DOUBLE SOLENOID**

To Order Specify: Model Number from chart
Options
Volts & Hertz (See page 11.29)

<table>
<thead>
<tr>
<th>Conduit Housing</th>
<th>14CC-3</th>
<th>14CC-4</th>
<th>M14CC-4</th>
<th>34CC-3</th>
<th>34CC-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet Housing</td>
<td>14GG-3</td>
<td>14GG-4</td>
<td>M14GG-4</td>
<td>34GG-3</td>
<td>34GG-4</td>
</tr>
<tr>
<td>Male Mini-DIN Housing</td>
<td>14FF-3</td>
<td>14FF-4</td>
<td>M14FF-4</td>
<td>34FF-3</td>
<td>34FF-4</td>
</tr>
<tr>
<td>Replacement Spool &amp; Seals</td>
<td>1400-923</td>
<td>1400-924</td>
<td>1400-904</td>
<td>1400-923</td>
<td>1400-924</td>
</tr>
</tbody>
</table>

Specifications subject to change without notice or incurring obligation

2-14-08
### Specifications Subject to Change Without Notice or Incurring Obligation

**Directional Control Valves**

**1/4 & 3/8 NPT**

**2, 3 & 4 Way**

**14, M14 & 34 Series**

---

**Standard 53 STYLE Solenoid Operator**

The solenoid operator is a 3-way NC valve which, upon receiving an electrical signal, directs a pilot pressure to shift the main valve spool. As standard, the operator is internally supplied with air pressure from the main valve inlet. Also see “External Pilot Supply” below.

---

**53 STYLE Solenoid Operator with External Pilot Supply**

Option -X

In the following listed applications, as well as many others, a proper air supply may not be available from the main valve inlet. For these applications, an external pilot supply port is available (Option -X). A proper air supply to this port then supplies the solenoid with air pressure for piloting the main valve spool.

- Dual Inlet - Single Exhaust 4 Way.
- Insufficient pressure at main valve inlet.
- Media, at main valve inlet, other than air.
- Extremely fast cycling.

**53 STYLE Solenoid Operator with Manual Override**

This manual override is a 3-way NC valve that, when pushed, directs pilot pressure to shift the main spool. Pressure must be present at main valve inlet for this override to function.

**STACKING - PRESSURE MANIFOLDED**

Versions of these 1400 Series 1/4 NPT solenoid valves with different adaptor blocks can be stacked and pressure manifolded for space and money savings. The valve bodies are bolted together with 4 through tie bolts and the pressure is manifolded with O-Ring seals between valves. Inlet pressure can be connected to either or both ends of the stack. Due to the fact that the pressure port, on all valve bodies, is tapped on both sides, the pressure manifold can be plugged at any point within the stack. This allows you to supply the stack with two different pressures, one from each end. Versions of the Air Pilot, Rod Actuator, Roller Cam and Small Palm Button valves may be mounted in the same stack along with these solenoid valves.

---

**Spring Return Valves**

<table>
<thead>
<tr>
<th>End Operator</th>
<th>Normally Closed</th>
<th>Normally Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Solenoid</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**4 Way - 5 Port**

Standard: Single Inlet - Port #1 - Dual Exhaust.

**Pilot Return Option -P**

1/8 NPT Port

See Page 11.13

**Pilot Bushing**

1/8 NPT

---

**TO ORDER**

Specify the quantity of each model desired, the order in which they are to be assembled, and Brackets, if desired.
1/4 & 3/8 NPT Ported 58 STYLE Solenoid Controlled, Pilot Operated Air Valves
2, 3 & 4 Way - 2 Position

**Features**
- Black anodized aluminum bar stock body
- Honed and burnished bore
- Lightweight Delrin® spool provides fast, positive, reliable response
- Simplicity • Reliability
- Corrosion resistant construction
- Buna N seals • Operation to 150 psi
- Solenoid operator information see page 11.31
- \(Cv = 1.0\)
- 56.2 SCFM Free flow to atmosphere @ 80 psi
- Prelubed with Magnalube®-G grease
- Operating temperature:
  - +32°F (0°C) to +122°F (50°C) ambient.
  - +32°F (0°C) to +122°F (50°C) media.
Standard catalog models are suitable for operation in intermittent low temperatures in a range of 0°F to +32°F.
A custom aluminum spool may be substituted when long-term application temperatures are expected to be 0°F to +32°F. These should be limited to double solenoid actuation. Consider that actuation force may exceed catalog specs and that spring return models may not be reliable at these low temperatures. Please consult factory.

**Options**
- External Pilot ...................... -X
- † External Pilot and Viton Seals .... -XV
- Light Spring .......................... -L

† Viton Seals are available in the main valve only, for media compatibility, and therefore only in conjunction with External Pilot: +32°F (0°C) to +122°F (50°C).

**Operating Ranges, psi**

<table>
<thead>
<tr>
<th></th>
<th>#1 Solenoid</th>
<th>#4 Solenoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Solenoid</td>
<td>0.9 Watts</td>
<td>3.5 Watts</td>
</tr>
<tr>
<td>Internal pilot supply (standard) inlet pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Spring Return</td>
<td>30 to 130</td>
<td>30 to 145</td>
</tr>
<tr>
<td>Spring Return</td>
<td>50 to 130</td>
<td>50 to 145</td>
</tr>
<tr>
<td>Light Spring Option -L</td>
<td>40 to 130</td>
<td>40 to 145</td>
</tr>
</tbody>
</table>

External pilot supply, Option -X inlet pressure .......................... 0 to 150

External pilot supply, Option -X pilot supply
- Non Spring Return ............. 30 to 130 ............ 30 to 145
- Spring Return ................ 50 to 130 ............ 50 to 145
- Light Spring Option -L ....... 40 to 130 ............ 40 to 145
Example: **14FS-4-41100-120/60**
1/4 NPT – Primary Actuator Solenoid with Micro DIN coil; Secondary Actuator, Spring Return – 4 Way Function 3.5 Watt Solenoid; Primary Solenoid Upright position with Manual Override in Position #1; Secondary Actuator is not a Solenoid; no Manual Override on Secondary Actuator – No Options – 120 Volt/60 Hertz.

**Solenoid Watts**
- #1 Solenoid (0.9 Watts)
- #4 Solenoid (3.5 Watts)

**Options**
- -X = External Pilot
- -XV = † External Pilot & Viton Seals
- -L = Light Spring

† Viton Seals are available in the main valve only for media compatibility and therefore only in conjunction with External Pilot (+32° to 180°F).

**External Pilot Supply Option -X**
- 1/8 NPT

**Upright**
(Solenoid centerline 90° to Valve Body centerline)

**Inline**
(Solenoid centerline inline with Valve Body centerline)
**Directional Control Valves**

### Specifications

**38 SERIES:** 3/8 NPT Ported Air Valves

**12, 12A & 12B SERIES:** 1/2 NPT Ported Air Valves

**2, 3 & 4 Way; 2 & 3 Position Operation to 150 psi**

**Note:** Spring return & spring centered models **NOT** suitable for dry air service.

### Features

- Direct ported 3/8 NPT, 1/2 NPT and 1/2 NPT high flow:
  - 4 Way - 2 & 3 Position.
- Aluminum bar stock body and operator blocks, black anodized.
- Light weight aluminum spool, hardened anodized for long life.
- Operator blocks field interchangeable.
- Buna N seals.
- Operating temperature (0° to + 180°F); solenoid controlled models +150° F max.
- All spool seals size checked to assure reliability.

### Catalog Options

- Manual Overrides for Piloted and Solenoid Valves
- External Pilot Supply for Solenoid Valve Option - X
- Explosion Proof Operators, Spade Coil Connections, and other Solenoid Coil choices - see Pg 11.29 - 11.32
- High Flow Body (see Model Charts)
- Service Kits
  - 2 or 3 Way - Seal Kit 12PV-903
  - 4 Way - Seal Kit 12PV-904
- Dual Inlet - Single Exhaust - 4 Way: See note below
- Mufflers for Solenoid Exhaust... SM-10, See page 14.4
- Other Operator Combinations
  - Solenoid - Pilot Return
  - Solenoid - Push-Pull Knob
  - See Model Charts

### Custom Options

- 10-32 Pilot Ports
- 10-32 Auxiliary Pressure Outlets
- Viton Seals
- Stacking and Manifolding to Customer requirements

### Specials

Fabco-Air, Inc. has the expertise and willingness to design and modify these valves to your necessary and specific job requirements. Please advise us of your needs. See pages ii & iii

### Spools

**2-Way or 3 Way - 2 Position - Type 3**

This 3 Way Valve may be used for any 2 Way, 3 Way, Selector or Diverter service. When used with internally supplied Solenoid Operators, the Supply Pressure must be connected to Port #1. For this same reason when a normally open Solenoid Valve is ordered the Solenoid Operator will be mounted on end 10 and the Spring on End 12.

**4-Way - 5 Ported - 3 Position - Type B**

“Blocked”

Center position - All ports blocked and isolated. Use on conventional block and hold circuits.

**4-Way - 5 Ported - 2 Position - Type 2**

Use on all 4 Way - 2 Position applications

**4-Way - 5 Ported - 3 Position - Type F**

“Float”

Center position - Inlet blocked and Cylinders open to exhaust. Used to vent both ends of cylinder to allow cylinder to float with a manual or machine movement. Flow controls or exhaust speed controls should not be used.

**Note:** Any of these 4 Way Valves, except the internally supplied Solenoid Valves, (See Option - X) can be used as Dual Inlet, Single Exhaust. Using this concept, with different pressures for force application and retraction, can effect large savings of high pressure air and its cost. The larger the cylinder or the faster the cycle, the higher the savings.
**Directional Control Valves**

### PILOT OPERATED

**When Ordering:**
Specify Model Number from chart. Specify Options.
(See page 11.27 & 11.28 for Dimensional Information.)

**OPERATING RANGE:**
- Inlet Pressure: 0 - 150 psi
- Pilot Pressure:
  - Models without Spring: 10 - 150 psi
  - 2 Position Standard Service Spring: 45 - 150 psi
  - 2 Position Light Service Spring (Option -L): 30 - 150 psi
  - 3 Position, Spring Centered: 30 - 150 psi

<table>
<thead>
<tr>
<th>Optional Manual Overrides</th>
<th>Model Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCKING</td>
<td>-MO1</td>
</tr>
<tr>
<td>LOCKS IN - Does not lock OUT</td>
<td>-MO2</td>
</tr>
<tr>
<td>Does not lock IN - LOCKS OUT</td>
<td>-MO3</td>
</tr>
<tr>
<td>NON-LOCKING</td>
<td>-MO4</td>
</tr>
</tbody>
</table>

**HAND LEVER OPERATED**

**When Ordering:**
Specify Model Number from chart. Specify Options.
(See page 11.27 & 11.28 for Dimensional Information.)

**OPERATING RANGE:** 0 - 150 psi

**PUSH-PULL KNOB OPERATED**

**When Ordering:**
Specify Model Number from chart. Specify Options.
(See page 11.27 & 11.28 for Dimensional Information.)

**OPERATING RANGE:** 0 - 150 psi

Standard knob color is black. For red knob add suffix -R to Model Number.
Specifications subject to change without notice or incurring obligation
Directional Control Valves

3/8 & 1/2 NPT 12, 12A, 12B & 38 Series

3/8 & 1/2 NPT Ported, 58 STYLE Solenoid Controlled, Pilot Operated Air Valves
2 Way, 3 Way - 2 Position — 4 Way 2 or 3 Position
Spring Return and Spring Centered Models NOT suitable for dry air service

See pages 11.27 & 11.28 for other dimensional information, 11.31 for solenoid information.

Operating Temperature:
0°F (–18°C) to +122°F (50°C) ambient.
0°F (–18°C) to +122°F (50°C) media.

Operating Ranges, psi

<table>
<thead>
<tr>
<th>#1 Solenoid</th>
<th>#4 Solenoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9 Watts</td>
<td>3.5 Watts</td>
</tr>
</tbody>
</table>

Internal Pilot Supply (Standard) Inlet Pressure
- No Spring: .......................... 10 to 130 .......................... 10 to 145
- Spring: 2 Position .......................... 45 to 130 .......................... 45 to 145
- 2 Position Light Service Spring,
  Option -L .......................... 30 to 130 .......................... 30 to 145
- 3 Position .......................... 30 to 130 .......................... 30 to 145

External Pilot Supply, Option -X:
- Inlet Pressure .......................... 0 to 150 .......................... 0 to 150
- Pilot Pressure, Same as Internal Pilot Supply above.

58 STYLE Solenoid Valve, Model Number Code

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<thead>
<tr>
<th>12</th>
<th>F</th>
<th>S</th>
<th>4</th>
<th>5</th>
<th>1</th>
<th>0</th>
<th>0</th>
<th>120/60</th>
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<tbody>
<tr>
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<td>F = Micro DIN</td>
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<tr>
<td>G = Wire leads</td>
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<tr>
<td>Secondary Actuator</td>
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<td>G = Wire leads, 2 Pos.*</td>
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<td>GB = Wire leads</td>
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<td>3 Position Type F*</td>
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<tr>
<td>S = Spring**</td>
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<tr>
<td>A = Pilot**</td>
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<tr>
<td>P = Knob (Black)**</td>
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<tr>
<td>PR = Knob (Red)**</td>
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<td>* See page 11.23, 11.31.</td>
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<td>** See pages 11.24 &amp; 11.28 for details.</td>
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</tr>
<tr>
<td>Primary Solenoid</td>
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<tr>
<td>Attitude</td>
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<tr>
<td>5 = Inline with Body</td>
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<td>Secondary Solenoid</td>
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<td>0 = Other than Solenoid</td>
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<td>5 = Inline with Body</td>
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<tr>
<td>Primary Solenoid Manual Override</td>
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<tr>
<td>3 = Position #3</td>
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<tr>
<td>4 = Position #4</td>
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<tr>
<td>Secondary Solenoid Manual Override</td>
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<tr>
<td>0 = None</td>
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<tr>
<td>3 = Position #3</td>
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<td>Options</td>
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<tr>
<td>-X = External Pilot</td>
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<td></td>
</tr>
<tr>
<td>-XV = † External Pilot &amp; Viton Seals</td>
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<tr>
<td>-L = Light Spring</td>
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</tr>
<tr>
<td>† Viton Seals are available in the main valve only for media compatibility and therefore only in conjunction with External Pilot [0°F (–18°C) to +122°F (50°C)].</td>
<td></td>
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</tbody>
</table>

Series:
- 38 = 3/8 NPT, 4 Way
- 383 = 3/8 NPT, 3 Way NC
- 3830 = 3/8 NPT, 3 Way NO
- 12 = 1/2 NPT, 4 Way
- 123 = 1/2 NPT, 3 Way NC
- 1230 = 1/2 NPT, 3 Way NO
- 12A = 4 Way, Subbase Mount
- 12B = 1/2 NPT, 4 Way, 2 Position High Flow
- 123B = 1/2 NPT, 3 Way NC, High Flow
- 1230B = 1/2 NPT, 3 Way NO, High Flow

Example: 12FS-45100-120/60
1/2 NPT, 4 Way – Primary Actuator Solenoid with Micro DIN coil; Secondary Actuator, Spring Return – 3.5 Watt; Primary Solenoid Inline Attitude with Manual Override on Primary Solenoid in Position #1; Secondary Actuator is not a Solenoid; no Manual Override on Secondary Actuator – No Options – 120 Volt/60 Hertz.

Inline
Solenoid Attitude #5
(Solenoid centerline inline with Valve Body centerline)
Specifications subject to change without notice or incurring obligation

**Directional Control Valves**

**BASIC BODIES**

<table>
<thead>
<tr>
<th>2 WAY (Plug 3 Way)</th>
<th>3 WAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Secondary</td>
</tr>
<tr>
<td>1.75</td>
<td>1.75</td>
</tr>
<tr>
<td>1.00</td>
<td>3.50</td>
</tr>
<tr>
<td>1.25</td>
<td>.27 Dia. Mounting Hole, 2 Places</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4 WAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>1.75</td>
</tr>
<tr>
<td>1.00</td>
</tr>
<tr>
<td>1.25</td>
</tr>
</tbody>
</table>

**Cv FLOW FACTORS**

<table>
<thead>
<tr>
<th>2-Way – 3-Way</th>
<th>4-Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Return Assembly</td>
<td>Standard this End</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4-Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>2.50</td>
</tr>
<tr>
<td>1.00</td>
</tr>
<tr>
<td>1.25</td>
</tr>
<tr>
<td>.88</td>
</tr>
<tr>
<td>.27 Dia. Mounting Hole, 2 Places</td>
</tr>
</tbody>
</table>

**4 WAY**

<table>
<thead>
<tr>
<th>Spring Return Assembly</th>
<th>Standard this End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Secondary</td>
</tr>
<tr>
<td>2.50</td>
<td>2.50</td>
</tr>
<tr>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>.88</td>
<td>.88</td>
</tr>
<tr>
<td>.27 Dia. Mounting Hole, 2 Places</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Any of these 4-way valves, except the internally supplied solenoid valves (see Option -X), can be used as dual inlet, single exhaust. Using this concept, with different pressures for force application and retraction, can effect large savings of high pressure air and its cost. The larger the cylinder or the faster the cycle, the higher the savings.

**SINGLE SUBBASES**

To Order
Specify Valve Model No. (See pages 11.23 - 11.26)
Specify Subbase Part No. listed below.
EXAMPLE - Photo shows 12A-SP-MO4 with 12 PV-50

**SIDE PORTED**

3/8 NPT Ports Specify 38 PV-50
1/2 NPT Ports Specify 12 PV-50

**MOUNT 4 WAY VALVE WITH ANY OPERATOR**

**BOTTOM PORTED**

3/8 or 1/2 NPT IN, CYL & EXH Ports
3/8 NPT Ports Specify 38 PV-51
1/2 NPT Ports Specify 12 PV-51

**MULTIPLE MANIFOLDS**

To Order
Specify Station No. - Valve Model - Manifold Number
EXAMPLE - Photo shows one unit consisting of 3 valves and manifolds:
Sta. No. 1 12A-CS-MO1 with 12 PV-65
Sta. No. 2 12A-DP with 12 PV-66
Sta. No. 3 12A-HL with 38 PV-65

**CylindEr PORTs**

1/2 NPT IN & EXH Ports
3/8 or 1/2 NPT In, CYL & EXH Ports

**Center UNIt**

38 PV-66 12 PV-66

**End Unit**

38 PV-65 12 PV-65

1/2 NPT IN & EXH

 specifications subject to change without notice or incurring obligation 2-18-08

11.27
**Directional Control Valves**

### 11.28 2-7-08

**12, 12A, 12B & 38 Series**

**3/8 & 1/2 NPT**

---

**AIR PILOT OPERATOR**

The **53 STYLE** solenoid operator is a 3-way valve which, upon receiving an electrical signal, directs a pilot pressure to shift the main valve spool. Unless otherwise specified, the operator is internally supplied from the main valve inlet with pressure for piloting. If an external pilot supply is required, specify Suffix -X after the model number. This external pilot supply may be required; where the media through the main valve is of insufficient pressure for piloting, where the media through the main valve is something other than compressed air, for 4-way dual inlet-single exhaust, or other applications.

#### 53 STYLE SOLENOID OPERATOR

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.50</td>
<td>Housing Can Rotate 360°</td>
</tr>
<tr>
<td>.75</td>
<td>Pilot Port 1/8 NPT</td>
</tr>
<tr>
<td>1.50</td>
<td>1.25</td>
</tr>
<tr>
<td>2.50</td>
<td>.19</td>
</tr>
</tbody>
</table>

#### 53 STYLE SOLENOID OPERATOR with Manual Override and External Pilot Supply, Option -X

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.50</td>
<td>Housing Can Rotate 360°</td>
</tr>
<tr>
<td>.75</td>
<td>Pilot Port 1/8 NPT</td>
</tr>
<tr>
<td>1.50</td>
<td>1.25</td>
</tr>
<tr>
<td>2.50</td>
<td>.19</td>
</tr>
</tbody>
</table>

#### Manual Overide applicable to Pilot Operated or 53 Style Solenoid Operated Valves

<table>
<thead>
<tr>
<th>Manual Override</th>
<th>To Specify Add Suffix to Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCKING</td>
<td>-MO1</td>
</tr>
<tr>
<td>LOCKS IN - Does not lock OUT</td>
<td>-MO2</td>
</tr>
<tr>
<td>Does not lock IN - LOCKS OUT</td>
<td>-MO3</td>
</tr>
<tr>
<td>NON-LOCKING</td>
<td>-MO4</td>
</tr>
</tbody>
</table>

**Note:** The manual override stem physically contacts and moves the spool.

---

**58 STYLE Solenoid Operator – See page 11.26**

---

**3 POSITION SPRING CENTERING OPERATOR FOR HAND LEVER ONLY**

**2 POSITION SPRING RETURN, STANDARD & LIGHT SERVICE**

All valve models – Standard service spring consists of two concentric helical springs. Either may be removed for "Light" Service.

---

**2-7-08** Specifications subject to change without notice or incurring obligation
53 STYLE Stocked Coils and Housings

Conduit Housing “C” and Grommet Housing “G”
Non-molded – Class A 221°F (105°C) Rating, 24” Leads of AWG #18 Wire.
Stocked Voltages:
24, 120 and 240 Volt at 50 or 60 Hertz;
6, 12 and 24 Volt DC;
Others available, see Options on page 11.30.
Temperature Range:
0°F (–18°C) to + 104°F (+40°C), ambient.
0°F (–18°C) to + 150°F (+65°C), media.
Typical Response Times:
AC 4 to 8 milliseconds to open or close;
DC 9 to 15 milliseconds to open;
DC 5 to 12 milliseconds to close.
To compute current requirements (±15%) divide factor shown below by voltage.

<table>
<thead>
<tr>
<th>Function</th>
<th>AC Volts, 60 Hertz</th>
<th>DC Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inrush, Amp</td>
<td>Holding, Amp</td>
</tr>
<tr>
<td>2 Way NC</td>
<td>13.2 ÷ Volts</td>
<td>7.8 ÷ Volts</td>
</tr>
<tr>
<td>2 Way NO</td>
<td>15.2 ÷ Volts</td>
<td>9.0 ÷ Volts</td>
</tr>
<tr>
<td>3 Way NC or NO</td>
<td>Examples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15.2 ÷ 120 = .13 Amp</td>
<td>9.0 ÷ 120 = .08 Amp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.2 ÷ 12 = .60 Amp</td>
</tr>
</tbody>
</table>

Male Mini-DIN Housing “F”
Molded – Water Tight - Class A 221°F (105°C) IP65 Coil Rating.
European (DIN) Style – 11 mm spacing.
See page 11.30 for connectors or contact your local distributor for additional choices.
Can also be connected with individual .25” quick connect terminals.
Stocked Voltages:
24, 120 and 240 Volt at 50 or 60 Hertz;
12 and 24 Volt DC;
Others available, see Options on page 11.30.
Temperature Range:
0°F (–18°C) to + 104°F (+40°C), ambient.
0°F (–18°C) to + 150°F (+65°C), media.
Typical Response Times:
AC 4 to 8 milliseconds to open or close;
DC 9 to 15 milliseconds to open;
DC 5 to 12 milliseconds to close.
To compute current requirements (±15%) divide factor shown below by voltage.

<table>
<thead>
<tr>
<th>Function</th>
<th>AC Volts, 60 Hertz</th>
<th>DC Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inrush, Amp</td>
<td>Holding, Amp</td>
</tr>
<tr>
<td>2 Way NC</td>
<td>14.4 ÷ Volts</td>
<td>9.7 ÷ Volts</td>
</tr>
<tr>
<td>2 Way NO</td>
<td>15.2 ÷ Volts</td>
<td>11.8 ÷ Volts</td>
</tr>
<tr>
<td>3 Way NC or NO</td>
<td>Examples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15.2 ÷ 120 = .13 Amp</td>
<td>11.8 ÷ 120 = .10 Amp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.4 ÷ 12 = .87 Amp</td>
</tr>
</tbody>
</table>
53 STYLE Options for Conduit Housing “C” and Grommet Housing “G”

AC Voltages from 5.4 to 575 in 50 or 60 Hertz.
DC Voltages from 3 to 300.

- Molded Coil .......................... Option -M
  Water tight, Molded Coil with Class A 221°F (105°C) Rating. Coil is completely molded in epoxy for maximum moisture resistance.
  NEMA 1, 2, and 3 when in Conduit “C”, or Grommet “G” housing.

- Potted Coil .......................... Option -P
  Coil is epoxy potted into Conduit “C” housing only.
  Class F 221°F (105C) Rating.
  It offers maximum moisture and vibration resistance.
  NEMA 3R, 3S, 4, 4X, 6, 11, 12 & 13.

- High Temperature .................. Option -H
  Molded coil with 356°F (180°C) rating.

- Viton Seals .......................... Option -V
  (for media compatibility)

- Strain Relief Connector ........... Option -Q

- “AN” Connector ...................... Option -W

- Splice Box .......................... Option -J

- Mounting Bracket ................... Option -R

- Third Wire Ground .................. Option -CC
  A CSA requirement.

53 STYLE Options for Male Mini-DIN Housing “F”

AC Voltages from 4.4 to 277 in 50 or 60 Hertz.
DC Voltages from 3 to 180.

- Viton Seals .......................... Option -V
  (for media compatibility)

53 STYLE Options for Yoke Housing

- Yoke with Standard coil
  (24" flying leads) ........................ Option -YB

- Yoke with Molded coil
  (24" flying leads) ........................ Option -YM

- Yoke with Molded Spade Terminal and coil ........................... Option -KM
  Yoke replaces housing for protected and control box applications. Molded coil with two .25” spade terminals for quick assembly and disconnect.

53 STYLE Explosion Proof ........ Option -EP

UL File #E37780
CSA File #LR-26894
For hazardous locations, includes Molded Coil.
UL Class I Div. 1 Groups C & D.
UL Class II Div. 1 Groups E, F & G.
UL Class II Div. 2 Groups A, B, C, D, E & F.
NEMA 7 Class 1 Group D.
NEMA 9 & 9A Class II Groups F & G.

! CAUTION !
To prevent explosion, disconnect electrical circuit before opening enclosure!
Keep tightly closed when in operation.

Option -EP Current Factors

<table>
<thead>
<tr>
<th>AC Volt, 60 Hertz</th>
<th>Inrush</th>
<th>Holding</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Way NC</td>
<td>16.0</td>
<td>7.8</td>
</tr>
<tr>
<td>2 Way NO</td>
<td>16.9</td>
<td>10.7</td>
</tr>
<tr>
<td>3 Way NC or NO</td>
<td>16.9</td>
<td>10.7</td>
</tr>
<tr>
<td>DC Volts</td>
<td>Inrush or Holding</td>
<td></td>
</tr>
<tr>
<td>2 Way NC or NO</td>
<td>7.2</td>
<td></td>
</tr>
<tr>
<td>3 Way NC or NO</td>
<td>7.2</td>
<td></td>
</tr>
</tbody>
</table>

Divide “Factor” shown above by Volts to find current.
See examples on opposite page.
58 Style
3 Way – Normally Closed – Exhaust to Atmosphere
Temperature Range:
- 0°F (–18°C) to + 122°F (+50°C), ambient.
- 0°F (–18°C) to + 122°F (+50°C), media.
Available with or without Push Button Manual Override

#1 Operator
0.9 Watts
Volts – 12 VDC . . . 24 VDC
Amperage Draw – (approximate) . . . 73 mA . . . 37 mA
Response time: 9 ms @ 0 psi
0.6 mm Inlet Orifice – 0.8 mm Exhaust Orifice
130 psi Maximum Operating Pressure

#4 Operator
3.5 Watts
Volts – See Chart at Right
Amperage Draw – See Chart at Right
Response time: 8 ms with DC Volts;
3 – 9 ms with AC Volts.
1.0 mm Inlet Orifice – 1.0 mm Exhaust Orifice
145 psi Maximum Operating Pressure

<table>
<thead>
<tr>
<th>Volts</th>
<th>Hertz</th>
<th>Amperage Draw, mA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inrush</td>
</tr>
<tr>
<td>24</td>
<td>60</td>
<td>252</td>
</tr>
<tr>
<td>120</td>
<td>60</td>
<td>43</td>
</tr>
<tr>
<td>12</td>
<td>DC</td>
<td>294</td>
</tr>
<tr>
<td>24</td>
<td>DC</td>
<td>145</td>
</tr>
</tbody>
</table>

58 Style
[#1 (0.9 Watts), or #4 (3.5 Watts)] Operator

Male Micro-DIN, Coil “F”
Molded – Water Tight
Class A 221°F (105°C) IP65 Coil Rating
European (DIN) Style – 9.4 mm spacing
See page 11.32 for connectors or contact your local distributor for additional choices.

Wire Leads, Coil “G”
Molded – Water Tight
Class A 221°F (105°C) IP65 Coil Rating
Leadwires – AWG #20, 18 inches long
Solenoid Accessories

Solenoid Exhaust Mufflers, #SM-10
for "C" & "G" housings and "F" DIN coil operators. See page 14.1.

Connectors 53 Style (11 mm spacing)
For Male Mini-DIN Housing “F”

Part Number without LED: ...................... 122-09-N
Black Housing

Part Number with LED: ............ 122-09-T-A.1-Voltage
Available in 12, 24, 120, or 240 Volt; AC or DC only.
(Transparent Housing allows LED to be seen)

Connectors 58 Style (9.4 mm Spacing)
For Male Micro-DIN Housing “F”:

Part Number without LED: ...................... 192-07-N
Black Housing

Part Number with LED: ............ 192-07-T-A.1-Voltage
Available in 12 or 24 Volt, AC or DC only.
(Transparent Housing allows LED to be seen)

Hard Wired Connectors ......................... Please see Section 16

J Series - Mini-DIN and Micro-DIN hard wired connectors

F Series - Mini-DIN and Micro-DIN hard wired connectors