**4-Way Air Valve**

**End Mount Solenoid**

**1/4˝ and 3/8˝ Sizes**

Vacuum to 250 PSI  
Soft Seal Type

*(Subject to Pressure Limitations on Certain Models)*

Threaded Body or Subplate Mounted Models

**Description**

AAA Products International’s new **End Mount Solenoid** valve is a low profile, and low wattage version of their standard 1/4˝ and 3/8˝ solenoid valves on page 70. All End Mount solenoid valves are equipped with a non-locking manual override. Solenoid structures with locking overrides are available.

Standard models are assembled for “internal pilot operation”. They will operate reliably on line pressures from 150 PSI down to 25 PSI minimum for no spring models ESS and ESR and down to 50 PSI on spring return and spring centered models ESO and ESY. External pilot operation (option “Z”) must be used in vacuum, low pressure (below minimum PSI), high pressure (above 150 PSI and less than 250 PSI), or 5-way service applications.

Cv Value is 1.7 on 1/4˝ Models and 1.95 on 3/8˝ Models. The air will flow out the “A (2)” port when the right solenoid is energized (looking at the 3 port side). To order external pilot operation, add suffix “Z” following the regular model number. Example: ES02Z.

The table below shows information on the most popular coils available. For other voltages contact your local Womack sales office or visit the AAA Products International website at [www.aaaproducts.com](http://www.aaaproducts.com).

### Coil Voltage and Frequency

<table>
<thead>
<tr>
<th>Model</th>
<th>1/4 NPTF Threads</th>
<th>3/8 NPTF Threads</th>
<th>3/8˝ for Subplate*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sing. Sol.</td>
<td>ESO2</td>
<td>ESO3</td>
<td>ESO3P</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Sing. Sol.</td>
<td>ESR2</td>
<td>ESR3</td>
<td>ESR3P</td>
<td>2-pos., pilot returned</td>
</tr>
<tr>
<td>Double Sol.</td>
<td>ESS2</td>
<td>ESS3</td>
<td>ESS3P</td>
<td>2-pos., no springs</td>
</tr>
<tr>
<td>Double Sol.</td>
<td>ESY2</td>
<td>ESY3</td>
<td>ESY3P</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
</tbody>
</table>

*Flow capacity of 5/16˝ diameter hole. Mount on choice of subplates with 1/4˝ or 3/8˝ NPTF connections. For subplate ordering information see page 78. To order valve for external pilot add suffix “Z” to model code. The **End Mount Solenoid** valve can be converted to external pilot in the field.

The coils are a “DIN” style with 11mm connector pin pattern. “DIN” caps are ordered as a separate line item. When ordering LED style “DIN” caps, specify voltage. Two caps required for double solenoid valves.

**Optional “DIN” Caps (11mm style):**

<table>
<thead>
<tr>
<th>Coil Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCC</td>
<td>5/16˝ Conduit style, non-indicator lamp cap</td>
</tr>
<tr>
<td>DCCL*</td>
<td>5/16˝ Conduit style, LED indicator lamp cap</td>
</tr>
<tr>
<td>DCG</td>
<td>Cord grip style, non-indicator lamp cap</td>
</tr>
<tr>
<td>DCGL*</td>
<td>Cord grip style, LED indicator lamp cap</td>
</tr>
<tr>
<td>DC3M</td>
<td>3 Meters of cord pre-wired to cap, non-indicator lamp cap</td>
</tr>
<tr>
<td>DC3ML*</td>
<td>3 Meters of cord pre-wired to cap, LED indicator lamp cap</td>
</tr>
</tbody>
</table>

*Specify Voltage
Description

AAA Products International new NAMUR mount valve is a semi-sub-plate mounting style that allows rapid valve replacement with reduced plumbing assembly.

Standard models are assembled for “internal pilot operation”. They will operate reliably on line pressures from 150 PSI down to 25 PSI for no spring models NSS and NSR and down to 50 PSI on spring return and spring centered models NSO and NSY. External pilot operation (option “Z”) must be used in vacuum, low pressure (below minimum PSI), high pressure (above 150 PSI and less than 250 PSI), or 5-way service applications.

The Cv value for the valve is 1.5. The air will flow out the bottom port on the right when the right solenoid is energized (looking at the 3-hole side). To order the valve with external pilot add suffix “Z” following the regular model code. Example NSO2Z.

The valve comes standard with a non-locking manual override on the side of the solenoid structure. Solenoid structures with locking overrides are available. A valve may be converted to operate using only 3 ports. To convert, remove the $\frac{5}{16}$-32 plug on side of body and install same plug into threaded bottom port.

The table below shows information on the most popular coils available. For other voltages contact your local Womack sales office or visit the AAA Products International website at www.aaaproducts.com.

<table>
<thead>
<tr>
<th>Model Selection – NAMUR Solenoid Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coil Number</strong></td>
</tr>
<tr>
<td>Single Solenoid</td>
</tr>
<tr>
<td>Single Solenoid</td>
</tr>
<tr>
<td>Double Solenoid</td>
</tr>
<tr>
<td>Double Solenoid</td>
</tr>
</tbody>
</table>

The coils are a “DIN” style with 11mm connector pin pattern. “DIN” caps are ordered as a separate line item. When ordering LED style “DIN” caps, specify voltage. Two caps required for double solenoid valves.

Optional “DIN” Caps (11mm style):

<table>
<thead>
<tr>
<th>Coil Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCC</td>
<td>$\frac{5}{16}$ Conduit style, non-indicator lamp cap</td>
</tr>
<tr>
<td>DCC1*</td>
<td>$\frac{5}{16}$ Conduit style, LED indicator lamp cap</td>
</tr>
<tr>
<td>DCG</td>
<td>Cord grip style, non-indicator lamp cap</td>
</tr>
<tr>
<td>DCG1*</td>
<td>Cord grip style, LED indicator lamp cap</td>
</tr>
<tr>
<td>DC3M</td>
<td>3 Meters of cord pre-wired to cap, non-indicator lamp cap</td>
</tr>
<tr>
<td>DC3ML1*</td>
<td>3 Meters of cord pre-wired to cap, LED indicator lamp cap</td>
</tr>
</tbody>
</table>

*Specify Voltage
All valves shown on these two pages are assembled from the same basic body size, although the 3/8˝ models have larger internal passages for greater air flow. Subplate mounted valves are listed in the model selection chart but are not illustrated.

For compressed air or inert gases at pressures from vacuum to 250 PSI, subject to limitations described on the next page for certain models. Spool-type 4-way valves for operation of double-acting cylinders or reversible air motors. The valve will stand full pressure on any port, so it may be used as a 5-way valve or it may be used for 2-way or 3-way service by plugging unused ports.

Valve bodies are pressure-cast aluminum alloy; end caps are steel, aluminum, or zinc; spools are machined from aluminum bar stock and processed to a glass-hard surface finish; springs are plated steel or stainless steel; O-rings are Viton® rubber.

Three options are offered in the model chart, each using the same basic body size: second column = 1/4˝ flow capacity with 1/4˝ NPTF body threads; third column = 3/8˝ flow capacity with 3/8˝ NPTF body threads; fourth column = 3/8˝ flow capacity with unthreaded port holes through base of valve; these models must be mounted on a subplate to which plumbing connections are made. Subplate must be ordered separately; see listings on page 78.

Model Selection Chart for 1/4˝ And 3/8˝ Valves

Find desired valve type in 1st column. Select appropriate model number in 2nd, 3rd, or 4th column. Subplate valves (4th column) have base O-ring seals furnished.

<table>
<thead>
<tr>
<th>Type</th>
<th>Model 1/4˝ NPTF Threads</th>
<th>Model 3/8˝ NPTF Threads</th>
<th>Model 3/8˝ for Subplate</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sing. Sol.</td>
<td>SO2</td>
<td>SO3</td>
<td>SO3P</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Sing. Sol.</td>
<td>SR2</td>
<td>SR3</td>
<td>SR3P</td>
<td>2-pos., pilot returned</td>
</tr>
<tr>
<td>Double Sol.</td>
<td>SS2</td>
<td>SS3</td>
<td>SS3P</td>
<td>2-pos., no springs</td>
</tr>
<tr>
<td>Double Sol.</td>
<td>SY2</td>
<td>SY3</td>
<td>SY3P</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Man. Lever</td>
<td>HE2</td>
<td>HE3</td>
<td>HE3P</td>
<td>2-pos., friction positioned</td>
</tr>
<tr>
<td>Man. Lever</td>
<td>HO2</td>
<td>HO3</td>
<td>HO3P</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Man. Lever</td>
<td>HY2</td>
<td>HY3</td>
<td>HY3P</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Man. Lever</td>
<td>HD2</td>
<td>HD3</td>
<td>HD3P</td>
<td>3-pos., 3-detent, closed center</td>
</tr>
<tr>
<td>Pilot Oper.</td>
<td>RR2</td>
<td>RR3</td>
<td>RR3P</td>
<td>2-pos., double pilot, no springs</td>
</tr>
<tr>
<td>Pilot Oper.</td>
<td>RO2</td>
<td>RO3</td>
<td>RO3P</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Pilot Oper.</td>
<td>RY2</td>
<td>RY3</td>
<td>RY3P</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Button Bleed</td>
<td>D2</td>
<td>D3</td>
<td>D3P</td>
<td>2-pos., no springs</td>
</tr>
<tr>
<td>Cam</td>
<td>CO2</td>
<td>CO3</td>
<td>CO3P</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Cam</td>
<td>CR2</td>
<td>CR3</td>
<td>CR3P</td>
<td>2-pos., remote pilot returned</td>
</tr>
<tr>
<td>Foot Pedal</td>
<td>FO2</td>
<td>FO3</td>
<td>FO3P</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Foot Pedal</td>
<td>FR2</td>
<td>FR3</td>
<td>FR3P</td>
<td>2-pos., remote pilot returned</td>
</tr>
<tr>
<td>Treadle</td>
<td>TE2</td>
<td>TE3</td>
<td>TE3P</td>
<td>2-pos., friction positioned</td>
</tr>
<tr>
<td>Treadle</td>
<td>TO2</td>
<td>TO3</td>
<td>TO3P</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Treadle</td>
<td>TY2</td>
<td>TY3</td>
<td>TY3P</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Treadle</td>
<td>TD2</td>
<td>TD3</td>
<td>TD3P</td>
<td>3-pos., 3-detent, closed center</td>
</tr>
<tr>
<td>Palm Button</td>
<td>KE2</td>
<td>KE3</td>
<td>KE3P</td>
<td>2-pos., friction positioned</td>
</tr>
<tr>
<td>Palm Button</td>
<td>KO2</td>
<td>KO3</td>
<td>KO3P</td>
<td>2-pos., spring return to “out”</td>
</tr>
<tr>
<td>Palm Button</td>
<td>KD2</td>
<td>KD3</td>
<td>KD3P</td>
<td>3-pos., detent positioned</td>
</tr>
<tr>
<td>Palm Button</td>
<td>KD2Q</td>
<td>KD3Q</td>
<td>KD3PQ</td>
<td>2-pos., detent positioned</td>
</tr>
</tbody>
</table>
Solenoid valves. Pilot-operated solenoid type. For pressure from 160 PSI to 50 PSI on spring models and down to 25 PSI on no spring models. If operated on pressure above or below this range, or on vacuum, valve must be converted to external pilot operation.

All standard voltages, both AC and DC can be furnished. All coils may be used for continuous duty. They have a power requirement of 11 watts. Inrush current is 0.36 amps, holding current is 0.23 amps at 120 volts, 60 Hz. Current at other voltages is in proportion. DC coils draw 9 watts at all voltages. Pigtail leads on solenoids are standard; DIN connectors are also available.

Converting to external pilot operation:
Remove the pilot operator from the main valve body. Leave gasket as is and rotate the solenoid operator 180° and remount. This will put the valve nameplate on the opposite side from that shown in photos. Connect a steady source of 50 to 160 PSI air to pilot port on top of valve.

Size of double solenoid model: 5¾” × 2½” × 3¾” high. Weight 2½ lbs.

Manual lever. Pressure range is vacuum to 250 PSI. Handle on 2-position spring models is offset opposite to position shown in photo. On 3-position models handle is vertical in neutral. Size: 6¼” × 2¼” × 4¾” high (includes handle). Weight approx. 1½ lbs.

Pilot operated. Vacuum to 250 PSI on main ports. Pilot pressure is maximum 250 PSI to 50 PSI minimum on spring loaded models or 20 PSI on no-spring model. Size: 4¾” × 2¼” × 1½” high. Weight 1 lb.

Button bleeder. Furnished in 2 or 3-position models. Limited to compressed air of 20 to 250 PSI. Not suitable for liquids or vacuum. Two bleed buttons are furnished in valve end caps. These may be remotely mounted on hose extensions. A momentary pressure on a bleed button causes main spool to shift. Size: 6” × 2¼” × 1¾” high. Weight 1 lb.

Cam actuated. Pressure range is vacuum to 250 PSI. Requires a force of 20 lbs. and a travel of 17/32” to fully shift spool. Has built-in over-travel of 1/32”. Roller may be taken off and remounted at right angles to position shown. Size: 6½” × 2¼” × 1½” high. Weight 1¼ lb.

Foot pedal. For toe actuation. Pressure range is vacuum to 250 PSI. Size: 8” × 2¼” × 2¼” over pedal. Weight 1¼ lbs.

Foot treadle. For toe and heel operation. Pressure range is vacuum to 250 PSI. Size: 8” × 2¼” × 3½” high over treadle. Weight 1½ lbs.

Palm button. Requires 5 lbs. force on Models KE and KR, 12 lbs. on Model KO. Pressure range is vacuum to 250 PSI. Can be panel mounted by specifying Suffix R. Size: 6¼” × 2¼” × 1½” high. Weight 1¼ lbs.
For compressed air or inert gases at pressures from vacuum to 250 PSI, subject to limitations described on the next page for certain models. These are spool-type 4-way valves for operation of double acting cylinders and reversible air motors. The valve will stand full pressure on any port, so it may be used as a 5-way valve, or it may be used for 2-way or 3-way service by plugging unused ports. O-ring seals between all ports give leak-tight operation.

The 3/4” and 1” valves are assembled in a large body. They have identical size and flow, the only difference being in connection thread size. The 1/2” valves are assembled in a smaller body. Photos on the next page show 1/2” valves. Appearance of the larger valves is similar. Although pipe thread valves are shown in the model chart, all listed models are available from stock with port holes through the base for subplate mounting. To order subplate valves see instructions at head of chart.

Three-position models are normally assembled with closed center spools, but are also furnished with float center or regenerative type spools if specified on order. For more information on the entire line of standard AAA valves contact your local Womack sales office and ask for a AAA Products International catalog or visit the AAA Products International website at www.aaaproducts.com.

Valve bodies and end caps are cast aluminum alloy; spools are machined from aluminum bar stock and processed for a glass-hard surface finish. Springs are stainless or rust-proofed carbon steel. O-rings are buna-N rubber.

Model Selection Chart for 1/2”, 3/4”, and 1” Valves

Find desired valve type in 1st column. Select model number from 2nd, 3rd, or 4th column. All models can be furnished with port holes through the base for subplate mounting. To order subplate valves, select model number from chart, then add suffix “P”.

<table>
<thead>
<tr>
<th>Type</th>
<th>1/2” NPTF Threads</th>
<th>3/4” NPTF Threads</th>
<th>1” NPTF Threads</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sing. Sol.</td>
<td>SO4</td>
<td>SO6</td>
<td>SO8</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Sing. Sol.</td>
<td>SR4</td>
<td>SR6</td>
<td>SR8</td>
<td>2-pos., pilot returned</td>
</tr>
<tr>
<td>Double Sol.</td>
<td>SS4</td>
<td>SS6</td>
<td>SS8</td>
<td>2-pos., no springs</td>
</tr>
<tr>
<td>Double Sol.</td>
<td>SY4</td>
<td>SY6</td>
<td>SY8</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Man. Lever</td>
<td>HE4</td>
<td>HE6</td>
<td>HE8</td>
<td>2-pos., friction positioned</td>
</tr>
<tr>
<td>Man. Lever</td>
<td>HO4</td>
<td>HO6</td>
<td>HO8</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Man. Lever</td>
<td>HY4</td>
<td>HY6</td>
<td>HY8</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Man. Lever</td>
<td>HD4</td>
<td>HD6</td>
<td>HD8</td>
<td>3-pos., 3-detent, closed center</td>
</tr>
<tr>
<td>Pilot Oper.</td>
<td>RR4</td>
<td>RR6</td>
<td>RR8</td>
<td>2-pos., double pilot, no springs</td>
</tr>
<tr>
<td>Pilot Oper.</td>
<td>RO4</td>
<td>RO6</td>
<td>RO8</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Pilot Oper.</td>
<td>Ry4</td>
<td>Ry6</td>
<td>Ry8</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Button Bleed</td>
<td>D4</td>
<td>D6</td>
<td>D8</td>
<td>2-pos., no springs</td>
</tr>
<tr>
<td>Cam</td>
<td>CO4</td>
<td>CO6</td>
<td>CO8</td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Cam</td>
<td>CR4</td>
<td></td>
<td></td>
<td>2-pos., remote pilot returned</td>
</tr>
<tr>
<td>Foot Pedal</td>
<td>FO4</td>
<td></td>
<td></td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Foot Pedal</td>
<td>FR4</td>
<td></td>
<td></td>
<td>2-pos., remote pilot returned</td>
</tr>
<tr>
<td>Treadle</td>
<td>TE4</td>
<td></td>
<td></td>
<td>2-pos., friction positioned</td>
</tr>
<tr>
<td>Treadle</td>
<td>TO4</td>
<td></td>
<td></td>
<td>2-pos., spring returned</td>
</tr>
<tr>
<td>Treadle</td>
<td>TY4</td>
<td></td>
<td></td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Treadle</td>
<td>TD4</td>
<td></td>
<td></td>
<td>3-pos., 3-detent, closed center</td>
</tr>
</tbody>
</table>
Model Description – 1/2”, 3/4”, & 1” AAA Valves

Soft-Seal Type

SOLENOID VALVES. Pilot-operated solenoid type. For pressure from 160 PSI to 50 PSI on spring models and down to 25 PSI on no spring models. If operated on pressure above or below this or on vacuum, valve must be converted to external pilot operation.

All standard voltages, both AC and DC can be furnished. All coils may be used for continuous duty. They have a power requirement of 11 watts. Inrush current is 0.36 amps. holding current is 0.23 amps at 120 VAC, 60 Hz. Current at other voltages is in proportion. DC coils draw 9 watts at all voltages.

Pigtail leads on solenoids are standard; DIN connectors are also available.

Converting to external pilot operation: On double solenoid valves this procedure must be followed for each solenoid: Remove 4 screws holding solenoid assembly to main body. Leave gasket as is, and rotate entire assembly 90° or 180° and remount. The source of external pilot pressure, 50 to 160 PSI, must be connected to the pilot port on each solenoid.

1/2˝ double solenoid valve 10¼” × 3½” × 2¾” high. Weight 4½ lbs.
3/4˝ and 1˝ double solenoid valve 13” × 4¾” × 3¾” high. Weight 7¼ lbs.

MANUAL LEVER. Vacuum to 250 PSI. Size: 1/2˝ valve 7¾” × 3½” × 7” high over handle. Weight 4½ lbs. 3/4˝ & 1˝ valves 10¾” × 4⅜” × 8⅜” high over handle. Weight 7 lbs.

PILOT OPERATED. Vacuum to 250 PSI on main ports. Pilot pressure maximum 250 PSI to 50 PSI minimum on spring loaded models or 25 PSI on no-spring model. Size: 1/2˝ valve 5⅝” × 3½” × 2¾” high. Weight 3½ lbs. 3/4˝ & 1˝ valves 8⅝” × 4⅜” × 3½” high. Wt. 6⅛ lbs.

BUTTON BLEEDER. Limited to compressed air of 25 to 250 PSI. Not suitable for liquids or vacuum. Two bleed buttons furnished in end caps. Size: 1/2˝ valve 7 × 3½” × 2¼” high. Weight 3-3/4 lbs. Size of 3/4˝ and 1˝ valves 10¾” × 4⅜” × 3⅜” high. Weight 6⅛ lbs.

CAM ACTUATED. Vacuum to 250 PSI. Requires 30 lbs and a 9/16” travel to fully shift the spool. Over-travel of 1/32” provided. Roller can be positioned at right angles by rotating end cap on valve. Size: 7½” × 3¼” × 2¾” high. Weight 3¾ lbs.

FOOT PEDAL. For toe actuation. Vacuum to 250 PSI. Furnished in 1/2” size only. Size: 9½” × 3½” × 3” high over pedal. Weight 4½ lbs.

FOOT TREADLE. Toe and heel actuation. Vacuum to 250 PSI. Furnished in 1/2” size only. Size: 10” × 3½” × 5” high over treadle. Weight 5¼ lbs.
Vacuum to 250 PSI
(Subject to Pressure Limitations on Some Models)
Threaded Body Models in 1½˝ Size Only. Subplate Models Will Mount on Choice of Subplates with 1½˝ or 2˝ NPTF Connections

NOTE: High capacity 3˝ air valves are available with solenoid, pilot, manual, and button bleeder operators. Ask for data sheet.

The 1½˝ and 2˝ valves are identical in size and flow rating. The only difference is in connection size. Valves with pipe threads in the body as in the photos on the next page are supplied only in 1½˝ NPTF. They are listed in the second column of the model chart. Subplate type valves, as listed in the third column of the chart, can be mounted on a choice of subplates having 1½˝ or 2˝ NPTF threads.

For compressed air or inert gases at pressures from vacuum to 250 PSI, subject to limitations described on next page for certain models. These are spool-type 4-way valves which may also be used for 2-way, 3-way or 5-way service by plugging all unused ports. Full pressure may be applied to any port. O-ring seals between all ports give leak-tight operation. Flow capacity is equal to area of 1½˝ diameter hole.

Solenoid, manual lever, and button bleeder models have AAA 3/8˝ piggy back valve to control shifting of the main spool. Air pressure for shifting is derived from the main inlet port, except when necessary to convert to external pilot operation. No piggy back operator is used on Models GR and GY. Their spools are shifted by pilot pressure from a remote location.

Valve body and end caps are aluminum alloy; spool is machined from aluminum bar stock and processed for a glass-hard surface finish. O-ring seals are buna-N rubber. Springs are not used in the main body; reference to springs in the model chart description refers to piggy back operator action.

Model Selection Chart for 1½ & 2˝ Valves

Find desired valve type in 1st column. Select appropriate model number in 2nd or 3rd column. Subplate valves (3rd column) have base O-ring seals furnished; subplate must be ordered separately; see listings on page 78.

**Type** | **Model No. 1½˝ NPTF Threads** | **Model No. Subplate Mounted** | **Description**
--- | --- | --- | ---
Single Solenoid | SO12 | SO16P | 2-position, spring returned
Single Solenoid | SR12 | SR16P | 2-position, pilot pres. returned
Double Solenoid | SS12 | SS16P | 2-position, no springs
Double Solenoid | SY12 | SY16P | 3-pos., spring cent., closed center
Man. Lever | HE12 | HE16P | 2-position, no spring, friction pos.
Man. Lever | HO12 | HO16P | 2-position, spring returned
Man. Lever | HY12 | HY16P | 3-pos., spring cent., closed center
Man. Lever | HD12 | HD16P | 3-position, 3-detent, closed center
Button Bleeder | D12 | D16P | 2-position, no springs
Remote Pilot | GR12 | GR16P | Double pilot, 2-position, no springs
Remote pilot | GY12* | GY16P* | 3-pos, pres. cent., closed center

*The remote valve (not furnished) for controlling Model GY must have a regenerative spool (both cylinder ports connected to pressure in center position).*
Model Description – 1½” & 2” 4-Way Air Valves

SOLENOID VALVES. Pilot operated solenoid type. For pressure of 50 PSI minimum to 160 PSI maximum. For operation on line pressure above or below this range or on vacuum, valve must be converted to external pilot operation. See below. All standard voltages, both AC and DC can be furnished. All coils may be used for continuous duty. They have a power requirement of 11 watts. Inrush current is 0.36 amps, holding current is 0.23 amps at 120VAC, 60 Hz. Current at other voltages is in proportion. DC coils draw 9 watts at all voltages.

Converting to external pilot operation: Remove complete piggy back valve and install a 1/16˝ NPTF pipe plug in the main body. Valve should then be re-mounted in same position and a 50 to 160 PSI pressure source is connected to the pilot port on the main body (not on the piggy back operator). Pigtail leads on solenoids are standard; DIN connectors are also available.


MANUAL LEVER VALVES. Requires very little force on the lever of the 1/4˝ AAA control valve mounted piggy back on top of the main body. Pressure range 50 to 250 PSI on main ports. Will work at lower pressure or vacuum if converted to external pilot operation as described above for solenoid valves.

Size: 13½˝ × 6¾˝ × 10¾˝ over handle. Weight 27¼ lbs.

BUTTON BLEEDER VALVE. Bleed buttons on the piggy back operator can be manually pressed to shift the main spool, or they can be removed and mounted on extensions to operate the valve from a remote point. Pressure range 50 to 250 PSI on main ports. Will work at lower pressures or vacuum if converted to external pilot operation as detailed above for solenoid valves.


REMOTELY PILOTED VALVES. No piggy back operator is used; main spool is shifted by 50 to 250 PSI pressure signals from a miniature control valve located remotely (not furnished). The remote valve can be solenoid, manual, cam, etc., but for operation of Model GY must have a “regenerative” spool, in which both cylinder ports are connected to pressure when spool is centered. Pressure range of main body and spool is vacuum to 250 PSI.

Size: 13½˝ × 6¾˝ × 5½˝. Weight: 27 lbs.
The **Series B** stack valve consists of individual sections sandwiched between two end plates, the stack being held together with three tie bolts. Individual sections shown in the model chart, are available with a variety of actuators. A stack assembly can have sections with an assortment of actuators.

Pressure and exhaust connections are 1/2˝ NPTF on both the 1/4˝ and 3/8˝ sizes. They come in through threaded port holes on one end plate and are manifolded to all sections. Cylinder connections come out threaded port holes, 1/4˝ or 3/8˝ NPTF in the side of each section. The stack can be turned with all cylinder port holes up or with all port holes down.

**RATINGS.** Valve bodies are rated for vacuum or compressed air up to 250 PSI. Not recommended for liquids. Solenoid sections are rated 50 to 150 PSI for spring centered and spring return models, 25 to 150 PSI for others. Higher or lower pressure can be handled by supplying external pilot pressure to each solenoid actuator.

Flow capacity is the same for 1/4˝ or 3/8˝ sizes. Only the cylinder connection size is different. Capacity is sufficient to operate air cylinders up to 3˝ bore at normal speeds, and larger cylinders at reduced speeds. Cylinder speed can be controlled with flow control valves installed in cylinder lines.

### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Model 1/4 NPTF Threads</th>
<th>Model 3/8 NPTF Threads</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single solenoid</td>
<td>EBSO2</td>
<td>EBSO3</td>
<td>2-position, spring returned spool</td>
</tr>
<tr>
<td>Single solenoid</td>
<td>EBSR2</td>
<td>EBSR3</td>
<td>2-position, pilot returned spool</td>
</tr>
<tr>
<td>Double solenoid</td>
<td>EBSS2</td>
<td>EBSS3</td>
<td>2-position spool, no springs</td>
</tr>
<tr>
<td>Double solenoid</td>
<td>EBSY2</td>
<td>EBSY3</td>
<td>3-pos., spring cent., closed center</td>
</tr>
<tr>
<td>Manual lever</td>
<td>BHE2</td>
<td>BHE3</td>
<td>2-position, friction positioned spool</td>
</tr>
<tr>
<td>Manual lever</td>
<td>BHO2</td>
<td>BHO3</td>
<td>2-position, spring returned spool</td>
</tr>
<tr>
<td>Manual lever</td>
<td>BHY2</td>
<td>BHY3</td>
<td>3-pos., spring cent., closed center</td>
</tr>
<tr>
<td>Manual lever</td>
<td>BHD2</td>
<td>BHD3</td>
<td>3-position, detented, closed center</td>
</tr>
<tr>
<td>Palm button</td>
<td>BKE2</td>
<td>BKE3</td>
<td>2-position, friction positioned spool</td>
</tr>
<tr>
<td>Palm button</td>
<td>BKO2</td>
<td>BKO3</td>
<td>2-position, spring returned spool</td>
</tr>
<tr>
<td>Palm button</td>
<td>BKY2</td>
<td>BKY3</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Palm button</td>
<td>B KD2</td>
<td>BKD3</td>
<td>3-position detented, closed center</td>
</tr>
<tr>
<td>Palm button</td>
<td>BKR2</td>
<td>BKR3</td>
<td>2-position, pilot returned spool</td>
</tr>
<tr>
<td>Palm button</td>
<td>BKD2Q</td>
<td>RKD3Q</td>
<td>2-position, detented spool</td>
</tr>
<tr>
<td>Cam operated</td>
<td>BCO2</td>
<td>BCO3</td>
<td>2-position, spring returned spool</td>
</tr>
<tr>
<td>Cam operated</td>
<td>BCR2</td>
<td>BCR3</td>
<td>2-position, pilot returned spool</td>
</tr>
<tr>
<td>Pilot operated</td>
<td>BRR2</td>
<td>BRR3</td>
<td>2-position, double piloted spool</td>
</tr>
<tr>
<td>Pilot operated</td>
<td>BRO2</td>
<td>BRO3</td>
<td>3-pos., spring returned spool</td>
</tr>
<tr>
<td>Pilot operated</td>
<td>BRY2</td>
<td>BRY3</td>
<td>3-pos., spr. cent., closed center</td>
</tr>
<tr>
<td>Button bleed</td>
<td>BD2</td>
<td>BD3</td>
<td>2-position, double bleed</td>
</tr>
<tr>
<td>Button bleed</td>
<td>BDY2</td>
<td>BDY3</td>
<td>3-pos. spring cent., closed center</td>
</tr>
<tr>
<td>Button bleed</td>
<td>BDO2</td>
<td>BDO3</td>
<td>2-position, spring returned spool</td>
</tr>
</tbody>
</table>
**VOLTAGES.** Standard voltages for solenoid sections are 120 or 240V, 60 Hz., and 12 or 24 VDC. Contact our office for other voltages.

**MATERIALS OF CONSTRUCTION.** Vacuum cast aluminum bodies. Aluminum spools with glass-hard surface finish.

**How to Order**
Model numbers in chart are for individual 1/4” or 3/8” sections with closed center spools. Ported end plate can be mounted on either end. Actuators can all extend the same direction or in opposite directions. Assemblies can have all cylinder ports on top or all coming out the bottom.

Your order should specify the number of sections and model number of each starting at the end with threaded inlet and exhaust ports. Your valve will be assembled with tie rods and any necessary spacer plates, and shipped ready to install. In clear text give any special instructions for assembly.

**Assembling in Your Plant**
Order individual sections and all necessary end plates and spacer plates. Place all sections side by side in any desired order. Place a threaded end plate **PEP-4** on one end (either end) and a blank end plate **BEP-4** on the other end. Place a **BOS-4** 1/8” spacer on one end of the stack (depending on which way the sections are turned), to support O-rings. Add spacer plate **PS-4** or **XPS-4** as required.

Cut tie rods to length from all-thread steel rod. Allow 1 5/16” for each valve section, 1” for threaded end plate, 5/8” for blank end plate, 1/8” for **BOS-4** spacer. For adjacent optional solenoid sections allow 5/16” for each **PS-4** spacer, or 1/2” for each **XPS-4** spacer if explosion proof solenoids are used. Threaded rods can be purchased locally or are available from the factory in tie rod kits.

Actuators are normally mounted on end shown in photo on page 76, but can be mounted on opposite end of section. Take off actuator and end cap and reverse their positions. **NOTE:** on manual lever, spring centered sections, the lever must be removed before spool can be pulled out.

**Accessories Required for Valve Assembly**
- **PEP-4.** End plate 1” thick, with 1/2” NPTF threaded inlet and exhaust ports. Includes 3 O-ring seals.
- **BEP-4.** Blank end plate 5/8” thick with 3 O-ring seals.
- **BOS-4.** 1/8” spacer with 3 holes. Used between an end plate and adjacent section to support O-rings. One required on each stack.
- **PS-4.** Spacer plate 5/16” thick with 3 O-ring seals. For use between two adjacent solenoid sections when using optional solenoid.
- **XPS-4.** Spacer plate, 1/2” thick with 3 O-ring seals. For use between two adjacent solenoid sections with optional explosion proof operators.
- **TRK-18.** Tie rod kit. Three tie rods, 18” long. Cut lengths to suit. Includes 6 nuts and 6 lockwashers.
- **TRK-36.** Tie rod kit, Three tie rods, 36” long. Cut lengths to suit. Includes 12 nuts and 12 lockwashers.
- **BRKV-3MP.** Replacement seal kit fits any Series B valve section. Includes 6 Viton® body O-Rings, 3 buna-N section O-rings, 2 end cap gaskets.

**“In-Line” Sleeve Valve**

**3-Way – 1/4” to 1/2” – Vacuum to 175 PSI**

**Air or Gas That Can be Vented to Atmosphere**

Has a sliding sleeve with a very short travel, and can be shifted by fingertip operation. It can be installed in an air line and used for example, to shut off the air while refilling the lubricator. Valve will handle full flow with very little pressure loss. Machined from brass bar stock. O-Ring seals give leak-tight shut-off.

When used as an air line shut-off, trapped system air pressure is vented to atmosphere when sleeve is closed. When used as a vacuum shut-off, connect vacuum pump to male end.

**SV-2:** 1/4” NPT  
**SV-3:** 3/8” NPT  
**SV-4:** 1/2” NPT
STAINLESS STEEL

SOFT SEAL VALVES, 1/4” AND 3/8” NPTF SIZES
AIR OR GAS TO 1500 PSI

Constructed of Type 316 stainless steel including the nameplate and screws (excluding knob). Soft seal construction with Viton® O-ring seals in body not on spool. Can be used on compressed air or any gas compatible with 316 stainless steel and Viton® seals. Four-way action; can be used for 2-way or 3-way service with full pressure on inlet and cylinder ports; limited pressure on exhaust ports (consult factory). Dryseal pipe ports, 1/4” or 3/8” NPTF. These are counterparts of the soft seal valves listed on page 70.

Palm Button Operated

Valve is shifted with a push-pull motion on the knob attached to the spool. Requires about 5 lbs shifting force on Model KE and 12 lbs on Model KO, with 17/32” spool travel. Can be panel mounted with valve body behind the panel.

Pilot Pressure Operated

Spool is shifted by application of air or gas pilot pressure obtained through auxiliary 3-way control valves.

Pilot ports are 1/8” NPTF (dryseal) on end cap(s). Maximum pilot pressure 250 PSI, minimum 20 PSI on RR models and 50 PSI on Model RO.

<table>
<thead>
<tr>
<th>1/4” NPTF</th>
<th>3/8” NPTF</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE2SS</td>
<td>KE3SS</td>
<td>Palm button actuated. Two position, no springs. Spool stays in shifted position when released.</td>
</tr>
<tr>
<td>KO2SS</td>
<td>KO3SS</td>
<td>Palm button actuated. Two position, spring return. Spool returns when knob is released.</td>
</tr>
<tr>
<td>RR2SS</td>
<td>RR3SS</td>
<td>Pilot pressure operated. Double pilot, no springs. Spool stays in shifted position.</td>
</tr>
<tr>
<td>RO2SS</td>
<td>RO3SS</td>
<td>Pilot operated. Single pilot, spring return. Spool returns to original position when pilot pressure is vented.</td>
</tr>
</tbody>
</table>

Subplates for AAA Valves

Soft Seals Models, pages 68 to page 75.
Type SM — Stacking Subplates
Bolt-Together Mounting Bases
For 3/8” Subplate Type Valves on pages 68, 70 and 71

These are individual subplates which can be bolted together to make a mounting surface for any number of 3/8” soft seal subplate type valves. Inlet pressure and exhaust connections are made to portholes on the side or bottom of either or both end plates, and are manifolded through to all sections. Cylinder and pilot ports come out the bottom of each subplate.

SM2. Subplate with 1/4” NPTF cylinder ports and 1/8” pilot ports.
SM3. Same as above but with 3/8” NPTF cylinder ports.
SMSC-4. End plate with 1/2” NPTF pressure and exhaust ports coming out side of end plate.
SMBC-4. End plate with 1/2” NPTF pressure and exhaust ports coming out bottom of end plate.
SMBE-3. Blind end plate to cover either end of assembly or can be used between subplates to separate pressure or media.
SMOS. Spacer. One required per assembly to support O-ring seals between first subplate & end plate.

AAA Valve Accessories

BUTTON VALVE Model BB-1S. Steel plunger.
BUTTON VALVE Model BB-1SSL. Stainless steel plunger.
PALM BUTTON BLEEDER Model BB-1P. Same as Model BB-1, with hard black plastic palm button 1¾” diameter. For use as manual control or panic button.
MOUNTING BLOCK Model TB-1/8. A convenient means for mounting a BB-1P or BB-1S bleeder button at a remote point, to be actuated by hand or cam. Has 1/8” NPTF connection on two sides. Mounts with 3/16” bolts or No. 10 screws.
MUFFLER/FLOW CONTROL Model MFC. Adjustable needle valve with built-in noise muffler. Machined from brass bar stock.
MUFFLER Model PM. Lightweight plastic body muffler that incorporates a fail safe tip to prevent excessive buildup of back pressure.
MUFFLER Model BM & BV. Muffler utilizes a 40 micron porous sintered bronze filter directly bonded to brass pipe thread fitting.

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MFC</th>
<th>PM</th>
<th>BM</th>
<th>BV</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-32</td>
<td></td>
<td></td>
<td>BM-0</td>
<td>BV-0</td>
</tr>
<tr>
<td>1/8” NPT</td>
<td>PM-1</td>
<td></td>
<td>BM-1</td>
<td>BV-1</td>
</tr>
<tr>
<td>1/4” NPT</td>
<td>MFC-2</td>
<td>PM-2</td>
<td>BM-2</td>
<td>BV-2</td>
</tr>
<tr>
<td>3/8” NPT</td>
<td>MFC-3</td>
<td>PM-3</td>
<td>BM-3</td>
<td>BV-3</td>
</tr>
<tr>
<td>1/2” NPT</td>
<td>MFC-4</td>
<td>PM-4</td>
<td>BM-4</td>
<td>BV-4</td>
</tr>
<tr>
<td>3/4” NPT</td>
<td></td>
<td></td>
<td>BM-6</td>
<td>BV-6</td>
</tr>
<tr>
<td>1” NPT</td>
<td></td>
<td></td>
<td>BM-8</td>
<td>BV-8</td>
</tr>
</tbody>
</table>