



# 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 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	Inrush Current	Holding Current	Power
12 volts DC	0.22 amps	0.22 amps	2.7 Watts
24 volts DC	0.11 amps	0.11 amps	2.7 Watts
120 volts, 60 Hz	0.05 amps	0.03 amps	3.7 VA
240 volts, 60 Hz	0.03 amps	0.02 amps	3.7 VA

## Model Selection – End Mount Solenoid Valve

Type	Model 1/4 NPTF Threads	Model 3/8 NPTF Threads	Model 3/8" for Subplate*	Description
Sing. Sol.	ESO2	ESO3	ESO3P	2-pos., spring returned
Sing. Sol.	ESR2	ESR3	ESR3P	2-pos., pilot returned
Double Sol.	ESS2	ESS3	ESS3P	2-pos., no springs
Double Sol.	ESY2	ESY3	ESY3P	3-pos., spr. cent., closed center

\* 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):

Coil Number	Description
DCC	1/2" Conduit style, non-indicator lamp cap
DCCL*	1/2" Conduit style, LED indicator lamp cap
DCG	Cord grip style, non-indicator lamp cap
DCGL*	Cord grip style, LED indicator lamp cap
DC3M	3 Meters of cord pre-wired to cap, non-indicator lamp cap
DC3ML*	3 Meters of cord pre-wired to cap, LED indicator lamp cap

\*Specify Voltage



# NAMUR Direct Mount Solenoid Valves

## 1/4" Size 4-Way

Vacuum to 250 PSI

Soft Seal Type

(Subject to Pressure Limitations on Certain Models)

### Description

AAA Products International new NAMUR mount valve is a semi-subplate 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 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.aaproducts.com](http://www.aaproducts.com).



Coil Voltage and Frequency	Inrush Current	Holding Current	Power
12 volts DC	0.22 amps	0.22 amps	2.7 Watts
24 volts DC	0.11 amps	0.11 amps	2.7 Watts
120 volts, 60 Hz	0.05 amps	0.03 amps	3.7 VA
240 volts, 60 Hz	0.03 amps	0.02 amps	3.7 VA

### Model Selection – NAMUR Solenoid Valve

Type	Model Number	Description
Single Solenoid	NSO2	2-position, spring returned
Single Solenoid	NSR2	2-position, pilot returned
Double Solenoid	NSS2	2-position, no springs
Double Solenoid	NSY2	3-position, spring, center, closed center

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):

Coil Number	Description
DCC	1/2" Conduit style, non-indicator lamp cap
DCCL*	1/2" Conduit style, LED indicator lamp cap
DCG	Cord grip style, non-indicator lamp cap
DCGL*	Cord grip style, LED indicator lamp cap
DC3M	3 Meters of cord pre-wired to cap, non-indicator lamp cap
DC3ML*	3 Meters of cord pre-wired to cap, LED indicator lamp cap

\*Specify Voltage



# 4-WAY AIR VALVES

## 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**

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.

Type	Model 1/4" NPTF Threads	Model 3/8" NPTF Threads	Model 3/8" for Subplate	Description
Sing. Sol.	SO2	SO3	SO3P	2-pos., spring returned
Sing. Sol.	SR2	SR3	SR3P	2-pos., pilot returned
Double Sol.	SS2	SS3	SS3P	2-pos., no springs
Double Sol.	SY2	SY3	SY3P	3-pos., spr. cent., closed center
Man. Lever	HE2	HE3	HE3P	2-pos., friction positioned
Man. Lever	HO2	HO3	HO3P	2-pos., spring returned
Man. Lever	HY2	HY3	HY3P	3-pos., spr. cent., closed center
Man. Lever	HD2	HD3	HD3P	3-pos., 3-detent, closed center
Pilot Oper.	RR2	RR3	RR3P	2-pos., double pilot, no springs
Pilot Oper.	RO2	RO3	RO3P	2-pos., spring returned
Pilot Oper.	RY2	RY3	RY3P	3-pos., spr. cent., closed center
Button Bleed	D2	D3	D3P	2-pos., no springs
Cam	CO2	CO3	CO3P	2-pos., spring returned
Cam	CR2	CR3	CR3P	2-pos., remote pilot returned
Foot Pedal	FO2	FO3	FO3P	2-pos., spring returned
Foot Pedal	FR2	FR3	FR3P	2-pos., remote pilot returned
Treadle	TE2	TE3	TE3P	2-pos., friction positioned
Treadle	TO2	TO3	TO3P	2-pos., spring returned
Treadle	TY2	TY3	TY3P	3-pos., spr. cent., closed center
Treadle	TD2	TD3	TD3P	3-pos., 3-detent, closed center
Palm Button	KE2	KE3	KE3P	2-pos., friction positioned
Palm Button	KO2	KO3	KO3P	2-pos., spring return to "out"
Palm Button	KR2	KR3	KR3P	2-pos., pilot returned to "out"
Palm Button	KD2	KD3	KD3P	3-pos., detent positioned
Palm Button	KD2Q	KD3Q	KD3PQ	2-pos., detent positioned

## Model Description – 1/4" & 3/8" AAA 4-Way Air 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 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: 5 3/4" × 2 1/2" × 3 3/4" high. Weight 2 1/2 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:** 6 1/4" × 2 1/4" × 4 5/8" high (includes handle). Weight approx. 1 1/4 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:** 4 7/8" × 2 1/4" × 1 7/16" 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" × 2 1/4" × 1 5/16" 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:** 6 1/8" × 2 1/4" × 1 1/2" high. Weight 1 1/4 lbs.

**FOOT PEDAL.** For toe actuation. Pressure range is vacuum to 250 PSI. **Size:** 8" × 2 1/4" × 2 9/16" over pedal. Weight 1 1/4 lbs.

**FOOT TREADLE.** For toe and heel operation. Pressure range is vacuum to 250 PSI. **Size:** 8" × 2 1/4" × 3 7/8" high over treadle. Weight 1 1/2 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:** 6 1/4" × 2 1/4" × 1 1/2" high. Weight 1 1/4 lbs.



SO2



SS2



HE2



RR2



D2



CO2



FO2



TE2



KO2



# 4-WAY AIR VALVES

## 1/2", 3/4", and 1" Sizes

Vacuum to 250 PSI

Soft-Seal Type

(Subject to Pressure Limitations on Certain Models)

Threaded Body or Subplate Mounted Models

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.aaproducts.com](http://www.aaproducts.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".

Type	Model 1/2" NPTF Threads	Model 3/4" NPTF Threads	Model 1" NPTF Threads	Description
Sing. Sol.	SO4	SO6	SO8	2-pos., spring returned
Sing. Sol.	SR4	SR6	SR8	2-pos., pilot returned
Double Sol.	SS4	SS6	SS8	2-pos., no springs
Double Sol.	SY4	SY6	SY8	3-pos., spr. cent., closed center
Man. Lever	HE4	HE6	HE8	2-pos., friction positioned
Man. Lever	HO4	HO6	HO8	2-pos., spring returned
Man. Lever	HY4	HY6	HY8	3-pos., spr. cent., closed center
Man. Lever	HD4	HD6	HD8	3-pos., 3-detent, closed center
Pilot Oper.	RR4	RR6	RR8	2-pos., double pilot, no springs
Pilot Oper.	RO4	RO6	RO8	2-pos., spring returned
Pilot Oper.	RY4	RY6	RY8	3-pos., spr. cent., closed center
Button Bleed	D4	D6	D8	2-pos., no springs
Cam	CO4	CO6	CO8	2-pos., spring returned
Cam	CR4	.....	.....	2-pos., remote pilot returned
Foot Pedal	FO4	.....	.....	2-pos., spring returned
Foot Pedal	FR4	.....	.....	2-pos., remote pilot returned
Treadle	TE4	.....	.....	2-pos., friction positioned
Treadle	TO4	.....	.....	2-pos., spring returned
Treadle	TY4	.....	.....	3-pos., spr. cent., closed center
Treadle	TD4	.....	.....	3-pos., 3-detent, closed center

## 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 10 1/4" x 3 1/2" x 2 3/4" high. Weight 4 3/4 lbs.

3/4" and 1" double solenoid valve 13" x 4 3/8" x 3 3/8" high. Weight 7 1/2 lbs.

**MANUAL LEVER.** Vacuum to 250 PSI. Size: 1/2" valve 7 3/8" x 3 1/2" x 7" high over handle. Weight 4 1/4 lbs. 3/4" & 1" valves 10 3/4" x 4 3/8" x 8 1/4" 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 5 3/8" x 3 1/2" x 2 3/4" high. Weight 3 1/2 lbs. 3/4" & 1" valves 8 1/2" x 4 3/8" x 3 5/16" high. Wt. 6 1/4 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 x 3 1/2" x 2 3/4" high. Weight 3-3/4 lbs. Size of 3/4" and 1" valves 10 1/4" x 4 3/8" x 3 5/16" high. Weight 6 1/2 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: 7 1/2" x 3 1/2" x 2 3/4" high. Weight 3 3/4 lbs.

**FOOT PEDAL.** For toe actuation. Vacuum to 250 PSI. Furnished in 1/2" size only. Size: 9 1/2" x 3 1/2" x 3" high over pedal. Weight 4 3/4 lbs.

**FOOT TREADLE.** Toe and heel actuation. Vacuum to 250 PSI. Furnished in 1/2" size only. Size: 10" x 3 1/2" x 5" high over treadle. Weight 5 1/4 lbs.



SS4



SO4



HE4



RR4



D4



CO4



FO4



TE4



# 4-WAY AIR VALVES

## 1½" and 2" Sizes

Soft-Seal Type

**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 1⅜" 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 remounted 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.

**Size:** 13½" × 6¾" × 9½". Weight: Single Solenoid, 27¾ lbs., Double Solenoid, 29½ lbs.

**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" × 10¼" 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.

**Size:** 13½" × 6¾" × 7". Weight: 27 pounds.

**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.



Single Solenoid



Double Solenoid



Manual Lever



Button Bleeder



Remotely Piloted





# STACKING VALVES

**SERIES B — SOFT SEAL — 1/4" & 3/8" SIZES  
VACUUM TO 250 PSI**

**(Subject to Pressure Limitations on Certain Models)**



**Typical Section**



**Typical 3-Section Assembly**

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	Model 1/4 NPTF Threads	Model 3/8 NPTF Threads	Description
Single solenoid	EBSO2	EBSO3	2-position, spring returned spool
Single solenoid	EBSR2	EBSR3	2-position, pilot returned spool
Double solenoid	EBSS2	EBSS3	2-position spool, no springs
Double solenoid	EBSY2	EBSY3	3-pos., spring cent., closed center
Manual lever	BHE2	BHE3	2-position, friction positioned spool
Manual lever	BHO2	BHO3	2-position, spring returned spool
Manual lever	BHY2	BHY3	3-pos., spring cent., closed center
Manual lever	BHD2	BHD3	3-position, detented, closed center
Manual lever	BHD2Q	BHD3Q	2-position, detented spool
Palm button	BKE2	BKE3	2-position, friction positioned spool
Palm button	BKO2	BKO3	2-position, spring returned spool
Palm button	BKY2	BKY3	3-pos., spr. cent., closed center
Palm button	BKD2	BKD3	3-position detented, closed center
Palm button	BKR2	BKR3	2-position, pilot returned spool
Palm button	BKD2Q	RKD3Q	2-position, detented spool
Cam operated	BCO2	BCO3	2-position, spring returned spool
Cam operated	BCR2	BCR3	2-position, pilot returned spool
Pilot operated	BRR2	BRR3	2-position, double piloted spool
Pilot operated	BRO2	BRO3	2-position, spring returned spool
Pilot operated	BRY2	BRY3	3-pos., spr. cent., closed center
Button bleed	BD2	BD3	2-position, double bleed
Button bleed	BDY2	BDY3	3-pos. spring cent., closed center
Button bleed	BDO2	BDO3	2-position, spring returned spool

**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 1/16" 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**.



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

## Subplates for AAA Valves

Soft Seals Models, page 68 to page 75.

Port Size	Side Ports, Dual Exh.	Side Ports, Single Exh.	Bottom Ports, Dual Exh.	Bottom Ports, Single Exh.	Pilot Ports
1/4	SP2-3N	SP2-4N	SP2-1N	SP2-2N	No Pilot Ports in Subplate
3/8	SP3-3N	SP3-4N	SP3-1N	SP3-2N	
1/2	SP4-3N	SP4-4N	SP4-1N	SP4-2N	
3/4	SP6-3N	SP6-4N	SP6-1N	SP6-2N	
1	SP8-3N	.....	SP8-1N	.....	
1½	SP12-3N	.....	SP12-1N	.....	
2	.....	.....	SP16-1N	.....	1/8" NPTF Pilot Ports in Subplate
1/4	SP2-3	SP2-4	SP2-1	SP2-2	
3/8	SP3-3	SP3-4	SP3-1	SP3-2	
1/2	SP4-3	SP4-4	SP4-1	SP4-2	
3/4	SP6-3	SP6-4	SP6-1	.....	
1	SP8-3	.....	SP8-1	.....	
1½	SP12-3	.....	SP12-1	.....	
2	.....	.....	SP16-1	.....	

## 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

**BB-1S**



**BUTTON VALVE Model BB-1S.** Steel plunger.

**BB-1P**



**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 1 3/8" diameter. For use as manual control or panic button.

**TB-1/8**



**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.

**MFC**



**MUFFLER/FLOW CONTROL Model MFC.** Adjustable needle valve with built-in noise muffer. Machined from brass bar stock

**PM**

**BM**

**BV**



**MUFFLER Model PM.** Lightweight plastic body muffer that incorporates a fail safe tip to prevent excessive buildup of back pressure.

**MUFFLER Model BM & BV.** Muffer utilizes a 40 micron porous sintered bronze filter directly bonded to brass pipe thread fitting.

SIZE	MFC	PM	BM	BV
10-32	.....	.....	BM-0	BV-0
1/8" NPT	.....	PM-1	BM-1	BV-1
1/4" NPT	MFC-2	PM-2	BM-2	BV-2
3/8" NPT	MFC-3	PM-3	BM-3	BV-3
1/2" NPT	MFC-4	PM-4	BM-4	BV-4
3/4" NPT	.....	.....	BM-6	BV-6
1" NPT	.....	.....	BM-8	BV-8