

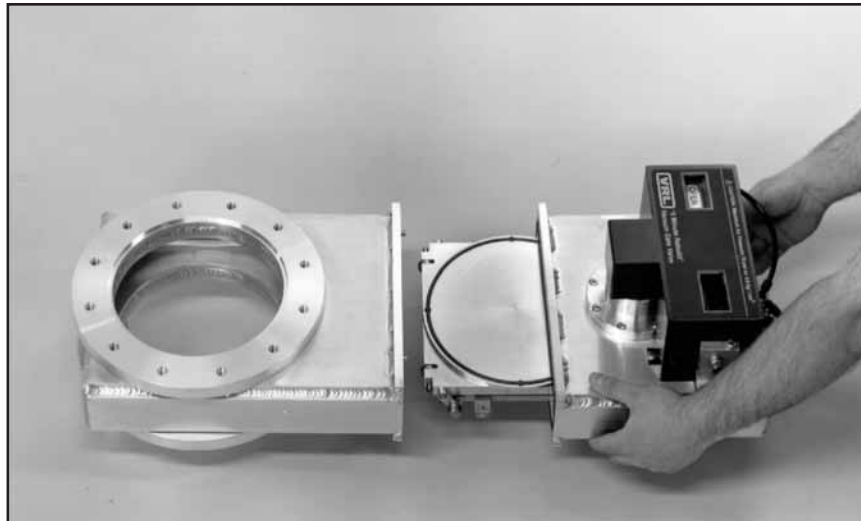


Vacuum Research Ltd.



Vacuum Valve Catalog Pricing in Euros

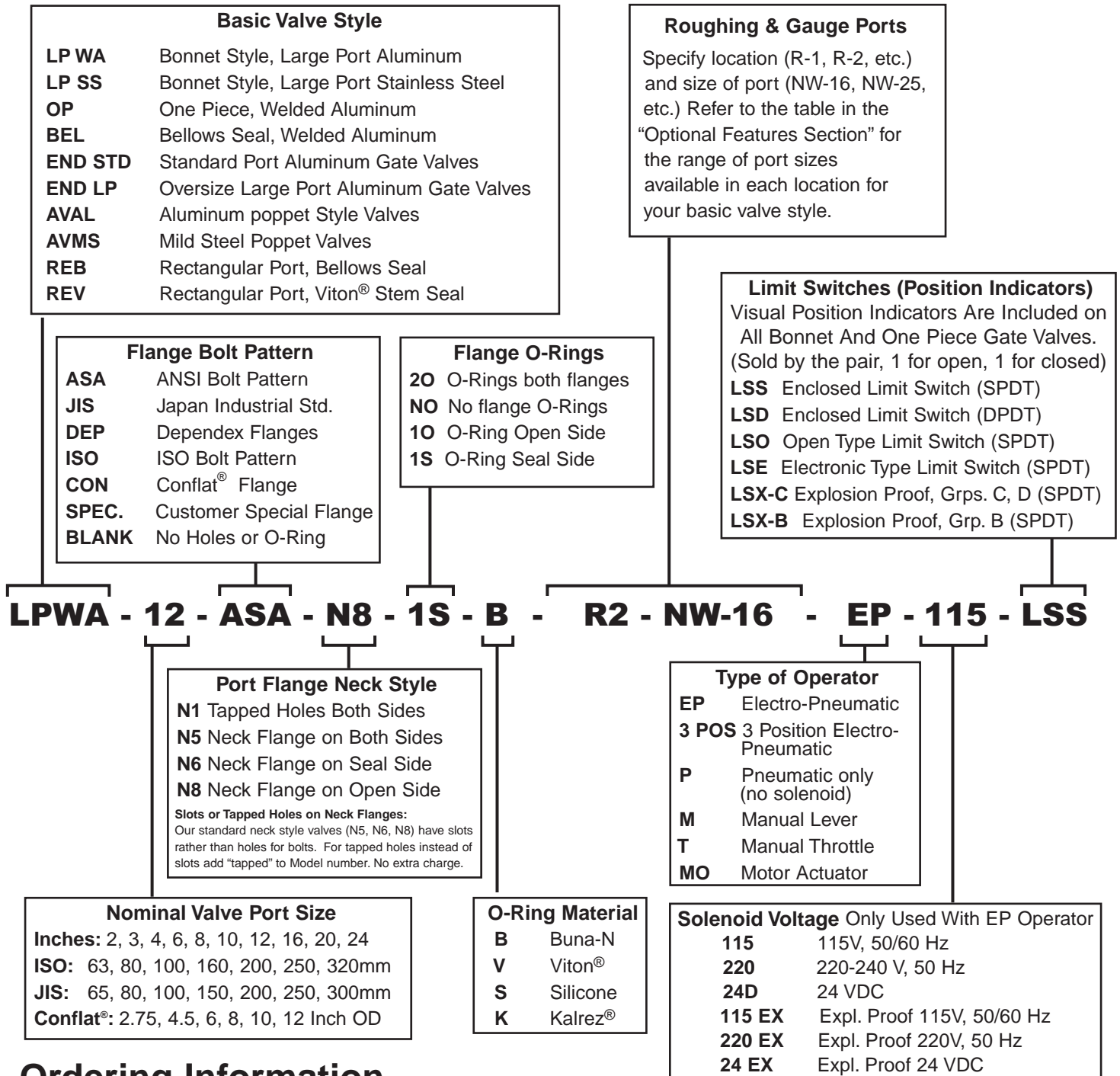
Prices Subject to Change Without Notice



- **Up to 1 Million Cycles Without Service**
- **“5 Minute Rebuild” Vacuum Gate Valves**
- **Replace All Moving Parts in 5 Minutes**
- **The Port Section Stays in Your System**
- **All Valves (RoHS) 2002/95/EC Compliant**



Vacuum Research valves are available with dozens of options to allow you to select exactly the features you need for your vacuum system. The model number system illustrated below will accurately describe most valves, but if you have any questions about the best way to specify what you need, just call or fax our customer service department and we will be happy to help you. All Valves (RoHS) 2002/95/EC Compliant



Ordering Information

Call our toll free number (800) 426-9340, or (412) 261-7630 to place orders, or for customer service. Our FAX number is (412) 261-7220. Address orders by mail to Vacuum Research Ltd.



2419 Smallman Street, Pittsburgh, PA 15222 USA. Prices in this catalog are FOB factory. CIF or C&F prices available. Contact factory for pro forma invoice or price quotation. Terms are Net 30 Days.

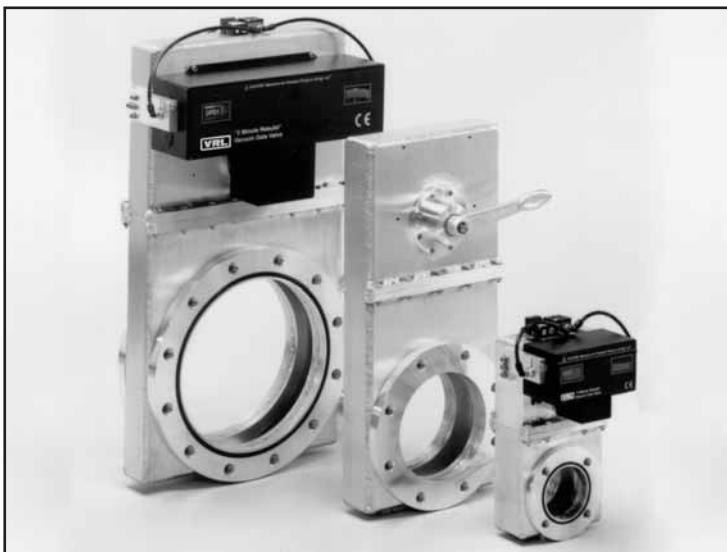


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Vacuum Research Ltd. • 2419 Smallman Street • Pittsburgh, PA 15222 USA • www.vacuumresearch.com
Phone: 800-426-9340 • 412-261-7630 • FAX: 412-261-7220 • e-mail: VRL@vacuumresearch.com



Stainless and Aluminum Gate Valves



Aluminum valves with (left to right): Electro Pneumatic, Manual, and Motor Actuators. Stainless Steel valves also available.

ANSI, ISO, JIS, or Special Flanges

These Vacuum Research 5 minute rebuild valves are available with virtually any flange or combination of flanges at no extra charge. Combinations of ISO on one flange and ANSI on the other are easily accommodated. Even different sizes such as 4 inch on one flange and 6 inch on the other.

Insertable "Flangeless" Valves

It is sometimes helpful to keep the flange to flange dimension ("A" dimension on the dimensions pages) as short as possible. In such cases your valves can be provided with no port flanges at all and with either O-Ring grooves machined into the valve body or with a precision machined surface on the body to seal against the O-rings on your pump or chamber. Contact the VRL factory for prices.

Aluminum or Stainless Steel

Vacuum Research Bonnet Style valves are available in stainless steel or 6061 aluminum. Smooth surface finish gives low outgassing and fast pump down.

High Conductance

All our Bonnet Style valves feature the high conductance large port design that we introduced over 35 years ago. Port sizes to the maximum for ANSI, ISO and JIS flanges give full speed from your cryo, turbo, or diffusion pump.

Fail Safe

All Vacuum Research Valves can be installed for fast close on power failure and air operated valves can be manually positioned without air or electricity.

RoHS Compliant

All Valves (RoHS) 2002/95/EC Compliant

Satisfaction Guaranteed

Vacuum Research has been building high vacuum valves for almost 50 years and has earned a reputation for world class product quality and customer service. If you are not satisfied with our valve just send it back.

Long Life

More than 250,000 cycles for aluminum valves. That's one cycle every 2 minutes, 24 hours/day for a year. An optional million cycle design is available.

Fast Repair

In under 5 minutes you can replace every moving part in a Vacuum Research Bonnet Style valve with no special tools or training. The valve port stays in your system to support the pump and vacuum lines.

Vacuum & Pressure

Vacuum Research Valves stay sealed against positive pressure in either direction. Seal and open with up to 3 atmospheres differential pressure.

No Leaks

All Vacuum Research valves have total leak rates of less than 2×10^{-9} std cc/sec. By total leak we mean that each completed valve is tested in a He filled bag.

Electric Motor, Air or Manual Actuators

All Vacuum Research gate valves are available with 3 types of actuators. Manual actuators are the least expensive. Electro-pneumatic actuators use 70 psi (4.9 kg/cm) compressed air and include the solenoid (specify the solenoid voltage that is most convenient for you). Electric motor actuators use high torque servo motors and operate from 115V or 230V, 1Ø 50 or 60 Hz. CE Mark included.

Roughing and Gauge Ports

There are six locations for optional gauge and roughing ports described on page 44.

Position Indicators, Limit Switches

Visual position indication of valve position is included on all valves. Limit switches for remote indication are described in Optional Features.

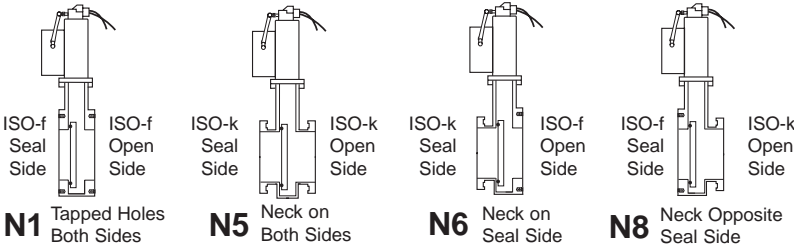
Complete Rebuild

in 5 Minutes!

With no special tools or training you can replace every moving part in your Vacuum Research Bonnet Style Valve in 5 minutes. (Our best guys can do it in less time, but they practice.)



- 250,000 Cycle Rotary Shaft Seal; Million Cycle Available
- Large Port, ISO Flanges; 6 Roughing Port Options
- All Valves (RoHS) 2002/95/EC Compliant
- Helium Leak Less Than 2×10^{-9} scc/sec
- Operate Manually If Air or Power Fail
- Fail Safe Design, Close On Power Loss
- Vacuum & Pressure - Seals Up To 3 Atm. ΔP
- Optional Operation to 10 Bar, 147 PSIG



ORDERING INFORMATION

Model Number: Refer to page 2 for instructions on how to specify the features you need.

Electric Motor Actuators: Any Vacuum Research valve can be supplied with a high torque electric motor actuator. Refer to "Electric Motor Actuator" Page.

Special Features: Refer to page 44 & 45 for specifications for roughing and gauge ports, position indicators & other special features.

Viton® or Kalrez® or Silicone O-Rings All standard Vacuum Research Valves use a Viton® O-Ring for the gate seal and Buna-N O-Rings for all other locations. You may specify Viton® or other materials throughout the valve with a "V" in the model number and add the following to the price.X

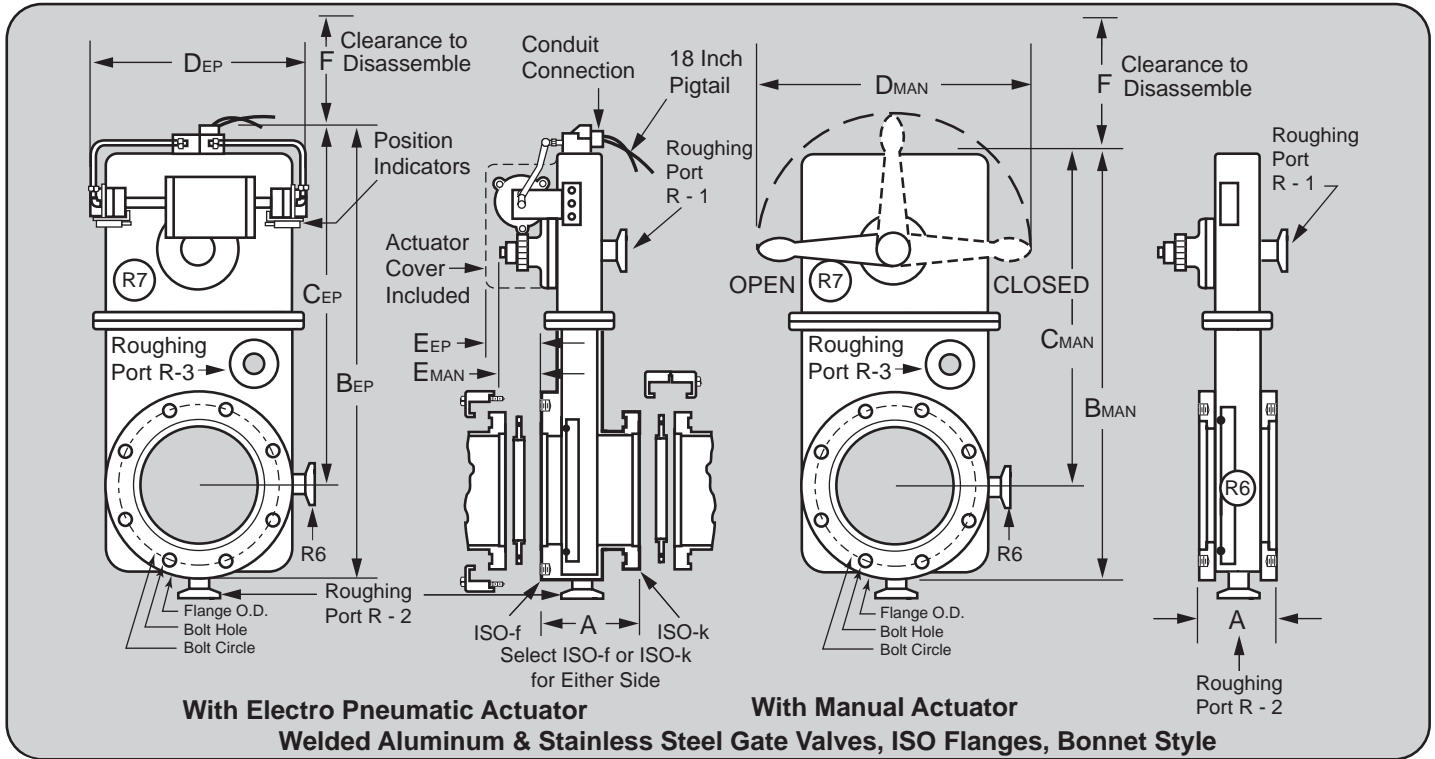
63 or 80 mm valves . . .€26.	200 mm valves€82.
100 mm valves€39.	250 mm valves€94.
160 mm valves€52.	320 mm valves€122.

(Use "S" for Silicone, "K" for Kalrez®, and contact the factory for prices.)

The gate seal O-ring is on the actuator side (to left) in aluminum valve sizes from 80 through 200 mm.
The gate seal is on the side opposite the actuator on 63, 250, 320, 400 mm aluminum and stainless steel valves.

Stainless Steel Gates in Aluminum Valves: To specify a stainless steel gate in an aluminum valve add a suffix to the model number "SS Gate". Refer to the "Optional Features and Accessories" page in this catalog for pricing information

Nominal Size	Electro-Pneumatic Operator "EP" Suffix				Manual Operator "M" Suffix			
	Aluminum Model & Neck Style	Price €	Stainless Steel Model & Neck Style	Price €	Aluminum Model & Neck Style	Price €	Stainless Steel Model & Neck Style	Price €
63 mm One piece style	OP-63-ISO-N1-EP	€739.	OPSS-63-ISO-N1-EP	€1375.	OP-63-ISO-N1-M	€580.	OPSS-63-ISO-N1-M	€1170.
	OP-63-ISO-N5-EP	€834.+	OPSS-63-ISO-N5-EP	€1535.	OP-63-ISO-N5-M	€710.	OPSS-63-ISO-N5-M	€1330.
	OP-63-ISO-N6-EP	€772.	OPSS-63-ISO-N6-EP	€1455.	OP-63-ISO-N6-M	€650.	OPSS-63-ISO-N6-M	€1260.
	OP-63-ISO-N8-EP	€772.	OPSS-63-ISO-N8-EP	€1455.	OP-63-ISO-N8-M	€650.	OPSS-63-ISO-N8-M	€1260.
80 mm	LPWA-80-ISO-N1-EP	€977.	LPSS-80-ISO-N1-EP	€1590.	LPWA-80-ISO-N1-M	€870.	LPSS-80-ISO-N1-M	€1345.
	LPWA-80-ISO-N5-EP	€1081.	LPSS-80-ISO-N5-EP	€1775.	LPWA-80-ISO-N5-M	€975.	LPSS-80-ISO-N5-M	€1520.
	LPWA-80-ISO-N6-EP	€1050.	LPSS-80-ISO-N6-EP	€1695.	LPWA-80-ISO-N6-M	€945.	LPSS-80-ISO-N6-M	€1450.
	LPWA-80-ISO-N8-EP	€1050.	LPSS-80-ISO-N8-EP	€1695.	LPWA-80-ISO-N8-M	€945.	LPSS-80-ISO-N8-M	€1450.
100 mm	LPWA-100-ISO-N1-EP	€1010.	LPSS-100-ISO-N1-EP	€2020.	LPWA-100-ISO-N1-M	€910.	LPSS-100-ISO-N1-M	€1720.
	LPWA-100-ISO-N5-EP	€1640.	LPSS-100-ISO-N5-EP	€2230.	LPWA-100-ISO-N5-M	€1010.	LPSS-100-ISO-N5-M	€1920.
	LPWA-100-ISO-N6-EP	€1180.	LPSS-100-ISO-N6-EP	€2125.	LPWA-100-ISO-N6-M	€965.	LPSS-100-ISO-N6-M	€1830.
	LPWA-100-ISO-N8-EP	€1180.	LPSS-100-ISO-N8-EP	€2125.	LPWA-100-ISO-N8-M	€965.	LPSS-100-ISO-N8-M	€1830.
160 mm	LPWA-160-ISO-N1-EP	€1098.	LPSS-160-ISO-N1-EP	€2345.	LPWA-160-ISO-N1-M	€990.	LPSS-160-ISO-N1-M	€2095.
	LPWA-160-ISO-N5-EP	€1258.	LPSS-160-ISO-N5-EP	€2560.	LPWA-160-ISO-N5-M	€1150.	LPSS-160-ISO-N5-M	€2295.
	LPWA-160-ISO-N6-EP	€1735	LPSS-160-ISO-N6-EP	€2500.	LPWA-160-ISO-N6-M	€1075.	LPSS-160-ISO-N6-M	€2250.
	LPWA-160-ISO-N8-EP	€1735.	LPSS-160-ISO-N8-EP	€2500.	LPWA-160-ISO-N8-M	€1075.	LPSS-160-ISO-N8-M	€2250.
200 mm	LPWA-200-ISO-N1-EP	€2130.	LPSS-200-ISO-N1-EP	€3120.	LPWA-200-ISO-N1-M	€1990.	LPSS-200-ISO-N1-M	€2770.
	LPWA-200-ISO-N5-EP	€2312.	LPSS-200-ISO-N5-EP	€3330.	LPWA-200-ISO-N5-M	€2170.	LPSS-200-ISO-N5-M	€2990.
	LPWA-200-ISO-N6-EP	€2200.	LPSS-200-ISO-N6-EP	€3275.	LPWA-200-ISO-N6-M	€2050.	LPSS-200-ISO-N6-M	€2950.
	LPWA-200-ISO-N8-EP	€2200.	LPSS-200-ISO-N8-EP	€3275.	LPWA-200-ISO-N8-M	€2050.	LPSS-200-ISO-N8-M	€2950.
250 mm	LPWA-250-ISO-N1-EP	€2570.	LPSS-250-ISO-N1-EP	€4610.	LPWA-250-ISO-N1-M	€2400.	LPSS-250-ISO-N1-M	€4050.
	LPWA-250-ISO-N5-EP	€2775.	LPSS-250-ISO-N5-EP	€4995.	LPWA-250-ISO-N5-M	€2600.	LPSS-250-ISO-N5-M	€4450.
	LPWA-250-ISO-N6-EP	€2675.	LPSS-250-ISO-N6-EP	€4860.	LPWA-250-ISO-N6-M	€2500.	LPSS-250-ISO-N6-M	€4290.
	LPWA-250-ISO-N8-EP	€2675.	LPSS-250-ISO-N8-EP	€4860.	LPWA-250-ISO-N8-M	€2500.	LPSS-250-ISO-N8-M	€4290.
320 mm	LPWA-320-ISO-N1-EP	€3125.	LPSS-320-ISO-N1-EP	€6080.	LPWA-320-ISO-N1-M	€3025.	LPSS-320-ISO-N1-M	€5530.
	LPWA-320-ISO-N5-EP	€3320.	LPSS-320-ISO-N5-EP	€6475.	LPWA-320-ISO-N5-M	€3230.	LPSS-320-ISO-N5-M	€6100.
	LPWA-320-ISO-N6-EP	€3210.	LPSS-320-ISO-N6-EP	€6375.	LPWA-320-ISO-N6-M	€3125.	LPSS-320-ISO-N6-M	€6950.
	LPWA-320-ISO-N8-EP	€3210.	LPSS-320-ISO-N8-EP	€6375.	LPWA-320-ISO-N8-M	€3125.	LPSS-320-ISO-N8-M	€6950.
400 mm	LPWA-400-ISO-N1-EP	€6200	LPSS-400-ISO-N1-EP	contact factory	LPWA-400-ISO-N1-M	€5710.	LPSS-400-ISO-N1-M	contact factory
	Contact factory for prices of 400 mm valves with N5, N6, and N8 styles							



All dimensions in millimeters. Roughing ports and position indicator limit switches optional. Centering rings not included. The gate seal O-ring is on the actuator side (to left) in aluminum valve sizes from 80 through 200 mm. The gate seal is on the side opposite the actuator on 63, 250, 320, 400 mm aluminum and stainless steel valves.

ISO Port Size	Model No. ISO Flange	Port Dia.	Flange O.D.	Bolt Circle	(number of bolts) size - pitch	A		BMAN Manual Overall Height	BEP EP Overall Height	CEP Port CL to Top of Valve	DMAN Manual Overall Width	DEP EP Overall Width	EMAN Manual	EMAN EP	F Disassy. Clearance	Weight	
						Stainless	Alum.									kg. Net	kg. Ship
63mm one piece style	OP 63 N1, both sides ISO-f	70	130	110	(4) M 8 - 1.25	60	70	238	270	205	100	175	45	60	67	8	13
	OP 63 N5, both sides ISO-k	70	95	110	no bolts, ISO-k	105	105	238	270	205	100	175	45	60	67	8	13
	OP 63 N6 & N8, ISO-f & ISO-k	70	130/95	110	(4) M 8 - 1.25	80	90	238	270	205	100	175	45	60	67	8	13
80 mm	LPWA 80 N1, both sides ISO-f	83	145	125	(8) M 8 - 1.25	60	95	353	385	312	254	228	52	60	67	10	15
	LPWA 80 N5, both sides ISO-k	83	110	125	no bolts, ISO-k	105	105	353	385	312	254	228	52	60	67	10	15
	LPWA 80 N6 & N8, ISO-f & ISO-k	83	145/110	125	(8) M 8 - 1.25	80	100	353	385	312	254	228	52	60	67	10	15
100 mm	LPWA 100 N1, both sides ISO-f	102	165	145	(8) M 8 - 1.25	60	95	362	394	312	254	228	52	60	100	10	15
	LPWA 100 N5, both sides ISO-k	102	130	145	no bolts, ISO-k	105	105	362	394	312	254	228	52	60	100	10	15
	LPWA 100 N6 & N8, ISO-f & ISO-k	102	165/130	145	(8) M 8 - 1.25	80	100	362	394	312	254	228	52	60	100	10	15
160 mm	LPWA 160 N1, both sides ISO-f	153	225	200	(8) M 10 - 1.5	60	105	513	544	432	406	257	57	89	114	14	21
	LPWA 160 N5, both sides ISO-k	153	180	200	no bolts, ISO-k	105	143	513	544	432	406	257	57	89	114	14	21
	LPWA 160 N6 & N8, ISO-f & ISO-k	153	225/180	200	(8) M 10 - 1.5	80	127	513	544	432	406	257	57	89	114	14	21
200 mm	LPWA 200 N1, both sides ISO-f	213	285	260	(12) M 10 - 1.5	84	111	629	660	518	406	318	67	86	140	25	30
	LPWA 200 N5, both sides ISO-k	213	240	260	no bolts, ISO-k	135	155	629	660	518	406	318	67	86	140	25	30
	LPWA 200 N6 & N8, ISO-f & ISO-k	213	285/240	260	(12) M 10 - 1.5	110	127	629	660	518	406	318	67	86	140	25	30
250 mm	LPWA 250 N1, both sides ISO-f	261	335	310	(12) M 10 - 1.5	98	117	738	770	602	533	458	50	79	121	50	59
	LPWA 250 N5, both sides ISO-k	261	290	310	no bolts, ISO-k	149	219	738	770	602	533	458	50	79	121	50	59
	LPWA 250 N6 & N8, ISO-f & ISO-k	261	335/290	310	(12) M 10 - 1.5	124	168	738	770	602	533	458	50	79	121	50	59
320 mm	LPWA 320 N1, both sides ISO-f	318	425	395	(12) M 12 - 1.75	98	117	783	815	602	533	458	50	79	121	58	68
	LPWA 320 N5, both sides ISO-k	318	370	395	no bolts, ISO-k	149	219	783	815	602	533	458	50	79	121	58	68
	LPWA 320 N6 & N8, ISO-f & ISO-k	318	425/370	395	(12) M 12 - 1.75	124	168	783	815	602	533	458	50	79	121	58	68
400 mm	LPWA 400 N1, both sides ISO-f	400	510	480	(16) M 12 - 1.75		165	1015	1047	792	560	584	191	330	178	200	350
	Contact factory for dimensions of 400 mm valves with N5, N6, and N8 neck styles																

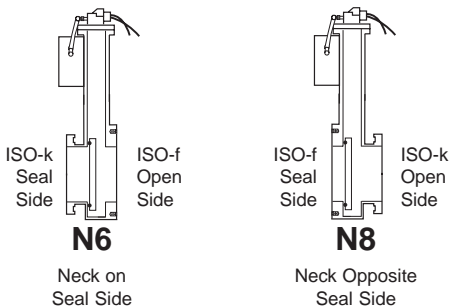
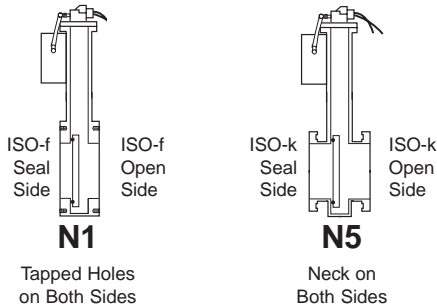


- 250,000 Cycle Rotary Shaft Seal
- Million Cycle Valves Also Available
- All Welded 6061 Aluminum Body
- Low Temperature Bake Out, 200 °C
- Uses Standard ISO Centering Rings
- Helium Leak Less Than 2 X 10⁻⁹ scc/sec
- All Valves (RoHS) 2002/95/EC Compliant
- Fail Safe Design, Close On Power Loss
- Vacuum & Pressure - Seals Up To 3 Atm. ΔP
- Optional Operation to 10 Bar, 147 PSIG

ORDERING INFORMATION

Model Number: Refer to page 2 for instructions on how to specify the features you need.
Electric Motor Actuators: Any Vacuum Research valve can be supplied with a high torque electric motor actuator. Refer to "Electric Motor Actuator" Page.
Special Features: Refer to pages 44 & 46 for specifications for roughing and gauge ports, position indicators & other special features.
Viton® or Kalrez® or Silicone O-Rings: All our standard Valves use a Viton® O-Ring for the gate seal and Buna-N O-Rings for all other locations. You may specify Viton® or other materials throughout the valve with a "V" in the model number and add the following to the price.
 63 or 80 mm valves . . .€26. 160 mm valves€52. 250 mm valves€94.
 100 mm valves€39. 200 mm valves€82. 320 mm valves€122.
 (Use "S" for Silicone, "K" for Kalrez®, and contact the factory for prices.)

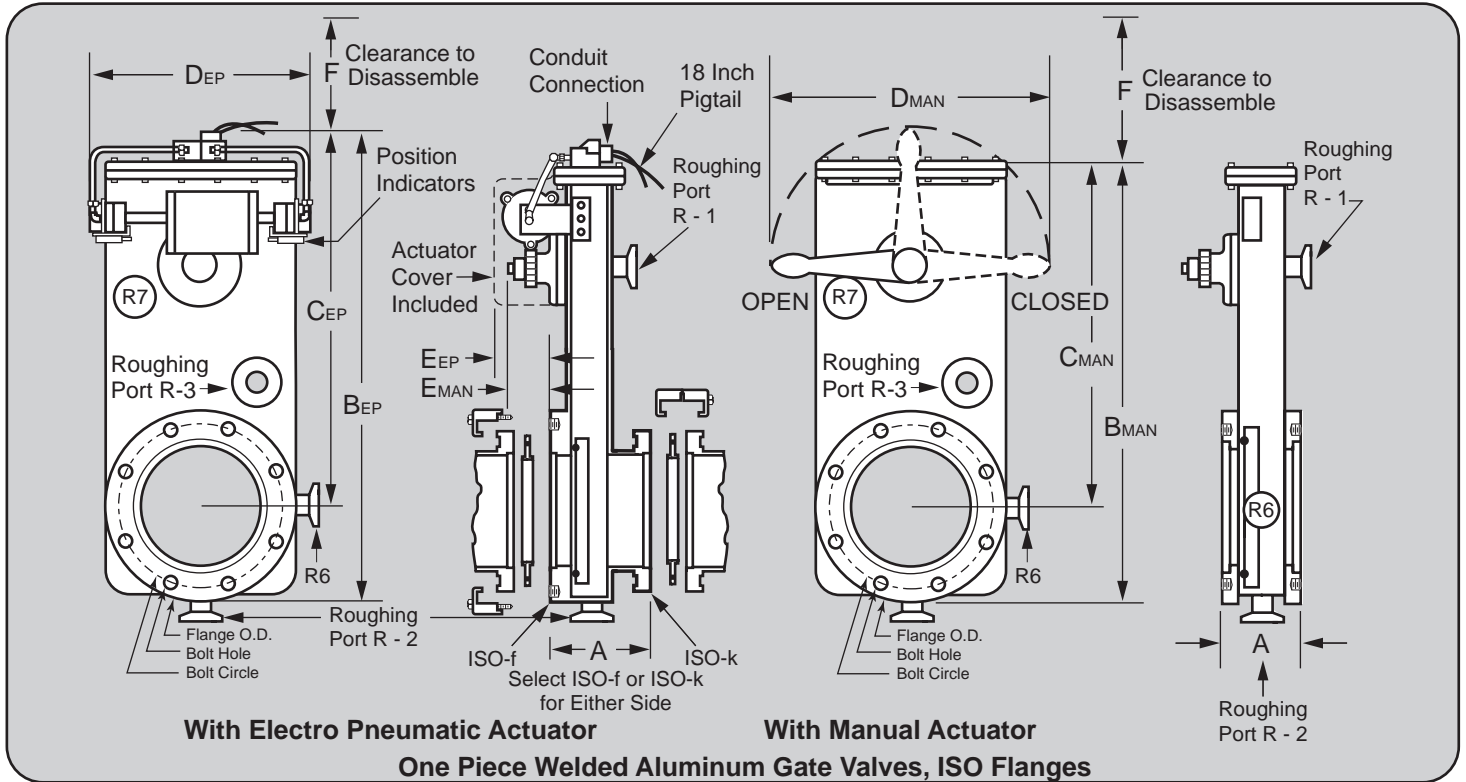
Nominal ISO Port Size	With Electro-Pneumatic Operator "EP" Suffix		With Manual Operator "M" Suffix	
	Model & Neck Style	Price, €	Model & Neck Style	Price, €
63 mm	OP-63-ISO-N1-EP	€740.	OP-63-ISO-N1-M	€625.
	OP-63-ISO-N5-EP		OP-63-ISO-N5-M	
	OP-63-ISO-N6-EP	€875.	OP-63-ISO-N6-M	€1715.
	OP-63-ISO-N8-EP		OP-63-ISO-N8-M	
80 mm	OP-80-ISO-N1-EP	€975.	OP-80-ISO-N1-M	€860.
	OP-80-ISO-N5-EP		OP-80-ISO-N5-M	
	OP-80-ISO-N6-EP	€1095.	OP-80-ISO-N6-M	€965.
	OP-80-ISO-N8-EP		OP-80-ISO-N8-M	
100 mm	OP-100-ISO-N1-EP	€1095.	OP-100-ISO-N1-M	€985.
	OP-100-ISO-N5-EP		OP-100-ISO-N5-M	
	OP-100-ISO-N6-EP	€1215.	OP-100-ISO-N6-M	€1095.
	OP-100-ISO-N8-EP		OP-100-ISO-N8-M	
160 mm	OP-160-ISO-N1-EP	€1220.	OP-160-ISO-N1-M	€1090.
	OP-160-ISO-N5-EP		OP-160-ISO-N5-M	
	OP-160-ISO-N6-EP	€1325.	OP-160-ISO-N6-M	€1195.
	OP-160-ISO-N8-EP		OP-160-ISO-N8-M	
200 mm	OP-200-ISO-N1-EP	€2095.	OP-200-ISO-N1-M	€1955.
	OP-200-ISO-N5-EP		OP-200-ISO-N5-M	
	OP-200-ISO-N6-EP	€2160.	OP-200-ISO-N6-M	€1985.
	OP-200-ISO-N8-EP		OP-200-ISO-N8-M	
250 mm	OP-250-ISO-N1-EP	€2655.	OP-250-ISO-N1-M	€2465.
	OP-250-ISO-N5-EP		OP-250-ISO-N5-M	
	OP-250-ISO-N6-EP	€2875.	OP-250-ISO-N6-M	€2590.
	OP-250-ISO-N8-EP		OP-250-ISO-N8-M	
320 mm	OP-320-ISO-N1-EP	€3280.	OP-320-ISO-N1-M	€3090.
	OP-320-ISO-N5-EP		OP-320-ISO-N5-M	
	OP-320-ISO-N6-EP	€3490.	OP-320-ISO-N6-M	€3190.
	OP-320-ISO-N8-EP		OP-320-ISO-N8-M	



The gate seal O-ring is on the actuator side (to left) in aluminum valve sizes from 80 through 200 mm. The gate seal is on the side opposite the actuator on 63, 250 & 320 mm aluminum valves.

One Piece Aluminum Gate Valves; ISO Flanges

Pricing in Euros



Note: All dimensions in millimeters. Roughing ports and position indicator limit switches optional. Centering rings not included.
 The gate seal O-ring is on the actuator side (to left) in aluminum valve sizes from 80 through 200 mm. The gate seal is on the side opposite the actuator on 63, 250 & 320 mm aluminum and stainless steel valves.

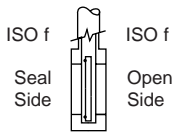
ISO Port Size	Model No. ISO Flange	Port Dia.	Flange O.D.	Bolt Circle	(number of bolts) size - pitch	A Flange to Flange	B _{MAN} Manual Overall Height	E _{EP} EP Overall Height	C _{EP} Port CL to Top of Valve	D _{MAN} Manual Overall Width	D _{EP} EP Overall Width	E _{MAN} Manual	E _{EP} EP	F Disassy. Clearance		Weight kgs.	
														8	13	Net	Ship
63 mm	OP 63 N1, both sides ISO-f	70	130	110	(4) M 8 - 1.25	70	238	270	205	100	175	45	60	67	8	13	
	OP 63 N5, both sides ISO-k	70	95	110	no bolts, ISO-k	105	238	270	205	100	175	45	60	67	8	13	
	OP 63 N6 & N8, ISO-f & ISO-k	70	130/95	110	(4) M 8 - 1.25	90	238	270	205	100	175	45	60	67	8	13	
80 mm	OP 80 N1, both sides ISO-f	83	145	125	(8) M 8 - 1.25	95	353	385	312	254	228	52	60	67	10	15	
	OP 80 N5, both sides ISO-k	83	110	125	no bolts, ISO-k	105	353	385	312	254	228	52	60	67	10	15	
	OP 80 N6 & N8, ISO-f & ISO-k	83	145/110	125	(8) M 8 - 1.25	100	353	385	312	254	228	52	60	67	10	15	
100 mm	OP 100 N1, both sides ISO-f	102	165	145	(8) M 8 - 1.25	95	362	394	312	254	228	52	60	100	10	15	
	OP 100 N5, both sides ISO-k	102	130	145	no bolts, ISO-k	105	362	394	312	254	228	52	60	100	10	15	
	OP 100 N6 & N8, ISO-f & ISO-k	102	165/130	145	(8) M 8 - 1.25	100	362	394	312	254	228	52	60	100	10	15	
160 mm	OP 160 N1, both sides ISO-f	153	225	200	(8) M 10 - 1.5	105	513	544	432	406	257	57	89	114	14	21	
	OP 160 N5, both sides ISO-k	153	180	200	no bolts, ISO-k	143	513	544	432	406	257	57	89	114	14	21	
	OP 160 N6 & N8, ISO-f & ISO-k	153	225/180	200	(8) M 10 - 1.5	127	513	544	432	406	257	57	89	114	14	21	
200 mm	OP 200 N1, both sides ISO-f	213	285	260	(12) M 10 - 1.5	111	629	660	518	406	318	67	86	140	25	30	
	OP 200 N5, both sides ISO-k	213	240	260	no bolts, ISO-k	155	629	660	518	406	318	67	86	140	25	30	
	OP 200 N6 & N8, ISO-f & ISO-k	213	285/240	260	(12) M 10 - 1.5	127	629	660	518	406	318	67	86	140	25	30	
250 mm	OP 250 N1, both sides ISO-f	261	335	310	(12) M 10 - 1.5	117	738	770	602	533	458	50	79	121	50	59	
	OP 250 N5, both sides ISO-k	261	290	310	no bolts, ISO-k	219	738	770	602	533	458	50	79	121	50	59	
	OP 250 N6 & N8, ISO-f & ISO-k	261	335/290	310	(12) M 10 - 1.5	168	738	770	602	533	458	50	79	121	50	59	
320 mm	OP 320 N1, both sides ISO-f	318	425	395	(12) M 12 - 1.75	117	783	815	602	533	458	50	79	121	58	68	
	OP 320 N5, both sides ISO-k	318	370	395	no bolts, ISO-k	219	783	815	602	533	458	50	79	121	58	68	
	OP 320 N6 & N8, ISO-f & ISO-k	318	425/370	395	(12) M 12 - 1.75	168	783	815	602	533	458	50	79	121	58	68	

End Operated Aluminum Gate Valves; ISO Flanges

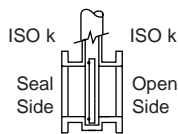
Pricing in Euros



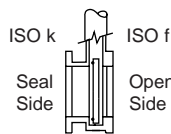
- Simple End Operated Air Cylinder
- Over 100,000 Cycles Without Maintenance
- Helium Tested to 2×10^{-9} scc/s
- All Valves (RoHS) 2002/95/EC Compliant
- Flanges to Match Diffusion & Cryo Pumps
- Optional Operation to 10 Bar, 147 PSIG
- Optional Remote Position Indicators
- NW & Compression Gauge & Roughing Ports
- Automatic Closure on Power Failure



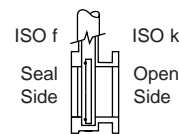
N1 Tapped Holes on Both Sides



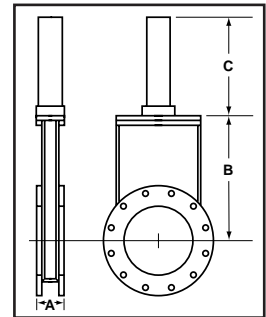
N5 Neck on Both Sides



N6 Neck on Seal Side



N8 Neck Opposite Seal Side



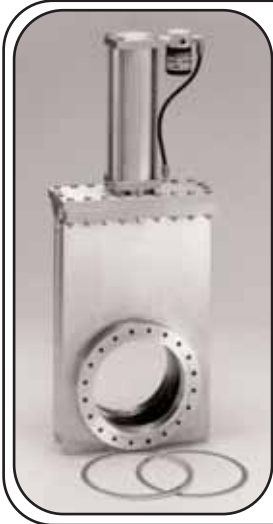
Stainless Steel Gates in Aluminum Valves: To specify a stainless steel gate in an aluminum valve add a suffix to the model number "SS Gate". Refer to the "Optional Features and Accessories" page in this catalog for pricing information

ISO Port Size	Model No. ISO Flange	Port Dia.	Flange O.D.	Bolt Circle	(number of bolts) size - pitch	A Flange to Flange	B mm	C mm	List Price
Dimensions in mm									
KF-50	END ISO KF-50	50			Not Applicable. STD. KF-50	95	159	187	€610.
63 mm	END ISO 63, N1, both sides ISO-f	70	130	110	(4) M 8 - 1.25	80	159	187	€700.
	END ISO 63, N5, both sides ISO-k	70	95	110	no bolts, ISO-k	105	159	187	€830.
	END ISO 63, N6 & N8, ISO-f & ISO-k	70	130/95	110	(4) M 8 - 1.25	90	159	187	€760.
100 mm	END ISO 100, N1, both sides ISO-f	102	165	145	(8) M 8 - 1.25	105	213	239	€1010.
	END ISO 100, N5, both sides ISO-k	102	130	145	no bolts, ISO-k	127	213	239	€1120.
	END ISO 100, N6 & N8, ISO-f & ISO-k	102	165/130	145	(8) M 8 - 1.25	111	213	239	€1070.
160 mm	END ISO 160, N1, both sides ISO-f	153	225	200	(8) M 10 - 1.5	105	289	296	€1100.
	END ISO 160, N5, both sides ISO-k	153	180	200	no bolts, ISO-k	143	289	296	€1230.
	END ISO 160, N6 & N8, ISO-f & ISO-k	153	225/180	200	(8) M 10 - 1.50	127	289	296	€1180.
200 mm	END ISO 200, N1, both sides ISO-f	213	285	260	(12) M 10 - 1.5	111	364	348	€1670.
	END ISO 200, N5, both sides ISO-k	213	240	260	no bolts, ISO-k	155	364	348	€1920.
	END ISO 200, N6 & N8, ISO-f & ISO-k	213	285/240	260	(12) M 10 - 1.5	127	364	348	€1840.
250 mm	END ISO 250, N1, both sides ISO-f	261	335	310	(12) M 10 - 1.5	117	484	406	€2560.
	END ISO 250, N5, both sides ISO-k	261	290	310	no bolts, ISO-k	219	484	406	€2770.
	END ISO 250, N6 & N8, ISO-f & ISO-k	261	335/290	310	(12) M 10 - 1.5	168	484	406	€2670.
320 mm	END ISO 320, N1, both sides ISO-f	318	425	395	(12) M 12 - 1.75	117	533	457	€3120.
	END ISO 320, N5, both sides ISO-k	318	370	395	no bolts, ISO-k	219	533	457	€3200.
	END ISO 320, N6 & N8, ISO-f & ISO-k	318	425/370	395	(12) M 12 - 1.75	168	533	457	€3170.
400mm	END ISO 400, N1, ISO-f both sides	400	510	480	(16) M 12 - 1.75	165	702	560	€5700.
500mm	END ISO 500, N1, ISO-f both sides	500	610	580	(16) M 12 - 1.75	203	908	730	€8940.
630mm	END ISO 630, N1, ISO-f both sides f	630*	780	720	(20) M 12 - 1.75	216	978	851	€12,860

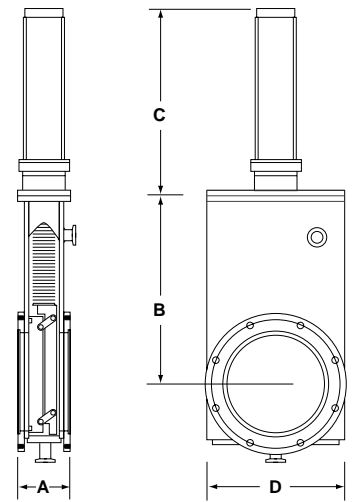
* 630 mm Port diameter flange will have a step of 651 mm diameter for center ring.

ORDERING INFORMATION
Model Number: Refer to pg. 2 for instructions on how to specify the features you need.
Position Indicators: Two reed switches activated by a magnet inside the pneumatic actuator provide closure for open and closed position. SPST contacts rated 0.5A @ 110 or 220 VAC non-inductive
 Add LSE to Model No..€130.00 /pair
Gauge and Roughing Ports: See page 46 for sizes and prices.
Special Features: Refer to pages 44 & 45 for information on special features and accessories.
Viton® or Kalrez® or Silicone O-Rings: All standard Vacuum Research Valves use a Viton® O-Ring for the gate seal and Buna-N O-Rings for all other locations. You may specify Viton® or other materials throughout the valve with a "V" in the model number and add the following to the price. (Use "S" for Silicone, "K" for Kalrez®, and contact the factory for prices.)

63 mm valves.....€34.
 100 mm valves.....€50.
 160 mm valves.....€62.
 200 mm valves.....€100.
 250 mm valves.....€130.
 320 mm valves.....€170.



- Conflat®, ISO, or ANSI Flanges
- Welded Bellows, 1 Million Cycles
- Metal or Viton® Bonnet Seal
- Viton® O-Ring Gate Seal
- Welded Aluminum Body
- Low Temperature Bakeout, 200 °C
- All Valves (RoHS) 2002/95/EC Compliant
- Mate With Any Conflat® Flange
- Fail Safe, Close on Power Loss
- He Leak Less Than 2 X 10⁻⁹ scc/s



Conflat® Type Flanges

Mate with Stainless Steel Conflat® Flanges, using aluminum port flange gaskets. See page 2 for ordering details.

Nominal Flange Outside Diameter	Model Number (dimensions shown in inches)	Port Diameter	Flange O.D.	Bolt Circle	(number of bolts) size - pitch	A Flange to Flange	B Body Height	C Actuator Height	D Body Width	Weight, Kg (lbs)		Price €	
										Net	Ship	Welded Bellows Seal	Sliding Quad Ring Seal
4.5 inch Conflat®	BEL-CON-4.5X2.5	2.51	4.5	3.6	(8) 5/16 - 24	3.5	6.2	9.8	4.6	6 (13)	7 (16)	€1265.	€1060.
6 inch Conflat®	BEL-CON-6X4	4.01	6	5.1	(16) 5/16 - 24	4.4	8.4	10.2	6.5	14 (31)	16 (35)	€1345.	€1140.
8 inch Conflat®	BEL-CON-8X6	6.02	8	7.1	(20) 5/16 - 24	4.6	11.4	12.4	9.1	22 (48)	25 (55)	€1746.	€1355.
10 inch Conflat®	BEL-CON-10X8	8.02	10	9.1	(24) 5/16 - 24	4.8	14.3	14.7	11.0	25 (56)	28 (62)	€2530.	€2155.
12 inch Conflat®	BEL-CON-12X10	10.02	12	11.2	(32) 5/16 - 24	4.9	17.8	18.4	14.4	42 (92)	47 (103)	€3660.	€3015.

ANSI Flanges

O-Rings on both flanges standard. Specify "Plain" flange to delete O-Rings. See page 2 for ordering details.

Nominal Flange Outside Diameter	Model Number (dimensions shown in inches)	Port Diameter	Flange O.D.	Bolt Circle	(number of bolts) size - pitch	A Flange to Flange	B Body Height	C Actuator Height	D Body Width	Weight, Kg (lbs)		Price €	
										Net	Ship	Welded Bellows Seal	Sliding Quad Ring Seal
2 inch ANSI	BEL-ANSI-2	2.5	6	4.7	(4) 5/8 - 11	3.13	6.25	9.84	4.63	6 (13)	7 (16)	€910.	€700.
3 inch ANSI	BEL-ANSI-3	3	7.5	6.0	(4) 5/8 - 11	4.13	7.88	9.75	6.5	12 (26)	14 (31)	€1150.	€1040.
4 inch ANSI	BEL-ANSI-4	4	9	6	(8) 5/8 - 11	4.13	8.38	10.24	6.5	14 (31)	16 (35)	€1235.	€1070.
6 inch ANSI	BEL-ANSI-6	6	11	9.5	(8) 3/4 - 10	4.38	11.38	12.44	9.1	22 (48)	25 (55)	€1520.	€1140.
8 inch ANSI	BEL-ANSI-8	8	13.5	11.7	(8) 3/4 - 10	4.38	14.31	14.72	11	25 (56)	28 (62)	€2150.	€1802.
10 inch ANSI	BEL-ANSI-10	10	16	14.1	(12) 7/8 - 9	4.63	17.81	18.44	14.38	45 (100)	57 (125)	€3160.	€2500.

ISO-f Flanges

Centering rings not included. See page 2 for ordering details.

Nominal Flange Outside Diameter	Model Number (dimensions shown in mm)	Port Diameter	Flange O.D.	Bolt Circle	(number of bolts) size - pitch	A Flange to Flange	B Body Height	C Actuator Height	D Body Width	Weight, Kg (lbs)		Price €	
										Net	Ship	Welded Bellows Seal	Sliding Quad Ring Seal
ISO-63	BEL-ISO-f-63	70	130	110	(4) M 8 X 1.25	79	159	250	117	6 (13)	7 (16)	€910.	€700.
ISO-100	BEL-ISO-f-100	102	165	145	(8) M 8 X 1.25	105	213	260	165	14 (31)	16 (35)	€1235.	€1010.
ISO-160	BEL-ISO-f-160	153	225	200	(8) M 10 X 1.25	105	289	316	231	22 (48)	25 (55)	€1520.	€1100.
ISO-200	BEL-ISO-f-200	213	285	260	(12) M 10 X 1.25	111	364	374	280	25 (56)	28 (62)	€2155.	€1740.
ISO-250	BEL-ISO-f-250	250	335	310	(12) M 10 X 1.25	111	452	468	365	42 (92)	47 (103)	€3160.	€2575.

Heated Valves All Vacuum Research Valves can be provided with heating jackets for baking or for continuous operation at elevated temperatures. Because of the Viton® gate seal O-Ring the valve should not be exposed to temperatures over 175 °C for prolonged periods. Consideration must be given to the solenoid valve location and other components in the electropneumatic actuator. We suggest that you discuss applications for heated valves with our customer service department.

Electronic Position Indicators: Two reed switches activated by a magnet inside the pneumatic actuator provide contact closure for open and closed position. See page 44 for specifications. Add LSE to Model number.€90. /pair

Gauge and Roughing Ports: See page 46 for specifications and ordering information.



Valve on the left has NW-40 flange. Valve on the right has special 2.75 In. Conflat® flange. Standard practice is for bolt circle to straddle center line.

Small Size

These compact valves will fit even the most crowded systems. The valve body with EP actuator is only 3.75 inches wide by 10.88 inches high (95 x 275 mm).

Vacuum & Pressure

Standard valves seal and open with vacuum on either side and up to 3 atmospheres differential pressure.

Long Life

These small stainless steel valves provide straight through high conductance pumping and our usual 250,000 cycles without any need for service.

Fail Safe All Vacuum Research Valves can be installed for fast close on power failure.

- All Stainless Steel Welded Construction
- Straight Through, High Conductance Design
- No Sliding Surfaces to Generate Particles
- 250,000 Cycle Life Before Any Maintenance
- Seals Up To 3 Atmosphere Differential
- Vacuum or Pressure on Either Side
- Electropneumatic or Manual Actuator
- Viton® Bonnet and Gate Seals are Standard
- Metal Bonnet & Kalrez® Gate Seals Available
- All Valves (RoHS) 2002/95/EC Compliant

Bake to 180°C With the standard Viton® O-Ring the valves can be baked to 180° C in open or closed position.

No Leaks All Vacuum Research valves have total leak rates of less than 2×10^{-9} std cc/sec. By total leak we mean that each completed valve is tested in a Helium filled bag.

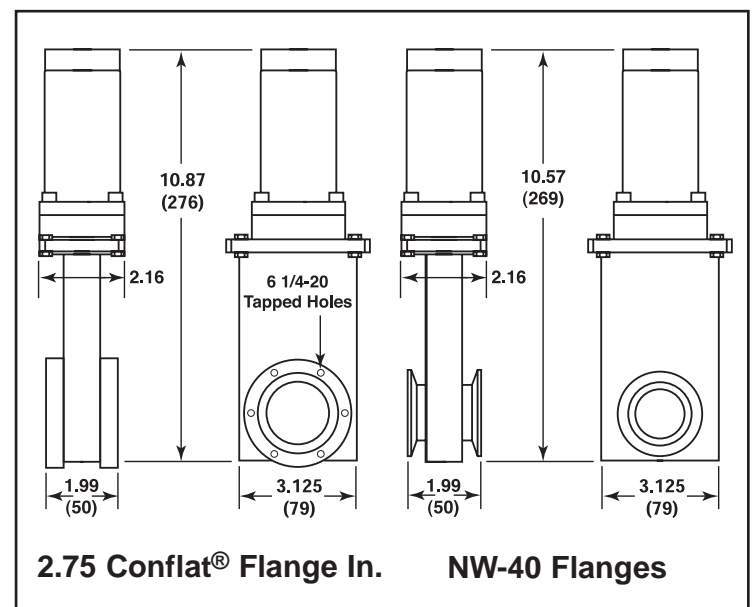
Fail Safe All Vacuum Research Valves can be installed for fast close on power failure.

NW Clamps & Centering Rings Prices on page 31 for clamps from NW-16 to NW-50.

Kalrez® or Silicone Seals Available

Standard Valves use all viton seals. Contact factory for Kalrez® and silicone prices

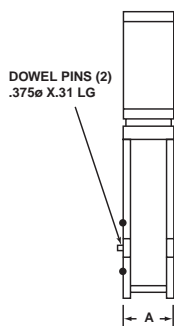
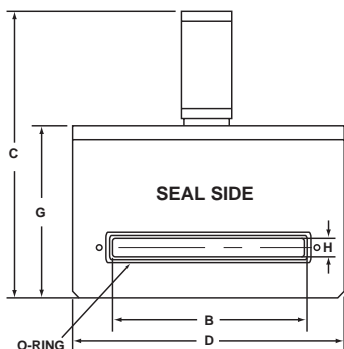
Small Stainless Steel Gate Valves	Manual Actuator Add "MAN" Suffix to Part No.	Electro-Pneumatic Actuator Add "EP" Suffix plus solenoid voltage
NW-16 Flanges P/N Mini-SS-NW-16-	€620.	€610.
NW-25 Flanges P/N Mini-SS-NW-25-	€620.	€610.
NW-40 Flanges P/N: Mini-SS-NW 40-	€620.	€610.
2.75 Non rotatable Flanges P/N: Mini-SS-275-ROT-	€610.	€595.
2.75 Rotatable Conflat® Flanges P/N: Mini-SS-275-ROT-	€625.	€615.



Conflat® is a registered trademark of Varian Associates. Kalrez® and Viton® are registered trademarks of Dupont Corp.



- Fabricated Entirely from 6061-T6 Aluminum
- Stainless Steel & Mild Steel Also Available
- Select Bellows or Shaft Seal Actuator
Long Life Welded Bellows Actuator, or
Standard Quad Ring Shaft Seal Actuator
- Leak Tested to Better Than 2×10^{-9} scc/sec
- All Valves (RoHS) 2002/95/EC Compliant
- Port Sizes to Fit Any Wafer or Display
- Bolt Pattern to Fit Any Tool or Chamber
- Select Automatic Close or Open on Power Fail
- Available with Viton, Buna-N or Kalrex Seals
- NW Style Gauge & Roughing Ports on Any Side



Model Number Bellows Seal - REB Quad Ring Seal - Req	Port Size H X B	Body Thickness	Overall Height	Body Width	Body Height	Price with Bellows (REB) €	Price with Shaft Seal (REQ) €
		A	C	D	G		
REB-1 X 6.3 REQ 1 X 6.3	1 X 6.30 in. (25 X 160 mm)	2.75 in. (70 mm)	16.375 in. (416 mm)	10.75 in. (273 mm)	9.5 in. (241 mm)	€2360.	€2050.
REB-1 X 8.3 REQ-1 X 8.3	1 X 8.30 in. (25 X 211 mm)	2.75 in. (70 mm)	16.375 in. (416 mm)	12.75 in. (324 mm)	9.5 in. (241 mm)	€2620.	€2300.
REB-1 X 10.4 REQ-1 X 10.4	1 X 10.40 in. (25 X 264 mm)	2.75 in. (70 mm)	16.375 in. (416 mm)	15 in. (381 mm)	9.5 in. (241 mm)	€810.	€2520.
REB-1.25 X 8.75 REQ-1.25 X 8.75	1.25 X 8.75 in. (32 X 222 mm)	2.75 in. (70 mm)	16.375 in. (416 mm)	14 in. (356 mm)	9.5 in. (241 mm)	€2920.	€2540.
REB-1.81 X 9.3 REQ-1.81 X 9.3	1.81 X 9.30 in. (46 X 236 mm)	3.375 in. (86 mm)	16.531 in. (416 mm)	14.375 in. (406 mm)	9.531 in. (242 mm)	€2010.	€2520.
REB-1.8 X 13.2 REQ-1.8 X 13.2	1.81 X 13.20 in. (46 X 335 mm)	3.375 in. (86 mm)	16.531 in. (420 mm)	16 in. (406 mm)	9.531 in. (242 mm)	€3360.	€2820.
REB-2 X 27 REQ-2 X27	2 X 27 in. (51 X 686 mm)	7 in. (178 mm)	36 in. (914 mm)	32 in. (813 mm)	245 in. (610 mm)	€9450.	€8340.
REB- 5 X 27 REQ 5 X 27	5 X 27 in. (127 X 686 mm)	7 in. (178 mm)	39 in. (990 mm)	32 in. (813 mm)	27 in. (686 mm)	€10,000.	€8900.
REB-15 X 27 REQ-15 X 27	15 X 27 in. (381 X 686 mm)	7 in. (178 mm)	46 in. (1168 mm)	32 in. (813 mm)	34 in. (863 mm)	Contact Factory	€13,400.
REB-15 X 24 REQ-15 X 24	15 X 24 in. (381 X 610 mm)	8.5 in. (216 mm)	87.1 in. (2210 mm)	29 in. (737 mm)	56 in. (1422 mm)	Contact Factory	€12,6580.
REB-3 X 16 REQ 3 X 16	3 X 16 in. (76 X 406 mm)	6.5 in. (165 mm)	37 in. (940 mm)	20 in. (508 mm)	25 in. (635 mm)	Contact Factory	€6050.
REB-2 X 16 REQ-2 X 16	2 X 16 in. (50 X 406 mm)	4.625 in. (117 mm)	22.06 in. (560 mm)	21 in. (533 mm)	11.56 in. (294 mm)	€ 5360.	Contact Factory
REB-3 X 30 REQ-3 X 30	3 X 30 in. (75 X 762 mm)	5.5 in. (139.7 mm)	35.13 in. (892 mm)	36 in. (914 mm)	21.75 in. (552 mm)	€10,980.	Contact Factory
REB-4 X 20 REQ-4 X 20	4 X 20 in. (100 X 508 mm)	5.5 in. (139.7 mm)	35.13 in. (892 mm)	26 in. (660 mm)	21.75 in. (552 mm)	€8090.	Contact Factory
REB-4 X 24 REQ-4 X 24	4 X 24 in. (100 X 609 mm)	5.5 in. (139.7 mm)	37.0 in. (940 mm)	30 in. (762 mm)	21.75 in. (552 mm)	€9170.	Contact Factory

Electronic Position Indicators: Two reed switches activated by a magnet inside the pneumatic actuator provide contact closure for open and closed position. See page 44 for specifications. . . . €90./pair

Gauge and Roughing Ports: See page 46 for specifications and ordering information.



Throttemaster Vacuum Gate Valves Pricing in Euros



Optional Hand Held Unit

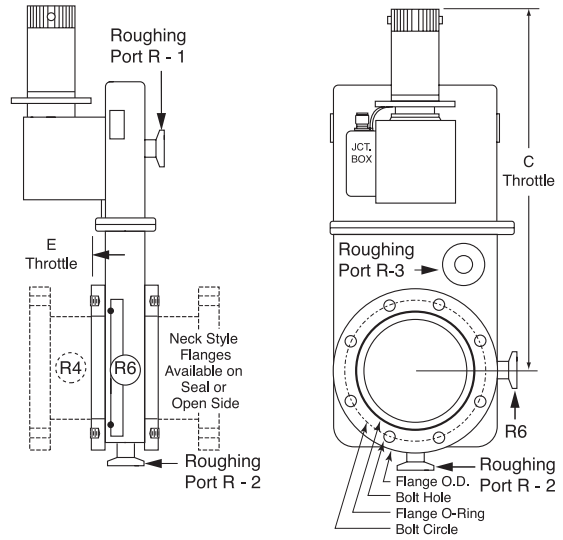
Throttemaster™ Gate Valve and Positioner Unit

- Aluminum or Stainless Steel Valves
- Seals Up To 3 Atmospheres Differential
- Vacuum or Pressure on Either Side
- ANSI Sizes From 2 Inch to 16 Inch
- ISO Flanges From 63 to 400 mm
- Manual or Closed Loop Operation
- All Valves (ROHS) 2002/95/EC Compliant

The Vacuum Research Throttemaster™ valve with positioner can be used in either of two control schemes. As a 3 position valve for upstream pressure control with an MFC, or for downstream pressure control with modulating gate position. For 3 position control the basic Throttemaster™ consists of two components: an aluminum or stainless steel gate valve and a positioner/indicator to drive the fast response servo motor. This is all you need to operate the Throttemaster™ as a 3 position valve in systems where the mass flow controller is controlling the pressure.

The Throttemaster™ can also be used for downstream pressure control where the gas flow to the chamber is held constant and the Throttemaster™ gate is moved to control conductance of the pumping system. This requires the use of a PID pressure controller to provide a signal to the valve positioner and a vacuum gauge with a 0 to 10 vdc signal to the PID controller. These may be purchased from Vacuum Research along with your Throttemaster™ Valve and positioner or you may be able to use your present gauge and controller.

Throttemaster™ Dimensions

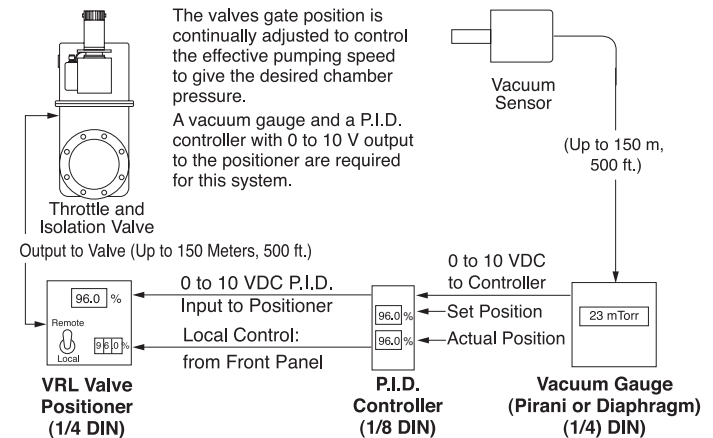


Port dimensions, bolt patterns, and other dimensions are shown on pages 6 and 7 for ANSI and page 17 for ISO valves. A few dimensions unique to the Throttemaster™ servo actuator are listed here.

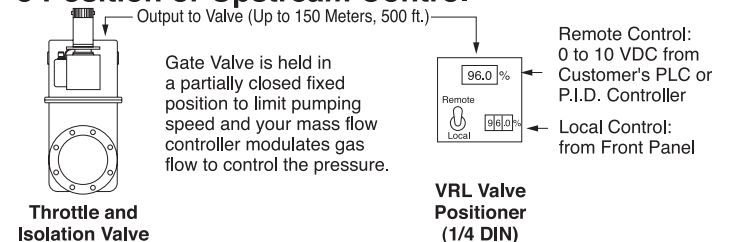
ANSI Port Size	2 & 3 inch	4 inch	6 inch	8 inch	10 inch	12 inch
C Throttle	15.9 inch	19.17 inch	22 inch	22 inch	20.67 inch	22.74 inch
E Throttle	4.34 inch	4.15 inch	4.03 inch	4.03 inch	3.90 inch	3.90 inch

ISO Port Size	63 & 80 mm	100 mm	160 mm	200 mm	250 mm	320 mm
C Throttle	403 mm	403 mm	487 mm	561 mm	525 mm	577 mm
E Throttle	110 mm	110 mm	105 mm	102 mm	99 mm	99 mm

P.I.D. Closed Loop Downstream Pressure Control



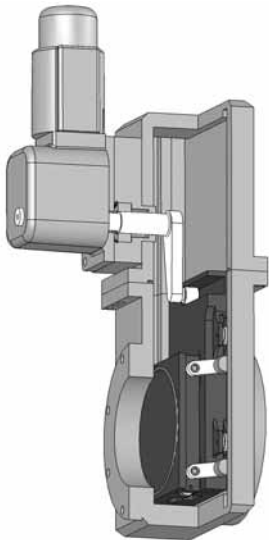
3 Position or Upstream Control



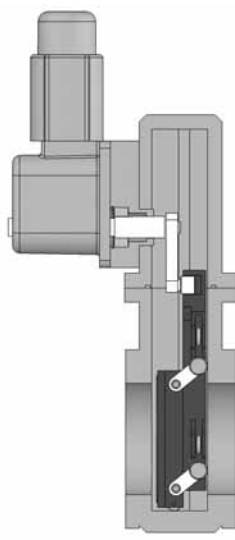
Stainless Steel Throttlemaster™

Valve System With Positioner
Pricing in Euros

Port Size	Flange Style	Model	Price €
25 mm	NW-25	STM-25	€2490.
40 mm	NW-40	STM-40	€2640.
50 mm	NW-50	STM-50	€2800.
63 mm	ISO-f 63 mm	STM-63	€3040.
80 mm	ISO-f 80 mm	STM-80	€3110.
100 mm	ISO-f 100 mm	STM-100	€3520.
160 mm	ISO-f 160 mm	STM-160	€3800.
200 mm	ISO-f 200 mm	STM-200	€5600.
250 mm	ISO-f 250 mm	STM-250	€7730.
3 5/8 inch	ANSI 2 inch	STM-2	€3040.
3 5/8 inch	ANSI 3 inch	STM-3	€3520.
5 3/8 inch	ANSI 4 inch	STM-4	€3810.
7 1/8 inch	ANSI 6 inch	STM-6	€5340.
8 inch	ANSI 8 inch	STM-8	€5600.
10 inch	ANSI 10 inch	STM-10	€7720.



Throttlemaster™ Fully Closed Note that crank arm is vertical and links are near horizontal



Throttlemaster™ 90% Closed Note that gate has moved only .036 inch (0.9mm) from the seal surface

Max Conductance Precision Where it's Most Important

The only Throttle Valve in the world that uses back-to-back sine law relationships to provide maximum conductance precision where you need it most; between 90% to 100% closed!

Why is the Throttlemaster™ conductance precision so good between 90% and 100% closed? There are two design features that allow both leak tight shut off and high resolution in the critical 90% to 100% closed range. The first of these is innovative mechanical design of our actuator, and the second is our high resolution feedback system.

The 180° arc of our actuator arm is double that of butterfly valves. More importantly, the critical 90% to 100% closed position is at bottom dead center where the motion per degree of rotation becomes zero. As this is happening, the gate links are approaching their full extension, which further enhances the resolution of the crank rotation and feedback sensor.

The Vacuum Research feedback element is directly coupled to the motor shaft, and provides stepless resolution of the valve position. The motor itself is a high torque servo that can repeatedly position the gate within a few thousandths of an inch and also lock the gate closed with a full atmosphere differential.

Pricing in Euros

Aluminum Throttlemaster™

Valve System With Positioner
Pricing in Euros

Port Size	Flange Style	Model	Price €
25 mm	NW-25	ATM-25	€1900.
40 mm	NW-40	ATM-40	€1880.
50 mm	NW-50	ATM-63	€1900.
63 mm	ISO-f 63 mm	ATM-63	€1950.
80 mm	ISO-f 80 mm	ATM-80	€2180.
100 mm	ISO-f 100 mm	ATM-100	€2240.
160 mm	ISO-f 160 mm	ATM-160	€2360.
200 mm	ISO-f 200 mm	ATM-200	€2980.
250 mm	ISO-f 250 mm	ATM-250	€4250.
320 mm	ISO-f 320 mm	ATM-320	€5020.
400 mm	ISO-f 400 mm	ATM-400	€8250.
3 5/8 inch	ANSI 2 inch	ATM-2	€950.
3 5/8 inch	ANSI 3 inch	ATM-3	€2180.
5 3/8 inch	ANSI 4 inch	ATM-4	€2260.
7 1/8 inch	ANSI 6 inch	ATM-6	€2720.
8 inch	ANSI 8 inch	ATM-8	€2810.
10 inch	ANSI 10 inch	ATM-10	€4250.
12 inch	ANSI 12 inch	ATM-12	€5010.
16 inch	ANSI 16 inch	ATM-16	€8260.

Optional Features

The valves used in the Vacuum Research Throttlemaster™ are the same as the standard open/close valves discussed on pages 4 to 7 of this catalog. The difference is that the Throttlemaster™ gate position is precisely controlled by the servo motor actuator and the valve positioner to full open, full close, or anywhere in between. A Throttlemaster™ valve can be equipped with roughing and gauge ports and most of the options listed in optional features section.

Valve Motor Voltage

The standard valve motor is 115V, 60 Hz approximately 300 w for 220-240V, 50 Hz. Add suffix 220/50 to P/N. No extra charge.

Viton® and Kalrez® O-Rings

Throttlemaster™ valves are shipped with Buna-N O-Rings except for the gate seal which is Viton®. For valves with all Viton® or Kalrez® see page 5 for prices on these special O-Rings.

Spare Valve Positioner

One positioner is included with each throttle valve system but if a spare is desired please order P/N X801403.....€650.

Optional Hand Held Control

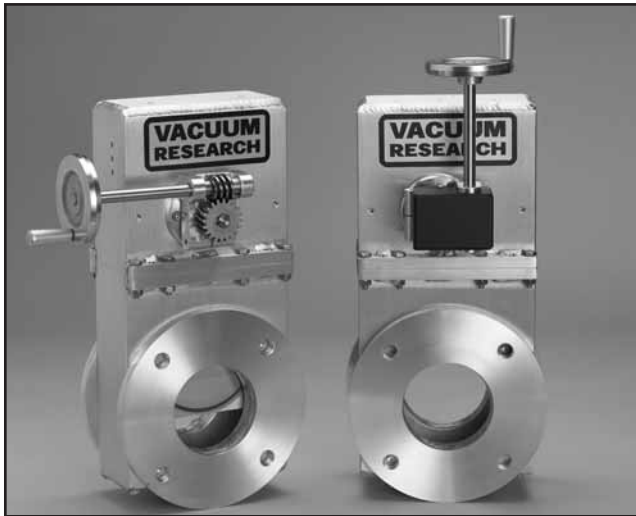


Approximately 3 X 2 inches, this hand held control includes selector switch for open, close, throttle and 3 digit selector for throttle position to 99.9%, ±.01%. 10 foot cable connects to valve positioner rear panel. P/N 801404.....€250.

Cable Between Valve and Positioner

A 25 ft. (7m) cable is included with each Throttlemaster™ and cables up to 500 ft. (150 m) are available. If more than 25 ft. is required add the length as a suffix to the valve model number and add:....\$1.00/ft.

Throttlemaster™ is trademark of Vacuum Research.

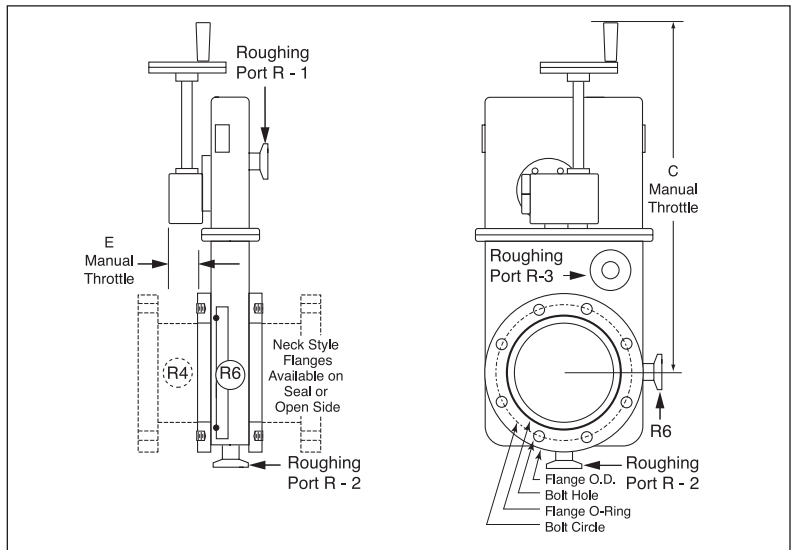


Actuator handle can be easily repositioned to anywhere from left to center to right to provide the most convenient access. Image on the left is shown with guard removed.

The Vacuum Research Manual Throttle Valves serve the dual purposes of high vacuum isolation valve with leak tight shutoff plus precision pump capacity control for sputtering or plasma. Suitable for use with turbo, diffusion or cryo pumps, and always leak tight during regeneration.

Both f and k style ISO flanges are available, as are neck style ANSI flanges. Optional ports for roughing and gauges can be located anywhere on the valve body, and sizes from NW-16 to NW-50 are available.

- Throttle & Leak Tight Shut Off in One Valve
- Aluminum or Stainless Steel Valves
- Seals Up To 3 Atmospheres Differential
- Vacuum or Pressure on Either Side
- ANSI Flange Sizes From 2 Inch To 12 Inch
- Tapped Hole or Neck Style ANSI Flanges
- ISO-k or f style Flanges From 63 To 320mm
- Locks in Open and Closed Positions
- All Valves (RoHS) 2002/95/EC Compliant



ANSI Flanges

Nominal ANSI Size	Model No. ANSI Flange	Port Diameter	Flange O.D.	Flange O-Rings	Bolt Circle	(no. of bolts) x bolt size	A Flange to Flange	C Manual Throttle	E Manual Throttle	F Disassy. Clearance	Weight lbs. Net	Weight lbs. Ship	Price €
2 inch	LPWA 2 N1	3 3/8	6	3 5/8 ID X .139	4 3/4	(4) 5/8-11	3 3/4	15	2 1/2	2 5/8	13	20	€950
3 inch	LPWA 3 N1	3 3/8	7 1/2	4 ID X .139	6	(4) 5/8-11	3 3/4	15	2 1/2	2 5/8	15	22	€1020
4 inch	LPWA 4 N1	5 3/8	9	5 3/4 ID X .139	7 1/2	(8) 5/8-11	4 1/8	21	2 9/16	4 1/2	31	45	€1120
6 inch	LPWA 6 N1	7 1/8	11	7 1/2 ID X .139	9 1/2	(8) 3/4-10	4 3/8	24	2 9/16	5 1/2	49	60	€1295
8 inch	LPWA 8 N1	8	13 1/2	9 ID X .275	11 3/4	(8) 3/4-10	4 3/8	24	2 9/16	5 1/2	55	66	€2095
10 inch	LPWA 10 N1	11 5/8	16	12 ID X .275	14 1/4	(12) 7/8-9	4 5/8	27 3/16	1 1/2	4 3/4	109	130	€2570
12 inch	LPWA 12 N1	12	19	13 ID X .275	17	(12) 7/8-9	4 5/8	27 3/16	1 1/2	4 3/4	129	150	€3185

ISO Flanges

Nominal ISO Size	Model No. ISO Flange	Port Diameter	Flange O.D.	Flange O-Rings	Bolt Circle	(no. of bolts) x bolt size	A Flange to Flange	C Manual Throttle	E Manual Throttle	F Disassy. Clearance	Weight lbs. Net	Weight lbs. Ship	Price €
63 mm	LPWA 63 N1	70	130	Use standard ISO centering rings. These are not included with the valve and should be purchased separately.	110	(4) M8-1.25	70	381	64	2 5/8	13	20	€740
80 mm	LPWA 80 N1	83	145		125	(8) M8-1.25	95	381	64	2 5/8	15	22	€980
100 mm	LPWA 100 N1	102	165		145	(8) M8-1.25	95	381	64	4 1/2	31	45	€1040
160 mm	LPWA 160 N1	153	225		200	(8) M10-1.5	105	533	65	5 1/2	49	60	€1100
200 mm	LPWA 200 N1	213	285		260	(12) M10-1.5	111	610	65	5 1/2	55	66	€2130
250 mm	LPWA 250 N1	261	335		310	(12) M10-1.5	117	690	38	4 3/4	109	130	€2560
320 mm	LPWA 320 N1	318	425		395	(12) M10-1.75	117	690	38	4 3/4	129	150	€3125



3 Position Throttle Valves; Poppet, Gate & Rectangular Port Pricing in Euros



This precision 3 position system is available on Gate, Poppet and Rectangular Port Valves

- Eliminates All Conductance Controllers
- For Any Sputter or Plasma Etch System
- Available on Gate And Poppet Style Valves
- All Sizes From 2 to 24 Inch, ISO 63 to 600
- Electropneumatic, Uses Standard Shop Air
- Specify Any Voltage, 115 or 230 VAC, 24 VDC
- Repeats Position to $\pm .015$ Inch, 0.4mm
- Adjust Throttle At Vacuum or Atmosphere

The Vacuum Research 3 Position Valve System was developed for use on sputter, plasma etch and other vacuum systems where it is desirable to reduce pumping speed to conserve gas and simplify pressure control. By utilizing the high vacuum valve for throttling the cost and maintenance of mechanical conductance controllers is completely eliminated. Even in the full open position all conductance controllers restrict pumping speed and this restriction can now be eliminated.

This precision 3 position system can be provided on Vacuum Research Poppet Valves, Rectangular Port Valves and Gate Valves with end-operated linear actuators. It is suitable for valves with port sizes from 2 inch to 24 inch, ISO-63 to ISO-600. The system can be provided on either aluminum or stainless steel valves.

The "3 POS" system consists of position indicators for full open and full closed plus a third position indicator for the throttle position. This throttle position indicator may be adjusted with a screw driver without any valve disassembly and with the valve either open or closed.

Ordering Information

To order this feature on a Vacuum Research Valve, add the suffix "3 POS" to the valve model number, and specify solenoid voltage of 115 V, 50/60 Hz; 230 V, 50 Hz or 24 VDC. Air pressure required is 70 PSI (5 kg/cm²)

Add to Valve Price.....€250.

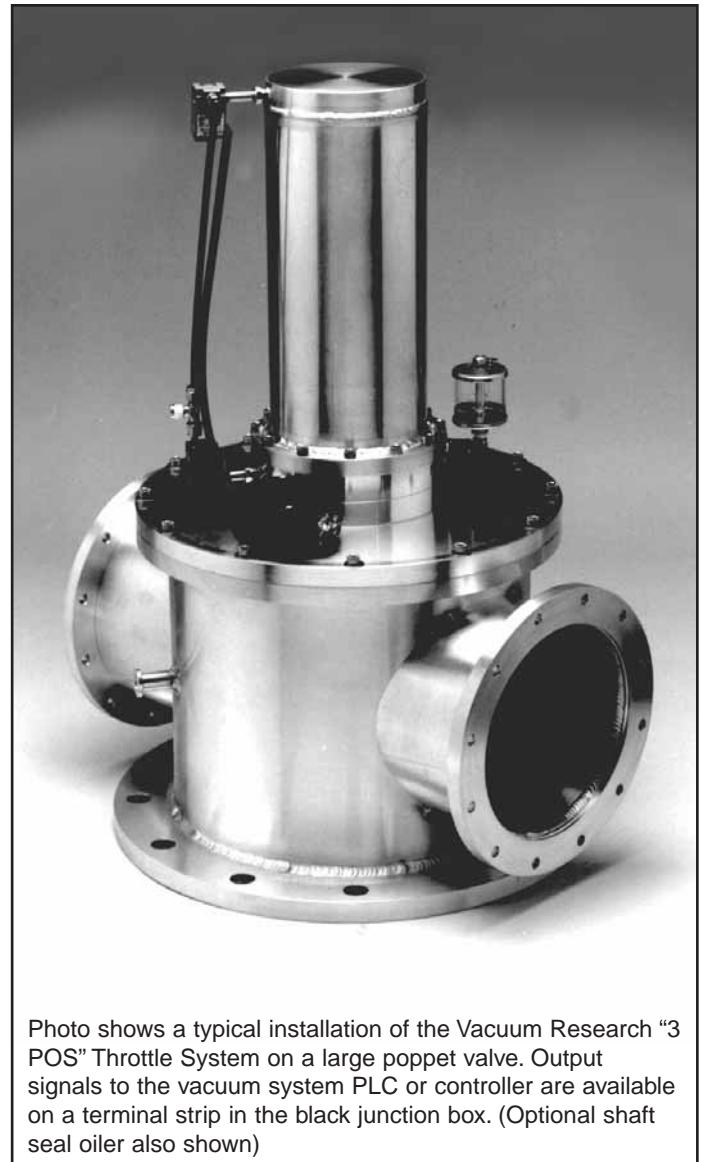


Photo shows a typical installation of the Vacuum Research "3 POS" Throttle System on a large poppet valve. Output signals to the vacuum system PLC or controller are available on a terminal strip in the black junction box. (Optional shaft seal oiler also shown)



Small Aluminum & Stainless Steel Angle Or Inline Valves

Pricing in Euros

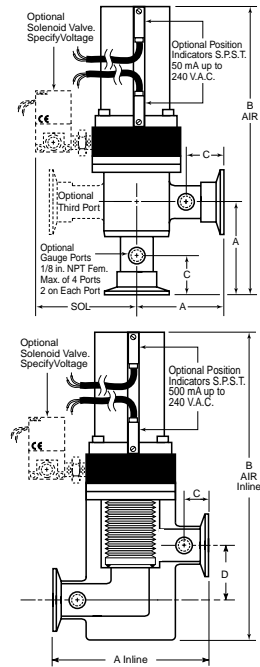


Aluminum and Stainless Steel Pneumatic or Manual Actuators, Angle or Inline Style with Port Sizes from NW-16 To NW-50

- Aluminum or 304 Stainless Steel Bodies
- Leak Tested to Better Than 2×10^{-9} scc/s
- Select Welded Bellows or O-Ring Stem Seals
- Viton® Seat And Bonnet Seal Are Standard
- Kalrez® Seat & Bonnet Seals Also Available
- Gauge Fittings Available On Either Port
- Failsafe; Choose Spring Close Or Air Close
- All Valves (RoHS) 2002/95/EC Compliant

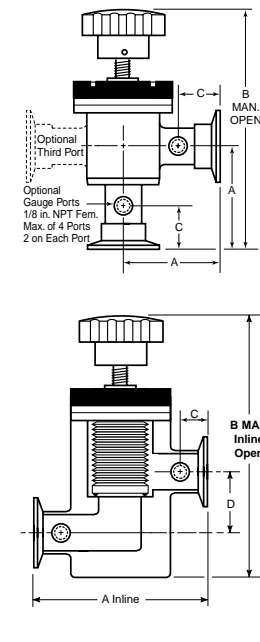
Air To Open/Spring To Close

(See "Optional Features" on next page for Air Open/Air Close or Spring to Open)



Part Number For Inline Style replace "ANG" with "INL"	Description	Angle Style			Inline Style				
		Price €	A	B Air	C	Price €	A	B Air	D
SS-BEL-ANG-.75-AIR	No Flanges, 0.75 O.D.	€185.	2.1	6.2	.85	€190.	4.2	5.9	1.1
SS-BEL-ANG-133-AIR	1.33 CF on Both Ports	€205.	2.1	6.2	.85	€210.	4.2	5.9	1.1
SS-BEL-ANG-16-AIR	NW-16 on Both Ports	€205.	2.1	6.2	.85	€210.	4.2	5.9	1.1
ALUM-BEL-ANG-16-AIR	Aluminum Body, NW-16	€175.	2.1	6.2	.85	€195.	4.2	5.9	1.1
Bellows Stem Seal									
SS-BEL-ANG-1.0-AIR	No Flanges, 1.00 O.D.	€220.	2.0	5.9	.82	€230.	4.0	6.1	1.4
SS-BEL-ANG-212-AIR	2.12 CF on Both Ports	€230.	2.0	5.9	.82	€250.	4.0	6.1	1.4
SS-BEL-ANG-25-AIR	NW-25 on Both Ports	€230.	2.0	5.9	.82	€250.	4.0	6.1	1.4
ALUM-BEL-ANG-25-AIR	Aluminum Body, NW-25	€198.	2.0	5.9	.82	€200.	4.0	6.1	1.4
1,000,000 Cycles									
SS-BEL-ANG-1.5-AIR	No Flanges, 1.50 O.D.	€250.	2.4	7.8	.90	€260.	4.8	8.4	1.9
SS-BEL-ANG-275-AIR	2.75 CF on Both Ports	€255.	2.4	7.8	.90	€265.	4.8	8.4	1.9
SS-BEL-ANG-40-AIR	NW-40 on Both Ports	€255.	2.4	7.8	.90	€265.	4.8	8.4	1.9
ALUM-BEL-ANG-40-AIR	Aluminum Body, NW-40	€235.	2.4	7.8	.90	€255.	4.8	8.4	1.9
SS-BEL-ANG-2.0-AIR	No Flanges, 2.00 O.D.	€315.	3.4	10.3	1.14	€330.	6.8	11.0	2.6
SS-BEL-ANG-338-AIR	3.38 CF on Both Ports	€320.	3.4	10.3	1.14	€335.	6.8	11.0	2.6
SS-BEL-ANG-50-AIR	NW-50 on Both Ports	€320.	3.4	10.3	1.14	€335.	6.8	11.0	2.6
ALUM-BEL-ANG-50-AIR	Aluminum Body, NW-50	€310.	3.4	10.3	1.14	€315.	6.8	11.0	2.6
O-Ring Stem Seal									
ALUM-O-ANG-16-AIR	Aluminum NW-16	€165.	1.6	5.6	.85	€165.	4.2	5.9	1.1
ALUM-O-ANG-25-AIR	Body with NW-25	€175.	2.0	5.9	.82	€180.	4.0	6.1	1.4
ALUM-O-ANG-40-AIR	O-Ring NW-40	€225.	2.6	7.8	.90	€235.	4.8	8.4	1.9
ALUM-O-ANG-50-AIR	Shaft Seal NW-50	€275.	2.8	9.7	1.14	€285.	6.8	11.0	2.6

Manual Valves

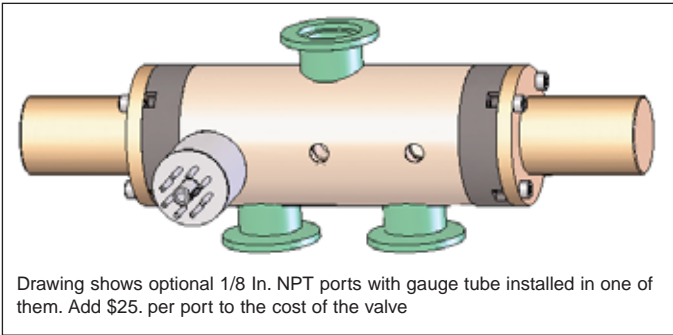


Part Number For Inline Style replace "ANG" with "INL"	Description	Angle Style			Inline Style				
		Price €	A	B Man	C	Price €	A	B Man	D
SS-BEL-ANG-.75-MAN	No Flanges, 0.75 O.D.	€175.	2.1	6.2	.85	€195.	4.2	5.9	1.1
SS-BEL-ANG-133-MAN	1.33 CF on Both Ports	€185.	2.1	6.2	.85	€198.	4.2	5.9	1.1
SS-BEL-ANG-16-MAN	NW-16 on Both Ports	€185.	2.1	6.2	.85	€198.	4.2	5.9	1.1
ALUM-BEL-ANG-16-MAN	Aluminum Body, NW-16	€165.	2.1	6.2	.85	€180.	4.2	5.9	1.1
Bellows Stem Seal									
SS-BEL-ANG-1.0-MAN	No Flanges, 1.00 O.D.	€175.	2.0	5.9	.82	€198.	4.0	6.0	1.3
SS-BEL-ANG-212-MAN	2.12 CF on Both Ports	€190.	2.0	5.9	.82	€200.	4.0	6.0	1.3
SS-BEL-ANG-25-MAN	NW-25 on Both Ports	€190.	2.0	5.9	.82	€200.	4.0	6.0	1.3
ALUM-BEL-ANG-25-MAN	Aluminum Body, NW-25	€180.	2.0	5.9	.82	€198.	4.0	6.0	1.3
1,000,000 Cycles									
SS-BEL-ANG-1.5-MAN	No Flanges, 1.50 O.D.	€260.	2.4	7.8	.90	€260.	4.8	8.4	1.9
SS-BEL-ANG-275-MAN	2.75 CF on Both Ports	€265.	2.4	7.8	.90	€265.	4.8	8.4	1.9
SS-BEL-ANG-40-MAN	NW-40 on Both Ports	€265.	2.4	7.8	.90	€265.	4.8	8.4	1.9
ALUM-BEL-ANG-40-MAN	Aluminum Body, NW-40	€260.	2.4	7.8	.90	€260.	4.8	8.4	1.9
SS-BEL-ANG-2.0-MAN	No Flanges, 2.00 O.D.	€285.	3.4	9.9	1.14	€280.	6.8	10.6	2.6
SS-BEL-ANG-338-MAN	3.38 CF on Both Ports	€315.	3.4	9.9	1.14	€295.	6.8	10.6	2.6
SS-BEL-ANG-50-MAN	NW-50 on Both Ports	€310.	3.4	9.9	1.14	€295.	6.8	10.6	2.6
ALUM-BEL-ANG-50-MAN	Aluminum Body, NW-50	€285.	3.4	9.9	1.14	€270.	6.8	10.6	2.6
O-Ring Stem Seal									
ALUM-O-ANG-16-MAN	Aluminum NW-16	€155.	1.6	5.6	.85	€168.	4.2	5.9	1.1
ALUM-O-ANG-25-MAN	Body with NW-25	€170.	2.0	5.8	.82	€185.	4.0	6.0	1.3
ALUM-O-ANG-40-MAN	O-Ring NW-40	€225.	2.6	7.8	.90	€235.	4.8	8.4	1.9
ALUM-O-ANG-50-MAN	Shaft Seal NW-50	€265.	2.8	9.3	1.14	€250.	6.8	10.6	2.6

Vacuum Research Ltd. • 2419 Smallman Street • Pittsburgh, PA 15222 USA • www.vacuumresearch.com

Phone: 800-426-9340 • 412-261-7630 • FAX: 412-261-7220 • e-mail: VRL@vacuumresearch.com

3 Way Valves, Manual or Air Operated



Drawing shows optional 1/8 In. NPT ports with gauge tube installed in one of them. Add \$25. per port to the cost of the valve

Aluminum bodies with bellows shaft seal. The standard pneumatic actuator is air to open, spring to close. Other options such as gauge ports and position indicators are available. Two 3-way solenoids required. See below for cost of solenoids.

- NW-16, P/N: 3W-ALUM-BEL-16AIR.....€365.
- NW-25, P/N: 3W-ALUM-BEL-25AIR..... €380.
- NW-40, P/N: 3W-ALUM-BEL-40AIR..... €415.
- NW-50, P/N: 3W-ALUM-BEL-50AIR..... €470.
- NW-16, P/N: 3W-ALUM-BEL-16AIR-MAN.....€345.
- NW-25, P/N: 3W-ALUM-BEL-25AIR-MAN.....€355.
- NW-40, P/N: 3W-ALUM-BEL-40AIR-MAN.....€395.
- NW-50, P/N: 3W-ALUM-BEL-50AIR-MAN.....€435.
- 1/8 In. NPT GAUGE PORTS Specify Location.....€17. Each

VCR or 1/8 Inch NPT Ports For Gauge Tubes

VCR-4 or 1/8 inch NPT female ports can be provided on the end or side valve ports. Any number of these ports in any combination can be specified by adding the appropriate suffix to the part number. For example 1/8 RS would specify a 1/8 inch NPT port on the right of the side port.

1/8 NPT Port Add, Alum. valves €17. SS valves €51.
VCR-4 Port Add, Stainless Steel only. €72.

	Position Reference		P/N for 1/8 NPT Port	P/N for VCR Port
	RS	Right Side Port	H700020	H700033
	LS	Left Side Port	H700021	H700034
	RB	Right Bottom Port	H700022	H700035
	LB	Left Bottom Port	H700023	H700036

Position Indicators

Pneumatically activated valves can be equipped with a pair of SPST switches to indicate valve open and closed. These unpowered switches have contacts rated for up to 500 mA at up to 240 VAC, non-inductive.

Add the suffix 'PI'. (Open & Closed). . . Add €98./pair

Optional Third Port for Angle or Inline Valves



Standard angle valves have two ports: one bottom and one side. To add an additional side port for vacuum gauge tube installation, specify the optional third port by simply adding the suffix "3-Port" to any valve part number and add the cost shown below:

- NW-16add€67. NW-40. . . add €94.
- NW-25add €84. NW-50. . add €120.

Spring to Open/Air to Close

For this option, add "SO" to the P/N & add cost below:

- NW-16add €32. NW-25add €32.
- NW-40add €60. NW-50add €90.

Air to Open/Air To Close

Standard valves use air to open and spring to close but as an option the valves can be built for air to open and close. Add the suffix 'AC' to the part number. Note that with this option a 4 way solenoid is required.

Air To Close and Open P/N: H700024 Add €39.
1/8 NPT/ISO Adapter Fitting for Air P/N: H700032. N/C

Solenoids For Pneumatic Valves

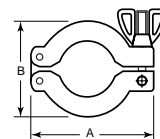
Because many customers use central air manifolds to activate valves we offer these solenoids as an optional rather than standard feature. Solenoids are specified by adding a suffix to Valve part number below.

3 Way for Standard, Spring to Close Valves€42.		4 Way for Air Open/Air Close Valves.€61.	
add Suffix to P/N	Solenoid P/N	add Suffix to P/N	Solenoid P/N
SOL-120 VAC	X134003	SOL-120 VAC	X703005
SOL-230 VAC	X134013	SOL-230 VAC	X134010
SOL-24 VDC	X134032	SOL-24 VDC	X703041

Centering Rings

		304 Stainless Steel With Viton O-Rings		
Flange Size	A	B	Part Number	Price €
NW-16	0.63 (16)	0.21 (5.3)	CTR-RING 16	€3.00
NW-25	0.984 (25)	0.21 (5.3)	CTR-RING 25	€3.50
NW-40	1.575 (40)	0.21 (5.3)	CTR-RING 40	€5.00
NW-50	1.969 (50)	0.21 (5.3)	CTR-RING 50	€6.50

Clamps



Aluminum Clamps With Wing Nut & Screw Fastener

Flange Size	A	B	Thickness	Part Number	Price €
NW-16	1.69 (43)	2.24 (57)	0.63 (16)	AL-Clamp 16	€3.00
NW-25	2.17 (55)	2.76 (70)	0.63 (16)	AL-Clamp 25	€3.75
NW-40	2.76 (70)	3.39 (88)	0.63 (16)	AL-Clamp 40	€4.00
NW-50	3.70 (94)	4.33 (110)	0.79 (20)	AL-Clamp 50	€5.50



Steel & Aluminum High Vacuum Poppet Valves, ISO-k Flanges Pricing in Euros



- 6061 Aluminum or Mild Steel
- All Valves (RoHS) 2002/95/EC Compliant
- Electroless Nickel Optional on Steel Valves
- Optional Operation to 10 Bar, 147 PSIG
- ISO-k Flanges Standard, f Style Optional
- Flanges to Match Diffusion & Cryo Pumps
- Extremely Low Outgassing Rate
- Leak Tested To 2×10^{-9} Std. scc/sec
- Automatic Closure on Power Failure
- Optional Open/Closed Position Indicators
- High Conductance Full Opening Port

ORDERING INFORMATION

Model Number: Refer to page 2 for instructions on how to specify the features you need.

Electronic Position Indicators: Two reed switches activated by a magnet inside the pneumatic actuator provide contact closure for open and closed positions. Add 'LSE' to Model No., refer to page 44 for specifications.€90. /pair

Roughing Ports or Gauge Ports: Standard location is 180° from side port as shown in drawing. Other locations and more than one port are available.

Available on Any Size Valve

- NW-16€90.
- NW-25€96.
- NW-40€113.
- NW-50 (Not On 63) . . .€120.

Available on 6 Inch or Larger Valves

- ISO k 63 . . .€160.
- ISO k 80 . . .€210.
- ISO k 100 . . .€230.

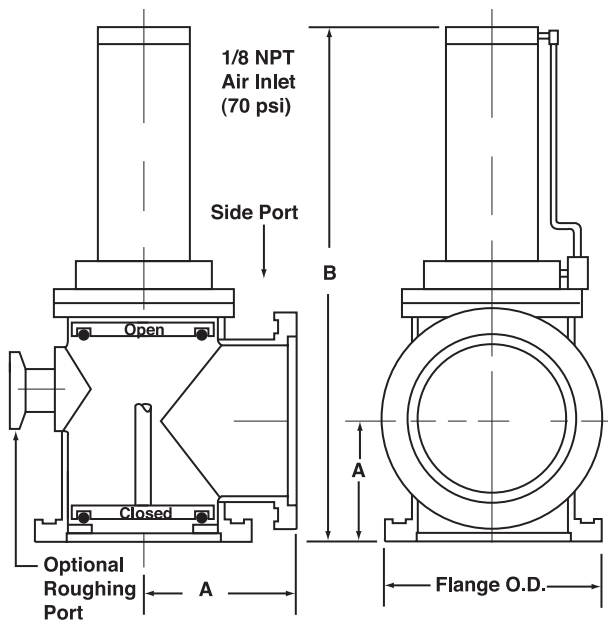
ISO-f flanges available for side or bottom ports at same price.

Special Features: See pages 42 to 47 for information on special features and accessories.

Viton® or Kalrez® or Silicone O-Rings: All Vacuum Research Poppet Valves use Buna-N O-Rings. You may specify Viton® O-Rings with a "V" in the model number and add the following to the price. Use "S" for Silicone, "K" for Kalrez®, and contact the factory for prices.

- ISO-63€34.
- ISO-100€50.
- ISO-160€64.
- ISO-200€102.
- ISO-250€132.
- ISO-320€170.
- ISO-400contact factory
- ISO-500contact factory

Poppet valves from ISO 250 to ISO 500 are designed to seal with vacuum on the bottom port and atmosphere on the side port. If you need to seal the valve with atmosphere on the bottom port (Pushing the valve open) specify this on your inquiry and a larger cylinder will be provided.



Nominal Size	Molecular Conductance	For Mild Steel Use "AVMS" Basic Valve Style in Model No.	Port Flanges Outside Diameter	Flange to Flange "A" Dimension	Overall Height "B" Dimension	Roughing Port Sizes Available	Aluminum Weight, lbs (kg)		Aluminum Price €	Mild Steel Weight, lbs (kg)		Mild Steel Price €
							Net	Ship		Net	Ship	
ISO 63	160	AV-63 ISO-k	95 mm	88 mm	373 mm	NW-16 to NW-40	13 (5.9)	18 (8.2)	€780.	25 (11)	40 (18)	€728.
ISO 100	440	AV-100 ISO-k	130 mm	108 mm	394 mm	NW-16 to NW-40	15 (6.8)	24 (11)	€1005.	40 (18)	49 (22)	€940.
ISO160	1,000	AV-160 ISO-k	180 mm	138 mm	424 mm	NW-16 to ISO-100	28 (13)	42 (19)	€1060.	50 (27)	74 (34)	€1018.
ISO 200	1,920	AV-200 ISO-k	240 mm	184 mm	800 mm	NW-16 to ISO-100	55 (25)	75 (34)	€1550.	95 (43)	115 (52)	€1445.
ISO 250	3,000	AV-250 ISO-k	290 mm	235 mm	850 mm	NW-16 to ISO-100	70 (32)	95 (43)	€2295.	125 (57)	150 (68)	€2160.
ISO 320	5,060	AV-320 ISO-k	370 mm	276 mm	869 mm	NW-16 to ISO-200	95 (43)	130 (59)	€2760.	150 (68)	185 (84)	€2645.
ISO 400	8,550	AV-400 ISO-k	450 mm	337 mm	1067 mm	NW-16 to ISO-320	125 (49)	180 (71)	Contact Factory	520 (236)	755 (343)	Contact Factory
ISO 500	21,840	AV-500 ISO-k	550 mm	387 mm	1372 mm	NW-16 to ISO-320	280 (130)	335 (152)	Contact Factory	800 (363)	1200 (545)	Contact Factory

Standard Exterior of Mild Steel Valves Painted, Turbine Blue.

Vacuum Research Ltd. • 2419 Smallman Street • Pittsburgh, PA 15222 USA • www.vacuumresearch.com

Phone: 800-426-9340 • 412-261-7630 • FAX: 412-261-7220 • e-mail: VRL@vacuumresearch.com



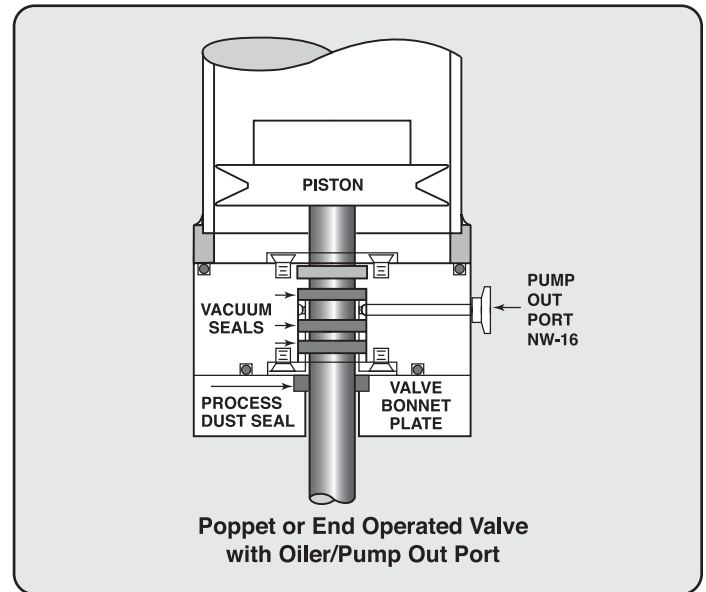
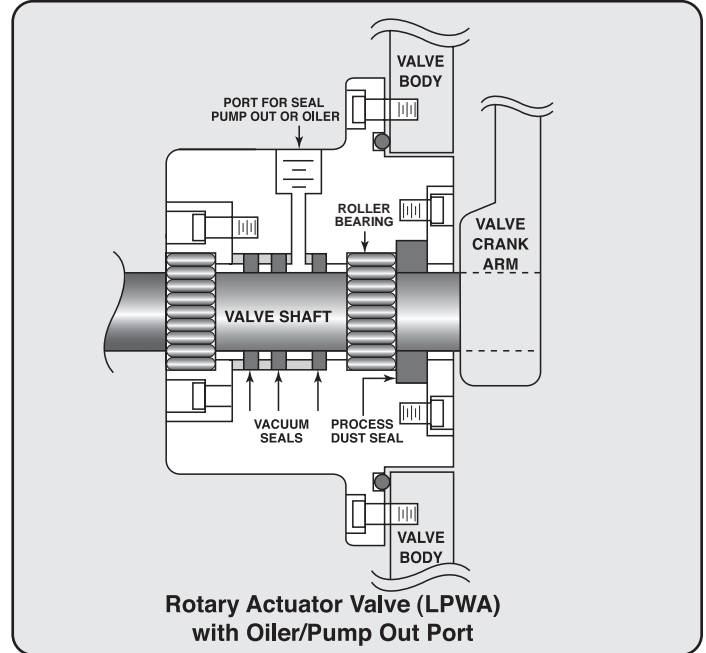
Our standard valves will give hundreds of thousands of cycles and years of service in most applications, however there are some industrial vacuum processes that are so dirty that the valves may need special features to provide long life and trouble free operation. Processes such as investment casting, tire reclamation and steel degassing often produce dust and particulate that can lead to frequent valve seal maintenance. Plasma systems may also need special care to protect the valve seals. The high temperature and corrosive nature of the plasma can cause the seals to quickly become dry and brittle and subsequently leak.

In these situations one of the most popular options is to apply a rough vacuum of approximately 0.1 Torr between the stages of the seal on the valve actuator shaft. Keeping a low pressure differential between seal stages can greatly extend the useful life of the seal.

Other customers prefer to lubricate the shaft and seals with high quality oil from a continuous gravity oiler. In this case the valve hub may be provided with both an inlet and outlet port so that a continuous drip of lubricant can be supplied.

In certain situations high viscosity grease is preferred and an appropriate fitting can be provided.

In all such situations a compliant dust seal is installed around the shaft at the vacuum interface to keep dust and particulate away from the vacuum seals and shaft roller bearings.



These inexpensive features are available on any size of our standard or water cooled gate or poppet valves. We recommend them on any application wherever dust and dirt from your process may contribute to increased maintenance and downtime.

Ordering Information

Although these options are not expensive they are always built to match the exact needs of each customer (for example, the pump out port may be pipe thread or 'NW' style flanges of various sizes). Because there are so many variables a firm price quotation will be provided after your discussion with our customer service people.



On the left is a 12 inch Bell Jar with the optional handles and a 4 inch view port. On the right is a 250 x 375 mm cylinder with top plate showing 4 holes 1" diameter and 2 NW-25 ports.

Aluminum Bell Jars

Top plate is welded on. Purchase base plates and ports as needed from the list below.

Inside Diameter	Inside Height	Weight Lbs.(kg)	Price €
6 Inch (152)	9 Inch (228)	5 (2.3)	€490.
8 Inch (203)	12 Inch (304)	8 (3.6)	€595.
10 Inch (254)	15 Inch (381)	15 (6.8)	€810.
12 Inch (304)	18 Inch (457)	20 (9.0)	€878.
16 Inch (406)	20 Inch (508)	30 (13.0)	€1210.
18 Inch (457)	25 Inch (635)	43 (20.0)	€1395.
20 Inch (508)	25 Inch (635)	50 (23.0)	€1830.

Aluminum Cylinders With Flanges

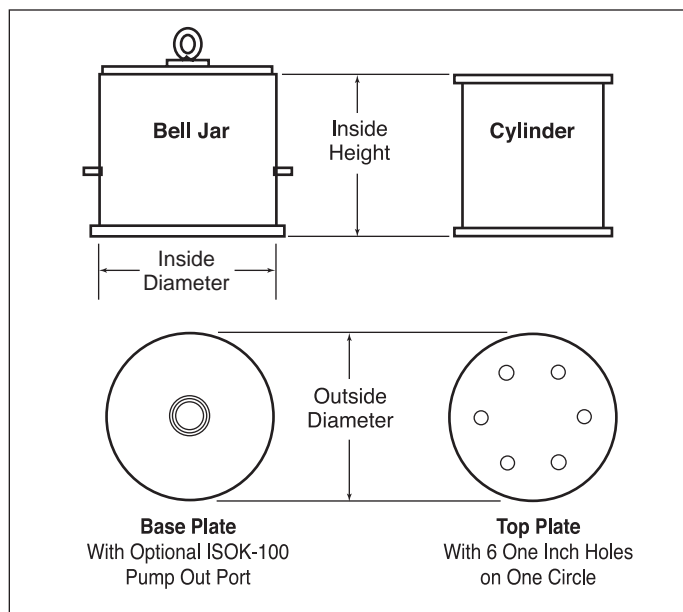
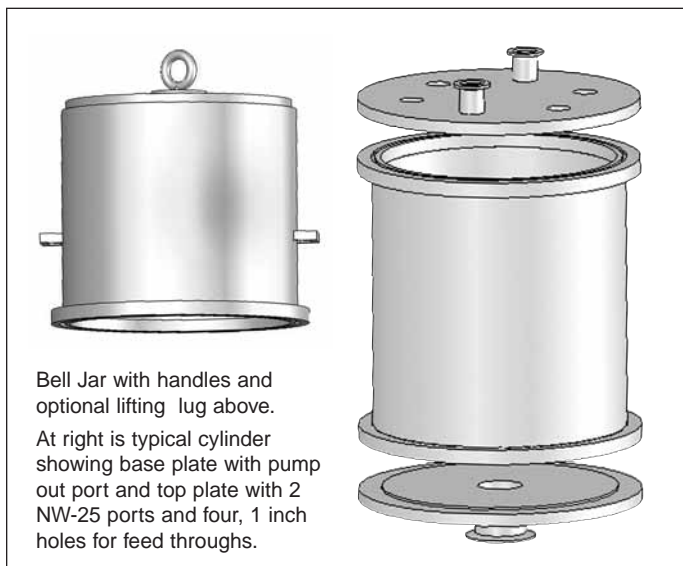
Flanges with O-ring at each end. Purchase base and top plate from the lists below.

Inside Diameter	Inside Height	Weight Lbs./kg	Price €
6 Inch (152)	9 Inch (228)	2.5 (1.1)	€335.
8 Inch (203)	12 Inch (304)	3.8 (1.7)	€415.
10 Inch (254)	15 Inch (381)	8 (3.6)	€465.
12 Inch (304)	18 Inch (457)	11 (5.0)	€590.
16 Inch (406)	20 Inch (508)	15 (6.8)	€655.
18 Inch (457)	25 Inch (635)	24 (11.0)	€740.
20 Inch (508)	25 Inch (635)	28 (13.0)	€1060.

Base Plates and Top Plates

For use with bell jars and cylinders. Select pump out and view ports as needed for your process.

Use with Bell Jar	Outside Diameter	Weight Lbs.(kg)	Price
6 Inch (152)	8 Inch (203)	2.5 (1.1)	€51.
8 Inch (203)	10 Inch (254)	4 (1.8)	€62.
10 Inch (254)	12 Inch (304)	6.5 (2.9)	€238.
12 Inch (304)	14 Inch (355)	8.8 (4.0)	€325.
16 Inch (406)	18 Inch (457)	15 (6.8)	€425.
18 Inch (457)	20 Inch (508)	18 (8.2)	€520.
20 Inch (508)	22 Inch (559)	22 (10.0)	€610.



Pump Out Ports

Located at Center of Base Plate

NW-25	€82.
NW-40	€98.
NW-50	€105.
ISO-100k	€130.
ISO-160k	€160.
ISO-200k	€220.
ANSI LP 4 Inch	€110.
ANSI LP 6 Inch	€130.

View Ports

Specify Location

NW-50	Polycarbonate	€50.
ISO-100	Pyrex	€205.
ISO-160	Pyrex	€245.

Feed Through Holes

1 inch diameter holes in base or top plates

Set up holes on 1 circle	€42.
Plus cost for each hole	€12.

Lifting Handles

Available on 6 In. to 12 In. jars & cylinders.
Price per pair. €85.

Lifting Lug

On top center of jar or plate.
1 In. diameter hole.
Price each. €84.



- Protective Ring Keeps Dirt Out of Valve
- Easy to Clean Dirt Sump Bonnet
- All Valves (RoHS) 2002/95/EC Compliant
- Air Purge Connection for Blow Down
- Helium Leak Rate Less Than 2×10^{-9} scc/sec
- Port Sizes From 2 to 24 Inch, 50 to 600 mm
- ANSI, ISO, JIS or Special Flanges
- Gauge & Roughing Ports Anywhere on Body
- 250,000 Cycle Rotary Shaft Seal
- Fail Safe Design, Close on Power Loss
- All Welded 6061 Aluminum Body

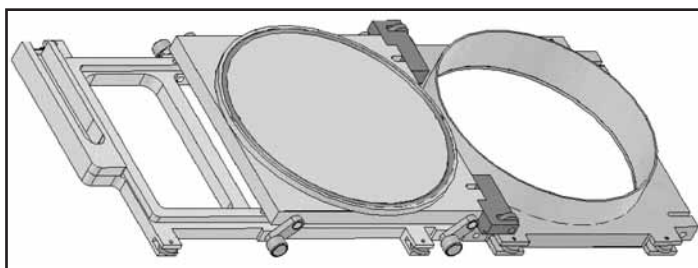


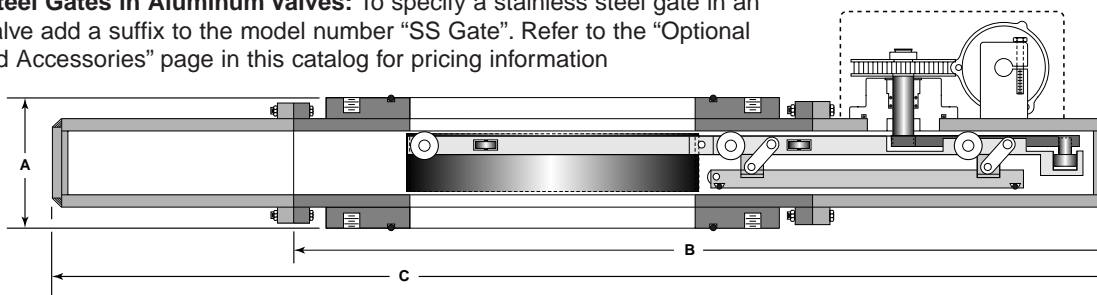
Photo shows a fully open valve with the protective ring in place. In the foreground is the gate/carryage assembly showing the protective ring assembly, also shown in 3-D drawing.

Valve on left is fully open with protective ring in place. Particles are directed through the port instead of into the valve body.

Although Vacuum Research valves are not affected by small amounts of dust and dirt some processes are so dirty that frequent cleaning is required. For such processes our Protective Ring Valve with the Dirt Sump can substantially reduce your costs by increasing the time between cleanouts. The Protective Ring and Dirt Sump are available on valves with port sizes from 2 inch to 24 inch (50 to 600 mm ISO). Other Vacuum Research options such as Position Indicators and ports for gauges and roughing can also be provided on these valves.

ANSI Flange	Port Diameter	Flange O.D.	Bolt Circle	Bolts	Flange O-Rings	A Flange To Flange	B OAL w/o Sump	C OAL With Sump	Net Weight Pounds (kg)	Ship Weight Pounds (kg)	Price €
4 Inch	5.375	9.0	7.5	(8) 5/8-11	5.75 x .139	4.125	21.19	27	50 (23)	65 (30)	€2120.
6 Inch	7.125	11.0	9.5	(8) 3/4-10	7.5 x .139	5.25	23	32	70 (32)	85 (39)	€3120.
8 Inch	8.0	13.5	11.75	(8) 3/4-10	9.0 x .275	5.25	23	32	74 (34)	89 (40)	€3445.
10 Inch	11.625	16.0	14.25	(12) 7/8-9	12 x .275	5.50	34	44	150 (68)	172 (78)	€3935.
12 Inch	12.0	19.0	17.0	(12) 7/8-9	13 x .275	5.50	34	44	163 (74)	183 (83)	€4265.

Stainless Steel Gates in Aluminum Valves: To specify a stainless steel gate in an aluminum valve add a suffix to the model number "SS Gate". Refer to the "Optional Features and Accessories" page in this catalog for pricing information





- Custom Fabricated Aluminum Weldments
- Nipples, Spool Pieces, Elbows & Loadlocks
- Leak Tested To Better Than 2×10^{-9} scc/sec
- Specify Rectangular or Cylindrical Bodies
- ANSI, ISO, JIS, CF, NW & Special Flanges
- Rotatable or Non-Rotatable Flanges

50 Years Experience

Vacuum Research has been welding and machining aluminum as part of our vacuum valve business for almost 50 years. With aluminum now replacing stainless steel as the material of choice for many vacuum processes the need for custom aluminum weldments is growing and Vacuum Research is available to help. We can provide nipples, manifolds, elbows, load locks or just about any aluminum vacuum component needed for your system.

Any Flange Style

We can provide both fixed and rotatable flange styles with bolt circles to match ANSI, ISO, JIS, CF and NW specifications. Both heated and water cooled pieces are available.

No Leaks

Our years of aluminum welding experience provide leak free joints in material up to 1 inch thick and beyond. Of course, prior to shipment each piece is tested and certified leak free by our assembly technicians.

Fast Quotations

Our equipment can handle orders for one or two pieces or for hundreds of pieces. Send us a sketch, drawing, or AutoCAD 2002 file for a quick quotation.

Custom Vacuum Valve Components

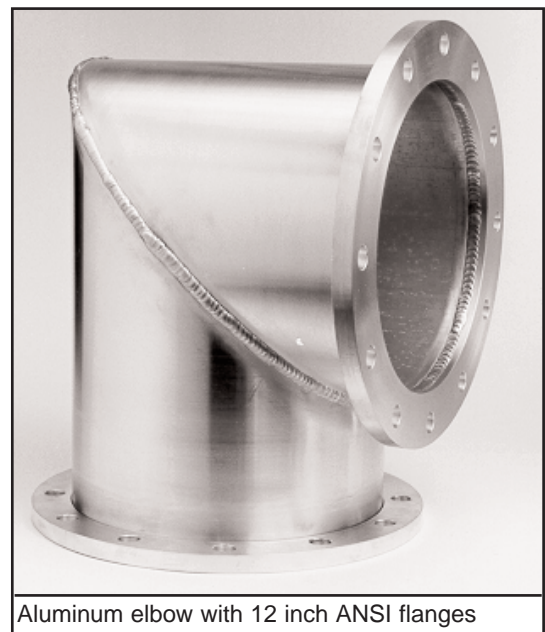


Valve gate with bellows

Some times the optimum system design requires the valves to be an integral part of the system structure. Vacuum Research can provide valve subassemblies and components such as gates and actuators to fit your chamber or tool. Send us a drawing showing the space available and we will provide dimensions of the Vacuum Research assembly that is best suited.



Modular vacuum chambers with ISO-320k flanges and lengths of 100, 200, 400 & 800 mm. Inside diameter is 362 mm.



Aluminum elbow with 12 inch ANSI flanges



Throttle valve with ISO-400 flange on one side and 16 inch ANSI flange on the other. An ISO-100 roughing port is located on both sides of the gate.



Aluminum cube with three, 10 inch ANSI flanges (11.7 inch ports) to join a cryo pump to two chambers.



Bell Jar with optional lifting handles, and view port. Standard Bell Jars and cylinders are described on page 35 of this catalog.



Aluminum valve with 24 inch ANSI flanges on both ports and electricpneumatic actuator.

Million Cycle Valves Vacuum Research Valves have been designed to eliminate sliding friction to extend operating life and reduce particle generation. For example, all of our valves use roller bearings on the actuator shaft and stainless steel rollers to guide the gate when opening and closing. This results in our standard operating life specification of 250,000 cycles without maintenance. For most situations our standard 250,000 cycle valve will out live the system it is installed on, but for some applications an even longer life is needed. For million cycle lifetime on VRL Welded Aluminum or Stainless Steel Valves add to the model number "10⁶ Cycles" and add the price shown below:
 2 to 8 inch ANSI, or 63 to 200 mm ISO valves €300.
 10 & 12 in. ANSI, or 250 to 320 mm ISO valves €375.

Kits to Convert Manual Valves to Electro-Pneumatic Operators for LPWA or OP Valves					
LPWA ISO 63	X810355	€250.	OP 2 or 3 in.	X810355	€275.
LPWA ISO 100	X810089	€275.	OP 4 in.	X810355	€310.
LPWA ANSI 2", 3"	X810022	€310.	OP 6 or 8 in.	X810355	€310.
LPWA ANSI 4"	X810061	€310.			
LPWA ANSI 6" or 8"	X810304	€310.			
LPWA ANSI 10" or 12"	X810529	€450.			

Double Solenoid in place of standard, P/N: X702942 ... €125.

Explosion-Proof Solenoids

Class I, Div. 1, Groups A,B,C,D; Class II, Div. 2, Groups E,F, & G
 24 VDC, P/N: X134020 €180.
 120V, 50/60 Hz, P/N: X134022 €180.
 220V, 50/60 Hz, P/N: X134023 €180.

Non-magnetic Valves The standard VRL valve is constructed of aluminum with non-magnetic stainless steel fasteners. There are, however, a few steel components that can be replaced with stainless steel at extra cost if completely non-magnetic valves are needed. (The Solenoid Valve is always magnetic, but can be located remotely.)

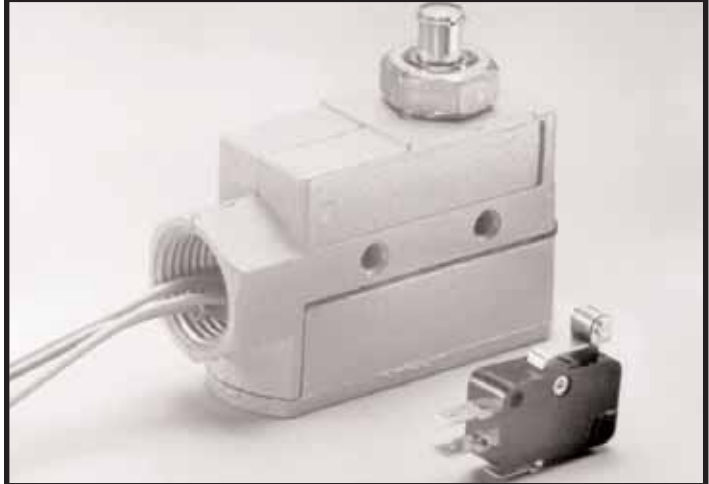
2 to 8 inch valves (63 mm to 200 mm) €110.
 10 and 12 inch valves (250 mm and 320 mm) €140.

OSHA Style EP Covers for VRL LPWA & OP Gate Valves Completely enclosed OSHA style covers with CE mark. This cover style is now standard on LPWA and OP gate valves with electro-pneumatic operators, but it may also be retrofitted to valves in the field. (Prices for LPWA and OP valves shown in this catalog include the OSHA style cover.)

Valve Size	Cover P/N	OSHA Style EP Cover with CE Mark
2 & 3 inch ANSI	X02WA152	€55.
63, 80, 100 mm ISO 65, 80, 100 mm JIS	X703042	€55.
4 inch ANSI 160 mm ISO 150 mm JIS	X04WA152	€70.
6 & 8 inch ANSI 200 mm ISO 200 mm JIS	X06WA152	€80.
10 & 12 inch ANSI 250, 320 mm ISO 250, 300 mm JIS	X10WA152	€95.

Position Indicators (Limit Switches)

Position indicators (Limit Switches) are available on all Valves to provide remote indication of the valve position. Position indicators are available for air operated or manually operated valves. Several styles are offered.



Fully enclosed style position indicator shown at left, the open style is shown at right.

All position indicators are RoHS compliant.

Fully Enclosed Style

LSS or LSD - Fully Enclosed switches with 1/2-14 NPT conduit connection for unprotected industrial applications where physical protection of the wiring is required.

LSS - Fully Enclosed Limit Switches, SPDT.
 Contact rating is 15 A@115 or 230 VAC, 0.5 A@115 VDC.
 Kit P/N: X706901 €90./pair

LSD - Fully enclosed Limit Switches, DPDT.
 Contact rating is 10 A @ 125 or 250 VAC, 0.3 A@125 VDC, 0.15A@250 VDC., Kit P/N: X706900 €250./pair

Open Style

LSO - Open Style switches are often used when the valve is inside a cabinet or is otherwise protected. Open Style Limit Switches SPDT, Kit P/N: X706907 €27./pair

Explosion Proof

LSX-C - Explosion Proof SPDT switches Class I, Division 1, Group C or D, and Class II, Division 1, Groups E,F,G (NEMA 7 & 9), Kit P/N: X706904 €490./pair.

LSX-B - Explosion Proof SPDT same as LSX-C but for Group B(H₂), Kit P/N: X706909 €595./pair.

Electronic

LSE - Electronic Position Indicators for Bellows Sealed, End Operated, Poppet & Rectangular Port Valves. Two reed switches activated by a magnet inside the pneumatic actuator provide contact closure for open and closed position. SPST contact rating 50 watts non-inductive.

Maximum voltage: 141 VAC or 200 VDC.
 Maximum current: 1 Amp. Contact factory for P/N for your particular valve €90./pair



Optional Features and Accessories Pricing in Euros

Reverse Carriage On standard Vacuum Research Bonnet Style valve sizes 2 to 8 inch (63 to 200 mm) the actuator is on the seal side. It is possible to build these valves with the actuator on the open side. Add to the model no. "REV. CARR." and add \$174. to the price.

Plain, Blank Or Special Flanges Valves may be specified with Plain or Blank flanges. Plain means without O-ring groove but with bolt holes. Blank means neither O-ring grooves nor bolt holes. Standard valves have O-rings and bolt holes on both sides. Special bolt circles and seal surfaces are also available but if non-standard flanges are required, be sure to specify "seal side" or "open side." no extra charge

JIS - ANSI - ISO - Conflat® Flange Combination VRL Valves are often used as an adapter to mate components of different flange styles. For example, valves can be provided with an ISO flange on one port and a Conflat®, or special flange on the other. Any combination can be provided to mate with your pumps, traps, or chamber. no extra charge

Reducer Valves Similar to adapting different flange styles as described above, valves can also be provided with port flanges of different sizes. Virtually any mix of port flange sizes or styles are available; for example, you may order a valve with a 6 in. flange on one side and an 8 inch on the otherno extra charge.

Viton®, Kalrez® or Silicone O-Rings All standard Vacuum Research Valves use a Viton® O-Ring for the gate seal and Buna-N O-Rings for all other locations. For special or higher temperature applications you may specify Viton® (or other materials) throughout the valve with a "V" in the model number ("S" for Silicone or "K" for Kalrez®).Contact the factory for price

Port Flange O-Rings The standard and most commonly ordered configuration is with O-Rings on both port flanges. As shown on page 2, this is specified in the model no. as "20". There is no extra cost however for valves with O-Rings on one or neither flange. Please be sure to specify "open" or "seal" side if only one O-Ring is required.no extra charge

Stainless Steel Flanges To specify a stainless steel gate in an aluminum valve add a suffix to the model number "SS Gate". Refer to the "Optional Features and Accessories" page in this catalog for pricing information.

Stainless Steel Gates in Aluminum Valves To substitute a stainless steel gate on an aluminum valve add the suffix "SS Gate" to the model No. and increase the price.

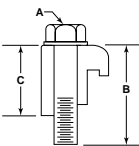
LP 2 in., LP 3 In. & LP 6 in. & ISO-200.....€590
 NW-50 & ISO-100.....€200 LP 8 in. & ISO-250€780
 LP 4 in. & ISO-160.....€390 LP 10 in. & ISO-320.....€950

ISO Centering Rings and Claw Clamps

Aluminum Centering Ring with O-Ring				
ISO Flange Size	With Buna-N O-Ring		With Viton O-Ring	
	Part No.	List Price	Part No.	List Price
ISO 63	063-ALBU	€7.00	063-ALVI	€10.00
ISO 80	080-ALBU	€9.00	080-ALVI	€12.00
ISO 100	100-ALBU	€11.00	100-ALVI	€15.00
ISO160	160-ALBU	€22.00	160-ALVI	€28.00
ISO 200	200-ALBU	€43.00	200-ALVI	€50.00
ISO 250	250-ALBU	€55.00	250-ALVI	€60.00
ISO 320	320-ALBU	€70.00	320-ALVI	€85.00
ISO 400	400-ALBU	€150.00	400-ALVI	€150.00
ISO 500	500-ALBU	€190.00	500-ALVI	€220.00
ISO 630	630-ALBU	contact factory	630-ALVI	contact factory

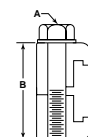
Replacement O-Ring Only				
ISO Flange Size	Buna-N O-Ring		Viton O-Ring	
	Part No.	List Price	Part No.	List Price
ISO 63	063-OBV	€0.60	063-OVI	€3.50
ISO 80	080-OBV	€0.80	080-OVI	€4.40
ISO 100	100-OBV	€0.90	100-OVI	€5.00
ISO160	160-OBV	€1.50	160-OVI	€9.00
ISO 200	200-OBV	€2.25	200-OVI	€11.00
ISO 250	250-OBV	€2.50	250-OVI	€13.00
ISO 320	320-OBV	€4.50	320-OVI	€20.00
ISO 400	400-OBV	€6.50	400-OVI	€25.00
ISO 500	500-OBV	€10.00	500-OVI	€35.00
ISO 630	630-OBV	contact factory	630-OVI	contact factory

Aluminum Single Claw Clamps With Stainless Steel Bolt and Washer for Joining k to f Flanges



ISO Flange Size (Quantity Needed)	A (THD)	B (mm)	C (mm)	Part Number	Price Each
ISO 63 (4) ISO 83 (4) ISO 100 (4)	M8	35	24	100-SGLAL	€1.50
ISO 160 (4) ISO 200 (6) ISO 250 (6)	M10	35	24	250-SGLAL	€43.00
ISO 320 (8) ISO 400 (8) ISO 500 (12) ISO 630 (16)	M12	50	30	630-SGLAL	€3.00

Aluminum Double Claw Clamps With Stainless Steel Bolt and Washer for Joining Two k Flanges



ISO Flange Size (Quantity Needed)	A (THD)	B (mm)	Part Number	Price Each
ISO 63 (4) ISO 83 (4) ISO 100 (4)	M8	35	100-DBLAL	€1.75
ISO 160 (4) ISO 200 (6) ISO 250 (6)	M10	35	250-DBLAL	€3.50
ISO 320 (8) ISO 400 (8) ISO 500 (12) ISO 630 (16)	M12	50	630-DBLAL	€3.50

All Vacuum Research Valves can be supplied with one or several extra ports in a variety of locations, sizes and styles. The most common use is for the connection of roughing pumps and gauge tubes, but these ports can also be used for vent, backfill and purge gas connections. Select either brass "Bolt-on" flanges or the more economical "NW" style.

NW Flanges

This is the least expensive style and is usually the easiest for the user because connection requires no tools. The NW port is welded to the valve in the location you select. Centering ring, clamp, and blank-off flange not included. The table below lists the 'NW' sizes available in each location.

Location R-4	Location R-1, R-2, R-3, R-6, & R-7
NW-16€90.	NW-16€78.
NW-25€98.	NW-25€83.
NW-40€115.	NW-40€98.
NW-50€125.	NW-50€115.

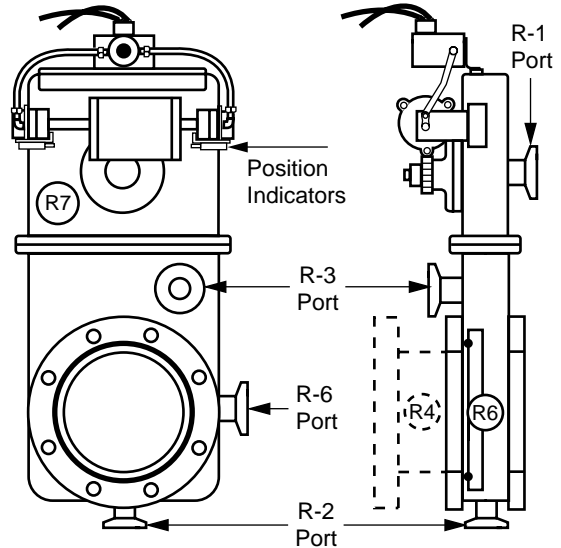
Bolt On Brass Flanges

This style is slightly more expensive than the NW ports because of the several machine setups to bore, mill and drill and tap the valve body, and manufacturing of the brass blank off flange which is included. With this style the customer must bore a hole in the blank-off flange and braze the required tubing to the flange.

Location R-4	Location R-1, R-2, R-3, R-6, R-7
2 to 4 inch and 63 to 100 mm . . .€190.	Roughing Port Diameter 0.5 to 1.25 in. dia. port . . .€170.
6 to 12 inch and 160 to 320 mm . . .€235.	Over 1.25 in. dia. port . . .€185.

NW Clamps and Centering Rings

The NW style roughing and gauge ports do not include clamps or centering rings. The items are available from VRL and are described on page 33 of this catalog.



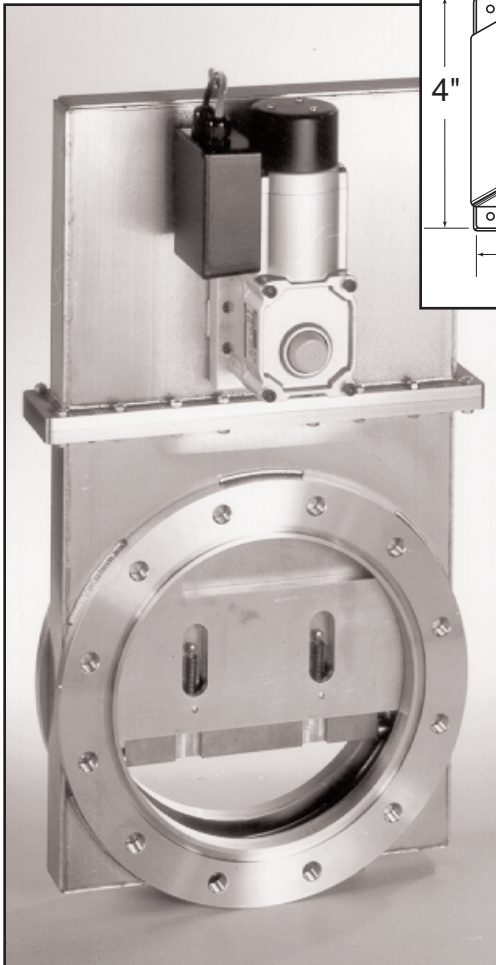
Gauge and Roughing Port Locations

Gauge & Roughing Port Locations

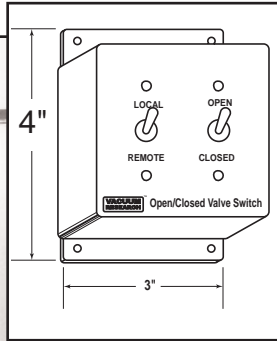
Nominal Valve Sizes	R-1	R-2	R-3	R-4 available only on valves with N5 or N6 necks	R-6	R-7
2 inch and 63 mm	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25	NW-16 NW-25	NW-16 NW-40 NW-25	NW-16 NW-25	NW-16 NW-40 NW-25 NW-50
3 inch and 80 mm	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25	Available only on OP style valves. NW-16, NW-25, NW-40, NW-50	NW-16 NW-40 NW-25	NW-16 NW-25	NW-16 NW-40 NW-25 NW-50
4 inch and 100 mm	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25	NW-16 NW-25	NW-16 NW-40 NW-25 NW-50
6 inch and 160 mm	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25	NW-16 NW-25	NW-16 NW-40 NW-25 NW-50
8 inch and 200 mm	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25	Available only on OP style valves. NW-16, NW-25, NW-40, NW-50	NW-16 NW-40 NW-25	NW-16 NW-25	NW-16 NW-40 NW-25 NW-50
10 inch and 250 mm	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25	NW-16 NW-25	NW-16 NW-40 NW-25 NW-50
12 inch and 320 mm	NW-16 NW-40 NW-25 NW-50	NW-16 NW-40 NW-25 NW-50	Available only on OP style valves. NW-16, NW-25, NW-40, NW-50	NW-16 NW-40 NW-25	NW-16 NW-25	NW-16 NW-40 NW-25 NW-50



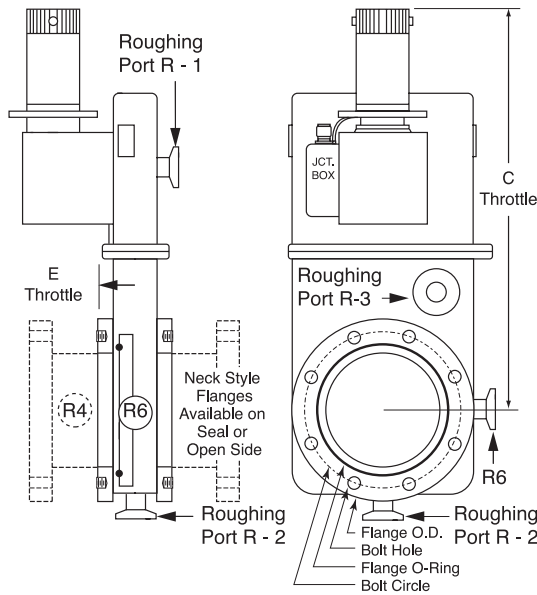
Electric Motor Actuators for LPWA Series Gate Valves Pricing in Euros



12 In. Stainless Valve with Electric Motor Actuator
All Valves (RoHS) 2002/95/EC Compliant



2 Position (open / closed) electric actuators are available for all LPWA valves from 2 to 16 inch ANSI and 50 to 400 mm ISO sizes. These actuators replace the standard electro-pneumatic actuators and can be installed on either aluminum or stainless steel valves. In addition to these open / closed actuators our Throttemaster® series provides full modulation from 0% to 100% for 3 position or PID throttling. Refer to pages 26 and 27 for Throttemaster® specifications.



ANSI Port Size	Motor C	Motor E
2 & 3 inch	15.9 inch	4.34 inch
4 inch	19.7 inch	4.15 inch
6 inch	22 inch	4.03 inch
8 inch	22 inch	4.03 inch
10 inch	20.67 inch	3.90 inch
12 inch	22.74 inch	3.90 inch

ISO Port Size	Motor C	Motor E
63 & 80 mm	403 mm	110 mm
100 mm	403 mm	110 mm
160 mm	487 mm	105 mm
200 mm	561 mm	102 mm
250 mm	525 mm	99 mm
320 mm	577 mm	99 mm

Dimensions: Port dimensions, bolt patterns, and other dimensions are shown in Valve Catalog on pages 6 and 7 for ANSI and page 17 for ISO valves. A few dimensions unique to the Electric Motor Actuator are listed here.

Electric Motor Actuator for Gate Valves

Electric Actuator includes motor with Thermal Protection, position indicators, open/close switch and cable.

Power Required

5 A @ 115V 50/60 Hz at the valve site.

Position Indicators

SPDT Relays located at the valve for full open and closed positions. Contacts rated 3A @ 120 VAC and 1.5 A at 230 VAC resistive or 1.5 A @ 28 VDC inductive.

Open / Close; Manual Switch

In a surface mount box with LEDs to indicate open and closed, and 25 ft. (7.7 m) of cable (longer cable can be added). No power required at the switch site. Switch box is approximately 3 X 4 inches.

Open / Close; Remote Input

In addition to the Manual Switch for Open/Close the valve may also be actuated by a signal from your PLC or other system controller. Any signal between 5 and 30 VDC will open the valve. Zero volts will close the valve. A 4 - 20 mA current signal may also be used.

Ordering Information

Cost shown below should be added to the cost of valve with Electro Pneumatic actuator.

2 or 3 inch ANSI or

63 or 80 mm ISO Port

LPWA Valve Electric Motor Actuator

p/n: V806101add €335.

4, 6 or 8 inch ANSI or

100 or 160 mm ISO Port

LPWA Valve Electric Motor Actuator

p/n: V806102add €385.

10, 12 or 16 inch ANSI or

250, 320 or 400 mm ISO Port

LPWA Valve Electric Motor Actuator

p/n: V806103add €485.



- Rotary and Push/Pull in the Same Feedthrough
- High Torque. Use Either Solid or Hollow Shafts
- High Speeds, Intermittent Use Up To 1200 RPM
- All Feed Throughs (RoHS) 2002/95/EC Compliant
- 303 Stainless Steel or Nickel Plated Brass
- Easy to Replace Viton® or Buna-N Chevron Seals
- Conflat®, NW or Pipe Thread Connection to System
- Available For Four Shaft Sizes: 1/4", 3/8", 1/2", 5/8"
- Includes Frelon® Bearing On Atmosphere Side

Bearings in Vacuum Research shaft seals are self-lubricating because a Teflon® film from the Frelon liner is deposited on the shaft during break in. Factors affecting wear rates include shaft hardness, surface finish, length of travel, contamination, and presence of fluids or lubricants.

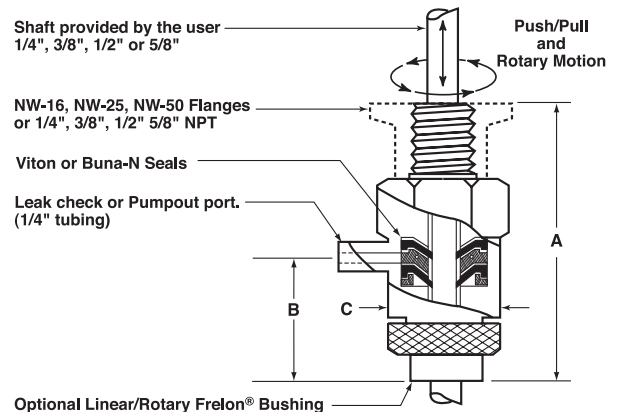
The presence of lubrication can reduce friction, improve life, and can carry away heat. Greases and hydrocarbon oils work well. However, do not use fluorocarbon and/or silicone oils and greases. They disrupt the heat transfer process and adversely affect Frelon bearing life.

Shaft finish and hardness should be 4 to 12 RMS with a minimum surface hardness of RC 50 for best results. Softer shafting can be used, but both bearing and shafting will wear at accelerated rates. Even the type of surface finish can affect the rate of wear. For a given RMS value radiused or polished peaks will provide the best rate of wear so electropolished shafts give best results.

Shaft Diameter Shaft is not included Best performance will result when your shaft diameter is held to these dimensions, but smaller diameters are acceptable. See below for optional shaft material.

Connection to System	1/4 inch	3/8 inch	1/2 inch	5/8 inch
	.2495 - .0000 + .0005	.3745 - .0000 + .0005	.4995 - .0000 + .0005	.6245 - .0000 + .0005
2.75 In. Conflat®	Model No. 2.75-B01-SS 303 Stainless Steel €260.	Model No. 2.75-B02-SS 303 Stainless Steel €285.	Model No. 2.75-B03-SS 303 Stainless Steel 1/2" €300. 5/8" €380.	
NW-16	Model No. 16-B01-NB Nickel Plated Brass €138.	Model No. 16-B02-NB Nickel Plated Brass €150.	Model No. 16-B03-NB Nickel Plated Brass 1/2" €160. 5/8" €250.	
	Model No. 16-B01-SS 303 Stainless Steel €260.	Model No. 16-B02-SS 303 Stainless Steel €285.	Model No. 16-B03-SS 303 Stainless Steel 1/2" €285. 5/8" €215.	
NW-25	Model No. 25-B01-NB Nickel Plated Brass €150.	Model No. 25-B02-NB Nickel Plated Brass €150.	Model No. 25-B03-NB Nickel Plated Brass 1/2" €165. 5/8" €250.	
	Model No. 25-B01-SS 303 Stainless Steel €290.	Model No. 25-B02-SS 303 Stainless Steel €285.	Model No. 25-B03-SS 303 Stainless Steel 1/2" €295. 5/8" €380.	
NW-50	Model No. 50-B01-NB Nickel Plated Brass €200.	Model No. 50-B02-NB Nickel Plated Brass €225.	Model No. 50-B03-NB Nickel Plated Brass 1/2" €225. 5/8" €315.	
	Model No. 50-B01-SS 303 Stainless Steel €355.	Model No. 50-B02-SS 303 Stainless Steel €335.	Model No. 50-B03-SS 303 Stainless Steel 1/2" €350. 5/8" €445.	
Pipe Thread	Model No. P-B01-NB Nickel Plated Brass €140.	Model No. P-B02-NB Nickel Plated Brass €150.	Model No. P-B03-NB Nickel Plated Brass 1/2" \$160. 5/8" \$245.	
	Model No. P-B01-SS 303 Stainless Steel €285.	Model No. P-B02-SS 303 Stainless Steel €300.	Model No. P-B03-SS 303 Stainless Steel 1/2" €320. 5/8" €400.	
For 1 Inch Baseplate Through Hole	Model No. 1in-B01-NB Nickel Plated Brass €225.	Model No. 1in-B02-NB Nickel Plated Brass €240.	Model No. 1in-B03-NB Nickel Plated Brass €260.	
	Model No. 1in-B01-SS 303 Stainless Steel €425.	Model No. 1in-B02-SS 303 Stainless Steel €450.	Model No. 1in-B03-SS 303 Stainless Steel €455.	
Replacement Seal Washers 2 Req'd.	Buna-N, P/N 701101-B €2.00 each	Buna-N, P/N 701102-B €2.00 each	Buna-N, P/N 701103-B €2.00 each	
	Viton®, P/N 701101-V €3.50 each	Viton®, P/N 701102-V €3.50 each	Viton®, P/N 701103-V €3.50 each	

Rotary & Push/Pull Motion Feedthrough



SHAFT DIAM.	NW-16			NW-25			NW-50			PIPE THREAD		
	A	B	C	A	B	C	A	B	C	A	B	C
1/4 INCH SHAFT										1/4 IN. NPT		
	2.35	1.00	1.00	2.26	.09	1.0	2.26	.09	1.0	2.73	1.39	1.00 ACROSS FLATS
3/8 INCH SHAFT										3/8 IN. NPT		
	2.35	1.00	1.13	2.35	1.00	1.13	2.8	1.50	1.13	2.75	1.38	1.125 ACROSS FLATS
1/2 & 5/8 INCH SHAFT										1/2 IN. NPT		
	2.38	1.00	1.25	2.38	1.00	1.25	2.50	1.13	1.25	2.76	1.38	1.25 ACROSS FLATS

Optional Precision Shaft Material, 316 S.S. The shaft is not included with the feedthrough. Most customers provide their own shaft but we offer this material as a convenience.

1/4 inch O.D. by 18 inch (457 mm) long P/N: SHFT-25-18-316 . . . €22. ea.
3/8 inch O.D. by 18 inch (457 mm) long P/N: SHFT-37-18-316 . . . €45. ea.
1/2 inch O.D. by 18 inch (457 mm) long P/N: SHFT-50-18-316 . . . €55. ea.