



### Throttlemaster™ 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 Throttlemaster™ servo actuator are listed here.

ANSI Flange Port Diameter	2 & 3 inch 4 inch Port	4 inch 6 inch Port	6 inch 8 inch Port	8 inch 10 inch Port	10 inch 12 inch Port	12 inch 12 inch Port
C Throttle	15.90 inch	19.17 inch	22.00 inch	22.00 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

- Aluminum or Stainless Steel Valves
- Seals Up To 3 Atmospheres Differential
- Vacuum or Pressure on Either Side
- ANSI Sizes From 2 Inch to 24 Inch
- ISO Flanges From 63 to 630 mm
- Manual or Closed Loop Operation
- All Valves (ROHS) 2002/95/EC Compliant

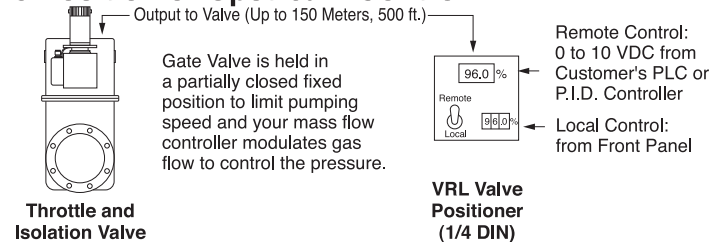
The Vacuum Research Throttlemaster™ valve with positioner can be used in either of two control schemes. As a 3 position valve for upstream pressure control with an MFC, or for downstream pressure control with modulating gate position. For 3 position control the basic Throttlemaster™ consists of two components: 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 Throttlemaster™ as a 3 position valve in systems where the mass flow controller is controlling the pressure.

The Throttlemaster™ can also be used for downstream pressure control where the gas flow to the chamber is held constant and the Throttlemaster™ 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 Throttlemaster™ Valve and positioner or you may be able to use your present gauge and controller.

### P.I.D. Closed Loop Downstream Pressure Control



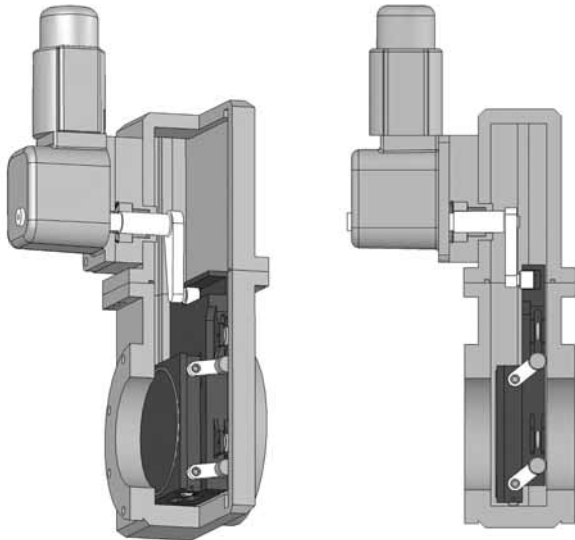
### 3 Position or Upstream Control



## Stainless Steel Throttemaster™

### Valve System With Positioner

Port Size	Flange Style	Model	Price
25 mm	NW-25	STM-25	\$3766.
40 mm	NW-40	STM-40	\$3993.
50 mm	NW-50	STM-50	\$4239.
63 mm	ISO-f 63 mm	STM-63	\$4594.
80 mm	ISO-f 80 mm	STM-80	\$4713.
100 mm	ISO-f 100 mm	STM-100	\$5325.
160 mm	ISO-f 160 mm	STM-160	\$5737.
200 mm	ISO-f 200 mm	STM-200	\$8469.
250 mm	ISO-f 250 mm	STM-250	\$11,689.
400 mm	ISO-f 400 mm	STM-400	\$21,095.
500 mm	ISO-f 500 mm	STM-500	\$29,200.
3 5/8 inch	ANSI 2 inch	STM-2	\$4594.
4 inch	ANSI 3 inch	STM-3	\$5325.
6 inch	ANSI 4 inch	STM-4	\$5762.
8 inch	ANSI 6 inch	STM-6	\$8088.
10 inch	ANSI 8 inch	STM-8	\$8469.
12 inch	ANSI 10 inch	STM-10	\$11,684.
16 inch	ANSI 16 inch	STM-16	\$21,095.
20 inch	ANSI 20 inch	STM-20	\$29,327.



#### Throttemaster™ Fully Closed

Note that crank arm is vertical and links are near horizontal

#### Throttemaster™ 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 Throttemaster™ 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.

## Aluminum Throttemaster™

### Valve System With Positioner

Port Size	Flange Style	Model	Price
25 mm	NW-25	ATM-25	\$2809.
40 mm	NW-40	ATM-40	\$2840.
50 mm	NW-50	ATM-63	\$2881.
63 mm	ISO-f 63 mm	ATM-63	\$2948.
80 mm	ISO-f 80 mm	ATM-80	\$3303.
100 mm	ISO-f 100 mm	ATM-100	\$3396.
160 mm	ISO-f 160 mm	ATM-160	\$3576.
200 mm	ISO-f 200 mm	ATM-200	\$4507.
250 mm	ISO-f 250 mm	ATM-250	\$6426.
320 mm	ISO-f 320 mm	ATM-320	\$7589.
400 mm	ISO-f 400 mm	ATM-400	\$12,502.
500 mm	ISO-f 500 mm	ATM-500	\$18,100.
630 mm	ISO-f 630 mm	ATM-630	\$24,900.
3 5/8 inch	ANSI 2 inch	ATM-2	\$2948.
4 inch	ANSI 3 inch	ATM-3	\$3303.
6 inch	ANSI 4 inch	ATM-4	\$3421.
8 inch	ANSI 6 inch	ATM-6	\$4121.
10 inch	ANSI 8 inch	ATM-8	\$4250.
12 inch	ANSI 10 inch	ATM-10	\$6426.
12 inch	ANSI 12 inch	ATM-12	\$7584.
16 inch	ANSI 16 inch	ATM-16	\$12,502.
20 inch	ANSI 20 inch	ATM-20	\$18,728.
24 inch	ANSI 24 inch	ATM-24	\$25,860.

### Optional Features

The valves used in the Vacuum Research Throttemaster™ are the same as the standard open/close valves discussed on pages 4 to 7 of this catalog. The difference is that the Throttemaster™ gate position is precisely controlled by the servo motor actuator and the valve positioner to full open, full close, or anywhere in between. A Throttemaster™ 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

Throttemaster™ 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.....\$978.

#### 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%, ±1%. 10 foot cable connects to valve positioner rear panel. P/N 801404.....\$370.

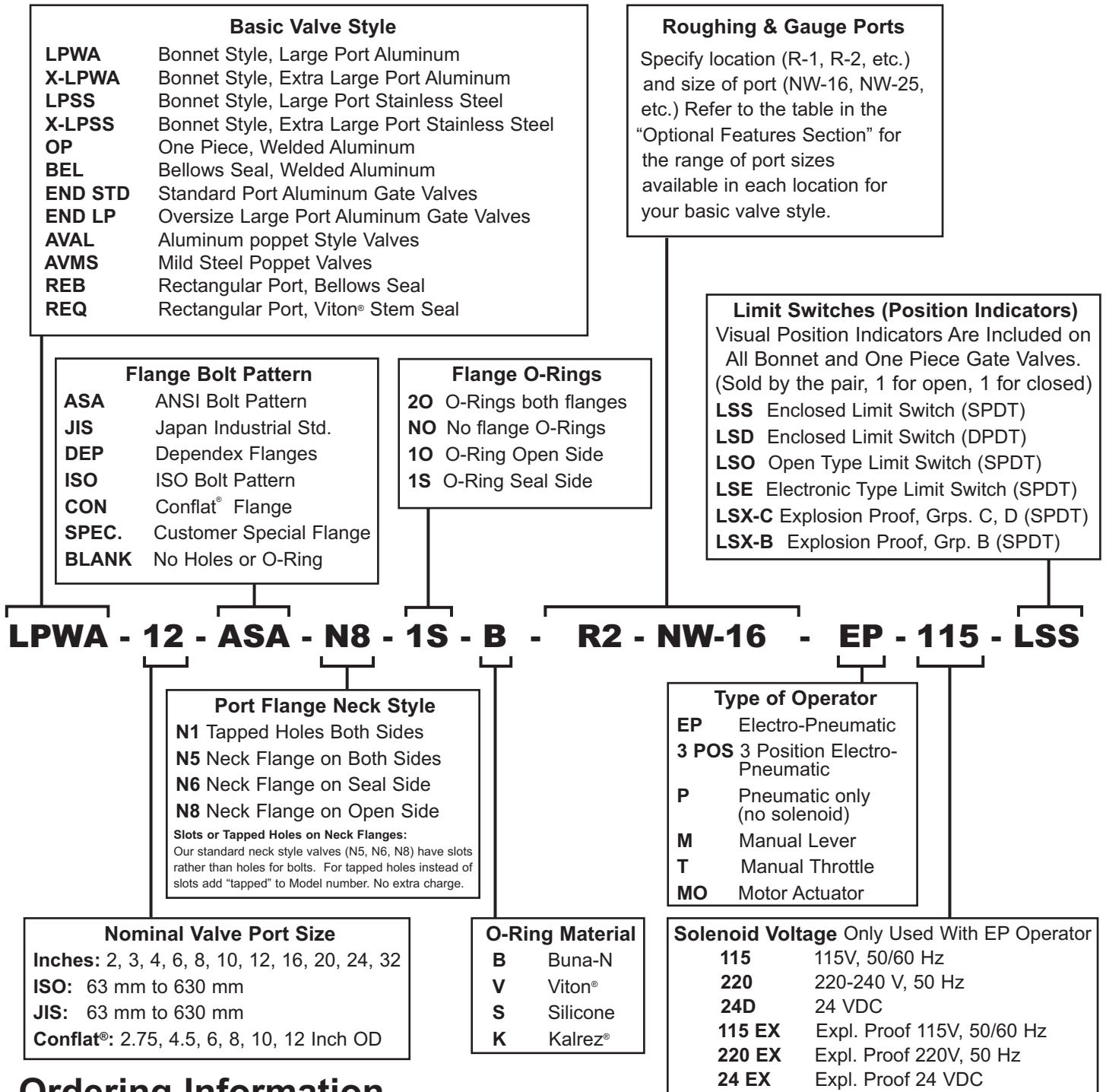
#### Cable Between Valve and Positioner

A 25 ft. (7m) cable is included with each Throttemaster™ 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.

Throttemaster™ is a trademark of Vacuum Research.



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 Corporation, 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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