

Valv-Powr® Series VPVL Stainless Steel Model D Double-Acting and Spring-Return Rack-and-Pinion Compact Pneumatic Actuators

Valv-Powr – VPVL double-opposed piston actuators combine the benefits of high cycle life, a rugged construction, and an extremely compact and symmetrical design with a unique range of features and options. They are specifically designed for fast efficient operation of ball, butterfly, and other rotary type valves.

FEATURES

Corrosion Resistant

The Jamesbury® brand line of forged stainless steel actuators are designed for use in corrosive environments. The products are constructed of A182 F316/EN 10088/3 1.4401 quality stainless steel and epoxy-coated springs, along with internal and external stainless steel fasteners, provide corrosion resistance in a variety of difficult applications and environments.

Typical applications include:

- Pharmaceutical
- Sanitary
- Food Industry
- Marine and Offshore

Single-Source Responsibility

- Valves, actuators, and accessories are designed to operate as a unit with the highest degree of compatibility.
- Valves, actuators, and accessories can be supplied completely assembled to provide unit responsibility from a single source.

Versatility

- Modular designs with same body and end caps for double-acting and spring-return reduce inventory. Springs can be added in the field to convert double-acting to spring-return or for changes in supply pressure.
- Failure direction can be easily reversed from spring-to-open or spring-to-close orientation simply by inverting the pistons.
- Actuator to valve attachments comply with ISO 5211.
- Solenoid valve and accessory attachments comply with NAMUR VDI/VDE 3845.
- A wide range of optional accessories and control devices that include limit switches, solenoid valves, and mechanical safety lockouts are available to satisfy virtually all automated valve requirements.



High Cycle Life

- Bearings on all sliding and rotating moving parts to ensure long life.
- Dual piston rack-and-pinion mechanism for simple construction, high cycle life, and constant torque.
- Body and end caps with honed internal surfaces for strength and lower coefficient of friction.
- Mechanically multi-guided aluminum pistons for precise movement, low friction, and high cycle life.
- Machined teeth on piston racks and pinions for excellent rack and pinion engagement and maximum efficiency.
- Extended temperature range option decreases cycle life.

Reliability

- Safety-contained multi-spring design with preloaded and heavy-duty coated springs for simpler range versatility, greater safety, and corrosion resistance.
- External adjustable stops in both directions assure flexibility and accuracy when setting the valve in the open and closed positions.
- As an added safety feature, the external adjustment screws are slotted. The slot will indicate the presence of internal pressure. Pressure will begin to vent before the adjustment screws are completely backed out of the actuator.

SPECIFICATIONS

Maximum Supply Range: 116 psi (8 bar)

Temperature Range:

Standard -40°F to +176°F (-40°C to +80°C)

High Temp 5°F to +302°F (-15°C to +150°C)

Low Temp -60°F to +176°F (-51°C to +80°C)

Rotation Adjustment: Close -5° to +5° from 0°
Open +5° to -5° from 90°

Supply Media: Air, mineral-based hydraulic fluid

STANDARDS

Actuator to valve mounting: ISO 5211

Actuator to solenoid mounting: Namur, VDI/VDE3845

Actuator to accessory mounting: Namur, VDI/VDE3845

Approved to ATEX 94/9/EC Directive:

IIGD c T95°C for Standard and Low Temperature option
or IIGD c T150°C for the High Temperature option.

ACTUATOR SELECTION

To select an actuator for a particular valve and service, first determine the maximum operating torque that will be required from the applicable valve bulletin. Then refer to the appropriate torque output table and select an actuator that will, at the available supply pressure, provide a torque output no less than the required operating torque for the

valve. For spring-return units, both the spring torque and the air torque must be sufficient. In the event confirmation is desired for the selection of an actuator under specific service conditions, include full details on trim, seat materials, and media characteristics.

Actuator Model		Air Volume						Bore Diam.		Moving Time Seconds ¹		Weight	
		cu. in.			ml								
		Opening	Closing	Swept	Opening	Closing	Swept	in.	mm	Opening	Closing	lb.	kg
VPVL051	DA	5.5	9.2	3.4	90.1	150.8	55.5	1.97	50	0.2	0.3	2.2	1.0
	SR		-			-				0.3	0.3	2.4	1.1
VPVL100	DA	9.8	15.9	6.0	160.6	260.6	97.8	2.48	63	0.3	0.3	3.5	1.6
	SR		-			-				0.3	0.4	3.7	1.7
VPVL200	DA	18.9	29.9	11.8	309.7	490	194.1	2.95	75	0.3	0.4	6.0	2.7
	SR		-			-				0.4	0.5	6.8	3.1
VPVL250	DA	31.1	47.6	18.6	509.6	780	305.4	3.46	88	0.4	0.5	8.2	3.7
	SR		-			-				0.5	0.6	9.5	4.3
VPVL300	DA	43.3	67.7	27.1	709.6	1109	443.7	3.94	100	0.5	0.7	11.5	5.2
	SR		-			-				0.6	0.8	13.4	6.1

NOTES:

(1) The above times are based on the following conditions: A) Room temperature , B) Solenoid valve orifice diameter of 4 mm (5/32 in.) and a flow rate capacity of 400 L/min (14.1 cfm), C) Minimum inner piping diameter of 8 mm (5/16 in.), D) 5.5 bar (80 psi) air supply pressure, E) Without valve loading.

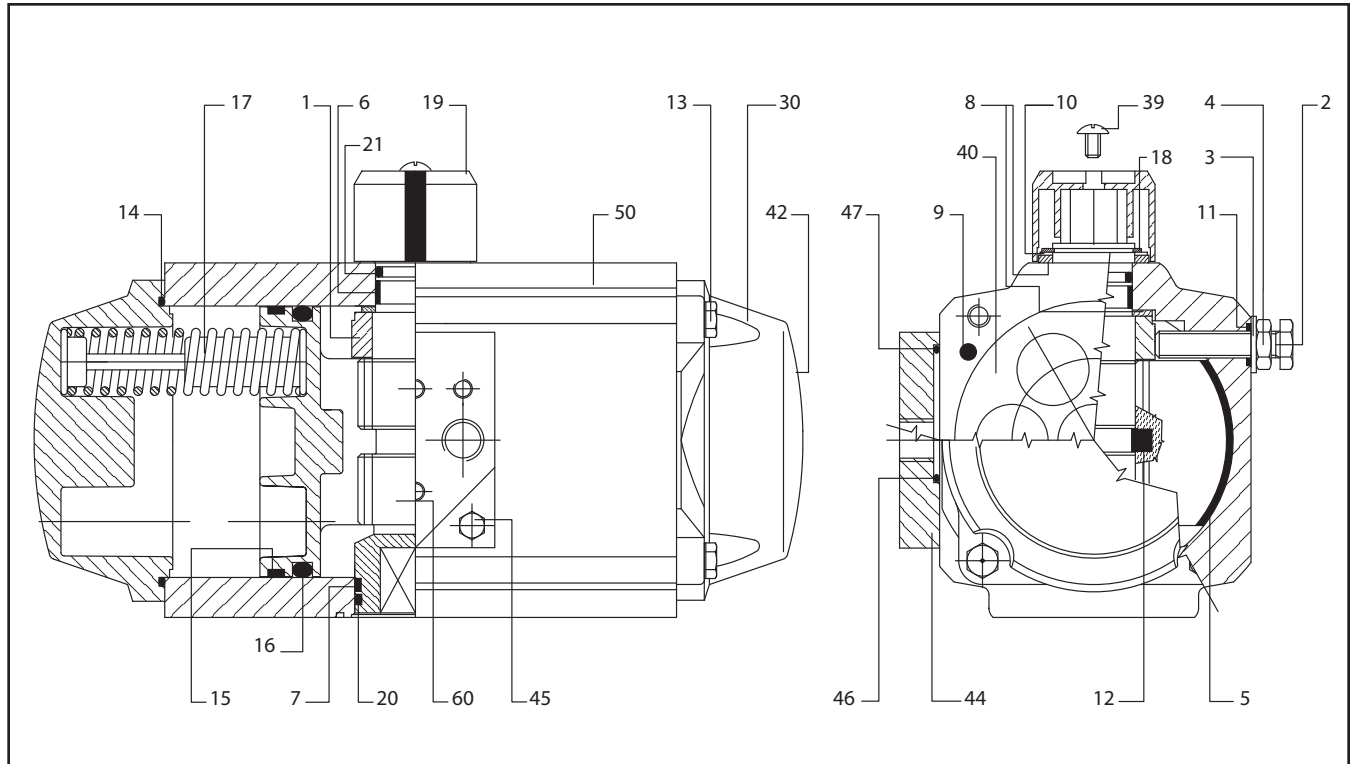
DOUBLE ACTING

Actuator Model	Torque Output in FT•LBS - VPVL XXDA Double-Acting Actuator at Specified psi Supply Pressures						
	40 psi	50 psi	60 psi	70 psi	80 psi	90 psi	100 psi
VPVL 051	6.8	8.5	10.1	11.8	13.5	15.2	16.9
VPVL 100	12	14.9	17.9	20.9	23.9	26.8	29.8
VPVL 200	23.7	29.6	35	41	47	53	59
VPVL 250	37.2	46.6	55	65	74	83	93
VPVL 300	54	67.6	81	94	108	122	135

Actuator Model	Torque Output in N•m - VPVL XXDA Double-Acting Actuator at Specified bar Supply Pressures						
	2.7 bar	3.5 bar	4.2 bar	4.8 bar	5.5 bar	6.2 bar	6.9 bar
VPVL 051	8.9	11.6	14	16	18.3	20.7	23
VPVL 100	16	20.5	24.6	28.1	32	36	40
VPVL 200	31	40	48	55	64	72	80
VPVL 250	48	66	79	90	103	117	130
VPVL 300	68	93	112	128	146	165	184

SPRING RETURN

Actuator Model	Spring-Return Torque Output		Air Torque Output at Specified Supply Pressure			
	FT•LBS	N•m	FT•LBS, @ 60 psi	N•m @ 4.2 bar	FT•LBS @ 80 psi	N•m @ 5.5 bar
051 SR4/5	4.4	6.0	3.1	4.2		
051 SR6	5.9	8.0			4.1	5.6
100 SR4/5	7.4	10	6.7	9.1		
100 SR6	9.8	13.3			8.9	12
200 SR4/5	14.7	19.9	13	17		
200 SR6	19.6	26.5			17	23
250 SR4/5	24.3	33	18	24		
250 SR6	32.5	44.5			23	32
300 SR4/5	33.6	45.6	29	39		
300 SR6	44.9	60.8			38	52

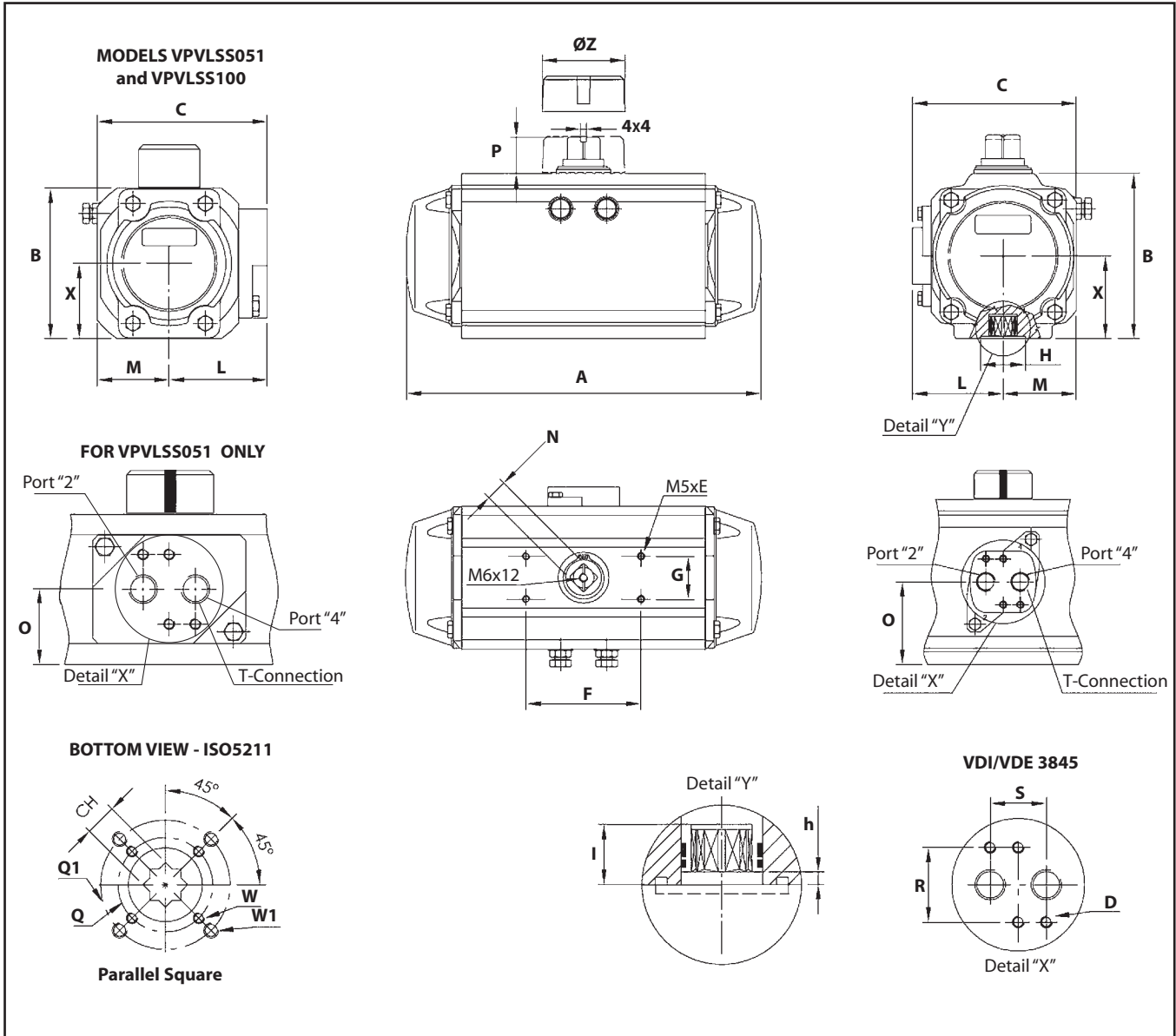


BILL OF MATERIALS AND PARTS LIST

No.	Unit Qty	Part Description	Material	Specifications
1	1	Octi-Cam (Stop Arrangement)	Stainless Steel	EN 10088-3
2	2	Stop Cap Screw	Stainless Steel	ISO 3506
3	2	Washer	Stainless Steel	ISO 3506
4	2	Nut (Stop Screw)	Stainless Steel	ISO 3506
5*	2	Bearing (Piston Back)	Polyphthalamide	Stanyl TW300
6*	1	Bearing (Pinion Top)	Polyetherimide	Stanyl TW300
7*	1	Bearing (Pinion Bottom)	Polyetherimide	Stanyl TW300
8*	2	Thrust Bearing (Pinion)	Polyphthalamide	Stanyl TW300
9*	2	Plug	Nitrile Rubber	NBR 70Shore A
10	1	Thrust Washer (Pinion)	Stainless Steel	EN 10088-3
11*	2	O-ring (Stop Screw)	Nitrile Rubber	NBR 70Shore A
12	2	Piston Guide	Polyphthalamide GF	Amodel AS1145
13	8	Cap Screw (End Cap)	Stainless Steel	ISO 3506
14*	2	O-ring (End Cap)	Nitrile Rubber	NBR 70Shore A
15*	2	Bearing (Piston Head)	Polyphthalamide	
16*	2	O-ring (Piston)	Nitrile Rubber	NBR 70Shore A
17	min. 9/ max.12	Spring (Cartridge)	Alloy Steel	DIN 17223 Part2
18	1	Spring Clip (Pinion)	X35CrMo17	
19	1	Position Indicator	Polypropylene GF	Halplen EP30
20*	1	O-ring (Pinion Bottom)	Nitrile Rubber	NBR 70Shore A
21*	1	O-ring (Pinion Top)	Nitrile Rubber	NBR 70Shore A
30	2	End Caps	Stainless Steel	EN 10088-3 / ASTM A351
39	1	Cap Screw (Indicator)	Stainless Steel	ISO 3506
40	2	Pistons	Aluminum	UNI 5075
44	1	NAMUR Connecting Plate	Stainless Steel	EN 10088-3
45	2	Cap Screw (Connection Plate)	Stainless Steel	ISO 3506
46	1	O-ring (Port 2)	Nitrile Rubber	NBR 70Shore A
47	1	O-ring (Port 4)	Nitrile Rubber	NBR 70Shore A
50	1	Body	Stainless Steel	EN 10088-3 / ASTM A182
60	1	Drive Shaft	Stainless Steel	EN 10088-3 / ASTM A582

* Suggested spare parts for maintenance

DIMENSIONS



Dimensions - inches / lb.

Size	A	B	C	D	E	F	G	H	I min.	L	M	N	O	P	Q	Q1	R	S	T NPT	W	W1	X	ISO Flange	CH	h min.	Z	Weight		
																													DA
051	5.55	2.72	2.95	M5x8	0.16	3.15	1.18	0.98	0.47	1.65	1.30	0.43	1.38	0.79	1.42	-	1.26	0.94	1/8"	M5	-	1.36	F03	0.43	0.02	1.57	5.9	6.2	
100	6.26	3.35	3.39	M5x8	0.31	3.15	1.18	1.38	0.63	1.93	1.46	0.43	1.69	0.79	1.97	-	1.26	0.94	1/4"	M6	-	1.67	F05	0.55	0.02	1.57	8.4	8.8	
200	8.31	4.02	3.90	M5x8	0.31	3.15	1.18	1.38	0.63	2.20	1.73	0.67	2.01	0.79	1.97	2.76	1.26	0.94	1/4"	M6	M8	2.01	F05 + F07	0.55	0.06	1.57	13.6	14.5	
250	9.76	4.53	4.49	M5x8	0.31	3.15	1.18	1.57	0.83	2.48	2.01	0.67	2.28	0.79	1.97	2.76	1.26	0.94	1/4"	M6	M8	2.26	F05 + F07	0.75	0.06	1.57	20	21.4	
300	10.55	5.00	5.04	M5x8	0.31	3.15	1.18	2.17	0.83	2.80	2.28	0.67	2.52	0.79	2.76	4.02	1.26	0.94	1/4"	M8	M10	2.50	F07 + F10	0.75	0.06	1.57	26.2	28.7	

Dimensions - mm / kg

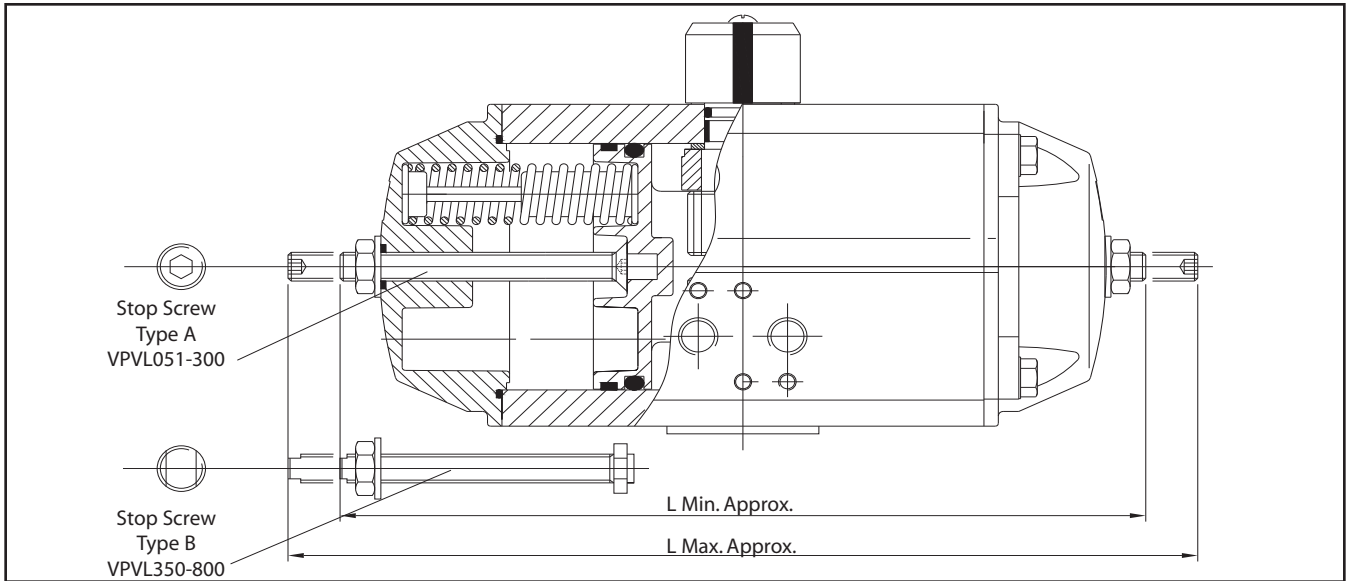
Size	A	B	C	D	E	F	G	H	I min.	L	M	N	O	P	Q	Q1	R	S	T NPT	W	W1	X	ISO Flange	CH	h min.	Z	Weight		
																													DA
051	141	69	75	M5x8	4	80	30	25	12	42	33	11	35	20	36	-	32	24	1/8"	M5	-	34.5	F03	11	0.5	40	2.7	2.8	
100	159	85	86	M5x8	8	80	30	35	16	49	37	11	43	20	50	-	32	24	1/4"	M6	-	42.5	F05	14	0.5	40	3.8	4.0	
200	211	102	99	M5x8	8	80	30	35	16	56	44	17	51	20	50	70	32	24	1/4"	M6	M8	51	F05 + F07	14	1.5	40	6.2	6.6	
250	248	115	114	M5x8	8	80	30	40	21	63	51	17	58	20	50	70	32	24	1/4"	M6	M8	57.5	F05 + F07	19	1.5	40	9.1	9.7	
300	268	127	128	M5x8	8	80	30	55	21	71	58	17	64	20	70	102	32	24	1/4"	M8	M10	63.5	F07 + F10	19	1.5	40	11.9	13.0	

OPTIONS

100% Adjustable Travel Stop

To limit the rotation on the stroke beyond the standard VPVL actuator, a stainless steel 100%-adjustable travel stop option can be added. The stops, located in the end caps, allow the valve position to be set anywhere between full closed and full open. This option limits travel of only the counter-clockwise stroke for standard double-acting and spring-closed units. The 100% Adjustable Stop option is specified in the actuator ordering code.

Actuator	100% Travel Stop Lengths			
	L Min		L Max	
	inch	mm	inch	mm
VPVL051	6.2	158	7.3	186
VPVL100	7.2	184	8.5	216
VPVL200	9.5	242	11.3	286
VPVL250	11.0	280	13.0	330
VPVL300	11.9	303	14.1	359

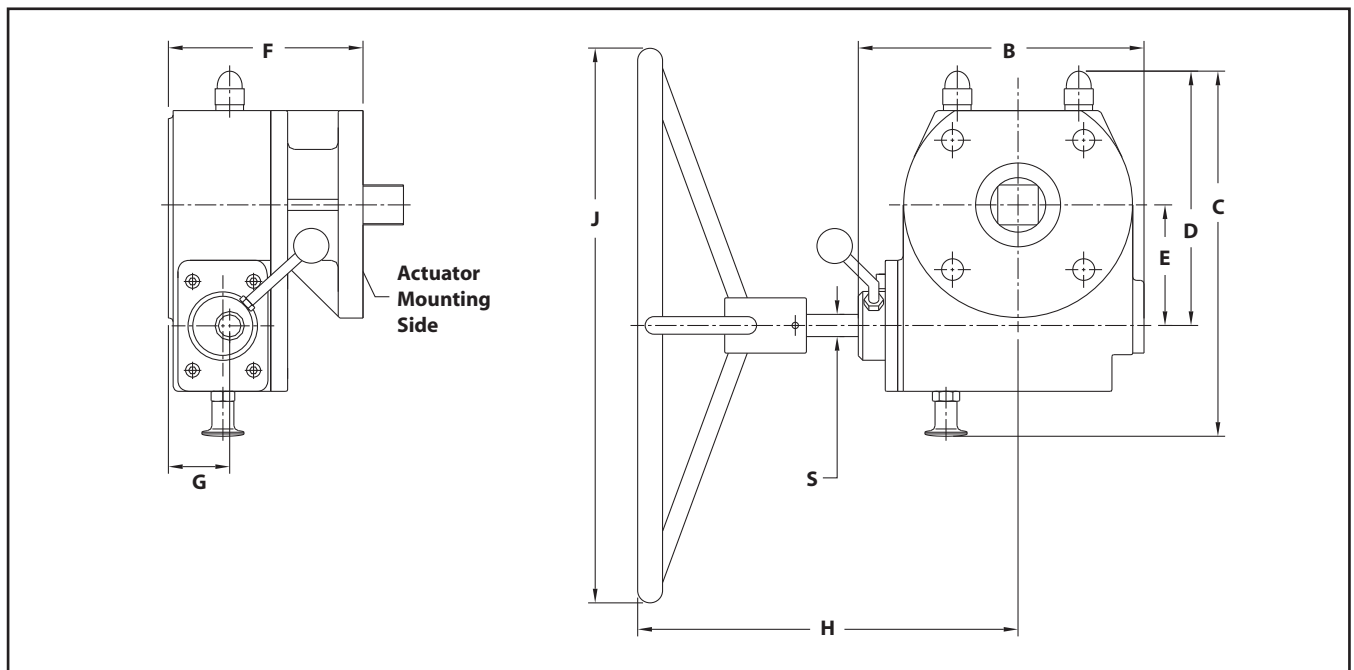


Declutchable Manual Override

A side-declutchable manual override is available for VPVL actuators. It consists of a manual gear actuator mounted between the actuator and the valve. The device is normally disengaged from the shaft. Upon engagement of the override clutch, overriding the actuator is done with ease, aided by the high-reduction ratio of the manual gear unit.



DIMENSIONS



VPVL Actuator Model (DA or SR)	Declutchable Override Kit	Approximate Dimensions - Inches									Approx. Weight lbs.
		B	C	D	E	F	G	H	J	S	
VPVL250 and VPVL300	DO-1	5.75	6.89	5.61	2.36	4.53	1.44	8.94	7.87	0.47	22

* The VPVL700 DA unit may be used if the air pressure required to produce the needed output torque is lower than 95 psi.

VPVL Actuator Model (DA or SR)	Declutchable Override Kit	Approximate Dimensions - mm									Approx. Weight kgs.
		B	C	D	E	F	G	H	J	S	
VPVL250 and VPVL300	DO-1	146	175	142	60	115	37	227	200	12	10

* The VPVL700 DA unit may be used if the air pressure required to produce the needed output torque is lower than 6.5 bar.

HOW TO ORDER

To specify a complete *Valv-Powr Value-Line*® Stainless Steel Actuator, simply make a selection from the code boxes below.

EXAMPLE: VPVLS200 SR4/5, shown below, is a 13.1 FT•LBS @ 60-psi (17 N•m @ 4.2 bar) spring-return actuator with spring-to-close rotation.

1	2	3	4	5	6	7
VPVLS		200	SR4/5	-	D	-

1	Product Group
VPVL	<i>Valv-Powr Value-Line</i> Double-Opposed Piston Actuator

2	Exterior Option
-	Standard
P	Polished Surfaces

3	Size
051	Select from Torque Table
100	
200	
250	
300	

4	Series
DA	<i>Valv-Powr Value-Line</i> Double-Opposed Piston Actuator
SR4/5	Spring-Return 60-psi (4.1 bar) Spring-to-Close (CW Rotation)
SR6	Spring-Return 80-psi (5.5 bar) Spring-to-Close (CW Rotation)

5	Options
-	Standard Temperature Rating: -40°F +176°F (-40°C to +80°C)
HT	High Temperature Rating: +5°F to +302°F (-15°C to +150°C)
LX	Low Temperature Rating: -60°F to +176°F (-51°C to +80°C)
FO	Spring-to-Open (CCW Rotation)
AS	100% Travel Stops

6	Model
D	Model D

7	Modifier Code
-	Standard

Subject to change without prior notice.

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