

# P3 Series Pneumatic Actuators

Chemline P3 Series are quarter turn pneumatic actuators specially chosen for all sizes of ball and butterfly valves. These actuators are designed to withstand highly corrosive environments, underwater and marine applications. All offer long cycling life.

Normal working temperatures are  $-32^{\circ}\text{C}$  to  $90^{\circ}\text{C}$ . They may be actuated with air or non-aggressive fluids up to 120 psi pressure.

P3 Series is one in a range of actuators specially selected for ball and butterfly valves. Hardware kits are available for mounting of actuators in the field. Also offers complete actuated valves, fully assembled and bench tested.

## Corrosion Resistant Long Cycling Life

### Features

#### Application Diversity

- Normal working temperatures are  $-32^{\circ}\text{C}$  to  $90^{\circ}\text{C}$ .
- They may be actuated with air or non-aggressive fluids up to 120 psi pressure.

#### Long Cycling Life

- Double O-ring shaft seals
- Massive teeth engagement between racks and pinion
- Balanced internal forces
- Minimal backlash and no play in parts
- Self-Lubricating O-Rings

#### Compact, Simple Design

- Double piston, double rack and pinion design supplies constant torque output
- All porting is integral

#### Standard ISO and NAMUR Dimensions

- Permits easy mounting of control accessories to actuator and actuator to valve

#### Integrated Travel Stops

- Permit adjustment of last 5 degrees of both open and close travel

#### Retained Spring Set

- Prevent over extension of spring during disassembly



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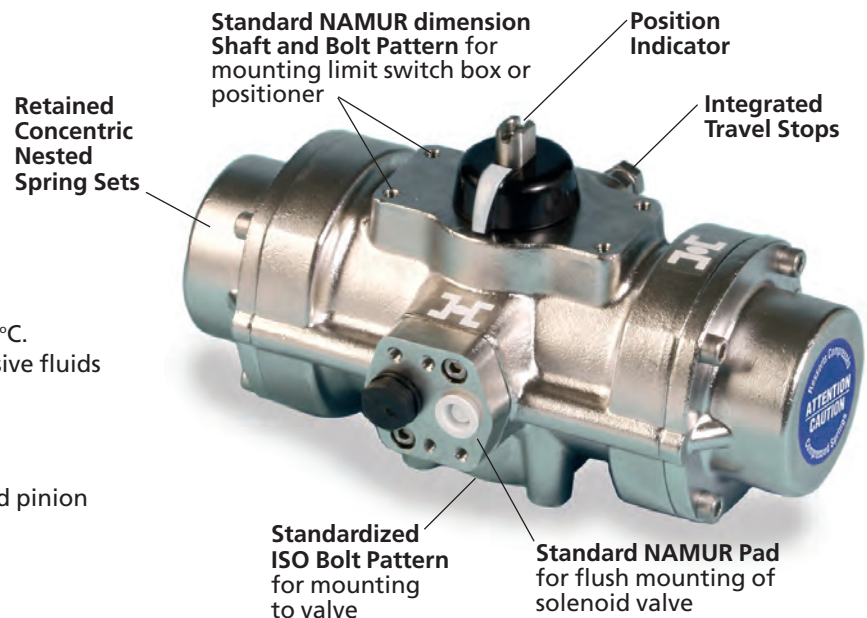
## 316 Stainless Steel

**SERIES:** P3SR – Spring Return  
P3DA – Double Acting

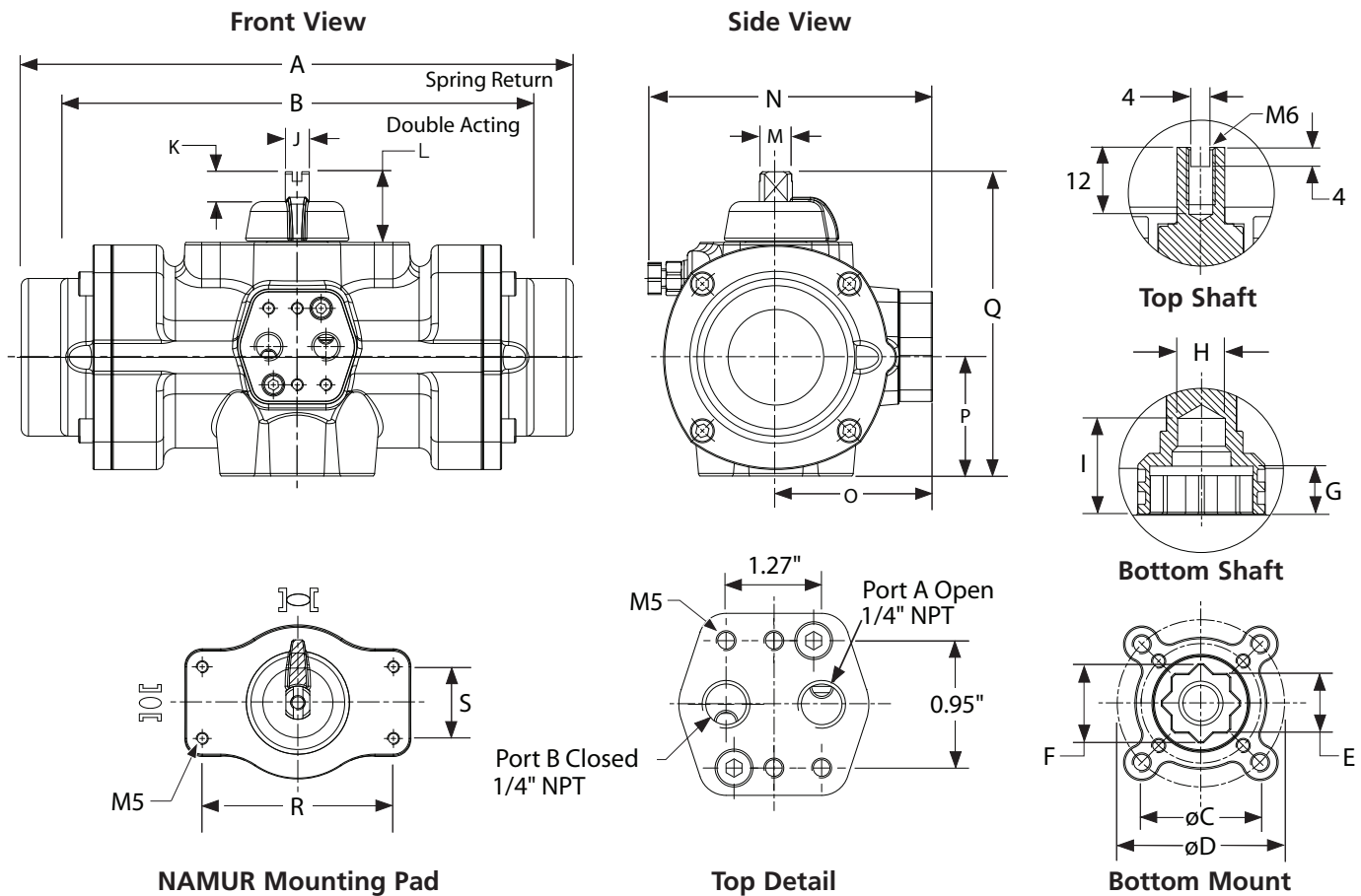
**CONTROL PRESSURE:** 40 psi to 120 psi

### OUTPUT TORQUES:

Up to 2,422 in.-lb. Spring Return  
and 5,757 in.-lb. Double Acting



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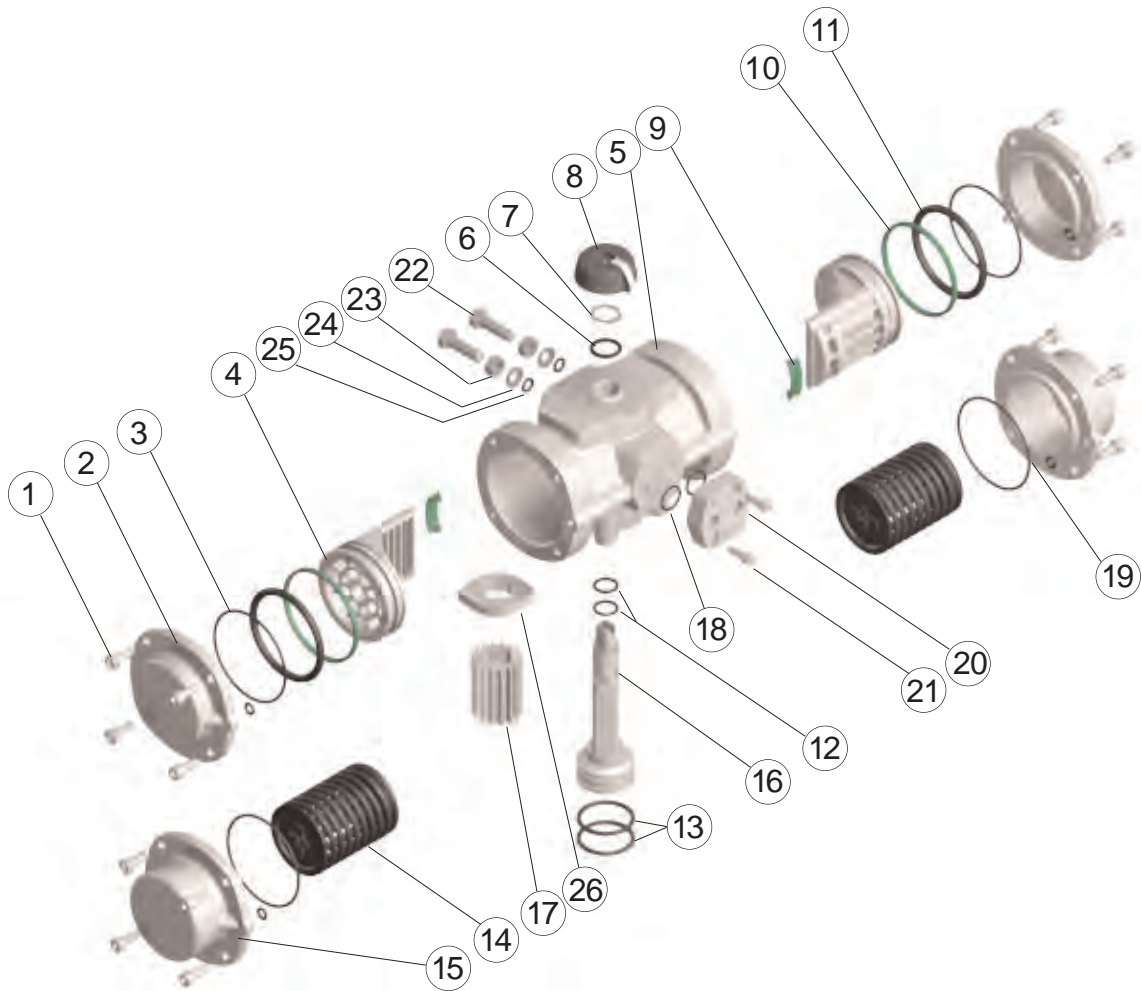
## DIMENSIONS INCHES

Size	Item No. DA SR		A SR	B DA	Bottom Mount Detail						Bottom Shaft Detail				
					C			D			E	F	G	H	I
					Dia.	Thread	Depth	Dia.	Thread	Depth					
00	P3DA00	P3SR00	6.30	5.47	1.97 (F05)	M6	0.71	-	-	-	0.55	0.75	0.59	0.57	1.18
10	P3DA10	P3SR10	9.09	7.80	1.97 (F05)	M6	0.67	2.76 (F07)	M8	0.79	0.67	0.91	0.59	0.59	1.18
20	P3DA20	P3SR20	12.13	10.12	1.97 (F05)	M6	0.71	2.76 (F07)	M8	0.91	0.87	1.14	0.75	0.87	1.26
30	P3DA30	P3SR30	18.80	13.76	2.76 (F07)	M6	0.91	4.02 (F10)	M8	1.06	1.18	1.57	1.18	1.06	1.65

## DIMENSIONS INCHES

Size	Item No. DA SR		Top Shaft Detail				N	O	P	Q	R	S
			J	K	L	M						
00	P3DA00	PASR00	0.39	0.43	1.18 (ISO-2)	0.54	3.58	2.17	1.77	4.37	3.15	1.18
10	P3DA10	PASR10	0.39	0.43	1.18 (ISO-2)	0.54	4.43	2.58	1.96	4.96	3.15	1.18
20	P3DA20	PASR20	0.63	0.43	1.18 (ISO-2)	0.86	5.47	3.19	2.80	6.31	3.15	1.18
30	P3DA30	PASR30	0.63	0.43	1.18 (ISO-2)	0.86	7.30	4.06	3.78	8.31	3.15	1.18

# P3 Series Pneumatic Actuators



## PARTS

▲ Recommended Spare Parts

No.	Part	Size	Pcs.	Materials
1▲	Allen Screw	0 to 20	8	316 Stainless Steel
		30	12	
2	Double Acting Cap	00 to 30	2	CF8M Stainless Steel
3▲	Cap O-Ring	00 to 30	2	Nitrile Buna-N
4	Piston	00 to 20	2	Polyarilamide
		30	2	Aluminum Alloy coated with cataphoresis
5	Cylinder	00 to 30	1	CF8M Stainless Steel
6	Washer	00 to 30	1	Polyamide 6
7	Spring Clip	00 to 30	1	Stainless Steel
8	Position Indicator	00 to 30	1	Polyamide
9	Piston Guide	00 to 20	2	Polyacetal
		30	4	PTFE-Bronze
10	Guide Ring	00 to 20	2	Polyacetal
		30	2	PTFE-Bronze
11▲	Piston O-Ring	00 to 20	2	Nitrile Buna-N
		30	4	
12▲	Upper Shaft O-Ring	00 to 30	2	Nitrile Buna-N

## PARTS

▲ Recommended Spare Parts

No.	Part	Size	Pcs.	Materials
13▲	Lower Shaft O-Ring	00 to 30	2	Nitrile Buna-N
14	Preloaded Springs Set	00 to 30	1	DIN-17223-C coated with cataphoresis
15	Spring Return Cap	00 to 30	2	CF8M Stainless Steel
16	Shaft	00 to 20	1	303 Stainless Steel
		30	1	316 Stainless Steel
17	Gear	10 to 30	1	Aluminum Alloy coated with cataphoresis
18	Plate O-Ring	00 to 30	2	Nitrile Buna-N
19	Cap O-Ring	00 to 30	2	Nitrile Buna-N
20	Pneumatic Connection Plate	00 to 30	1	CF8M Stainless Steel
21	Plate Allen Screw	00 to 30	2	316 Stainless Steel
22	Bolt	10 to 30	2	316 Stainless Steel
23	Nut	10 to 30	2	316 Stainless Steel
24	Bushing	10 to 30	2	316 Stainless Steel
25	O-Ring	10 to 30	2	Nitrile Buna-N
26	Cam	10 to 30	1	CF8M Stainless Steel

# P3 Series Pneumatic Actuators



## TORQUE – DOUBLE ACTING INCH POUNDS

Model No.	Supply Pressure (psi)					Model No.	Supply Pressure (psi)				
	40	60	80	100	120		40	60	80	100	120
P3DA00	93	147	201	256	309	P3DA20	622	978	1,334	1,689	2,045
P3DA10	263	417	571	725	880	P3DA30	1,825	2,804	3,789	4,770	5,757

## TORQUE – SPRING RETURN INCH POUNDS

Model No.	Number of Springs	Spring		Supply Pressure (psi)									
				40		60		80		100		120	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
P3SR00	1	62	42	50	31	105	85	159	139	213	194	-	-
	2	93	66	-	-	81	54	136	108	190	163	244	217
	3	116	91	-	-	56	31	110	85	164	139	218	193
	4 <sup>1</sup>	141	100	-	-	47	6	101	60	155	115	210	169
P3SR10	1	166	115	147	97	302	252	457	407	612	561	-	-
	2	248	175	-	-	241	169	396	323	550	477	704	632
	3	358	253	-	-	164	60	318	214	473	368	627	523
	4 <sup>1</sup>	412	286	-	-	131	5	286	159	440	313	594	468
P3SR20	1	371	223	399	251	755	607	1,111	963	1,467	1,319	-	-
	2	593	346	-	-	632	384	987	740	1,342	1,095	1,698	1,451
	3	816	494	-	-	483	162	839	518	1,195	874	1,551	1,229
	4 <sup>1</sup>	915	569	-	-	410	64	766	419	1,121	774	1,476	1,130
P3SR30	1	831	484	1,338	992	2,321	1,975	3,304	2,958	4,287	3,941	-	-
	2	1,315	831	992	508	1,975	1,490	2,957	2,473	3,940	3,455	4,922	4,438
	3	1,799	1,246	-	-	1,558	1,005	2,543	1,989	3,527	2,973	4,511	3,957
	4 <sup>1</sup>	2,422	1,592	-	-	1,216	385	2,199	1,368	3,182	2,351	4,165	3,334

<sup>1</sup>Standard Spring set.

## WEIGHTS, AIR CONSUMPTIONS AND CYCLE TIMES

Size	Item No.	Weight Lbs.	Double Acting				Spring Return				
			Air Consumption (li) <sup>2</sup>		Cycle Time (Sec.)		Item No.	Weight Lbs.	Air Consumption (Standard litres) <sup>2</sup>	Cycle Time (Sec.)	
			Open Port A	Close Port B	Open Port A	Close Port B				Open Port A	Close Port B
00	P3DA00	4.85	0.15	0.18	0.15	0.15	P3SR00	5.73	0.15	0.20	0.20
10	P3DA10	10.36	0.35	0.45	0.25	0.25	P3SR10	12.35	0.35	0.30	0.30
20	P3DA20	13.01	0.80	1.05	0.40	0.40	P3SR20	21.83	0.80	0.50	0.50
30	P3DA30	39.46	2.10	1.90	0.60	0.60	P3SR30	56.00	2.10	1.20	1.20

<sup>2</sup>1 Liter = 61.02 cubic inches

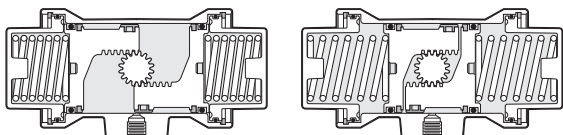
## OPERATION

Pressure to **Port A** moves pistons inward, turning output shaft 90° clockwise, as viewed from top of actuator.

Pressure to **Port B** moves pistons outward, compressing springs (on spring return models only) and turning output shaft 90° counter-clockwise, as viewed from top of actuator.

## OTHER ACTUATOR TYPES

- Aluminum Actuators
- Plastic Actuators
- 180° Actuators
- High-Temperature Actuators



# P Series Accessories



## For P Series Actuators

Accessories are supplied mounted to actuators and bench tested, or separately.

### SOLENOID VALVES

Pilot solenoid valves control air supply air in and out of pneumatic actuators to open and close the valve and are electrically actuated. They are usually but not always mounted directly to the actuator. V Series Solenoid Valves are CSA/UL approved and designed for multi-million cycle life. These mount flush to P Series or any other NAMUR compliant pneumatic actuator. They are robust, reliable and corrosion resistant, offering high air flows and fast response. The same valve functions as both 5/2 way (for double acting actuators) and 3/2 way (for spring return actuators). Simply flip over the base plate which changes porting configurations. A screw type manual override is standard. Construction is glass reinforced polyamide body, nitrile seals, nickel plated ports and screws, and epoxy encapsulated coil. The electrical connection is a 3-pin DIN plug with 1/2" NPT for conduit connection. Grommet (cable gripper) and LED grommet (glows to indicate power) version plugs are also available. Versions are available in different voltages, also in intrinsically safe and explosion proof designs.



Solenoid Valves

### LIMIT SWITCHES

Limit switches are for On and/or Off valve position feedback. YT Series Limit Switch Boxes are CSA/UL approved 2-position units which are easily mounted to P Series or any other NAMUR compliant rotary actuator. They are compact and robust, featuring quick-setting switch cams, high visibility position indicator beacon and a quick-access cover. Dual 1/2" NPT conduit entries and an 8-position terminal strip allow for wiring of a solenoid valve through the box. The standard model has an epoxy coated aluminum housing and single-pole double-throw switches rated for multi million cycles. An intrinsically safe version is available with inductive proximity switches. Also available are hazardous area enclosures. Another series is available with various BUS modules.



Limit Switches

### DECLUTCHABLE GEAR OVERRIDE

The MO Series Manual Declutchable Gear Override allows manual valve/actuator operation of actuated valves in case supply pressure fails. The unit is mounted between the actuator and the valve mounting bracket. For normal powered operation the worm gear is disengaged by moving the lever bar upwards. Construction is epoxy coated cast iron housing with aluminum or welded steel hand wheel. These rugged units are suitable for indoor and outdoor use. The self-locking worm gear design offers safe and easy operation, positive manual positioning and long life.



Declutchable Gear Override

### POSITIONERS

Valve positioners control actuator-valve position, responding to a signal from a process controller, usually electronic (most often 4–20mA) or sometimes pneumatic (3–15 psi). YT Series positioners are easy to mount directly to P Series actuators and other NAMUR compliant rotary actuators. They have epoxy coated aluminum enclosures and are also available in 316 stainless steel. All available models are attractively priced:

- **YT1200R 3–15 psi Pneumatic** – a conventional all-mechanical positioner
- **YT1300R 4–20 mA Electro-Pneumatic** – an electronic positioner designed for vibration resistance, better control and easy calibration
- **YT2300 4–20 mA Smart** – a fully digital positioner with intelligent functions like auto calibration, PID control, also theoretical and user defined characterized output. Options include alarms (switch or relay output), 4–20 mA transmitter for position feedback and HART digital communication protocol.



Positioners

### AIR FILTER/REGULATOR

A filter/regulator is required to protect pneumatic equipment with small orifices from clogging due to debris and to protect from corrosion or fouling due to excess oil or condensed water in the air supply. Chemline **includes an air filter/regulator with all positioners** mounted to actuators. Chemline recommends they **also be supplied with all pilot solenoid valves**. The F/R-A is a one-piece air filter/regulator and pressure gauge with a GRP plastic body, polycarbonate filter bowl and polyethylene filter element. The filter bowl has a manual drain valve.



Air Filter/Regulator