

# PH Series High Temperature Pneumatic Actuators

Chemline PH Series are quarter turn pneumatic actuators specially chosen for all sizes of ball and butterfly valves. These actuators are designed to operate in ambient temperatures up to 265°C on kilns, boilers, furnaces, process vessels and heat exchangers. They are actuated by air or non-aggressive fluids up to 120 psi pressure. All offer long cycling life.

The housing and end caps are of die-cast aluminum specially treated to prevent deformation at high temperatures. The housing is coated with DACROMET (a corrosion inhibitor) with a top layer of 10 mils of Teflon® PTFE.

PH 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

#### Long Cycling Life

- Self-lubricating O-Rings
- Double O-Ring Shaft Seals
- Minimal backlash with no play in parts

#### Application Diversity

- Normal working temperatures are -32°C to 265°C
- Can be actuated with air or non-aggressive fluids up to 120 psi pressure

#### Standard ISO and NAMUR Dimensions

- Permits easy mounting of control accessories to actuator and of actuator to valve
- Standardized mounting kits/brackets are readily available

#### Compact, Simple Design

- Double piston, double rack and pinion design supplies constant torque output
- Balanced Internal Forces
- High torque-to-weight ratio
- All porting is integral

\* Largest double-acting unit will power up to 24". Largest spring return unit will power up to 18".

† Fluorocarbon coating with reinforced binder resins

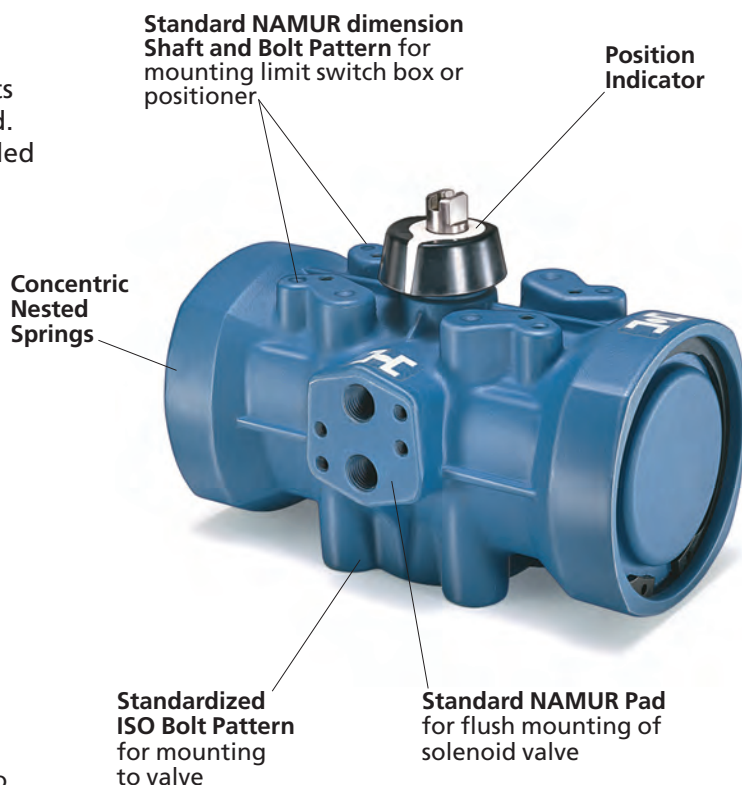


## Xylan® Coated Aluminum†

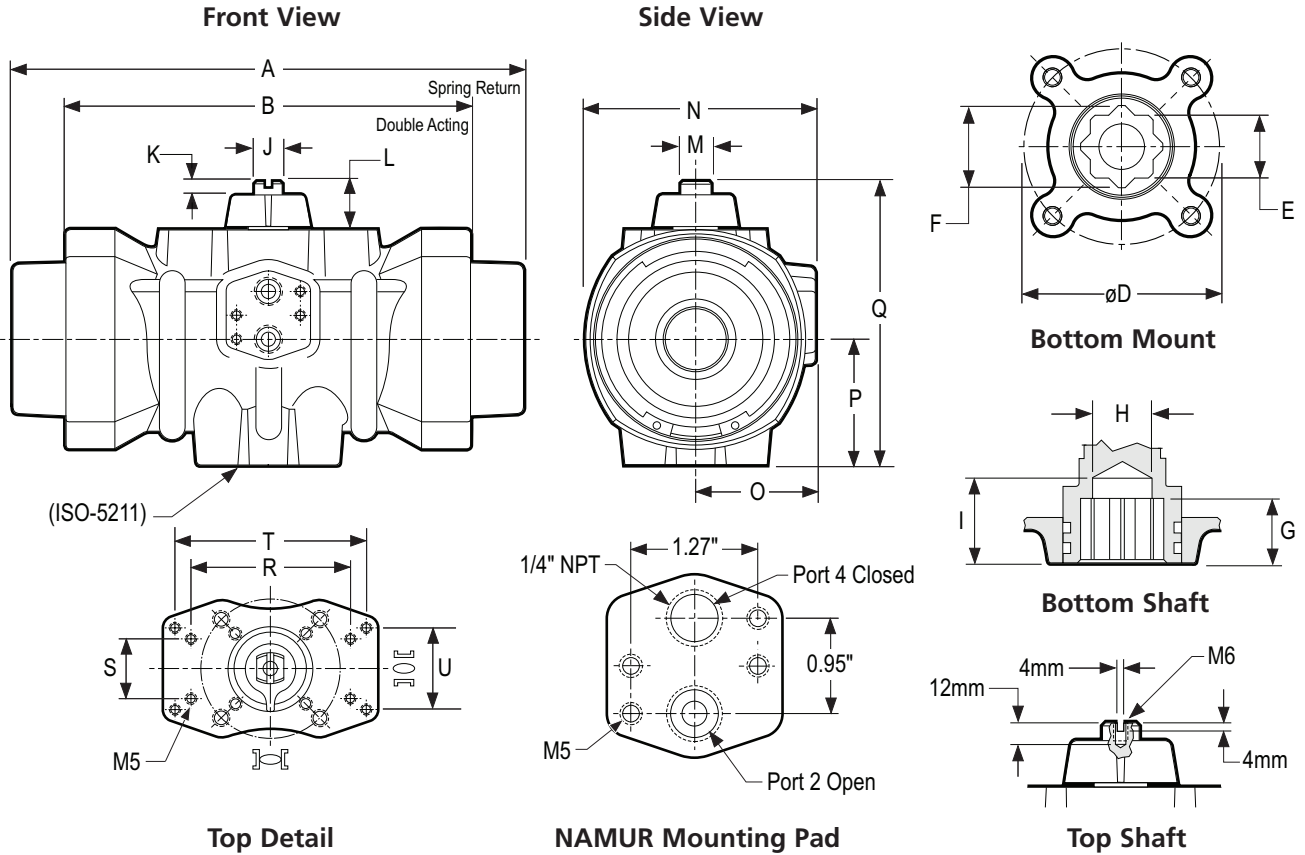
SERIES: PHSR – Spring Return  
PHDA – Double Acting

CONTROL PRESSURE: 40 to 120 psi

OUTPUT TORQUES:\*  
Up to 10,600 in.-lb. Spring Return  
and to 25,300 in.-lb. Double Acting



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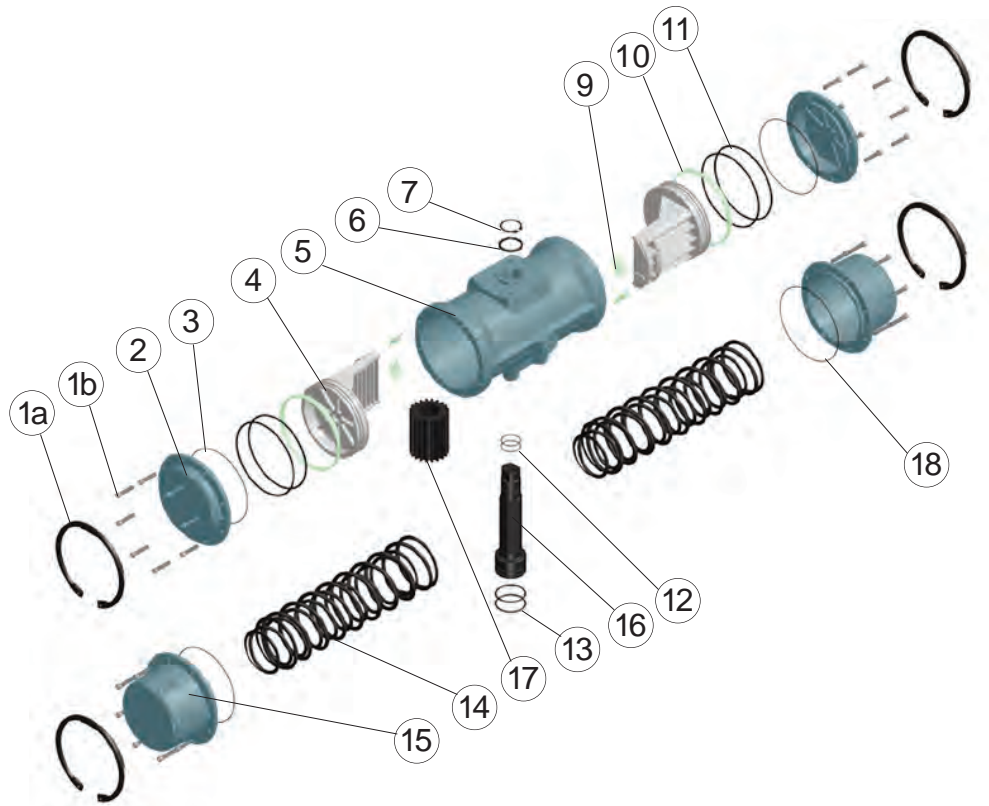
## DIMENSIONS INCHES

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	PHDA00	PHSR00	6.30	4.92	1.65 (F04)	M5	0.67	1.97 (F05)	M6	0.67	0.55	0.75	0.59	0.57	1.18
10	PHDA10	PHSR10	9.29	7.17	1.97 (F05)	M6	0.67	2.76 (F07)	M8	0.79	0.67	0.91	0.59	0.59	1.18
20	PHDA20	PHSR20	12.13	9.21	1.97 (F05)	M6	0.71	2.76 (F07)	M8	0.91	0.87	1.14	0.75	0.87	1.26
30	PHDA30	PHSR30	18.86	13.74	2.76 (F07)	M8	0.91	4.02 (F10)	M10	1.06	1.18	1.57	1.18	1.18	1.65
40	PHDA40	PHSR40	23.54	17.48	-	-	-	4.92 (F12)	M12	1.02	1.42	1.93	1.50	1.38	1.97
50	PHDA50	PHSR50	27.32	20.63	-	-	-	5.51 (F14)	M16	1.18	1.42	1.93	1.50	1.38	1.97

## DIMENSIONS INCHES

Size	Item No. DA SR		Top Shaft Detail				N	O	P	Q	R	S	T	U
			J	K	L	M								
00	PHDA00	PHSR00	0.39	0.63	1.18 (ISO-2)	0.54	3.15	1.73	1.77	4.33	3.15	1.18	3.78	1.61
10	PHDA10	PHSR10	0.39	0.63	1.18 (ISO-2)	0.54	4.02	2.17	1.99	5.00	3.15	1.18	3.78	1.61
20	PHDA20	PHSR20	0.63	0.63	1.18 (ISO-2)	0.86	5.00	2.64	2.48	6.34	3.15	1.18	3.78	1.61
30	PHDA30	PHSR30	0.63	0.63	1.18 (ISO-2)	0.86	6.97	3.70	2.80	8.31	3.15	1.18	3.78	1.61
40	PHDA40	PHSR40	1.26	0.79	1.97 (ISO-4)	1.65	8.90	4.72	4.57	10.71	5.12	1.18	4.65	1.61
50	PHDA50	PHSR50	1.26	0.79	1.97 (ISO-4)	1.65	10.14	5.31	5.24	12.32	5.12	1.18	4.65	1.61

# PH Series Pneumatic Actuators



## PARTS

▲ Recommended Spare Parts

No.	Part	Size	Pcs.	Materials
1a▲	Snap Ring	00 to 20	2	Steel coated with cataphoresis
1b▲	Allen Screw	30	12	304 SS
		40 to 50	16	304 SS
2	Double Acting Cap	00 to 50	2	Aluminum Alloy coated with Xylan
3▲	Cap O-Ring	00 to 20	2	Viton
4	Piston	00 to 20	2	Bichromated Steel
		30 to 50	2	Aluminum Alloy
5	Cylinder	00 to 50	1	Aluminum Alloy coated with Xylan
6	Washer	00 to 50	1	Stainless Steel
7	Spring Clip	00 to 50	1	Steel coated with cataphoresis
9	Piston Guide	00 to 50	2	PTFE & Graphite

## PARTS

▲ Recommended Spare Parts

No.	Part	Size	Pcs.	Materials
10	Guide Ring	00 to 50	2	PTFE & Graphite
11▲	Piston O-Ring	00 to 20	2	Nitrile Buna-N
		30 to 50	4	Nitrile Buna-N
12▲	Upper Shaft O-Ring	00 to 50	2	Nitrile Buna-N
13▲	Lower Shaft O-Ring	00 to 50	2	Nitrile Buna-N
14	Springs Set	00 to 50	1	302 SS
15	Spring Return Cap	00 to 50	2	Aluminum Alloy coated with Xylan
16	Shaft	00 to 50	1	303 SS
17	Gear	00 to 50	1	Aluminum Alloy coated with cataphoresis
18	Water Tightness Plane Gasket	30 to 50	2	Viton

# PH 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
PHDA00	93	147	201	256	309	PHDA30	1,823	2,804	3,789	4,770	5,757
PHDA10	263	417	571	725	880	PHDA40	4,708	7,124	9,549	11,963	14,392
PHDA20	622	978	1,334	1,689	2,045	PHDA50	8,033	12,357	16,697	21,019	25,367

## 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
PHSR00	4 <sup>1</sup>	151	62	–	–	–	–	139	51	194	105	248	160
PHSR10	4 <sup>1</sup>	398	230	–	–	–	–	341	173	495	327	649	481
PHSR20	4 <sup>1</sup>	903	416	–	–	563	76	918	431	1,273	786	1,627	1,141
PHSR30	4 <sup>1</sup>	2,664	1,434	–	–	1,375	145	2,356	1,126	3,337	2,106	4,317	3,087
PHSR40	4 <sup>1</sup>	6,787	4,351	–	–	4,350	1,914	6,764	4,328	9,179	6,743	11,593	9,157
PHSR50	4 <sup>1</sup>	10,673	6,404	8,160	3,891	12,481	8,212	16,803	12,534	21,124	16,855	25,445	21,176

<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	PHDA00	3.20	0.15	0.18	0.15	0.15	PHSR00	3.70	0.15	0.20	0.20
10	PHDA10	6.40	0.35	0.45	0.25	0.25	PHSR10	8.20	0.35	0.30	0.30
20	PHDA20	12.90	0.80	1.05	0.40	0.40	PHSR20	17.40	0.80	0.50	0.50
30	PHDA30	26.30	2.10	1.90	0.60	0.60	PHSR30	41.00	2.10	1.20	1.20
40	PHDA40	38.72	5.30	5.30	1.20	1.02	PHSR40	80.10	5.30	2.00	2.00
50	PHDA50	67.50	10.50	7.00	2.00	2.00	PHSR50	128.50	10.50	6.00	6.00

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

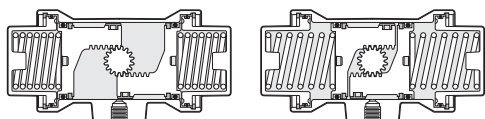
### OPERATION

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
- Stainless Steel Actuators
- 180° 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