

Type 1066 and 1066SR Piston Rotary Actuators

Type 1066 and 1066SR actuators (see figures 1 and 2) are compact, piston, rotary actuators for throttling (with Type 3710 pneumatic or Type 3720 electro-pneumatic positioners) or on-off applications. The Type 1066 actuator is double-acting. The Type 1066SR actuator is spring-return, which provides automatic fail-open or fail-close action. Both actuators can be used on Design V150, V200, V300, V500, and CV500 valves; or on Type 8510B, 8532, 8560 and 9500 butterfly valves.

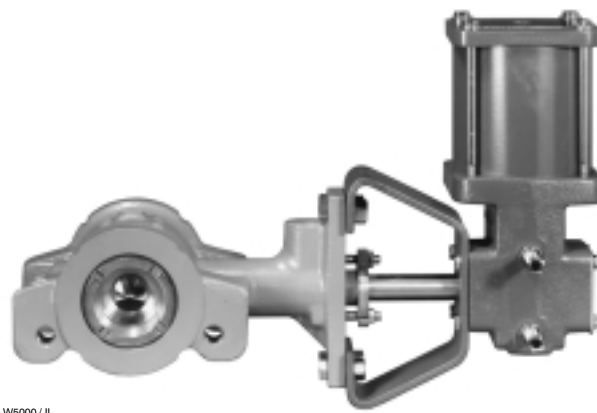
For the Type 1066 actuator, piston movement is accomplished by loading air pressure on one side of the piston while unloading air pressure from the other side (see figure 4). For the Type 1066SR actuator, piston movement is accomplished by loading air pressure on the top side of the piston with opposing spring compression force applied on the bottom side (see figure 4). In both cases, the piston moves a lever to open or close the valve.

Both actuator types are field reversible between push-down-to-close (PDTC) and push-down-to-open (PDTO). Type 1066SR actuators are field reversible between fail-open and fail-close.

For Type 1066 actuators, a positioner, a loading solenoid, a four-way switching valve, or two three-way valves are required for operation of the actuator.

Features

- **Longer Service Life**—Heavy duty construction provides corrosion resistance and overpressure protection.
- **Compact Design**—Housing and cylinder constructions occupy little space and provide for quick and easy installation.



W5000 / IL

Figure 1. Design CV500 Flangeless Valve with Type 1066 Actuator

- **Minimal Lost Motion**—Linkage consists of single-joint piston rod/lever connection and splined lever/shaft connection.
- **Easy-to-Use Travel Indicator**—Highly visible travel indicator gives valve position at a glance.
- **Versatile**—Actuator is easily converted between push-down-to-open and push-down-to-close action. Actuator/valve combination may be mounted in any of the positions shown in figure 3. Actuator travel is adjustable between 60 and 90 degrees with standard units.
- **Enclosed Linkages**—Actuator/control valve linkage is completely enclosed for personal protection, while the valve packing remains accessible for adjustment.



Specifications

Actuator Sizes

■ 20, ■ 27, and ■ 75

Cylinder Pressure

Maximum Allowable⁽¹⁾:

Type 1066

Sizes 20 and 75: 8.3 bar (120 psig)

Size 27: 4.1 bar (60 psig)

Type 1066SR

Sizes 20 and 75: 8.3 bar (120 psig)

Size 27: Up to 8.3 bar (120 psig) depending upon spring selection

Minimum Recommended:

Type 1066: 2.8 bar (40 psig)

Type 1066SR: 3.4 bar (50 psig)

Connection Diameter for Valve Shafts, mm (Inches)

Sizes 20 and 27: ■ 12.7 (1/2), ■ 15.9 (5/8), ■ 19.1 (3/4), ■ 22.2 (7/8) and ■ 25.4 (1)
Size 75: ■ 19.1 (3/4), ■ 22.2 (7/8), ■ 25.4 (1), ■ 31.8 (1-1/4), and ■ 38.1 (1-1/2)

Maximum Breakout Torque⁽²⁾

Type 1066:

Sizes 20 and 27: Up to 225 N•m (2000 lbf•in)

Size 75: Up to 850 N•m (7500 lbf•in)

Type 1066SR:

Size 20: Up to 111 N•m (980 lbf•in)

Size 27: Up to 225 N•m (2000 lbf•in)

Size 75: Up to 478 N•m (4230 lbf•in)

Stroking Time

Dependent on actuator size, rotation, and supply pressure. If stroking time is critical, consult your Fisher sales office.

Temperature Capabilities⁽¹⁾

Nitrile O-Rings: -40 to 82°C (-40 to 180°F)

Fluoroelastomer O-Rings: -18 to 149°C (0 to 300°F)

Cylinder Volumetric Displacement

See table 1

Valve Position Indication

Graduated scale and pointer combination (see figure 4)

Pressure Connections

1/4-inch NPT female

Mounting Styles and Positions

See figure 3

Construction Materials

Housing: Cast iron

Piston Rod, Mounting Yoke, Cylinder, and Cylinder Cover: Chrome-plated steel

Piston: Aluminum

Lever and Bearing Assembly: Steel with carbon-filled PTFE bearing

Hub and Bearing Assembly: Steel with carbon-filled PTFE bearings

Bearing: Cast iron

O-Rings: ■ Nitrile or ■ Fluoroelastomer (optional)

Approximate Weight, kg (Pounds)

Type 1066:

Size 20: 15 (32)

Size 27: 28 (62)

Size 75: 38 (84)

Type 1066SR:

Size 20: 15 (32)

Size 27: 34 (74)

Size 75: 49 (108)

Options

■ Type 4200 Series electronic position transmitter, ■ Type 3710 pneumatic or Type 3720 electro-pneumatic valve positioner, ■ A variety of Type 304 and other limit switches, ■ Solenoid valves for actuator operation, ■ An actuator bypass valve, ■ Style H mounting for connection to a variety of devices other than Fisher valves, ■ Trip valves (Type 1066 actuator only) for fail-open, fail-closed, or lock in last position operation, ■ and wrench override for manual operation of actuator without instrument or supply pressure.

1. The pressure/temperature limits in this bulletin and any applicable standard or code limitation for the actuator should not be exceeded.

2. Actual actuator torque depends on specific construction and cylinder pressure. For more information on torque requirements of the valve being considered, consult your Fisher sales office.

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Table 1. Cylinder Volumetric Displacement

ACTUATOR SIZE	DISPLACEMENT VOLUME ⁽¹⁾		CLEARANCE VOLUME ABOVE PISTON ⁽¹⁾		HOUSING VOLUME BELOW PISTON ⁽¹⁾	
	cm ³	Inch ³	cm ³	Inch ³	cm ³	Inch ³
Type 1066						
20	688	42	410	25	1803	110
27	1311	80	410	25	4014	245
75	2622	160	1180	72	1442	88
Type 1066SR						
20	688	42	410	25	---	---
27	1311	80	410	25	---	---
75	2622	160	410	25	---	---
<small>1. Total volume to stroke piston down is equal to displacement volume plus clearance volume above piston; total volume to stroke piston up is equal to displacement volume plus housing volume below piston.</small>						



Figure 2. Type 1066 Actuator with Type 3710 Positioner

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Table 2. Mounting Styles and Positioners for Type 1066 and 1066SR Actuators

ACTUATOR MOUNTING	ACTION ⁽¹⁾	VALVE SERIES OR DESIGN				VALVE SERIES OR DESIGN		
		BALL/PLUG ROTATION TO CLOSE	V250	V150, V200 and V300	CV500, V500	DISK/BALL ROTATION TO CLOSE	V250	8532, 8560 and 9500
Right-hand	PDTC	CCW	A	A	A	CW	NA	B
	PDTO	CCW	B	B	B	CW	NA	A
Left-hand	PDTC	CCW	NA	D	D	CW	C	C
	PDTO	CCW	NA	C	C	CW	D	D
Left-hand (optional) ⁽²⁾	PDTC	CW	NA	C	NA	NA	NA	NA
	PDTO	CW	NA	D	NA	NA	NA	NA

1. PDTC—Push-down-to-close; PDTO—Push-down-to-open.
 2. A left-hand ball will be required for the 3- through 12-inch V150, V200 or V300 Series B and the 14- to 20-inch, with or without an attenuator.

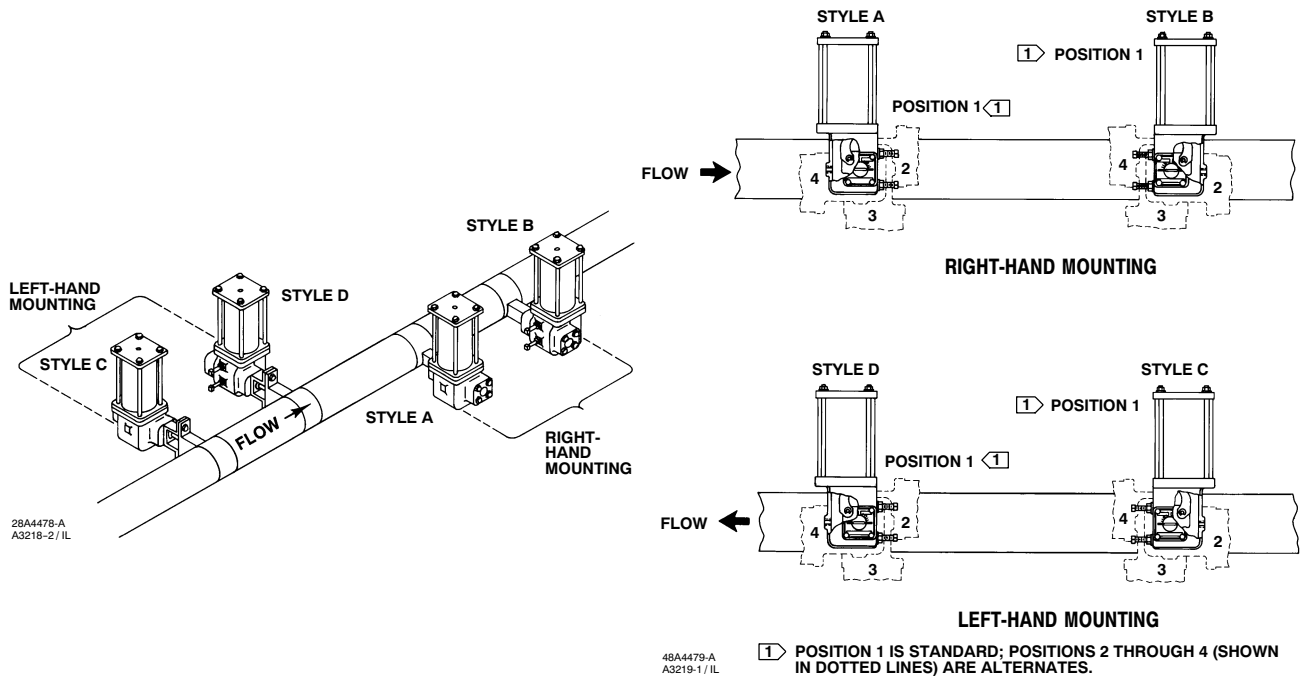
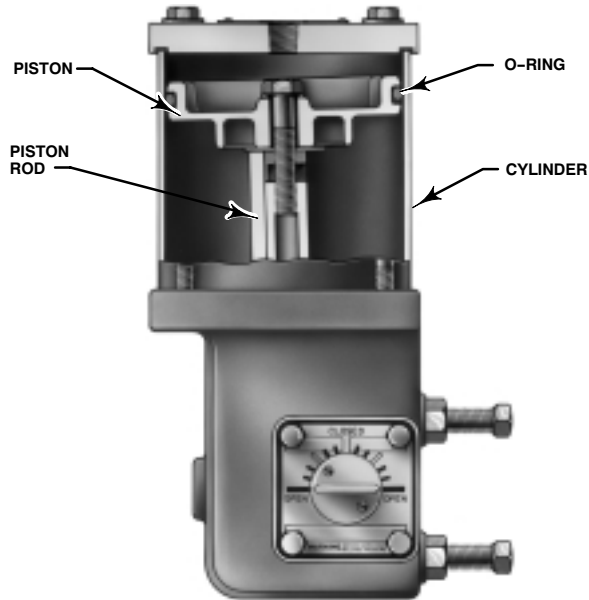
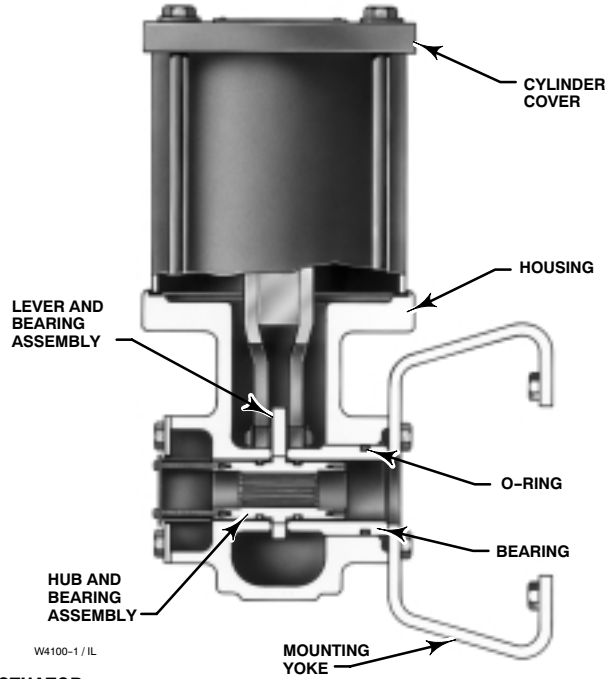


Figure 3. Mounting Styles and Positioners for Type 1066 and 1066SR Actuators (also see table 2)

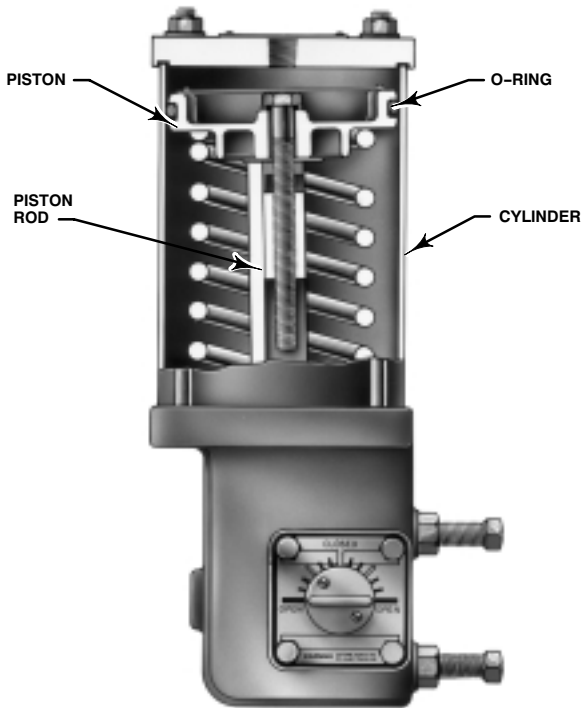


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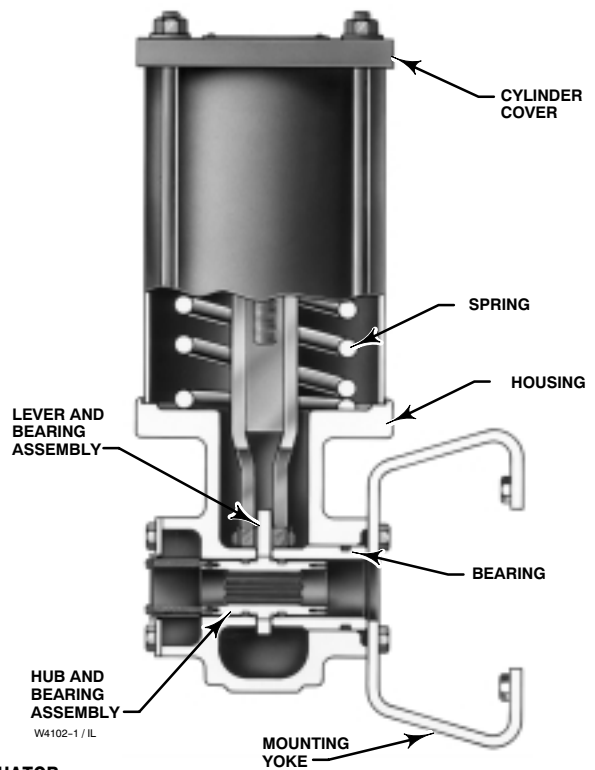


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TYPE 1066 ACTUATOR



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TYPE 1066SR ACTUATOR

Figure 4. Sectional Views

1066 and 1066RS Actuators

Table 3. Dimensions

ACTUATOR SIZE	C		E				F		H		P	
	mm	Inches	Type 1066		Type 1066SR		mm	Inches	mm	Inches	mm	Inches
			mm	Inches	mm	Inches						
20	143	5.63	324	12.75	324	12.75	33	1.31	60	2.38	124	4.88
27	200	7.88	387	15.25	387	15.25	33	1.31	60	2.38	140	5.50
75	200	7.88	359	14.13	518	20.38	64	2.50	95	3.75	197	7.75

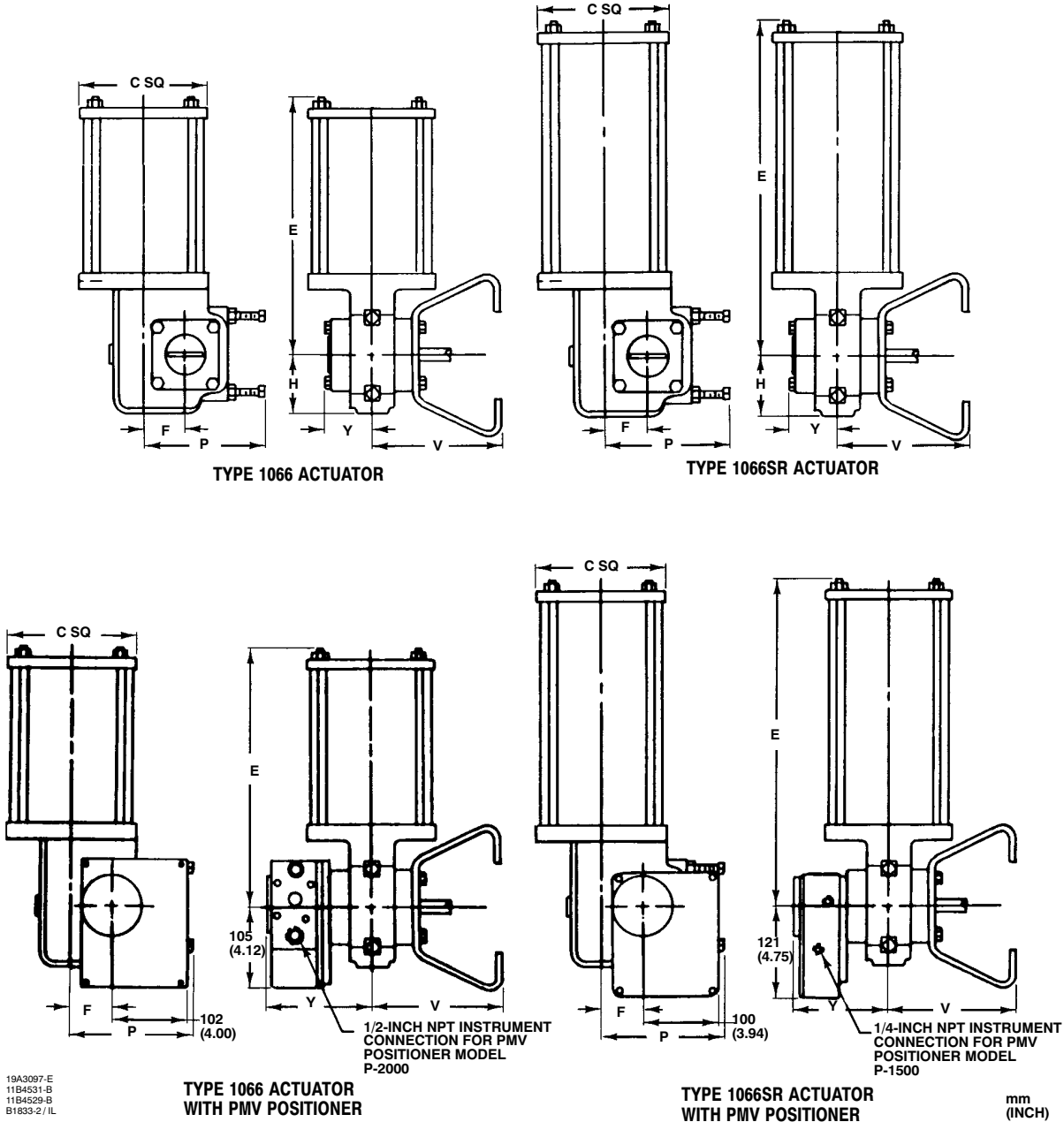


Figure 5. Dimensions (also see tables 3, 4 and 5)

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Table 4. Style F and G Mounting Dimensions

VALVE SHAFT DIAMETER		ACTUATOR SIZE	T		U		V		W	
mm	Inches		mm	Inches	mm	Inches	mm	Inches	mm	Inches
Style F Mounting: Type 8532, 8560, and Design CV500, V150, V200, V300 and V500										
12.7 and 15.9	1/2 and 5/8	20 and 27	118	4.63	---	---	143	5.63	14	0.56
19.1—25.4	3/4—1	20 and 27	152	6.00	32	1.25	173	6.81	14	0.56
		75	152	6.00	32	1.25	179	7.06	14	0.56
31.8 and 38.1	1-1/4 and 1-1/2	75	235	9.25	46	1.81	178	7.00	17	0.69
Style G Mounting: Type 9500 Valve										
12.7	1/2	20 and 27	118	4.63	---	---	143	5.63	14	0.56
15.9—25.4	5/8—1	20 and 27	146	5.75	32	1.25	173	6.81	11	0.44
		75 ⁽¹⁾	146	5.75	32	1.25	179	7.06	11	0.44
31.8 and 38.1	1-1/4 and 1-1/2	75	210	8.25	51	2.00	178	7.00	17	0.69

1. 19.1 to 25.4 mm (3/4 to 1-inch) valve shafts only.

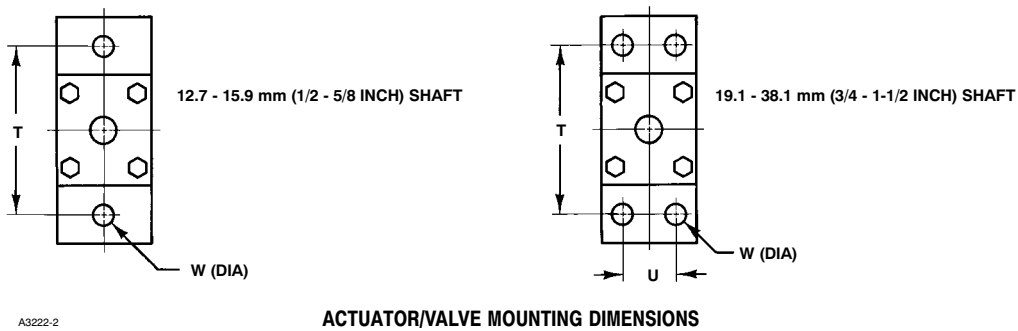
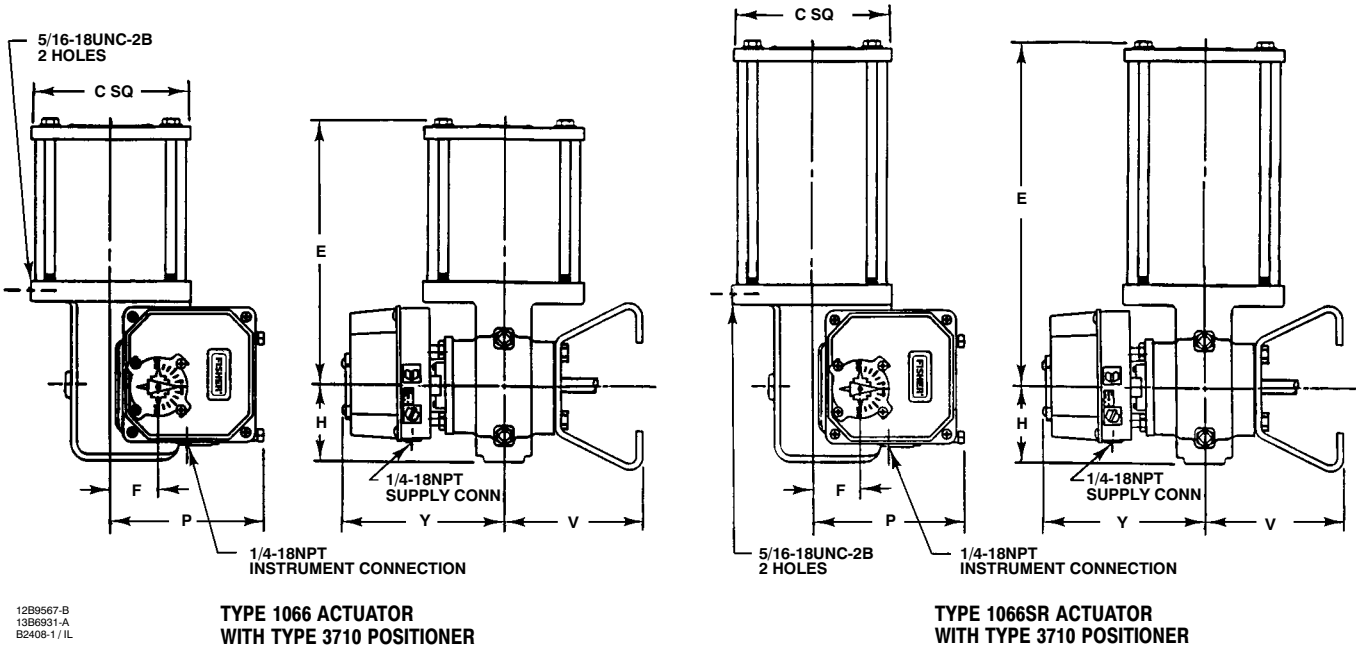


Figure 6. Actuator / Valve Mounting Dimensions (see also table 4)

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Table 5. Dimensions

ACTUATOR SIZE	Y							
	w/o Positioner		w/ PMV Positioner				w/ Type 3710 Positioner	
	Type 1066 or 1066SR		Type 1066		Type 1066SR		Type 1066 or 1066SR	
	mm	Inches	mm	Inches	mm	Inches	mm	Inches
20	67	2.63	138	5.44	130	5.12	200	7.88
27	67	2.63	138	5.44	130	5.12	200	7.88
75	76	3.00	146	5.75	138	5.44	206	8.12



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Figure 7. Dimensions (see also tables 3, 4 and 5)

Installation

When looking in the direction of flow in the pipeline, an actuator is right-hand mounted when it is on the right side of the pipeline, and an actuator is left-hand mounted when it is mounted on the left side of the pipeline. The actuator may be installed in any of the positions shown in figure 3.

By Fisher definition, forward flow is into the face side of the disk or ball, and reverse flow is into the hub side of the disk or ball.

Dimensions are shown in figure 5, 6 and 7.

Ordering Information

Application

When ordering, specify:

1. Maximum air supply pressure
2. Valve type and size with which the actuator will be used
3. Valve disk or ball rotation in degrees

4. Actuator torque required with piston rod fully retracted and with piston rod extended

5. Options

Actuator

Be sure to specify the actuator type number, size, mounting style, and mounting position desired. Refer to the Specifications section. Review the description to the right of each specification and in the referenced tables and figures. Specify the desired choice wherever there is a selection to be made.

Valve and Accessories

Refer to the separate valve bulletin and bulletins covering accessories for ordering information.

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