

# Fisher™ 1052 Size 70 Diaphragm Rotary Actuator

Fisher 1052 size 70 spring-return diaphragm rotary actuators operate splined shaft rotary valves, such as 8580, 8532, 8590, CV500, V500, and Vee-Ball™ (V150, V200 and V300) valves. 1052 actuators are suitable for on-off service or for throttling service.

This actuator is designed for easy installation of a broad range of options: limit switches, position indicating switches, positioners, and manual over-rides. Option applicability varies with actuator size. Refer to the specifications table and table 4 for information concerning option applicability and specifications.

## Features

- **Application Flexibility**-- 1052 rotary actuators are available with fail-open or fail-close construction and can be mounted in any of four actuator-valve mounting positions. See figure 5 for mounting positions. These actuators can be mounted on a broad range of Fisher valves or used with other equipment.
- **Minimal Dead Band**-- Single joint linkage with splined and clamped lever minimizes lost motion and improves control accuracy.
- **Long Service Life**-- Rugged construction provides stability, corrosion resistance, and protection from deformation should over-pressurization occur.
- **Safety**-- The 1052 actuator has an externally accessible spring adjuster to relieve spring compression (see figure 1). Actuator-valve linkage is completely enclosed, yet the valve packing adjustment remains accessible without removing any parts (see figure 2).



Typical Fisher 1052 Actuator with Vee-Ball Valve and FIELDVUE™ DVC6200 Digital Valve Controller

**Specifications****Available Configurations**

For on-off service without a positioner or for throttling services with or without a positioner  
**Direct Acting:** Increasing loading pressure extends the diaphragm rod out of the spring barrel

**Actuator Sizes**

70

**Standard Diaphragm Pressure Ranges**

■ 0 to 2.3 bar (0 to 33 psig), ■ 0 to 2.8 bar (0 to 40 psig), and ■ 0 to 3.8 bar (0 to 55 psig)

**Maximum Diaphragm Sizing Pressure<sup>(1)</sup>**

3.8 bar (55 psig)

**Maximum Diaphragm Casing Pressure<sup>(5)</sup>**

4.5 bar (65 psig)

**Nominal Valve Shaft Rotation**

■ 90 degrees (standard), ■ 60 degrees (optional), or  
 ■ 75 degrees (optional)

**Valve Shaft Diameters, mm (Inches)**

■ 31.8 (1-1/4), ■ 38.1 (1-1/2),  
 ■ 44.5 (1-3/4), or ■ 50.8 (2)

**Maximum Breakout Torque<sup>(2)</sup>**

Up to 1370 N•m (12,100 lbf•in)

**Stroking Time**

Dependent on rotation, spring rate, initial spring compression, supply pressure, and size of supply

pipng. If stroking time is critical, consult your [Emerson sales office](#) or Local Business Partner

**Diaphragm Casing Displacement**

See table 1

**Construction Materials**

See table 3

**Material Temperature Capabilities<sup>(1)</sup>**

Nitrile Diaphragm or O-Rings<sup>(3)</sup>: -40 to 82°C (-40 to 180°F)

Silicone Diaphragm: -40 to 149°C (-40 to 300°F)

**Travel Indication**

Graduated scale and pointer combination located on actuator end of valve drive shaft

**Pipe or Tubing Connection Sizes**

Standard: 1/4 NPT internal

Optional: ■ 1/2 or ■ 3/4 NPT internal,  
 and ■ 3/4 NPT Pipe-Away vent opening

**Mounting Positions**

See figure 5

**Approximate Weights**

See table 2

**Options**

Option applicability varies with actuator size. Refer to table 4 and the Options section.

1. Use this value to determine the maximum torque output. 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 available depends on specific construction and casing pressure. For information on torque requirements of the valve being considered, contact your Emerson sales office or Local Business Partner
3. Nitrile O-rings are used in the optional top-mounted handwheel and in the optional up and down travel stop assemblies.
4. For higher temperature ratings, contact your Emerson sales office or Local Business Partner.
5. This maximum casing pressure is not to be used for normal operating pressure. Its purpose is to allow for typical regulator supply settings and/or relief valve tolerances.

**Options**

**Top-Mounted Handwheel:** For infrequent use as a manual actuator or for use as an adjustable up travel stop (see figure 4). For repeated or daily manual operation, the unit should be equipped with a declutchable handwheel actuator.

**Declutchable Handwheel Actuator:** A side-mounted manual actuator can be used to provide on-site control and to provide override capabilities. See bulletin

61.8:1078 (D101339X012) for handwheel actuator specifications.

**Limit Switches:** Micro-Switch or NAMCO switches for one or two single-pole, double-throw contacts. See separate bulletins for limit switch information.

**Position Indicating Switch:** TopWorx™ DXP M21GNEB switch for one through six single pole, double throw switch contacts are available. See separate bulletin for position indicating switch information.

**Positioner:** For precise positioning of the valve disk or ball, the actuator should be equipped with a positioner. Under some service conditions, the 1052 actuator may be used successfully in these applications without a positioner. For additional information, contact your [Emerson sales office](#) or Local Business Partner with complete service conditions.

**Adjustable Down-Travel Stop:** Used to limit the actuator stroke in the downward direction (see figure 3).

**Adjustable Up-Travel Stop:** Used to limit the actuator stroke in the upward direction (see figure 3).

**Actuator Locking Mechanism:** An actuator locking mechanism is available. It can be used to keep the actuator in a locked position (the same as the spring-fail position) during maintenance. The padlock is customer supplied, and the mechanism requires a modified actuator housing.

**Pipe Away Vent:** Some applications use natural gas or other hazardous gases as a supply pressure to the actuator. These applications sometimes require the actuator housing to be vented, reducing the accumulation of gases. For new constructions and retrofit kit information, contact your Emerson sales office or Local Business Partner with complete service conditions.

**Table 1. Diaphragm Casing Displacement**

CASING SIZE	CLEARANCE VOLUME <sup>(1)</sup>		CASING VOLUME <sup>(2)</sup>			
			60 Degree Rotation		90 Degree Rotation	
	cm <sup>3</sup>	Inches <sup>3</sup>	cm <sup>3</sup>	Inches <sup>3</sup>	cm <sup>3</sup>	Inches <sup>3</sup>
70	3490	213	13,929	850	19,025	1161

1. Volume when the diaphragm is in the up position.  
2. Includes clearance volume.

**Table 2. Approximate Actuator Weights**

SIZE	1052 ACTUATOR		TOP-MOUNTED HANDWHEEL	
	Kg	Pounds	Kg	Pounds
70	123	272	21.3	47

**Figure 1. Sectional Views of Spring Seat Construction Details**



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**TYPICAL OF THE 1052 ACTUATOR WITH ADJUSTABLE SPRING SEAT**

**Table 3. Construction Materials**

PART	MATERIAL
<b>Actuator</b>	
Actuator Housing and Spring Barrel	Cast iron
Diaphragm	Nitrile on nylon or silicone on polyester
Diaphragm Head	Cast Iron
Diaphragm Casing <sup>(1)</sup>	Pressed steel
Diaphragm Rod	Steel
Housing Cover	Cast iron or aluminum
Lever	Ductile iron
<b>Optional Top-Mounted Handwheel Assembly</b>	
Handwheel and Handwheel Body	Cast iron
Handwheel Stem	Bronze
O-Rings	Nitrile
Pusher Plate	Cast iron or steel
<b>Optional Down Travel Stop Assembly</b>	
Closing Cap	Brass
O-ring	Nitrile
Stem	Stainless steel
Travel Stop Body	Cast iron
<b>Optional Up Travel Stop Assembly</b>	
Closing Cap	Brass
O-Ring	Nitrile
Stem	Bronze
Travel Stop Body	Cast iron

Figure 2. Sectional Views Typical of 1052 Actuator

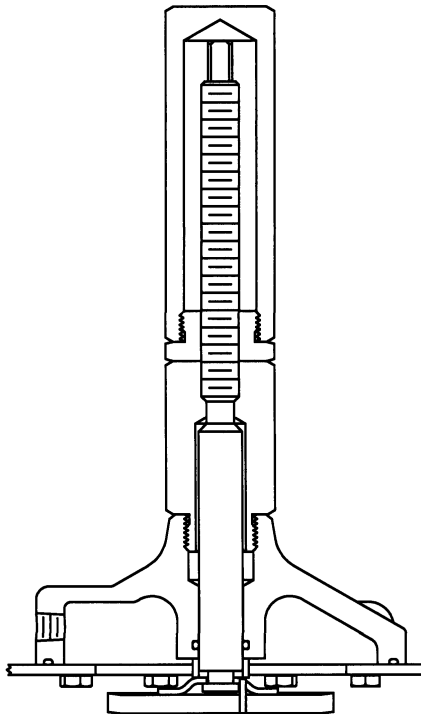


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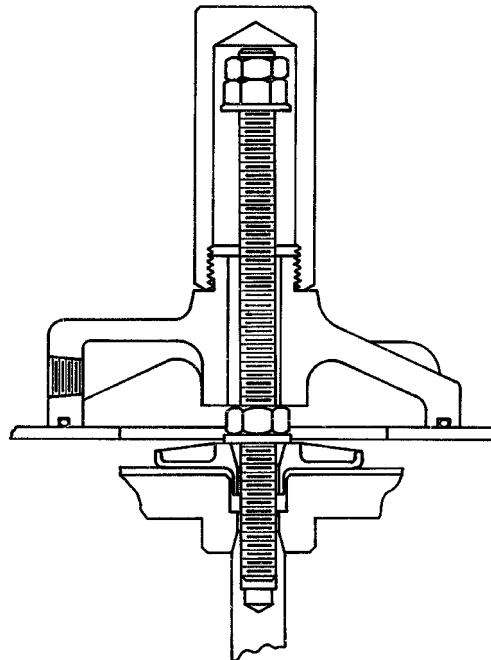
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Figure 3. Optional Adjustable Travel Stops



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**TYPICAL ADJUSTABLE UP TRAVEL STOP**



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**TYPICAL ADJUSTABLE DOWN TRAVEL STOP**

Table 4. Construction Features and Option Applicability

ACTUATOR SIZE	ACTUATOR TYPE	STANDARD TRAVEL STOP	OPTIONAL TRAVEL STOP		OPTIONAL MANUAL OVERRIDE	ACCESSORY SWITCH MOUNTING
		Style	Style	Range of Adjustability		Mechanically Operated Switches
70	1052	Fixed	Top-mounted up-travel stop or down-travel stop	90 degrees	Top-mounted handwheel for infrequent operation or side-mounted manual actuator for routine operation	Externally mounted, lever operated

Figure 4. Top-Mounted Handwheel



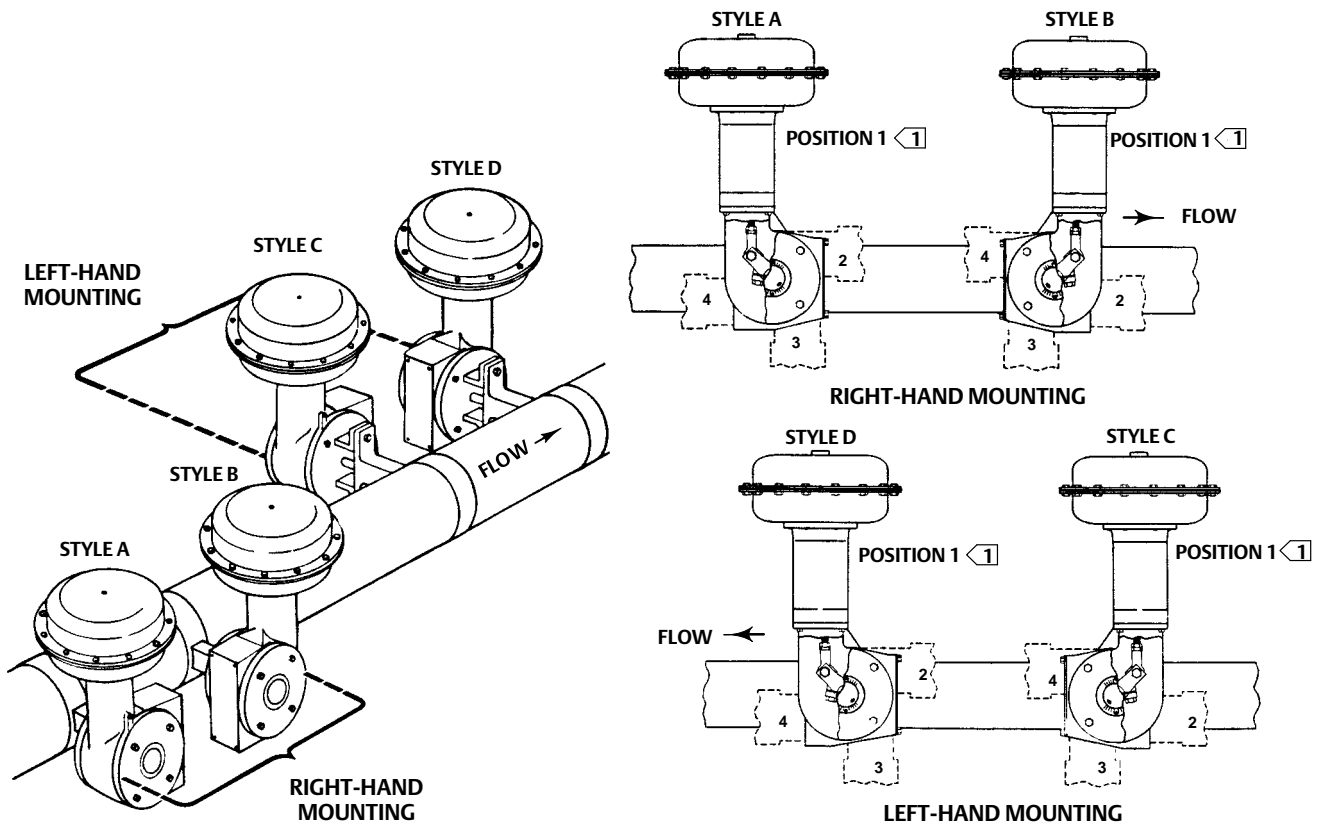
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**Table 5. Mounting Styles and Positions**

MOUNTING	ACTION <sup>(1)</sup>	VALVE SERIES OR DESIGN				VALVE SERIES OR DESIGN		
		BALL/PLUG ROTATION TO CLOSE	V250	V150, V200 and V300	CV500 and V500	DISK/BALL ROTATION TO CLOSE	V250	8532, 8560, 8580, and 8590
Right-Hand	PDTC	CCW <sup>(3)</sup>	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) <sup>(2)</sup>	PDTC	CW <sup>(4)</sup>	NA	C	NA	NA	NA	NA
	PDTO	CW	NA	D	NA	NA	NA	NA

1. PDTC—Push-down-to-close, and PDTO—Push-down-to-open.  
 2. A left hand ball will be required for NPS 3 through 12 V150, V200 and V300, Series B and NPS 14 through 20, with or without an attenuator.  
 3. CCW = counterclockwise  
 4. CW = clockwise

**Figure 5. Mounting Styles and Positions (also see table 5)**

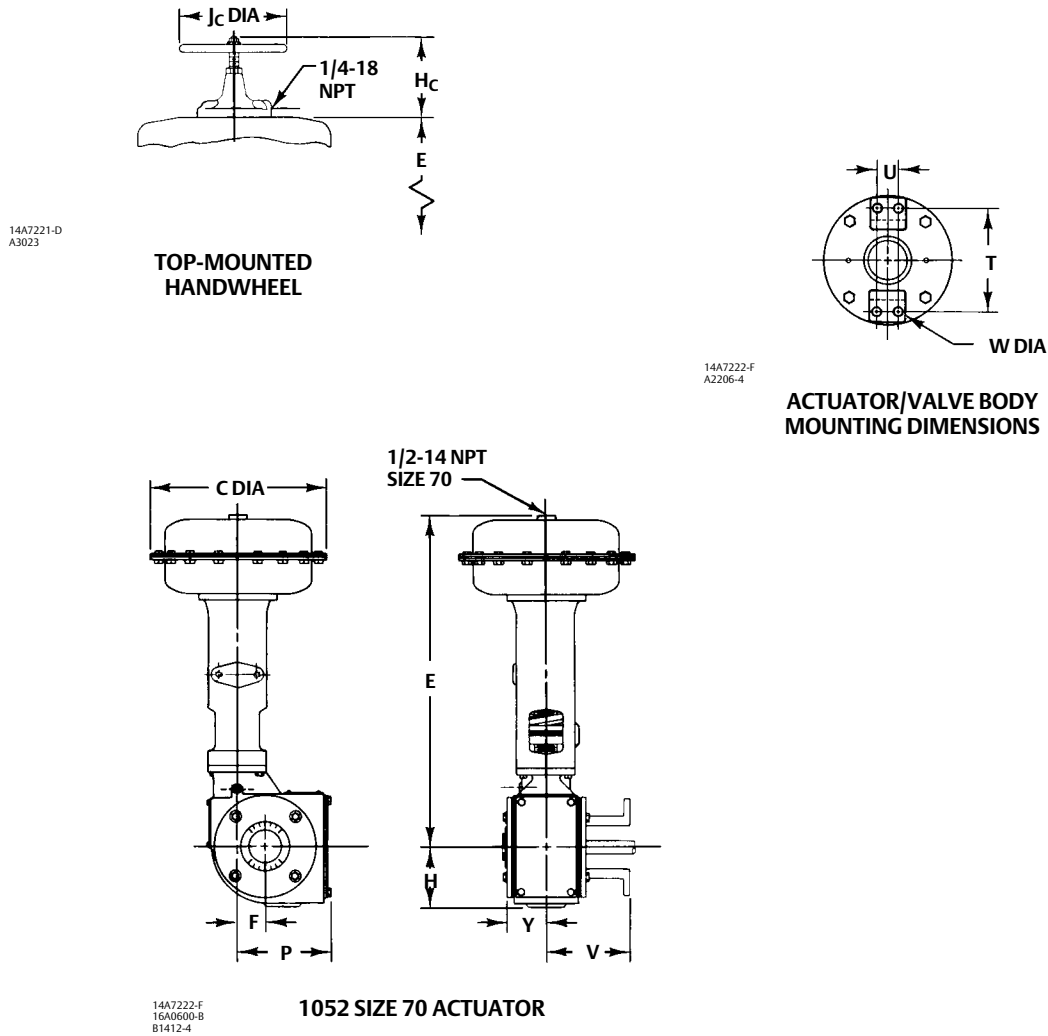


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**Notes:**

1. Position 1 is standard; Positions 2 through 4 (shown in dotted lines) are alternatives.

Figure 6. Dimensions (also see tables 6, 7 and 8)



## Installation

The actuator is normally positioned vertically in a horizontal pipeline. Four mounting styles and four positions for each style are possible (see figure 5). Due to its weight, the 1052 size 70 actuator must be externally supported if mounted in the horizontal position.

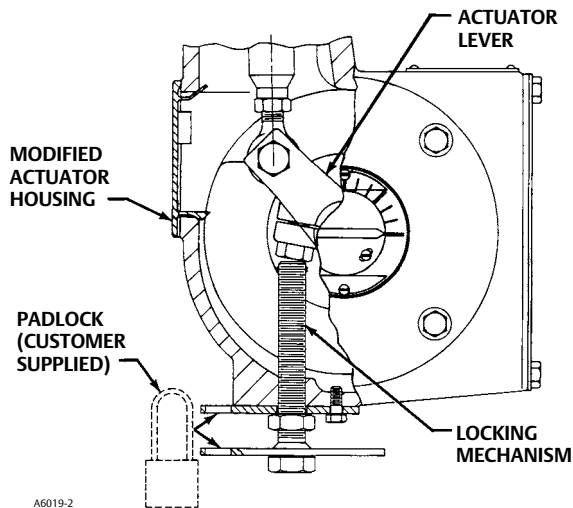
When looking in the direction of flow in the pipeline, an actuator is right-hand mounted when it is on the right side of the pipeline, and an actuator is left-hand

mounted when it is mounted on the left side of the pipeline.

By Emerson Automation Solutions 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 for both actuator types are shown in figure 6. These dimensions should be used in conjunction with the mounting positions shown in figure 5. Make clearance considerations before mounting the actuator to determine the most suitable mounting position.

Figure 7. Actuator Locking Mechanism



## Adjustable Travel Stops

Adjustable travel stops (in addition to those shown in figure 3) are available as discussed below.

As used here, down or downward means in a direction toward the valve shaft and away from the piston and diaphragm.

An adjustable down travel stop is installed in a special actuator housing. The assembly consists of a special housing, cap screw, locknut, lever, and rod end bearing. The cap screw can be positioned to limit downward travel of the actuator lever to any rotation between 0 and 90 degrees.

The locking mechanism shown in figure 7 is not to be used as a travel stop. Please specify an adjustable travel stop assembly instead.

Table 6. Dimensions

ACTUATOR SIZE	C		E		F		H		P		Y	
	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches
70	536	21.12	849	33.44	64	2.50	121	4.75	186	7.31	76	3.00

Table 7. Actuator / Valve Body Mounting Dimensions

VALVE SHAFT DIAMETER		T		U		V		W	
mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches
31.8 - 38.1	1-1/4 - 1-1/2	235	9.25	46	1.81	148	5.81	17.5	0.69
44.5 - 50.8	1-3/4 - 2	273	10.75	51	2.00	286	11.25	20.6	0.81

Table 8. Dimensions for Top-Mounted Handwheel

ACTUATOR SIZE	H <sub>c</sub>		J <sub>c</sub>	
	mm	Inches	mm	Inches
70	378	14.88	356	14.00

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