

Fisher™ 3025 Diaphragm Actuator

Fisher 3025 Size 1 and 2 spring opposed diaphragm actuators position the valve plug in the valve body in response to varying controller or valve positioner pneumatic output signals applied to the actuator diaphragm. The 3025 actuator can be specified as either direct, or reverse acting. It is designed to provide dependable on-off or throttling operation of automatic control valves.

Size 1 is available for travels up to 203.2 mm (8 in) and Size 2 for travels up to 139.7 mm (5.5 in). For more information contact your [Emerson sales office](#).

Features

- **Long Travel Capability**—Suitable for valves with valve plug travels of up to 203.2 mm (8 in) with a size 1 actuator.
- **High Thrust Capability**—Up to 4 bar air supply on the molded diaphragm. Size 2 with a double stack of diaphragms can produce up to 88,000 N (20,000 lbf) of force.
- **Application Versatility**—Yoke boss mountings, travel stops, and manual handwheel are available to match valve thrust and travel requirements.
- **Positive Connections**—Split block stem connection provides for a solid transfer of motion while allowing easy mounting, and it includes no linkages to create lost motion and inaccurate valve positioning.
- **Reversible Construction**—Actuator action can be changed on site without need of additional parts.



X1861_03

Fisher 3025 Actuator

Specifications

Standard Operating Pressure Range⁽¹⁾

See tables 3 and 4

Maximum Travel

See table 1

Output Indication

Stainless steel pointer and graduated scale

Stroking Speed

Dependent on actuator size, travel, spring rate, initial spring compression, and supply pressure. If stroking speed is critical, consult your [Emerson sales office](#).

Operating Temperature Range⁽¹⁾

-30 to 82°C (-22 to 180°F)

Volumetric Displacement

See table 2

Signal Connections

1/2 NPT, 3/4 NPT, or 1 NPT internal

Effective Diaphragm Area

See tables 3 and 4

Maximum Pressure

4 barg (58 psig)

Construction Materials

Diaphragm Casing: Steel
Diaphragm: Nitrile on nylon
Diaphragm Plate: Steel
Actuator Spring: Steel alloy
Actuator Stem: Steel alloy
Travel Indicator: Stainless steel
Yoke: Steel

Steam and Yoke Boss Diameters

See table 1

Dimensions and Weights

See table 7

Options

■ Side-mounted gear handwheel ■ Adjustable travel stops

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

Contents

Features	1
Specifications	2
Available Configurations	3
Direct Action	3
Reverse Action	3
Accessories	3
Handwheels	3
Adjustable Travel Stops	3
Other	3
Ordering Information	15

Tables	
Additional Specifications	5
Volumetric Casing Displacement	5
Thrust Capabilities	6
Handwheel Specifications	10
Adjustable Travel Stop Styles	11
Dimensions	12

Available Configurations

Direct Action

In direct action, applying air pressure to the upper diaphragm casing forces the actuator stem downward. When this pressure is reduced, the opposing spring force moves the actuator stem upward. Should the loading pressure fail, the spring forces the stem to the extreme upward position. This provides fail-open action for push-down-to-close valves and fail-closed action for push-down-to-open valves.

Reverse Action

In reverse action, applying air pressure to the lower diaphragm casing forces the actuator stem upward against the opposing spring force. When this loading pressure is reduced, the spring moves the actuator stem to the extreme downward position. Should the loading pressure fail, the spring forces the stem to the extreme downward position. Reverse acting actuators provide fail-closed action for push-down-to-close valves and fail-open action for push-down-to-open valves.

Accessories

Adjustable Travel Stops

Top-mounted adjustable travel stops are available for 3025 Series actuators. They are used to limit travel in the up, down, or up and down directions. Figure 4 illustrates the different constructions. Table 6 indicates the maximum travel reduction, and the additional height and weight when a travel stop is used.

Side-Mounted Handwheels—Side-mounted handwheels can be used to stroke the valve in either direction at any point in the actuator stem travel. They provide a ready means of positioning the control valve in an emergency.

The side-mounted handwheel specifications are shown in table 5. Figure 3 shows the side-mounted handwheels applicable to 3025 actuators.

Size 1 Side-Mounted Handwheel—The side-mounted handwheel of size 1 actuators can be positioned to limit travel in upward direction. With the handwheel in the neutral position, automatic operation is possible throughout full valve travel. In any other position, valve travel will be restricted.

The handwheel is furnished with a spring-loaded ball detent which prevents vibration from changing the setting.

Size 2 Side-Mounted Handwheel—Unlike the size 1, the side-mounted handwheel of size 2 actuator cannot be used as adjustable travel stop. Automatic operation is possible only with the handwheel in the neutral position.

The handwheel is furnished with latch which prevents vibration from changing the setting.

Other

Accessories such as transducers, positioners, position transmitters, air relays, volume boosters, switching valves, lockup valves, limit switches, and solenoid valves are also available for actuator mounting. They are described in separate publications. Contact your [Emerson sales office](#) for details.

Figure 1. Typical Actuator

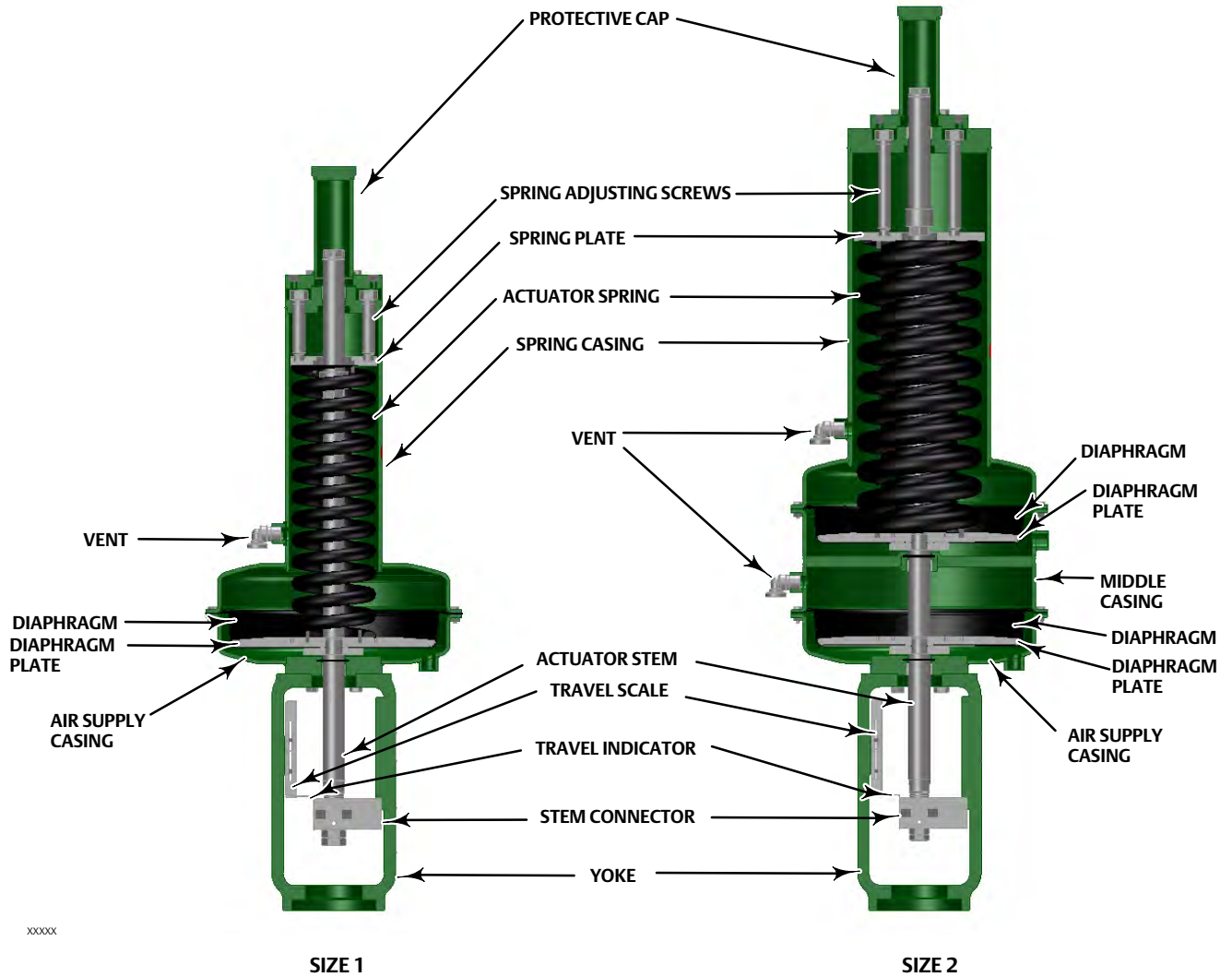


Figure 2. Reverse and Direct Action

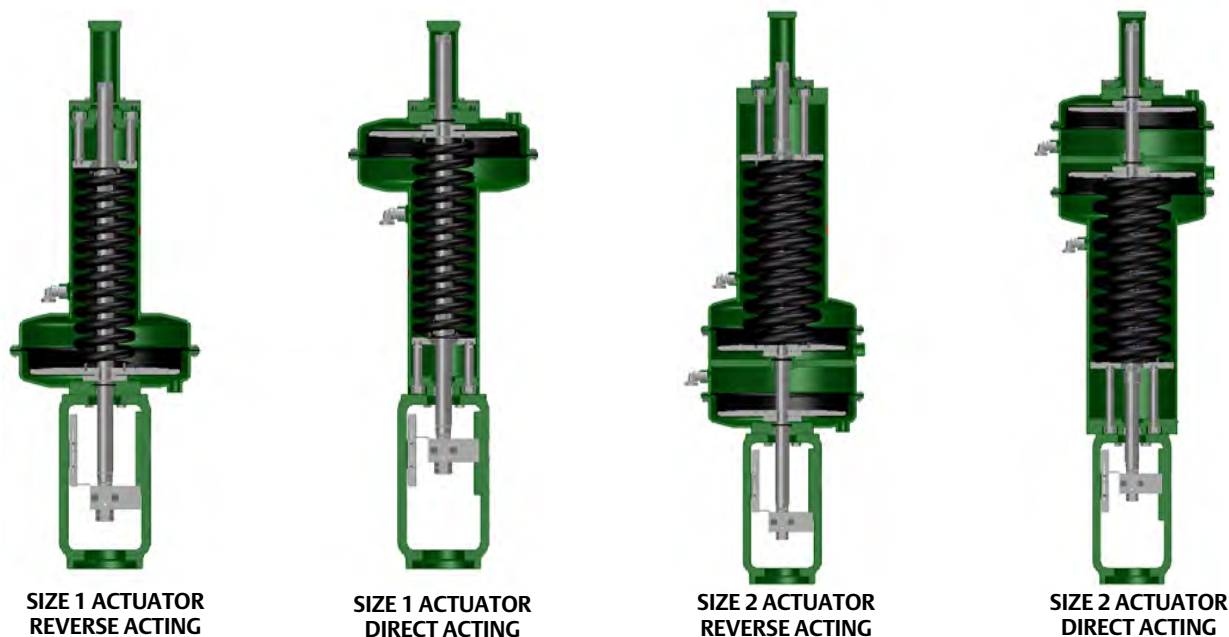


Table 1. Additional Specifications for Fisher 3025 Series Actuator

ACTUATOR SIZE	YOKE BOSS DIAMETER	STEM DIAMETER	MAXIMUM TRAVEL
			mm
Size 1	90	19.1	203.2
	127 127H	25.4 and 31.8	
Size 2	127 127H	25.4 and 31.8	139.7
Size 1	3-9/16	3/4	8
	5 5H	1 and 1-1/4	
Size 2	5 5H	1 and 1-1/4	5.5

Table 2. Volumetric Casing Displacement for Fisher 3025 Series Actuator

ACTUATOR SIZE	CLEARANCE VOLUME ⁽¹⁾ cm ³	TRAVEL, mm							
		50.8	76.2	101.6	127	139.7	152.4	177.8	203.2
Casing Volume⁽²⁾, cm³									
Size 1	6,700	16,600	21,200	25,900	30,500	32,900	---	---	---
	7,100	---	---	---	---	---	36,500	41,300	45,800
Size 2	13,400	33,200	42,400	51,800	61,000	65,800	---	---	---
TRAVEL, INCH									
Casing Volume⁽²⁾, Inch³									
Size 1	410	1,010	1,300	1,580	1,860	2,010	---	---	---
	440	---	---	---	---	---	2,230	2,520	2,800
Size 2	820	2,020	2,600	3,160	3,720	4,020	---	---	---

1. Clearance volume indicates casing volume at zero travel.
2. Includes clearance volume.

Table 3. Thrust Capabilities for Fisher 3025 Series Actuator in Reverse Action

ACTUATOR SIZE	TRAVEL mm	BENCH SET Bar	THRUST DOWN N	EFFECTIVE DIAPHRAGM AREA	
				0% TRAVEL	100% TRAVEL
				cm ²	
Size 1	50.8	0.8-1.5	15,750	1860	1815
		1.4-2.2	25,200		
	76.2	0.7-1.1	12,275		1795
		1.1-2.1	20,250		
		1.4-2.2	25,840		
	101.6	0.5-1.0	8,555		1775
		0.8-2.2	15,750		
		1.2-2.2	22,440		
	127	0.4-1.1	6,695		1750
		0.7-1.9	12,240		
		1.0-2.3	19,040		
	139.7	0.4-1.1	6,695		1740
		0.8-2.3	15,640		
	152.4	0.7-1.3	13,300		1790
		1.1-2.0	20,330		
		1.7-2.9	32,000		
	177.8	0.6-1.3	10,500		1775
		0.9-2.0	16,050		
1.6-2.9		29,440			
203.2	0.5-1.3	9,100	1760		
	0.7-2.0	13,910			
	1.4-3.0	26,880			
Size 2	50.8	0.9-1.6	33,250	3710	3630
		1.4-2.1	52,250		
		1.9-2.5	68,850		
	76.2	0.9-1.9	33,250		3585
		1.2-2.2	42,750		
		1.6-2.6	60,750		
	101.6	0.9-1.9	34,870		3545
		1.3-2.2	47,550		
		1.8-2.8	66,780		
	127	0.6-1.8	22,190		3505
		0.9-2.1	34,870		
		1.5-2.7	54,060		
	139.7	0.6-1.9	22,190		3485
		0.9-2.3	34,870		
		1.5-2.8	54,060		

-continued-

Table 3. Thrust Capabilities for Fisher 3025 Series Actuator in Reverse Action (cont.)

ACTUATOR SIZE	TRAVEL Inch	BENCH SET psi	THRUST DOWN lb	EFFECTIVE DIAPHRAGM AREA	
				0% TRAVEL	100% TRAVEL
				Inch ²	
Size 1	2	12-22	3,540	288	281
		20-32	5,665		
	3	10-16	2,760		278
		16-30	4,550		
		20-31	5,810		
	4	7-15	1,925		275
		12-32	3,540		
		18-32	5,045		
	5	5-15	1,505		272
		10-28	2,750		
		15-34	4,280		
	5.5	5-16	1,505		270
		12-33	3,515		
	6	10-19	2,990		277
		16-30	4,570		
		25-42	7,195		
	7	8-19	2,360		275
		12-29	3,610		
23-43		6,620			
8	7-19	2,045	273		
	11-29	3,125			
	21-44	6,045			
Size 2	2	13-23	7,475	575	562
		20-31	11,745		
		27-36	15,480		
	3	13-28	7,475		556
		17-32	9,610		
		24-37	13,655		
	4	14-27	7,840		550
		19-33	10,690		
		26-41	15,015		
	5	9-26	4,990		543
		14-31	7,840		
		21-39	12,155		
	5.5	9-28	4,990		540
		14-33	7,840		
		21-41	12,155		

Table 4. Thrust Capabilities for Fisher 3025 Series Actuator in Direct Action

ACTUATOR SIZE	TRAVEL mm	BENCH SET Bar	THRUST DOWN ⁽¹⁾ N	EFFECTIVE DIAPHRAGM AREA	
				0% TRAVEL	100% TRAVEL
				cm ²	
Size 1	50.8	0.8-1.5	45,385	1860	1815
		1.4-2.2	33,140		
	76.2	0.7-1.1	52,375		1795
		1.1-2.1	34,345		
		1.4-2.2	32,945		
	101.6	0.5-1.0	52,910		1775
		0.8-2.2	32,305		
		1.2-2.2	31,200		
	127	0.4-1.1	51,580		1750
		0.7-1.9	36,260		
		1.0-2.3	29,460		
	139.7	0.4-1.1	49,990		1740
		0.8-2.3	30,285		
	152.4	0.7-1.3	47,545		1790
		1.1-2.0	34,875		
		1.7-2.9	20,005		
177.8	0.6-1.3	48,040	1775		
	0.9-2.0	35,915			
	1.6-2.9	18,790			
203.2	0.5-1.3	47,140	1760		
	0.7-2.0	34,815			
	1.4-3.0	17,575			
Size 2	50.8	0.9-1.6	87,750	3710	3630
		1.4-2.1	68,750		
		1.9-2.5	55,705		
	76.2	0.9-1.9	74,035		3585
		1.2-2.2	64,535		
		1.6-2.6	51,870		
	101.6	0.9-1.9	74,750		3545
		1.3-2.2	62,070		
		1.8-2.8	42,740		
	127	0.6-1.8	77,730		3505
		0.9-2.1	65,050		
		1.5-2.7	45,730		
	139.7	0.6-1.9	72,875		3485
		0.9-2.3	60,195		
		1.5-2.8	40,865		

-continued-

Table 4. Thrust Capabilities for Fisher 3025 Series Actuator in Direct Action (cont.)

ACTUATOR SIZE	TRAVEL Inch	BENCH SET psi	THRUST DOWN ⁽¹⁾ lb	EFFECTIVE DIAPHRAGM AREA	
				0% TRAVEL	100% TRAVEL
				Inch ²	
Size 1	2	12-22	10,205	288	281
		20-32	7,450		
	3	10-16	11,775		278
		16-30	7,720		
		20-31	7,405		
	4	7-15	11,895		275
		12-32	7,260		
		18-32	7,015		
	5	5-15	11,595		272
		10-28	8,150		
		15-34	6,625		
	5.5	5-16	11,240		270
		12-33	6,810		
	6	10-19	10,690		277
		16-30	7,840		
		25-42	4,495		
	7	8-19	10,800		275
		12-29	8,075		
23-43		4,225			
8	7-19	10,600	273		
	11-29	7,825			
	21-44	3,950			
Size 2	2	13-23	19,725	575	562
		20-31	15,455		
		27-36	12,525		
	3	13-28	16,645		556
		17-32	14,510		
		24-37	11,660		
	4	14-27	16,805		550
		19-33	13,955		
		26-41	9,610		
	5	9-26	17,475		543
		14-31	14,625		
		21-39	10,280		
	5.5	9-28	16,385		540
		14-33	13,535		
		21-41	9,185		

1. Actuator thrust at 4 bar air supply.

Figure 3. Typical Side-Mounted Handwheels

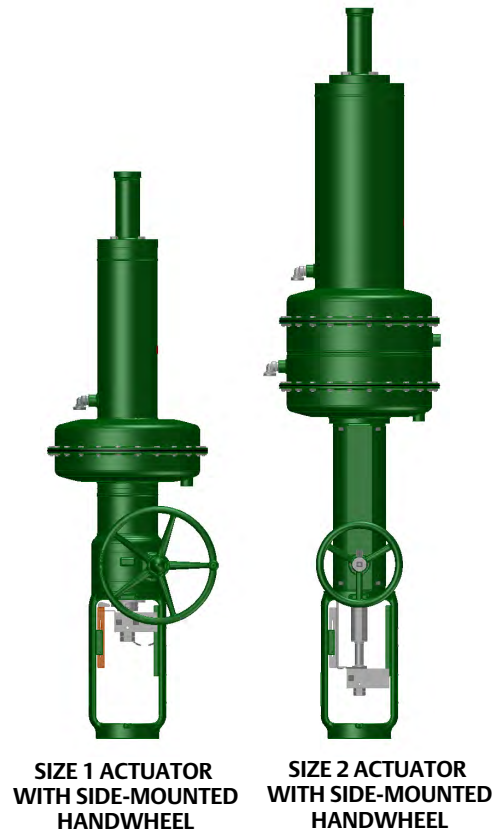


Table 5. Fisher 3025 Side-Mounted Handwheel Specifications

ACTUATOR SIZE	Handwheel Diameter	Turns Per mm Travel	Maximum Actuator Spring Load	Maximum Rim Force for Spring Compression	Maximum Handwheel Output Force ⁽¹⁾	Maximum Rim Force ⁽²⁾
	mm		N	N	N	N
Size 1	432	0.4	52,890	380	75,000	540
Size 2	315	0.3	N/A	N/A	88,000	460
	Inch	Turns Per Inch Travel	lb	lb	lb	lb
Size 1	17	10	11,890	85	16,860	120
Size 2	12.4	8.5	N/A	N/A	19,780	105

1. For size 1, maximum force available to compress the actuator spring and apply load on the valve stem. For size 2, maximum force available to apply load on the valve stem.
2. Tangential handwheel force required to produce the maximum handwheel output force shown.

Figure 4. Adjustable Travel Stops

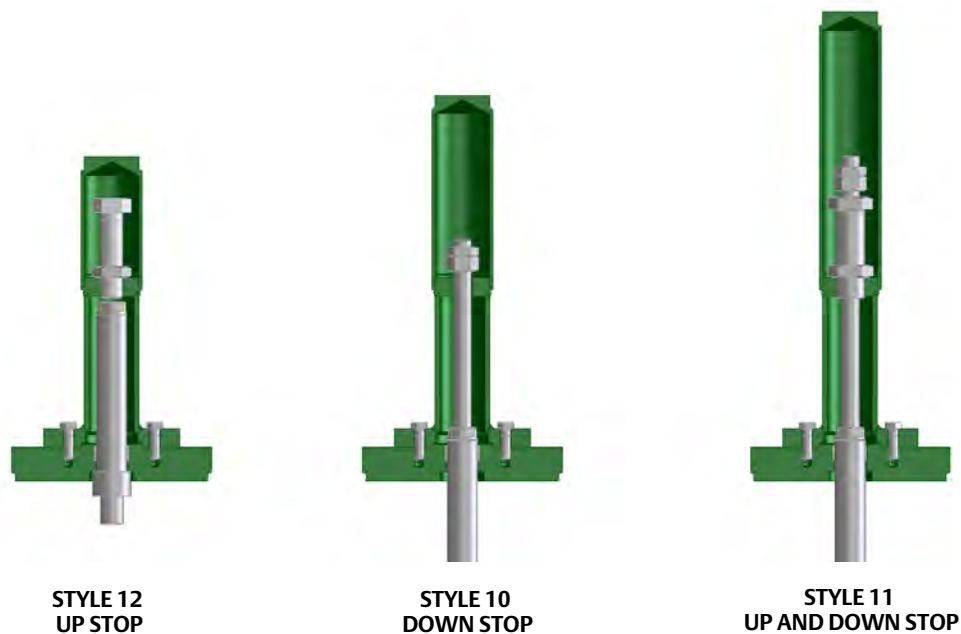


Table 6. Fisher 3025 Adjustable Travel Stop Specifications

ACTUATOR TRAVEL	MAXIMUM TRAVEL REDUCTION		ADDITIONAL HEIGHT			ADDITIONAL WEIGHT		
	Up Direction	Down Direction	Adjustable Up Stop	Adjustable Down Stop	Adjustable Down Stop	Adjustable Up Stop	Adjustable Down Stop	Adjustable Down Stop
	mm		mm			kg		
Up to 101.6 mm included	40	Full Stroke	195	195	295	5.1	5.4	8.7
Above 101.6 mm	80	Full Stroke	195	295	430	5.4	7.0	11.1
	Inch		Inch			lb		
Up to 4 inch included	1.57	Full Stroke	7.68	7.68	11.61	11.2	11.9	19.2
Above 4 inch	3.15	Full Stroke	7.68	11.61	16.93	11.9	15.4	24.5

Product Bulletin

61.1:3025(B)
September 2022

3025 Actuator
D104735X012

Table 7. Dimensions for Fisher 3025 Series Actuator

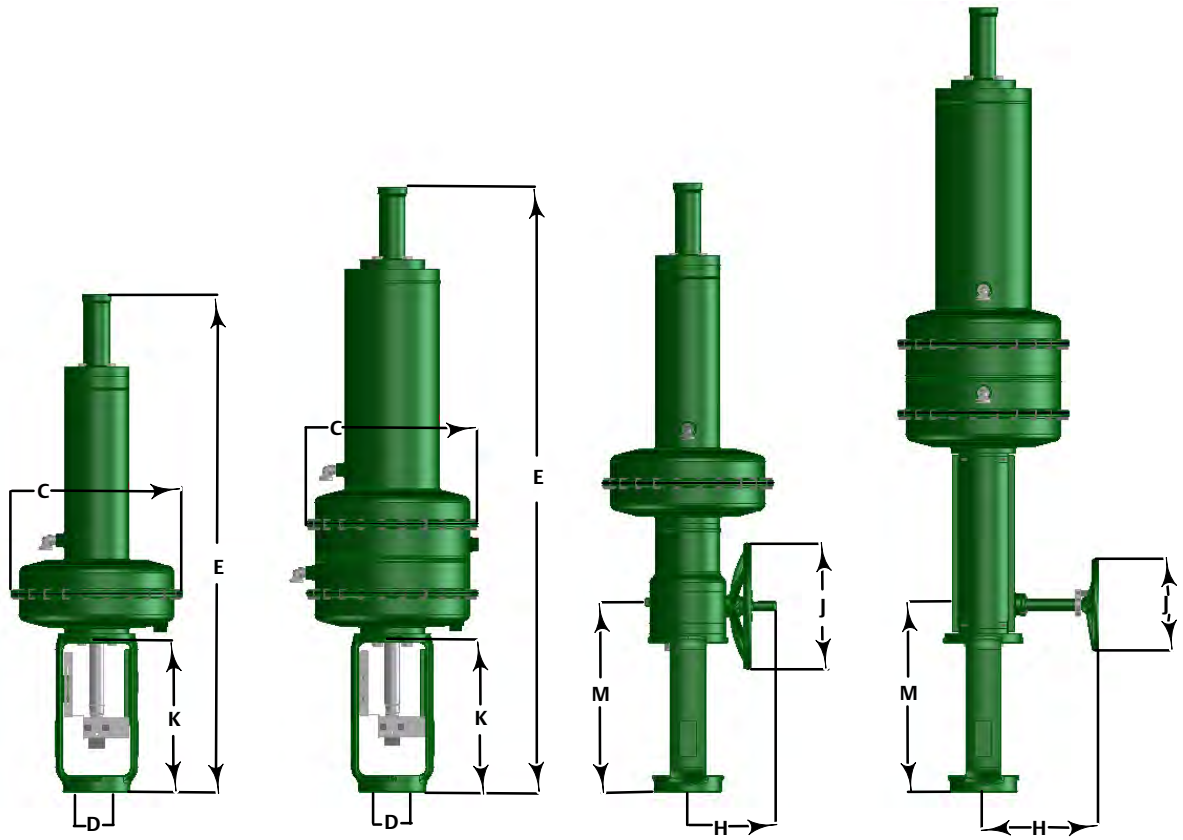
ACTUATOR SIZE	DIMENSION REFERENCE										WEIGHT			
	TRAVEL	BENCH SET	E w/o Handwheel	E with Handwheel	C	D	K	M	H	J	w/o Handwheel	with Handwheel		
	mm	Bar	mm										kg	
Size 1	50.8	0.8-1.5	1247	1537	580	90 or 127	400	515	300	432	210	300		
		1.4-2.2											210	300
	76.2	0.7-1.1	1247	1537							400	515		
		1.1-2.1	1467	1757									240	330
	1.4-2.2	1247	1537	400							515	210		
	0.5-1.0												1467	1757
	0.8-2.2	1437	1812	210			310							
	1.2-2.2							1657	2032	240	340			
	127	0.4-1.1	1437	1812			490					605	210	310
		0.7-1.9	1437	1812				210	310					
	1.0-2.3	1657	2032	240			340							
	139.7							0.4-1.1	1657	2032	280	380		
		0.8-2.3	1597	1972			300	400						
	152.4	0.7-1.3							1872	2247	360	460		
		1.1-2.0	1597	1972			280	380						
	1.7-2.9	1872							2247	300	400			
	177.8		0.6-1.3	1597			1972	360				460		
		0.9-2.0	1872						2247	280	380			
203.2	1.6-2.9	1597		1972	300	400								
	0.5-1.3		1872				2247	360	460					
0.7-2.0	1597	1972		280	380									
1.4-3.0			1872			2247	300	400						

-continued-

Table 7. Dimensions for Fisher 3025 Series Actuator (cont.)

ACTUATOR SIZE	DIMENSION REFERENCE										WEIGHT	
	TRAVEL	BENCH SET	E w/o Handwheel	E with Handwheel	C	D	K	M	H	J	w/o Handwheel	with Handwheel
	Inch	psi	Inch								lb	
Size 1	2	12-22	49.09	60.51	22.83	3.56 or 5	15.75	20.28	11.81	17.01	463	661
		20-32										
	3	10-16	49.09	60.51							463	661
		16-30										
		20-31										
	4	7-15	49.09	60.51							463	661
		12-32										
		18-32										
	5	5-15	56.57	71.34							463	683
		10-28	65.24	80.00								
		15-34					529	750				
	5.5	5-16	56.57	71.34			463	683				
		12-33	65.24	80.00								
		10-19	62.87	77.64					617	838		
	16-30	661					882					
	25-42	73.70					88.46	794	1014			
	7	8-19	62.87	77.64			617	838				
		12-29										
		23-43							73.70	88.46	661	882
	8	7-19	62.87	77.64			794	1014				
11-29												
21-44		73.70			88.46	617			838			
Size 2	2	13-23	56.85	76.14	22.83	5	15.75	20.47	15.35	12.40	816	948
		20-31										
		27-36										
	3	13-28	56.85	76.14							816	948
		17-32										
		24-37										
	4	14-27	64.13	83.43							926	1058
		19-33										
		26-41					72.01	91.30	1058	1190		
	5	9-26	71.61	95.63			926	1080				
		14-31										
		21-39							79.49	103.50	1058	1213
	5.5	9-28	71.61	95.63			926	1080				
		14-33										
		21-41							79.49	103.50	1058	1213

Figure 5. Dimensions (See Table 7)



Ordering Information

When ordering, specify:

Application

1. On-off or throttling service
2. Input signal range
3. Maximum supply pressure
4. Valve body type and size with which the actuator will be used
5. Valve plug travel
6. Valve yoke boss and valve stem diameter
7. Actuator thrust required with actuator stem both fully retracted and fully extended
8. Stroking time requirements, if critical

9. Seismic requirements, if critical

10. Ambient temperature range

Actuator and Positioner

Be sure to specify: actuator type number; whether a positioner is required; whether a top-mounted handwheel is required; and whether an adjustable up or down travel stop is required. Refer to the Specifications section. Review the information under each specification and in the referenced tables and figures. Specify the desired choice wherever there is a selection to be made.

Valve Body and Accessories

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

Neither Emerson, Emerson Automation Solutions, nor any of their affiliated entities assumes responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use, and maintenance of any product remains solely with the purchaser and end user.

Fisher is a mark owned by one of the companies in the Emerson Automation Solutions business unit of Emerson Electric Co. Emerson Automation Solutions, Emerson, and the Emerson logo are trademarks and service marks of Emerson Electric Co. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

Emerson Automation Solutions
Marshalltown, Iowa 50158 USA
Sorocaba, 18087 Brazil
Cernay, 68700 France
Dubai, United Arab Emirates
Singapore 128461 Singapore

www.Fisher.com

