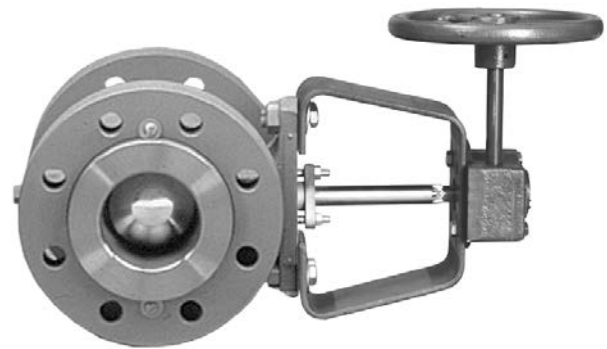


Fisher™ 1077 Manual Handwheel Rotary Actuator

Fisher 1077 manual-only handwheel actuator is for use with rotary-shaft valves such as the 9500 butterfly valve; 8532, 8560, and 8580 High Performance Butterfly valves; V150, V200 and V300 Vee-Ball™ valves; V250 valves; and CV500 and V500 valves.

Figure 1 shows the gearbox of the actuator. In this actuator, torque is transmitted from the handwheel through the handwheel input shaft to a worm and drive sleeve gear (sector) with splined bore. The worm and drive sleeve gear multiply the torque and transmit it to a splined valve shaft or splined stub shaft. The size 10-KE:6 actuator additionally has a spur gear reduction drive for increased torque capability.



W8176-1

Fisher 1077 Handwheel Actuator

Features

- **Easy to Operate**—Handwheel rotation direction required to open the valve disk or ball is marked on the handwheel; the rotation indicator is marked in bold print at the open and closed positions and with bold incremental lines to indicate the valve disk or ball position.
- **Easy to Install and Maintain**—Splined valve shaft mates directly with the drive gear sleeve, reducing the number of parts required and simplifying installation and maintenance.
- **Consistency of Operation**—When installed according to instructions, clockwise handwheel rotation closes the valve in all applications.
- **Accurate Valve Disk or Ball Positioning**—Travel stops can be adjusted and locked in place to provide accurate disk or ball positioning at closed (0-degree) and open (90-degree) positions. Travel stops for 60-degree operation may be used to establish a disk or ball closing stop at any angle between 0 and 30 degrees and/or to establish a disk or ball opening stop at any angle between 60 and 90 degrees. This option is available on sizes 2-KE and 7-KE as a set screw change. For sizes 0-KE, 6-KE, 9-KE, and 10-KE:6, a different actuator is required when changing from 90-degree to 60-degree ball rotation.

Specifications

Available Configuration

Manual-only handwheel actuator for use with splined rotary-shaft valves

Actuator Sizes

See tables 1 and 2

Acceptable Valve Shaft Diameters

See tables 1 and 2

Output Torque

See tables 1 and 2

Wheel-Rim Force

See tables 1 and 2

Handwheel Turns Required for Full Rotation

See tables 1 and 2

Handwheel Rotation

Direct Acting Construction: Clockwise handwheel rotation closes the valve (produces clockwise rotation of the valve shaft) as shown in figure 2.

Reverse Acting Construction: Clockwise handwheel rotation closes the valve (produces counterclockwise rotation of the valve shaft) as shown in figure 2.

Maximum Output Rotation

Standard: 90 degrees

Optional: 60 degrees ■ valve ball or disk closed position may be set to any angle between 0 and 30 degrees, and/or ■ valve ball or disk open position may be set to any angle between 60 and 90 degrees. (This option is available on actuator sizes 2-KE and 7-KE as a set screw change. For sizes 0-KE, 6-KE, 9-KE, and 10-KE:6, a different actuator is required when changing from 90-degree to 60-degree ball rotation.)

Construction Materials

Housing: Cast iron
Housing Cover: Cast iron
Worm: Steel
Drive Sleeve Gear:

For Sizes 0-KE through 7-KE: Phosphor bronze sector with steel hub

For Sizes 9-KE and 10-KE:6: Manganese bronze sector with ductile iron hub

Worm Gear Shaft and Handwheel Shaft: Steel
Handwheel:

Through 431 mm (16-Inch) Diameter: Cast iron

Over 431 mm (16-Inch) Diameter: Fabricated steel

Mounting Yoke

For NPS 30 and 36 8510, NPS 16 V250, and any other valve with 76.2 or 88.9 mm (3 or 3-1/2 Inch) Shaft

Diameter: Cast iron

For All Valve Bodies Other Than Those Listed Above:
Painted steel

Mounting Positions

■ Right-hand (actuator on the right side of the valve when viewed from the valve inlet) or ■ Left-hand (actuator on the left side of the valve when viewed from the valve inlet). Position 1 as shown in figure 3 is standard; however, the actuator may be mounted in any of the positions shown in figure 3. Refer to figure 2 to determine the correct actuator construction.

Approximate Weight

ACTUATOR	METRIC UNITS		U.S. UNITS	
	Handwheel Diameter, mm	Weight of Actuator Assembly, kg	Handwheel Diameter, Inches	Weight of Actuator Assembly, Pounds
0-KE	152	3.7	6	8
	203	4.7	8	10
2-KE	203	10.3	8	22
	305	11.3	12	24
6-KE	610	20.2	24	43
7-KE	762	28.2	30	60
9-KE	914	40.9	36	87
10-KE:6	432	62.6	16	133
	610	62.6	24	133

Accessories

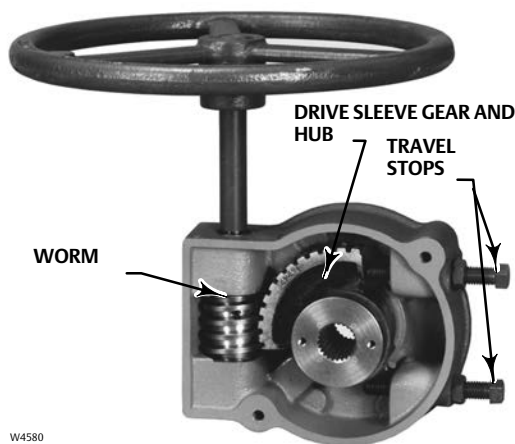
Position and Limit Switches: ■ One position switch, or ■ One or two limit switches, can be mounted

Table 1. Actuator Size Selection (Metric Units)

ACTUATOR SIZE	ACCEPTABLE VALVE SHAFT DIAMETER	MAXIMUM ALLOWABLE TORQUE ⁽¹⁾	HAND-WHEEL DIAMETER	WHEEL-RIM FORCE		HANDWHEEL TURNS REQUIRED FOR FULL VALVE DISK OR BALL ROTATION	
				To Produce Maximum Allowable Torque	To Produce Torque Lower Than Maximum Allowable Shaft Torque	60-Degree Rotation	90-Degree Rotation
				N	N		
0-KE	12.7	58	152	129	Torque Req'd (N•m) ÷ 0.4572	4	6
	15.9	138	152	307			
	19.1 22.2 and 25.4	240 271 ⁽²⁾	203 203	396 445 ⁽³⁾	Torque Req'd (N•m) ÷ 0.6096	4	6
2-KE	22.2 and 25.4	468	203	485	Torque Req'd (N•m) ÷ 0.9652	6-1/2	9-1/2
	31.8 38.1	678 ⁽²⁾ 678 ⁽²⁾	305 305	467 ⁽³⁾ 467 ⁽³⁾	Torque Req'd (N•m) ÷ 1.4478	6-1/2	9-1/2
6-KE	31.8	1110	610	365	Torque Req'd (N•m) ÷ 3.0480	6-1/2	10
	38.1	1360	610	445			
	44.5	1360 ⁽²⁾	610	445 ⁽²⁾			
	50.8	1360 ⁽²⁾	610	445 ⁽²⁾			
7-KE	44.5	2260 ⁽²⁾	762	440 ⁽³⁾	Torque Req'd (N•m) ÷ 5.1435	9	13-1/2
	50.8	2260 ⁽²⁾	762	440 ⁽³⁾			
9-KE	44.5	2260	762	436	Torque Req'd (N•m) ÷ 6.096	10-1/2	16
	50.8	2260	762	436			
	63.5	3390 ⁽²⁾	914	463 ⁽³⁾	Torque Req'd (N•m) ÷ 7.3152	10-1/2	16
10-KE:6	63.5	6305	431	431	Torque Req'd (N•m) ÷ 15.476	48	72
	76.2	6780 ⁽²⁾	610	310 ⁽³⁾	Torque Req'd (N•m) ÷ 21.848	48	72
	88.9	6780 ⁽²⁾	610	310 ⁽³⁾	Torque Req'd (N•m) ÷ 21.848	48	72

1. Values shown are the maximum allowable torque of a splined valve shaft except where indicated. Without regard to the shaft, maximum allowable torque output is 271 N•m for the size 0-KE actuator, 678 N•m for the size 2-KE actuator, 1360 N•m for the size 6-KE actuator, 2260 N•m for the size 7-KE actuator, 3390 N•m for the size 9-KE actuator, and 6780 N•m for the size 10-KE:6 actuator.
2. Limited to this value by the maximum allowable output torque of the actuator.
3. Wheel-rim force required to produce maximum actuator output torque.

Figure 1. Gearbox Subassembly



W4580

Table 2. Actuator Size Selection (U.S Units)

ACTUATOR SIZE	ACCEPTABLE VALVE SHAFT DIAMETER	MAXIMUM ALLOWABLE TORQUE ⁽¹⁾	HAND-WHEEL DIAMETER	WHEEL-RIM FORCE		HANDWHEEL TURNS REQUIRED FOR FULL VALVE DISK OR BALL ROTATION	
				To Produce Maximum Allowable Torque	To Produce Torque Lower Than Maximum Allowable Shaft Torque	60-Degree Rotation	90-Degree Rotation
				Pounds	Pounds		
0-KE	1/2	515	6	29	Torque Req'd (In.-Lb.) ÷ 18.00	4	6
	5/8	1225	6	69			
	3/4 7/8 and 1	2120 2400 ⁽²⁾	8 8	89 100 ⁽³⁾	Torque Req'd (In.-Lb.) ÷ 24.00	4	6
2-KE	7/8 and 1	4140	8	109	Torque Req'd (In.-Lb.) ÷ 38.00	6-1/2	9-1/2
	1-1/4 1-1/2	6000 ⁽²⁾ 6000 ⁽²⁾	12 12	105 ⁽³⁾ 105 ⁽³⁾	Torque Req'd (In.-Lb.) ÷ 57.00	6-1/2	9-1/2
6-KE	1-1/4	9820	24	82	Torque Req'd (In.-Lb.) ÷ 120.00	6-1/2	10
	1-1/2	12,000	24	100			
	1-3/4	12,000 ⁽²⁾	24	100 ⁽³⁾			
	2	12,000 ⁽²⁾	24	100 ⁽³⁾			
7-KE	1-3/4	20,000 ⁽²⁾	30	99 ⁽³⁾	Torque Req'd (In.-Lb.) ÷ 202.50	9	13-1/2
	2	20,000 ⁽²⁾	30	99 ⁽³⁾			
9-KE	1-3/4	23,524	30	98	Torque Req'd (In.-Lb.) ÷ 240.00	10-1/2	16
	2	23,524	30	98			
10-KE:6	2-1/2	55,762	16	97	Torque Req'd (In.-Lb.) ÷ 612.00	48	72
	3	60,000 ⁽²⁾	24	69 ⁽³⁾	Torque Req'd (In.-Lb.) ÷ 864	48	72
	3-1/2	60,000 ⁽²⁾	24	69 ⁽³⁾	Torque Req'd (In.-Lb.) ÷ 864	48	72

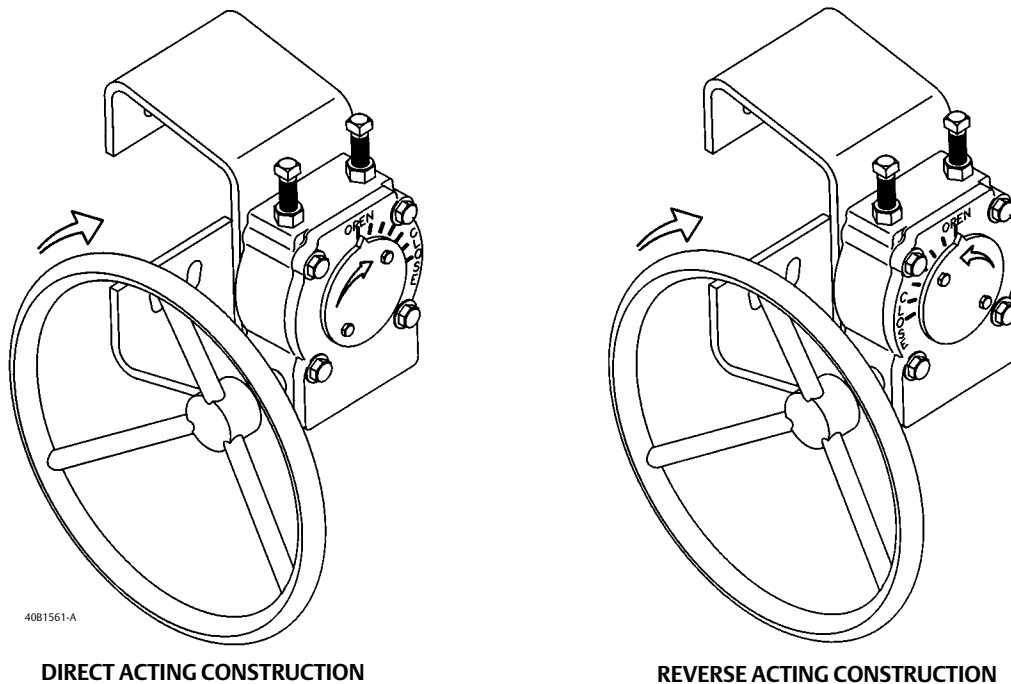
1. Values shown are the maximum allowable torque of a splined valve shaft except where indicated. Without regard to the shaft, maximum allowable torque output is 2400 inch-pounds for the size 0-KE actuator, 6000 inch-pounds for the size 2-KE actuator, 12,000 inch-pounds for the size 6-KE actuator, 20,000 inch-pounds for the size 7-KE actuator, 30,000 inch-pounds for the size 9-KE actuator, and 60,000 inch-pounds for the size 10-KE:6 actuator.
 2. Limited to this value by the maximum allowable output torque of the actuator.
 3. Wheel-rim force required to produce maximum actuator output torque.

Table 3. Direct and Reverse Acting Actuator Constructions

MOUNTING	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 8580, and 9500
Right-Hand	CCW CW	REVERSE	REVERSE	REVERSE	CW CW	NA NA	DIRECT
Left-Hand	CCW CCW	NA NA	REVERSE	REVERSE	CW CW	DIRECT	DIRECT
Left-Hand (Optional) ⁽¹⁾	CW CW	NA NA	DIRECT	NA NA	NA NA	NA NA	NA NA

1. A left hand ball will be required for the NPS 3 through 12 Series B and the NPS 14 to 20, with or without attenuator.

Figure 2. Direct and Reverse Acting Actuator Constructions (also see table 3)

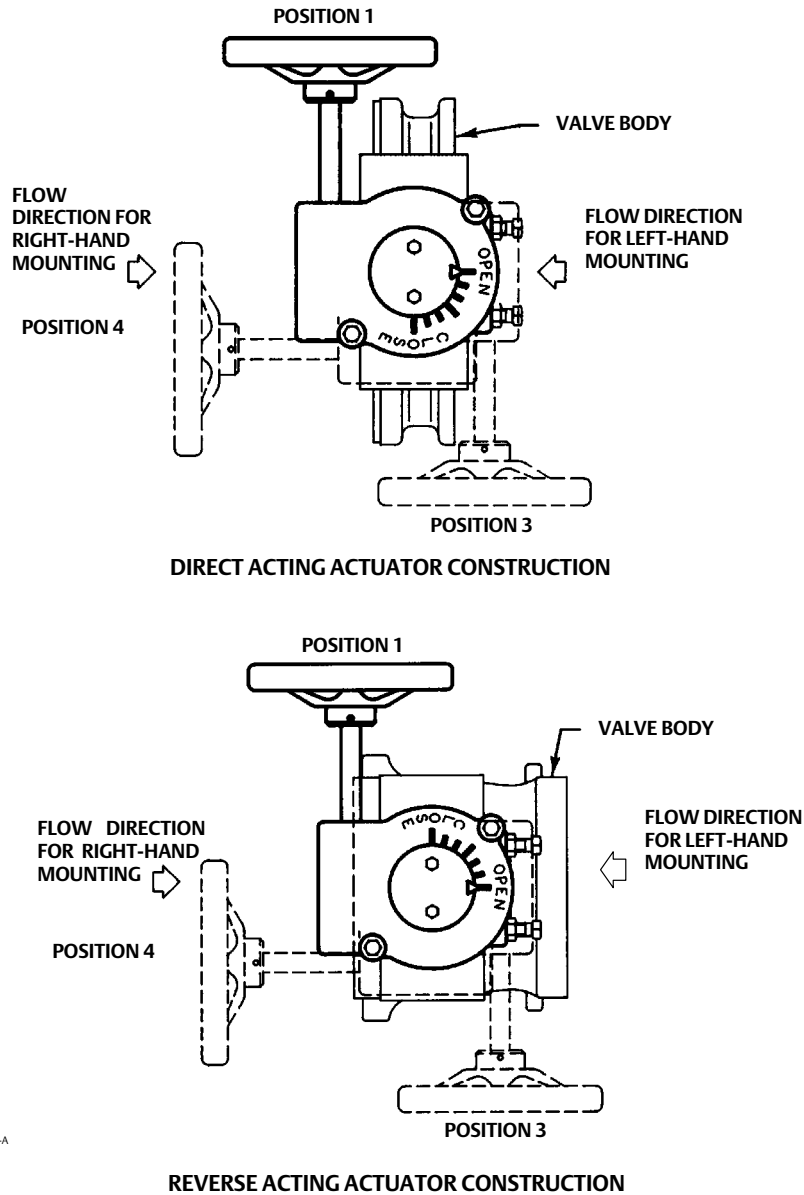


Installation

The valve body and actuator assembly may be installed in any of the positions shown in figure 3. The actuator will be factory mounted on the valve body in the position specified.

Dimensions are shown in figure 4. Make clearance considerations before mounting the actuator to determine the most suitable mounting position.

Figure 3. Available Mounting Positions



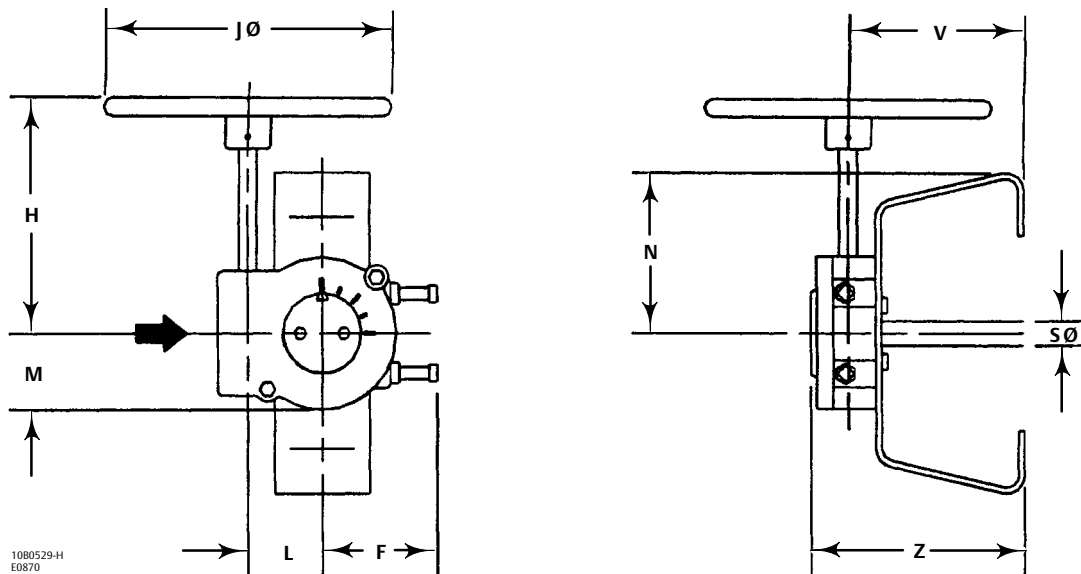
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Table 4. Envelope Dimensions

ACTUATOR SIZE	HANDWHEEL DIAMETER J \varnothing	VALVE SHAFT DIAMETER	F	H	L	M	N	V	Z
mm									
0-KE	152	12.7, 15.9	70	164	45	52	111	186	222
	203	19.1, 22.2, 25.4		170					
2-KE	203	22.2, 25.4	124	221	79	79	111	187	230
	305	31.8, 38.1		238			165	200	243
6-KE	610	31.8, 38.1	145	356	83	84	165	213	260
		44.5, 50.8					191	321	368
7-KE	762	44.5, 50.8	152	381	105	103	191	324	384
9-KE	762	44.5, 50.8	178	406	119	117	191	346	432
	914	63.5					241		
		63.5 ⁽¹⁾					305	448	533
10-KE:6	406	63.5	178	419	127	117	241	346	432
		63.5 ⁽¹⁾					305	448	533
	610	76.2, 88.9							
Inches									
0-KE0	6.00	1/2, 5/8	2.75	6.44	1.75	2.06	4.38	7.31	8.75
	8.00	3/4, 7/8, 1		6.69					
2-KE	8.00	7/8, 1	4.88	8.69	3.12	3.12	4.38	7.38	9.06
	12.00	1-1/4, 1-1/2		9.38			6.50	7.88	9.56
6-KE	24.00	1-1/4, 1-1/2	5.69	14.00	3.25	3.31	6.50	8.38	10.25
		1-3/4, 2					7.50	12.62	14.50
7-KE	30.00	1-3/4, 2	6.00	15.00	4.12	4.06	7.50	12.75	15.12
9-KE	30.00	1-3/4, 2	7.00	16.00	4.69	4.62	7.50	13.62	17.00
	36.00	2-1/2					9.50		
		2-1/2 ⁽¹⁾					12.00	17.62	21.00
10-KE:6	16.00	2-1/2	7.00	16.50	5.00	4.62	9.50	13.62	17.00
		2-1/2 ⁽¹⁾					12.00	17.62	21.00
	24.00	3, 3-1/2							

1. Used with NPS 30, 36 8510 and NPS 16 V250.

Figure 4. Envelope Dimensions (also see table 4)



Ordering Information

When ordering, specify:

Application

1. Valve body type or design, size, and shaft diameter.
2. Valve disk or ball rotation (e.g., 0 to 60 or 0 to 90 degrees). For adjustability between 0 and 30 degrees for the closed stop position, or for adjustability between 60 and 90 degrees for the open stop position, the 60-degree travel stop is used.
 - a. This option is available on actuator sizes 2-KE, 7-KE, 9-KE, and 10-KE:6 as a set screw change.
 - b. For sizes 0-KE and 6-KE a different actuator is required when changing from 90-degree to 60-degree ball rotation.
3. Right- or left-hand mounting and desired mounting position from figure 3. If the control valve assembly is to be used for bidirectional flow, assume that the flow direction arrows in figure 3 point to the seal retainer or flow ring end of the valve body.

Handwheel Actuator

Refer to the Specifications section. Review the description for each specification and in the referenced tables and figures. Indicate a choice whenever there is a selection to be made.

Note

When specifying a mounting position, make certain the handwheel diameter specified will not interfere with the valve body, pipe flanges, or line bolting connected to the system.

Accessories

If ordering limit switches, specify the number of switches desired (one or two). For one limit switch, specify whether switching is to occur at the open or closed valve position.

Valve Body and Accessories

Refer to the separate valve body and accessory information bulletins for ordering information.

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