Fisher™ 2052 Diaphragm Rotary Actuator

Contents

Figure 1. Fisher Control-Disk™ Valve with 2052 Actuator and DVC6200 Digital Valve Controller

Introduction

Scope of Manual

This instruction manual includes installation, adjustment, operation, maintenance, and parts information for the Fisher 2052 diaphragm rotary actuator (figure 1). Instructions for the control valve, positioner, manual actuator, and other accessories are included in separate manuals.

Do not install, operate, or maintain a 2052 actuator without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. **To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings.** If you have any questions about these instructions, contact your Emerson sales office or Local Business Partner before proceeding.

Description

2052 spring-and-diaphragm rotary actuators are used on rotary-shaft valve bodies for throttling or on-off applications. The 2052 may be used for on-off service without a positioner, or it may be used for throttling service with a positioner, depending on service conditions. The 2052 has an ISO 5211 mating interface that allows installation to non-Fisher valves. Refer to separate bulletins for valve and positioner information.

A top-mounted handwheel option is available for infrequent service as a manual actuator. For repeated or daily manual operation, the unit should be equipped with a side-mounted declutchable 1078 manual actuator. Externally adjustable travel stops are used to limit the degree of rotation at both ends of the actuator stroke.

The lever for the 2052 actuator is supported by bushings. The lever may be changed to accommodate valve bodies with different size valve shafts.

Table 1. Fisher 2052 Actuator Specifications

Specifications	
Actuator Mounting Connections	Splined shaft connection, ISO 5211 actuator-to-bracket connection **Size 1:** F07, **Size 2:** F10, **Size 3:** F14
Actuator Sizes	See table 2
Operating Pressure(1)	See table 3
Maximum Diaphragm Casing Pressure	Size 1, 2, and 3 Actuators: 5 barg (73 psig)
Pressure Connection	See table 5
Torque Output	See table 3
Actuator Temperature Capabilities(1)	Standard: -45 to 80°C (-50 to 176°F) Optional: -45 to 100°C (-50 to 212°F)(3) or -60 to 80°C (-76 to 176°F)(4)
Operation	Field reversible between PDTC and PDTO; right- and left-hand mounting, any angle of orientation
Approximate Weight	Size 1: 22.2 kg (49 lb) Size 2: 54.4 kg (120 lb) Size 3: 113 kg (250 lb)
Controller/Positioners Available	DVC2000, DVC6020, DVC6030, DVC6200, 3610J, 3620J, 4190, C1
Adjustable Travel Stops	Standard adjustable up and down stops capable of 30 degrees of adjustment per stop.
Accessories Available	846, 646, 2625, and 67C Series, switches, i2P-100, VBL, DXP, GO Switch™
Handwheel	Top-mounted handwheel: Optional on Size 1, 2, and 3 actuators Declutchable handwheel: Optional on Size 1, 2, and 3 actuators
Operational Lockout(2)	Available for customer-supplied padlock to lock the actuator in the spring-fail position

1. The pressure/temperature limits in this manual should not be exceeded. The current SIL certification for the 2052 actuator is only relevant for the standard temperature ratings shown.
2. Lockout and declutchable handwheel cannot be used together on size 2 and size 3 actuators.
3. Temperature range only applies when using silicone diaphragm material. Silicone diaphragm is not available with the top-mounted handwheel option.
4. Temperature range requires use of stainless steel bolting for yoke and travel stops. Not available with top-mounted handwheel.

Table 2. Actuator and Shaft Size Availability

SHAFT SIZE		ACTUATOR SIZE		
mm	**Inches**	**1**	**2**	**3**
12.7	1/2	X		
14.3 x 15.9	9/16 x 5/8	X	X	
15.9	5/8	X	X	
19.1	3/4	X	X	X
22.2	7/8		X	X
25.4	1		X	X
28.6 x 31.8	1-1/8 x 1-1/4		X	X
31.8	1-1/4		X	X
31.8 x 38.1	1-1/4 x 1-1/2			X
38.1	1-1/2			X
39.7 x 44.5	1-9/16 x 1-3/4			X
44.5	1-3/4			X
50.8	2			X

Table 3. Torque versus Actuator Size

ACTUATOR SIZE AND ACTION	OPERATING PRESSURE							
	2 barg (29 psig)(1)		3 barg (44 psig)(1)		4 barg (58 psig)(1)		4.7 barg (68 psig)(1)	
	Torque							
	N•m	**lbf•in**	**N•m**	**lbf•in**	**N•m**	**lbf•in**	**N•m**	**lbf•in**
1 (PDTO)	25.5	226	25.5	226	51.2	453	51.2	453
1 (PDTC)	25.5	226	36.2	320	51.2	453	72.4	641
2 (PDTO)	105	930	105	930	210	1860	210	1860
2 (PDTC)	105	930	175	1550	210	1860	320	2840
3 (PDTO)	327	2890	327	2890	631	5580	631	5580
3 (PDTC)	280	2480	557	4930	584	5170	930	8230

1. Do not interpolate between operating pressures. Consult your Emerson sales office or Local Business Partner for assistance.

Table 4. Fisher 2052 Actuator Mounting Styles

MOUNTING	ACTION(1)	VALVE SERIES OR DESIGN			VALVE SERIES OR DESIGN	
		BALL/PLUG ROTATION TO CLOSE	V150, V200 & V300	CV500 V500	DISK/BALL ROTATION TO CLOSE	A11, 8510B, 8532, 8560, 8580, 9500, and Control-Disk Valve
Right-Hand	PDTC PDTO	CCW CCW	A B	A B	CW CW	B A
Left-Hand	PDTC PDTO	CCW CCW	D C	D C	CW CW	C D
Left-Hand (Optional)(2)	PDTC PDTO	CW CW	C D	NA NA	NA NA	NA NA

1. PDTC—Push-down-to-close, and PDTO—Push-down-to-open.
2. A left hand mounted ball will be required for the NPS 3 through 12 Vee-Ball Series B and the NPS 14 and 16, with or without attenuator.

Figure 2. Fisher 2052 Actuator Mounting Styles

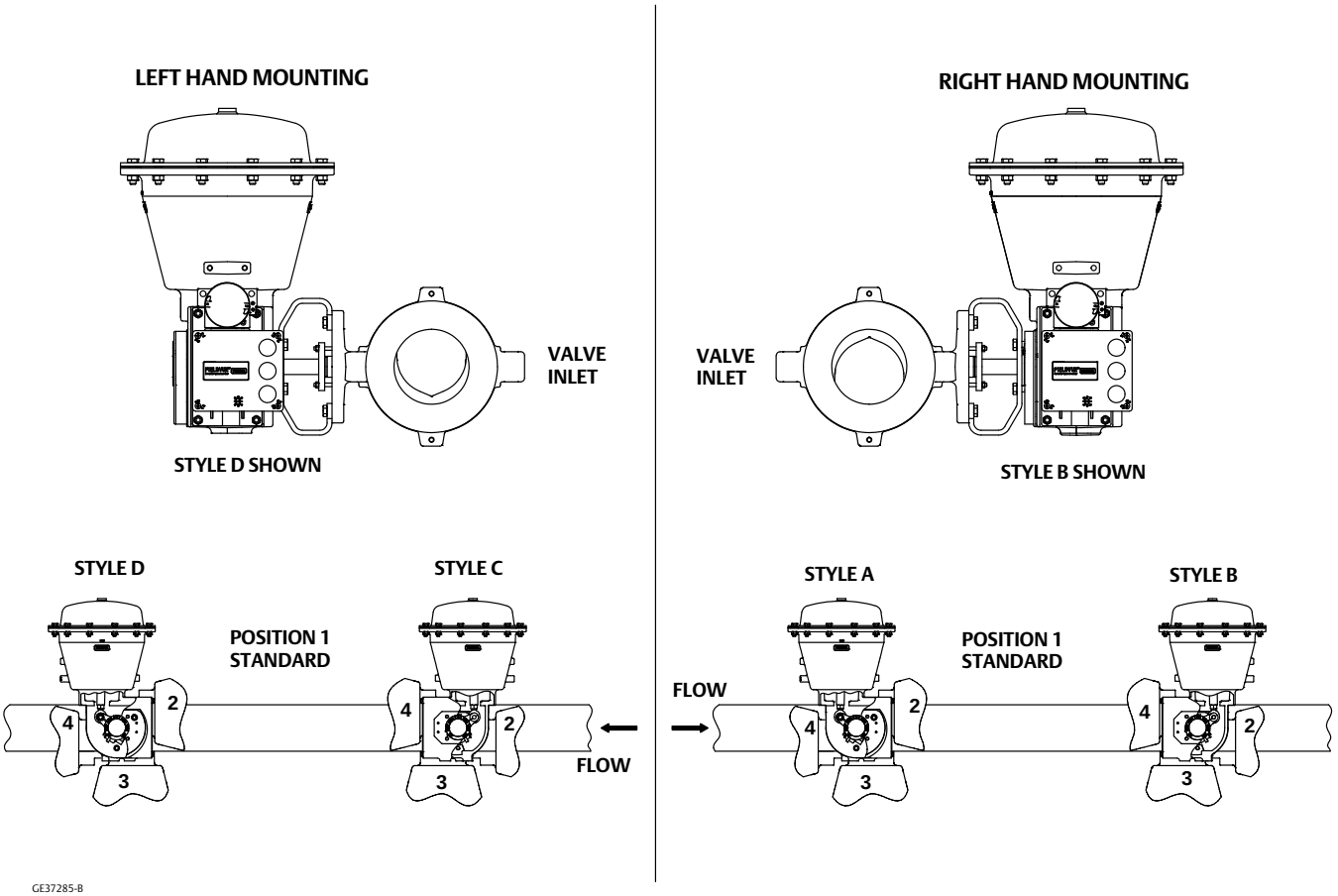


Table 5. Pressure Connections

ACTUATOR SIZE	PRESSURE CONNECTION			
	1/4 NPT	1/2 NPT	3/4 NPT	G 1/4
1	standard	optional	not available	optional
2	standard	optional	not available	optional
3	not available	standard	optional	not available

Educational Services

For information on available courses for Fisher 2052 actuators, as well as a variety of other products, contact:

Emerson Automation Solutions
Educational Services - Registration
Phone: 1-641-754-3771 or 1-800-338-8158
E-mail: education@emerson.com
emerson.com/fishervalvetraining

Specifications

Specifications are shown in table 1 for 2052 actuators. Specifications for actuator operation are stamped on a metal nameplate attached to the actuator.

Table 6. Bolting Torque Requirements(1)

DESCRIPTION KEY NUMBER	ACTUATOR SIZE	TORQUE		FASTENER LUBRICATION
		N•m	Lbf•ft	
Rod End Bearing Clamping Bolt Torque , Key 16	1 2 3	38 180 400	28 130 295	None
End Plate to Housing Bolt Torque, Key 4	1 2 3	68 120 210	50 90 155	None
Diaphragm Plate to Rod Bolt Torque, Key 7	1 2 3	27 115 300	20 85 220	Anti-Seize Lubricant
Casing Bolt Torque, Key 8	1 2 3	55 55 55	40 40 40	None
Housing to Yoke Bolt Torque, Key 28	1 2 3	27 68 245	20 50 180	None
Lever-Spline Clamping Bolt Torque, Key 15	1 2 3	38 115 175	28 85 130	None
Optional Lockout Kit Mounting Bolt Torque, Key 53	1 2 3	NA 88 340	NA 65 250	None

1. Exceeding any torque requirements could damage the actuator and impair safe operation.

Installation

⚠ WARNING

Always wear protective gloves, clothing, and eyewear when performing any installation operations.

Check with your process or safety engineer for any other hazards that may be present from exposure to process media.

If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.

CAUTION

To avoid parts damage, do not apply pressure that exceeds the Maximum Diaphragm Casing Pressure in table 1. Use pressure-limiting or pressure-relieving devices to prevent the Operating Pressure from exceeding the values shown in table 3.

The actuator, as it comes from the factory, is normally mounted on a valve body. If the actuator is shipped separately or if it is necessary to mount the actuator on the valve, perform the procedures presented in the Actuator Mounting section. Follow the procedures given in the valve instruction manual when installing the control valve in the pipeline.

If a positioner is ordered with the actuator, the pressure connection to the actuator is normally made at the factory. If it is necessary to make this connection, run tubing of the appropriate size for the diaphragm casing pressure connection (reference table 5) between the pressure connection and the instrument. Keep the length of tubing or pipe as short as possible to avoid transmission lag in the control signal.

When the control valve is completely installed and connected to the controlling instrument, check to make sure that the action is correct (air-to-open or air-to-close) and that the controlling instrument is properly configured for the desired action. For successful operation, the diaphragm rod assembly, lever, and valve shaft must move freely in response to changes in the loading pressure on the diaphragm.

Actuator Mounting

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or bursting of parts. Before performing any maintenance operations:

- **Do not remove the actuator from the valve while the valve is still pressurized.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Safely vent the power actuator loading pressure.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **The valve packing box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline.* Process fluids may spray out under pressure when removing the packing hardware or packing rings.**
- **Check with your process or safety engineer for any hazards that may be present from exposure to process media.**

Use the following steps to mount the actuator or to change actuator mounting style or position.

Unless otherwise specified, key numbers referenced in the following procedures are shown in figure 7 for the 2052 actuator.

If the Actuator is mounted on a valve body and it is necessary to change mounting style or position, the actuator must first be separated from the valve body.

1. Isolate the valve body from the process. Release process pressure and vent all actuator pressure.
2. Remove the cover or plug (key 2).

⚠ WARNING

To avoid personal injury and equipment damage from moving parts, keep fingers and tools clear while stroking the actuator with the cover removed.

3. Loosen the cap screw (key 15).
4. Separate the actuator from the valve body by removing the cap screws and nuts which secure the valve to the mounting yoke (key 27). Proceed to step 5.

If the actuator is not mounted on a valve body ensure the up and down travel stops (see figure 3) are adjusted correctly to achieve the desired actuator rotation. Use the travel indicator (key 21) and travel scale (key 19) as reference.

Note

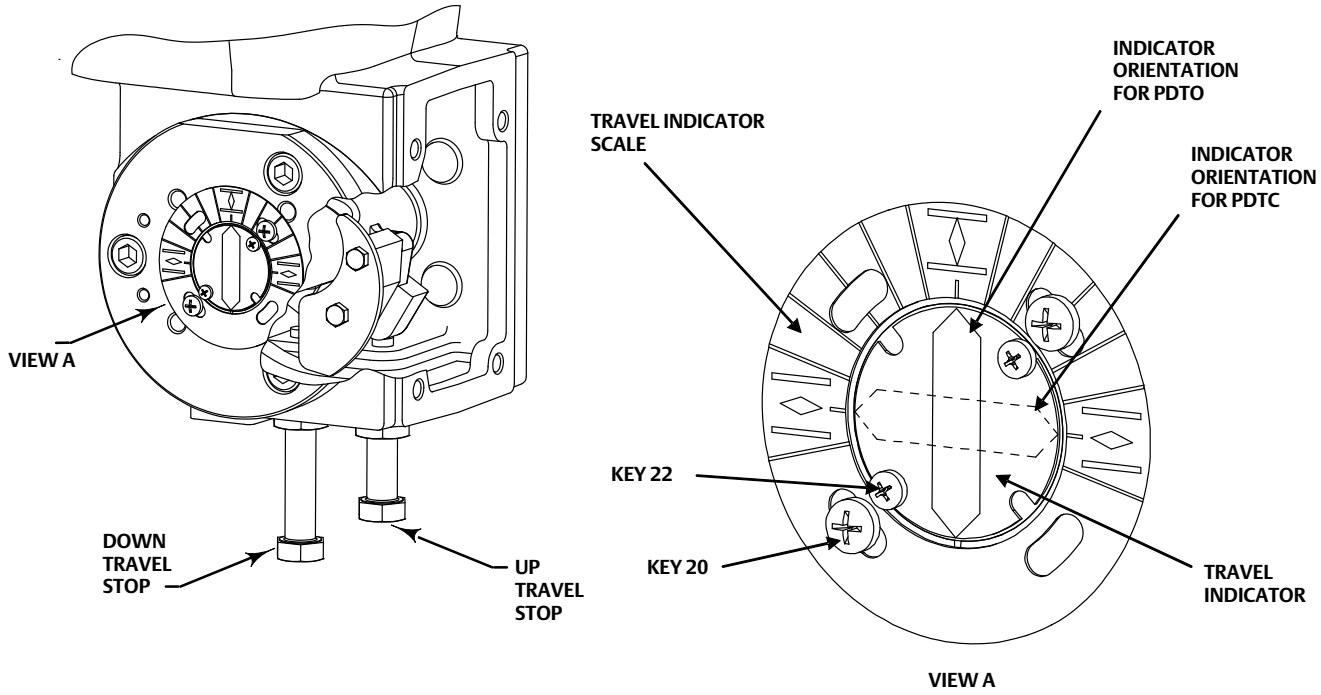
Once each travel stop is properly positioned, adequately tighten the hex nut (key 24) to lock the travel stop in place.

5. Refer to figure 2 and table 4 for available mounting styles and positions. The actuator is normally positioned vertically with the valve in a horizontal pipeline.
6. Determine whether the actuator mounting yoke (key 27) will be mounted on the end plate assembly (key 3) side or on the actuator housing boss side of the actuator. If the desired mounting position and style require moving the mounting yoke (key 27) and travel indicator components to opposite sides of the actuator, remove the machine screws (keys 20 and 22), the travel indicator scale (key 19), and the travel indicator (key 21). Remove the cap screws (key 28) and the mounting yoke (key 27). Install the mounting yoke in the desired position (on the end plate assembly or on the actuator housing boss). Tighten the mounting cap screws to the torque specified in table 6. Install the travel indicator components on the opposite side of the actuator.

⚠ WARNING

To avoid personal injury or property damage, ensure the travel indicator is installed correctly to coincide with the desired actuator action. Refer to figure 3 for more information.

Figure 3. Fisher 2052 Actuator Travel Stops and Travel Indication



7. Before sliding the valve shaft into the lever, position the valve ball or disk as follows:

For push-down-to-close action, the valve ball or disk should be in the fully open position.

For push-down-to-open action, the valve ball or disk should be in the fully closed position (see the valve body instruction manual).

8. Make sure that the index markings on the valve shaft are properly aligned with either the markings on the lever or the travel indicator scale mounting holes. Slide the valve shaft into the lever. (See figure 4 for one possible orientation.) Install the valve mounting cap screws and nuts. Tighten to the torque value given in the appropriate valve body instruction manual.
9. Ensure all end play in the valve shaft is removed by directing the valve shaft and control element toward the actuator as much as possible.
10. Tighten the socket head cap screw (key 15) which compresses the splined lever connection to the valve shaft (see table 6). Install the cover or plug (key 2) into the access hole in the housing.

CAUTION

When adjusting the travel stop for the closed position of the valve ball or disk, refer to the appropriate valve instruction manual for detailed procedures. Undertravel or overtravel at the closed position may result in poor valve performance and/or damage to the equipment.

Over-rotation of the lever could result in the diaphragm stroking to the point where the diaphragm seals off against the air signal connection. This could prevent an air signal from being able to stroke the valve.

11. Adjust the up travel stop (see figure 3) so that the valve ball or disk is in the desired position. When adjusting the up travel stop, ensure the stop is not backed out too far, causing the lever to over-rotate. Over-rotation of the lever may cause damage to valve components. Avoid over-rotation by adjusting the up travel stop so that the travel indicator screws (key 22) align with the travel scale screws (key 20). See figure 3.
12. Stroke the actuator and adjust the down travel stop so that the valve ball or disk is in the desired position.

Note

Once each travel stop is properly positioned, adequately tighten the hex nut (key 24) to lock the travel stop in place.

13. Make sure that the travel indicator pointer matches the ball or disk position. Remove and install in the proper position if necessary.
14. Refer to the table of contents for accessory installation procedures.

Maintenance

Actuator parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement depends upon the severity of service conditions. Instructions are given below for disassembly and assembly of parts. Key numbers referenced in the following steps are shown in figure 7 for the 2052, except as listed below or otherwise specified in the procedures.

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or bursting of parts. Before performing any maintenance operations:

- **Do not remove the actuator from the valve while the valve is still pressurized.**

- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Safely vent the power actuator loading pressure.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **Check with your process or safety engineer for any hazards that may be present from exposure to process media.**

Replacing Diaphragm

Isolate the valve body from the process. Release process pressure and vent all actuator pressure.

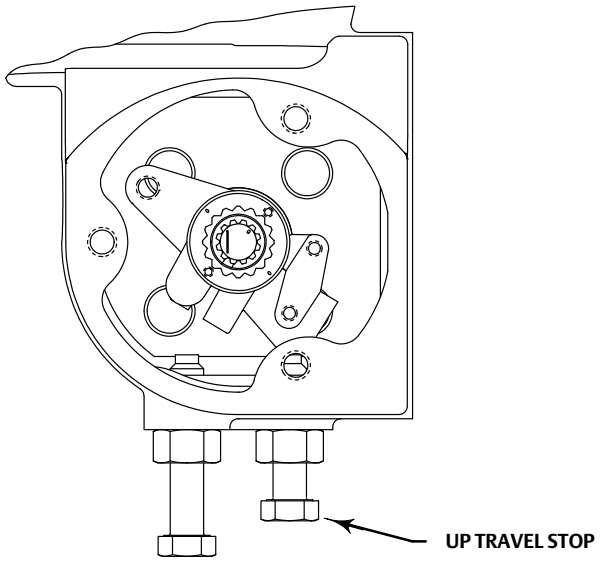
Disassembly

1. Remove the supply tubing or pipe from the top casing assembly (key 5).

⚠ WARNING

To avoid personal injury from precompressed spring force suddenly thrusting parts away from the actuator, spring compression must first be relieved. Closely follow the instructions below.

Figure 4. Orientation of the Fisher 2052 Actuator Lever into the Housing and Aligning the Actuator to the Valve Shaft Markings



2. Loosen, but do not remove, all casing cap screws and hex nuts (keys 8 and 9). Ensure there is no spring force to the top casing assembly (key 5). If spring force is detected against the top casing assembly, ensure the up travel stop cap screw (key 23) is adjusted correctly to prevent over-rotation of the lever (key 14). Refer to figure 3. The travel indicator screws (key 22) in the end of the lever should be in alignment with the travel scale screws (key 20). If the up travel stop is confirmed to be adjusted correctly and force is still detected against the top casing assembly, contact your local Emerson Automation Solutions Instrument and Valves Service Center. Alternatively, replace two oppositely located casing cap screws (key 8) with 100 mm (4 inch) long fully threaded M10 cap screws of ISO 898-1

Property Class 8.8 material or equivalent. Loosen the nuts (key 9) on the two fasteners in an equivalent manner to relieve spring force.

3. Carefully remove all cap screws and hex nuts (keys 8 and 9) from the top casing assembly. The spring forces are retained by the diaphragm rod assembly (key 10), allowing quick removal of the pressure retaining components.
4. Remove the top casing assembly and the diaphragm (key 11).
5. Inspect the diaphragm plate (key 6). If the diaphragm plate is damaged or if further disassembly of the actuator is required, proceed to the Replacing Diaphragm Plate, Diaphragm Rod Assembly, and Spring(s) procedure.
6. Inspect the diaphragm and replace if necessary.

Assembly

1. Place the diaphragm (key 11) on the diaphragm plate (key 6), making certain that it is properly centered.
2. Observe the correct position of the loading connection fitting and install the top casing assembly (key 5). Replace the cap screws and nuts (keys 8 and 9) which secure the top casing assembly to the actuator housing. Tighten the nuts in an alternating fashion (see table 6).
3. Install the inlet piping to the top casing assembly.

Replacing Diaphragm Plate, Diaphragm Rod Assembly, and Spring(s)

Isolate the valve body from the process. Release process pressure and vent all actuator pressure.

Disassembly

1. Remove the supply tubing or pipe from the top casing assembly (key 5).

⚠ WARNING

To avoid personal injury from precompressed spring force suddenly thrusting parts away from the actuator, spring compression must first be relieved. Closely follow the instructions below.

2. Loosen, but do not remove, all casing cap screws and hex nuts (keys 8 and 9). Ensure there is no spring force to the top casing assembly (key 5). If spring force is detected against the top casing assembly, ensure the up travel stop cap screw (key 23) is adjusted correctly to prevent over-rotation of the lever (key 14). Refer to figure 3. The travel indicator screws (key 22) in the end of the lever should be in alignment with the travel scale screws (key 20). If the up travel stop is confirmed to be adjusted correctly and force is still detected against the top casing assembly, contact your local Emerson Instrument and Valves Service Center. Alternatively, replace two oppositely located casing cap screws (key 8) with 100 mm (4 inch) long fully threaded M10 cap screws of ISO 898-1 Property Class 8.8 material or equivalent. Loosen the nuts (key 9) on the two fasteners in an equivalent manner to relieve spring force.
3. Carefully remove all cap screws and hex nuts (keys 8 and 9) from the top casing assembly. The spring forces are retained by the diaphragm rod assembly (key 10), allowing quick removal of the pressure retaining components.
4. Remove the top casing assembly and the diaphragm (key 11).
5. Inspect the diaphragm plate (key 6).
   a. To relieve spring compression, using a hex wrench, unscrew and remove the socket head cap screw (key 7) which secures the diaphragm plate (key 6) to the diaphragm rod assembly (key 10). Remove the diaphragm plate.
6. Remove the spring (key 13) or springs (keys 12 and 13).

7. The guide assembly (key 48) may be removed for inspection (size 3 only).

Note

At this stage of disassembly, it may be determined that further disassembly is not necessary. If separation of the diaphragm rod assembly from the lever is not warranted, proceed to the Assembly portion within this section of the procedure.

8. To gain access to the cap screw (key 16) which secures the diaphragm rod assembly to the lever, the end plate assembly (key 3) must be removed. Before the end plate assembly can be removed, one of the following procedures must be performed. Proceed as appropriate:

- For actuators with valve bodies mounted on the end plate assembly (key 3) side of the actuator, the actuator must be separated from the valve body. Perform steps 1 through 4 of the Actuator Mounting section, remove the mounting yoke (key 27), and then return to step 9 of this section.

- For actuators with valve bodies mounted on the actuator housing boss side of the actuator [opposite of the endplate (key 3)], remove the travel indicator pointer (key 21). Proceed to step 9.

9. Remove the socket head cap screws (key 4) and the end plate assembly (key 3).
10. Remove the cap screw (key 16) and nut (key 17) if applicable (size 3 only), that secures the actuator lever (key 14) to the diaphragm rod assembly (key 10). Remove the diaphragm rod assembly.
11. Inspect all parts and replace if necessary.
12. If total disassembly of the actuator is required, or if the actuator will be assembled for use with a valve body with a different valve shaft diameter, proceed to the Changing or Replacing Actuator Lever procedure.

Assembly

1. Fasten the diaphragm rod assembly (key 10) to the lever using the cap screw (key 16) and nut (key 17) if applicable. Tighten per table 6.
2. Install the housing end plate (key 3).
3. Adjust the travel stop bolts to the correct position so that the travel indicator screws (key 22) align with the travel scale screws (key 20). See figure 3.
4. Install the guide assembly (key 48 - size 3 only).
5. Install the spring(s). The outer (larger diameter) spring is standard for the single spring size 1 & 2 constructions. The inner spring is standard for the single spring size 3 construction.
6. Place the diaphragm plate (key 6) onto the spring(s). It is important that the springs be properly seated in their respective counterbores on the bottom side of the plate. If necessary, push or pull the diaphragm plate toward center to ensure the springs are engaged into their respective seats.
7. Lubricate the socket head capscrew (key 7) and tighten per table 6.
8. Place the diaphragm (key 11) on the diaphragm plate (key 6), making certain that it is properly centered.
9. Observe the correct position of the loading connection fitting and install the top casing assembly (key 5). Replace the cap screws and nuts (keys 8 and 9) which secure the top casing assembly to the actuator housing. Tighten the nuts in an alternating fashion (see table 6).
10. Install the inlet piping to the top casing assembly.
11. Install the travel indicator (key 19) if removed.
12. If the actuator was removed from the valve body, refer to the appropriate section in the Actuator Mounting procedure and proceed as applicable.

Changing or Replacing Actuator Lever

⚠ WARNING

Avoid personal injury or property damage. The end plate assembly (key 3) and lever (key 14) may only be removed after the actuator spring compression forces are safely relieved. Refer to the instructions below.

Disassembly

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or bursting of parts. Before performing any maintenance operations:

- **Do not remove the actuator from the valve while the valve is still pressurized.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Safely vent the power actuator loading pressure.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **Check with your process or safety engineer for any other hazards that may be present from exposure to process media.**

1. Isolate the valve body from the process. Release process pressure and vent all actuator pressure.
2. Remove the cover or plug (key 2).

⚠ WARNING

To avoid personal injury and equipment damage from moving parts, keep fingers and tools clear while stroking the actuator with the cover removed.

3. Loosen the cap screw (key 15).
4. Follow steps 2 through 10 in the Replacing Diaphragm Plate, Diaphragm Rod Assembly, and Spring(s) section.
5. Remove and inspect the lever (key 14). If the lever is worn or damaged, or if the actuator will be mounted to a valve body requiring a different size lever, replace the lever.
6. Inspect the bushings located in the end plate (key 3) and housing (key 1) assemblies. If bushings are excessively worn or damaged, remove them with a press. Press in new bushings so that they are flush with the exterior surfaces of the actuator housing and the end plate assembly.

Assembly

1. Refer to figure 4 for the correct orientation of the lever during assembly.
2. If a cam-operated positioner is used, install the cam to the lever with the parts provided by the appropriate instrument mounting kit. Be sure to observe the orientation shown in figure 4 and follow all procedures given in the positioner instruction manual.
3. Insert the lever into the bushing in the actuator housing.
4. Fasten the rod end bearing diaphragm rod assembly to the lever using the cap screw (key 16) and nut (key 17) if applicable. Tighten per table 6.

5. Install the end plate assembly (key 3).
6. Adjust the travel stop bolts to the correct position so that the travel indicator screws (key 22) align with the travel scale screws (key 20). See figure 3.
7. Install the guide assembly (key 48) size 3 only.
8. Install the spring(s). The outer (larger diameter) spring is standard for the single spring size 1 & 2 constructions. The inner spring is standard for the single spring size 3 construction.
9. Place the diaphragm plate (key 6) onto the spring(s). It is important that the springs be properly seated in their respective counterbores on the bottom side of the plate. If necessary, push or pull the diaphragm plate toward center to ensure the springs are engaged into their respective seats.
10. Lubricate the socket head capscrew (key 7) and tighten per table 6.
11. Place the diaphragm (key 11) on the diaphragm plate (key 6), making certain it is properly centered.
12. Observe the correct position of the loading connection fitting and install the top casing assembly (key 5). Replace the cap screws and nuts (keys 8 and 9) which secure the top casing assembly to the actuator housing. Tighten the nuts in an alternating fashion (see table 6).
13. Install the inlet piping to the top casing assembly.
14. Refer to the Actuator Mounting procedure and proceed as applicable.

Positioner Mounting (3610, DVC6020, or DVC6200)

1. Before installing the positioner, the positioner cam must be installed on the lever.
2. Refer to assembly step 2 in the previous section on Changing or Replacing Actuator Lever.
3. Refer to the positioner instruction manual for setup and calibration procedures.

Top-Mounted Handwheel (Size 1 and 2)

Key numbers used in this procedure are shown in figure 9 except where indicated.

The optional top-mounted handwheel can be used as a manual actuator for intermittent service. It is not to be used as an adjustable travel stop. This is built into the housing.

The handwheel assembly is welded to a special top casing assembly (key 5, figure 9). A hex nut (key 43) locks the handwheel in position. For field installation of a handwheel, the special upper diaphragm casing is supplied with the handwheel.

Turning the handwheel (key 32) clockwise into the upper casing forces the pusher plate (key 36) against the diaphragm and diaphragm plate (keys 11 and 6, figure 7) to compress the inner and outer springs (keys 12 and 13, figure 7) and move the diaphragm rod assembly downward. Turning the handwheel counter-clockwise allows the actuator spring(s) to move the diaphragm rod assembly upward.

CAUTION

Damage to the handwheel screw can occur if the handwheel is over-rotated in the counter-clockwise direction. The handwheel should not continue to be rotated once the actuator reaches the up stop and resistance to turning the handwheel significantly drops.

Instructions are given below for complete disassembly and assembly required for inspection and parts replacement.

Disassembly

⚠ WARNING

To avoid personal injury from the precompressed spring force thrusting the upper diaphragm casing away from the actuator, fully turn the handwheel counterclockwise.

1. Perform steps 1 through 6 of the Replacing Diaphragm procedure.
2. Remove the cotter pin, hex nut, handwheel, and locknut (keys 34, 33, 32, and 43). Unscrew the stem (key 35) out through the actuator end of the handwheel body (key 5).
3. Check the condition of the O-ring (key 44); replace if necessary.
4. If it is necessary to remove the pusher plate or spacer (key 36 or 42), drive out the groove pin (key 37).

Assembly

1. Before assembling, lubricate the thread of the stem (key 35) with anti-seize lubricant. Lubricate the bearing surfaces of the stem and rounded end with lithium grease.
2. If the pusher plate or spacer was removed, attach them to the stem and drive in a new groove pin (key 37).
3. With the O-ring (key 44) in place, thread the stem into the handwheel assembly.
4. Install the locknut, handwheel, hex nut, and cotter pin (keys 43, 32, 33, and 34).

Note

Be sure to install the handwheel so that the arrow of operation on the top side coincides with the action of the actuator, as stated on the nameplate. (The arrow should point clockwise for PDTO. The arrow should point counter-clockwise for PDTC.)

5. Install the top casing assembly, making certain the warning tag is in place on the casing flange.

Locking Mechanism

Refer to figures 5 or 6 for the appropriate size locking mechanism when installing or planning to operate the device.

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or bursting of parts. Before performing any maintenance operations:

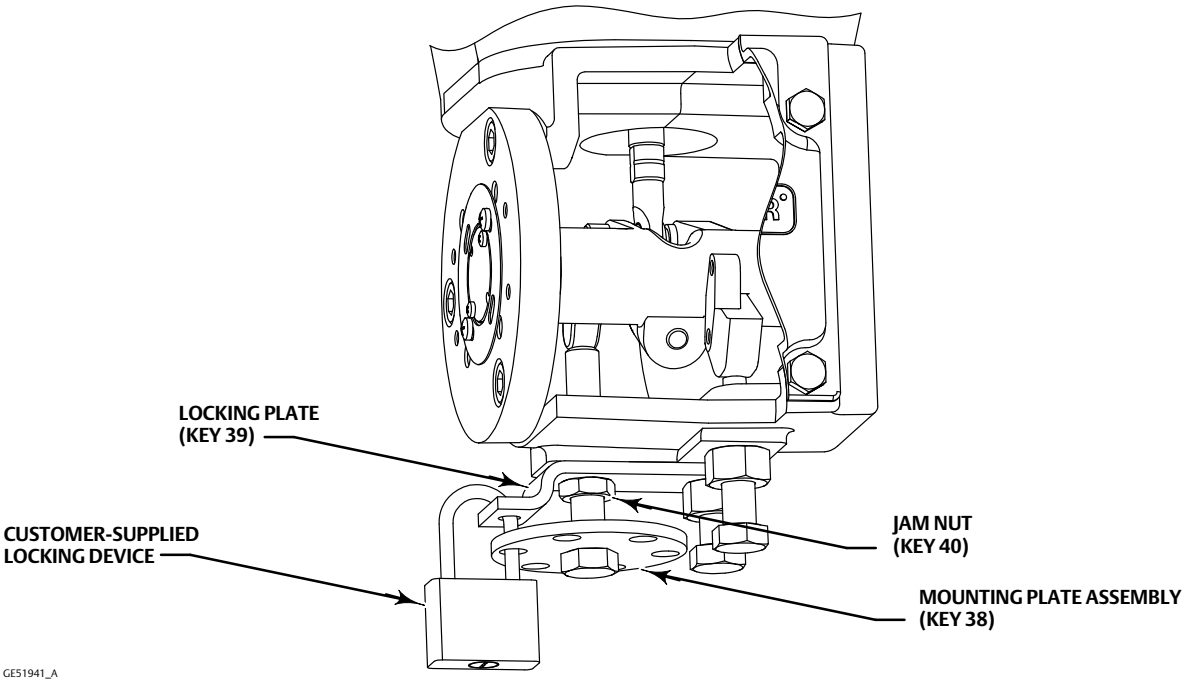
- **Do not remove the actuator from the valve while the valve is still pressurized.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Safely vent the power actuator loading pressure.**
- **Check with your process or safety engineer for any hazards that may be present from exposure to process media.**

Installing the Size 1 Locking Mechanism

To add the locking mechanism (figure 5) to an existing actuator, purchase the required kit from Emerson Automation Solutions.

1. Ensure the diaphragm rod assembly (key 10) is in the upward position and the lever (key 14) is against the up travel stop (spring fail position).
2. Thread the supplied jam nut (key 40) all the way onto the threaded bolt portion of the mounting plate assembly.
3. Loosen the down travel stop hex nut (key 24) and remove the travel stop cap screw (key 23).
4. Remove the vent screen (key 47) from the threaded hole in the bottom of the actuator housing.
5. Secure the locking plate (key 39) to the bottom of the housing assembly by reinstalling the down travel stop (key 23) and hex nut (key 24). Ensure the clearance hole in the locking plate is aligned with the threaded hole in the bottom of the housing.
6. Ensure the down travel stop is adjusted correctly to achieve the desired actuator rotational output.
7. Install the mounting plate assembly (key 38) by inserting it through the clearance hole in the locking plate and threading it into the hole in the actuator housing.

Figure 5. Size 1 Locking Mechanism



Operating the Locking Mechanism (Size 1)

To Lock the Actuator

1. Screw the mounting plate assembly into the housing until it contacts the actuator lever.
2. Align the hole in the locking plate (key 39) with one of the holes in the disk of the mounting plate assembly.
3. Tighten the jam nut (key 40) against the locking plate.

4. Insert a padlock (not furnished by Emerson Automation Solutions) to prevent the mounting plate assembly from rotating.

To Unlock the Actuator

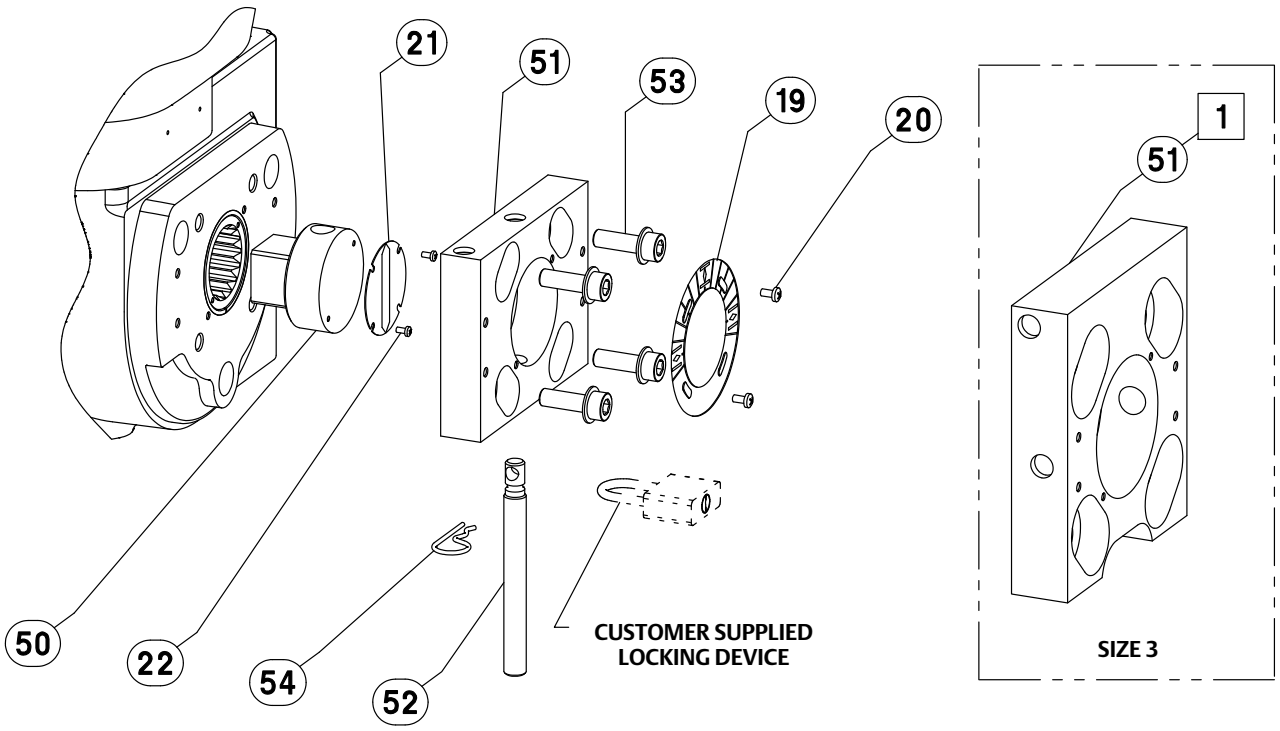
1. Remove the padlock. Loosen the jam nut (key 40), and unscrew the threaded bolt until it no longer protrudes inside the housing.

Note

Ensure the mounting plate assembly bolt is unthreaded far enough that the actuator lever will not contact the bolt during normal actuator operation.

2. If the mounting plate assembly is to be left partially threaded into the housing, lock it with the jam nut (key 40) so that it cannot be screwed further into the housing and interfere with normal actuator operation.

Figure 6. Size 2 and 3 Locking Mechanism



Installing the Size 2 and 3 Locking Mechanism

To add the locking mechanism (figure 6) to an existing actuator, purchase the required kit from Emerson Automation Solutions.

1. The actuator should be mounted to the valve body and both travel stops (key 23) properly positioned prior to installing the locking mechanism.
2. Ensure the actuator lever (key 14) is in the spring-fail position (against the up travel stop).
3. Assemble the lockout kit by positioning the locking shaft (key 50) within the center through-hole of the mounting plate (key 51), as shown in figure 6. Insert the locking pin (key 52) through the center pinhole of the mounting plate and through the pin hole in the locking shaft. Install the hairpin cotter pin (key 54) for retention.
4. If installing the lockout kit on an existing actuator, remove the travel indicator (key 21) and travel indicator scale (key 19) from the actuator by loosening the appropriate screws.
5. Position the lockout kit against the actuator outboard end. The locking shaft will insert and engage the lever end geometry.

Size 2 actuator: The standard size 2 lockout kit orientation shown in figure 6 will accommodate the use of window-mount and end-mount digital valve controllers, positioners, and accessories. This orientation requires removal of the locking pin in the direction of the bottom side of the actuator.

Size 3 actuator: For the window mounted DVC6200 digital valve controller, the size 3 lockout kit should be oriented such that locking pin removal is in the direction of the bottom side of the actuator. This mounting plate position provides necessary clearance with the integral supply pressure regulator. For the end-mount digital valve controller or accessory option, the size 3 lockout kit should be oriented as shown in the inset picture of figure 6.

6. Loosely install the four flanged cap screws (key 53). Prior to tightening the fasteners, ensure the through-hole in the mounting plate is centered around the outside diameter of the locking shaft (key 50). Rotate the assembly by hand in the appropriate direction opposite of anticipated lever rotation to eliminate initial clearance among parts.
7. Tighten the cap screws (key 53) per the recommended torque values in table 6.
8. Install the travel indicator (key 21) and travel indicator scale (key 19) to the lockout parts as illustrated in figure 6.

⚠ WARNING

To avoid personal injury or property damage, ensure the travel indicator is installed correctly to coincide with the desired actuator action. Refer to figure 3 for more information.

9. For normal actuator operation, remove the hairpin cotter pin (key 54) and locking pin (key 52) from the center pinhole of the mounting plate and reinstall these parts in the second pinhole for storage.

Operating the Locking Mechanism (Size 2 & 3)

To Lock the Actuator

1. With the actuator lever (key 14) against the up travel stop (spring-fail position), insert the locking pin (key 52) through the center pinhole of the mounting plate and through the pin hole in the locking shaft. Install the hairpin cotter pin (key 54) for retention.
2. Install the customer-supplied locking device to further prevent removal of the locking pin.

To Unlock the Actuator

1. Remove the customer-supplied locking device.
2. Remove the hairpin cotter pin (key 54) and locking pin (key 52) from the center pinhole of the mounting plate and reinstall these parts in the second pinhole for storage.

⚠ WARNING

To avoid personal injury or property damage, be aware the travel indicator scale (key 19) retains the locking shaft (key 50) during normal actuator operation. Removal of the travel indicator scale could allow the locking shaft to fall out in certain actuator orientations.

Parts Ordering

When corresponding with your Emerson sales office or Local Business Partner about this equipment, refer to the serial number found on the actuator nameplate.

⚠ WARNING

Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Automation Solutions should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and property damage.

Parts List

Note
Contact your Emerson sales office or Local Business Partner for Part Ordering information.

Key	Description
1	Housing Assembly
1a*	Bushing
2	Cover or Plug
3	End Plate Assembly
3a*	Bushing
4	Cap Screw
5	Top Casing Assembly
6	Diaphragm Plate
7	Cap Screw
8	Cap Screw
9	Hex Nut
10	Diaphragm Rod Assembly
11*	Diaphragm
	Molded nitrile/nylon
	Standard Construction
	Molded silicone/polyester
	Standard Construction
12	Spring, Inner
13	Spring, Outer
14	Lever
15	Cap Screw
16	Cap Screw
17	Hex Nut
18	Insert
19	Travel Indicator Scale
20	Self Tapping Screw
21	Travel Indicator
22	Machine Screw
23	Cap Screw
24	Hex Nut
25	Cover Plate
26	Cap Screw
27	Mounting Yoke
28	Cap Screw
29	Label
30	Nameplate
31	Drive Screw
32	Handwheel
33	Slotted Hex Nut
34	Cotter Pin
35	Screw
36	Pusher Assembly
37	Groove Pin
41	Warning Label
42	Washer
43	Hex Nut
44*	O-Ring
45	Lubricant
46	Lubricant
47	Vent Screen
48*	Guide Assembly
49	Lockout Kit

Kits for Actuator Locking Mechanisms are available to keep the actuator in a locked position, the same as spring-fail, during maintenance. (Padlock is customer supplied). Not compatible with the declutchable handwheel on size 2 and 3 actuators.

Kits

Description	Part Number
Size 1	GE51941X012
Size 2	GE52968X012
Size 3	GE52968X022

*Recommended spare parts

Figure 7. Fisher 2052 Actuator Assembly

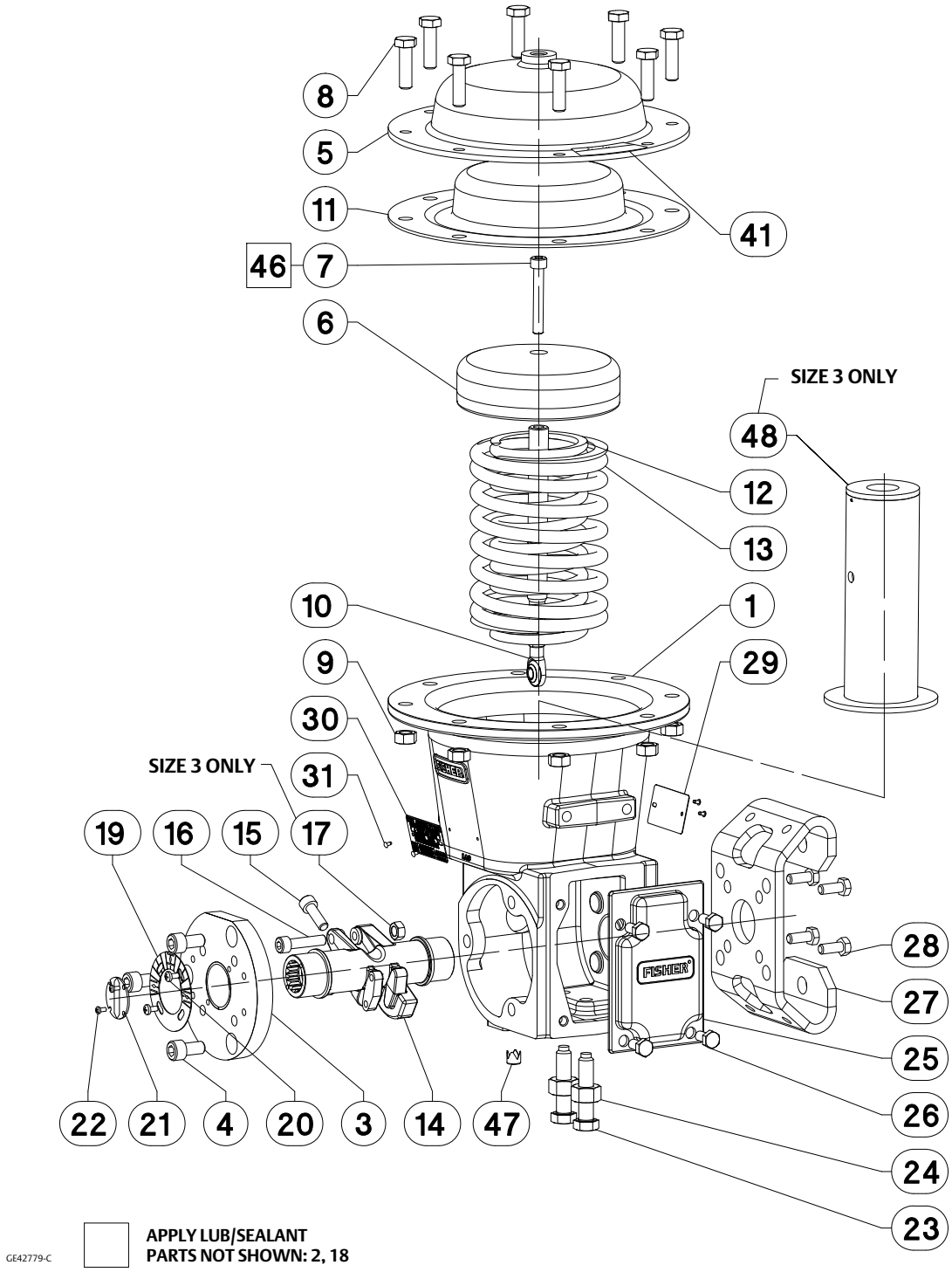


Figure 8. Fisher 2052 Size 3 Actuator Assembly

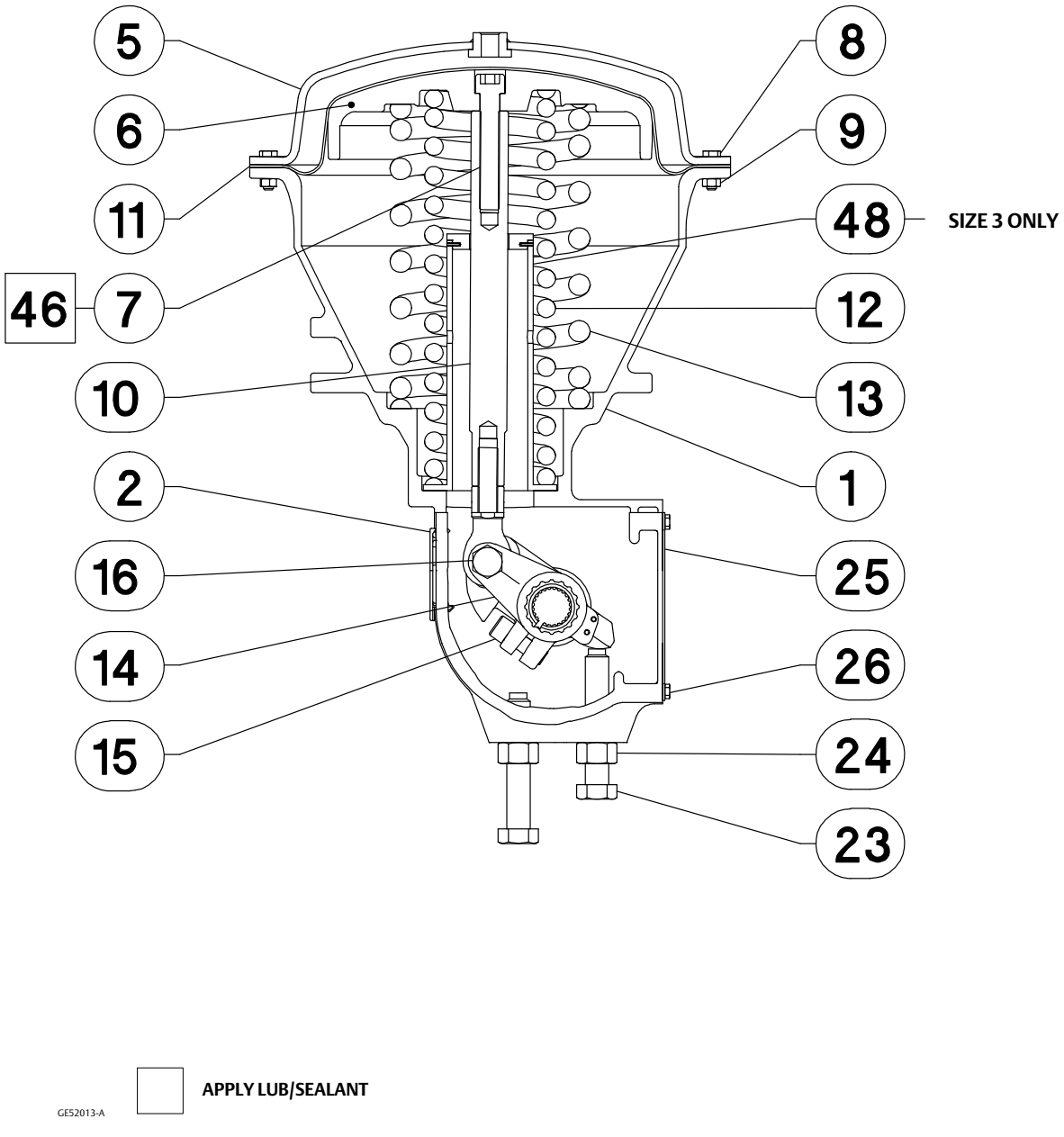
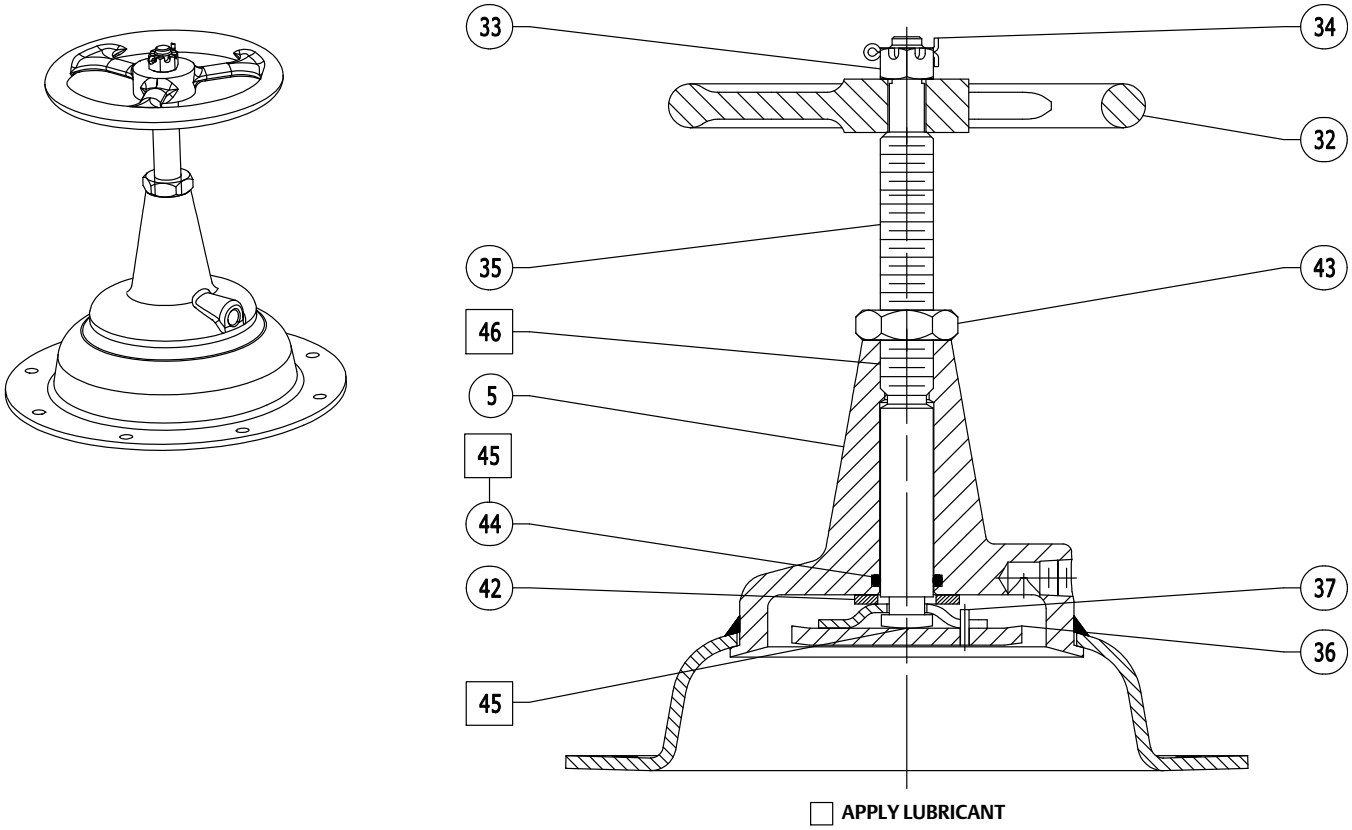


Figure 9. Fisher 2052 Size 1 Handwheel Assembly



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

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Fisher™ 1068 Rotary Vane Actuator

Fisher 1068 rotary vane spring return and double acting pneumatic actuators have a large range of sizes that can be mounted to rotary shaft valves. The 1068 rotary vane actuator is one of the simplest and most reliable units for quarter-turn rotary actuation.

The 1068 design offers a wide torque range. The double acting actuator is capable of outputting the same torque at every valve rotation. The spring return actuator has torque outputs that are linear, and balanced for both air-to-open and air-to-close applications.

X1591

1068 SPRING RETURN ACTUATOR

X1590

1068 DOUBLE ACTING ACTUATOR

Features

- Accuracy -- The 1068 actuator vane and shaft are an integral casting, removing a means of lost motion or dead band. Clamped coupler used on size 5i through 15i spring return minimizes the possibility of lost motion between the actuator and valve shaft connection.
- Integral Air Passage -- The 1068 sizes 5i through 15i spring return actuator incorporates an integral air passage that eliminates the need for external tubing and fittings when paired with a Fisher FIELDVUE™ DVC6200 digital valve controllers. The double acting unit will require minimal external tubing.
- Compact Construction -- Reduced valve/actuator envelope dimensions leads to more mounting flexibility when space is at a premium.
- Long Life Service -- Tested to over 1 million cycles. Rugged construction provides stability, corrosion resistance, and protection from demanding process control applications.
- Improved Ease of Use -- Integral mounting pad for DVC6200 eliminates the traditional mounting bracket and reduces the number of parts required to mount for the size 5i through 15i spring return and double acting actuators.

Specifications

Available Configuration

Actuator Sizes:

Spring Return and Double Acting: ■ 5i (spring return), ■ 7i, ■ 8i, ■ 9i, ■ 10i, ■ 12i, ■ 14i, and ■ 15i

Spring Return and Double Acting: ■ 16, ■ 18, ■ 20, and ■ 30

Mounting Connections

Square Shaft: ISO 5211 5i through 15i
Keyed Shaft: 16 through 30

Operating Pressure

Double Acting: 20 psig (1.5 bar) to 100 psi (7 bar); 80 psig (5.5 bar), standard

Spring Return: 80 psig (5.5 bar) standard(1)

Operation:

Fail-Safe Spring Return: *Clock type spring return gives fail-safe operation with high torque output throughout spring stroke in either clockwise or counter-clockwise direction*

Double Acting:
Air to close CW or CCW

Spring Return:
Spring to close CW or CCW/ Air to close CW or CCW

Pressure Connections

See table 4

Adjustable Travel Stops

Standard: 80° minimum rotation, 84° size 5i

Torque Output

Refer to table 5

Digital Valve Controllers

DVC6200 Series

Temperature Range

Standard: -20 to 80°C (-4 to 176°F)

Materials of Construction

See table 1

Approximate Weight

See table 3

1. The torque output of the spring return actuator is optimized for an 80 psig operating pressure. The actuators are still capable of creating usable torque at 60 or 70 psig, but the net torque output will be significantly reduced and will no longer be balanced with the spring torque. See table 5 for spring return torque valves at 60 or 70 psig.

Features (cont.)

- Large Size Range -- The 1068 actuator offers sizes that cover torques up to 150,000 in•lb.
- Single Moving Part -- The rotary vane actuator ensures a long service life with minimal maintenance.
- Corrosion Resistant -- Robust epoxy coated zinc/titanium alloy, or aluminum housings, epoxy enamel coated inside/out to provide substantial corrosion resistance.
- Efficiency -- The small internal volume minimizes the air consumption of the 1068.

Options/Available Configurations

- Double Acting -- Air supplied to both sides of the vane which is the only moving part. Allowing for the highest torque values and compact design.
- Spring Return -- Designed for long cycle life and have a balanced net and spring stroke torque.

Fisher 1068 size 5i through 15i spring return actuators feature an integral air passage that eliminates the need for tubing and fittings with the DVC6200. The 1068 actuator with the DVC6200 digital valve controller is a combination for precision and repeatability in the field.

Table 1. Materials

Component	Material
Yoke	Diecast Aluminum Alloy (5i through 15i)
Casing	Aluminum Alloy (8i through 30), Zinc (5i and 7i)
Vane and Output Shaft	Stainless Steel (5i), Ductile Iron Zinc Plated (7i through 15i and 16 through 30)
Seals	Molded Polyurethane
Couplers	Stainless Steel 5i through 15i
Shaft Bushings	PTFE Coated Bronze

Table 2. Shaft Size Compatibility

Spring Return Size	Square Size (mm)					
	9	11	14	19	22	27
	Shaft Size (inches)					
	0.5	0.62	0.75	1	1.25	1.5
5i	X	X				
7i	X	X	X	X		
8i	X	X	X	X	X	X
9i	X	X	X	X	X	X
10i	X	X	X	X	X	X
12i			X	X	X	X
14i			X	X	X	X
15i					X	X
16 18 20 30	Contact your Emerson sales office					

Double Acting Size	Square Size (mm)					
	9	11	14	19	22	27
	Shaft Size (inches)					
	0.5	0.62	0.75	1	1.25	1.5
7i	X	X				
8i	X	X	X	X	X	
9i			X	X	X	X
10i			X	X	X	X
12i				X	X	X
14i				X	X	X
15i					X	X
16 18 20 30	Contact your Emerson sales office					

Table 3. Approximate Shipping Weight

Size	Shaft Diameter, inch	Spring Return		Double Acting	
		lb	kg	lb	kg
5i	1/2	9	4.1	---	---
	5/8				
7i	1/2	19	8.6	10	4.5
	5/8				
	3/4			---	---
	1				
8i	1/2	22	10	12	5.4
	5/8				
	3/4				
	1				
	1 1/4				
	1 1/2			---	---
9i	1/2	29	13.1	---	---
	5/8				
	3/4			15	6.8
	1				
	1 1/4				
	1 1/2				
10i	1/2	38	17.2	---	---
	5/8				
	3/4			18	8.2
	1				
	1 1/4				
	1 1/2				
12i	3/4	72	32.6	---	---
	1			26	11.8
	1 1/4				
	1 1/2				
14i	3/4	167	75.7	---	---
	1			40	18.1
	1 1/4				
	1 1/2				
15i	1 1/4	241	109.3	59	26.8
	1 1/2				
16	1 1/2	272	123.4	88	39.9
	1 3/4				
	2				
	2 1/8				
18	2 1/2	530	240.4	170	77.1
	3				
	3 1/2				
20	2 1/2	1058	480	464	210.5
	3				
	3 1/2				
30	2 1/2	1701	771.6	635	288.0
	3				
	3 1/2				

Table 4. Pressure Connections

Actuator Size	PRESSURE CONNECTION, NPT					
	1/8	1/4	3/8	1/2	3/4	1
5i	X					
7i		X				
8i		X				
9i		X				
10i		X				
12i			X			
14i				X		
15i				X		
16				X		
18					X	
20						X
30						X

Table 5. 1068 Spring Return Torques at Various Operating Pressures

FAIL OPEN 1068 SPRING RETURN ACTUATOR(1)								
Actuator Size	Spring Torque (all pressures)		60 psi		70 psi		80 psi	
	Torque (in • lb)		Net Torque (in • lb)					
	0°	90°	0°	90°	0°	90°	0°	90°
5i	185	155	63	93	109	139	155	185
7i	450	375	150	225	263	338	375	450
8i	720	580	229	368	405	544	580	720
9i	925	830	356	452	593	688	830	925
10i	1450	1270	523	703	896	1076	1270	1450
12i	2110	1810	763	1063	1286	1586	1810	2110
14i	5200	4230	1748	2717	2990	3959	4230	5200
15i	8514	6992	2848	4370	4921	6442	6992	8514
16	11691	9567	4100	6224	6833	8957	9567	11691
18	26143	21390	8723	13476	15056	19809	21390	26143
20	48286	39506	16506	25286	28006	36786	39506	48286
30	72428	59260	24760	37928	42010	55178	59260	72428
FAIL CLOSED 1068 SPRING RETURN ACTUATOR(1)								
Actuator Size	Spring Torque (all pressures)		60 psi		70 psi		80 psi	
	Torque (in • lb)		Net Torque (in • lb)					
	0°	90°	0°	90°	0°	90°	0°	90°
5i	155	185	93	63	139	109	185	155
7i	375	450	225	150	338	263	450	375
8i	580	720	368	229	544	405	720	580
9i	830	925	452	356	688	593	925	830
10i	1270	1450	703	523	1076	896	1450	1270
12i	1810	2110	1063	763	1586	1286	2110	1810
14i	4230	5200	2717	1748	3959	2990	5200	4230
15i	6992	8514	4370	2848	6442	4921	8514	6992
16	9567	11691	6224	4100	8957	6833	11691	9567
18	21390	26143	13476	8723	19809	15056	26143	21390
20	39506	48286	25286	16506	36786	28006	48286	39506
30	59260	72428	37928	24760	55178	42010	72428	59260

1. 0° and 90° for valve rotation.

Table 6. Actuator/Valve Body Mounting Dimensions A through G (see figures 1, 2, and 3)

SPRING RETURN ACTUATOR SIZE OPTIONS														
Square Shaft (9 mm)														
Size	**A**		**B**		**C**		**D**		**E**		**F**		**G**	
	mm	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**
5i	137	5.39	79.4	3.13	67	2.64	36	1.42	50	1.97	105	4.13	57	2.24
7i	178	7.01	102.6	4.04	100	3.94	36	1.42	82	3.23	105	4.13	57	2.24
8i	208	8.19	120.7	4.75	110	4.33	36	1.42	87	3.43	105	4.13	57	2.24
9i	227	8.94	132.3	5.21	126	4.96	36	1.42	92	3.62	105	4.13	57	2.24
10i	229	9.02	131	5.16	175	6.89	36	1.42	110	4.33	105	4.13	57	2.24
Square Shaft (11 mm)														
5i	137	5.39	79.4	3.13	67	2.64	36	1.42	50	1.97	105	4.13	60	2.36
7i	178	7.01	102.6	4.04	100	3.94	36	1.42	82	3.23	105	4.13	60	2.36
8i	208	8.19	120.7	4.75	110	4.33	36	1.42	87	3.43	105	4.13	60	2.36
9i	227	8.94	132.3	5.21	126	4.96	36	1.42	92	3.62	105	4.13	60	2.36
10i	229	9.02	131	5.16	175	6.89	36	1.42	110	4.33	105	4.13	60	2.36
Square Shaft (14 mm)														
7i	178	7.01	102.6	4.04	100	3.94	41	1.61	82	3.23	150	5.91	83	3.27
8i	208	8.19	120.7	4.75	110	4.33	41	1.61	87	3.43	150	5.91	83	3.27
9i	227	8.94	132.3	5.21	126	4.96	41	1.61	92	3.62	150	5.91	83	3.27
10i	229	9.02	131	5.16	175	6.89	41	1.61	110	4.33	150	5.91	83	3.27
12i	294	11.57	171	6.73	172	6.75	41	1.61	136	5.35	150	5.91	83	3.27
14i	380	14.96	224	8.82	216	8.48	41	1.61	187	7.36	150	5.91	83	3.27
Square Shaft (19 mm)														
7i	178	7.01	102.6	4.04	100	3.94	41	1.61	82	3.23	150	5.91	83	3.27
8i	208	8.19	120.7	4.75	110	4.33	41	1.61	87	3.43	150	5.91	83	3.27
9i	227	8.94	132.3	5.21	126	4.96	41	1.61	92	3.62	150	5.91	83	3.27
10i	229	9.02	131	5.16	175	6.89	41	1.61	110	4.33	150	5.91	83	3.27
12i	294	11.57	171	6.73	172	6.75	41	1.61	136	5.35	150	5.91	83	3.27
14i	380	14.96	224	8.82	216	8.48	41	1.61	187	7.36	150	5.91	83	3.27
Square Shaft (22 mm)														
8i	208	8.19	120.7	4.75	110	4.33	42	1.65	87	3.43	160	6.30	77	3.03
9i	227	8.94	132.3	5.21	126	4.96	42	1.65	92	3.62	160	6.30	77	3.03
10i	229	9.02	131	5.16	175	6.89	42	1.65	110	4.33	160	6.30	77	3.03
12i	294	11.57	171	6.73	171.5	6.75	42	1.65	136	5.35	160	6.30	77	3.03
14i	380	14.96	224	8.82	215.5	8.48	42	1.65	187	7.36	160	6.30	77	3.03
15i	433	17.05	252	9.92	260.5	10.26	42	1.65	187	7.36	160	6.30	77	3.03
Square Shaft (27 mm)														
8i	208	8.19	120.7	4.75	110	4.33	42	1.65	87	3.43	160	6.30	77	3.03
9i	227	8.94	132.3	5.21	126	4.96	42	1.65	92	3.62	160	6.30	77	3.03
10i	229	9.02	131	5.16	175	6.89	42	1.65	110	4.33	160	6.30	77	3.03
12i	294	11.57	171	6.73	171.5	6.75	42	1.65	136	5.35	160	6.30	77	3.03
14i	380	14.96	224	8.82	215.5	8.48	42	1.65	187	7.36	160	6.30	77	3.03
15i	433	17.05	252	9.92	260.5	10.26	42	1.65	187	7.36	160	6.30	77	3.03

-continued-

Table 6. Actuator/Valve Body Mounting Dimensions A through G (cont.) (see figures 1, 2, and 3)

DOUBLE ACTING ACTUATOR SIZE OPTIONS														
Square Shaft (9 mm)														
Size	**A**		**B**		**C**		**D**		**E(1)**		**F**		**G**	
	mm	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**
7i	178	7.01	102.6	4.04	100	3.94	36	1.42	---	---	105	4.13	57	2.24
8i	208	8.19	120.7	4.75	110	4.33	36	1.42	---	---	105	4.13	57	2.24
Square Shaft (11 mm)														
7i	178	7.01	102.6	4.04	100	3.94	36	1.42	---	---	105	4.13	60	2.36
8i	208	8.19	120.7	4.75	110	4.33	---	---	---	---	105	4.13	60	2.36
Square Shaft (14 mm)														
8i	208	8.19	120.7	4.75	110	4.33	41	1.61	---	---	150	5.91	83	3.27
9i	227	8.94	132.3	5.21	126	4.96	41	1.61	---	---	150	5.91	83	3.27
10i	229	9.02	131.0	5.16	175	6.89	41	1.61	---	---	150	5.91	83	3.27
Square Shaft (19 mm)														
8i	208	8.19	120.7	4.75	110	4.33	41	1.61	---	---	150	5.91	83	3.27
9i	227	8.94	132.3	5.21	126	4.96	41	1.61	---	---	150	5.91	83	3.27
10i	229	9.02	131.0	5.16	175	6.89	41	1.61	---	---	150	5.91	83	3.27
12i	294	11.57	171	6.73	172	6.75	41	1.61	---	---	150	5.91	83	3.27
14i	380	14.96	224	8.82	216	8.48	41	1.61	---	---	150	5.91	83	3.27
Square Shaft (22 mm)														
8i	208	8.19	120.7	4.75	110	4.33	42	1.65	---	---	160	6.30	77	3.03
9i	227	8.94	132.3	5.21	126	4.96	42	1.65	---	---	160	6.30	77	3.03
10i	229	9.02	131	5.16	175	6.89	42	1.65	---	---	160	6.30	77	3.03
12i	294	11.57	171	6.73	171.5	6.75	42	1.65	---	---	160	6.30	77	3.03
14i	380	14.96	224	8.82	215.5	8.48	42	1.65	---	---	160	6.30	77	3.03
15i	433	17.05	252	9.92	260.5	10.26	42	1.65	---	---	160	6.30	77	3.03
Square Shaft (27 mm)														
8i	208	8.19	120.7	4.75	110	4.33	42	1.65	---	---	160	6.30	77	3.03
9i	227	8.94	132.3	5.21	126	4.96	42	1.65	---	---	160	6.30	77	3.03
10i	229	9.02	131	5.16	175	6.89	42	1.65	---	---	160	6.30	77	3.03
12i	294	11.57	171	6.73	171.5	6.75	42	1.65	---	---	160	6.30	77	3.03
14i	380	14.96	224	8.82	215.5	8.48	42	1.65	---	---	160	6.30	77	3.03
15i	433	17.05	252	9.92	260.5	10.26	42	1.65	---	---	160	6.30	77	3.03

1. Double Acting Actuators will not have the Spring Return Chamber (E).

Table 7. Actuator/Valve Body Mounting Dimensions H through O (see figures 1, 2, and 3)

SPRING RETURN ACTUATOR SIZE OPTIONS													
Square Shaft (9 mm)													
Size	**H**		**I**		**J**		**K**		**M (NPT)**	**N**		**O**	
	mm	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**Inch**	**mm**	**Inch**	**mm**	**Inch**
5i	148	5.83	40	1.57	105	4.13	9	0.35	1/8	41.2	1.62	---	---
7i	148	5.83	40	1.57	105	4.13	9	0.35	1/4	41.2	1.62	---	---
8i	148	5.83	40	1.57	105	4.13	9	0.35	1/4	41.2	1.62	---	---
9i	148	5.83	40	1.57	105	4.13	9	0.35	1/4	41.2	1.62	---	---
10i	148	5.83	40	1.57	105	4.13	9	0.35	1/4	41.2	1.62	---	---
Square Shaft (11 mm)													
5i	148	5.83	40	1.57	105	4.13	11	0.43	1/8	41.2	1.62	---	---
7i	148	5.83	40	1.57	105	4.13	11	0.43	1/4	41.2	1.62	---	---
8i	148	5.83	40	1.57	105	4.13	11	0.43	1/4	41.2	1.62	---	---
9i	148	5.83	40	1.57	105	4.13	11	0.43	1/4	41.2	1.62	---	---
10i	148	5.83	40	1.57	105	4.13	11	0.43	1/4	41.2	1.62	---	---
Square Shaft (14 mm)													
7i	189	7.44	62	2.44	135	5.31	14	0.55	1/4	41.2	1.62	---	---
8i	189	7.44	62	2.44	135	5.31	14	0.55	1/4	41.2	1.62	---	---
9i	189	7.44	62	2.44	135	5.31	14	0.55	1/4	41.2	1.62	---	---
10i	189	7.44	62	2.44	135	5.31	14	0.55	1/4	41.2	1.62	---	---
12i	189	7.44	62	2.44	135	5.31	14	0.55	1/8	41.2	1.62	15.5	0.61
14i	189	7.44	62	2.44	135	5.31	14	0.55	1/2	41.2	1.62	15.5	0.61
Square Shaft (19 mm)													
7i	189	7.44	62	2.44	135	5.31	19	0.75	1/4	41.2	1.62	---	---
8i	189	7.44	62	2.44	135	5.31	19	0.75	1/4	41.2	1.62	---	---
9i	189	7.44	62	2.44	135	5.31	19	0.75	1/4	41.2	1.62	---	---
10i	189	7.44	62	2.44	135	5.31	19	0.75	1/4	41.2	1.62	---	---
12i	189	7.44	62	2.44	135	5.31	19	0.75	1/8	41.2	1.62	15.5	0.61
14i	189	7.44	62	2.44	135	5.31	19	0.75	1/2	41.2	1.62	15.5	0.61
Square Shaft (22 mm)													
8i	278	10.94	82	3.23	155	6.10	22	0.87	1/4	41.2	1.62	---	---
9i	278	10.94	82	3.23	155	6.10	22	0.87	1/4	41.2	1.62	---	---
10i	278	10.94	82	3.23	155	6.10	22	0.87	1/4	41.2	1.62	---	---
12i	278	10.94	82	3.23	155	6.10	22	0.87	1/8	41.2	1.62	15.5	0.61
14i	278	10.94	82	3.23	155	6.10	22	0.87	1/2	41.2	1.62	15.5	0.61
15i	278	10.94	82	3.23	155	6.10	22	0.87	1/2	41.2	1.62	15.5	0.61
Square Shaft (27 mm)													
8i	278	10.94	82	3.23	155	6.10	27	1.06	1/4	41.2	1.62	---	---
9i	278	10.94	82	3.23	155	6.10	27	1.06	1/4	41.2	1.62	---	---
10i	278	10.94	82	3.23	155	6.10	27	1.06	1/4	41.2	1.62	---	---
12i	278	10.94	82	3.23	155	6.10	27	1.06	1/8	41.2	1.62	15.5	0.61
14i	278	10.94	82	3.23	155	6.10	27	1.06	1/2	41.2	1.62	15.5	0.61
15i	278	10.94	82	3.23	155	6.10	27	1.06	1/2	41.2	1.62	15.5	0.61

-continued-

Table 7. Actuator/Valve Body Mounting Dimensions H through O (cont.) (see figures 1, 2, and 3)

DOUBLE ACTING ACTUATOR SIZE OPTIONS													
Square Shaft (9 mm)													
Size	**H**		**I**		**J**		**K**		**M (NPT)**	**N**		**O**	
	mm	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**Inch**	**mm**	**Inch**	**mm**	**Inch**
7i	148	5.83	40	1.57	105	4.13	9	0.35	1/8	41.2	1.62	---	---
8i	148	5.83	40	1.57	105	4.13	9	0.35	1/4	41.2	1.62	---	---
Square Shaft (11 mm)													
7i	148	5.83	40	1.57	105	4.13	11	0.43	1/8	41.2	1.62	---	---
8i	148	5.83	40	1.57	105	4.13	11	0.43	1/4	41.2	1.62	---	---
Square Shaft (14 mm)													
8i	189	7.44	62	2.44	135	5.31	14	0.55	1/4	41.2	1.62	---	---
9i	189	7.44	62	2.44	135	5.31	14	0.55	1/4	41.2	1.62	---	---
10i	189	7.44	62	2.44	135	5.31	14	0.55	1/4	41.2	1.62	---	---
Square Shaft (19 mm)													
8i	189	7.44	62	2.44	135	5.31	19	0.75	1/4	41.2	1.62	15.5	0.61
9i	189	7.44	62	2.44	135	5.31	19	0.75	1/4	41.2	1.62	15.5	0.61
10i	189	7.44	62	2.44	135	5.31	19	0.75	1/4	41.2	1.62	15.5	0.61
12i	189	7.44	62	2.44	135	5.31	19	0.75	1/8	41.2	1.62	15.5	0.61
14i	189	7.44	62	2.44	135	5.31	19	0.75	1/2	41.2	1.62	15.5	0.61
Square Shaft (22 mm)													
8i	278	10.94	82	3.23	155	6.10	22	0.87	1/4	41.2	1.62	---	---
9i	278	10.94	82	3.23	155	6.10	22	0.87	1/4	41.2	1.62	---	---
10i	278	10.94	82	3.23	155	6.10	22	0.87	1/4	41.2	1.62	---	---
12i	278	10.94	82	3.23	155	6.10	22	0.87	1/8	41.2	1.62	15.5	0.61
14i	278	10.94	82	3.23	155	6.10	22	0.87	1/2	41.2	1.62	15.5	0.61
15i	278	10.94	82	3.23	155	6.10	22	0.87	1/2	41.2	1.62	15.5	0.61
Square Shaft (27 mm)													
8i	278	10.94	82	3.23	155	6.10	27	1.06	1/4	41.2	1.62	---	---
9i	278	10.94	82	3.23	155	6.10	27	1.06	1/4	41.2	1.62	---	---
10i	278	10.94	82	3.23	155	6.10	27	1.06	1/4	41.2	1.62	---	---
12i	278	10.94	82	3.23	155	6.10	27	1.06	1/8	41.2	1.62	15.5	0.61
14i	278	10.94	82	3.23	155	6.10	27	1.06	1/2	41.2	1.62	15.5	0.61
15i	278	10.94	82	3.23	155	6.10	27	1.06	1/2	41.2	1.62	15.5	0.61

Figure 1. 1068 Actuator — Spring Return and Double Acting Dimension Drawing for 9 and 11 mm Square Shaft (see tables 6 and 7)

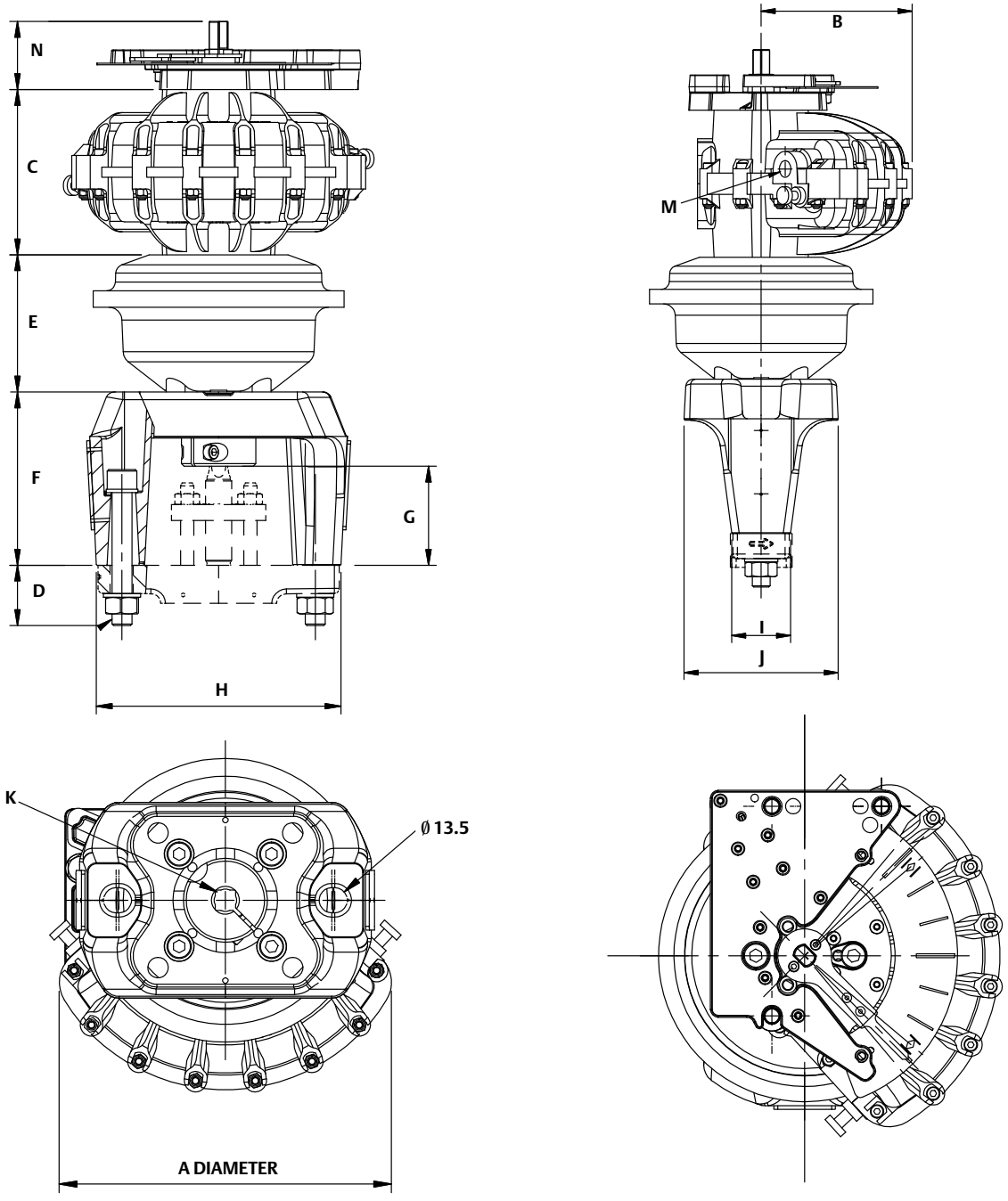

Figure 2. 1068 Actuator — Spring Return and Double Acting Dimension Drawing for 14 and 19 mm Square Shaft (see tables 6 and 7)

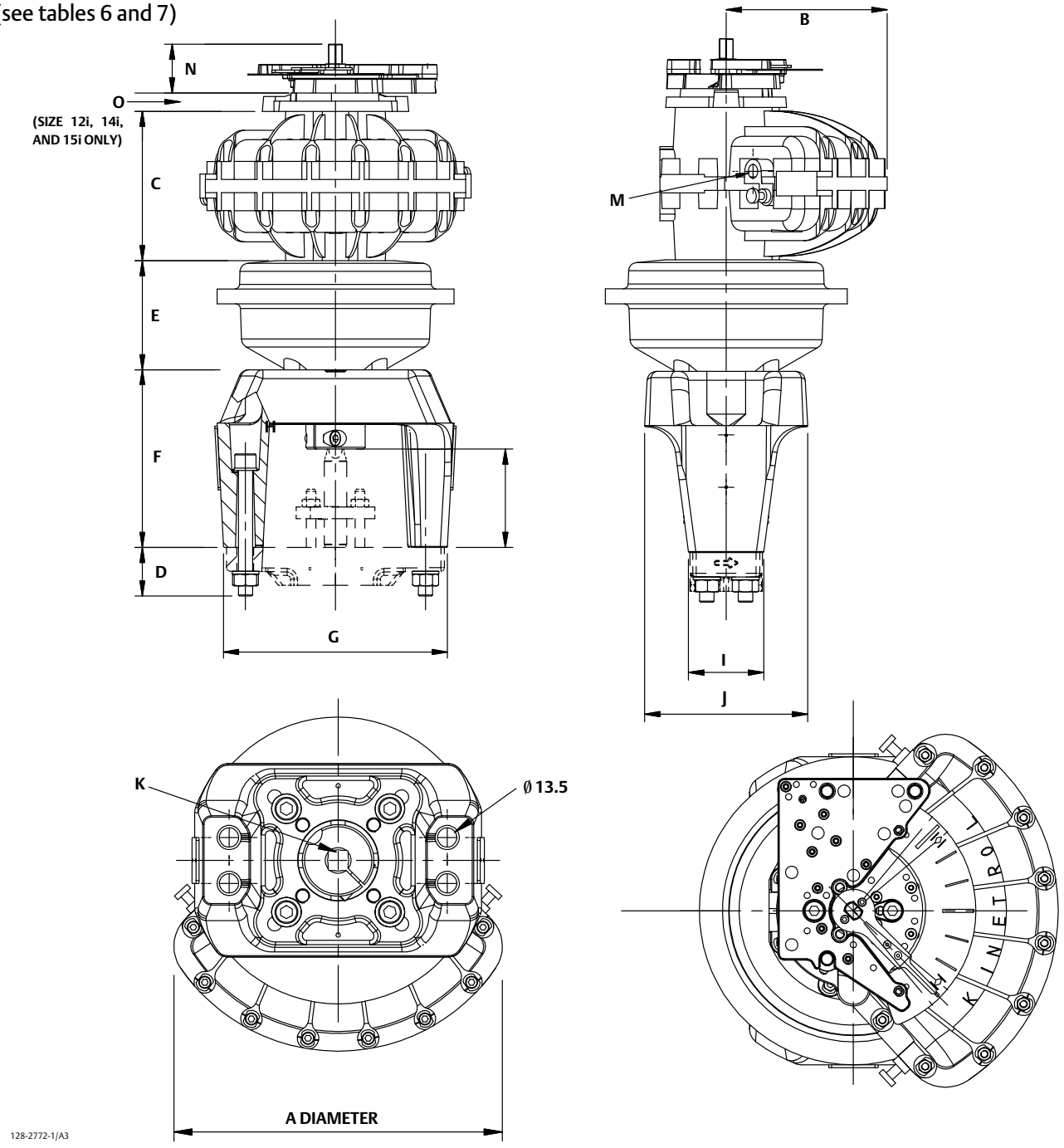

Figure 3. 1068 Actuator — Spring Return and Double Acting Dimension Drawing for 22 and 27 mm Square Shaft (see tables 6 and 7)

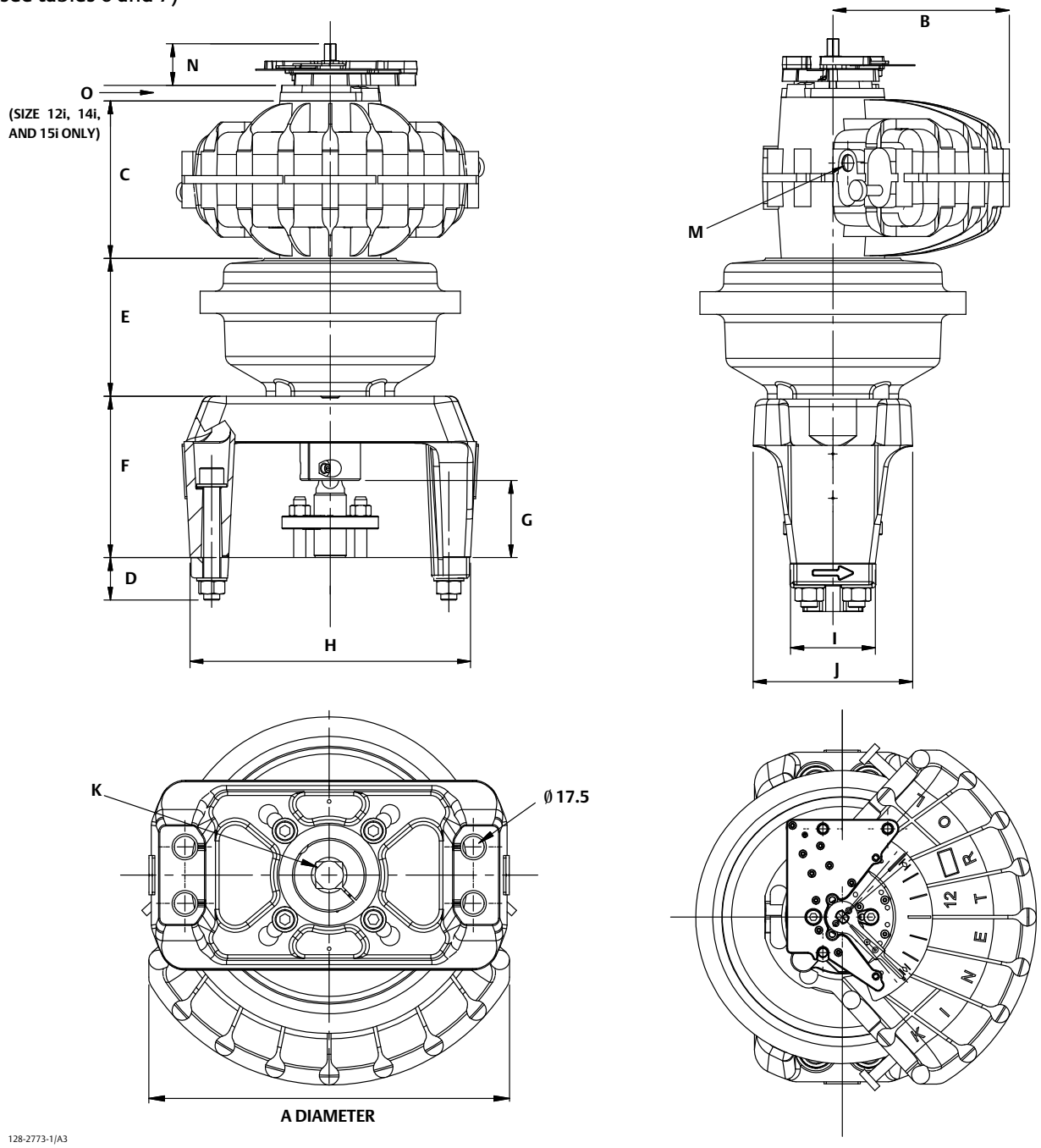

Table 8. Actuator/Valve Body Mounting Dimensions 16 through 30 (see figure 4)

SPRING RETURN ACTUATOR SIZE OPTIONS																						
Size	B		D		G1/G2		H(1)		M (NPT)	N		OU		P		PCD		R		S1/S2		T (UNC)
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	Inch
16	530	20.87	38	1.50	40.95	1.61	212	8.35	1/8	4	0.16	524	20.63	274	10.79	152.7	6.01	302	11.89	55	2.17	7/8
18	680	26.77	50	1.97	56.95	2.24	312	12.28	1/4	4	0.16	524	20.63	360	14.17	226.3	8.91	392	15.43	78	3.07	1 1/8
20	680	26.77	50	1.97	72.95	2.87	512	20.16	1/4	8	0.31	524	20.63	620	24.41	226.3	8.91	392	15.43	100	3.94	1 1/8
30	680	26.77	50	1.97	72.95	2.87	712	28.03	1/4	8	0.31	524	20.63	880	34.65	226.3	8.91	392	15.43	100	3.94	1 1/8
DOUBLE ACTING ACTUATOR SIZE OPTIONS																						
16	530	20.87	38	1.50	40.95	1.61	---	---	1/8	4	0.16	524	20.63	274	10.79	152.7	6.01	302	11.89	55	2.17	7/8
18	680	26.77	50	1.97	56.95	2.24	---	---	1/4	4	0.16	524	20.63	360	14.17	226.3	8.91	392	15.43	78	3.07	1 1/8
20	680	26.77	50	1.97	72.95	2.87	---	---	1/4	8	0.31	524	20.63	620	24.41	226.3	8.91	392	15.43	100	3.94	1 1/8
30	680	26.77	50	1.97	72.95	2.87	---	---	1/4	8	0.31	524	20.63	880	34.65	226.3	8.91	392	15.43	100	3.94	1 1/8

1. Double Acting Actuators will not have the Spring Return Chamber (H).

Figure 4. 1068 Actuator/Valve Body Mounting for Spring Return and Double Acting 16 through 30 (see table 8)

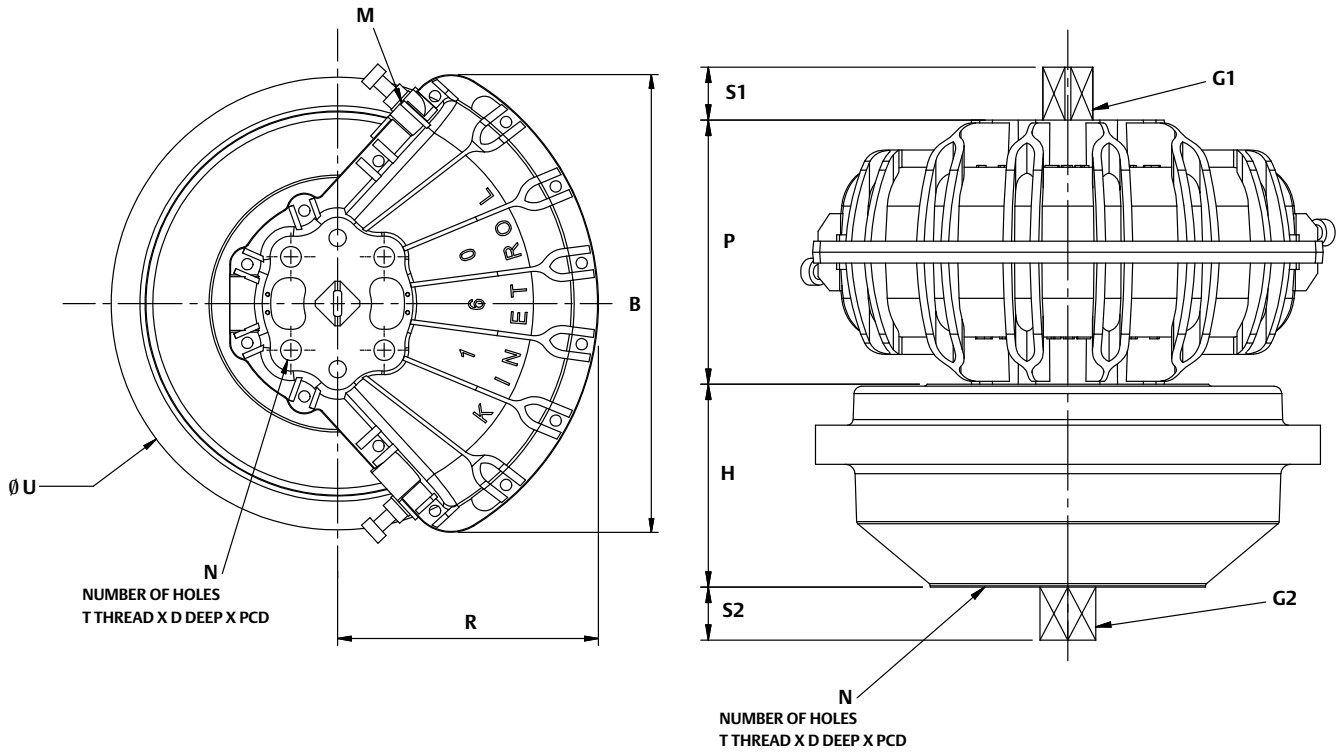

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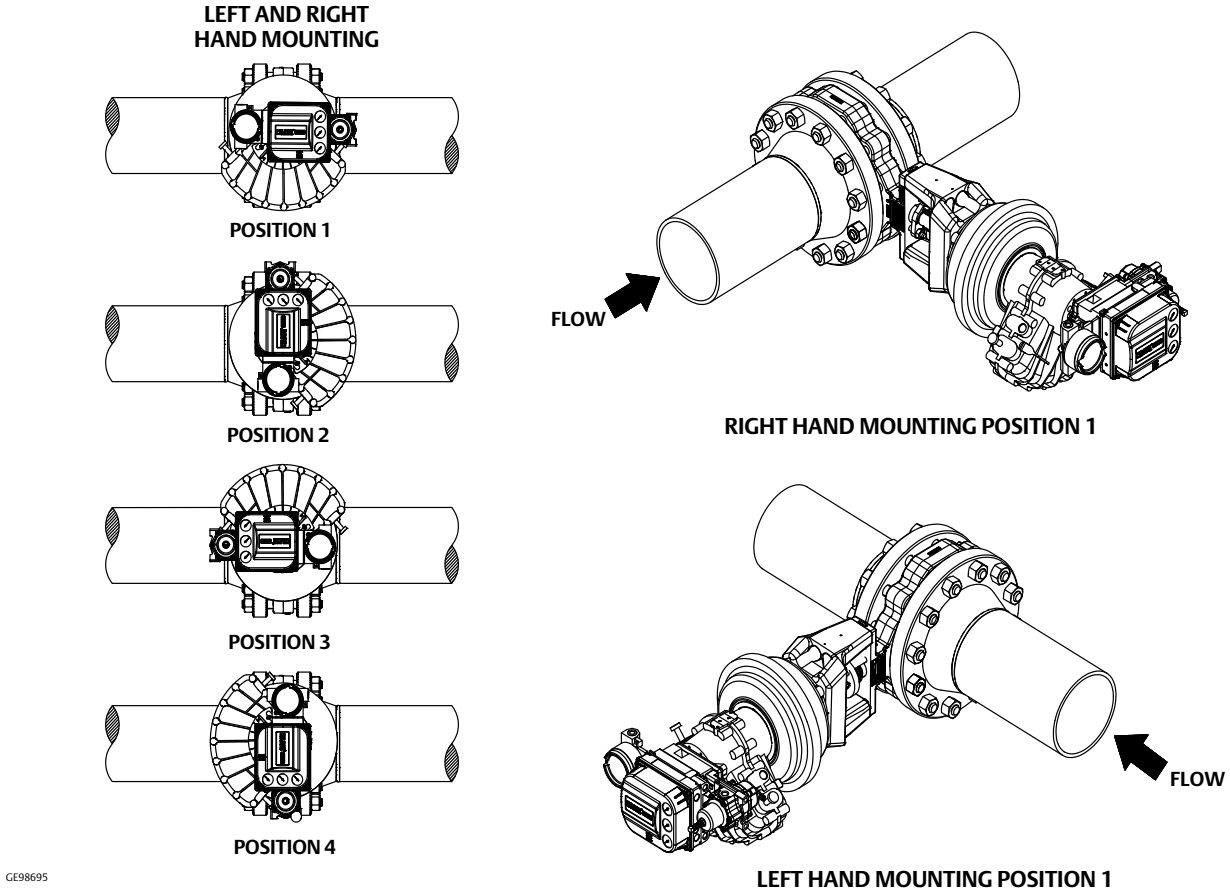
Figure 5. 1068 Actuator Mounting



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

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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.

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

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).

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(1)

3.8 bar (55 psig)

Maximum Diaphragm Casing Pressure(5)

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(2)

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 piping. 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(1)

Nitrile Diaphragm or O-Rings(3): -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

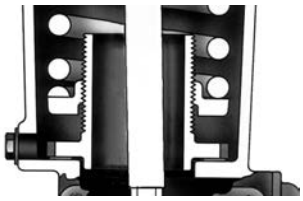
CASING SIZE	CLEARANCE VOLUME(1)		CASING VOLUME(2)			
			60 Degree Rotation		90 Degree Rotation	
	cm^3	$Inches^3$	cm^3	$Inches^3$	cm^3	$Inches^3$
70	3490	213	13,929	850	19,025	1161

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

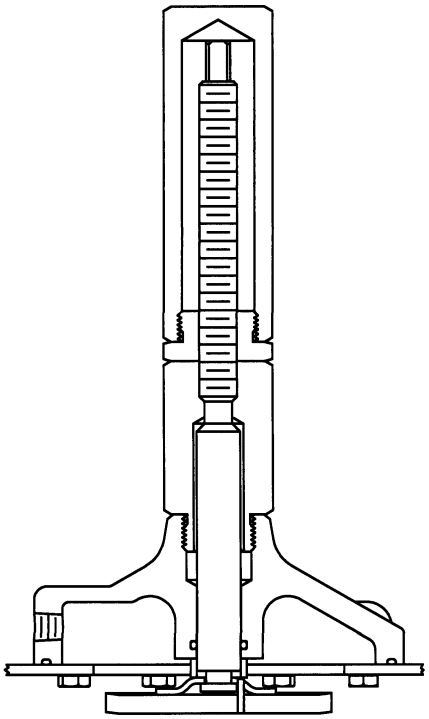
PART	MATERIAL
Actuator	
Actuator Housing and Spring Barrel	Cast iron
Diaphragm	Nitrile on nylon or silicone on polyester
Diaphragm Head	Cast Iron
Diaphragm Casing(1)	Pressed steel
Diaphragm Rod	Steel
Housing Cover	Cast iron or aluminum
Lever	Ductile iron
Optional Top-Mounted Handwheel Assembly	
Handwheel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

Figure 2. Sectional Views Typical of 1052 Actuator

W3813-1

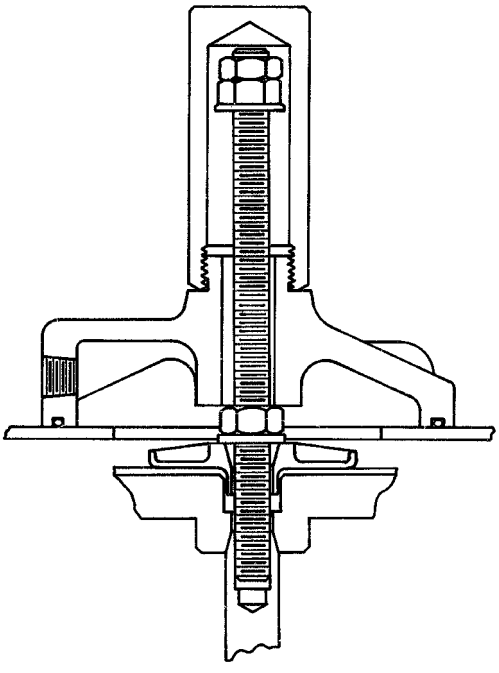
W2291-3

Figure 3. Optional Adjustable Travel Stops



28A1761-B

TYPICAL ADJUSTABLE UP TRAVEL STOP



36A6250-B

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

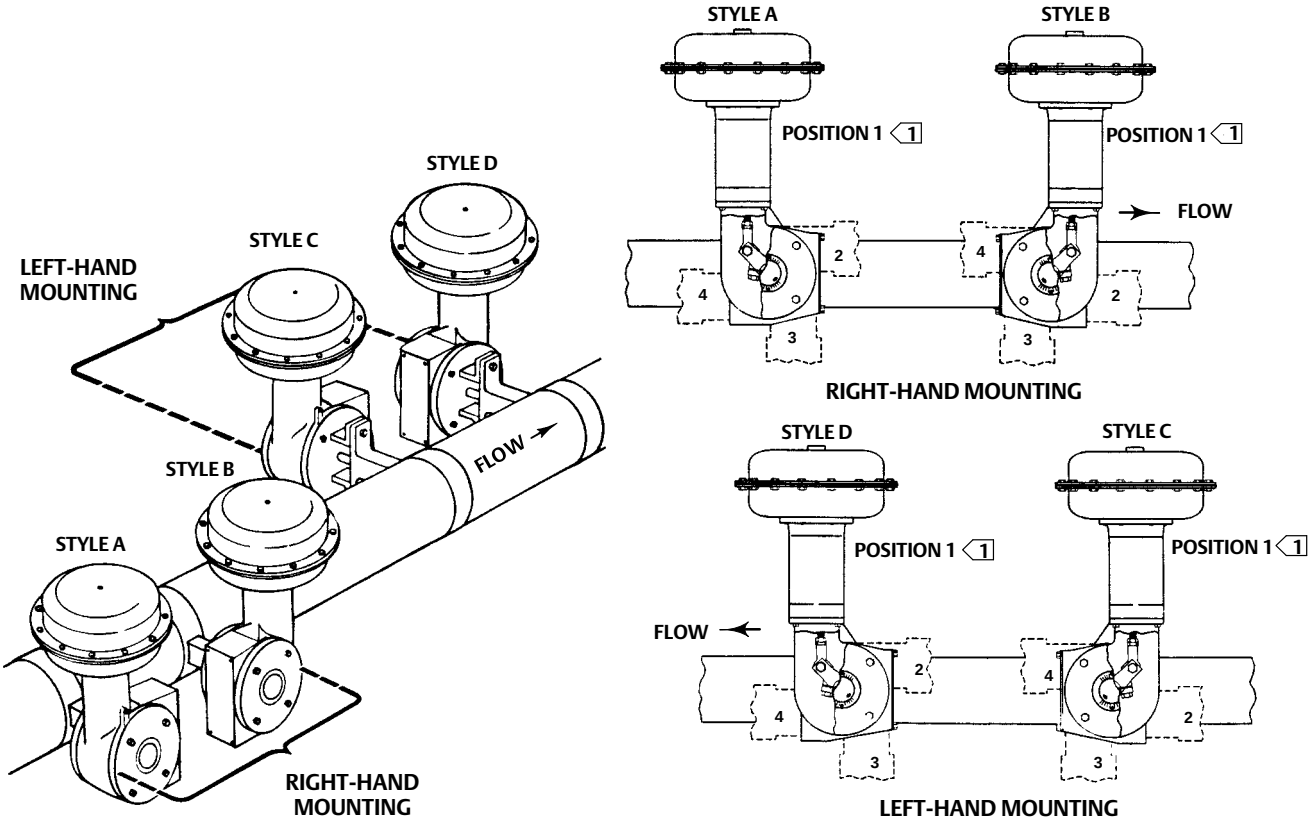
W3145

Table 5. Mounting Styles and Positions

MOUNTING	ACTION[1]	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 PDTO	CCW[3] CCW	A B	A B	A B	CW CW	NA NA	B A
Left-Hand	PDTC PDTO	CCW CCW	NA NA	D C	D C	CW CW	C D	C D
Left-Hand (Optional)[2]	PDTC PDTO	CW[4] CW	NA NA	C D	NA NA	NA NA	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

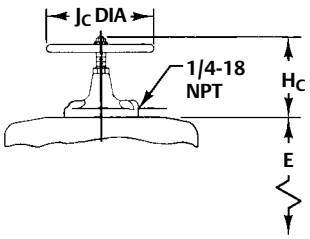
Figure 5. Mounting Styles and Positions (also see table 5)



43A6505-A
A1584-3

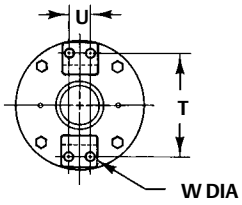
Notes:
1 Position 1 is standard; Positions 2 through 4 (shown in dotted lines) are alternatives.

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



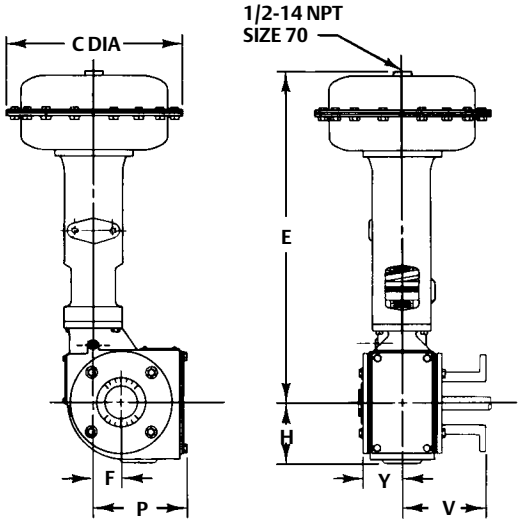
14A7221-D
A3023

TOP-MOUNTED HANDWHEEL



14A7222-F
A2206-4

ACTUATOR/VALVE BODY MOUNTING DIMENSIONS



14A7222-F
16A0600-B
B1412-4

1052 SIZE 70 ACTUATOR

Installation

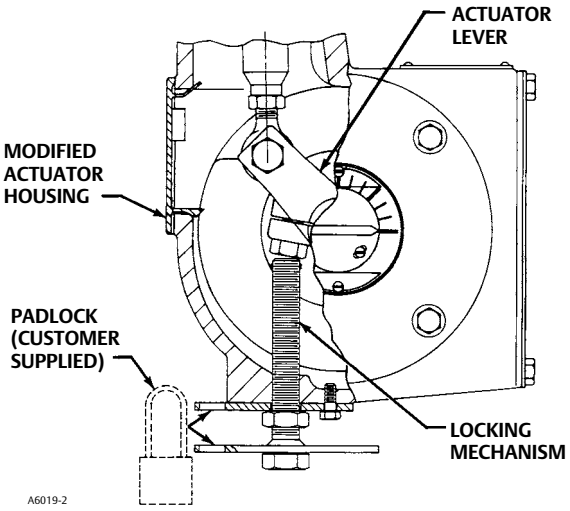
The actuator is normally positioned vertically in a horizontal pipeline. Four mounting styles and four positions for each style are possible (see figure 5). Due to its weight, the 1052 size 70 actuator must be externally supported if mounted in the horizontal position.

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_C		J_C	
	mm	Inches	mm	Inches
70	378	14.88	356	14.00

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

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Fisher™ 1061 Pneumatic Piston Rotary Actuator

Fisher 1061 pneumatic piston rotary actuators are used to operate splined-shaft rotary control valves such as Vee-Ball™ valves, eccentric disk valves, and butterfly valves. The actuator/valve body linkage of this actuator can be positioned for either push-down-to-open or push-down-to-close action.

Additionally, the 1061 actuator can be used with a two-position control signal for on-off service or with a valve positioner for throttling service. An optional handwheel actuator is also available to allow for auxiliary or emergency manual valve operation when the 1061 piston actuator is not in use. For complete information on the valve positioner and the manual handwheel actuator, refer to the appropriate bulletin.

W8380-2

1061 Actuator with FIELDVUE™ DVC6200 Digital Valve Controller Mounted on a Fisher V500 Valve

Features

- Application Flexibility—Actuator is available in push-down-to-open or push-down-to-close construction and may be mounted in any of four actuator/valve body mounting positions (see figure 2).
- Minimal Dead Band—Single-point linkage with splined and clamped lever minimizes lost motion and improves control accuracy.
- Compact Construction—Compared to similar actuators, overall size is reduced by as much as 30 percent.
- Long Service Life—Rugged construction provides stability, corrosion resistance, and protection from deformation should the actuator be over-pressured.
- Accessibility—Actuator/valve body linkage is completely enclosed, yet the valve packing adjustment remains accessible without removing any parts.
- Monitoring Ease—Highly visible travel indicator allows easy determination of valve position.

Specifications

Available Configuration

Actuator Sizes: ■ 30, ■ 40, ■ 60, ■ 68, ■ 80, ■ 100, and ■ 130

Action: Double-acting pneumatic piston rotary actuator for ■ throttling service when used with positioner, or ■ on-off service when used with switching devices

Cylinder Operating Pressure

Minimum Recommended: ■ 1.4 bar (20 psig) without positioner, or ■ 0.35 bar (5 psi) above actuator requirement with positioner(1).

Maximum Allowable(2)

Sizes 30 and 60: 6.9 bar (100 psig)
Size 40: 10.3 bar (150 psig)
Size 68: 5.9 bar (85 psig)
Size 80: 10.3 bar (150 psig)
Size 100: 10.3 bar (150 psig)
Size 130: 10.3 bar (150 psig)

Valve Shaft Diameters, mm (Inch)

Size 30: ■ 12.7 (1/2), ■ 15.9 (5/8),■ 19.1 (3/4), ■ 22.2 (7/8), ■ 25.4 (1), and ■ 31.8 (1-1/4)
Sizes 40, 60, and 68: ■ 19.1 (3/4), ■ 22.2 (7/8), ■ 25.4 (1), ■ 31.8 (1-1/4), ■ 38.1 (1-1/2), ■ 44.5 (1-3/4), and ■ 50.8 (2)
Sizes 80 and 100: ■ 44.5 (1-3/4), ■ 50.8 (2), and ■ 63.5 (2-1/2)
Size 130: ■ 76.2 (3) and ■ 88.9 (3-1/2)

Maximum Valve Shaft Rotation

■ 90 degrees without travel stop or ■ 60 degrees with optional travel stop

Maximum Breakout Torque(1)

Size 30: Up to 282 N•m (2500 lbf•in)
Size 40: Up to 847 N•m (7500 lbf•in)
Size 60: Up to 1130 N•m (10,000 lbf•in)
Size 68: Up to 1540 N•m (13,600 lbf•in)
Size 80: Up to 5080 N•m (45,000 lbf•in)
Size 100: Up to 6290 N•m (55,700 lbf•in) with 63.5 mm (2-1/2 in.) valve shaft diameter

Size 130: Up to 19,800 N•m (175,000 lbf•in)

Stroking Time

Dependent on actuator size, rotation, and positioner if used. If stroking time is critical, consult your Emerson sales office or Local Business Partner

Construction Materials

Cylinder and Cylinder Flange: Aluminum

Housing Cover: ■ Cast iron or ■ aluminum (only for size 130)

Piston: ■ Aluminum or ■ Nylon-coated piston (optional only for sizes 30 to 100)

Piston Rod: Chrome-plated stainless steel

Lever: Ductile iron

Sliding Seal: Aluminum

O-Rings: Nitrile

Housing:

Sizes 30, 40, 60, and 68: Cast iron
Sizes 80, 100 and 130: Aluminum

Mounting Yoke: Cast iron

Mounting Yoke Bushing: PTFE and steel

Material Temperature Capabilities with Standard Elastomers(2)

-34 to 82°C (-30 to 180°F)

Pressure Connections

■ 1/4 NPT internal (standard)
■ 1/2 and 3/4 NPT internal (optional on sizes 68, 80, and 100)
■ 3/4 NPT internal for Pipe-Away Vent option
■ 1 NPT internal for size 130

Travel Indication

Graduated scale and pointer located on actuator end of valve shaft

Mounting Positions

See figure 2

Approximate Weight

See table 2

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

Figure 1. Sectional of Fisher 1061 Actuator

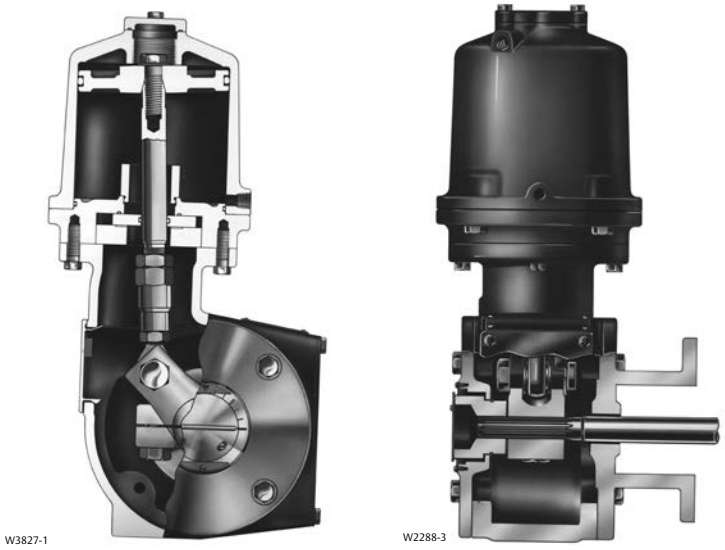


Table 1. Displacement for 90 Degree Rotation

SIZE	PISTON DOWN		PISTON UP	
	cm^3	$Inch^3$	cm^3	$Inch^3$
30	1100	67	1200	74
40	2130	130	2230	136
60	4060	248	4380	267
68	7210	440	7110	434
80	13,000	794	12,900	788
100	19,100	1165	18,800	1150
130	41,100	2508	40,200	2454

Table 2. Approximate Weight

ACTUATOR SIZE	kg	Lb
30	22	49
40	29	63
60	39	86
68	56	123
80	122	246
100	135	298
130	299	660

Options

Pneumatic Instruments: ■ 3710, ■ 3610JP, or ■ 3620JP pneumatic or electro-pneumatic positioners or ■ FIELDVUE DVC6200 Digital Valve Controllers are available. Also, the 377 Series trip valves are available with ■ lock-in-last position, ■ fail-up, or ■ fail-down action (for specifications, see separate bulletins).

Potentiometer: It is used for remote valve rotation indication.

Cylinder Bypass: The bypass valve is required when a handwheel actuator is specified.

Limit Switches: ■ TopWorx™ DXP M21GNEB limit switch for one through six single-pole, double-throw contacts (see separate bulletin), ■ GO Switch™ proximity switches for one or two single-pole, double-throw contacts, or ■ Micro-Switches or NAMCO switches for one or two single-pole, double-throw or double-pole, double-throw contacts. GO Switch proximity switch is not available for size 80, 100 or 130 actuators.

Handwheel Actuator: The Fisher 1078 manual declutchable actuator (see figure 3) allows auxiliary or emergency valve operation of sizes 30 through 100 when engaged see Fisher bulletin 61.8:1078 (D101339X012).

Locking Mechanism: The locking mechanism shown in figure 4 is available for sizes ■ 30, ■ 40, ■ 60, and ■ 68 actuators. The locking mechanism shown in figure 5 is available for sizes ■ 80 and ■ 100 actuators.

FlowScanner™ Connections: Optional quick disconnect connections are available for use with the portable FlowScanner microprocessor-based diagnostic testing unit.

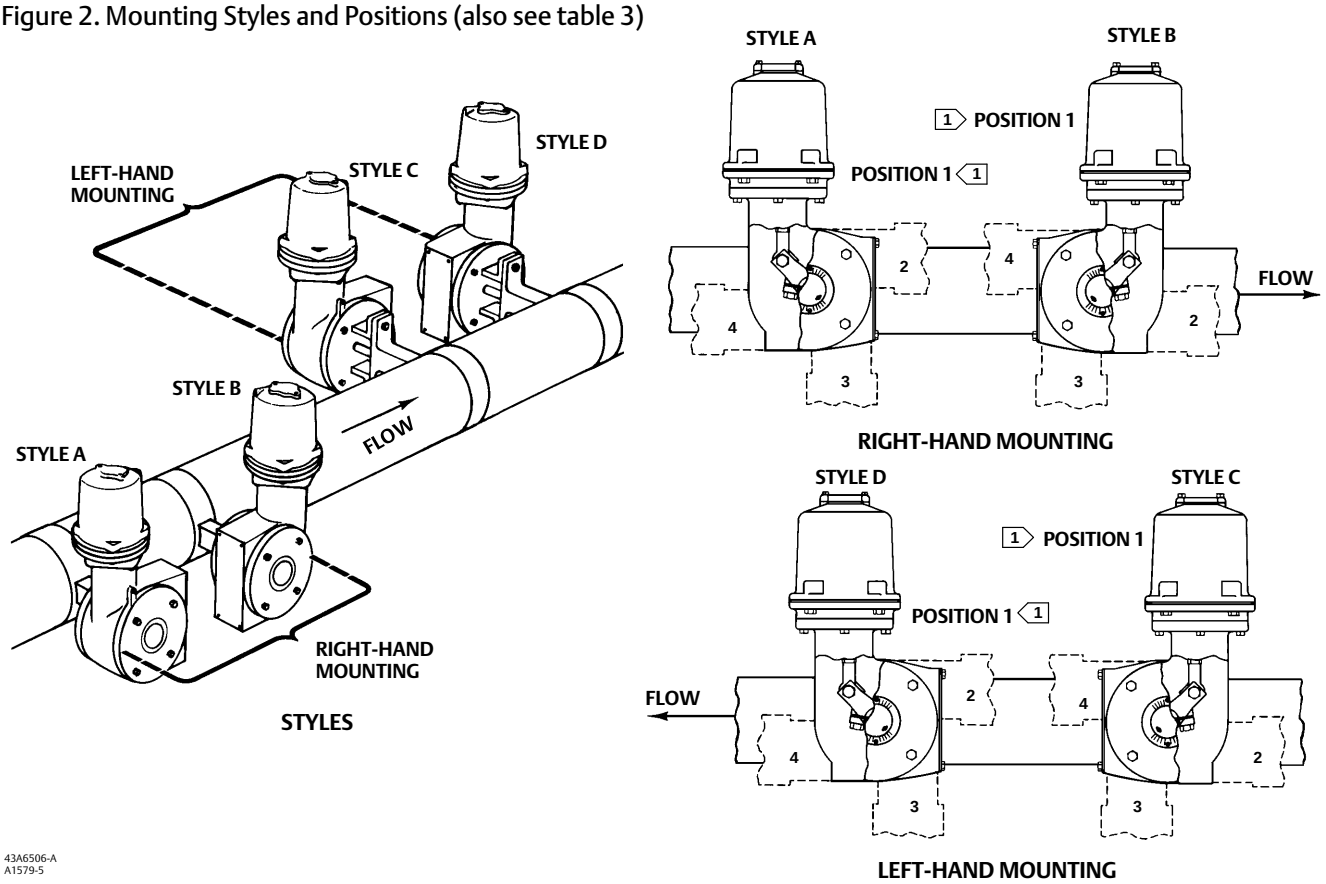
Pipe-Away Vent: Some applications use natural gas or other hazardous gases as a supply pressure to the actuator. These applications require the actuator housing to be vented, reducing the accumulation of gases. For new constructions and retrofit kit information, contact your Emerson sales office or Local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

Table 3. Mounting Styles and Positions

MOUNTING	ACTION(1)	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	8510B, 8532, 8560 and 9500
Right-Hand	PDTC PDTO	CCW CCW	A B	A B	A B	CW CW	NA NA	B A
Left-Hand	PDTC PDTO	CCW CCW	NA NA	D C	D C	CW CW	C D	C D
Left-Hand (Optional)(2)	PDTC PDTO	CW CW	NA NA	C D	NA NA	NA NA	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 the 3- through 12-inch Series B and the 14- to 20-inch, with or without attenuator.

Figure 2. Mounting Styles and Positions (also see table 3)



Notes:
1 Position 1 is standard; positions 2 through 4 (shown in dotted lines) are alternates.

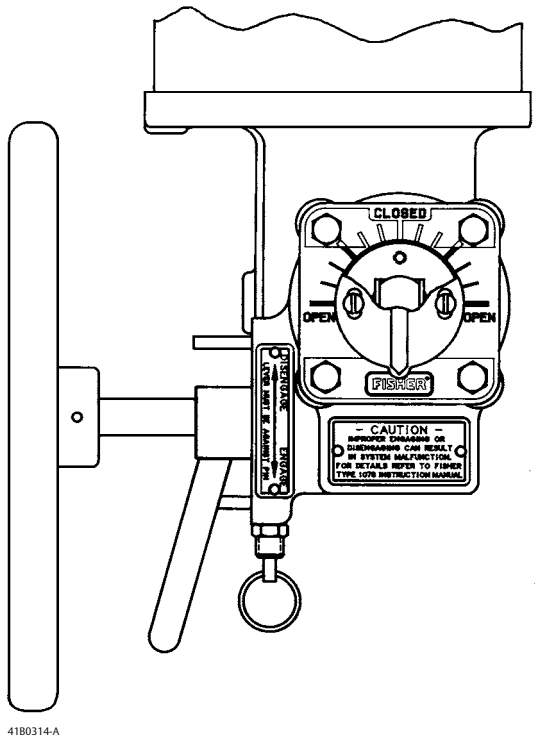
2. By Emerson definition:
- Forward flow is into the face side of the disk , or ball sealing surface.
- Reverse flow is into the hub side of the disk or ball.

Installation

The actuator is normally positioned vertically in a horizontal pipeline. However, four mounting styles and four positions are possible for each style (see figure 2).

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.

Figure 3. Fisher 1078 Declutchable Manual Actuator



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 the 1061 actuator are shown in figure 6. These dimensions should be used in conjunction with the mounting positions shown in figure 2.

Actuator Locking Mechanism

The 1061 actuator (sizes 30 through 100) is available with a locking mechanism which may be used to keep the actuator in the locked position during maintenance shutdowns (see figures 4 and 5). The device is intended to prevent accidental operation of the valve during shutdown and does not imply or qualify a control valve as a safety shutdown device.

Adjustable Travel Stops

An adjustable down travel stop for the 1061 size 30, 40, 60, and 68 actuators is installed in a special actuator housing. The assembly consists of locking screws, locknut, special end rod bearing, and special lever.

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

The locking screw can be positioned to limit downward travel of the actuator lever to any rotation between 0 and 90 degrees. The travel stop is installed similar to the locking mechanism shown in figure 4, except the travel stop does not accommodate a padlock and the travel stop can be completely unscrewed from the housing.

An adjustable up travel stop for the 1061 sizes 40 through 100 actuators is installed in the top of a special actuator cylinder. The top of the special cylinder is tapped and faced (machined) for the travel stop. The assembly consists of a screw, locknut, and pressure seal. The screw can be positioned to limit upward travel of the piston to any rotation between 30 and 90 degrees for PDTC, and 0 to 60 degrees for PDTO. Longer screws are available to further limit travel.

Figure 4. Actuator Locking Mechanism for Size 30, 40, 60, and 68 Actuators

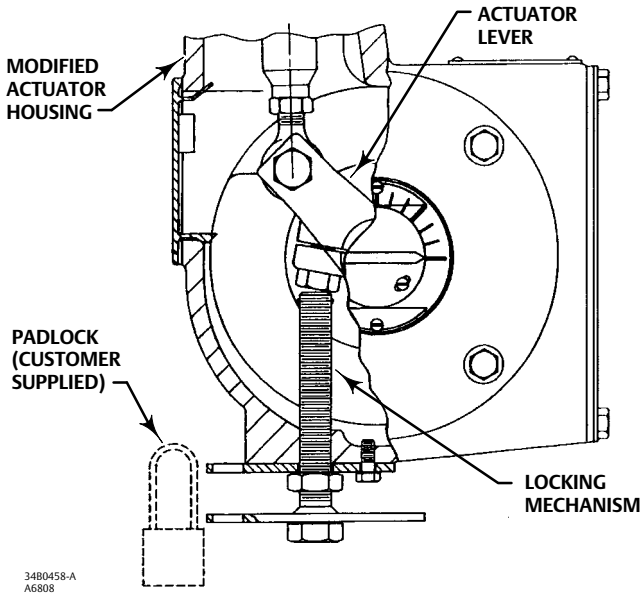


Figure 5. Actuator Locking Mechanism for Size 80 and 100 Actuators

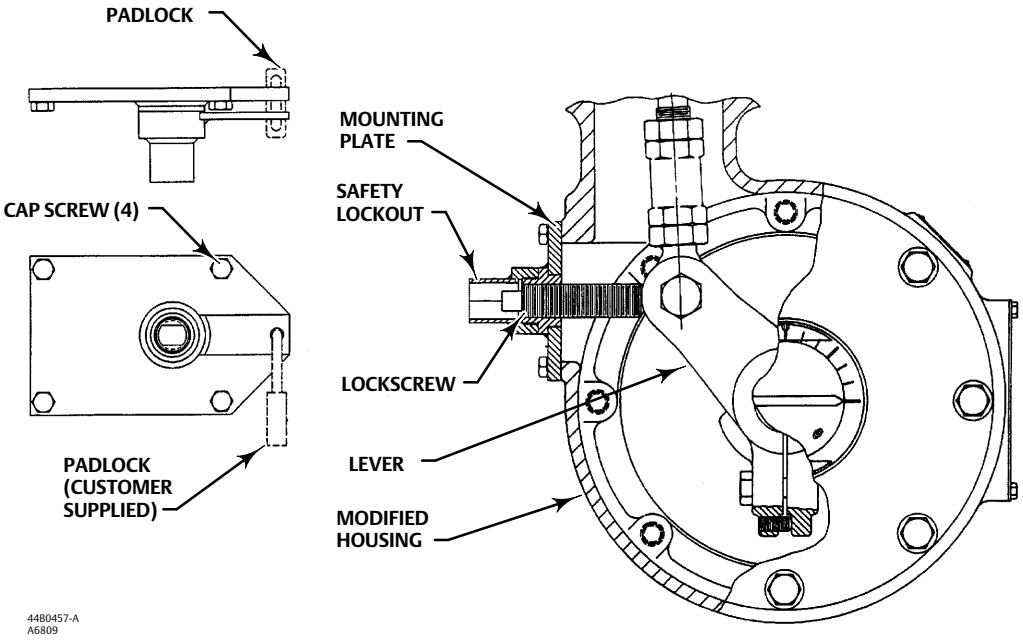


Table 4. Dimensions

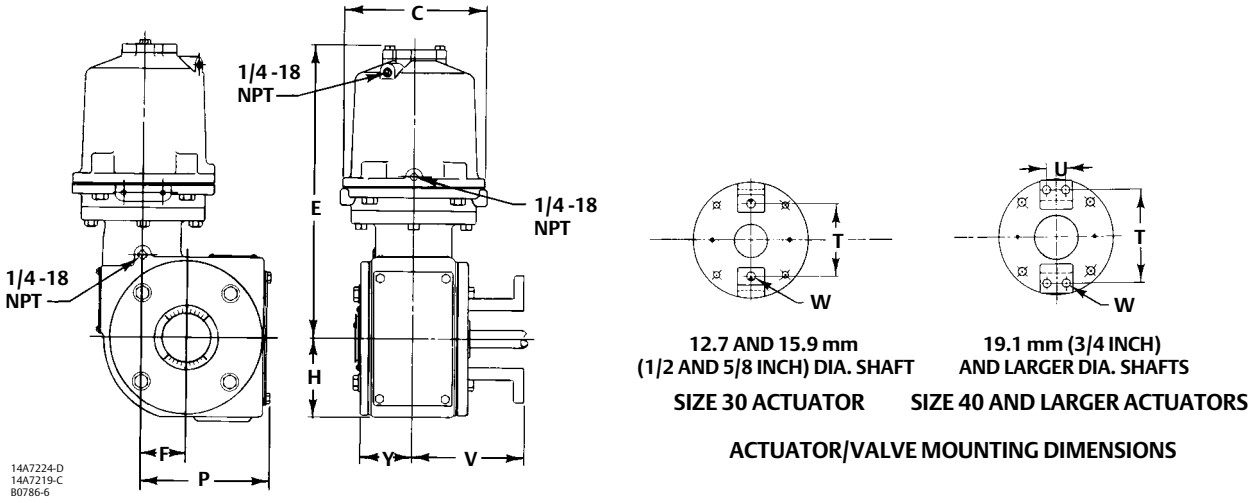
ACTUATOR SIZE	C		E		F		H		P				Y	
									w/o Positioner		w/3610JP Pos.			
	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches
30	171	6.75	378	14.88	53.8	2.12	114	4.50	175	6.88	281	11.07	73.2	2.88
40	206	8.12	425	16.75	63.5	2.50	121	4.75	186	7.31	292	11.50	76.2	3.00
60	267	10.50	406	16.00	63.5	2.50	121	4.75	186	7.31	292	11.50	76.2	3.00
68	324	12.75	483	19.00	63.5	2.50	121	4.75	186	7.31	292	11.50	76.2	3.00
80	324	12.75	714	28.12	123	4.84	213	8.38	345	13.62	452	17.81	127	5.00
100	381	15.00	714	28.12	123	4.84	213	8.38	345	13.62	452	17.81	127	5.00
130	489	19.24	926	36.47	169	6.67	291	11.46	471	18.55	578	22.74	167	6.56

Table 5. Dimensions

VALVE SHAFT DIAMETER		STYLE F MOUNTING: V-LINE, 8532, 8560, AND ECCENTRIC DISK VALVES						STYLE G MOUNTING: 9500 SERIES VALVES						V	
		T		U		W		T		U		W			
mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches
12.7	1/2	117	4.62	- - -	- - -	14.3	0.56	117	4.62	- - -	- - -	11.1	0.44	137	5.38
15.9	5/8	117	4.62	- - -	- - -	14.3	0.56	146	5.75	31.7	1.25	11.1	0.44	137(1)	5.38(1)
19.1 and 25.4	3/4 and 1	152	6.00	31.7	1.25	14.3	0.56	146	5.75	31.7	1.25	11.1	0.44	160	6.31
31.8 and 38.1	1-1/4 and 1-1/2	235	9.25	45.9	1.81	17.5	0.69	210	8.25	50.8	2.00	17.5	0.69	148	5.81
44.5 and 50.8	1-3/4 and 2	273	10.75	50.8	2.00	20.5	0.81	241	9.50	69.8	2.75	17.5	0.69	286(2)	11.25(2)
63.5	2-1/2	337	13.25	76.2	3.00	23.8	0.94	---	---	---	---	---	---	235	9.25
76.2	3(3)	533	21.00	127	5.00	33.5	1.32	---	---	---	---	---	---	322	12.68
88.9	3-1/2(3)	533	21.00	127	5.00	33.5	1.32	---	---	---	---	---	---	322	12.68

1. Dimension shown is for eccentric disk, V150, V200, V300, CV500, 8532, and 8560 valves only; For 7600 and 9500 valves, dimension "V" is 160 mm (6.31 inches).
2. Dimension shown is for size 60 and 68 actuators only; for Size 80 and 100 actuators, the dimension "V" is 235 mm (9.25 inches).
3. Dimensions shown are for V260 valves only.

Figure 6. Dimensions (also see tables 4 and 5)



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

www.Fisher.com

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Fisher™ 2052 Diaphragm Rotary Actuator

Fisher 2052 spring-and-diaphragm rotary actuators are used on rotary-shaft valve bodies for throttling or on-off applications. The 2052 may be used for throttling service with a positioner, or it may be used for on-off service without a positioner. The 2052 has an ISO 5211 mating interface that allows installation to non-Fisher valves. Refer to separate bulletins for valve and positioner information.

Fisher Control-Disk™ Valve with 2052 Actuator and FIELDVUE™ DVC6200 Digital Valve Controller

Features

- **Compact design, smaller actuators--** Ensures reduced valve/actuator envelope dimensions leading to greater mounting versatility for both skids and process plants, where space is at a premium.
- **Compatible with DVC2000, DVC6200, and DVC6000 digital valve controllers; and 3610J and 3620J positioners--** The new actuator allows linkage-less feedback, via a contact-less magnetic array, from the lever to the end-mounted DVC2000. Integral window mounting of the DVC6200, DVC6000, 3610J, and 3620J is also available.
- **Clamped lever to reduce lost motion--** The clamping of the lever onto a splined valve shaft, coupled with the single pivot linkage, reduces lost motion between the actuator and the valve. The typical cumulative deadband for a Fisher rotary control valve assembly results in 0.5% or less variability.
- **No bench set required--** The new nested spring design requires no bench set. This also simplifies the actuator selection process, see table 3.
- **ISO 5211 mounting with optional insert--** The actuator can now be mounted directly onto non-spline shafts, such as Square and Double D. This allows the actuator, with its enhanced control, to mount on a wider range of valves conforming to ISO 5211.
- **Adjustable travel stops standard--** Provides the ability to adjust or change the travel range by 30 degrees in either direction without removing the actuator or the addition of extra parts.
- **Fail-safe mechanism contains no aluminum--** All parts in the fail-safe mechanism (made of steel, cast iron, and ductile iron) ensure the actuator will maintain safety integrity in the event of a fire.
- **Powder paint as standard--** The Emerson powder paint finish offers an excellent corrosion-resistant finish to all external steel and cast iron parts.
- **NAMUR VDE/VDI 3845 bolt pattern for accessory mounting--** Meeting the global standard ensures compatibility for most accessories, enabling quick and easy mounting.
- **Field reversible, right- or left-hand mounting--** The actuator/valve assembly action can be converted from push-down-to-open to push-down-to-close, or vice-versa, without additional parts.
- **Declutchable and top-mounted handwheels--** Available for all sizes.

2052 Actuator Specifications and Materials of Construction

Table 1. Fisher 2052 Actuator Specifications

Specifications	
Actuator Mounting Connections	Splined shaft connection, ISO 5211 actuator-to-bracket connection **Size 1:** F07, **Size 2:** F10, **Size 3:** F14
Actuator Sizes	See table 3
Operating Pressure(1)	See table 5
Maximum Diaphragm Casing Pressure	Size 1, 2, and 3 Actuators: 5 barg (73 psig)
Pressure Connection	See table 4
Torque Output	See table 5
Actuator Temperature Capabilities(1)	Standard: -45 to 80°C (-50 to 176°F) Optional: -45 to 100°C (-50 to 212°F)(3) or -60 to 80°C (-76 to 176°F)(4)
Operation	Field reversible between PDTC and PDTO; right- and left-hand mounting, any angle of orientation
Approximate Weight	Size 1: 22.2 kg (49 lb) Size 2: 54.4 kg (120 lb) Size 3: 113 kg (250 lb)
Controller/Positioners Available	DVC2000, DVC6020, DVC6030, DVC6200, 3610J, 3620J, 4190, C1
Adjustable Travel Stops	Standard adjustable up and down stops capable of 30 degrees of adjustment per stop.
Accessories Available	846, 646, 2625, and 67C Series, switches, i2P-100, VBL, DXP, GO Switch™
Handwheel	Top-mounted handwheel: Optional on Size 1, 2, and 3 actuators Declutchable handwheel(2): Optional on Size 1, 2, and 3 actuators
Operational Lockout(2)	Available for customer-supplied padlock to lock the actuator in the spring-fail position

1. The pressure/temperature limits in this bulletin should not be exceeded. The current SIL certification for the 2052 actuator is only relevant for the standard temperature ratings shown.
2. Lockout and declutchable handwheel cannot be used together on size 2 and size 3 actuators.
3. Temperature range only applies when using silicone diaphragm material. Silicone diaphragm is not available with the top-mounted handwheel option.
4. Temperature range requires use of stainless steel bolting for yoke and travel stops. Not available with top-mounted handwheel.

Table 2. Materials of Construction

Component	**Material**
Top Casing	Steel
Housing	Cast Iron
Diaphragm	Nitrile and nylon standard, Silicone on polyester
Lever	Ductile iron, Steel
Diaphragm Plate	Cast iron
OPTIONAL TOP-MOUNTED HANDWHEEL ASSEMBLY	
Component	**Material**
Handwheel	Cast iron
Handwheel Stem	Aluminum-Bronze
Top Casing Assembly	Steel
O-ring	Nitrile
Pusher Plate	Steel

Contents

Options

Top-Mounted Handwheel: For infrequent use as a manual actuator (see figure 2). For repeated or daily manual operation, the unit should be equipped with a declutchable handwheel actuator.

Declutchable Handwheel Actuator: An end-mounted manual actuator can be used to provide on-site control and to provide override capabilities. See Fisher 1078 Declutchable Manual Actuator bulletin (D101339X012) for handwheel actuator specifications. The declutchable handwheel is not compatible with the lockout option on the size 2 and size 3 actuators.

Limit Switches: ■ Micro-Switch or NAMCO switches for one or two single-pole, double-throw contacts, or ■ GO Switch™ proximity switches for one or two single-pole, double-throw contacts are available. 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 control element, the actuator should be equipped with a positioner. For additional information, contact your Emerson sales office with complete service conditions.

Optional Lockout Option: An actuator locking mechanism is available, which 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. The lockout option on the size 2 and size 3 actuators is not compatible with the declutchable handwheel.

Low Ambient Temperature: For services with ambient temperatures down to -60°C (-76°F). This construction is suitable for cold climate regions per GOST 15150. Contact your Emerson sales office for details. Note the current SIL certification for the 2052 actuator is only relevant for the standard temperature ratings shown in table 1. Not available with the top-mounted handwheel option.

Tandem Linkage: Fisher three-way valve assemblies for converging and diverging throttling or on/off service. Valves are operated by a single actuator through a tandem linkage, typically arranged so that one of the valves is opening while the other is closing. Consult your Emerson sales office for additional details on sizing, selection, and installation.

Figure 1. Fisher 2052 Assembly

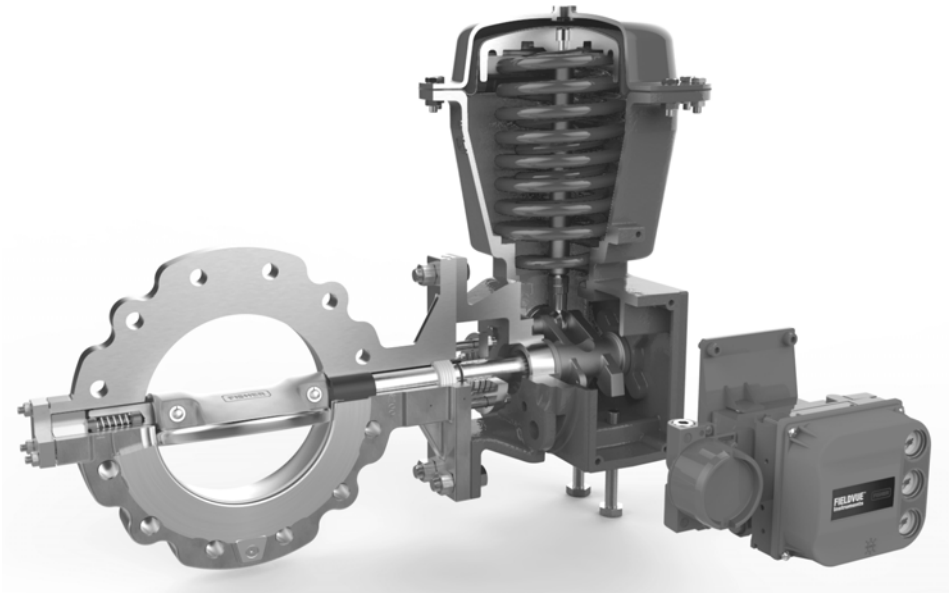

Figure 2. Top-Mounted Handwheel

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Table 3. Actuator and Shaft Size Availability

SHAFT SIZE		ACTUATOR SIZE		
mm	**Inches**	**1**	**2**	**3**
12.7	1/2	X	---	---
14.3 x 15.9	9/16 x 5/8	X	X	---
15.9	5/8	X	X	---
19.1	3/4	X	X	X
22.2	7/8	---	X	X
25.4	1	---	X	X
28.6 x 31.8	1-1/8 x 1-1/4	---	X	X
31.8	1-1/4	---	X	X
31.8 x 38.1	1-1/4 x 1-1/2	---	---	X
38.1	1-1/2	---	---	X
39.7 x 44.5	1-9/16 x 1-3/4	---	---	X
44.5	1-3/4	---	---	X
50.8	2	---	---	X

Table 4. Pressure Connections

ACTUATOR SIZE	PRESSURE CONNECTION			
	1/4 NPT	**1/2 NPT**	**3/4 NPT**	**G 1/4**
1	Standard	Optional	Not Available	Optional
2	Standard	Optional	Not Available	Optional
3	Not Available	Standard	Optional	Not Available

Table 5. Torque versus Actuator Size

ACTUATOR SIZE AND ACTION	OPERATING PRESSURE							
	2 barg (29 psig)(1)		**3 barg (44 psig)(1)**		**4 barg (58 psig)(1)**		**4.7 barg (68 psig)(1)**	
	Torque							
	N•m	**lbf•in**	**N•m**	**lbf•in**	**N•m**	**lbf•in**	**N•m**	**lbf•in**
1 (PDTO)	25.5	226	25.5	226	51.2	453	51.2	453
1 (PDTC)	25.5	226	36.2	320	51.2	453	72.4	641
2 (PDTO)	105	930	105	930	210	1860	210	1860
2 (PDTC)	105	930	175	1550	210	1860	320	2840
3 (PDTO)	327	2890	327	2890	631	5580	631	5580
3 (PDTC)	280	2480	557	4930	584	5170	930	8230

1. Do not interpolate between operating pressures. Consult your Emerson sales office for assistance.

Table 6. Dimensions

ACTUATOR SIZE	C		E		F		H		P		Y	
	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches
1	245	9.65	267	10.51	29	1.14	103	4.06	107	4.21	71	2.80
2	350	13.78	424	16.69	49	1.93	187	7.36	170	6.69	84.5	3.33
3	496	19.53	592	23.31	64	2.52	254	10.0	185	7.28	92	3.62

Table 7. Actuator / Valve Body Mounting Dimensions

VALVE SHAFT DIAMETER		FIGURE 6 REFERENCE	T		U		W	
mm	Inches		mm	Inches	mm	Inches	mm	Inches
Style F Mounting: Control-Disk, Vee-Ball™, 8532, 8510B, 8560, and 8580 Eccentric Disk Valves								
12.7 - 15.9	1/2 - 5/8	A	117	4.62	---	---	14.2	0.56
19.1 - 25.4	3/4 - 1	B	152	6.00	32	1.25	14.2	0.56
31.8 - 38.1	1-1/4 - 1-1/2	B	235	9.25	46	1.81	17.5	0.69
44.5 - 50.8	1-3/4 - 2	B	273	10.75	51	2.00	20.6	0.81
Style G Mounting: 9500 Series Valves								
12.7	1/2	A	117	4.62	---	---	11.0	0.44
15.9 - 25.4	5/8 - 1	B	146	5.75	32	1.25	11.0	0.44
31.8 - 38.1	1-1/4 - 1-1/2	B	210	8.25	51	2.00	17.5	0.69

Table 8. Actuator / Valve Body Mounting Dimensions

VALVE SHAFT DIAMETER		V					
		Size 1		Size 2		Size 3	
mm	Inches	mm	Inches	mm	Inches	mm	Inches
12.7	1/2	135	5.3	---	---	---	---
15.9	5/8	135	5.3	148.5	5.8	---	---
19.1	3/4	158	6.2	171.5	6.8	179	7.0
25.4	1	---	---	171.5	6.8	179	7.0
31.8	1-1/4	---	---	169.5	6.7	177	7.0
38.1	1-1/2	---	---	---	---	177	7.0
44.5	1-3/4	---	---	---	---	316	12.4
50.8	2	---	---	---	---	316	12.4

Table 9. Actuator / Valve Body Mounting Dimensions

ACTUATOR SIZE	Hc		Jc		R
	mm	Inches	mm	Inches	NPT Connection Used
1	207	8.1	171	6.7	1/4 NPT
2	289	11.4	305	12.0	1/4 NPT
3	398	15.67	356	14.0	1/2 NPT

Table 10. NAMUR Instrument Mounting Dimensions

ACTUATOR SIZE	J	K	L	N
	mm	mm	mm	mm
1	80	30	30.4	35
2	130	30	48.34	55
3	130	30	65	75

Table 11. ISO 5211 Mounting Information

ACTUATOR SIZE	F SIZE	A	B	AA	BB
		mm	mm	mm	mm
1	F07	70	M8	16.5	See table 12
2	F10	102	M10	29.0	
3	F14	140	M16	49.0	

Table 12. ISO 5211 Square Insert Sizes Available

SQUARE SIZE	ACTUATOR SIZE		
mm	1	2	3
9	X	---	---
11	X	X	---
14	X	X	X
19	---	X	X
22	---	X	X
27	---	---	X
36	---	---	X

Figure 3. Dimensions (also see tables 6, 7, and 8)

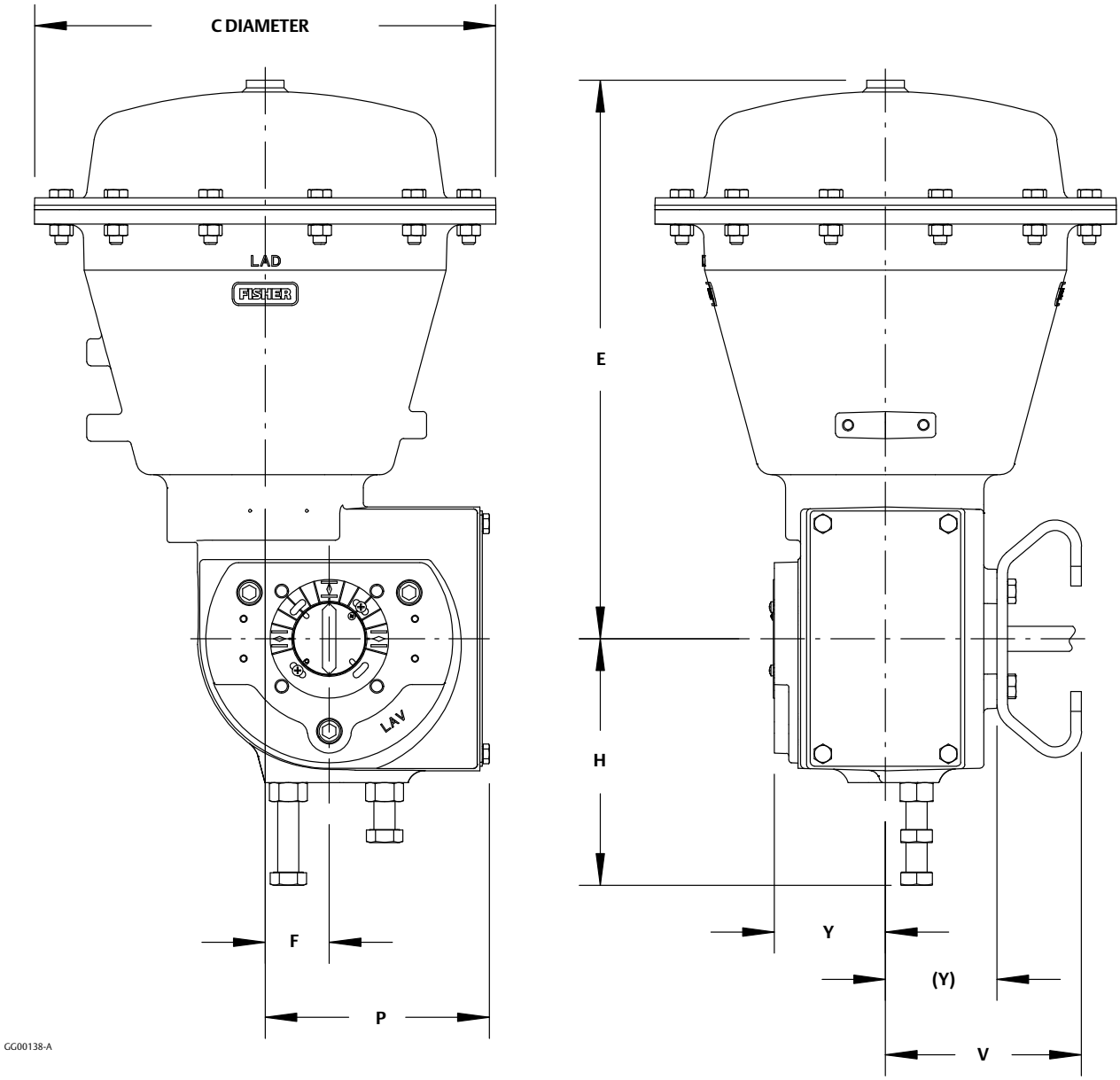


Figure 4. Handwheel Dimensions (also see tables 6 and 9)

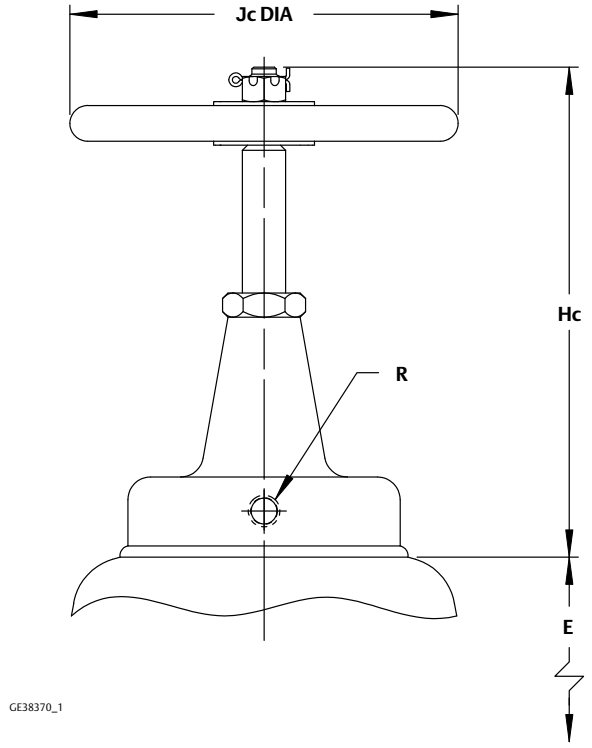
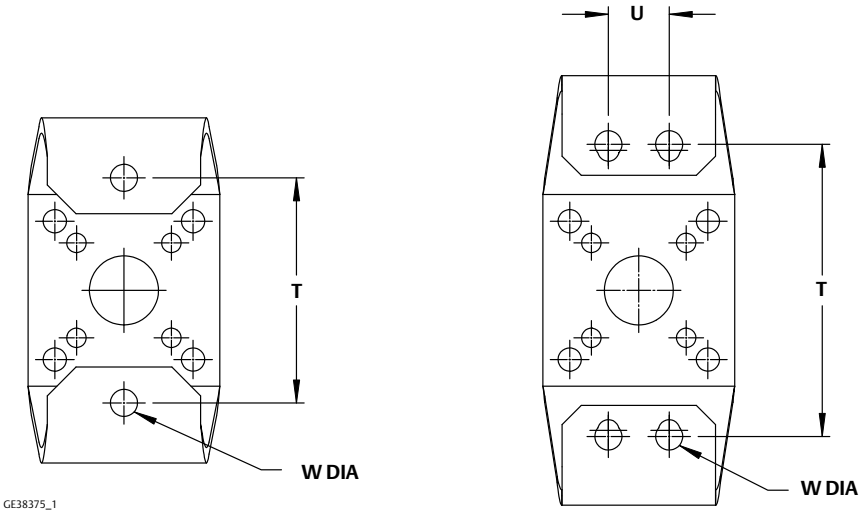
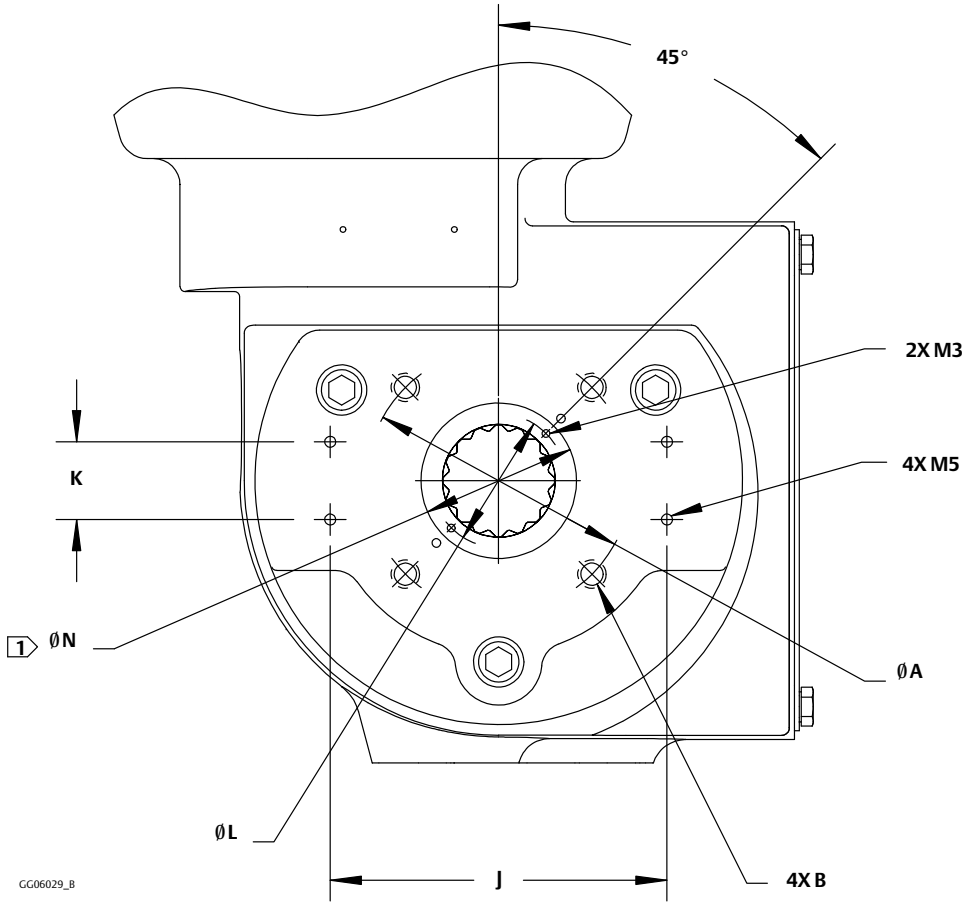


Figure 5. Mounting Yokes Dimensions (also see table 7)



REFERENCE A **REFERENCE B**

Figure 6. NAMUR Instrument Mounting Dimensions (also see tables 10 and 11)



1 N is the outside diameter of the lever hub.

Figure 7. ISO 5211 Square Lever Insert Dimensions (also see table 11)

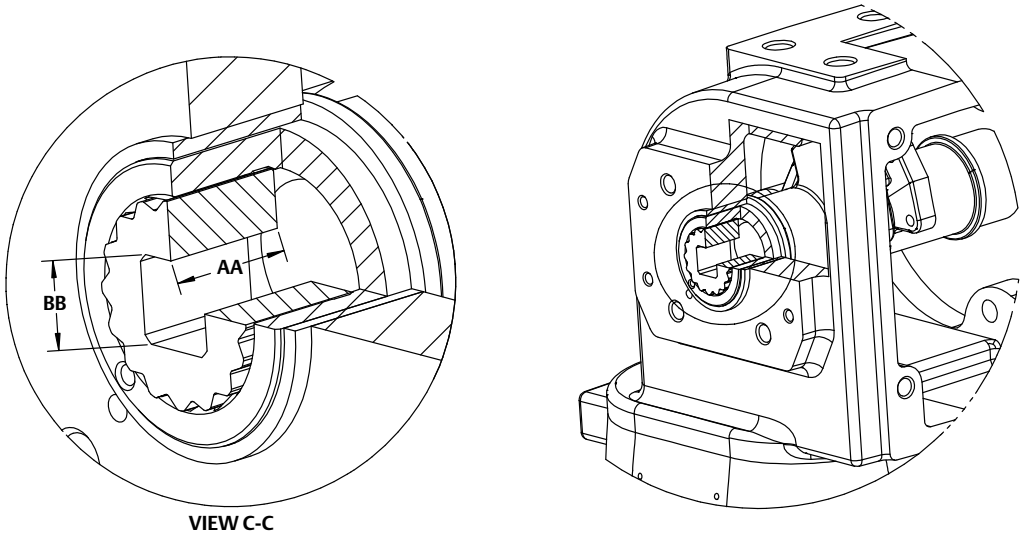


Figure 8. Fisher 2052 Actuator Mounting Styles (also see table 13)

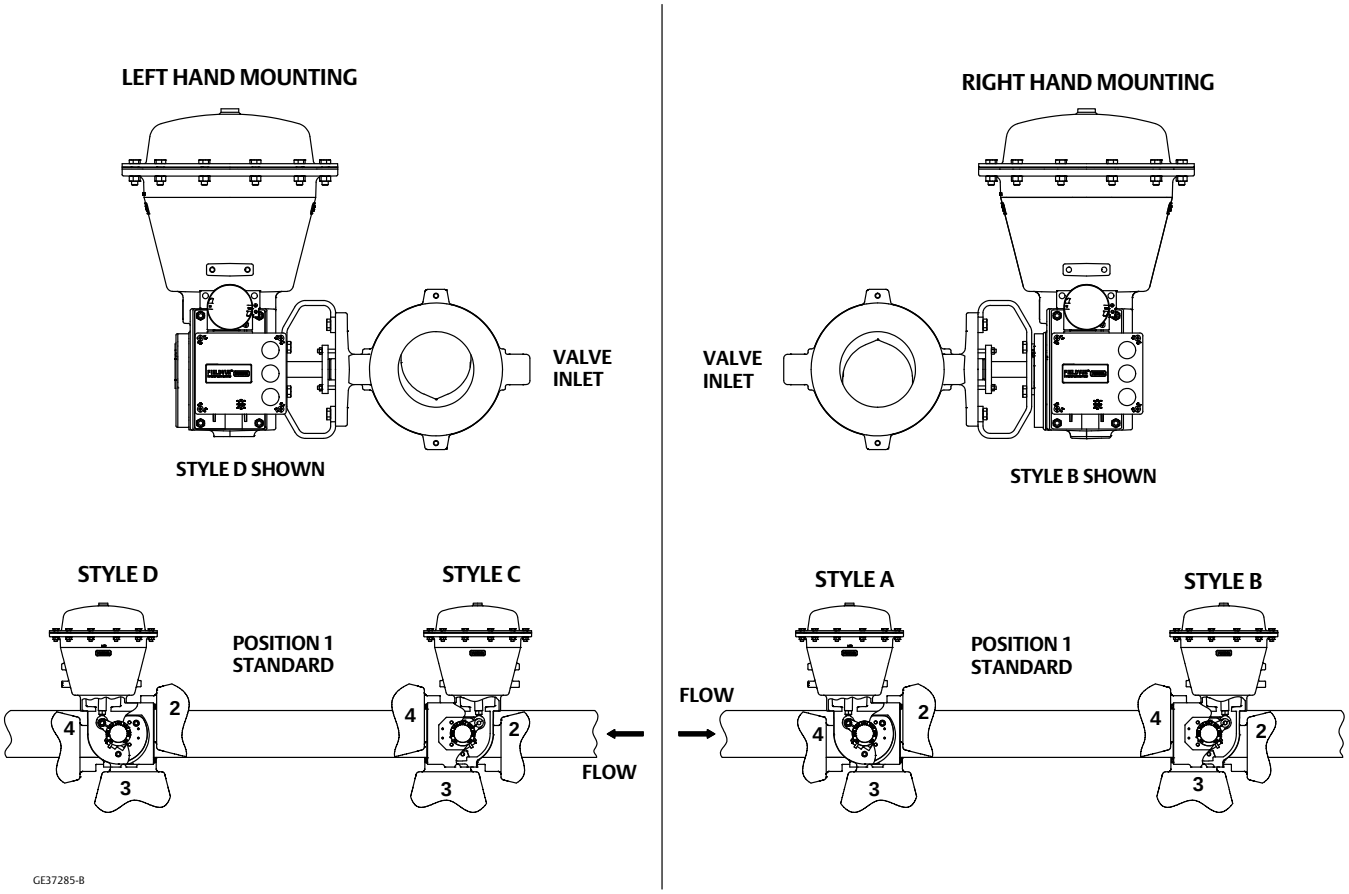


Table 13. Fisher 2052 Actuator Mounting Styles

MOUNTING (SEE FIGURE 8)	ACTION(1)	VALVE						
		Ball/Plug Rotation to Close	V150, V200, V300 Series	CV500 and V500	V250	Ball/Plug Rotation to Close	V250	8510, 8510B, 8532, 8560, 8580, 9500, Control-Disk
RIGHT-HAND	PDTC	CCW	A	A	A	CW	NA	B
	PDTO	CCW	B	B	B	CW	NA	A
LEFT-HAND	PDTC	CCW	D	D	NA	CW	C	C
	PDTO	CCW	C	C	NA	CW	D	D
LEFT-HAND (Optional)	PDTC	CW	C	NA	NA	NA	NA	NA
	PDTO	CW	D	NA	NA	NA	NA	NA

1. PDTC = Push Down To Close. PDTO = Push Down To Open.

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

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Fisher™ 8532 High-Performance Butterfly Valve

The Fisher 8532 high-performance butterfly valve provides outstanding performance under extreme pressure and temperature conditions. The 8532 valve maintains tight shutoff, is available in a fire-tested version, and can be specified for cryogenic applications and oxygen service.

The 8532 valve is available as either a flangeless, wafer-style design or as a single-flange (lugged) design. A splined drive shaft combines with a variety of spring-and-diaphragm or pneumatic piston actuators to make the 8532 a reliable, high-performance butterfly valve for a variety of throttling and on-off applications in the various process industries.

The 8532 valve can be supplied with one of several dynamic seals (figure 4) that can be used in a variety of demanding applications. With the appropriate seal selection and materials of construction, the pressure-assisted seal provides excellent shutoff against the full CL150 or CL300 pressure ratings.

W9138-2

Features

- Economical Tight Shutoff-- The pressure-assisted seal design provides tight shutoff against the full pressure rating of the specified valve.
- Safety-- Shaft blowout protection is designed into the 8532 valve (figure 6). The anti-blowout gland fits securely over the valve shaft which has been turned down to form a circumferential shoulder that contacts the anti-blowout gland.
- Excellent Flow Control-- With a modified equal percentage flow characteristic, the 8532 can be used for throttling applications through 90 degrees of disk rotation. Rangeability is 100 to 1.
- Economically Designed for Minimal Deadband-- A splined end connection on the drive shaft allows lever clamping by most Fisher rotary actuators.
- Application Versatility-- Optional keyed shaft is ideal for on/off applications and allows actuator selection flexibility. Standard construction materials and seal assemblies provide long life and outstanding performance in a broad range of liquid and gas applications.
- Ease of Maintenance-- Interchangeability of all parts including shafts and disks simplifies service and reduces maintenance costs.
- Improved Environmental Capabilities-- The optional ENVIRO-SEAL™ packing system is designed with very smooth stem surfaces and live-loading provides improved sealing, guiding, and loading force transmission. The ENVIRO-SEAL packing system can control emissions below the EPA (Environmental Protection Agency) limit of 100 ppm (parts per million).
- Easy Installation-- The valve body self-centers on the line flange bolts as a fast, accurate means of centering the valve in the pipeline.
- Reliable Flange Gasketing Surface-- Seal retainer screws are located so there is no interference with the sealing function of either flat sheet or spiral wound line flange gaskets.

Specifications

Available Valve Configurations

■ Wafer (Flangeless), ■ Lugged (Single Flange), or ■ Double Flanged valve bodies

Valve Body Sizes

NPS ■ 14, ■ 16, ■ 18, ■ 20, ■ 24, ■ 30, ■ 36, ■ 42, and ■ 48

End Connection Style

Valve body is designed to fit between raised-face mating flanges per ASME B16.5 CL150 or CL300

Maximum Inlet Pressure/Temperature(1)

Consistent with ■ CL150 and ■ CL300 pressure/temperature ratings per ASME B16.34. Also, see figures 2 and 3 for additional information
NPS 30 through 48: ■ CL150/150 construction has CL150 rated pressure retaining parts and 150 psid rated trim

Available Seal Configurations

Standard Constructions
See figure 4 and table 2

Standard Construction Materials

Valve Body and Disk: ASTM grades of ■ carbon steel or ■ stainless steel

Disk Coating:

Hardfacing options are available. Chrome plate is standard with NOVEX, Phoenix III, or Cryogenic seals

Shaft: ASTM grade of ■ S17400 (17-4PH H1025 SST), or ■ S20910

Shaft Extension Lengths:
High Temperature ■ Extensions are available but not required for temperatures less than 343°C (650°F), ■ Optional 6 inches for temperatures from 343 to 538°C (650 to 1000°F), or ■ 12 inches for temperatures above 538°C (1000°F)
Cryogenic ■ 914mm (36 in) from valve center line

Seal Ring: ■ PTFE, ■ S31600 (316 SST), ■ S21800, ■ S31600/PTFE, ■ UHMWPE(4), or ■ CTFE(5).

Backup ring: ■ Nitrile, ■ Chloroprene, ■ PTFE, ■ Fluorocarbon--for a broad range of hydrocarbon and chemical process applications(1) or ■ EPR--for process applications including steam and water(1). A backup ring is not used with the NOVEX seal

Packing: ■ PTFE V-ring (standard packing), ■ Graphite (optional), or ■ ENVIRO-SEAL packing (optional)

Bearings: ■ PEEK(2) (standard material), and ■ S31600, ■ PTFE Composition, or ■ CoCr-A (Alloy 6) (optional)

Gaskets: ■ Flexible graphite ■ Aramid with Neoprene

Valve Body Classification

Wafer and Lugged face-to-face dimensions are in compliance with MSS SP68 and API 609 standards through NPS 24. Double Flange valve bodies comply with API 609 short face-to-face dimensions. Valve bodies are designed for installation between ASME B16.5 CL150 or CL300 raised-face flanges

Shutoff Classification. Per ANSI/FCI 70-2 and IEC 60534-4

Standard Soft Seal: Bidirectional shutoff Class VI (bubble-tight)
NOVEX Seal: Unidirectional shutoff Class IV (preferred flow direction only(3)), Class VI optional (excluding NPS 42 and 48)
Phoenix III Seal: Bidirectional shutoff Class VI (bubble-tight)
Phoenix III Seal for Fire-Tested Applications: Unidirectional shutoff Class VI (reverse flow direction only) (bubble-tight). Fire Tested per API 607 Rev. 4. Contact your Emerson sales office for more information

Flow Characteristic

Modified equal percentage

Flow Coefficients

See table 1 and Fisher Catalog 12

Noise Levels

See Catalog 12 for sound pressure level prediction

-continued-

Specifications (cont.)

Disk Rotation

Clockwise to close

Valve Dimensions and Approximate Weights

See figures 7, 8, 9, and 10

ENVIRO-SEAL Packing

This optional ■ PTFE or ■ graphite packing system provides improved sealing, guiding, and transmission of loading force to control liquid and gas emissions. See Bulletin 59.3:041 ENVIRO-SEAL Packing Systems for Rotary Valves (D101638X012) for more information.

1. The pressure/temperature limits in this bulletin (figures 2 and 3), and any application code or standard limitation, should not be exceeded.
2. PEEK stands for poly-ether-ether-ketone.
3. For optimum seal performance, the preferred valve orientation at shutoff is with the retaining ring downstream from the high pressure side of the valve.
4. UHMWPE stands for ultra high molecular weight polyethylene.
5. CTFE not recommended for fast cycling, less than 2 seconds. Contact your Emerson sales office for other seals available for fast cycling or tighter shutoff.

Figure 1. Flow Direction

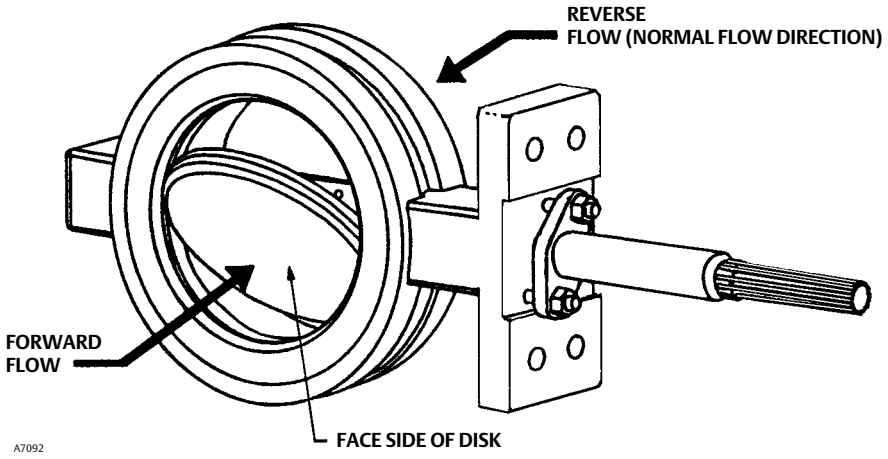


Table 1. Flow Coefficients[1][3]

VALVE SIZE, NPS	MAX C_v [2], VALVE 90° OPEN		
	CL150/150	CL150	CL300
14	---	6320	4550
16	---	8600	5630
18	---	11,050	8230
20	---	13,850	9530
24	---	21,500	12,510
30	40,500	33,900	23,800
36	60,600	50,500	36,800
42	79,800	72,700	57,100
48	106,000	92,600	62,200

1. To obtain the flow coefficient K_v in terms of cubic meters per hour at one kilogram force per square centimeter differential pressure across the valve, using the following multiplier: $K_v = 0.856\ C_v$.
2. Measured in gallons per minutes at 1 psi differential pressure across the valve.
3. See Catalog 12 for a complete listing of flow coefficients.

Installation

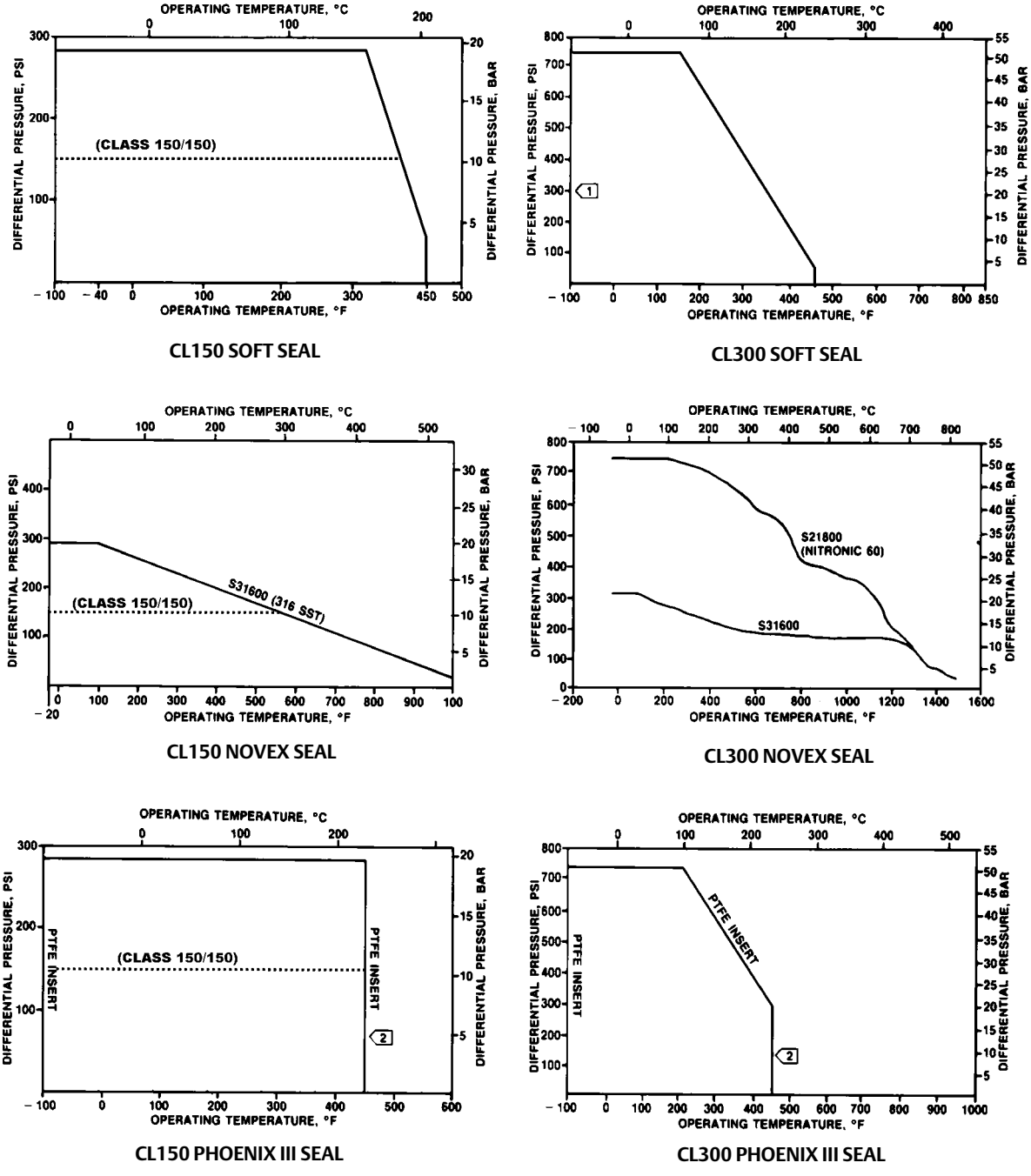
Recommended installation for the 8532 valve is with the shaft horizontal in a normal-flow direction. Horizontal installation will enhance valve performance because process fluid flow will sweep entrained solids from valve surfaces. This sweeping action prevents particle buildup on seal surfaces. However, the valve may be installed in either the forward or reverse flow direction.

The standard soft seal offers bubble-tight, bidirectional shutoff. To meet the performance requirements of many of today's fire-tested requirements, a Phoenix III valve must be installed in the preferred valve orientation. Both the NOVEX and cryogenic seals are uni-directional and should be installed with the shaft upstream of the seal.

Unique operating conditions may require a specific combination of actuator motion. To satisfy unique operating requirements, the valve and actuator can be assembled in eight ways, providing for actuator motion and open disk position. For assistance in selecting the appropriate combination of actuator action and open valve position, consult your Emerson sales office.

Dimensions and weights are shown in figures 7, 8, 9, and 10.

Figure 2. Maximum Pressure/Temperature Ratings for Soft Seal, NOVEX Seal and Phoenix III Seal, CL150 and CL300



Note

1 Because of potential erosive effects and premature seal failure that can occur, throttling PTFE seals at differential pressures greater than 300 psid at disk angles less than 20° open is not recommended.

2 Temperature limitations do not account for the additional limitations imposed by the backup O-ring used with this seal. To determine the effective temperature limitation of the appropriate seal, backup O-ring combination, refer to table 1.

Figure 3. Maximum Pressure/Temperature Ratings for Cryogenic Seal, CL150 and CL300

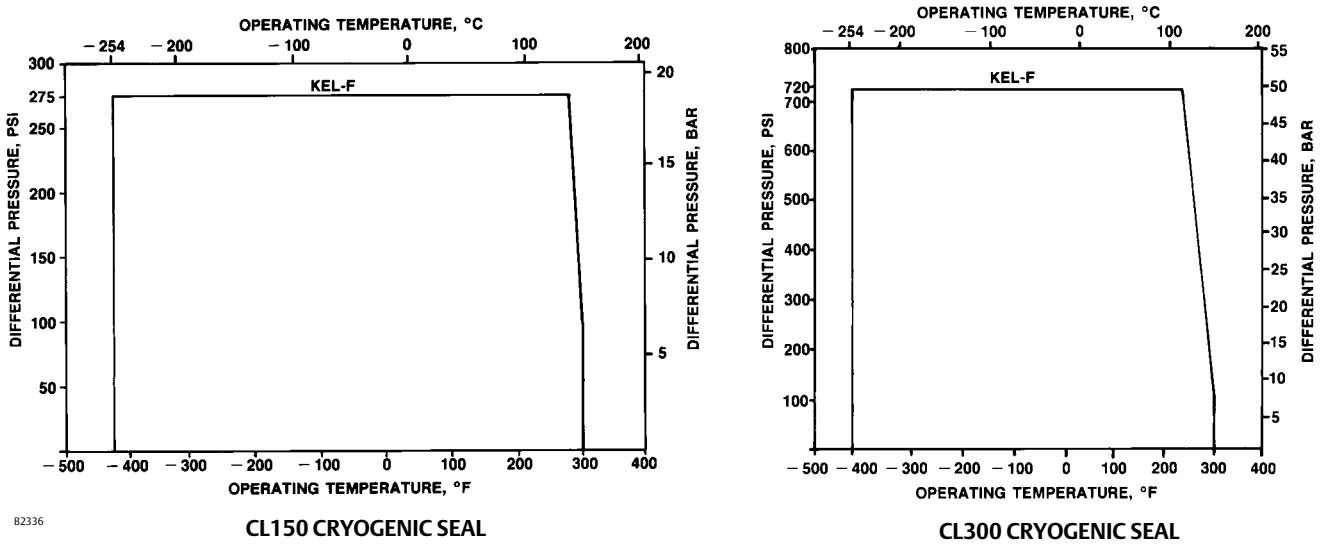


Figure 4. Available Seal Configurations

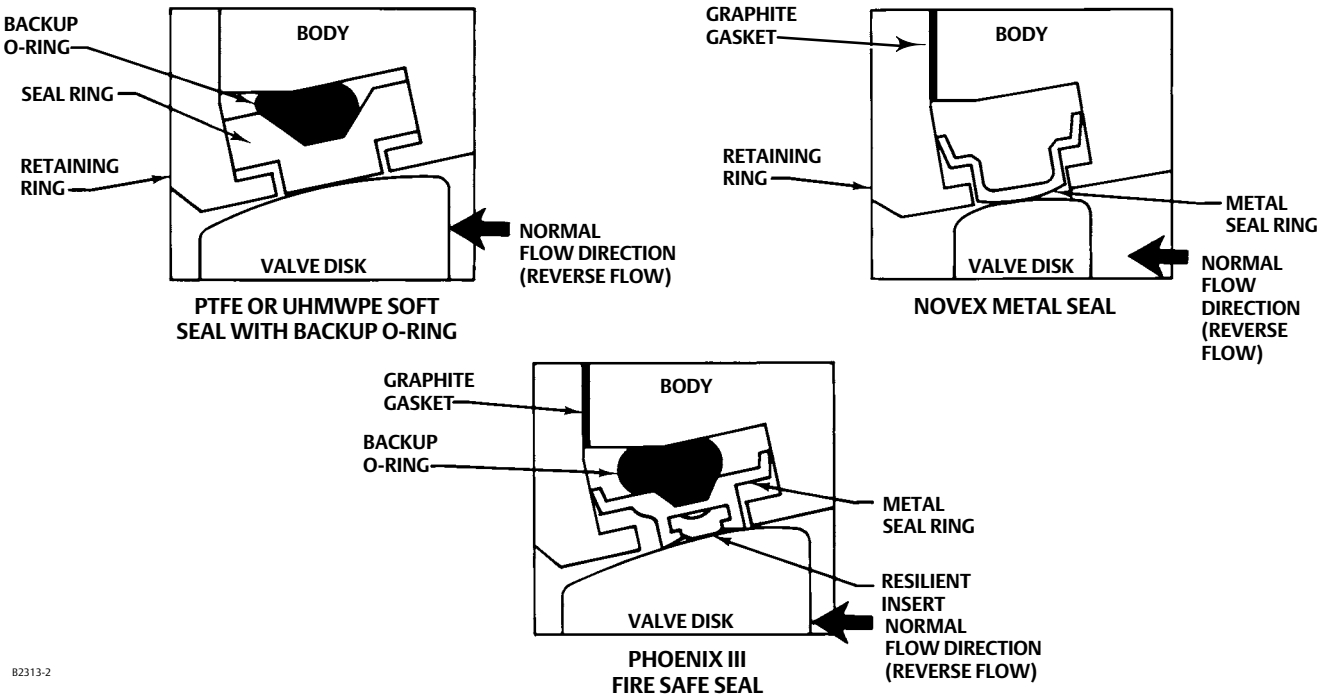


Figure 5. Typical Valve Assembly

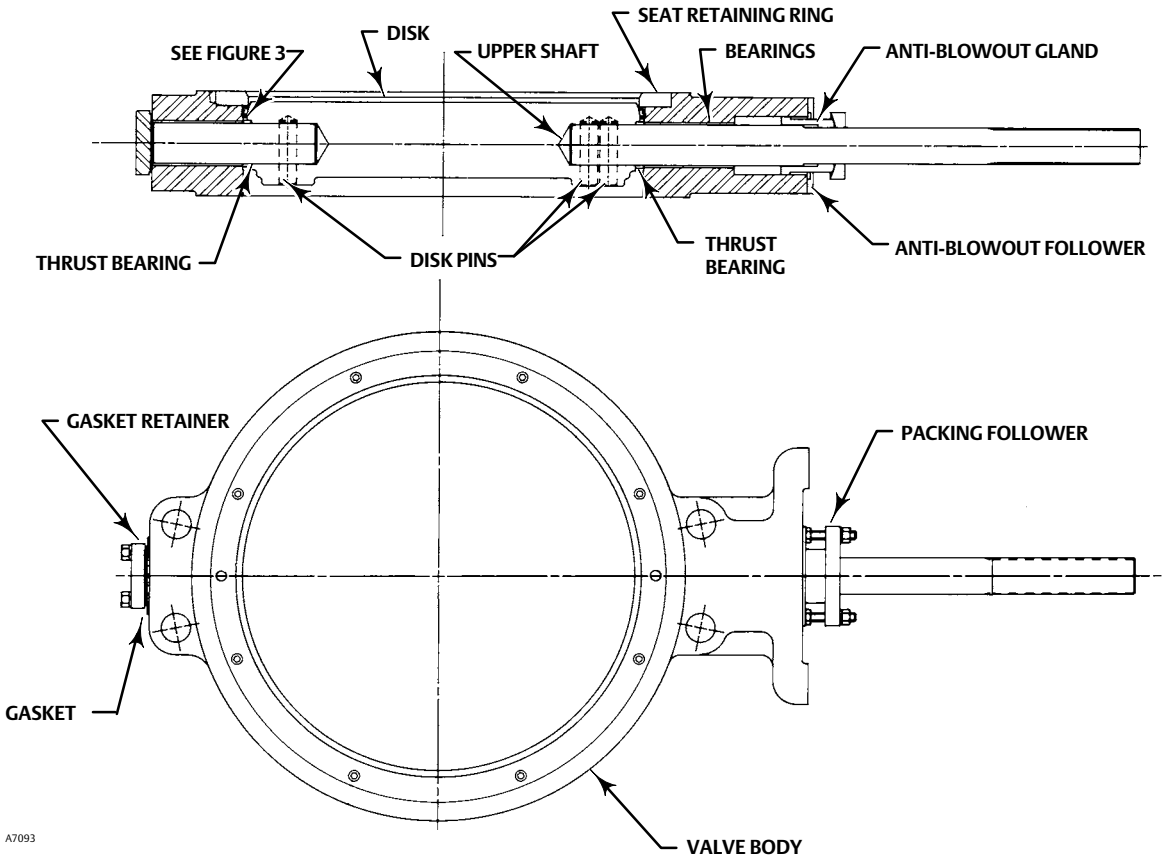
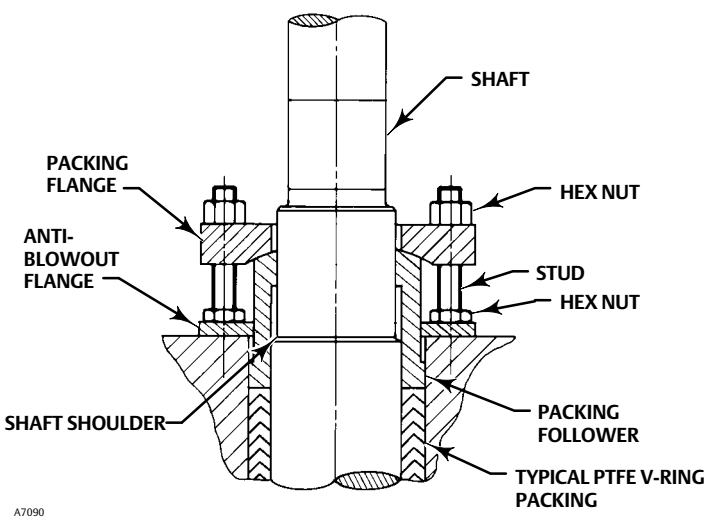
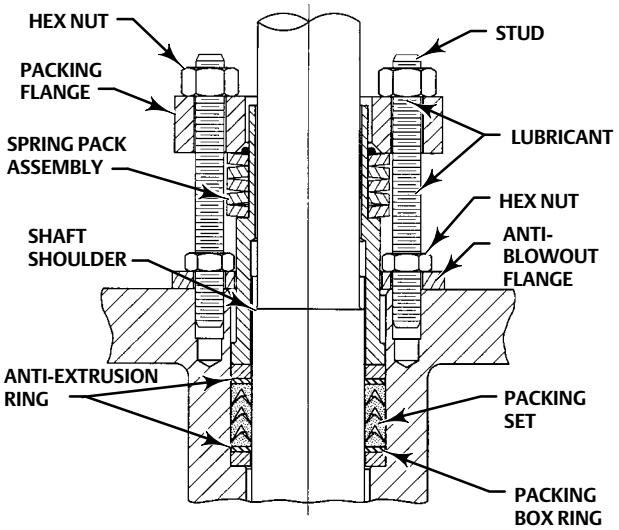


Figure 6. Blowout Protection



STANDARD PACKING ARRANGEMENT



ENVIRO-SEAL ARRANGEMENT (PTFE SHOWN)

Table 2. Material Temperature Ratings

COMPONENT AND MATERIAL OF CONSTRUCTION[1]		TEMPERATURE RANGE	
		°C	°F
Valve Body[2]			
Carbon Steel (WCC or SA 516-70)[7]		-29 to 427	-20 to 800
CF8M (316 SST)		-198 to 538	-325 to 1000
CF8M/CF10M (316/316H)[3] Dual-Certified		over 538 to 816	over 1000 to 1500
Disk			
CF8M (316 SST)		-198 to 538	-325 to 1000
CF8M/CF10M (316/316H)[3] Dual-Certified		over 538 to 816	over 1000 to 1500
Disk Coating			
Chromium Carbide		-198 to 816	-325 to 1500
Chrome Plating		-254 to 427	-425 to 800
Chromium Coating		-254 to 593	-425 to 1100
Shaft			
S20910		-198 to 538	-325 to 1000
S17400 (17-4 pH 1025)		-73 to 427	-100 to 800
N07718		-254 to 704	-425 to 1300
N07750		over 593 to 816	over 1100 to 1500
N05500		-198 to 482	-325 to 900
Bearings[6]			
PEEK (standard)		-73 to 260	-100 to 500
S31600[4]		-198 to 816	-325 to 1500
R30006 (Alloy 6)		-198 to 816	-325 to 1500
Bronze		-254 to 302	-425 to 575
Packing			
PTFE Packing and PTFE ENVIRO-SEAL Packing		-148 to 232	-325 to 450
Graphite packing		-198 to 816	-325 to 1500
Graphite packing with oxidizing media		-198 to 538	-325 to 1000
Graphite ENVIRO-SEAL Packing		-148 to 315	-325 to 600
Seal Ring and Backup Ring	**PTFE Seal Ring**		
	Nitrile Backup O-Ring	-29 to 93	-20 to 200
	Chloroprene Backup O-Ring	-43 to 149	-45 to 300
	EPR Backup O-Ring	-54 to 149	-65 to 300
	Fluorocarbon Backup O-Ring	-29 to 204	-20 to 400
	PTFE Backup O-Ring	-73 to 204	-100 to 400
	UHMWPE[5] Seal Ring (CL150 Only)		
	EPR Backup O-Ring	-54 to 93	-65 to 200
	Fluorocarbon Backup O-Ring	-29 to 93	-20 to 200
	Phoenix III and/or Fire Tested Construction		
	S31600 and PTFE Seal Ring with Nitrile Backup O-Ring	-40 to 149	-40 to 300
	Chloroprene Backup O-Ring	-54 to 149	-65 to 300
	EPR Backup O-Ring	-62 to 204	-80 to 400
	Fluorocarbon Backup O-Ring	-40 to 232	-100 to 200
Seal Ring	NOVEX S31600 Seal[4] Ring (CL150)	-29 to 538	-20 to 1000
	NOVEX S31600 Seal[4] Ring (CL300)	-29 to 816	-20 to 1500
	NOVEX S21800 Seal[4] Ring (CL300)	-29 to 816	-40 to 1500
	Cryogenic Seal Ring	Contact your Emerson sales office	
Gaskets	Flexible Graphite	-254 to 816	-425 to 1500
	Aramid with Neoprene	-254 to 538	-425 to 1000

1. NACE trim constructions are available; consult your Emerson sales office.
2. Special gasket retainer bolts are required for over 427°C (800°F)
3. Special retaining ring screws for single flange valves over 538°C (1000°F)
4. For a complete material description, contact your Emerson sales office.
5. UHMWPE stands for ultra high molecular weight polyethylene.
6. Special thrust bearings are required for high temp. applications over 343°C (650°F) (with 6- and 12-inch shaft extensions). Constructions with carbon steel valves and SST disks may require special thrust bearings at temperatures less than 343°C (650°F).
7. Cast or wrought /plate grades used interchangeably, depending upon availability - unless requested by customer.

Table 3. Dimensions and Weights, Wafer Style Valves

Valve Size, NPS[5]	Rating	A[1]	D	G	K	M[2]	R	S[3]	T	U	W	Y	Approx. Weight
		mm											kg
14	CL150	91.9	208	295	327	331	422	31.8	235	46.0	17.5	---[4]	72
	CL300	117	356	319	364	304	437	44.5	273	50.8	20.6	1-1/8 - 8 UNC	121
16	CL150	102	208	318	371	375	465	31.8	235	46.0	17.5	1 - 8 UNC	94
	CL300	133	356	353	397	346	498	44.5	273	50.8	20.6	1-1/4 - 8 UNC	183
18	CL150	114	356	349	400	419	529	39.6	273	50.8	20.1	1-1/8 - 8 UNC	139
	CL300	149	356	384	419	389	556	57.2	337	76.2	23.9	1-1/4 - 8 UNC	227
20	CL150	127	356	381	432	464	584	44.5	273	50.8	20.1	1-1/8 - 8 UNC	167
	CL300	159	265	416	483	442	605	76.0	337	76.2	23.9	1-1/4 - 8 UNC	364
24	CL150	154	356	438	292	581	692	57.2	337	76.2	23.9	1-1/4 - 8 UNC	255
	CL300	181	546	483	546	523	716	76.0	337	76.2	23.9	1-1/2 - 8 UNC	469
30	CL150/150	121	---	516	559	744	864	---	337	76	7/8-9	1 1/4-8	365
	CL150	159	---	521	591	736	867	---	337	76	7/8-9	1 1/4-8	528
	CL300	241	---	576	648	681	865	---	508	203	1 1/4-7	1 3/4-8	953
36	CL150/150	149	---	613	683	888	1029	---	337	76	7/8-9	1 1/2-8	626
	CL150	178	---	619	657	888	1032	---	305	152	1 1/4-7	1 1/2-8	806
	CL300	273	---	675	740	838	1035	---	432	203	1 1/4-7	2 -8	1315
42	CL150/150	210	---	695	762	1032	1207	---	337	76	7/8-9	1 1/2-8	1100
	CL150	229	---	730	838	1028	1207	---	305	152	1 1/4-7	1 1/2-8	1302
	CL300	298	---	768	867	943	1162	---	432	203	1 1/4-7	1 5/8-8	2263
48	CL150/150	229	---	826	889	1180	1364	---	305	152	1 1/4-7	1 1/2-8	1604
	CL150	260	---	797	902	1171	1372	---	508	203	1 1/4-7	1 1/2-8	1904
Size	**Rating**	**Inch**											**lb**
14	CL150	3.62	8.19	11.62	12.88	13.04	16.62	1-1/4	9.25	1.81	0.69	---[4]	158
	CL300	4.62	14.00	12.56	14.31	12.00	17.19	1-3/4	10.75	2.00	0.81	1-1/8 - 8 UNC	266
16	CL150	4.00	8.19	12.50	14.62	14.77	18.31	1-1/4	9.25	1.81	0.69	1 - 8 UNC	207
	CL300	5.25	14.00	13.88	15.62	13.60	19.62	1-3/4	10.75	2.00	0.81	1-1/4 - 8 UNC	403
18	CL150	4.50	14.00	13.75	15.75	16.49	20.81	1-9/16	10.75	2.00	0.81	1-1/8 - 8 UNC	307
	CL300	5.88	14.00	15.12	16.50	15.30	21.88	2-1/4	13.25	3.00	0.94	1-1/4 - 8 UNC	500
20	CL150	5.00	14.00	15.00	17.00	18.27	23.00	1-3/4	10.75	2.00	0.81	1-1/8 - 8 UNC	368
	CL300	6.25	10.44	16.38	19.00	17.40	23.81	3	13.25	3.00	0.94	1-1/4 - 8 UNC	802
24	CL150	6.06	14.00	17.25	19.38	22.87	27.25	2-1/4	13.25	3.00	0.94	1-1/4 - 8 UNC	563
	CL300	7.12	21.50	19.00	21.50	20.60	28.19	3	13.25	3.00	0.94	1-1/2 - 8 UNC	1035
30	CL150/150	4.75	---	20.31	22.00	29.30	34.00	---	13.25	3.00	7/8-9	1 1/4-8	805
	CL150	6.25	---	20.50	23.25	28.97	34.12	---	13.25	3.00	7/8-9	1 1/4-8	1164
	CL300	9.50	---	22.69	25.50	26.80	34.06	---	20.00	8.00	1 1/4-7	1 3/4-8	2100
36	CL150/150	5.88	---	24.12	26.88	34.96	40.50	---	13.25	3.00	7/8-9	1 1/2-8	1380
	CL150	7.00	---	24.38	25.88	34.95	40.62	---	12.00	6.00	1 1/4-7	1 1/2-8	1778
	CL300	10.75	---	26.56	29.12	33.00	40.75	---	17.00	8.00	1 1/4-7	2 -8	2900
42	CL150/150	8.25	---	27.38	30.00	40.64	47.50	---	13.25	3.00	7/8-9	1 1/2-8	2425
	CL150	9.00	---	28.75	33.00	40.48	47.50	---	12.00	6.00	1 1/4-7	1 1/2-8	2871
	CL300	11.75	---	30.25	34.12	37.13	45.75	---	17.00	8.00	1 1/4-7	1 5/8-8	4989
48	CL150/150	9.00	---	32.50	35.00	46.47	53.69	---	12.00	6.00	1 1/4-7	1 1/2-8	3537
	CL150	10.25	---	31.38	35.50	46.09	54.00	---	20.00	8.00	1 1/4-7	1 1/2-8	4198

1. For NPS 14 through 24, face-to-face dimensions are in compliance with MSS SP68 and API 609.
2. Minimum internal diameter of the mating pipe or flange required for full disk clearance.
3. For valves with spline shafts. Use this nominal shaft diameter for selecting Fisher actuators.
4. This size and class wafer body has no tapped holes for mating pipe flange.
5. NPS 30 through 48 use keyed shaft as standard.

Figure 7. Dimensions and Weights, Wafer Style Valves (also see table 3)

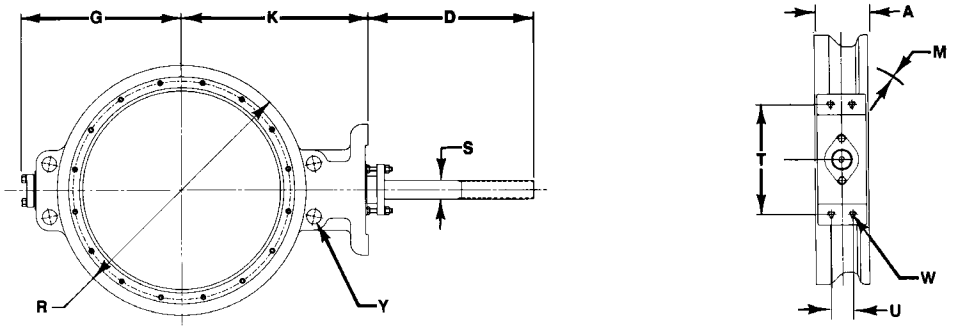


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Table 4. Dimensions and Weights, Lugged Valves

Valve Size, NPS[5]	Rating	A[1]	D	G	K	M[2]	R	S[3]	T	U	W	Y[4]	Approx-Weight
		mm											kg
14	CL150	91.9	208	295	327	331	531	31.8	235	46.0	17.5	1 - 8 UNC	95
	CL300	117	356	319	364	304	594	44.5	273	50.8	20.6	1-1/8 - 8 UNC	227
16	CL150	102	208	318	371	375	607	31.8	235	46.0	17.5	1 - 8 UNC	138
	CL300	133	356	353	397	346	657	44.5	273	50.8	20.6	1-1/4 - 8 UNC	294
18	CL150	114	356	349	400	419	645	39.6	273	50.8	20.1	1-1/8 - 8 UNC	178
	CL300	149	356	384	419	389	721	57.2	337	76.2	23.9	1-1/4 - 8 UNC	402
20	CL150	127	356	381	432	464	696	44.5	273	50.8	20.1	1-1/8 - 8 UNC	224
	CL300	159	265	416	483	442	784	76.0	337	76.2	23.9	1-1/4 - 8 UNC	544
24	CL150	154	356	438	292	581	822	57.2	337	76.2	23.9	1-1/4 - 8 UNC	315
	CL300	181	546	483	546	523	924	76.0	337	76.2	23.9	1-1/2 - 8 UNC	821
30	CL150/150	121	---	516	559	744	864	---	337	76	7/8-9	1 1/4-8	525
	CL150	159	---	521	591	736	867	---	337	76	7/8-9	1 1/4-8	736
	CL300	241	---	576	648	681	865	---	508	203	1 1/4-7	1 3/4-8	1406
36	CL150/150	149	---	613	683	888	1029	---	337	76	7/8-9	1 1/2-8	897
	CL150	178	---	619	657	888	1032	---	305	152	1 1/4-7	1 1/2-8	1120
	CL300	273	---	675	740	838	1035	---	432	203	1 1/4-7	2 -8	1989
42	CL150/150	210	---	695	762	1032	1207	---	337	76	7/8-9	1 1/2-8	1328
	CL150	229	---	730	838	1028	1207	---	305	152	1 1/4-7	1 1/2-8	1550
	CL300	298	---	768	867	943	1162	---	432	203	1 1/4-7	1 5/8-8	2726
48	CL150/150	229	---	826	889	1180	1364	---	305	152	1 1/4-7	1 1/2-8	1907
	CL150	260	---	797	902	1171	1372	---	508	203	1 1/4-7	1 1/2-8	2248
Size	**Rating**	**Inch**											**lb**
14	CL150	3.62	8.19	11.62	12.88	13.04	20.88	1-1/4	9.25	1.81	0.69	1 - 8 UNC	209
	CL300	4.62	14.00	12.56	14.31	12.00	23.38	1-3/4	10.75	2.00	0.81	1-1/8 - 8 UNC	500
16	CL150	4.00	8.19	12.50	14.62	14.77	23.88	1-1/4	9.25	1.81	0.69	1 - 8 UNC	304
	CL300	5.25	14.00	13.88	15.62	13.60	25.88	1-3/4	10.75	2.00	0.81	1-1/4 - 8 UNC	649
18	CL150	4.50	14.00	13.75	15.75	16.49	25.38	1-9/16	10.75	2.00	0.81	1-1/8 - 8 UNC	393
	CL300	5.88	14.00	15.12	16.50	15.30	28.38	2-1/4	13.25	3.00	0.94	1-1/4 - 8 UNC	886
20	CL150	5.00	14.00	15.00	17.00	18.27	27.38	1-3/4	10.75	2.00	0.81	1-1/8 - 8 UNC	493
	CL300	6.25	10.44	16.38	19.00	17.40	30.88	3	13.25	3.00	0.94	1-1/4 - 8 UNC	1200
24	CL150	6.06	14.00	17.25	19.38	22.87	32.38	2-1/4	13.25	3.00	0.94	1-1/4 - 8 UNC	773
	CL300	7.12	21.50	19.00	21.50	20.60	36.38	3	13.25	3.00	0.94	1-1/2 - 8 UNC	1810
30	CL150/150	4.75	---	20.31	22.00	29.30	34.00	---	13.25	3.00	7/8-9	1 1/4-8	1157
	CL150	6.25	---	20.50	23.25	28.97	34.12	---	13.25	3.00	7/8-9	1 1/4-8	1623
	CL300	9.50	---	22.69	25.50	26.80	34.06	---	20.00	8.00	1 1/4-7	1 3/4-8	3100
36	CL150/150	5.88	---	24.12	26.88	34.96	40.50	---	13.25	3.00	7/8-9	1 1/2-8	1978
	CL150	7.00	---	24.38	25.88	34.95	40.62	---	12.00	6.00	1 1/4-7	1 1/2-8	2470
	CL300	10.75	---	26.56	29.12	33.00	40.75	---	17.00	8.00	1 1/4-7	2 -8	4385
42	CL150/150	8.25	---	27.38	30.00	40.64	47.50	---	13.25	3.00	7/8-9	1 1/2-8	2928
	CL150	9.00	---	28.75	33.00	40.48	47.50	---	12.00	6.00	1 1/4-7	1 1/2-8	3418
	CL300	11.75	---	30.25	34.12	37.13	45.75	---	17.00	8.00	1 1/4-7	1 5/8-8	6009
48	CL150/150	9.00	---	32.50	35.00	46.47	53.69	---	12.00	6.00	1 1/4-7	1 1/2-8	4204
	CL150	10.25	---	31.38	35.50	46.09	54.00	---	20.00	8.00	1 1/4-7	1 1/2-8	4955

1. For NPS 14 through 24, face-to-face dimensions are in compliance with MSS SP68 and API 609.
2. Minimum internal diameter of the mating pipe or flange required for full disk clearance.
3. For valves with spline shafts. Use this nominal shaft diameter for selecting Fisher actuators.
4. Bolt hole quantity and bolt circle diameter to mate with B16.5 flanges for CL150 and CL300. Valve bodies also available with drilled-thru, clearance holes.
5. NPS 30 through 48 use keyed shaft as standard.

Figure 8. Dimensions and Weights, Lugged Valves (also see table 4)

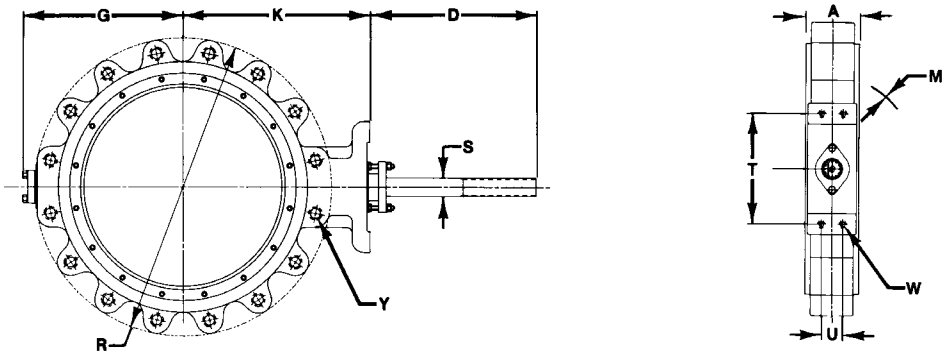


Table 5. Dimensions and Weights, Double Flange Valves

Valve Size, NPS	Rating	A(1)	B	D	G	K	R	S(2)	T	U	W	X	Y	Approx-Weight
		mm												kg
14	CL150	191	95.3	208	295	327	533	31.8	235	46.0	17.5	28.4	---(3)	152
	CL300	290	145	356	319	364	584	44.5	273	50.8	20.6	31.8	1-1/8 - 8 UNC	345
16	CL150	216	108	208	318	371	597	31.8	235	46.0	17.5	28.4	1 - 8 UNC	201
	CL300	310	155	356	353	397	648	44.5	273	50.8	20.6	34.8	1-1/4 - 8 UNC	563
18	CL150	222	111	356	349	400	635	39.6	273	50.8	20.1	31.8	1-1/8 - 8 UNC	243
	CL300	330	165	356	384	419	711	57.2	337	76.2	23.9	34.8	1-1/4 - 8 UNC	591
20	CL150	229	114	356	381	432	699	44.5	273	50.8	20.1	31.8	1-1/8 - 8 UNC	277
	CL300	350	175	265	416	483	767	76.0	337	76.2	23.9	34.8	1-1/4 - 8 UNC	706
24	CL150	267	133	356	438	292	813	57.2	337	76.2	23.9	35.0	1-1/4 - 8 UNC	434
	CL300	390	195	546	483	546	914	76.0	337	76.2	23.9	41.1	1-1/2 - 8 UNC	1307
Size	**Rating**	**Inch**												
14	CL150	7.50	3.75	8.19	11.62	12.88	21.00	1-1/4	9.25	1.81	0.69	1.13	---(3)	335
	CL300	11.41	5.70	14.00	12.56	14.31	23.00	1-3/4	10.75	2.00	0.81	1.25	1-1/8 - 8 UNC	760
16	CL150	8.50	4.25	8.19	12.50	14.62	23.50	1-1/4	9.25	1.81	0.69	1.13	1 - 8 UNC	443
	CL300	12.20	6.10	14.00	13.88	15.62	25.50	1-3/4	10.75	2.00	0.81	1.38	1-1/4 - 8 UNC	1240
18	CL150	8.75	4.38	14.00	13.75	15.75	25.00	1-9/16	10.75	2.00	0.81	1.25	1-1/8 - 8 UNC	535
	CL300	13.00	6.50	14.00	15.12	16.50	28.00	2-1/4	13.25	3.00	0.94	1.38	1-1/4 - 8 UNC	1303
20	CL150	9.00	4.50	14.00	15.00	17.00	27.50	1-3/4	10.75	2.00	0.81	1.25	1-1/8 - 8 UNC	611
	CL300	13.78	6.89	10.44	16.38	19.00	30.20	3	13.25	3.00	0.94	1.38	1-1/4 - 8 UNC	1556
24	CL150	10.50	5.25	14.00	17.25	19.38	32.00	2-1/4	13.25	3.00	0.94	1.38	1-1/4 - 8 UNC	956
	CL300	15.35	7.67	21.50	19.00	21.50	36.00	3	13.25	3.00	0.94	1.62	1-1/2 - 8 UNC	2881

1. Face-to-face dimensions are in compliance with API 609 short series and ISO 5752. Contact your Emerson sales office for other face-to-face lengths.
2. For valves with spline shafts. Use this nominal shaft diameter for selecting Fisher actuators.
3. This size and class double-flange valve body has no tapped holes for mating pipe flange.

Figure 9. Dimensions and Weights, Double Flange Valves (also see table 5)

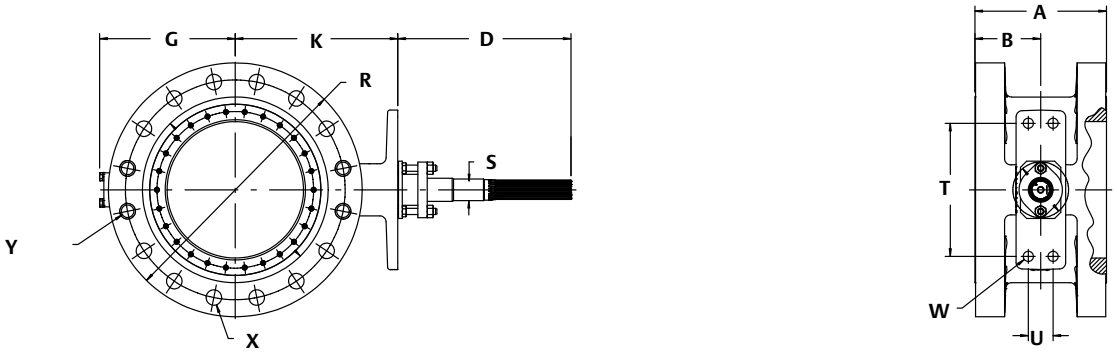
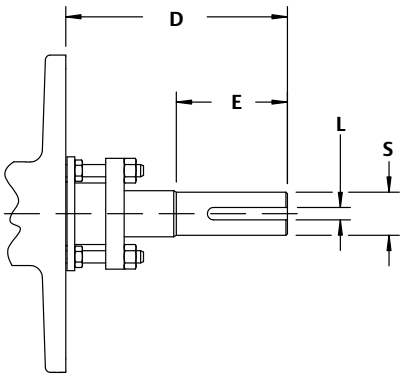


Table 6. Dimensions, Optional Keyed Shaft Valves

Valve Size, NPS[3]	Rating	D	E	L[1]	S[2]
		mm			
14	CL150	146	63.5	6.4	30.2
	CL300	229	79.5	9.5	44.5
16	CL150	146	63.5	6.4	31.8
	CL300	229	79.5	9.5	44.5
18	CL150	229	79.5	9.5	38.1
	CL300	254	105	12.7	57.2
20	CL150	229	79.5	9.5	44.5
	CL300	273	124	15.9	69.9
24	CL150	254	105	12.7	57.2
	CL300	273	124	15.9	69.9
30	CL150/150	295	95	12.7	57
	CL150	314	114	15.9	70
	CL300	314	114	15.9	70
36	CL150/150	295	95	12.7	57
	CL150	314	114	15.9	70
	CL300	353	152	22.2	95
42	CL150/150	314	114	15.9	70
	CL150	314	114	15.9	70
	CL300	363	164	25.4	102
48	CL150/150	314	114	15.9	70
	CL150	314	114	15.9	70
Size	**Rating**	**Inch**			
14	CL150	5.75	2.50	0.25	1.19
	CL300	9.00	3.13	0.38	1.75
16	CL150	5.75	2.50	0.25	1.25
	CL300	9.00	3.13	0.38	1.75
18	CL150	9.00	3.13	0.38	1.50
	CL300	10.00	4.13	0.50	2.25
20	CL150	9.00	3.13	0.38	1.75
	CL300	10.75	4.88	0.63	2.75
24	CL150	10.00	4.13	0.50	2.25
	CL300	10.75	4.88	0.63	2.75
30	CL150/150	11.62	3.75	0.500	2.25
	CL150	12.38	4.50	0.625	2.75
	CL300	12.38	4.50	0.625	2.75
36	CL150/150	11.62	3.75	0.500	2.25
	CL150	12.38	4.50	0.625	2.75
	CL300	13.88	6.00	0.875	3.75
42	CL150/150	12.38	4.50	0.625	2.75
	CL150	12.38	4.50	0.625	2.75
	CL300	14.31	6.44	1.000	4.00
48	CL150/150	12.38	4.50	0.625	2.75
	CL150	12.38	4.50	0.625	2.75

1. Nominal square key size.
2. Nominal shaft diameter at the keyway.
3. NPS 30 through 48 use keyed shaft as standard.

Figure 10. Dimensions, Optional Keyed Shaft Valves (also see table 6)



OPTIONAL KEYED DRIVE SHAFT

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

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Fisher™ 8560 High-Performance Butterfly Control Valve

Fisher 8560 high-performance butterfly valves feature a stainless steel disk with a stainless steel seal ring. The pressure-assisted metal seal ring provides excellent shutoff against pressure applied in the recommended flow direction for both liquid and gas applications.

The NOVEX and Phoenix III metal seals are available for demanding applications requiring excellent shutoff capabilities. The splined-shaft valve combines with a variety of power actuators to form a reliable, high-performance control valve suitable for throttling applications requiring extremely low leakage rates.

An optional double D shaft combines with a variety of power and manual actuators for use in quarter-turn or on/off applications.

Unless otherwise noted, all NACE references are to NACE MR0175-2002.

Fisher 8560 Lugged Valve

Features

- Excellent Flow Control—The eccentrically- mounted disk design provides an approximate linear flow characteristic and can be used for throttling or on/off control applications through 90 degrees of disk rotation.
- Sour Service Capability—Trim and bolting materials are available for applications involving sour service. These constructions comply with the recommendations of NACE MR0175-2002.
- Improved Environmental Capabilities—The optional ENVIRO-SEAL™ packing system is designed with improved sealing, guiding, and loading force transmission. The ENVIRO-SEAL packing system can control emissions to below the EPA (Environmental Protection Agency) limit of 100 ppm (parts per million) for valves.
- Integral Shaft-to-Body Bonding—Standard valve construction includes conductive packing to provide electrical bonding for hazardous area applications.
- Low Cost Maintenance—Individual disk/shaft components can be replaced after disassembly due to sleeve and taper pin connections (see figure 1).

Specifications

Valve Sizes and End Connection Styles

NPS ■ 3, ■ 4, ■ 6, ■ 8, ■ 10, and ■ 12 valve size available in lugged style

Maximum Inlet Pressure(1)

Carbon Steel and Stainless Steel Valve Bodies: Consistent with CL150 and 300 pressure-temperature ratings per ASME B16.34 unless limited by material temperature capabilities

Maximum Pressure Drops(1)

Consistent with CL150 and 300 pressure-temperature ratings per ASME B16.34 except for Phoenix III seals which are derated at some higher pressure-temperature values. Refer to figure 6

Shutoff Classifications

■ NOVEX Seal: For NPS 3 through 12. Unidirectional shutoff is Class IV. See figure 2
■ Phoenix III Seal: For NPS 3 through 12. Bidirectional shutoff to Class VI per ANSI/FCI 70-2 and IEC 60534-4. See figure 2. For the optional Phoenix III Fire-Tested seal(2), consult your Emerson sales office.

Construction Materials

Refer to table 2 for standard material selections and component temperature ranges

Material Temperature Capabilities(1)

NOVEX Seal: -46 to 538°C (-50 to 1000°F)
Phoenix III: -46 to 232°C (-50 to 450°F)

Flow Characteristic

Approximately linear

Flow Direction

Refer to figure 7

Flow Coefficients

See table 1 and Fisher Catalog 12

Flow Coefficient Ratio(3)

100 to 1

Noise Levels

See Catalog 12 for sound pressure level prediction

Disk Rotation

Clockwise to close (when viewing from the drive shaft end) through 90 degrees of disk rotation

Actuator/ Valve Action

With a diaphragm or piston rotary actuator, the valve action is field-reversible. Refer to information provided in the Installation section and figure 7

Valve Classification

Face-to-face dimensions of NPS 3 through 12 valves in CL150 or 300, meets API 609 or MSS-SP68 standards for face-to-face dimensions of lugged valves (see figure 4)

Mating Flange Capabilities

All sizes compatible with CL150 and 300 flanges (schedule 80 or lighter, see figure 4, Dimension M)

Shaft Diameters

See figure 4

ENVIRO-SEAL Packing

This optional ■ PTFE or ■ graphite packing system provides improved sealing, guiding, and transmission of loading force to control liquid and gas emissions (see figure 3). See Bulletin 59.3:041 ENVIRO-SEAL Packing Systems for Rotary Valves (D101638X012)for more information.

1. The pressure-temperature limits in this bulletin and any applicable standard or code limitation should not be exceeded.
2. For component selection and applicable fire-tested standards and codes, consult your Emerson sales office (see table 2).
3. Ratio of maximum flow coefficient to minimum usable flow coefficient.

Installation

It is recommended that the valve drive shaft be mounted in a horizontal position as shown in the figures on page 1. Operating conditions may require specific valve/actuator fail action, styles, positions and flow direction. Valves with NOVEX seal rings require mounting in the reverse flow direction. Refer to figure 7. Large valve/actuator assemblies may require additional support because of their combined weight.

Fail Action: For actuators with spring returns, spring fail action is available for push-down-to-open or push-down-to-close valve action. The valve action is field reversible.

For assistance in selecting the valve/actuator mounting suited to your application, consult your Emerson sales office.

Dimensions for lugged valves are shown in figure 4.

Table 1. Flow Coefficients(1)

VALVE SIZE, NPS	C_v FORWARD FLOW WITH DISK WIDE OPEN (90 DEGREES ROTATION)	
	CL150	CL300
3	237	237
4	499	488
6	1250	1110
8	2180	2070
10	3600	3480
12	5400	5130

1. See Fisher Catalog 12 for a complete listing of flow coefficients.

Table 2. Construction Material Temperature Limits

COMPONENTS AND MATERIALS OF CONSTRUCTION	TEMPERATURE LIMITS	
	°C	°F
Valve Body Material		
Carbon Steel CF8M	-29 to 427 -198 to 538	-20 to 800 -325 to 1000
Disk Material		
CF8M	-198 to 538	-325 to 1000
Shaft Material		
S20910 S17400	-198 to 538 -62 to 427	-325 to 1000 -80 to 800
Bearing Material		
PEEK / PTFE lined Metal	-73 to 260 -198 to 538	-100 to 500 -325 to 1000
Packing Material		
PTFE V-Rings Graphite rings	-46 to 232 -198 to 538	-50 to 450 -325 to 1000
Seal Ring		
NOVEX Metal Seal Ring	-46 to 538	-50 to 1000
Phoenix III Metal Seal Ring Fluorocarbon backup ring	-40 to 232	-40 to 450
Phoenix III Fire-Tested(1) Metal Seal Ring Fluorocarbon backup ring (Specify metal bearings and graphite packing)	-40 to 232	-40 to 450

1. For component selection and applicable fire-tested standards and codes, consult your Emerson sales office.

Figure 1. Typical Valve Construction

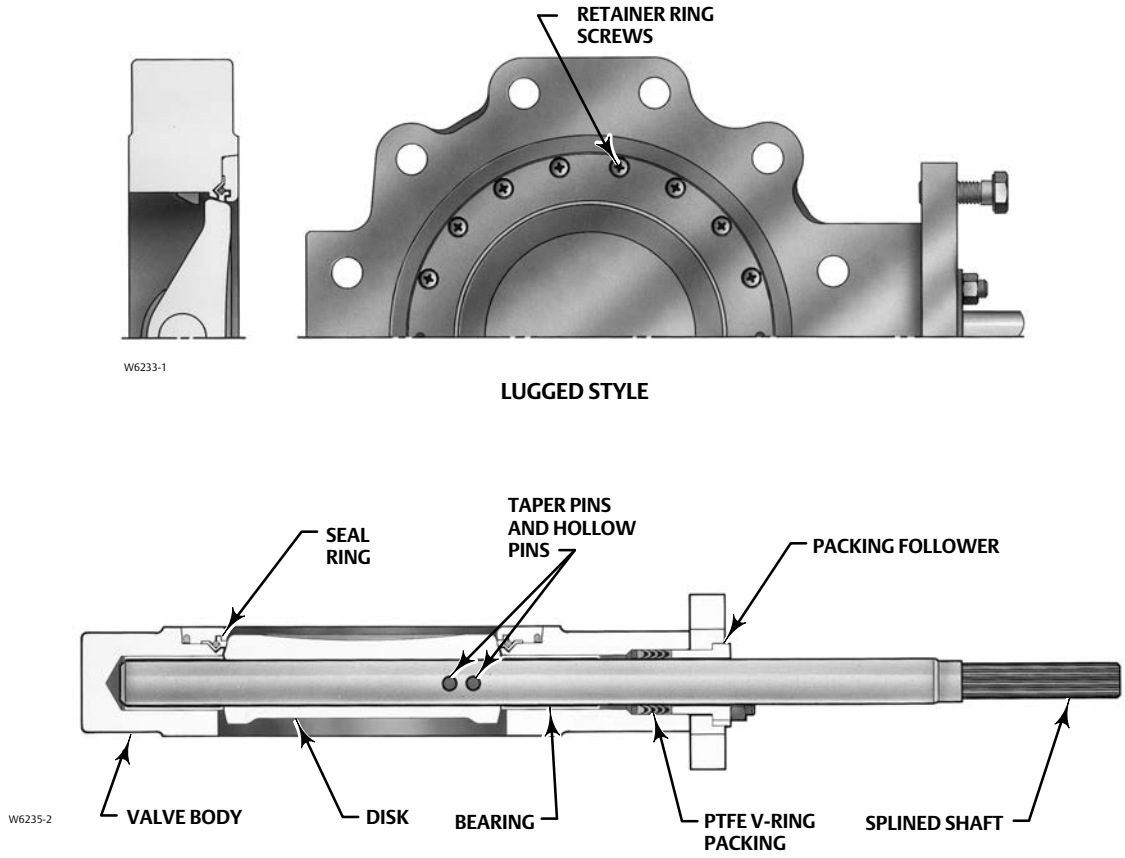


Figure 2. Available Seal Configuration

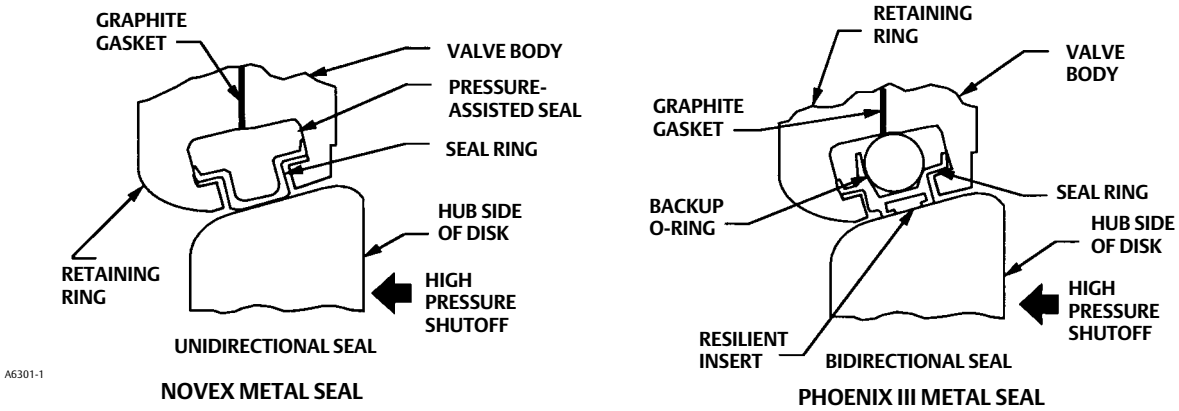
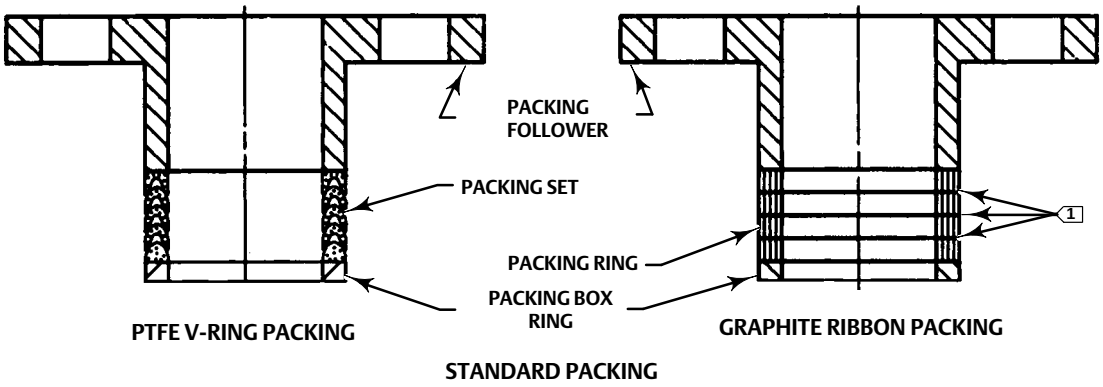
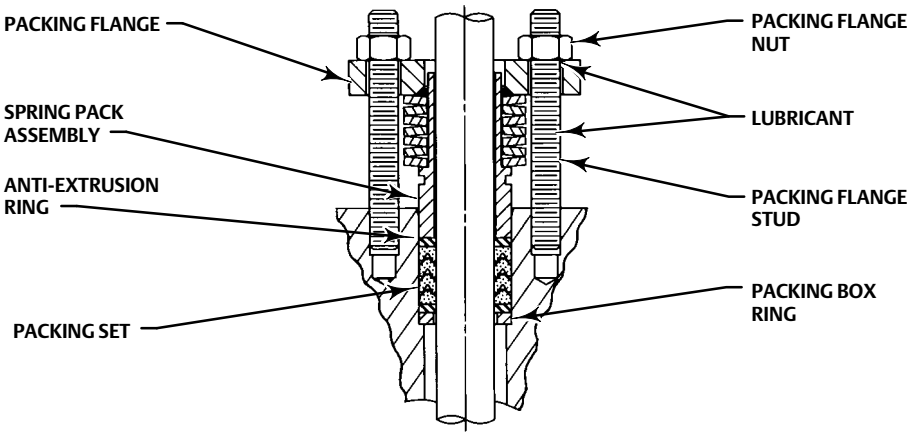
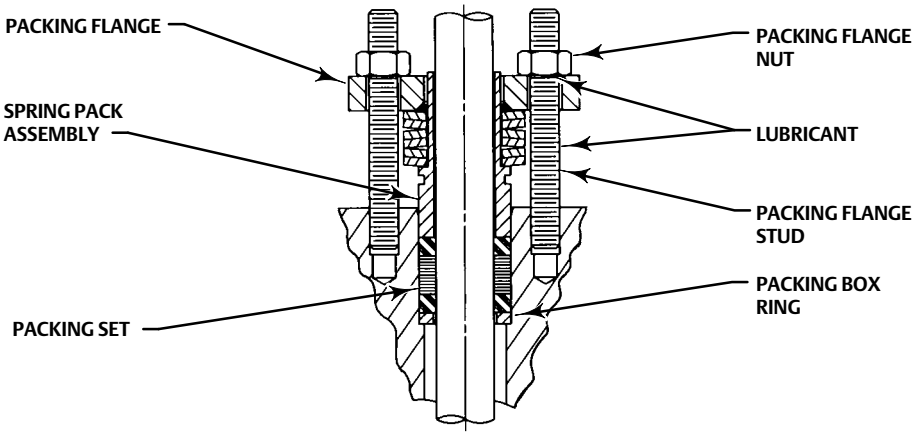


Figure 3. Typical Packing Arrangement







Note:
1 Includes zinc washers for graphite ribbon packing only.

Table 3. CL150 Valve Dimensions

Valve Size, NPS	A	E	G	K	M(2)	R	S(1)	T	U	W	Y
mm											
3	48	188	79	121	73	189	12.7	117	---	See thread information below	See thread information below
4	54	188	102	143	97	219	15.9	117	---		
6	57	214	129	172	146	273	19.1	152	32		
8	64	214	157	200	191	333	25.4	152	32		
10	71	208	198	254	238	406	31.8	235	46		
12	81	208	230	279	284	476	38.1	235	46		
Inches											
3	1.88	7.38	3.12	4.00	2.88	7.44	1/2	4.62	---	1/2-13	5/8-11 4-holes
4	2.12	7.38	4.00	5.62	3.81	8.62	5/8	4.62	---	1/2-13	5/8-11 8-holes
6	2.25	8.44	5.06	6.75	5.75	10.75	3/4	6.00	1.25	1/2-13	3/4-10 8-holes
8	2.50	8.44	6.19	7.88	7.50	13.12	1	6.00	1.25	1/2-13	3/4-10 8-holes
10	2.81	8.19	7.81	10.00	9.38	16.00	1-1/4	9.25	1.81	5/8-11	7/8-9 12-holes
12	3.19	8.19	9.06	11.00	11.19	18.75	1-1/2	9.25	1.81	5/8-11	7/8-9 12-holes

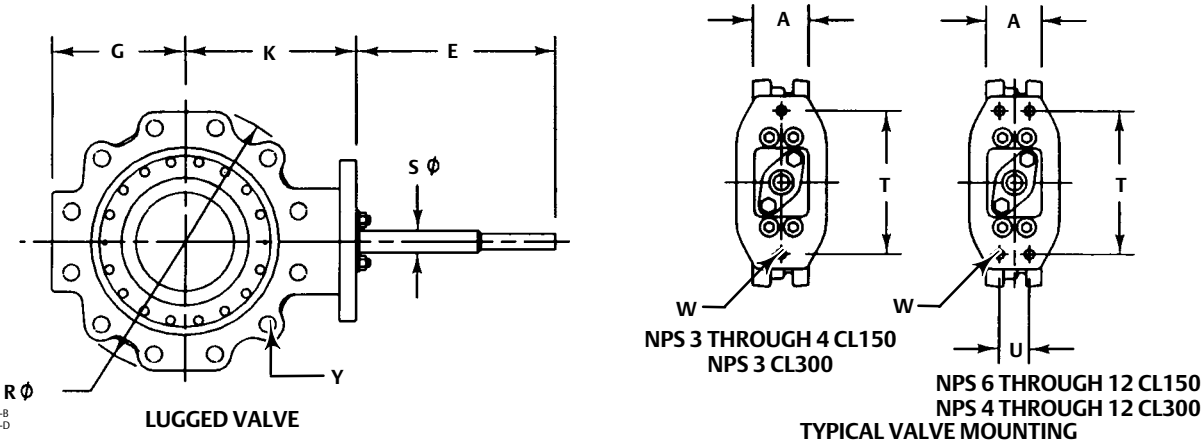
1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.
2. Disk chordal swing diameter at valve face. Please verify with piping.

Table 4. CL300 Valve Dimensions

Valve Size, NPS	A	E	G	K	M(2)	R	S(1)	T	U	W	Y
mm											
3	48	188	95	137	73	206	15.9	117	---	See thread information below	See thread information below
4	54	214	121	165	97	238	19.1	152	32		
6	59	214	152	197	146	308	25.4	152	32		
8	73	208	183	235	188	375	31.8	235	46		
10	83	208	229	268	233	438	38.1	235	46		
12	92	365	308	308	278	508	44.5	273	51	21	
Inches											
3	1.88	7.38	3.75	5.38	2.88	8.12	5/8	4.62	---	1/2-13	3/4-10 8-holes
4	2.12	8.44	4.75	6.50	3.81	9.38	3/4	6.00	1.25	1/2-13	3/4-10 8-holes
6	2.31	8.44	6.00	7.75	5.69	12.12	1	6.00	1.25	1/2-13	3/4-10 12-holes
8	2.88	8.19	7.19	9.25	7.38	14.75	1-1/4	9.25	1.81	5/8-11	7/8-9 12-holes
10	3.25	8.19	9.00	10.56	9.19	17.25	1-1/2	9.25	1.81	5/8-11	1-8 16-holes
12	3.61	14.00	12.12	12.12	10.94	20.00	1-3/4	10.75	2.00	0.82	1-1/8-8 16-holes

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.
2. Disk chordal swing diameter at valve face. Please verify with piping.

Figure 4. Typical Valve Dimensions (also see tables 3 and 4)



14B0833-B
14B0835-D
B2433

LUGGED VALVE

NPS 3 THROUGH 4 CL150
NPS 3 CL300

NPS 6 THROUGH 12 CL150
NPS 4 THROUGH 12 CL300

TYPICAL VALVE MOUNTING

Note:
Disk chordal swing diameter at valve face is M. Please verify clearance with piping.

Table 5. CL150 Valve Dimensions

Valve Size, NPS	A	E	G	K	M(2)	R	S(1)	Flat Size	Flat Length	T	U	W	Y
mm													
3	48	83	79	121	73	189	12.7	9.50	25.4	83	19	See thread information below	See thread information below
4	54	83	102	124	97	219	15.9	11.07	25.4	83	19		
6	57	83	129	152	146	273	19.1	14.25	25.4	95	25		
8	64	83	157	181	191	333	25.4	17.45	25.4	95	25		
10	71	89	198	229	238	406	31.8	20.60	25.4	133	38		
12	81	89	230	254	284	476	38.1	25.37	38.1	133	38		
Inches													
3	1.88	3.25	3.12	4.00	2.88	7.44	1/2	0.374	1	3.25	0.75	3/8-16	5/8-11 4-holes
4	2.12	3.25	4.00	4.88	3.81	8.62	5/8	0.436	1	3.25	0.75	3/8-16	5/8-11 8-holes
6	2.25	3.25	5.06	6.00	5.75	10.75	3/4	0.561	1	3.75	1.00	1/2-13	3/4-10 8-holes
8	2.50	3.25	6.19	7.12	7.50	13.12	1	0.687	1	3.75	1.00	1/2-13	3/4-10 8-holes
10	2.81	3.50	7.81	9.00	9.38	16.00	1-1/4	0.811	1	5.25	1.50	5/8-11	7/8-9 12-holes
12	3.19	3.50	9.06	10.00	11.19	18.75	1-1/2	0.999	1.5	5.25	1.50	5/8-11	7/8-9 12-holes

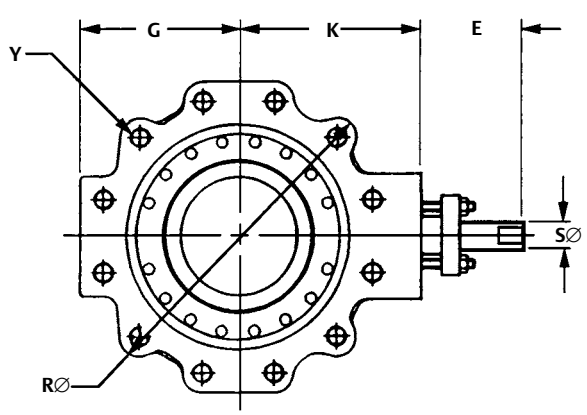
1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.
2. Disk chordal swing diameter at valve face. Please verify clearance with piping.

Table 6. CL300 Valve Dimensions

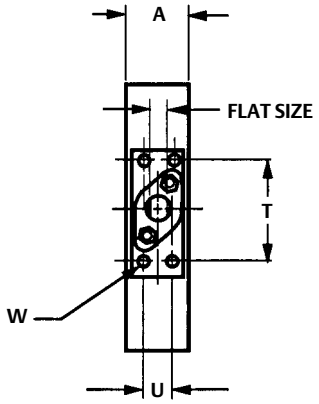
Valve Size, NPS	A	E	G	K	M(2)	R	S(1)	Flat Size	Flat Length	T	U	W	Y
mm													
3	48	83	95	119	73	206	15.7	11.07	25.4	83	19	See thread information below	See thread information below
4	54	83	121	146	97	238	19.0	14.25	25.4	95	25		
6	59	83	152	178	145	308	25.4	17.45	25.4	95	25		
8	73	89	183	210	188	375	31.8	20.60	25.4	133	38		
10	83	89	229	243	233	438	38.1	25.37	38.1	133	38		
12	92	89	308	279	278	508	44.4	28.55	38.1	146	38		
Inches													
3	1.88	3.25	3.75	4.69	2.88	8.12	5/8	0.436	1	3.25	0.75	3/8-16	3/4-10 8-holes
4	2.12	3.25	4.75	5.75	3.81	9.38	3/4	0.561	1	3.75	1.00	1/2-13	3/4-10 8-holes
6	2.31	3.25	6.00	7.00	5.69	12.12	1	0.687	1	3.75	1.00	1/2-13	3/4-10 12-holes
8	2.88	3.50	7.19	8.25	7.38	14.75	1-1/4	0.811	1	5.25	1.50	5/8-11	7/8-9 12-holes
10	3.25	3.50	9.00	9.56	9.19	17.25	1-1/2	0.999	1.5	5.25	1.50	5/8-11	1-8 16-holes
12	3.62	3.50	12.12	11.00	10.94	20.00	1-3/4	1.124	1.5	5.75	1.50	3/4-10	1 1/8-8 16-holes

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.
2. Disk chordal swing diameter at valve face. Please verify clearance with piping.

Figure 5. Typical Valve Dimensions with Double D Shaft (also see tables 5 and 6)

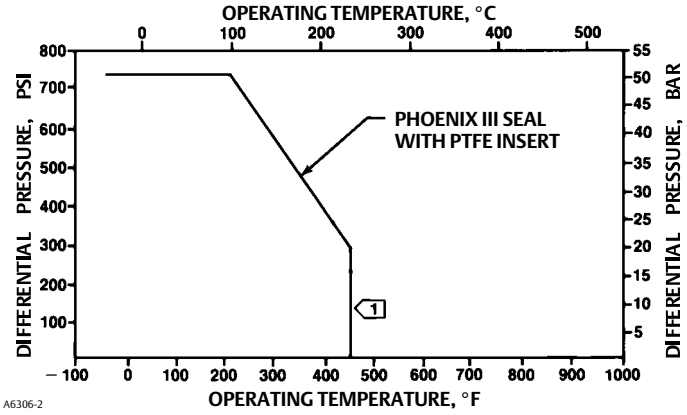


LUGGED VALVE



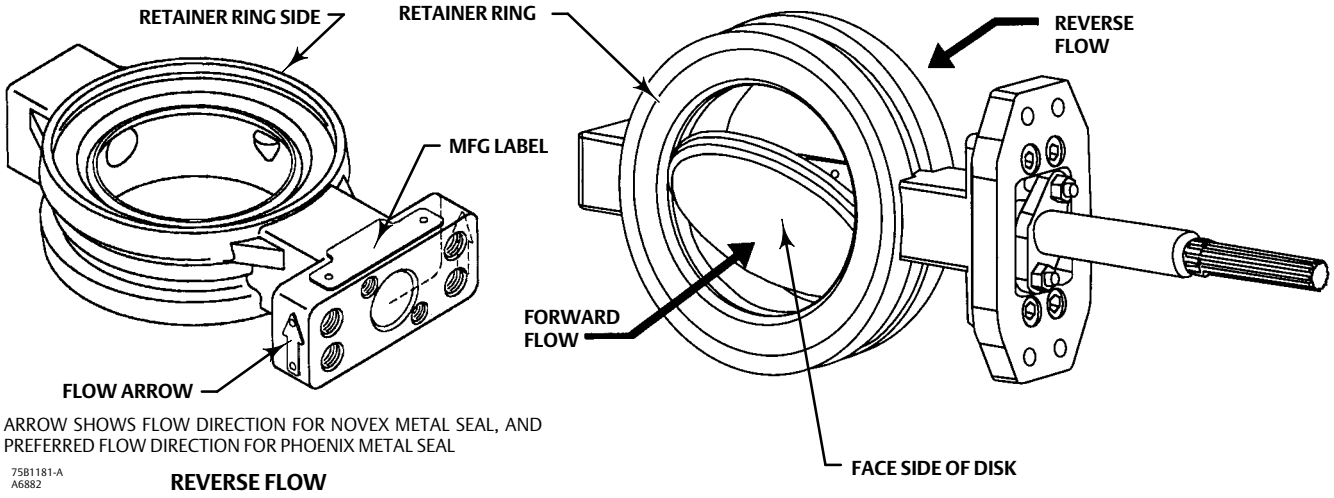
TYPICAL VALVE MOUNTING

Figure 6. Maximum Pressure-Temperature Ratings



Note:
1 Temperature limitations do not account for the additional limitations imposed by the backup ring used with this seal. To determine the effective temperature limitation of the appropriate seal/backup ring combination, refer to table 2.

Figure 7. Actuator Mounting



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

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Fisher™ 8580 Rotary Valve

The Fisher 8580 rotary valve offers excellent throttling and automated on-off, quarter-turn performance. An approximately linear flow characteristic provides precise throttling control. The 8580 valve offers high cycle life and rugged reliability.

The valve body meets PN 10 through PN 40, CL150, and CL300 ratings. Face-to-face dimensions meet EN 558, API 609, and MSS-SP68 standards. Line centering clips provide for versatility to mount and align the same wafer style valve body in different piping configurations (ASME and EN ratings).

The 8580 rotary valve features an eccentrically-mounted disk with either soft or metal seal, providing capability for enhanced shutoff. The interchangeable sealing technology allows for the same valve body to accept both soft and metal seals.

W9498-3

LUGGED STYLE
(NPS 3 through NPS 12)

X1426

DOUBLE FLANGED STYLE
(NPS 3 through NPS 12)

8580 Features

- Approximately linear flow characteristic -- An approximately linear flow characteristic provides precise throttling control.
- Global Standards -- The valve is based on API, ASME, and EN standards, making it suitable for use in all world areas. An optional mounting bracket provides ISO 5211 actuator mounting capability.
- PEEK/PTFE bearing as standard -- The PTFE-lined PEEK bearing is a low friction, low wear bearing. It allows the valve to operate under high pressure drops for a high cycle life while maintaining low torque. The “drop-in” bearing design enables fast, easy maintenance.
- Spline-ended Shaft -- The splined shaft with clamped lever and single-pivot linkage reduces lost motion between the actuator and the valve shaft.
- Application Versatility -- Optional square shaft is ideal for on/off applications and allows actuator selection flexibility. Standard construction materials and seal assemblies provide long life and superior performance in a broad range of liquid and gas applications.

- Excellent Shutoff -- Both the metal and soft seal rings have pressure-assisting sealing action that ensures tight shutoff regardless of pressure drop.

- Improved shaft-disk pinning -- The improved expansion pin system ensures there is a positive, durable connection between disk and shaft. This connection reduces backlash and wear in the drive system, optimizing long-term performance. It also makes disassembly for maintenance quick and simple with no need for special tools.

- New Spring-Loaded Shaft -- The spring in the outboard shaft provides support to the drive train and disk, enabling the shaft to be installed in both horizontal and vertical orientations with no detriment to performance or cycle life. This complements the ability to mount the actuator on the left- or right-hand side, enabling access for any installation.

- Excellent Emissions Capabilities -- The optional ENVIRO-SEAL™ packing systems, are designed with very smooth shaft surfaces and live-loading to provide improved sealing, guiding, and loading force transmission. The seal of the ENVIRO-SEAL system can control emissions to below 100 ppm (parts per million).

- Sour Service Capability -- Trim and bolting materials are available for applications involving sour liquids and gases. These constructions comply with NACE MR0175-2002, MR0103, and MR0175 / ISO 15156.

- Field-Reversible Valve Action -- The actuator/valve assembly action can be converted from push-down-to-open to push-down-to-close, or vice versa, without additional parts.

- Easy Installation -- Line-centering clips engage the line flange bolts to simplify installation and provide for centering of wafer-style valves in the pipeline. End connections are compatible with EN and ASME standards.

- Long Seal Life -- The opening and closing path of the eccentric disk minimizes disk contact with the seal ring, thereby reducing seal wear, undue friction, and seating torque requirements. See figure 2.

- Reliable Flange Gasketing Surface -- The seal retainer screws and retention clips are outside the gasket surface of the seal retainer. Spiral-wound or flat-sheet gaskets can be installed between the uninterrupted seal retainer face and the pipeline flange.

- Integral Shaft-to-Valve Body Bonding -- Standard valve construction includes conductive packing to provide electrical bonding for hazardous area applications.

- Powder paint as standard -- The Emerson powder paint finish offers an excellent corrosion-resistant finish to all steel parts.

- High Temperature Capability -- The valve will operate at elevated temperatures, with the appropriate trim components.

- Shaft Retention -- Redundant shaft retention provides added protection. The packing follower, anti-blowout ring, and shaft groove interact to hold the shaft securely in the valve body (see figure 1).

- Travel Indication -- Additional travel indication can be achieved by using the indication line on the shaft, along with the disk position markings on the packing follower (see figure 4).

Table of Contents

8580 Valve Specifications and Materials of Construction

Table 1. Fisher 8580 Valve Specifications

Specifications		EN	ASME
Valve Body Size		DN 50, 80, 100, 150, 200, 250, and 300	NPS 2, 3, 4, 6, 8, 10, and 12
Pressure Rating		PN 10 to 40	CL150 / 300, CL150-600 for NPS 2
Valve Body Materials		EN 1.0619 steel	WCC steel
		EN 1.4409 stainless steel	CF3M (316L) stainless steel
		LCC	LCC
		CW2M[1]	CW2M[1]
		M35-2[2]	M35-2
Disk Materials	PTFE or RPTFE[4] Seal	EN 1.4409 stainless steel	CF3M stainless steel
		CW2M	CW2M
		M35-2	M35-2
	Metal or UHMWPE[3] Seal	Chrome-plated EN 1.4409 Stainless Steel	Chrome-plated CF3M Stainless Steel
		Chrome-carbide EN 1.4409 Stainless Steel	Chrome-carbide CF3M Stainless Steel
End Connections[5]		Mates with raised-face flanges per EN 1092-1	Mates with raised-face flanges per ASME B16.5
Valve Body Style		Lugged with tapped or through holes, Double-Flange with through holes, and Wafer (for select sizes)	
Face-to-Face Dimensions		Meets MSS SP68, API 609, and EN 558 standards	
Shutoff		PTFE, RPTFE, or UHMWPE seal ring - Class VI per ANSI/FCI 70-2 and IEC 60534-4	
		S31600 (316 SST) seal ring - Class IV per ANSI/FCI 70-2 and IEC 60534-4	
Flow Coefficients		See Fisher Catalog 12	
Flow Direction		Standard (forward flow) is with the seal retainer facing upstream; reverse flow is permissible for soft seals only	
Flow Characteristic		Approximately linear	
Disk Rotation		Counterclockwise to open (when viewed from actuator side of valve body) through 90 degrees of disk rotation	
Shaft Diameters and Approximate Weights		See table 7	

1. This material is not listed in EN 12516-1 or ASME B16.34. See figure 6 for pressure/temperature ratings.
2. This material is not listed in EN 12516-1. See figure 6 for pressure/temperature ratings.
3. UHMWPE stands for ultra high molecular weight polyethylene.
4. RPTFE is a reinforced PTFE seal.
5. Valve is designed to be installed between two pipe flanges. Valve has not been designed for dead-end service.

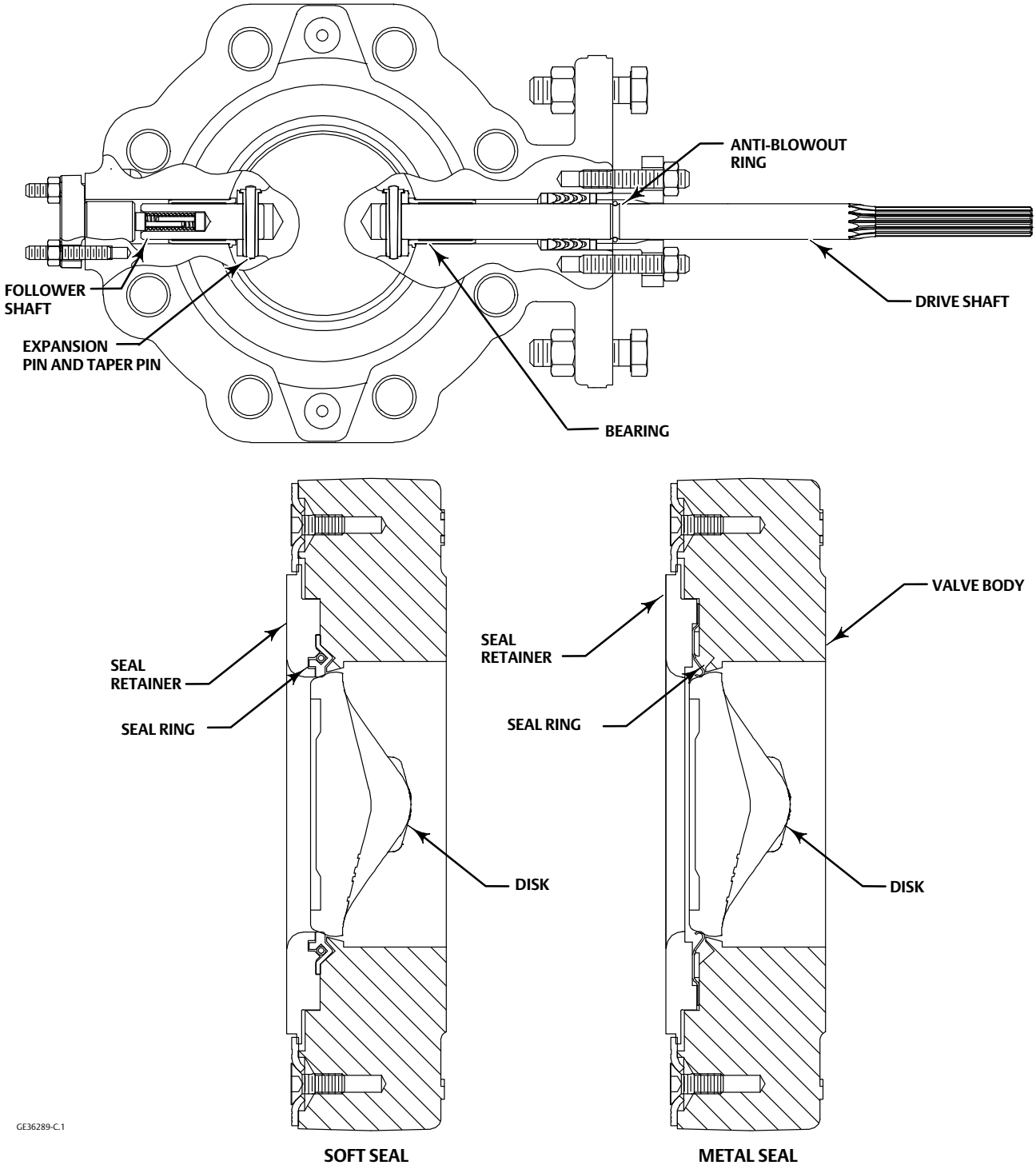
Table 2. Materials (Other Valve Components)

Component	Material
Shafts and Pins	S17400 (17-4PH) stainless steel, S20910 (XM-19) stainless steel, N10276, N05500
Anti-blowout Ring	N07718
Seal	PTFE, RPTFE, or UHMWPE with S31600 (316 stainless steel) or R30003 spring. Metal seal is 316 stainless steel with graphite gaskets
Bearings	PEEK/PTFE, R30006 (Alloy 6), S31600 Nitride
Packing	PTFE/carbon-filled PTFE (standard), graphite die-molded ribbon, ENVIRO-SEAL PTFE packing, ENVIRO-SEAL graphite packing
Follower Spring	N07718 with carbon-filled PEEK or S31600 spring seats
Bolting	B8M Class 2, B7M, N05500, N07718
Nuts	8M, 2HM, N04400, N10276

Table 3. Trim Combinations with Standard Construction Materials

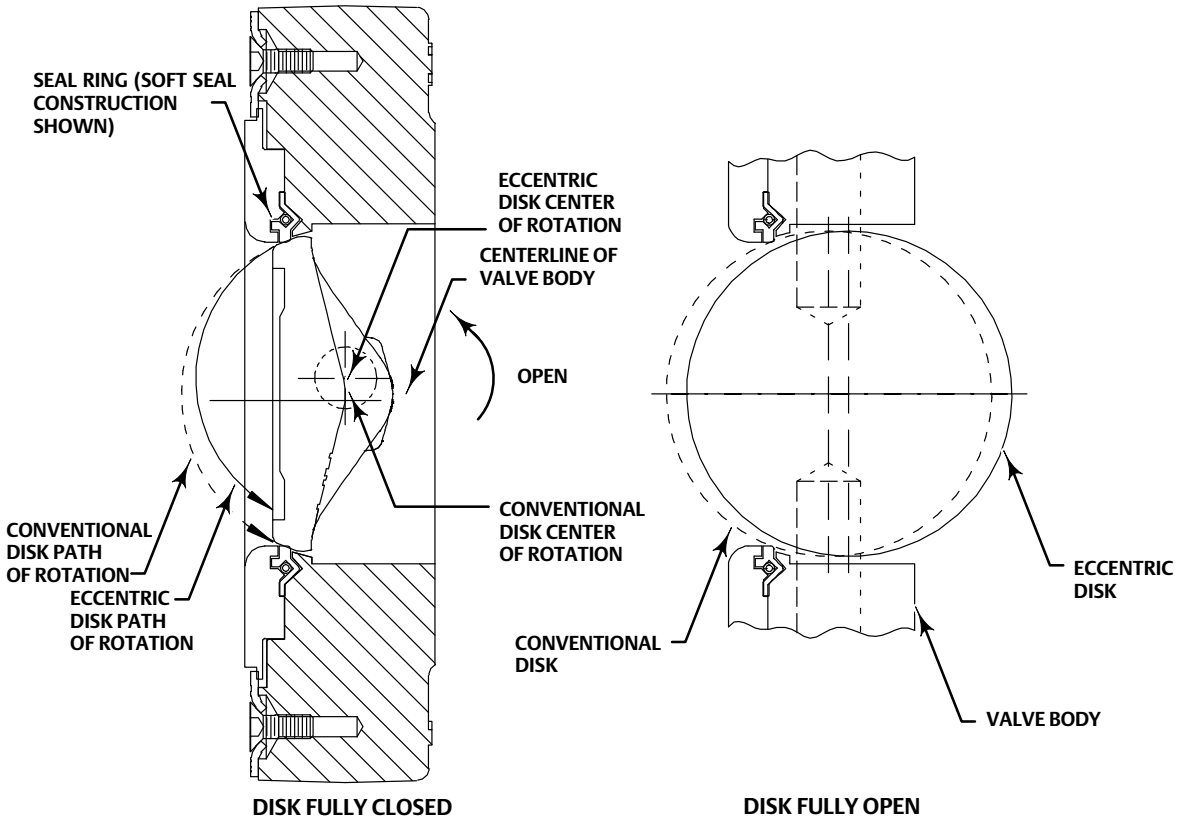
Valve Body Material	Shaft Material	Disk Material	Bearings	Seal Material
1.0619 & WCC	S17400 H1075	1.4409 & CF3M	PEEK/PTFE	PTFE or RPTFE
		1.4409 & CF3M Chrome-Plated	PEEK/PTFE	UHMWPE or Metal
			Alloy 6 or S31600 Nitride	Metal
LCC	S17400 H1075	1.4409 & CF3M	PEEK/PTFE	PTFE
1.4409 & CF3M	S20910	1.4409 & CF3M	PEEK/PTFE	PTFE or RPTFE
		1.4409 & CF3M Chrome-Plated, 1.4409 & CF3M Chrome-Carbide	PEEK/PTFE	UHMWPE or Metal
			Alloy 6 or S31600 Nitride	Metal
CW2M	N10276	CW2M	PEEK/PTFE	PTFE or RPTFE
M35-2	N05500	M35-2	PEEK/PTFE	PTFE or RPTFE

Figure 1. Typical Fisher 8580 Valve Construction Detail



Note: Split shaft construction shown. Size NPS 8 through NPS 12 are thru-shaft.

Figure 2. Comparison of Disk Action



Note: Split shaft construction shown.

Figure 3. Available Seal Configuration

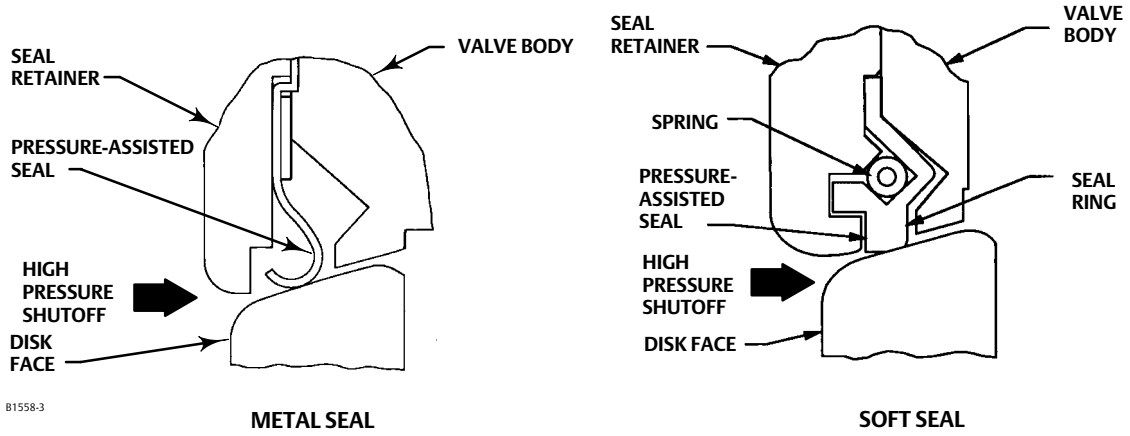


Figure 4. Travel Indication

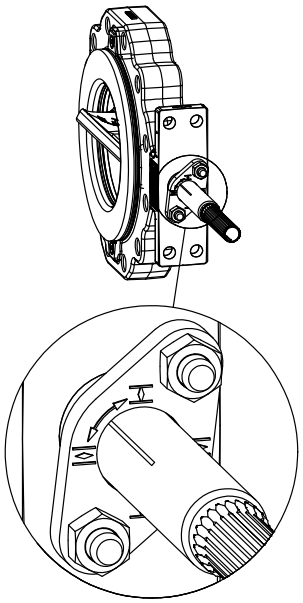


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Table 4. Material Temperature Capabilities

MATERIAL					TEMPERATURE LIMITS	
PN FLANGES						
Valve Body	**Shaft**	**Bearing Lining and Jacket**	**Seal**	**Packing**	**°C**	**°F**
1.0619 Steel	S17400 or S20910	PEEK / PTFE	PTFE or RPTFE	PTFE or Graphite	–10 to 232	14 to 450
			UHMWPE	PTFE or Graphite	–10 to 93	14 to 200
			Metal or Flow Ring	PTFE	–10 to 232	14 to 450
				Graphite	–10 to 260	14 to 500
		R30006 (Alloy 6) or S31600 Nitride	Metal or Flow Ring	Graphite	–10 to 400	14 to 752
LCC	S17400 or S20910	PEEK / PTFE	PTFE	PTFE	–46 to 232	–50 to 450
1.4409 Stainless Steel	S20910	PEEK / PTFE	PTFE or RPTFE	PTFE or Graphite	–46 to 232	–50 to 450
			UHMWPE	PTFE or Graphite	–18 to 93	0 to 200
			Metal or Flow Ring	PTFE	–46 to 232	–50 to 450
				Graphite	–46 to 260	–50 to 500
		R30006 (Alloy 6) or S31600 Nitride	Metal or Flow Ring	Graphite	–10 to 500(1)	14 to 932(1)
CW2M	N10276	PEEK / PTFE	PTFE or RPTFE	PTFE	–10 to 232	14 to 450
M35-2	N05500	PEEK / PTFE	PTFE or RPTFE	PTFE	–10 to 232	14 to 450
ASME FLANGES						
Valve Body	**Shaft**	**Bearing Lining and Jacket**	**Seal**	**Packing**	**°C**	**°F**
WCC steel	S17400 or S20910	PEEK / PTFE	PTFE or RPTFE	PTFE or Graphite	–29 to 232	-20 to 450
			UHMWPE	PTFE or Graphite	–18 to 93	0 to 200
			Metal or Flow Ring	PTFE	–29 to 232	-20 to 450
				Graphite	–29 to 260	-20 to 500
		R30006 (Alloy 6) or S31600 Nitride	Metal or Flow Ring	Graphite	–29 to 427	-20 to 800
LCC	S17400 or S20910	PEEK / PTFE	PTFE	PTFE	–46 to 232	–50 to 450
CF3M Stainless Steel	S20910	PEEK / PTFE	PTFE or RPTFE	PTFE or Graphite	–46 to 232	–50 to 450
			UHMWPE	PTFE or Graphite	–18 to 93	0 to 200
			Metal or Flow Ring	PTFE	–46 to 232	–50 to 450
				Graphite	–46 to 260	–50 to 500
		R30006 (Alloy 6) or S31600 Nitride	Metal or Flow Ring	Graphite	–46 to 454(1)	–50 to 850(1)
CW2M	N10276	PEEK / PTFE	PTFE or RPTFE	PTFE	–46 to 232	–50 to 450
M35-2	N05500	PEEK / PTFE	PTFE or RPTFE	PTFE	–46 to 232	–50 to 450

1. For applications exceeding 427°C (800°F), consult your Emerson sales office for appropriate disk edge coating material selection.

Figure 5. Material Pressure/Temperature Curves

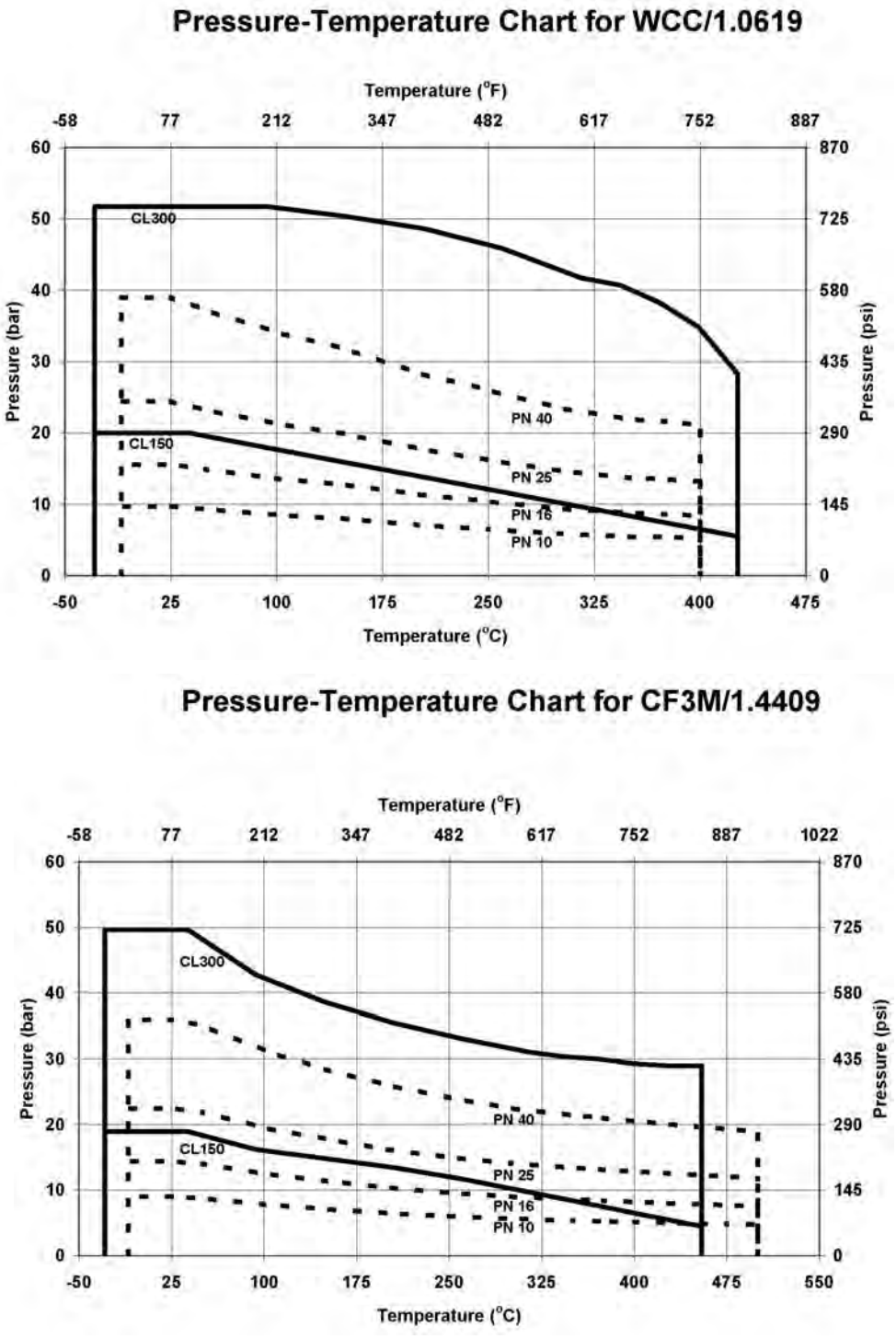
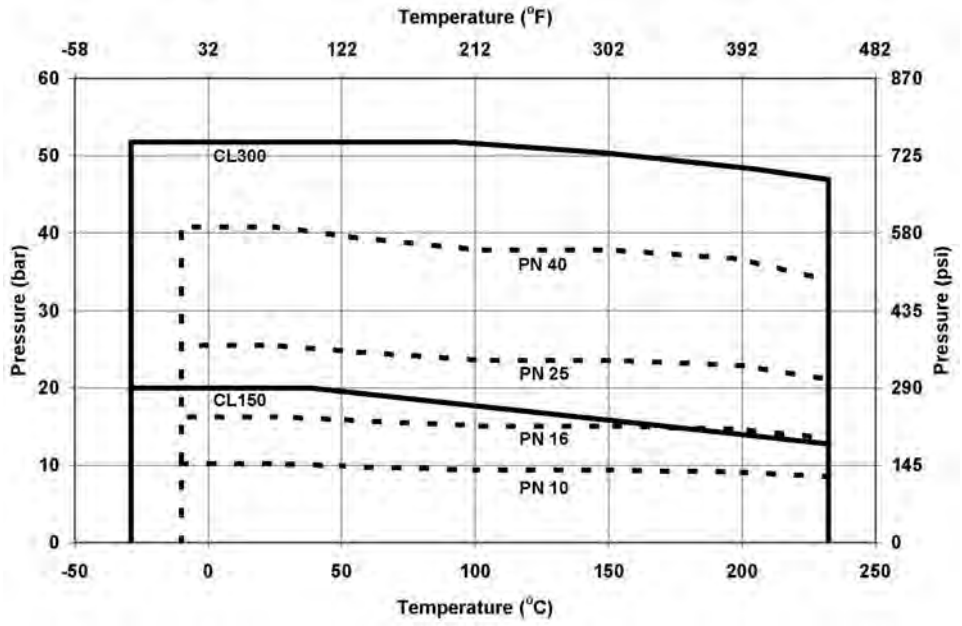
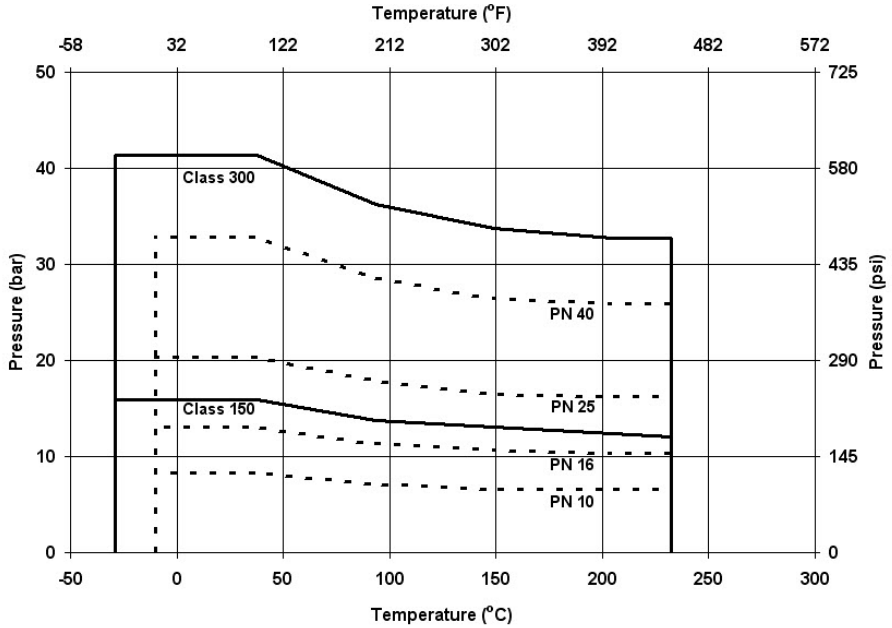


Figure 6. Material Pressure/Temperature Curves

Pressure-Temperature Chart for CW2M 1



Pressure-Temperature Chart for M35-2 2



1. CW2M is not listed in EN 12516-1 or ASME B16.34. The PN and CL designations are used only to indicate relative pressure-retaining capabilities.
2. M35-2 is not listed in EN 12516-1. The PN designations are used only to indicate relative pressure-retaining capabilities.

Figure 7. Material Pressure/Temperature Curves

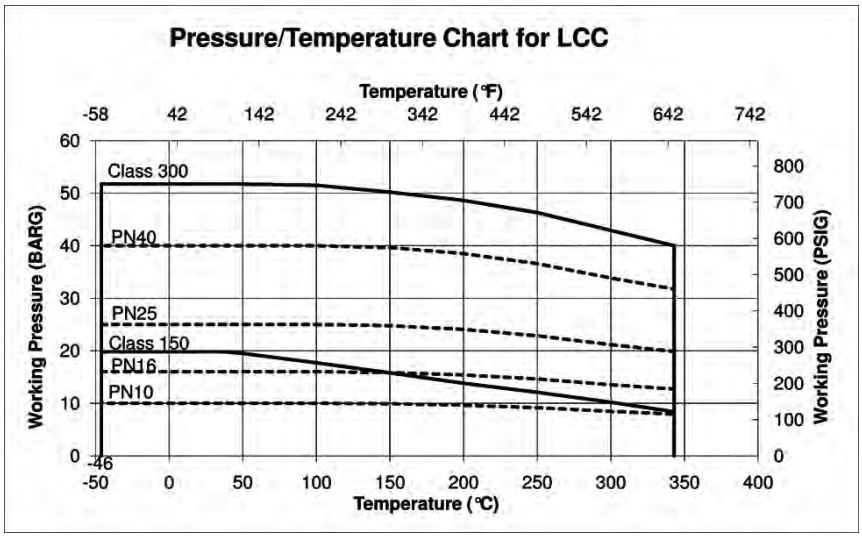


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Table 5. Maximum Allowable Shutoff Pressure Drops based on Trim (Seal, Shaft, and Bearings), Bar

Note: Do not exceed the EN12516-1 or ASME B16.34 pressure/temperature rating of the valve or mating flanges.

TRIM	TEMPERATURE, °C	DN						
		50	80	100	150	200	250	300
		Bar						
PTFE or RPTFE Seal PEEK/PTFE Bearings	-46 to 65	51.7	51.7	51.7	51.7	51.7	51.7	51.7
	93	48.5	48.5	48.5	48.5	48.5	45.6	46.8
	121	38.6	38.6	38.6	38.6	38.6	38.6	38.6
	149	28.7	28.7	28.7	28.7	28.7	28.7	28.7
	191	13.8	13.8	13.8	13.8	13.8	13.8	13.8
	204	10.3	10.3	10.3	10.3	10.3	10.3	10.3
	232	3.4	3.4	3.4	3.4	3.4	3.4	3.4
UHMWPE Seal PEEK/PTFE Bearings	-17 to 37	51.7	51.7	51.7	51.7	51.7	51.7	51.7
	66	38.6	38.6	38.6	38.6	38.6	38.6	38.6
	93	25.9	25.9	25.9	25.9	25.9	25.9	25.9
Metal Seal(1) Alloy 6 Bearings	-46 to 37	18.5	16.5	13.9	12.8	11.0	6.8	7.0
	93	17.0	15.1	12.8	11.7	10.1	6.3	6.5
	149	16.0	14.2	12.0	11.0	9.4	5.9	6.1
	204	15.1	13.4	11.4	10.4	9.0	5.6	5.7
	260	14.3	12.8	10.8	9.9	8.5	5.3	5.4
	316	13.8	12.3	10.3	9.5	8.2	5.1	5.2
	371	13.2	11.9	10.0	9.2	7.9	5.0	5.0
	427	12.5	11.6	9.8	9.0	7.7	4.8	5.0
	454	12.1	11.5	9.7	8.9	7.7	4.8	4.9
Metal Seal(1) S31600/Nitride Bearings, Spline Shaft	-46 to 37	19.5	28.2	26.1	20.8	31.0	15.5	8.0
	93	19.3	28.0	26.0	20.6	31.0	15.4	7.9
	149	17.0	25.4	23.7	18.7	28.8	14.0	7.1
	204	15.9	24.3	22.7	17.8	26.3	13.3	6.8
	260	14.5	22.9	21.4	16.8	24.6	12.5	6.3
	316	13.8	22.1	20.8	16.2	23.2	12.1	6.1
	371	13.2	21.5	20.2	15.7	22.4	11.8	5.9
	427	12.5	20.7	19.5	15.2	21.8	11.4	5.6
	454	12.1	20.3	19.2	14.9	21.6	11.2	5.4
Metal Seal(1) S31600/Nitride Bearings, Square Shaft	-46 to 37	19.5	22.4	26.1	20.8	27.6	12.8	8.0
	93	19.3	22.4	26.0	20.6	27.6	12.8	7.9
	149	17.0	22.4	23.7	18.7	27.6	12.8	7.1
	204	15.9	22.4	22.7	17.8	26.3	12.8	6.8
	260	14.5	22.4	21.4	16.8	24.6	12.5	6.3
	316	13.8	22.1	20.8	16.2	23.2	12.1	6.1
	371	13.2	21.5	20.2	15.7	22.4	11.8	5.9
	427	12.5	20.7	19.5	15.2	21.8	11.4	5.6
	454	12.1	20.3	19.2	14.9	21.6	11.2	5.4
Metal Seal(1) PEEK/PTFE Bearings	-46 to 37	51.7	51.7	51.7	51.7	31.0	17.2	17.2
	93	51.7	51.7	51.7	51.7	31.0	17.2	17.2
	149	50.3	50.3	50.3	50.3	31.0	17.2	17.2
	204	48.6	48.6	48.6	48.2	31.0	17.2	17.2
	232	47.2	47.2	46.3	42.6	31.0	17.2	17.2
	260	24.7	21.9	18.5	17.0	14.6	9.1	9.4
Flow Ring PEEK/PTFE Bearings	-46 to 37	51.7	51.7	51.7	51.7	51.7	45.5	46.8
	93	51.7	51.7	51.7	51.7	51.7	37.7	38.8
	149	50.3	50.3	50.3	50.3	50.3	31.7	32.6
	204	48.6	48.6	48.6	48.1	41.3	25.7	26.4
	232	47.2	47.2	46.3	42.6	36.6	22.8	23.4
	260	24.6	21.9	18.5	17	14.6	9.1	9.3
Flow Ring S31600/Nitride Bearings	-46 to 37	32	34.4	34.8	28.6	31.6	20.2	13
	93	31.8	34.4	34.6	28.5	31.6	19.7	12.9
	149	29.5	34.4	32.4	26.6	28.7	17.9	12.1
	204	28.5	34.4	31.3	25.7	26.3	16.4	11.7
	260	27.3	37.5	30.1	24.8	24.6	15.3	11.3
	316	26.6	35.5	29.5	24.2	23.2	14.4	11.1
	371	26.1	34.1	28.7	23.7	22.4	13.9	10.8
	427	25.4	28.9	27.9	23.2	21.7	13.5	10.6
	454	25	28.9	27.6	22.9	21.5	13.3	10.5

1. Pressure drops shown for metal seals are for forward flow only.

Table 6. Maximum Allowable Shutoff Pressure Drops based on Trim (Seal, Shaft, and Bearings), Psi

Note: Do not exceed the EN12516-1 or ASME B16.34 pressure/temperature rating of the valve or mating flanges.

TRIM	TEMPERATURE, °F	NPS						
		2	3	4	6	8	10	12
		Psi						
PTFE or RPTFE Seal PEEK/PTFE Bearings	-50 to 150	750	750	750	750	750	750	750
	200	704	704	704	704	704	662	679
	250	560	560	560	560	560	560	560
	300	416	416	416	416	416	416	416
	375	200	200	200	200	200	200	200
	400	150	150	150	150	150	150	150
	450	50	50	50	50	50	50	50
UHMWPE Seal PEEK/PTFE Bearings	0 to 100	750	750	750	750	750	750	750
	150	560	560	560	560	560	560	560
	200	375	375	375	375	375	375	375
Metal Seal(1) Alloy 6 Bearings	-50 to 100	268	239	202	185	159	99	102
	200	246	219	185	170	146	91	94
	300	232	206	174	160	137	86	88
	400	219	195	165	151	130	81	83
	500	208	186	157	144	124	77	79
	600	200	178	150	138	119	74	76
	700	192	172	145	134	115	72	73
	800	181	168	142	130	112	70	72
	850	176	167	141	129	111	69	71
Metal Seal(1) S31600/Nitride Bearings, Spline Shaft	-50 to 100	283	409	379	301	450	225	116
	200	280	406	377	299	450	223	115
	300	246	369	344	271	417	203	103
	400	230	352	329	258	382	193	98
	500	211	332	311	243	357	182	91
	600	200	321	301	235	337	176	88
	700	192	312	293	228	325	171	85
	800	181	300	283	220	316	165	81
	850	176	295	278	216	313	162	79
Metal Seal(1) S31600/Nitride Bearings, Square Shaft	-50 to 100	283	325	379	301	400	185	116
	200	280	325	377	299	400	185	115
	300	246	325	344	271	400	185	103
	400	230	325	329	258	382	185	98
	500	211	325	311	243	357	182	91
	600	200	321	301	235	337	176	88
	700	192	312	293	228	325	171	85
	800	181	300	283	220	316	165	81
	850	176	295	278	216	313	162	79
Metal Seal(1) PEEK/PTFE Bearings	-50 to 100	750	750	750	750	450	250	250
	200	750	750	750	750	450	250	250
	300	730	730	730	730	450	250	250
	400	705	705	705	699	450	250	250
	450	685	685	672	618	450	250	250
	500	358	318	269	247	212	132	136
Flow Ring PEEK/PTFE Bearings	-50 to 150	750	750	750	750	750	661	679
	200	750	750	750	750	750	548	563
	300	730	730	730	730	730	461	474
	400	705	705	705	699	600	374	384
	450	685	685	672	618	531	331	340
	500	358	318	269	247	212	132	136
Flow Ring S31600/Nitride Bearings	-50 to 150	465	499	505	416	459	293	189
	200	462	499	502	414	459	287	188
	300	429	499	470	387	417	260	176
	400	414	499	455	374	382	238	171
	500	397	545	438	360	357	222	165
	600	387	515	428	351	337	210	161
	700	379	496	417	345	325	202	158
	800	369	420	405	337	316	196	155
	850	364	420	401	333	313	194	153

1. Pressure drops shown for metal seals are for forward flow only.

Table 7. Dimensions and Weights

VALVE SIZE, PRESSURE RATING		A	E		F		G		K	R(4)	S(1)	T	U	W	APPROXIMATE WEIGHT(2)	
			Splined	Square Shaft	Wafer	Lugged	Wafer	Lugged							Wafer	Lugged
		mm													kg	
DN50/ NPS 2	PN10-40/ CL150-300	43	187.5	74	150	---	109	---	125	102	12.7	117	---	14	4.7	6.7
DN80/ NPS 3	PN10-40/ CL150-300	47/48 (3)	187.5	76	---	196	---	133	130	144	15.9	117	---	14	---	11.2
DN100/ NPS 4	PN10-40/ CL150-300	53	214.4	103	---	226	---	147	172	162	19.1	152	32	14	---	17.6
DN150/ NPS 6	PN10-40/ CL150-300	57	214.4	108	270(5)	300	147(5)	182	205	218	25.4	152	32	14	15.7(5)	26.5
DN200/ NPS 8	PN10-16/ CL150	61	208	107	---	342	---	225	258	278	31.8	235	46	18	---	40.9
	PN25-40	61	208	107	358(5)	364	225(5)	225	258	291	31.8	235	46	18	34.6(5)	46.7
	CL300	73														
DN250/ NPS 10	PN10-16/ CL150	69	208	109	---	395	---	250	270	331	31.8	235	46	18	---	50.7
	PN25-40	69	208	109	400(5)	450	265(5)	265	270	352	31.8	235	46	18	52.0(5)	79.4
	CL300	83														
DN300/ NPS 12	PN10-16/ CL150	78	208	114	---	467	---	309	304	381	38.1	235	46	18	---	98.6
	PN25-40	78	208	114	---	512	---	309	304	410	38.1	235	46	18	---	104.9
	CL300	92														
		Inches													lbs	
DN50/ NPS 2	PN10-40/ CL150-300	1.69	7.38	2.91	5.91	---	4.29	---	4.92	4.02	0.50	4.62	---	0.55	10	15
DN80/ NPS 3	PN10-40/ CL150-300	1.85/ 1.89 (3)	7.38	2.99	---	7.72	---	5.24	5.12	5.67	0.63	4.62	---	0.55	---	25
DN100/ NPS 4	PN10-40/ CL150-300	2.09	8.44	4.06	---	8.90	---	5.79	6.77	6.38	0.75	6.00	1.25	0.55	---	39
DN150/ NPS 6	PN10-40/ CL150-300	2.24	8.44	4.25	10.63(5)	11.81	5.79(5)	7.17	8.07	8.58	1.00	6.00	1.25	0.55	35(5)	58
DN200/ NPS 8	PN10-16/ CL150	2.40	8.19	4.21	---	13.46	---	8.86	10.16	10.96	1.25	9.25	1.81	0.71	---	90
	PN25-40	2.40	8.19	4.21	14.09(5)	14.33	8.86(5)	8.86	10.16	11.46	1.25	9.25	1.81	0.71	76(5)	103
	CL300	2.87														
DN250/ NPS 10	PN10-16/ CL150	2.72	8.19	4.29	---	15.55	---	9.84	10.63	13.03	1.25	9.25	1.81	0.71	---	112
	PN25-40	2.72	8.19	4.29	15.75(5)	17.72	10.43(5)	10.43	10.63	13.86	1.25	9.25	1.81	0.71	115(5)	175
	CL300	3.27														
DN300/ NPS 12	PN10-16/ CL150	3.07	8.19	4.49	---	18.39	---	12.17	11.97	15.00	1.50	9.25	1.81	0.71	---	217
	PN25-40	3.07	8.19	4.49	---	20.16	---	12.17	11.97	16.14	1.50	9.25	1.81	0.71	---	231
	CL300	3.62														

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.
2. Valve assembly only.
3. 48 mm for CL150 and CL300 lugged only.
4. Dimension shown is seal retainer OD. Diameter for serrated gasket surface may be smaller.
5. Values shown are for PN10-PN-40 or PN25-PN40 bodies only. Wafer bodies in this valve size are not available for CL150 and CL300 flanges.

Table 8. Line Bolting Dimensions

VALVE SIZE	Y					
	Pressure Rating					
	CL150	CL300	PN10	PN16	PN25	PN40
DN80 / NPS 3	4X 5/8-11	8X 3/4-10	8X M16X2			
DN100 / NPS 4	8X 5/8-11	8X 3/4-10	8X M16X2		8X M20X2.5	
DN150 / NPS 6	8X 3/4-10	12X 3/4-10	8X M20X2.5		8X M24X3(1)	
DN200 / NPS 8	8X 3/4-10	12X 7/8-9	8X M20X2.5	12X M20X2.5	12X M24X3	12X M27X3(1)
DN250 / NPS 10	12X 7/8-9	16X 1-8	12X M20X2.5	12X M24X3	12X M27X3	12X M30X3.5(1)
DN300 / NPS 12	12X 7/8-9	16X 1-1/8-8	12X M20X2.5	12X M24X3	16X M27X3	16X M30X3.5
1. Not available in lugged with threaded holes.						

Figure 8. Dimensions for Fisher 8580, Lugged Valve

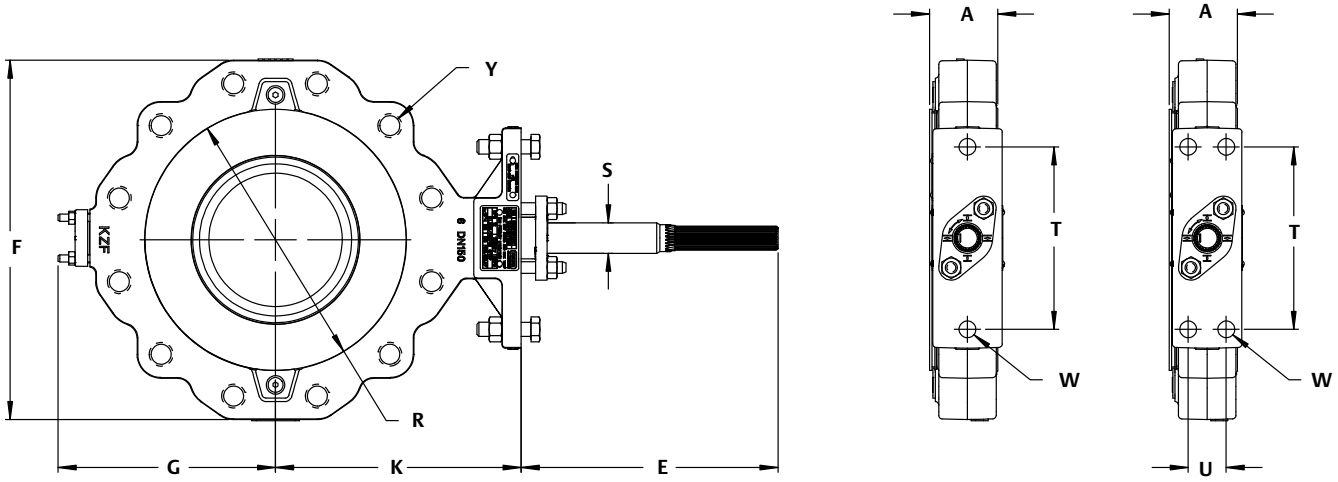


Figure 9. Dimensions for Fisher 8580, Wafer Style Valve (limited sizes)

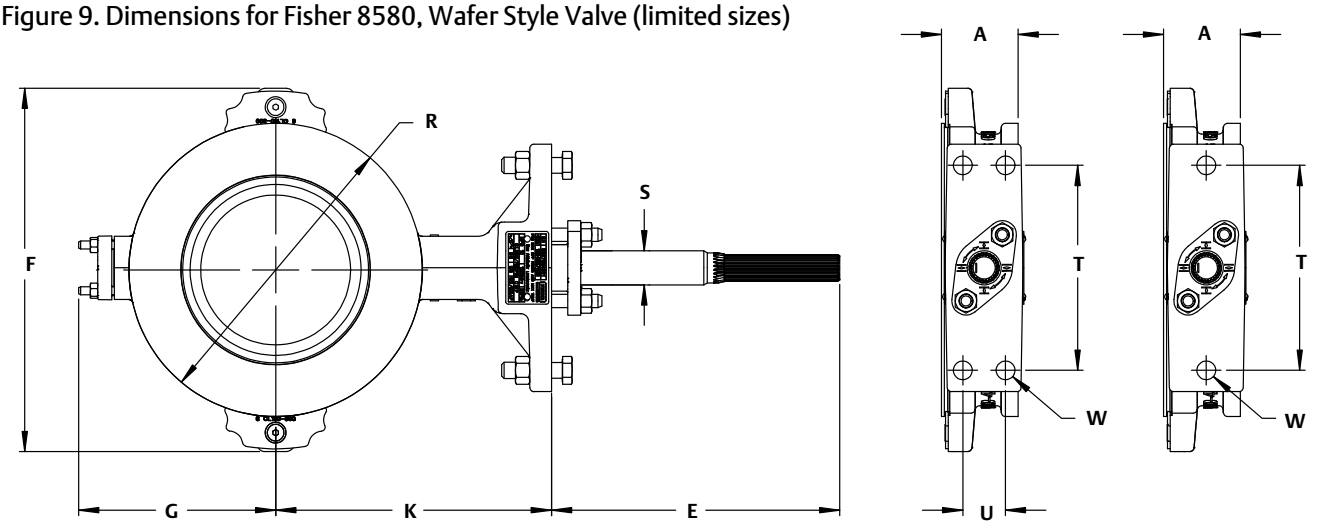
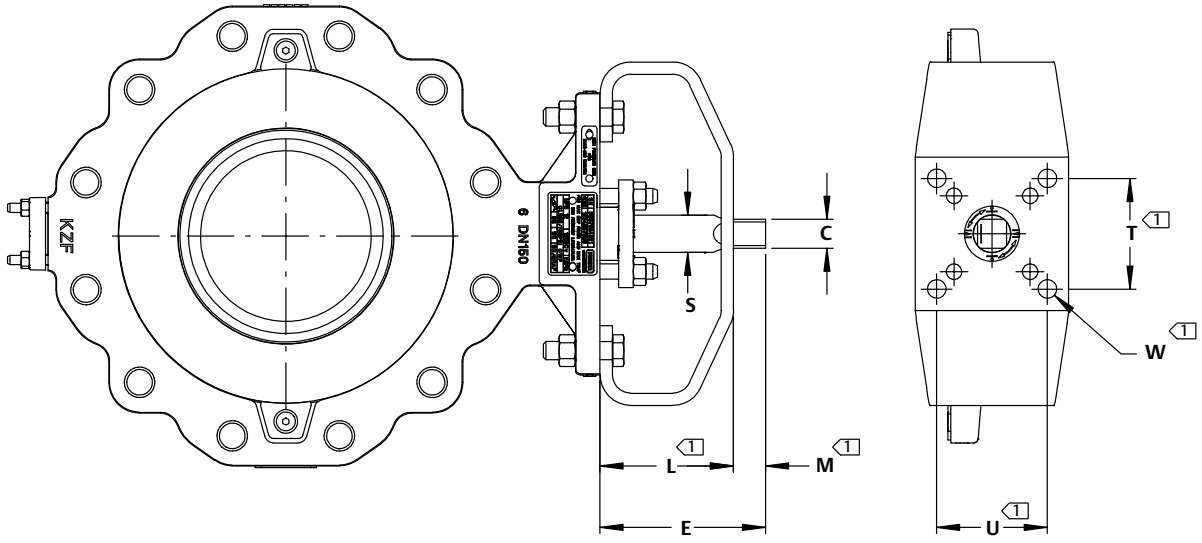


Table 9. Dimensions and Weights, Optional Square Shaft Mounting Bracket

VALVE SIZE	PRESSURE RATING	S(1)		C		E		L		M		T		U		W		ISO 5211
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
DN50/ NPS 2	PN10-40/ CL150-300	12.7	0.50	9	0.35	74	2.91	64	2.52	10	0.39	49.50	1.95	49.50	1.95	10	0.39	F07
												72.12	2.84	72.12	2.84	12	0.47	F10
DN80/ NPS 3	PN10-40/ CL150-300	15.9	0.63	11	0.43	76	2.99	64	2.52	12	0.47	49.50	1.95	49.50	1.95	10	0.39	F07
												72.12	2.84	72.12	2.84	12	0.47	F10
DN100/ NPS 4	PN10-40/ CL150-300	19.1	0.75	14	0.55	103	4.06	87	3.43	16	0.63	49.50	1.95	49.50	1.95	10	0.39	F07
												72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88..39	3.48	14	0.55	F12
DN150/ NPS 6	PN10-40/ CL150-300	25.4	1.00	19	0.75	108	4.25	87	3.43	21	0.82	49.50	1.95	49.50	1.95	10	0.39	F07
												72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88.39	3.48	14	0.55	F12
												99.00	3.90	99.00	3.90	18	0.71	F14
												116.67	4.59	116.67	4.59	22	0.87	F16
DN200/ NPS 8	PN10-16/ CL150	31.8	1.25	22	0.87	107	4.21	85	3.35	22	0.87	72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88.39	3.48	14	0.55	F12
	PN25-40/ CL300	31.8	1.25	22	0.87	107	4.21	85	3.35	22	0.87	99.00	3.90	99.00	3.90	18	0.71	F14
												116.67	4.59	116.67	4.59	22	0.87	F16
DN250/ NPS 10	PN10-16/ CL150	31.8	1.25	22	0.87	109	4.29	85	3.35	24	0.94	72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88.39	3.48	14	0.55	F12
	PN25-40/ CL300	31.8	1.25	22	0.87	109	4.29	85	3.35	24	0.94	99.00	3.90	99.00	3.90	18	0.71	F14
												116.67	4.59	116.67	4.59	22	0.87	F16
DN300/ NPS 12	PN10-16/ CL150	38.1	1.50	27	1.06	114	4.49	85	3.35	29	1.14	72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88.39	3.48	14	0.55	F12
	PN25-40/ CL300	38.1	1.50	27	1.06	114	4.49	85	3.35	29	1.14	99.00	3.90	99.00	3.90	18	0.71	F14
												116.67	4.59	116.67	4.59	22	0.87	F16

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.

Figure 10. Dimensions for Fisher 8580 with Optional Square Shaft Mounting Bracket

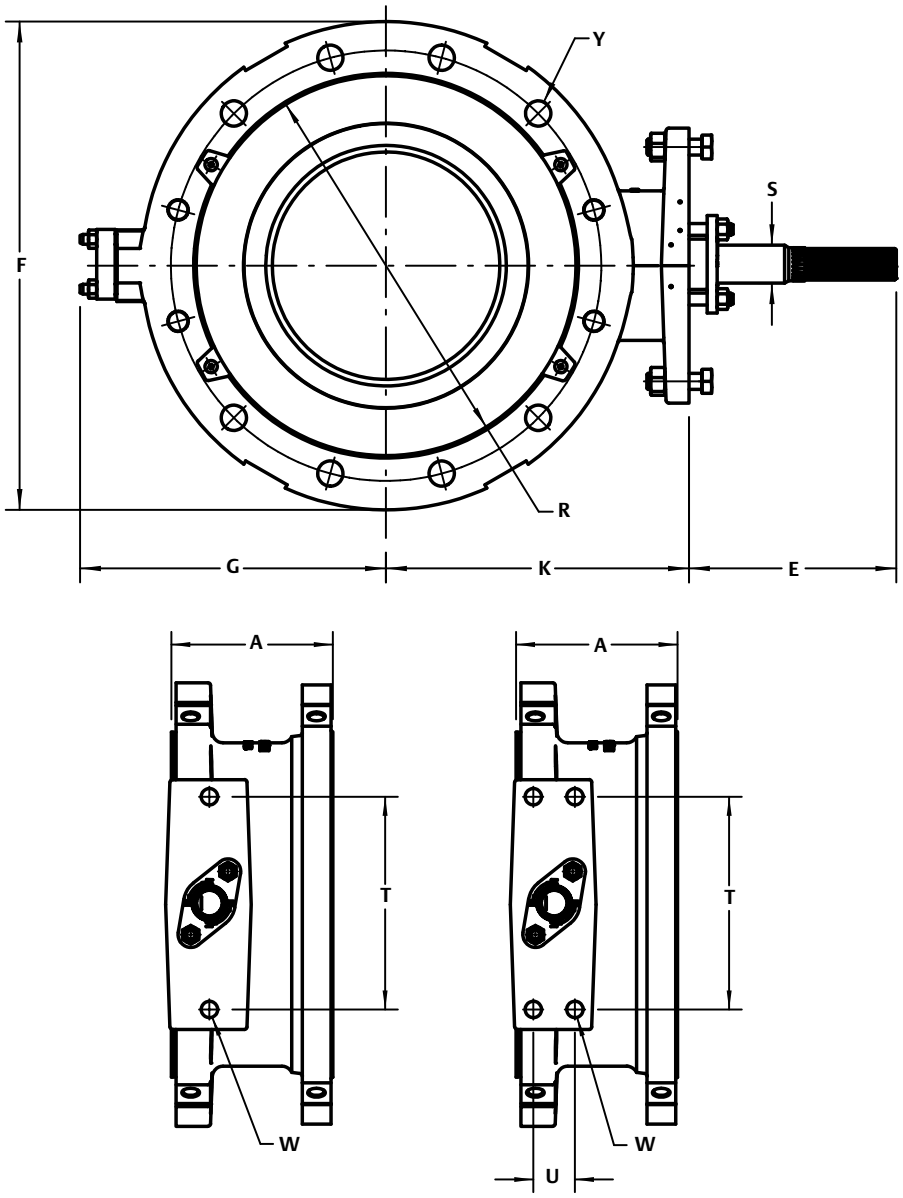


1 Mounting bracket optional.

Table 10. Dimensions and Weights, Double Flange Valve Body (See Figure 11)

VALVE SIZE, PRESSURE RATING		A	B	E		F	G	K	R	S	T	U	W	APPROX-IMATE WEIGHT
				Splined	Square									
		mm												kg
DN80/ NPS 3	PN10-16 /CL150	114	25.3	187.5	76	190	133	130	144	15.9	117	---	14	17.6
	PN25-40 /CL300	180	25.3	187.5	76	210	133	130	144	15.9	117	---	14	29
DN100/ NPS 4	PN10-16 /CL150	127	28.5	214.4	103	230	147	172	162	19.1	152	32	14	28.9
	PN25-40 /CL300	190	28.5	214.4	103	254	147	172	162	19.1	152	32	14	47.8
DN150/ NPS 6	PN10-16 /CL150	140	31.7	214.4	108	280	182	205	218	25.4	152	32	14	40.2
	PN25-40 /CL300	210	31.7	214.4	108	322	182	205	218	25.4	152	32	14	76.4
NPS200/ NPS 8	PN10-16 /CL150	152	32.8	208	107	345	225	258	278	31.8	235	46	18	71.3
	PN25-40 /CL300	230	32.8	208	107	380	225	258	291	31.8	235	46	18	124
DN250/ NPS 10	PN10-16 /CL150	165	35.6	208	109	405	250	270	331	31.8	235	46	18	80
	PN25-40 /CL300	250	35.6	208	109	445	265	270	352	31.8	235	46	18	203
DN300/ NPS 12	PN10-16 /CL150	178	41.7	208	114	485	309	304	381	38.1	235	46	18	144
	PN25-40 /CL300	270	41.7	208	114	520	309	304	410	38.1	235	46	18	275
		Inches												lbs
DN80/ NPS 3	PN10-16 /CL150	4.5	1	7.38	2.99	7.48	5.24	5.12	5.67	0.63	4.62	---	0.55	39
	PN25-40 /CL300	7.1	1	7.38	2.99	8.26	5.24	5.12	5.67	0.63	4.62	---	0.55	64
DN100/ NPS 4	PN10-16 /CL150	5	1.12	8.44	4.06	9.05	5.79	6.77	6.38	0.75	6	1.25	0.55	64
	PN25-40 /CL300	7.5	1.12	8.44	4.06	10	5.79	6.77	6.38	0.75	6	1.25	0.55	105
DN150/ NPS 6	P10-16/ CL150	5.5	1.25	8.44	4.25	11.02	7.17	8.07	8.58	1	6	1.25	0.55	89
	PN25-40 /CL300	8.3	1.25	8.44	4.25	12.66	7.17	8.07	8.58	1	6	1.25	0.55	168
NPS200/ NPS 8	PN10-16 /CL150	6	1.29	8.19	4.21	13.58	8.86	10.16	10.96	1.25	9.25	1.81	0.71	157
	PN25-40 /CL300	9.1	1.29	8.19	4.21	14.96	8.86	10.16	11.46	1.25	9.25	1.81	0.71	273
DN250/ NPS 10	PN10-16 /CL150	6.5	1.4	8.19	4.29	15.94	9.84	10.63	13.03	1.25	9.25	1.81	0.71	176
	PN25-40 /CL300	9.8	1.4	8.19	4.29	17.52	10.43	10.63	13.86	1.25	9.25	1.81	0.71	448
DN300/ NPS 12	PN10-16 /CL150	7	1.64	8.19	4.49	19.09	12.17	11.97	15	1.5	9.25	1.81	0.71	317
	PN25-40 /CL300	10.6	1.64	8.19	4.49	20.47	12.17	11.97	16.14	1.5	9.25	1.81	0.71	606

Figure 11. Dimensions for Fisher 8580 Double-Flange



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

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Fisher™ 8590 High-Performance Butterfly Valve

The Fisher 8590 High-Performance Butterfly Valve maintains tight shutoff, and can be specified for a wide range of pressure and temperature conditions.

The 8590 valve is available in a lugged or double flanged body design. A splined shaft can combine with a variety of spring-and- diaphragm or pneumatic piston actuators. A square or keyed shaft can combine with a variety of handlevers, handwheels, or pneumatic piston diaphragm actuators. These combinations help make the 8590 valve a reliable, high-performance butterfly valve for both throttling and on-off applications in the process industries.

The 8590 valve can be supplied with one of several dynamic seals (figure 1) that can be used in a variety of demanding applications. With the appropriate seal selection and materials of construction, the pressure-assisted seal helps provide excellent shutoff against the full ASME class pressure range for the 8590 valve.

X0955-2 **Lugged Style Fisher 8590 Valve**

X1610 **Double Flanged Style Fisher 8590 Valve**

Features

- Shaft Versatility— This valve will meet your actuator needs with a choice of splined, square, or keyed shaft connections.
- Excellent Shutoff Integrity—The pressure-assisted seal design provides tight shutoff and permits the use of smaller, less expensive actuators in applications requiring full ASME B16.34 shutoff capabilities.
- Excellent Emissions Capabilities— The optional ENVIRO-SEAL™ packing systems are designed with very smooth shaft surfaces and live-loading to provide improved sealing, guiding, and loading force transmission. The seal of the ENVIRO-SEAL system can control emissions to below 100 ppm (parts per million).
- Sour Service Capability— Trim and bolting materials are available for applications involving sour liquids and gases. These constructions comply with NACE MR0175-2002, MR0175-2003, MR0103, and MR0175 / ISO 15156.

- Fire Safe Construction — The 8590 valve has been fire tested per API 607, 6th edition with the Phoenix III seal. Standard construction requires 316 stainless steel chrome plated disk, graphite packing, metal bearings and S17400 H1025 SST or S20910 SST shaft. For information on fire tested valves, consult product bulletin 59.3:025 (D103907X012).

- Reliable Flange Gasketing Surface—Seal retainer screws are located so there is no interference with the sealing function of either flat sheet or spiral wound line flange gaskets.

- True Bidirectional Shutoff Performance—A feature of the valve design is that the torque necessary to open and close the valve is the same regardless of the direction in which the differential pressure is applied.

- Easy Installation—The valve body self-centers on the line flange bolts as a fast, accurate means of centering the valve in the pipeline.

- Powder Paint as Standard—The Emerson Automation Solutions powder paint finish offers an excellent corrosion-resistant finish to all steel parts.

- Shaft Retention—Redundant shaft retention provides added protection. The packing follower, anti-blowout ring, and shaft groove interact to hold the shaft securely in the valve body in NPS 3 through 10 (see figure 4). The NPS 12 through 24 utilize a stepped packing follower and stepped shaft to hold the shaft securely in the valve body.

8590 Valve Specifications and Materials of Construction

Table 1. Fisher 8590 Valve Specifications

Specifications	ASME
Valve Body Size	NPS 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24
Pressure Rating	CL600 per ASME B16.34
Valve Body Materials	WCC or CF8M (std)
	LCC, CD3MN, M35-2, and CW2M
Disk Materials	CF8M (std), CD3MN, M35-2, and CW2M
Disk Edge Coating	Chrome Plate (std) Chrome Coat Chromium Carbide Coating
End Connections	Mates with RF Flanges per ASME B16.5 Optional construction mates with RTJ Flanges per ASME B16.5
Valve Body Style	Lugged (single flange), lugged with drilled through flange holes, or double flange with drilled through holes
Shaft Connection Style	NPS 3-24: Splined (std) NPS 3-12: Square NPS 14-24: Keyed
Face-to-Face Dimensions	Meets MSS SP68, API 609, ASME B16.10, and EN 558 standards, double flange
Shutoff	Soft Seal: Class VI
	Metal Seal: Class IV, reverse direction only
	Phoenix III Seal: Class VI; reverse direction preferred, forward direction optional
	High Pressure Seal: Class VI, reverse direction only
Flow Direction	Standard (reverse flow) is with the flow into the shaft side of the disk
Flow Characteristic	Linear
Disk Rotation	Clockwise (CW) to close

Table 2. Materials (Other Valve Components)

Component	Material
Shafts and Pins	S17400 H1025
	S20910
	N07718
Anti-Blowout Ring (NPS 3-8 only)	N07718
Seal Ring	Soft: ETFE
	Metal: S21800
	Phoenix III: S20910/ETFE
	HPS: S21800 nitrided
Bearings	PEEK, S31600 Nitrided, R30006 (Alloy 6)
Packing	PTFE/carbon-filled PTFE (standard), graphite die-molded ribbon, ENVIRO-SEAL PTFE packing, ENVIRO-SEAL graphite packing

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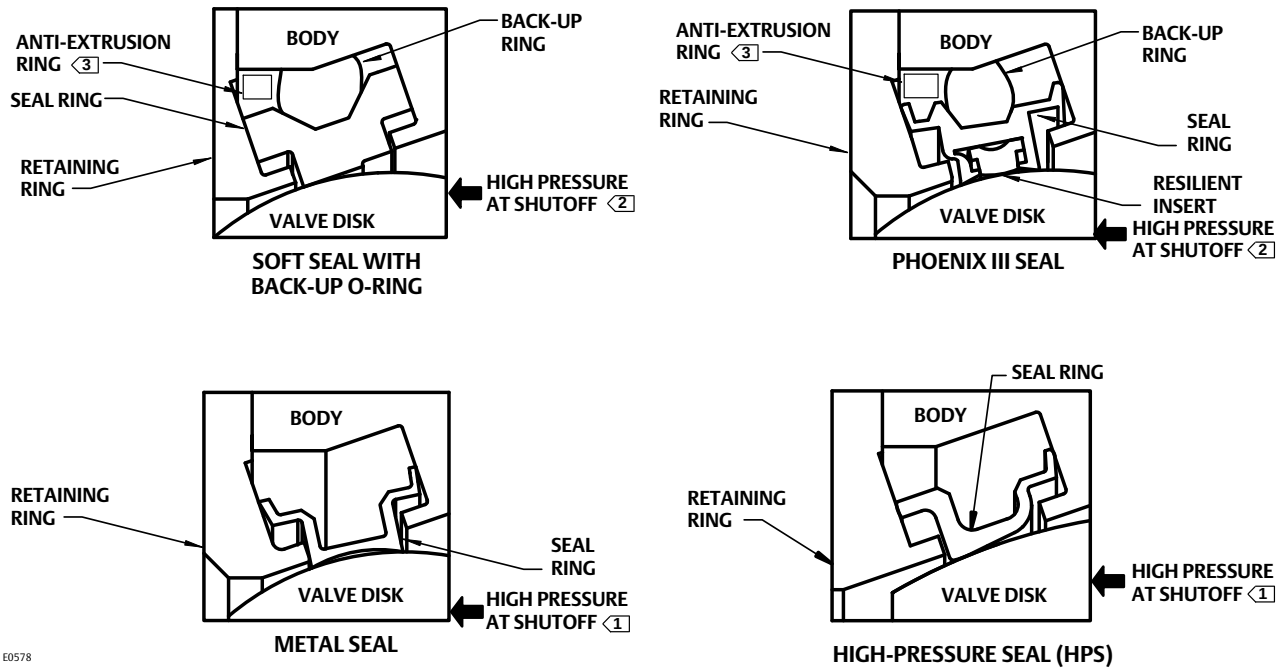
Figure 1. Available Seal Configurations



Notes:
1 This unidirectional seal must be installed so that the retaining ring is downstream from the high pressure side of the valve at shutoff, as shown.
2 For this bidirectional seal, the "preferred" valve orientation places the retaining ring downstream from the high pressure side of the valve at shutoff.
3 NPS 3 only.

Standard Seal Configurations

- Standard Soft Seal—A resilient dynamic seal with an elastomeric back-up ring for low to moderate temperature applications.

- Metal Seal—This stainless steel seal is available for severe service and high-temperature applications to 538°C (1000°F).

- Phoenix III Seal—This three-component, metal-and-polymeric seal is available for severe service with low to moderate temperature applications.

- High-Pressure Seal—This robust, stainless steel seal is available for severe service, cryogenic, and high-temperature applications to 538°C (1000°F).

Installation

Preferred valve orientation for the 8590 valve is reverse flow direction. Reverse flow direction is into the side of the valve body opposite the retaining ring or into the shaft side of the disk.

For erosive and many severe service applications, valves with bidirectional seals can and should be installed with the shaft horizontal and in the forward flow direction to prevent direct impingement of the process media on the seal, and to minimize the exposure of the shaft bearings to the process media.

The standard soft seal and the Phoenix III seal both offer bidirectional shutoff. Valves using either metal or HPS are unidirectional and must be installed in the reverse flow orientation.

For assistance in selecting the appropriate combination of actuator action and open valve position, consult your Emerson sales office.

Dimensions and weights are shown in figures 5, 6, and 7.

Figure 2. 8590, NPS 3 to 6, Valve Body Assembly

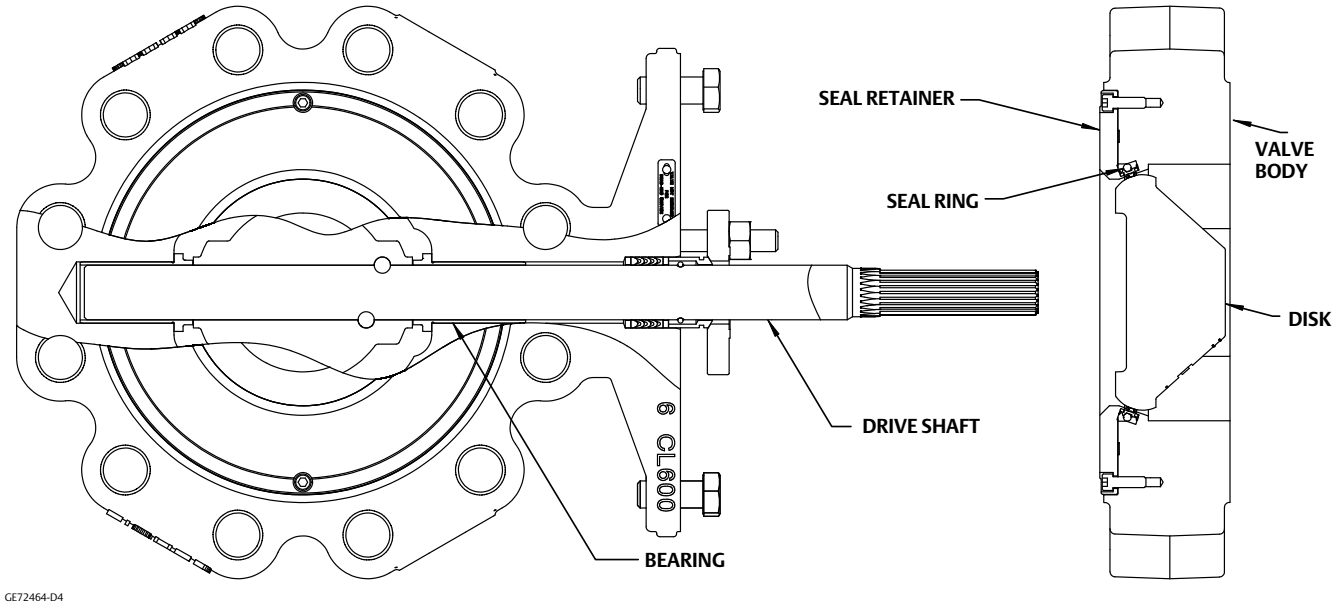
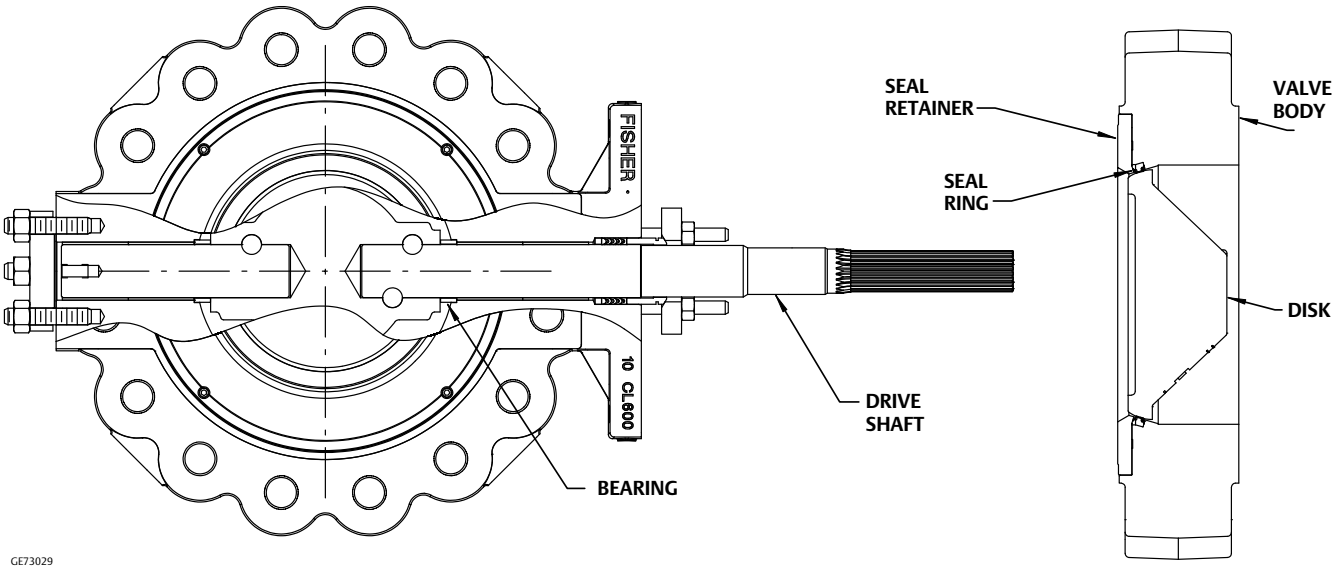


Figure 3. 8590, NPS 8 to 24, Valve Body Assembly 1



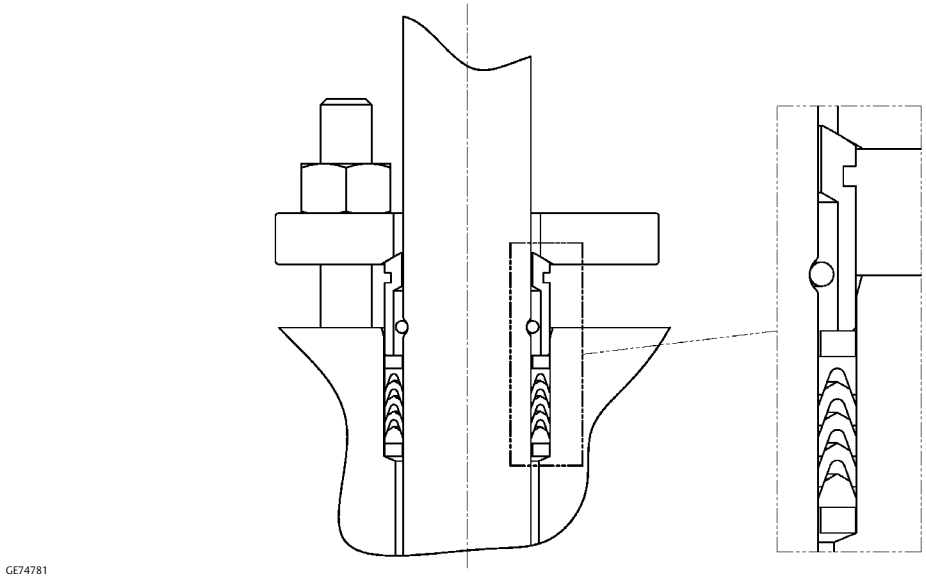
Note:
1 NPS 8 valve utilizes a one piece shaft

Table 3. Material Temperature Ranges

PART NAME	MATERIAL	TEMP °C	TEMP °F
Valve Body	WCC Steel	-29 to 427	-20 to 800
	CF8M(1)	-254 to 538	-425 to 1000
	LCC	-45 to 343	-50 to 650
	CD3MN	-51 to 316	-60 to 600
	M35-2	-198 to 482	-325 to 900
	CW2M(1)	-198 to 538	-325 to 1000
Disk	CF8M with Chrome Plated Disk Edge	-254 to 427	-425 to 800
	CF8M with Chrome Coated Disk Edge(1)	-254 to 538	-425 to 1000
	CF8M with Chromium Carbide Disk Edge(1)	-254 to 538	-425 to 1000
	CD3MN (no plating)(2)	-51 to 316	-60 to 600
	M35-2 (no plating)(2)	-198 to 482	-325 to 900
	CW2M (no plating)(1)(2)	-198 to 538	-325 to 1000
Shaft	S17400 (H1025)	-46 to 427	-50 to 800
	S20910(1)	-198 to 538	-325 to 1000
	S31803	-51 to 316	-60 to 600
	N05500	-198 to 482	-325 to 900
	N10276	-198 to 538	-325 to 1000
	N07718(1)	-254 to 538	-425 to 1000
Bearings	PEEK(1)	-73 to 149	-100 to 300
	S31600 Nitrided(1)	-254 to 538	-425 to 1000
	R30006 (Alloy 6)(1)	-198 to 538	-325 to 1000
Seal	**ETFE Soft Seal Ring**		
	ETFE Soft Seal Ring with FKM Backup Ring	-29 to 149	-20 to 300
	ETFE Soft Seal Ring with EPR Backup Ring	-54 to 149	-65 to 300
	S20910/ETFE Phoenix III Seal Ring		
	S20910/ETFE Phoenix III Seal Ring with FKM Backup Ring	-40 to 149	-40 to 300
	S20910/ETFE Phoenix III Seal Ring with EPR Backup Ring	-62 to 149	-80 to 300
	Metal Seal		
	S21800(1)	-198 to 538	-325 to 1000
	S20910(1)	-198 to 538	-325 to 1000
	High Pressure Seal		
	S21800 Nitrided(1)	-198 to 538	-325 to 1000
	S20910 Nitrided(1)	-198 to 538	-325 to 1000
Packing	PTFE /Carbon-filled PTFE (standard)	-45 to 232	-50 to 450
	ENVIRO-SEAL PTFE	-45 to 232	-50 to 450
	Graphite Die-molded Ribbon	-198 to 538	-325 to 1000
	ENVIRO-SEAL Graphite	-198 to 371	-325 to 700

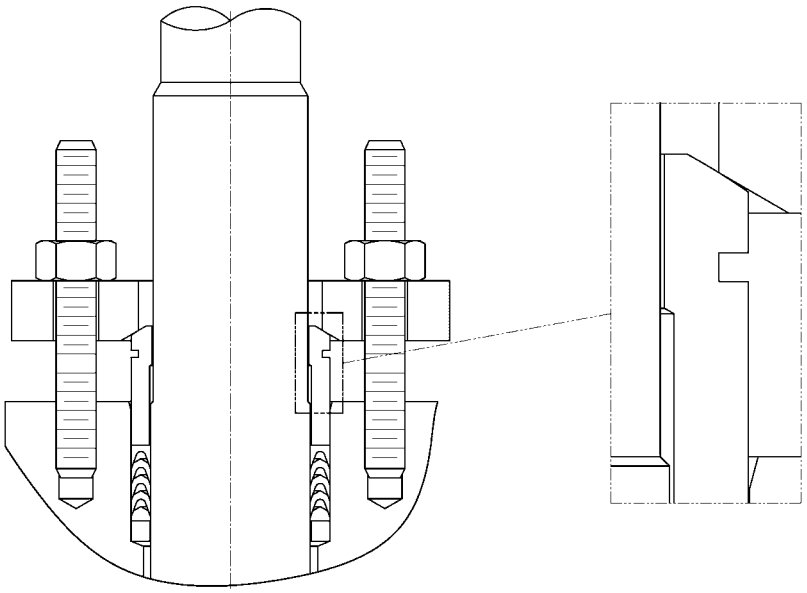
1. The maximum temperature for a standard design of the 8590 valve is 538°C (1000°F). Contact your Emerson sales office for use in higher temperature applications.
2. For use with soft seal only.

Figure 4. Anti-Blowout Protection



GE74781

NPS 3 THROUGH 8 WITH ANTI-BLOWOUT RING



GE72841

NPS 10 THROUGH 24 WITH STEPPED SHAFT

Pressure Drops

Pressure drop limits of any given valve are based on valve body, and trim material limits. To find the appropriate pressure drop limitation, choose the desired valve size and temperature range. Then search table 4 for body limitations and table 5 for trim limitations. Information on limits for CW2M, M35-2, and other alloy constructions can be obtained by contacting your Emerson sales office. The lowest number from the tables is the appropriate limit. **The tables for both trim and body limits must be consulted.**

Table 4. Maximum Allowable Shutoff Pressure Drops (Valve Ratings) Based on Carbon Steel and Stainless Steel Valve Types(1) (The tables for both trim and body limits must be consulted)

TEMPERATURE RANGE	PRESSURE RANGE			
	CL600			
	WCC(2)	CF8M(2)	LCC(2)	CD3MN
°C	Bar			
-254 to -29	---	99.3	---	103.4
-29 to 38	103.4	99.3	103.4	103.4
93	103.4	85.5	103.4	102.7
149	100.3	77.2	100.3	92
204	96.9	70.7	96.9	84.8
260	91.7	65.8	91.7	80
316	83.4	62.1	83.4	76.9
343	81.0	61.0	81.0	---
371	76.5	60.0	---	---
399	70.0	59.0	---	---
427	56.9	58.3	---	---
454	---	57.6	---	---
482	---	57.2	---	---
510	---	53.4	---	---
538	---	50.0	---	---
°F	PSI			
-425 to -20	---	1440	---	1500
-20 to 100	1500	1440	1500	1500
200	1500	1240	1500	1490
300	1455	1120	1455	1335
400	1405	1025	1405	1230
500	1330	955	1330	1160
600	1210	900	1210	1115
650	1175	885	1175	---
700	1110	870	---	---
750	1015	855	---	---
800	825	845	---	---
850	---	835	---	---
900	---	830	---	---
950	---	775	---	---
1000	---	725	---	---

1. For pressure/temperature rating of other materials, contact your Emerson sales office.
2. WCC, LCC, and CF8M valve bodies use S31600 seal retainers and blind flanges.

Table 5. Maximum Allowable Shutoff Pressure Drops based on Trim[1]

Note: Do not exceed the ASME pressure/temperature ratings of the valve or mating flanges.

Trim	Temperature, °C	NPS										
		3	4	6	8	10	12	14	16	18	20	24
		Bar										
ETFE Seal, PEEK Bearings	-46 to 37	103	94	103	103	103	102	103	103	103	103	100
	93	76	76	76	76	76	76	76	76	76	76	76
	121	41	41	41	41	41	41	41	41	41	41	41
	149	7	7	7	7	7	7	7	7	7	7	7
Phoenix III Seal, PEEK Bearings	-46 to 37	103	92	103	103	103	81	103	102	103	103	80
	93	103	86	103	101	103	73	103	92	103	103	72
	121	61	61	61	61	61	61	61	61	61	61	61
	149	21	21	21	21	21	21	21	21	21	21	21
Phoenix III Seal, Metal Bearings	-46 to 37	103	90	103	103	103	63	103	78	103	103	61
	93	98	84	103	99	96	56	103	71	103	101	56
	121	61	61	61	61	61	54	61	61	61	61	54
	149	21	21	21	21	21	21	21	21	21	21	21
Metal Seal, PEEK Bearings	-46 to 37	103	92	103	103	103	86	103	103	103	103	91
	149	100	83	100	97	100	73	100	95	100	100	79
Metal Seal, Metal Bearings	-46 to 37	103	90	103	103	103	66	103	84	103	103	69
	316	83	75	83	78	81	49	83	65	83	83	54
	427[2]	70	70	70	70	70	47	70	62	70	70	51
HPS Seal, Metal Bearings	-46 to 37	33	44	89	80	89	57	103	77	103	103	67
	316	18	28	67	59	68	43	83	60	83	83	52
	427[2]	16	26	63	56	64	41	70	57	70	70	50
Trim	**Temperature, °F**	**PSI**										
ETFE Seal, PEEK Bearings	-50 to 100	1500	1370	1500	1500	1500	1483	1500	1500	1500	1500	1456
	200	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	250	600	600	600	600	600	600	600	600	600	600	600
	300	100	100	100	100	100	100	100	100	100	100	100
Phoenix III Seal, PEEK Bearings	-50 to 100	1500	1332	1500	1500	1500	1175	1500	1476	1500	1500	1155
	200	1500	1251	1500	1464	1500	1058	1500	1340	1500	1500	1051
	250	890	890	890	890	890	890	890	890	890	890	890
	300	300	300	300	300	300	300	300	300	300	300	300
Phoenix III Seal, Metal Bearings	-50 to 100	1500	1303	1500	1500	1500	907	1500	1134	1500	1500	887
	200	1428	1222	1500	1435	1394	817	1496	1030	1500	1463	807
	250	890	890	890	890	890	788	890	890	890	890	781
	300	300	300	300	300	300	300	300	300	300	300	300
Metal Seal, PEEK Bearings	-50 to 100	1500	1336	1500	1500	1500	1245	1500	1500	1500	1500	1327
	300	1455	1207	1455	1407	1455	1053	1455	1381	1455	1455	1147
Metal Seal, Metal Bearings	-50 to 100	1500	1309	1500	1500	1500	954	1500	1221	1500	1500	998
	600	1210	1093	1210	1127	1176	714	1210	939	1210	1210	777
	800[2]	1015	1015	1015	1015	1015	675	1015	894	1015	1015	741
HPS Seal, Metal Bearings	-50 to 100	484	640	1284	1154	1289	831	1500	1124	1500	1500	978
	600	264	408	968	862	981	624	1210	865	1210	1210	760
	800[2]	228	370	916	815	932	590	1015	823	1015	1015	725

1. Trim ratings based on S17400 H1025 shaft. For other shaft materials, please contact factory.
2. The temperature limit of S17400 H1025 shaft material is 427°C (800°F). For higher temperatures another shaft material option must be selected.

Table 6. Single Flange Dimensions and Weights

Valve Size, NPS	A	E	F	G	K	R	S(1)	T	U	Y(2)	W(2)	Approximate Weight
	mm											kg
3	52	187	198	98	123	127	15.9	117	- - -	3/4-10	1/2-13	10.8
4	62	214	259	128	150	157	19.1	152	32	7/8-9	1/2-13	21.6
6	76	208	333	166	220	216	31.8	235	46	1-8	5/8-11	45.5
8	102	208	407	241	234	270	38.1	235	46	1-1/8-8	5/8-11	80.2
10	116	356	506	312	302	324	44.5	273	51	1-1/4-8	3/4-10	157
12	140	356	553	339	332	381	50.8	273	51	1-1/4-8	3/4-10	213
14	157	356	597	370	348	413	63.5	337	76	1-3/8-8	7/8-9	281
16	178	356	678	408	386	470	63.5	337	76	1-1/2-8	7/8-9	395
18	198	508	735	451	427	533	76.2	533	127	1-5/8-8	1-1/4-8	563
20	216	508	807	478	446	584	76.2	533	127	1-5/8-8	1-1/4-8	721
24	230	508	933	544	513	692	76.2	533	127	1-7/8-8	1-1/4-8	1000
	Inches											lbs
3	2.04	7.38	7.80	3.85	4.84	5.00	0.63	4.62	- - -	3/4-10	1/2-13	24
4	2.44	8.44	10.20	5.04	5.89	6.19	0.75	6.00	1.25	7/8-9	1/2-13	48
6	2.98	8.19	13.11	6.54	8.65	8.50	1.25	9.25	1.81	1-8	5/8-11	101
8	4.00	8.19	16.02	9.49	9.20	10.62	1.50	9.25	1.81	1-1/8-8	5/8-11	178
10	4.56	14.00	19.92	12.28	11.90	12.75	1.75	10.75	2.00	1-1/4-8	3/4-10	348
12	5.51	14.00	21.77	13.35	13.07	15.00	2.00	10.75	2.00	1-1/4-8	3/4-10	473
14	6.18	14.00	23.50	14.57	13.70	16.25	2.50	13.25	3.00	1-3/8-8	7/8-9	624
16	7.00	14.00	26.69	16.06	15.20	18.50	2.50	13.25	3.00	1-1/2-8	7/8-9	876
18	7.81	20.00	28.94	17.76	16.81	21.00	3.00	21.00	5.00	1-5/8-8	1-1/4-8	1250
20	8.50	20.00	31.77	18.82	17.57	23.00	3.00	21.00	5.00	1-5/8-8	1-1/4-8	1600
24	9.06	20.00	36.73	21.42	20.20	27.25	3.00	21.00	5.00	1-7/8-8	1-1/4-8	2220

1. This is the nominal valve shaft diameter to be used when selecting Fisher actuators.
2. Threaded hole per ASME B1.1.

Figure 5. Single Flange Dimensions (also see table 6)

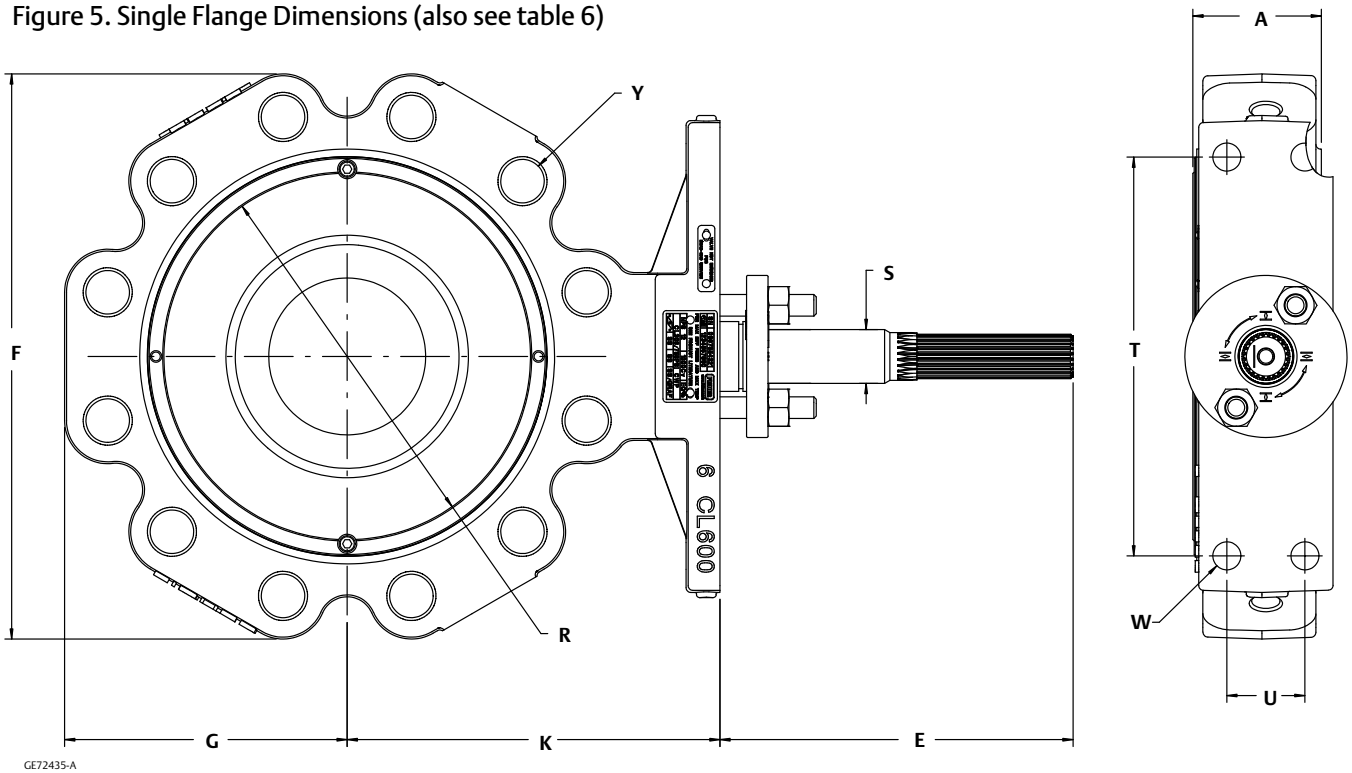


Table 7. Double Flange Dimensions and Weights

Valve Size, NPS	A	E	F	G	H	K	R	S(1)	T	U	Y(2)	W(2)	Approximate Weight
	mm												kg
3	180	187	211	106	21.5	123	127	15.9	117	- - -	3/4-10	1/2-13	25.9
4	190	214	277	138	25.6	150	157	19.1	152	32	7/8-9	1/2-13	48.1
6	210	208	357	178	28.4	220	216	31.8	235	46	1-8	5/8-11	97.1
8	230	208	423	243	31.9	234	270	38.1	235	46	1-1/8-8	5/8-11	145.6
10	250	356	515	316	35.1	302	324	44.5	273	51	1-1/4-8	3/4-10	247.7
12	270	356	563	343	35.1	332	381	50.8	273	51	1-1/4-8	3/4-10	316.6
14	290	356	610	374	38.3	348	413	63.5	337	76	1-3/8-8	7/8-9	410
16	310	356	691	412	41.5	386	470	63.5	337	76	1-1/2-8	7/8-9	571.5
18	330	508	751	455	43.7	428	533	76.2	533	127	1-5/8-8	1-1/4-8	817.4
20	350	508	831	483	44.6	446	584	76.2	533	76	1-5/8-8	1-1/4-8	989.3
24	390	508	946	549	50.8	543	692	76.2	533	127	1-7/8-8	1-1/4-8	1422
	Inches												lbs
3	7.09	7.38	.32	4.16	0.85	4.84	5.00	0.63	4.62	- - -	3/4-10	1/2-13	57
4	7.48	8.44	.89	5.45	1.01	5.89	6.19	0.75	6.00	1.25	7/8-9	1/2-13	106
6	8.27	8.19	.04	7.02	1.12	8.65	8.50	1.25	9.25	1.81	1-8	5/8-11	214
8	9.06	8.19	.65	9.56	1.26	9.20	10.62	1.50	9.25	1.81	1-1/8-8	5/8-11	321
10	9.84	14.00	.28	12.42	1.38	11.90	12.75	1.75	10.75	2.00	1-1/4-8	3/4-10	546
12	10.63	14.00	.15	13.50	1.38	13.07	15.00	2.00	10.75	2.00	1-1/4-8	3/4-10	698
14	11.42	14.00	.00	14.71	1.51	13.70	16.25	2.50	13.25	3.00	1-3/8-8	7/8-9	904
16	12.2	14.00	.19	16.21	1.63	15.20	18.50	2.50	13.25	3.00	1-1/2-8	7/8-9	1260
18	12.99	20.00	.55	17.93	1.72	16.81	21.00	3.00	21.00	5.00	1-5/8-8	1-1/4-8	1802
20	13.78	20.00	.70	19.00	1.76	17.57	23.00	3.00	21.00	3.00	1-5/8-8	1-1/4-8	2181
24	15.35	20.00	.24	21.62	2.00	20.20	27.25	3.00	21.00	5.00	1-7/8-8	1-1/4-8	3135

Figure 6. Double Flange Dimensions (also see table 7)

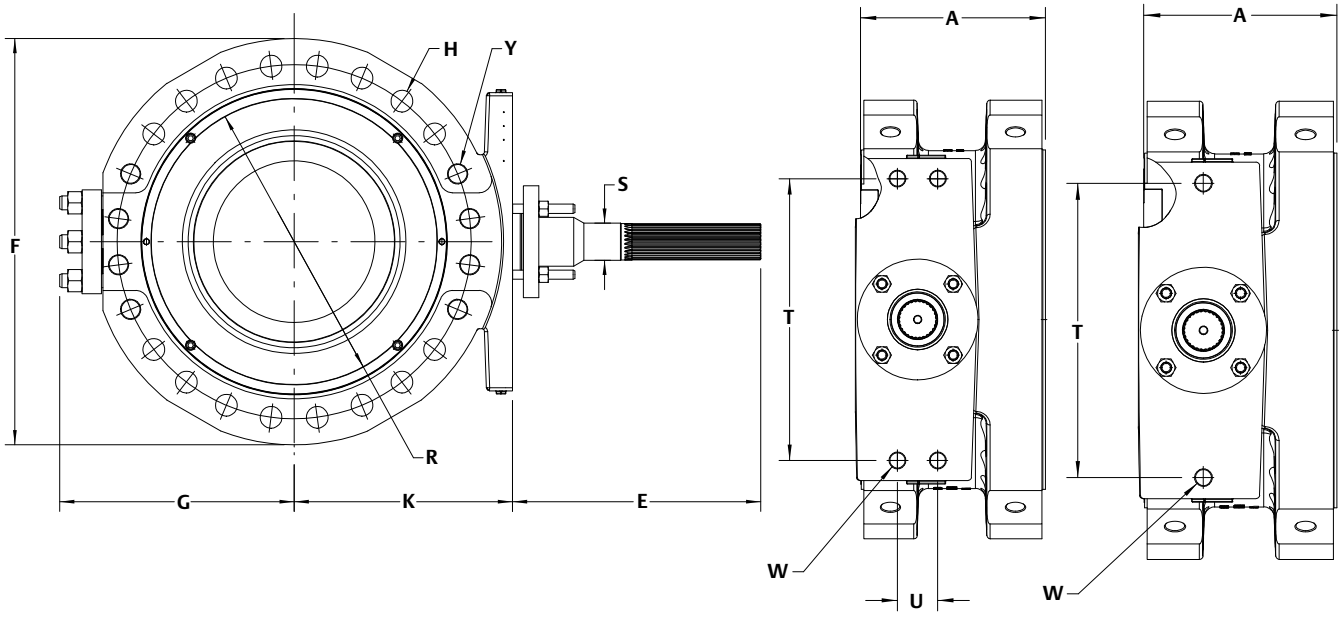


Table 8. Dimensions, Optional Square Shaft and Mounting Bracket (ISO 5211)

Valve Size, NPS	C	E	L	M	S	T	U	W	ISO 5211
	mm								
3	11	76	64	12	15.9	49.5	49.5	10	F07
						72.1	72.1	12	F10
4	14	103	87	16	19.1	49.5	49.5	10	F07
						72.1	72.1	12	F10
						88.4	88.4	14	F12
6	22	108	85	23	31.8	72.1	72.1	12	F10
						88.4	88.4	14	F12
						99	99	18	F14
						116.7	116.7	22	F16
8	27	114	85	29	38.1	72.1	72.1	12	F10
						88.4	88.4	14	F12
						99	99	18	F14
						116.7	116.7	22	F16
10	36	190	152	38	44.5	99	99	18	F14
						116.7	116.7	22	F16
12	36	190	152	38	50.8	99	99	18	F14
						116.7	116.7	22	F16
	Inches								
3	0.43	3.00	2.52	0.48	0.63	1.95	1.95	0.39	F07
						2.84	2.84	0.47	F10
4	0.55	4.06	3.43	0.63	0.75	1.95	1.95	0.39	F07
						2.84	2.84	0.47	F10
						3.48	3.48	0.55	F12
6	0.87	4.25	3.35	0.90	1.25	2.84	2.84	0.47	F10
						3.48	3.48	0.55	F12
						3.90	3.90	0.71	F14
						4.59	4.59	0.87	F16
8	1.06	4.49	3.35	1.14	1.50	2.84	2.84	0.47	F10
						3.48	3.48	0.55	F12
						3.90	3.90	0.71	F14
						4.59	4.59	0.87	F16
10	1.42	7.48	6	1.50	1.75	3.90	3.90	0.71	F14
						4.59	4.59	0.87	F16
12	1.42	7.48	6	1.50	2.00	3.90	3.90	0.71	F14
						4.59	4.59	0.87	F16

Figure 7. 8590 Valve Assembly with Square Shaft and Mounting Bracket (also see table 8)

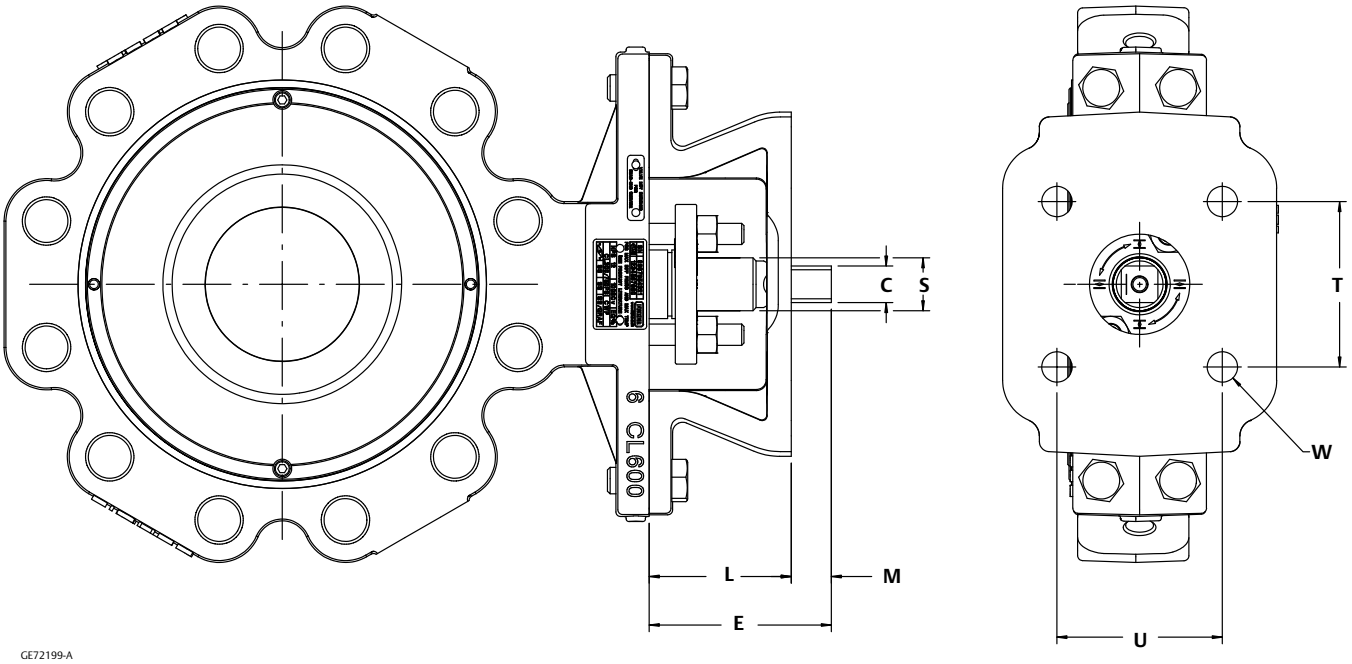
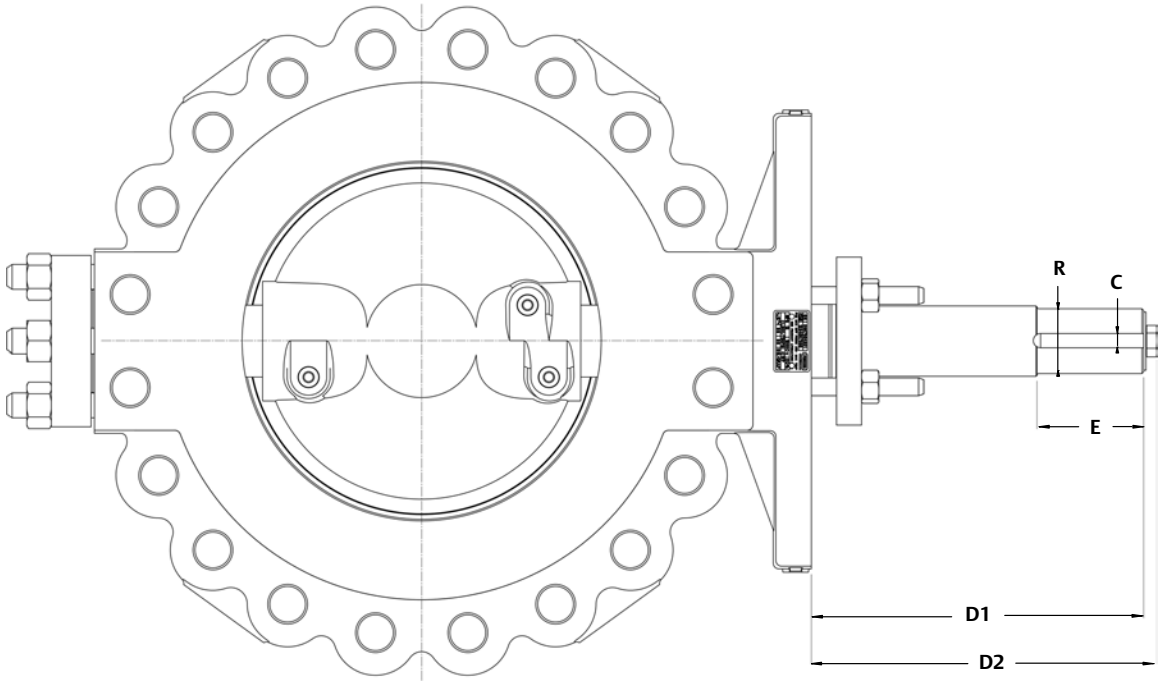


Table 9. Dimensions, Optional Keyed Shaft

Valve Size, NPS	C	D1	D2	E	R
	mm				
14	12.7	297	309	95.3	57.2
16	16.0	316	330	114.3	69.9
18	16.0	394	408	114.3	69.9
20	16.0	394	408	114.3	69.9
24	16.0	394	408	114.3	69.9
	Inches				
14	0.50	11.68	12.2	3.75	2.25
16	0.63	12.44	13.0	4.5	2.75
18	0.63	15.51	16.1	4.5	2.75
20	0.63	15.51	16.1	4.5	2.75
24	0.63	15.51	16.1	4.5	2.75

Figure 9. Dimensions for Fisher 8590 NPS 14 to 24 Valve with Keyed Shaft (also see table 9)



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

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Fisher™ 9500 Butterfly Control Valve

The Fisher 9500 butterfly valve is a fully lined valve for use with corrosive fluids and where tight shutoff is required. The nitrile or PTFE liner totally isolates the valve body and shaft from the process fluid and maintains excellent shutoff at pressure drops to 15.2 bar (220 psi), and temperatures to 121°C (250°F).

The 9500 valve is available in NPS 2 through 12 and is compatible with ASME B16.1 CL125B, with ASME B16.34 CL150 and CL300, or with DIN flanges. These valves are furnished with splined shafts for use with power actuators, with a Fisher 1077 manual actuator, or with a 1078 declutchable manual actuator (see figure 1).

W9224-3

Fisher 9500 Valve with 1052 Actuator and FIELDVUE™ DVC6200 Digital Valve Controller

W4082-1

Fisher 9500 Valve with 1066SR Actuator

Specifications

Valve Sizes

NPS ■ 2, ■ 3, ■ 4, ■ 6, ■ 8, ■ 10, or ■ 12

Valve Style

Flangeless (wafer-type) valve to be installed between two pipe flanges

End Connection Styles

Flangeless (wafer-style) valve mates with CL125 flat-face flanges per ASME B16.1, CL150 and CL300 raised-face flanges per ASME B16.34, or DIN flanges as shown in table 2

Maximum Allowable Inlet Pressure(1)

Maximum material temperature capabilities are limited as shown in table 3. The material maximum allowable shutoff or flowing pressure drop limits are shown in tables 1 and 4. Valve bodies are consistent with applicable pressure/temperature ratings for ■ CL125B per ASME B16.1, or ■ CL150 and CL300 per ASME B16.34.

Vacuum Service

Valves suitable are for vacuum service to approximately 10^{-7} mm Hg absolute (3.4×10^{-12} mbar, absolute)

Maximum Allowable Pressure Drop(1)

Maximum Allowable Shutoff: See table 1
Maximum Flowing Pressure Drops: See table 4

Construction Materials

Valve body: ■ Cast iron, ■ carbon steel, or ■ S31600 [316 stainless steel (SST)]
Disk and Liner: See table 3
Shaft and Taper Pins: S17400 (17-4PH SST) standard or S20910
Thrust Bearing: All cast iron or steel valves use a PTFE/bronze in a carbon steel shell; NPS 2 through 6 SST valves use a PTFE-liner in a S31600 shell; NPS 8 through 12 SST valves use a PTFE-liner in a fiberglass shell
Thrust Bearing Sleeves: Stainless steel
Shaft-Seal Thrust Plate: ■ Plated carbon steel (standard) or ■ S31600 SST
Thrust-Plate Cap Screws: Steel

Material Temperature Capabilities(1)

See table 3

Flow Characteristic

Conventional Disk: Approximately equal percentage through 60 degrees of disk rotation
FISHTAIL™ Disk: Approximately equal percentage through 90 degrees of disk rotation

Flow Direction

Conventional Disk: Bidirectional
FISHTAIL Disk: Forward flow -The tail of the disk opens into the downstream end of the valve

Flow Coefficients

See Fisher Catalog 12

Flow Coefficient Ratio(2)

Conventional Disk: approximately 33 to 1 for a 0 to 60 degree disk rotation
FISHTAIL Disk: 100 to 1 or greater for a 0 to 90 degree disk rotation

Disk Rotation

Conventional Disk:

On/Off Service: ■ 0 to 60 or ■ 0 to 90 degrees
Throttling Service: 0 to 60 degrees

FISHTAIL Disk: 0 to 60 or 0 to 90 degrees for on/off or throttling

Noise Levels

Refer to Catalog 12 for sound pressure level prediction

Shutoff Classification per ANSI/FCI 70-2 and IEC 60534-4

Nitrile or PTFE Liner: Class VI

Actuator/Valve Action

Field-reversible between ■ push-down-to-open (extending actuator stem opens disk) or ■ push-down-to-close (extending actuator stem closes disk)

(continued)

Specifications (continued)

Actuator Mounting

Mounting configurations are as follows: Actuator can be ■ perpendicular to (standard) or ■ parallel with pipeline with actuator to ■ right (standard) or ■ left of valve body (when viewed from valve inlet). With perpendicular mounting in horizontal pipeline, actuator can extend ■ above (standard) or ■ below pipeline. With parallel mounting, actuator can extend ■ upstream or ■ downstream of valve

Mating Flange Capabilities

All sizes compatible with weld-neck flanges; also see the Installation section for slip-on flanges

Face-to-Face Dimensions

Dimensions meet MSS SP-67 specifications for face-to-face dimensions of flangeless valves

Valve Shaft Diameters

See figure 4 and table 5

Approximate Weights

See figure 4 and table 5

Options

Three-Way Valve: For converging or diverging service. Consists of two 9500 valves and a single actuator mounted on a pipe tee. Actuator operates both valves through tandem linkage. Contact your Emerson sales office for sizing information
Flange Adapters: Provide additional liner support for use with ■ slip-on flanges and valve bodies NPS 6 and larger, ■ flexible flanges, ■ flanges having inside diameters less than or greater than standard weld-neck flanges, or for ■ dead-end service (valve installed at end of pipe run)
Valve body for mating between CL300 flanges.
Manual Actuator: Fisher 1077 manual handwheel rotary actuator, or the 1078 declutchable manual actuator, see figure 1

1. The pressure/temperature limits in this bulletin and any other applicable standard or code limitation should not be exceeded.
2. Ratio of maximum flow coefficient to minimum usable flow coefficient.

Figure 1. Fisher 1077 and 1078 Manual Rotary Actuators

1077 MANUAL ACTUATOR

1078 DECLUTCHABLE MANUAL ACTUATOR

Table 1. Maximum Allowable Shutoff Pressure Drops(1)

VALVE SIZE, NPS	MAXIMUM ALLOWABLE SHUTOFF PRESSURE DROPS							
	Liquid Service				Gaseous Service			
	PTFE Liner		Nitrile Liner		PTFE Liner		Nitrile Liner	
	Cast Iron Valve Material	Steel or Stainless Steel Valve Material	Cast Iron Valve Material	Steel or Stainless Steel Valve Material	Cast Iron Valve Material	Steel or Stainless Steel Valve Material	Cast Iron Valve Material	Steel or Stainless Steel Valve Material
Bar								
2, 3, and 4	12.1	15.2	12.1	15.2	12.1	15.2	12.1	15.2
6, 8, 10, and 12	12.1	15.2	10.4	10.4	12.1	15.2	10.4	10.4
Psi								
2, 3, and 4	175	220	175	220	175	220	175	220
6, 8, 10, and 12	175	220	150	150	175	220	150	150

1. The values in this table were determined using S17400 (17-4PH SST) shaft and taper pins. If other materials are used, you **must** refer to Catalog 14 Pages (section D) for adjustment percentages.

Features

- Versatile—Conventional disks are available for bidirectional, on/off or throttling control. Valves are available with S31600 [316 stainless steel (SST)] FISHTAIL disk for on/off or throttling control (see figure 2). The disks can be obtained in a variety of alloy materials for additional corrosion resistance.

- Economical—Valve body and shafts are isolated from process fluid, allowing use of cast iron valve bodies for corrosive applications.

- Adjustable Shaft Seal—Liner is directed against a flat disk hub by a thrust bearing, creating a seal between the liner and the disk as shown in figure 3. Seals are adjusted as necessary to provide leak control.

- Flange Gasket Not Required—Partial O-ring (figure 3) is molded as part of the liner. It seals against mating flanges which eliminate the need for flange gaskets.

- Excellent Flow Control—The conventional disk is approximately equal percentage flow characteristic through 60 degrees of its rotation. The FISHTAIL disk has an approximate equal percentage flow characteristic through a full 90 degrees of disk rotation.

- Operational Economy—The FISHTAIL disk reduces dynamic torque, which allows the use of a smaller actuator size for a given application.

- Minimum Maintenance—No lubrication is required, and no packing or flange gaskets to replace. Shaft seal is easy to adjust. Removing valve components and changing the valve action is accomplished without complete disassembly. Field-replaceable slip-in liner minimizes downtime and reduces maintenance costs.

Table 2. Mating Flange Compatibility

VALVE SIZE, NPS	CAST IRON		STEEL AND STAINLESS STEEL	
	ASME	DIN	ASME	DIN
2, 3	CL125B	PN10	CL150	PN16
4	CL125B	---	CL150	PN16
6, 8, 10	CL125B	PN10	CL150	PN16
12	CL125B	---	CL150	PN16

Table 3. Disk and Liner Materials

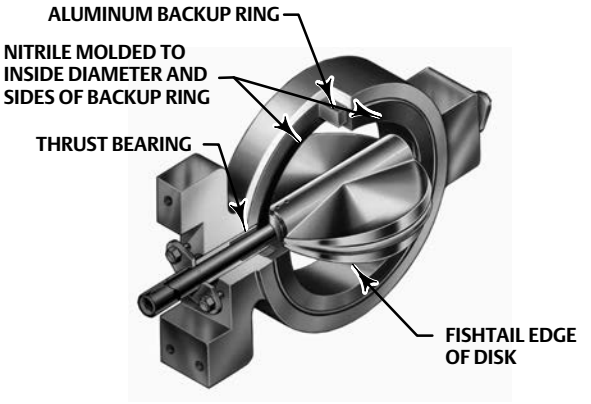
DISK STYLE	DISK MATERIAL	LINER MATERIAL	TEMPERATURE RANGE	
			°C	°F
Conventional	Aluminum bronze	PTFE-lined elastomer molded to aluminum backup ring	-18 to 121	0 to 250
		Nitrile molded to hard rubber backup ring	-7 to 93	20 to 200
FISHTAIL	S31600 stainless steel	PTFE-lined elastomer molded to aluminum backup ring	-18 to 121	0 to 250

Table 4. Maximum Allowable Flowing Pressure Drops Due to Strength Capabilities of Valve Body Components

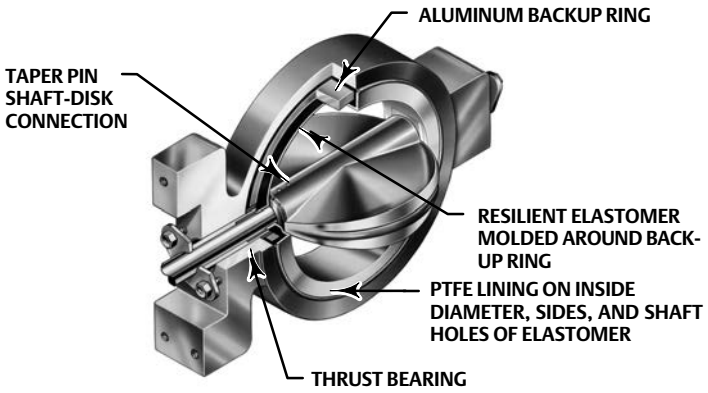
VALVE SIZE, NPS	MAXIMUM ALLOWABLE FLOWING PRESSURE DROPS			
	Conventional Disk		FISHTAIL Disk	
	At 60 Degrees Rotation	At 90 Degrees Rotation	At 60 Degrees Rotation	At 90 Degrees Rotation
Bar				
2	12.1(1) 15.2(2)	8.5	12.1(1) 15.2(2)	12.1(1) 15.2(2)
3	12.1(1) 15.2(2)	5.0	12.1(1) 15.2(2)	12.1(1) 15.2(2)
4	6.6	2.1	11.9	6.8
6	3.4	1.1	5.9	2.9
8	3.4	1.1	5.9	2.9
10	1.7	0.6	2.8	1.2
12	2.0	0.6	3.2	1.3
Psi				
2	175(1) 220(2)	124	175(1) 220(2)	175(1) 220(2)
3	175(1) 220(2)	73	175(1) 220(2)	175(1) 220(2)
4	96	31	173	99
6	50	16	85	42
8	50	16	85	42
10	25	8	41	17
12	29	9	47	19

1. For cast iron valve bodies.
2. For steel or stainless steel valve bodies.

Figure 2. Sectional Views of Fisher 9500 Valves

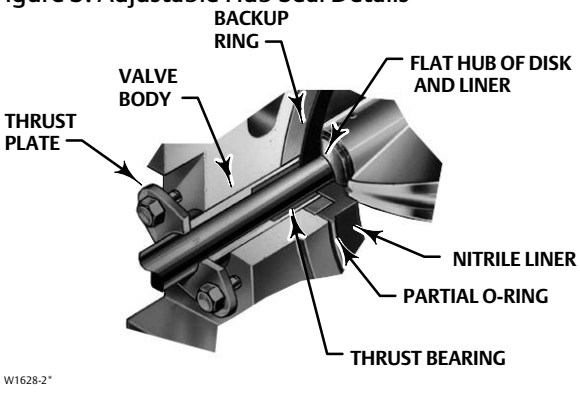


NITRILE LINER



PTFE LINER

Figure 3. Adjustable Hub Seal Details



Installation

Please refer to the Fisher 9500 instruction manual, (D100380X012) for additional / complete installation and maintenance instructions.

These valves may be installed in any position. For conventional disks, flow may be in either direction. For FISHTAIL disks, the FISHTAIL edge of the disks must be located in to the downstream end of the valve (see figure 2).

The liner overlaps the valve face producing the partial O-ring shown in figure 3. It acts as the flange gasket. Improper use of additional gasketing materials may damage the valve liner.

The simplicity of the 9500 valve design is achieved by relying on mating pipe flanges to retain the slip-in liner in the valve body. Care must be taken during installation to assure that the pipe flanges are properly supported to avoid liner damage, flange joint leakage, and problems with valve operation. Flexible, plastic flanges; fiberglass, slip-on flanges; or weld-neck flanges with other than standard inside diameters may not provide adequate support for the liner. The use of flange adapters can overcome flange support problems during installation. Whenever a flange adapter is used, a standard flange gasket must be installed between the line flange and flange adapter. Do not use a flange gasket between the valve and flange adapter. The partial O-ring on the liner acts as the flange gasket and any additional gasket here will damage the liner.

Excessive line bolt load on flexible mating flanges can warp the liner. Also, failing to support the liner at the inside diameter can warp the liner. The use of flange adapters can overcome bolt load problems during installation.

Slip-on pipe flanges may be used with NPS 2, 3, or 4 9500 valves. Valves NPS 6 and larger will require flange adapters for complete liner support.

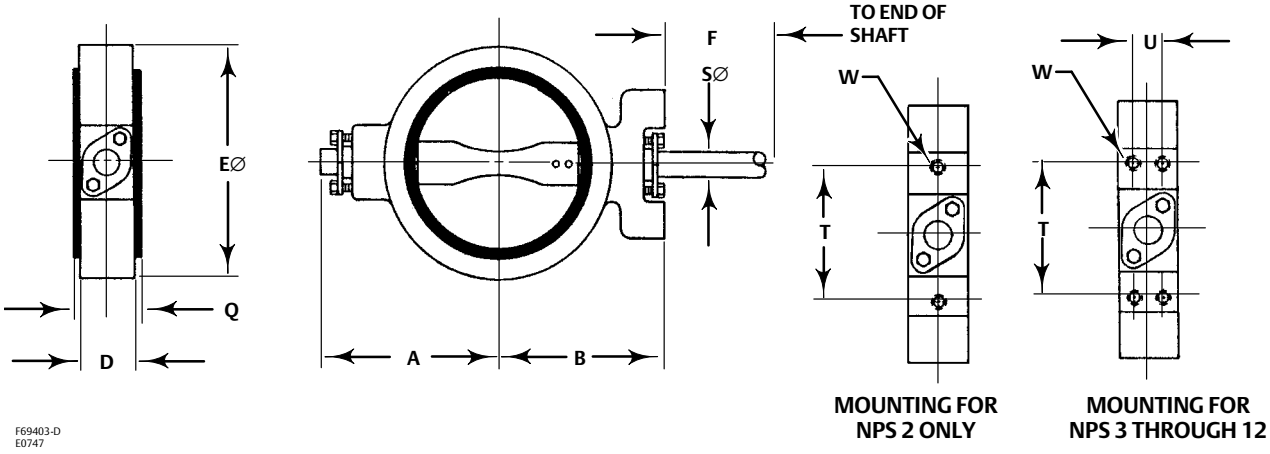
The maximum and minimum allowable inside diameter of mating flanges or adjacent pipes are given in figure 4 and table 5. Flanges or pipes with inside diameters smaller than the minimum shown may interfere with the opening of the disk. Flanges or pipes with an inside diameter larger than the maximum shown may not be in full contact with the liner. Flange adapters are needed in either case, to provide disk clearance or to fully contact the liner.

Table 5. Dimensions

VALVE SIZE NPS	A		B		D	E	F	Q	S (Shaft Diameter)	T	U	W	ALLOWABLE MATING FLANGE / PIPEBORE		APPROX -IMATE WEIGHT
	CL125 / 150	CL300	CL125 / 150	CL300			Splined Valve Shaft						Min	Max	
							mm								kg
2	105	111	108	114	42.00	103	187	44	12.7	117	---	3/8-16	31	63	9.4
3	119	129	127	137	45.00	133	211	48	15.9	146	32	3/8-16	64	92	11
4	116	151	146	159	51.00	171	211	54	15.9	146	32	3/8-16	89	117	14
6	167	186	171	191	54.00	220	214	57	19.1	146	32	3/8-16	145	171(1)	20
8	198	217	203	222	61.00	276	214	64	25.4	146	32	3/8-16	196	222(1)	27
10	230	249	235	254	69.00	335	214	71	25.4	146	32	3/8-16	246	273(1)	32
12	268	287	273	292	78.00	405	208	81	31.8	210	51	5/8-11	297	330(1)	54
							Inches								Pounds
2	4.13	4.38	4.25	4.50	1.64	4.06	7.38	1.75	0.50	4.62	---	3/8-16	1.20	2.50	20
3	4.69	50.6	5.00	5.38	1.76	5.25	8.31	1.88	0.62	5.75	1.25	3/8-16	2.50	3.62	25
4	5.44	5.94	5.75	6.25	2.02	6.75	8.31	2.12	0.62	5.75	1.25	3/8-16	3.50	4.62	30
6	6.56	7.31	6.75	7.50	2.14	8.68	8.44	2.25	0.75	5.75	1.25	3/8-16	5.70	6.75(1)	46
8	7.81	8.56	8.00	8.75	2.39	10.88	8.44	2.50	1.00	5.75	1.25	3/8-16	7.70	8.75(1)	60
10	9.06	9.81	9.25	10.00	2.70	13.19	8.44	2.81	1.00	5.75	1.25	3/8-16	9.70	10.75(1)	70
12	10.56	11.31	10.75	11.50	3.08	15.94	8.19	3.19	1.25	8.25	2.00	5/8-11	11.70	13.00(1)	119

1. These size valves when installed between slip-on flanges require flange adapters for complete support.

Figure 4. Dimensions (also see table 5)



NOTE:
FOR NON-CODE MATERIAL THE ASME CLASS REPRESENTS DIMENSIONS NOT PRESSURE TEMPERATURE RATING.
DISK CHORDAL SWING DIA. AT VALVE FACE IS “M”. PLEASE VERIFY CLEARANCE WITH PIPING.

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

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Fisher™ A11 High-Performance Butterfly Valve CL900-2500

The Fisher A11 High-Performance Butterfly Valve maintains tight shutoff, and can be specified for a wide range of pressure and temperature conditions, including cryogenic applications.

The A11 valve is available in a lugged design. A square or keyed shaft can combine with a variety of handlevers, handwheels, or pneumatic piston diaphragm actuators. A splined shaft can combine with a variety of spring-and-diaphragm or pneumatic piston actuators. These combinations help make the A11 valve a reliable, high-performance butterfly valve for both throttling and on-off applications in the process industries.

The A11 valve can be supplied with one of several dynamic seals (figure 1) that can be used in a variety of demanding applications. With the appropriate seal selection and materials of construction, the pressure-assisted seal helps provide excellent shutoff against the full ASME class pressure range for the A11 valve.

W9570-1

Features

- Shaft Versatility— This valve will meet your actuator needs with a choice of square, keyed, or splined shaft connections.
- Excellent Shutoff Integrity— The pressure-assisted seal design provides tight shutoff and permits the use of smaller, less expensive actuators in applications requiring full ASME B16.34 shutoff capabilities.
- Excellent Emissions Capabilities— The optional ENVIRO-SEAL™ packing systems are designed with very smooth shaft surfaces and live-loading to provide improved sealing, guiding, and loading force transmission. The seal of the ENVIRO-SEAL system can control emissions to below 100 ppm (parts per million).
- Sour Service Capability— Trim and bolting materials are available for applications involving sour liquids and gases. These constructions comply with NACE MR0175-2002, MR0103, and MR0175 / ISO 15156.
- High-Temperature/Cryogenic Capabilities— Optional valve constructions allow this valve to meet both high-temperature and cryogenic applications (see table 4 for cryogenic and high-temperature actuator configurations).
- Easy Installation— The valve body self-centers on the line flange bolts as a fast, accurate means of centering the valve in the pipeline.

Features (continued)

- **Reliable Flange Gasketing Surface—** Seal retainer screws are located so there is no interference with the sealing function of either flat sheet or spiral wound line flange gaskets.

- **True Bidirectional Shutoff Performance—** A feature of the valve design is that the torque necessary to open and close the valve is the same regardless of the direction in which the differential pressure is applied.

- **Ease of Maintenance—** Interchangeability of all parts, including shafts and disks, simplifies service and reduces maintenance costs.

Standard Seal Configurations

- **Standard Soft Seal (ETFE CL900, and 1500)—** A resilient dynamic seal with an elastomeric back-up ring for low to moderate temperature applications.

- **High-Pressure Seal (CL900, and 1500)—** This robust, stainless steel seal is available for severe service, cryogenic, and high-temperature applications to 704°C (1300°F), for NACE, and for other applications to 816°C (1500°F).

- **Cryo-Tight Cryogenic Seal—** This resilient dynamic seal is available with or without an aluminum back-up ring for low temperature applications.

Table of Contents

Specifications

Available Configurations and Sizes

Lugged

Available Sizes and Shaft Styles

PRESSURE RATING	VALVE SIZE, NPS		
	Keyed	Square	Splined
CL900	12 to 24 (standard), 3[2] to 10 (optional)	Consult your Emerson sales office	Consult your Emerson sales office
CL1500	3[3] to 20 (standard)		
CL2500	Consult your Emerson sales office		

1. Refers to a valve construction consisting of a CL150 body and trim suitable for a shutoff pressure drop of 150 psid.
2. Sizes NPS 3 and 4 are CL900 bodies with CL600 internals.
3. Sizes NPS 3 and 4 are CL1500 bodies with CL600 internals. Sizes NPS 6 and 8 are CL1500 bodies with CL900 internals.

End Connection Style

Lugged style designed to fit between raised-face mating flanges of appropriate class pressure rating ASME B16.5
NPS 6 through 24: CL900
NPS 10 through 20: CL1500

Maximum Inlet Pressure[1]

Valve Body: Consistent with CL900 and 1500 pressure/temperature ratings per ASME B16.34, see table 9

Seal: See figure 1

Materials of Construction

See table 1
Disk Hard Surfacing: All CL900 and 1500 disk edges must be coated, regardless of the seal type. Metal, Phoenix III and cryogenic seals require the disk to be coated, regardless of the valve class.

Maximum Temperature Capabilities[1]

See table 1

High-Temperature and Cryogenic Applications: See table 4 for available valve and actuator combinations

Shutoff Classification per ANSI/FCI 70-2 and IEC 60534-4

Class VI Soft Seal: Bubble-tight shutoff (exceeds Class VI)
High Pressure Seal: Standard Class V
Cryogenic Seal (Reverse direction only)
CTFE: 10% of Class IV
CTFE with Aluminum Backup Ring: Class VI
Consult Emerson sales office for other shutoff classifications

Flow Characteristic

Modified equal percentage

Flow Coefficients

See Fisher Catalog 12

Noise Levels

See Fisher Catalog 12 for sound pressure level prediction

Available Actuators

Handlever; handwheel; or pneumatic piston, spring return, double-acting, spring and diaphragm

Disk Rotation

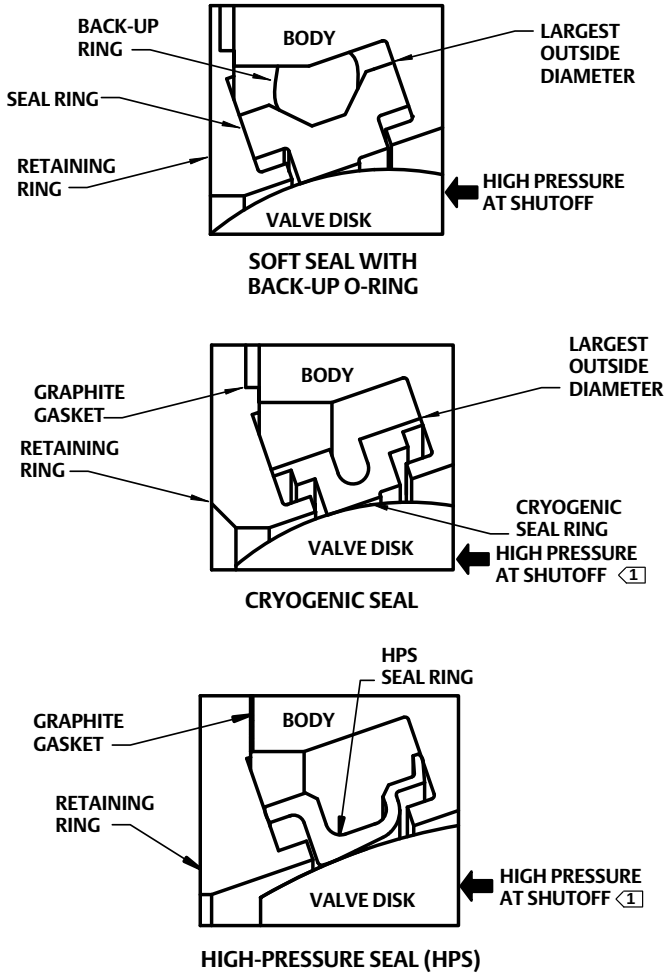
Clockwise (CW) to close

Valve Dimensions and Approximate Weights

See figure 3
For general packing guidelines, see Bulletin 59.3:042 Packing Selection Guidelines for Rotary Valves, (D102093X012)
For information on ENVIRO-SEAL packing system see Bulletin 59.3:041 ENVIRO-SEAL Packing Systems for Rotary Valves, (D101638X012)

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

Figure 1. Available Seal Configurations



Notes:
1 This unidirectional seal must be installed so that the retaining ring is downstream from the high pressure side of the valve at shutoff, as shown.

Installation

Preferred valve orientation for the A11 valve is reverse flow direction. Reverse flow direction is into the side of the valve body opposite the retaining ring or into the shaft side of the disk.

For erosive and many severe service applications, valves with bidirectional seals can and should be installed with the shaft horizontal and in the forward flow direction to prevent direct impingement of the process media on the seal, and to minimize the exposure of the shaft bearings to the process media.

The standard soft seal and the Phoenix III seal both offer bidirectional shutoff. Valves using either metal or cryogenic seals are unidirectional and must be installed in the reverse flow orientation.

For assistance in selecting the appropriate combination of actuator action and open valve position, consult your Emerson sales office or Local Business Partner.

Dimensions and weights for lugged valves are shown in figure 3.

Table 1. Material Temperature Ranges

PART NAME	MATERIAL	TEMP °C	TEMP °F
Valve Body	WCC Steel, SA-516-70 or SA-105	-29 to 427	-20 to 800
	CF8M, CF8, CF3M, CF3	-254 to 538	-425 to 1000
	CF8M, CF8C, CF8(1) FMS 20B16 a Fisher material standard (0.04% min carbon)	over 538 to 816	over 1000 to 1500
	LCC	-45 to 343	-50 to 650
	C12A	-29 to 649	-20 to 1200
	WC9	-29 to 593	-20 to 1100
	CG8M, CG3M, CF8C	-198 to 538	-325 to 1000
Disk	CF8M	-254 to 538	-425 to 1000
	CB7Cu-1	-29 to 427	-20 to 800
Disk Seating Surface Coating	Chrome Plating	-254 to 427	-425 to 800
	Chromium Coat per FFS 2E1	-254 to 593	-425 to 1100
	Chromium Carbide Coating	-254 to 816	-425 to 1500
	CoCr-A (Alloy 6)(3)		
Shaft	S17400 (H1025)	-73 to 427	-100 to 800
	S17400 (H1150M)	-196 to 427	-320 to 800
	N05500(3)	-254 to 482	-425 to 900
	N07718	-254 to 704	-425 to 1300
	S20910(3)	-196 to 593	-320 to 1100
	N07750(3)	over 593 to 816	over 1100 to 1500
Bearings(2)	PEEK	-73 to 260	-100 to 500
	PTFE Composition	-254 to 163	-425 to 325
	S31600 (316 SST Nitrided)	-254 to 816	-425 to 1500
	R30006 (Alloy 6)(3)		
Seal Ring	Soft - ETFE	-54 to 149	-65 to 300
	HPS - S20910(3)	-254 to 649	-425 to 1200
Backup Ring	Used with Soft Seal		
	Fluorocarbon	-29 to 204	-20 to 400
	EPR	-54 to 182	-65 to 360
	Nitrile(3)	-29 to 93	-20 to 200
	Chloroprene(3)	-43 to 149	-45 to 300
	Used with Cryogenic Seal		
	Aluminum(3)	-254 to 149	-425 to 300
Packing	PTFE V-Ring	-254 to 232	-425 to 450
	PTFE ENVIRO-SEAL	-254 to 232	-425 to 450
	Square Ring Graphite for Oxidizing Service	-254 to 538	-425 to 1000
	Square Ring Graphite for Non-oxidizing Service	-254 to 816	-425 to 1500
	Graphite ENVIRO-SEAL	-198 to 315	-325 to 600

1.Special retaining ring screws for lugged valves over 538°C (1000°F).
2. Special thrust bearings are required for high temperature applications over 343°C (650°F) (with 6 and 12 inch extensions). Constructions with carbon steel valves and SST disks may require special thrust bearings at temperatures greater than 343°C (650°F).
3. Special option; contact your Emerson sales office.

Table 2. Trim Descriptions - CL900 and CL1500

Trim Type	Trim Number	Temperature Range	Disk Material	Disk Edge Coating	Seal Type	Seal Material	Shaft	Bearings	Packing[5]
Standard	500[1]	-29 to 149°C -20 to 300°F	CB7Cu-1	Chrome Plated	Soft	ETFE	S17400 H1025	PEEK	PTFE
	502	-46 to 232°C -50 to 450°F	CB7Cu-1	Chrome Plated	HPS	S20910 Nitrided	S17400 H1025	PEEK	PTFE
	504	-40 to 149°C -40 to 300°F	CB7Cu-1	Chrome Plated	Phoenix III	S31600/ETFE	S17400 H1025	PEEK	PTFE
	506[2]	-46 to 427°C -50 to 800°F	CB7Cu-1	Chromium Coat per FFS 2E1	HPS	S20910 Nitrided	S17400 H1025	316 SST Nitrided	Graphite
High-Temperature	514H[3]	-46 to 427°C -50 to 800°F	CB7Cu-1	Chromium Coat per FFS 2E1	HPS	S20910 Nitrided	S17400 H1025	316 SST Nitrided	Graphite
	516H[4]	-46 to 538°C -50 to 1000°F	CF8M	Chromium Coat per FFS 2E1	HPS	S21800 Nitrided	N07718	316 SST Nitrided	Graphite

1. Trim 500 is furnished as standard trim in all CL1500 A11 valves.
2. If operating temperature is above 343°C (650°F), see table 4 for available actuator configurations.
3. Trim includes 6-inch shaft extension.
4. Trim includes 12-inch shaft extension.
5. Consult Bulletin 59.3:042 Packing Selection Guidelines for Rotary Valves, D102093X012, for packing selection guidelines regarding pressure/temperature limits.

Table 3. Cryogenic Shaft Extension Lengths[1]

STANDARD CRYOGENIC EXTENSION LENGTH, INCH FOR VALVE BODY SIZE, NPS										
3	4	6	8	10	12	14	16	18	20	24
14-3/4	17-3/4	19-1/4	26-3/4	28-1/2	33-1/2	36	36	36	36	36

1. Extension length measured from center of valve body to bottom of packing flange.

Table 4. Valve/Actuator Combinations

TEMPERATURE RANGE	SELECTION GUIDELINES	
	1052, 1061, or 2052(1)	G Series(2), FieldQ ™ (4)
-254 to -196°C (-425 to -320°F)	Valve with cryogenic extension and special trim materials(3) and standard actuator	
-196 to -46°C (-320 to -50°F)	Valve with cryogenic extension and trim and standard actuator	
-46 to 343°C (-50 to 650°F)	Valve (select appropriate trim) and standard actuator	
343 to 426°C (650 to 800°F)	**Mounting positions 1 and 3:** Valve (select appropriate trim) and standard actuator **Mounting positions 2 and 4:** Valve with 6-inch extension (select trim 514H or 564H) and standard actuator - ambient temperature may dictate the need for a high-temperature diaphragm	Valve (select appropriate trim) and actuator with high-temperature O-rings option or Valve with 6-inch extension (select trim 514H) and standard actuator
426 to 538°C (800 to 1000°F)	**Mounting positions 1 and 3:** Valve (select appropriate trim) and standard actuator **Mounting positions 2 and 4:** Valve with 6-inch extension (select trim 564H or 514H with N07718 shaft) and standard actuator - ambient temperature may dictate the need for a high-temperature diaphragm	Valve (select appropriate trim) and actuator with high-temperature O-rings option or Valve with 6-inch extension (select trim 564H or 514H with N07718 shaft) and standard actuator
538 to 816°C (1000 to 1500°F)	Valve with 12-inch extension and special trim materials(3) and standard actuator	Valve with 12-inch extension and special trim materials(3) and standard actuator

1. See figure 2 for actuator mounting positions.
2. Select keyed shaft option when using G series actuator.
3. Consult your Emerson sales office.
4. Select square shaft option when using FieldQ actuators.

Figure 2. Mounting Styles and Positions

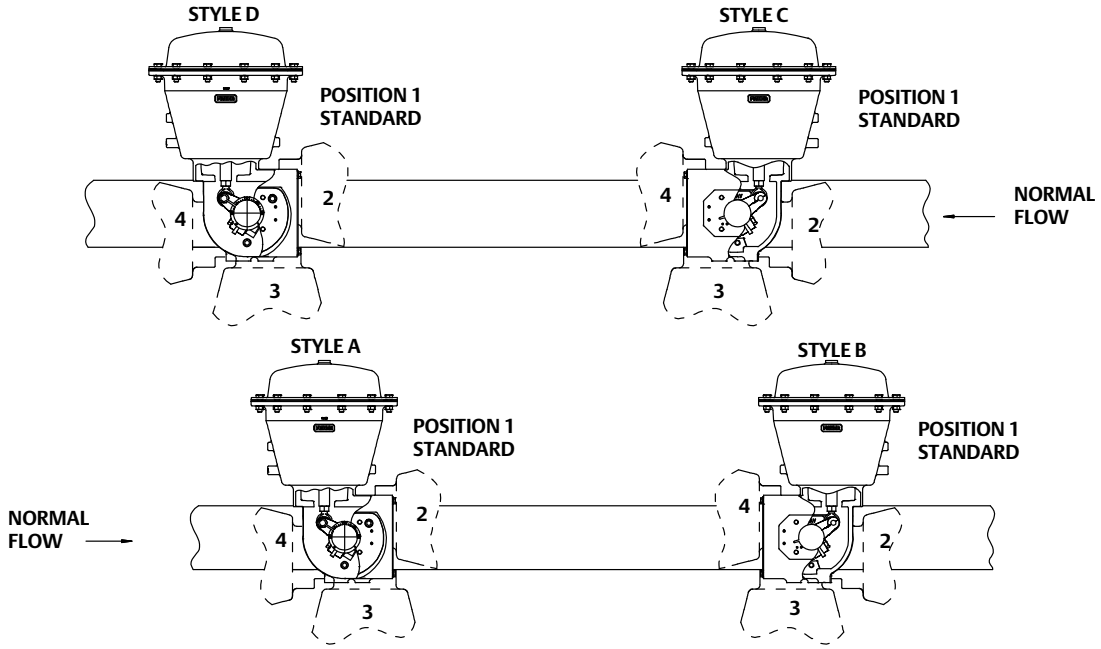


Table 5. Dimensions and Weights Lugged Style CL900

VALVE SIZE, NPS	A	B	C	D	E		F	G	H	K	M(1)	RØ	KEY SQ SIZE	APPROX WEIGHT
					Keyed Shaft	Sq Shaft		Square				Keyed		
	mm													kg
6	381	76	233	233	210	90	67	22	235	46	126	25	6	59.0
8	470	109	305	305	210	90	67	35	273	51	164	38	10	120
10	546	146	353	353	210	95	67	35	273	51	182	44	10	210
12	610	229	445	445	295	---	95	---	337	76	165	57	13	450
14	635	216	451	451	295	---	95	---	337	76	208	57	13	444
16	705	241	438	438	314	---	117	---	337	76	217	70	16	513
18	781	273	524	524	314	---	114	---	337	76	(2)	70	16	703
20	857	292	695	695	314	---	114	---	305	165	284	70	16	991
24	1041	333	657	657	314	---	117	---	572	203	366	95	22	1628
	Inches													lbs
6	15.00	3.00	9.19	9.19	8.25	3.56	2.62	0.87	9.25	1.812	4.98	1.00	1/4	130
8	18.50	4.31	12.00	12.00	8.25	3.75	2.62	1.37	10.75	2.00	6.46	1.50	3/8	264
10	21.50	5.75	13.88	13.88	8.25	3.75	2.62	1.37	10.75	2.00	7.17	1.75	3/8	463
12	24.00	9.00	17.50	17.50	11.62	---	3.75	---	13.25	3.00	6.48	2.25	1/2	993
14	25.00	8.50	17.75	17.75	11.62	---	3.75	---	13.25	3.00	8.17	2.25	1/2	978
16	27.75	9.50	17.25	17.25	12.38	---	4.62	---	13.25	3.00	8.55	2.75	5/8	1132
18	30.76	10.75	20.63	20.63	12.38	---	4.50	---	13.25	3.00	(2)	2.75	5/8	1550
20	33.75	11.50	27.38	27.38	12.38	---	4.50	---	12.00	6.50	11.19	2.75	5/8	2185
24	41.00	13.12	25.88	25.88	12.38	---	4.62	---	22.50	8.00	14.40	3.75	7/8	3590

1. M dimension is the disk chordal swing diameter.
2. Contact your Emerson sales office.

Table 6. Dimensions Lugged Style CL900

VALVE SIZE, NPS	L	J
	mm	
6	See Thread Info Below	See Thread Info Below
8		
10		
12		
14		
16		
18		
20		
24		
VALVE SIZE, NPS	Inches	
6	5/8-11 4 Holes	1-1/8-8 12 Holes
8	3/4-10 4 Holes	1-3/8-8 12 Holes
10	3/4-10 4 Holes	1-3/8-8 16 Holes
12	7/8-9 4 Holes	1-3/8-8 20 Holes
14	7/8-9 4 Holes	1-1/2-8 20 Holes
16	7/8-9 4 Holes	1-5/8-8 20 Holes
18	1-1/4-7 6 Holes	1-7/8-8 20 Holes
20	1-1/4-7 6 Holes	2-8 20 Holes
24	1-1/4-7 6 Holes	2-1/2-8 20 Holes

Table 7. Dimensions and Weights Lugged Style CL1500

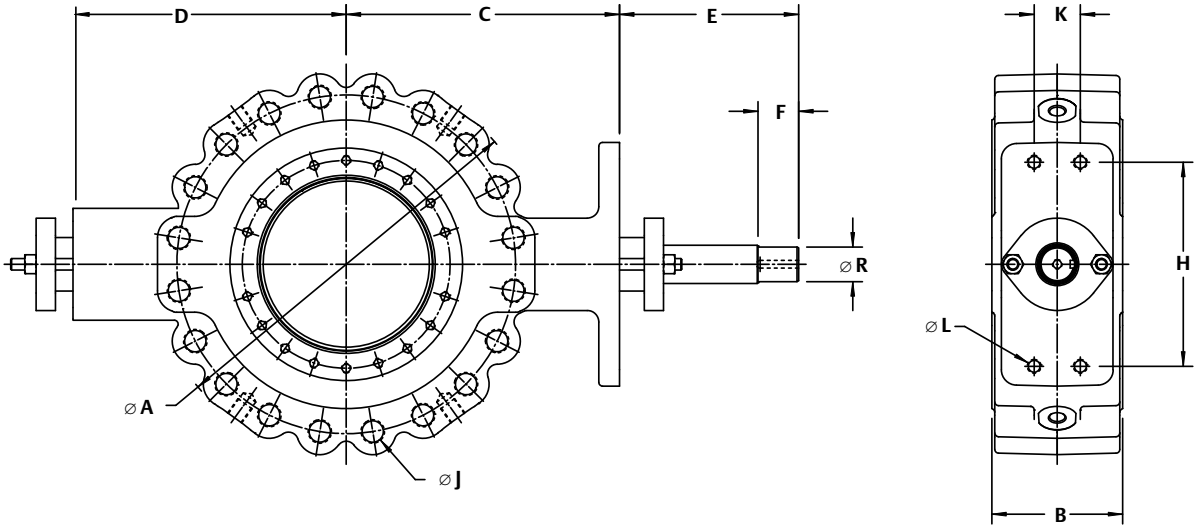
VALVE SIZE, NPS	A	B	C	D	E Keyed Shaft	F	H	K	M(1)	R⌀ Keyed	KEY SQ SIZE	APPROX WEIGHT
	mm											kg
10	584	178	399	399	295	95	337	76	118	57	13	311
12	673	267	445	445	305	105	337	76	(2)	64	16	663
14	754	283	483	483	210	114	337	76	(2)	70	16	810
16	826	321	559	559	314	152	305	152	(2)	70	22	1152
18	914	349	629	629	379	164	508	203	(2)	102	25	1613
20	991	410	682	682	404	171	508	203	(2)	108	25	2250
	Inches											lbs
10	23.00	7.00	15.69	15.69	11.62	3.75	13.25	3.00	4.63	2.25	1/2	685
12	26.50	10.50	17.50	17.50	12.00	4.13	13.25	3.00	(2)	2.50	5/8	1462
14	29.69	11.13	19.00	19.00	8.25	4.50	13.25	3.00	(2)	2.75	5/8	1785
16	32.52	12.63	22.00	22.00	12.38	6.00	12.00	6.00	(2)	2.75	7/8	2540
18	36.00	13.75	24.75	24.75	14.94	6.44	20.00	8.00	(2)	4.00	1	3555
20	39.00	16.13	26.84	26.84	15.89	6.75	20.00	8.00	(2)	4.25	1	4960

1. M dimension is the disk chordal swing diameter.
2. The disk size is less than the face-to-face dimension of this valve. Therefore, the disk chordal swing is not applicable when sizing this valve.

Table 8. Dimensions Lugged Style CL1500

VALVE SIZE, NPS	L	J
	mm	
10	See Thread Info Below	See Thread Info Below
12		
14		
16		
18		
20		
VALVE SIZE, NPS	Inches	
10	7/8-9 4 Holes	1-7/8-8 12 Holes
12	7/8-9 4 Holes	2-8 16 Holes
14	7/8-9 4 Holes	2-1/4-8 16 Holes
16	1-1/4-7 6 Holes	2-1/2-8 16 Holes
18	1-1/4-7 6 Holes	2-3/4-8 16 Holes
20	1-1/4-7 6 Holes	3-8 16 Holes

Figure 3. Dimensions Lugged Style CL900 and CL1500 (also see tables 5 and 7)



Pressure Drops

Pressure drop limits of any given valve are based on valve body, and trim material limits. To find the appropriate pressure drop limitation, choose the desired valve size and temperature range. Then search table 9 for body limitations and tables 10 and 11 for trim limitations. Information on limits for S31254, CW2M, M35-1 and other alloy constructions can be obtained by contacting your Emerson sales office or Local Business Partner. The lowest number from the tables is the appropriate limit. **The tables for both trim and body limits must be consulted.**

Table 9. Maximum Allowable Shutoff Pressure Drops (Valve Ratings) Based on Carbon Steel and Stainless Steel Valve Types(1) (The tables for both trim and body limits must be consulted)

TEMPERATURE RANGE	PRESSURE RANGE			
	CL900		CL1500	
	WCC	CF8M	WCC	CF8M
°C	Bar			
-254 to -29	- - -	148.9	- - -	248.2
-29 to 38	155.1	148.9	258.6	248.2
93	155.1	128.2	258.6	213.4
149	150.7	115.8	251.0	192.7
204	145.5	106.2	242.7	177.2
260	137.6	98.9	229.3	164.8
316	125.1	93.4	208.6	155.5
343	121.7	91.4	202.7	152.4
371	114.8	90.0	191.3	149.6
399	104.8	88.3	174.8	147.2
427	85.2	87.2	141.7	145.5
454	- - -	86.5	- - -	144.1
482	- - -	85.8	- - -	143.1
510	- - -	80.0	- - -	133.1
538	- - -	75.2	- - -	125.5
°F	Psi			
-450 to -20	- - -	2160	- - -	3600
-20 to 100	2250	2160	3750	3600
200	2250	1860	3750	3095
300	2185	1680	3640	2795
400	2110	1540	3520	2570
500	1995	1435	3325	2390
600	1815	1355	3025	2255
650	1765	1325	2940	2210
700	1665	1305	2775	2170
750	1520	1280	2535	2135
800	1235	1265	2055	2110
850	- - -	1255	- - -	2090
900	- - -	1245	- - -	2075
950	- - -	1160	- - -	1930
1000	- - -	1090	- - -	1820

1. For pressure/temperature rating of other materials, contact your Emerson sales office.

Table 10. Maximum Allowable Shutoff Pressure Drops, CL900(1, 2)

TRIM NUMBER	TEMP RANGE	NPS 6	NPS 8	NPS 10	NPS 12	NPS 14	NPS 16	NPS 18	NPS 20	NPS 24
	°C	Bar								
500	-46 to 38	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4
	38 to 93	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8
	93 to 121	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4
	121 to 149	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
502	-46 to 38	100.0	155.1	110.7	155.1	146.6	154.2	151.9	120.0	128.7
	38 to 149	84.6	146.2	110.7	150.7	146.5	139.3	139.1	120.0	128.6
	149 to 232	78.8	140.4	110.7	141.7	141.7	131.5	134.1	120.0	128.7
504	-46 to 38	103.4	103.4	103.4	103.4	103.4	103.4	103.4	91.0	92.8
	38 to 93	96.5	96.5	96.5	96.5	96.5	96.5	96.5	91.0	92.8
	93 to 121	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1
	121 to 149	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
506	-46 to 38	81.1	122.2	78.5	131.3	104.1	119.8	118.7	82.5	89.9
	38 to 149	67.6	122.2	78.5	131.3	104.1	103.4	118.7	82.5	89.9
	149 to 232	62.6	122.2	78.5	131.3	104.1	97.4	118.7	82.5	89.9
	232 to 343	58.1	121.3	78.5	121.3	104.1	91.8	118.7	82.5	89.9
	343 to 427	55.5	105.1	78.5	105.1	104.1	88.7	105.1	82.5	89.9
514H, 516H	343 to 427	55.5	105.1	78.5	105.1	104.1	88.7	105.1	82.5	89.9
514H(3), 516H	427 to 538	70.4	62.5	58.7	88.0	48.9	39.1	37.2	52.8	43.0
TRIM NUMBER	°F	Psi								
500	-50 to 100	1500	1500	1500	1500	1500	1500	1500	1500	1500
	100 to 200	1100	1100	1100	1100	1100	1100	1100	1100	1100
	200 to 250	600	600	600	600	600	600	600	600	600
	250 to 300	100	100	100	100	100	100	100	100	100
502	-50 to 100	1451	2250	1606	2250	2126	2237	2203	1741	1866
	100 to 300	1227	2120	1606	2185	2125	2020	2017	1741	1865
	300 to 450	1143	2036	1606	2055	2055	1907	1945	1741	1866
504	-50 to 100	1500	1500	1500	1500	1500	1500	1500	1320	1346
	100 to 200	1400	1400	1400	1400	1400	1400	1400	1320	1346
	200 to 250	900	900	900	900	900	900	900	900	900
	250 to 300	300	300	300	300	300	300	300	300	300
506	-50 to 100	1176	1773	1138	1905	1510	1737	1721	1197	1304
	100 to 300	980	1773	1138	1905	1510	1500	1721	1197	1304
	300 to 450	908	1773	1138	1905	1510	1412	1721	1197	1304
	450 to 650	842	1760	1138	1760	1510	1332	1721	1197	1304
	650 to 800	805	1525	1138	1525	1510	1286	1525	1197	1304
514H, 516H	650 to 800	805	1525	1138	1525	1510	1286	1525	1197	1304
514H(3), 516H	800 to 1000	1021	907	851	1276	709	567	539	766	624

1. Consult your Emerson sales office if higher pressure drops are required.
2. Consult Bulletin 59.3:042 Packing Selection Guidelines for Rotary Valves, D102093X012, for packing selection guidelines regarding pressure/temperature limits.
3. Trim 514H with optional N07718 shaft.

Table 11. Maximum Allowable Shutoff Pressure Drops, CL1500[1, 2]

TRIM NUMBER	TEMP RANGE	NPS 10	NPS 12	NPS 14	NPS 16	NPS 18	NPS 20
	°C	Bar					
500	-46 to 38	103.4	103.4	103.4	103.4	103.4	103.4
	38 to 93	75.8	75.8	75.8	75.8	75.8	75.8
	93 to 121	41.4	41.4	41.4	41.4	41.4	41.4
	121 to 149	6.9	6.9	6.9	6.9	6.9	6.9
502	-46 to 38	155.1	155.1	155.1	155.1	155.1	155.1
	38 to 149	155.0	155.1	155.1	155.1	155.1	155.1
	149 to 232	146.1	155.1	155.1	155.1	155.1	155.1
504	-46 to 38	103.4	103.4	103.4	103.4	103.4	103.4
	38 to 93	96.5	96.5	96.5	96.5	96.5	96.5
	93 to 121	62.1	62.1	62.1	62.1	62.1	62.1
	121 to 149	20.7	20.7	20.7	20.7	20.7	20.7
506	-46 to 38	133.5	155.1	116.5	139.5	155.1	155.1
	38 to 149	114.2	155.1	116.5	139.5	155.1	155.1
	149 to 232	107.1	155.1	116.5	139.5	155.1	155.1
	232 to 343	100.6	155.1	116.5	139.5	155.1	155.1
	343 to 427	96.9	155.1	116.5	139.5	155.1	155.1
514H, 516H	343 to 427	96.9	155.1	116.5	139.5	155.1	155.1
514H[3], 516H	427 to 538	78.2	70.4	86.0	78.2	66.5	74.3
TRIM NUMBER	**°F**	**Psi**					
500	-50 to 100	1500	1500	1500	1500	1500	1500
	100 to 200	1100	1100	1100	1100	1100	1100
	200 to 250	600	600	600	600	600	600
	250 to 300	100	100	100	100	100	100
502	-50 to 100	2250	2250	2250	2250	2250	2250
	100 to 300	2248	2250	2250	2250	2250	2250
	300 to 450	2119	2250	2250	2250	2250	2250
504	-50 to 100	1500	1500	1500	1500	1500	1500
	100 to 200	1400	1400	1400	1400	1400	1400
	200 to 250	900	900	900	900	900	900
	250 to 300	300	300	300	300	300	300
506	-50 to 100	1936	2250	1689	2024	2250	2250
	100 to 300	1657	2250	1689	2024	2250	2250
	300 to 450	1553	2250	1689	2024	2250	2250
	450 to 650	1459	2250	1689	2024	2250	2250
	650 to 800	1405	2250	1689	2024	2250	2250
514H, 516H	650 to 800	1406	2250	1689	2024	2250	2250
514H[3], 516H	800 to 1000	1134	1021	1248	1134	964	1077

1. Consult your Emerson sales office if higher pressure drops are required.
2. Consult Bulletin 59.3:042 Packing Selection Guidelines for Rotary Valves, D102093X012, for packing selection guidelines regarding pressure/temperature limits.
3. Trim 514H with optional N07718 shaft.

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

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Fisher™ A31A Cryogenic High Performance Butterfly Valve

The Fisher A31A Cryogenic High Performance Butterfly Valve (HPBV) is designed for extreme temperature cryogenic services and features a valve body extension which positions the packing system and the actuator away from the extreme temperatures. The NPS 3 through 12 valves feature a unique one-piece investment cast extension housing. The NPS 14 through 24 valves employ a two-piece fabricated extension housing. The valve also features a metal NOVEX seal as standard providing tight shutoff, low operating torques and the rugged durability needed for cryogenic service.

The A31A Cryogenic HPBV has been developed as a valve/actuator package with a Double D drive shaft (standard for NPS 3 through 12) to allow easy, direct mounting to the Fisher 1035 Rack and Pinion actuator, eliminating the need for external coupling systems. Also available are keyed shaft (standard for NPS 14 through 24) and splined drive shafts to allow easy mounting to other Fisher actuators.

The A31A Cryogenic HPBV is available in either flangeless (wafer) or single flange styles, and S31600 is the standard valve body and disk material. This valve is offered in full rated CL150 and CL300 pressure classes.

W7451-1

FISHER A31A CRYOGENIC VALVE WITH 1035 ACTUATOR

Specifications

Valve Body Sizes and Ratings

NPS ■ 3, ■ 4, ■ 6, ■ 8, ■ 10, and ■ 12
CL150 and 300
■ NPS 14 through 24 valves are also available in CL150 and 300

End Connection Style

■ Flangeless, wafer-style or ■ single flange valve body designed to fit between raised-face mating flanges per ASME B16.5 CL150 or 300

Maximum Inlet Pressure/Temperature(1)

Consistent with CL150 and CL300 pressure/temperature ratings per ASME B16.34, except that 38°C (100°F) rating is applicable to -254°C (-425°F). NOVEX seal maximum pressure/temperature rating is the same as the valve body. See figure 3 for rating of CTFE seal.

Temperature Range(1)

-234 to 260°C (-425 to 500°F)

Available Seal Configurations

See figure 2 and table 2

Standard Construction Materials

Valve Body and Disk: ASTM grades of S31600 stainless steel
Disk Coating:Hardcoating Standard (Chrome or Nickel)
Shaft: ■ ASTM grade of S17400 H1150M SST, ■ N05500 (Optional), ■ N07718 (Optional)
Seal Ring: ■ S31600 NOVEX Std for CL 150, ■ S21800 NOVEX Std for CL300, ■ CTFE(2) optional, or ■ CTFE(2) with Aluminum Back-up ring optional
Packing: ■ PTFE V-ring, or ■ graphite (optional)
Bearings: ■ PTFE Composition, or ■ bronze (optional)

Valve Body Classification

Face-to-face dimensions are in compliance with MSS SP68 and API 609 standards; valve bodies are designed for installation between ASME B16.5 CL150 or 300 raised-face flanges

Shutoff Classification

Unidirectional Reverse flow. Per ANSI/FCI 70-2 and IEC 60534-4 at ambient temperature

NOVEX Seal: Class VI

CTFE Seal with Aluminum back-up ring: Class VI

Flow Characteristic

Modified equal percentage

Flow Coefficients

See Fisher Catalog 12

Noise Levels

See Catalog 12 for sound pressure level prediction

Available Actuators

■ Rack and Pinion 1035 for NPS 3 through 12,
■ Bettis G Series for keyed shaft NPS 14 through 24 or
■ Rotary Diaphragm 1051 and 1052 for splined shafts

Disk Rotation

Clockwise to close

Valve Dimensions and Approximate Weights

See figures 5, 6, 7, 8, 9, 10, 11, and 12 and tables 1, 3, 4, 5, 6, 7, 8, 9, and 10.

1. The pressure/temperature limits in this bulletin, and any application code or standard limitation, should not be exceeded.
2. CTFE not recommended for fast cycling, less than 2 seconds.

Figure 1. Fisher A31A Cryogenic Valve, Single Flange Style

W7449

Table 1. Approximate Weights

VALVE SIZE, NPS	WAFER CL150		SINGLE FLANGE CL150		WAFER CL300		SINGLE FLANGE CL300	
	kg	lbs	kg	lbs	kg	lbs	kg	lbs
3	12	27	16	36	12	27	16	35
4	21	46	22	48	21	46	24	52
6	24	53	28	61	24	53	28	61
8	34	75	40	89	47	104	52	115
10	57	125	67	148	80	176	100	220
12	74	164	93	206	103	227	135	298
14	87	191	120	265	142	314	249	548
16	133	294	182	401	213	470	325	716
18	170	374	231	510	259	570	434	956
20	210	463	302	665	401	884	582	1282
24	326	719	455	1004	512	1128	863	1903

Features

- Cryogenic Seal Improvement— The NOVEX pressure-assisted metal seal design provides tight shutoff (ANSI Class VI, ambient) and permits the use of smaller, less expensive actuators in applications requiring full ASME B16.34 shutoff capabilities. The NOVEX seal is standard on all A31A Cryogenic valves.

- Direct Actuation—The A31A Cryogenic NPS 3 through 8 Double D shaft allows direct mounting with the 1035 actuator, eliminating the need for a coupler.

- Excellent Shutoff Integrity—Concentric rotation enables the valve disk to remain in the closed position in spite of line pressure surges or actuator failure.

- Safety—Redundant shaft retention provides added protection. The packing follower and shaft step interact to hold the shaft securely in the valve body. The NPS 3 through 12 valves use a one-piece packing follower, and the NPS 14 through 24 valves use a two-piece follower (see figure 4).

- Strength— The cast S31600 one-piece extensions are welded directly onto the NPS 3 through 8 valves for greater strength under service conditions.

- Easy Installation—The valve body self-centers on the line flange bolts as a fast, accurate means of centering the valve in the pipeline.

- Reliable Flange Gasketing Surface—Seal retainer screws are located so there is no interference with the sealing function of either flat sheet or spiral wound line flange gaskets.

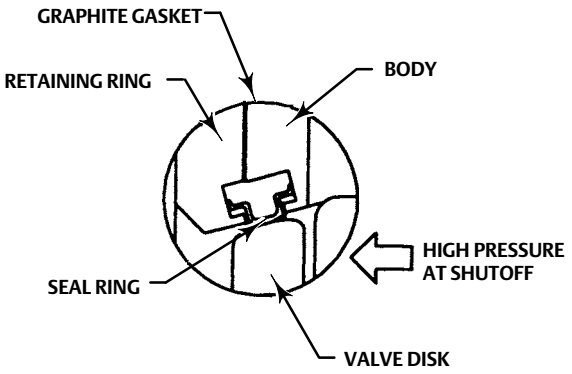
Installation

Recommended installation for the A31A Cryogenic valve is with the shaft upstream of the seal (reverse flow).

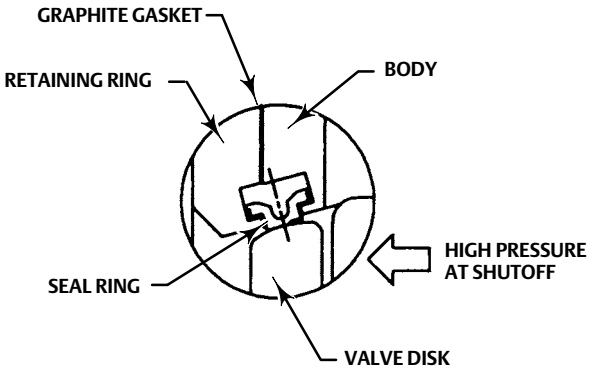
Dimensions for wafer-style and single-flange valves are shown in figures 5, 6, 7, 8, 9, 10, 11, and 12 and tables 3, 4, 5, 6, 7, 8, 9 and 10.

For assistance in selecting the appropriate combination of actuator action and open valve position, consult your Emerson sales office.

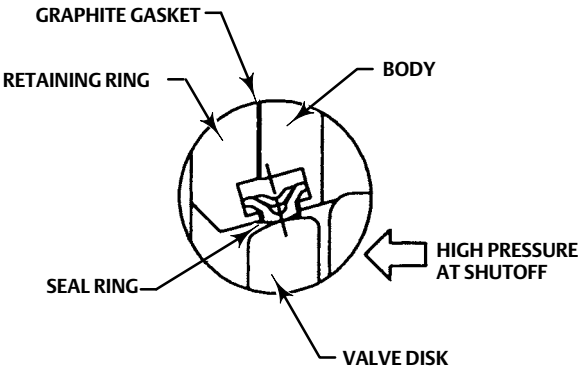
Figure 2. Available Seal Configurations



NOVEX SEAL



CTFE SEAL



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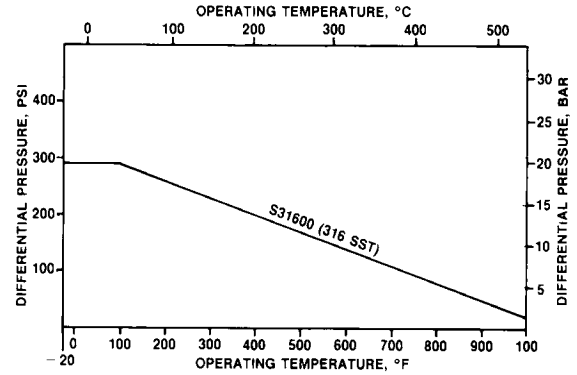
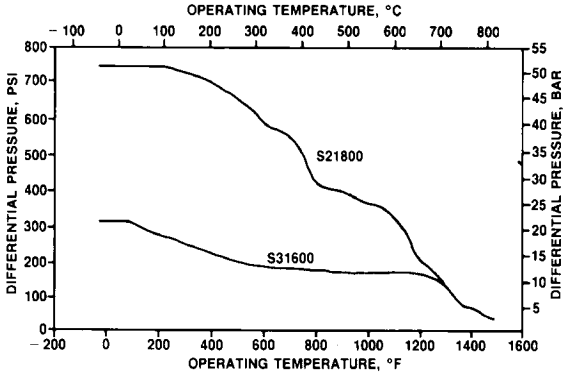
CTFE / ALUM SEAL

Figure 3. Maximum Pressure/Temperature Ratings

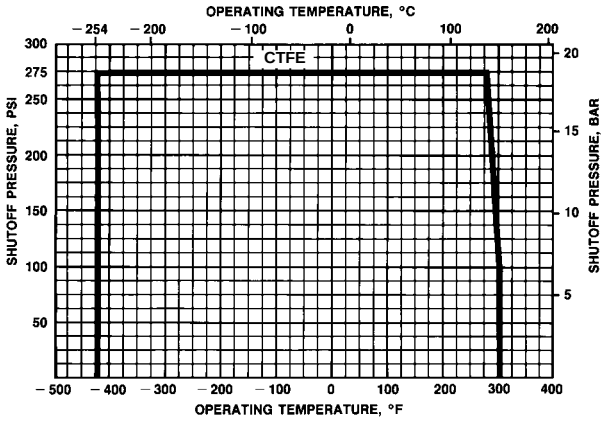


CL150, NOVEX SEAL

C0759-1



CL300, NOVEX SEAL



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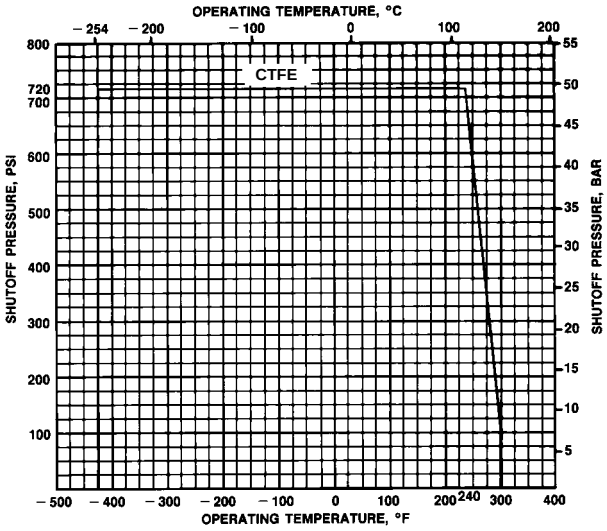
CL150, CTFE SEAL



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CL300, CTFE SEAL

Table 2. Material Temperature Ratings

COMPONENT AND MATERIAL OF CONSTRUCTION		TEMPERATURE RANGE	
		°C	°F
Valve Body			
CF8M (316 SST) CL150 and 300		-254 to 260	–425 to 500
Disk			
CF8M (316 SST)		-254 to 260	–425 to 500
Disk Coating			
Hard Coating(1)		-254 to 260	–425 to 500
Shaft			
S17400 H1150M (standard)		-196 to 260	–320 to 500
N05500		-198 to 260	-325 to 500
N07718		-254 to 260	-425 to 500
Bearings			
PTFE Composition Rexnord (standard)		-254 to 163	–425 to 325
Bronze		-254 to 260	–425 to 500
Packing			
PTFE Packing (standard)		-254 to 232	–425 to 450
Graphite		-254 to 260	-425 to 500
Seal Ring	NOVEX S31600 Seal Ring (CL150) (standard)	-254 to 260	-425 to 500
	NOVEX S21800 Seal Ring (CL300) (standard)	-254 to 260	-425 to 500
	CTFE Cryogenic Seal Ring	-254 to 149	-425 to 300

1. The material for hard coating on the disk is either hard chrome plating or Electroless Nickel Coating (ENC) depending upon availability.

Figure 4. Anti-Blowout Protection

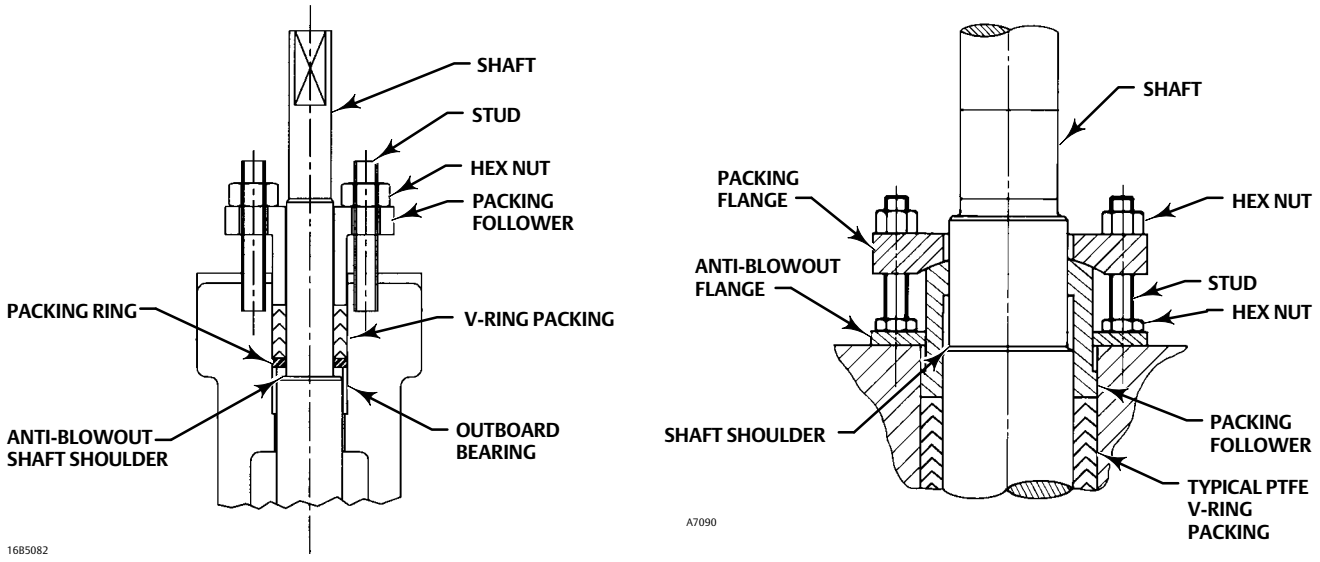


Table 3. Dimensions, Wafer Style Valves, CL150, NPS 3 through 8

VALVE SIZE, NPS	A	D	E	F	F1	G	J	K	M(2)	R(1)	S	T	U	V	FLAT LENGTH	FLAT SIZE
	mm															
3	48	87	83	10	19	79	146	375	71	133	16	152	32	117	25	11
4	54	113	83	22	25	95	178	451	94	171	19	152	32	117	25	14
6	57	165	83	41	51	127	248	489	148	219	25	152	32	117	25	17
8	64	210	83	65	68	152	---	679	197	273	25	152	32	117	25	17
	Inches															
3	1.88	3.44	3.25	0.38	0.75	3.13	5.75	14.75	2.82	5.25	0.625	6.0	1.25	4.63	1.0	0.436
4	2.13	4.44	3.25	0.88	1.0	3.75	7.0	17.75	3.69	6.75	0.75	6.0	1.25	4.63	1.0	0.561
6	2.25	6.50	3.25	1.63	2.0	5.0	9.75	19.25	5.82	8.63	1	6.0	1.25	4.63	1.0	0.687
8	2.50	8.25	3.25	2.57	2.69	6.0	---	26.75	7.75	10.75	1	6.0	1.25	4.63	1.0	0.687

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. Minimum I.D. is the minimum pipe or flange I.D. required for disk swing clearance.

Figure 5. Dimensions, Wafer Style Valves, CL150, NPS 3 through 8 (also see table 3)

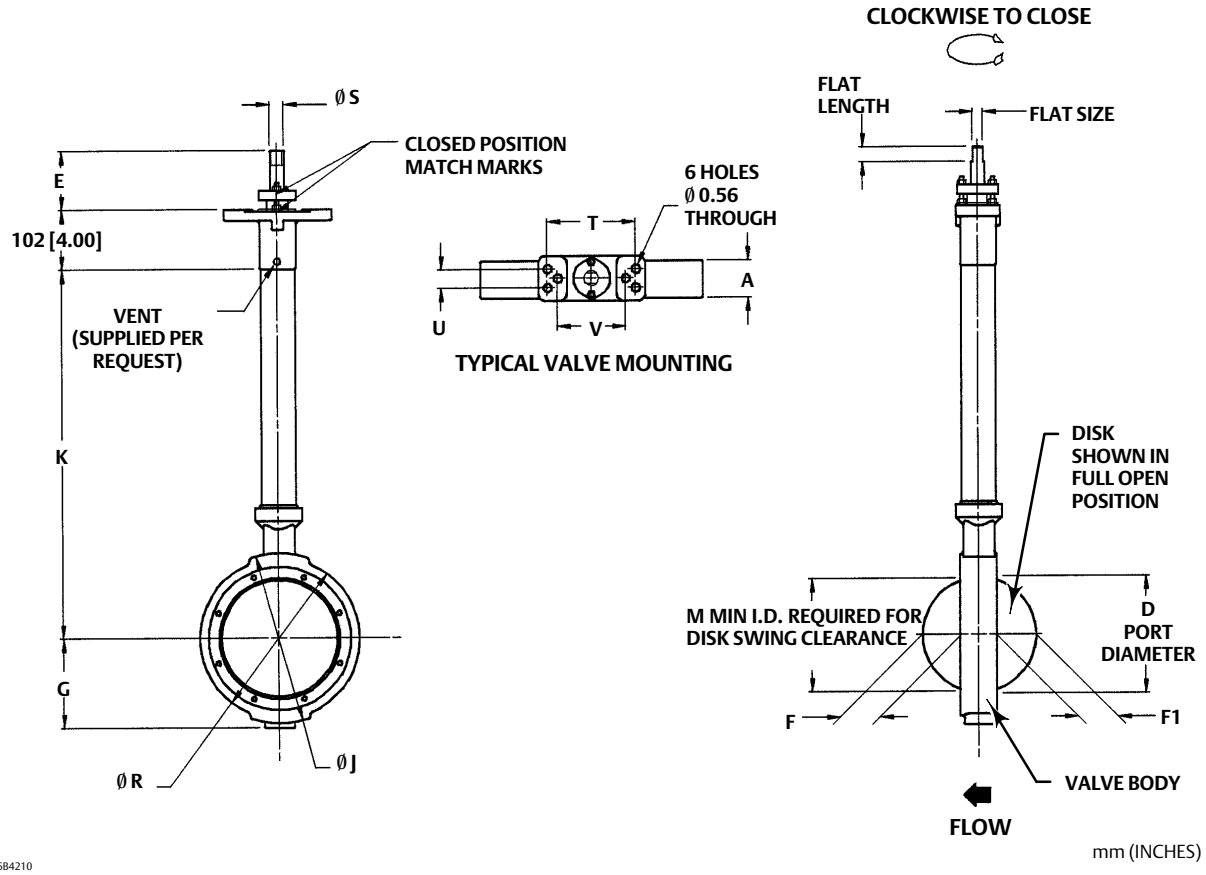


Table 4. Dimensions, Single Flange Style Valves, CL150, NPS 3 through 8

VALVE SIZE, NPS	A	D	E	F	F1	J	K	M(2)	R(1)	S	T	U	V	W	FLAT LENGTH	FLAT SIZE
	mm															
3	48	87	83	10	19	152	375	71	207	16	152	32	117	See thread information below	25	11
4	54	113	83	22	25	191	451	94	238	19	152	32	117		25	14
6	57	165	83	41	51	241	489	148	308	25	152	32	117		25	17
8	64	210	83	65	68	298	679	197	336	25	152	32	117		25	17
	Inches															
3	1.88	3.44	3.25	0.375	0.75	6.0	14.75	2.82	8.25	0.625	6.0	1.25	4.63	0.625-11 4 holes	1.0	0.436
4	2.13	4.44	3.25	0.875	1.0	7.5	17.75	3.69	9.38	0.75	6.0	1.25	4.63	0.625-11 8 holes	1.0	0.561
6	2.25	6.50	3.25	1.63	2.0	9.5	19.25	5.82	12.13	1	6.0	1.25	4.63	0.75-10 8 holes	1.0	0.687
8	2.50	8.25	3.25	2.57	2.69	11.75	26.75	7.75	13.25	1	6.0	1.25	4.63	0.75-10 8 holes	1.0	0.687

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. Minimum I.D. is the minimum pipe or flange I.D. required for disk swing clearance.

Figure 6. Dimensions, Single Flange Style Valves, CL150, NPS 3 through 8 (also see table 4)

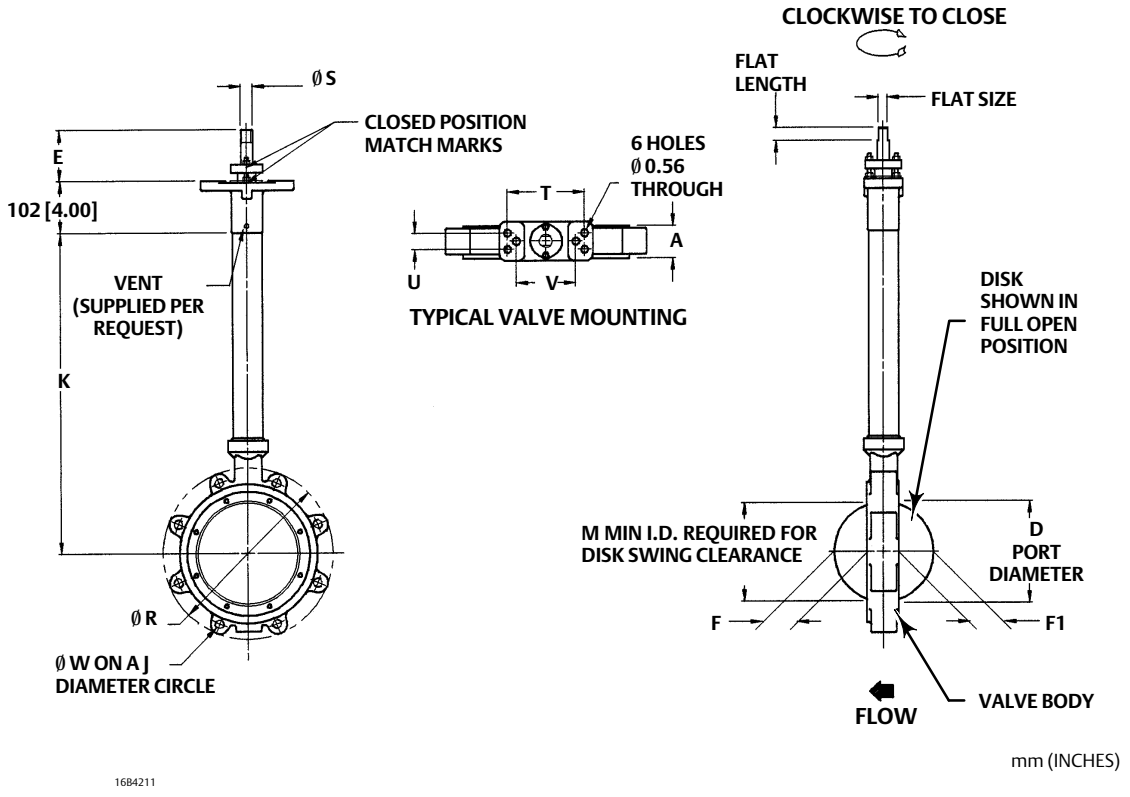


Table 5. Dimensions, Wafer Style valves, CL300, NPS 3 through 6

VALVE SIZE, NPS	A	D	E	F	F1	G	J	K	M(2)	R(1)	S	T	U	V	FLAT LENGTH	FLAT SIZE
	mm															
3	48	87	83	10	19	79	146	375	71	133	16	152	32	117	25	11
4	54	113	83	22	25	95	178	451	94	171	19	152	32	117	25	14
6	57	164	83	41	48	127	248	489	146	219	25	152	32	117	25	17
	Inches															
3	1.88	3.44	3.25	0.375	0.75	3.13	5.75	14.75	2.81	5.25	0.625	6.0	1.25	4.63	1.0	0.436
4	2.13	4.44	3.25	0.875	1.0	3.75	7.0	17.75	3.69	6.75	0.75	6.0	1.25	4.63	1.0	0.561
6	2.25	6.44	3.25	1.63	1.88	5.0	9.75	19.25	5.75	8.63	1	6.0	1.25	4.63	1.0	0.687

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. Minimum I.D. is the minimum pipe or flange I.D. required for disk swing clearance.

Figure 7. Dimensions, Wafer Style valves, CL300, NPS 3 through 6 (also see table 5)

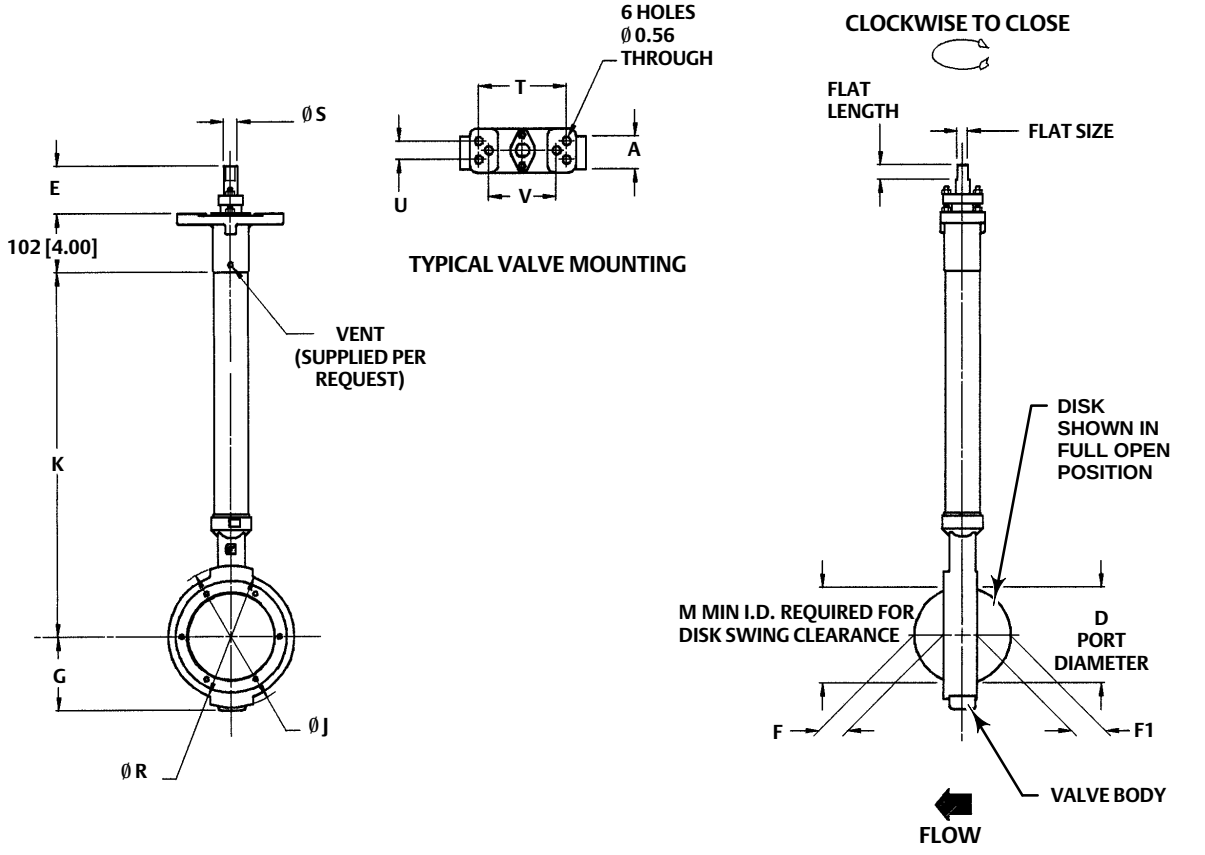


Table 6. Dimensions, Single Flange Style Valves, CL300, NPS 3 through 6

VALVE SIZE, NPS	A	D	E	F	F1	J	K	M(2)	R(1)	S	T	U	V	W	FLAT LENGTH	FLAT SIZE
	mm															
3	48	87	83	10	19	168	375	71	207	16	152	32	117	See thread information below	25	11
4	54	113	83	22	25	200	451	94	238	19	152	32	117		25	14
6	57	164	83	41	48	270	489	146	308	25	152	32	117		25	17
	Inches															
3	1.88	3.44	3.25	0.375	0.75	6.63	14.75	2.81	8.13	0.625	6.0	1.25	4.63	0.75-10 8 holes	1.0	0.436
4	2.13	4.44	3.25	0.875	1.0	7.88	17.75	3.69	9.75	0.75	6.0	1.25	4.63	0.75-10 8 holes	1.0	0.561
6	2.25	6.44	3.25	1.63	1.88	10.63	19.25	5.75	12.63	1	6.0	1.25	4.63	0.75-10 12 holes	1.0	0.687

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. Minimum I.D. is the minimum pipe or flange I.D. required for disk swing clearance.

Figure 8. Dimensions, Single Flange Style Valves, CL300, NPS 3 through 6 (also see table 6)

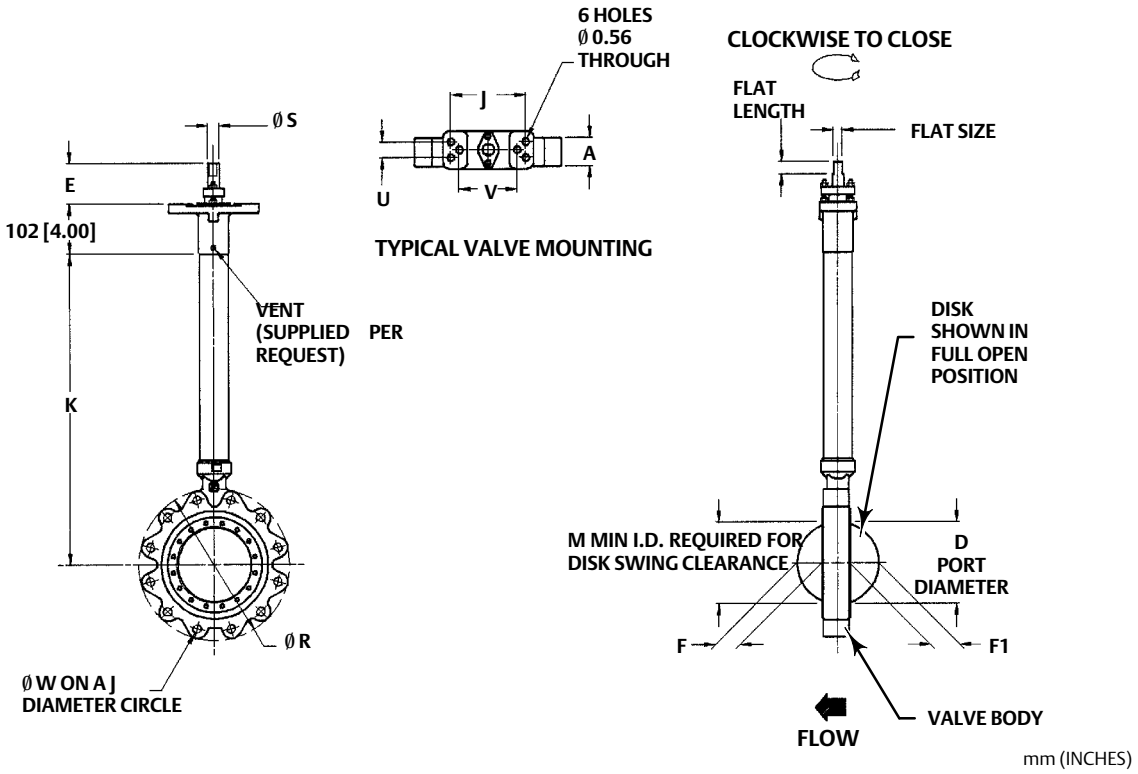


Table 7. Dimensions, Wafer Style Valve, CL150, NPS 10 through 24

VALVE SIZE, NPS	A(1)	D	E	F	F1	G	J	K	M(2)	R	S(3)	T	U	W
	mm													
10	71	265	89	83	98	187	---	724	254	337	32	235	46.0	---
12	81	316	89	105	113	224	406	851	298	381	38	235	46.0	---
14	92	338	102	122	117	240	476	914	330	448	30.2	235	46.0	29
16	102	384	102	143	133	276	540	914	378	511	31.8	235	46.0	29
18	114	432	102	162	149	341	578	914	429	533	38.1	273	50.8	32
20	127	479	102	182	162	375	635	914	470	584	44.5	273	50.8	32
24	154	594	102	227	203	432	749	914	575	692	57.2	337	76.2	35
	Inches													
10	2.82	10.44	3.5	3.25	3.81	7.38	---	28.5	10	13.25	1.25	9.25	1.81	---
12	3.19	12.44	3.5	4.13	4.44	8.82	16.0	33.5	11.75	15.0	1.5	9.25	1.81	---
14	3.6	13.3	4	4.80	4.61	9.45	18.75	36	13	17.64	1.1875	9.25	1.81	1.125
16	4	15.1	4	5.63	5.25	10.87	21.25	36	14.88	20.11	1.25	9.25	1.81	1.125
18	4.5	17	4	6.38	5.87	13.43	22.75	36	16.89	21	1.5	10.75	2.00	1.25
20	5	18.86	4	7.17	6.38	14.75	25	36	18.5	23	1.75	10.75	2.00	1.25
24	6.06	23.38	4	8.94	8	17	29.5	36	22.64	27.25	2.25	13.25	3.00	1.375

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. Minimum I.D. is the minimum pipe or flange I.D. required for disk swing clearance.
3. Shaft diameter at key.

Figure 9. Dimensions, Wafer Style Valve, CL150, NPS 10 through 24 (see also table 7)

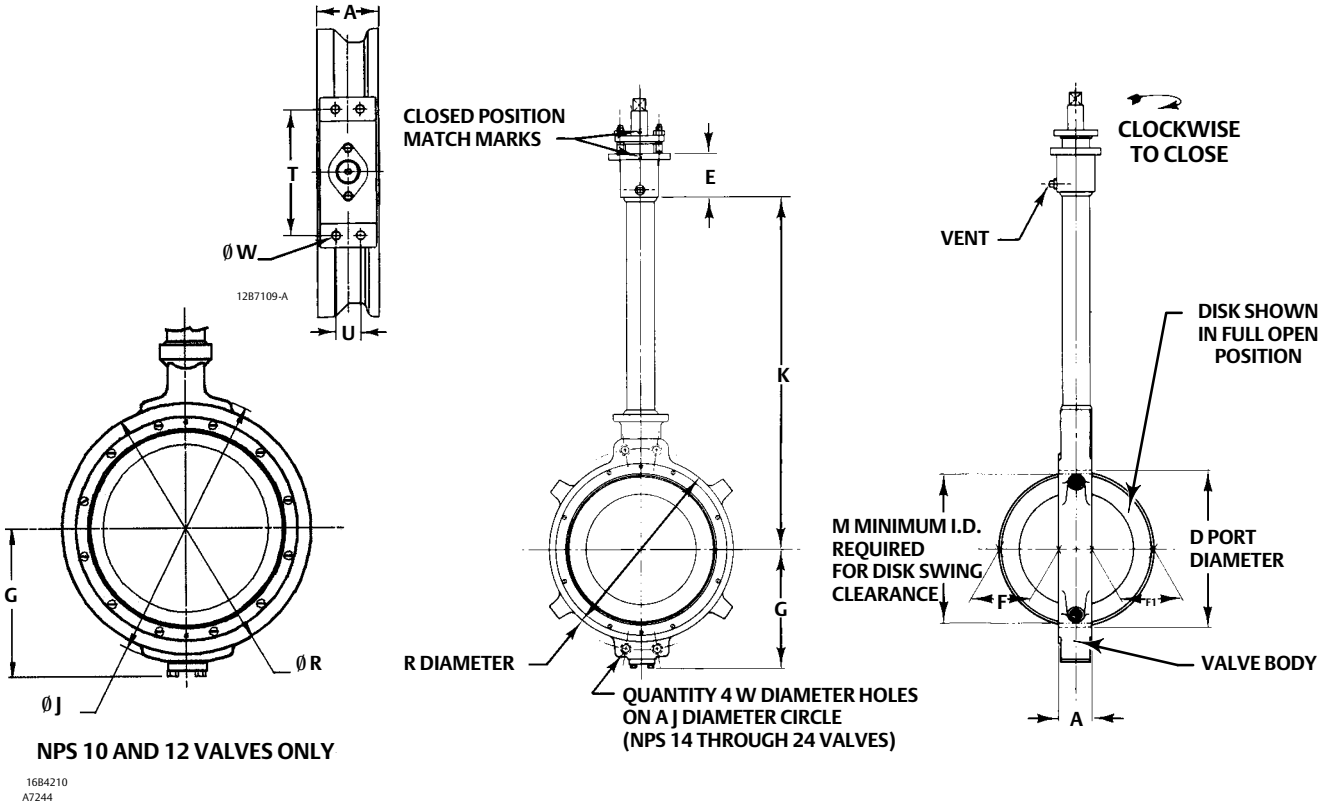


Table 8. Dimensions, Single Flange Style Valve, CL150, NPS 10 through 24

VALVE SIZE, NPS	A(1)	D	E	F	F1	G	J	K	M(2)	R	S(3)	T	U	W
	mm													
10	71	265	89	83	98	---	362	724	254	406	32	235	46.0	See thread information below
12	81	316	89	105	113	---	432	851	298	476	32	235	46.0	
14	92	338	102	122	117	240	476	914	330	533	30.2	235	46.0	
16	102	384	102	143	133	316	540	914	378	597	31.8	235	46.0	
18	114	432	102	162	149	341	578	914	429	635	38.1	273	50.8	
20	127	479	102	182	162	375	635	914	470	705	44.5	273	50.8	
24	154	594	102	227	203	432	749	914	575	813	57.2	337	76.2	
	Inches													
10	2.82	10.44	3.5	3.25	3.82	---	14.25	28.5	10.0	16.0	1.25	9.25	1.81	0.875-9 12 holes
12	3.19	12.44	3.5	4.13	4.38	---	17.0	33.5	11.75	18.75	1.25	9.25	1.81	0.875-9 12 holes
14	3.62	13.30	4	4.8	4.60	9.45	18.75	36	13	21	1.1875	9.25	1.81	1-8 12 holes
16	4	15.12	4	5.63	5.25	12.44	21.25	36	14.88	23.5	1.25	9.25	1.81	1-8 16 holes
18	4.5	17	4	6.38	5.86	13.43	22.75	36	16.89	25	1.5	10.75	2.00	1.125-8 16 holes
20	5	18.85	4	7.17	6.38	14.75	25	36	18.50	27.75	1.75	10.75	2.00	1.125-8 20 holes
24	6.06	23.38	4	8.94	8	17	29.50	36	22.64	32	2.25	13.25	3.00	1.25-8 20 holes

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. Minimum I.D. is the minimum pipe or flange I.D. required for disk swing clearance.
3. Shaft diameter at key.

Figure 10. Dimensions, Single Flange Style Valve, CL150, NPS 10 through 24 (see also table 8)

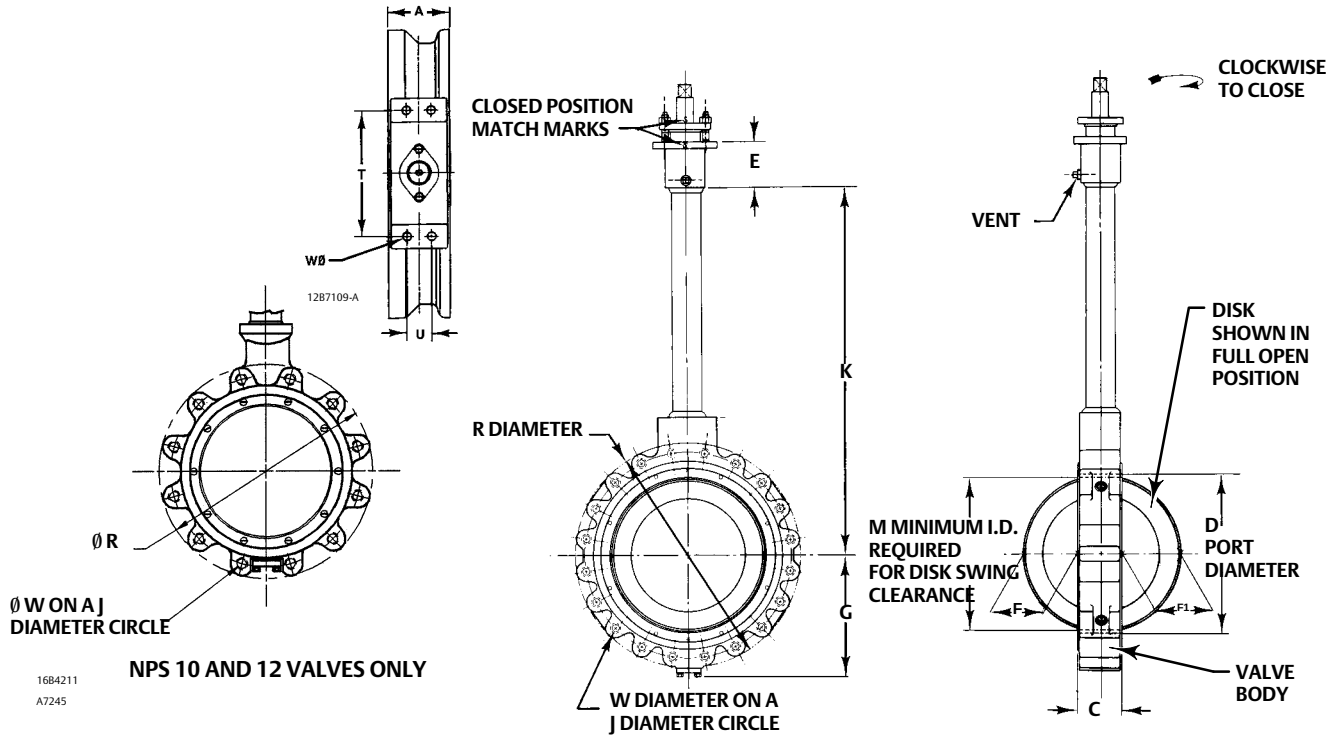


Table 9. Dimensions, Wafer Style Valve, CL300, NPS 8 through 24

VALVE SIZE, NPS	A(1)	D	E	F	F1	G	J	K	M(2)	R	S(3)	T	U	W
	mm													
8	73	195	89	51	62	173	305	679	186	279	32	235	46.0	See thread information below
10	85	246	89	75	75	265	387	724	230	349	38	235	46.0	
12	94	292	89	93	99	281	451	851	282	394	44	273	50.8	
14	117	321	102	100	97	314	514	914	305	432	44.5	273	50.8	
16	133	367	102	117	105	348	572	914	349	489	44.5	273	50.8	
18	149	413	152	129	125	379	629	914	391	546	57.2	337	76.2	
20	159	468	152	149	146	410	686	914	442	600	69.9	337	76.2	
24	181	551	152	176	173	476	813	914	523	711	69.9	337	76.2	
	Inches													
8	2.88	7.69	3.5	2.0	2.44	6.81	12.0	26.75	7.31	11.0	1.25	9.25	1.81	---
10	3.36	9.69	3.5	2.94	2.94	10.44	15.25	28.5	9.06	13.75	1.5	9.25	1.81	1-8
12	3.70	11.5	3.5	3.88	3.88	11.06	17.75	33.5	11.09	15.5	1.75	10.75	2.00	1.125-8
14	4.60	12.64	4	3.93	3.82	12.36	20.25	36	12	17	1.75	10.75	2.00	1.125-8
16	5.25	14.45	4	4.60	4.13	13.7	22.50	36	13.75	19.25	1.75	10.75	2.00	1.25-8
18	5.86	16.25	6	5.08	4.92	14.92	24.75	36	15.40	21.5	2.25	13.25	3.00	1.25-8
20	6.25	18.43	6	5.86	5.75	16.14	37	36	17.40	23.62	2.75	13.25	3.00	1.25-8
24	7.13	21.69	6	6.93	16.81	18.75	32	36	20.59	28	2.75	13.25	3.00	1.5-8

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. Minimum I.D. is the minimum pipe or flange I.D. required for disk swing clearance.
3. Shaft diameter at key.

Figure 11. Dimensions, Wafer Style Valve, CL300, NPS 8 through 24 (also see table 9)

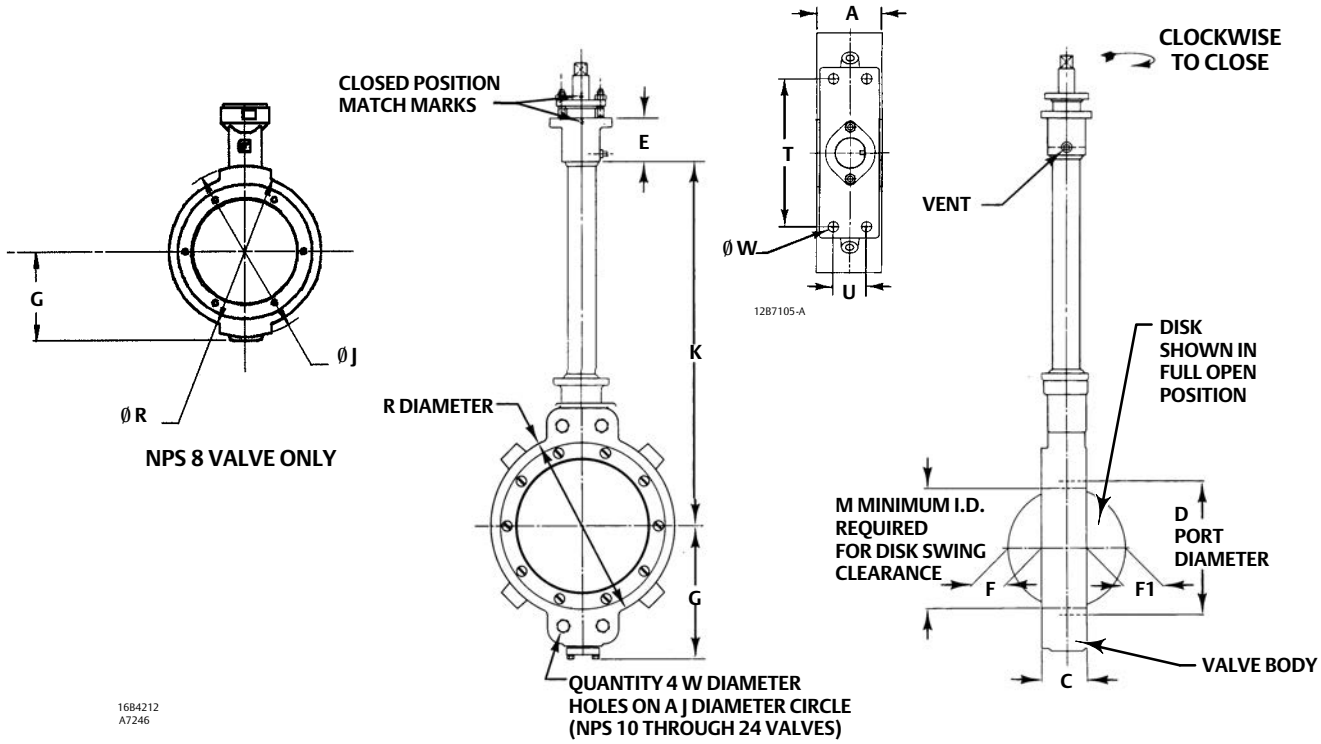
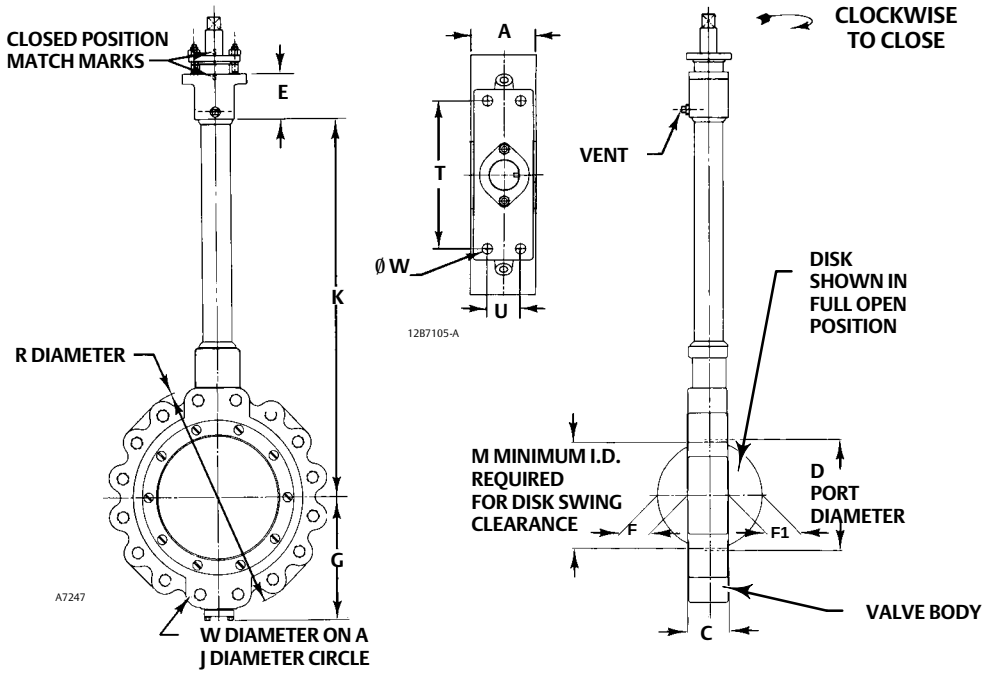


Table 10. Dimensions, Single Flange Style Valve, CL300, NPS 8 through 24

VALVE SIZE, NPS	A(1)	D	E	F	F1	G	J	K	M(2)	R	S(3)	T	U	W
	mm													
8	73	195	89	51	62	214	330	679	186	375	32	235	46.0	See thread information below
10	85	246	89	75	75	265	387	724	230	438	38	235	46.0	
12	94	292	89	93	99	281	451	851	282	514	47.6	273	50.8	
14	117	321	102	100	97	314	514	914	305	584	44.5	273	50.8	
16	133	367	102	117	105	348	572	914	349	648	44.5	273	50.8	
18	149	413	152	129	125	379	629	914	391	711	57.2	337	76.2	
20	159	468	152	149	146	410	686	914	442	775	69.9	337	76.2	
24	181	551	152	176	173	476	813	914	523	914	69.9	337	76.2	
	Inches													
8	2.88	7.69	3.5	2.0	2.44	8.44	13.0	26.75	7.32	14.75	1.25	9.25	1.81	0.875-9 12 holes
10	33.6	9.69	3.5	2.94	2.94	10.44	15.25	28.5	9.06	17.25	1.5	9.25	1.81	1-8 16 holes
12	3.70	11.5	3.5	3.69	3.88	11.06	17.75	33.5	11.09	20.25	1.875	10.75	2.00	1.125-8 16 holes
14	4.60	12.63	4	3.94	3.82	12.36	20.25	36	12	23	1.75	10.75	2.00	1.125-8 20 holes
16	5.25	14.45	4	4.60	4.13	13.70	22.50	36	13.75	25.5	1.75	10.75	2.00	1.25-8 20 holes
18	5	16.25	6	5.08	4.92	14.92	24.75	36	15.39	28	2.25	13.25	3.00	1.25-8 24 holes
20	6.25	18.43	6	5.87	5.75	16.14	37	36	17.40	30.5	2.75	13.25	3.00	1.25-8 24 holes
24	7.13	2121.69	6	6.93	6.81	18.75	32	36	20.59	36	2.75	13.25	3.00	1.5-8 24 holes

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. Minimum I.D. is the minimum pipe or flange I.D. required for disk swing clearance.
3. Shaft diameter at key.

Figure 12. Dimensions, Single Flange Style Valve, CL300, NPS 8 through 24 (also see table 10)



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

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Fisher™ Control-Disk™ Rotary Valve

The Fisher Control-Disk rotary valve offers excellent throttling performance. An equal percentage flow characteristic provides an improved throttling range comparable to that of a segmented ball valve. This improved capability allows you to control closer to the target set point, regardless of process disturbances, which results in a reduction in process variability.

The valve body meets PN 10 through PN 40, CL150, and CL300 ratings. Face-to-face dimensions meet EN 558, API 609, and MSS-SP68 standards. Line centering clips provide for versatility to mount and align the same wafer style valve body in different piping configurations (ASME and EN ratings).

The Control-Disk rotary valve features an eccentrically-mounted disk with either soft or metal seal, providing capability for enhanced shutoff. The interchangeable sealing technology allows for the same valve body to accept both soft and metal seals.

W9418-2

LUGGED STYLE
(NPS 3 through NPS 12)

X1426

DOUBLE FLANGED STYLE
(NPS 3 through NPS 12)

Control-Disk Valve Features

- Equal percentage flow characteristic— An equal percentage flow characteristic provides an improved throttling range comparable to that of a segmented ball valve. This improved capability allows you to control closer to the target set point, regardless of process disturbances, which results in a reduction in process variability.
- Global Standards— The valve meets API, ASME, and EN standards, making it suitable for use in all world areas.
- PEEK/PTFE bearing as standard— The PTFE-lined PEEK bearing is a low friction, low wear bearing. It allows the valve to operate under high pressure drops for a high cycle life while maintaining low torque. The “drop-in” bearing design enables fast, easy maintenance.
- Lower Operating Torques— The equal percentage disk reduces operating torque at peak angles of disk opening.
- Spline-ended Shaft— The splined shaft with clamped lever and single-pivot linkage reduces lost motion between the actuator and the valve shaft.

- Improved shaft-disk pinning— The improved expansion pin system ensures there is a positive, durable connection between disk and shaft. This connection reduces backlash and wear in the drive system, optimizing long-term performance. It also makes disassembly for maintenance quick and simple with no need for special tools.

- New Spring-Loaded Shaft— The spring in the outboard shaft provides support to the drive train and disk, enabling the shaft to be installed in both horizontal and vertical orientations with no detriment to performance or cycle life. This complements the ability to mount the actuator on the left- or right-hand side, enabling access for any installation.

- Excellent Emissions Capabilities— The optional ENVIRO-SEAL™ packing systems, are designed with very smooth shaft surfaces and live-loading to provide improved sealing, guiding, and loading force transmission. The seal of the ENVIRO-SEAL system can control emissions to below 100 ppm (parts per million).

- Sour Service Capability— Trim and bolting materials are available for applications involving sour liquids and gases. These constructions comply with NACE MR0175-2002, MR0103, and MR0175 / ISO 15156.

- Field-Reversible Valve Action— The actuator/valve assembly action can be converted from push-down-to-open to push-down-to-close, or vice versa, without additional parts.

- Easy Installation— Line-centering clips engage the line flange bolts to simplify installation and provide for centering of wafer-style valves in the pipeline. End connections are compatible with EN and ASME standards.

- Excellent Shutoff— Both the metal and soft seal rings have pressure-assisting sealing action that ensures tight shutoff regardless of pressure drop.

- Long Seal Life— The opening and closing path of the eccentric disk minimizes disk contact with the seal ring, thereby reducing seal wear, undue friction, and seating torque requirements. See figure 2.

- Reliable Flange Gasketing Surface— The seal retainer screws and retention clips are outside the gasket surface of the seal retainer. Spiral-wound or flat-sheet gaskets can be installed between the uninterrupted seal retainer face and the pipeline flange.

- Integral Shaft-to-Valve Body Bonding— Standard valve construction includes conductive packing to provide electrical bonding for hazardous area applications.

- Powder paint as standard— The Emerson powder paint finish offers an excellent corrosion-resistant finish to all steel parts.

- High Temperature Capability— The valve will operate at elevated temperatures, with the appropriate trim components.

- Shaft Retention— Redundant shaft retention provides added protection. The packing follower, anti-blowout ring, and shaft groove interact to hold the shaft securely in the valve body (see figure 1).

- Travel Indication— Additional travel indication can be achieved by using the indication line on the shaft, along with the disk position markings on the packing follower (see figure 4).

Table of Contents

Control-Disk Valve Specifications and Materials of Construction

Table 1. Fisher Control-Disk Valve Specifications

Specifications		EN	ASME
Valve Body Size		DN 50, 80, 100, 150, 200, 250, and 300	NPS 2, 3, 4, 6, 8, 10, and 12
Pressure Rating		PN 10 to 40 per EN 12516-1	CL150 / 300 per ASME B16.34 (CL150-600 for NPS 2)
Valve Body Materials		EN 1.0619 steel	WCC steel
		EN 1.4409 stainless steel	CF3M (316L) stainless steel
		LCC	LCC
		CW2M(1)	CW2M(1)
		M35-2(2)	M35-2
Disk Materials	PTFE or RPTFE(4) Seal	EN 1.4409 stainless steel	CF3M stainless steel
		CW2M	CW2M
		M35-2	M35-2
	Metal or UHMWPE(3) Seal	Chrome-plated EN 1.4409 Stainless Steel	Chrome-plated CF3M Stainless Steel
End Connections		Mates with raised-face flanges per EN 1092-1	Mates with raised-face flanges per ASME B16.5
Valve Body Style		Lugged with tapped or through holes, Double-Flange with through holes, and Wafer (for select sizes)	
Face-to-Face Dimensions		Meets MSS SP68, API 609, and EN 558 standards	
Shutoff		PTFE, RPTFE, or UHMWPE seal ring - Class VI per ANSI/FCI 70-2 and IEC 60534-4	
		S31600 (316 SST) seal ring - Class IV per ANSI/FCI 70-2 and IEC 60534-4	
Flow Coefficients		See Fisher Catalog 12	
Flow Direction		Standard (forward flow) is with the seal retainer facing upstream; reverse flow is permissible for soft seals only	
Flow Characteristic		Equal percentage	
Disk Rotation		Counterclockwise to open (when viewed from actuator side of valve body) through 90 degrees of disk rotation	
Shaft Diameters and Approximate Weights		See table 7	

1. This material is not listed in EN 12516-1 or ASME B16.34. See figure 6 for pressure/temperature ratings.
2. This material is not listed in EN 12516-1. See figure 6 for pressure/temperature ratings.
3. UHMWPE stands for ultra high molecular weight polyethylene.
4. RPTFE is a reinforced PTFE seal.

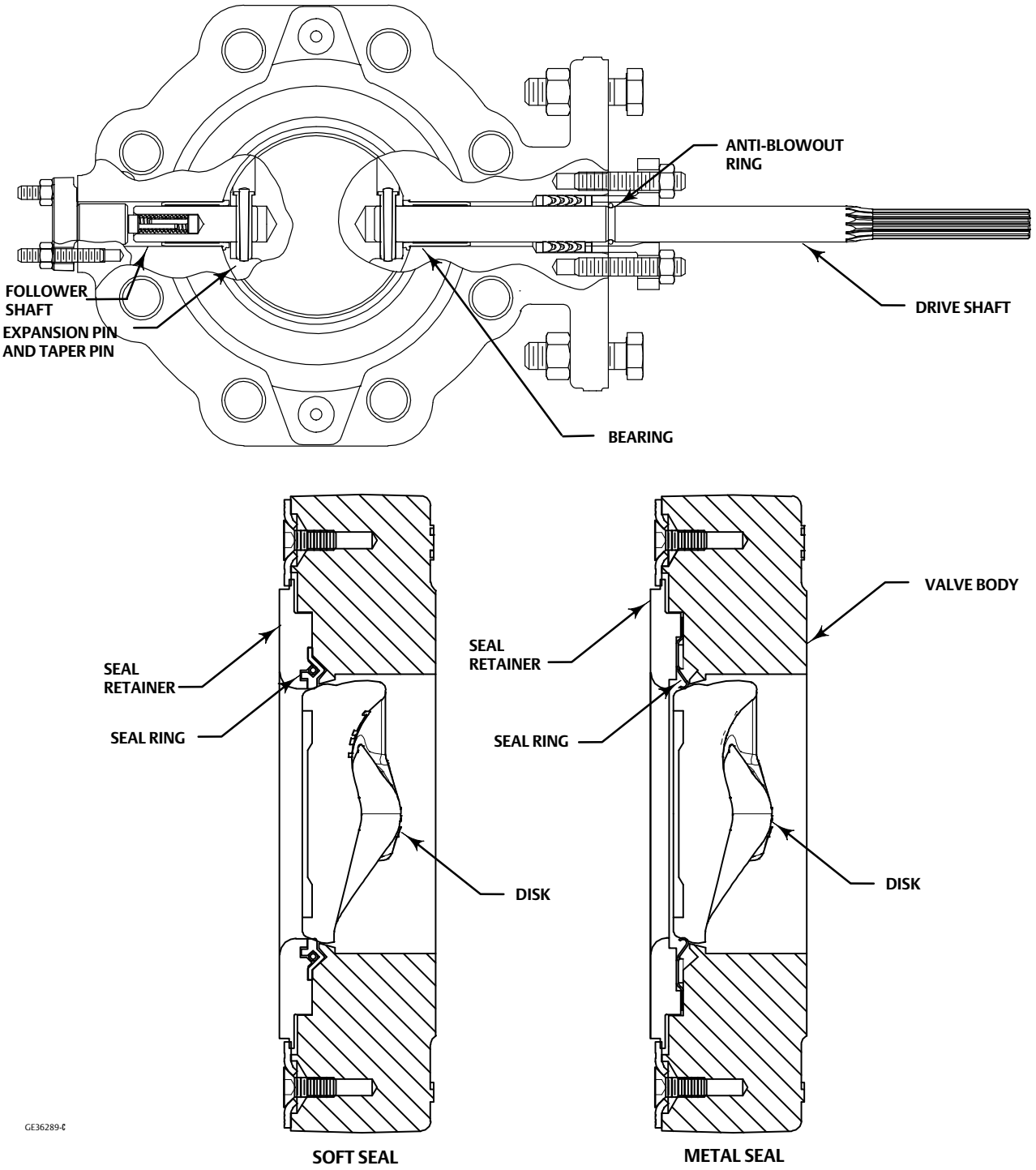
Table 2. Materials (Other Valve Components)

Component	Material
Shafts and Pins	S17400 (17-4PH) stainless steel, S20910 (XM-19) stainless steel, N10276, N05500
Anti-blowout Ring	N07718
Seal	PTFE, RPTFE, or UHMWPE with S31600 (316 stainless steel) or R30003 spring. Metal seal is 316 stainless steel with graphite gaskets
Bearings	PEEK/PTFE, R30006 (Alloy 6), S31600 Nitride
Packing	PTFE/carbon-filled PTFE (standard), graphite die-molded ribbon, ENVIRO-SEAL PTFE packing, ENVIRO-SEAL graphite packing
Follower Spring	N07718 with carbon-filled PEEK or S31600 spring seats
Bolting	B8M Class 2, B7M, N05500, N07718
Nuts	8M, 2HM, N04400, N10276

Table 3. Trim Combinations with Standard Construction Materials

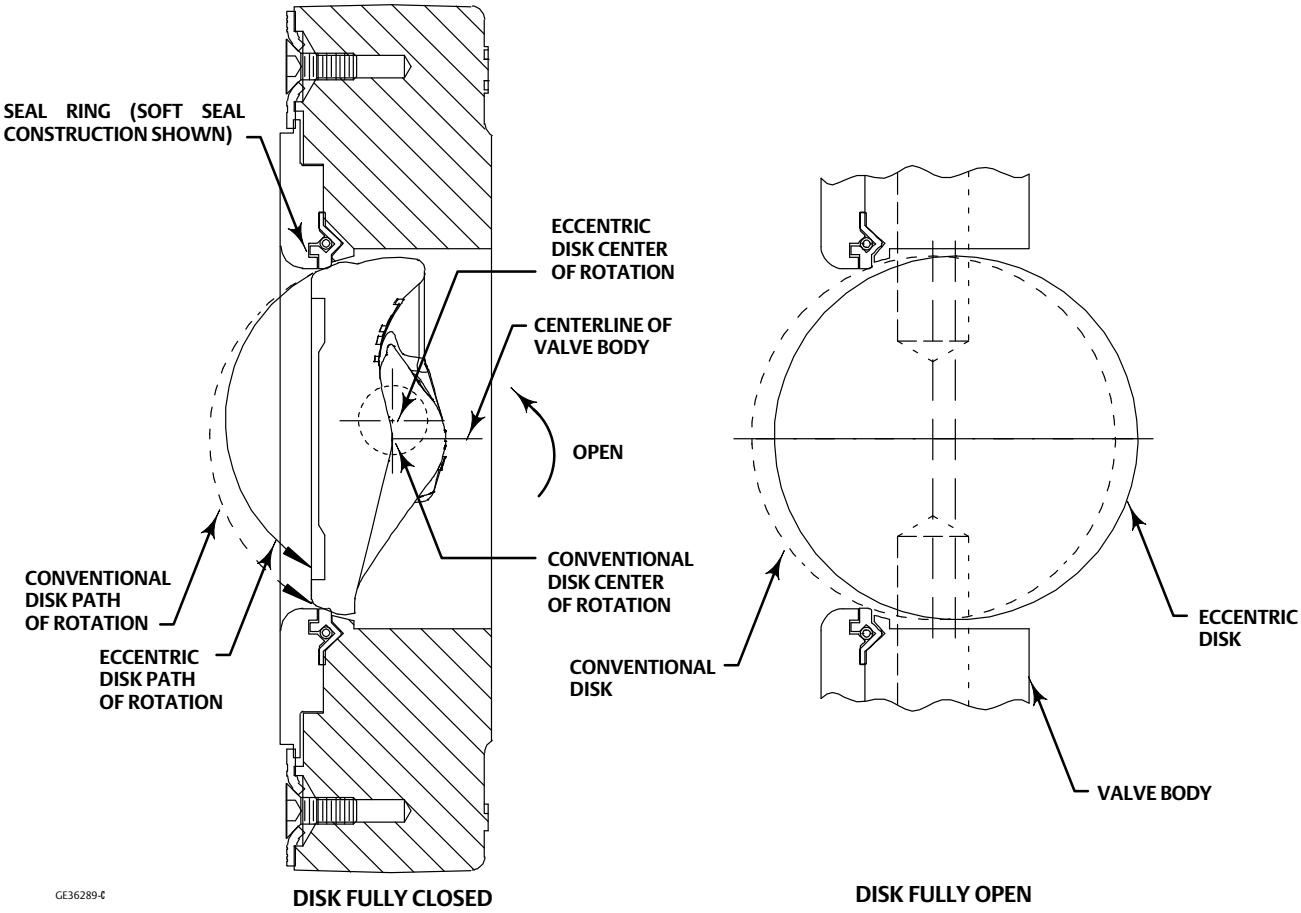
Valve Body Material	Shaft Material	Disk Material	Bearings	Seal Material
1.0619 & WCC	S17400 H1075	1.4409 & CF3M	PEEK/PTFE	PTFE or RPTFE
		1.4409 & CF3M Chrome-Plated	PEEK/PTFE	UHMWPE or Metal
			Alloy 6 or S31600 Nitride	Metal
LCC	S17400 H1075	1.4409 & CF3M	PEEK/PTFE	PTFE
1.4409 & CF3M	S20910	1.4409 & CF3M	PEEK/PTFE	PTFE or RPTFE
		1.4409 & CF3M Chrome-Plated	PEEK/PTFE	UHMWPE or Metal
			Alloy 6 or S31600 Nitride	Metal
CW2M	N10276	CW2M	PEEK/PTFE	PTFE or RPTFE
M35-2	N05500	M35-2	PEEK/PTFE	PTFE or RPTFE

Figure 1. Typical Fisher Control-Disk Valve Construction Detail



Note: Split shaft construction shown.

Figure 2. Comparison of Disk Action



Note: Split shaft construction shown.

Figure 3. Available Seal Configuration

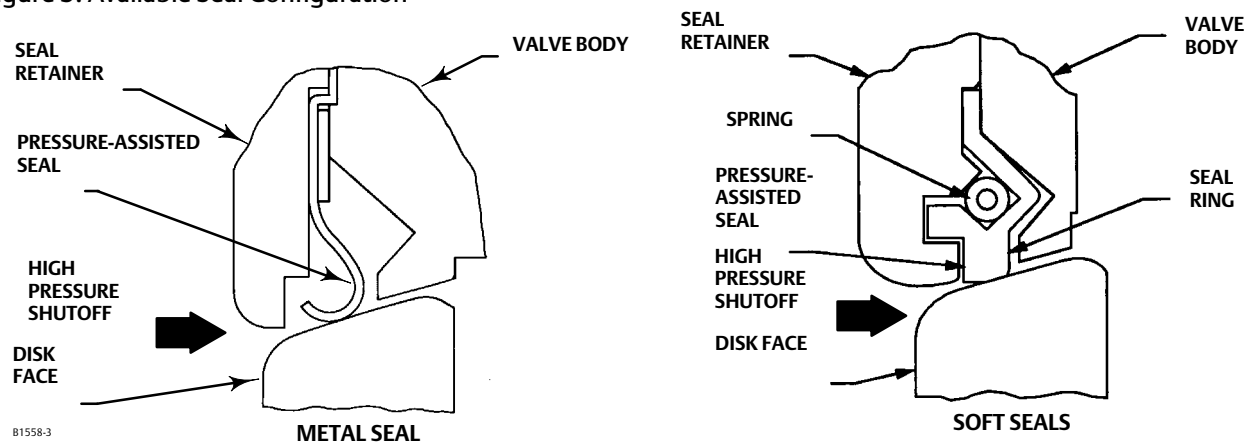


Figure 4. Travel Indication

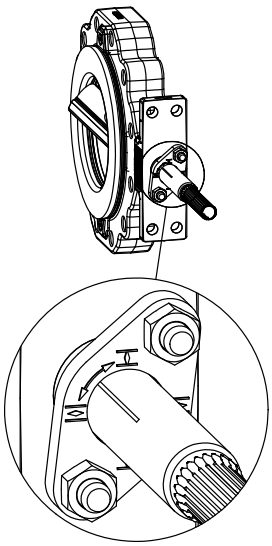


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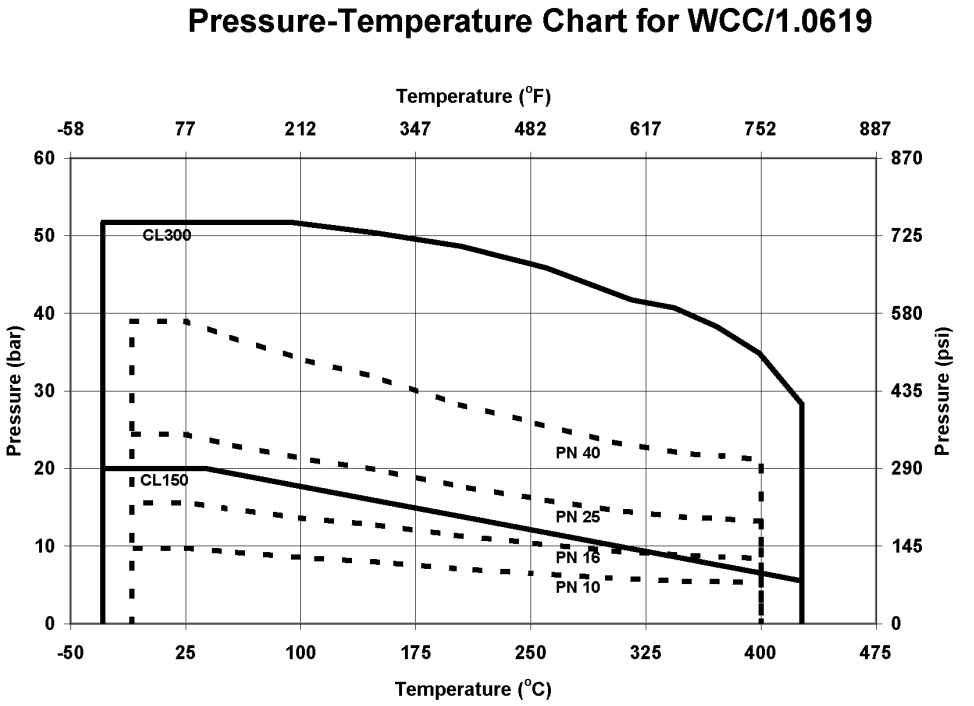
Table 4. Material Temperature Capabilities

MATERIAL					TEMPERATURE LIMITS	
PN FLANGES						
Valve Body	**Shaft**	**Bearing Lining and Jacket**	**Seal**	**Packing**	**°C**	**°F**
1.0619 Steel	S17400 or S20910	PEEK / PTFE	PTFE or RPTFE	PTFE or Graphite	–10 to 232	14 to 450
			UHMWPE	PTFE or Graphite	–10 to 93	14 to 200
			Metal or Flow Ring	PTFE	–10 to 232	14 to 450
				Graphite	–10 to 260	14 to 500
		R30006 (Alloy 6) or S31600 Nitride	Metal or Flow Ring	Graphite	–10 to 400	14 to 752
LCC	S17400 or S20910	PEEK / PTFE	PTFE	PTFE	–46 to 232	–50 to 450
1.4409 Stainless Steel	S20910	PEEK / PTFE	PTFE or RPTFE	PTFE or Graphite	–46 to 232	-50 to 450
			UHMWPE	PTFE or Graphite	–18 to 93	0 to 200
			Metal or Flow Ring	PTFE	–46 to 232	-50 to 450
				Graphite	–46 to 260	-50 to 500
		R30006 (Alloy 6) or S31600 Nitride	Metal or Flow Ring	Graphite	–46 to 500(1)	-50 to 932(1)
CW2M	N10276	PEEK / PTFE	PTFE or RPTFE	PTFE	–10 to 232	14 to 450
M35-2	N05500	PEEK / PTFE	PTFE or RPTFE	PTFE	–10 to 232	14 to 450
ASME FLANGES						
Valve Body	**Shaft**	**Bearing Lining and Jacket**	**Seal**	**Packing**	**°C**	**°F**
WCC steel	S17400 or S20910	PEEK / PTFE	PTFE or RPTFE	PTFE or Graphite	–29 to 232	-20 to 450
			UHMWPE	PTFE or Graphite	–18 to 93	0 to 200
			Metal or Flow Ring	PTFE	–29 to 232	-20 to 450
				Graphite	–29 to 260	-20 to 500
		R30006 (Alloy 6) or S31600 Nitride	Metal or Flow Ring	Graphite	–29 to 427	-20 to 800
LCC	S17400 or S20910	PEEK / PTFE	PTFE	PTFE	–46 to 232	–50 to 450
CF3M Stainless Steel	S20910	PEEK / PTFE	PTFE or RPTFE	PTFE or Graphite	–46 to 232	–50 to 450
			UHMWPE	PTFE or Graphite	–18 to 93	0 to 200
			Metal or Flow Ring	PTFE	–46 to 232	–50 to 450
				Graphite	–46 to 260	–50 to 500
		R30006 (Alloy 6) or S31600 Nitride	Metal or Flow Ring	Graphite	–46 to 454(1)	–50 to 850(1)
CW2M	N10276	PEEK / PTFE	PTFE or RPTFE	PTFE	–46 to 232	–50 to 450
M35-2	N05500	PEEK / PTFE	PTFE or RPTFE	PTFE	–46 to 232	–50 to 450

1. For applications exceeding 427°C (800°F), consult your Emerson sales office or Local Business Partner for appropriate high temperature disk edge coating.

Figure 5. Material Pressure/Temperature Curves



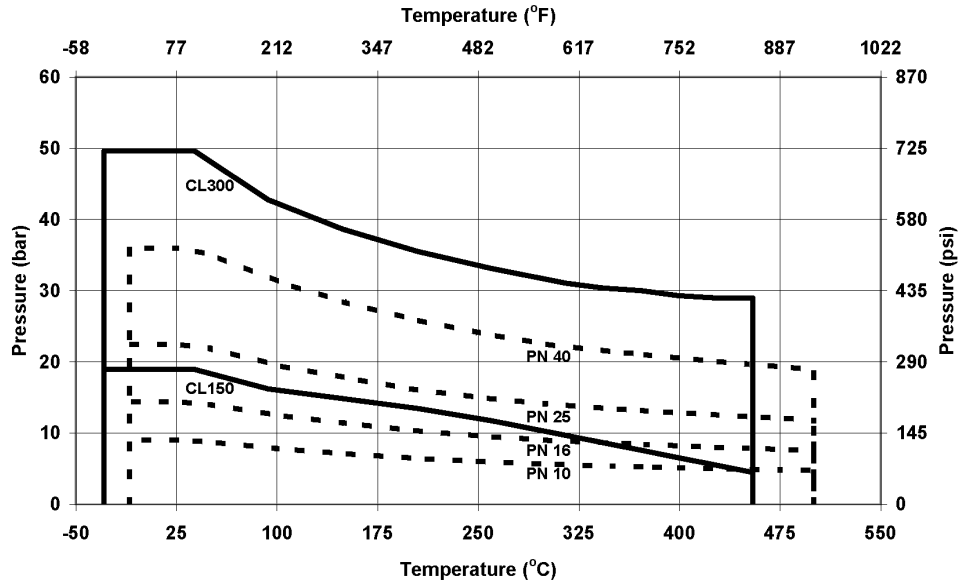
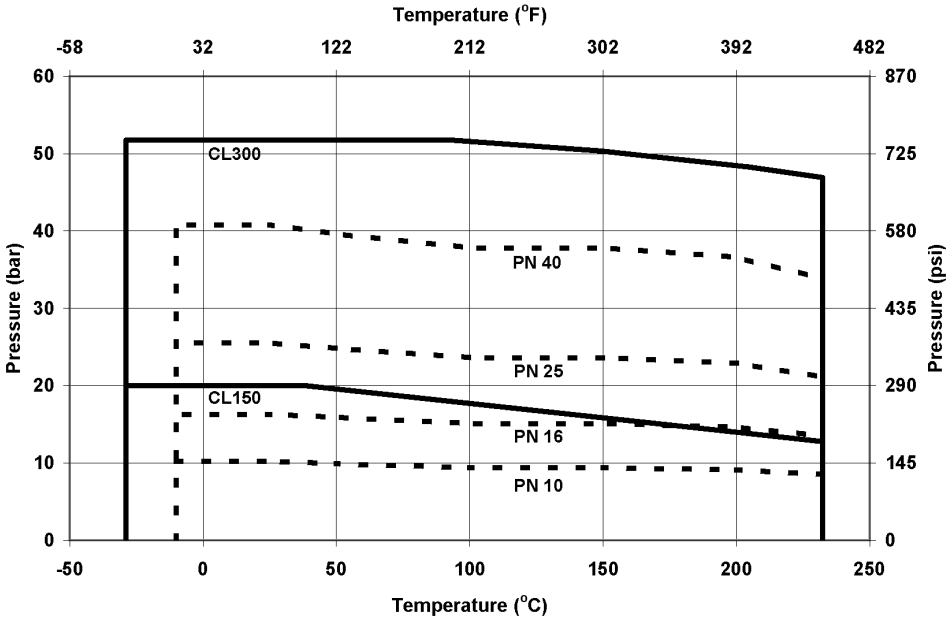
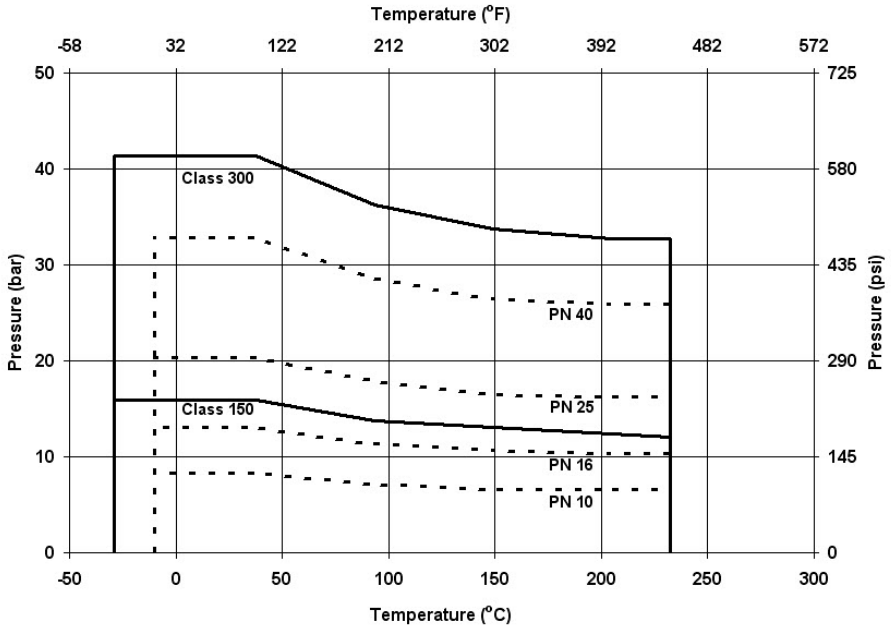


Figure 6. Material Pressure/Temperature Curves

Pressure-Temperature Chart for CW2M [1]



Pressure-Temperature Chart for M35-2 [2]



Note:
[1] CW2M is not listed in EN 12516-1 or ASME B16.34. The PN and CL designations are used only to indicate relative pressure-retaining capabilities.
[2] M35-2 is not listed in EN 12516-1. The PN designations are used only to indicate relative pressure-retaining capabilities.

Figure 7. Material Pressure/Temperature Curves

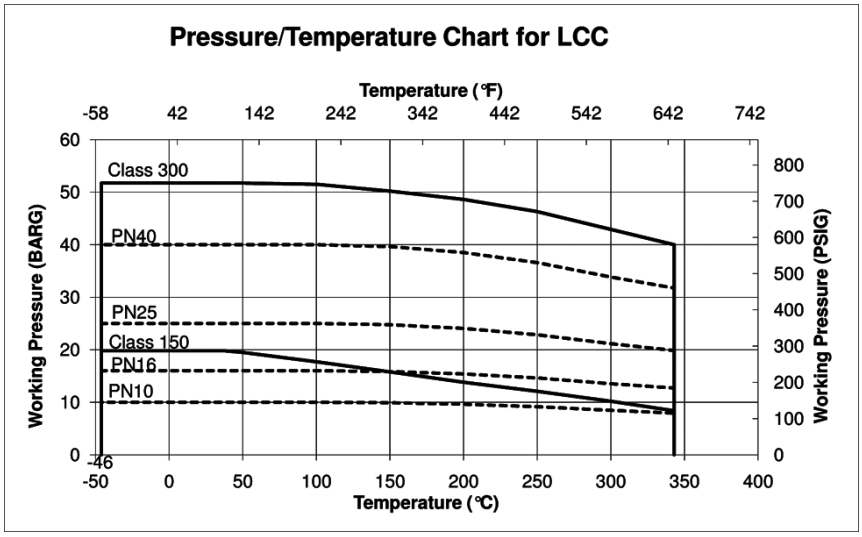


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Table 5. Maximum Allowable Shutoff Pressure Drops based on Trim (Seal, Shaft, and Bearings), Bar

Note: Do not exceed the EN or ASME pressure/temperature rating of the valve or mating flanges.

TRIM	TEMPERATURE, °C	DN						
		50	80	100	150	200	250	300
		Bar						
PTFE or RPTFE Seal PEEK/PTFE Bearings	-46 to 65	51.7	51.7	51.7	51.7	51.7	51.7	51.7
	93	48.5	48.5	48.5	48.5	48.5	45.6	46.8
	121	38.6	38.6	38.6	38.6	38.6	38.6	38.6
	149	28.7	28.7	28.7	28.7	28.7	28.7	28.7
	191	13.8	13.8	13.8	13.8	13.8	13.8	13.8
	204	10.3	10.3	10.3	10.3	10.3	10.3	10.3
	232	3.4	3.4	3.4	3.4	3.4	3.4	3.4
UHMWPE Seal PEEK/PTFE Bearings	-17 to 37	51.7	51.7	51.7	51.7	51.7	51.7	51.7
	66	38.6	38.6	38.6	38.6	38.6	38.6	38.6
	93	25.9	25.9	25.9	25.9	25.9	25.9	25.9
Metal Seal(1) Alloy 6 Bearings	-46 to 37	18.5	16.5	13.9	12.8	11.0	6.8	7.0
	93	17.0	15.1	12.8	11.7	10.1	6.3	6.5
	149	16.0	14.2	12.0	11.0	9.4	5.9	6.1
	204	15.1	13.4	11.4	10.4	9.0	5.6	5.7
	260	14.3	12.8	10.8	9.9	8.5	5.3	5.4
	316	13.8	12.3	10.3	9.5	8.2	5.1	5.2
	371	13.2	11.9	10.0	9.2	7.9	5.0	5.0
	427	12.5	11.6	9.8	9.0	7.7	4.8	5.0
	454	12.1	11.5	9.7	8.9	7.7	4.8	4.9
Metal Seal(1) S31600/Nitride Bearings	-46 to 37	19.5	28.2	26.1	20.8	31.0	15.5	8.0
	93	19.3	28.0	26.0	20.6	31.0	15.4	7.9
	149	17.0	25.4	23.7	18.7	28.8	14.0	7.1
	204	15.9	24.3	22.7	17.8	26.3	13.3	6.8
	260	14.5	22.9	21.4	16.8	24.6	12.5	6.3
	316	13.8	22.1	20.8	16.2	23.2	12.1	6.1
	371	13.2	21.5	20.2	15.7	22.4	11.8	5.9
	427	12.5	20.7	19.5	15.2	21.8	11.4	5.6
	454	12.1	20.3	19.2	14.9	21.6	11.2	5.4
Metal Seal(1) PEEK/PTFE Bearings	-46 to 37	51.7	51.7	51.7	51.7	31.0	17.2	17.2
	93	51.7	51.7	51.7	51.7	31.0	17.2	17.2
	149	50.3	50.3	50.3	50.3	31.0	17.2	17.2
	204	48.6	48.6	48.6	48.2	31.0	17.2	17.2
	232	47.2	47.2	46.3	42.6	31.0	17.2	17.2
	260	24.7	21.9	18.5	17.0	14.6	9.1	9.4
Flow Ring PEEK/PTFE Bearings	-46 to 37	51.7	51.7	51.7	51.7	51.7	45.5	46.8
	93	51.7	51.7	51.7	51.7	51.7	37.7	38.8
	149	50.3	50.3	50.3	50.3	50.3	31.7	32.6
	204	48.6	48.6	48.6	48.1	41.3	25.7	26.4
	232	47.2	47.2	46.3	42.6	36.6	22.8	23.4
	260	24.6	21.9	18.5	17	14.6	9.1	9.3
Flow Ring S31600/Nitride Bearings	-46 to 37	32	34.4	34.8	28.6	31.6	20.2	13
	93	31.8	34.4	34.6	28.5	31.6	19.7	12.9
	149	29.5	34.4	32.4	26.6	28.7	17.9	12.1
	204	28.5	34.4	31.3	25.7	26.3	16.4	11.7
	260	27.3	37.5	30.1	24.8	24.6	15.3	11.3
	316	26.6	35.5	29.5	24.2	23.2	14.4	11.1
	371	26.1	34.1	28.7	23.7	22.4	13.9	10.8
	427	25.4	28.9	27.9	23.2	21.7	13.5	10.6
	454	25	28.9	27.6	22.9	21.5	13.3	10.5

1. Pressure drops shown for metal seals are for forward flow only.

Table 6. Maximum Allowable Shutoff Pressure Drops based on Trim (Seal, Shaft, and Bearings), Psi

Note: Do not exceed the EN or ASME pressure/temperature rating of the valve or mating flanges.

TRIM	TEMPERATURE, °F	NPS						
		2	3	4	6	8	10	12
		Psi						
PTFE or RPTFE Seal PEEK/PTFE Bearings	-50 to 150	750	750	750	750	750	750	750
	200	704	704	704	704	704	662	679
	250	560	560	560	560	560	560	560
	300	416	416	416	416	416	416	416
	375	200	200	200	200	200	200	200
	400	150	150	150	150	150	150	150
	450	50	50	50	50	50	50	50
UHMWPE Seal PEEK/PTFE Bearings	0 to 100	750	750	750	750	750	750	750
	150	560	560	560	560	560	560	560
	200	375	375	375	375	375	375	375
Metal Seal(1) Alloy 6 Bearings	-50 to 100	268	239	202	185	159	99	102
	200	246	219	185	170	146	91	94
	300	232	206	174	160	137	86	88
	400	219	195	165	151	130	81	83
	500	208	186	157	144	124	77	79
	600	200	178	150	138	119	74	76
	700	192	172	145	134	115	72	73
	800	181	168	142	130	112	70	72
	850	176	167	141	129	111	69	71
Metal Seal(1) S31600/Nitride Bearings	-50 to 100	283	409	379	301	450	225	116
	200	280	406	377	299	450	223	115
	300	246	369	344	271	417	203	103
	400	230	352	329	258	382	193	98
	500	211	332	311	243	357	182	91
	600	200	321	301	235	337	176	88
	700	192	312	293	228	325	171	85
	800	181	300	283	220	316	165	81
	850	176	295	278	216	313	162	79
Metal Seal(1) PEEK/PTFE Bearings	-50 to 100	750	750	750	750	450	250	250
	200	750	750	750	750	450	250	250
	300	730	730	730	730	450	250	250
	400	705	705	705	699	450	250	250
	450	685	685	672	618	450	250	250
	500	358	318	269	247	212	132	136
Flow Ring PEEK/PTFE Bearings	-50 to 150	750	750	750	750	750	661	679
	200	750	750	750	750	750	548	563
	300	730	730	730	730	730	461	474
	400	705	705	705	699	600	374	384
	450	685	685	672	618	531	331	340
	500	358	318	269	247	212	132	136
Flow Ring S31600/Nitride Bearings	-50 to 150	465	499	505	416	459	293	189
	200	462	499	502	414	459	287	188
	300	429	499	470	387	417	260	176
	400	414	499	455	374	382	238	171
	500	397	545	438	360	357	222	165
	600	387	515	428	351	337	210	161
	700	379	496	417	345	325	202	158
	800	369	420	405	337	316	196	155
	850	364	420	401	333	313	194	153

1. Pressure drops shown for metal seals are for forward flow only.

Table 7. Dimensions and Weights

VALVE SIZE, PRESSURE RATING		A	E	F		G		K	R(4)	S(1)	T	U	W	APPROXIMATE WEIGHT(2)	
				Wafer	Lugged	Wafer	Lugged							Wafer	Lugged
		mm												kg	
DN50/ NPS 2	PN10-40/ CL150-300	43	187.5	150	---	109	---	125	102	12.7	117	---	14	4.7	6.7
DN80/ NPS 3	PN10-40/ CL150-300	47/48 (3)	187.5	---	196	---	133	130	144	15.9	117	---	14	---	11.2
DN100/ NPS 4	PN10-40/ CL150-300	53	214.4	---	226	---	147	172	162	19.1	152	32	14	---	17.6
DN150/ NPS 6	PN10-40/ CL150-300	57	214.4	270	300	147	182	205	218	25.4	152	32	14	15.7	26.5
DN200/ NPS 8	PN10-16/ CL150	61	208	---	342	---	225	258	278	31.8	235	46	18	---	40.9
	PN25-40	61	208	358	364	225	225	258	291	31.8	235	46	18	34.6	46.7
	CL300	73													
DN250/ NPS 10	PN10-16/ CL150	69	208	---	395	---	250	270	331	31.8	235	46	18	---	50.7
	PN25-40	69	208	400	450	265	265	270	352	31.8	235	46	18	52.0	79.4
	CL300	83													
DN300/ NPS 12	PN10-16/ CL150	78	208	---	467	---	309	304	381	38.1	235	46	18	---	98.6
	PN25-40	78	208	---	512	---	309	304	410	38.1	235	46	18	---	104.9
	CL300	92													
		Inches												lbs	
DN50/ NPS 2	PN10-40/ CL150-300	1.69	7.38	5.91	---	4.29	---	4.92	4.02	0.50	4.62	---	0.55	10	15
DN80/ NPS 3	PN10-40/ CL150-300	1.85/ 1.89 (3)	7.38	---	7.72	---	5.24	5.12	5.67	0.63	4.62	---	0.55	---	25
DN100/ NPS 4	PN10-40/ CL150-300	2.09	8.44	---	8.90	---	5.79	6.77	6.38	0.75	6.00	1.25	0.55	---	39
DN150/ NPS 6	PN10-40/ CL150-300	2.24	8.44	10.63	11.81	5.79	7.17	8.07	8.58	1.00	6.00	1.25	0.55	35	58
DN200/ NPS 8	PN10-16/ CL150	2.40	8.19	---	13.46	---	8.86	10.16	10.96	1.25	9.25	1.81	0.71	---	90
	PN25-40	2.40	8.19	14.09	14.33	8.86	8.86	10.16	11.46	1.25	9.25	1.81	0.71	76	103
	CL300	2.87													
DN250/ NPS 10	PN10-16/ CL150	2.72	8.19	---	15.55	---	9.84	10.63	13.03	1.25	9.25	1.81	0.71	---	112
	PN25-40	2.72	8.19	15.75	17.72	10.43	10.43	10.63	13.86	1.25	9.25	1.81	0.71	115	175
	CL300	3.27													
DN300/ NPS 12	PN10-16/ CL150	3.07	8.19	---	18.39	---	12.17	11.97	15.00	1.50	9.25	1.81	0.71	---	217
	PN25-40	3.07	8.19	---	20.16	---	12.17	11.97	16.14	1.50	9.25	1.81	0.71	---	231
	CL300	3.62													

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.
2. Valve assembly only.
3. 48 mm for CL150 and CL300 lugged only.
4. Dimension shown is seal retainer OD. Diameter for serrated gasket surface may be smaller.

Table 8. Line Bolting Dimensions

VALVE SIZE	Y					
	Pressure Rating					
	CL150	CL300	PN10	PN16	PN25	PN40
DN80 / NPS 3	4X 5/8-11	8X 3/4-10	8X M16X2			
DN100 / NPS 4	8X 5/8-11	8X 3/4-10	8X M16X2		8X M20X2.5	
DN150 / NPS 6	8X 3/4-10	12X 3/4-10	8X M20X2.5		8X M24X3(1)	
DN200 / NPS 8	8X 3/4-10	12X 7/8-9	8X M20X2.5	12X M20X2.5	12X M24X3	12X M27X3(1)
DN250 / NPS 10	12X 7/8-9	16X 1-8	12X M20X2.5	12X M24X3	12X M27X3	12X M30X3.5(1)
DN300 / NPS 12	12X 7/8-9	16X 1-1/8-8	12X M20X2.5	12X M24X3	16X M27X3	16X M30X3.5
1. Not available in single flange with threaded holes.						

Figure 8. Dimensions for Fisher Control-Disk Valve, Single Flange

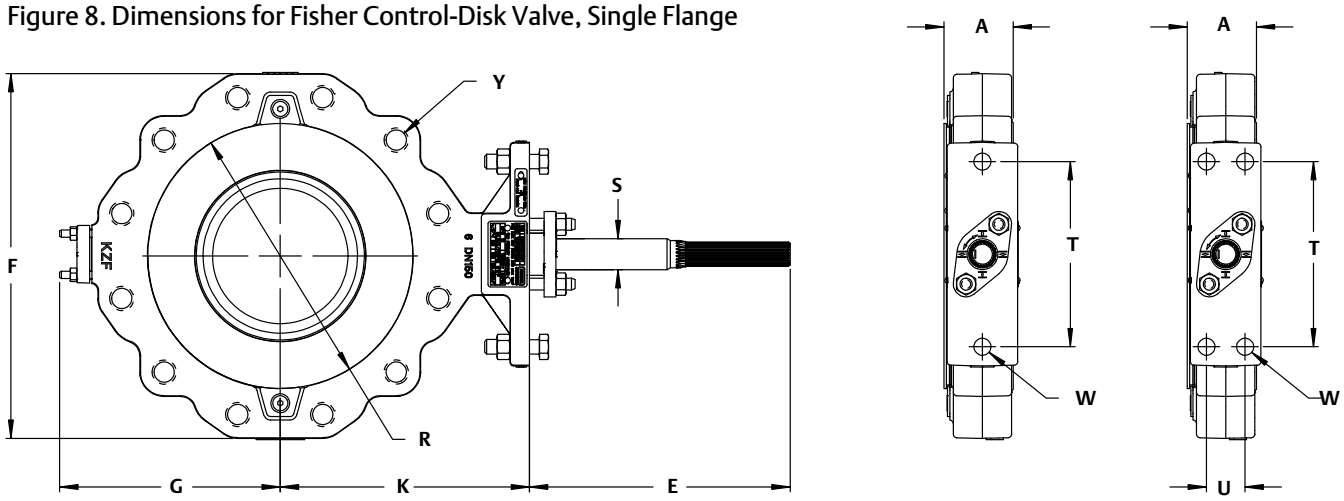


Figure 9. Dimensions for Fisher Control-Disk Valve, Wafer Style (limited sizes)

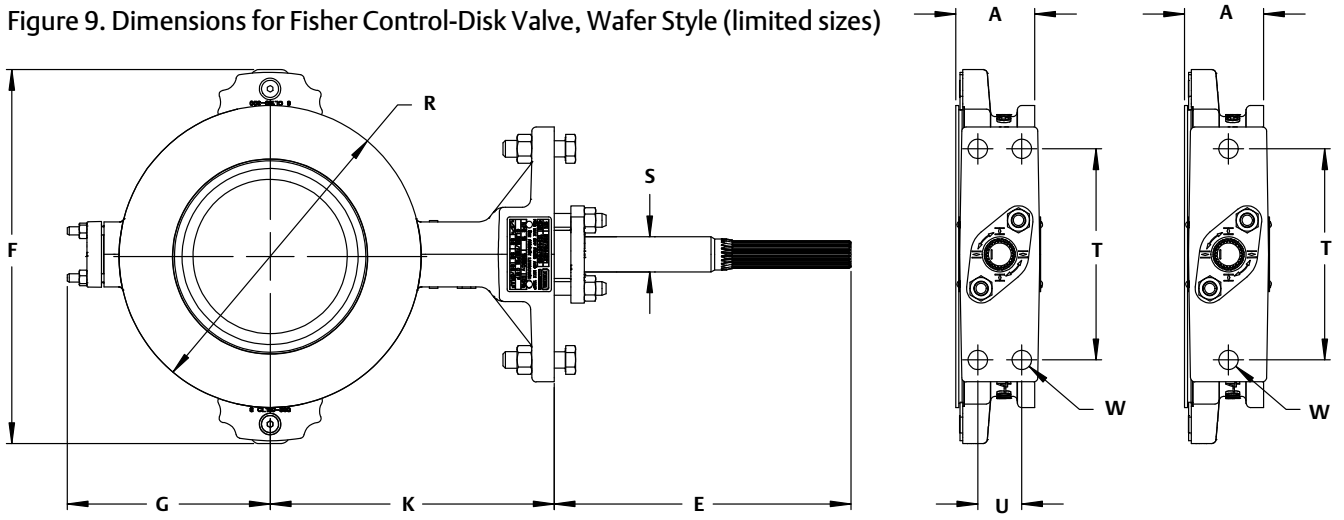
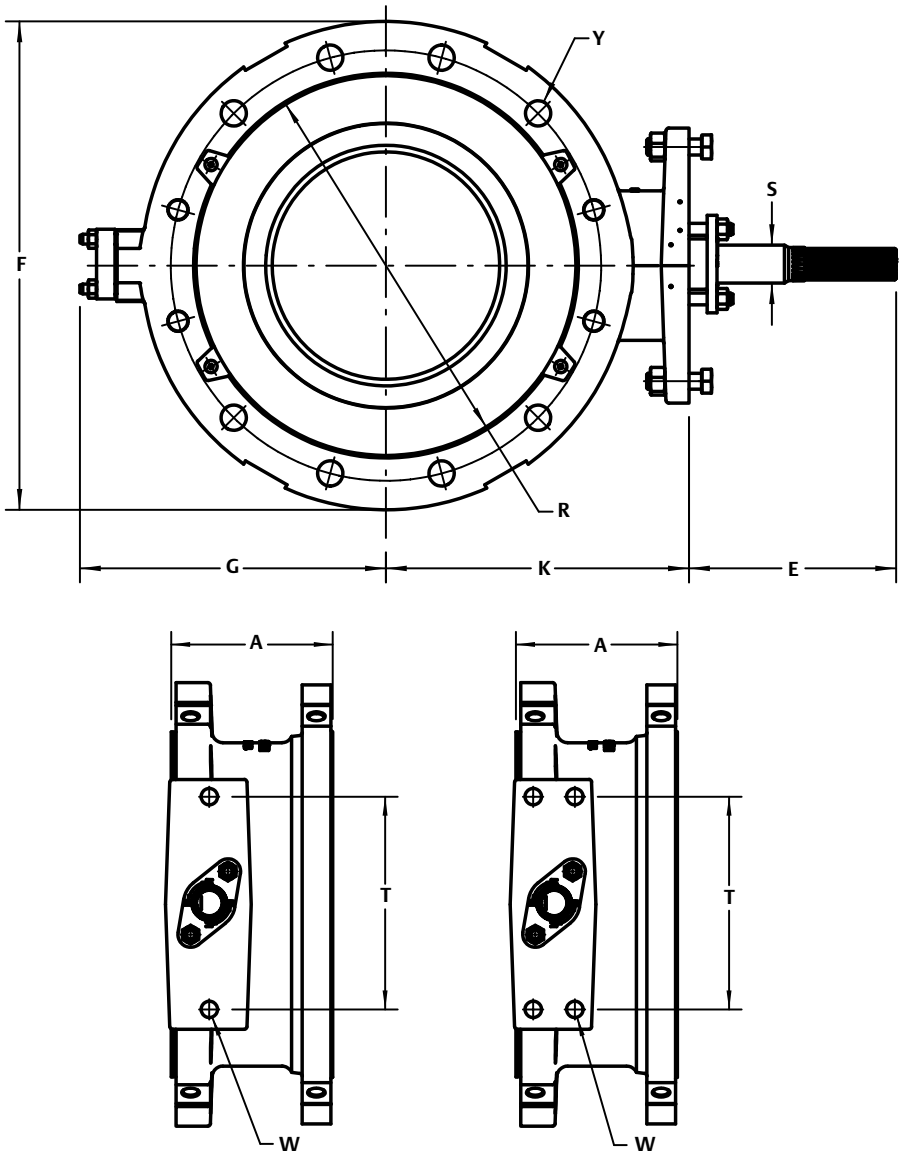


Table 9. Dimensions and Weights, Double Flange Valve Body (See Figure 10)

VALVE SIZE, PRESSURE RATING		A	B	E		F	G	K	R	S	T	U	W	APPROX-IMATE WEIGHT
				Splined	Square									
		mm												kg
DN80/ NPS 3	PN10-16 /CL150	114	25.3	187.5	76	190	133	130	144	15.9	117	---	14	17.6
	PN25-40 /CL300	180	25.3	187.5	76	210	133	130	144	15.9	117	---	14	29
DN100/ NPS 4	PN10-16 /CL150	127	28.5	214.4	103	230	147	172	162	19.1	152	32	14	28.9
	PN25-40 /CL300	190	28.5	214.4	103	254	147	172	162	19.1	152	32	14	47.8
DN150/ NPS 6	PN10-16 /CL150	140	31.7	214.4	108	280	182	205	218	25.4	152	32	14	40.2
	PN25-40 /CL300	210	31.7	214.4	108	322	182	205	218	25.4	152	32	14	76.4
NPS200/ NPS 8	PN10-16 /CL150	152	32.8	208	107	345	225	258	278	31.8	235	46	18	71.3
	PN25-40 /CL300	230	32.8	208	107	380	225	258	291	31.8	235	46	18	124
DN250/ NPS 10	PN10-16 /CL150	165	35.6	208	109	405	250	270	331	31.8	235	46	18	80
	PN25-40 /CL300	250	35.6	208	109	445	265	270	352	31.8	235	46	18	203
DN300/ NPS 12	PN10-16 /CL150	178	41.7	208	114	485	309	304	381	38.1	235	46	18	144
	PN25-40 /CL300	270	41.7	208	114	520	309	304	410	38.1	235	46	18	275
		Inches												lbs
DN80/ NPS 3	PN10-16 /CL150	4.5	1	7.38	2.99	7.48	5.24	5.12	5.67	0.63	4.62	---	0.55	39
	PN25-40 /CL300	7.1	1	7.38	2.99	8.26	5.24	5.12	5.67	0.63	4.62	---	0.55	64
DN100/ NPS 4	PN10-16 / CL150	5	1.12	8.44	4.06	9.05	5.79	6.77	6.38	0.75	6	1.25	0.55	64
	PN25-40 /CL300	7.5	1.12	8.44	4.06	10	5.79	6.77	6.38	0.75	6	1.25	0.55	105
DN150/ NPS 6	PN10-16 /CL150	5.5	1.25	8.44	4.25	11.02	7.17	8.07	8.58	1	6	1.25	0.55	89
	PN25-40 /CL300	8.3	1.25	8.44	4.25	12.66	7.17	8.07	8.58	1	6	1.25	0.55	168
NPS200/ NPS 8	PN10-16 /CL150	6	1.29	8.19	4.21	13.58	8.86	10.16	10.96	1.25	9.25	1.81	0.71	157
	PN25-40 /CL300	9.1	1.29	8.19	4.21	14.96	8.86	10.16	11.46	1.25	9.25	1.81	0.71	273
DN250/ NPS 10	PN10-16 /CL150	6.5	1.4	8.19	4.29	15.94	9.84	10.63	13.03	1.25	9.25	1.81	0.71	176
	PN25-40 /CL300	9.8	1.4	8.19	4.29	17.52	10.43	10.63	13.86	1.25	9.25	1.81	0.71	448
DN300/ NPS 12	PN10-16 /CL150	7	1.64	8.19	4.49	19.09	12.17	11.97	15	1.5	9.25	1.81	0.71	317
	PN25-40 /CL300	10.6	1.64	8.19	4.49	20.47	12.17	11.97	16.14	1.5	9.25	1.81	0.71	606

Figure 10. Dimensions for Fisher Control-Disk Valve Double Flange



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

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Fisher™ CV500 Rotary Globe Control Valve

The Fisher CV500 Cam Vee-Ball™ control valve combines the rangeability of the cammed-segmented V-notched ball, with the inherent ruggedness found in the V500 heavy duty bearings, seals and body. This combination provides a balance of erosion resistance and pressure control for gas and liquids. The unrestricted, straight-through flow design provides high capacity for gas, steam, liquids, or fibrous slurries. The flanged valve features streamlined flow passages, rugged metal trim components, and a self-centering seat ring (figures 1 and 2).

With these components, the CV500 valve, designed for throttling or on-off applications, combines globe valve ruggedness with the efficiency of a rotary valve. Matched with a Fisher power or manual actuator, the CV500 valve dependably controls fluids in many process industries.

Unless otherwise noted, all NACE references are to NACE MR0175-2002.

X0189

Fisher CV500 VALVE WITH 2052 ACTUATOR AND FIELDVUE™ DVC6200 DIGITAL VALVE CONTROLLER

Features

- Excellent Flow Characteristic—Precise contouring of V-notch ball provides a modified equal percentage flow characteristic.
- High Capacity—Unrestricted, straight-through, flow design provides greater capacity than many conventional globe and rotary eccentric plug valves.
- Long Seat Life—The V-notch ball cams into and out of the seat minimizing contact with the seat ring for reduced wear and friction (figure 3). The V-notch ball does not contact the seat during throttling operation. S31600 (316 stainless steel) or R30006 (Alloy 6) seat ring has two shutoff surfaces and can be easily reversed, reducing downtime.
- One-Piece Body—Valve body is cast in one piece. There are no body gaskets to leak as a result of pipeline stresses.
- Operational Versatility—Self-centering seat ring and rugged V-notch ball allow forward or reverse flow with tight shutoff in either flow direction.
- Easy Installation—Integral valve flanges mate with many different classes of pipeline flanges, satisfying a variety of piping requirements. Flanges eliminate exposed line flange bolting, shorten alignment and installation time, and promote secure valve installations and piping integrity.

(continued on page 3)

Specifications

Available Configuration

Flanged valve body assembly with reversible(1) metal seat ring and splined shaft. See tables 2 and 3.

Valve Sizes

NPS ■ 3, ■ 4, ■ 6, ■ 8, ■ 10, and ■ 12.
DN 80, 100, 150, 200, 250 and 300 are also available.

End Connection Style and Rating

■ Raised-face flanges or ■ ring-type joint flanges (ASME B16.5). Valve bodies with EN PN10 through PN100 flanges also available. See tables 2 and 3 for ASME and EN availability.

Maximum Inlet Pressure(2)

Consistent with applicable ASME or EN flange ratings

Maximum Pressure Drops(2)

See table 4 for both forward and reverse flow pressure drops

Shutoff Classification

Class IV per ANSI/FCI 70-2 and IEC 60534-4, (0.01% of valve capacity at full travel) for either flow direction

Construction Materials

See table 5

Material Temperature Capability(2)

See table 5

Flow Characteristic

Modified equal percentage

Flow Direction

■ Forward (normal) flow is into the convex side of the V-notch ball
■ Bidirectional flow is into either side of the V-notch ball

Flow Coefficients

See Fisher Catalog 12

Flow Coefficient Ratio(3)

200 to 1

Actuator Mounting

■ Right-hand or ■ left-hand as viewed from the upstream side of the valve.

Mounting position depends on the desired open valve position and flow direction required by operating conditions. For more information, see the Installation section.

Valve V-Notch Ball Rotation

Counterclockwise to close (when viewed from the actuator side of the valve body) through 90 degrees of V-notch ball rotation

Valve Body/Actuator Action

With diaphragm or piston rotary actuator, field-reversible between
■ push-down-to-close (extending actuator rod closes valve body) and
■ push-down-to-open (extending actuator rod opens valve body)

Packing Constructions

PTFE V-Ring: With one carbon-filled PTFE conductive packing ring in ■ single, ■ double, or ■ leak-off arrangements
Braided PTFE Composition and Graphite Ribbon: With one graphited composition conductive packing ring in ■ single, ■ double, or ■ leak-off arrangements
Graphite Ribbon Packing Rings: In ■ single, ■ double, or ■ leak-off arrangements
ENVIRO-SEAL™: ■ PTFE or ■ Graphite in single arrangements

Approximate Weights

See table 1

Dimensions

See figure 4; face-to-face dimensions conform to ISA S75.04. IEC 60534-3-2 face-to-face dimensions are equivalent to S75.04 face-to-face dimensions.

Options

■ Sealed bearing constructions, ■ purged bearings

1. The reversible seat is not available in every trim material. Consult your Emerson sales office.
2. The pressure or temperature limits in the referenced tables or figures, and in any applicable code limitation, should not be exceeded.
3. Ratio of maximum flow coefficient to minimum usable flow coefficient. May also be called rangeability.

Table 1. Approximate Weights

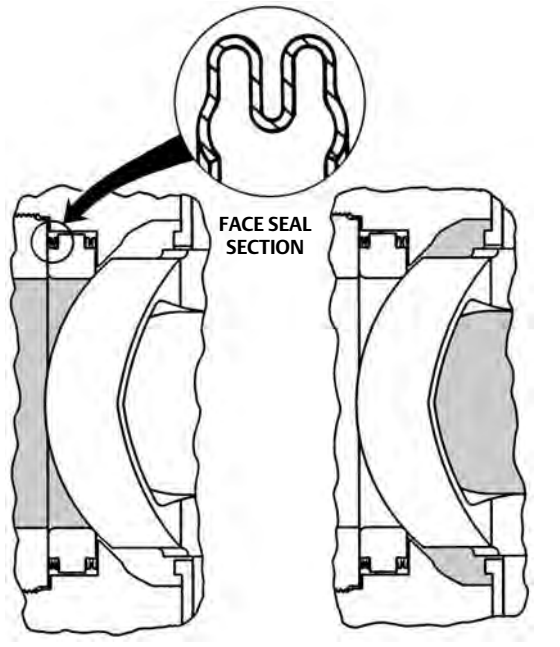
VALVE SIZE, NPS	FLANGED		
	CL150	CL300	CL600
DN	kg		
80	19	24	26
100	36	42	50
150	54	69	93
200	79	98	135
250	---	208	312
300	---	253	367
NPS	Pounds		
3	42	52	57
4	79	93	111
6	120	152	204
8	175	217	298
10	---	458	687
12	---	558	810

Table 2. Valve Size, ASME Ratings, and Flange Compatibility

VALVE SIZE, NPS	ASME FLANGED		
	CL150	CL300	CL600
3	X	X	X
4	X	X	X
6	X	X	X
8	X	X	X
10	---	X	X
12	---	X	X

X indicates availability.

Figure 1. Detail of Seat Ring Design



Features (continued)

- Simple Assembly and Maintenance—No special orientation, precision clamping or repetitive centering of V-notch ball and seat ring is required when tightening the retainer, promoting accurate alignment and easy assembly.

- Sour Service Capability—Trim and bolting materials are available for applications handling sour fluids and gases. These constructions comply with the requirements of NACE MR0175-2002.

- Rugged Construction—Durable, solid metal seat ring and ball shut off tightly. Oversized shaft diameters and rugged trim parts allow high pressure drops.

- Reliable Performance—The seat ring design (figure 1) self-centers, self-laps, and dynamically aligns with V-notch ball, giving superior cycle life. Optional sealed metal bearings help prevent particle buildup and valve shaft seizure in severe applications.

Figure 2. Sectionals of Fisher CV500 Rotary Control Valves

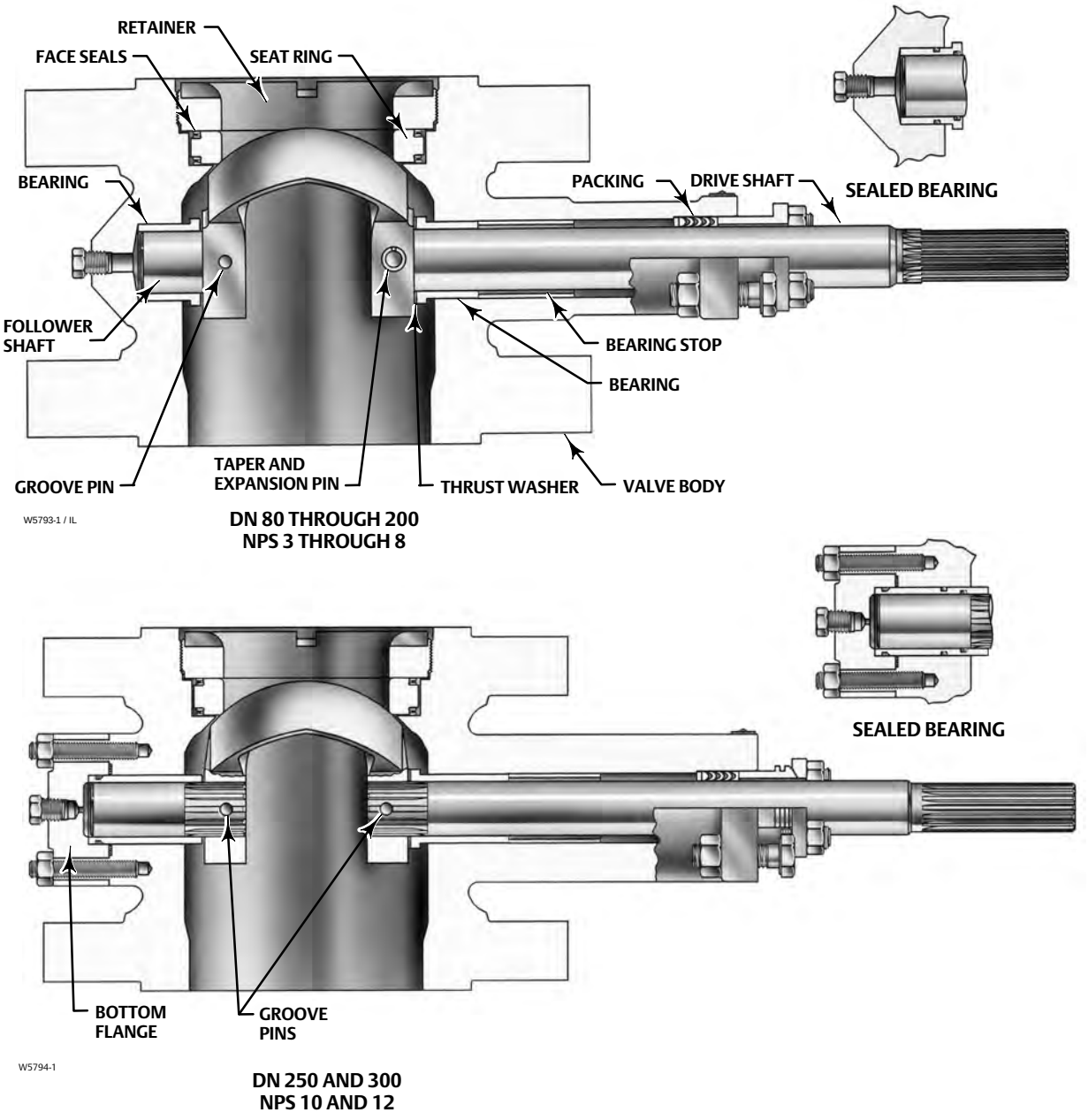


Table 3. Valve Size, DN Ratings, and Flange Compatibility

VALVE SIZE, DN	EN					
	Flanged					
	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
80	X	X	X	X	X	X
100	X	X	X	X	X	X
150	X	X	X	X	X	X
200	X	X	X	X	X	X
250	---	---	X	X	---	---
300	---	---	X	X	---	---

X indicates availability.

Table 4. Maximum Allowable Shutoff Pressure Drops(2)

VALVE BODY MATERIAL	BEARING MATERIAL	TEMPERATURE,	VALVE SIZE, DN					
			80	100	150	200	250	300
		°C	Bar					
WCC steel	S44004 (440C SST)	-29 to 149	41.4	41.4	41.4	24.1	24.1	27.6
		149 to 204	41.4	41.4	41.4	23.8	24.1	27.6
		204 to 316	41.4	41.4	41.4	23.1	24.1	27.6
WCC Steel, 1.0619 steel, CF8M (316 SST), 1.4581 SST, or CF3M(3) (316L SST)	R30006 (Alloy 6)	-46(1) to 204	41.4	41.4	20.7	15.2	24.1	27.6
		204 to 260	41.4	41.4	20.7	15.2	24.1	27.6
		260 to 316	41.4	41.4	20.7	15.2	24.1	27.6
	PTFE/composition-lined S31603(3) (S316L SST)	-46(1) to 93	41.4	41.4	41.4	24.1	31	34.5
		93 to 149	41.4	41.4	41.4	24.1(4) 23.1(5)	31	34.5
		149 to 204	41.4	41.4	41.4	23.8(4) 22.1(5)	31	34.5
		204 to 232	41.4	41.4	41.4	23.4(4) 21.7(5)	31	34.5
VALVE BODY MATERIAL	**BEARING MATERIAL**	**TEMPERATURE,**	**VALVE SIZE, NPS**					
			3	**4**	**6**	**8**	**10**	**12**
		°F	Psi					
WCC steel	S44004 (440C SST)	-20 to 300	600	600	600	350	350	400
		300 to 400	600	600	600	345	350	400
		400 to 600	600	600	600	335	350	400
WCC Steel, 1.0619 steel, CF8M (316 SST), 1.4581 SST, or CF3M(3) (316L SST)	R30006 (Alloy 6)	-50(1) to 400	600	600	300	220	350	400
		400 to 500	600	600	300	220	350	400
		500 to 600	600	600	300	220	350	400
	PTFE/composition-lined S31603(3) (S316L SST)	-50(1) to 200	600	600	600	350	450	500
		200 to 300	600	600	600	350(4) 335(5)	450	500
		300 to 400	600	600	600	345(4) 320(5)	450	500
		400 to 450	600	600	600	340(4) 315(5)	450	500

1. -29°C (-20°F) for WCC steel valve body material.
2. The pressure or temperature limits in this table or in any applicable code limitation, should not be exceeded.
3. Fisher standard material offerings in Europe only.
4. S17400 (17-4PH SST) shaft only.
5. ASME SA-479 Grade S20910 stainless steel shaft only. Pressure drops appropriate for both shaft materials.

Table 5. Materials of Construction and Temperature Capabilities

PART NAME	MATERIAL		MINIMUM TO MAXIMUM TEMPERATURE	
			°C	°F
Valve body and retainer	WCC steel bodies	CB7Cu-1 (17-4PH) retainer	-29 to 427	-20 to 800
		R30006 (Alloy 6) retainer	-29 to 427	-20 to 800
		CF8M (316 SST) retainer	-29 to 260	-20 to 500
	1.0619 steel bodies	CB7Cu-1 (17-4PH) retainer	-26 to 427	-14 to 800
		R30006 (Alloy 6) retainer	-26 to 427	-14 to 800
		CF3M (316L SST) retainer	-26 to 260	-14 to 500
	CF8M (316 SST) bodies	CF8M retainer	-198 to 427	-325 to 800
		R30006 (Alloy 6) retainer	-46 to 316	-50 to 600
		CF8M with CoCr-A (Alloy 6) bore	-198 to 427	-325 to 800
	1.4581 SST bodies	CF3M retainer	-195 to 427	-319 to 800
		R30006 (Alloy 6) retainer	-46 to 316	-50 to 600
		CF3M with CoCr-A bore	-198 to 427	-319 to 800
	CF3M[1] (316L SST) bodies	CF3M retainer	-198 to 427	-325 to 800
		R30006 (Alloy 6) retainer	-46 to 316	-50 to 600
		CF3M with CoCr-A bore	-198 to 427	-325 to 800
Seat ring	CF8M		-198 to 538	-325 to 1000
	R30006 (Alloy 6)		-198 to 538	-325 to 1000
	CF8M with CoCr-A seat		-198 to 538	-325 to 1000
	CF3M[1]		-198 to 454	-325 to 850
	CF3M[1] with CoCr-A seat		-198 to 454	-325 to 850
Ball	Chrome plated CF3M		-198 to 316	-325 to 600
	Chrome plated CF3M with CoCr-A V-notch		-198 to 316	-325 to 600
Drive shaft and follower shaft	S17400 (17-4PH SST)		-62 to 427	-80 to 800
	ASME SA479 grade S20910		-198 to 538	-325 to 1000
Taper and expansion pins (NPS 3 through 8)	ASME SA479 grade S20910		-198 to 538	-325 to 1000
Groove pin	S31600		-198 to 538	-325 to 1000
Bearings	S44004 (440C SST)		-29 to 427	-20 to 800
	R30006 (Alloy 6)		-198 to 538	-325 to 1000
	PTFE/composition lined S31603		-46 to 232	-50 to 450
O-rings[2] (for S44004 or R30006 sealed bearings)	Fluorocarbon		-18 to 204	0 to 400
	Nitrile		-29 to 93	-20 to 200
Bearing stop	S31600		-198 to 538	-325 to 1000
	S31603[1]		-198 to 454	-325 to 850
Thrust washer	S17700 for S17400 drive shaft		-198 to 427	-325 to 800
	Alloy 6B for S20910 drive shaft		-198 to 538	-325 to 1000
Face seals	N07718		-198 to 538	-325 to 1000
Retainer gasket	S31600		-198 to 538	-325 to 1000
	S31603[1]		-198 to 454	-325 to 850
Packing	PTFE V-ring with one carbon-filled PTFE ring[3]		-46 to 260	-50 to 500
	Braided PTFE composition with one graphite filament ring[4]		-73 to 260	-100 to 500
	Graphite ribbon		-198 to 538	-325 to 1000
Packing follower	S31600		-198 to 538	-325 to 1000
Studs and nuts	SA-193-B7 studs and SA-194-2H nuts		-46 to 427	-50 to 800
	SA-193-B7M studs and SA-194-2HM nuts		-29 to 427	-20 to 800
	SA-193-B8M studs and SA-194-8M nuts		-198 to 538	-325 to 1000
Packing box ring	S31600		-198 to 538	-325 to 1000
	S31603[1]		-198 to 454	-325 to 850

1. Fisher standard material offerings in Europe only.
2. For sealed bearing constructions.
3. Carbon-filled PTFE ring used for grounding purposes.
4. Graphite filament ring used for grounding purposes.

Installation

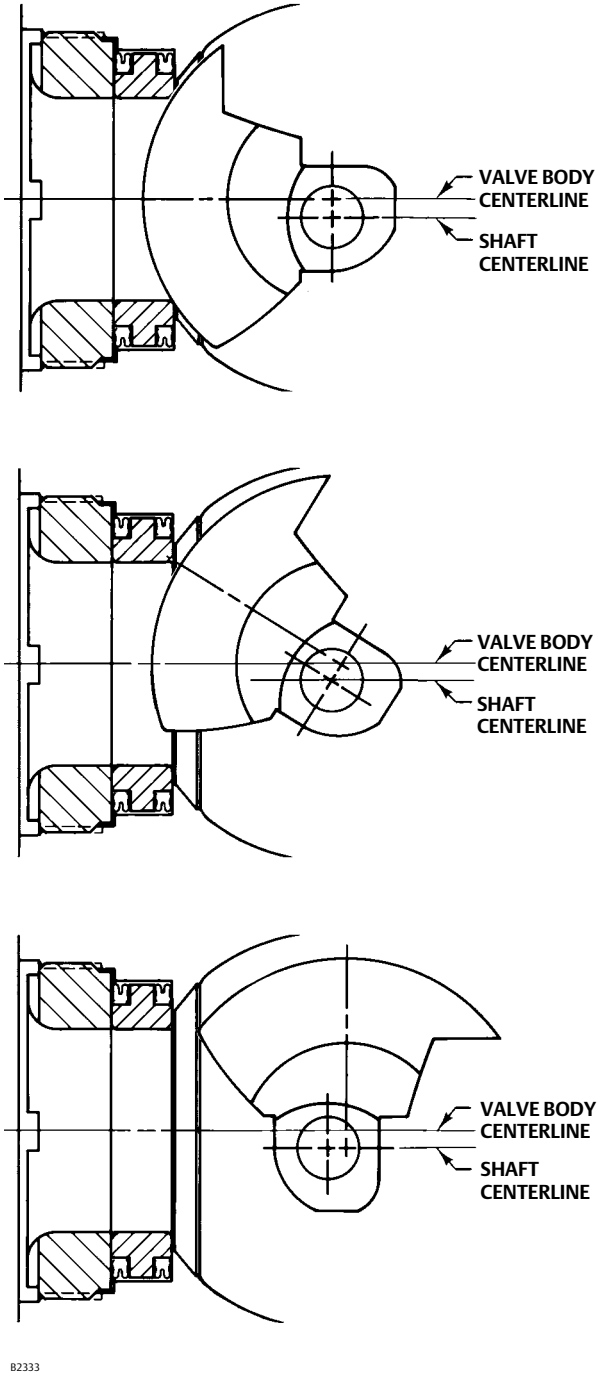
The CV500 control valve may be installed in any position. However, for best shutoff performance, a position with the shaft horizontal is recommended.

The control valve may be installed in forward or reverse flow direction. Forward flow (through the seat ring and past the V-notch ball) tends to open the valve; reverse flow (past the V-notch ball and through the seat ring) tends to close the valve. The forward flow direction is recommended. Refer to the Fisher CV500 Rotary Control Valve instruction manual, D101640X012, to determine the proper installation orientation of the V-notch ball and actuator, and to determine the flow direction of the process fluid through the valve.

Refer to the appropriate actuator bulletin for possible assembly and installation options. For assistance in selecting the appropriate combination of actuator action and open valve position, consult your Emerson sales office.

Dimensions are shown in figure 4.

Figure 3. Eccentric V-Notch Ball Rotation



Ordering Information

Valve Information

To determine what valve ordering information is needed, refer to the specifications table. Review the information under each specification and in the referenced tables; specify your choice whenever there is a selection to be made.

Actuator and Accessory Information

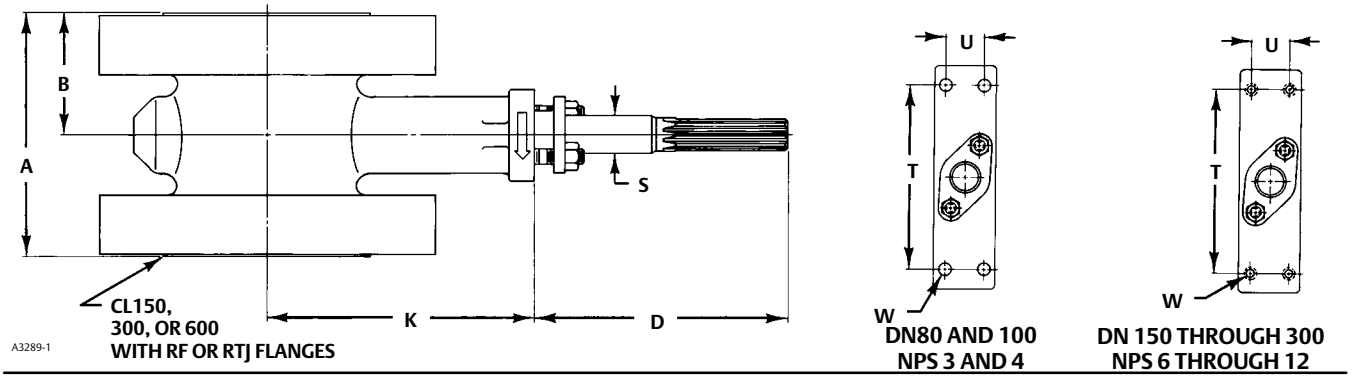
Refer to the specific actuator and accessory bulletins for required ordering information.

Table 6. Fisher CV500 Valve Body Dimensions

VALVE SIZE	DIMENSIONS									
	A		B		D	K	S (Shaft Dia)(1)	T	U	W
	RF	RTJ	RF	RTJ						
DN	mm									
80	165	165	83	83	213	200	25.4 25.4 x 19.1	152	32	14
100	194	194	97	97	208	216	31.8	235	46	18
150	229	229	114	114	208	270	38.1 38.1 x 31.8	235	46	5/8-inch 11 UNC
200	243	243	121	121	208	318	38.1	235	46	5/8-inch 11 UNC
250	297	312	148	156	356	353	44.5	273	51	3/4-inch 10 UNC
300	338	354	169	177	356	408	53.8 53.8 x 50.8	273	51	3/4-inch 10 UNC
NPS	Inches									
3	6.50	6.50	3.25	3.25	8.44	7.88	1.00 1.00 x 0.75	6.00	1.25	0.56
4	7.62	7.62	3.81	3.81	8.19	8.50	1.25	9.25	1.81	0.69
6	9.00	9.00	4.50	4.50	8.19	10.62	1.50 1.50 x 1.25	9.25	1.81	5/8-inch 11 UNC
8	9.56	9.56	4.78	4.78	8.19	12.50	1.50	9.25	1.81	5/8-inch 11 UNC
10	11.68	12.30	5.84	6.15	14.00	13.91	1.75	10.75	2.00	3/4-inch 10 UNC
12	13.31	13.93	6.66	6.97	14.00	16.07	2.12 2.12 x 2.00	10.75	2.00	3/4-inch 10 UNC

1. Shaft diameter versus spline diameter.

Figure 4. Fisher CV500 Valve Body Dimensions (also see table 6)



Note:
For dimensions of valves with DN (or other) end connections, contact your Emerson sales office.

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

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Fisher™ Multiport Flow Selector Valve

The Fisher Multiport Flow Selector Valve connects up to eight input lines, allowing for the diversion and testing of fluid from any individual line through a rotating plug, while the remaining seven lines continue to flow to a common group outlet. This product provides compact selection and diversion of fluids from individual wells for testing without disrupting the production from all other wells.

The Multiport Flow Selector consists of four main components: the body, bonnet, plug, and actuator. The body consists of inlet and outlet ports to connect all the 7 well inlets, 1 test outlet and common group outlet. The bonnet will hold the plug vertically and balanced to rotate within the body and provides tight sealing to the valve body. The plug is used to select which well media or well port is sent through the test outlet port.

FISHER MULTIPORT FLOW SELECTOR VALVE

Features

- Reliable Bearing Life—A tapered roller thrust bearing and wiper are fitted at the top of the plug and a carbon filled PTFE bushing is located at the bottom of the plug. Tapered roller bearings can take large axial forces as well as being able to sustain large radial forces.

- Sour Service Capability—Standard material configurations are compliant to NACE MR0175/ISO 15156.

- Fire Safe Construction—The Fisher Multiport product has been Fire-Tested in accordance with API 6FA by third party laboratories and has met the external leakage requirements.

- Manual Travel Indicator—Integral travel indication allows for quick visible confirmation of plug alignment to each inlet port within the manifold.

- Scraper Seat—The leading edge of the rotating seal contains a scraper seat providing a wiping action on the sealing surface inside the manifold. This removes process debris allowing for the seat to reliably seal around each inlet port.

- High Differential Seal—Features a high differential seal assembly, allowing for tight shut off. This dynamic seal prevents leakage and contamination to the test port from the bulk production.

(continued on page 3)

Specifications

Body Design Standards

ASME B16.34

Valve Sizes

NPS ■ 2x4, ■ 3x6, ■ 4x8, ■ 4x10, and ■ 6x16

Reference table 1

Available Configuration

Flanged or FNPT body assembly with optional alternative end connections.

End Connection Styles

■ Raised-face flanges (ASME B16.5) or ■ Threaded connections for NPS 2x4 constructions only

Flow Direction

Typically flow down, flow up optional

Maximum Group Outlet Flow (C_V)

See tables 4 and 5

Maximum Inlet Pressure(1)

Flanged: Consistent with ASME CL150, 300, 600, 900, 1500, and 2500 per ASME B16.34

See tables 4 and 5

Maximum Pressure Drops

See tables 4 and 5

Shutoff Classification

Class IV per ANSI/FCI70-2 and IEC 60534-4

Material Temperature Capability

See table 3

Dimensions

See table 6

Actuator

Automated with a Bettis™ Multiport Electric Actuator

Approximate Weights

See table 2

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

Features (continued)

- Serviceable Seal—Field adjustable seal/seat with various materials for adverse service conditions. In this manner, seal adjustments can be made in the field without removing the actuator. Replacement soft seal kits are available for maintenance.
- Plug Alignment—One-piece angle plug is centered in the body from bonnet to test outlet and provides smooth operation through the full 360 degrees of travel. The bonnet will hold the plug vertically and balanced to rotate within the body and provides tight sealing to the valve body.
- Precise Positioning—Inlet port calibration with the Bettis MPA electric actuator provides precision alignment with each inlet throughout the actuators 360 degrees of travel. The Bettis exclusive solid state motor starter and control software provides precise positioning of flow selector within +/- 1 degree of the selected port.

Multiport Functionality

The maximum number of wells that can be connected to a single MPFS is 8. However, for best operation, it is recommended to connect maximum 7 number of wells.

The well lines can be easily diverted to production and test separator from MPFS. The seven inlets of the Multiport flow selector are connected to wells along with the isolation valve. The remaining one port is kept free which is the home port.

Table 1. Valve Size, ANSI Ratings, and Flange Compatibility

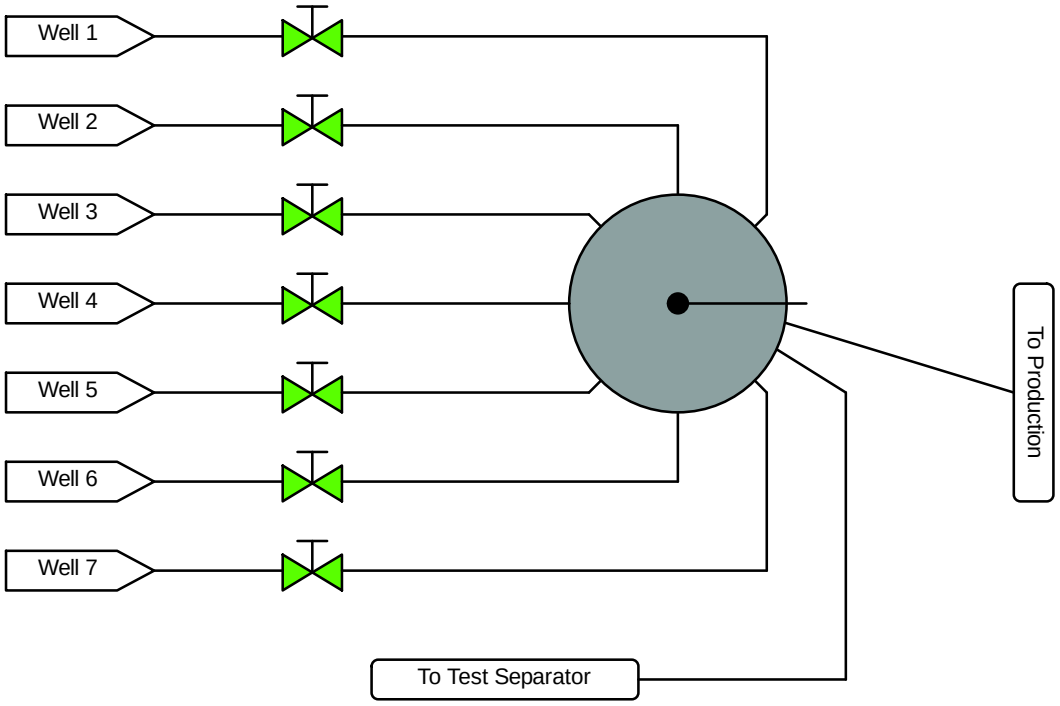
VALVE SIZE, NPS	ANSI CLASS RATING					
	CL150	CL300	CL600	CL900	CL1500	CL2500
2x4	– – –	X	X	X	X	– – –
3x6	X	X	X	X	X	X
4x8	– – –	X	X	X	X	– – –
4x10	– – –	– – –	– – –	– – –	– – –	X
6x16	– – –	X	X	X	X	X

X indicates availability

Table 2. Approximate Weights

VALVE SIZE, NPS	FLANGED, KG (LB)					
	CL150	CL300	CL600	CL900	CL1500	CL2500
2x4	---	---	90.7 (200)	362.9 (800)	---	---
3x6	551.1 (1215)	629.1 (1387)	655.9 (1446)	678.6 (1496)	968.9 (2136)	---
4x8	---	959.3 (2115)	976.1 (2152)	1134.8 (2502)	---	---
4x10	---	---	---	---	1740 (3836)	---
6x16	---	1809 (3988)	2017.5 (4448)	3589.7 (7914)	5343.3 (11780)	8703 (19187)

Figure 1. Detail Multiport Selector in Production



Arrangement and Working of Multiport Selector in Production Manifold

A Multiport Flow Selector typically has eight inlet and two outlet connections.

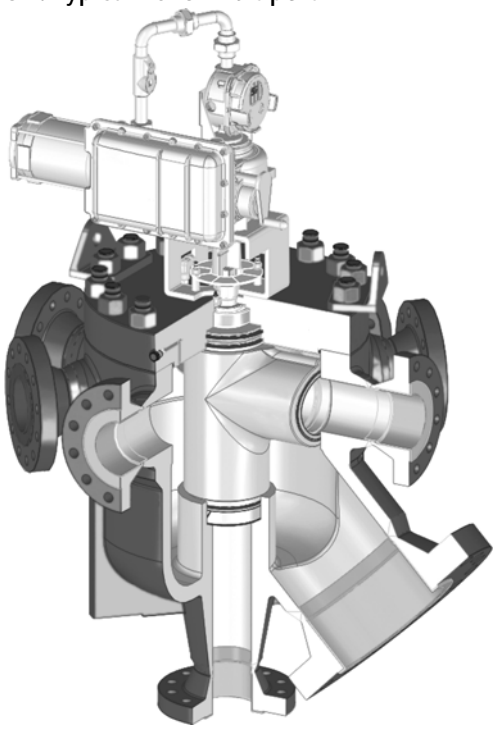
- Inlets—Out of eight inlets it is recommended to connect seven to the wells, and the eighth connection is generally used as a parking location and/or observation port for the selector plug. This allows for an observation port for temporary maintenance, flushing and allows production of all seven wells if the test system is offline. The internal plug diverts one wells fluid stream to the test port at a time. The plug is rotated to align with the well inlet to be tested.
- Outlets—The test outlet connects to the test system and the group outlet carries the flow of all other wells together to the production header.

Table 3. Materials of Construction and Temperature Capabilities

BONNET & BODY MATERIAL	FLANGE MATERIAL	PLUG MATERIAL	SEAL ASSEMBLY MATERIAL	STUD MATERIAL	NUT MATERIAL	O-RING MATERIAL	OPERATING TEMPERATURE RANGE	
							°C	°F
WCB/WCC	WCC or A105N	CF3M/CF8M	S31600/S31603 with 25% carbon graphite filled insert or S31600/S31603 with PTFE-PFA insert	A193 Gr. B7M	A194 Gr. 2HM	AFLAS	-9 to 232	16 to 450
CF3M/CF8M	CF3M or A182 F316L	CF8M						
CD3MN	CD3MN or A182 F51	CD3MN	Inconel 718 with PTFE/25% carbon graphite filled insert or Inconel 718 with PTFE-PFA insert					
CD3MWCuN	CD3MWCuN or A182 F55	CD3MWCuN						

Typical Fisher Multiport Construction Detail

Figure 2. Typical Fisher Multiport



X1515

Figure 3. Fisher Multiport Plug Cross Section

X1517

Table 4. Multiport Specifications 2x4 and 3x6

	MULTIPORT SIZES						
	2x4		3x6				
ANSI RATING	600 Max (threaded)	900 Max (flanged)	150	300	600	900	1500
MAXIMUM WORKING PRESSURE PSIG (BARG)(2)	1480 (102)	2220 (153.1)	285 (19.7)	740 (51)	1480 (1480)	2220 (153.1)	3705 (255.5)
TEMP RANGE °C (°F)	-29 to 300 (-20 to 572)						
TEST OUTLET C_V	67		151				100
GROUP OUTLET C_V	262		594				429
INLET PORTS	8 @ 2 FNPT	8 @ 2 flange	8 @ NPS 3 flange				
TEST OUTLET PORT	1 @ 2 FNPT	1 @ 2 flange	1 @ NPS 3 flange				
GROUP OUTLET PORT	1 @ 4 FNPT	1 @ 4 flange	1 @ NPS 6 flange				
WEIGHT, KG (LB)	90.7 (200)	362.8 (800)	551.1 (1215)	629.1 (1387)	655.9 (1446)	678.6 (1496)	968.4 (2135)
MAXIMUM DYNAMIC DIFFERENTIAL PRESSURE TEST TO GROUP PSID (BARG)(2)	600 (41.4)		500 (34.5)				
MAXIMUM DYNAMIC DIFFERENTIAL PRESSURE GROUP TO TEST PSID (BARG)(2)	550 (37.9)						
STATIC STATIONARY DIFFERENTIAL TEST TO GROUP PSID (BARG)(1,2)	1200 (82.7)		1000 (68.9)				
STATIC STATIONARY DIFFERENTIAL GROUP TO TEST PSID (BARG)(1,2)	1000 (68.9)						

1. In emergency situations only, the Multiport Flow Selector seal can maintain STATIC STATIONARY DIFFERENTIAL pressure rating per specifications above. However, do not operate the electric actuator at greater than the MAXIMUM DYNAMIC DIFFERENTIAL pressure rating because damage may occur to the electric actuator.
2. Pressure at ambient temperature.

Table 5. Multiport Specifications 4x8, 4x10, and 6x16

	MULTIPORT SIZES							
	4x8			4x10	6x16			
ANSI RATING	300	600	900	1500	300	600	900	1500
MAXIMUM WORKING PRESSURE PSIG (BARG)(2)	740 (51)	1480 (102)	2220 (153.1)	3705 (153.1)	740 (51)	1480 (102)	2220 (153.1)	3705 (255.5)
TEMP RANGE °C (°F)	-29 to 300 (-20 to 572)							
TEST OUTLET C_V	270		217	217	951			
GROUP OUTLET C_V	1040		1292	1292	5121			
SHELL HYDROSTATIC TEST PRESSURE PSIG (Kpa)	1110 (7650)	2220 (15300)	3330 (22950)	5560 (38310)	1110 (7650)	2220 (15300)	3330 (22950)	5560 (38310)
INLET PORTS	8 @ NPS 4 flange				8 @ NPS 6 flange			
TEST OUTLET PORT	1 @ NPS 4 flange				1 @ NPS 6 flange			
GROUP OUTLET PORT	1 @ NPS 8 flange			1 @ NPS 10 flange	1 @ NPS 16 flange			
WEIGHT, KG (LB)	959 (2115)	976 (2152)	1135 (2502)	1740 (3836)	1809 (3988)	2017 (4448)	3589 (7914)	5343 (11780)
MAXIMUM DYNAMIC DIFFERENTIAL PRESSURE TEST TO GROUP PSID (BARG)(2)	500 (34.5)							
MAXIMUM DYNAMIC DIFFERENTIAL PRESSURE GROUP TO TEST PSID (BARG)(2)								
STATIC STATIONARY DIFFERENTIAL TEST TO GROUP PSID (BARG)(1,2)	1000 (68.9)							
STATIC STATIONARY DIFFERENTIAL GROUP TO TEST PSID (BARG)(1,2)								

1. In emergency situations only, the Multiport Flow Selector seal can maintain STATIC STATIONARY DIFFERENTIAL pressure rating per specifications above. However, do not operate the electric actuator at greater than the MAXIMUM DYNAMIC DIFFERENTIAL pressure rating because damage may occur to the electric actuator.
2. Pressure at ambient temperature.

Figure 4. Dimensions for Multiport (see table 6)

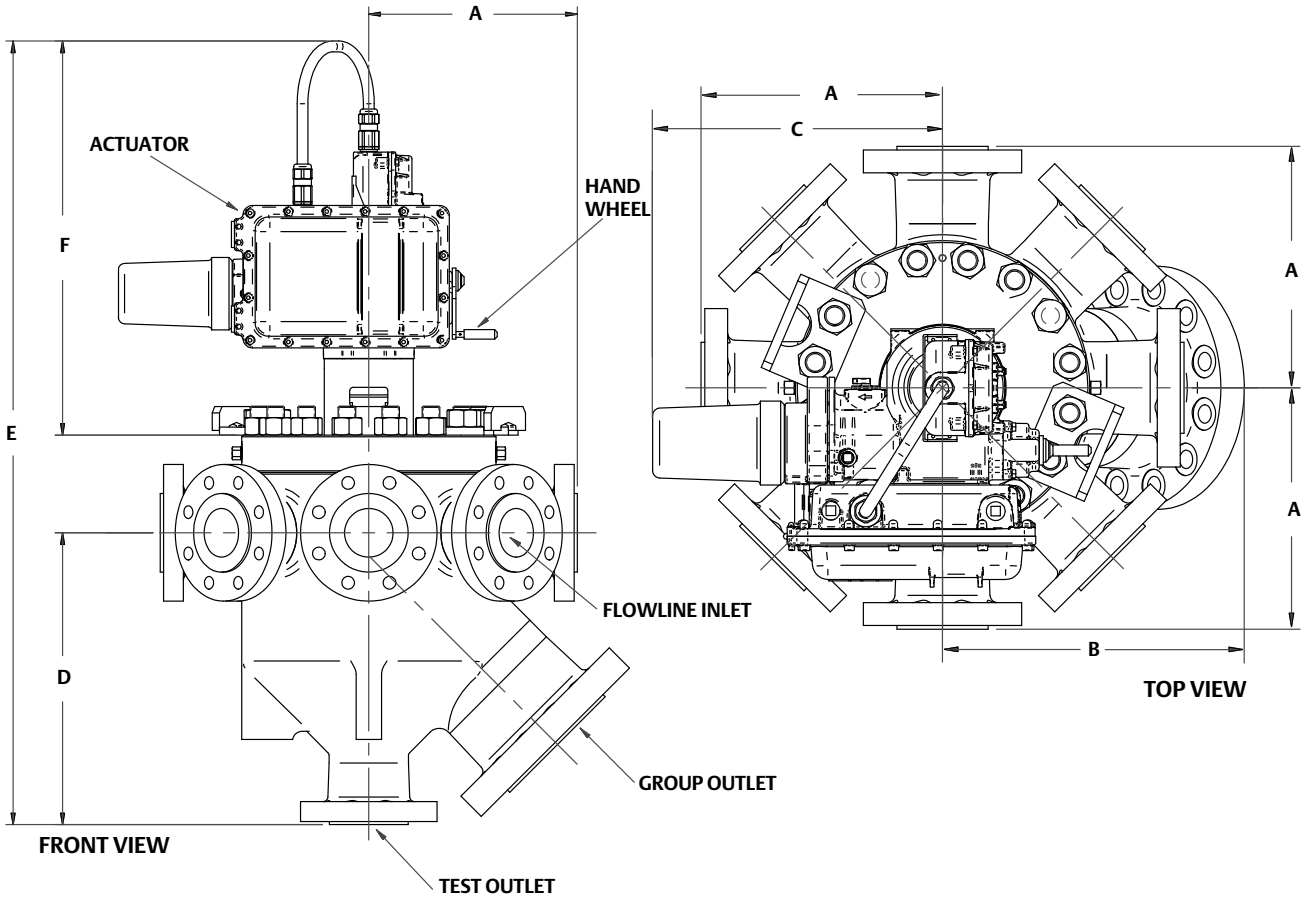


Table 6. Fisher Multiport Valve Body Dimensions (Raised-face Only)

VALVE SIZE, NPS	ASME CLASS	DIMENSIONS, MM (INCH)					
		A	B	C	D	E	F[1]
2x4	CL150	- - -	- - -	- - -	- - -	- - -	- - -
	CL300	353 (13.9)	345 (13.6)	500 (19.7)	417 (16.4)	1161 (45.7)	787 (31)
	CL600	353 (13.9)	358 (14.1)	500 (19.7)	417 (16.4)	1161 (45.7)	787 (31)
	CL900	353 (13.9)	386 (15.2)	500 (19.7)	417 (16.4)	1161 (45.7)	787 (31)
3x6	CL150	340 (13.4)	391 (15.4)	500 (19.7)	437 (17.2)	1382 (54.4)	787 (31)
	CL300	351 (13.8)	411 (16.2)	500 (19.7)	446 (17.6)	1390 (54.7)	787 (31)
	CL600	360 (14.2)	427 (16.8)	500 (19.7)	456 (17.9)	1399 (55.1)	787 (31)
	CL900	379 (14.9)	451 (17.8)	500 (19.7)	475 (18.7)	1399 (55.1)	787 (31)
	CL1500	432 (17.0)	498 (19.6)	500 (19.7)	533 (21.0)	1537 (60.5)	787 (31)
4x8	CL150	- - -	- - -	- - -	- - -	- - -	- - -
	CL300	395 (15.6)	491 (19.3)	500 (19.7)	560 (22.1)	1544 (60.8)	787 (31)
	CL600	417 (16.4)	520 (20.5)	500 (19.7)	583 (22.9)	1565 (61.6)	787 (31)
	CL900	430 (16.9)	558 (22.0)	500 (19.7)	595 (23.4)	1577 (62.1)	787 (31)
4x10	CL1500	478 (18.8)	712 (28.0)	500 (19.7)	661 (26.0)	1793 (70.6)	787 (31)
6x16	CL150	- - -	- - -	- - -	- - -	- - -	- - -
	CL300	527 (20.8)	684 (26.9)	500 (19.7)	361 (33.9)	1908 (75.1)	787 (31)
	CL600	551 (21.7)	721 (28.4)	500 (19.7)	884 (34.8)	1932 (76.1)	787 (31)
	CL900	667 (26.2)	790 (31.1)	500 (19.7)	957 (37.7)	2054 (80.9)	787 (31)
	CL1500	657 (25.9)	919 (36.2)	500 (19.7)	1038 (40.9)	2250 (88.6)	843 (33)
	CL2500	829 (32.6)	950 (37.4)	500 (19.7)	1105 (43.5)	2383 (93.8)	800 (31.5)

1. 28 inches of space is required to remove the actuator assembly from the valve.

Installation

The Multiport Flow Selector is installed vertically with the test port down. Flow is normally from the 7 inlets to the group outlet or test outlet. The 8th inlet is normally used as the home port for when testing of an individual inlet is not desired.

The Multiport Flow Selector plug seal/port alignment is factory adjusted when supplied with actuator and should not require further adjustment.

Note

When hydrotesting external piping, position the plug between any two inlet ports in order to equalize test pressure between the multiport body and external piping to prevent possible seal damage from happening.

Ordering Information

Valve Information

To determine what valve ordering information is needed, refer to the specifications table. Review the information under each specification and in the referenced tables; specify your choice whenever there is a selection to be made.

Actuator and Accessory Information

Refer to the specific actuator and accessory bulletins for required ordering information.

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

www.Fisher.com

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Fisher™ Slurry Vee-Ball™ V150S and V300S Rotary Control Valves

The Fisher V150S and V300S Slurry Vee-Ball valve mates with CL150 and CL300 raised-face flanges. Rugged construction, highly wear-resistant trim materials, and an unrestricted straight through flow path make the design ideal for controlling the most abrasive of slurries.

A shaft with a choice of drive connections will allow a variety of power operated actuators and valve positioners or controllers to be used.

The design is particularly effective in minimizing erosive damage to the adjoining pipework, thereby providing greater operational safety and service life when compared with other valve types.

Fisher Slurry Vee-Ball Control Valve

Features

- Fully protective trim—The valve body, shaft, and bearings are fully protected by hard wear-resistant trim materials.

- Pipeline and flange protection—The throttled flow stream is guided through a specially shaped flow ring to minimize turbulence and impingement on the pipe wall. The valve can be matched to the bore size of the inlet and outlet piping in order to prevent turbulence being generated by the step resulting in scouring erosion of the flange faces, unexpected leakage, and expensive rework. In addition, both the inlet and outlet valve flange faces are protected by a portion of the hard trim.

- Long Service Life—The Vee-Ball design, when used in reverse flow mode, keeps the high velocity down stream of the vena contracta within the flow ring bore at the outlet of the valve. Compared with other styles of valves, the exit flow is essentially parallel with the flow ring wall and a minimum of flow impingement occurs. Combined with a choice of hard wear-resistant materials, a significantly long life is obtained.

  Easily replaceable trim parts allow the valve to be overhauled at predetermined intervals and the valve body used again during repeated operational cycles.

- Ease of installation—Full flanging on the valve body allows the valve body to be easily aligned centrally with the pipe flanges, an essential requirement in avoiding erosion across the flange faces.

- Excellent Flow Control—Precise contouring of the V-notch ball provides a modified equal percentage flow characteristic. When combined with a valve actuator/controller system having minimal lost motion, improved process control can be obtained.

(continued on page 2)

Features (continued)

- Quick and Easy Maintenance—All trim parts are retained without the use of press fits or screw threads exposed to the process fluid. See figure 1.

- Structural Integrity—The valve body, complete with flanges, is made from a one-piece casting. No welding is employed. No O-ring seals are used. Use of a flanged valve body does not require the use of extra long studs.

  The shaft seal is made from well-proven PTFE chevron ring packing with the means for external adjustment.

Options

- A PSZ (partially stabilized zirconia) ceramic flow ring insert is available with HCI (high chrome iron) or PSZ ceramic ball for particularly aggressive slurry services with extended lifetime requirements. The ceramic insert offers substantial increase in flow ring lifetimes.

- Trim materials are available to meet the requirements of corrosive/erosive slurries. See table 2.

- The “Flow Over the Top” V-Notch Ball offers an alternative to the standard V-Notch Ball in scaling applications.

- The drive shaft is available with either a double D or splined actuator connection to accommodate a choice of actuation between a spring-opposed diaphragm or a rack and pinion.

Specifications

Valve Sizes

■ NPS 3, ■ 4, ■ 6, ■ 8, ■ 10, and ■ 12

End Connection

V150S: CL150 Raised-face flange

V300S: CL300 Raised-face flange

Face to Face Dimension

See figure 2

Maximum Inlet Pressure

Consistent with pressure-temperature ratings per ASME B16.34 but do not exceed the material temperature capabilities shown below or the pressure drop limitations

Maximum Shut Off Pressure

See tables 3 and 4

Shutoff Classification

Class I per ANSI/FCI 70-2 and IEC 60534-4 (Class II and better not available). A defined initial maximum leak rate can be provided subject to review of service conditions.

Construction Materials

Standard Construction: See table 1

Temperature Capability

For Trim 1: 427°C (801°F) maximum
For Trims 2 and 3: 230°C (446°F) maximum
For materials: See table 1

Flow Characteristic

Modified equal percentage

Dimensions

See figures 2 and 3

Flow Direction

Reverse flow recommended (into concave face of ball, out through the flow ring)

Flow Coefficients

See Fisher Catalog 12

Maximum Ball Rotation

90 degrees

Valve Installation

Shaft axis to be horizontal

Actuator Mounting

Standard ball rotation is clockwise (CW) to close with right hand mount actuator. Left hand mount actuator with counter clockwise (CCW) to close ball action is optional. For horizontal pipe run and horizontal shaft orientation, it is recommended the ball rotate to the top of the valve body upon opening.

Valve/Actuator Action

With diaphragm or piston rotary actuator and splined shaft, the valve is field-reversible between PDTC or PDTO: ■ push-down-to-close (extending actuator rod closes valve) and ■ push-down-to-open (extending actuator rod opens valve)

Actuator Size Selection

Contact your Emerson sales office for information.

Approximate Weight

Valve Size, NPS	V150S		V300S	
	kg	lb	kg	lb
3	15	33	30	66
4	28	62	39	86
6	45	99	65	142
8	82	180	120	265
10	120	265	213	470
12	178	390	314	692

Table 1. Standard Construction Materials

Part	Material	MATERIAL TEMPERATURE CAPABILITY			
		°C		°F	
		Minimum	Maximum	Minimum	Maximum
Valve Body	Carbon Steel ASME SA216 WCC	-29	427	-20	800
Body Liner	High Chrome Iron (HCI) ASTM A532 Class III Type A	-29	427	-20	800
V-Notch Ball	High Chrome Iron ASTM A532 Class III Type A	-29	427	-20	800
	Ceramic (optional)	-29	427	-20	800
Flow Ring	High Chrome Iron ASTM A532 Class III Type A	-29	427	-20	800
	HCI with Ceramic Insert (optional)	-29	230	-20	450
Flow Ring Retainer	Carbon Steel ASME SA105	-29	427	-20	800
Bearing Shroud	High Chrome Iron ASTM A532 Class III Type A	-29	427	-20	800
Bearing	S44004	-29	427	-20	800
Drive Shaft	S17400	-29	427	-20	800
Follower Shaft	S17400	-29	427	-20	800
Shaft Pins	S42000	-29	427	-20	800
Gaskets	Graphite SST Laminate	-198	538	-325	1000
Packing Set	PTFE V-ring	-46	230	-50	450
	Graphite	-198	538	-325	1000
Packing Box Ring and Follower	S31600	-198	538	-325	1000
Studs	B8M Class 2	-45	538	-50	1000
Nuts	S31600	-45	538	-50	1000
Retainer Screws and Clips	S31600	-45	538	-50	1000
Spring	S30400	-29	427	-20	800
Plug	S31600	-45	538	-50	1000

Table 2. Trim Levels

Trim Level	Ball	Flow Ring	Valve Body Liner	Bearing Shrouds
1 (standard)	HCI (High Chrome Iron)	HCI	HCI	HCI
2	HCI	HCI with ceramic insert	HCI	HCI
3	Ceramic Ball	HCI with ceramic insert	HCI	HCI

Table 3. V150S and V300S Maximum Allowable Shutoff Pressure Drops (Body Ratings) (Tables for both trim and body limits must be consulted)

TEMPERATURE RANGE	PRESSURE RATING	
	WCC CL150	WCC CL300
°C	Bar	
-46 to -29	---	---
-29 to 38	20.0	51.7
93	17.9	51.7
149	15.9	50.3
204	13.8	48.6
232	12.8	47.2
260	11.7	45.9
316	10.7	43.8
343	9.65	41.7
371	8.62	38.3
399	6.55	34.8
427	5.52	28.3
°F	Psi	
-50 to -20	---	---
-20 to 100	290	750
200	260	750
300	230	730
400	200	705
450	185	685
500	170	665
550	155	635
600	140	605
650	125	590
700	110	555
750	95	505
800	80	410

Table 4. V150S and V300S Maximum Allowable Shutoff Pressure Drops based on Standard Trim. Note: Do not exceed the pressure/temperature rating of the valve or mating flanges

TEMPERATURE RANGE	VALVE SIZE, NPS					
	3	4	6	8	10	12
°C	Bar					
-29 to 427	47.0	27.5	28.3	27.5	15.2	13.8
°F	Psi					
-20 to 800	680	400	410	400	220	200
1. Refer to table 3.						

Figure 1. Slurry Vee-Ball Cutaway View

W9177-2

Table 5. Fisher V150S Dimensions

VALVE SIZE	V150S DIMENSIONS(1)										
	A	B	D	G	K	M(2)	N(2)	S Diameter	T	U	W
NPS	mm										
3	165	80.0	235	140	130	104	98.0	19.1	152	31.8	14.2
4	194	102	214	152	140	117	98.0	19.1	152	31.8	14.2
6	230	111	214	175	164	124	112	25.4	152	31.8	14.2
8	304	184	208	220	231	195	124	31.8	235	46.0	17.5
10	385	235	208	250	261	235	132	31.8	235	46.0	17.5
12	455	291	208	300	304	270	132	38.1	235	46.0	17.5
	Inch										
3	6.49	3.15	9.26	5.51	5.12	4.11	3.86	0.75	6.00	1.25	0.56
4	7.62	4.02	8.44	5.98	5.53	4.61	3.86	0.75	6.00	1.25	0.56
6	9.06	4.38	8.44	6.89	6.45	4.90	4.40	1.00	6.00	1.25	0.56
8	11.96	7.25	8.19	8.66	9.11	7.68	4.90	1.25	9.25	1.81	0.69
10	15.16	9.26	8.18	9.84	10.26	9.25	5.19	1.25	9.25	1.81	0.69
12	17.91	11.47	8.18	11.81	11.97	10.63	5.19	1.50	9.25	1.81	0.69

1. Stud length associated with clearance dimension "M" is longer than standard length specified in ASME B16.5.
2. Clearance necessary to remove flange bolts.

Figure 2. Slurry Vee-Ball Dimensions (see tables 5 and 6)

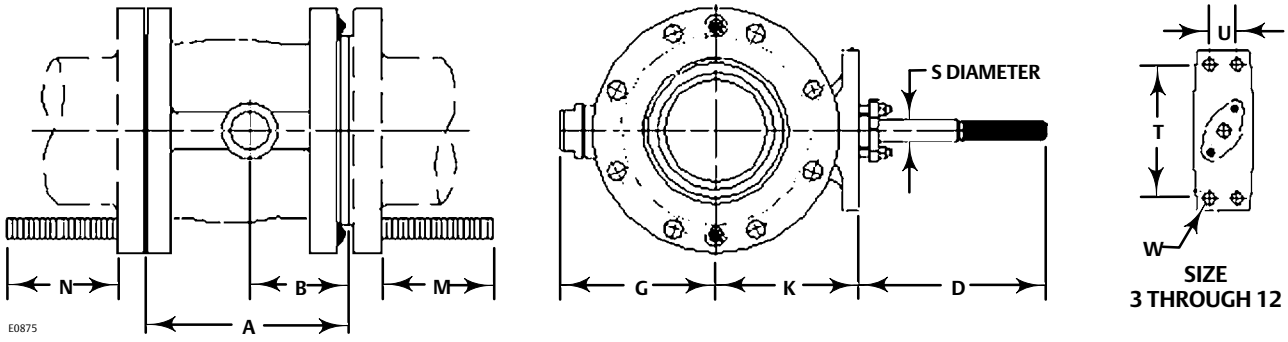


Table 6. Fisher V300S Dimensions

VALVE SIZE	V300S DIMENSIONS										
	A	B	D	G	K	M(1)	N(1)	S Diameter	T	U	W
NPS	mm										
3	165	80.0	235	140	130	127	121	19.1	152	31.8	14.2
4	194	102	214	152	140	146	127	19.1	152	31.8	14.2
6	230	111	214	175	164	152	140	25.4	152	31.8	14.2
8	304	184	208	220	231	223	152	31.8	235	46.0	17.5
10	385	235	208	250	261	276	137	31.8	235	46.0	17.5
12	455	291	208	300	304	324	186	38.1	235	46.0	17.5
	Inch										
3	6.49	3.15	9.26	5.51	5.12	5	4.75	0.75	6.00	1.25	0.56
4	7.62	4.02	8.44	5.98	5.53	5.75	5	0.75	6.00	1.25	0.56
6	9.06	4.38	8.44	6.89	6.45	6	5.5	1.00	6.00	1.25	0.56
8	11.96	7.25	8.19	8.66	9.11	8.78	6	1.25	9.25	1.81	0.69
10	15.16	9.26	8.18	9.84	10.26	10.87	6.81	1.25	9.25	1.81	0.69
12	17.91	11.47	8.18	11.81	11.97	12.75	7.31	1.50	9.25	1.81	0.69

1. Clearance necessary to remove flange bolts.

Table 7. Fisher Slurry Vee-Ball Dimensions for Double D Shaft Drive

VALVE SIZE	E	S(1)	FLAT LENGTH	FLAT SIZE	T	U	W
NPS	mm						
3	83	19.0	25.4	14.2	95	25	see below
4	83	19.0	25.4	14.2	95	25	
6	83	25.4	25.4	17.5	95	25	
8	83	31.8	25.4	20.6	133	38	
10	89	31.8	25.4	20.6	133	38	
12	89	38.1	38.1	25.4	133	38	
	Inch						
3	3.25	0.75	1.0	0.56	3.75	1.0	1/2-13
4	3.25	0.75	1.0	0.56	3.75	1.0	1/2-13
6	3.25	1	1.0	0.69	3.75	1.0	1/2-13
8	3.25	1.25	1.0	0.81	5.25	1.5	5/8-11
10	3.5	1.25	1.0	0.81	5.25	1.5	5/8-11
12	3.5	1.5	1.5	1.0	5.25	1.5	5/8-11

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.

Figure 3. Fisher Slurry Vee-Ball Dimensions for Double D Shaft Drive (see table 7)

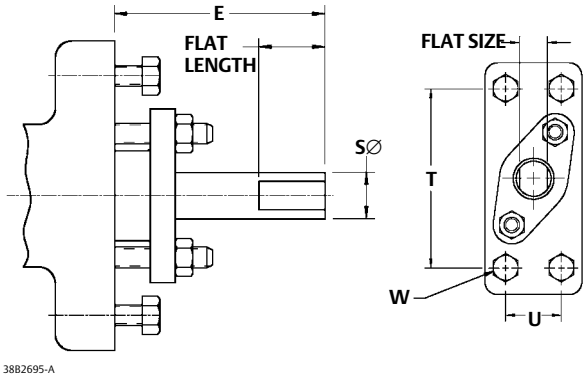
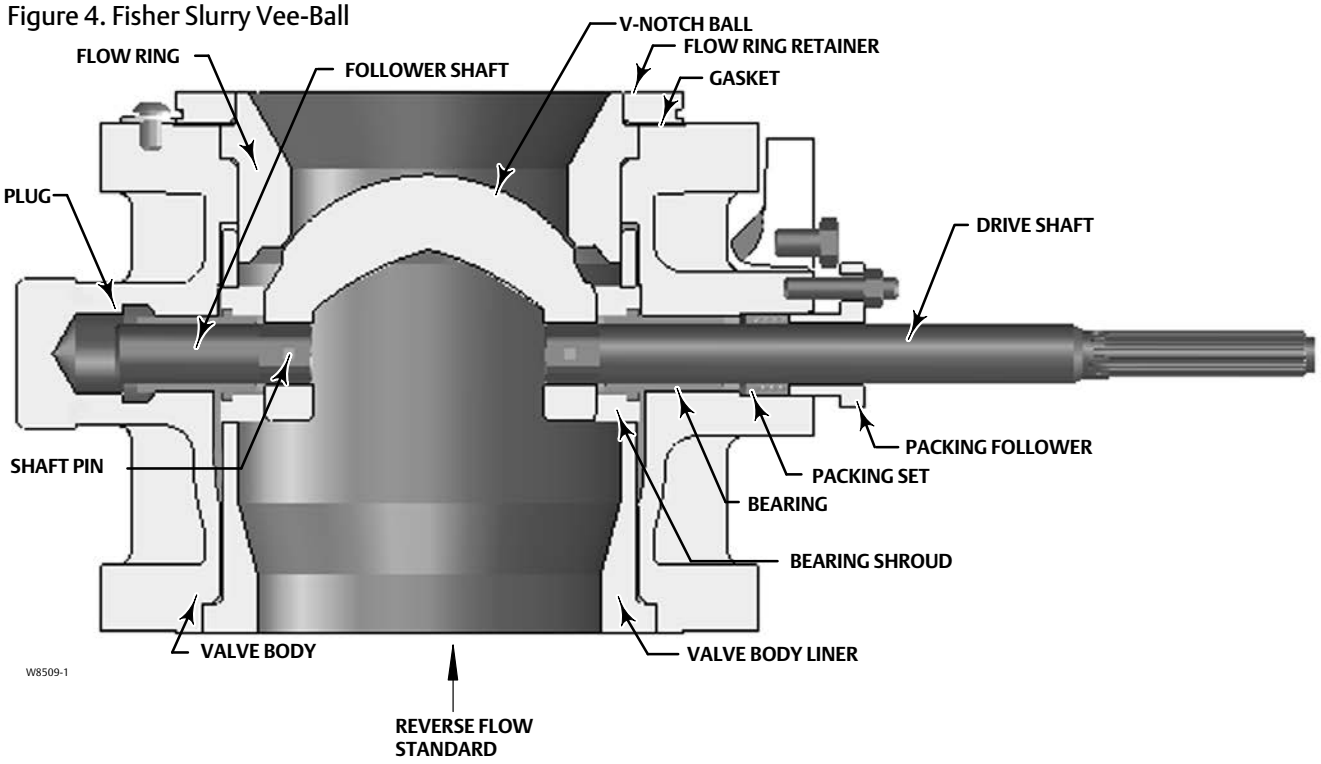


Figure 4. Fisher Slurry Vee-Ball



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

www.Fisher.com

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Fisher™ V250 Rotary Control Valve

The V250 Hi-Ball rotary control valve is designed for heavy-duty throttling and on-off applications. Depending on size, this valve installs between two CL600 or CL900 pipeline flanges. The V250 valve is available with a single ball seal, flow ring, or dual-seal construction. Single-seal constructions are used in tight shutoff applications; the flow ring construction can satisfy higher temperature requirements. The dual-seal construction, with a seal in the inlet and outlet openings, is used in bidirectional flow-shutoff applications. The V250 Hi-Ball valve is typically used for throttling and controlled flow applications in gas transmission lines, gas distribution, or liquid pipelines.

W4177

Features

- High Pressure Drop Capabilities—Depending on the construction, a V250 valve is capable of a maximum static pressure differential of 103 bar (1500 psi) at 82°C (180°F) for CL600, and 155 bar (2250 psi) for CL900 constructions at 38°C (100°F) for LCC steel and CF8M (316 stainless steel).
- Efficient Operation—Tapered-polygon ball-to-shaft connection (see figure 4) and clamped splined actuator connection (see figure 5) remove lost motion or deadband from the drive train for throttling control applications.
- Excellent Flow Control—Reduced ball port design provides a modified equal percentage flow characteristic and an excellent response characteristic.
- Tight Shutoff—Shutoff with the V250 ball seal is 0.0001 percent of maximum capacity.
- Greater Capacities—V250 ball valve construction offers greater capacities than conventional globe valves for both compressible and incompressible fluids.
- Sour Service Capability—Materials are available for applications handling sour service. These materials comply with the requirements of NACE MR0175-2002.
- Long Service Life—Pressure-balanced drive shaft design with PTFE-lined bearings and pressure-assisted shaft sealing arrangement provides for a long life of reliable service.
- Minimum Maintenance—Two-piece ball and shaft assembly allows for complete trim overhaul; parts replacement is kept to a minimum.
- Excellent Environmental Capabilities—The optional live loaded packing system is designed with very smooth shaft surfaces and live loading to provide excellent sealing.

Specifications

Available Configuration

Flangeless ball valve assembly with ■ single ball seal, ■ flow ring, or ■ dual ball seal

Valve Body Sizes and End Connection Styles

NPS 4 through 12 flangeless valves retained by line flange bolts and designed to fit between CL600 or CL900 ■ raised-face or ■ ring-type joint flanges (ASME B16.5)

NPS 16 through 24 flangeless valves retained by line flange bolts and designed to fit between CL600 ■ raised-face or ■ ring-type joint flanges (ASME B16.5)

Maximum Inlet Pressure(1)

NPS 4 through 12 consistent with CL600 or CL900 (ASME B16.34)
NPS 16 through 24 consistent with CL600 (ASME B16.34)

Maximum Allowable Shutoff Pressure Drop(1,2)

Single-Seal and Dual-Seal Construction: See figure 2.
Flow Ring Construction: Limited by the pressure-temperature rating of the valve body

Shutoff Classification

Single-Seal and Dual-Seal Constructions: 0.0001% of maximum valve capacity (less than 1% of Class IV, ANSI/FCI 70-2 and IEC 60534-4)
Flow Ring Construction: 1% of maximum valve capacity

Construction Materials

See table 1

Seal Material Temperature Capability(1)

Single-Seal and Dual-Seal Construction:
■ -46 to 82°C (-50 to 180°F) for LCC steel and CF8M [316 stainless steel (SST)] valve bodies
Flow Ring with Nitrile O-Rings: ■ -46 to 93°C (-50 to 200°F) for LCC steel and CF8M valve bodies
Flow Ring with Fluorocarbon O-Rings: ■ -46 to 204°C (-50 to 400°F) for LCC steel and CF8M valve bodies

Flow Characteristic

Modified equal percentage

Flow Direction

Single Seal Construction: Forward-flow only (see figure 3)

Flow Ring Construction: Forward- or reverse-flow (see figure 3)

Dual Seal Construction: Required to provide shutoff for bi-directional flow

Flow Coefficients

See Catalog 12

Noise Levels

See Catalog 12 for sound pressure level prediction

Maximum Ball Rotation

90 degrees

Actuator Mounting

■ Right-hand or ■ left-hand mounted as viewed from the valve inlet for forward-flow

Shaft and Bore Diameters

See figure 7

(continued)

Specifications (continued)

Approximate Weights
See table 2

Options
■ Line flange bolts, ■ Sour service trim(3), ■ Buried service actuator adaptation, and ■ Dual seal configuration for bi-directional shutoff (this configuration incorporates a tapped and plugged connection which can be used in a double block and bleed system to test seal integrity), ■ Live Loaded PTFE Packing

1. The pressure or temperature limits in this bulletin and any applicable standard or code limitations should not be exceeded.
2. The maximum allowable shutoff pressure drops are further limited for the following constructions. The NPS 12 with S20910 drive shaft is limited to 128 bar (1862 psi) from -46 to 59°C (-50 to 139°F) and to 103 bar (1490 psi) at 93°C (200°F). The NPS 16 with 17-4PH steel, with 2-1/2 inch splined driveshaft is limited to 1000 psi (69 bar), and with the S20910, 2-1/2 inch splined drive shaft is limited to 55 bar (795 psi) at all service temperatures. The NPS 24 with S20910 drive shaft is limited to 92 bar (1336 psi) at all service temperatures.
3. See table 1 for sour service trim materials.

Figure 1. Sectional View of Fisher V250 Valve

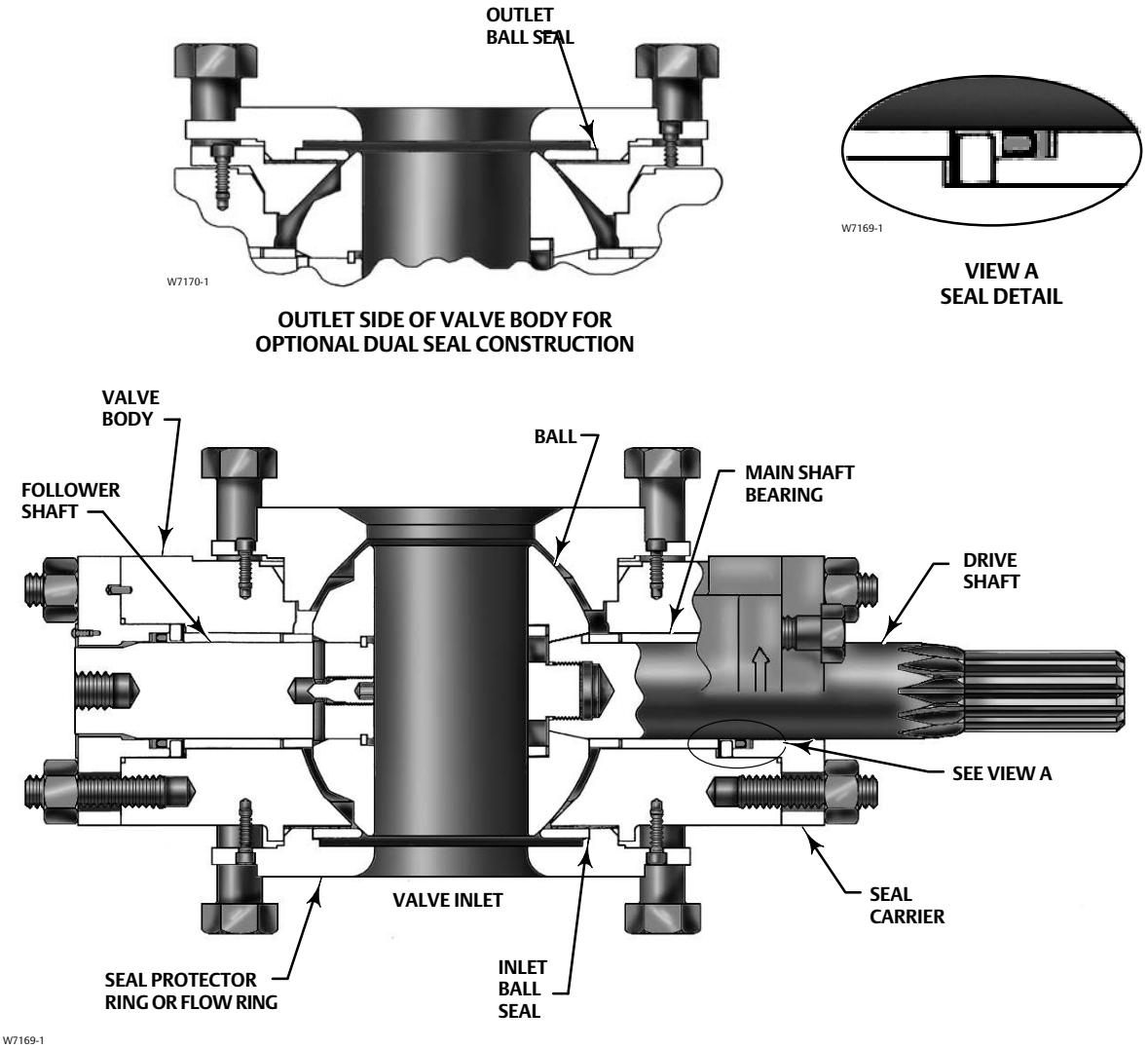


Table 1. Construction Materials

Part		Construction Material
Valve Body, Body Outlet, and Seal Protector Ring or Flow Ring	Standard	LCC carbon steel
	Sour Service Trim(1)	LCC steel, heat-treated
	Optional	WCC carbon steel or S31600 [316 stainless steel (SST)]
Drive Shaft, Follower Shaft, and Shaft Retainer	Standard	S17400 (17-4PH SST)
	Sour Service Trim(1)	S17400 (17-4PH SST) H1150 DBL
	Optional	S20910 stainless steel
Ball	Standard	Chrome-plated WCC steel
	Sour Service Trim(1)	Chrome-plated WCC steel, heat-treated
	Optional	Chrome-plated S31600
Ball Seal	All Trims	POM (polyoxymethylene)
Bearings	All Trims	PTFE/Composition-lined S31600
O-Rings	Standard	Nitrile
	Sour Service Trim(1)	Fluorocarbon
	Optional	Fluorocarbon
Shaft Seal	Std. with Backup Ring	PTFE R30003 / PEEK
	Live Loaded Packing	PTFE / SST
Seal Carrier	All Trims	S31600 SST
Seal Carrier Stud Bolts	Standard	Grade B7 steel
	Sour Service Trim(1)	Grade B7M steel
	Optional	Grade B8M stainless steel
Seal Carrier Hex Nuts	Standard	Grade 2H steel
	Sour Service Trim(1)	Grade 2HM steel
	Optional	Grade 8M stainless steel
Line Bolts(2)	Standard	Grade B7 steel
	Sour Service Trim(1)	Grade B7M steel
Line Nuts(2)	Standard	Grade 2H steel
	Sour Service Trim(1)	Grade 2HM

1. As detailed in NACE MR0175-2002.
2. Line bolts and nuts are not included as part of the standard package. Specify line bolts and nuts as an option.

Table 2. Approximate Weights

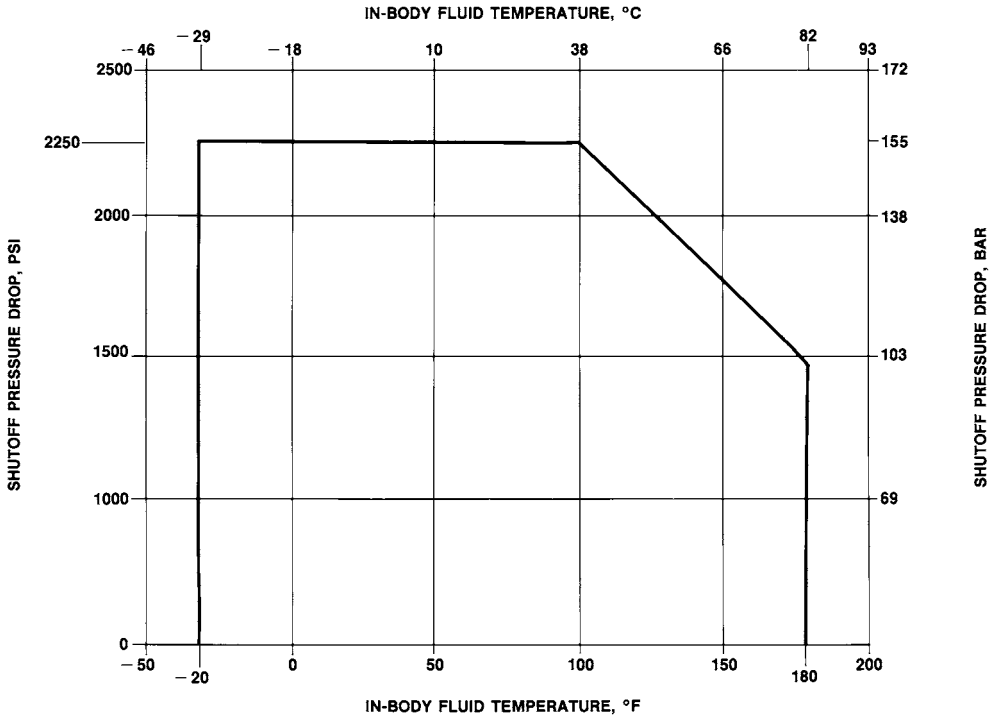
VALVE SIZE, NPS	WEIGHT	
	Kilograms	Pounds
4	73	160
6	132	290
8	222	490
10	345	760
12	431	950
16	771	1700
20	1814	4000
24	2404	5300

Installation

Install the V250 valve in any position, but the recommended orientation is in a horizontal pipeline with the shaft positioned horizontally and the ball closing in the downward direction. The actuator can be either right- or left-hand mounted as viewed from the valve inlet for forward-flow. For bidirectional flow, install the valve so that the highest pressure condition will flow as shown by the flow direction arrow on the valve body.

Dimensions are shown in figure 7.

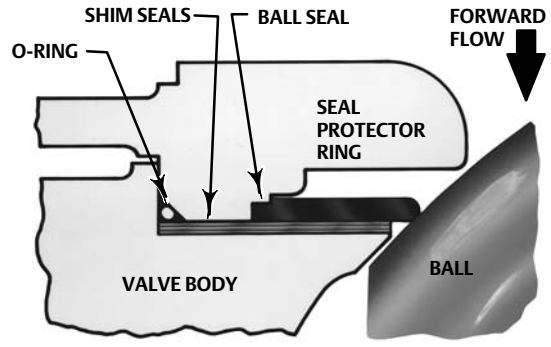
Figure 2. Maximum Allowable Shutoff Pressure Drop for Single and Dual POM Seal Construction



Note:
Do not exceed the limits in this curve or the body rating, whichever is lower.

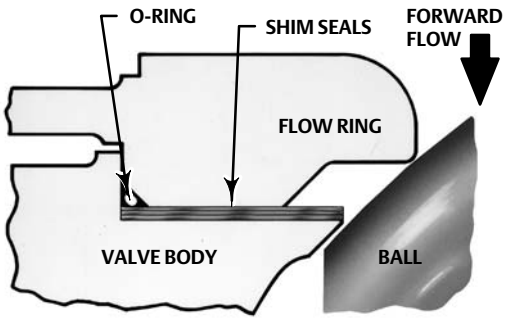
A4947-1

Figure 3. Ball Seal and Flow Ring Constructions



BALL SEAL

W3701-1



W3700-1

FLOW RING

Figure 4. Drive Shaft for Fisher V250 Valve

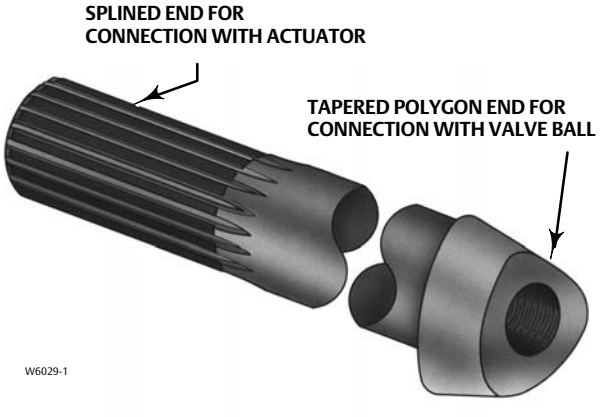


Figure 5. Clamped Splined Actuator Connection on Fisher 1061 Actuator

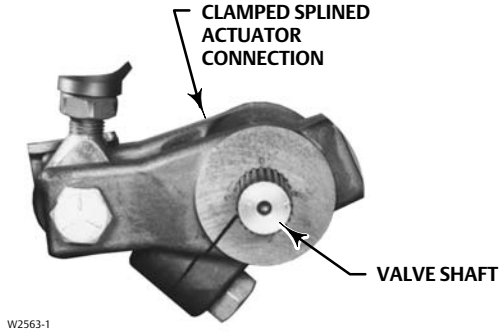


Figure 6. Live Loaded PTFE Packing

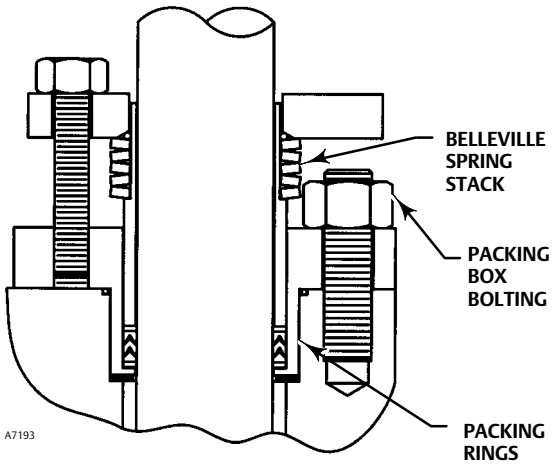
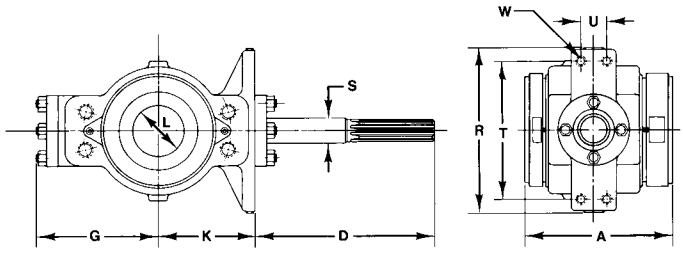
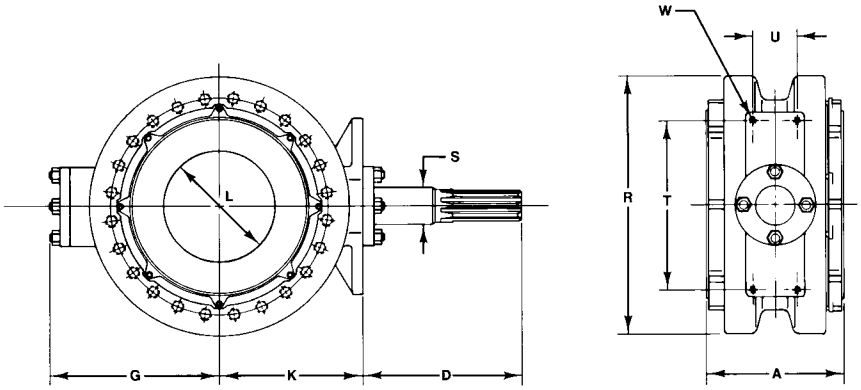


Figure 7. Dimensions (also see table 3)



NPS 4 THROUGH 16



18A5915-B
18A5916-C
B1609-2

NPS 20 AND 24

Table 3. Dimensions

VALVE SIZE, NPS	A	D	G	K	L (BORE DIAMETER)	R	S		T	U	W
							Shaft Diameter	Spline Diameter(1)			
mm											
4	194	208	197	162	76.2	279	31.8	31.8	235	46	5/8-UNC
6	229	356	238	194	101.6	327	50.8	50.8	273	51	3/4-UNC
8	243	356	327	270	152.4	413	63.5	63.5	337	76	7/8-UNC
10	297	356	343	287	187.5	445	69.9	63.5	337	76	7/8-UNC
12	338	356	381	324	228.6	483	76.2	63.5	337	76	7/8-UNC
16	400	470	460	392	292.1	613	101.6	63.5	533	127	1-1/4—8UN
		508						88.9			
20	533	508	546	480	371.3	864	127.0	88.9	533	127	1-1/4—8UN
24	679	508	629	546	438.2	991	152.4	88.9	533	127	1-1/4—8UN
Inches											
4	7.62	8.19	7.75	6.38	3.00	11.00	1.25	1.25	9.25	1.81	5/8-UNC
6	9.00	14.00	9.38	7.62	4.00	12.88	2.00	2.00	10.75	2.00	3/4-UNC
8	9.56	14.00	12.88	10.62	6.00	16.25	2.50	2.50	13.25	3.00	7/8-UNC
10	11.69	14.00	13.50	11.31	7.38	17.50	2.75	2.50	13.25	3.00	7/8-UNC
12	13.31	14.00	15.00	12.75	9.00	19.00	3.00	2.50	13.25	3.00	7/8-UNC
16	15.75	18.50	18.12	15.44	11.50	24.12	4.00	2.50	21.00	5.00	1-1/4—8UN
		20.00						3.50			
20	21.00	20.00	21.50	18.88	14.62	34.00	5.00	3.50	21.00	5.00	1-1/4—8UN
24	26.75	20.00	24.75	21.50	17.25	39.00	6.00	3.50	21.00	5.00	1-1/4—8UN

1. Use this dimension to select compatible Fisher rotary actuators.

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

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Fisher™ V260 Ball Control Valve

The Fisher V260 is a full-bore control valve designed from the ground up with features for optimized pressure, flow and process control. An integral drilled attenuator controls noise and vibration from high pressure drop liquids and gases. The splined shaft connection to the actuator reduces lost motion.

The V260A with Aerodome attenuator, V260B with Hydrodome attenuator, and V260C Ball Control Valves (figures 1 and 3) combine the efficiency of a rotary valve with the energy-dissipating capability of a special trim to provide improved performance for demanding applications. The valve is available with single, dual, or dual block-and-bleed seal options (see the Specifications table).

The trim design of the V260A is used in gas service to reduce noise effects that cause pipeline vibration. The V260B provides improved performance for demanding applications such as pump bypass and pipeline take-off. The trim is designed for liquid service to help eliminate or reduce cavitation and associated pipeline noise and vibration. The V260C full-bore ball valve is designed for automated control in bypass, batch, monitor, and emergency shutoff service applications, and it presents little or no restriction to flow.

The V260 full-bore ball valve is available with composition seals, and process type stem packing for improved service life.

Unless otherwise noted, all NACE references are to NACE MR0175-2002.

Fisher V260 Valve

Features

- Excellent Flow Control-- The splined ball to shaft connection, splined shaft to actuator connection, double power-end bushing assemblies, and trunnion guiding, all provide improved dynamic control.
- Aerodynamic Performance-- Up to -20 dBA acoustical attenuation can be achieved for the V260A within a single stage construction. Dual-stage construction can provide up to -25 dBA attenuation.
- Improved Service Life-- The attenuator is not part of the seal assembly. The seal wipes to ball surface, not the attenuator, promoting increased service life.
- Trim Versatility-- Key valve components, such as valve body, ball, shaft and bearings, are interchangeable between the V260A, V260B and V260C. This feature allows you to reduce your spare parts inventory and maintenance time.

(continued on page 3)

Specifications

Valve Body Sizes and End Connection Styles

NPS ■ 6 ■ 8, ■ 10, ■ 12, ■ 16, ■ 20, and ■ 24 flanged valves with CL150, CL300, or CL600 raised-face flanges compatible with ASME B16.5. Consult your Emerson sales office for other end style connections.

Maximum Inlet Pressures and Temperatures(1)

Consistent with CL150, CL300, or CL600 pressure-temperature ratings per ASME B16.34

Maximum Allowable Shutoff Pressure Drop(1).

For Single-Seal and Dual-Seal Construction (Except where further limited by the pressure-temperature rating of the valve body):

■ CL150: 20 bar (285 psi) at 38°C (100°F)
■ CL300: 51 bar (740 psi) at 38°C (100°F)
■ CL600: 103 bar (1480 psi) at 38°C (100°F)

Flow Characteristic

■ Modified linear with single high density attenuator,
■ Modified equal percentage with single characterized attenuator (see figure 2), or
■ Modified equal percentage without attenuator

Flow and Shutoff Direction

Unidirectional flow for V260 is forward flow. Seal is upstream.

■ **Single Seal Constructions:** Should be used for unidirectional flow and unidirectional shutoff only.

■ **Double Seal Constructions:** V260A and V260C may be used for unidirectional and bidirectional flow. V260B should be used for unidirectional flow only for effective anti-cavitation protection. Bidirectional shutoff requires the dual seal construction.

Flow Coefficients

See Fisher Catalog 12

Shutoff Classification (per ANSI/FCI 70-2 and IEC 60534-4)

Single-Seal Composition Constructions: Class IV, optional Class VI
Dual-Seal Composition Constructions: Class IV, optional Class VI

Seal Material and Temperature Capability(1)

Standard: ■ POM (polyoxymethylene) -29 to 82°C (-20 to 180°F)

Optional: ■ PTFE/PEEK(2)(3) -37 to 100°C (-35 to 212°F)

Maximum Ball Rotation

90 degrees

Actuator Mounting

Right-hand or left-hand mounted as viewed from the valve inlet for forward flow

Packing Arrangements

PTFE Packing: Standard construction (see figure 4)

ENVIRO-SEAL™ Packing: This optional packing system provides improved sealing, guiding, and transmission of loading force to control liquid and gas emissions. Contact your Emerson sales office for availability of ENVIRO-SEAL packing (see figure 4)

Dimensions

See figure 5

Options

■ Double block-and-bleed applications (Dual-seal construction is required), ■ Two Stage V260A Attenuator, ■ Two or Three Stage V260B Attenuator, ■ CL900 flanges, ■ Ring type joint flanges

1. The pressure/temperature limits in this bulletin and any applicable standard or code limitation for this valve should not be exceeded.
2. PTFE stands for Polytetrafluoroethylene, and PEEK stands for PolyEtherEtherKetone.
3. Temperature limit of PTFE/PEEK is limited due to standard Nitrile O-Ring. Contact your Emerson sales office for higher temperature options, up to 232°C (450°F).

Features (continued)

- Sour Service and Sour Crude Oil Capability-- Optional materials are available that comply with NACE Standard MR0175-2002.

- Tight Shutoff-- Self-adjusting seal(s) that are pressure assisted provide tight shutoff for long reliable service. The design incorporates a heavy duty S31600 stainless steel carrier that retains the composition seal for full-rated pressure drop service. Class IV and VI shutoff available.

- Heavy Duty Trunnion-- The ball trunnions are designed for demanding applications requiring long service life, with a reduction in maintenance time and costs.

- Broad Hydrodynamic Applications-- Single, dual, and three-stage attenuators for the V260B may be provided for a varying range of applications. A K_C value of 1.0 is achievable depending on service conditions.

- Flexible Applications-- The attenuator is active throughout the ball rotation for very demanding services or a characterized attenuator is used to match the service conditions (see figure 2).

Table 1. Aerodome and Hydrodome Trim Benefits Comparison

Benefits	Typical Competitive Device	V260A with Aerodome Attenuator	V260B with Hydrodome Attenuator
Up to -20 dBA aerodynamic noise attenuation	No	Yes	N/A
Excellent attenuation effect at critical opening position	No	Yes	Yes
High Density (Full) or characterized attenuation	No	Yes	Yes
2 or 3 stage options	No	Yes	Yes
Effective bidirectional attenuation option	No	Yes	Yes
Integrated ball, shaft, and attenuator design for best throttling dynamics	No	Yes	Yes
Dual seal option	No	Yes	Yes
Ball seal exchange without actuator removal	No	Yes	Yes
K_C improved versus unattenuated device	Yes	N/A	Yes
Double block-and-bleed option	No	Yes	Yes
Overall ease of maintenance	No	Yes	Yes
Trunnion-mounted ball for excellent wear resistance	Yes	Yes	Yes
Low profile for ease of piping	Yes	Yes	Yes

Table 2. Standard Materials of Construction

Part	Material
Valve Body	LF2 Carbon Steel
Ball	WCC Carbon Steel or Low Temperature Carbon Steel
Seal	POM with S31600 SST Seal Blank or PTFE/PEEK with S31600 SST Seal Blank
Dome Attenuator	S17400 SST
Shaft	S17400 SST H1075 or S17400 SST H1150 DBL
Wave Spring	S17700 SST or N07750
Tailpiece	Low Temperature Carbon Steel
Tailpiece Mounting Bolting	B7 Steel or B7M Steel
Bearing Plate	Carbon Steel
Bearings	S30400 SST with Aramid liner
Thrust Washer	Carbon filled PTFE
Packing Box Housing	Low Temperature Carbon Steel
Packing	PTFE/Carbon filled PTFE
Packing Bolting	B7 Steel, B7M Steel, or B8M Class 2 SST
Packing Follower, Packing Box Ring	Annealed S31600 SST
Groove Pins	B8M SST
O-Rings	Nitrile
Actuator Mounting Bolting	Steel Grade 5

Figure 1. Sectional View of Valve (Single Seal)

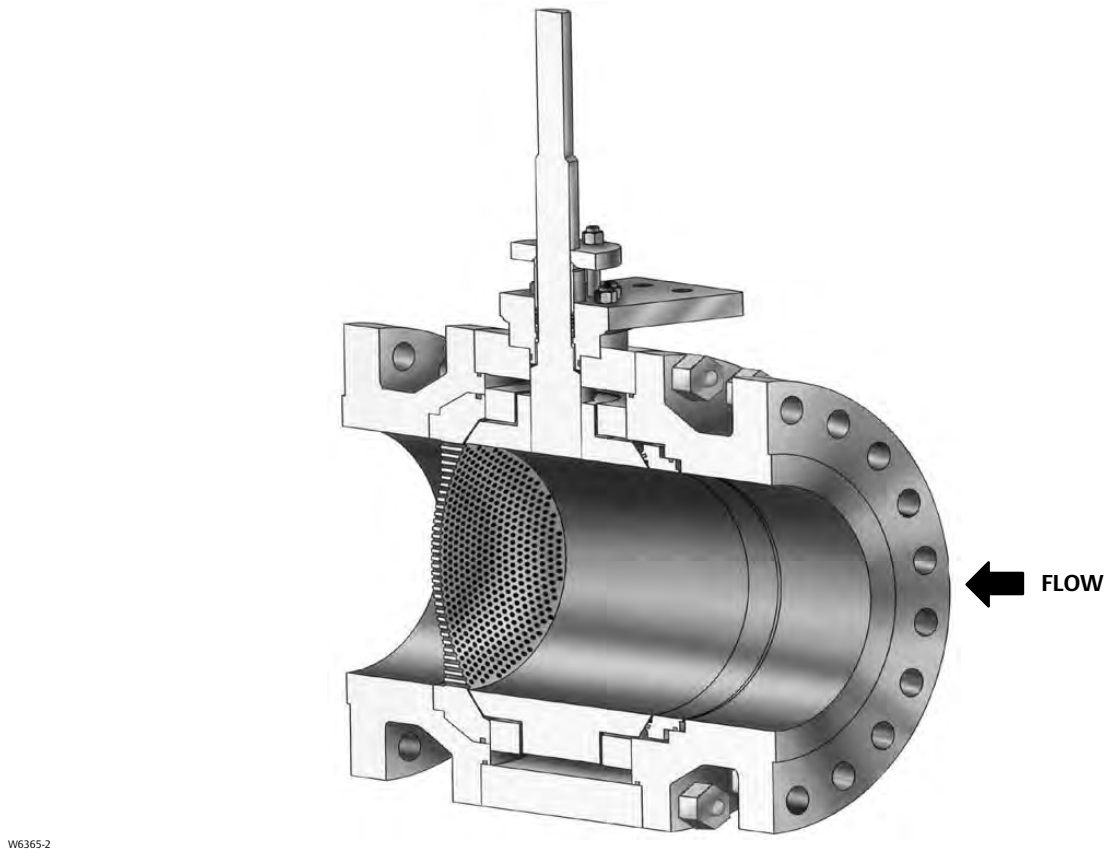


Figure 2. Aerodome and Hydrodome Attenuator Details

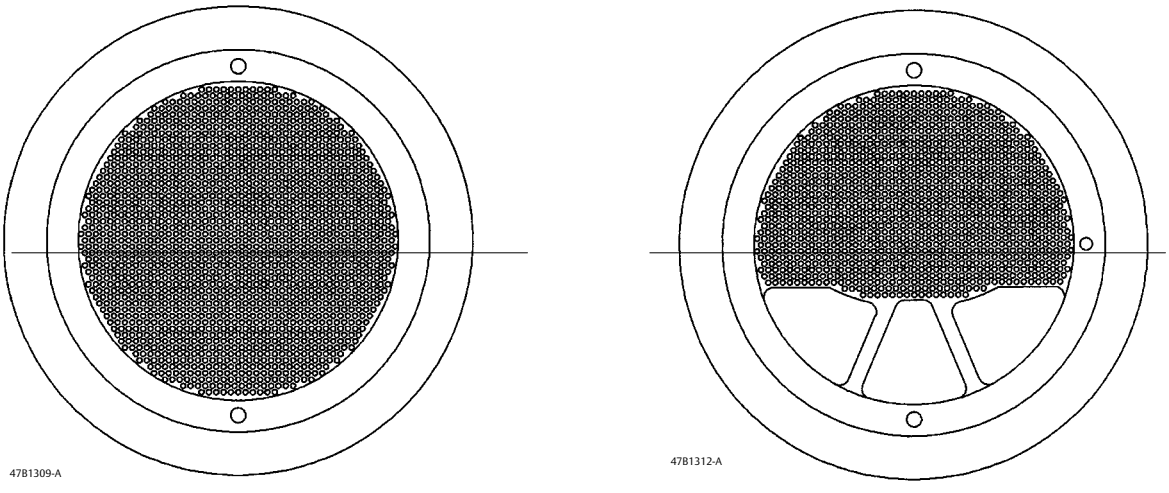


Figure 3. Typical Fisher V260 Valve Assembly

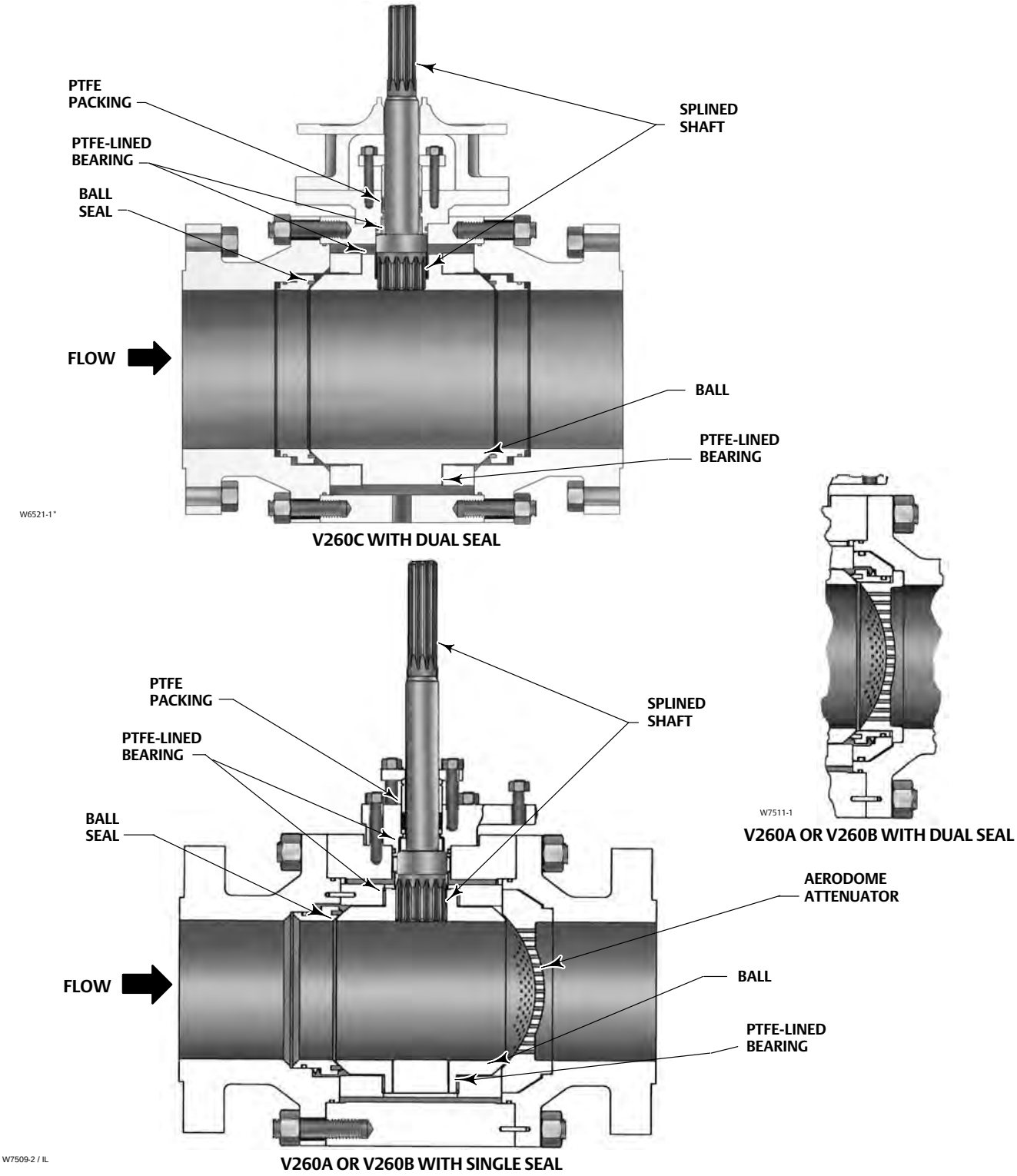


Figure 4. Packing Arrangement Details

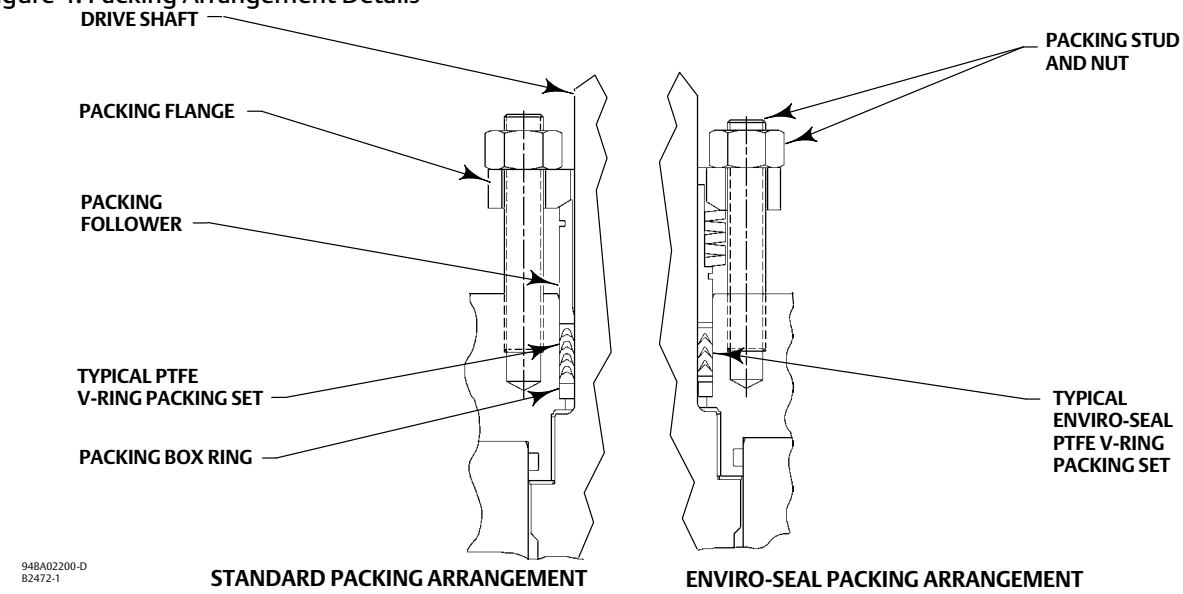
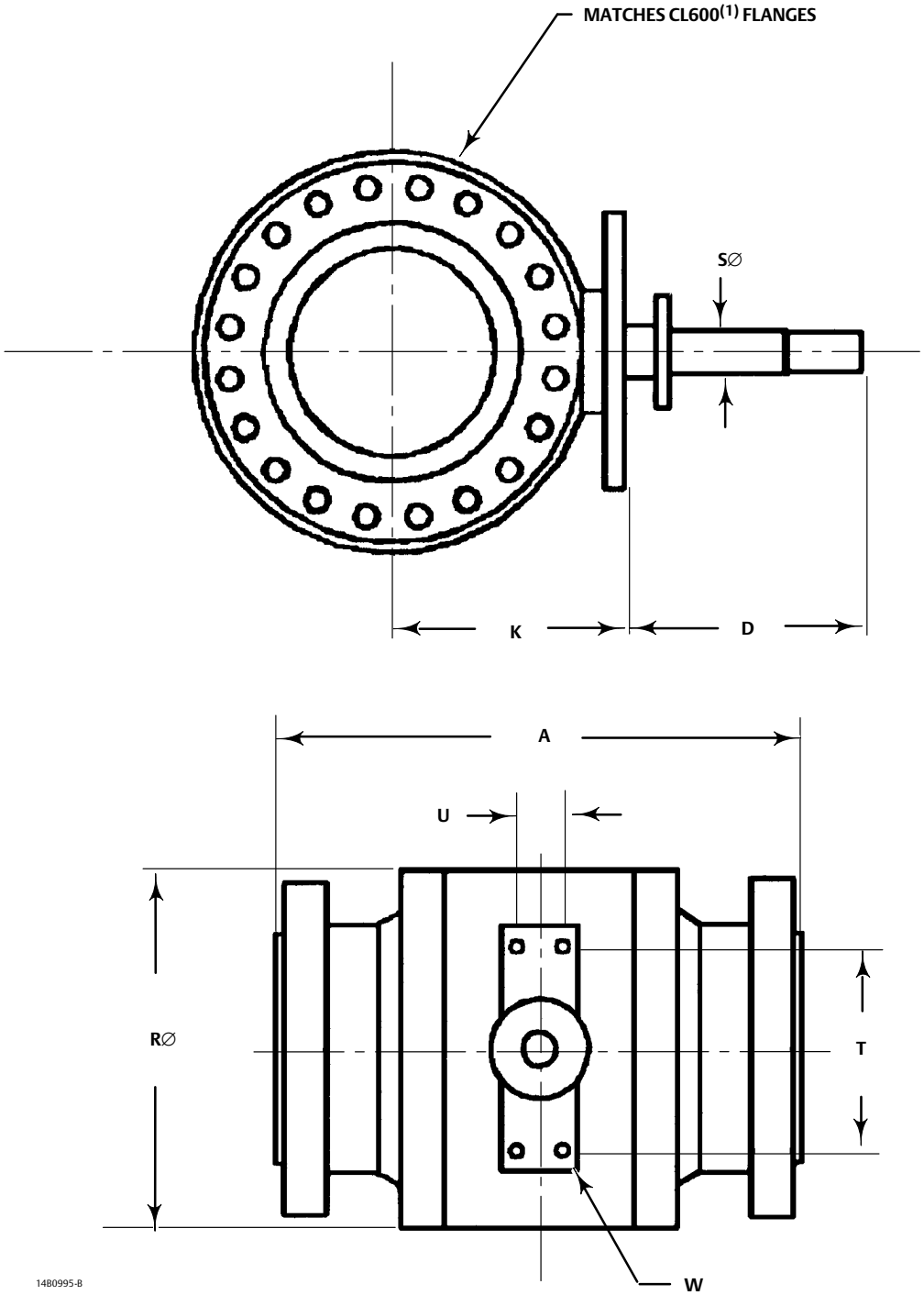


Table 3. Dimensions

VALVE SIZE, NPS	A	D	K	R∅	S∅		T	U	W (THREADED)	APPROXIMATE WEIGHT
					Shaft Dia.	Spline Dia.				
mm										**kg**
6	559	356	228	381	44.4	44.4	273	51	See thread info below	311
8	661		273	457						442
10	788		324	553	63.5	63.5	337	76		703
12	840		369	639						919
16	991	508	508	848	76.2	76.2(1)	533	127		2472
		471			76.2	63.5(2)				
20	1194	508	602	1040	88.9	88.9(1)				4309
		471			88.9	63.5(2)				
24 CL150	1397	314	671	1158	88.9	88.9 (keyed shaft)	533	127		5352
24 CL300	1397	508	708	1158	88.9	88.9	533	127		5761
24 CL600	1397	364	708	1241	102	102 (keyed shaft)	610	457 (U1)(3) 254 (U2)(3)		7076
Inches										**Pounds**
6	22	14.00	8.99	15.00	1-3/4	1-3/4	10.75	2.00	3/4-10	686
8	26.04		10.75	18.00						975
10	31.04		12.75	21.77	2-1/2	2-1/2	13.25	3.00	7/8-9	1550
12	33.07		14.53	25.15						2025
16	39.00	20.00	19.99	33.38	3	3(1)	21.00	5.00	1-1/4-8	5450
		18.56			3	2-1/2(2)				
20	47.00	20.00	23.70	40.96	3-1/2	3-1/2(1)				9500
		18.56			3-1/2	2-1/2(2)				
24 CL150	55.00	12.38	26.40	45.60	3-1/2	3-1/2 (keyed shaft)	21.00	5.00	1-1/4-8	11800
24 CL300	55.00	20.00	27.87	45.60	3-1/2	3-1/2	21.00	5.00	1-1/4-8	12700
24 CL600	55.00	14.32	27.87	48.86	4	4 (keyed shaft)	24.00	18 (U1)(3) 10 (U2)(3)	1-1/4-8	15600

1. For 1069 size 100 actuator.
2. For 1061 size 100 actuator.
3. See table 6 for NPS 24 U1 and U2 information.

Figure 5. Dimensions (also see table 3)



Note:
1. For CL150 and 300 valves, face-to-face dimensions are the same as CL600 valves.
2. Valve shown meets CL600 flanges. Flange and bolt dimensions vary for CL150 and 300 valves.

Figure 6. NPS 24 Additional Dimensions (also see table 3)

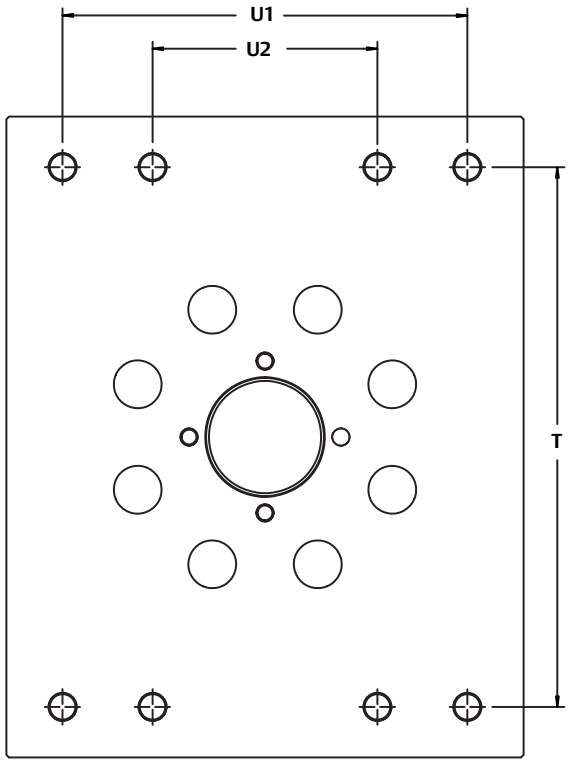


Figure 7. Dead Angle (also see table 4)

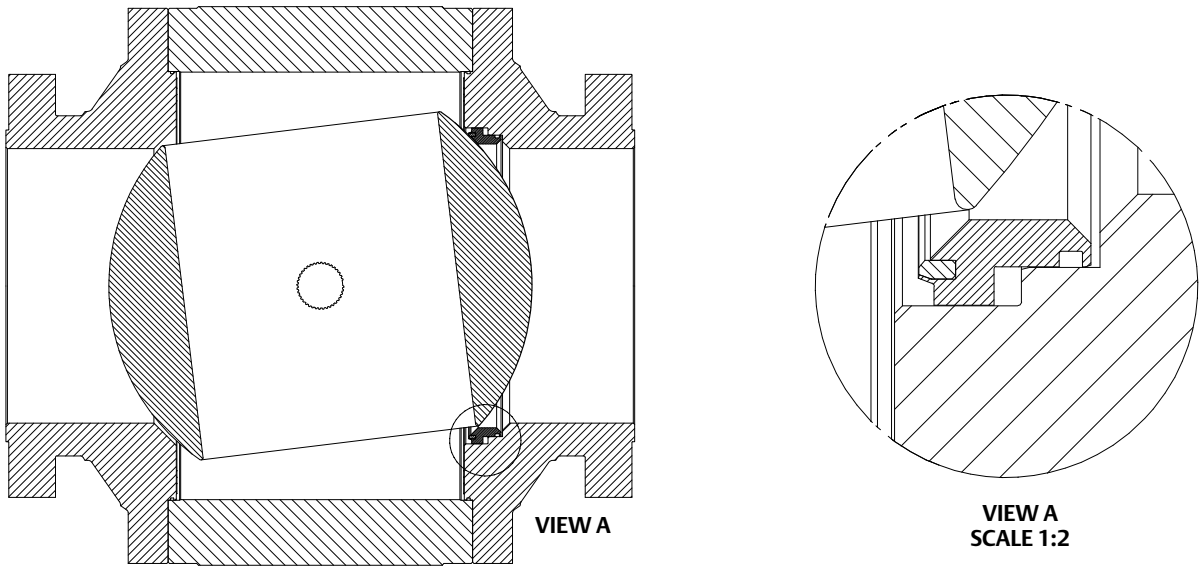


Table 4. Dead Angle Degrees

VALVE SIZE, NPS	DEAD ANGLE, DEGREES
6	10
8	11
10	10
12	9
16	11
20	9
24	9

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

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Fisher™ V270 Full-Bore Ball Control Valve

The Fisher V270 is a three piece, trunnion mounted, full-bore control valve designed from the ground up with features for optimized pressure, flow and process control.

The V270 full-bore ball valve is designed for automated control in bypass, batch, monitor, and emergency shutoff service applications, and it presents little or no restriction to flow.

The V270 full-bore ball valve is available with composition seals, and process type live-loaded shaft packing for improved service life and lower emissions.

Unless otherwise noted, all NACE references are to NACE MR0175/ ISO 15156.

FISHER V270 VALVE

Features

- Excellent Flow Control—Shaft and trunnion guiding provides improved dynamic control.
- Sour Service and Sour Crude Oil Capability—Standard construction materials comply with NACE Standard MR0175 / ISO 15156.
- Tight Shutoff—Self-adjusting seals that are pressure assisted provide Class VI shutoff for long reliable service. The design incorporates a heavy duty S31600 stainless steel carrier that retains the composition seal.
- Free Standing Design—Comes standard with a base bracket allowing the valve to sit upright.
- Heavy Duty Trunnions—The ball trunnions are designed for demanding applications requiring long service life, with a reduction in maintenance time and costs.
- Double Block and Bleed—Design comes standard with a dual seal arrangement.
- Optional Fire-Safe Construction

Specifications

Valve Body Sizes and End Connection Styles

NPS ■ 6, ■ 8, ■ 10, ■ 12, ■ 14, ■ 16, ■ 20, and ■ 24 flanged valves with CL150, CL300, or CL600 raised-face flanges compatible with ASME B16.5-2013

Designed in accordance with API 6D

Maximum Inlet Pressures and Temperatures(1)

Consistent with CL150, CL300, or CL600 pressure-temperature ratings per ASME B16.34-2013

Allowable Temperature Range: -40 to 82°C (-40 to 180°F)

Flow Characteristic

Modified equal percentage

Flow and Shutoff Direction

Dual Seal Construction: The V270 may be used for unidirectional or bidirectional flow

Flow Coefficients

See Fisher Catalog 12

Shutoff Classification

ANSI/FCI 70-2 Class VI

Seal Material

Standard: POM (Polyoxymethylene)

Maximum Ball Rotation

90°

Packing Arrangements

Standard: Live-Loaded Packing

This packing system provides improved sealing, guiding, and transmission of loading force to control liquid and gas emissions

Dimensions

See figure 2 through 7

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

Table 1. Standard Materials of Construction

Part	Material
Valve Body	LF2 Carbon Steel
Ball	LF2 Carbon Steel / ENP
Seal	POM with S31600 SST Seal Carrier
Drive Shaft	S17400 H1150D
Spring	N07750
Tailpiece	LF2 Carbon Steel
Tailpiece Mounting and Packing Box Bolting	L7M Steel
Bearing Plate	LF2 Carbon Steel
Trunnion Bushings	Carbon Steel, Bronze, PTFE
Thrust Washer	Glass filled PTFE
Shaft Bushing	N04400 / Comp
Packing Box Housing	Carbon Steel
Packing	Live-Loaded PTFE
Packing Bolting	B7M Steel
Packing Follower, Packing Box Ring	S31600 SST
Straight Pins	S17400 H1150D
O-Rings, Backup Rings	Nitrile
Actuator Mounting Bolting	Steel Grade 5

Figure 1. Sectional View of V270 Valve

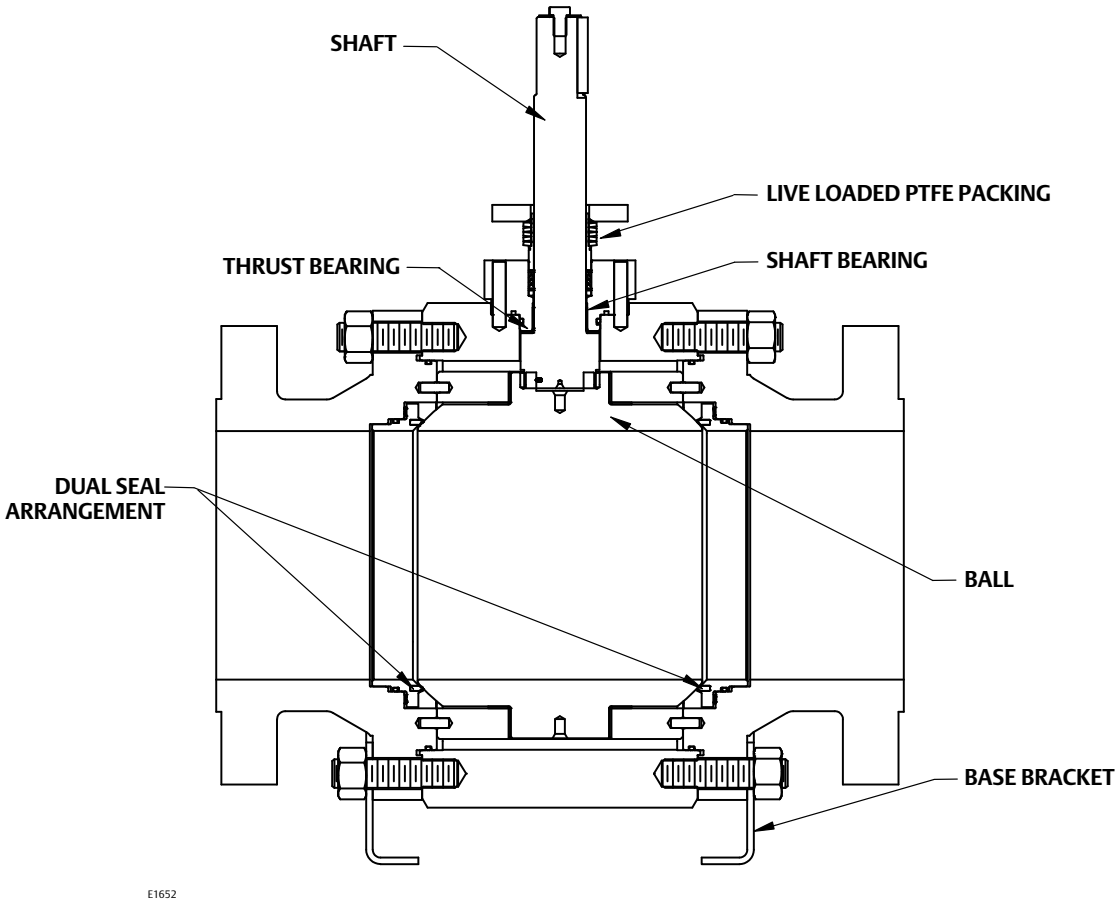


Figure 2. Envelope Dimensions (see table 2)

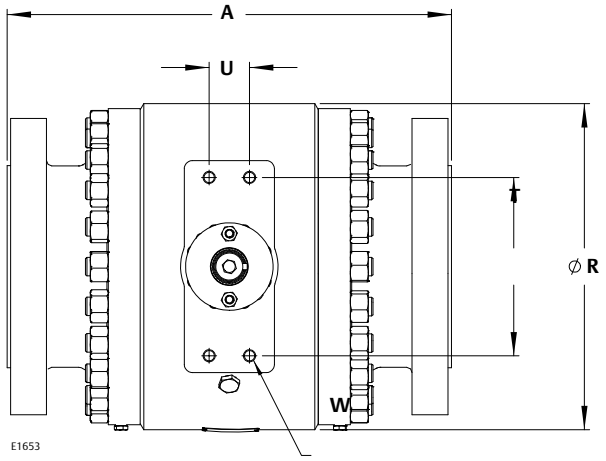


Figure 3. Envelope Dimensions (see table 2 and 3)

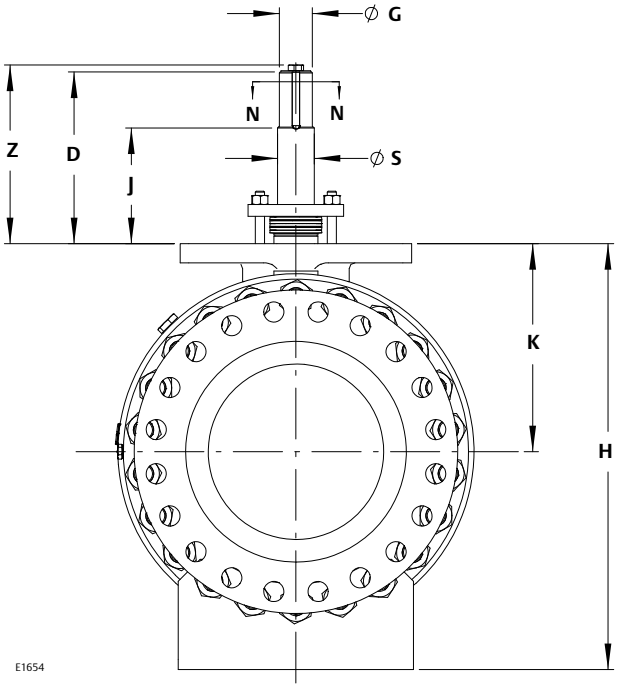


Figure 4. NPS 24 CL600 Packing Box Housing Mounting Pad Dimensions (see table 2)

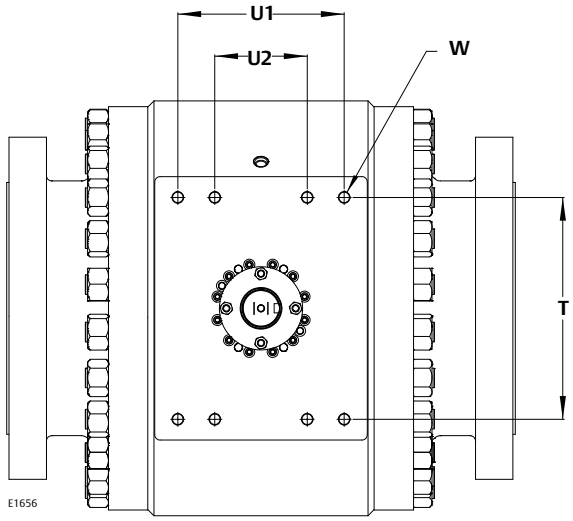
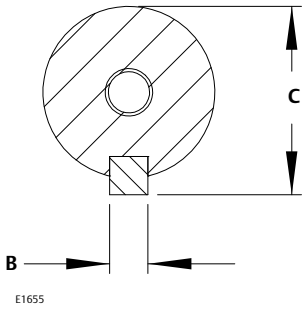


Figure 5. Shaft Detail (see table 3)



SECTION N-N

Figure 6. NPS 6 CL600 thru NPS 14 CL300 Base Bracket Dimensions (see table 3)

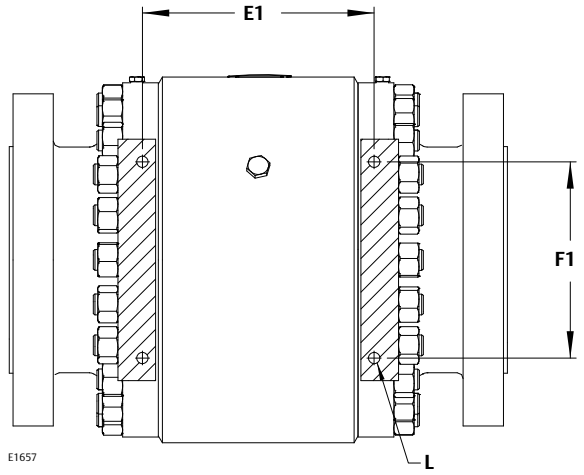


Figure 7. NPS 14 CL600 thru NPS 24 CL600 Base Bracket Dimensions (see table 3)

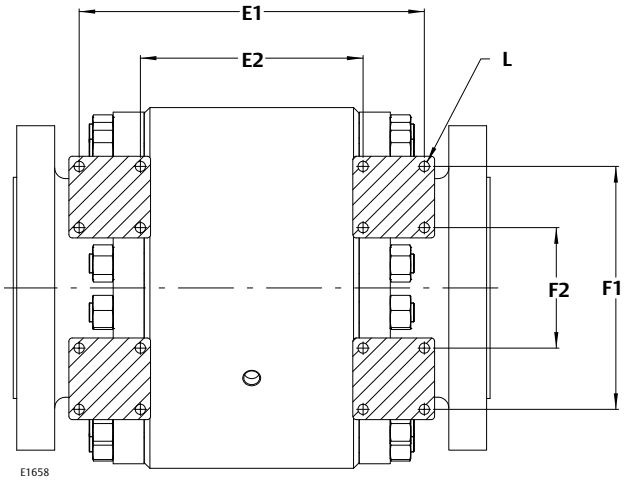


Figure 8. Live-Loaded Packing Arrangement Details

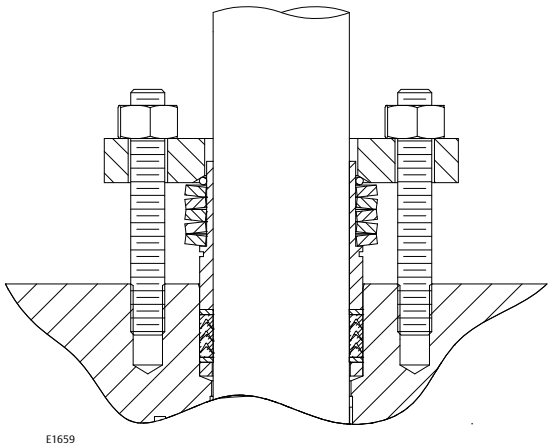


Table 2. Envelope Dimensions

VALVE SIZE, NPS	PRESSURE CLASS	A	K	H	R⌀	S⌀ Shaft Dia.	G⌀ Keyway Dia.	T	U	W (THREADED)	APPROXIMATE WEIGHT
mm											**kg**
6	150	394	210.2	388.2	330	44.4	41.3	237.1	50.8	See Below	170
	300	403	216.4	387.9	343						190
	600	559	220.4	470.5	351						280
8	150	457	259.4	521.1	424						305
	300	502	259.4	526.1	426						350
	600	660	265.7	565.6	440						465
10	150	533	295.3	616.3	482	63.5	57.1	336.6	76.2		430
	300	568	301.3	622.3	492						495
	600	787	313.8	645.4	525						745
12	150	610	338.8	704.5	569						645
	300	648	345.8	716.6	587						770
	600	838	359.5	736.0	615						1050
14	150	686	369.0	821.0	628	76.2	69.8	533.4	127.0		1045
	300	762	401.8	827.2	630						1065
	600	889	419.0	866.8	673						1365
16	150	762	435.2	936.9	701						1275
	300	838	440.7	878.9	713						1455
	600	991	464.5	923.1	762						1925
20	150	914	522.9	1074.9	875	88.9					2245
	300	991	530.0	1110.2	895		82.5				2580
	600	1194	555.5	1129.2	947						3450
24	150	1067	600.0	1287.9	1029	101.6	69.8				3380
	300	1143	615.0	1312.2	1066		88.8				4280
	600	1397	649.0	1280.4	1140		101.6	609.6	475.2 (U1) 254.0 (U2)		5775
Inches											**Pounds**
6	150	15.50	8.27	15.28	12.99	1 3/4	1 5/8	10.75	2.00	3/4-10	370
	300	15.88	8.52	15.27	13.50						415
	600	22.00	8.68	18.52	13.82						620
8	150	18.00	10.21	20.52	16.70						670
	300	19.75	10.21	20.71	16.77						775
	600	26.00	10.46	22.27	17.32						1020
10	150	21.00	11.62	24.26	18.98	2 1/2	2 1/4	13.25	3.00	7/8-9	950
	300	22.38	11.86	24.50	19.37						1095
	600	31.00	12.35	25.41	20.67						1640
12	150	24.00	13.34	27.74	22.40						1425
	300	25.50	13.61	28.21	23.11						1695
	600	33.00	14.15	28.97	24.21						2320
14	150	27.00	15.59	32.32	24.70	3	2 3/4	21.00	5.00	1-1/4-8	2305
	300	30.00	15.82	32.57	24.80						2350
	600	35.00	16.50	34.13	26.50						3015
16	150	30.00	17.13	36.89	27.61						2810
	300	33.00	17.35	34.60	28.05						3210
	600	39.00	18.29	36.34	29.98						4250
20	150	36.00	20.59	42.32	34.45	3 1/2					4945
	300	39.00	20.87	43.71	35.24		3 1/4				5685
	600	47.00	21.87	44.46	37.28						7610
24	150	42.00	23.62	50.71	40.51	4	2 3/4				7450
	300	45.00	24.21	51.66	41.97		3 1/2				9435
	600	55.00	25.55	50.41	44.88		4	24.00	18.00 (U1) 10.00 (U2)		12740

Table 3. Additional Envelope Dimensions

VALVE SIZE, NPS	PRESSURE CLASS	D	Z	J	C Shaft & Key Height	B Key Width	E1	E2	F1	F2	L
mm											
6	150	228.6	239.8	149.1	45.3	9.5	N/A	N/A	N/A	N/A	N/A
	300										
	600						242.4		200.1		15.9
8	150						250.4		273.1		
	300						269.4		231.4		
	600						302.4		292.1		
10	150	297.0	309.4	201.7	62.6	12.7	278.1		297.0		19.1
	300						282.4		251.8		
	600						328.9		307.6		
12	150						318.0		279.9		
	300						328.2		330.2		
	600						389.4		330.2		
14	150	394.0	408.3	279.7	76.7	15.9	422.5		482.5		
	300						428.5		396.8		
	600						644.0	415.4	453.3	224.7	
16	150						706.1	439.4	489.3	222.6	
	300						678.0	487.5	502.5	312.0	
	600						677.1	486.6	568.2	352.3	
20	150						823.2	556.5	598.7	338.3	
	300	381.0	409.0	260.6	90.7	19.1	813.5	559.5	618.9	364.9	
	600						871.2	604.5	708.4	441.7	
24	150	394.0	408.3	282.7	82.8	15.9	944.6	627.1	634.6	317.1	
	300	381.0	409.0	260.6	98.3	22.2	1001.3	658.4	657.3	314.4	
	600	363.0	379.0	N/A	112.5	25.4	1009.5	704.7	853.4	548.6	
Inches											
6	150	9.00	9.44	5.87	1.78	0.38	N/A	N/A	N/A	N/A	N/A
	300										
	600						9.54		7.88		0.63
8	150						9.86		10.75		
	300						10.61		9.11		
	600						11.91		11.50		
10	150	11.69	12.18	7.94	2.46	0.50	10.95	N/A	11.69	N/A	0.75
	300						11.12		9.92		
	600						12.95		12.11		
12	150						12.52		11.02		
	300						12.92		13.00		
	600						15.33		13.00		
14	150	15.51	16.07	11.01	3.02	0.63	16.63		19.00		
	300						16.87		15.62		
	600						25.35	16.35	17.85	8.85	
16	150						27.80	17.30	19.26	8.76	
	300						26.69	19.19	19.78	12.28	
	600						26.66	19.16	22.37	13.87	
20	150						32.41	21.91	23.57	13.32	
	300	15.00	16.10	10.26	3.57	0.75	32.03	22.03	24.37	14.37	
	600						34.30	23.80	27.89	17.39	
24	150	15.51	16.07	11.13	3.26	0.63	37.19	24.69	24.99	12.49	
	300	15.00	16.10	10.26	3.87	0.88	39.42	25.92	25.88	12.38	
	600	14.29	14.92	N/A	4.43	1.00	39.74	27.74	33.60	21.60	

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

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Fisher™ V280 Full-Bore Ball Control Valve

The Fisher V280 is a three-piece, trunnion mounted, full-bore control valve capable of handling full ASME CL900 pressure drops. It is designed with features for optimized pressure, flow, and process control. An optional drilled attenuator controls noise and vibration from high pressure drop liquids and gases. The splined shaft connection to the actuator reduces lost motion.

The V280 with an Aerodome attenuator is used in gas service to reduce noise in demanding applications such as anti-surge, station recycle and worker/monitor applications.

The V280 with a Hydrodome attenuator provides improved performance for demanding applications such as pump bypass or pipeline take-off. The trim is designed for liquid service to help eliminate or reduce cavitation associated with pipeline noise and vibration.

The V280 without attenuation is designed for automated control in bypass, batch, monitor, and emergency shutoff service applications. It presents little or no restriction to flow.

Unless otherwise noted, all NACE references are to NACE MR0175/ISO 15156.

Fisher V280 Valve

Features

- Thoroughly Tested—Valve construction cycle tested and flow tested in laboratory subject to full ASME CL900 pressure drops to maximize service life.
- Excellent Flow Control—Robust drive train designed to guide the shaft and properly absorb energy during dynamic operation.
- Aerodynamic Performance—Up to -20 dBA acoustical attenuation can be achieved for the V280 with Aerodome within a single stage construction. Dual-stage construction can provide up to -25 dBA attenuation.
- Sour Service and Sour Crude Oil Capability—Standard construction materials comply with NACE MR0175/ISO 15156.
- Heavy Duty Trunnion—The ball trunnions are designed for demanding applications requiring long service life, with a reduction in maintenance time and costs.
- Broad Hydrodynamic Applications—Single and dual stage attenuators for the V280 with Hydrodome may be provided for a varying range of applications. A KC value of 1.0 is achievable depending on service conditions.
- Flexible Applications—The attenuator is active throughout the ball rotation for very demanding services. The characterized attenuator can be utilized when more flow capacity is necessary.

Features (continued on 3)

Specifications

Valve Sizes and End Connection Styles

NPS ■ 6, ■ 8, ■ 10, ■ 12, and ■ 16 flanged valve size with CL900 raised-face flanges compatible with ASME B16.5. Consult your Emerson sales office for other end connection styles

Maximum Inlet Pressure and Temperatures(1)

Consistent with CL900 pressure-temperature ratings per ASME B16.34

Maximum Allowable Shutoff Pressure Drop(1)

For Single-Seal and Dual-Seal Construction (except where further limited by pressure-temperature rating of the valve body):

CL900: 153.2 bar (2220 psig) at 38°C (100°F)
TCM Ultra Seal: 120 bar (1750 psig) at 38°C (100°F)

Shutoff Classifications

Single or Dual-Seal Construction

Class IV standard: ANSI/FCI 70-2 and IEC 65034-4
Class VI optional: ANSI/FCI 70-2 and IEC 65034-4

Flow Characteristic

■ Modified linear with single high-density attenuator

■ Modified equal percentage with single characterized attenuator

■ Modified equal percentage without attenuator

Flow and Shutoff Direction

Unidirectional flow is forward flow. Seal is upstream

Single Seal Construction: Should be used for unidirectional flow and unidirectional shutoff only

Dual Seal Construction: V280 with Aerodome and unattenuated V280 may be used for unidirectional and bidirectional flow

V280 with Hydrodome should be used for unidirectional flow only for effective anti-cavitation protection. Bidirectional shutoff requires dual seal construction

Flow Coefficients

See Fisher Catalog 12

Seal Material and Temperature Capabilities(1)

Standard: POM (polyoxymethylene) -29 to 82°C (-20 to 180°F)
Optional: POM (polyoxymethylene) with Nitrile MoS_2 Impregnated O-rings -46 to 82°C (-50 to 180°F) or PTFE/PEEK(2) with flurorocarbon O-rings -23 to 204°C (-10 to 400°F)

Maximum Ball Rotation

90°

Actuator Mounting

Right-hand or left-hand mounted as viewed from the valve inlet from forward flow

Packing Arrangements

PTFE Packing: Standard construction
ENVIRO-SEAL™ Packing: This optional packing system provides improved sealing, guiding, and transmission of leading force to control liquid and gas emissions

Dimensions

See figure 3

Options

■ Double block-and-bleed applications (Dual seal construction is required)
■ Two or three-stage Aerodome attenuator, two-stage or three-stage Hydrodome attenuator
■ Ring type joint flanges
■ Inconel drive shaft
■ Keyed shaft
■ Nitrile MoS_2 Impregnated O-rings
■ S31600 SST ENC ball
■ PTFE/PEEK seal insert
■ Contact your Emerson sales office for other options

1. The pressure or temperature limits in this bulletin and any applicable standard or code limitation for this valve should not be exceeded.
2. PTFE stands for Polytetrafluoroethylene and PEEK stands for PolyEtherEtherKetone.

Features (continued)

- Construction Versatility—Seal and dome attenuators are interchangeable. The valve construction can be altered by adding/removing a dome attenuator and/or seal without requiring a different body flange. This allows for flexibility to meet changing demands. See figure 2.

- Base Bracket—Standard easy-removal base bracket simplifies maintenance and storage prior to installation. The base bracket is designed to remain secured to the valve body during removal of the body flanges for maintenance.

- Integral Valve Lifting Provision—Valve body includes standard tapped holes for easy attachment of swivel hoist rings or other appropriate rigging equipment.

- Tight Shutoff—Self-adjusting seal(s) that are pressure assisted provide tight shutoff for long reliable service. The design incorporates a heavy duty S31600 stainless steel carrier that retains the composition seal for full-rated pressure drop service.

- Improved Service Life—The attenuator is not part of the seal assembly. The seal wipes the ball surface, not the attenuator, promoting increased service life.

Table 1. Fisher V280 Standard Materials of Construction

PART	MATERIAL
Valve Body	LF2 Carbon Steel
Ball	Carbon Steel ENC
Seal	POM with S31600 SST Seal Blank
Drive Shaft	S17400 SST H1150D
Dome Attenuator	S17400 SST
Wave Spring	N07750
Retaining Ring	N07750
Tailpiece	LF2 Carbon Steel
Tailpiece Mounting Bolting	B7M Steel
Bearing Plate	Carbon Steel
Bearings	N04400 with PTFE
Thrust Washer	Carbon filled PTFE
Packing Box Housing	Carbon Steel
Packing	PTFE/Carbon filled PTFE
Packing Bolting	B7M Steel
Packing Follower, Packing Box Ring	Annealed S31600 SST
Groove Pins	S31600
O-Rings	Nitrile
Actuator Mounting Bolting	Steel Grade 5

Figure 1. V280 with Dual Seal and Single Dome Attenuator

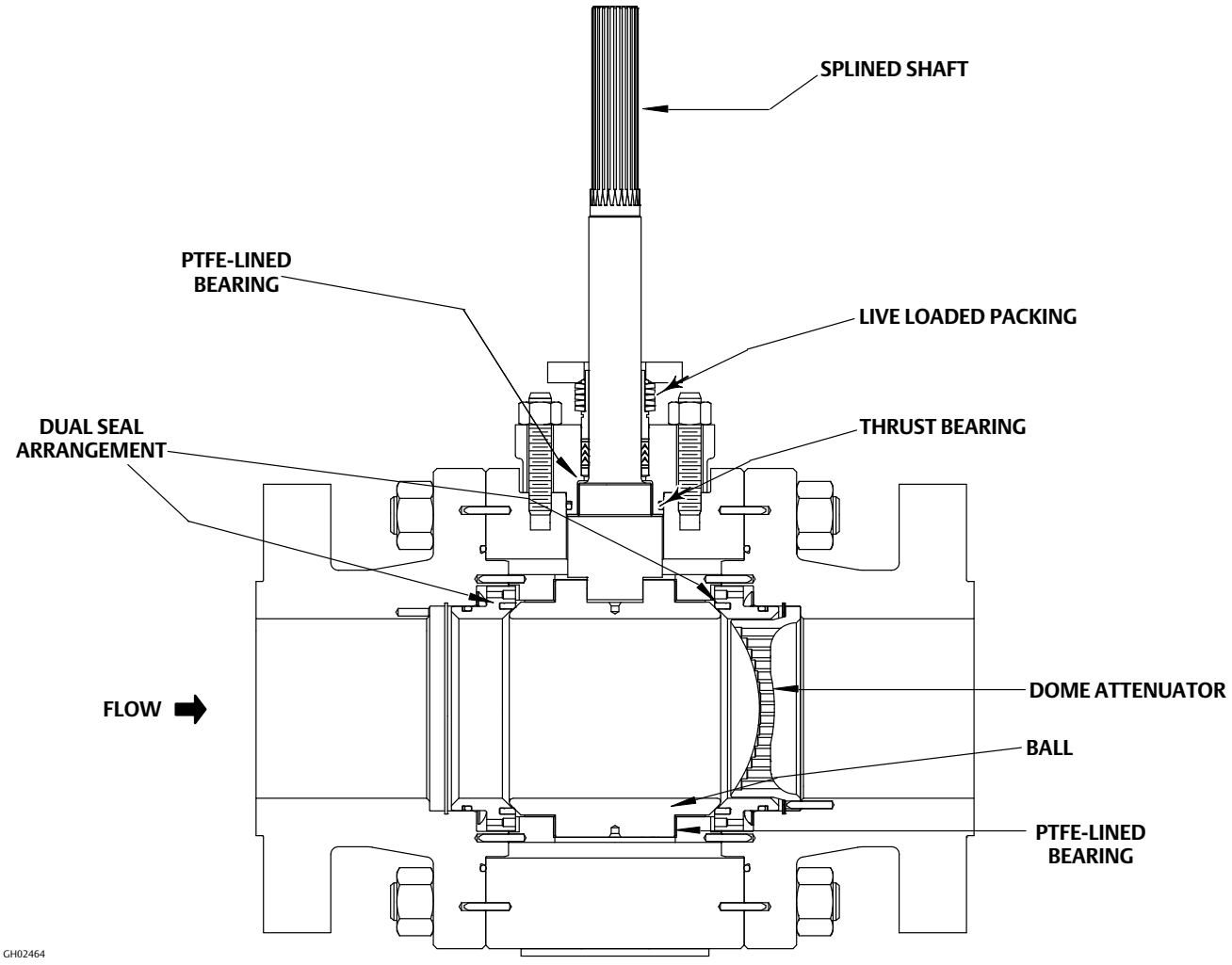

Figure 2. Construction Versatility Seal/Dome Assembly Details

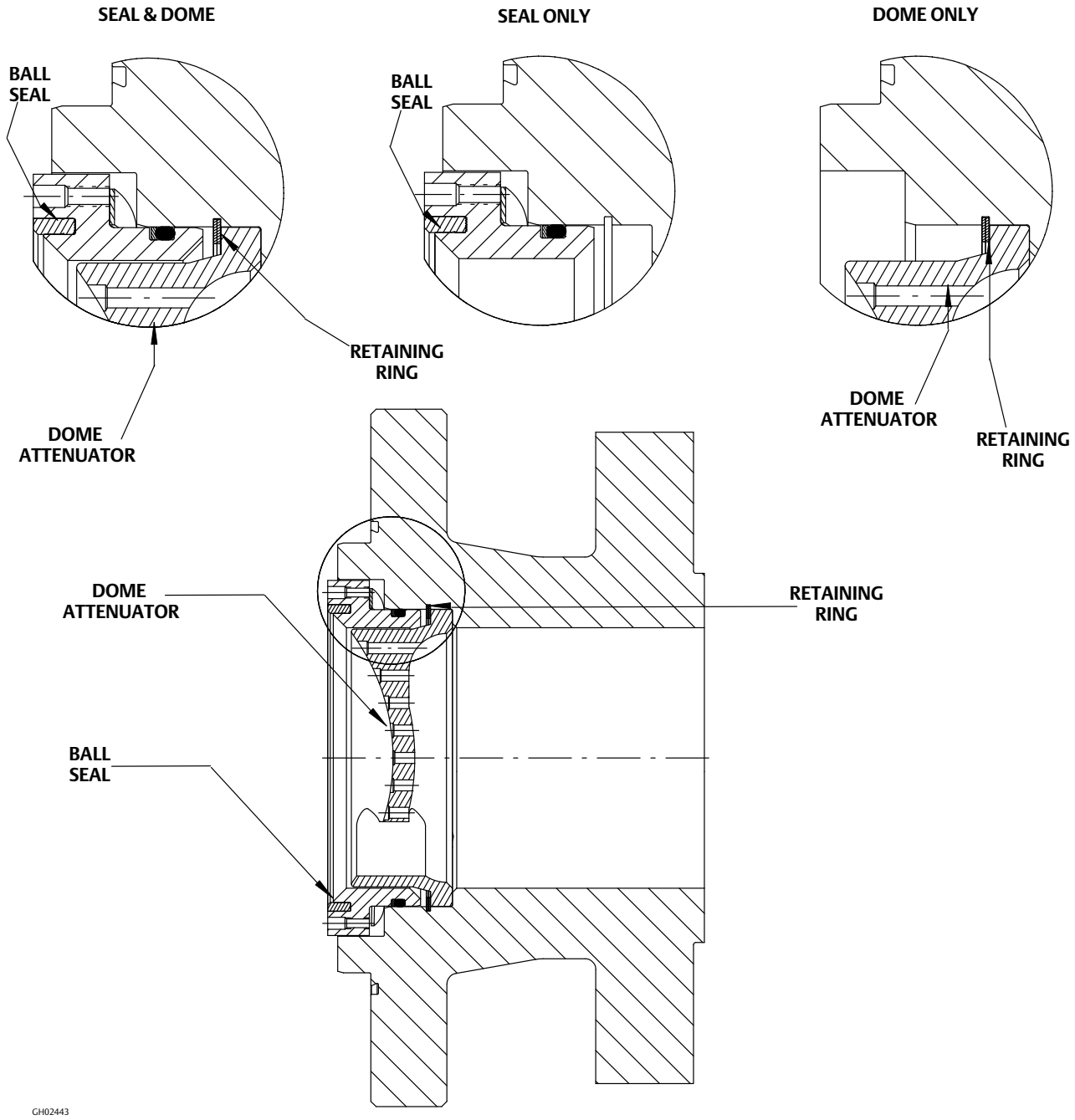

Figure 3. V280 Envelope Dimensions

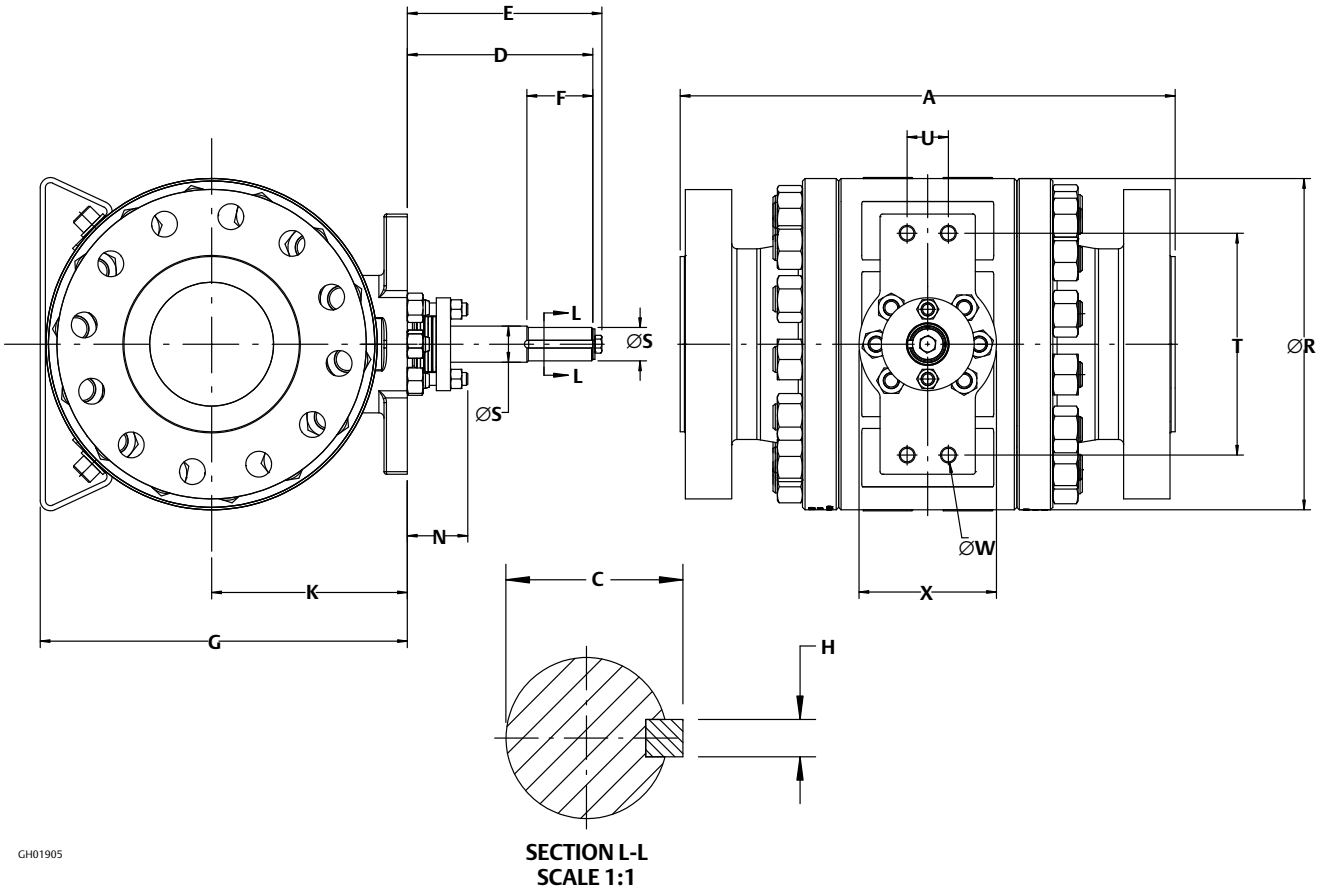

Table 2. V280 Envelope Dimensions (see figure 3)

Valve Size, NPS	Pressure Class	∅Bore	A	K	G	ØR	∅S			V	U	∅W (Threaded)	Approximate Weight
							Shaft Dia.	Spline Dia.	Keyway Dia.				
		mm											kg
6	900	152	610	241	452	409	44.4	38.1	41.2	273	51	See Below	415
8		203	737	300	561	508	63.5	50.8	57.1	337	76		753
10		254	838	343	648	597							1143
12		305	965	434	798	705	76.2	71.1	69.8	533	127		1823
16		374	1130	503	937	851							2885
		Inches											lbs
6	900	6.00	24.00	9.50	17.80	16.10	1.75	1.50	1.625	10.75	2.00	3/4-10	915
8		8.00	29.00	11.80	22.10	20.00	2.50	2.00	2.25	13.25	3.00	7/8-9	1660
10		10.00	33.00	13.50	25.50	23.50							2520
12		12.00	38.00	17.10	31.40	27.75	3.00	2.80	2.75	21.00	5.00	1-1/4-8	4020
16		14.71	44.50	19.80	36.90	33.50							6360

Table 3. V280 Envelope Dimensions (see figure 3) (cont.)

Valve Size, NPS	Pressure Class	D		E	F		C	H	N	X
		Splined Shaft	Keyed Shaft	Keyed Shaft	Splined Shaft	Keyed Shaft	Shaft & Key Height	Key Width	Packing Nut Removal Clearance	Flange Width
		mm								
6	900	356	229	243	155	80	45.2	9.52	96	169
8			297	312		95	62.4	12.70	109	191
10										
12		508	394	408	264	111	76.7	15.87	134	244
16										
		Inches								
6	900	14.00	9.00	9.60	6.12	3.13	1.78	0.375	3.81	6.66
8			11.70	12.30		3.75	2.46	0.500	4.31	7.50
10										
12		20.00	15.50	16.10	10.38	4.38	3.02	0.625	5.31	9.62
16										

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

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Fisher™ V500 Rotary Globe Control Valve

The Fisher V500 eccentric plug rotary control valve controls erosive, coking, and other hard-to-handle fluids, providing either throttling or on/off operation. The flanged valve features streamlined flow passages, rugged metal trim components, and a self-centering seat ring (figures 1 and 2). With these components, the V500 rotary control valve combines globe valve ruggedness with the efficiency of a rotary valve. Matched with a Fisher power or manual actuator, the V500 rotary control valve dependably controls fluids in many process industries.

Fisher V500 Flanged Rotary Control Valve with 2052 Actuator and FIELDVUE™ DVC6200 Digital Valve Controller

Features

- Easy Installation -- Integral valve body flanges mate with many different classes of pipeline flanges, satisfying a variety of piping requirements. Flanges help to eliminate exposed line flange bolting, shorten alignment and installation time, and promote secure valve installations and piping integrity.

- Operational Versatility -- Self-centering seat ring and rugged plug allow forward or reverse flow with tight shutoff in either flow direction. Reverse flow direction helps move downstream turbulence away from shutoff surfaces. Full 90-degree rotation removes valve plug from flowstream, helping to reduce plug wear. Seat ring and retainer are available in full and restricted port constructions, and can easily be changed if capacity requirements change.

- Furnace Feed Design -- Specially selected trim materials and body coatings help to withstand oil sands, furnace feed, and other highly erosive applications.

- Resists Damage from Erosive Flow -- Valve assembly is specifically designed to combat the process of erosion. Streamlined flow passages, rugged components, and a wide choice of erosion-resistant trim materials all promote long, dependable service life in erosive applications.

- Long Seat Life -- Path of eccentric plug (figure 4) minimizes contact with seat ring when opening, reducing seat wear and friction. When the valve plug rotates into the seat ring, a self-lapping action occurs, improving the fit between shutoff surfaces. Full-port, S31600, R30006, or VTC seat ring has two shutoff surfaces and can be easily reversed, reducing downtime.

(continued on page 3)

Specifications

Available Configuration

Flanged valve assembly (NPS 3 through 8 only) with reversible(1) metal or VTC (ceramic) seat ring and splined valve shaft

Valve Sizes

■ NPS 1, ■ 1-1/2, ■ 2, ■ 3, ■ 4, ■ 6, and ■ 8
DN sizes are also available (see tables 1 and 2).

End Connection Style and Rating

■ Raised-face flanges or ■ ring-type joint flanges (ASME B16.5). Valves with EN PN10 through PN100 flanges also available. (See tables 1 and 2 for ASME and EN availability by valve size.)

Maximum Inlet Pressure(2)

Consistent with applicable ASME or EN flange ratings

Maximum Pressure Drops(2)

See tables 5, 6, 7, 8 and 9

Shutoff Classification

Class IV per ANSI/FCI 70-2 and IEC 60534-4, (0.01% of valve capacity at full travel) for either flow direction. Leak rates for full and restricted port valves are based on full port valve capacities. Reduced port valves seat at the full port diameter.

Construction Materials

See table 4 for individual parts and table 3 for trim combinations

Material Temperature Capability(2)

See table 4

Flow Characteristic

Modified linear

Flow Direction

Reverse flow (standard): Past valve plug and through seat ring; tends to close the valve; recommended for erosive service
Forward flow: Through seat ring and past valve plug; tends to open the valve

Flow Coefficients

See Fisher Catalog 12

Flow Coefficient Ratio(3)

See Fisher Catalog 12

Noise Levels

See Fisher Catalog 12

Actuator Mounting

■ Right-hand or ■ left-hand as viewed from the upstream side of the valve.

Mounting position depends on the desired open valve plug position and flow direction required by operating conditions. For more information, see the Installation section.

Valve Plug Rotation

Counterclockwise to close (when viewed from actuator side of valve) through 90 degrees of plug rotation

Valve/Actuator Action

With diaphragm or piston rotary actuator, field-reversible between
■ push-down-to-close (extending actuator rod closes valve) and
■ push-down-to-open (extending actuator rod opens valve

Packing Constructions

■ PTFE V-Ring: With one carbon-filled PTFE conductive packing ring in single, double, or leak-off arrangements, -46 to 232°C (-50 to 450°F)
■ PTFE/Bound-Composition: With one graphited composition conductive packing ring in single, double, or leak-off arrangements, -46 to 232°C (-50 to 450°F)
■ Graphite Ribbon Packing Rings: In single, double, or leak-off arrangements, -198 to 538°C (-325 to 1000°F)
■ ENVIRO-SEAL™ PTFE: -46 to 232°C (-50 to 450°F) (for 100 ppm service requirements)
■ ENVIRO-SEAL Graphite: -7 to 316°C (20 to 600°F) (for 100 ppm service requirements). This packing arrangement can be used to 371°C (700°F) for non-environmental service.

(continued)

Specifications (continued)

Shaft Diameters

See figure 5

Dimensions and Approximate Weights

See figure 5; face-to-face dimensions conform to ISA S75.04 and IEC 60534-3-2

Options

■ Restricted trim (retainer and seat ring) for low-flow applications, ■ sealed bearing constructions, ■ purged bearings, ■ tungsten carbide trim option, ■ flushing connections, ■ chrome carbide valve body coating, ■ ENVIRO-SEAL packing system; see figure 3 and bulletin 59.3:041, ENVIRO-SEAL Packing Systems for Rotary Valves (D101638X012) for more information

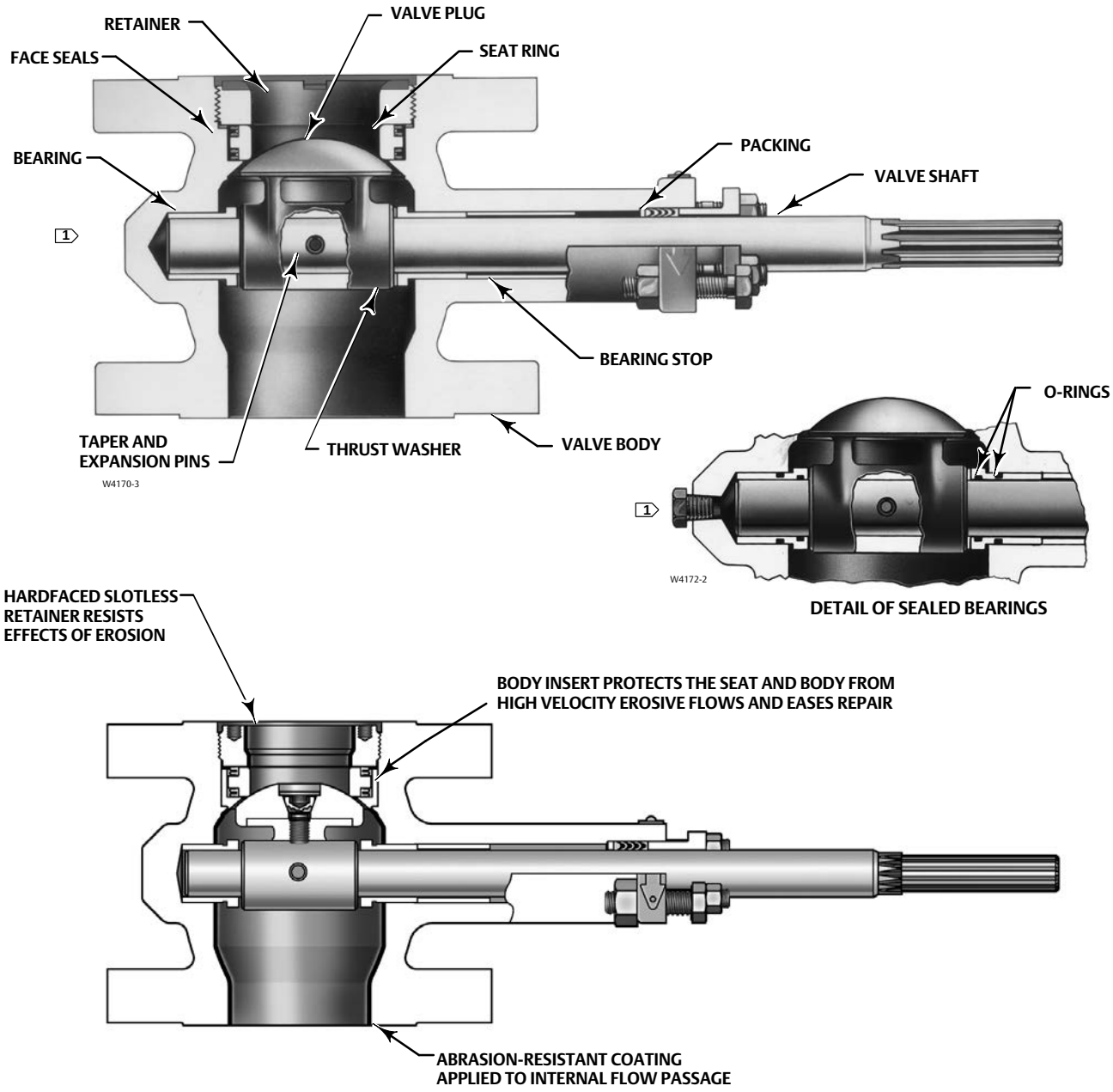
1. The reversible seat is not available in every trim material. Consult your Emerson sales office.
2. The pressure or temperature limits in the referenced tables or figures, and in any applicable code limitation, should not be exceeded.
3. Ratio of maximum flow coefficient to minimum usable flow coefficient. May also be called rangeability.

Features (continued)

- **Simple Assembly and Maintenance --** No special orientation, precision clamping or repetitive centering of valve plug and seat ring is required when tightening the retainer, promoting accurate alignment and easy assembly.
- **Improved Environmental Capabilities --** The optional ENVIRO-SEAL packing systems are designed with very smooth shaft surfaces and live loading to provide improved sealing. The seal of the ENVIRO-SEAL system can restrict emissions to less than the EPA (Environmental Protection Agency) limit of 100 ppm (parts per million).
- **Sour Service Capability --** Materials are available for applications involving sour liquids and gases. Depending on the construction, the product will comply with NACE MR0175-2002, MR0175-2003, MR0103 and/or MR0175/ISO15156. Contact your Emerson sales office for additional information.
- **Rugged Construction --** Durable, solid metal or VTC seat ring and valve plug shutoff tightly without deforming plug arms or employing thin ball seals. Oversized shaft diameters and rugged trim parts allow high pressure drops. Tungsten carbide is also available for erosive service.
- **Reliable Performance --** Seat ring design (figure 2) self-centers, self-laps, and dynamically aligns with plug, giving excellent cycle life. Sealed metal bearings (see figure 1) help prevent particle buildup and valve shaft seizure in erosive applications.
- **Choice of Construction Materials --** Plug, seat ring, and retainer are available in four levels of hardness for selection of erosion resistance.
- **Optional Alloy 6 Seat Ledge Insert Available --** Protects seat and valve body from high-velocity erosive flows and eases repair. Available for NPS 2-8.

Contents

Figure 1. Sectional of Fisher V500 Control Valve



1 End-tapped valve body and pipe plug optional (limited to less than 232°C [450°F])

Figure 2. Detail of Seat Ring Design

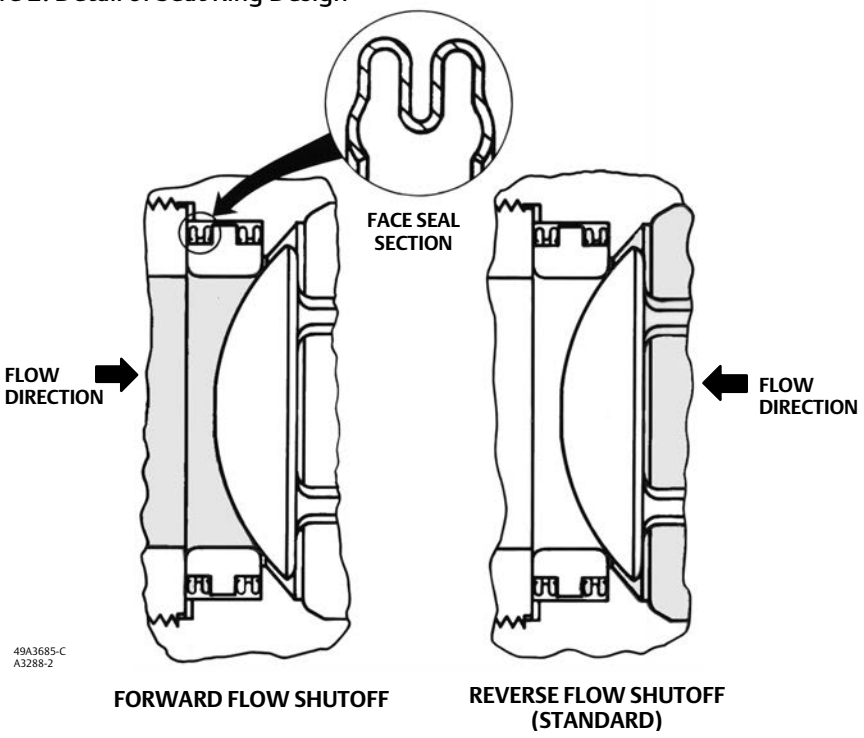


Figure 3. Typical ENVIRO-SEAL Packing Arrangements for Rotary Valves

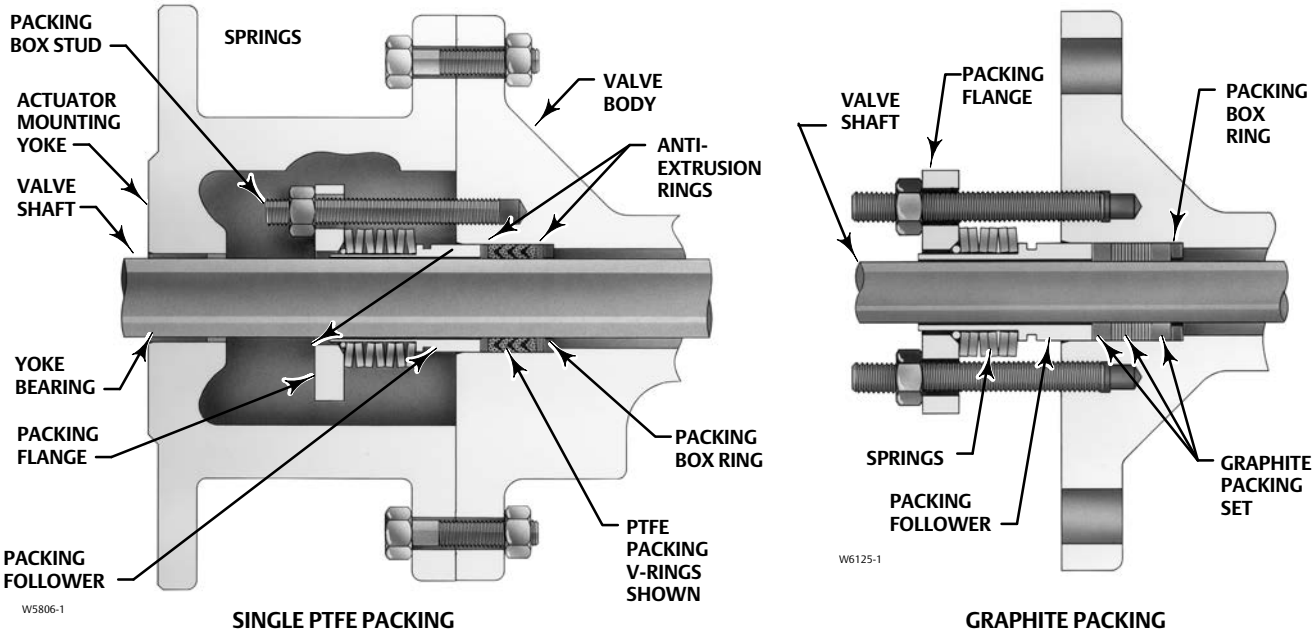


Table 1. Valve Size, ASME Pressure Ratings, and Flange Compatibility (X indicates availability)

VALVE SIZE, NPS	FLANGED		
	CL150	CL300	CL600
1	X	X	X
1-1/2	X	X	X
2	X	X	X
3	X	X	X
4	X	X	X
6	X	X	X
8	X	X	X

Table 2. Valve Size, EN Pressure Ratings, and Flange Capability (X indicates availability)

VALVE SIZE, DN	Flanged					
	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
25	X	X	X	X	X	X
40	X	X	X	X	X	X
50	X	X	X	X	X	X
80	X	X	X	X	X	X
100	X	X	X	X	X	X
150	X	X	X	X	X	X
200	X	X	X	X	X	X

Table 3. Material Combinations

Trim Level	Body Material	Valve Size, NPS	Valve Plug	Seat Ring	Retainer
1	WCC	1 & 1-1/2	CF8M/Chrome Plate	CF8M	CF8M
		2 through 8	CF8M/Chrome Plate	CF8M	CB7Cu-1
	CF8M	1 through 8	CF8M/Chrome Plate	CF8M	CF8M
	CF3M(2)	1 through 8	CF3M/Chrome Plate	CF3M	CF3M
2	WCC	1 & 1-1/2	R30006	R30006	CF8M
		2 through 8	R30006	R30006	CB7Cu-1
	CF8M	1 through 8	R30006	R30006	CF8M
	CF3M(2)	1 through 8	R30006	R30006	CF3M
3	WCC/CF8M/CF3M(1,3)	1 & 1-1/2	R30006	R30006	CF8M/R30006 bore or CF3M/R30006 bore(3)
		2 through 8	R30006	R30006	R30006
3H (over 600°F)	CF8M/CF3M(3)	2 through 8	R30006	R30006	CF8M/R30006 bore or CF3M/R30006 bore(3)
4(5,6)	WCC/CF8M/CF3M(3)	1 & 1-1/2(4)	Solid VTC	Solid VTC	CF8M/VTC bore or CF3M/VTC bore(3)
		2(4)	Solid VTC	Solid VTC	R30006/VTC bore
		3 through 8	R30006 hub, Titanium Gr 5 cap screw, and VTC surface cap	Solid VTC	R30006/VTC bore
4S(5,6)	WCC/CF8M/CF3M(3)	3 through 8	R30006 hub, S17400SST treated insert, N07718 cap screw, and VTC surface cap	Solid VTC	R30006/VTC bore
FFD(6)	CF8M with Tungsten Carbide Coating and R30006 Drop-in Seat Ledge	2 through 8	R30006/Tungsten Carbide Seating Surface	Solid VTC	CF8M/R30006 Bore

1. Trim 3 for NPS 2 through 8 stainless steel bodies is limited to 600°F.
2. European Sourcing Only.
3. European sources supply CF3M in lieu of CF8M.
4. Includes an S20910 SST shaft for NPS 1, 1-1/2, and 2.
5. Use trim 4S when sour service construction is required for compliance to NACE MR0175-2002.
6. VTC trim is not compatible with water and steam above 180°C (360°F).

Table 4. Material Temperature Capabilities[1, 4]

PART NAME	MATERIAL		MINIMUM TO MAXIMUM TEMPERATURE	
			°C	°F
Valve body and retainer NPS 1 and 1-1/2	Steel body	CF8M retainer CF8M retainer with R30006 bore CF8M retainer with VTC bore	-29 to 427	-20 to 800
	CF8M body	CF8M retainer CF8M retainer with R30006 bore S31600 retainer with VTC bore	-198 to 538	-325 to 1000
Valve body and retainer NPS 2 through 8	WCC steel body	CB7Cu-1 retainer	-29 to 427	-20 to 800
		Solid R30006 retainer	-29 to 427	-20 to 800
		CF8M retainer	-29 to 260	-20 to 500
		R30006 retainer with VTC bore	-29 to 427	-20 to 800
	CF8M body	CF8M retainer	-198 to 427	-325 to 800
		Solid R30006 retainer	-46 to 324	-50 to 600
		CF8M with R30006 bore	-198 to 427	-325 to 800
		R30006 retainer with VTC bore	-46 to 427	-50 to 800
Seat Ledge Insert	R30006		-46 to 538	-50 to 1000
Seat ring	CF8M		-198 to 538	-325 to 1000
	Solid R30006		-46 to 538	-50 to 1000
	CF8M with R30006 seat		-198 to 538	-325 to 1000
	Solid VTC		-46 to 427	-50 to 800
Valve plug	Chrome-plated CF8M		-198 to 316	-325 to 600
	Solid R30006		-46 to 427	-50 to 800
	Solid VTC (NPS 1 through 2 valves only)		-46 to 427	-50 to 800
	VTC surface bolted to an R30006 hub (NPS 3 through 8 valves only)		-46 to 427	-50 to 800
	R30006 Hub, Tungsten Carbide Seat		-40 to 538	-40 to 1000
Valve shaft	S17400		-62 to 427	-80 to 800
	S20910		-198 to 538	-325 to 1000
Taper and expansion pins	1 through 2-inch solid VTC valve plug	N10276	-46 to 427	-50 to 800
	Other valve plugs	S20910	-198 to 538	-325 to 1000
Bearings	PTFE/composition-lined S31600		-46 to 260	-50 to 500
	R30006[2]		-198 to 538	-325 to 1000
	S44004[2]		-29 to 427	-20 to 800
O-rings[3] (for Alloy 6 or 440C SST sealed bearings)	FKM		-18 to 204	0 to 400
	NBR		-29 to 93	-20 to 200
Bearing stop	S31600		-198 to 538	-325 to 1000
Thrust washer	S17700 for S17400 shaft		-198 to 427	-325 to 800
	R30016 for S20910 SST shaft		-198 to 538	-325 to 1000
Face seals	N07718 (NACE MR0175-2002 or PTFE/N10276		-198 to 538	-325 to 1000
Retainer gasket	Graphite laminate for NPS 1 and 1-1/2 valves or S31600 for NPS 2 through 8 valves		-198 to 538	-325 to 1000
Packing rings	PTFE		-46 to 260	-50 to 500
	PTFE/bound composition		-73 to 260	-100 to 500
	Graphite ribbon		-198 to 538	-325 to 1000
Packing follower	S31600		-198 to 538	-325 to 1000
Studs and nuts	SA-193-B7 studs and SA-194-2H nuts		-46 to 427	-50 to 800
	SA-193-B7M studs and SA-194-2HM nuts		-29 to 427	-20 to 800
	B8M studs and 8M nuts		-198 to 538	-325 to 1000
Packing box ring	S31600		-198 to 538	-325 to 1000

1. VTC trim is incompatible with water and steam above 180°C (360°F).
2. Recommended for erosive applications.
3. For sealed bearing constructions
4. Component ratings (not indicative of assembly rating)

Table 5. Maximum Allowable Shutoff Pressure Drops for Level 1 Trim, Bar

VALVE BODY MATERIAL	BEARING MATERIAL	TEMPERATURE, °C	VALVE BODY SIZE, NPS						
			1	1-1/2	2	3	4	6	8
WCC steel	S44004	-29 to 149	68.9	55.2	41.4	41.4	41.4	41.4	24.1
		149 to 204	68.9	55.2	41.4	41.4	41.4	41.4	23.8
		204 to 316	68.9	55.2	41.4	41.4	41.4	41.4	23.1
	R30006	-29 to 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 to 260	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		260 to 316	68.9	55.2	41.4	41.4	41.4	20.7	15.2
	PTFE/ composition-lined S31600	-29 to 93	68.9	55.2	41.4	41.4	41.4	41.4	24.1
		93 to 149	68.9	55.2	41.4	41.4	41.4	41.4	24.1[1] 23.1[2]
		149 to 204	68.9	55.2	41.4	41.4	41.4	41.4	23.8[1] 22.1[2]
		204 to 260	68.9	55.2	41.4	41.4	41.4	41.4	23.4[1] 21.7[2]
CF8M SST	R30006	-46 to 20	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 to 260	65.8	55.2	41.4	41.4	41.4	20.7	15.2
		260 to 316	62.4	55.2	41.4	41.4	41.4	20.7	15.2
	PTFE/ composition-lined S31600	-46 to 93	68.9	55.2	41.4	41.4	41.4	41.4	24.1
		93 to 149	68.9	55.2	41.4	41.4	41.4	41.4	24.1[1] 23.1[2]
		149 to 204	68.9	55.2	41.4	41.4	41.4	41.4	23.8[1] 22.1[2]
		204 to 260	65.8	55.2	41.4	41.4	41.4	41.4	23.4[1] 21.7[2]

1. S17400 shaft only
2. ASME SA-479 Grade S20910 SST shaft only. Pressure drops appropriate for both shaft materials.

Table 6. Maximum Allowable Shutoff Pressure Drops for Level 1 Trim, Psi

VALVE BODY MATERIAL	BEARING MATERIAL	°F	VALVE BODY SIZE, NPS						
			1	1-1/2	2	3	4	6	8
WCC steel	S44004	-20 to 300	1000	800	600	600	600	600	350
		300 to 400	1000	800	600	600	600	600	345
		400 to 600	1000	800	600	600	600	600	335
	R30006	-20 to 400	1000	800	600	600	600	300	220
		400 to 500	1000	800	600	600	600	300	220
		500 to 600	1000	800	600	600	600	300	220
	PTFE/ composition-lined S31600	-20 to 200	1000	800	600	600	600	600	350
		200 to 300	1000	800	600	600	600	600	350(1) 335(2)
		300 to 400	1000	800	600	600	600	600	345(1) 320(2)
		400 to 500	1000	800	600	600	600	600	340(1) 315(2)
CF8M SST	R30006	-50 to 400	1000	800	600	600	600	300	220
		400 to 500	955	800	600	600	600	300	220
		500 to 600	905	800	600	600	600	300	220
	PTFE/ composition-lined S31600	-50 to 200	1000	800	600	600	600	600	350
		200 to 300	1000	800	600	600	600	600	350(1) 335(2)
		300 to 400	1000	800	600	600	600	600	345(1) 320(2)
		400 to 500	955	800	600	600	600	600	340(1) 315(2)

1. S17400 shaft only
2. ASME SA-479 Grade S20910 SST shaft only. Pressure drops appropriate for both shaft materials.

Table 7. Maximum Allowable Shutoff Pressure Drops for Level 2 and 3 Trims, Bar

VALVE BODY MATERIAL	BEARING MATERIAL	TEMPERATURE, °C	VALVE BODY SIZE, NPS						
			1	1-1/2	2	3	4	6	8
WCC steel	S44004	-29 to 93	103.4	103.4	103.4	103.4	82.7	51.7	24.1
		93 to 149	100.3	100.3	99.0	100.3	82.7	51.7	24.1
		149 to 204	97.2	97.2	93.8	97.2	82.7	51.0	23.8
		204 to 260	91.7	91.7	91.4	91.7	82.7	50.0	23.1
		260 to 316	83.4	83.4	83.4	83.4	82.7	49.3	23.1
		316 to 343	81.0	81.0	81.0	81.0	81.0	48.3	22.4
		343 to 371	78.3	78.3	78.3	78.3	78.3	48.3	22.4
		371 to 399	69.6	69.6	69.6	69.6	69.6	46.9	21.7
		399 to 427	56.9	56.9	56.9	56.9	56.9	46.9	21.7
	R30006	-29 to 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 to 260	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		260 to 316	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		316 to 343	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		343 to 371	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		371 to 399	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		399 to 427	56.9	55.2	41.4	41.4	41.4	20.7	15.2
	PTFE/ composition-lined S31600	-29 to 38	103.4	103.4	103.4	103.4	89.6	55.2	24.1
		38 to 93	103.4	103.4	103.4	103.4	89.6	55.2	24.1
		93 to 149	100.3	100.3	100.3	100.3	89.6	55.2	24.1[1] 23.1[2]
		149 to 204	97.2	97.2	97.2	97.2	89.6	54.8[1] 51.0[2]	23.8[1] 22.1[2]
		204 to 232	91.7	91.7	91.7	91.7	89.6	53.8[1] 50.0[2]	23.4[1] 21.7[2]
CF8M SST[3]	R30006	-46 to 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 to 260	65.8	55.2	41.4	41.4	41.4	20.7	15.2
		260 to 316	62.4	55.2	41.4	41.4	41.4	20.7	15.2
		316 to 343	61.4	55.2	41.4	41.4	41.4	20.7	15.2
		343 to 371	59.6	55.2	41.4	41.4	41.4	20.7	15.2
		371 to 399	58.3	55.2	41.4	41.4	41.4	20.7	15.2
		399 to 427	57.2	55.2	41.4	41.4	41.4	20.7	15.2
	PTFE/ composition-lined S31600	-46 to 38	99.3	99.3	99.3	99.3	89.6	55.2	24.1
		38 to 93	85.5	85.5	85.5	85.5	85.5	55.2	24.1
		93 to 149	77.3	77.3	77.3	77.3	77.2	53.1	24.1[1] 23.1[2]
		149 to 204	71.0	71.0	71.0	71.0	71.0	54.8[1] 51.0[2]	23.8[1] 22.1[2]
		204 to 232	65.8	65.8	65.8	65.8	65.8	53.8[1] 50.0[2]	23.4[1] 21.7[2]

1. S17400 shaft only
2. ASME SA-479 Grade S20910 SST shaft only. Pressure drops appropriate for both shaft materials.
3. Level 3 trim is limited to a maximum temperature of 316°C. For temperatures above 316°C, use trim 3H.

Table 8. Maximum Allowable Shutoff Pressure Drops for Level 2 and 3 Trims, Psi

VALVE BODY MATERIAL	BEARING MATERIAL	TEMPERATURE, °F	VALVE BODY SIZE, NPS						
			1	1-1/2	2	3	4	6	8
WCC steel	S44004	-20 to 200	1500	1500	1500	1500	1200	750	350
		200 to 300	1455	1455	1435	1455	1200	750	350
		300 to 400	1410	1410	1360	1410	1200	740	345
		400 to 500	1330	1330	1325	1330	1200	725	335
		500 to 600	1210	1210	1210	1210	1200	715	335
		600 to 650	1175	1175	1175	1175	1175	700	325
		650 to 700	1135	1135	1135	1135	1135	700	325
		700 to 750	1010	1010	1010	1010	1010	680	315
		750 to 800	825	825	825	825	825	680	315
	R30006	-20 to 400	1000	800	600	600	600	300	220
		400 to 500	1000	800	600	600	600	300	220
		500 to 600	1000	800	600	600	600	300	220
		600 to 650	1000	800	600	600	600	300	220
		650 to 700	1000	800	600	600	600	300	220
		700 to 750	1000	800	600	600	600	300	220
		750 to 800	825	800	600	600	600	300	220
	PTFE/ composition-lined S31600	-20 to 100	1500	1500	1500	1500	1300	800	350
		100 to 200	1500	1500	1500	1500	1300	800	350
		200 to 300	1455	1455	1455	1455	1300	800	350[1] 335[2]
		300 to 400	1410	1410	1410	1410	1300	795[1] 740[2]	345[1] 320[2]
		400 to 450	1330	1330	1330	1330	1300	780[1] 725[2]	340[1] 315[2]
CF8M SST[3]	R30006	-50 to 400	1000	800	600	600	600	300	220
		400 to 500	955	800	600	600	600	300	220
		500 to 600	905	800	600	600	600	300	220
		600 to 650	890	800	600	600	600	300	220
		650 to 700	865	800	600	600	600	300	220
		700 to 750	845	800	600	600	600	300	220
		750 to 800	830	800	600	600	600	300	220
	PTFE/ composition-lined S31600	-50 to 100	1440	1440	1440	1440	1300	800	350
		100 to 200	1240	1240	1240	1240	1240	800	350
		200 to 300	1120	1120	1120	1120	1120	770	350[1] 335[2]
		300 to 400	1030	1030	1030	1030	1030	795[1] 740[2]	345[1] 320[2]
		400 to 450	955	955	955	955	955	780[1] 725[2]	340[1] 315[2]

1. S17400 shaft only
2. ASME SA-479 Grade S20910 SST shaft only. Pressure drops appropriate for both shaft materials.
3. Level 3 trim is limited to a maximum temperature of 600°F. For temperatures above 600°F, use trim 3H.

Table 9. Maximum Allowable Shutoff Pressure Drops for Level 4 Trim(1)

VALVE BODY MATERIAL	BEARING MATERIAL	TEMPERATURE, °C	BAR						
			VALVE SIZE, NPS						
			1	1-1/2	2	3	4	6	8
WCC steel	S44004	-29 to 93	103.4	103.4	70.3	103.4	78.6	52.4	24.1
		93 to 149	100.3	100.3	70.3	100.3	78.6	52.4	24.1
		149 to 204	97.2	97.2	70.3	97.2	78.6	51.0	23.8
		204 to 260	91.7	91.7	70.3	91.7	78.6	50.0	23.1
		260 to 316	83.4	83.4	70.3	83.4	78.6	49.3	23.1
		316 to 371	78.3	78.3	70.3	78.3	78.3	48.3	22.4
		371 to 427	56.9	56.9	56.9	56.9	56.9	46.9	21.7
	R30006	-29 to 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 to 260	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		260 to 316	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		316 to 371	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		371 to 427	56.9	55.2	41.4	41.4	41.4	20.7	15.2
CF8M SST	R30006	-46 to 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 to 260	65.8	55.2	41.4	41.4	41.4	20.7	15.2
		260 to 316	62.4	55.2	41.4	41.4	41.4	20.7	15.2
		316 to 371	59.6	55.2	41.4	41.4	41.4	20.7	15.2
		371 to 427	57.2	55.2	41.4	41.4	41.4	20.7	15.2
VALVE BODY MATERIAL	BEARING MATERIAL	TEMPERATURE, °F	PSI						
			1	1-1/2	2	3	4	6	8
WCC steel	S44004	-20 to 200	1500	1500	1020	1500	1140	750	350
		200 to 300	1455	1455	1020	1455	1140	760	350
		300 to 400	1410	1410	1020	1410	1140	740	345
		400 to 500	1330	1330	1020	1330	1140	725	335
		500 to 600	1210	1210	1020	1210	1140	715	335
		600 to 700	1135	1135	1020	1135	1135	700	325
		700 to 800	825	825	825	825	825	680	315
	R30006	-20 to 400	1000	800	600	600	600	300	220
		400 to 500	1000	800	600	600	600	300	220
		500 to 600	1000	800	600	600	600	300	220
		600 to 700	1000	800	600	600	600	300	220
		700 to 800	825	800	600	600	600	300	220
CF8M SST	R30006	-50 to 400	1000	800	600	600	600	300	220
		400 to 500	955	800	600	600	600	300	220
		500 to 600	905	800	600	600	600	300	220
		600 to 700	855	800	600	600	600	300	220
		700 to 800	830	800	600	600	600	300	220

1. VTC trim is incompatible with water and steam above 180°C (360°F).

Table 10. Maximum Allowable Shutoff Pressure Drops for FFD Trim(1)

VALVE BODY MATERIAL	BEARING MATERIAL	TEMPERATURE, °C	BAR		
			VALVE SIZE, NPS		
			3	4	6
CF8M SST	R30006	-46 to 204	41.4	41.4	20.7
		204 to 260	41.4	41.4	20.7
		260 to 316	41.4	41.4	20.7
		316 to 371	41.4	41.4	20.7
		371 to 427	41.4	41.4	20.7
VALVE BODY MATERIAL	**BEARING MATERIAL**	**TEMPERATURE, °F**	**PSI**		
			3	**4**	**6**
CF8M SST	R30006	-50 to 400	600	600	300
		400 to 500	600	600	300
		500 to 600	600	600	300
		600 to 700	600	600	300
		700 to 800	600	600	300

1. VTC trim is incompatible with water and steam above 180°C (360°F).

Table 11. Actuator Mounting Selections, with Action and Open Plug Position Options

MOUNTING	ACTION(1)	OPEN PLUG POSITION	
		Forward Flow	Reverse Flow
Left-hand	PDTC	Below shaft(2)	Above shaft
	PDTO	Below shaft(2)	Above shaft
Right-hand	PDTC	Above shaft	Below shaft(2)
	PDTO	Above shaft	Below shaft(2)

1. PDTC—Push-down-to-close (extending actuator rod closes valve)
PDTO—Push-down-to open (extending actuator rod opens valve).
2. Consult your Emerson sales office for compatibility with process fluid. Particulate can cause the valve to stick if the plug is rotated below the shaft.

Installation

The V500 control valve may be installed in any position. However, for best shutoff performance, a position with the shaft horizontal is recommended.

The control valve may be installed in forward or reverse flow direction. Forward flow (through the seat ring and past the plug) tends to open the valve; reverse flow (past the plug and through the seat ring) tends to close the valve. The reverse flow direction is recommended for erosive applications.

Specific operating conditions may require a specific combination of push-down-to-close or -open actuator motion and open valve plug position above or below the shaft. To satisfy specific operating requirements, the complete control valve package (valve and actuator) can be assembled and installed in different ways, providing eight options for actuator motion and open plug position.

Table 11 and the appropriate actuator bulletin describe possible assembly and installation options. For assistance in selecting the appropriate combination of actuator action and open valve position, consult your Emerson sales office.

Dimensions are shown in figure 5.

Valve Information

To determine the required valve ordering information, refer to the Specifications table. Review the information under each specification and in the referenced tables.

Actuator and Accessory Information

Refer to the specific actuator and accessory bulletins for required ordering information.

Figure 4. Eccentric Rotation

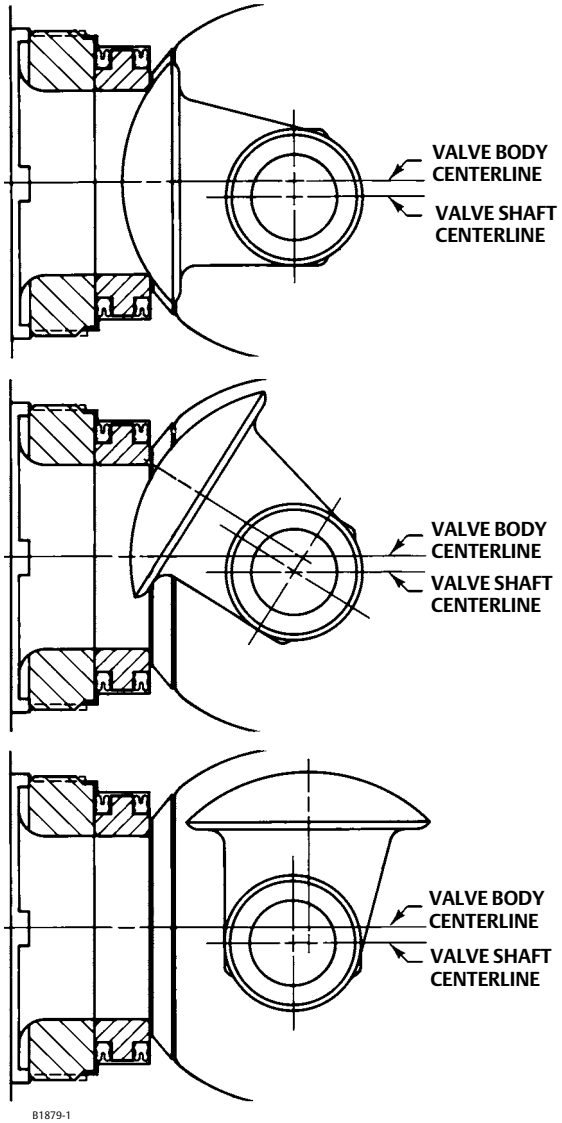
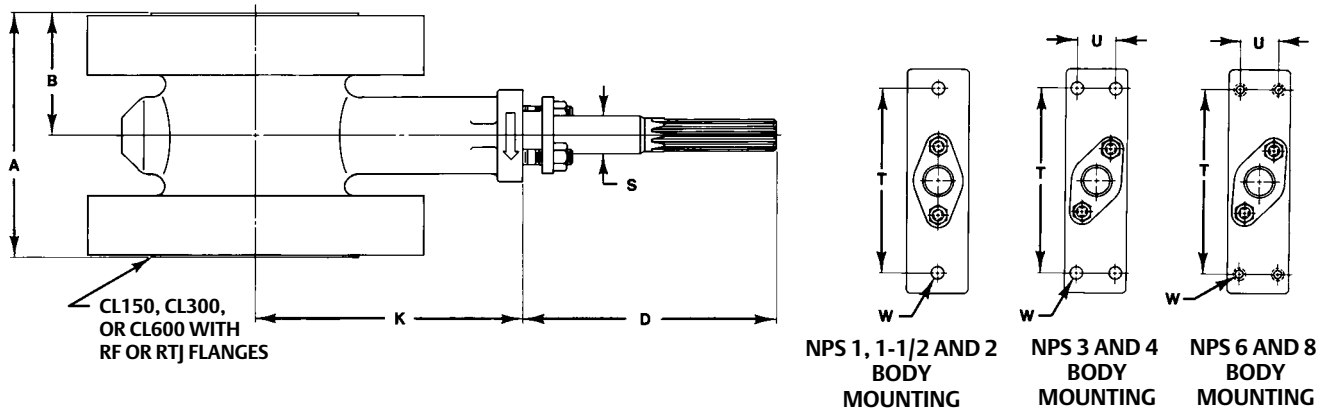


Table 12. Fisher V500 Rotary Control Flanged Valve Dimensions

VALVE SIZE, NPS	DIMENSIONS										APPROXIMATE WEIGHT		
	A		B		D	K	S (SHAFT DIA)(1)	T	U	W	Flanged		
	RF	RTJ	RF	RTJ							Pressure Class		
											CL150	CL300	CL600
	mm										kg		
1	102	108	51	57	187	126	12.7	118	---	11	5.4	5.9	5.9
1-1/2	114	122	57	63	187	135	15.9	118	---	14	8.6	9.5	10
2	124	124	62	62	187	151	15.9	118	---	14	9.5	11	13
3	165	165	83	83	213	200	25.4 25.4 x 19.1	152	32	14	19	24	26
4	194	194	97	97	208	216	31.8	235	46	18	36	42	50
6	229	229	114	114	208	270	38.1 38.1 x 31.8	235	46	5/8-Inch 11 UNC	54	69	93
8	243	243	121	121	208	318	38.1	235	46	5/8-Inch 11 UNC	79	98	135
VALVE SIZE, NPS	Inches										Pounds		
1	4.00	4.25	2.00	2.25	7.38	4.97	1/2	4.62	---	0.45	12	13	13
1-1/2	4.50	4.75	2.25	2.50	7.38	5.31	5/8	4.62	---	0.56	19	21	23
2	4.88	4.88	2.44	2.44	7.38	5.94	5/8	4.62	---	0.56	21	25	28
3	6.50	6.50	3.25	3.25	8.44	7.88	1 1 x 3/4	6.00	1.25	0.56	42	52	57
4	7.62	7.62	3.81	3.81	8.19	8.50	1-1/4	9.25	1.81	0.69	79	93	111
6	9.00	9.00	4.50	4.50	8.19	10.6	1-1/2 1-1/2 x 1-1/4	9.25	1.81	5/8-Inch 11 UNC	120	152	204
8	9.56	9.56	4.78	4.78	8.19	12.5	1-1/2	9.25	1.81	5/8-Inch 11 UNC	175	217	298

1. Shaft diameter versus spline diameter.

Figure 5. Fisher V500 Rotary Control Flanged Valve Dimensions (refer to table 12)



A3289-1

Note:
For dimensions of valves with DN (or other) end connections, consult your Emerson sales office.

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

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Fisher™ Vee-Ball™ V150, V200, and V300 Rotary Control Valves

This bulletin covers the DN 25 through 600 (NPS 1 through 24) V150, V200 and V300 Vee-Ball control valves. The Vee-Ball valve combines globe valve ruggedness with the efficiency of a rotary valve. The Vee-Ball valve is a segmented ball valve which features a contoured segmented V-Notch ball. A shearing action between the V-notch ball and the ball seal (figure 1) promotes smooth, nonclogging operation. The unrestricted straight-through flow design provides high capacity for gas, steam, liquids, and fibrous slurries.

V150, V200, and V300 valves mate with a variety of ASME raised face flanges, as well as with EN flanges (see Specifications).

To meet specific application requirements, a variety of metal and soft ball seal materials are available. A splined drive shaft combines with a variety of power operated and manual actuators to provide reliable, high-performance throttling or on-off operation for many different applications in the process industries.

V150

V200

Typical Vee-Ball Valves with Fisher 2052 Actuators and FIELDVUE ™ DVC6200 Digital Valve Controllers

V300

NPS 6 V300 Cutaway Image with Optional Cavitrol™ Hex Anti-Cavitation Trim

Features

- Trim Versatility—Trim components are interchangeable between V150, V200, and V300 valves. This feature allows you to reduce your spare parts inventory and maintenance procedures. The seal assembly can be changed without removing the actuator or without removing the ball from the valve body.

- Easy Installation—Flanged body design of the V150 and V300 eliminates exposed line flange bolting, reduces alignment and installation time, and promotes secure valve installations and piping integrity. The V200 is available with flanges in NPS 2 through 8.

Specifications

Valve Sizes

See table 1

Valve End Connection Styles

V150: Flanged valves that mate with CL150 raised-face flanges and EN 1092-1 Type B raised-face and Type F Recess

V200: Flangeless (all sizes) and flanged valves that mate with CL600 raised-face flanges (NPS 2-8)

V300: Flanged valves that mate with CL300 raised-face flanges and EN 1092-1 Type B raised-face and Type F Recess

Maximum Inlet Pressures(1)

V150 or V300 WCC (or 1.0619 Steel), CF3M (or 1.4409 SST), CG8M, LCC, M35-2, CK3McuN, CD3MN, and CD3MWCuN Valves: Consistent with CL150 for V150 or CL300 for V300 pressure-temperature ratings per ASME B16.34 or with PN pressure-temperature ratings shown in table 1.
Note: CF3M is the standard material offering in Europe and Asia-Pacific. 1.0619 Steel and 1.4409 SST are also standard material offerings in Europe.

V200 WCC, CG8M, and LCC Valves: Consistent with applicable pressure-temperature ratings in table 1 per ASME B16.34.

CW2M: Consistent with applicable pressure-temperature ratings shown in table 7.
Do not exceed the material temperature capabilities shown below or the pressure drop limitations.

Maximum Shutoff Pressure/Temperature Ratings(1)

Composition (Fisher TCM Plus or TCM Ultra), Flat Metal (NPS 3 through 12 valves only), HD and High Temperature HD Metal Ball Seals and Flow Ring: See table 9.

Shutoff Classification(1)

Fisher TCM Plus or Ultra Ball Seal (Forward Flow): Class VI per ANSI/FCI 70-2 and per IEC 60534-4,
Flat Metal Ball Seal for NPS 3 through 12 only (Forward Flow): Class IV per ANSI/FCI 70-2 and per IEC 60534-4,
HD (Heavy Duty) Ball Seal (Bidirectional Flow): 0.01% of valve capacity; Class IV per ANSI/FCI 70-2 and IEC 60534-4; Maximum allowable pressure drop in reverse flow is 6.9 bar (100 psi);
High Temperature HD (Heavy Duty) Ball Seal (Bidirectional Flow): Class III per ANSI/FCI 70-2 and IEC 60534-4
Flow Ring Construction (Bidirectional Flow): 5% of valve capacity at full travel
Micro-Notch Ball with HD Seal: 4 SCFH (Leakage rate equivalent to Class IV for standard ball. This is based on the capacity of a standard ball.)

Construction Materials

See tables 5 and 6

Temperature Capabilities(1,2)

Composition Seals
Fisher TCM Plus: -46 to 232°C (-50 to 450°F)
Fisher TCM Ultra: -46 to 260°C (-50 to 500°F)
HD Metal Seals: -46 to 288°C (-50 to 550°F)
PEEK HD Seal: -46 to 232°C (-50 to 450°F)
High Temperature HD Metal Seal: 288 to 427°C (550 to 800°F). Contact your Emerson sales office if higher temperatures are required.
Ceramic Micro-Notch Ball: -46 to 93°C (-50 to 200°F)(4)
Flow Ring or Flat Metal Seal : -198 to 425°C (-325 to 800°F)
PEEK/PTFE Bearings: -198 to 260°C (-325 to 500°F)

Packing Constructions

PTFE V-ring: -46 to 232°C (-50 to 450°F)
Graphite: -198 to 538°C (-325 to 1000°F)
ENVIRO-SEAL™ Single PTFE V-ring: -46 to 232°C (-50 to 450°F) (for 100 ppm service requirements)
ENVIRO-SEAL Graphite: -7 to 316°C (20 to 600°F) (for 100 ppm service requirements). This packing arrangement can be used to 371°C (700°F) for non-environmental service.

Flow Characteristic

Modified equal percentage

Dimensions

See figures 10, 11, and 13 for dimensions

Face-to-Face Dimensions

■ Standard Face-to-Face dimensions comply with ISA S75.08.02
■ ASME B16.10 short face-to-face dimensions are available as an option for NPS 1 through 12 valves. Note that ASME B16.10 short dimensions are longer than ISA S75.08.02. See figure 14 for dimensions.

(continued)

Specifications (continued)

Standard Flow Direction

Forward (into the convex face of the V-notch ball)

Flow Coefficients, Flow Coefficient Ratio(3), and Noise Levels

See Fisher Catalog 12

Maximum Ball Rotation

90 degrees

Actuator Mounting

Standard actuator mounting is on the right-hand side, as viewed from the valve inlet. The standard ball design and actuator action is counter-clockwise to close (CCW) so the ball will rotate to the top of the valve body when open for a horizontal pipe run with the valve shaft positioned horizontal.

Left-hand actuator mounting with CCW action is an option. Left-hand (optional) actuator mounting with a special clockwise to close (CW) ball design and actuator action is also available to allow the ball to rotate to the top of the valve body.(5)

Valve/Actuator Action

With diaphragm or piston rotary actuator, the valve is field-reversible between PDTC or PDTO: ■ push-down-to-close (extending actuator rod closes valve) and ■ push-down-to-open (extending actuator rod opens valve)

Approximate Weight

See table 2

Options

■ Pipe plug at end of follower shaft for all sizes, ■ Line flange bolting, ■ Materials that are compatible with sour service, ■ Alloy construction materials, ■ ENVIRO-SEAL packing system: See figure 9 and Bulletin 59.3:041, ENVIRO-SEAL Packing Systems for Rotary Valves (D101638X012) for more information, ■ Micro-Notch construction for NPS 1 valves (see Micro-Notch Construction section), ■ Alloy trim material , ■ Chrome Carbide coated internals (NPS 2 through 12), ■ Rotary attenuator to reduce aerodynamic noise and cavitation effects, ■ Double D, Square, and Keyed shaft options, ■ Cavitrol Hex anti-cavitation trim

1. The pressure/temperature limits in this bulletin, and any applicable code or standard limitation, should not be exceeded.
2. Additional limits are shown in tables 7, 8 and 9.
3. Ratio of maximum flow coefficients to minimum usable flow coefficient can also be called rangeability.
4. For the CG8M and alloy 6 Micro-Notch constructions, pressure and temperature capabilities are the same as for standard constructions.
5. The special clockwise to close (CW) action ball design is not available for the Micro-Notch, Macro-Notch, and Micro-Scratch constructions.

Table of Contents

Features (continued)

- Application Versatility—The valves are available with ISA S75.08.02 and IEC 534-3-2 face-to-face dimensions as a standard construction, and optional ASME B16.10 short face-to-face dimensions. IEC 534.3.2 face-to-face dimensions are equivalent to S75.08.02 face-to-face dimensions.

- Long Service Life—The solid HD ball seal (figures 1 and 2) construction provides long service life in demanding applications. The constant wiping action of the seal across the ball's sealing surface prevents scale and sludge buildup, and provides excellent service on steam, gases, slurries, and various liquid applications.

- Excellent Flow Control—Precise contouring of the Vee-Ball provides a modified equal percentage flow characteristic. For very precise control of low flow rates, the Micro-Notch option is available on the NPS 1 valve. See the Micro-Notch Construction section of this bulletin for more information.

- Sour Service Capability—Materials are available for applications involving sour liquids and gases. These constructions comply with NACE MR0175-2002, MR0175-2003, MR0103, and MR0175/ISO 15156.

- Smooth Valve Operation—Precision machined parts and pressure balanced seal designs allow smooth, precise movement of the ball.

- Quick and Easy Maintenance—Ball seal inspection and replacement is done at the valve body inlet without removing the actuator or disassembling the valve. Valve maintenance requires no special tools.

- Structural Integrity—One-piece valve body improves structural integrity of the pressure boundary by eliminating leak paths that could be caused by the gaskets in two-piece, bolted valve designs.

- Exceptional Environmental Capabilities—The optional ENVIRO-SEAL packing systems are designed with very smooth shaft surfaces and live loading to provide exceptional sealing. The seal of the ENVIRO-SEAL system can restrict emissions to less than the EPA (Environmental Protection Agency) limit of 100 ppm (parts per million).

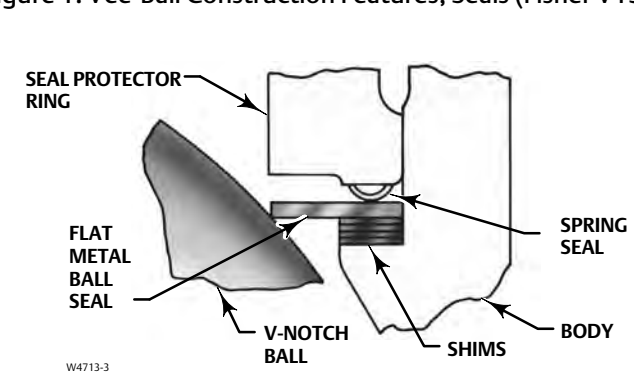
- Severe Service Trim Options—Fisher Vee-Ball Series valves with the severe service attenuator or Cavitrol Hex anti-cavitation trim installed combine the efficiency of a rotary valve with the energy absorbing capability of a special trim to provide improved performance for demanding applications. The Fisher attenuator and Cavitrol Hex trim options were designed for gas and liquid service to reduce noise and cavitation effects that cause pipeline vibration.

Table 1. Valve Body Materials, End Connections, and Ratings

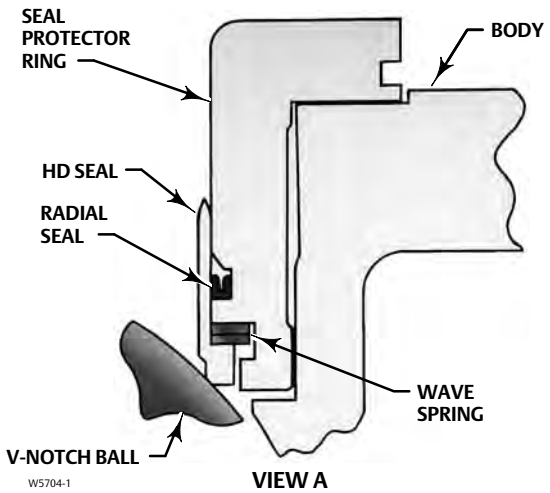
VALVE DESIGN	VALVE BODY MATERIAL	SIZE	RATINGS
		NPS / DN	ASME / PN
V150	WCC	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 20, 24x20[5]	CL150
	WCC / 1.0619[1]	DN 80, 100, 150	PN 10-16
		DN 200, 250, 300	PN 10 or PN 16
	LCC	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	CL150
		DN 80, 100, 150	PN 10-16
		DN 200, 250, 300	PN 10 or PN 16
	CF3M[2]	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	CL150
	CF3M/1.4409[1]	DN 80, 100, 150	PN 10-16
		DN 200, 250, 300	PN 10 or PN 16
	R50550	NPS 1, 1-1/2, 2, 3, 4, 6	CL150
	CG8M	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 20, 24x20[5]	
	CW2M	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	
	M35-2	NPS 1, 1-1/2, 2, 3, 4, 6, 8	
	CD3MN[3]	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	
	CD3MWCuN[3]	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	
	CK3MCuN	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	
V200[4]	WCC, LCC, CG8M, or CF3M[2]	NPS 1, 1-1/2, 2	CL150/300/600 flangeless
		NPS 3, 4	CL150 and CL300/600 flangeless
		NPS 6, 8	CL150/300 and CL600 flangeless
		NPS 10	CL150 flangeless
	WCC, LCC, or CG8M	NPS 2, 3, 4, 6, 8	CL600
	CW2M, M35-2, or CK3MCuN	NPS 1, 1-1/2, 2, 3, 4, 6, 8	CL150/300/600 flangeless
	CK3MCuN	NPS 10	CL150 flangeless
V300	WCC	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 20	CL300
	WCC / 1.0619[1]	DN 25, 40, 50	PN 10-40
		DN 80, 100, 150	PN 25-40
		DN 200, 250, 300	PN 25 or PN 40
	LCC	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	CL300
		DN 25, 40, 50	PN 10-40
		DN 80, 100, 150	PN 25-40
		DN 200, 250, 300	PN 25 or PN 40
	CF3M[2]	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	CL300
	CF3M/1.4409[1]	DN 25, 40, 50	PN 10-40
		DN 80, 100, 150	PN 25-40
	R50550	NPS 1, 1-1/2, 2, 3, 4	CL300
	CF3M/1.4409[1]	DN 200, 250, 300	PN 25 or PN 40
	CG8M	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 20	CL300
	CW2M	NPS 1, 1-1/2, 2, 3, 4, 6, 8	
	M35-2	NPS 1, 1-1/2, 2, 3, 4, 6, 8	
	CD3MN[3]	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	
	CD3MWCuN[3]	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	
	CK3MCuN	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	

1. WCC and EN Stl 1.0619 are dual certified. CF3M and EN SST 1.4409 are dual certified.
2. CF3M is a standard offering in Europe and Asia Pacific.
3. NORSOK compliant materials available upon request.
4. Flangeless V200 assemblies mate with raised-face flanges.
5. Valve body mates with NPS 24 ASME CL150 flanges. Internal based on NPS 20 valve design.

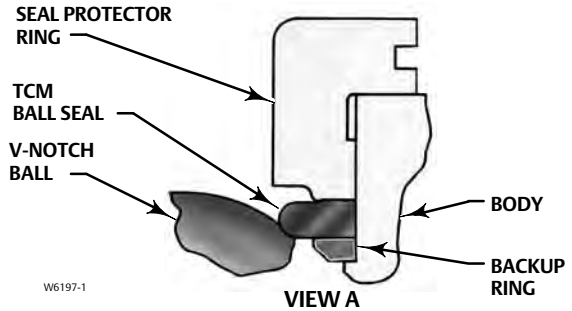
Figure 1. Vee-Ball Construction Features, Seals (Fisher V150 Shown)



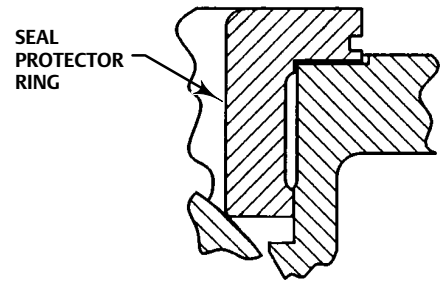
VIEW A
FLAT METAL BALL SEAL DETAIL
FOR DN 80 THROUGH 300
(NPS 3 THROUGH 12)



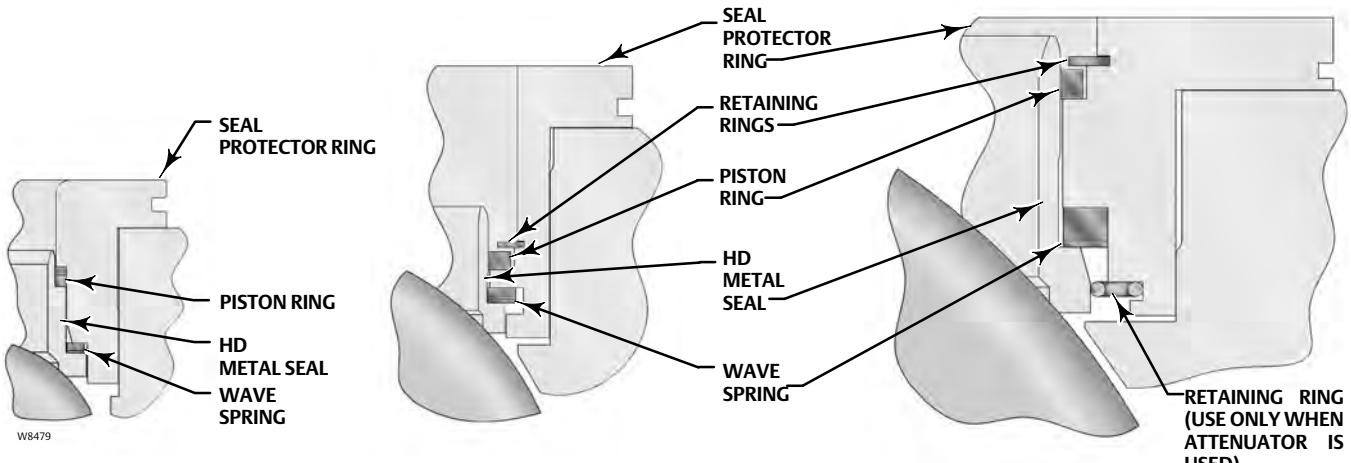
VIEW A
HD BALL SEAL DETAIL



VIEW A
FISHER TCM PLUS BALL SEAL
DN 25, 40, AND 50
(NPS 1, 1-1/2, AND 2) VALVES



VIEW A
FLOW RING DETAIL



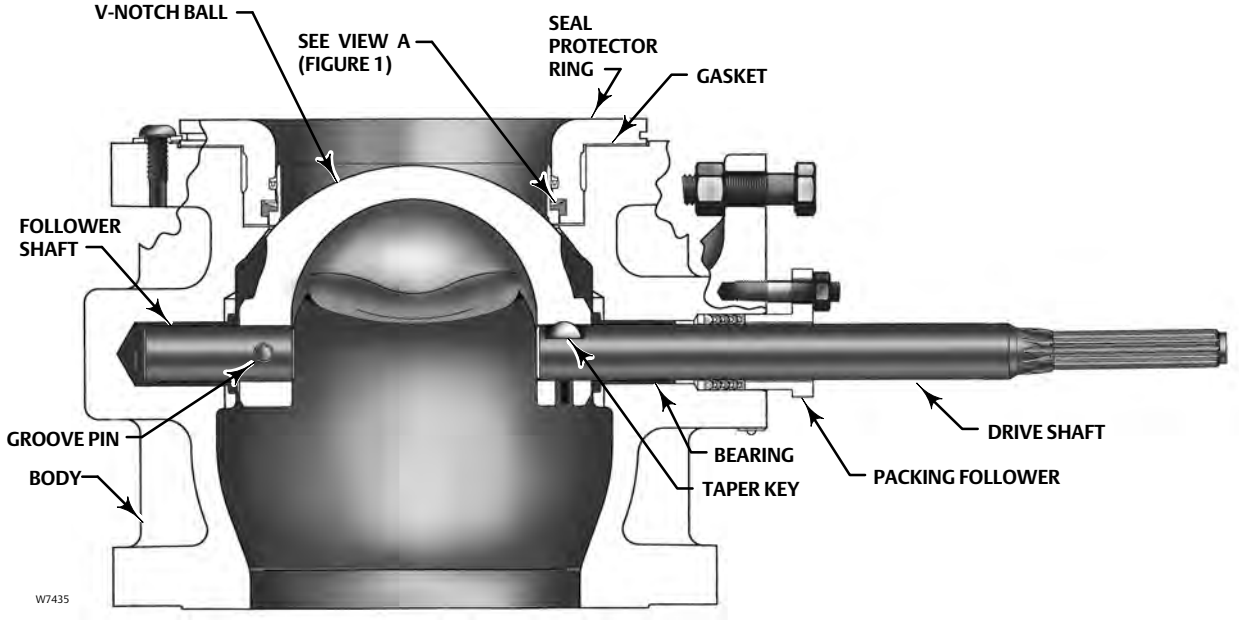
DN 25, 40, AND 50
(NPS 1, 1-1/2 AND 2)
HD BALL SEAL

DN 8 THROUGH 200 AND DN 350 THROUGH 600x500
(NPS 3 THROUGH 8 AND NPS 14 THROUGH 24x20)
HD BALL SEAL

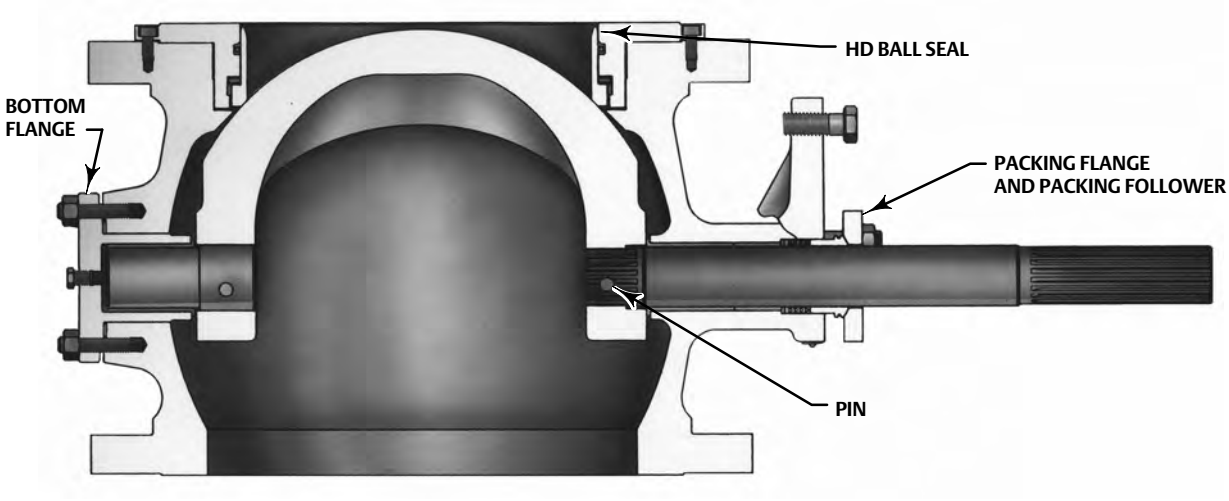
DN 250 AND 300
(NPS 10 AND 12)
HD BALL SEAL

VIEW A
HIGH-TEMPERATURE HD BALL SEAL

Figure 2. Vee-Ball Construction Features (Fisher V150 Shown)



DN 80 THROUGH 300 (NPS 3 THROUGH 12) VALVES (HD BALL SEAL SHOWN)



DN 350, 400, 500 and 600x500 (NPS 14, 16, 20, and 24x20) VALVES (HD BALL SEAL)

Table 2. Valve Weights, Approximate

VALVE SIZE		V150		V200		V300	
DN	NPS	kg	lbs	kg	lbs	kg	lbs
25	1	5.6	13	4.5	10	8	17
40	1-1/2	8.2	19	6.4	14	12	27
50	2	9.1	21	10	23	17	38
80	3	13	43	15	34	28	61
100	4	26	57	22	48	37	81
150	6	42	93	36	80	60	133
200	8	72	158	62	136	103	226
250	10	107	235	114	252	200	440
300	12	157	347	---	---	293	645
350	14	247	545	---	---	374	825
400	16	333	735	---	---	510	1125
500	20	524	1155	---	---	755	1661
600x500	24x20	757	1666	---	---	---	---

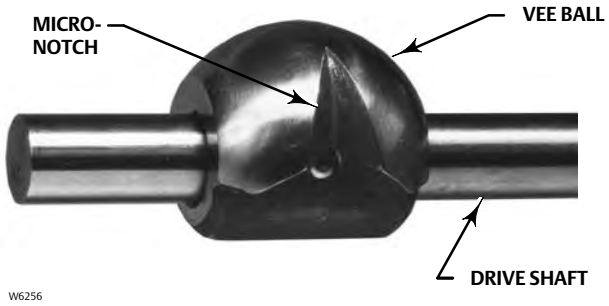
Series B

NPS 3 through 12 have been changed to reduce parts and to improve control performance. The V-notch Ball now resembles the NPS 14 through 24x20 V-notch Ball. The pressed-in bushings have been eliminated, as well as the thrust washer.

Micro-Notch Construction

For very precise control of low flow rates, the Micro-Notch construction (see figure 3) is available on DN 25 (NPS 1) valves. Three Micro-Notch ball materials are available: chrome-plated CG8M (317 stainless steel), solid alloy 6, and solid VTC ceramic. A VTC ceramic HD seal is standard with the VTC ceramic ball. For the CG8M and alloy 6 constructions, pressure and temperature capabilities are the same as for standard constructions. For the ceramic construction, maximum temperature is 93°C (200°F).

Figure 3. Typical Micro-Notch Ball and Shaft



For further information, please refer to the Fisher Vee-Ball V150, V200 and V300 Rotary Control Valves NPS 1 through 12 instruction manual (D101554X012).

In addition to the standard Micro-Notch offering, options are available in both low (Micro-Scratch) and high (Macro-Notch) flow construction. Contact your Emerson sales office for more information.

Severe Service Attenuator

Fisher Vee-Ball series valves (V150, V200 flanged and flangeless, and V300), with the severe service attenuator, combine the efficiency of a rotary valve with the energy absorbing capability of a special trim to provide improved performance for demanding applications. The Fisher attenuator design can be utilized in both liquid and gas service to reduce cavitation and noise effects that cause pipeline vibration. See table 3 for a competitive comparison.

The attenuator will not change the NACE compliance of the Vee-Ball valve. When a rotary noise attenuator is installed in a Vee-Ball valve, the V-Notch is no longer a point of high-velocity erosion. As a result, the CoCr-A V-Notch option is not required when a rotary attenuator is used. The rotary attenuator and CoCr-A V-Notch options are not available together.

Features

- Trim Versatility — Trim components are interchangeable for Fisher V150, V200, and V300 valves. This feature allows you to reduce your spare parts inventory and maintenance procedures.
- Attenuator-Ball Fabrication — The ball-attenuator construction provides structural integrity because of its rugged fabrication weld.
- Attenuator Performance — Up to -10 dBA acoustical attenuation, and a K_c = 1.0 for hydrodynamics are achievable depending on service conditions.
- Valve Sizes and End Connection Styles — NPS 4 through 20 applicable Vee-Ball valves that mate with ASME CL150, CL300, and CL600 raised-face flanges. In addition, DN100 through DN300 valve sizes that mate with PN10, 16, 25, or 40 raised-face flanges.

Attenuator Ball Material

Standard attenuator ball material is CG8M, M35-1, CW2M, or CK3McuN.

Standard Flow Direction

Forward flow direction is into the convex face of the V-notch ball. The valve with the attenuator must be placed in the forward flow direction for the attenuator to be effective.

Actuator Mounting

Right-hand or left-hand as viewed from the upstream end of the valve. Counter-clockwise to close and clockwise to close ball designs are available.

Figure 4. Fisher Vee-Ball Series Noise Attenuator Ball

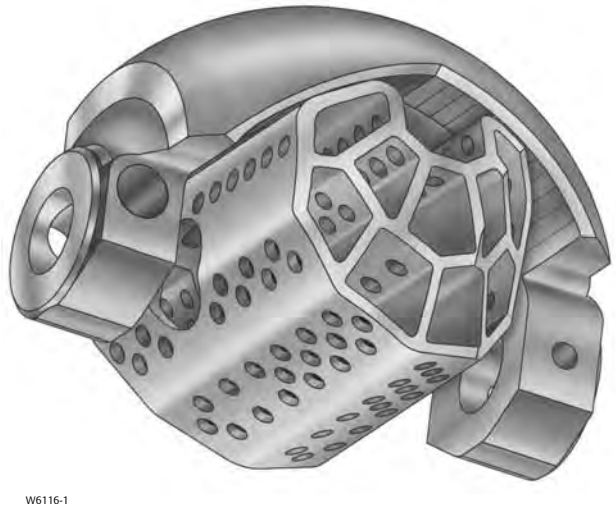


Figure 5. Fisher Vee-Ball Series Rotary Attenuator Construction

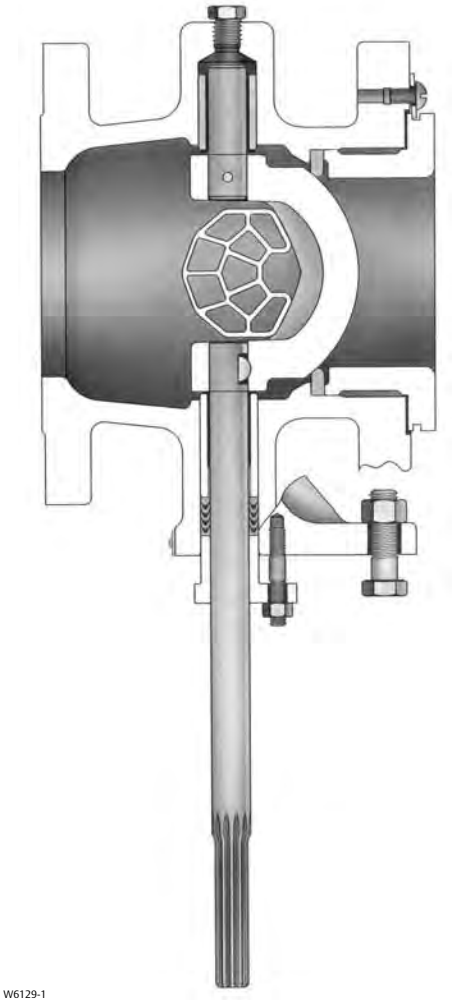


Table 3. Segmented Ball Benefits Analysis Comparison

Benefits	Typical Competitive Device	Fisher Vee-Ball Attenuator
Predictable Performance	No	Yes
-10 dBA Aerodynamic Noise Attenuation	No	Yes
Superior Attenuation Effect at Critical Opening Position	No	Yes
Maximum Pressure Drop Capability	No	Yes
Heavy Duty, Integrally Welded Attenuator/Ball Assembly	No	Yes
Valve Splined Shaft Connects to Clamped Actuator Lever to Minimize Lost Motion	No	Yes
Superior Soft Seats for Tight Shutoff	No	Yes
Moderate Kc Improvement vs Unattenuated Device	Yes	Yes
Trunnion Mounted Ball for Superior Wear Resistance	Yes	Yes
Heavy Duty Metal Seats for Demanding Applications	Yes	Yes

Cavitrol Hex Anti-Cavitation Trim

Designed for the V150, V300, and V200 flanged CL600 valve designs, the Fisher Cavitrol Hex trim option provides improved performance for severe service applications and maintains the efficiency of a rotary valve. The Cavitrol Hex reduces cavitation and noise effects that cause pipeline vibration

Figure 6. Fisher NPS 6 V300 Cutaway Image with Optional Cavitrol Hex Anti-Cavitation Trim

X1561

Features

- Retrofitability — Convert previously installed Fisher Vee-Ball Series valves with the Cavitrol Hex anti-cavitation trim after minimal modification to the valve body outlet flange.
- Materials — Standard Cavitrol Hex trim material is S31603. R31233 material is also available when a harder, more erosion-resistant trim option is required.
- Performance — A Kc=1.0 for hydrodynamics is achievable at extreme service conditions.
- Standard Flow Direction — Forward flow is into the convex face of the V-notch ball. The valve with the Cavitrol Hex trim should be installed in the forward flow direction for the anti-cavitation trim to be most effective.
- Actuator Mounting — Right hand or left hand as viewed from the upstream end of the valve. Counter-clockwise to close and clockwise to close ball action is available.
- Valve Sizes and End Connection Styles — NPS 4 through 12, applicable Vee-Ball valves that mate with CL150, 300 or 600 raised face flanges.

Figure 7. Fisher NPS 8 V300 Cavitrol Hex Cross Sectional View

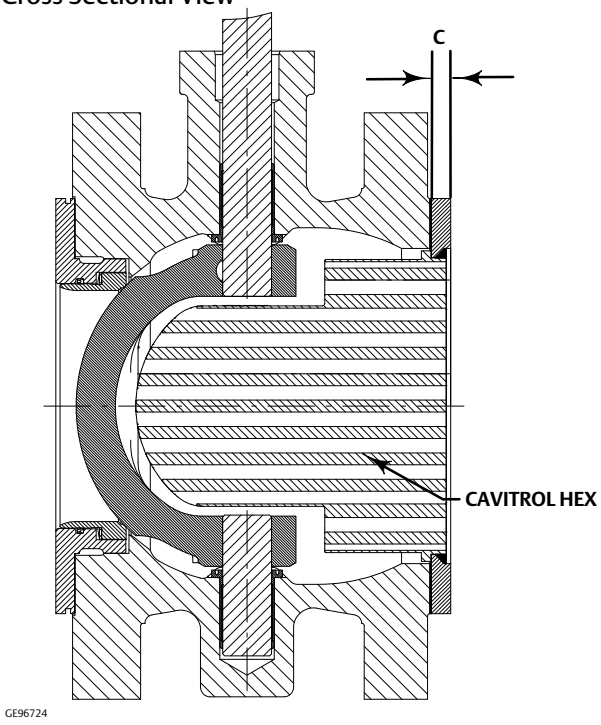


Table 4. Fisher Cavitrol Hex Dimensions and Weight

VALVE SIZE	FLANGE THICKNESS C (ADD TO OVERALL FACE-TO-FACE DIMENSION)		WEIGHT	
NPS	mm	Inch	kg	lbs
4	12.7	0.5	3.3	7.3
6	12.7	0.5	7.8	17.3
8	12.7	0.5	12.8	28.3
10	12.7	0.5	24.0	53.1
12	12.7	0.5	35.7	78.8

Figure 8. Fisher NPS 10 Fisher Cavitrol Hex Trim

Table 5. Materials of Construction for DN 25 through 300 (NPS 1 through 12) Valves

PART		MATERIAL
Valve Body and Seal Protector Ring or Flow Ring		WCC steel (EN 1.0619), CG8M (317 SST), R50550[10], CF3M[1] (316L SST EN 1.4409 or optional EN 1.4581), CD3MN, CD3MWCuN, CW2M (CW2M valve available with Fisher TCM Plus seal only), M35-2 or CK3MCuN
Backup Ring [DN 25, 40, and 50 (NPS 1, 1-1/2, and 2) only]		CG8M, CF3M[1], R50550, or CW2M
Segmented V-Notch Ball		CG8M, R50550, CF3M, CW2M, chromium-plated CF3M, chromium-plated CG8M, chromium-plated CG8M with alloy 6 notch, chromium-plated CF3M with alloy 6 notch, chromium-plated CD3MN, chromium-plated CD3MWCuN, M35-1, or CK3MCuN
Seal	Fisher TCM	Fisher TCM Plus and Fisher TCM Ultra
	Flat Metal Seal, Shims, and Spring Seal[7]	Spring Tempered S31600 (316 stainless steel) or Spring Tempered S30200 (302 stainless steel) for NPS 12 valves only
	HD (Heavy-Duty) Ball Seal	CF10SMnN[2] , CD7MCuN[3] (alloy 255 duplex stainless steel) or R30006 (Alloy 6)
	High Temperature HD Seal	R30006 (Alloy 6)
Wave Spring (use with HD seal)		N07750
HD Seal Radial Seal		Graphite reinforced PTFE
High Temp HD Seal Piston Ring		Graphite FMS 17F39
Bearings		PEEK[4]/Carbon-filled PTFE liner, S31603 Nitride, R30006 (alloy 6), silver-plated R30006, N10276 with carbon-filled PTFE liner, or N10276 with glass-filled PTFE liner R50400 PTFE/carbon liner (through NPS 6), R50400 PTFE/glass liner (through NPS 6)
Seal Retainer Gasket		Laminated graphite
Packing		PTFE V-ring with one carbon-filled PTFE ring[5], PTFE V-ring, graphite ribbon, ENVIRO-SEAL PTFE, or ENVIRO-SEAL graphite
Shafts		S20910, S17400 (17-4PH stainless steel), N10276, N05500, S31254[8], R50550, or S32760[8]
Groove Pin		R50550, S31600 or N10276
Taper Key		R50550, R30006[6], S20910, or N10276
Taper Pin [DN 25, 40, and 50 (NPS 1, 1-1/2, and 2) only]		R50550, S20910, or N10276
Pipe Plug (Optional)		S31600 N10276, or S31603 (316L stainless steel)
Seal Retainer Screws and Washers		Stainless steel
Packing Follower and Packing Box Ring		R50550, CF8M (316 stainless steel), N10276, S312254, or N10276 with separate S31600 packing box flange
Actuator Mounting Bolts and Nuts		Grade 5 steel or strain-hardened B8M stainless steel
Spacer and Bushing		S31700, N10276, or S31603
Packing Follower Bolting and Optional Line Bolting		SA-193-B7, SA-193-B7M, or strain-hardened SA-193-B8M
Attenuator[9]		CG8M, M35-1, CW2M, or CK3MCuN
Cavitrol Hex		S31603 or R31233

1. CF3M is available in all areas as a special order and is the standard material offered in Europe.
2. Recommended for lubricated and non-lubricated service and where corrosion properties similar to 304 stainless steel are acceptable.
3. Recommended for lubricated service and where corrosion properties equal to or better than 317 stainless steel are required.
4. PEEK is poly-ether-ether-ketone.
5. The carbon-filled PTFE ring is used for grounding.
6. Standard material offered in North America.
7. Offered for lubricated service only.
8. S31254 and S32760 shafts may cause the valve to be derated. Contact your Emerson sales office.
9. Attenuator material will match segmented V-Notch ball material.
10. R50550 is available with TCM seat. For other seal availability contact your Emerson sales office.

Table 6. Materials of Construction for DN 350, 400, 500, and 600x500 (NPS 14, 16 20, and 24x20) Valves

PART		MATERIAL
Valve Body, Seal Protector Ring, and Flow Ring		WCC steel or CG8M (317 stainless steel)
Segmented V-Notch Ball		Chromium-plated CG8M, CG8M, Chromium-plated CG8M with alloy 6 notch
Ball Seal	Fisher TCM	Fisher TCM Plus and Fisher TCM Ultra
	HD (Heavy-Duty Metal)	CF10SMnN(1) , CD7MCuM(2) (alloy 225 duplex stainless steel) or CG8M/CoCr-A
Wave Spring (use with HD seal)		N07750
Radial Seal (use with HD seal)		PTFE with N10276 spring
Bearings		PEEK/PTFE(3), S44004 (440C stainless steel--use with S17400 [17-4PH stainless steel] shafts, alloy 6B, and silver plated alloy 6B
Thrust Washer (use with metal bearings)		Alloy 6B
Seal Retainer Gasket		Laminated Graphite
Packing		PTFE V-ring with one conductive V-ring(4), PTFE V-ring, graphite ribbon, ENVIRO-SEAL PTFE, or ENVIRO-SEAL graphite
Shafts		S17400 (17-4 stainless steel) or S20910
Pins		S20910
Pipe Plug		S31700 (317 stainless steel)
Packing Follower Bolting		B7M steel or strain-hardened B8M stainless steel
Retainer Screw		B8M stainless steel
Packing Follower and Packing Box ring		S31600 (316 stainless steel)
Packing Flange		Steel or S31600
Actuator Mounting Bolts and Nuts		Grade 5 steel or strain-hardened B8M stainless steel
Gasket (used with bottom flange)		S31603 (316L stainless steel) spiral wound
Stud and Hex Nut (used with bottom flange)		B7 steel or strain-hardened B8M stainless steel
Attenuator		CG8M

1. Recommended where corrosion properties similar to 304 stainless steel are acceptable.
2. Recommended for lubricated service and where corrosion properties equal to or better than S31700 stainless steel.
3. PEEK (Poly-ether-ether-ketone) w/PTFE liner.
4. A carbon-filled PTFE ring is used for grounding.

Figure 9. Typical ENVIRO-SEAL Packing Arrangements

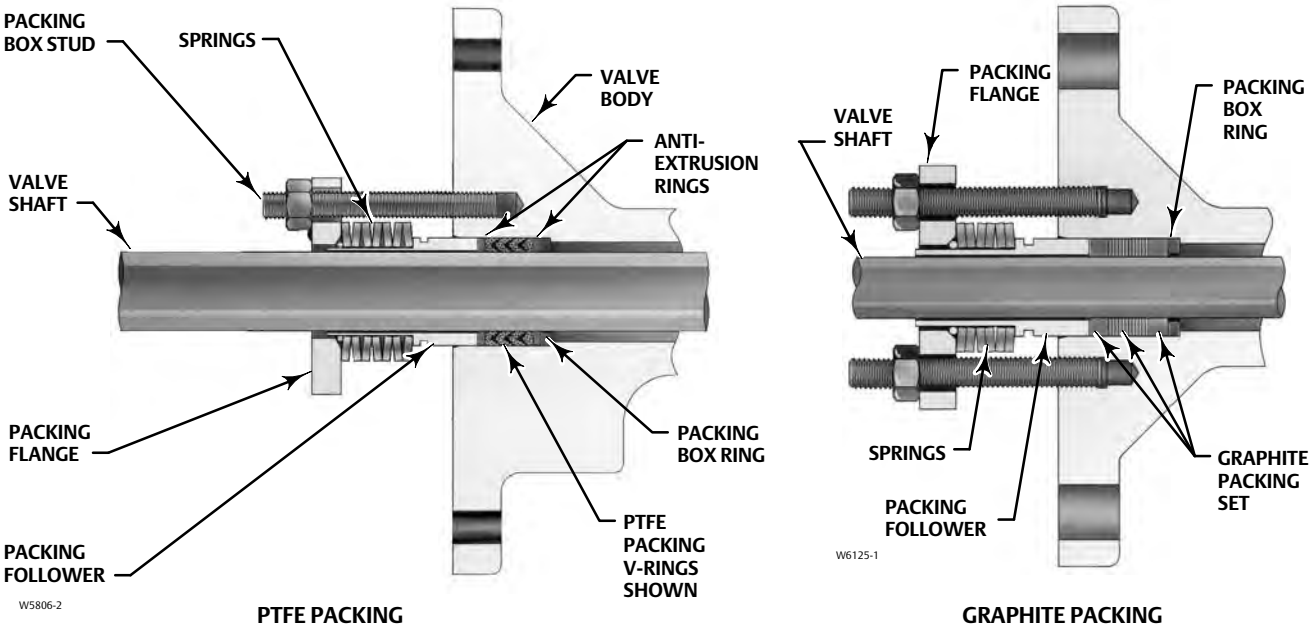


Table 7. Maximum Allowable Inlet Pressure for CW2M Valves

TEMPERATURE	CW2M[1]					
	150[2]	300[2]	PN 10[2]	PN 16[2]	PN 25[2]	PN 40[2]
°C	Bar					
–46 to 38	20.0	51.7	10.0	16.0	25.0	40.0
50	19.5	51.7	9.9	15.9	24.8	39.6
100	17.7	51.5	9.4	15.1	23.6	37.8
150	15.8	50.3	9.4	15.1	23.6	37.8
200	13.8	48.3	9.1	14.6	22.9	36.6
232	12.7	47.0	9.1	14.6	22.9	36.6
°F	Psi					
–50 to 100	290	750	145	232	362	580
200	260	750	144	230	359	575
300	230	730	137	219	342	548
400	200	700	133	212	331	530
450	185	680	133	212	331	530

1. This material is not listed in EN 12516-1 or ASME B16.34. Also see the Installation section.
2. The designations PN or 150 and 300 are used only to indicate relative pressure-retaining capabilities and are not EN or ASME pressure-temperature rating class designations.

Pressure Drops

Pressure drop limits of any given valve are based on valve body, and trim material limits. To find the appropriate pressure drop limitation, choose the desired valve size and temperature range. Then search table 8 for body limitations and table 9 for trim limitations. Information on limits for S31254, CW2M, M35-2, CD3MN, CD3MWCuN, and other alloy constructions can be obtained by contacting your Emerson sales office. The lowest number from the tables is the appropriate limit. The tables for both trim and body limits must be consulted.

Table 8. Maximum Allowable Shutoff Pressure Drops (Body Ratings)
(Tables for both trim and body limits must be consulted)

TEMPERATURE RANGE	PRESSURE CLASS													
	WCC CL150	CF3M CL150	CG8M CL150	LCC CL150	R50550 CL150	WCC CL300	CF3M CL300	CG8M CL300	LCC CL300	R50550 CL300	WCC CL600	CF3M CL600	CG8M CL600	LCC CL600
°C	Bar													
-46 to -29	---(1)	19.0	19.0	20	18.3	---(1)	49.6	49.6	51.7	47.2	---(1)	99.3	99.3	103
-29 to 38	20.0	19.0	19.0	20	18.3	51.7	49.6	49.6	51.7	47.2	103	99.3	99.3	103
93	17.9	16.2	16.2	17.9	15.5	51.7	42.7	42.7	51.7	40.7	103	85.5	85.5	103
149	15.9	14.8	14.8	15.9	12.8	50.3	38.6	38.6	50.3	33.0	100	77.2	77.2	100
177	---(2)	---(2)	---(2)	---(2)	11.7	---(2)	---(2)	---(2)	---(2)	30.0	---(2)	---(2)	---(2)	---(2)
204	13.8	13.4	13.4	13.8	10.3	48.6	35.5	35.5	48.6	26.9	97.2	70.6	70.6	97.2
232	12.8	12.8	12.8	12.8	9.3	47.2	34.5	34.5	47.2	24.5	94.5	68.6	68.6	94.5
260	11.7	11.7	11.7	11.7	8.3	45.9	33.1	33.1	45.9	22.1	91.7	65.8	65.8	91.7
316	10.7	10.7	10.7	10.7	7.9	43.8	32.1	32.1	43.8	20.7	87.6	64.1	64.1	87.6
343	9.65	8.62	8.62	9.65	7.2	41.7	31.0	31.0	41.7	19.0	83.4	62.4	62.4	83.4
371	8.62	7.58	7.58	---	---	40.7	30.7	30.7	---	---	81.0	60.0	60.0	---
399	6.55	6.55	6.55	---	---	34.8	29.3	29.3	---	---	69.6	58.9	58.9	---
427	5.52	5.52	5.52	---	---	28.3	29.0	29.0	---	---	56.9	58.3	58.3	---
°F	Psi													
-50 to -20	---(1)	275	275	290	265	---(1)	720	720	750	695	---(1)	1440	1440	1500
-20 to 100	290	275	275	290	265	750	720	720	750	695	1500	1440	1440	1500
200	260	235	235	260	225	750	620	620	750	590	1500	1240	1240	1500
300	230	215	215	230	185	730	560	560	730	480	1455	1120	1120	1455
350	---(2)	---(2)	---(2)	---(2)	170	---(2)	---(2)	---(2)	---(2)	435	---(2)	---(2)	---(2)	---(2)
400	200	195	195	200	150	705	515	515	705	390	1410	1025	1025	1410
450	185	185	185	185	135	685	500	500	685	355	1370	995	995	1370
500	170	170	170	170	120	665	480	480	665	320	1330	955	955	1330
550	155	155	155	155	115	635	465	465	635	300	1270	930	930	1270
600	140	140	140	140	105	605	450	450	605	275	1210	905	905	1210
650	125	125	125	125	---	590	445	445	590	---	1175	890	890	1175
700	110	110	110	---	---	570	430	430	---	---	1135	870	870	---
750	95	95	95	---	---	505	425	425	---	---	1010	855	855	---
800	80	80	80	---	---	410	420	420	---	---	825	845	845	---

1. Low temperature for these materials limited to -29°C (-20°F).
2. Refer to ASME B16.34.

Table 9. Maximum Allowable Shutoff Pressure Drops based on Trim (Bearing and Seal)
(Note: Do not exceed the PN or ASME pressure/temperature rating of the valve or mating flanges)

BEARING MATERIAL	BALL SEAL	TEMPERATURE RANGE, °C	VALVE SIZE, DN												
			25	40	50	80	100	150	200	250	300	350	400		500[4]
			Bar												
			Shaft Size, Inches												
			1/2	5/8	5/8	3/4	3/4	1	1-1/4	1-1/4	1-1/2	1-3/4	2-1/8x2	2-1/8	2-1/2
PEEK/PTFE	Fisher TCM Plus or Ultra	-46 to 38	51.7	51.7	51.7	51.7	51.7	51.7	51.7	40.2	37.6	31.0	23.8	31.0	31.0
		93	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.6	31.0	23.8	31.0	31.0
		149	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	23.8	24.1	24.1
		204	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
		232	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.44	3.45
	HD Seal[1]	-46 to 260	51.7	51.7	51.7	51.7	51.7	51.7	51.7	40.9	38.1	31.0	26.5	31.0	31.0
	Flat Metal[2]	-73 to 260	---	---	---	20.7	20.7	20.7	20.7	10.3	10.3	---	---	---	---
	Flow Ring	260	103.4	103.4	103.4	103.4	72.4	75.2	73.8	40.5	37.7	40.5	35.0	48.8	44.7
R30006	HD Seal[1]	-46 to 288	51.7	50.0	25.7	17.5	11.0	10.9	11.2	6.14	5.72	6.14	7.52	7.51	6.83
	High Temp HD Seal[1]	228 to 427	38.3[3]	37.5[3]	19.3[3]	13.2[3]	8.3[3]	8.2[3]	8.4[3]	4.6[3]	4.3[3]	4.62	5.65	5.65	5.10
	Flat Metal[2]	-73 to 427	---	---	---	17.0	10.1	10.7	10.6	5.86	5.52	---	---	---	---
	Flow Ring	427	74.5	49.6	26.8	18.8	10.9	11.2	11.1	6.07	5.65	6.07	7.31	7.30	6.69
R30006 Silver Plated	HD Seal[1]	-46 to 288	51.7	51.7	51.7	35.0	22.1	21.8	22.5	12.3	11.4	12.3	13.2	15.0	13.7
	High Temp HD Seal[1]	228 to 427	38.3[3]	38.3[3]	38.3[3]	26.3[3]	16.5[3]	16.3[3]	16.9[3]	9.2[3]	8.6[3]	9.16	11.2	11.2	10.2
	Flat Metal[2]	-73 to 427	---	---	---	20.7	20.1	20.7	20.7	10.3	10.3	---	---	---	---
	Flow Ring	427	103.4	103.4	53.5	37.6	21.8	22.5	22.2	12.1	11.3	12.1	14.6	14.6	13.4
S31603L Nitride	HD Seal[1]	-46 to 288	51.0	51.0	51.0	51.7	36.7	36.3	37.4	20.5	19.1	20.5	25.0	25.0	14.0
	High Temp HD Seal[1]	228 to 427	---	---	---	38.3[3]	27.6[3]	27.2[3]	28.1[3]	15.4[3]	14.3[3]	15.3	18.7	18.7	17.0
	Flat Metal[2]	-73 to 427	---	---	---	20.7	20.7	20.7	20.7	10.3	10.3	---	---	---	---
	Flow Ring	427	99.3	99.3	88.9	62.7	36.3	37.4	37.0	20.2	18.8	20.2	24.3	24.3	22.3
R50400 PTFE or N10276 PTFE	Fisher TCM Plus or Ultra	-46 to 38	51.7	51.7	51.7	51.7	36.75	36.3	37.4	20.5	19.1	20.5	25	25	22.75
		93	37.9	37.9	37.9	37.9	36.75	36.3	37.4	20.5	19.1	20.5	25	25	22.75
		149	24.1	24.1	24.1	24.1	24.1	24.1	24.1	20.5	19.1	20.5	25	25	22.75
		204	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
		232	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45
	Flow Ring	260	103.4	103.4	103.4	103.4	72.4	75.2	73.8	40.5	37.7	40.5	35.0	48.8	44.7

-continued-

Table 9. Maximum Allowable Shutoff Pressure Drops based on Trim (Bearing and Seal)
(Note: Do not exceed the PN or ASME pressure/temperature rating of the valve or mating flanges) (cont.)

BEARING MATERIAL	BALL SEAL	TEMPERATURE RANGE, °F	VALVE SIZE, NPS												
			1	1-1/2	2	3	4	6	8	10	12	14	16		20[4]
			Psi												
			Shaft Size, Inches												
			1/2	5/8	5/8	3/4	3/4	1	1-1/4	1-1/4	1-1/2	1-3/4	2-1/8x2	2-1/8	2-1/2
PEEK/PTFE	Fisher TCM Plus or Ultra	-50 to 100	750	750	750	750	750	750	750	583	545	450	345	450	450
		200	550	550	550	550	550	550	550	550	545	450	345	450	450
		300	350	350	350	350	350	350	350	350	350	350	345	350	350
		400	150	150	150	150	150	150	150	150	150	150	150	150	150
		450	50	50	50	50	50	50	50	50	50	50	50	50	50
	HD Seal[1]	-50 to 500	750	750	750	750	750	750	750	593	553	450	384	450	450
	Flat Metal[2]	-100 to 500	---	---	---	300	300	300	300	150	150	---	---	---	---
	Flow Ring	500	1500	1500	1500	1500	1050	1090	1070	587	547	587	508	708	648
R30006	HD Seal[1]	-50 to 550	750	725	373	254	160	158	163	89	83	89	109	109	99
	High Temp HD Seal[1]	550 to 800	555[3]	544[3]	280[3]	191[3]	120[3]	119[3]	122[3]	67[3]	62[3]	67	82	82	74
	Flat Metal[2]	-100 to 800	---	---	---	246	146	155	154	85	80	---	---	---	---
	Flow Ring	800	1080	720	388	273	158	163	161	88	82	88	106	106	97
R30006 Silver Plated	HD Seal[1]	-50 to 550	750	750	750	508	320	316	326	178	166	178	192	218	198
	High Temp HD Seal[1]	550 to 800	555[3]	555[3]	555[3]	381[3]	240[3]	237[3]	245[3]	134[3]	125[3]	133	163	163	148
	Flat Metal[2]	-100 to 800	---	---	---	300	292	300	300	150	150	---	---	---	---
	Flow Ring	800	1500	1500	776	546	316	326	322	176	164	176	212	212	194
S31603L Nitride	HD Seal[1]	-50 to 550	740	740	740	750	533	527	543	297	277	297	363	363	203
	High Temp HD Seal[1]	550 to 800	---	---	---	555[3]	400[3]	395[3]	407[3]	223[3]	208[3]	222	272	272	247
	Flat Metal[2]	-100 to 800	---	---	---	300	300	300	300	150	150	---	---	---	---
	Flow Ring	800	1440	1440	1290	910	527	543	537	293	273	293	353	353	323
R50400 PTFE or N10276 PTFE	Fisher TCM Plus or Ultra	-50 to 100	750	750	750	750	533	527	543	297	277	297	363	363	330
		200	550	550	550	550	533	527	543	297	277	297	363	363	330
		300	350	350	350	350	350	350	350	297	277	297	363	363	330
		400	150	150	150	150	150	150	150	150	150	150	150	150	150
		450	50	50	50	50	50	50	50	50	50	50	50	50	50
	Flow Ring	500	1500	1500	1500	1500	1050	1090	1070	587	547	587	508	708	648

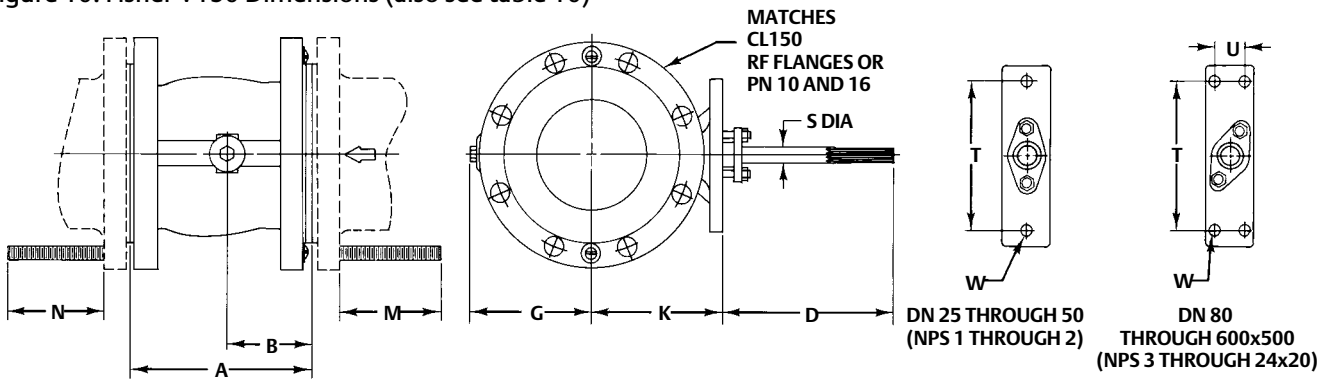
1. Pressure drops shown for HD seals are for forward flow only. For reverse flow with HD seal, limit pressure drop to 6.9 bar (100 psig).
2. Lubricated service only.
3. Consult your Emerson sales office if higher pressure drops are required.
4. This column is also appropriate for the DN 600x500 (NPS 24x20).

Table 10. Fisher V150 Dimensions

VALVE SIZE	V150 DIMENSIONS (ISA S75.08.02)[1]											APPROXIMATE WEIGHT
	A[5]	B	D	G	K	M[3]	N[3,4]	S Diameter	T	U	W	
DN	**mm**											**kg**
25	102	56		83	95	79	73	13				5.9
40	114	62	188	90	121	92	80	15.9 and 15.9 x 12.7	117	---	14.2	8.6
50	124	67		87	127	100	87	15.9 and 15.9 x 12.7				9.5
80	165	79		100	130	106	100	19.1			14.2	19.5
100	194	101	214	133	141	119	100	19.1	152	31.8	14.2	26
150	229	109		151	164	127	114	25.4			14.2	42
200	243	124		184	232	133	127	31.8				72
250	297	147	208	222	260	146	133	31.8	235	46.0	17.5	107
300	338	174		268	303	152	133	38.1				158
350[2]	381	206		295	343	152	133	44.5	273	50.8	19.1	248
400[2]	406	229	356	330	365	152	133	54.0	273	50.8	19.1	333
500	508	235		406	457	178	159	63.5	337	76.2	22.4	525
600x500	608	373		406	457	192	171	63.5	337	76.2	22.4	757
NPS	**Inch**											**lbs**
1	4.00	2.21		3.19	3.75	3.12	2.88	1/2				13
1-1/2	4.50	2.46	7.38	3.38	4.75	3.62	3.12	5/8 and 5/8 x 1/2	4.62	---	0.56	19
2	4.88	2.63		4.19	5.00	3.94	3.44	5/8 and 5/8 x 1/2				21
3	6.50	3.10		4.62	5.12	4.19	3.94	3/4			0.56	43
4	7.62	3.99	8.44	5.25	5.56	4.69	3.94	3/4	6.00	1.25	0.56	57
6	9.00	4.29		5.94	6.44	5.00	4.50	1			0.56	93
8	9.56	4.88		7.69	9.12	5.25	5.00	1-1/4				158
10	11.69	5.77	8.19	8.75	10.25	5.75	5.25	1-1/4	9.25	1.81	0.69	235
12	13.31	6.87		10.56	11.94	6.00	5.25	1-1/2				347
14[2]	15.00	8.12		11.62	13.50	6.00	5.25	1-3/4	10.75	2.00	0.75	545
16[2]	16.00	9.00	14.00	13.00	14.38	6.00	5.25	2-1/8	10.75	2.00	0.75	735
20	20.00	9.25		16.00	18.00	7.00	6.25	2-1/2	13.25	3.00	0.88	1155
24x20	23.94	14.69		16.00	18.00	7.56	6.75	2-1/2	13.25	3.00	0.88	1666

1. Inlet flange stud bolt length is longer than the standard length specified in ASME B16.5. See dimension M below.
2. DN350 and 400 (NPS 14 and 16) valves are available in ASME B16.10 short, only. See dimension A for ASME B16.10 short shown in figure 14.
3. Clearance necessary to remove flange bolts.
4. For valve assemblies with the Cavitrol Hex anti-cavitation trim installed, the required outlet flange bolt length and the clearance necessary to remove the bolt will be 12.7 mm (1/2 inch) longer than dimension N specified. In this case, use dimension M to determine the outlet flange bolt length.
5. For valve assemblies with Cavitrol Hex anti-cavitation trim installed, dimension A will be 12.7 mm (1/2 inch) larger than specified.

Figure 10. Fisher V150 Dimensions (also see table 10)



11B2625-K
B2153-5

Table 11. Fisher V200 Flangeless Dimensions[1]

VALVE SIZE, NPS	V200 DIMENSIONS (ISA S75.08.02)														ASME B16.5 RF FLANGES	APPROX WEIGHT
	A	B	D	G	K	M			R	R1	S	T	U	W		
						CL150	CL300	CL600								
mm																**kg**
1	102	56	188	81	95	176	202	202	51	102	12.7	117	---	14.2	CL150, 300, and 600	4.3
1-1/2	114	62		89	121	189	224	224	73	119	15.7 and 15.7 x 12.7					6.4
2	124	67		106	127	211	236	236	92	137	15.7 and 15.7 x 12.7					10
3	165	79	214	117	130	254	279	286	127	167	19.1	152	32	14.2		15
4	194	101		133	141	286	305	343	157	197	19.1					22
6	229	109		159	164[1]	343	362	413	216	260	25.4					27
8	243	124	208	195	232	343	387	426	270	314	31.8	235	46	17.5		62
10	297	147		222	260	419	---	---	324	368					CL150	114
Inch																**lbs**
1	4.00	2.21	7.38	3.19	3.75	6.94	7.94	7.94	2	4.00	1/2	4.62	---	0.56	CL150, 300, and 600	10
1-1/2	4.50	2.46		3.50	4.75	7.44	8.81	8.81	2.88	4.68	5/8 and 5/8 x 1/2					14
2	4.88	2.63		4.19	5.00	8.31	9.31	9.31	3.63	5.38	5/8 and 5/8 x 1/2					23
3	6.50	3.10	8.44	4.62	5.12	10.00	11.00	11.25	5.00	6.56	3/4	6.00	1.25	0.56		34
4	7.62	3.99		5.25	5.56	11.25	12.00	13.50	6.19	7.76	3/4					48
6	9.00	4.29		6.25	6.44[2]	13.50	14.25	16.25	8.50	10.24	1					60
8	9.56	4.88	8.19	7.69	9.12	13.50	15.25	16.75	10.63	12.38	1-1/4	9.25	1.81	0.69		136
10	11.69	5.77		8.75	10.25	16.50	---	---	12.75	14.50					CL150	252

1. Multi-class valves are not interchangeable because of line bolting requirements. Please select the appropriate valve based on the pressure class of your piping.
2. 179 mm (7.06 inches) for NPS 6, CL600 valves only.

Figure 11. Fisher V200 Dimensions (also see table 11)

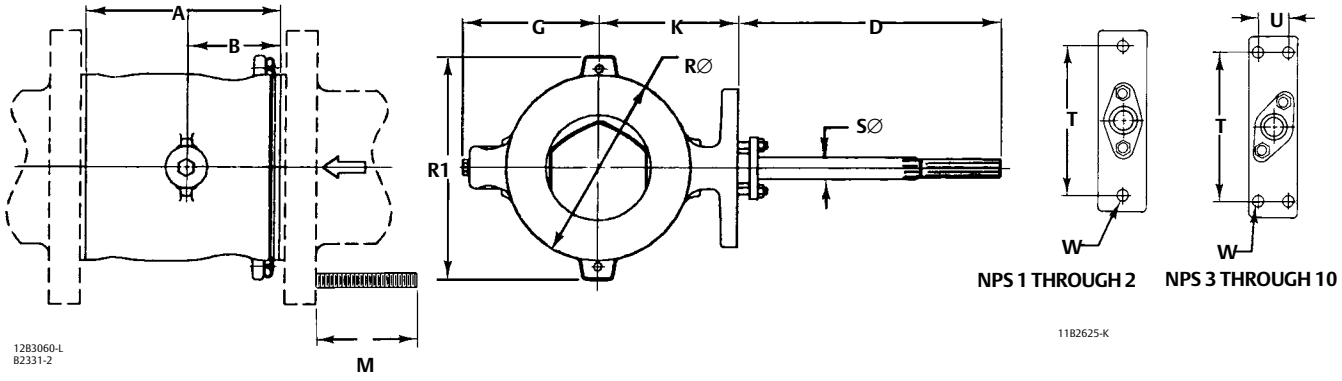


Table 12. Fisher V200 Flanged CL600 Dimensions

VALVE SIZE	DIMENSIONS (ANSI/ISA 75.08.02)												APPROXIMATE WEIGHT
	A(2)	B	D	G	K	M (Qty)(1)	Bolt Size	Threaded Holes Per Flange	S Diameter	T	U	W	
DN	**mm**												**kg**
50	124	67	188	106	127	121 (16)	5/8-11 UNC	4	16	117	---	14.2	17
80	165	79	214	117	130	140 (16)	3/4-10 UNC	4	19	152	32		28
100	194	101	214	133	141	165 (16)	7/8-9 UNC	---	19	152	32	14.2	48
150	229	109	214	159	164	197 (24)	1-8 UNC	2	25	152	32	14.2	93
200	243	124	208	195	232	216 (24)	1-1/8-8 UNC	4	32	235	46	17.5	160
NPS	**Inch**												**lbs**
2	4.88	2.63	7.38	4.19	5.00	4.75 (16)	5/8-11 UNC	4	5/8	4.62	---	0.56	38
3	6.50	3.10	8.44	4.62	5.12	5.50 (16)	3/4-10 UNC	4	3/4	6.00	1.25		61
4	7.62	3.99	8.44	5.25	5.56	6.50 (16)	7/8-9 UNC	---	3/4	6.00	1.25	0.56	105
6	9.00	4.29	8.44	6.25	6.44	7.75 (24)	1-8 UNC	2	1	6.00	1.25	0.56	205
8	9.56	4.88	8.19	7.69	9.12	8.50 (24)	1-1/8-8 UNC	4	1-1/4	9.25	1.81	0.69	353

1. For valve assemblies with the Cavitrol Hex anti-cavitation trim installed, the required outlet flange bolt length and the clearance necessary to remove the bolt will be 12.7 mm (1/2 inch) longer than dimension M specified.
2. For valve assemblies with Cavitrol Hex anti-cavitation trim installed, dimension A will be 12.7 mm (1/2 inch) larger than specified.

Figure 12. Fisher V200 CL600 Flanged Dimensions (also see table 12)

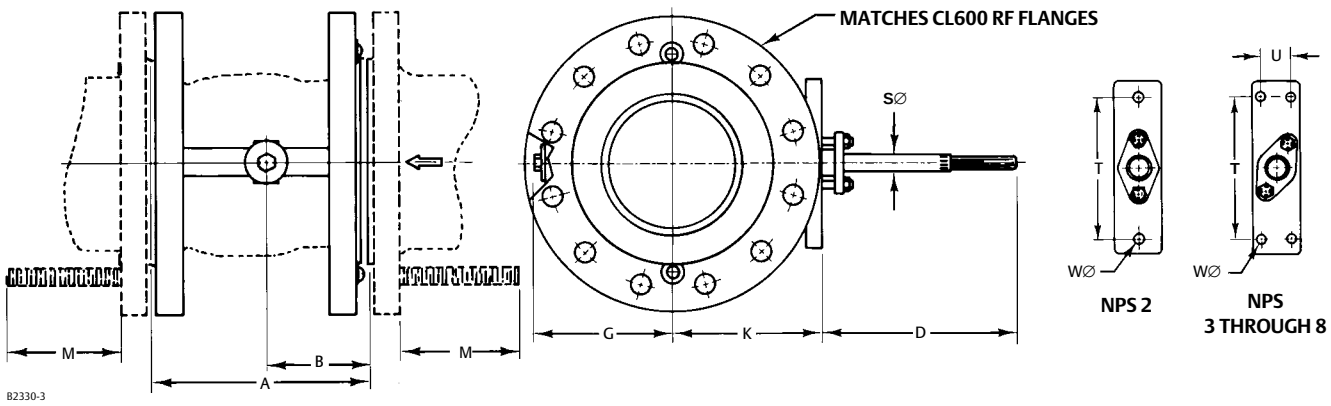


Table 13. Fisher V300 Dimensions

VALVE SIZE,	V300 DIMENSIONS (ISA S75.08.02)											APPROXIMATE WEIGHT
	A(5)	B	D	G	K	M(3)	N(3,4)	S Diameter	T	U	W	
DN(1)	mm											kg
25	102	56		81	95	100	94	13				8
40	114	62	188	89	121	114	108	16 and 16 X 13	117	---		12
50	124	67		106	127	106	100	16 and 16 X 13			14.2	17
80	165	79		117	130	133	121	19				28
100	194	101	214	133	141	140	127	19	152	32		37
150	229	109		159	164	152	140	25				60
200	243	124		195	232	165	152	32				103
250	297	147	208	222	260	186	173	32	235	46	17.5	200
300	338	174		268	303	198	186	38				293
350(2)	381	206		295	343	152	133	44.5	273	50.8	19.1	375
400(2)	406	229	356	330	365	152	133	54.0	273	50.8	19.1	511
500	508	235		406	457	224	203	63.5	337	76.2	22.4	755
NPS	Inch											lbs
1	4.00	2.21		3.19	3.75	3.94	3.69	1/2				17
1-1/2	4.50	2.46	7.38	3.50	4.75	4.50	4.25	5/8 and 5/8 X 1/2	4.62	---		27
2	4.88	2.63		4.19	5.00	4.19	3.94	5/8 and 5/8 X 1/2				38
3	6.50	3.10		4.62	5.12	5.25	4.75	3/4			0.56	61
4	7.62	3.99	8.44	5.25	5.56	5.50	5.00	3/4	6.00	1.25		81
6	9.00	4.29		6.25	6.44	6.00	5.50	1				133
8	9.56	4.88		7.69	9.12	6.50	6.00	1-1/4				226
10	11.69	5.77	8.19	8.75	10.25	7.31	6.81	1-1/4	9.25	1.81	0.69	440
12	13.31	6.87		10.56	11.94	7.81	7.31	1-1/2				645
14(2)	15.00	8.12	14.00	11.62	13.50	7.75	7.00	1-3/4	10.75	2.00	0.75	825
16(2)	16.00	9.00	14.00	13.31	14.38	8.25	7.50	2-1/8	10.75	2.00	0.75	1125
20	20.00	9.25	14.00	16.00	18.00	8.81	8.00	2-1/2	13.25	3.00	0.88	1661

1. DN25, 40, 50, 80, and 100 are the only sizes offered in V300 for Europe.
2. DN350 and 400 (NPS 14 and 16) valves are available in ASME B16.10 short, only. See dimension A for ASME B16.10 short shown in figure 14.
3. Clearance necessary to remove flange bolts.
4. For valve assemblies with the Cavitrol Hex anti-cavitation trim installed, the required outlet flange bolt length and the clearance necessary to remove the bolt will be 12.7mm (1/2 inch) longer than dimension N specified. In this case, use dimension M to determine the outlet flange bolt length.
5. For valve assemblies with Cavitrol Hex anti-cavitation trim installed, dimension A will be 12.7 mm (1/2 inch) larger than specified.

Figure 13. Fisher V300 Dimensions (also see table 13)

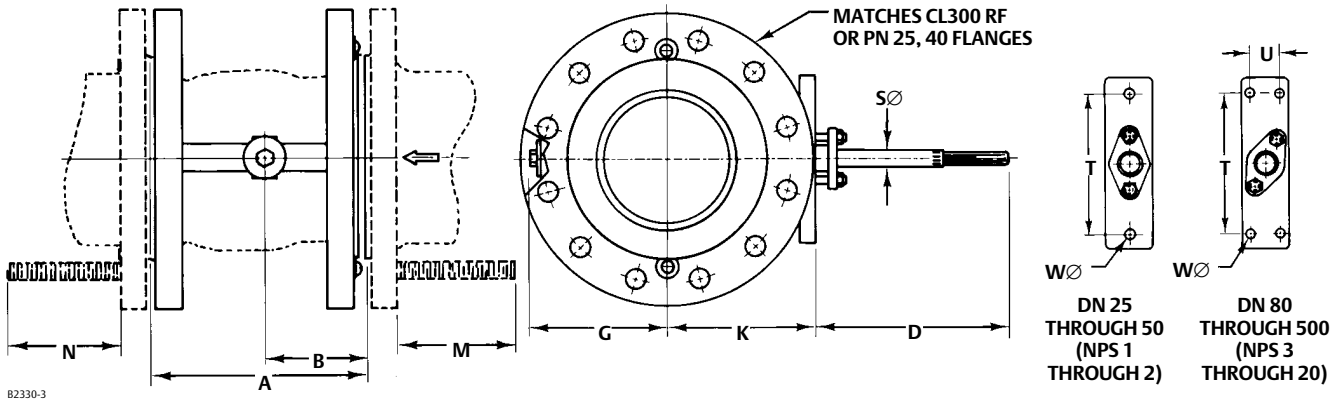


Table 14. Fisher V150 Optional Dimensions

V150 OPTIONAL DIMENSIONS FOR NPS 1 THROUGH 12 (ASME B16.10 SHORT)							
VALVE SIZE		A(3)		M(1)		N(1,2)	
DN	NPS	mm	Inches	mm	Inches	mm	Inches
25	1	127	5.00	103	4.06	71	2.81
40	1-1/2	165	6.50	135	5.31	78	3.06
50	2	178	7.00	155	6.11	92	3.61
80	3	203	8.00	142	5.61	98	3.86
100	4	229	9.00	155	6.11	98	3.86
150	6	267	10.50	163	6.40	112	4.40
200	8	292	11.50	182	7.15	124	4.90
250	10	330	13.00	176	6.94	132	5.19
300	12	356	14.00	170	6.69	132	5.19

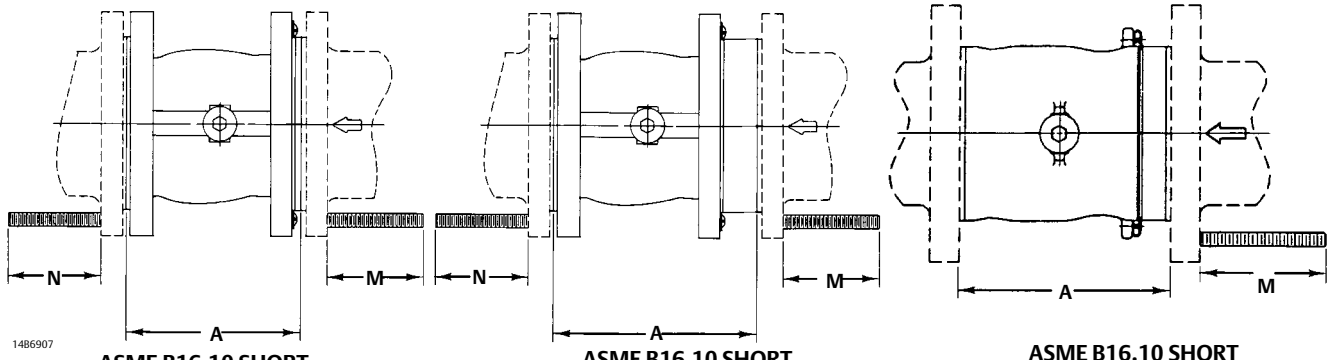
1. Clearance necessary to remove flange bolts.
2. For valve assemblies with the Cavitrol Hex anti-cavitation trim installed, the required outlet flange bolt length and the clearance necessary to remove the bolt will be 12.7 mm (1/2 inch) longer than dimension N specified.
3. For valve assemblies with Cavitrol Hex anti-cavitation trim installed, dimension A will be 12.7 mm (1/2 inch) larger than specified.

Table 15. Fisher V200 Optional Dimensions

V200 OPTIONAL DIMENSIONS (ASME B16.10 SHORT)(1,2)		
VALVE SIZE, NPS	A	M
mm		
1	127	202
1-1/2	165	240
2	178	268
3	203	286
4	229	321
6	267	381
8	292	394
10	330	451
Inch		
1	5.00	7.94
1-1/2	6.50	9.44
2	7.00	10.56
3	8.00	11.25
4	9.00	12.62
6	10.50	15.00
8	11.50	15.50
10	13.00	17.75

1. Available for CL150 valves only.
2. ASME B16.10 short dimensions are actually longer than ISA S75.08.02 dimensions.

Figure 14. Fisher V150 and V200 Optional Dimensions (also see tables 14 and 15)



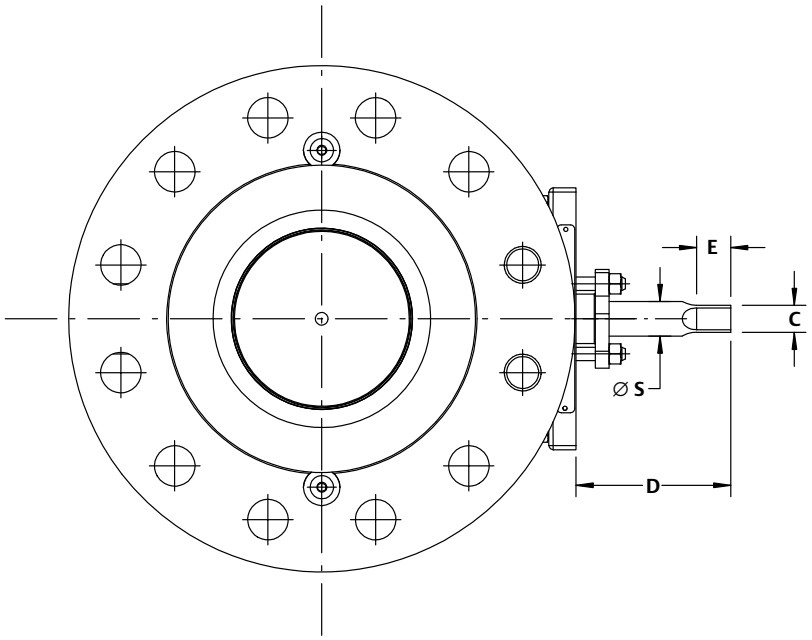
Notes:
- NPS 1 through 12 valves are available with either ISA S75.08.02 face-to-face dimensions or ASME B16.10 short face-to-face dimensions. NPS 1 through 12 valves will be supplied in ISA S75.08.02 unless you specify otherwise. Note that ASME B16.10 short dimensions are actually longer than ISA S75.08.02.
- NPS 14 and 16 valves are available only with ASME B16.10 short face-to-face dimensions.
- NPS 20 valves are available only with a 508 mm (20-inch) face-to-face dimension.
- M and N dimensions shown for V150 are clearance necessary to remove flange bolts.

Table 16. Fisher Vee-Ball Square Shaft Dimensions

VALVE SIZE/ PRESSURE RATING		C		D		E		S(1)	
DN	NPS	mm	Inches	mm	Inches	mm	Inches	mm	Inches
DN25/ PN10-40	NPS 1/ CL150-300	9.0	0.4	74.0	2.91	15.0	0.59	13.0	1/2
DN40/ PN10-40	NPS 1.5/ CL150-600	11.0	0.4	76.0	2.99	15.0	0.59	15.9	5/8
DN50/ PN10-40	NPS 2/ CL150-600	11.0	0.4	76.0	2.99	15.0	0.59	15.9	5/8
DN80/ PN10-40	NPS 3/ CL150-600	14.0	0.6	103.0	4.06	19.0	0.75	19.1	3/4
DN100/ PN10-40	NPS 4/ CL150-600	14.0	0.6	103.0	4.06	19.0	0.75	19.1	3/4
DN150/ PN10-40	NPS 6/ CL150-600	19.0	0.8	108.0	4.25	25.0	0.94	25.4	1
DN200/ PN10-40	NPS 8/ CL150-600	22.0	0.9	109.0	4.29	30.0	1.18	31.8	1 1/4
DN250/ PN10-40	NPS 10/ CL150-600	22.0	0.9	109.0	4.29	30.0	1.18	31.8	1 1/4
DN300/ PN10-25	NPS 12/ CL150-600	27.0	1.1	114.0	4.49	35.0	1.38	38.1	1 1/2
---	NPS 14/ CL150-300	---	1.4	---	6.25	---	1.77	---	1 3/4

1. This nominal Valve Shaft Diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.

Figure 15. Fisher Vee-Ball Square Shaft Dimensions (also see table16)



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

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