

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).

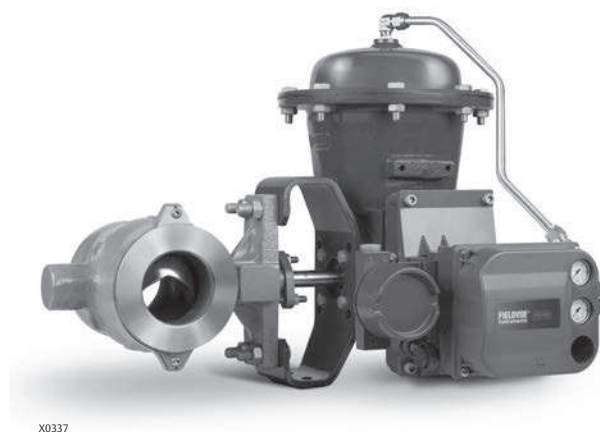
To meet specific application requirements, a variety of metal and soft ball seal materials are available. A splined drive shaft combines with a variety of power operated and manual actuators to provide reliable, high-performance throttling or on-off operation for many different applications in the process industries.

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.



V150



V200

Typical Vee-Ball Valves with Fisher 2052 Actuators and
FIELDVUE™ DVC6200 Digital Valve Controllers

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 6. 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 8.

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 4 and 5

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)

High Temperature HD Metal Seal: 288 to 427°C (550 to 800°F). Contact your [Emerson Process Management 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 7, 8, and 10 for dimensions

Optional Face-to-Face Dimensions

■ 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 actually longer than ISA S75.08.02. See figure 11 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 valve construction is for right-hand mounting, as viewed from upstream end of valve. Left-hand (optional) mounting is available upon request⁽⁵⁾

Valve/Actuator Action

With diaphragm or piston rotary actuator, the valve is field-reversible between PDTC or PDO:

■ 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 6 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

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 6, 7 and 8.

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. True left-hand mount is not available for Micro-Notch constructions, as it will cause the ball to rotate to the bottom of the valve body.

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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.

- **Smooth Valve Operation**—Precision machined parts and pressure balanced seal designs allow smooth, precise movement of the ball.
- **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.
- **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).

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
	CF3M ⁽²⁾	DN 200, 250, 300	PN 10 or PN 16
		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
	CG8M	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 20, 24x20 ⁽⁵⁾	CL150
	CW2M	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	
V200 ⁽⁴⁾	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	
	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
V300	WCC	NPS 2, 3, 4, 6, 8	CL600
		NPS 1, 1-1/2, 2, 3, 4, 6, 8	CL150/300/600 flangeless
		NPS 10	CL150 flangeless
	WCC / 1.0619 ⁽¹⁾	NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 20	CL300
		DN 25, 40, 50	PN 10-40
		DN 80, 100, 150	PN 25-40
	LCC	DN 200, 250, 300	PN 25 or PN 40
		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
	CF3M ⁽²⁾	DN 200, 250, 300	PN 25 or PN 40
		NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12	CL300
		DN 25, 40, 50	PN 10-40
	CF3M/1.4409 ⁽¹⁾	DN 80, 100, 150	PN 25-40
		DN 200, 250, 300	PN 25 or PN 40
		NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 20	CL300
	CG8M	NPS 1, 1-1/2, 2, 3, 4, 6, 8	
	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)

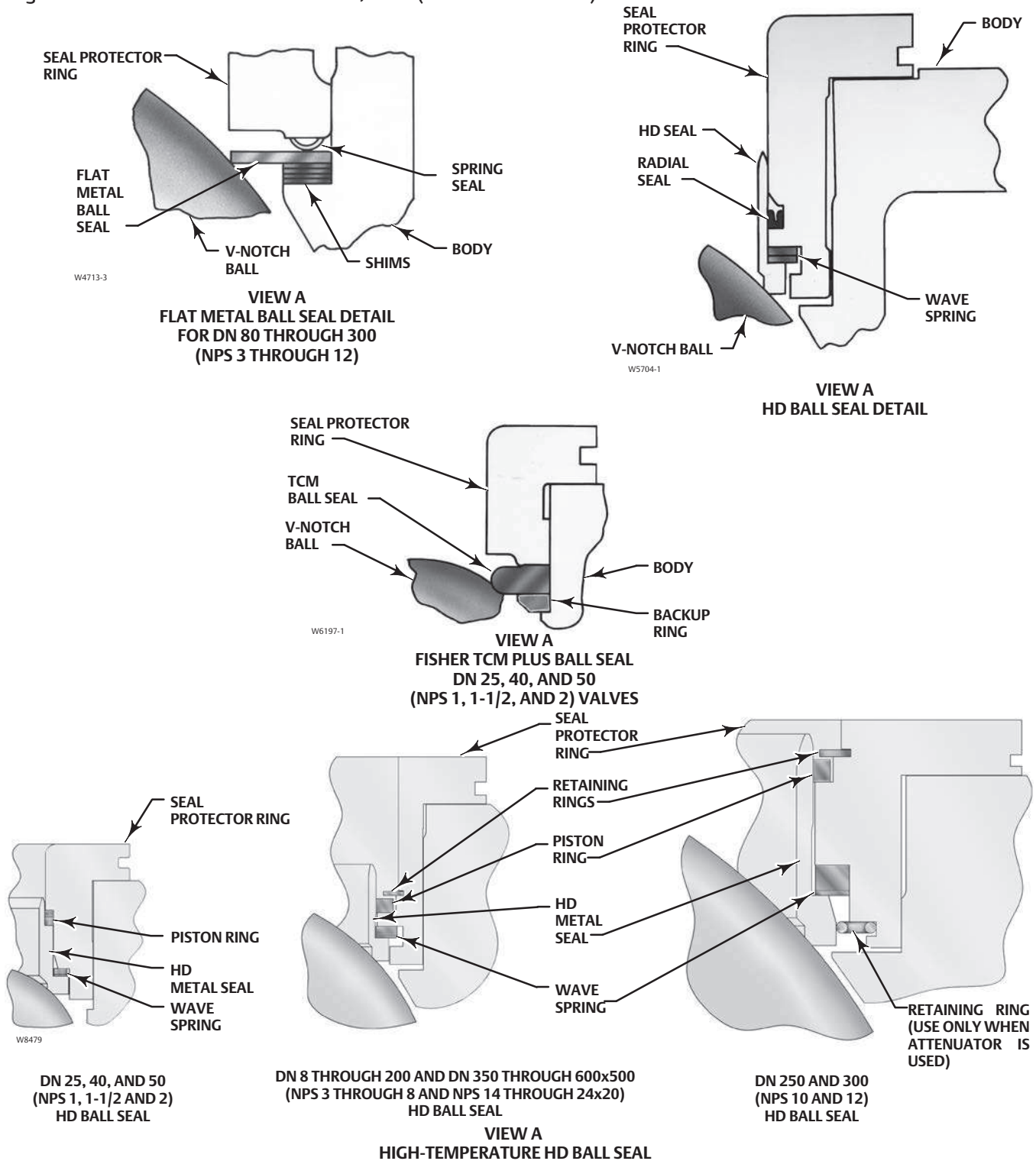
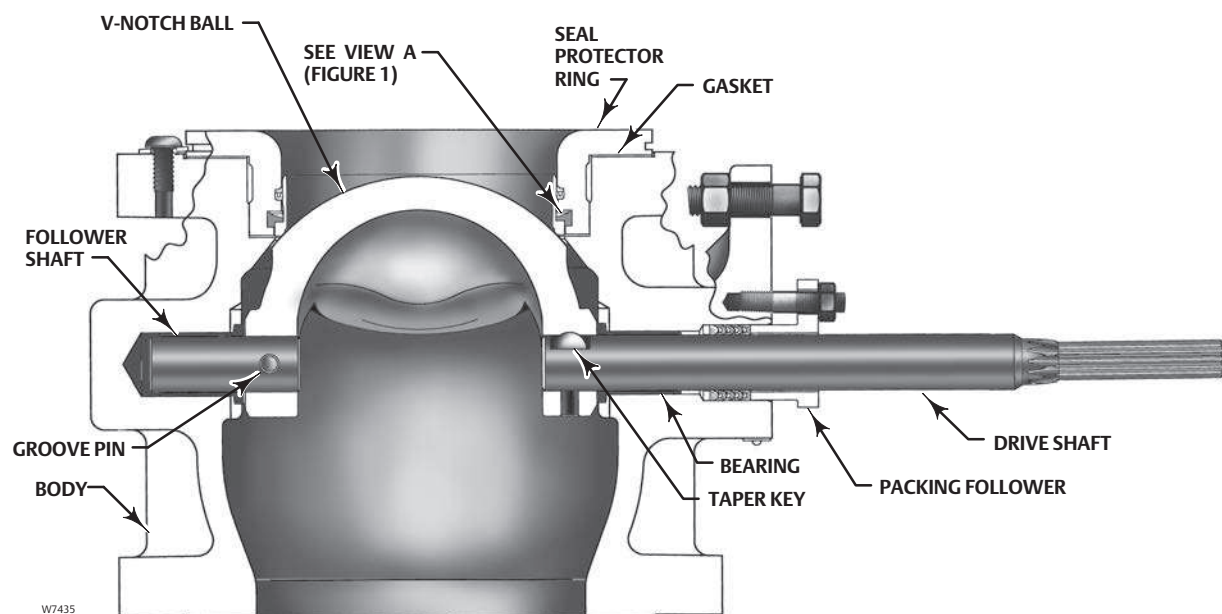
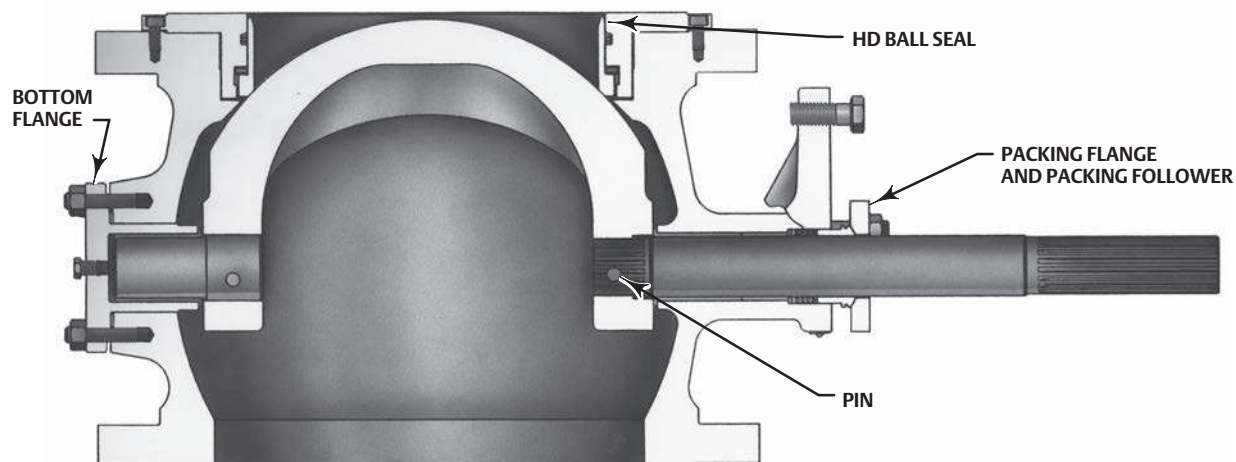


Figure 2. Vee-Ball Construction Features (Fisher V150 Shown)



**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	---	---	---	---

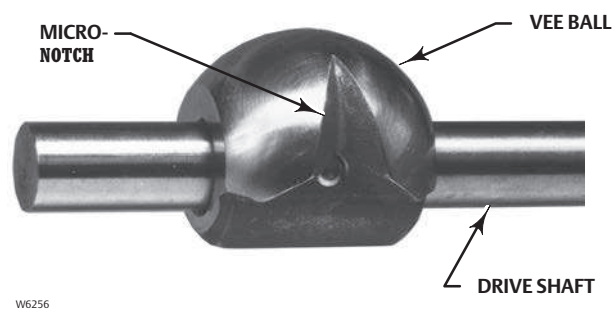
Series B

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 Process Management sales office](#) for more information.



Severe Service Attenuator

Fisher Vee-Ball series valves (V150, V200, 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.

Attenuator Ball Material

Standard attenuator ball material is CG8M, M35-1, CW2M, or CK3McuN.

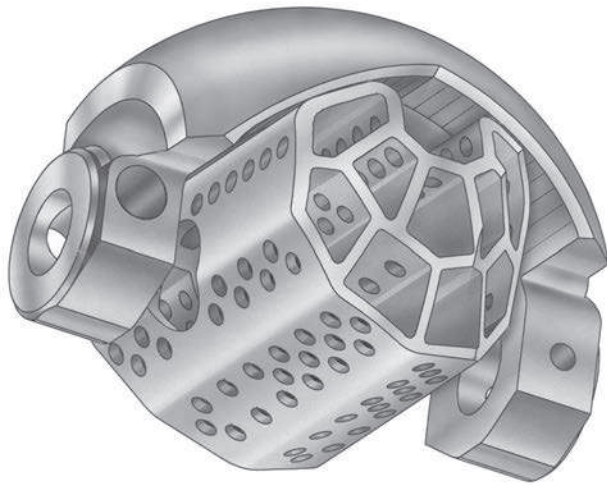
Standard Flow Direction

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

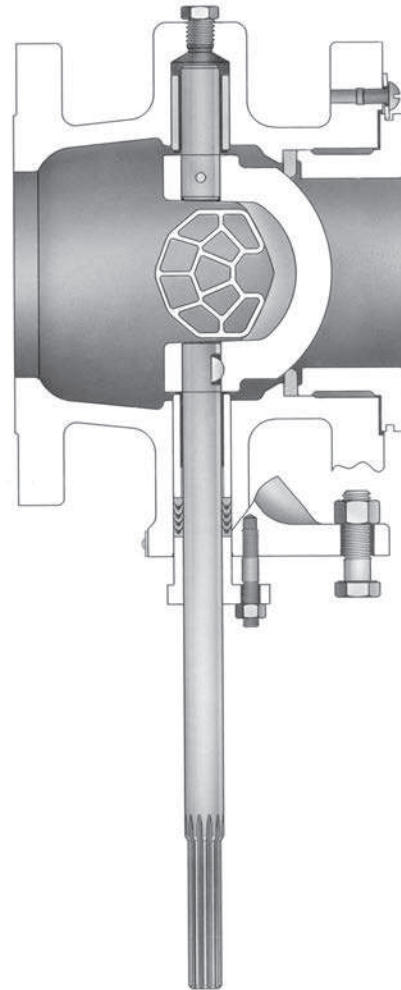
Right-hand or left-hand as viewed from the upstream end of the valve. Counter-clockwise to close for both mounting styles.

Figure 4. Fisher Vee-Ball Series Noise Attenuator Ball



W6116-1

Figure 5. Fisher Vee-Ball Series Rotary Attenuator Construction



W6129-1

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

Table 4. 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), 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⁾ , or CW2M
Segmented V-Notch Ball		CG8M, 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
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⁾ , or S32760 ⁽⁸⁾
Groove Pin		S31600 or N10276
Taper Key		R30006 ⁽⁶⁾ , S20910, or N10276
Taper Pin [DN 25, 40, and 50 (NPS 1, 1-1/2, and 2) only]		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		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

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 Process Management sales office](#).
 9. Attenuator material will match segmented V-Notch ball material.

Table 5. 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 6. Typical ENVIRO-SEAL Packing Arrangements

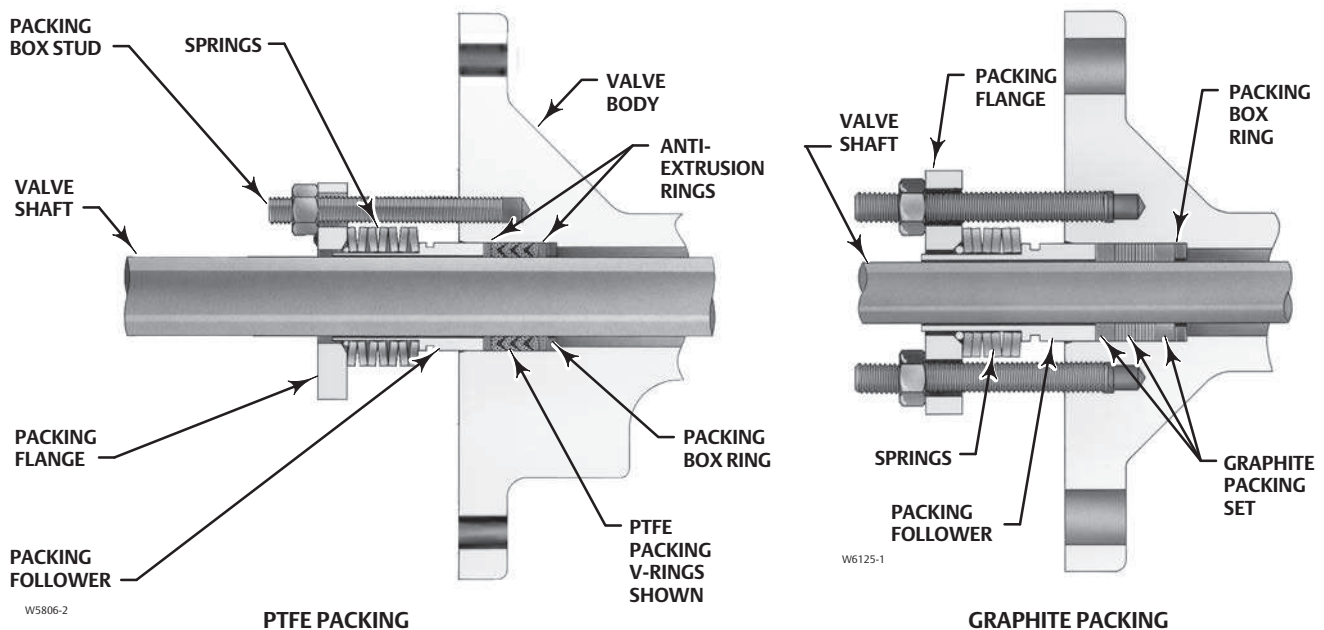


Table 6. Maximum Allowable Inlet Pressure for CW2M Valves

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	Psig					
-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 7 for body limitations and table 8 for trim

limitations. Information on limits for S31254, CW2M, M35-2, CD3MN, CD3MWCuN, and other alloy constructions can be obtained by contacting your [Emerson Process Management sales office](#). The lowest number from the tables is the appropriate limit. The tables for both trim and body limits must be consulted.

Table 7. Maximum Allowable Shutoff Pressure Drops (Body Ratings) based on Carbon Steel and Stainless Steel Valve Body Types. (The tables for both trim and body limits must be consulted.)

TEMPERATURE RANGE	PRESSURE CLASS											
	WCC CL150	316L SST CL150	317 SST CL150	LCC CL150	WCC CL300	316L SST CL300	317 SST CL300	LCC CL300	WCC CL600	316L SST CL600	317 SST CL600	LCC CL600
°C	Bar											
-46 to -29	---	15.9	19.0	20	---	41.4	49.6	51.7	---	82.7	99.3	103
-29 to 38	20.0	15.9	19.0	20	51.7	41.4	49.6	51.7	103	82.7	99.3	103
93	17.9	13.4	16.2	17.9	51.7	34.8	42.7	51.7	103	70.0	85.5	103
149	15.9	12.1	14.8	15.9	50.3	31.4	38.6	50.3	100	62.7	77.2	100
204	13.8	11.0	13.4	13.8	48.6	28.6	35.5	48.6	97.2	56.9	70.6	97.2
232	12.8	10.7	12.8	12.8	47.2	27.9	34.5	47.2	94.5	54.8	68.6	94.5
260	11.7	10.0	11.7	11.7	45.9	26.2	33.1	45.9	91.7	52.7	65.8	91.7
316	10.7	9.9	10.7	10.7	43.8	25.5	32.1	43.8	87.6	51.0	64.1	87.6
343	9.65	9.7	8.62	9.65	41.7	23.8	31.0	41.7	83.4	49.6	62.4	83.4
371	8.62	8.6	7.58	---	40.7	23.8	30.7	---	81.0	48.3	60.0	---
399	6.55	6.6	6.55	---	34.8	23.1	29.3	---	69.6	46.2	58.9	---
427	5.52	5.5	5.52	---	28.3	22.8	29.0	---	56.9	45.5	58.3	---
°F	Psi											
-50 to -20	---	230	275	290	---	600	720	750	---	1200	1440	1500
-20 to 100	290	230	275	290	750	600	720	750	1500	1200	1440	1500
200	260	195	235	260	750	505	620	750	1500	1015	1240	1500
300	230	175	215	230	730	455	560	730	1455	910	1120	1455
400	200	160	195	200	705	415	515	705	1410	825	1025	1410
450	185	155	185	185	685	405	500	685	1370	795	995	1370
500	170	145	170	170	665	380	480	665	1330	765	955	1330
550	155	143	155	155	635	370	465	635	1270	740	930	1270
600	140	140	140	140	605	360	450	605	1210	720	905	1210
650	125	125	125	125	590	350	445	590	1175	700	890	1175
700	110	110	110	---	570	345	430	---	1135	685	870	---
750	95	95	95	---	505	335	425	---	1010	670	855	---
800	80	80	80	---	410	330	420	---	825	660	845	---

Table 8. 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	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	37.9	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	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	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	3.44	3.45
	HD Seal ⁽¹⁾	-46 to 260	51.7	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	---	---	---	---	---
R30006	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	
	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	---	---	---	---	
R30006 Silver Plated	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	
	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	---	---	---	---	
S31603L Nitride	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	
	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	---	---	---	---	
S31603L Nitride	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	
	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	---	---	---	---	
R30006	Flow Ring	500	1500	1500	1500	1500	1050	1090	1070	587	547	587	508	708	648	
	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	---	---	---	---	
R30006 Silver Plated	Flow Ring	800	1080	720	388	273	158	163	161	88	82	88	106	106	97	
	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	---	---	---	---	
S31603L Nitride	Flow Ring	800	1500	1500	776	546	316	326	322	176	164	176	212	212	194	
	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	---	---	---	---	
S31603L Nitride	Flow Ring	800	1440	1440	1290	910	527	543	537	293	273	293	353	353	323	
	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 Process Management sales office if higher pressure drops are required.															
4. This column is also appropriate for the DN 600x500 (NPS 24x20).																

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 Process Management sales office](#) if higher pressure drops are required.
4. This column is also appropriate for the DN 600x500 (NPS 24x20).

Table 9. Fisher V150 Dimensions

VALVE SIZE	V150 DIMENSIONS (ISA S75.08.02) ⁽¹⁾											APPROXIMATE WEIGHT
	A	B	D	G	K	M ^(3,4)	N ⁽³⁾	S Diameter	T	U	W	
DN	mm											kg
25	102	56	188	83	95	79	73	13	117	---	14.2	5.9
40	114	62		90	121	92	80	15.9 and 15.9 x 12.7				8.6
50	124	67		87	127	100	87	15.9 and 15.9 x 12.7				9.5
80	165	79	214	100	130	106	100	19.1	152	31.8	14.2	19.5
100	194	101		133	141	119	100	19.1				26
150	229	109		151	164	127	114	25.4				42
200	243	124	208	184	232	133	127	31.8	235	46.0	17.5	72
250	297	147		222	260	146	133	31.8				107
300	338	174		268	303	152	133	38.1				158
350 ⁽²⁾	381	206	356	295	343	152	133	44.5	273	50.8	19.1	248
400 ⁽²⁾	406	229		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	7.38	3.19	3.75	3.12	2.88	1/2	4.62	---	0.56	13
1-1/2	4.50	2.46		3.38	4.75	3.62	3.12	5/8 and 5/8 x 1/2				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	8.44	4.62	5.12	4.19	3.94	3/4	6.00	1.25	0.56	43
4	7.62	3.99		5.25	5.56	4.69	3.94	3/4				57
6	9.00	4.29		5.94	6.44	5.00	4.50	1				93
8	9.56	4.88	8.19	7.69	9.12	5.25	5.00	1-1/4	9.25	1.81	0.69	158
10	11.69	5.77		8.75	10.25	5.75	5.25	1-1/4				235
12	13.31	6.87		10.56	11.94	6.00	5.25	1-1/2				347
14 ⁽²⁾	15.00	8.12	14.00	11.62	13.50	6.00	5.25	1-3/4	10.75	2.00	0.75	545
16 ⁽²⁾	16.00	9.00		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. DN 350 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 11.

3. Clearance necessary to remove flange bolts.

4. DN 25 and NPS 1 constructions have threaded inlet flange holes.

1. Inlet flange stud bolt length is longer than the standard length specified in ASME B16.5. See dimension M below.
2. DN 350 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 11.
3. Clearance necessary to remove flange bolts.
4. DN 25 and NPS 1 constructions have threaded inlet flange holes.

Figure 7. Fisher V150 Dimensions (also see table 9)

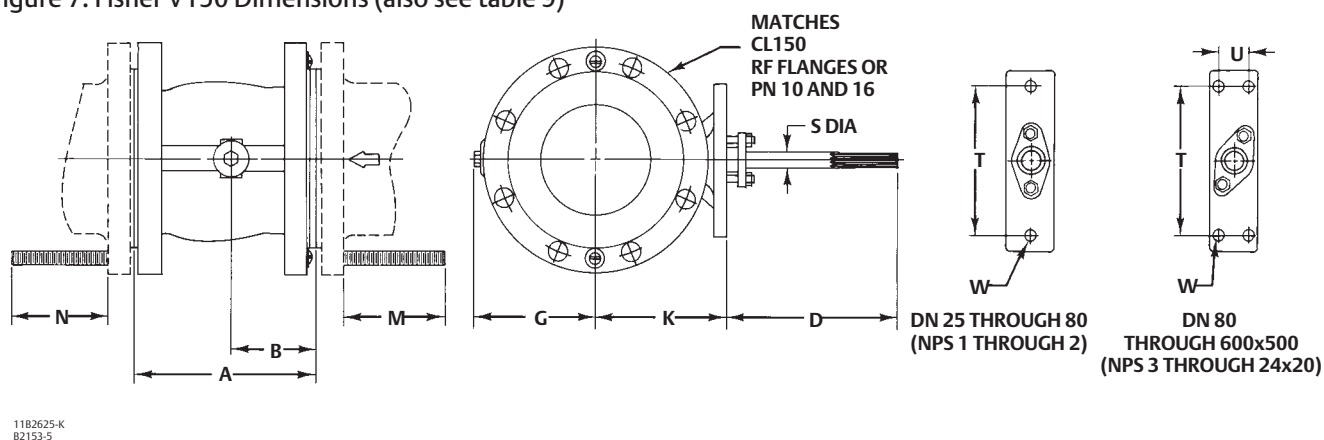


Table 10. Fisher V200 Flangeless Dimensions

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					15.7 and 15.7 x 12.7	6.4
2	124	67		106	127	211	236	236	92	137	6.4						
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					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					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					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 ⁽¹⁾	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					252		
1. 179 mm (7.06 inches) for NPS 6, CL600 valves only.																	

1. 179 mm (7.06 inches) for NPS 6, CL600 valves only.

Figure 8. Fisher V200 Dimensions (also see table 10)

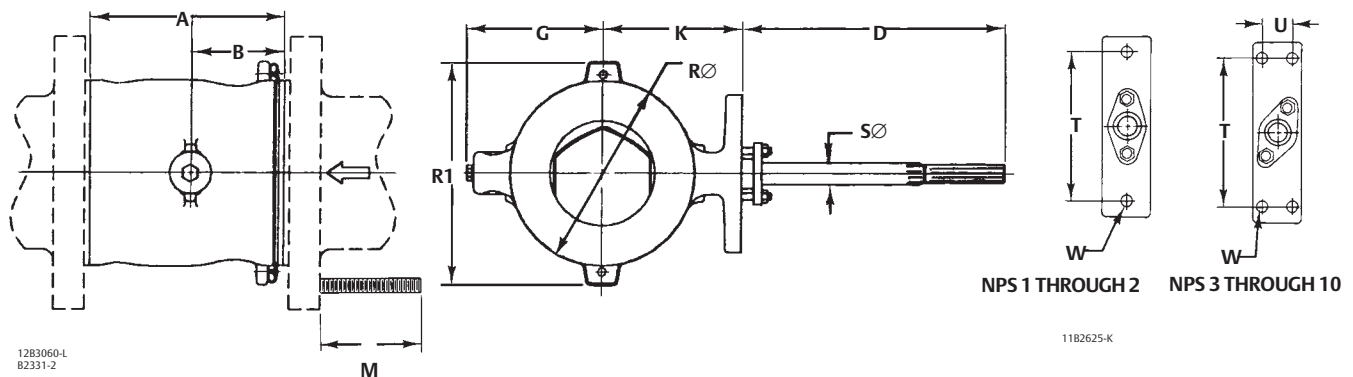


Table 11. Fisher V200 Flanged CL600 Dimensions

VALVE SIZE	DIMENSIONS (ANSI/ISA 75.08.02)												APPROXIMATE WEIGHT
	A	B	D	G	K	M (Qty)	Bolt Size	Flange Hole Thread, Inch	S Diameter	T	U	W	
DN	mm												kg
50	124	67	188	106	127	121 (16)	5/8-11 UNC	5/8-11 UNC	16	117	---	14.2	17
80	165	79	214	117	130	140 (16)	3/4-10 UNC	3/4-10 UNC	19	152	32	14.2	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	1-8 UNC	25	152	32	14.2	93
200	243	124	208	195	232	216 (24)	1-1/8-8 UNC	1-1/8-8 UNC	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	5/8-11 UNC	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	3/4-10 UNC	3/4	6.00	1.25	0.56	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	1-8 UNC	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	1-1/8-8 UNC	1-1/4	9.25	1.81	0.69	353

Figure 9. Fisher V200 CL600 Flanged Dimensions (also see table 11)

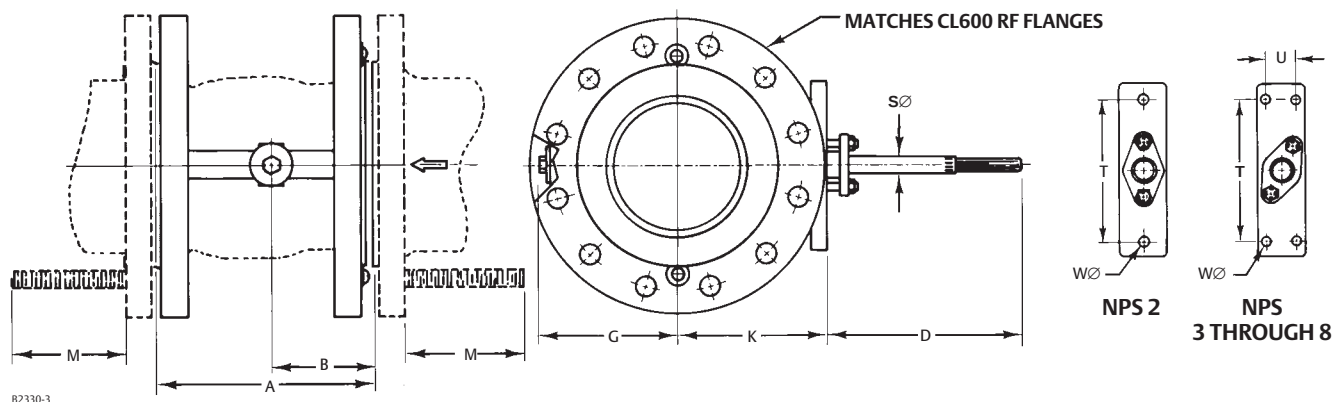


Table 12. Fisher V300 Dimensions

VALVE SIZE, DN ⁽¹⁾	V300 DIMENSIONS (ISA S75.08.02)											APPROXIMATE WEIGHT
	A	B	D	G	K	M ^(3,4)	N ⁽³⁾	S Diameter	T	U	W	
	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
	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			0.56	38
3	6.50	3.10		4.62	5.12	5.25	4.75	3/4				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. DN 25, 40, 50, 80, and 100 are the only sizes offered in V300 for Europe.
2. DN 350 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 11.
3. Clearance necessary to remove flange bolts.
4. DN 25 and NPS 1 constructions have threaded inlet flange holes.

Figure 10. Fisher V300 Dimensions (also see table 12)

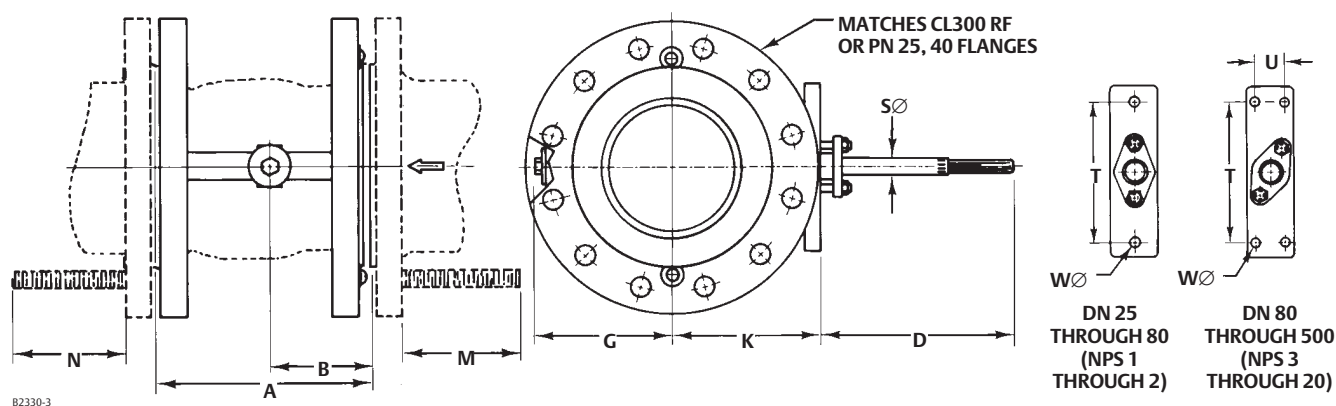


Table 13. Fisher V150 Optional Dimensions

V150 OPTIONAL DIMENSIONS FOR NPS 1 THROUGH 12 (ASME B16.10 SHORT)							
VALVE SIZE		A		M ⁽¹⁾		N	
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. NPS 1 constructions have threaded inlet flange holes.

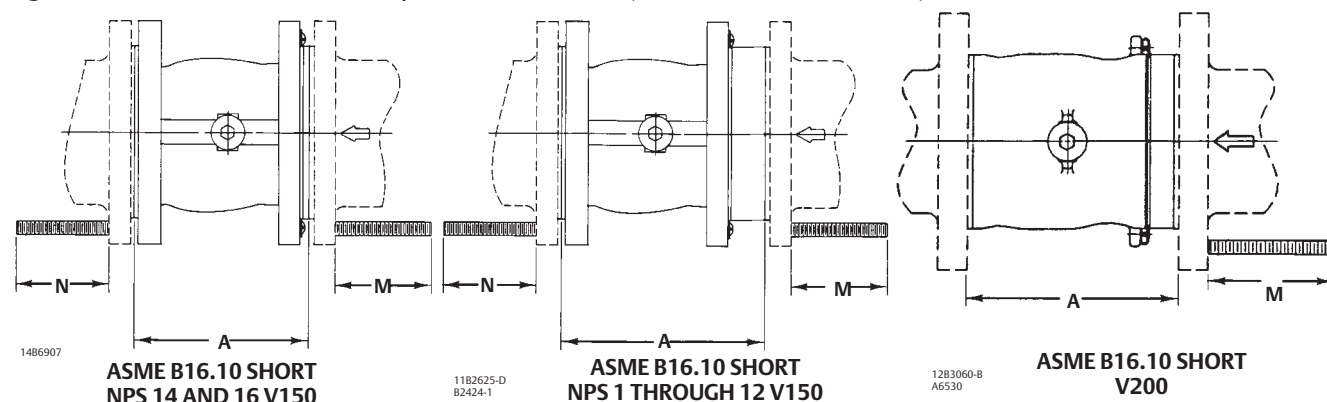
Table 14. Fisher V200 Optional Dimensions

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 11. Fisher V150 and V200 Optional Dimensions (also see tables 13 and 14)



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.

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