

Fisher® EU and EW Valves NPS 16 through 24 x 20

The Fisher NPS 16 through 24 × 20 CL150 through CL600 EUT-2, EWT-2, EUD, EWD, EUT, and EWT control valves (figures 3 and 4) are used for either throttling or on-off control of a wide variety of liquids and gasses.

CL900 NPS 16 and 20 x 16 valves are available upon request. Please contact your Emerson Process Management sales office for more details. These valves have single ports, balanced valve plugs, and cage guiding.

EUT-2 and EWT-2 valves with a hanging cage (figure 3) are available for demanding applications in oil and natural gas to 232°C (450°F). The hanging cage, with the seat ring threaded into the cage, gives these valves easy-maintenance trim--no trim parts are threaded into the valve body. The seal between the plug and cage and the seal between the seat ring and valve body are spring-loaded PTFE seals.

EUD and EWD valves (figure 4) have a bolted-in seat ring. These valves have metal-to-metal seating and use two graphite piston rings between the valve plug and cage. They are used primarily for high temperature (over 232°C [450°F]) service. The Bore Seal is used to obtain Class V shutoff above 316°C (600°F).

EUT and EWT valves (figure 1) have a bolted-in seat ring. These valves have metal-to-metal seating and use PEEK anti-extrusion rings to obtain temperatures up to 316°C (600°F).

These valves share the following characteristics: multiple trim material choices, trim part interchangeability, and different cage styles to provide particular flow characteristics to handle specific applications.



To help reduce aerodynamic noise in gas service, Whisper Trim™ III (figure 5) and WhisperFlo™ cages are available. To eliminate liquid cavitation damage, Cavitrol™ III cages are available. For cavitating liquids with particulate, DST (dirty service trim) is available.



Specifications

Valve Sizes

EUT-2, EUD, and EWT: ■ NPS 16 and ■ 20
EWT-2, EWD, and EWT: ■ NPS 20 x 16,
 ■ 24 x 16, and ■ 24 x 20 valves (size designations
 are end connection size x nominal trim size)

End Connection Styles

Flanged: CL150, 300, and 600 raised-face or ring-type
 joint flanges per ASME B16.5

Buttwelding: All ASME B16.25 schedules through
 schedule 120 that are compatible with the ASME
 B16.34 valve body rating

For other end connections, contact your Emerson
 Process Management sales office for details.

Maximum Inlet Pressure⁽¹⁾

Flanged: Consistent with CL150, 300, and 600
 pressure-temperature ratings per ASME B16.34

Buttwelding: Consistent with CL600 per
 ASME B16.34

**Material Temperature and Pressure Drop
 Capabilities⁽¹⁾**

See table 1 and figures 6 and 7.

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

EUT and EWT with Metal Seats

Standard: Class V

EUT-2 and EWT-2 with Metal Seats

*Standard (for all trims except 2-Stage Cavitrol Trim):
 Class IV*

Standard (for 2-Stage Cavitrol Trim): Class V

*Optional (for all trims except 2-Stage Cavitrol Trim):
 Class V*

EUT-2 and EWT-2 with Soft Metal Seats

Class V

EUD and EWD with Metal Seats

Standard: Class III

Optional: Class IV and V

Construction Materials

Valve Body and Bonnet: ■ WCC steel, ■ WC9 steel,
 ■ LCC steel, or ■ CF8M (316 stainless steel). For
 other materials, consult your Emerson Process
 Management sales office

Trim and Other Parts: See tables 1, 2, and 3.

Flow Characteristics

Standard Cages: ■ Linear or ■ equal percentage

Whisper Trim III and Cavitrol III Cages: Linear

WhisperFlo Cages: Linear

For other characteristics, contact your Emerson
 Process Management sales office for details.

Flow Direction

Standard and Cavitrol III Cages: Down

Whisper Trim III Cages: Up

WhisperFlo Cages: Up

Flow Coefficients

See Fisher Catalog 12

Port Diameters

See tables 6 and 7

Valve Plug Travel

102 through 432 mm (4 to 17 inches).

Contact your Emerson Process Management sales
 office for further details if needed

Yoke Boss and Stem Diameters

■ 127 mm (5-inch) or ■ 127 mm (5H-inch) diameter
 yoke boss, each with 31.8 mm
 (1.25 inch) diameter valve stem

Typical Bonnet Style

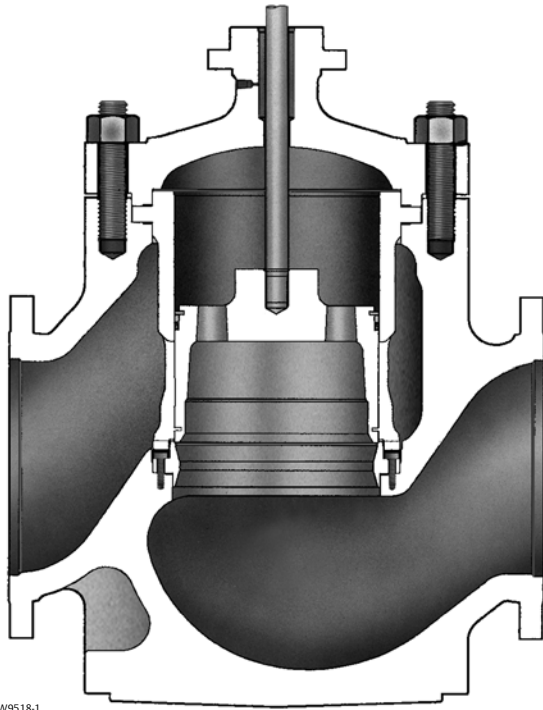
Standard Plain (style 1 extension)

Approximate Weights

See figure 8

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

Figure 1. Fisher EUT / EWT Valve with PEEK Anti-Extrusion Rings



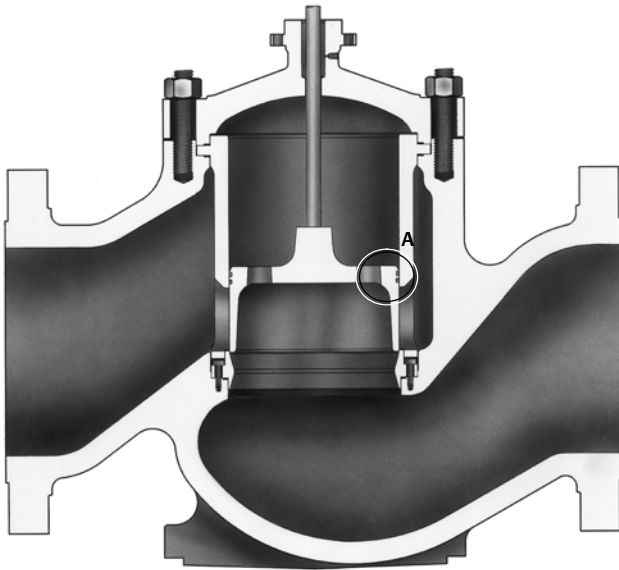
Features

- **Stable Control at High Pressure Drops**-- Rugged cage guiding stabilizes the valve plug at all points in its travel range. This guiding reduces vibration, mechanical noise, and the need for hydraulic snubbers.
- **Economy**-- Streamlined flow passages provide greater capacities per initial investment than most

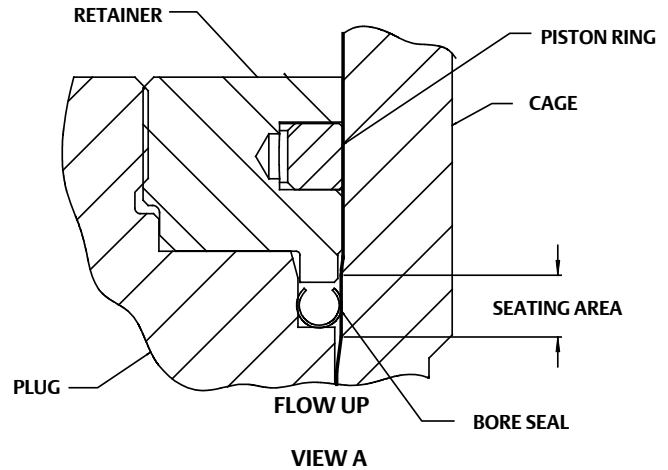
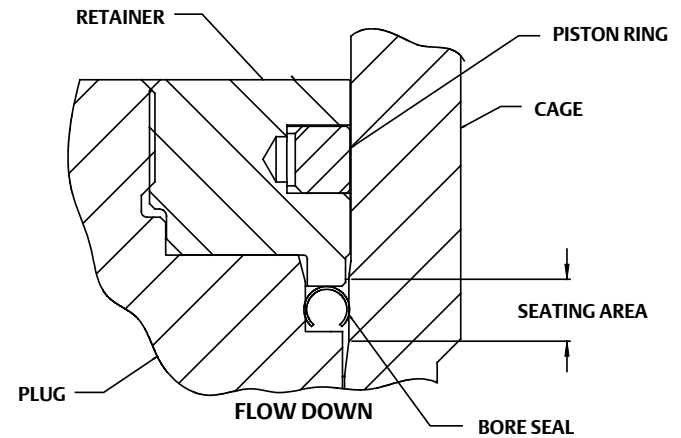
globe valves of the same size. Balanced valve plug design can allow use of smaller actuators for high pressure drops.

- **Cost-Effective Operation**-- Increased wear resistance of the standard hardened stainless steel trim means long-lasting service.
- **Easy Maintenance**-- The valve can stay in the pipeline during removal of trim parts for inspection or maintenance.

Figure 2. Typical Fisher EUD with Bore Seal



W6022-2



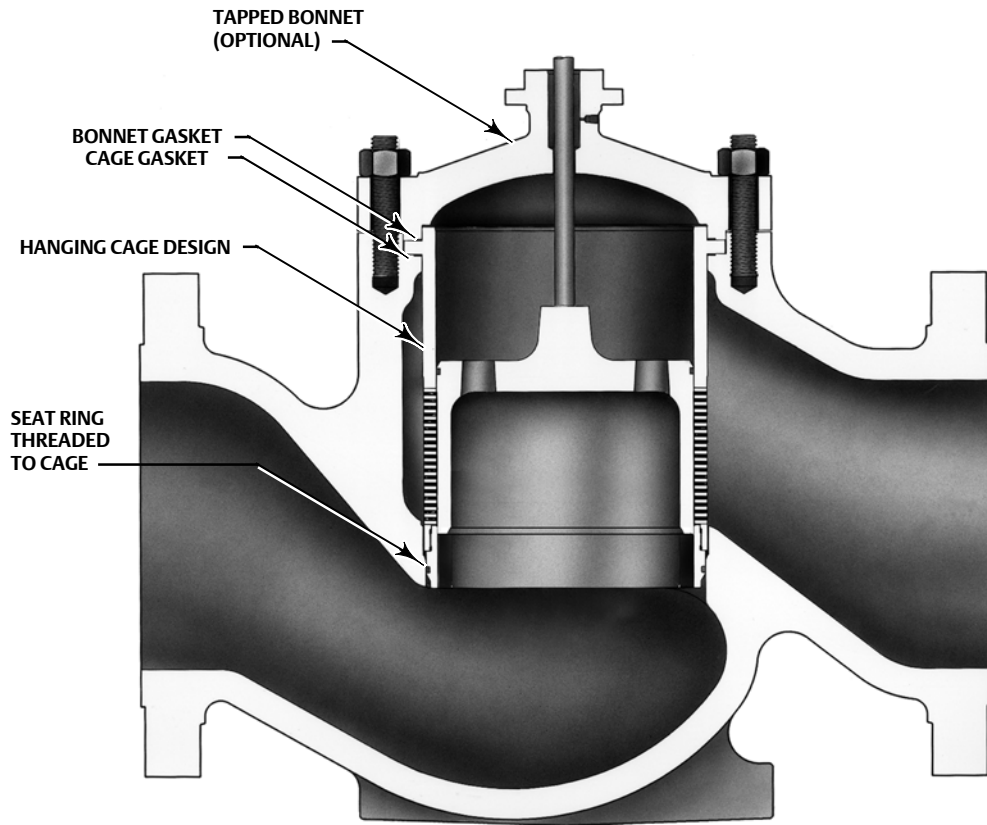
Bore Seal Description

The Bore Seal (figure 2) is available for the EUD and EWD only and is required for Class V shutoff applications where the service temperature exceeds 316°C (600°F). For service temperatures below 316°C (600°F), the EWT and EUT should be used when Class V shutoff is required. See table 4 for availability and temperature limits and figure 2.

The Bore Seal employs a metal C-shaped seal ring that

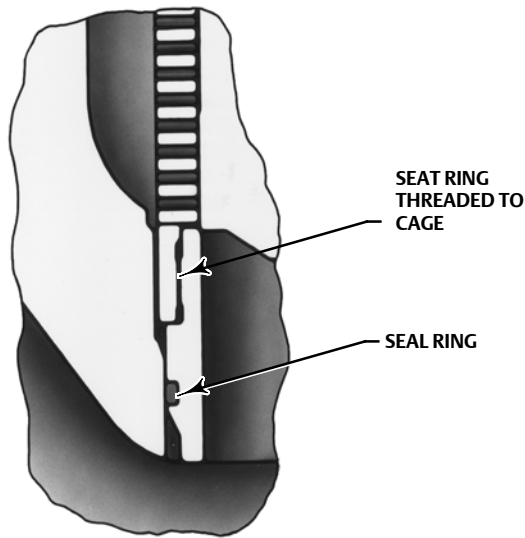
is secured to the outside diameter of the valve plug. When the valve plug comes into contact with the seat ring to close the valve, the Bore Seal is compressed against the cage wall, thereby blocking a secondary leakage path that exists between the plug and cage wall. When the valve plug is not in contact with the seat ring (i.e. valve open), the Bore Seal is not engaged and the piston rings that are also secured to the outside diameter of the plug assume the role of blocking this secondary leakage path.

Figure 3. Typical Fisher EUT-2 or EWT-2 Valve



W6088-2

COMPLETE VALVE



W6089-1A

SEAT RING SEAL DETAIL

Figure 4. Typical Fisher EUD or EWD Valve

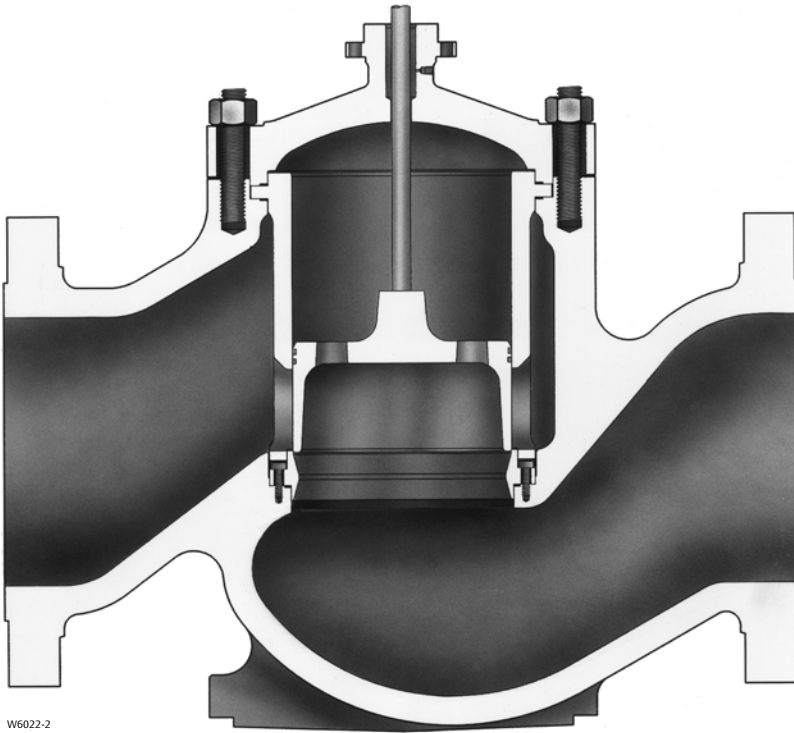


Figure 5. Fisher EWT-2 Valve with Whisper Trim III D3 Cage, Baffle, and Lower Metal Piston Ring

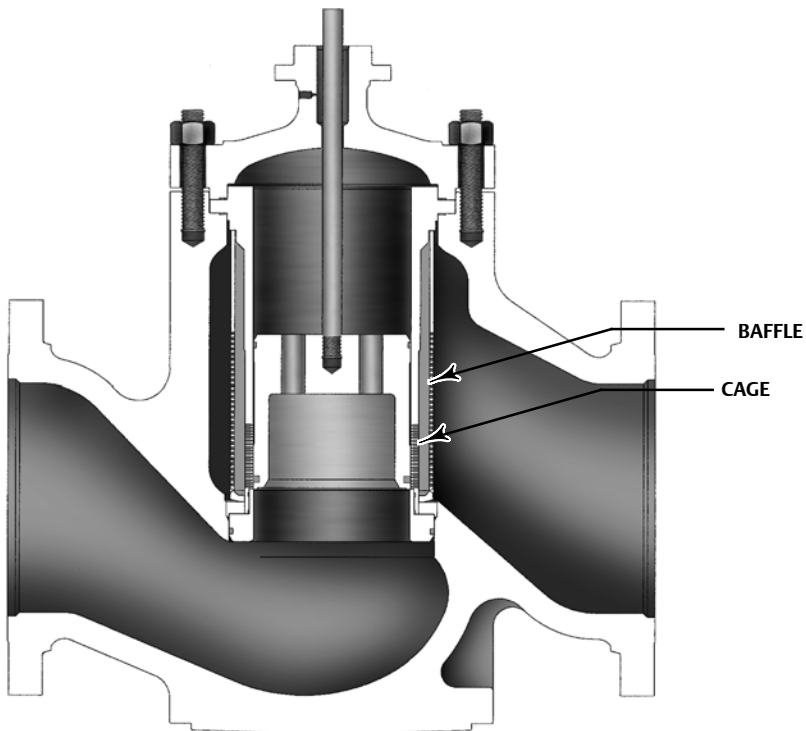


Table 1. Construction Materials

PART		MATERIAL	TEMPERATURE		
			°C	°F	
Valve Body and Bonnet		WCC Steel WC9 Steel CF8M (316 Stainless Steel) LCC	-29 to 427 -29 to 593 -198 to 593 -46 to 343	-20 to 800 -20 to 1100 -325 to 1000 -50 to 650	
Cage, Seat Ring, and Valve Plug		See tables 2 and 3	See figures 6 and 7		
Soft Metal Seat (with trim 233 in EUT-2 and EWT-2 valves only)		CF8M	See figures 6 and 7		
Valve Stem		S20910 SST	Not a Limiting Factor		
Valve-to-Bonnet Bolting	WCC Valve	SA-193-B7 Studs	-29 to 427	-20 to 800	
		SA-194-2H Nuts			
	LCC Valve	SA-193-B7 Studs	-46 to 343	-50 to 650	
		SA-194-2H Nuts			
	WC9 Valve	SA-193-B7 Studs	-29 to 427	-20 to 800	
		SA-194-2H Nuts			
	CF8M Valve	S20910 CrCt Studs	-198 to 538	-325 to 1000	
		S20910 Nuts			
		B8M Class 2 studs	-198 to 427	-325 to 800	
		8M nuts			
SA-193-B7 Studs		-29 to 427	-20 to 800		
SA-194-2H Nuts					
Seat Ring Cap Screws		S17400 N07718	-29 to 354 -198 to 593	-20 to 700 -325 to 1100	
Bonnet, Seat Ring, and Cage Gaskets		N06600/Graphite	Oxidizing	-198 to 427	-325 to 800
			Non-Oxidizing	-198 to 593	-325 to 1100
EUD and EWD Piston Ring or Lower Graphite Piston Ring (254 mm [10 inch] port only)		Graphite (Fisher Designation FMS 17F27)	Oxidizing	-198 to 427	-325 to 800
			Non-Oxidizing	-198 to 482	-325 to 900
		Graphite (Fisher Designation FMS 17F39)	Oxidizing	-198 to 538	-325 to 1000
			Non-Oxidizing	-198 to 593	-325 to 1100
EUD and EWD Bore Seal		N07718	-198 to 593	-325 to 1100	
EUT-2 and EWT-2 Seat Ring Seal Ring and Plug Seal Ring		N10276/Glass and Moly-Filled PTFE	-73 to 232	-100 to 450	
EUT and EWT valves with PEEK anti-extrusion rings	Backup ring	S41000	Not a Limiting Factor	Not a Limiting Factor	
		S31600			
	Retaining ring	18-8			
	Seal ring	PTFE/graphite with N10276 spring	232 to 316	450 to 600	
For applications using a lower metal piston ring	Lower metal piston ring	Iron / N07750	-73 to 427	-100 to 800	
Packing (Temperatures shown are in-body temperatures with plain bonnet.)		PTFE V-Ring		-46 to 232	-50 to 450
		PTFE Composition		-46 to 232	-50 to 450
		Graphite Ribbon/Filament	Oxidizing	-198 to 354	-325 to 700
			Non-Oxidizing	-198 to 538	-325 to 1000
Packing Flange, Studs, and Nuts		Steel		-29 to 427	-20 to 800
		S31600 (316 Stainless Steel)		-198 to 593	-325 to 1100
Packing Follower, Spring (PTFE V-Ring Packing), or Lantern Ring		S31600	Not a Limiting Factor		
Packing Box Ring		S17400	-101 to 427	-150 to 800	
		S31600	-198 to 593	-325 to 1100	

Table 2. Typical Combinations of Metal Trim Materials for All Valves Except Those with WhisperFlo Trim⁽¹⁾

Valve Design	Trim Designation	Valve Plug	Seat Ring	Cage	Seat Ring Cap Screws	Temperature
EUT-2, EWT-2	231 ⁽²⁾	CA6NM HT	CB7CU-1 H1075	CB7CU-1 H1075	---	See figure 6
	232 ⁽³⁾	CF8M with CoCr-A on Seat and Guide	CF8M with CoCr-A on seat	CF8M ENC	---	
EUD, EWD	226	CA6NM	CB7CU-1 H1075	CB7CU-1 H1075	S17400 H1100	See figure 7
	227A	WC9 Steel with CoCr-A on Seat and Guide	CF8M with CoCr-A on seat	WC9 Nitrided	N07718	
	229 ⁽³⁾	CF8M with CoCr-A on Seat and Guide	CF8M with CoCr-A on seat	CF8M ENC	N07718	
EUT, EWT	229H ⁽³⁾	CF8M with CoCr-A on Seat and Guide	CF8M with CoCr-A on seat	CF8M Chrome-Coated	N07718	See figure 7
	231	CA6NM HT	CB7CU-1 H1075	CB7CU-1 H1075	S17400 H1100	
	232 ⁽³⁾	CF8M with CoCr-A on Seat and Guide	CF8M with CoCr-A on seat	CF8M ENC	N07718	

1. For WhisperFlo trims, see table 3.
2. Cavitrol III cage is standard with trim 231
3. NACE MR0175 approved trim materials.

Table 3. WhisperFlo Metal Trim Materials and Valve Body/Trim Temperature Capabilities

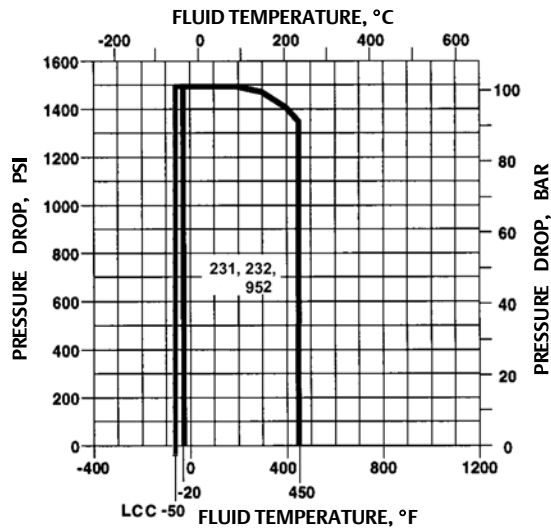
Valve Design	Trim Designation	Valve Plug	Seat Ring	Cage	Seat Ring Cap Screws	Temperature
EUT-2, EWT-2	952	CA6NM HT	CF8M with CoCr-A on seat	410 SST/ ENC/Ultimet	---	See figure 6
	953 ⁽¹⁾	CF8M with CoCr-A on Seat and Guide	CF8M with CoCr-A on seat	316L SST/ ENC/Ultimet	---	
EUD, EWD	950	CA6NM HT	CF8M with CoCr-A on seat	410 SST/ ENC/Ultimet	N07718	See figure 7
	951 ⁽¹⁾	CF8M with CoCr-A on Seat and Guide	CF8M with CoCr-A on seat	316L SST/ ENC/Ultimet	N07718	
EUT, EWT	952	CA6NM HT	CF8M with CoCr-A on seat	410 SST/ ENC/Ultimet	N07718	See figure 7
	953 ⁽¹⁾	CF8M with CoCr-A on Seat and Guide	CF8M with CoCr-A on seat	316L SST/ ENC/Ultimet	N07718	

1. NACE MR0175 approved trim materials.

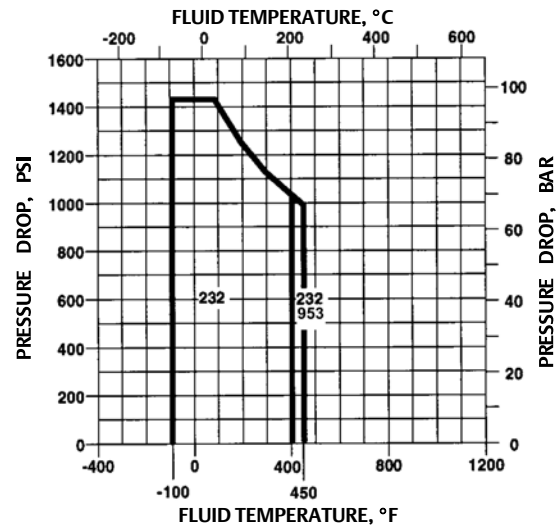
Table 4. Bore Seal Availability and Temperature Capabilities (EUD/EWD only)

Valve Design	Valve Size, NPS	Trim Designation	Temperature	ANSI/FCI/IEC Shutoff Class
EUD and EWD	16, 20x16, 24x16, 20, 24x20	226	See figure 7	V
		227A		
		950		

Figure 6. Temperature and Pressure Drops for Typical Trim Used in Fisher EUT-2 and EWT-2 Valves



FOR STANDARD METAL SEATING WITH CL600 \triangleleft
WCC/LCC STEEL BODY



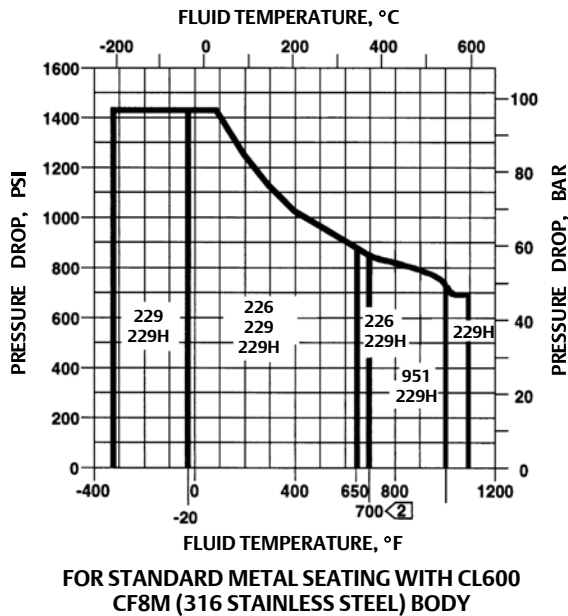
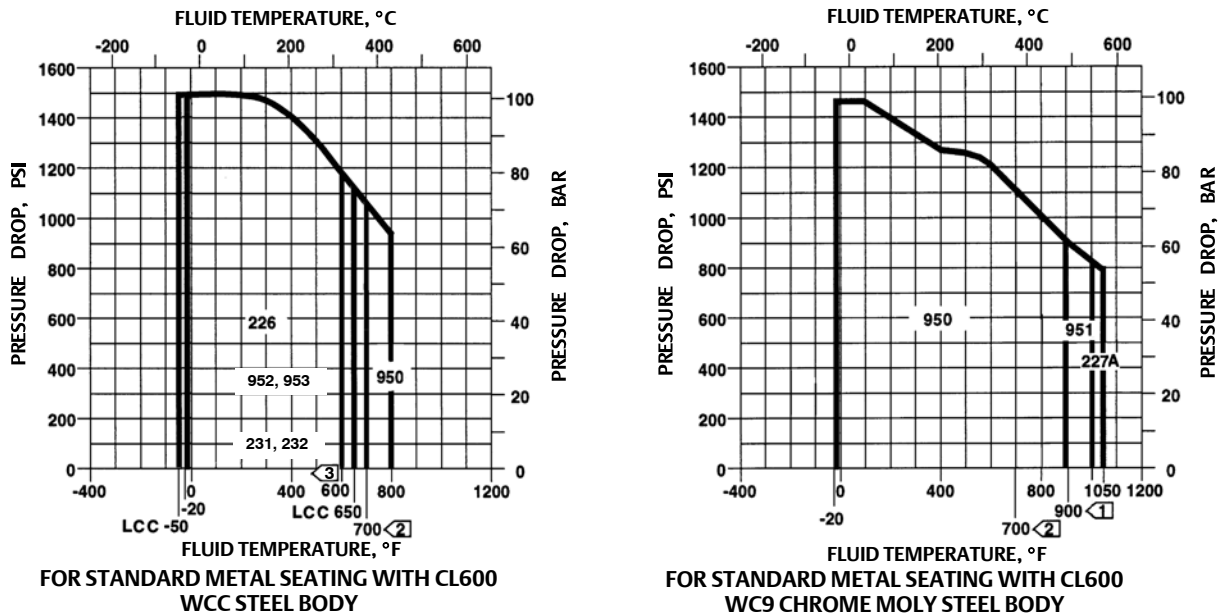
FOR STANDARD METAL SEATING WITH CL600 \triangleleft
CF8M (316 STAINLESS STEEL) BODY

MC140-1/AR.1
A6890

Notes:

\triangleleft Do not exceed the maximum pressure and temperature for the class rating of the body material used, even though the trims shown may have higher capabilities.

Figure 7. Temperature and Pressure Drops for Typical Trim Used in Fisher EUD, EWD, EUT, and EWT Valves



MC140-2/AR 1
A6891

Notes:

- ① 482°C (900°F) limit -- WCC steel valve plug
- ② 371°C (700°F) limit -- S17400 seat ring bolting
- ③ 316°C (600°F) limit -- EUT and EWT valves with 231, 232, 952, and 953 trims

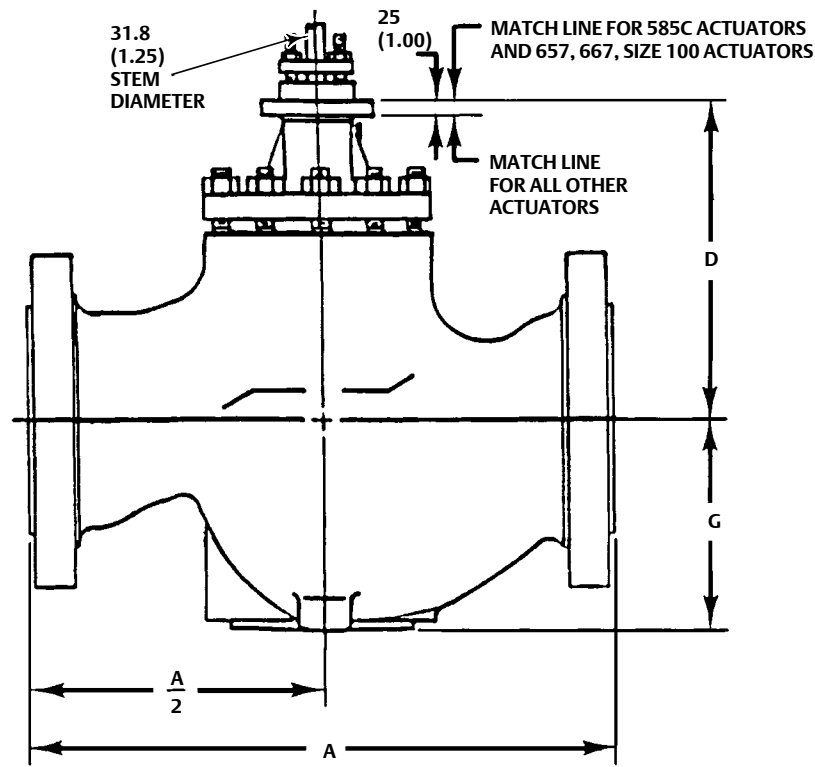
Do not exceed the maximum pressure and temperature for the class rating of the body material used, even though the trims shown may have higher capabilities.

Table 5. Dimensions and Approximate Weights

END CONNECTION		APPROXIMATE WEIGHT (LONG-NECK VALVE ⁽²⁾)		DIMENSION															
				A						G		Standard Plain Bonnet (Style 1 Extension)							
				CL150		CL300		CL600				Short-Neck Valve ⁽²⁾				Long-Neck Valve ⁽²⁾			
				mm	Inch	mm	Inch	mm	Inch			D		Max. Travel		D		Max. Travel	
Size, NPS	Type ⁽¹⁾	Kg	Lb	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch		
16	RF	2540	5600	1016	40.00	1057	41.62	1108	43.62	437	17.19	663	26.12	127	5.00	816	32.12	226	8.88
	RTJ			1026	40.38	1073	42.25	1111	43.75										
	BW			---	---	---	---	1108	43.62										
20 × 16	RF	3540	7800	1267	49.88	1308	51.50	1372	54.00	487	19.19	706	27.81	226	8.88	859	33.81	276	10.88
	RTJ			1276	50.25	1327	52.25	1378	54.25										
	BW			---	---	---	---	1372	54.00										
20	RF	5220	11500	1267	49.88	1308	51.50	1372	54.00	514	20.25	917	36.12	276	10.88	1121	44.12	378	14.88
	RTJ			---	---	---	---	---	---										
	BW			4810	10600	---	---	---	---										
24 × 16	RF	5220	11500	1556	61.25	1600	63.00	1676	66.00	526	20.69	816	32.12	226	8.88	1121	44.12	378	14.88
	RTJ			1565	61.62	1623	63.88	1686	66.38										
	BW			4630	10200	---	---	---	---										
24 × 20	RF	7710	17000	1556	61.25	1600	63.00	1676	66.00	565	22.25	917	36.12	276	10.88	1121	44.12	378	14.88
	RTJ			1565	61.62	1623	63.88	1686	66.38										
	BW			7120	15700	---	---	---	---										

1. RF--raised face; RTJ--ring-type joint; BW--butt-welding.
2. For longer travels, the neck of the valve (the portion of the valve body that supports the bonnet) is longer to accommodate the travel. The longer neck increases the D dimension.

Figure 8. Dimensions and Approximate Weights (also see table 5)



A6068

Table 6. Port Diameters for Fisher EUT-2 and EWT-2 CL 150 through CL600 Valves

Valve Size, NPS	TRIM	PORT DIAMETER	
		mm	Inches
16	Cast cages ⁽¹⁾ , WhisperFlo, and Cav III	374.7	14.75
	Whisper Trim III A, B, and C	412.8	16.25
	Whisper Trim III D	355.6	14.00
20 × 16	Cast cages ⁽¹⁾ , WhisperFlo, and Cav III	374.7	14.75
	Drilled cages ⁽¹⁾ and Whisper Trim III A, B, and C	412.8	16.25
	Whisper Trim III D	355.6	14.00
24 × 16	Cast cages ⁽¹⁾ , WhisperFlo, and Cav III	374.7	14.75
	Drilled cages ⁽¹⁾ and Whisper Trim III A, B, and C	412.8	16.25
	Whisper Trim III D	355.6	14.00
20	WhisperFlo and Cav III	463.6	18.25
	Drilled cages ⁽¹⁾ and Whisper Trim III A, B, and C	501.7	19.75
	Whisper Trim III D	431.8	17.00
24 × 20	WhisperFlo and Cav III	463.6	18.25
	Drilled cages ⁽¹⁾ and Whisper Trim III A, B, and C	501.7	19.75
	Whisper Trim III D	431.8	17.00

1. Linear or equal percentage.

Table 7. Port Diameters for Fisher EUD, EWD, EUT and EWT CL 150 through CL600 Valves

Valve Size, NPS	TRIM	PORT DIAMETER	
		mm	Inches
16	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cav III	374.7	14.75
	Whisper Trim III D	355.6	14.00
20 × 16	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cav III	374.7	14.75
	Whisper Trim III D	355.6	14.00
24 × 16	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cav III	374.7	14.75
	Whisper Trim III D	355.6	14.00
20	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cav III	463.6	18.25
	Whisper Trim III D	431.8	17.00
24 × 20	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cav III	463.6	18.25
	Whisper Trim III D	431.8	17.00

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