

# Fisher® Large ET and ED Valves NPS 12 through 16 and NPS 30

Fisher NPS 12 through 16 and NPS 30 CL150 through CL600 ET and ED control valves are used for either throttling or on-off control of a wide variety of liquids and gasses.

ET valves with a hanging cage are available for demanding applications in oil and natural gas up to 232°C (450° F). The hanging cage, with the seat ring threaded into the cage, provides the valve with easy-maintenance trim. The seal between the plug and cage and the seal between the seat ring and body are spring-loaded PTFE. The spring-loaded PTFE seal configuration can provide Class V shutoff per ANSI/FCI 70-2 and IEC 60534-4. The temperature range can be extended to 316°C (600° F) for non-oxidizing service and to 260°C (500° F) for oxidizing service by using PEEK (Poly Ether Ether Ketone) anti-extrusion rings in combination with the spring-loaded PTFE seals.

ED valves utilize a hanging cage and a seat ring that is bolted into the body. These valves have two graphite piston rings between the cage and plug. They are used for high temperature applications between 316°C (600° F) and 593°C (1100° F) with a Class IV standard shutoff. Shutoff can be improved to Class V by using the Bore seal trim.

To help reduce aerodynamic noise in gas service, Whisper Trim™ III and WhisperFlo™ cages are available. Cavitrol™ III cages are available to eliminate the effects of liquid cavitation damage and DST, Dirty Service Trim, is available for cavitating liquid with particulates.

## 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.



W9156-1

Fisher NPS 24 Valve Assembly with Piston Actuator

- **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.



**Specifications**

**Valve Sizes**

■ NPS 12, ■ 14, ■ 16, and ■ 30

**End Connection Styles**

**Flanged:** CL150, 300, and 600 raised-face or ring-type joint flanges per ASME B16.5. NPS 30 valve size has series A flanges as standard, per ASME B16.47

**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<sup>(1)</sup>**

**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<sup>(1)</sup>**

See tables 3, 4, and 5

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

**ET with Metal Seats**

*Standard:* Class V

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

**ED with Metal Seats**

*Standard:* Class IV

*Optional:* Class V

**ET for Cryogenic**

*Standard:* Class IV

**Construction Materials**

**Valve Body and Bonnet:** ■ WCC steel, ■ LCC steel, ■ WC9 alloy steel, ■ C12A alloy steel, or ■ CF8M stainless steel. For other materials, consult your Emerson Process Management sales office

**Trim and Other Parts:** See table 3

**Flow Characteristics**

**Standard Cages:** ■ Linear or ■ equal percentage

**Whisper Trim III and WhisperFlo Cages:** Linear

**Cavitrol III 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 and WhisperFlo Cages:** Up

**Flow Coefficients**

See Fisher Catalog 12

**Port Diameters**

See tables 1 and 2

**Valve Plug Travel**

102 through 432 mm (4 to 19-7/8 inches).

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

**Yoke Boss and Stem Diameters**

■ 127 mm (5H-inch) diameter yoke boss, with 31.8 mm (1.25 inch) diameter valve stem for all valves except NPS 30

■ 179 mm (7-inch) diameter yoke boss, with 50.8 mm (2 inch) diameter valve stem for NPS 30 valve

**Typical Bonnet Style**

**Standard:** Style 1 extension

**Optional:** Style 3 extension

**Approximate Weights**

See figure 4

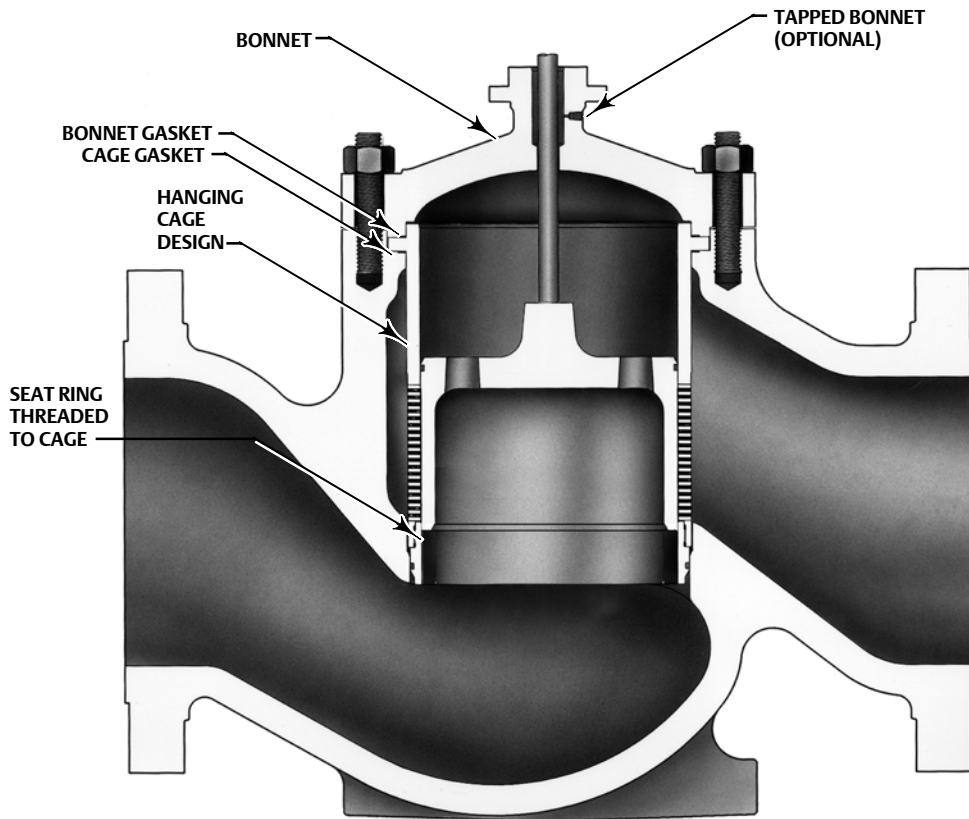
1. The pressure/temperature limits in this bulletin and any applicable standard or code limitation for valve should not be exceeded.

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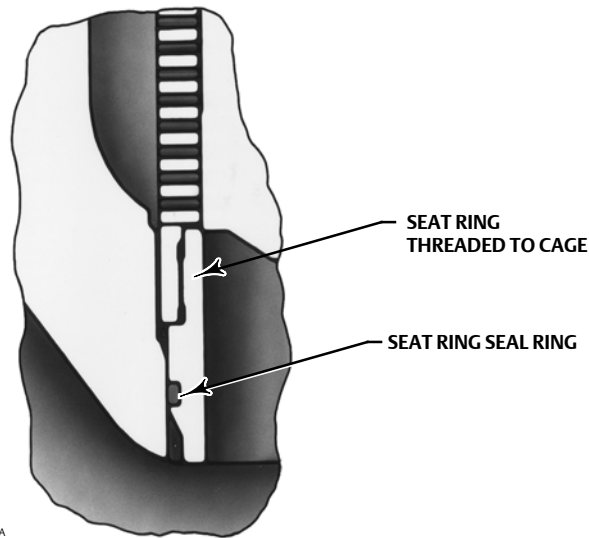
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Figure 1. Typical Fisher Large ET Valve



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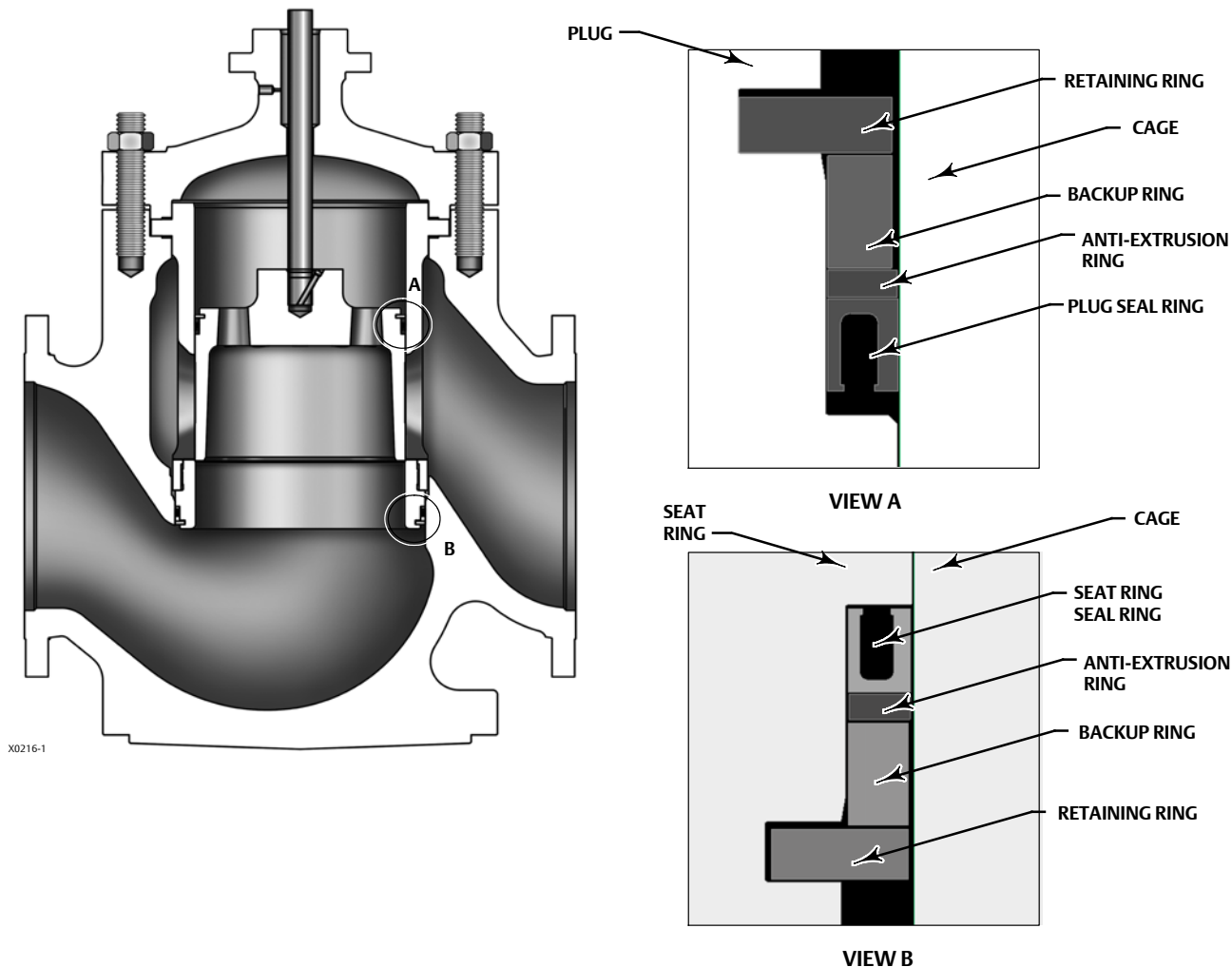
COMPLETE VALVE



W6089-1A

SEAT RING SEAL DETAIL

**Figure 2. Typical Fisher Large ET Valve with HTS1 Option**



**Table 1. Port Diameters for Fisher ET CL150 through CL600 Valves**

VALVE SIZE, NPS	TRIM	PORT DIAMETER	
		mm	Inches
12	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cavitrol III	279.4	11.00
	Whisper Trim III D	254	10.00
14	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cavitrol III	279.4	11.00
	Whisper Trim III D	254	10.00
16	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cavitrol III	279.4	11.00
	Whisper Trim III D	254	10.00
30	Whisper Trim III Levels A, B, and C	660.4	26.00
	Whisper Trim III D, WhisperFlo, Linear, Equal %	609.6	24.00

1. Linear or equal percentage.

Figure 3. Typical Fisher Large ED Valve

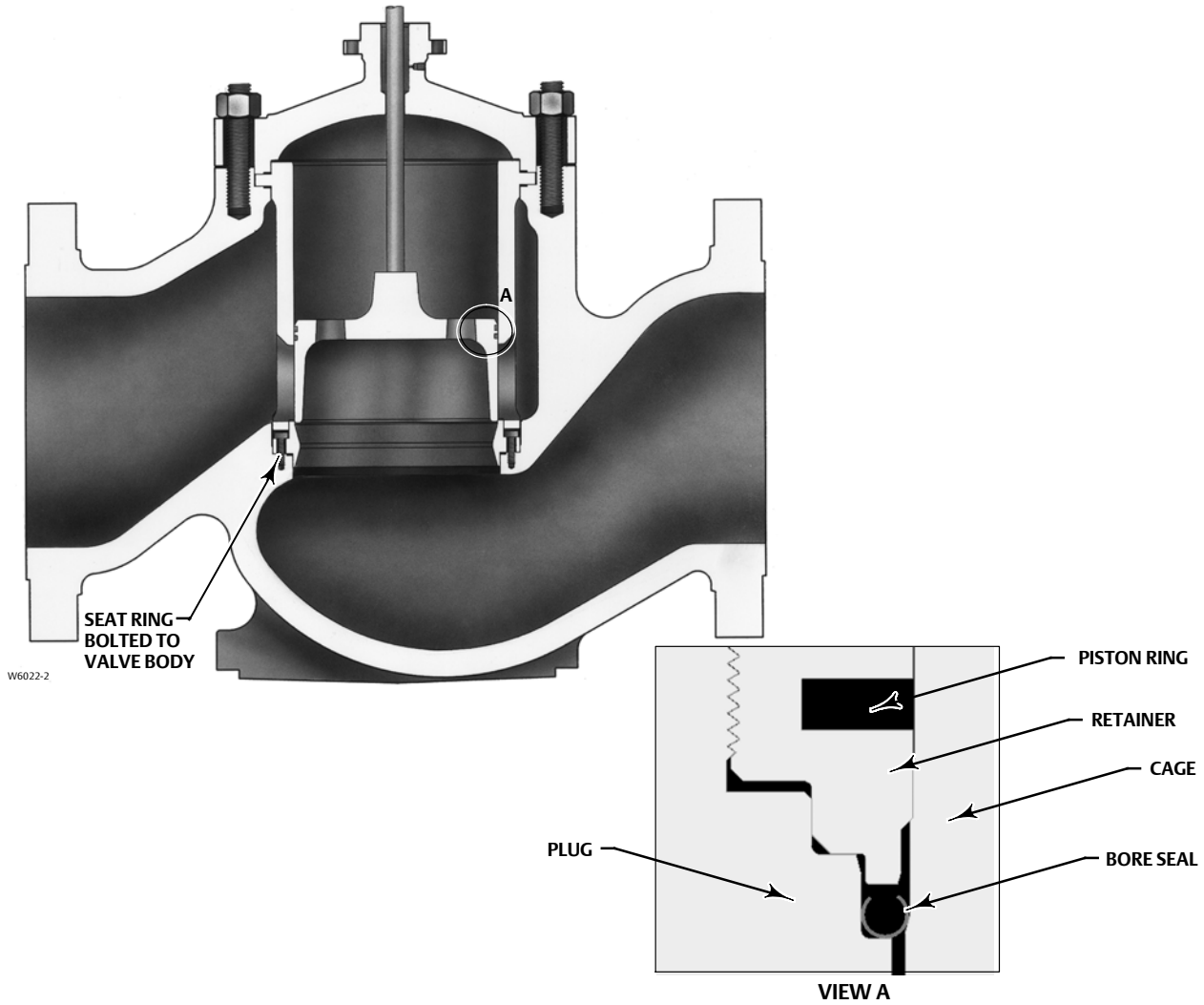


Table 2. Port Diameters for Fisher ED CL150 through CL600 Valves

VALVE SIZE, NPS	TRIM	PORT DIAMETER	
		mm	Inches
12	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cavitrol III	279.4	11.00
	Whisper Trim III D	254	10.00
14	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cavitrol III	279.4	11.00
	Whisper Trim III D	254	10.00
16	Linear; Equal Percentage; Whisper Trim III A, B, and C; WhisperFlo; and Cavitrol III	279.4	11.00
	Whisper Trim III D	254	10.00
30	All	609.6	24.00

**Table 3. Construction Materials**

PART		MATERIAL	TEMPERATURE		
			°C	°F	
Valve Body and Bonnet		WCC Steel WC9 Alloy Steel <sup>(2)</sup> CF8M Stainless Steel LCC Steel C12A Alloy Steel	-29 to 427 -29 to 593 -198 to 593 -46 to 343 -29 to 649	-20 to 800 <sup>(3)</sup> -20 to 1100 -325 to 1000 <sup>(1)</sup> -50 to 650 -20 to 1200	
Cage, Seat Ring, and Valve Plug		See tables 4 and 5	See table 4 and 5		
Valve Stem		S20910	Not a Limiting Factor		
Valve Body-to-Bonnet Bolting	WCC Valve	SA-193-B7 Studs SA-194-2H Nuts	-29 to 427	-20 to 800	
	LCC Valve	SA-193-B7 Studs SA-194-2H Nuts	-46 to 343	-50 to 650	
	WC9 Valve	SA-193-B7 Studs SA-194-2H Nuts	-29 to 427	-20 to 800	
		SA-193-B16 Studs SA-194-7 Nuts	-29 to 566	-20 to 1050	
	C12A Valve	N07718 HT Studs N07718 HT Chrome Coat Nuts	-29 to 621	-20 to 1150	
	CF8M Valve	SA479 S20910 Chrome Coat Studs SA479 S20910 Nuts	-198 to 538	-325 to 1000	
SA-193-B8M Class 2 Studs SA-194-8M Nuts		-198 to 427	-325 to 800		
Seat Ring Cap Screws		N07718	-198 to 593	-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
ED 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
ED Bore Seal		N07718	-198 to 593	-325 to 1100	
ET Seat Ring Seal Ring and Plug Seal Ring		Glass and Moly-Filled PTFE with N10276 spring	-73 to 232	-100 to 450	
ET valves with HTS1 option	Anti-extrusion Ring	PEEK (poly ether ether ketone)	Not a Limiting Factor	Not a Limiting Factor	
	Backup Ring	S41000			
		S31600			
	Retaining Ring	18-8			
Seat Ring Seal Ring Plug seal ring	PTFE/graphite with R30003 spring	232 to 316	450 to 600		
Cryogenic seal Ring		UHMWPE	-198 to 66	-325 to 150	
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	-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	

1. May be used up to 1100°F if manufacturing controls carbon content to 0.04% minimum or 0.08% maximum.  
 2. Flanged valve bodies are limited to 427°C (800°F).  
 3. Limited to 354°C (700°F) in flanged valve bodies.

Table 4. Standard, Whisper Trim III, and Cavitrol III Trim Descriptions

VALVE	TRIM DESIGNATION	BODY MATERIAL	VALVE PLUG	SEAT RING	CAGE	CAP SCREWS	TEMPERATURE LIMIT	
							°C	°F
ED	40	WCC/WC9	CA6NM (modified 410 SST)	CB7CU-1 H1075	CB7CU-1 H1075	N07718	-29 to 427	-20 to 800
		LCC					-46 to 343	-50 to 650
	41	WCC	WC9 Steel with CoCr-A	WC9 Steel with CoCr-A	WC9 - Nitrided	N07718	-29 to 427	-20 to 800
		LCC					-46 to 343	-50 to 650
		WC9	WC9 Steel with CoCr-A	WC9 Steel with CoCr-A	WC9 - Nitrided	N07718	-29 to 566	-20 to 1050
		C12A					-29 to 593	-20 to 1100
	42	C12A	F91 with CoCr-A	F91 with CoCr-A	F91 - Nitrided	N07718	-29 to 621	-20 to 1150
	43(1)	WCC/WC9	CF8M with CoCr-A on seat & guide	CF8M with CoCr-A seat	CF8M Chrome Plate	N07718	-29 to 343	-20 to 650
		LCC					-46 to 343	-50 to 650
		CF8M					-73 to 343	-100 to 650
44(1)	CF8M	CF8M with CoCr-A on seat & guide	CF8M with CoCr-A seat	CF8M Chrome-Coated	N07718	-73 to 538(2)	-100 to 1000(2)	
ET	45	WCC/WC9	CA6NM HT	CB7CU-1 H1075	CB7CU-1 H1075	---	-29 to 316	-20 to 600
		LCC					-46 to 316	-50 to 600
		CF8M					-46 to 316	-50 to 600
	46	WCC/WC9	CF8M with CoCr-A on seat & guide	CF8M with CoCr-A seat	CF8M Chrome Plate	---	-29 to 316	-20 to 600
		LCC					-46 to 316	-50 to 600
		CF8M					-73 to 316	-100 to 600
	47(3)	WCC/WC9	CF8M with CoCr-A on seat & guide	CF8M with CoCr-A seat	CB7CU-1 DBL H1150	---	-29 to 93	-20 to 200
		LCC					-46 to 93	-50 to 200
	48(1)	CF8M	CF8M with CoCr-A on seat & guide	CF8M	CF8M Chrome-Coated	---	-198 to 66	-325 to 150

1. NACE MR0175-2002, MR0175, ISO 15156, and MR0103 approved trim combinations. Environmental restrictions apply to MR0175/ISO15156.  
2. May be used up to 593°C (1100°F) if 316H valve body material is used. Contact your Emerson Process Management sales office for additional information.  
3. NACE MR0175-2002 approved trim combination.

Table 5. WhisperFlo Trim Descriptions

VALVE	TRIM DESIGNATION	BODY MATERIAL	VALVE PLUG	SEAT RING	CAGE	CAP SCREWS	TEMPERATURE LIMIT	
							°C	°F
ED	954	WCC	CA6NM	WC9 with CoCr-A seat	S41000/ ENC/Ult	N07718	-29 to 427	-20 to 800
		WC9					-29 to 482	-20 to 900
	951(1)	WCC	CF8M with CoCr-A on seat & guide	CF8M with CoCr-A seat	S31600/ ENC/Ult	N07718	-29 to 427	-20 to 800
		WC9					-29 to 566	-20 to 1050
		CF8M(2)					-29 to 593	-20 to 1100
ET	955	WCC/WC9	CA6NM	S17400 H1075	S41000/ ENC/Ult	---	-29 to 316	-20 to 600
ET	953(1)	WCC/WC9	CF8M with CoCr-A on seat & guide	CF8M with CoCr-A seat	S31600/ ENC/Ult	---	-29 to 316	-20 to 600
		CF8M					-29 to 316	-20 to 600

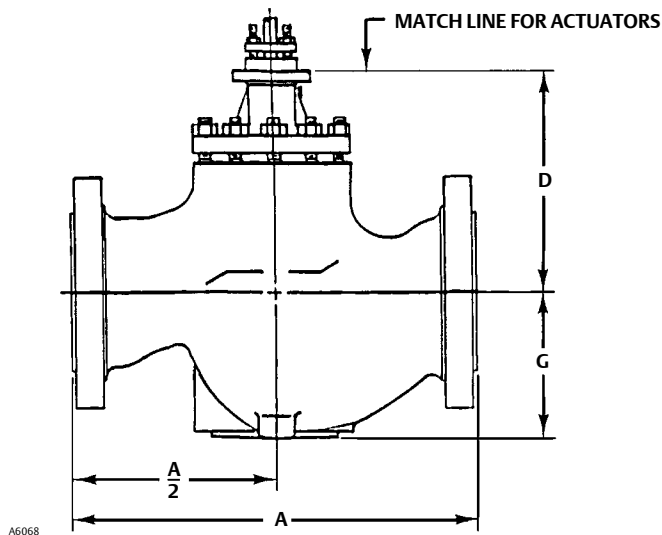
1. NACE approved trim combinations. Environmental restrictions apply to MR0175/ISO15156.  
2. May be used up to 593°C (1100°F) if 316H valve body material is used. Contact your Emerson Process Management sales office for additional information.

**Table 6. Dimensions and Approximate Weights**

END CONNECTION		APPROXIMATE WEIGHT (LONG-NECK VALVE <sup>(2)</sup> )		DIMENSION															
				A						G		Standard Plain Bonnet							
				CL150		CL300		CL600				Short-Neck Valve				Long-Neck Valve			
				mm	Inch	mm	Inch	mm	Inch			D		Max. Travel		D		Max. Travel	
Size, NPS	Type <sup>(1)</sup>	Kg	Lb	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
12	RF	1410	3100	737	29.00	775	30.50	819	32.25	338	13.31	592	23.32	140	5.5	745	29.32	203	8
	RTJ			746	29.38	790	31.12	822	32.38										
	BW			---	---	---	---	819	32.25										
14	RF	1565	3450	889	35	927	36.5	972	38.25	379	14.92	561	22.07	140	5.5	713	28.06	203	8
	RTJ			---	---	---	---	---	---										
	BW			1340	2950	---	---	---	---										
16	RF	1720	3800	1016	40.00	1057	41.62	1108	43.62	389	15.31	561	22.07	140	5.5	713	28.06	203	8
	RTJ			1026	40.38	1073	42.25	1111	43.75										
	BW			1450	3200	---	---	---	---										
30	Class 300 RF	6690	14750	2134	84.00	2134	84.00	---	---	673	26.5	1134	44.64	372	14.63	1401	55.14	504	19.84
	Class 600 RF	13600	30000	---	---	---	---	2210	87.00	699	27.5	1134	44.64	372	14.63	1401	55.14	504	19.84

1. RF--raised face; RTJ--ring-type joint; BW--buttwelding.

**Figure 4. Dimensions and Approximate Weights (also see table 6)**



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