

Fisher™ EWN Series Control Valve

Fisher EWN Series valves are available only with Whisper Trim™ III cages (figures 1 and 2) and are used on compressible fluid applications (including sour service) requiring maximum noise attenuation capability coupled with high capacity. As members of the versatile easy-e™ family of industrial control valves, these valves share the following characteristics: single ports, multiple trim material choices, and the interchangeability of trim parts that permits reconfiguring the valve body to a different design variation.

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

Features

- **Noise Attenuation**—A Whisper Trim III cage used in an EWN Series valve body can reduce noise produced by high flow rates and large pressure drops up to 30 decibels below the normal valve noise level.
- **Piping Economy**—Expanded end connections of EWN Series valve bodies reduce the need for line swages while accommodating oversized piping arrangements used to limit fluid flow velocities.
- **Temperature Compensation**—The hanging cage design (figure 1 or 2) reduces gasketing problems caused by thermal expansion and contraction of long parts such as the cage assembly.
- **Full Rated Inlet Pressure Capability**—Design of standard body-to-bonnet bolting allows inlet pressures equal to full rating: no derating required.



W3310

Fisher EWNT-2, NPS 12x8 Valve
with Typical Actuator

Specifications

Valve Body Sizes

See table 1

End Connection Styles

Flanged Ends: Styles per ASME B16.5 are CL300, 600, or 900 ■ raised-face or ■ ring-type joint
Buttwelding Ends: Standard styles per ASME B16.25 are Schedule ■ 40 or ■ 80 for all CL300 and 600 valves or Schedule ■ 80, ■ 100, or ■ 120 for all CL900 valves; optional styles are available

Maximum Inlet Pressures and Temperatures⁽¹⁾

Consistent with applicable ■ CL300, ■ 600, or ■ 900 pressure/temperature ratings per ASME B16.34, unless limited by the individual pressure/temperature capabilities in figure 3 or 4 or temperature capabilities in table 4

Maximum Pressure Drop⁽¹⁾

0.999 $\Delta P/P_1$ maximum for levels A1 through D3.

Shutoff Classifications

See table 2

Construction Materials

Body and Bonnet: ■ WCC steel, ■ WC6 or ■ WC9 chrome moly steel, or ■ CF8M
Trim Parts: See table 3.
Other Parts: See table 4

Material Temperature Capabilities⁽¹⁾

Valve Body-Trim Combinations: See figure 3 or 4.
Other Parts: See table 4

Whisper Trim Flow Characteristic

NPS 8x6 Valve:
Cage Level A, B, or C: Linear

Cage Level D: Equal percentage for first 38.1 mm (1.5 inches) of travel, then linear
NPS 12 x 8 Valve: Linear

Whisper Trim Flow Direction

Up through the valve body seat ring and out through the cage (figure 2)

Flow Coefficients and Noise Level Prediction

See Fisher Catalog 12

Port Diameters and Valve Plug Travels

See table 1

Yoke Boss and Stem Diameters

See table 5

Typical Bonnet Styles

Plain: Available with all valves
Style 1 Extension: Available with CL300 or 600 valves. Standard for NPS 12x8 CL900 valves

Approximate Weights

See figures 5 and 6

Options

- Lubricator ■ lubricator/isolating valve
- drilled and tapped connection in extension bonnet for leakoff service ■ valve body drain plug
- style 3 fabricated extension bonnet made on order to a specific length for cryogenic service ■ packings suitable for nuclear service ■ valve body and bonnet in castable alloys other than those given in the construction materials specification, and ■ forged bonnet for 127 mm (5-inch) yoke boss on CL900 NPS 8x6 valve body

1. The pressure/temperature limits in this bulletin and any applicable standard or code limitation for valve should not be exceeded.
 2. Limitation based on excessive noise if max $\Delta P/P_1$ ratio for a given cage level is exceeded.

Available Configurations

All valve body designs covered in this bulletin have single ports, balanced push-down-to-close valve plugs, a choice of eight different Whisper Trim III cage levels (A1, A3, B1, B3, C1, C3, D1, or D3), and metal-to-metal seating. In this series, the EW designates expanded end connections, and the N designates an extended upper valve body cavity that permits full utilization of a long-travel cage without requiring a bonnet spacer. This valve body is combined with different plug styles and either a seat ring threaded into the valve body (-1 suffix) or a seat ring threaded into the cage (-2 suffix) to result in the following configurations:

EWND-1: EWN Series valve body with graphite piston ring(s) on the valve plug (see table 2) and with the seat ring threaded into the valve body (figure 1), for all general applications over a wide range of pressure drops and temperatures.

EWNT-1: EWN Series valve body with spring-loaded seal ring and seat ring threaded into the valve body, for more stringent shutoff requirements up to 232°C (450°F).

EWNT-2: EWN Series valve body with spring-loaded seal rings on both the seat ring and valve plug and with the seat ring threaded into the cage (figure 2), for more stringent shutoff requirements up to 232°C (450°F).

Material Selection Guidelines

1. Select the body/bonnet material from the specifications table and the shutoff classification from table 2, keeping in mind that the valve service conditions cannot exceed the ASME pressure/temperature limitations for the selected valve body.
2. Choose a trim combination for the service conditions according to figure 3 or 4, while making sure from table 3 that this combination provides the desired trim materials.
3. Finally, check in table 4 that packing and other valve parts also are available in materials that meet the desired service conditions.

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Table 1. Valve Body Sizes, Valve Plug Travels, Port Diameters, and Unbalance Area

VALVE		PRESSURE RATING	VALVE PLUG TRAVEL		PORT DIAMETER		UNBALANCE AREA Inch ²
Design	Size, NPS ⁽¹⁾		mm	Inch	mm	Inch	
EWND-1/ EWNT-1	8 x 6	CL900	127 ⁽²⁾	5 ⁽²⁾	136	5.375	0.63
	12 x 8	CL300, 600, or 900	203	8	197 ⁽³⁾	7.75 ⁽³⁾	4.33
	172 ⁽⁴⁾				6.75 ⁽⁴⁾	3.79	
EWNT-2	12 x 8	CL300, 600, or 900	203	8	197 ⁽³⁾	7.75 ⁽³⁾	4.33
					172 ⁽⁴⁾	6.75 ⁽⁴⁾	3.79

1. End connection x trim size
2. Restricted to 114 mm (4.5 inch) with 3 piston rings for optional Class IV shutoff.
3. Level A, B, or C cages.
4. Level D cages.

Figure 1. Fisher EWND-1, NPS 8x6 Trim Detail With Seat Ring Threaded Into the Valve Body (Also Typical of NPS 12 x 8)

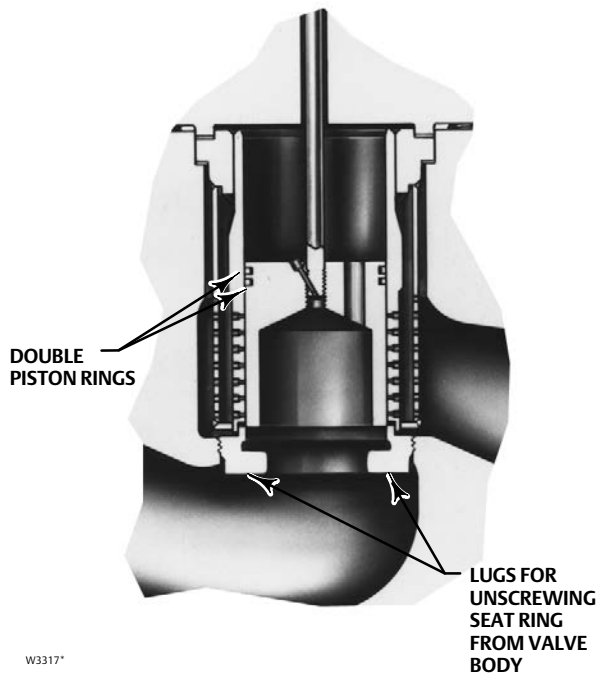


Figure 2. Fisher EWNT-2, NPS 12x8 Valve with Seat Ring Threaded Into the Cage

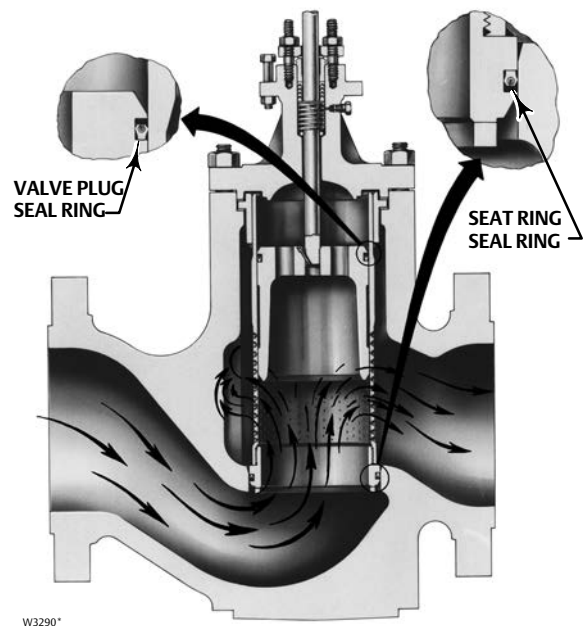


Table 2. Shutoff Classifications per ANSI/FCI 70-2 and IEC 60534-4

Valve Design	Shutoff Class	Max Leakage ⁽¹⁾	Fisher Test Fluid
EWND-1	III (standard for NPS 8x6 valve with 2 piston rings and NPS 12x8 valve)	0.1% of valve capacity at full travel	Air at service ΔP or 3.4 bar (50 psi) drop, whichever is lower, and between 10 and 52°C (50 and 125°F)
	IV (optional for NPS 8x6 valve with 3 piston rings and restricted travel ⁽²⁾ , and for NPS 12x8 valve)	0.01% of valve capacity at full travel	
EWNT-1/EWNT-2	IV	0.01% of valve capacity at full travel	

1. Based on capacity obtained with level A cage.
2. 4.5 inch travel.

Table 3. Metal Trim Part Combinations⁽¹⁾

Trim Designation	Valve Plug	Cage	Baffle (for Level D Cages Only)	Seat Ring
I	CA6NM ⁽²⁾	S17400 with H1025 heat-treat condition	Steel	CA6NM
II and IV	S31600 with seat and guide hard-faced with CoCr-A (Alloy 6)	S17400 with H1025 heat-treat condition	Steel ⁽³⁾	S31600 with seat hard-faced with CoCr-A
III (available only in NPS 8x6 valve)	S41600	S17400 with H1025 heat-treat condition	Steel	S31600 with seat hard-faced with CoCr-A
V ⁽⁴⁾ and VI ⁽⁴⁾	S31600 with seat and guide hard-faced with CoCr-A	S17400 with H1150 heat-treat condition	Steel	S31600 with seat hard-faced with CoCr-A

1. Does not include seat ring seal ring or valve plug piston ring, seal ring, retaining ring, or backup ring; these parts covered in table 5.
2. CA6NM is similar to S41000.
3. 18-8 SST is optional baffle material for this trim.
4. Materials in this trim are listed in NACE MR0175-2002 as being acceptable for direct exposure to sour service when used under conditions stated in that standard.

Table 4. Materials and Temperature Limits for Other Parts

PART			MATERIAL		MATERIAL TEMPERATURE CAPABILITIES	
					Minimum	Maximum
Body-to-bonnet bolting	WCC, WC6, or WC9 body and bonnet	Sour service	Studs	SA-193-B7M steel	-29°C (-20°F)	427°C (800°F)
			Nuts	SA-194-2M steel		
		Other applications	Studs	SA-193-B7 steel		
			Nuts	SA-194-2H steel		
	WC9 body and bonnet		Studs	SA-193-B16 steel	-29°C (-20°F)	This material not a limiting factor
			Nuts	SA-194-7 steel		
	CF8M body and bonnet	Sour service	Studs	SA-193-B7M steel for CL900 valves	-46°C (-50°F)	232°C (450°F)
			Nuts	SA-194-2M steel for CL900 valves		
			Studs	SA-193-B8M SST for CL300 or 600 valves		
			Nuts	SA-194-8M SST for CL300 or 600 valves		
		Other applications	Studs	SA-193-B7 steel	-46°C (-50°F)	232°C (450°F)
			Nuts	SA-194-2H steel		
			Studs	SA-320-B8 SST for NPS 12x8 valves	-254°C (-425°F)	38°C (100°F)
			Nuts	SA-194-8 SST for NPS 12x8 valves		
			Studs	SA-193-B8M SST	-198°C (-325°F) ⁽¹⁾	538°C (1000°F)
			Nuts	SA-194-8M SST		
Studs			Strain hardened SA-193-B8M SST for NPS 8x6 or NPS 12x8 CL300 or 600 valves	-198°C (-325°F)	427°C (800°F) ⁽²⁾	
Nuts			SA-194-8M SST for NPS 8x6 or NPS 12x8 CL300 or 600 valves			
Studs	Chrome-coated SA-193-B8M SST for CL900 valves	-198°C (-325°F)	These materials not limiting factors			
Nuts	SA-194-8M SST for CL900 valves					
Design EWND-1 piston ring			Graphite	Air or oxidizing service	-254°C (-425°F)	538°C (1000°F)
				Steam or nonoxidizing service	-254°C (-425°F)	593°C (1100°F)
EWNT-1/EWNT-2 spring-loaded valve plug seal construction	Backup ring (used only with NPS 8x6 valve body)		S41600		-29°C (-20°F)	These materials not limiting factors
	Retaining ring (used only with NPS 8x6 valve body)		S30200			
	Seal ring		PTFE with N10276 spring			
Valve plug stem and groove pin			S31600		-198°C (-325°F) ⁽¹⁾	427°C (800°F) ⁽²⁾
Bonnet gaskets for NPS 12x8 CL600 valve			Graphite		These materials not limiting factors	
Bonnet gasket and cage gasket for NPS 8x6 and 12x8 CL900 valve	Sour service		Tin-plated N04400		-18°C (0°F)	149°C (300°F)
	Other applications		Silver-plated N04400		-254°C (-425°F)	593°C (1100°F)
Packing (temperatures shown are material temperature capabilities)			PTFE V-ring		See note 3	See note 3
			Optional PTFE/composition		-73°C (-100°F)	232°C (450°F)
			Optional graphite ribbon/filament	Oxidizing service	-198°C (-325°F)	371°C (700°F)
				Nonoxidizing service	-198°C (-325°F)	538°C (1000°F)
			Optional graphite ribbon for high-temperature oxidizing service		271°C (700°F)	This material not a limiting factor

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Table 4. Materials and Temperature Limits for Other Parts (continued)

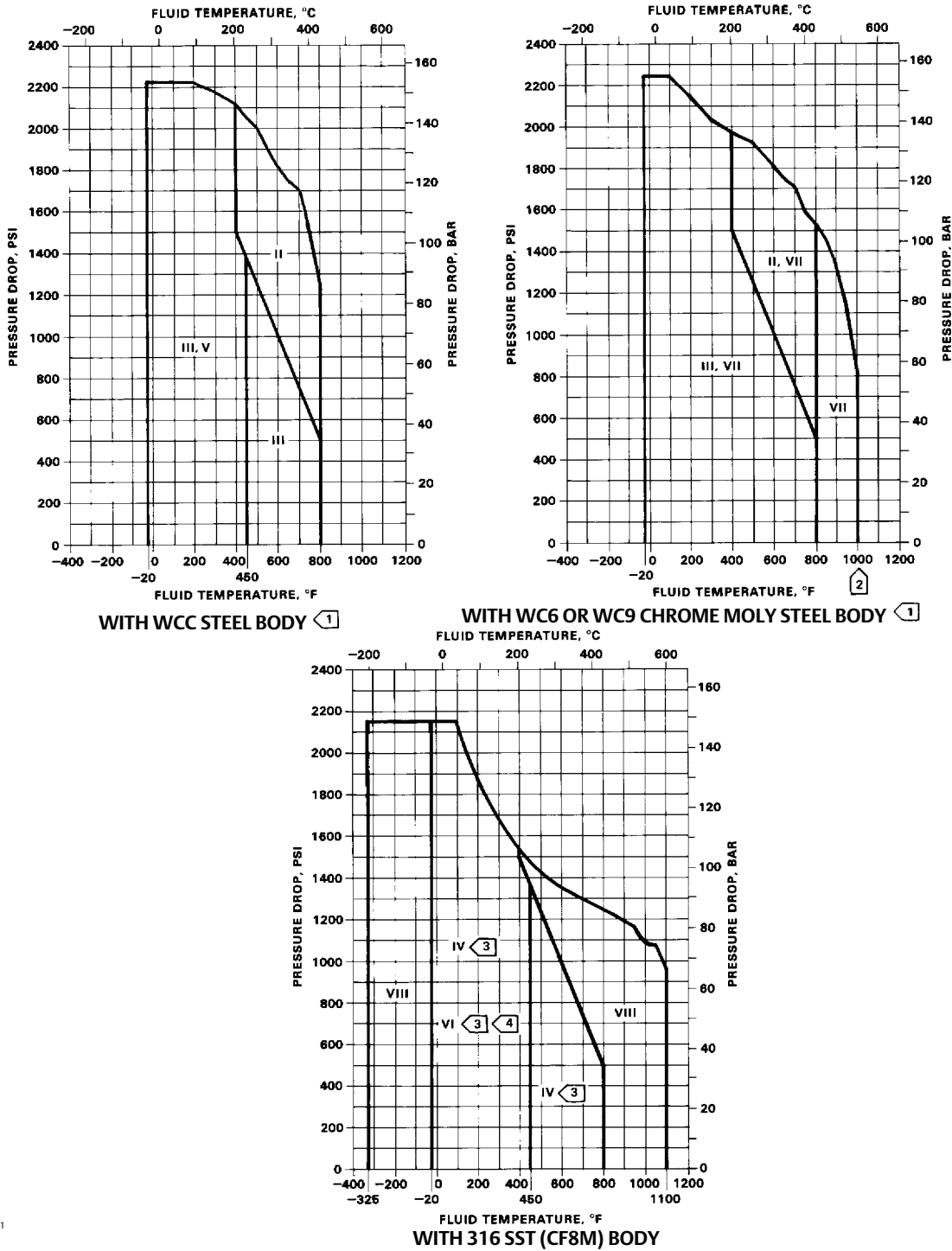
PART		MATERIAL	MATERIAL TEMPERATURE CAPABILITIES	
			Minimum	Maximum
Packing flange, studs and nuts		Steel	-29°C (-20°F)	427°C (800°F)
		Optional S31600	-198°C (-325°F)	593°C (1100°F)
Packing follower, and packing spring or lantern ring		S31600	-198°C (-325°F)	593°C (1100°F)
Packing box ring	19.1 mm (3/4 in.) stem	S31600	-198°C (-325°F)	593°C (1100°F)
	25.4 mm (1 in.) and 31.8 mm (1-1/4 in.) stems	S17400	-102°C (-150°F)	427°C (800°F)

1. May be used down to -254°C (-425°F) if manufacturing process includes Charpy impact test.
2. May be used up to 593°C (1100°F) if manufacturing process controls carbon content to 0.04% minimum or 0.08% maximum.
3. Consult your [Emerson sales office](#) or Local Business Partner.

Table 5. Additional Specifications

VALVE SIZE, NPS	PRESSURE RATING	YOKE BOSS AND STEM DIA							
		Standard				Optional			
		Yoke Boss		Stem		Yoke Boss		Stem	
		mm	In.	mm	In.	mm	In.	mm	In.
8 x 6	CL900	127	5	25.4	1	90	3-9/16	19.1	3/4
				31.8	1-1/4				
12 x 8	CL900	127	5	31.8	1-1/4	127	5	31.8	1-1/4
	CL300 or 600	90	3-9/16	19.1	3/4	127	5	25.4	1

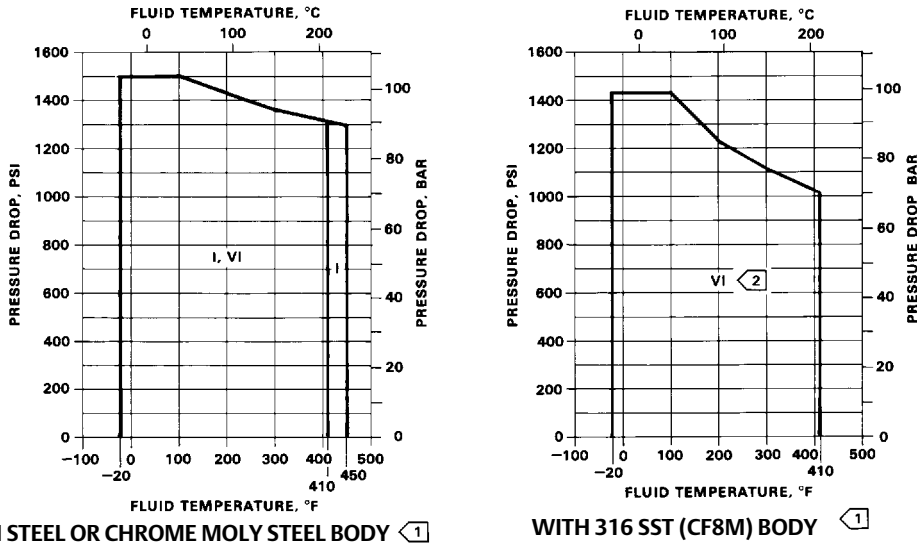
Figure 3. Typical Trim Use in Fisher EWND-1 and EWNT-1 Valve Bodies



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- ① Do not exceed the maximum pressure and temperature for the class rating of the body material used, even though the trims shown have higher capabilities.
- ② Maximum temperature for a WCC body. Maximum temperature for a WC9 body is 566°C (1060°F) with a CL900 pressure rating at this temperature of 41bar (595 psi).
- ③ May be used down to -101°C (-150°F) with Level A, B, or C cage, or with Level D cage that has an 18-8 SST baffle.
- ④ Limited to 210°C (410°F) in CL300 or CL600 body.

Figure 4. Typical Trim Use in Fisher EWNT-2 Valve Bodies



WITH STEEL OR CHROME MOLY STEEL BODY 1

WITH 316 SST (CF8M) BODY 1

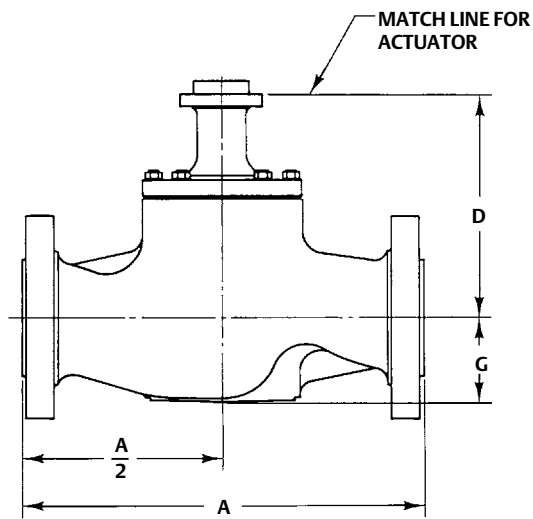
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- 1 Do not exceed the maximum pressure and temperature for the class rating of the body material used, even though the trims shown have higher capabilities.
- 2 May be used down to -101 °C (-150 °F) with Level A, B, or C cage, or with Level D cage that has an 18-8 SST baffle.

Table 6. NPS 8x6 Dimensions and Approximate Weights

END CONN.	APPROXIMATE WEIGHT		DIMENSION							
			A		D (Plain Bonnet)				G (Max)	
					19.1 mm (3/4 In.) Stem		25.4 or 31.8 mm (1 or 1-1/4 In.) Stem			
Kg	Lb	mm	Inch	mm	Inch	mm	Inch	mm	Inch	
RF	839	1850	914	36.00	503	19.81	530	20.88	198	7.81
RTJ	839	1850	917	36.12						
BW	703	1550	972	38.25						

Figure 5. Dimensions and Approximate Weights (also see table 6)



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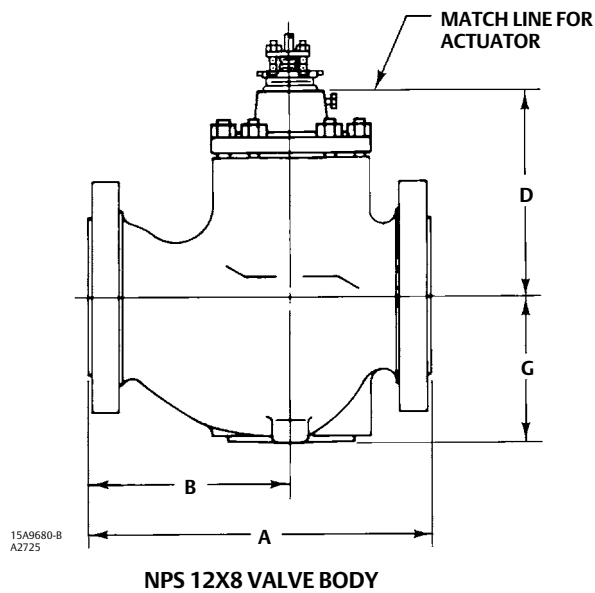
NPS 8x6 CL900 VALVE BODY

Table 7. NPS 12x8 Dimensions and Approximate Weights

VALVE BODY AND END CONNECTION		APPROXIMATE WEIGHT		DIMENSION ⁽¹⁾											
				A		B		D						G (Max)	
								25.4 mm (1 Inch) Stem with Style 1 Ext. Bonnet		31.8 mm (1-1/4 Inch) Stem					
										Plain Bonnet		Style 1 Ext. Bonnet			
Kg	Lb	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch		
CL300	RF	721	1590	775	30.50	464	18.25	633	24.94	---	---	613	24.12	356	14.00
	RTJ	721	1590	791	31.12	471	18.56								
CL600	RF	930	2050	819	32.25	486	19.12	633	24.94	---	---	613	24.12	356	14.00
	BW	726	1600												
	RTJ	930	2050	822	32.38	487	19.19								
CL900	RF	1497	3300	902	35.50	505	19.88	---	---	734 ⁽²⁾	28.88 ⁽²⁾	---	---	356	14.00
	RTJ	1497	3300	905	35.62	506	19.94								
	BW	1293	2850	953	37.50	530	20.88								

1. Per ASME B16.10 and FCI 65-2 for CL300 and 600 only.
2. Add 25.4 mm (1 inch) for 585C Series and Size 100 657 or 667 Series actuators.

Figure 6. Dimensions and Approximate Weights (also see table 7)



Installation

Unless limited by seismic criteria, the control valve can be installed in any position (as long as sufficient support is provided if a fabricated extension bonnet is used). However, the normal method is with the actuator vertical above the valve body; non vertical positions may cause uneven trim wear and thus decrease trim life. Flow through the valve must be in the direction indicated by the flow direction arrow on the valve body. Consideration should be given to installing an upstream strainer since these valves use multihole Whisper Trim III cages.

Dimensions are shown in figures 5 and 6.

Ordering Information

When ordering specify:

Application information

1. Type application
 - a. Throttling or on-off
 - b. Reducing or relief
2. Controlled fluid (include chemical analysis of fluid if possible)
3. Specific gravity of controlled fluid
4. Fluid temperature

5. Inlet pressures
 - a. Minimum
 - b. Normal
 - c. Maximum
6. Pressure drop
 - a. Minimum flowing drop
 - b. Normal flowing drop
 - c. Maximum flowing drop
 - d. Maximum at shutoff
7. Flow rate
 - a. Minimum
 - b. Normal
 - c. Maximum
8. Maximum permissible noise level, if critical
9. Shutoff classification required (see table 2)
10. Line size, schedule, and end connections

Valve Body Information

To determine what valve body ordering information is needed, refer to the specifications. Carefully review the description at the right of each specification and in the referenced tables and figures. Indicate your choice whenever there is a selection to be made. Always specify the valve design being ordered, as identified in the Available Configurations section.

Actuator and Accessory Information

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

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