# Design NotchFlo® DST Control Valve

CL600 3-stage, CL900 and CL1500 4-stage, and CL2500 6-stage Design NotchFlo DST control valves (figure 1) with dirty service anti-cavitation trim (figure 2) offer excellent control of high pressure drop liquids with entrained solids while avoiding the damaging effects of cavitation and erosive solids.

## Features

- **Long Trim Life—**NotchFlo DST control valves feature a protected seat design whereby the shutoff function is separate from the throttling areas of the trim.

- **Class V Shutoff—**Use of hardened metal seats provides tight shutoff to minimize seat erosion.

- **High Pressure Drops—**Rugged cage guiding of the plug, combined with a staged pressure drop, enables the NotchFlo DST control valve to be effective in a wide range of allowable high pressure drop applications. It can be operated by either spring and diaphragm or piston actuators, depending on plug design (balanced or unbalanced) and application requirements.

- **Sour Service Capability—**Materials are available for applications handling sour fluids. All references in this document are for NACE MR0175-2002 unless otherwise noted. Contact your Emerson Process Management™ sales office for information on NACE MR0175/ISO 15156 and NACE MR0103.

- **Availability—**NotchFlo DST control valves are available in both globe and angle valve body designs.

**Note**

**Neither Emerson, Emerson Process Management, nor any of their affiliated entities assumes responsibility for the selection, use and maintenance of any product. Responsibility for the selection, use, and maintenance of any product remains with the purchaser and end-user.**


*Figure 1. Design NotchFlo® DST Control Valve*

## Principle of Operation

NotchFlo DST control valves utilize a high resistance, multi-stage, axial flow path (or passage) where fluid flow is parallel to the axis of the plug and cage (see figure 2).

Pressure reduction occurs throughout the length of the plug; thus individual stages aren't exposed to the full pressure differential. Therefore, trim life is enhanced.

NotchFlo DST trim utilizes a series of notched flow restrictions and expansions to control the pressure drop of the fluid. The amount of pressure drop per stage is controlled to prevent cavitation problems and minimize erosion issues on a properly sized valve.

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Flow passage configuration provided by the multi-stage plug and cage design make CL600 3-stage, CL900 and CL1500 4-stage, and CL2500 6-stage valves well-suited for applications involving fluids with entrained particles. This is a potentially serious problem for other anti-cavitation valve designs which are subject to clogged flow passages.

Design of the trim allows for high rangeability.

## Characteristics

The NotchFlo DST control valve has a linear flow characteristic. See figure 3.

To maximize seat life, the trim is designed not to have significant flow for the first 15% of travel.

The multi-stage clearance flow design helps prevent high pressure drops in the seating area during throttling at low capacity. This design feature extends the shutoff capability significantly, while enhancing throttling control capability at low travels.

## Trim Selection Guidelines

Refer to the following descriptions and tables 4, 5, and 6 as guidelines for the selection of appropriate trims. Trims 278, 278N, 279, 281, 282, and 283 should not be used in boiler feedwater due to amine corrosion problems associated with CoCr-A and R30006 (alloy 6).

- **Trim 277—**Trim 277 is the standard trim for carbon steel and alloy steel valve bodies and recommended for general and severe service applications up to 316°C (600°F). See tables 4 and 5 for operating temperature ranges per valve size. Typical applications for Trim 277 include services in boiler feedwater, water, non-sour hydrocarbons, and other non-sour liquids.

- **Trim 278—**Trim 278 is the standard trim for stainless steel valve bodies and is optional for use in carbon steel and alloy steel valve bodies. Trim 278 is recommended for use in moderately corrosive liquid applications. Trim 278 can be used up to 316°C (600°F). See tables 4 and 5 for operating temperature ranges per valve size. Not suitable for boiler feedwater use if amine problems exist.

- **Trim 278N—**Trim 278N should be used for sour liquid service in carbon steel, alloy steel, and stainless steel valve bodies. Trim 278N complies with the requirements of NACE MR0175-2002. Trim 278N can be used up to 316°C (600°F). See tables 4 and 5 for operating temperature ranges per valve size. Not suitable for boiler feedwater use if amine problems exist.

- **Trim 279—**Trim 279 is available with CL600 3-stage control valves only and should be used for sour liquid service in carbon steel, alloy steel, and stainless steel valve bodies. Trim 279 complies with the requirements of NACE

MR0175-2002. Trim 279 can be used up to 316°C (600°F). See table 4 for operating temperature ranges per valve size. Not suitable for boiler feedwater use if amine problems exist.

- **Trim 280—**Trim 280 is available with CL1500 ≥ NPS 6 and CL2500 control valves only and should be used in SA105 steel valve bodies. Trim 280 can be used up to 316°C (600°F). See table 5 for operating temperature ranges per valve size. Typical applications for Trim 280 include services in boiler feedwater, water, non-sour hydrocarbons, and other non-sour liquids.

- **Trim 281—**Trim 281 is available with CL1500 ≥ NPS 6 and CL2500 control valves only and should be used in SA105 NACE steel valve bodies. Trim 281 complies with the requirements of NACE MR0175-2002. Trim 281 can be used up to 316°C (600°F). See table 5 for operating temperature ranges per valve size. Not suitable for boiler feedwater if anime problems exist.

- **Trim 282—**Trim 282 is available with CL1500 ≥ NPS 6 and CL2500 control valves only and should be used in 316 stainless steel valve bodies. Trim 282 complies with the requirements of NACE MR0175-2002. Trim 282 can be used up to 316°C (600°F). See table 5 for operating temperature ranges per valve size. Not suitable for boiler feedwater if anime problems exist.

- **Trim 283—**Trim 283 is available with CL1500 ≥ NPS 6 and CL2500 control valves only and should be used in 347 stainless steel valve bodies. Trim 283 complies with the requirements of NACE MR0175-2002. Trim 283 can be used up to 316°C (600°F). See table 5 for operating temperature ranges per valve size. Not suitable for boiler feedwater if anime problems exist.

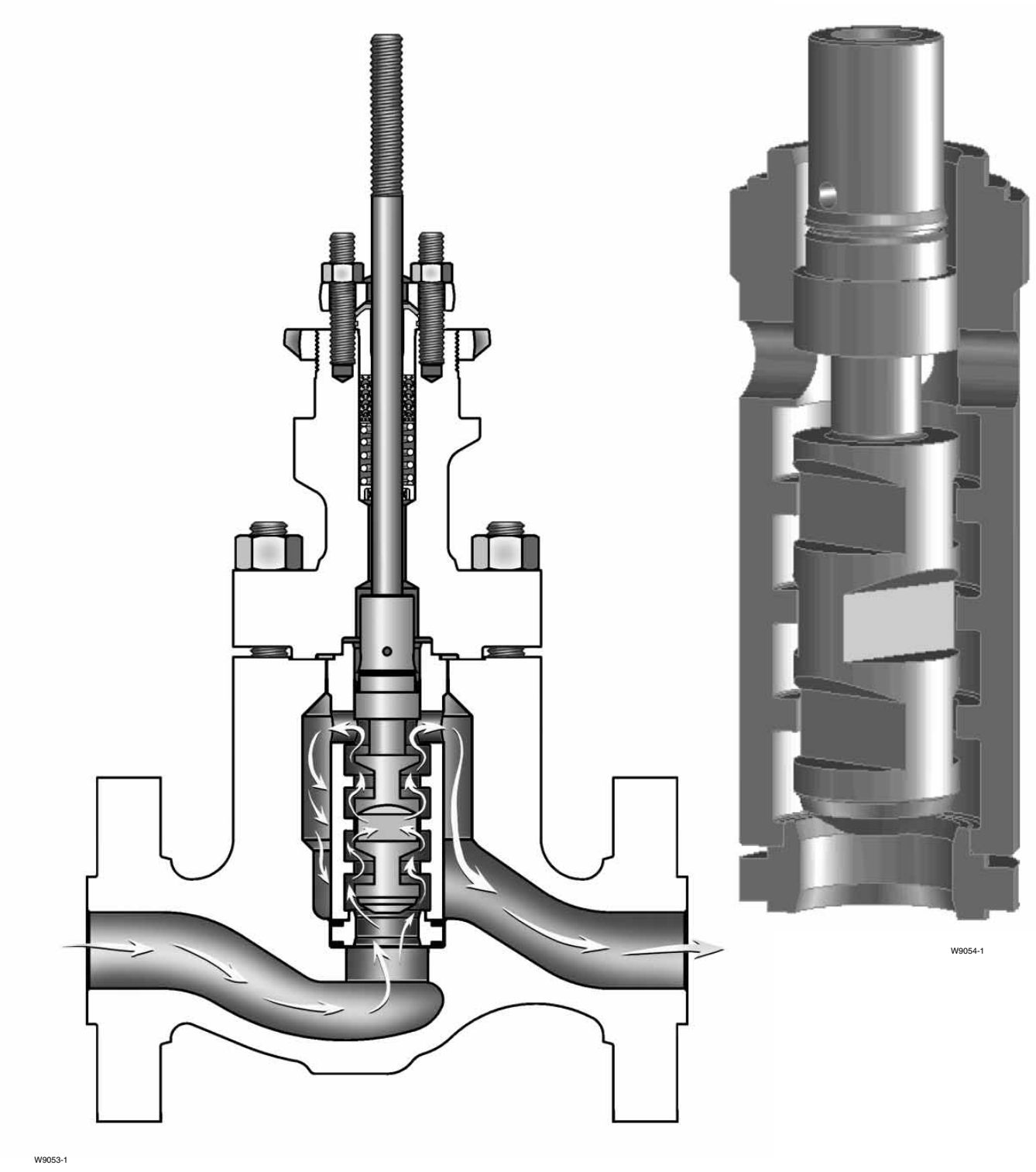


*Figure 2. NotchFlo® DST 3-Stage Trim*

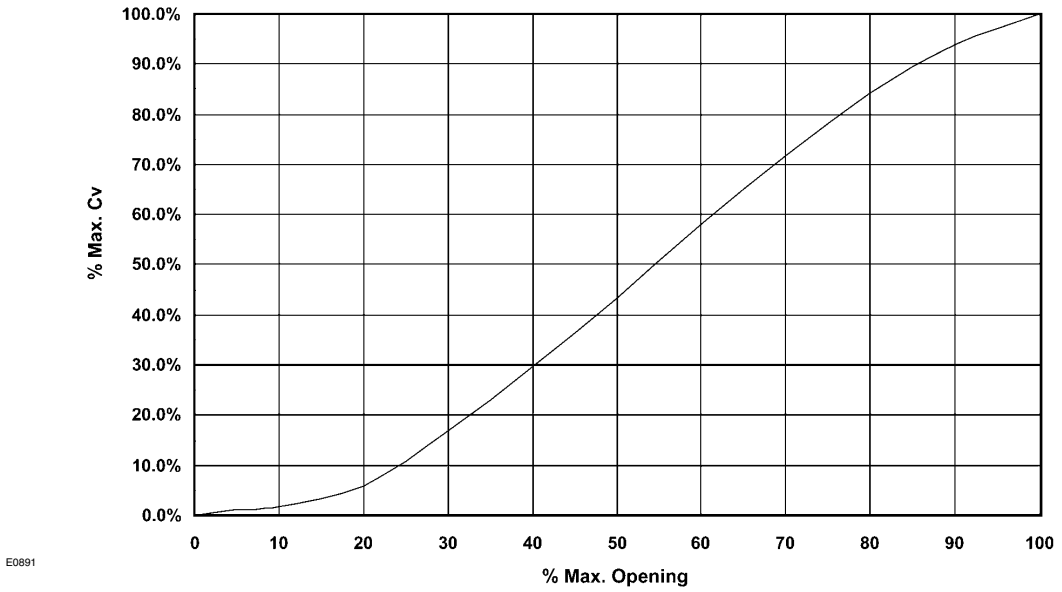


*Figure 3. NotchFlo® DST Cv versus Travel*

*Table 1. CL600 3-Stage Available Constructions*

| VALVE STYLE | VALVE SIZE, NPS | VALVE BODY MATERIAL AND END CONNECTION STYLE(1) | | | |
|---|---|---|---|---|---|
| | | WCC, WC9, LCC, CF8M (316 SST), and CD3MN (Duplex SST) Cast Steel Valves(2) | | | |
| | | Screwed | RF or RTJ Flanged CL600 | Butt Weld | Socket Weld |
| Globe | 1 or 2 | X | X | X | X |
| | 3 or 4 | - - - | X | X | - - - |

X = Available Construction.
1. End connection style abbreviations: RF - Raised Face, RTJ - Ring Type Joint.
2. LCC available as RF or RTJ Flanged only. Contact your Emerson Process Management sales office for other end connections.

*Table 2. CL900 and CL1500 ≤ NPS 4, 4-Stage Available Constructions*

| VALVE STYLE | VALVE SIZE, NPS | PRESSURE RATING | VALVE BODY MATERIAL AND END CONNECTION STYLE(1) | | |
|---|---|---|---|---|---|
| | | | WCC, WC9, and LCC Cast Steel Valves(3) | CF8M (316 Stainless Steel) Cast Valves | SA-105, SA-182-F22, and SA-182-F316 forged SST (for forged steel angle valves) |
| | | | RF or RTJ Flanged, Butt Weld, and Socket Weld(2) | RF or RTJ Flanged, Butt Weld, and Socket Weld(2) | RF or RTJ Flanged and Socket Weld(2) |
| Angle | 1, 1-1/2, 2, 3, or 4 | CL900 and CL1500 | - - - | - - - | X |
| Globe | 2, 3, or 4 | CL900 and CL1500 | X | X | - - - |

X = Available Construction.
1. End connection style abbreviations: RF - Raised Face, RTJ - Ring Type Joint.
2. Socket Weld available on NPS 1, 1-1/2, and 2 only.
3. LCC available as RF or RTJ Flanged only. Contact your Emerson Process Management sales office for other end connections.

*Table 3. CL1500 ≥ NPS 6, 4-Stage and CL2500 6-Stage Available Constructions*

| VALVE STYLE | VALVE SIZE, NPS | PRESSURE RATING | VALVE BODY MATERIAL AND END CONNECTION STYLE(1) |
|---|---|---|---|
| | | | SA-105, F316, and F347 Forged Steel Angle Valves |
| | | | RF or RFT Flanged |
| Angle | 6, 8 | CL1500 | X |
| Angle | 4, 6 | CL2500 | X |

X = Available Contruction
1. End connection style abbreviations: RF = Raised Face, RTJ = Ring Type Joint

*Table 4. CL600 3-Stage Metal Trim Material Combinations and Valve Body/Trim Temperature Capabilities(1)*

| TRIM DESIGNATION | VALVE PLUG | VALVE PLUG STEM | CAGE | SEAT RING | VALVE BODY MATERIAL | VALVE SIZE | OPERATING TEMPERATURE | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | NPS | °C | °F |
| 277 | S44004 | S20910 | S17400 H900 | S44004 | SA105, WCC, F22 WC9, LCC | 1 and 2 | –29 to 316 | –20 to 600 |
| | | | | | | 3 and 4 | –29 to 288 | –20 to 550 |
| 277 | S44004 | S20910 | S17400 H900 | S44004 | S31600, CF8M | 1 | –29 to 149 | –20 to 300 |
| | | | | | | 2 | –29 to 121 | –20 to 250 |
| | | | | | | 3 and 4 | –29 to 93 | –20 to 200 |
| 278 | S41000 NACE(2) heat treated | S20910 | S17400, double H1150 heat treated | S31600 with CoCr-A seat | SA105, WCC F22, WC9, LCC | 1, 2, 3, and 4 | –29 to 316 | –20 to 600 |
| 278 | S41000 NACE(2) heat treated | S20910 | S17400, double H1150 heat treated | S31600 with CoCr-A seat | S31600, CF8M | 1 | –29 to 204 | –20 to 400 |
| | | | | | | 2 | –29 to 177 | –20 to 350 |
| | | | | | | 3 and 4 | –29 to 121 | –20 to 250 |
| 278N NACE(2) | S41000 NACE(2) heat treated | S20910 | S17400, double H1150 heat treated | S31600 with CoCr-A seat | SA105, WCC F22, WC9, LCC | 1, 2, 3, and 4 | –29 to 316 | –20 to 600 |
| 278N NACE(2) | S41000 NACE(2) heat treated | S20910 | S17400, double H1150 heat treated | S31600 with CoCr-A seat | S31600, CF8M | 1 | –29 to 204 | –20 to 400 |
| | | | | | | 2 | –29 to 177 | –20 to 350 |
| | | | | | | 3 and 4 | –29 to 121 | –20 to 250 |
| 279(2) | R30016 (Alloy 6B) | S20910 | R30016 or R30006 (Alloy 6) | R30016 or R30006 | S31600, CF8M | 1 | –29 to 232 | –20 to 450 |
| | | | | | | 2 | –29 to 177 | –20 to 350 |
| | | | | | | 3 and 4 | –29 to 121 | –20 to 250 |
| | | | | | SA105, WCC, F22 WC9, LCC | 1, 2, 3, and 4 | –29 to 316 | –20 to 600 |
| | | | | | CD3MN (Duplex SST) | 1, 2, 3, and 4 | –29 to 316 | –20 to 600 |

1. For metal trim parts only.
2. NACE MR0175-2002. Contact your Emerson Process Management sales office for information on NACE MR0175/ISO 15156 and NACE MR0103.

*Table 5. CL900 and CL1500 ≤ NPS 4, 4-Stage Metal Trim Material Combinations and Valve Body/Trim Temperature Capabilities*(1)

| TRIM DESIGNATION | VALVE PLUG | VALVE PLUG STEM | CAGE | SEAT RING | VALVE BODY MATERIAL | VALVE SIZE | OPERATING TEMPERATURE | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | NPS | °C | °F |
| 277 | S44004 | S20910 | S17400 H900 | S44004 | SA105, WCC, F22 WC9, LCC | 1, 1-1/2, and 2 | –29 to 316 | –20 to 600 |
| | | | | | | 3 | –29 to 288 | –20 to 550 |
| | | | | | | 4 | –29 to 260 | –20 to 500 |
| 277 | S44004 | S20910 | S17400 H900 | S44004 | S31600, CF8M | 1 | –29 to 177 | –20 to 350 |
| | | | | | | 1-1/2 | –29 to 149 | –20 to 300 |
| | | | | | | 2 | –29 to 121 | –20 to 250 |
| | | | | | | 3 and 4 | –29 to 93 | –20 to 200 |
| 278 | S41000 NACE(2) heat treated | S20910 | S17400, double H1150 heat treated | S31600 with CoCr-A seat | SA105, WCC F22, WC9, LCC | 1, 1-1/2, 2, 3, and 4 | –29 to 316 | –20 to 600 |
| 278 | S41000 NACE(2) heat treated | S20910 | S17400, double H1150 heat treated | S31600 with CoCr-A seat | S31600, CF8M | 1 | –29 to 232 | –20 to 450 |
| | | | | | | 1-1/2 | –29 to 205 | –20 to 400 |
| | | | | | | 2 | –29 to 177 | –20 to 350 |
| | | | | | | 3 | –29 to 121 | –20 to 250 |
| | | | | | | 4 | –29 to 93 | –20 to 200 |
| 278N NACE(2) | S41000 NACE(2) heat treated | S20910 | S17400, double H1150 heat treated | S31600 with CoCr-A seat | SA105, WCC F22, WC9, LCC | 1, 1-1/2, 2, 3, and 4 | –29 to 316 | –20 to 600 |
| 278N NACE(2) | S41000 NACE(2) heat treated | S20910 | S17400, double H1150 heat treated | S31600 with CoCr-A seat | S31600, CF8M | 1 | –29 to 232 | –20 to 450 |
| | | | | | | 1-1/2 | –29 to 205 | –20 to 400 |
| | | | | | | 2 | –29 to 177 | –20 to 350 |
| | | | | | | 3 | –29 to 121 | –20 to 250 |
| | | | | | | 4 | –29 to 93 | –20 to 200 |

1. For metal trim parts only.
2. NACE MR0175-2002. Contact your Emerson Process Management sales office for information on NACE MR0175/ISO 15156 and NACE MR0103.

*Table 6. CL1500 ≥ NPS 6, 4-Stage and CL2500 6-Stage Metal Trim Material Combinations and Valve Body/Trim Temperature Capabilities*(1)

| TRIM DESIGNATION | VALVE PLUG | VALVE PLUG STEM | CAGE | SEAT RING | VALVE BODY MATERIAL | VALVE SIZE | | OPERATING TEMPERATURE | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Rating | NPS | °C | °F |
| 280 | S44004 | S20910 | S17400 H1075 | S44004 | SA105 | CL1500 | 6, 8 | –29 to 316 | –20 to 600 |
| | | | | | | CL2500 | 4, 6 | –29 to 316 | –20 to 600 |
| 281(2) | S41000 NACE(2) heat treated | S20910 | S17400, H1150 heat treated | S31600/ CoCr-A | SA105 NACE(2) | CL1500 | 6, 8 | –29 to 316 | –20 to 600 |
| | | | | | | CL2500 | 4, 6 | –29 to 316 | –20 to 600 |
| 282(2) | S31600/ CoCr-A | S20910 | S20910 | S31600/ CoCr-A | S31600 | CL1500 | 6, 8 | –29 to 316 | –20 to 600 |
| | | | | | | CL2500 | 4, 6 | –29 to 316 | –20 to 600 |
| 283(2) | S34700/ CoCr-A | S20910 | S20910 | S33700/ CoCr-A | S34700 | CL1500 | 6, 8 | –29 to 316 | –20 to 600 |
| | | | | | | CL2500 | 4, 6 | –29 to 316 | –20 to 600 |

1. For metal trim parts only.
2. NACE MR0175-2002. Contact your Emerson Process Management sales office for information on NACE MR0175/ISO 15156 and NACE MR0103.

*Table 7. Application Guidelines for NotchFlo® DST Trim*

| VALVE PRESSURE RATING | TRIM TYPE | VALVE SIZE, NPS | $K_C$ = 1 | | $K_C$ = 0.8 | |
|---|---|---|---|---|---|---|
| | | | bar | psid | bar | psid |
| CL600 | 3-Stage, Level C | All | <103 | <1500 | N/A | N/A |
| CL900 and CL1500 | 4-Stage, Level A | All | <128 | <1850 | 128 - 160 | 1850 - 2325 |
| | 4-Stage, Level B | | <130 | <1890 | 130 - 163 | 1890 - 2360 |
| | 4-Stage, Level C | | <179 | <2600 | 179 - 224 | 2600 - 3250 |
| CL1500 | 4-Stage, Level C | All | <179 | <2600 | 179 - 224 | 2600 - 3250 |
| CL2500 | 6-Stage, Level C | All | <289 | <4200 | 289 - 362 | 4200 - 5250 |

*Table 8. Typical Applications*

| | |
|---|---|
| Oil Field | Well Control (produced and waste water injection)<br>Water Injection Pump Recirculation.<br>Separator Letdown |
| Refinery | $H_2S$ Contactor Letdown<br>Charge Pump Recirculation<br>Separator Letdown<br>Amine Pump Recirculation<br>Sour Water Letdown |
| Power Industry | Feedwater Startup Regulators<br>Boiler Feedpump Recirculation |

## Valve Sizing Guidelines

Standard ISA equations, sizing procedures from Catalog 12, or Fisher® Specification Manager can be used to size NotchFlo DST control valves.

Noise calculations are best performed by using Fisher Specification Manager. The serial stage configuration of the NotchFlo DST design reduces valve trim noise significantly. Select CAV III 2-Stage as the valve type in Fisher Specification Manager to perform the noise prediction calculation.

Selection of the correct trim can be made by determining the $K_C$ value from table 7.

Ensure that the correct $K_C$ value for the appropriate valve size, trim type, and pressure drop are selected.

## Ordering Information

When ordering, specify:

### Application Information

1. Process liquid—State particle size and type of entrained impurities, if any.
2. Specific gravity of liquid
3. Temperature and vapor pressure of liquid
4. Critical pressure
5. Range of flowing inlet pressures
6. Pressure drops
   a. Range of flowing pressure drops
   b. Maximum at shutoff
7. Flow rates
   a. Minimum controlled flow
   b. Normal flow
   c. Maximum flow
8. Required $C_v$
9. Line size and schedule

### Valve Body Information

To determine what information is needed for ordering the valve body and trim, refer to the Specifications section. Review the description at the right of each specification or in the referenced tables, figures, and bulletins, and indicate the desired choice wherever a selection is to be made.

*Table 9. Construction Materials and Temperature Capabilities for Parts Other than Valve Body and Trim*

| PART | | MATERIAL | TEMPERATURE CAPABILITIES | |
|---|---|---|---|---|
| | | | °C | °F |
| Valve plug stem | | S20910<br>S31600 | - - -(4) | - - -(4) |
| Spring-loaded valve plug seal(6) | Backup ring | S41600 (416 SST)<br>316A FMS 20B64 (NACE)<br>S41000 (410 SST)<br>S34700 (347 SST) | –29 to (4) | –20 to (4) |
| | Retaining ring | 18-8 20B15 SPGT<br>N07750 (NACE) | - - -(4) | - - -(4) |
| | Seal ring | PTFE/Graphite with N10276 Spring<br>UHMWPE (ultra high molecular weight polyethylene)(5) with N10276 Spring | –73 to 316(3)<br>–73 to 93 | –100 to 600(3)<br>–100 to 200 |
| | Anti-extrusion rings | PEEK (PolyEtherEtherKetone) | - - -(4) | - - -(4) |
| Bonnet gasket (CL600) | | Graphite/316 SST | - - -(4) | - - -(4) |
| Bonnet gasket (CL900, CL1500, and CL2500) | | N06600/Graphite | - - -(4) | - - -(4) |
| Seat ring gasket | | N06600/Graphite | - - -(4) | - - -(4) |
| Cage gasket | | N06600/Graphite | - - -(4) | - - -(4) |
| Valve Body-to-bonnet bolting(1) See table 10 for NACE bolting materials and temperature limits. | Studs<br>Nuts | Steel SA193-B7 (all valve body materials)<br>Steel SA194-2H (all valve body materials) | –29 to (4) (WCC, WC9, SA105, F22)<br>–48 to (4) (LCC, CF8M, S31600, and S34700)<br>–29 to 316 (CD3MN [Duplex SST]) | –20 to (4) (WCC, WC9, SA105, F22)<br>–55 to (4) (LCC, CF8M, S31600, and S34700)<br>–20 to 600 (CD3MN [Duplex SST]) |
| | Studs<br>Nuts | Steel SA193-B7M for sour service<br>Steel SA194-2HM for sour service | –29 to (4) (WCC and SA105)<br>–46 to (4) (LCC) | –20 to (4) (WCC and SA105)<br>–50 to (4) (LCC) |
| | Studs<br>Nuts | S31600 stainless steel SA193-B8M (strain hardened) (CF8M and S31600 valve body mat'ls)<br>S31600 stainless steel SA194-8M (CF8M and S31600 valve body mat'ls) | (CF8M and S31600)- - -(4) | (CF8M and S31600)- - -(4) |
| | Studs<br>Nuts | S20910 SST (SA479-XM-19)(2) (CF8M and S31600 valve body mat'ls)<br>Steel SA194-7 | (CF8M and S31600)- - -(4) | (CF8M and S31600)- - -(4) |
| Packing | | PTFE V-ring | –40 to 232 | –40 to 450 |
| | | Graphite ribbon filament (oxidizing service to 700°F) | - - -(4) | - - -(4) |
| | | Graphite ULF (non-environmental service) | - - -(4) | - - -(4) |
| Packing follower, spring, or lantern ring | | S31600 stainless steel | - - -(4) | - - -(4) |
| Packing box ring | | S31600 stainless steel | - - -(4) | - - -(4) |
| Packing flange, studs, or nuts | | S31600 stainless steel | - - -(4) | - - -(4) |

1. Valve body materials with which these bolting materials may be used are shown in parentheses.
2. This stud material is not listed in ASME B16.34.
3. With PEEK anti-extrusion rings in non-oxidizing service. Maximum operating temperature limited to 260°C (500°F) in oxidizing service.
4. These materials are not limiting factors.
5. Standard
6. Not required for NPS 1 or 1-1/2 CL900 and CL1500 4-stage valves.

*Table 10. CL600 3-Stage Bolting Materials and Temperature Limits for Bolting Compliance with NACE MR0175-2002, NACE MR0175/ISO 15156, and NACE MR0103*

| VALVE BODY MATERIAL | | BOLTING MATERIAL | TEMPERATURE CAPABILITIES | |
|---|---|---|---|---|
| | | | °C | °F |
| **Non-exposed bolting (Standard)** | | | | |
| WCC, CF8M (316 SST), and CD3MN (Duplex SST) | Studs | Steel SA-193-B7 | –48[2] to 427 (WCC and CF8M)<br>–29 to 316 (CD3MN [Duplex SST]) | –55[2] to 800 (WCC and CF8M)<br>–20 to 600 (CD3MN [Duplex SST]) |
| | Nuts | Steel SA-194-2H | | |
| **Exposed bolting (Optional)<br>May require derating of valve[1] when these body-to-bonnet bolting materials are used** | | | | |
| WCC, CF8M (316 SST), and CD3MN (Duplex SST) | Studs | Steel SA-193-B7M | –48[2] to 427 (WCC and CF8M)<br>–29 to 316 (CD3MN [Duplex SST]) | –55[2] to 800 (WCC and CF8M)<br>–20 to 600 (CD3MN [Duplex SST]) |
| | Nuts | Steel SA-194-2HM | | |

1. Derating may be required for valves rated at CL600. Contact your Emerson Process Management sales office for assistance in determining the derating of valves when these body-to-bonnet bolting materials are used. Derating is not required for CL900 and CL1500 valves.
2. –29°C (–20°F) with WCC valve body material.

*Table 11. Approximate Weights (Valve and Bonnet Assemblies)*

| VALVE DESIGN | VALVE SIZE, NPS | PRESSURE RATING | KILOGRAMS | | POUNDS | |
|---|---|---|---|---|---|---|
| | | | Flanged | Socket Weld[1], Butt Weld[3], Screwed[2] | Flanged | Socket Weld[1], Butt Weld[3], Screwed[2] |
| 3-Stage Globe Valves | 1 | CL600 | 19 | 15 | 42 | 34 |
| | 2 | CL600 | 40 | 31 | 88 | 68 |
| | 3 | CL600 | 72 | 51 | 158 | 112 |
| | 4 | CL600 | 120 | 80 | 264 | 176 |
| 4-Stage Globe Valves | 2 | CL900 and CL1500 | 93 | 83 | 204 | 184 |
| | 3 | CL900 | 177 | - - - | 391 | - - - |
| | | CL1500 | 185 | 140 | 408 | 308 |
| | 4 | CL900 | 327 | - - - | 722 | - - - |
| | | CL1500 | 338 | 282 | 745 | 622 |
| 4-Stage Angle Valves | 1 | CL900 and CL1500 | 48 | 41 | 105 | 91 |
| | 1-1/2 | CL900 and CL1500 | 55 | 43 | 121 | 94 |
| | 2 | CL900 and CL1500 | 93 | 97 | 206 | 214 |
| | 3 | CL900 and CL1500 | 174 | - - - | 384 | - - - |
| | 4 | CL900 and CL1500 | 285 | - - - | 628 | - - - |
| | 6 | CL1500 | 562 | - - - | 1240 | - - - |
| | 8 | CL1500 | 1260 | - - - | 2770 | - - - |
| 6-Stage Angle Valves | 4 | CL2500 | 467 | - - - | 1030 | - - - |
| | 6 | CL2500 | 1060 | - - - | 2340 | - - - |

1. SWE available on NPS 1, 1-1/2, and 2 only.
2. Screwed end available on NPS 1 and 2 CL600 only.
3. BWE available on globe valves only.

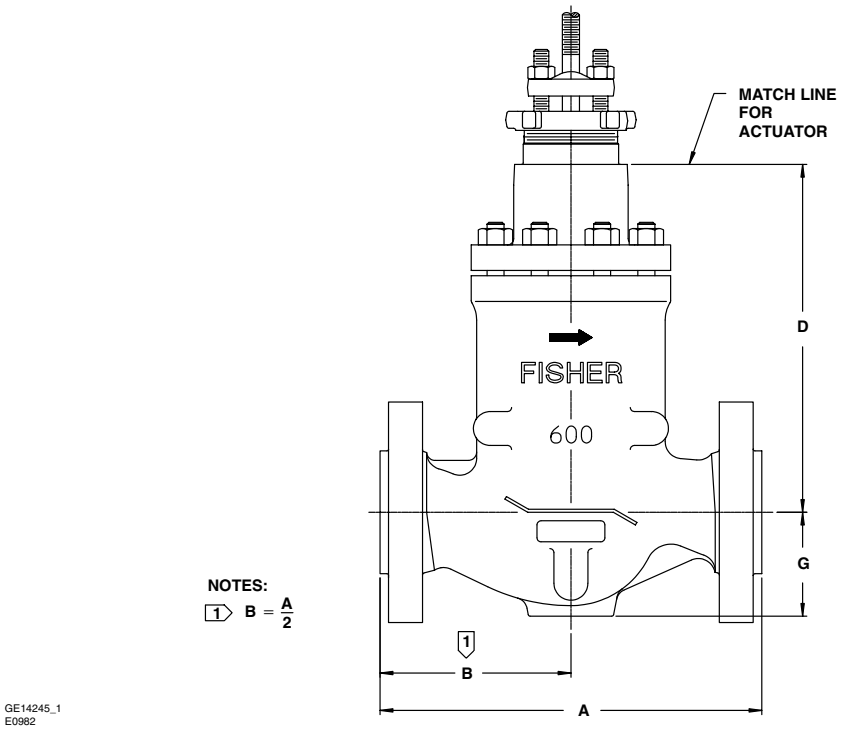


*Figure 4. Typical CL600 3-Stage NotchFlo® DST Valve Dimensions (also see tables 12 and 13)*

*Table 12. CL600 3-Stage Globe Valve Dimensions with Plain Bonnet*

| VALVE SIZE, NPS | A(1) | | | |
|---|---|---|---|---|
| | CL600 | | | |
| | Scrd or SWE | BWE | RF | RTJ |
| | mm | | | |
| 1 | 209.6 | 209.6 | 209.6 | 209.6 |
| 2 | 285.8 | 285.8 | 285.8 | 289.1 |
| 3 | NA | 336.6 | 336.6 | 339.9 |
| 4 | NA | 393.7 | 393.7 | 396.7 |
| | Inches | | | |
| 1 | 8.25 | 8.25 | 8.25 | 8.25 |
| 2 | 11.25 | 11.25 | 11.25 | 11.38 |
| 3 | NA | 13.25 | 13.25 | 13.38 |
| 4 | NA | 15.50 | 15.50 | 15.62 |

1. RF: raised-face flanges, RTJ: ring-type-joint flanges, BWE: buttwelding ends, SWE: socketweld ends; Scrd: screwed

*Table 13. CL600 3-Stage Globe Valve Dimensions*

| VALVE SIZE, NPS | YOKE BOSS DIAMETER | D | G |
|---|---|---|---|
| | | Plain Bonnet | |
| | mm | | |
| 1 | 71 | 220.7 | 60.5 |
| 2 | 71 | 260.4 | 77.7 |
| | 90 | 257.3 | 77.7 |
| 3 | 90 | 318.5 | 96.8 |
| 4 | 90 | 329.4 | 128.5 |
| | 127 | 375.4 | 128.5 |
| | Inches | | |
| 1 | 2-13/16 | 8.69 | 2.38 |
| 2 | 2-13/16 | 10.25 | 3.06 |
| | 3-9/16 | 10.13 | 3.06 |
| 3 | 3-9/16 | 12.54 | 3.81 |
| 4 | 3-9/16 | 12.97 | 5.06 |
| | 5 | 14.78 | 5.06 |

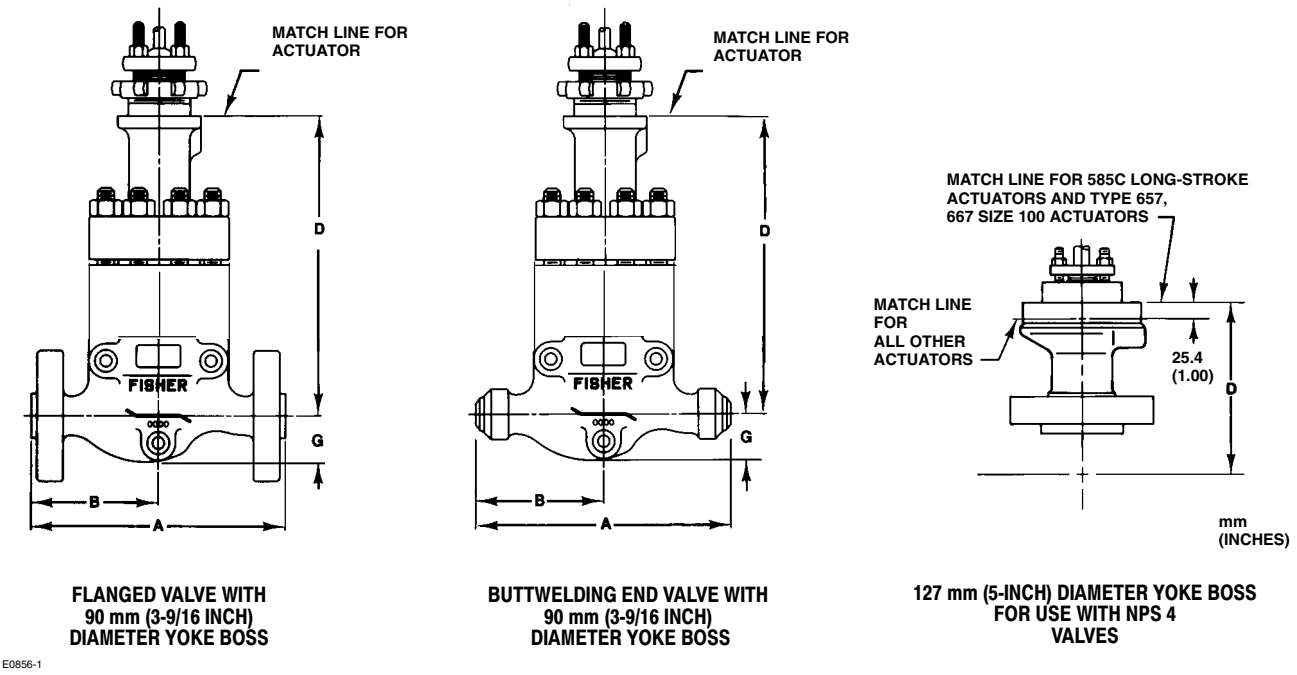


*Figure 5. Typical CL900 and CL1500 ≤ NPS 4, 4-Stage NotchFlo® DST Globe Valve Dimensions (also see tables 14 and 15)*

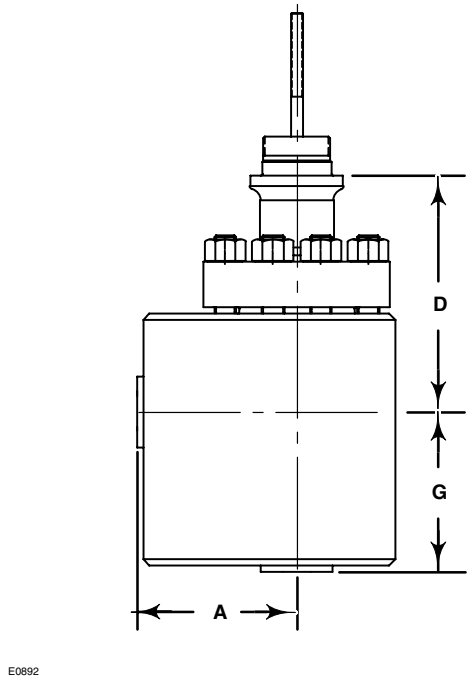


*Figure 6. Typical CL900 and CL1500 ≤ NPS 4, 4-Stage NotchFlo® DST Angle Valve Dimensions (also see tables 16 and 17)*

*Table 14. CL900 and CL1500 ≤ NPS 4, 4-Stage Globe Valve Dimensions with Plain Bonnet*

| VALVE SIZE, NPS | A(1) | | | | | |
|---|---|---|---|---|---|---|
| | CL900 | | CL1500 | | | |
| | RF | RTJ | BWE | SWE | RF | RTJ |
| | mm | | | | | |
| 2 | 375 | 378 | 375 | 375 | 375 | 378 |
| 3 | 442 | 445 | 460 | - - - | 460 | 464 |
| 4 | 511 | 514 | 530 | - - - | 530 | 533 |
| | Inches | | | | | |
| 2 | 14.75 | 14.88 | 14.75 | 14.75 | 14.75 | 14.88 |
| 3 | 17.38 | 17.50 | 18.12 | - - - | 18.12 | 18.25 |
| 4 | 20.12 | 20.25 | 20.88 | - - - | 20.88 | 21.00 |
| VALVE SIZE, NPS | B | | | | | |
| | CL900 | | CL1500 | | | |
| | RF | RTJ | BWE | SWE | RF | RTJ |
| | mm | | | | | |
| 2 | 187 | 189 | 187 | 187 | 187 | 189 |
| 3 | 221 | 222 | 230 | - - - | 230 | 232 |
| 4 | 229 | 230 | 238 | - - - | 238 | 240 |
| | Inches | | | | | |
| 2 | 7.38 | 7.44 | 7.38 | 7.38 | 7.38 | 7.44 |
| 3 | 8.69 | 8.75 | 9.06 | - - - | 9.06 | 9.12 |
| 4 | 9.00 | 9.06 | 9.38 | - - - | 9.38 | 9.44 |

1. RF: raised-face flanges, RTJ: ring-type-joint flanges, BWE: buttwelding ends, SWE: socketweld ends

*Table 15. CL900 and CL1500 ≤ NPS 4, 4-Stage Globe Valve Dimensions*

| VALVE SIZE, NPS | D | | G |
|---|---|---|---|
| | Plain Bonnet | | |
| | 90 mm (3-9/16 Inch) Yoke Boss | 127 mm (5-Inch) Yoke Boss | |
| | mm | | |
| 2 | 333 | - - - | 77 |
| 3 | 412 | - - - | 121 |
| 4 | 427 | 495 | 175 |
| | Inches | | |
| 2 | 13.12 | - - - | 3.06 |
| 3 | 16.24 | - - - | 4.75 |
| 4 | 16.79 | 19.48 | 6.88 |

*Table 16. CL900 and CL1500 ≤ NPS 4, 4-Stage Angle Valve Dimensions with Plain Bonnet*

| VALVE SIZE, NPS | A(1) | | |
|---|---|---|---|
| | CL900 - CL1500 | | |
| | RF | RTJ | SWE |
| | mm | | |
| 1 | 115 | 115 | 74 |
| 1-1/2 | 140 | 140 | 74 |
| 2 | 99 | 100 | 102 |
| 3 | 120 | 122 | - - - |
| 4 | 140 | 142 | - - - |
| | Inches | | |
| 1 | 4.50 | 4.50 | 2.88 |
| 1-1/2 | 5.50 | 5.50 | 2.88 |
| 2 | 3.88 | 3.94 | 4.00 |
| 3 | 4.75 | 4.81 | - - - |
| 4 | 5.50 | 5.56 | - - - |

1. RF: raised-face flanges, RTJ: ring-type-joint flanges, SWE: socketweld ends

*Table 17. CL900 and CL1500 ≤ NPS 4, 4-Stage Angle Valve Dimensions*

| VALVE SIZE, NPS | YOKE BOSS DIAMETER | D | G |
|---|---|---|---|
| | | Plain Bonnet | |
| | mm | | |
| 1 | 71 | 260 | 70 (FLG) or 64 (SWE) |
| 1-1/2 | 71 | 274 | 83 (FLG) or 70 (SWE) |
| 2 | 90 | 251 | 153 |
| 3 | 90 | 294 | 197 |
| 4 | 90 | 319 | 223 |
| | 127 | 387 | 223 |
| | Inches | | |
| 1 | 2-13/16 | 10.25 | 2.75 (FLG) or 2.50 (SWE) |
| 1-1/2 | 2-13/16 | 10.75 | 3.25 (FLG) or 2.75 (SWE) |
| 2 | 3-9/16 | 9.87 | 6.00 |
| 3 | 3-9/16 | 11.56 | 7.75 |
| 4 | 3-9/16 | 12.54 | 8.75 |
| | 5 | 15.23 | 8.75 |

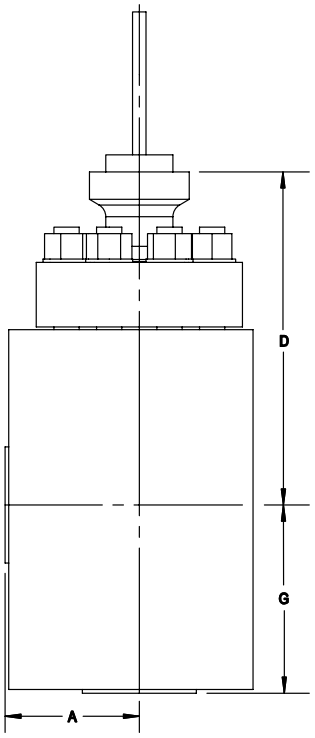


*Figure 7. Typical CL1500 ≥ NPS 6, 4-Stage or CL2500 6-Stage NotchFlo® DST Angle Valve Dimensions (also see table 18)*

*Table 18. CL1500 ≥ NPS 6, 4-Stage and CL2500 6-Stage Angle Valve Dimensions with Plain Bonnet*

| PRESSURE RATING | VALVE SIZE, NPS | A(1) | | D | G(1) | |
|---|---|---|---|---|---|---|
| | | RF | RTJ | Plain Bonnet | RF | RTJ |
| | | mm | | | | |
| CL1500 | 6 | 184.2 | 186.7 | 497.2 | 287.0 | 290 |
| | 8 | 260.0 | 262.5 | 613.2 | 400.0 | 403 |
| CL2500 | 4 | 190.0 | 192.5 | 529.2 | 250.0 | 253 |
| | 6 | 254.0 | 256.5 | 620.8 | 350.0 | 353 |
| | | Inches | | | | |
| CL1500 | 6 | 7.25 | 7.35 | 19.57 | 11.30 | 11.40 |
| | 8 | 10.24 | 10.33 | 24.14 | 15.75 | 15.85 |
| CL2500 | 4 | 7.48 | 7.58 | 20.83 | 9.84 | 9.94 |
| | 6 | 10.00 | 10.10 | 24.44 | 13.78 | 13.88 |

1. RF: Raised-face flanges, RTJ: Ring-type-joint flanges

*Table 19. CL600 3-Stage Port Diameter, Travel, Stem, Yoke Boss Diameter, and Unbalance Area*

| VALVE SIZE, NPS | PORT DIAMETER | TRAVEL | STEM DIAMETER | YOKE BOSS DIAMETER | UNBALANCE AREA |
|---|---|---|---|---|---|
| | mm | | | | $cm^2$ |
| 1 | 25.4 | 9.5 | 12.7 | 71 | 0.1(2) |
| 2 | 38.1 | 9.5 | 12.7 | 71 | 0.3(2) |
| | | | 19.1(1) | 90(1) | |
| 3 | 55.6 | 15.9 | 19.1 | 90 | 0.5(2) |
| 4 | 73.2 | 19.1 | 19.1 | 90 | 0.4(2) |
| | | | 25.4(1) | 127(1) | |
| | Inch | | | | $Inch^2$ |
| 1 | 1.0 | 0.375 | 1/2 | 2-13/16 | 0.02(2) |
| 2 | 1.5 | 0.375 | 1/2 | 2-13/16 | 0.05(2) |
| | | | 3/4(1) | 3-9/16(1) | |
| 3 | 2.19 | 0.625 | 3/4 | 3-9/16 | 0.07(2) |
| 4 | 2.88 | 0.75 | 3/4 | 3-9/16 | 0.06(2) |
| | | | 1(1) | 5(1) | |

1. Optional.
2. Balanced trim, PTTC (pressure tends to close).

*Table 20. CL900 and CL1500 ≤ NPS 4, 4-Stage Port Diameter, Travel, Stem, Yoke Boss Diameter, and Unbalance Area*

| VALVE SIZE, NPS | PORT DIAMETER | TRAVEL | STEM DIAMETER | YOKE BOSS DIAMETER | UNBALANCE AREA |
|---|---|---|---|---|---|
| | mm | | | | $cm^2$ |
| 1 | 17.8 | 6.4 | 12.7 | 71 | 2.5(1) |
| 1-1/2 | 25.4 | 6.4 | 12.7 | 71 | 5.1(1) |
| 2 | 38.1 | 9.5 | 19.1 | 90 | 0.3(2) |
| 3 | 55.6 | 15.9 | 19.1 | 90 | 0.5(2) |
| 4 | 73.2 | 19.1 | 19.1 | 90 | 0.4(2) |
| | | | 25.4 (optional) | 127 (optional) | |
| | Inch | | | | $Inch^2$ |
| 1 | 0.7 | 0.25 | 1/2 | 2-13/16 | 0.39(1) |
| 1-1/2 | 1.0 | 0.25 | 1/2 | 2-13/16 | 0.79(1) |
| 2 | 1.5 | 0.375 | 3/4 | 3-9/16 | 0.05(2) |
| 3 | 2.19 | 0.625 | 3/4 | 3-9/16 | 0.07(2) |
| 4 | 2.88 | 0.75 | 3/4 | 3-9/16 | 0.06(2) |
| | | | 1 (optional) | 5 (optional) | |

1. Unbalanced trim, PTTO (pressure tends to open).
2. Balanced trim, PTTC (pressure tends to close).

*Table 21. CL1500 ≥ NPS 6, 4-Stage and CL2500 6-Stage Port Diameter, Travel, Stem, Yoke Boss Diameter, and Unbalance Area*

| VALVE SIZE, NPS | PORT DIAMETER | TRAVEL | STEM DIAMETER | YOKE BOSS DIAMETER | UNBALANCE AREA |
|---|---|---|---|---|---|
| | mm | | | | $cm^2$ |
| 4 | 73.0 | 19.1 | 25.4 | 127 | 0.4(1) |
| 6 | 111.1 | 25.4 | 25.4 | 127 | 0.6(1) |
| 8 | 136.5 | 31.8 | 31.8 | 127 | 0.7(1) |
| | Inch | | | | $Inch^2$ |
| 4 | 2.88 | 0.75 | 1.00 | 5.00 | 0.06(1) |
| 6 | 4.38 | 1.00 | 1.00 | 5.00 | 0.09(1) |
| 8 | 5.38 | 1.25 | 1.25 | 5.00 | 0.10(1) |

1. Balanced trim, PTTC (pressure tends to close).

## Coefficients

*Table 22. CL600 -- 3-Stage, Linear*

**CL600 -- 3-Stage, Level C** — **Linear Characteristic**

| Valve Size, NPS | Port Diameter | | Maximum Travel | | Level | Flow Coefficient | Valve Opening—Percent of Total Travel | | | | | | | | | | | $F_L$[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | Inch | mm | Inch | | | Min | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
| 1 Balanced | 25.4 | 1.0 | 9.5 | 0.375 | C | $C_v$ | 0.100 | (2) | 0.226 | 0.615 | 1.28 | 2.13 | 3.02 | 3.80 | 4.34 | 4.58 | 4.58 | 0.99 |
| 2 Balanced | 38.1 | 1.5 | 9.5 | 0.375 | C | $C_v$ | 0.150 | (2) | 0.545 | 1.45 | 2.64 | 3.85 | 5.17 | 6.50 | 7.75 | 8.75 | 9.30 | 0.99 |
| 3 Balanced | 55.6 | 2.19 | 15.9 | 0.625 | C | $C_v$ | 0.250 | (2) | 1.17 | 3.12 | 5.68 | 8.28 | 11.1 | 14.0 | 16.7 | 18.8 | 20.0 | 0.99 |
| 4 Balanced | 73.2 | 2.88 | 19.1 | 0.75 | C | $C_v$ | 0.430 | (2) | 1.99 | 5.30 | 9.65 | 14.1 | 18.9 | 23.8 | 28.3 | 32.0 | 34.0 | 0.99 |

1. At 100% travel.
2. Clearance flow only.

*Table 23. CL900 and CL1500 ≤ NPS 4, 4-Stage, Linear*

**CL900 and CL1500 ≤ NPS 4, 4-Stage, Levels A, B, and C** — **Linear Characteristic**

| Valve Size, NPS | Port Diameter | | Maximum Travel | | Level | Flow Coefficient | Valve Opening—Percent of Total Travel | | | | | | | | | | | $F_L$[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | Inch | mm | Inch | | | Min | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
| 1 Unbalanced | 17.8 | 0.7 | 6.4 | 0.25 | A | $C_v$ | 0.040 | (2) | 0.030 | 0.150 | 0.270 | 0.390 | 0.520 | 0.640 | 0.76 | 0.88 | 1.00 | 0.99 |
| | | | | | B | | 0.040 | (2) | 0.042 | 0.210 | 0.378 | 0.546 | 0.728 | 0.896 | 1.06 | 1.23 | 1.40 | 0.99 |
| | | | | | C | | 0.040 | (2) | 0.051 | 0.255 | 0.459 | 0.663 | 0.884 | 1.09 | 1.29 | 1.50 | 1.70 | 0.99 |
| 1-1/2 Unbalanced | 25.4 | 1.0 | 6.4 | 0.25 | A | $C_v$ | 0.080 | (2) | 0.057 | 0.285 | 0.513 | 0.741 | 0.988 | 1.22 | 1.44 | 1.67 | 1.90 | 0.99 |
| | | | | | B | | 0.080 | (2) | 0.075 | 0.375 | 0.675 | 0.975 | 1.30 | 1.60 | 1.90 | 2.20 | 2.50 | 0.99 |
| | | | | | C | | 0.080 | (2) | 0.096 | 0.480 | 0.864 | 1.25 | 1.66 | 2.05 | 2.43 | 2.82 | 3.20 | 0.99 |
| 2 Balanced | 38.1 | 1.5 | 9.5 | 0.375 | A | $C_v$ | 0.120 | (2) | 0.400 | 0.960 | 1.54 | 2.20 | 2.86 | 3.42 | 3.92 | 4.32 | 4.55 | 0.99 |
| | | | | | B | | 0.120 | (2) | 0.460 | 1.10 | 1.85 | 2.63 | 3.39 | 4.26 | 5.19 | 5.99 | 6.63 | 0.99 |
| | | | | | C | | 0.120 | (2) | 0.570 | 1.53 | 2.62 | 3.85 | 5.00 | 6.16 | 7.29 | 8.19 | 8.85 | 0.99 |
| 3 Balanced | 55.6 | 2.19 | 15.9 | 0.625 | A | $C_v$ | 0.200 | (2) | 0.580 | 1.84 | 3.20 | 4.57 | 6.23 | 7.35 | 8.25 | 8.82 | 8.90 | 0.99 |
| | | | | | B | | 0.200 | (2) | 0.620 | 2.00 | 3.78 | 5.45 | 7.30 | 9.32 | 11.5 | 13.4 | 14.6 | 0.99 |
| | | | | | C | | 0.200 | (2) | 0.416 | 2.19 | 4.41 | 6.90 | 9.80 | 12.4 | 14.7 | 16.4 | 16.8 | 0.99 |
| 4 Balanced | 73.2 | 2.88 | 19.1 | 0.75 | A | $C_v$ | 0.350 | (2) | 0.462 | 2.31 | 4.16 | 6.01 | 8.01 | 9.86 | 11.7 | 13.6 | 15.4 | 0.99 |
| | | | | | B | | 0.350 | (2) | 0.723 | 3.62 | 6.51 | 9.40 | 12.5 | 15.4 | 18.3 | 21.2 | 24.1 | 0.99 |
| | | | | | C | | 0.350 | (2) | 0.879 | 4.40 | 7.91 | 11.4 | 15.2 | 18.8 | 22.3 | 25.8 | 29.3 | 0.99 |

1. At 100% travel.
2. Clearance flow only.

*Table 24. CL1500 ≥ NPS 6, 4-Stage and CL2500 6-Stage, Linear*

| **CL1500 ≥ NPS 6, 4-Stage and CL2500 6-Stage, Level C** | | | | | | | | | | | | | | | | | | **Linear Characteristic** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Valve Size, NPS/ Rating** | **Port Diameter** | | **Maximum Travel** | | **Level** | **Flow Coeffi-cient** | **Valve Opening—Percent of Total Travel** | | | | | | | | | | | $F_L$[1] |
| | **mm** | **Inch** | **mm** | **Inch** | | | **Min** | **10** | **20** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | |
| 6 CL1500 | 111.1 | 4.38 | 25.4 | 1 | C | $C_v$ | 0.5 | (2) | 1.8 | 7.7 | 16 | 25 | 34 | 42 | 50 | 56 | 61 | 0.99 |
| 8 CL1500 | 136.5 | 5.38 | 31.8 | 1.25 | C | $C_v$ | 0.7 | (2) | 3.5 | 16 | 32 | 50 | 67 | 82 | 96 | 107 | 117 | 0.99 |
| 4 CL2500 | 73.0 | 2.88 | 19.1 | 0.75 | C | $C_v$ | 0.3 | (2) | 0.7 | 2.8 | 5.6 | 8.8 | 12 | 15 | 18 | 21 | 23 | 0.99 |
| 6 CL2500 | 111.1 | 4.38 | 25.4 | 1 | C | $C_v$ | 0.4 | (2) | 1.4 | 5.9 | 12 | 19 | 26 | 33 | 40 | 45 | 49 | 0.99 |

1. At 100% travel.
2. Clearance flow only.

## Specifications

**Available Valves**

**CL600 3-Stage:** Level C only
**CL900 and CL1500 ≤ NPS 4, 4-Stage:** Levels A, B, and C
**CL1500 ≥ NPS 6, 4-Stage and CL2500 6-Stage:** Level C only

**Valve Sizes and End Connection Styles**

**CL600 3-Stage:** See table 1
**CL900 and CL1500 ≤ NPS 4, 4-Stage:** See table 2
**CL1500 ≥ NPS 6, 4-Stage and CL2500, 6-Stage:** See table 3

**Shutoff Classification**

**Class V:** [$5x10^{-12}m^3$/sec/bar/mm of port diameter (0.0005 mL/min/psid/in) of water at service pressure drop] per ANSI/FCI 70-2 and IEC 60534-4

**Maximum Inlet Pressures and Temperatures**(1)

Consistent with applicable CL600, CL900, CL1500, and CL2500 pressure/temperature ratings according to ASME B16.34 unless limited by individual temperature limits shown in tables 4, 5, 6, 8, 9, or 10

**Maximum Pressure Drop**(1)

See table 7

**Construction Materials**

**Valve Body and Bonnet:**
*CL600, CL900, and CL1500:* ■ WCC steel, ■ WC9 Cr-Mo steel, ■ CF8M SST, and ■ LCC for low temperature service
*CL600 only:* ■ Duplex SST ASME SA995 CD3MN, FMS 20B70
*CL1500 ≥ NPS 6 and CL2500 only:* ■ SA105, ■ F316, and ■ F347
**Valve Plug:** ■ S44004 SST (440C SST), ■ S41000 SST (NACE) (410 SST), or ■ Alloy 6 (CL600 only), ■ S31600 with CoCr-A (CL1500 ≥ NPS 6 and CL2500 only), or ■ S34700 with CoCr-A (CL1500 ≥ NPS 6 and CL2500 only)
**Seat Ring:** ■ S44004 SST (440C SST), ■ S31600 SST with hardface (NACE) (316 SST), or ■ Alloy 6 (CL600 only), or ■ S34700 with CoCr-A (CL1500 ≥ NPS 6 and CL2500 only)
**Cage:** ■ S17400 SST with H900 heat- treat condition, ■ S17400 H1150 DBL (NACE), or ■ Alloy 6 (CL600 only), ■ S17400 SST with H1075 heat-treat (CL1500 ≥ NPS 6 and CL2500 only), or ■ S20910 (CL1500 ≥ NPS 6 and CL2500 only)
**Other Parts:** See table 9

**Temperature Capabilities**(1)

**3-Stage, 4-Stage, and 6-Stage:** See tables 4, 5, 6, 8, 9, and 10

**Valve Body/Trim Combinations:** See tables 4, 5, and 6

**Bolting for Sour Applications:** See table 10 (CL600 -- 3-Stage only). For all other valve pressure ratings, contact your Emerson Process Management sales office

**All Other Parts:** See table 9

**Flow Coefficients**

See tables 22, 23, and 24

**Flow Characteristic**

Linear

**Flow Direction**

Flow up

**Port Diameter, Travel, Stem, Yoke Boss Diameters, Unbalance Area**

See tables 19, 20, and 21

**Minimum Seating Force**

Use Class V seat load requirements (refer to Catalog 14)

**Noise Level**

Use Fisher liquid noise prediction methods available in the Fisher sizing program

(continued)

## Specifications (continued)

**Bonnet Style**

**Plain Bonnet:** See figures 4, 5, 6, and 7

**Packing Arrangements**

**Standard Material:** Single PTFE V-ring
**Optional Material:** See table 9

**Approximate Weights**

See table 11

**Dimensions**

**Globe Valve CL600, CL900, and CL1500:** See tables 12, 13, 14, and 15
**Angle Valve CL600:** Contact your Emerson Process Management sales office
**Angle Valve CL900 and CL1500 ≤ NPS 4:** See tables 16 and 17
**Angle Valve CL1500 ≥ NPS 6 and CL2500:** See table 18

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

**Note**

**Neither Emerson, Emerson Process Management, nor any of their affiliated entities assumes responsibility for the selection, use and maintenance of any product. Responsibility for the selection, use, and maintenance of any product remains with the purchaser and end-user.**



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