

Fisher™ ET, EAT, and ETR Sliding-Stem Control Valves

Fisher ET, EAT, and ETR general-purpose control valves (figures 1, 2, and 3) are used for throttling or on-off control of a wide variety of liquids and gases. All three valve designs have single ports, balanced valve plugs, and cage guiding. Metal-to-PTFE seating for stringent shutoff requirements is standard in all valves except those with Cavitrol™ III cages. Metal-to-metal seating for higher temperatures is standard for valves with Cavitrol III cages and optional for all other valves.

The temperature limits of ET valves can be extended above 232°C (450°F) by using PEEK (PolyEtherEtherKetone) anti-extrusion rings in combination with a spring-loaded PTFE seal. The PEEK anti-extrusion rings expand to close off the clearance gap between the plug and the cage where the PTFE seal may extrude at high temperatures and pressures. The temperature limits are extended to 316°C (600°F) for non-oxidizing service and to 260°C (500°F) for oxidizing service.

The ET product line is available for a wide range of applications, including sulfide and chloride stress-cracking environments common to the oil and gas production industries. To discuss available constructions, contact your [Emerson sales office](#) and include the applicable codes and standards required for these environments.

The easy-e™ Valve Family

ET, EAT, and ETR control valves are part of the versatile easy-e family of Fisher industrial control valves. easy-e valves share the following characteristics:

- Multiple trim material choices
- Interchangeable, restricted-capacity trims and full-sized trims to match variable process flow demands



W1916-4

FISHER ET CONTROL VALVE
WITH 667 ACTUATOR

- Different cage/plug styles that provide particular flow characteristics for highly-specialized applications. The standard cage comes in three different flow characteristics: quick-opening, linear, or equal percentage.
- Whisper Trim™ I, Whisper Trim III (figure 6), and WhisperFlo™ cages (figures 4 and 5) attenuate aerodynamic noise in gaseous service.
- To help eliminate cavitation damage in a properly-sized valve, a standard-travel, Cavitrol III, one-stage cage (figure 8) and a long-travel, Cavitrol III, two-stage cage are available in the NPS 1 through NPS 8 ET control valve.

Features

- **Compliance with the Clean Air Act—ENVIRO-SEAL™** packing systems (figures 9 and 10) that provide an improved stem seal to help prevent the loss of process fluid are available. These packing systems feature PTFE or Graphite ULF packing with live-loading for reduced packing maintenance.
- **PTFE Seating for Long-Lasting Shutoff Capability—**Controlled compression of standard seat construction protects PTFE disk between metal disk seat and disk retainer (figure 1). Only the edge of the PTFE disk is contacted by the flowstream during normal operation. Excellent shutoff is maintained by a backup ring or spring-loading that forces the valve plug seal ring against the cage (figure 1).
- **Valve Plug Stability—**Rugged cage guiding provides high valve plug stability, which reduces vibration and mechanical noise.
- **Cost-Effective Operation and Maintenance Economy—**Increased wear resistance of hardened stainless steel trim means longer-lasting service. When inspection or maintenance is necessary, the body can stay in the pipeline during removal of trim parts. Balanced valve plug construction permits use of smaller, lower-cost Fisher actuators. The ETR valve also permits easy body interior access without having to remove the bonnet or actuator (figure 3). And, trim inventory costs are cut because dimensional standardization permits use of most standard easy-e trim parts.
- **Compliance with European Standards—**Valves are available with dimensions specified by EN/DIN standards. See figure 14.
- **Sour Service Capability—**Unless otherwise noted, references are to NACE MR0175-2002. Optional materials are available to meet NACE MR0103 and NACE MR0175 / ISO 15156. Material requirements under these standards vary by edition and year of issue; the specific standard must be specified.

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Specifications

Available Configurations

ET: Single-port, globe-style control valve with cage guiding, balanced valve plug, and push-down-to-close valve plug action (figure 1)

EAT: Angle version of ET control valve, used to facilitate piping or in applications where a self-draining valve is desired (figure 2)

ETR: Same as ET control valve except with push-down-to-open valve plug action (figure 3)

Valve Sizes and End Connection Styles

Flanged raised-face per EN 1092-1/B and see table 1

Maximum Inlet Pressures and Temperatures^(1,2)

As listed below, unless limited by maximum pressure drop or material temperature capabilities

Valves with Cast Iron Bodies

Flanged: Consistent with CL125B or 250B per ASME B16.1

Valves with Steel and Stainless Steel Bodies

Flanged: Consistent with CL150, 300, and 600⁽³⁾ per ASME B16.34

Screwed or Welding: Consistent with flanged CL600 per ASME B16.34

Maximum Pressure Drops⁽²⁾

Same as maximum inlet pressure for specific construction defined above, except where further limited as follows:

All Valves Except Those with Cavitrol III, Whisper Trim III, and WhisperFlo Cages: See figure 11.

Valves with Cavitrol III Cages: See figure 12.

Valves with Whisper Trim III Cages: 0.999 $\Delta P/P_1$ maximum for levels A1 through D3

Valves for NACE MR0175 / ISO 15156 and MR0103: See figure 13

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

Class IV, V, or VI. See tables 2, 3, or 4

Construction Materials

Body, Bonnet, and Bonnet Spacer or Bottom Flange, if used: ■ Cast iron, ■ WCC carbon steel, or ■ LCC carbon steel, ■ WC9 chrome moly steel, ■ CF8M

(cast 316 stainless steel), ■ CF3M (cast 316L stainless steel) or ■ other materials upon request

Valve Plug, Cage, and Metal Seating Parts:

All Valves Except Those with Cavitrol III or Whisper Trim III Cages: See table 5

Valves with Cavitrol III Cages: See table 6

Valves with Whisper Trim III Cages: See table 8

Valves with WhisperFlo Cages: See table 7

Bellows Seal Assembly: ■ 316L stainless steel or ■ N04400

All Other Parts: See table 9

Material Temperature Capabilities⁽²⁾

Body/Trim Combinations:

All Valves Except Those with Cavitrol III or Whisper Trim III Cages: See figure 11

Valves with Cavitrol III Cages: See table 6

Valves with Whisper Trim III Cages: See table 8

Valves with WhisperFlo Cages: See table 7

Bolting For NACE MR0175 / ISO 15156 and MR0103: See table 19

Bonnets: See table 11

All Other Parts: See table 9

Flow Characteristics

Standard Cages: ■ Quick-opening, ■ linear, or ■ equal percentage

Whisper Trim, WhisperFlo, and Cavitrol Cages: Linear

Flow Directions

ET

Standard Cage: Normally down

Whisper Trim and WhisperFlo Cages: Always up

Cavitrol Cage: Always down

EAT

Standard Cage with Liner for Metal Seat: Normally down

Standard Cage without Liner: Flow up or down

Whisper Trim and WhisperFlo Cages: Always up

ETR

Standard Cage: Normally up

Whisper Trim Cage: Always down

Flow Coefficients and Noise Level Prediction

See table 12 and Catalog 12

- continued -

Specifications (continued)

Port Diameters and Maximum Valve Plug Travels

See tables 13, 15, and 16

Yoke Boss and Stem Diameters

See table 14

Typical Bonnet Styles

See table 11

Packing Arrangements

Standard Material: Single PTFE V-ring
 Optional Materials: See table 9
 ENVIRO-SEAL Packing Systems: See figures 9 and 10
ENVIRO-SEAL Packing Systems in vacuum service:
 Standard ENVIRO-SEAL packing systems can be used in vacuum service with packing rings in standard orientation. Do not reverse the ENVIRO-SEAL PTFE packing rings. Also, see Bulletin 59.1:061, ENVIRO-SEAL Packing Systems for Sliding-Stem Valves ([D101633X012](#)).

Approximate Weights

NPS 1: 14 kg (30 lb)
 NPS 1-1/2: 20 kg (45 lb)
 NPS 2: 39 kg (85 lb)
 NPS 2-1/2: 45 kg (100 lb)
 NPS 3: 57 kg (125 lb)
 NPS 4: 77 kg (170 lb)
 NPS 6: 159 kg (350 lb)
 NPS 8: 408 kg (900 lb)

Optional Safety Instrumented System Classification

SIL3 capable — certified by exida Consulting LLC

Additional Options

■ Lubricator, ■ lubricator/isolating valve, ■ drilled and tapped connection in extension bonnet for leak-off service, ■ body drain plug, ■ style 3 fabricated extension bonnet made on order to a specific length for cryogenic service, ■ style NS bonnet for seismic service requirements, ■ packings suitable for nuclear service, ■ Class V shutoff for ET above 232°C (450°F) using PEEK anti-extrusion rings

1. EN (or other) ratings and end connections can usually be supplied; consult your [Emerson sales office](#).
 2. The pressure or temperature limits in this bulletin, and any applicable code limitations, should not be exceeded.
 3. Certain bonnet bolting material selections may require a CL600 easy-e valve assembly to be derated. Contact your Emerson Automation Solutions sales office for more information.
 4. Limitation based on excessive noise increase if max ΔP/P₁ ratio for a given cage level is exceeded.

ENVIRO-SEAL Packing System Specifications

Applicable Stem Diameters

■ 9.5 mm (3/8 inches), ■ 12.7 mm (1/2 inches),
 ■ 19.1 mm (3/4 inches), ■ 25.4 mm (1 inch), and
 ■ 31.8 mm (1-1/4 inches) diameter valve stems

Maximum Pressure/Temperature Limits⁽¹⁾

To Meet the EPA Fugitive Emission Standard of 100 PPM⁽²⁾
For ENVIRO-SEAL PTFE and ENVIRO-SEAL Duplex packing systems: full CL300 up to 232°C (450°F)
For ENVIRO-SEAL Graphite ULF packing: 104 bar (1500 psig) at 316°C (600°F)

Construction Materials

PTFE Packing Systems
Packing Ring and Lower Wiper: PTFE V-ring⁽³⁾
Male and Female Adaptor Rings: Carbon-filled PTFE V-ring

Graphite ULF Packing Systems: Graphite rings
 Duplex Packing Systems:
Male and Female Adaptor Rings: Carbon-filled PTFE V-ring
Guide Bushings: Carbon graphite
Packing Rings: Graphite composite
Packing Washer: PTFE
Anti-Extrusion Washer: Filled PTFE (not required for Graphite ULF or duplex packing)
Lantern Ring: S31600 (316 stainless steel) (not required for Graphite ULF packing)
Packing Box Flange: S31600
Spring: ■ 17-7PH stainless steel or ■ N06600
Packing Follower: S31600 lined with carbon-filled PTFE
Packing Box Studs: Strain-hardened 316 stainless steel
Packing Box Nuts: 316 stainless steel SA194 Grade 8M

1. Refer to the valve specifications in this bulletin for pressure/temperature limits of valve parts. Do not exceed the pressure/temperature rating of the valve. Do not exceed any applicable code or standard limitation.
 2. The Environmental Protection Agency (EPA) has set a limit of 100 parts per million (ppm) for fugitive emissions from a valve in selected VOC (Volatile Organic Compound) services.
 3. In vacuum service, it is not necessary to reverse the ENVIRO-SEAL PTFE packing rings.

Table 1. Available Constructions

| VALVE | VALVE SIZE, NPS | VALVE BODY MATERIAL AND END CONNECTION STYLE ⁽¹⁾ | | | | | | | |
|-------|---|---|---------------------|--|-------------------|-------|-----|--------------|----------------|
| | | Cast Iron Valve Body | | Carbon Steel, Alloy Steel, or Stainless Steel Valve Body | | | | | |
| | | CL125 FF Flanged | CL250 RF Flanged | Screwed | RF or RTJ Flanged | | | Butt Weld | Socket Weld |
| | | | CL150 | CL300 | CL600 | | | | |
| ET | 1, 1-1/2, or 2 2-1/2, 3, 4, 6, or 8 | X | X | X | X | X | X | X | X |
| EAT | 1 or 2 3, 4, or 6 | --- | --- | --- | X | X | X | X | X |
| ETR | 1, 1-1/2, or 2 2-1/2, 3, or 4 | --- | --- | X | X | X | X | X | X |
| | | --- | --- | --- | --- | --- | --- | --- | --- |
| VALVE | VALVE SIZE, DN | STEEL VALVE BODY MATERIAL AND RAISED-FACE END CONNECTION STYLE ⁽²⁾ | | | | | | | |
| | | PN16 | PN25 | PN40 | PN63 | PN100 | | | |
| ET | 25, 40, 50, 65, 80, 100, 150, or 200 | X | X | X | X | X | | | |
| EAT | 25, 50, 80, 100, or 150 | X | X | X | X | X | | | |
| ETR | 25, 40, 50, 65, 80, or 100 | X | X | X | X | X | | | |

X = Available Construction.
1. End connection style abbreviations: FF - Flat Faced, RF - Raised Face, RTJ - Ring Type Joint.
2. End connection EN1092-1/B.

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

| Valve Design | Seating | Shutoff Class |
|--|---|--|
| All except those with Cavitrol III cages | PTFE | V Air Test |
| | | V (optional) |
| | | VI (optional) ⁽³⁾ |
| | Metal | IV (standard) |
| | | V (optional) ⁽¹⁾ |
| | | VI (optional) ⁽³⁾ |
| ET with Cavitrol III one-stage cage | Metal | IV (standard) |
| ET with Cavitrol III two-stage cages | Metal | V (optional) |
| ET and EAT w/ TSO (Tight Shutoff) trim (CL125 through 600) | Replaceable, protected soft seat | V |
| ET w/ TSO (Tight Shutoff) trim (CL125 through 600) | Std or Cavitrol III trim. Replaceable, protected soft seat. | TSO ⁽²⁾ TSO is not an ANSI/FCI leakage class. Valves with TSO trim are factory tested to a more stringent Emerson Automation Solutions test requirement of no leakage at time of shipment. Test medium is water. Specify service ΔP when ordering. Shutoff class V. |

1. Class V shutoff requires spring-loaded seal ring, radius-seat plug, and wide-bevel seat ring (not available with 8-inch port, quick-opening cage). Not available with trims 4, 29, and 85.
2. For additional information, contact your [Emerson sales office](#).
3. Refer to table 3.

ENVIRO-SEAL, HIGH-SEAL Packing Systems

ENVIRO-SEAL and HIGH-SEAL packing systems offer exceptional sealing capabilities. These systems easily install in existing valves or can be purchased with new valves. These systems help seal the process to conserve valuable process fluid. The long-life and reliability of these systems also reduce maintenance costs and downtime.

For applications requiring compliance with environmental protection regulations, the unique ENVIRO-SEAL packing system (figure 10) and a unique ENVIRO-SEAL bellows seal system (figure 9) are offered. The emission control packing system keeps emission concentrations below the EPA 100 ppm requirement.

For an excellent stem seal in applications that are not environmentally-sensitive, the HIGH-SEAL Graphite

ULF packing system (figure 10) is offered. The HIGH-SEAL packing system provides improved sealing at pressure/temperature ratings beyond ENVIRO-SEAL limits.

ENVIRO-SEAL packing systems, available with PTFE, Graphite ULF, or duplex packing, and the HIGH-SEAL Graphite ULF packing system feature live-loading and unique packing-ring arrangements for long-term, consistent sealing performance.

ANSI/FCI Class VI Shutoff Capabilities

ET valves with soft seat and metal seat constructions can provide ANSI/FCI Class VI shut-off capabilities. See tables 3 and 4.

Table 3. Class VI Shutoff Availability^(1, 2)

| Valve | Port Size, Inches | Seat | Minimum Seat Load |
|-------|----------------------|-------|---------------------|
| ET | $\geq 3.4375 \leq 7$ | Soft | See Catalog 14 |
| ET | $\geq 3.4375 \leq 7$ | Metal | 300 lbs/lineal inch |

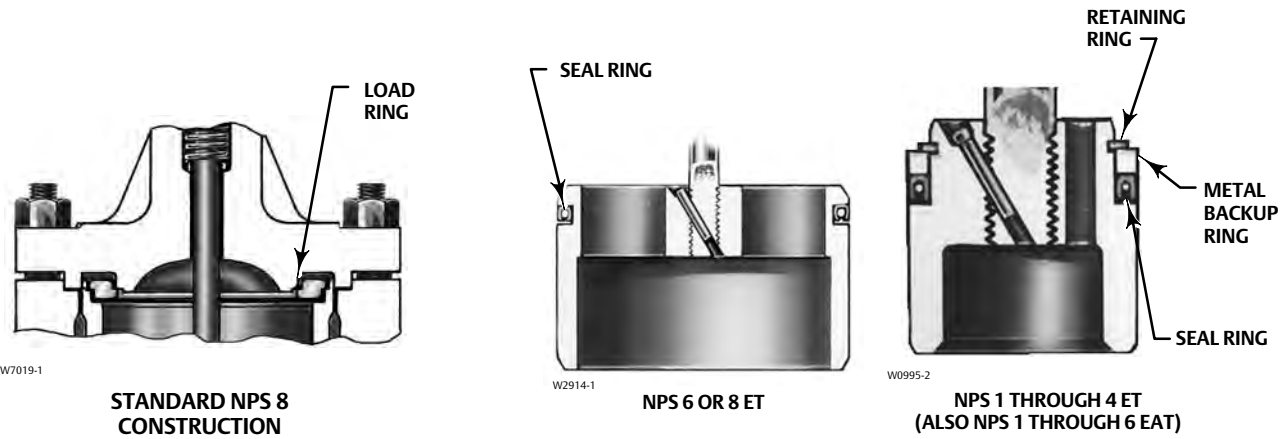
1. Limited retrofit capability. Consult your [Emerson sales office](#).
2. Not for use with NPS 8.

Table 4. Class VI Trim Materials

| VALVE | CAGE/SEAT RING RETAINER | VALVE PLUG | SEAT RING | SEAL RING | TRIM TEMPERATURE LIMIT | |
|-------|-------------------------|--|--|------------------------------|------------------------|-------------|
| | | | | | °C | °F |
| ET | 316 SST / ENC | S31600 w/ standard beveled seat | S31600/PTFE | UHMWPE ⁽¹⁾ R30003 | -198 to 66 | -325 to 150 |
| | 316 SST / ENC | S31600/CoCr-A seat w/ radiused seat (special design) | S31600 w/ wide beveled seat (special design) | UHMWPE R30003 | -198 to 66 | -325 to 150 |
| | 17-4 SST (17-4PH SST) | S41600 w/ standard beveled seat | S31600/PTFE | UHMWPE R30003 | -29 to 66 | -20 to 150 |
| | 17-4 SST | S41600 w/ radiused seat (special design) | S31600 w/ wide beveled seat (special design) | UHMWPE R30003 | -29 to 66 | -20 to 150 |

1. UHMWPE (Ultra High Molecular Weight Polyethylene)

Figure 1. Fisher ET Sectional with Standard Cages



SPRING-LOADED SEAL RING CONSTRUCTION FOR USE WITH CAVITROL CAGES AND FOR METAL SEAT WITH OPTIONAL CLASS V SHUTOFF

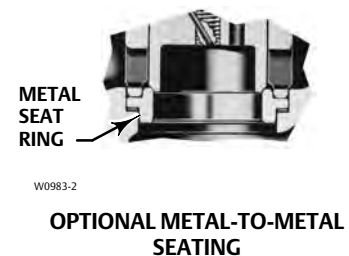
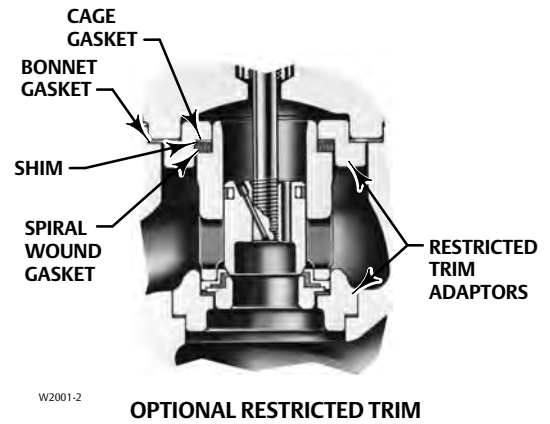
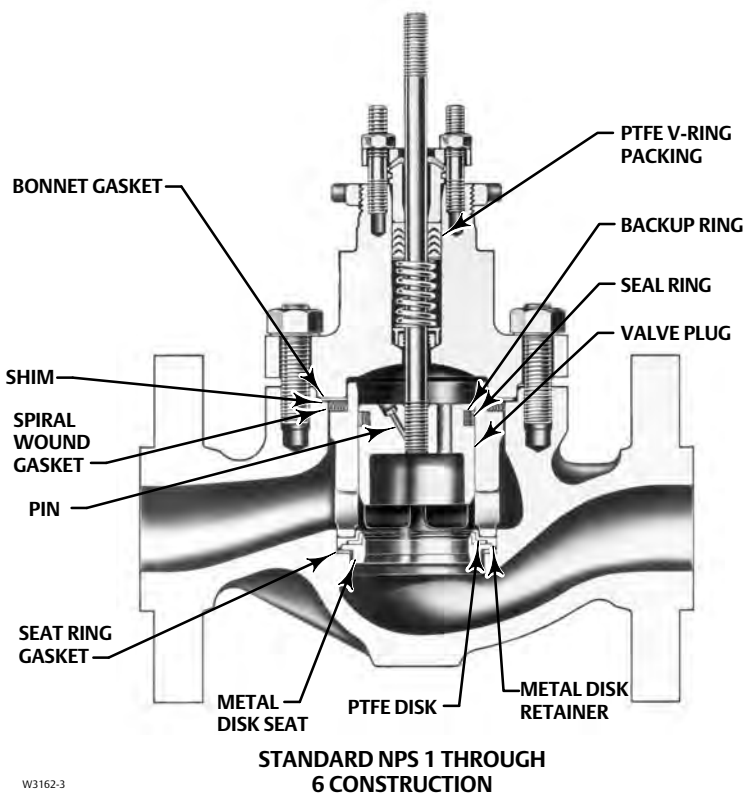
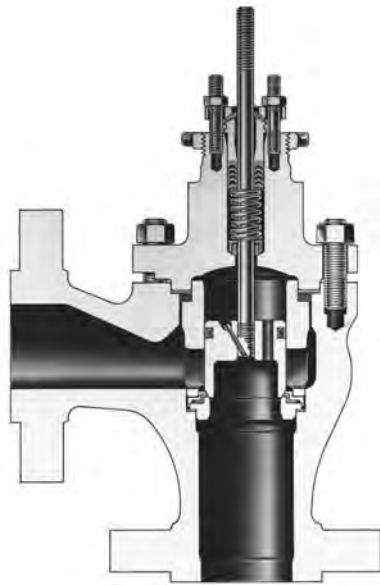
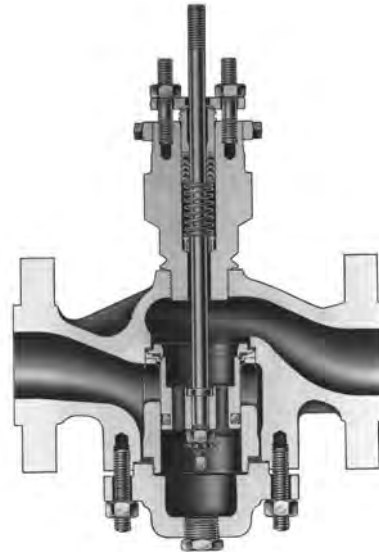


Figure 2. Fisher EAT Sectional



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Figure 3. Fisher ETR Sectional



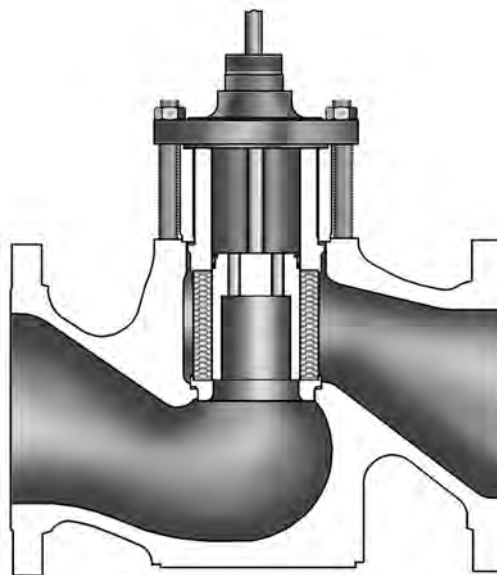
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Figure 4. Typical Valve with WhisperFlo Aerodynamic Trim



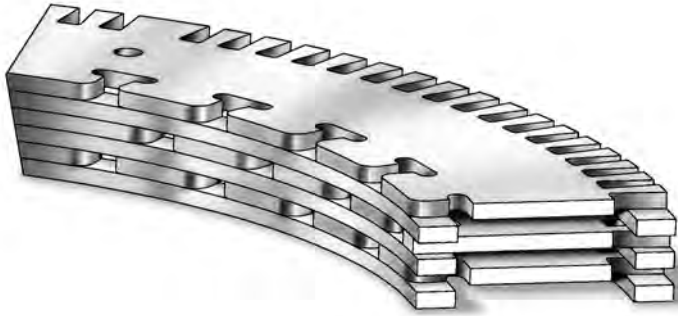
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WhisperFlo TRIM

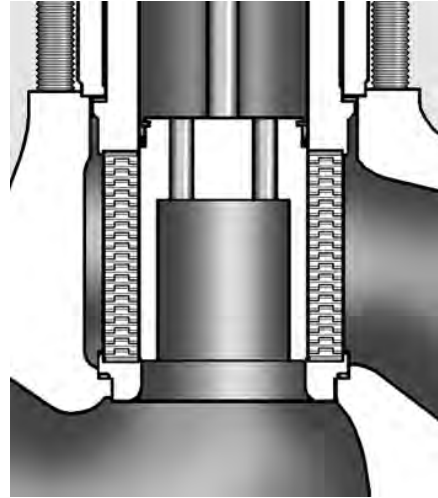


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Figure 5. Typical WhisperFlo Cage



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Table 5. Typical Combinations of Metal Trim Parts for All Valves Except Those for NACE MR0175 / ISO 15156 and MR0103 Specifications⁽¹⁾, Cavitrol III⁽²⁾, Whisper Trim III⁽³⁾, and 4, 6, and 8-Inch WhisperFlo Cages⁽⁶⁾

| Trim Designation | Valve Plug | Cage | Disk Seat and Retainer for Standard PTFE-Seat Construction | Seat Ring or Liner for Optional Metal-Seat Construction | Optional Liner (Metal Seat EAT Valve Only) |
|---|--|--|--|---|--|
| 1 (typically used with optional metal-seat constructions in all designs and body materials except CF8M) | S41600 HT | 17-4 SST HT | --- | S41600 HT or CA15 HT ⁽⁴⁾ | S41600 HT |
| | 17-4 SST HT HT ⁽⁵⁾ | 17-4 SST HT ⁽⁵⁾ | | | |
| 3 | S31600 with seat and guide hard faced with CoCr-A hardfacing alloy | R30006 or R30016 (alloy 6) | --- | R30006 (alloy 6) | --- |
| 4 ⁽⁷⁾ | S31600 | 17-4 SST HT | S31600 | S31600 | S31600 |
| 5 ⁽⁵⁾ | S31600 with seat and guide hard faced with CoCr-A hardfacing alloy | R31233 | R30006 Disk Seat & retainer | R30006 (alloy 6) | --- |
| 6 ⁽⁵⁾ | S31600 with seat and guide hard faced with CoCr-A hardfacing alloy | S31603 CRPL | R30006 Disk Seat & retainer | R30006 (alloy 6) | --- |
| 27 | S31600 with seat and guide hard faced with CoCr-A hardfacing alloy | 316 SST with electroless nickel coating (ENC) | S31600 disk retainer with CoCr-A disk seat | R30006 (alloy 6) | --- |
| 28 ⁽⁸⁾ | S31600 with seat hard faced with CoCr-A hardfacing alloy | 316 SST with electroless nickel coating (ENC) | S31600 disk retainer with CoCr-A disk seat | R30006 (alloy 6) | --- |
| 29 (standard for CF8M bodies in all designs regardless of seat construction) ⁽⁸⁾ | S31600 | 316 SST with electroless nickel coating (ENC) | S31600 | S31600 | S31600 |
| 37 and 37H (trim 37H has clearances for high-temperature service above 210°C [410°F]) | S31600 with seat and guide hard faced with CoCr-A | 17-4 SST HT | S31600 disk retainer with CoCr-A disk seat | Seat Ring: R30006 (alloy 6) | --- |
| 57 (standard for standard PTFE-seat ET, EAT, ETR in all body materials except CF8M) | S41600 HT | 17-4 SST HT ⁽⁵⁾ | S31600 | --- | --- |
| | 17-4 SST HT ⁽⁵⁾ | | | | |
| 316L | S31603 | 316L SST with electroless nickel coating (ENC) | S31603 | S31603 | --- |
| 316L HF | S31603 with seat and guide hard faced with CoCr-A hardfacing alloy | 316L SST with electroless nickel coating (ENC) | S31603 disk retainer with CoCr-A disk seat | R30006 (alloy 6) | --- |

1. For NACE MR0175 / ISO 15156 and MR0103 specification trims, see table 18
2. For Cavitrol III trims, see table 6.
3. For Whisper Trim III trims, see table 8
4. CA15 is used for NPS 6 and 8 full-sized and restricted-trim valves.
5. For 8-inch Whisper Trim I.
6. For 4, 6, and 8-Inch WhisperFlo trims, see table 7.
7. Not for use with Whisper Trim I.
8. Not for use with Whisper Trim I with 136 mm (5.375 inch) and larger ports.

Table 6. Cavitrol III⁽¹⁾ Metal Trim Part Materials and Body/Trim Temperature Capabilities

| TRIM DESIGNATION | VALVE PLUG | CAGE | CAGE RETAINER | SEAT RING | BODY & BONNET | MATERIAL TEMPERATURE CAPABILITY | | | | |
|------------------|---------------------|---|---------------|---------------------------------------|--|------------------------------------|--------------------------------------|--|--------------------------------------|--|
| | | | | | | °C | | °F | | |
| | | | | | | Minimum | Maximum | Minimum | Maximum | |
| 76 | Heat-treated S42000 | 17-4 SST H900 for Cavitrol III 1-stage or 17-4 SST H1075 for Cavitrol III 2-stage | S31600 | S17400 with H900 heat-treat condition | WCC carbon steel, WC9 chrome moly steel, or LCC carbon steel | -29 | These materials not limiting factors | -20 | These materials not limiting factors | |
| | | | | | CF8M | NPS 1, 1-1/2, or 2 valve body size | -29 | These materials and sizes not limiting factors | -20 | These materials and sizes not limiting factors |
| | | | | | | NPS 2-1/2 or 3 valve body size | -29 | 216 | -20 | 420 |
| | | | | | | NPS 4, 6, or 8 valve body size | -29 | 177 | -20 | 350 |

1. Available only in NPS 1 through 8 ET valves.

Table 7. WhisperFlo Metal Trim Part Materials and Valve Body/Trim Temperature Capabilities (NPS 4, 6, and 8 Fisher ET only)

| TRIM DESIGNATION | VALVE BODY | VALVE PLUG | CAGE | CAGE RETAINER | SEAT | MATERIAL TEMPERATURE CAPABILITY ⁽¹⁾ | | | |
|------------------|------------|-----------------------------|------------------------------------|-----------------|-------------------|--|-----|------|-----|
| | | | | | | °C | | °F | |
| | | | | | | Min | Max | Min | Max |
| 901 | WCC | S41600 | 410 SST | WCC ENC | S41600 | -29 | 316 | -20 | 600 |
| 902 | WCC | S31600/CoCrA Seat and Guide | 410 SST | WCC ENC | S31600/CoCrA | -29 | 316 | -20 | 600 |
| 926 | WCC | S31600/CoCrA Seat and Guide | 410 SST NACE | WCC/NACE/ENC | S31600/CoCrA | -29 | 316 | -20 | 600 |
| 936 | 316 CF8M | S31600/CoCrA Seat and Guide | 316 SST/R31233 | S31600/ENC | S31600/CoCrA | -198 | 316 | -325 | 600 |
| 901C | WCC | S41000 | 410 SST | WCC ENC | S31600/PTFE | -29 | 232 | -20 | 450 |
| 904C | WCC | S31600 | 410 SST | WCC ENC | S31600/PTFE | -29 | 149 | -20 | 300 |
| 984C | WCC | S31600 | 410 SST NACE | WCC/NACE/ENC | S31600/PTFE | -29 | 149 | -20 | 300 |
| 985C | CF8M | S31600 | 316 SST/R31233 | S31600/ENC | S31600/PTFE | -73 | 149 | -100 | 300 |
| 990 | CD3MN | S31803/CoCrA Seat and Guide | 2205 Duplex ⁽²⁾ /R31233 | S31800/Cr Plate | S31803/CoCrA Seat | -51 | 316 | -60 | 600 |
| | LCC | | | | | -46 | 316 | -51 | 600 |
| | WCC | | | | | -29 | 316 | -20 | 600 |
| 990C | CD3MN | S31803/CoCrA Seat and Guide | 2205 Duplex ⁽²⁾ /R31233 | S31800/Cr Plate | S31803/PTFE | -51 | 232 | -60 | 450 |
| | LCC | | | | | -46 | 232 | -51 | 450 |
| | WCC | | | | | -29 | 232 | -20 | 450 |

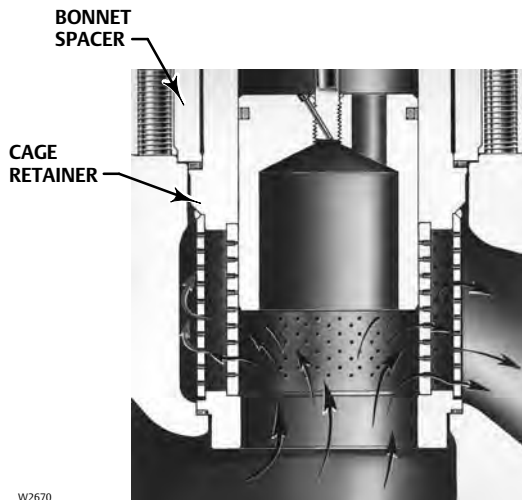
1. Temperatures above 232°C (450°F) require PEEK anti-extrusion rings and spring-loaded seal ring. This option allows ET construction to be used up to 316°C (600°F) for non-oxidizing service and 260°C (500°F) for oxidizing service.
2. 22 Cr-5Ni duplex stainless steel

Table 8. Whisper Trim III Metal Trim Part Materials and Body/Trim Temperature Capabilities

| TRIM DESIGNATION | VALVE PLUG | CAGE | CAGE RETAINER | BAFFLE (FOR LEVEL D3 CAGE ONLY) | SEAT RING FOR METAL-SEAT CONSTRUCTION | DISK SEAT AND RETAINER FOR PTFE-SEAT CONSTRUCTION | STEM | BODY, BONNET & BONNET SPACER | MATERIAL TEMPERATURE CAPABILITY | | | |
|---|---|---|---|---------------------------------|--|---|--------|----------------------------------|---------------------------------|--------------------|------|--------------------|
| | | | | | | | | | °C | | °F | |
| | | | | | | | | | Min | Max | Min | Max |
| 19.1 through 111.1, 177.8 and 203.2 mm (0.75 through 4.375, 7 and 8 Inch) Port Sizes | | | | | | | | | | | | |
| 301G | S41600 | 17-4 SST | -- | Steel | S41600 | -- | S31600 | WCC, WC9 | -29 | 316 ⁽²⁾ | -20 | 600 ⁽²⁾ |
| | | | | | | | | CF8M ⁽⁵⁾ | -29 | 176 | -20 | 350 |
| 301GC | S41600 | 17-4 SST | -- | Steel | -- | S31600 | S31600 | WCC, WC9 | -29 | 204 | -20 | 400 |
| | | | | | | | | CF8M | -29 | 176 | -20 | 350 |
| 312G ⁽¹⁾ | S31600/ CoCr-A Seat & Guide | 316 SST/ENC Electroless Nickel Coated | -- | S31600 | R30006 | -- | S20910 | WCC, WC9 | -29 | 316 ⁽²⁾ | -20 | 600 ⁽²⁾ |
| | | | | | | | | CF8M | -198 | 316 ⁽²⁾ | -325 | 600 ⁽²⁾ |
| 312GC ⁽¹⁾ | S31600/ CoCr-A Seat & Guide | 316 SST/ENC Electroless Nickel Coated | -- | S31600 | -- | R30006/ S31600 ⁽⁶⁾ | S20910 | WCC, WC9 | -29 | 204 | -20 | 400 |
| | | | | | | | | CF8M | -73 | 204 | -100 | 400 |
| 315G ⁽¹⁾ | S31600/ CoCr-A Seat & Guide | 316 SST Chrome Plate | -- | S31600 | R30006 | -- | S20910 | WCC, WC9 | -29 | 316 ⁽²⁾ | -20 | 600 ⁽²⁾ |
| | | | | | | | | CF8M | -198 | 316 ⁽²⁾ | -325 | 600 ⁽²⁾ |
| 315GC ⁽¹⁾ | S31600/ CoCr-A Seat & Guide | 316 SST Chrome Plate | -- | S31600 | -- | R30006/ S31600 ⁽⁶⁾ | S20910 | WCC, WC9 | -29 | 204 | -20 | 400 |
| | | | | | | | | CF8M | -73 | 204 | -100 | 400 |
| 306 | S31803/ CoCr-A Seat & Guide (< 3"Port), S31803/ Ultimet Seat & Guide (≥ 3"Port) | 2205 Duplex ⁽⁴⁾ Chrome Plate | -- | S31803 | S31803/ CoCr-A (< 3"Port), S31803/ Ultimet (≥ 3"Port) | -- | S31803 | WCC, WC9, CF8M | -29 | 316 ⁽²⁾ | -20 | 600 ⁽²⁾ |
| 307G | S31600/ CoCr-A Seat & Guide | S17400 | -- | Steel | R30006 | -- | S31600 | WCC, WC9 | -29 | 210 | -20 | 410 |
| 307GH ⁽³⁾ | S31600/ CoCr-A Seat & Guide | S17400 | -- | Steel | R30006 | -- | S31600 | WCC, WC9 | 210 | 316 | 410 | 600 |
| 136.5 mm (5.375 Inch) Port | | | | | | | | | | | | |
| 301 | S17400 | 416 SST | WCC/ENC | Steel | S41600 | -- | S31600 | WCC, WC9 | -29 | 316 ⁽²⁾ | -20 | 600 ⁽²⁾ |
| | | | | | | | | CF8M | -29 | 163 | -20 | 325 |
| 301 C | S17400 | 416 SST | WCC/ENC | Steel | -- | S31600 | S31600 | WCC, WC9 | -29 | 204 | -20 | 400 |
| | | | | | | | | CF8M | -29 | 163 | -20 | 325 |
| 304 | S31600/ CoCr-A Seat & Guide | 416 SST | WCC/ENC | Steel | S31600/ CoCr-A Seat | -- | S31600 | WCC, WC9 | -29 | 316 ⁽²⁾ | -20 | 600 ⁽²⁾ |
| | | | | | | | | CF8M | -29 | 177 | -20 | 350 |
| 312 ⁽¹⁾ | S31600/ CoCr-A Seat & Guide | 316 SST/ENC Electroless Nickel Coated | 316/ENC Electroless Nickel Coated | S31600 | R30006 | -- | S20910 | WCC, WC9 | -29 | 260 | -20 | 500 |
| | | | | | | | | CF8M | -198 | 316 ⁽²⁾ | -325 | 600 ⁽²⁾ |
| 312C ⁽¹⁾ | S31600/ CoCr-A Seat & Guide | 316 SST/ENC Electroless Nickel Coated | 316/ENC Electroless Nickel Coated | S31600 | -- | R30006/ S31600 | S20910 | WCC, WC9 | -29 | 204 | -20 | 400 |
| | | | | | | | | CF8M | -198 | 204 | -325 | 400 |
| 306 | S31803/ Ultimet Seat & Guide | 2205 Duplex ⁽⁴⁾ Chrome Plate | -- | S31803 | S31803/ Ultimet | -- | S31803 | WCC, WC9, CF8M or CD3MN | -29 | 316 ⁽²⁾ | -20 | 600 ⁽²⁾ |

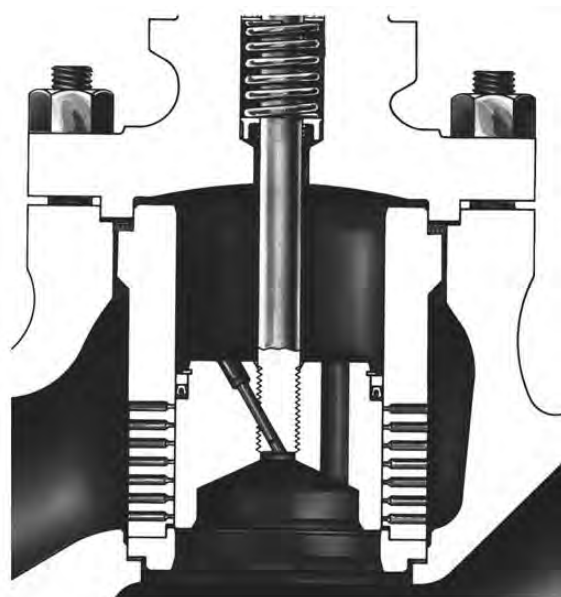
1. NACE compatible trims meets NACE MR0175 2002, MR0175/ISO15156, MR0103.
 2. Temperatures above 202°C (450°F) require PEEK anti-extrusion rings and spring loaded. This option allows ET construction to be used up to 316°C (600°F) for non-oxidizing service and 260°C (500°F) for oxidizing service.
 3. For high temperature service.
 4. 22 Cr-5Ni duplex stainless steel.
 5. Trim 301G can be used up to 216°C (420°F) with NPS 3 CF8M body, can be used up to 288°C (550°F) with NPS 2 CF8M body.
 6. For 8 inch port size, both disk seat and retainer use R30006.

Figure 6. Metal Seat and Whisper Trim III Cage in Fisher ET Valve



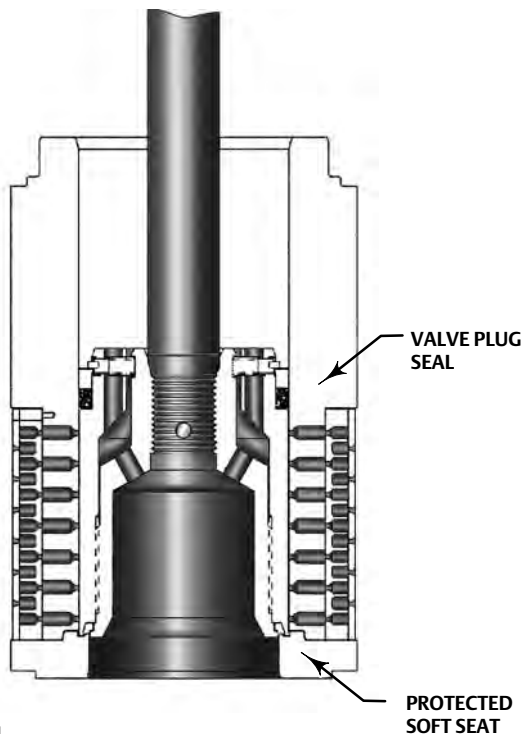
W2670

Figure 8. Cavitrol III One-Stage Cage



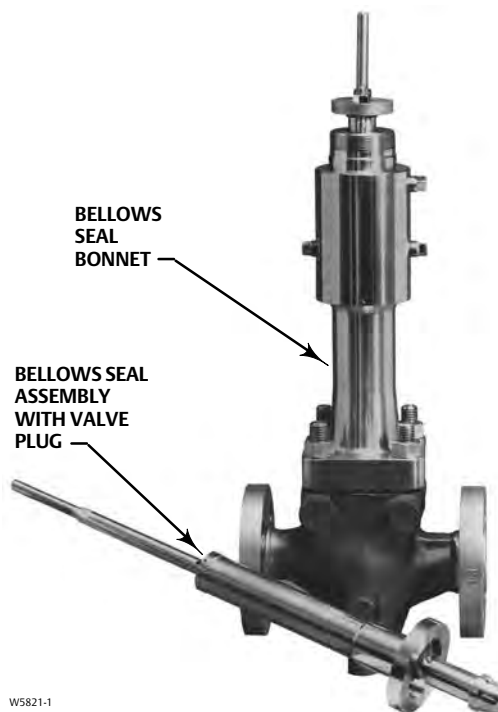
W3746A-4

Figure 7. Typical Balanced TSO Trim



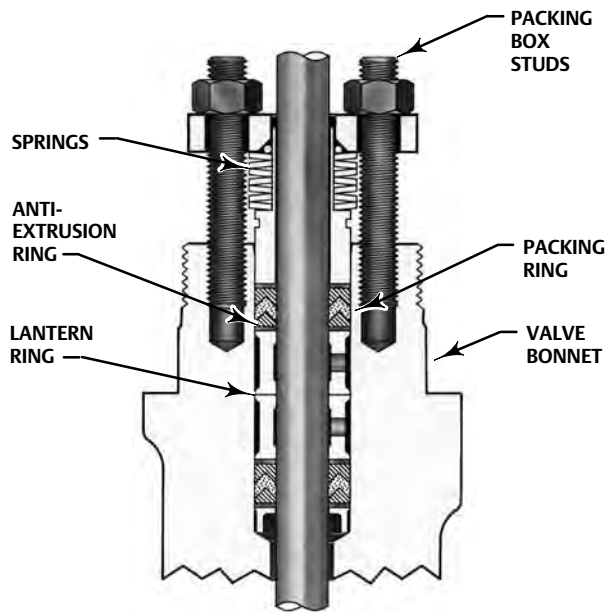
W7020-1

Figure 9. Typical ENVIRO-SEAL Bellows Seal Bonnet and Bellows Seal Assembly



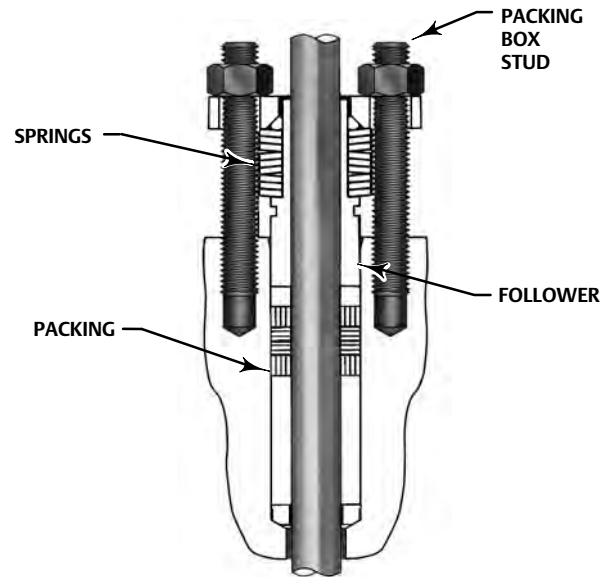
W5821-1

Figure 10. ENVIRO-SEAL and HIGH-SEAL Packing Systems



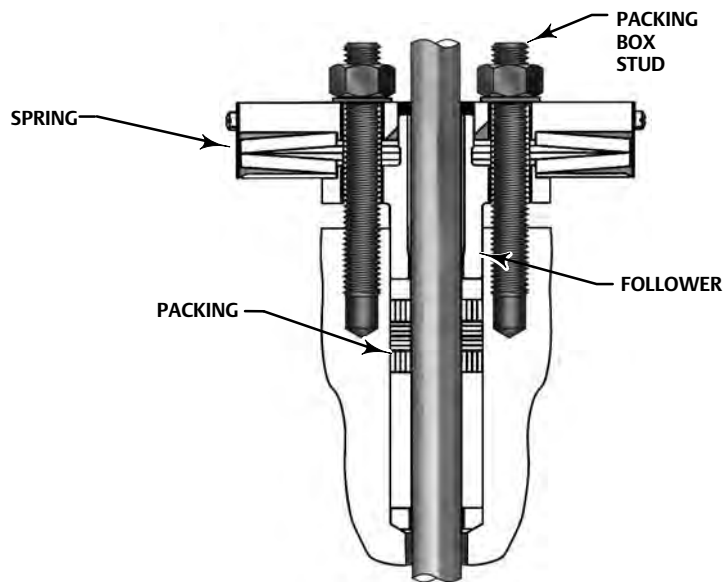
W5803-3

TYPICAL ENVIRO-SEAL PACKING SYSTEM WITH PTFE PACKING



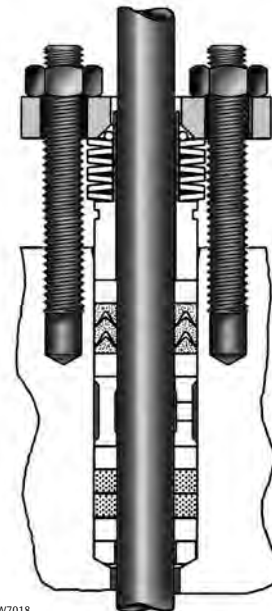
W8532-1

TYPICAL ENVIRO-SEAL PACKING SYSTEM WITH GRAPHITE ULF PACKING



W8533-1

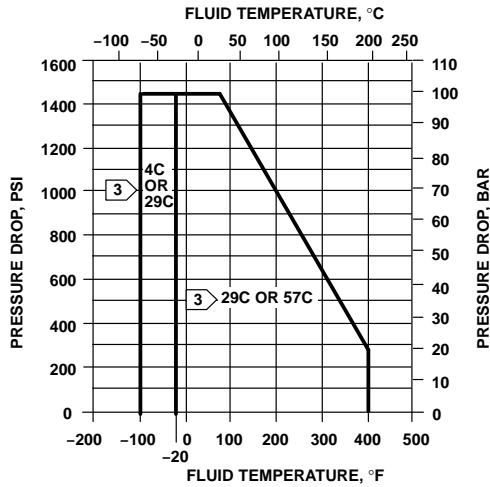
TYPICAL HIGH-SEAL PACKING SYSTEM WITH GRAPHITE ULF PACKING



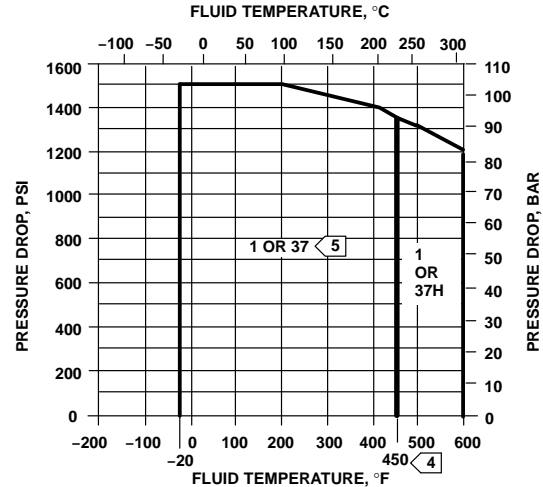
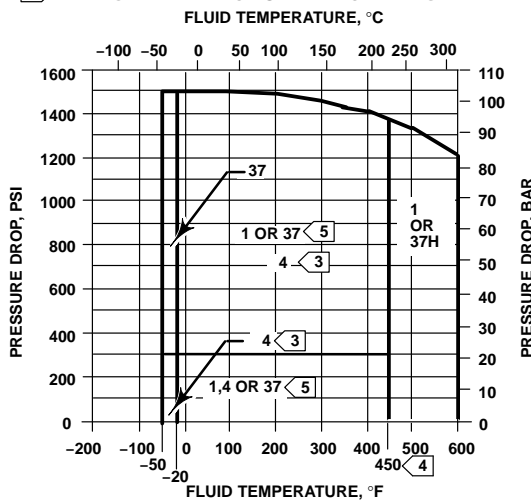
W7018

TYPICAL ENVIRO-SEAL PACKING SYSTEM WITH DUPLEX PACKING

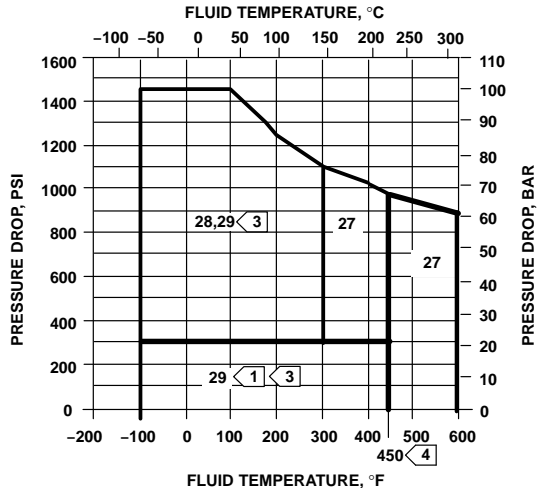
Figure 11. Typical Trim for All Valves Except Those with Cavitrol III, Whisper Trim III, or WhisperFlo Cages



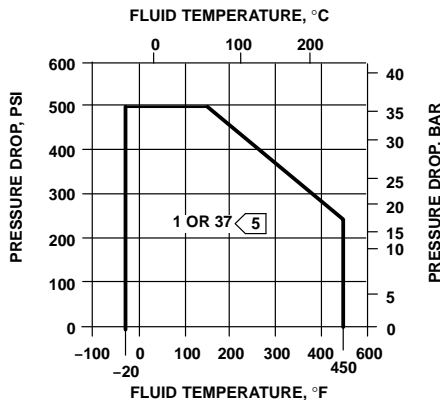
2 TRIM CAPABILITIES FOR PTFE SEATING



2 FOR OPTIONAL METAL SEATING WITH CL600 WCC STEEL, OR WC9 CHROME MOLY STEEL, BODY



2 FOR OPTIONAL METAL SEATING WITH CL600 LCC STEEL BODY

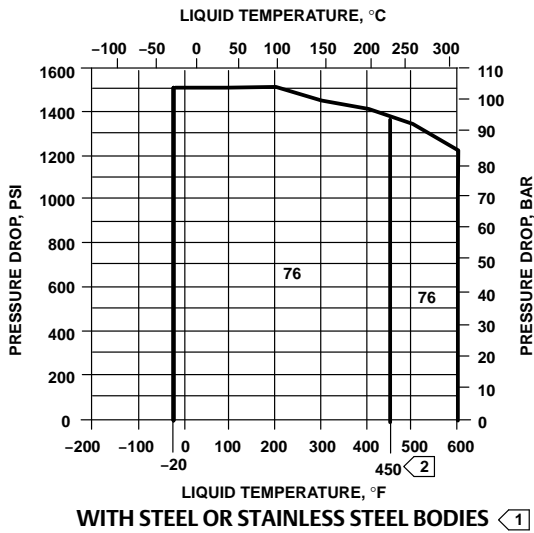


2 FOR OPTIONAL METAL SEATING WITH CL250B CAST IRON BODY

NOTES:

- 1 Use trim 27 instead of trim 29 for nonlubricating fluids such as superheated steam or dry gases between 149°C (300°F) and 232°C (450°F).
- 2 Do not exceed the maximum pressure and temperature for the pressure rating of the body material used, even though the trims shown may have higher capabilities.
- 3 Trims 4 and 29 may be used up to 99 bar (1440 psi) with clean dry gas. For process fluids other than clean dry gas, use trims 4 and 29 only up to 21 bar (300 psi).
- 4 Trims 1, 27, and 37H temperature limits can be extended to 316°C (600°F) for non-oxidizing service or 260°C (500°F) oxidizing service if PEEK anti-extrusion rings are used with spring-loaded seal rings.
- 5 Use trim 37H instead of trim 37 for temperatures above 210°C (410°F). Requires anti-extrusion rings and spring-loaded seal rings for temperatures above 232°C (450°F).

Figure 12. Typical Trim for Cavitrol III Cage Constructions



Notes:

- 1 Do not exceed the maximum pressure and temperature for the pressure rating of the body material used, even though the trim shown may have higher capabilities.
- 2 Trim 76 temperature limits can be extended to 316°C (600°F) for non-oxidizing service or 260°C (500°F) for oxidizing service if IF PEEK anti-extrusion rings are used with spring-loaded seal rings.

A6737

Table 9. Materials and Temperature Limits for Other Parts

| PART | | | MATERIAL | TEMPERATURE CAPABILITIES | | | |
|--|--|--|--|--------------------------|--------------------|---------|--------------------|
| | | | | °C | | °F | |
| | | | | Minimum | Maximum | Minimum | Maximum |
| Body-to-bonnet bolting. See table 19 for NACE bolting materials and temperature limits | Cast iron body | Cap screws | Steel SAE Grade 5 | -29 | 232 | -20 | 450 |
| | WCC body | Studs | Steel SA-193-B7 | -29 | ..(5) | -20 | ..(5) |
| | | Nuts | Steel SA-194-2H | | | | |
| | LCC body | Studs | Steel SA-193-B7 | -46 | ..(5) | -50 | ..(5) |
| | | Nuts | Steel SA-194-2H | | | | |
| | CF3M or CF8M (316 stainless steel) body | Studs | Steel SA-193-B7 (std) (NACE [non-exposed bolting]) | -48 | ..(5) | -55 | ..(5) |
| | | Nuts | Steel SA-194-2H (std) (NACE [non-exposed bolting]) | -46 | ..(5) | -50 | ..(5) |
| | | Studs | S30400 stainless steel SA-320-B8 | ..(5) | 38 | ...(5) | 100 |
| Nuts | | S30400 stainless steel SA-194-8 | | | | | |
| Studs | | S31600 stainless steel SA-193-B8M (strain-hardened) or S31600 stainless steel SA-193-B8M | ..(5) | ..(5) | ..(5) | ..(5) | |
| Nuts | S31600 stainless steel SA-194-8M | | | | | | |
| Disk | | | PTFE | -73 | 204 | -100 | 400 |
| 2-piece valve plug seal (standard for NPS 1 thru 6 valves except those with Cavitrol III cage) | Backup ring | Fluorocarbon ⁽¹⁾ | | -18 | 204 | 0 | 400 |
| | | Ethylene-propylene ⁽²⁾ | | -40 | 232 | -40 | 450 |
| | | Nitrile ⁽³⁾ | For use with air and hydrocarbons | -40 | 71 | -40 | 160 |
| | | | For use with other compatible fluids | -40 | 82 | -40 | 180 |
| Seal ring | | Carbon-filled PTFE | | -73 | 232 | -100 | 450 |
| Spring-loaded valve plug seal ⁽⁷⁾ | Backup ring ⁽⁴⁾ | S41600 stainless steel | | -29 | ..(5) | -20 | ..(5) |
| | | S31600 stainless steel | | ..(5) | ..(5) | ..(5) | ..(5) |
| | Retaining ring ⁽⁴⁾ | S30200 stainless steel (N07750, NACE Std) | | ..(5) | ..(5) | ..(5) | ..(5) |
| Seal ring | | PTFE with N10276 spring | | -73 | 232 | -100 | 450 |
| For applications using PEEK Anti-Extrusion Rings: Spring-loaded valve plug seal | Backup ring ⁽⁴⁾ | S41600 stainless steel | | -29 | ..(5) | -20 | ..(5) |
| | | S31600 stainless steel | | ..(5) | ..(5) | ..(5) | ..(5) |
| | Retaining ring ⁽⁴⁾ | S30200 stainless steel | | ..(5) | ..(5) | ..(5) | ..(5) |
| | Seal ring | PTFE/graphite with R30003spring | | -73 | 316 ⁽⁶⁾ | -100 | 600 ⁽⁶⁾ |
| Anti-extrusion rings | | PEEK (PolyEtherEtherKetone) | | ..(5) | | ...(5) | |
| Valve plug stem | | | S31600 (S20910, NACE Std.) or S31603 | ..(5) | ..(5) | ..(5) | ..(5) |
| Load ring (NPS 8 ET valve only) | | | S17400 or optional N06600 or N05500 | ..(5) | ..(5) | ..(5) | ..(5) |
| Restricted trim adaptors | Cast iron | | | -73 | 232 | -100 | 450 |
| | WCC steel | | | -29 | ..(5) | -20 | ..(5) |
| | S31600 stainless steel | | | ..(5) | | ..(5) | |
| Seat ring, bonnet and cage gaskets | | | FGM (standard) | ..(5) | | ..(5) | |
| | | | PTFE-coated N04400 | ..(5) | 149 | ..(5) | 300 |
| Spiral wound gasket | | | N06600/graphite (FGM-standard) | ..(5) | | ..(5) | |
| | | | N04400/PTFE | -73 | 149 | -100 | 300 |
| Shim | | | S31600 stainless steel | ..(5) | ..(5) | ..(5) | ..(5) |
| | | | N04400 | ..(5) | ..(5) | ..(5) | ..(5) |
| Packing | (temperatures shown are material temperature capabilities) | See table 11 for proper bonnet selection | PTFE V-ring | -40 | 232 | -40 | 450 |
| | | | PTFE/composition | -73 | 232 | -100 | 450 |
| | | | Graphite ribbon/filament | ..(5) | | ..(5) | |

-continued-

Table 9. Materials and Temperature Limits for Other Parts (continued)

| PART | | MATERIAL | TEMPERATURE CAPABILITIES | | | |
|--|-------------|--|--------------------------|---------|---------|---------|
| | | | °C | | °F | |
| | | | Minimum | Maximum | Minimum | Maximum |
| Packing flange, studs, and nuts when used with standard bonnet | | S31600 stainless steel | ...(5) | | ...(5) | |
| Metal packing box parts | | S31600 or S17400 stainless steel depending on part | ...(5) | | ...(5) | |
| Extension bonnet bushing | Trims 1 & 4 | S41600 stainless steel | -29 | ...(5) | -20 | ...(5) |
| | Other trims | S31600 stainless steel | ...(5) | | ...(5) | |
| 1. For high-temperature air, hydrocarbons, and certain other chemicals and solvents. Not for use with steam or ammonia. Not recommended for water above 82°C (180°F). 2. Has excellent moisture resistance to hot water and steam and may be used with most fire-resistant hydraulic oils, but cannot be used with petroleum-based fluids and other hydrocarbons. 3. Cannot be used with fire-resistant hydraulic oils. 4. These parts not used with 137 mm (7 inch) ports or larger. 5. These materials not limiting factors. 6. This material may be used in temperatures up to 260°C (500°F) for oxidizing service. 7. Standard for NPS 8 valve regardless of cage and all NPS 1 thru 6 valves with Cavitrol III cages, optional in NPS 1 thru 6 valves with other than Cavitrol III cages. | | | | | | |

Table 10. Fisher ET Valve Body/Trim Temperature Capabilities For All Valves Except Cavitrol III, Whisper Trim III Cage, and NPS 4, 6, and 8 ET with WhisperFlo Cage

| BODY/BONNET ⁽³⁾ MATERIALS | TRIM DESIGNATION | VALVE SIZE, NPS | MATERIAL TEMPERATURE CAPABILITY | | | |
|---|---------------------|-----------------|---------------------------------|--------------------|---------------------|--------------------|
| | | | °C | | °F | |
| | | | Min | Max | Min | Max |
| Cast Iron | 1,3,27, 29 or 57 | All | -29 | 232 | -20 | 450 |
| | 5 ⁽⁵⁾ | 8 | -29 | 232 | -20 | 450 |
| | 6 ⁽⁵⁾ | | -29 | 232 | -20 | 450 |
| | 37 | All | -29 | 210 | -20 | 410 |
| | 37H | | 210 | 232 | 410 | 450 |
| CF3M (316L stainless steel) | 316L | All | -198 ⁽⁴⁾ | 149 ⁽²⁾ | -325 ⁽⁴⁾ | 300 ⁽²⁾ |
| | 316L HF | | -198 ⁽⁴⁾ | 316 ⁽¹⁾ | -325 ⁽⁴⁾ | 600 ⁽¹⁾ |
| CF8M (316 stainless steel) | 5 ⁽⁵⁾ | 8 | -198 ⁽⁴⁾ | 316 ⁽¹⁾ | -325 ⁽⁴⁾ | 600 ⁽¹⁾ |
| | 6 ⁽⁵⁾ | | -198 ⁽⁴⁾ | 316 ⁽¹⁾ | -325 ⁽⁴⁾ | 600 ⁽¹⁾ |
| | 27 | All | -198 ⁽⁴⁾ | 316 ⁽¹⁾ | -325 ⁽⁴⁾ | 600 ⁽¹⁾ |
| | 28 | | -198 ⁽⁴⁾ | 149 ⁽²⁾ | -325 ⁽⁴⁾ | 300 ⁽²⁾ |
| | 29 | | -198 ⁽⁴⁾ | 149 ⁽²⁾ | -325 ⁽⁴⁾ | 300 ⁽²⁾ |
| LCC steel | 1 | All | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 4 | | -46 | 210 | -50 | 410 |
| | 5 ⁽⁵⁾ | 8 | -46 | 316 ⁽¹⁾ | -50 | 600 ⁽¹⁾ |
| | 6 ⁽⁵⁾ | | -46 | 316 ⁽¹⁾ | -50 | 600 ⁽¹⁾ |
| | 27 | All | -46 | 316 ⁽¹⁾ | -50 | 600 ⁽¹⁾ |
| | 29 | | -46 | 149 ⁽²⁾ | -50 | 300 ⁽²⁾ |
| | 37 | | -46 | 210 | -50 | 410 |
| | 37H | | 210 | 316 ⁽¹⁾ | 410 | 600 ⁽¹⁾ |
| 57 | -29 | | 232 | -20 | 450 | |
| WCC steel | 1 | All | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 5 ⁽⁵⁾ | 8 | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 6 ⁽⁵⁾ | | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 27 | All | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 29 | | -29 | 149 ⁽²⁾ | -20 | 300 ⁽²⁾ |
| | 37 | | -29 | 210 | -20 | 410 |
| | 37H | | 210 | 316 ⁽¹⁾ | 410 | 600 ⁽¹⁾ |
| 57 | -29 | | 232 | -20 | 450 | |
| WC9 Chrome moly steel | 1 or 3 | All | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 5 ⁽⁵⁾ | 8 | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 6 ⁽⁵⁾ | | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 27 | All | -29 | 316 ⁽¹⁾ | -20 | 600 ⁽¹⁾ |
| | 29 | | -29 | 149 ⁽²⁾ | -20 | 300 ⁽²⁾ |
| | 37 | | -29 | 210 | -20 | 410 |
| | 37H | | 210 | 316 ⁽¹⁾ | 410 | 600 ⁽¹⁾ |
| | 57 | | -29 | 232 | -20 | 450 |

1. Temperatures above 232°C (450°F) require PEEK anti-extrusion rings and spring-loaded seal ring. This option allows ET construction to be used up to 316°C (600°F) for non-oxidizing service and 260°C (500°F) for oxidizing service.
2. Lubricating service allows usage to 232°C (450°F)
3. Same material also used for bottom flange, if required. Restricted trim and full-sized limits are the same.
4. May be used down to -254°C (-425°F) if manufacturing process includes Charpy impact test.
5. Only available for Whisper Trim I cages.

Table 11. Bonnet Selection Guidelines

| BONNET STYLE | PACKING MATERIAL | IN-BODY PROCESS TEMPERATURE LIMITS ⁽¹⁾ | |
|---|--------------------------|---|----------------------------|
| | | °C | °F |
| Plain: ■ Standard for all valve sizes through NPS 6 with 2-13/16 yoke boss diameter ■ Standard for NPS 6 and 8 valves in cast iron and WCC steel bonnet material with 3-9/16 yoke boss diameter | PTFE V-ring | -18 to 232 | 0 to 450 |
| | PTFE/Composition | -18 to 232 | 0 to 450 |
| | Graphite ribbon/filament | -18 to 316 ⁽²⁾ | 0 to 600 ⁽²⁾ |
| Style 1 Cast Extension: ■ Standard for NPS 8 valves in S31600 bonnet material with 3-9/16 yoke boss diameter | PTFE V-ring | -46 to 316 ⁽²⁾ | -50 to 600 ⁽²⁾ |
| | PTFE/Composition | | |
| | Graphite ribbon/filament | | |
| Style 2 Cast Extension: ■ Optional for NPS 2 through 4 valve sizes with 2-13/16 inch yoke boss diameter ■ Optional for NPS 6 and 8 valves with 3-9/16 yoke boss diameter. Not available for NPS 8 valve in S31600 bonnet material | PTFE V-ring | -101 to 316 ⁽²⁾ | -150 to 600 ⁽²⁾ |
| | PTFE/Composition | | |
| | Graphite ribbon/filament | | |
| ENVIRO-SEAL bellows seal bonnet | PTFE | For exceptional stem sealing capabilities. See Bulletin 59.1:070, ENVIRO-SEAL Bellows Seal Bonnets (D101641X012), for pressure/temperature ratings. | |
| | Graphite ULF | For exceptional stem sealing capabilities. See Bulletin 59.1:070, ENVIRO-SEAL Bellows Seal Bonnets (D101641X012), for pressure/temperature ratings. | |

1. These in-body process temperatures assume an outside, ambient temperature of 21°C (70°F) and no insulation on the bonnet. When using any packing at low process temperatures, a cast extension bonnet may have to be used to prevent packing damage which could result from the formation of valve stem frost. Material selection for trim and other components will also be limiting factors.
2. Temperatures above 232°C (450°F) require PEEK anti-extrusion rings and spring-loaded seal ring.

Table 12. Maximum Flow Coefficients for Full-Sized Trim with Equal Percentage Cage and Normal Flow Direction

| Valve | | Valve Size, NPS | Cv at Max. Valve Plug Travel |
|-------|---------------|--------------------------------------|------------------------------|
| ET | | 1 | 17.2 |
| | | 1-1/2 | 35.8 |
| | | 2 | 59.7 |
| | | 2-1/2 | 99.4 |
| | | 3 | 136 |
| | | 4 | 224 |
| | | 6 | 394 |
| | | 8 ⁽¹⁾ 8 ⁽²⁾ | 567 819 |
| EAT | with liner | 1 | 18.5 |
| | | 2 | 48.1 |
| | | 3 | 149 |
| | | 4 | 152 |
| | | 6 | 336 |
| | without liner | 1 | 19.0 |
| | | 2 | 47.2 |
| | | 3 | 148 |
| | | 4 | 156 |
| | | 6 | 328 |
| ETR | | 1 | 17.2 |
| | | 1-1/2 | 35.8 |
| | | 2 | 59.7 |
| | | 2-1/2 | 99.4 |
| | | 3 | 136 |
| | | 4 | 224 |

1. With 51 mm (2 inch) travel.
2. With 76 mm (3 inch) travel.

Table 13. Port Diameters and Valve Plug Travel

| VALVE SIZE, NPS | | | | PORT DIAMETER ⁽¹⁾ | | MAXIMUM VALVE PLUG TRAVEL ⁽¹⁾ | |
|------------------|--------------------------|-----------------|--------------------------|------------------------------|------------------|--|------------------|
| ET or ETR | | EAT | | mm | Inch | mm | Inch |
| Full-Sized Trim | Restricted-Capacity Trim | Full-Sized Trim | Restricted-Capacity Trim | | | | |
| 1 | 1-1/2 | 1 | 2 | 33.3 | 1.3125 | 19.1 | 0.75 |
| --- | 2 | --- | --- | 33.3 | 1.3125 | 19.1 | 0.75 |
| 1-1/2 | --- | 2 | --- | 46.7 | 1.875 | 19.1 | 0.75 |
| --- | 2-1/2 | --- | --- | 46.7 | 1.875 | 19.1 | 0.75 |
| 2 | 3 | --- | 4 | 58.7 | 2.3125 | 29 | 1.125 |
| 2-1/2 | 4 | 3 | 6 | 73.0 | 2.875 | 38 | 1.5 |
| 3 | --- | 4 | --- | 87.3 | 3.4375 | 38 | 1.5 |
| 4 | --- | 6 | --- | 111.1 | 4.375 | 51 | 2 |
| 6 ⁽²⁾ | --- | --- | --- | 177.8 ⁽³⁾ | 7 ⁽³⁾ | 51 ⁽³⁾ | 2 ⁽³⁾ |
| | | | | --- | --- | --- | --- |
| 8 ⁽²⁾ | --- | --- | --- | 203.2 | 8 | 51 | 2 |
| | | | | | | 76 | 3 |

1. For Cavitrol III trim, see table 15.
2. Not available in ETR valves.
3. Standard-travel cages.

Table 14. Stem and Yoke Boss Diameters

| VALVE SIZE, NPS | | | | STEM AND YOKE BOSS DIAMETERS | | | | | | | |
|------------------|--------------------------|-----------------|--------------------------|------------------------------|------|-----------|---------|--------------|------------|-----------|---------|
| ET or ETR | | EAT | | Standard | | | | Optional | | | |
| Full-Sized Trim | Restricted-Capacity Trim | Full-Sized Trim | Restricted-Capacity Trim | Stem | | Yoke Boss | | Stem | | Yoke Boss | |
| | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| 1 | 1-1/2 | 1 | 2 | 9.5 | 3/8 | 54 | 2-1/8 | 12.7 | 1/2 | 71 | 2-13/16 |
| --- | 2 | --- | --- | 12.7 | 1/2 | 71 | 2-13/16 | --- | --- | --- | --- |
| 1-1/2 | --- | 2 | --- | 9.5 | 3/8 | 54 | 2-1/8 | 12.7 | 1/2 | 71 | 2-13/16 |
| --- | 2-1/2 | --- | --- | 12.7 | 1/2 | 71 | 2-13/16 | --- | --- | --- | --- |
| 2 | 3 | --- | 4 | 12.7 | 1/2 | 71 | 2-13/16 | 19.1 | 3/4 | 90 | 3-9/16 |
| 2-1/2 | 4 | 3 | 6 | 12.7 | 1/2 | 71 | 2-13/16 | 19.1 | 3/4 | 90 | 3-9/16 |
| 3 | --- | 4 | --- | 12.7 | 1/2 | 71 | 2-13/16 | 19.1 | 3/4 | 90 | 3-9/16 |
| 4 | --- | 6 | --- | 12.7 | 1/2 | 71 | 2-13/16 | 19.1 | 3/4 | 90 | 3-9/16 |
| | | | | | | | | 25.4 | 1 | 127 | 5 |
| 6 ⁽¹⁾ | --- | --- | --- | 19.1 | 3/4 | 90 | 3-9/16 | 25.4 or 31.8 | 1 or 1-1/4 | 127 | 5 |
| 8 ⁽¹⁾ | --- | --- | --- | | | | | | | | |

1. Not available in ETR valves.

Table 15. Port Diameters and Valve Plug Travel for Cavitrol III Cage

| ET VALVE SIZE, NPS | ONE-STAGE CAGE | | TWO-STAGE CAGE | |
|--------------------|----------------|----------------------------------|----------------|-------------------|
| | Port Diameters | Valve Plug Travel ⁽¹⁾ | Port Diameters | Valve Plug Travel |
| mm | | | | |
| 1 | 33.3 | 25 | 25.4 | 25 |
| 1-1/2 | 47.6 | 22 | 33.3 | 38 |
| 2 | 58.7 | 29 | 47.6 | 51 |
| 2-1/2 | 73.0 | 38 | 58.7 | 64 |
| 3 | 87.3 | 41 | 73.0 | 76 |
| 4 | 111.1 | 54 | 73.0 | 102 |
| 6 | 177.8 | 57 | 136.5 | 102 |
| 8 | 203.2 | 86 | 177.8 | 152 |
| Inch | | | | |
| 1 | 1.3125 | 1 | 1 | 1 |
| 1-1/2 | 1.875 | 0.875 | 1.3125 | 1.5 |
| 2 | 2.3125 | 1.125 | 1.875 | 2 |
| 2-1/2 | 2.875 | 1.5 | 2.3125 | 2.5 |
| 3 | 3.4375 | 1.625 | 2.875 | 3 |
| 4 | 4.375 | 2.125 | 2.875 | 4 |
| 6 | 7 | 2.25 | 5.375 | 4 |
| 8 | 8 | 3.375 | 7 | 6 |

1. The travel listed is the maximum travel that can be obtained for the given size. In situations where increased valve capacity is not needed, standard ET valve travels should be utilized in selecting the actuator.

Table 16. Port Diameter, Valve Plug Travel, and Stem and Yoke Boss Diameters for Whisper III Trims⁽¹⁾

| VALVE SIZE, NPS | | PORT DIAMETER | | MAX VALVE PLUG TRAVEL | | STEM AND YOKE BOSS DIAMETERS | | | | | | | | PERFORMANCE LEVEL |
|-----------------|-------|----------------------------|--------|-----------------------|-------|------------------------------|------|-----------|---------|----------------------------|------------|-----------|---------|----------------------------|
| | | | | | | Standard | | | | Optional | | | | |
| ET | EAT | mm | Inch | mm | Inch | Stem | | Yoke Boss | | Stem | | Yoke Boss | | |
| | | | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch | |
| 1 | 1 | 33.3 | 1 5/16 | 19 | 3/4 | 9.5 | 3/8 | 54 | 2 1/8 | 12.7 | 1/2 | 71 | 2 13/16 | A1 |
| 1 1/2 | 2 | 47.6 | 1 7/8 | 19 | 3/4 | 9.5 | 3/8 | 54 | 2 1/8 | 12.7 | 1/2 | 71 | 2 13/16 | A1 |
| | | 33.3 | 1 5/16 | 19 | 3/4 | | | | | | | | | A3, B1, B3 |
| 2 | -- | 58.7 | 2 5/16 | 35 | 1 3/8 | 12.7 | 1/2 | 71 | 2 13/16 | 19.1 | 3/4 | 90 | 3 9/16 | A1 |
| 2 | -- | 33.3 | 1 5/16 | 29 | 1 1/8 | 12.7 | 1/2 | 71 | 2 13/16 | 19.1 | 3/4 | 90 | 3 9/16 | A3, B1, B3, C1, C3, D1, D3 |
| | | 73 | 2 7/8 | 38 | 1 1/2 | 12.7 | 1/2 | 71 | 2 13/16 | 19.1 | 3/4 | 90 | 3 9/16 | A1 |
| 47.6 | 1 7/8 | A3, B1, B3, C1, C3, D1, D3 | | | | | | | | | | | | |
| 3 | 4 | 87.3 | 3 7/16 | 38 | 1 1/2 | 12.7 | 1/2 | 71 | 2 13/16 | 19.1 | 3/4 | 90 | 3 9/16 | A1 |
| | | 58.7 | 2 5/16 | | | | | | | | | | | A3, B1, B3, C1, C3, D1, D3 |
| 4 | 6 | 111.1 | 4 3/8 | 51 | 2 | 12.7 | 1/2 | 71 | 2 13/16 | 19.1 | 3/4 | 90 | 3 9/16 | A1 |
| | | 87.3 | 3 7/16 | | | | | | | 25.4 | 1 | 127 | 5 | A3, B1, B3, C1, C3, D1, D3 |
| 6 | -- | 177.8 | 7 | 51 | 2 | 19.1 | 3/4 | 90 | 3.5625 | 25.4 or 31.8 | 1 or 1 1/4 | 127 | 5 | A1 |
| | | 136.5 | 5 3/8 | 76 | 3 | | | | | A3, B1, B3, C1, C3, D1, D3 | | | | |
| 8 | -- | 203.2 | 8 | 76 | 3 | 19.1 | 3/4 | 90 | 3.5625 | 25.4 or 31.8 | 1 or 1 1/4 | 127 | 5 | A1 |
| | | | | 102 | 4 | | | | | | | | | A3, B1, B3, C1, C3 |

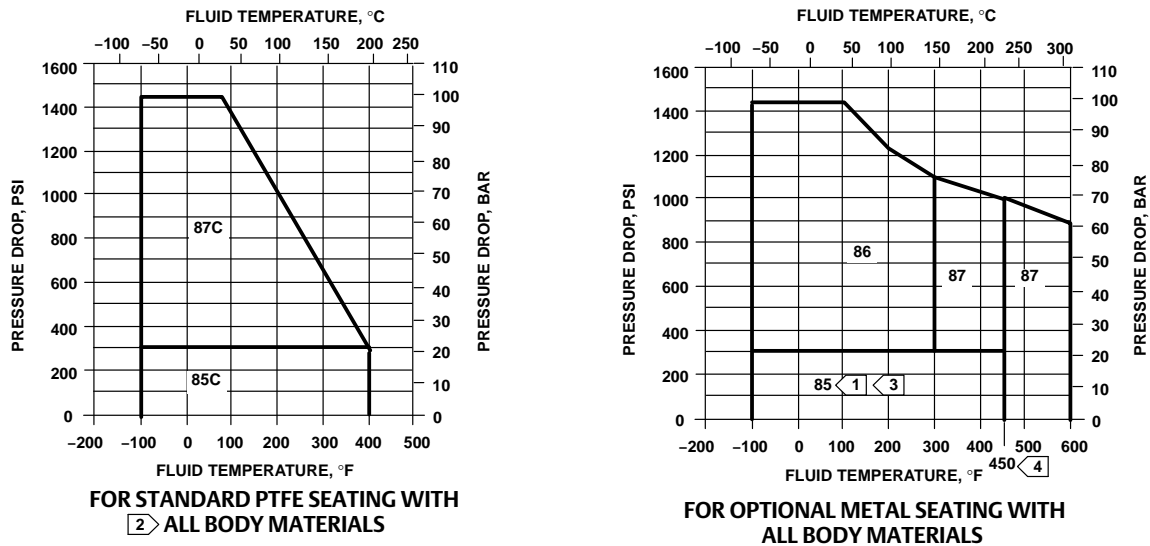
1. Refer Fisher Bulletin 80.1:010 Whisper Trim III (D100191X012) for more information.

Table 17. Port Diameters, Valve Plug Travel, Yoke Boss Diameters for TSO (Tight Shutoff) Trim

| VALVE | TRIM | MAX TRAVEL | | YOKE BOSS SIZE | | PORT DIAMETER | | | | C _v REDUCTION AT 100% TRAVEL ⁽¹⁾ | UNBALANCE AREA |
|-----------|-----------------|------------|------|----------------|-------------------|---------------|--------|------------|--------|--|----------------|
| | | mm | Inch | mm | Inch | Nominal | | Actual TSO | | | |
| | | | | | | mm | Inch | mm | Inch | | mm |
| ET NPS 3 | CAV III 2-Stage | 76.2 | 3 | 90 127 | 3-9/16 5 | 73.0 | 2.875 | 68.3 | 2.6875 | 0% | 0.098 |
| ET NPS 4 | CAV III 2-Stage | 102 | 4 | 90 127 | 3-9/16 5 | 73.0 | 2.875 | 68.3 | 2.6875 | 5% | 0.098 |
| EAT NPS 4 | Std | 38.1 | 1.5 | 71.4 90 | 2-13/16 3-9/16 | 87.3 | 3.4375 | 82.6 | 3.25 | 6% 4% | 0.118 |
| EAT NPS 6 | Std | 50.8 | 2 | 90 | 3-9/16 | 111 | 4.375 | 106 | 4.1875 | 4% (linear) 3% (equal percent) | 0.154 |

1. This column lists the percent reduction of published maximum C_v of the trim listed in the TRIM column.

Figure 13. Typical Trim for NACE MR0175 / ISO 15156 and MR0103 (Sour Service)



A6739-1

Notes:

- 1 Use trim 87 instead of trim 85 for nonlubricating fluids such as super-heated steam or dry gases between 149°C (300°F) and 232°C (450°F).
- 2 Do not exceed the maximum pressure and temperature for the pressure rating of the body material used, even though the trims shown may have higher capabilities.
- 3 Trim 85 may be used up to 99 bar (1440 psi) with clean dry gas. For process fluids other than clean dry gas, use trim 85 only up to 21 bar (300 psi).
- 4 Trim 87 temperature limits can be extended to 316°C (600°F) for non-oxidizing service or 260°C (500°F) for oxidizing service if PEEK anti-extrusion rings are used with spring-loaded seal rings.

Table 18. Metal Trim Part Materials for Compatibility with NACE MR0175 / ISO 15156 and MR0103 (Sour Service) Specifications. Environmental Restrictions Apply, Refer to Standard.

| Trim Designation ⁽⁴⁾ | Valve Plug | Cage | Seat Ring for Standard Metal Seat Construction | Optional Liner for Metal Seat (EAT only) | Disk Seat and Retainer for Optional PTFE-Seat Construction | Valve Stem, Packing Follower, Lantern Ring, Packing Box Ring, and Pin | Load Ring ⁽¹⁾ |
|---|--|--|--|--|--|---|--------------------------|
| 85 ⁽⁵⁾ | S31600 | 316 SST with electroless nickel coating (ENC) | S31600 | S31600 | --- | S20910 (Valve Stem) S31600 (All Other Parts) | N05500 |
| 85C ^(2, 5) | S31600 | 316 SST with electroless nickel coating (ENC) | --- | --- | S31600 | | |
| 86 ⁽⁵⁾ | S31600 with seat hard faced with CoCr-A hardfacing alloy | 316 SST with electroless nickel coating (ENC) | R30006 (alloy 6) | --- | --- | | |
| 87 (Also used for 8-inch Whisper Trim I) | S31600 with seat and guide hard faced with CoCr-A hardfacing alloy | 316 SST with electroless nickel coating (ENC) ⁽³⁾ | R30006 (alloy 6) | --- | --- | | |
| 87C ⁽²⁾ (Also used for 8-inch Whisper Trim I) | S31600 with seat and guide hard faced with CoCr-A hardfacing alloy | 316 SST with electroless nickel coating (ENC) ⁽³⁾ | --- | --- | S31600 | | |

1. NPS 8 valve body only.
 2. 85C and 87C are trims for PTFE-seat construction.
 3. 8-inch Whisper Trim I cage is 17-4 SST, double H1150 (NACE) / ENC.
 4. N07750 retaining ring is standard for spring-loaded seal ring construction.
 5. Not for use with Whisper Trim I with 136 mm (5.375 inch) and larger ports.

Table 19. Bolting Materials and Temperature Limits for Bolting Compliance with NACE MR0175-2002, NACE MR0175/ISO 15156, and NACE MR0103. Environmental restrictions may apply

| VALVE BODY MATERIAL | | BOLTING MATERIAL | | TEMPERATURE CAPABILITIES | | | |
|--|-------|------------------|--|--------------------------|-----|--------------------|-----|
| | | | | °C | | °F | |
| | | | | Min | Max | Min | Max |
| Non-exposed bolting (Standard) | | | | | | | |
| WCC and CF8M (316 SST) | Studs | Steel SA-193-B7 | | -48 ⁽²⁾ | 427 | -55 ⁽²⁾ | 800 |
| | Nuts | Steel SA-194-2H | | | | | |
| Exposed bolting (Optional) May require derating of valve⁽¹⁾ when these body-to-bonnet bolting materials are used | | | | | | | |
| WCC and CF8M | Studs | Steel SA-193-B7M | | -48 ⁽²⁾ | 427 | -55 ⁽²⁾ | 800 |
| | Nuts | Steel SA-194-2HM | | | | | |

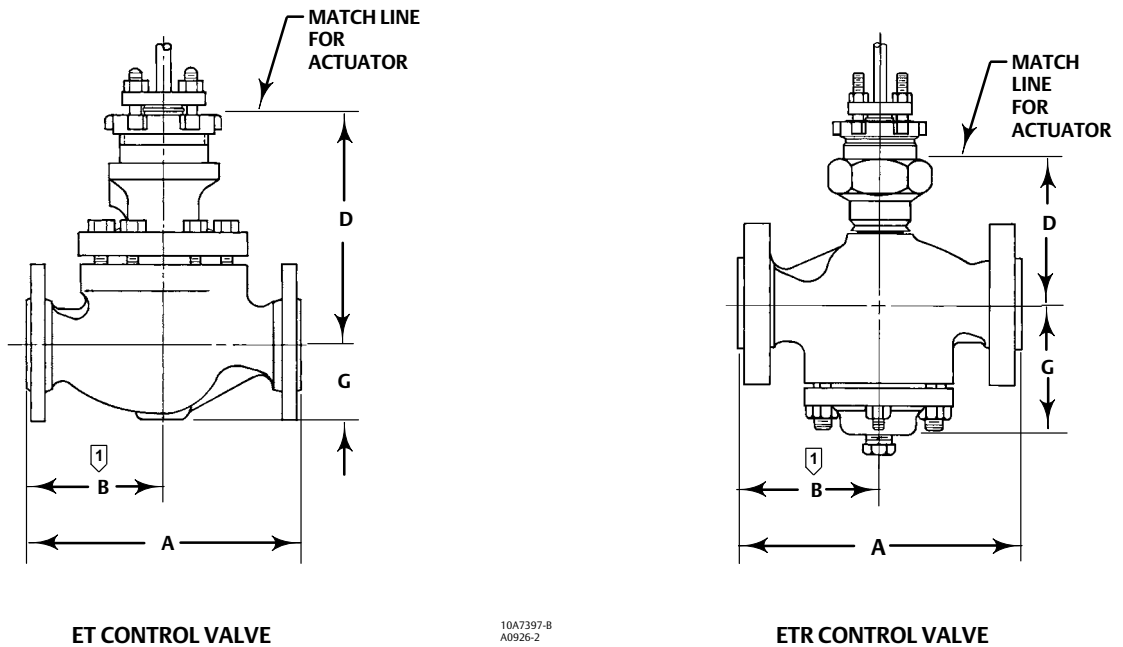
1. Derating is not required for CL150 and 300 valves. Derating may be required for valves rated at CL600. Contact your [Emerson sales office](#) for assistance in determining the derating of valves when these body-to-bonnet bolting materials are used.
 2. -29°C (-20°F) with WCC body material.

Table 20. Fisher ET and ETR Dimensions

| VALVE SIZE, NPS | A | | | | | | | | | G (MAX) | |
|-----------------|---|----------------------|-----------|----------------------|-----------|----------------|-----------|--------------|--------------|---------|------|
| | Pressure Rating, End Connection Style (1) | | | | | | | | | ET | ETR |
| | Scrd or SW | CL125 FF or CL150 RF | CL150 RTJ | CL250 RF or CL300 RF | CL300 RTJ | BW or CL600 RF | CL600 RTJ | PN16-40 (2) | PN63-100 (2) | | |
| mm | | | | | | | | | | | |
| 1 | 210 | 184 | 197 | 197 | 210 | 210 | 210 | 160 | 230 | 60 | 119 |
| 1-1/2 | 251 | 222 | 235 | 235 | 248 | 251 | 251 | 200 | 260 | 71 | 116 |
| 2 | 286 | 254 | 267 | 267 | 282 | 286 | 289 | 230 | 300 | 78 | 133 |
| 2-1/2 | --- | 276 | 292 | 292 | 308 | 311 | 314 | 290 | 340 | 90 | 159 |
| 3 | --- | 298 | 311 | 317 | 333 | 337 | 340 | 310 | 380 | 97 | 168 |
| 4 | --- | 353 | 365 | 368 | 384 | 394 | 397 | 350 | 430 | 129 | 192 |
| 6 | --- | 451 | 464 | 473 | 489 | 508 | 511 | 480 | 550 | 140 | --- |
| 8 | --- | 543 | 556 | 568 | 584 | 610 | 613 | 600 | 650 | 191 | --- |
| Inch | | | | | | | | | | | |
| 1 | 8.25 | 7.25 | 7.75 | 7.75 | 8.25 | 8.25 | 8.25 | See mm above | See mm above | 2.38 | 4.69 |
| 1-1/2 | 9.88 | 8.75 | 9.25 | 9.25 | 9.75 | 9.88 | 9.88 | | | 2.81 | 4.56 |
| 2 | 11.25 | 10.00 | 10.50 | 10.50 | 11.12 | 11.25 | 11.38 | | | 3.06 | 5.25 |
| 2-1/2 | --- | 10.88 | 11.38 | 11.50 | 12.12 | 12.25 | 12.38 | See mm above | See mm above | 3.56 | 6.25 |
| 3 | --- | 11.75 | 12.25 | 12.50 | 13.12 | 13.25 | 13.38 | | | 3.81 | 6.62 |
| 4 | --- | 13.88 | 14.38 | 14.50 | 15.12 | 15.50 | 15.62 | | | 5.06 | 7.56 |
| 6 | --- | 17.75 | 18.25 | 18.62 | 19.25 | 20.00 | 20.12 | | | 5.51 | --- |
| 8 | --- | 21.38 | 21.88 | 22.38 | 23.00 | 24.00 | 24.12 | | | 7.50 | --- |

1. End connection style abbreviations: BW - Butt-welding, FF - Flat Faced, Scrd - Screwed, SW - Socketweld, RF - Raised Face, RTJ - Ring Type Joint
 2. Valves which meet EN 1092 flange standards and have EN face-to-face dimensions are available only from Europe (EN 558-1). Valves which meet EN 1092 flange standards but not EN face-to-face standards are available in the US. Consult your [Emerson sales office](#).

Figure 14. Fisher ET and ETR Dimensions (also see tables 20, 21, and 22)



Notes:

1. $B = \frac{A}{2}$

2. For dimensions of valves with other end connections, consult your Emerson sales office.

Table 21. Fisher ET and ETR Dimensions

| VALVE SIZE, NPS | D FOR PLAIN BONNET | | | | | | | | | | |
|------------------|---|------|----------------------|--------------|------------------------------------|-------|-------|--------------|---------------------|------|------|
| | ET Except with Cavtrol III Two-Stage Cage | | | | ET with Cavtrol III Two-Stage Cage | | | | ETR | | |
| | Stem Diameter, mm | | | | Stem Diameter, mm | | | | Stem Diameter, mm | | |
| | 9.5 | 12.7 | 19.1 | 25.4 or 31.8 | 9.5 | 12.7 | 19.1 | 25.4 or 31.8 | 9.5 | 12.7 | 19.1 |
| 1 | 127 | 149 | --- | --- | --- | 184 | --- | --- | 113 | 124 | --- |
| 1-1/2 | 124 | 146 | --- | --- | 155 | 177 | --- | --- | 122 | 133 | --- |
| 2 | --- | 165 | 162 | --- | --- | 201 | 198 | --- | --- | 148 | 140 |
| 2-1/2 | --- | 187 | 184 | --- | --- | 229 | 226 | --- | --- | 157 | 152 |
| 3 | --- | 191 | 187 | --- | --- | 260 | 256 | --- | --- | 167 | 159 |
| 4 | --- | 221 | 217 | 264 | --- | 311 | 308 | 354 | --- | 198 | 191 |
| 6 ⁽¹⁾ | --- | --- | 251 | 270 | --- | --- | 336 | 380 | --- | --- | --- |
| 6 ⁽²⁾ | --- | --- | 312 | 330 | --- | --- | --- | --- | --- | --- | --- |
| 8 | --- | --- | 375 ⁽³⁾ | 426 | --- | --- | 511 | 560 | --- | --- | --- |
| | Stem Diameter, Inch | | | | Stem Diameter, Inch | | | | Stem Diameter, Inch | | |
| | 3/8 | 1/2 | 3/4 | 1 or 1-1/4 | 3/8 | 1/2 | 3/4 | 1 or 1-1/4 | 3/8 | 1/2 | 3/4 |
| 1 | 5.00 | 5.88 | --- | --- | --- | 7.25 | --- | --- | 4.44 | 4.88 | --- |
| 1-1/2 | 4.88 | 5.75 | --- | --- | 6.09 | 6.97 | --- | --- | 4.81 | 5.25 | --- |
| 2 | --- | 6.50 | 6.38 | --- | --- | 7.91 | 7.78 | --- | --- | 5.81 | 5.50 |
| 2-1/2 | --- | 7.38 | 7.25 | --- | --- | 9.03 | 8.91 | --- | --- | 6.31 | 6.00 |
| 3 | --- | 7.50 | 7.38 | --- | --- | 10.22 | 10.09 | --- | --- | 6.56 | 6.25 |
| 4 | --- | 8.69 | 8.56 | 10.38 | --- | 12.25 | 12.12 | 13.94 | --- | 7.81 | 7.50 |
| 6 ⁽¹⁾ | --- | --- | 9.88 | 10.62 | --- | --- | 13.22 | 14.97 | --- | --- | --- |
| 6 ⁽²⁾ | --- | --- | 12.26 | 13.00 | --- | --- | --- | --- | --- | --- | --- |
| 8 | --- | --- | 14.75 ⁽³⁾ | 16.75 | --- | --- | 20.12 | 22.06 | --- | --- | --- |

1. For all NPS 6 valves except with Whisper III and WhisperFlo cages.
 2. For NPS 6 valves with Whisper III and WhisperFlo cages.
 3. Available only in cast iron or WCC steel for the stem diameter with plain bonnet.

Table 22. Fisher ET and ETR Dimensions

| VALVE SIZE, NPS | D FOR EXTENSION AND ENVIRO-SEAL BELLOWS SEAL BONNETS (ET ONLY, EXCEPT WITH CAVITROL III CAGE) | | | | | | | | | | |
|------------------|---|-------|-------|--------------|---------------------|-------|-------|---------------------------------|-------|-------|--|
| | Style 1 Ext. Bonnet | | | | Style 2 Ext. Bonnet | | | ENVIRO-SEAL Bellows Seal Bonnet | | | |
| | Stem Diameter | | | | Stem Diameter | | | Stem diameter | | | |
| | mm | | | | | | | | | | |
| | 9.5 | 12.7 | 19.1 | 25.4 or 31.8 | 9.5 | 12.7 | 19.1 | 9.5 | 12.7 | 19.1 | |
| 1 | 213 | 251 | --- | --- | 303 | 319 | --- | 320 | --- | --- | |
| 1-1/2 | 210 | 248 | --- | --- | 300 | 316 | --- | 317 | --- | --- | |
| 2 | --- | 267 | 272 | --- | --- | 465 | --- | --- | 384 | --- | |
| 2-1/2 | --- | 289 | 294 | --- | --- | 492 | --- | --- | --- | --- | |
| 3 | --- | 292 | 297 | --- | --- | 495 | 487 | --- | 517 | 517 | |
| 4 | --- | 322 | 327 | 370 | --- | 526 | 518 | --- | 541 | --- | |
| 6 ⁽¹⁾ | --- | --- | 357 | 402 | --- | --- | 543 | --- | --- | 573 | |
| 6 ⁽²⁾ | --- | --- | 418 | 462 | --- | --- | 604 | --- | --- | --- | |
| 8 | --- | --- | 421 | 450 | --- | --- | 621 | --- | --- | 703 | |
| | Inch | | | | | | | | | | |
| | 3/8 | 1/2 | 3/4 | 1 or 1-1/4 | 3/8 | 1/2 | 3/4 | 3/8 | 1/2 | 3/4 | |
| 1 | 8.38 | 9.88 | --- | --- | 11.94 | 12.56 | --- | 12.62 | --- | --- | |
| 1-1/2 | 8.25 | 9.75 | --- | --- | 11.81 | 12.44 | --- | 12.50 | --- | --- | |
| 2 | --- | 10.50 | 10.69 | --- | --- | 18.31 | --- | --- | 15.12 | --- | |
| 2-1/2 | --- | 11.38 | 11.56 | --- | --- | 19.38 | --- | --- | --- | --- | |
| 3 | --- | 11.50 | 11.69 | --- | --- | 19.50 | 19.19 | --- | 20.38 | 20.38 | |
| 4 | --- | 12.69 | 12.88 | 14.56 | --- | 20.69 | 20.38 | --- | 21.31 | --- | |
| 6 ⁽¹⁾ | --- | --- | 14.06 | 15.81 | --- | --- | 21.38 | --- | --- | 22.56 | |
| 6 ⁽²⁾ | --- | --- | 16.44 | 18.19 | --- | --- | 23.76 | --- | --- | --- | |
| 8 | --- | --- | 16.56 | 17.75 | --- | --- | 24.44 | --- | --- | 27.69 | |

1. Standard-travel cages.
 2. For NPS 6 valves with Whisper III and WhisperFlo cages.

Table 23. Fisher EAT Dimensions⁽¹⁾

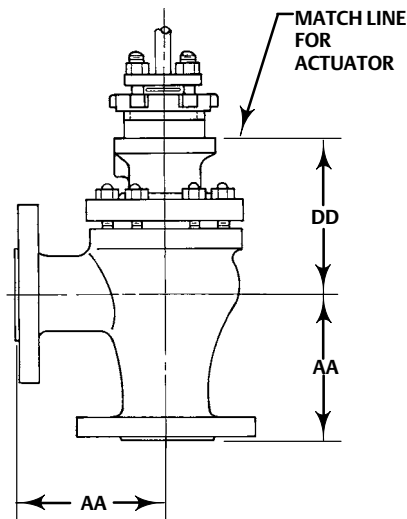
| VALVE SIZE, NPS | AA | | | | | |
|-----------------|-------|------|-------|------|--------------|-------|
| | CL150 | | CL300 | | CL600 | |
| | RF | RTJ | RF | RTJ | BW, SW or RF | RTJ |
| | mm | | | | | |
| 1 | 92 | 98 | 98 | 105 | 105 | 105 |
| 2 | 127 | 133 | 133 | 141 | 143 | 144 |
| 3 | 149 | 156 | 159 | 167 | 168 | 170 |
| 4 | 176 | 183 | 184 | 197 | 197 | 198 |
| 6 | 225 | 232 | 237 | 244 | 254 | 256 |
| | Inch | | | | | |
| 1 | 3.62 | 3.88 | 3.88 | 4.12 | 4.12 | 4.12 |
| 2 | 5.00 | 5.25 | 5.25 | 5.56 | 5.62 | 5.69 |
| 3 | 5.88 | 6.12 | 6.25 | 6.56 | 6.62 | 6.69 |
| 4 | 6.94 | 7.19 | 7.25 | 7.56 | 7.75 | 7.81 |
| 6 | 8.88 | 9.12 | 9.31 | 9.62 | 10.00 | 10.06 |

1. End connection style abbreviations: BW - Butt welding, FF - Flat Faced, Scrd - Scribed, SW - Socket weld, RF - Raised Face, RTJ - Ring Type Joint.

Table 24. Fisher EAT Dimensions

| VALVE SIZE, NPS | DD | | | | | | |
|-----------------|--------------------|------|------|--------------|--------------------------|------|-------|
| | Plain Bonnet | | | | Style 1 Extension Bonnet | | |
| | Stem Diameter, mm | | | | Stem Diameter, mm | | |
| | 9.5 | 12.7 | 19.1 | 25.4 or 38.1 | 9.5 | 12.7 | 19.1 |
| 1 | 111 | 133 | --- | --- | 197 | 253 | --- |
| 2 | 98 | 121 | --- | --- | 184 | 223 | --- |
| 3 | --- | 149 | 146 | --- | --- | 251 | 256 |
| 4 | --- | 140 | 137 | --- | --- | 241 | 246 |
| 6 | --- | 144 | 141 | 187 | --- | 246 | 251 |
| | Stem Diameter, In. | | | | Stem Diameter, In. | | |
| | 3/8 | 1/2 | 3/4 | 1 or 1-1/4 | 3/8 | 1/2 | 3/4 |
| 1 | 4.38 | 5.25 | --- | --- | 7.75 | 9.95 | --- |
| 2 | 3.88 | 4.75 | --- | --- | 7.25 | 8.75 | --- |
| 3 | --- | 5.88 | 5.75 | --- | --- | 9.88 | 10.06 |
| 4 | --- | 5.50 | 5.38 | --- | --- | 9.50 | 9.69 |
| 6 | --- | 5.69 | 5.56 | 7.38 | --- | 9.69 | 9.88 |

Figure 15. Fisher EAT Dimensions (also see tables 23, 24, and 25)



A0927-2

Note:
For dimensions of valves with PN (or other) end connections, consult your [Emerson sales office](#).

Table 25. Fisher EAT Dimensions

| VALVE SIZE, NPS | DD | | | | | |
|-----------------|--------------------------|-------|-------|---------------------------------|-------|------|
| | Style 2 Extension Bonnet | | | ENVIRO-SEAL Bellows Seal Bonnet | | |
| | Stem Diameter, mm | | | Stem Diameter, mm | | |
| | 9.5 | 12.7 | 19.1 | 9.5 | 12.7 | 19.1 |
| 1 | 291 | 305 | --- | 305 | --- | --- |
| 2 | 278 | 291 | --- | 292 | --- | --- |
| 3 | --- | 454 | --- | --- | --- | --- |
| 4 | --- | 445 | 437 | --- | 467 | --- |
| 6 | --- | 449 | 441 | --- | 465 | --- |
| | Stem Diameter, In. | | | Stem Diameter, In. | | |
| | 3/8 | 1/2 | 3/4 | 3/8 | 1/2 | 3/4 |
| 1 | 11.44 | 12.00 | --- | 12.00 | --- | --- |
| 2 | 10.94 | 11.44 | --- | 11.50 | --- | --- |
| 3 | --- | 17.88 | --- | --- | --- | --- |
| 4 | --- | 17.50 | 17.19 | --- | 18.38 | --- |
| 6 | --- | 17.69 | 17.38 | --- | 18.31 | --- |

Ordering Information

Inlet pressure and temperature must always be limited by the applicable ASME pressure/temperature rating. Pressure drop information for various trim material combinations is provided in figures 11, 12, and 13. The maximum allowable pressure drop for the application must not exceed the lowest value indicated for the combination of materials selected.

When ordering, specify:

Application Information

1. Type of 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 drops:
 - a. Minimum flowing drop

- b. Normal flowing drop
 - c. Maximum flowing drop
 - d. Maximum at shutoff
7. Flow rates:
 - a. Minimum controlled flow
 - b. Normal flow
 - c. Maximum flow
8. Maximum permissible noise level, if critical
9. Shutoff classification required
10. Valve stem diameter and bonnet type (plain, extension, or ENVIRO-SEAL bellows seal bonnet)
11. Line size and schedule

Valve Information

To determine what valve ordering information is needed, refer to the specifications. Review the description for each specification and in the referenced tables; write down your choice whenever there is a selection to be made. Always specify the valve design letter designation.

Actuator and Accessory Information

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

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