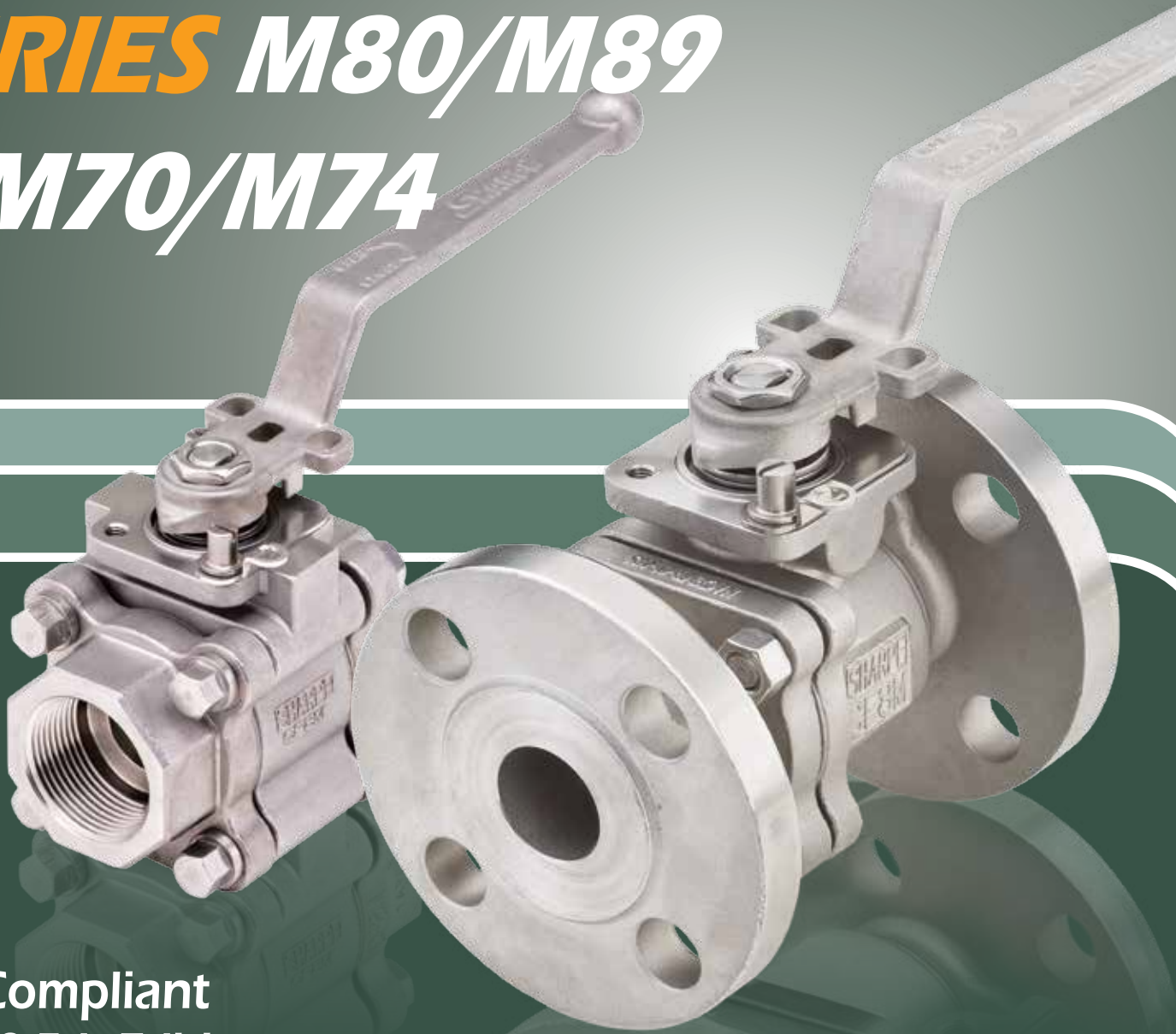




Valves, Automation & Controls

***SERIES* M80/M89 & M70/M74**



Fully Compliant
API 608 5th Edition

METAL SEAT SERIES

SMITH-COOPER®
INTERNATIONAL

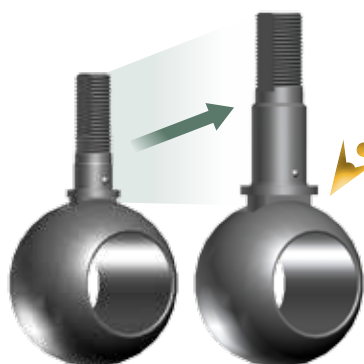
Overview

Valves designed for high temperatures and severe service applications

BODY MATERIALS:
316 Stainless Steel,
Carbon Steel, Alloy 20



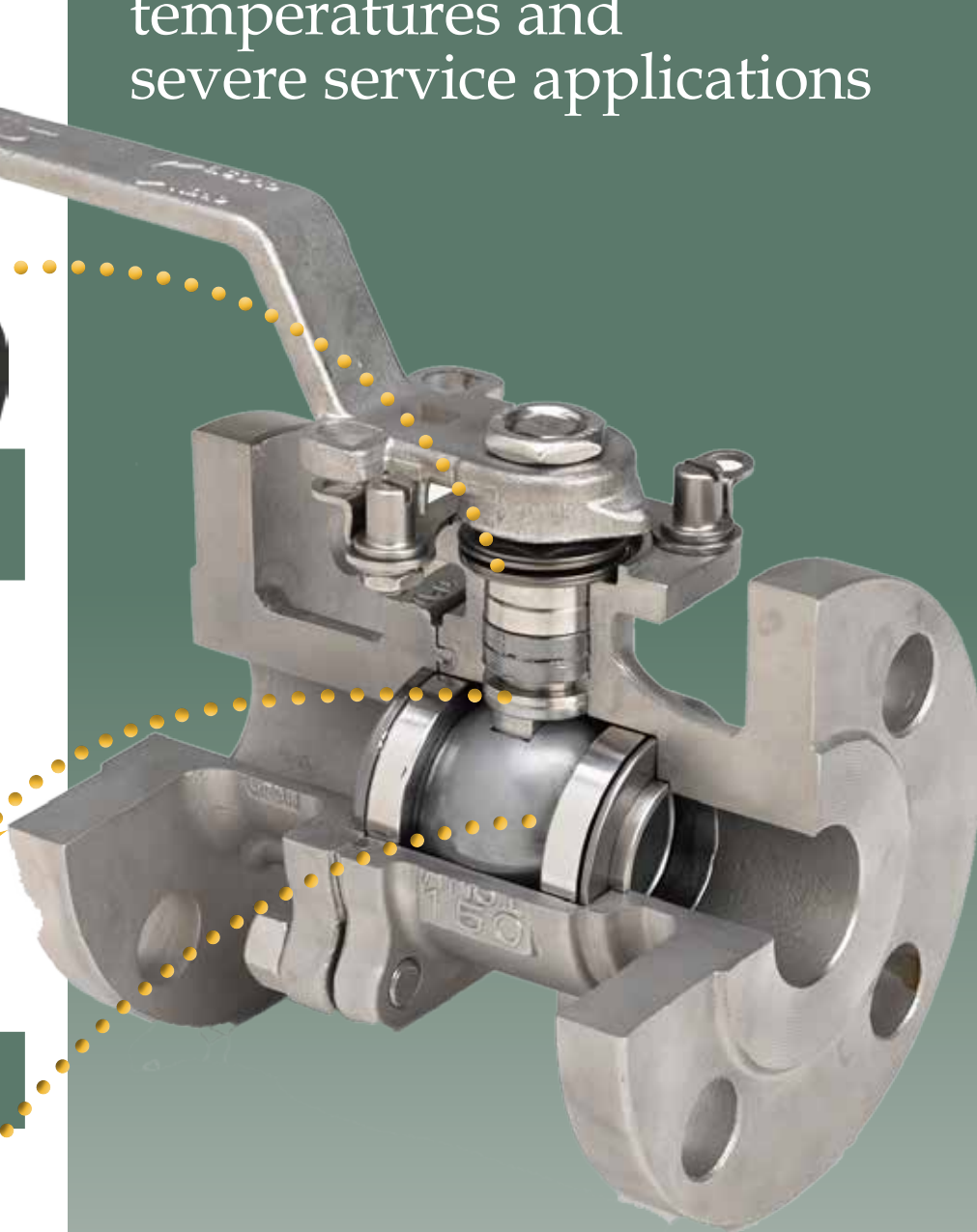
Integral fugitive emissions ports for monitoring system control



Enlarged stem and slot for higher operating torques



Tight toleranced stem and ball with characterized port for precise process control



The exceptional capabilities of metal sealing together with the advanced features of the new line of Sharpe® API 608 valves, results in a superior valve that functions under the most demanding applications where soft seats are not an option.

Mate-Lapped Ball and Seat Set

The design is based on a ball and two metal seats which are precision machined, and then mate-lapped together to provide an extremely tight fit.

Behind the seats are a spring or seal whose function is to enable sealing by applying a load to the sealing surfaces.

Protected Seat Seal and Springs

The seat design protects the seat seals and the springs from the media, which reduces problems associated with solidification of material in the valve.

The metal seated valves come in two configurations depending on the application:

Bi-Directional

Provides shut-off in both directions.

The valves have a symmetric build where both the upstream and downstream seats have a seat seal.

The seat seal material is polymeric or O-rings for low temperatures, and graphite or metal for high temperatures.

Uni-Directional

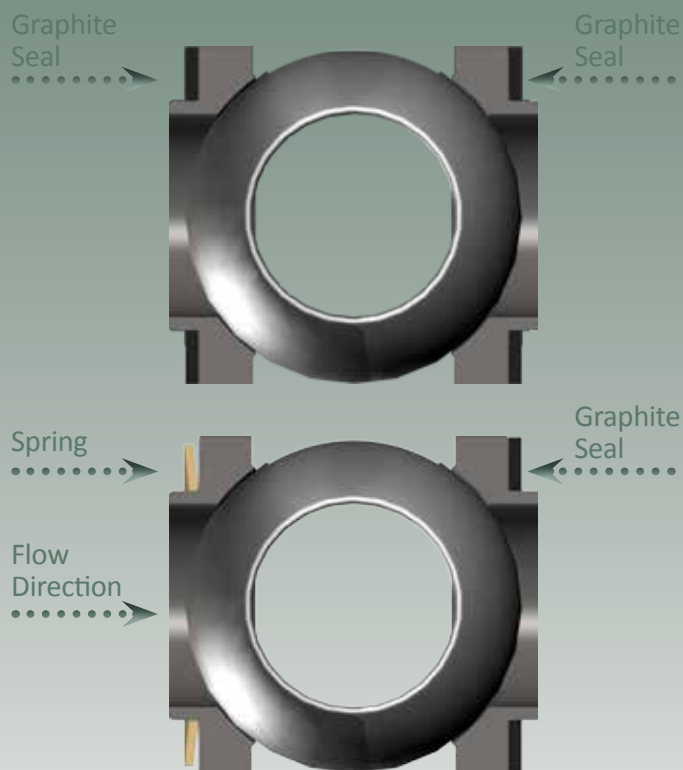
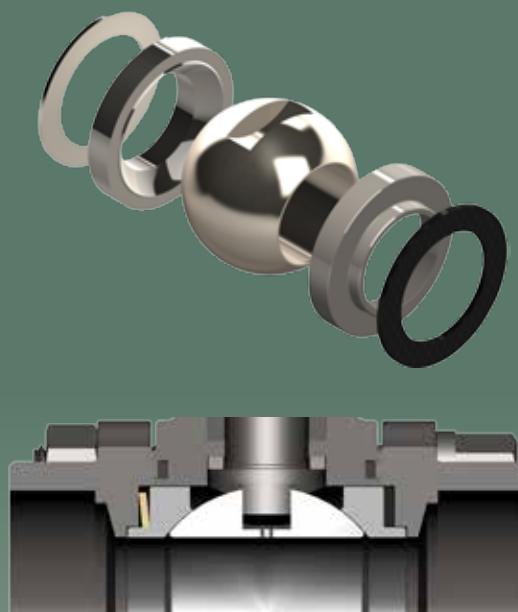
Provides shut-off in one direction.

The valve is built with an upstream spring and downstream seat seal.

The spring is assembled behind the upstream seat and is protected from the media. The spring material is specified according to the application media and temperature. All uni-directional valves carry a flow direction arrow.

Design

Sharpe® metal seated valves are designed for applications requiring resistance to erosion, abrasion, corrosion, and high temperatures beyond the capabilities of the currently available polymeric seat materials. Typical applications include Pulp and Paper, Petrochemical, Petroleum, Chemical, and Power industries to name a few.



Tongue and Groove Design

Fully encapsulated body seals, allowing ends to be welded in-line, without time consuming and labor intensive disassembly.

Design compensates for bolt expansion and reduces the chance of external leakage.

Helps prevent seal ruptures in high pressure, cryogenic or steam applications.

Heavy Duty Stem Design

Stem diameters have been increased to meet the higher torque requirements of the most demanding applications.

Stem to ball contact area is wider and larger, allowing the valve to be used for higher torque applications.

Design allows for the use of 316 stainless steel stem material, rather than 17-4PH, for superior corrosion resistance.

ISO 5211 Top-Works Compatibility

The top-works offer compatibility for mounting a wide range of accessories.

Sharpe® actuators and accessories may be retrofitted on existing valves without disruption of line integrity.

Lockable Stem Extension

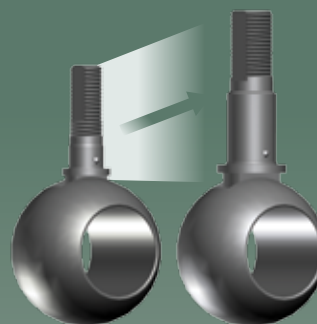
An option to move the valve top interface away from the pipe line to accommodate insulation.

Tamper Proof Locking Device

All Sharpe® Valves come standard with a lockable handle. The optional, Sharpe® exclusive, tamper proof locking device cannot be removed with a lock in place. When not being used with a lock its springs ensure the locking device snaps into place in the open or closed position to prevent accidental operation.

FEATURES:

Important construction components



Process compatibility of stem assemblies provide operational flexibility

Stem Assemblies

Various stem assemblies are available based on application requirements.

Standard - a multiple pack of chevron "V" shaped stem seals for better sealing in TFM® or Nova materials.

High temperature - double pack of flexible graphite seals for sealing under high temperature conditions.

Fugitive emission - 2-pack stem seals in PTFE or graphite, with lantern ring to allow leak detection through the emission port(s).

High Cycle – unique design for demanding high cycle applications that consist of multi-system sealing devices in the stem bonnet.

Stem Sealing

Increased Stem Sealing Area

Allows for a range of sealing combinations for severe applications and other stringent design demands.

Live-Loaded Stem

Two pairs of concave and opposing spring washers provide additional compensation for seal wear.

Safe Design

Blowout proof stem ensures the stem cannot be blown out by accidental medium pressure rise.

Wear Resistance

The thrust washer is either metallic for higher temperatures and wear resistance, or PEEK for lower temperatures.

Anti-Static

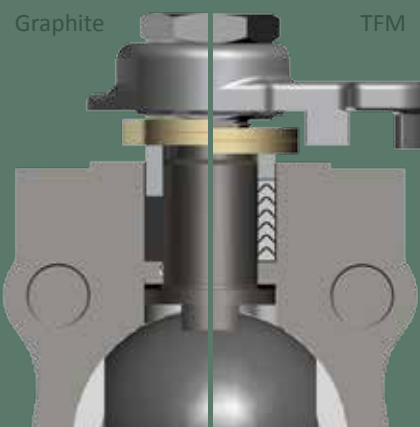
Static build-up discharges by anti-static device in stem or the metallic thrust washer.

Stem Trim for Sizes Greater Than 3"

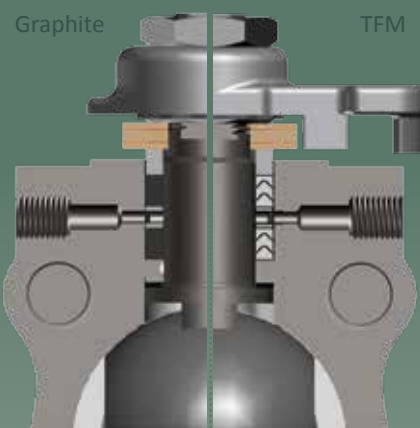
According to API 608 all valve sizes greater than 3" have an adjustable packing gland with thru bolt holes. Gland bolts pass through the holes and thread to the valve body. The position stops are bolted to the body and are not integral to the packing gland, gland flange or gland bolting.

FEATURES:

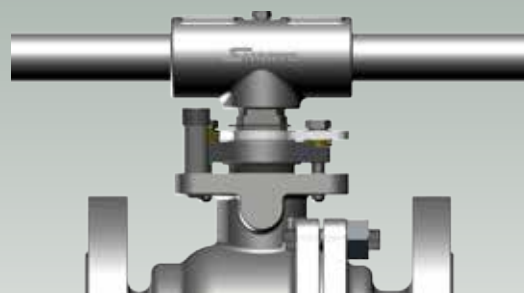
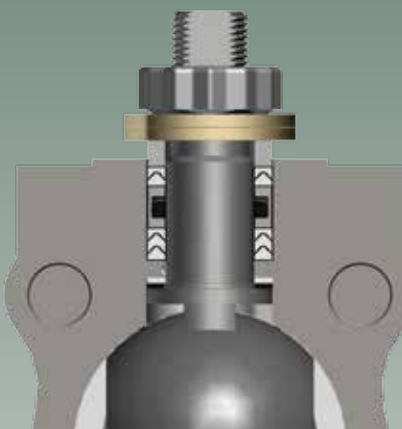
Standard Stem Assembly



Fugitive Emission Assembly

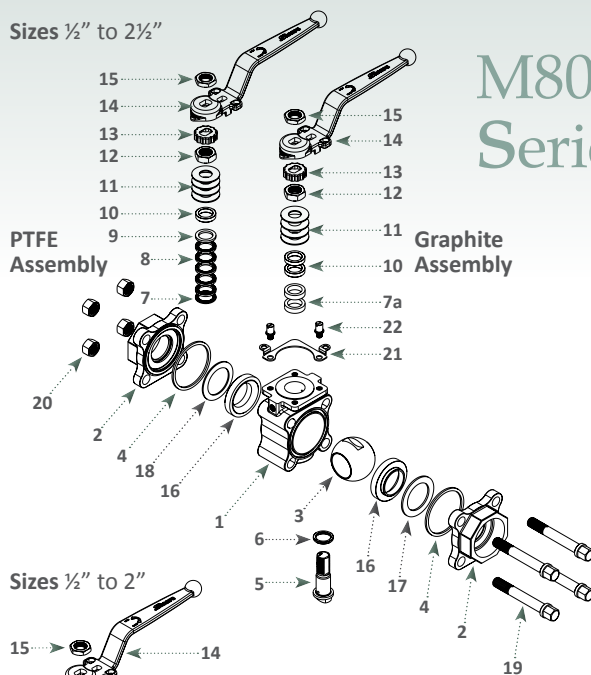


High Cycle Assembly



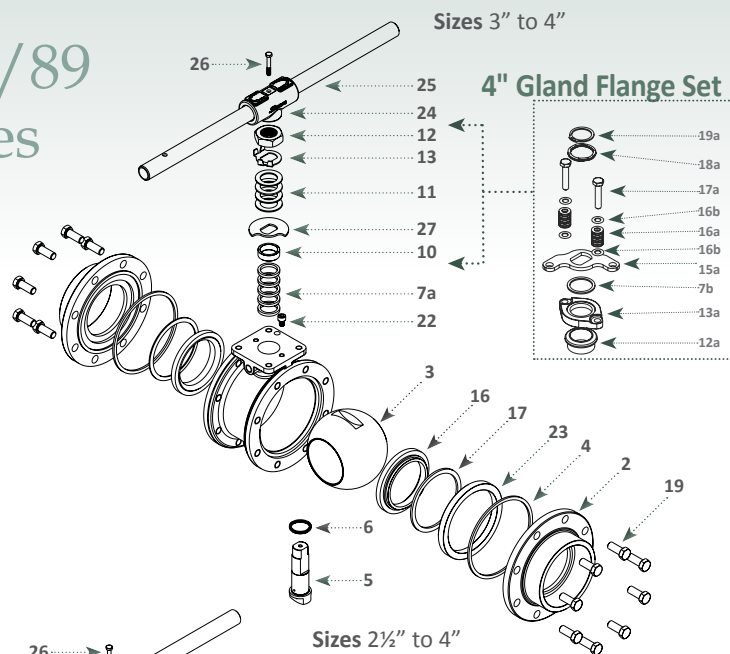
SERIES M80/M89 & M70/M74 HIGH PERFORMANCE BALL VALVE

Sizes ½" to 2½"

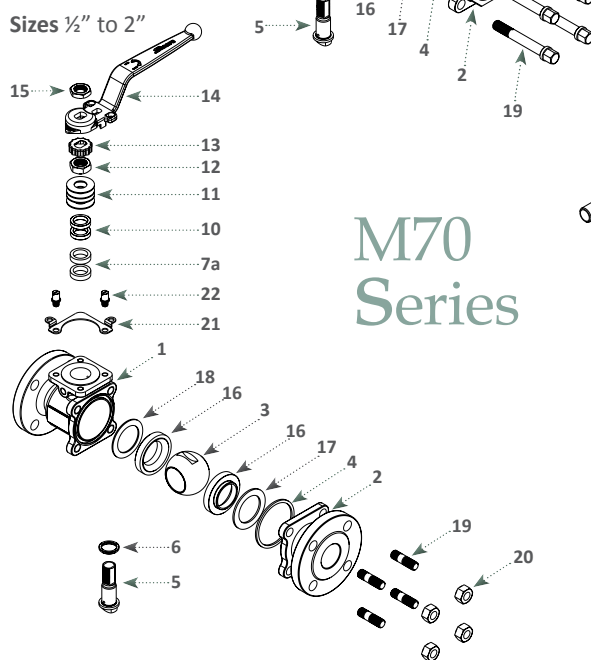


M80/89 Series

Sizes 3" to 4"

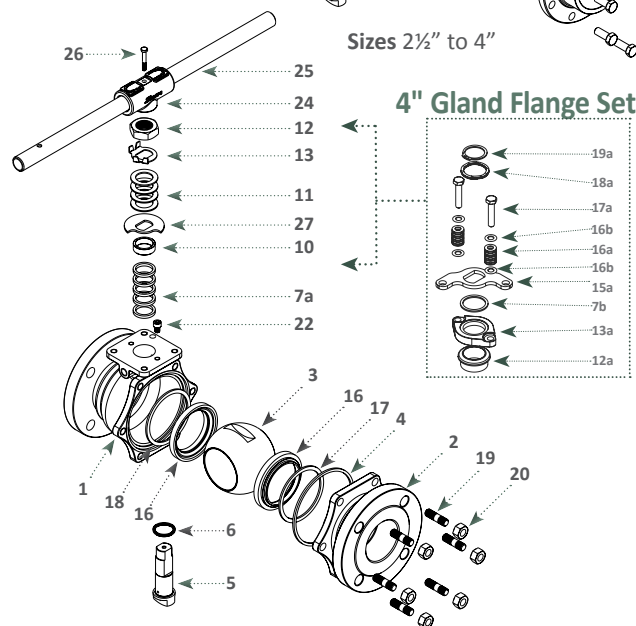


Sizes ½" to 2"



M70 Series

Sizes 2½" to 4"



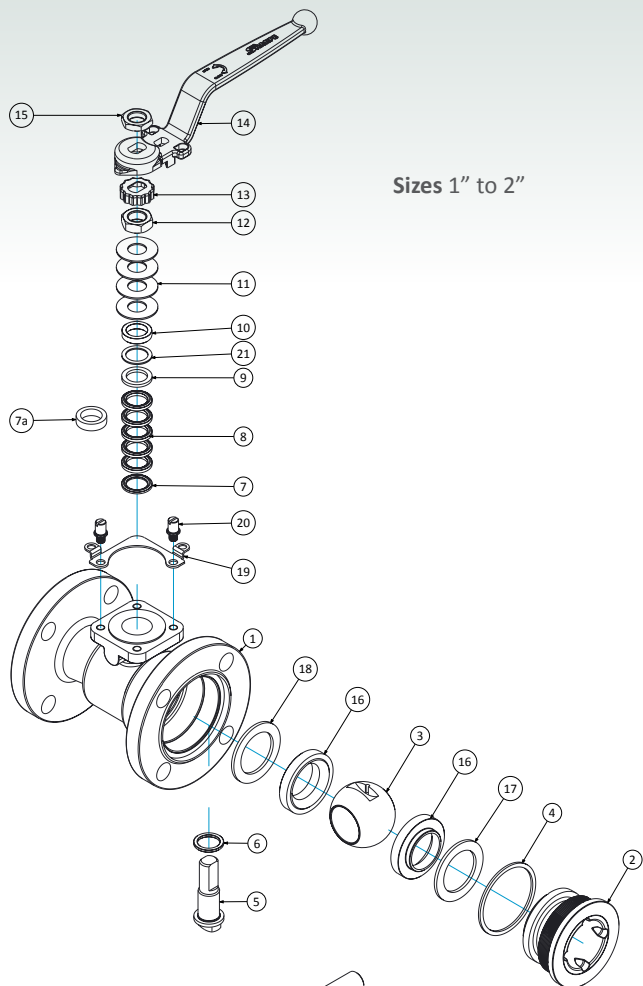
| ITEM | DESCRIPTION | MATERIAL | QTY |
|------|----------------------|---|--------|
| 1 | Body | 316 STAINLESS STEEL ASTM A351 CF8M CARBON STEEL ASTM A216 WCB ALLOY 20 ASTM A351 CN7M | 1 |
| 2 | End Cap | 316 STAINLESS STEEL ASTM A351 CF8M CARBON STEEL ASTM A216 WCB ALLOY 20 ASTM A351 CN7M | 1/2 |
| 3 | Ball | 316 Stainless Steel Hard Chrome Plated (HCP) | 1 |
| 4* | Body Seal | PTFE, RTFE, Graphite, Viton® | 1/2 |
| 5 | Stem | 316 Stainless Steel, 17-4PH Stainless Steel, Inconel | 1 |
| 6* | Thrust Washer | Nitronic 60, Inconel 718, PEEK (x2) | 1 |
| 7* | Stem Seal - Bottom | PTFE, TFM®, Nova | 1 |
| 7a* | Stem Seal | GRAPHITE (high temperature) | 2 or 5 |
| 7b | Thrust Bearing | PEEK | 1 |
| 8* | Stem Seal - Middle | PTFE, TFM®, Nova | 5 |
| 9* | Stem Seal - Top | PTFE, TFM®, Nova | 1 |
| 10 | Gland | 300 Series Stainless Steel | 1 or 2 |
| 11 | Belleville Spring | 17-7PH Stainless Steel | 4 |
| 12 | Stem Nut | 300 Series Stainless Steel | 1 |
| 12a | Gland Position Ring | 300 Series Stainless Steel | 1 |
| 13 | Lock Tab | 300 Series Stainless Steel | 1 |
| 13a | Gland (Size 4" only) | 316 Stainless Steel A351 CF8M | 1 |

| ITEM | DESCRIPTION | MATERIAL | QTY |
|------|-------------------|---|--------|
| 14 | Handle | 300 Series Stainless Steel | 1 |
| 15 | Handle Nut | 300 Series Stainless Steel | 1 |
| 15a | Stop Plate | 300 Series Stainless Steel | 1 |
| 16 | Metal Seat | Stainless Steel Stellite® 6 coated | 2 |
| 16a | Belleville Washer | 17-7PH | 16 |
| 16b | Washer | 300 Series Stainless Steel | 4 |
| 17* | Seat Seal | Graphite, PTFE, Viton® | 1 |
| 17a | Gland Bolt | 300 Series Stainless Steel | 2 |
| 18 | Seat Disk Spring | 17-7PH Stainless Steel, 1/2 Hard 301, Inconel 718 | 1 |
| 18a | Retainer Spring | 300 Series Stainless Steel | 1 |
| 19 | Body Bolt/Stud | A193 8/8M | 4/16 |
| 19a | Retainer Lock | 300 Series Stainless Steel | 1 |
| 20 | Body Nut | 300 Series Stainless Steel | 4/8 |
| 21 | Stop Pin | 300 Series Stainless Steel | 1 |
| 22 | Stop Plate | 300 Series Stainless Steel | 1 or 2 |
| 23 | Seat Ring | 300 Series Stainless Steel | 1 |
| 24 | Wrench Block | 300 Series Stainless Steel | 1 |
| 25 | Handle Pipe | 300 Series Stainless Steel | 1 |
| 26 | Wrench Bolt | 300 Series Stainless Steel | 1 |
| 27 | Stop Plate | 300 Series Stainless Steel | 1 |

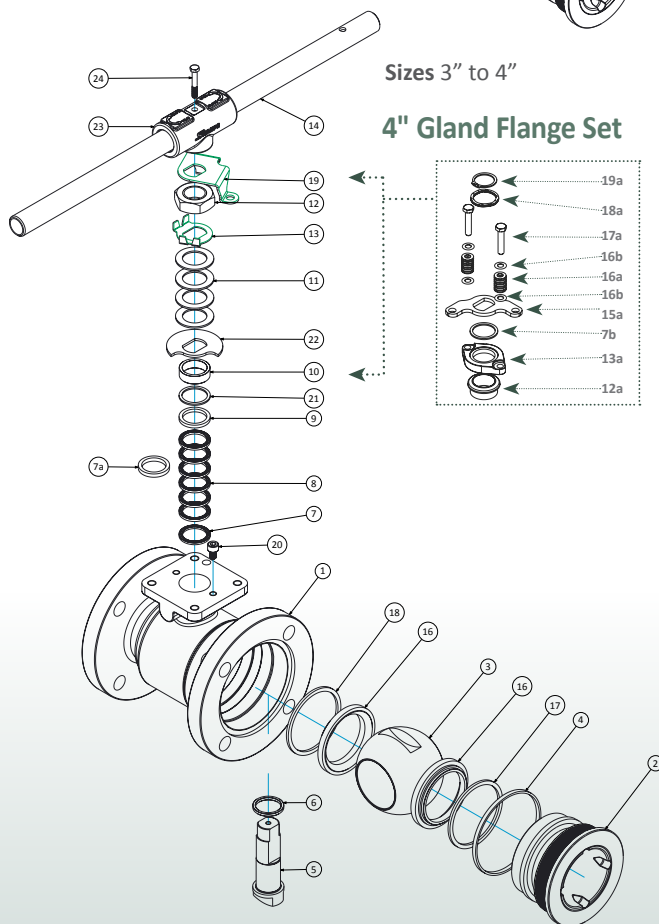
The quantities listed in the stem arrangement are for standard stem assemblies. The fugitive emission stem assemblies carry a lantern ring and less number of seals.

* These parts are used in repair kits.

M74 Series



Sizes 1" to 2"

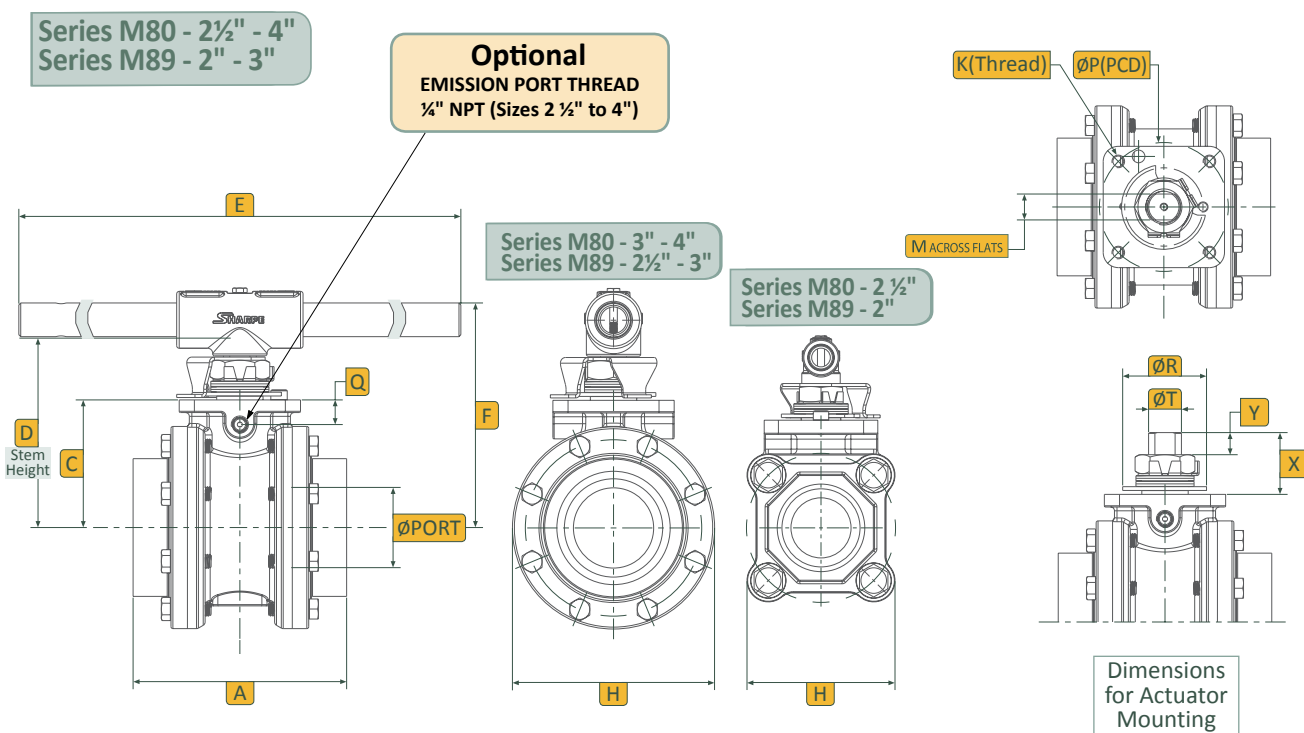
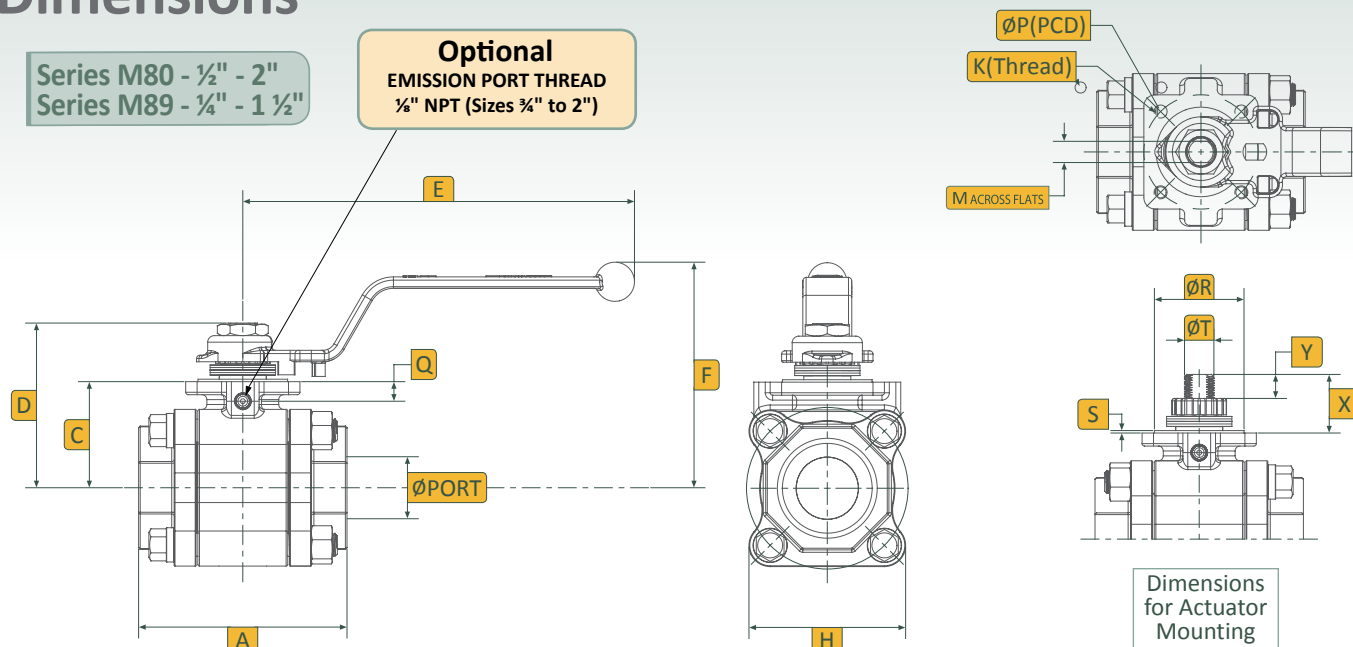


Sizes 3" to 4"

4" Gland Flange Set

| ITEM | DESCRIPTION | MATERIAL | QTY |
|------|----------------------|---|--------|
| 1 | Body | 316 STAINLESS STEEL ASTM A351 CF8M CARBON STEEL ASTM A216 WCB ALLOY 20 ASTM A351 CN7M | 1 |
| 2 | End Cap | 316 STAINLESS STEEL ASTM A351 CF8M CARBON STEEL ASTM A216 WCB ALLOY 20 ASTM A351 CN7M | 1 |
| 3 | Ball | 316 Stainless Steel Hard Chrome Plated (HCP) | 1 |
| 4* | Body Seal | PTFE, RTFE, Graphite, Viton® | 1 |
| 5 | Stem | 316 Stainless Steel, 17-4PH Stainless Steel, Inconel | 1 |
| 6* | Thrust Washer | Nitronic 60, Inconel 718, PEEK (x2) | 1 |
| 7* | Stem Seal - Bottom | PTFE, TFM®, Nova | 1 |
| 7a* | Stem Seal | GRAPHITE (high temperature) | 2 or 5 |
| 7b | Thrust Bearing | PEEK | 1 |
| 8* | Stem Seal - Middle | PTFE, TFM®, Nova | 5 |
| 9* | Stem Seal - Top | PTFE, TFM®, Nova | 1 |
| 10 | Gland | 300 Series Stainless Steel | 1 or 2 |
| 11 | Belleville Spring | 17-7PH Stainless Steel | 4 |
| 12 | Stem Nut | 300 Series Stainless Steel | 1 |
| 12a | Gland Position Ring | 300 Series Stainless Steel | 1 |
| 13 | Lock Tab | 300 Series Stainless Steel | 1 |
| 13a | Gland (Size 4" only) | 316 Stainless Steel A351 CF8M | 1 |
| 14 | Handle | 300 Series Stainless Steel | 1 |
| 15 | Handle Nut | 300 Series Stainless Steel | 1 |
| 15a | Stop Plate | 300 Series Stainless Steel | 1 |
| 16 | Metal Seat | Stainless Steel Stellite® 6 coated | 1 |
| 16a | Belleville Washer | 17-7PH | 16 |
| 16b | Washer | 300 Series Stainless Steel | 4 |
| 17 | Seat Seal | Graphite, PTFE, Viton® | 1 |
| 17a | Gland Bolt | 300 Series Stainless Steel | 2 |
| 18 | Seat Disk Spring | 17-7PH Stainless Steel, 1/2 Hard 301, Inconel 718 | 1 |
| 18a | Retainer Spring | 300 Series Stainless Steel | 1 |
| 19 | Lock Plate | 300 Series Stainless Steel | 1 |
| 19a | Retainer Lock | 300 Series Stainless Steel | 1 |
| 20 | Stop Pin | 300 Series Stainless Steel | 1 or 2 |
| 21 | Thrust Seal | 300 Series Stainless Steel | 1 |
| 22 | Stop Plate | 300 Series Stainless Steel | 1 |
| 23 | Wrench Block | 300 Series Stainless Steel | 1 |
| 24 | Wrench Bolt | 300 Series Stainless Steel | 1 |

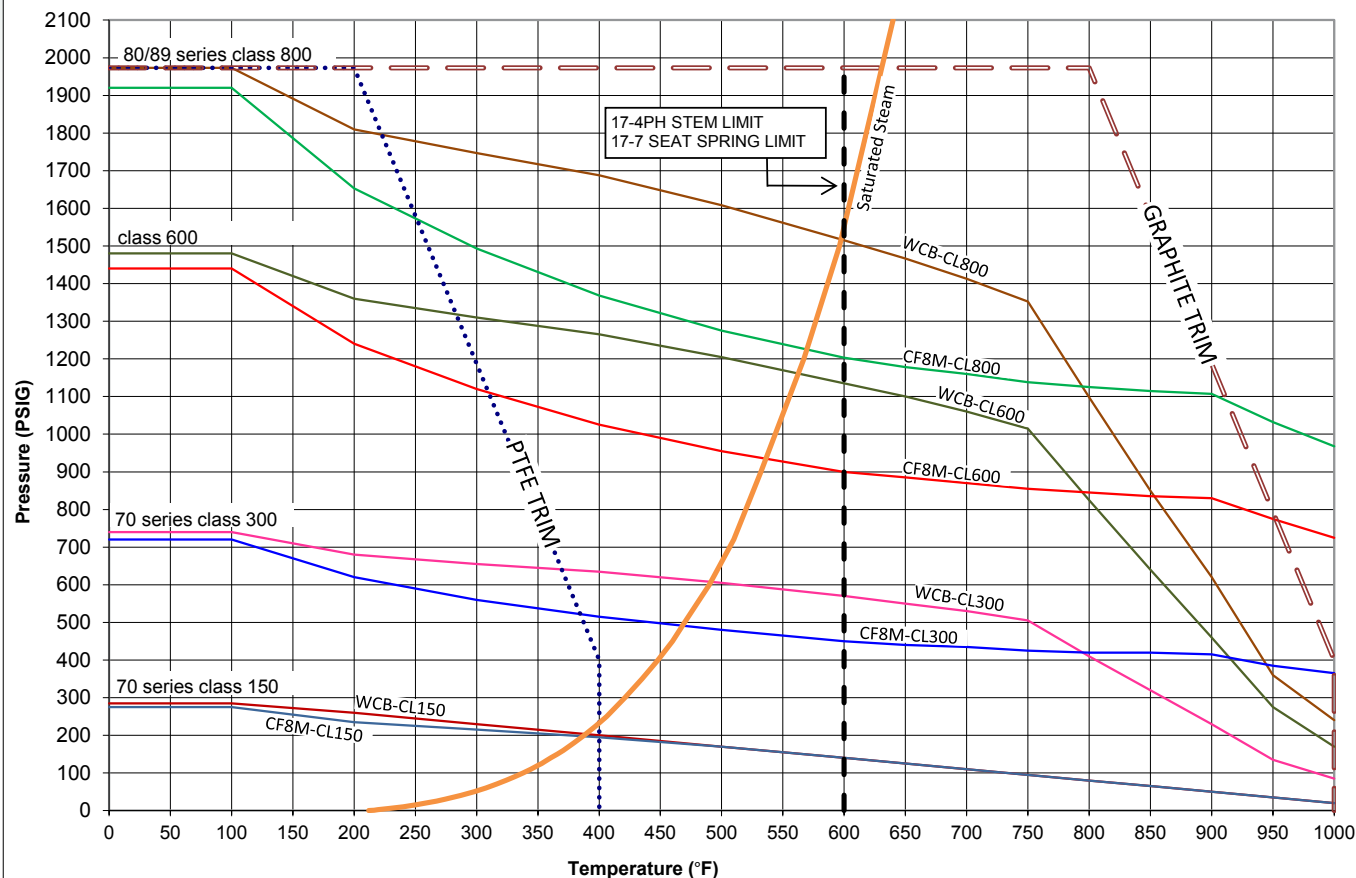
Dimensions



| Standard Port | Full Port | | TE/SW BW | Ext BW Full Port | Dimensions (Inches) | | | | | | | | | | | | | |
|---------------|-----------|-------|----------|------------------|---------------------|------|-------|------|------|------------|-------|------------|------|------|-------|-------|------|------|
| M80 | M89 | ØPORT | A | A | C | D | E | F | H | K (Thread) | M | ØP (PCD) | Q | ØR | S | ØT | X | Y |
| ½" | ¼", ⅜" | 0.44 | 2.91 | - | 1.27 | 2.01 | 6.42 | 3.39 | 1.81 | M5-P0.8 | 0.264 | F04 (1.65) | NA | 1.18 | 0.051 | 0.394 | 0.74 | 0.33 |
| ¾" | ½" | 0.56 | 3.07 | 13.10 | 1.42 | 2.17 | 6.42 | 3.54 | 1.95 | M5-P0.8 | 0.264 | F04 (1.65) | 0.27 | 1.18 | 0.051 | 0.394 | 0.74 | 0.33 |
| 1" | ¾" | 0.81 | 3.72 | 13.25 | 1.74 | 2.57 | 7.28 | 3.83 | 2.39 | M6-P1.0 | 0.343 | F05 (1.97) | 0.39 | 1.38 | 0.059 | 0.472 | 0.81 | 0.30 |
| 1¼" | 1" | 1.00 | 4.25 | 13.61 | 1.91 | 2.74 | 7.28 | 4.00 | 2.85 | M6-P1.0 | 0.343 | F05 (1.97) | 0.37 | 1.38 | 0.059 | 0.472 | 0.81 | 0.30 |
| 1½" | 1¼" | 1.24 | 4.57 | 13.90 | 2.40 | 3.82 | 9.45 | 5.28 | 3.15 | M8-P1.25 | 0.512 | F07 (2.76) | 0.47 | 2.17 | 0.059 | 0.709 | 1.41 | 0.48 |
| 2" | 1½" | 1.50 | 5.04 | 14.21 | 2.56 | 3.98 | 9.45 | 5.43 | 3.78 | M8-P1.25 | 0.512 | F07 (2.76) | 0.47 | 2.17 | 0.059 | 0.709 | 1.41 | 0.48 |
| 2½" | 2" | 2.00 | 6.34 | 14.87 | 3.58 | 5.28 | 15.75 | 6.34 | 4.92 | M10-P1.5 | 0.630 | F10 (4.02) | 0.76 | - | - | 0.886 | 1.92 | 0.65 |
| 3" | 2½" | 2.50 | 6.65 | - | 3.98 | 5.87 | 23.62 | 7.48 | 6.30 | M10-P1.5 | 0.807 | F10 (4.02) | 0.77 | - | - | 1.024 | 1.93 | 0.65 |
| 4" | 3" | 3.25 | 8.43 | - | 4.59 | 6.50 | 23.62 | 8.07 | 7.99 | M10-P1.5 | 0.807 | F10 (4.02) | 0.77 | - | - | 1.024 | 1.93 | 0.65 |

The dimensions above are for informational purpose only. Please refer to Sharpe® Valves if you need dimensions for construction.

Pressure-Temperature Ratings Series M80/M89 & M70/M74



Note:
 The maximum pressure/temperature ratings of the valve assemblies are limited to lowest of the body or seat material fitted.
 The valve body ratings are based on ASME B16.34 rating for materials.
 The graphs are based on laboratory testing and our experience in field.
 The seat ratings depend on the material, design, application and function.

Coating Options

The standard combination is a hard chrome plated (HCP) stainless steel ball and stainless steel seats with stellite 6 hard facing. Other optional coatings are available, please refer to Sharpe® for more information.

Shut Off Class

All the valves are tested to ANSI/FCI 70-2.
 The seat standard leakage rates are Class V.
 Leakage rates to Class VI are available.

Size Range

M80/M89 series

M80 ½" to 2½" Standard port to Class 800
 M89 ½" to 2" Full port to Class 800
 M80 3" to 4" Standard port to Class 300
 M89 2½" to 3" Full port to Class 150 & 300

M70/M74 series

1" to 4" Standard port Class 150 & 300
 ½" to 4" Full port Class 150 & 300
 For sizes above 4", please call Sharpe®.


How To Order Series M80/89 & M70/74

1" Size M80 Series 4 Body 4 Ends Z Stem G Body Seal G Stem Packing Z Thrust Bearing U Flow (see coding below) 6GZ Seat Set TE/TE Ends (80/89 only) L Options

| Size | Series | Body/Ends | Body Seal | Stem Packing | Thrust Bearing | Ends | Options |
|--------|------------------------|-----------------------|------------|--------------|----------------|----------------------------------|------------------------------------|
| 1/4" | M80 3-piece R/P | 2 Alloy 20* | G Graphite | G Graphite | C Nitronic 60 | TE Threaded / NPT | F1 1 Emission Port |
| 3/8" | M89 3-piece F/P | 4 Carbon Steel | T PTFE | M TFM® | P PEEK | BW10 Buttweld SCH 10* | F2 2 Emission Port |
| 1/2" | M701 Flanged #150 F/P | 6 316 Stainless Steel | V Viton® | N Nova | Z Inconel 718 | BW40 Buttweld SCH 40 | L Lockable Stem Ext. |
| 3/4" | M703 Flanged #300 F/P | | | R RTFE | | BW80 Buttweld SCH 80* | A NACE (Stainless Steel Stem Only) |
| 1" | M741 Flanged #150 S/P* | | | T PTFE | | SW Socketweld | VB Vented Ball |
| 1 1/4" | M743 Flanged #300 S/P* | | | | | FB Flush Bottom* | SJ Steam Jacket |
| 1 1/2" | | | | | | 1 150# Flanged RF | SJ3 Steam Jacket With 3 Outlets |
| 2" | | | | | | 3 300# Flanged RF | TP Tamper Proof Locking Device |
| 2 1/2" | | | | | | 6 600# Flanged RF* | |
| 3" | | | | | | EBW Extended BW (Series 89 only) | |
| 4" | | | | | | | |

*POA

Stem: 7 17/4PH, 6 316 Stainless Steel, Z Inconel 718



When placing an order or requesting a quotation, please provide as many details on the application as possible such as media type, temperature, pressure, pipe size and etc.

| Flow | Material (ball/seat) | Coating (ball/seat) | Seat Seal | Spring |
|-------------------|----------------------|---------------------|--------------|------------------------------|
| U Uni-Directional | 6* 316/316 | HCP/S6 | T PTFE | 7 17-7PH Stainless Steel |
| B Bi-Directional | | | V Viton® | Z* Inconel 718 |
| | | | G** Graphite | 3 300 Series Stainless Steel |

Applicable Standards

| | |
|---------------------|------------------------------|
| Body Wall Thickness | ASME B16.34 |
| SW & Threaded Ends | ASME B16.11 |
| Butt-Weld Ends | ASME B16.25 |
| Flange Dimensions | ASME B16.5 |
| Basic Design | ASME B16.34, API 608 5th Ed. |
| Pressure Test | ANSI/FCI 70-2, API 598 |
| Mounting Dimensions | ISO 5211 |
| NACE | MR0175/ISO 15156 |
| Marking | MSS-SP 25 |

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TFM® is a registered trademark of Dyneon.
STELLITE® is a registered trademark of KENNA METAL.

Bi-Directional Set (B)

- B6T** 316/316, HCP/S6, PTFE seat seal for temperatures up to 400°F
- B6V** 316/316, HCP/S6, Viton® seat seal for temperatures up to 400°F
- B6G** 316/316, HCP/S6, Graphite seat seal for temperatures up to 750°F

Uni-Directional Set (U)

- U6T7** 316/316, HCP/S6, PTFE seat seal, 17-7 spring for temperatures up to 400°F
- U6V7** 316/316, HCP/S6, Viton® seat seal, 17-7 spring for temperatures up to 400°F
- U6GZ** 316/316, HCP/S6, Graphite seat seal, Inconel spring for temperatures up to 1000°F



Definitions:

HCP Hard Chrome Plated

S6 Stellite® 6

** these items used as standard



SMITH-COOPER®

INTERNATIONAL

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