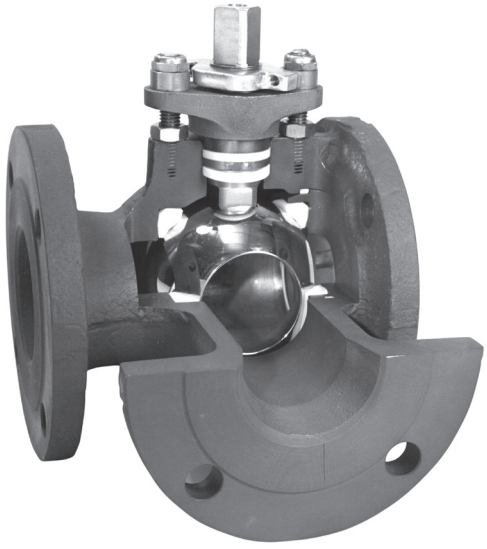
# 2”- 12” (DN 50-300) side ported Jamesbury™ 3-way flanged ball valves

Jamesbury 3-way ball valves are extremely versatile units of rugged design for diverting or blending flow in a variety of gases or liquids. Important savings result from the fact that one 3-way valve does the work of two or even three conventional valves.



Equipped with a ball having a right angle port which connects either end port with the side port of the valve, they can be used for diversion of flow entering the side port to either end port,or for mixing or blending when there is flow of different fluids into the end ports and out the side port. Just one 3-way valve can control a by-pass or recirculation system,or direct flow out of or into different storage tanks (see Figure 1).

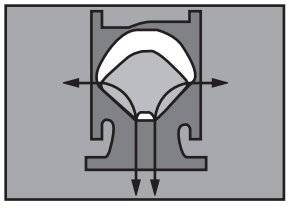
Available in 2” – 12” (DN 50 – 300) sizes, these valves are designed for Class 150 service. They are rated for a maximum differential pressure of 275 psi (19 bar), and for temperatures from -40°F to +300°F (-40°C to 149°C) depending on size and material. Standard materials include carbon steel with 316 stainless steel trim or all 316 stainless steel. Valves in other materials, flange designs and waterway configurations are available on application.

Class 150 3-way valves in sizes 2” – 4” (DN 50 – 100) have the designation AM150FD. Valves in sizes 6” – 12” (DN 150 – 300) are designated as DM150FD.

## Features

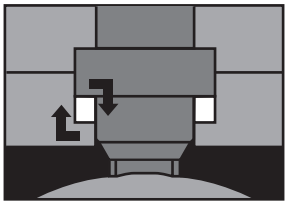
### Bidirectional Flow

- Handles flow into the end ports and out of the common side port for mixing applications, or into the side port and out of either end port for diverting applications.



### Effective Stem Sealing

- “Corner Sealing,” the compression of low friction PTFE box rings, eliminates stem leakage by avoiding straightline leakage paths.
- Stem seal adjustment, if ever required, is done by simply tightening bonnet screws or bolts.



### Economical

- One 3-way valve does the work of two or three conventional valves.
- Lowers the investment in valves, flanges, intermediate piping, actuators, installation labor, and circuit requirements.

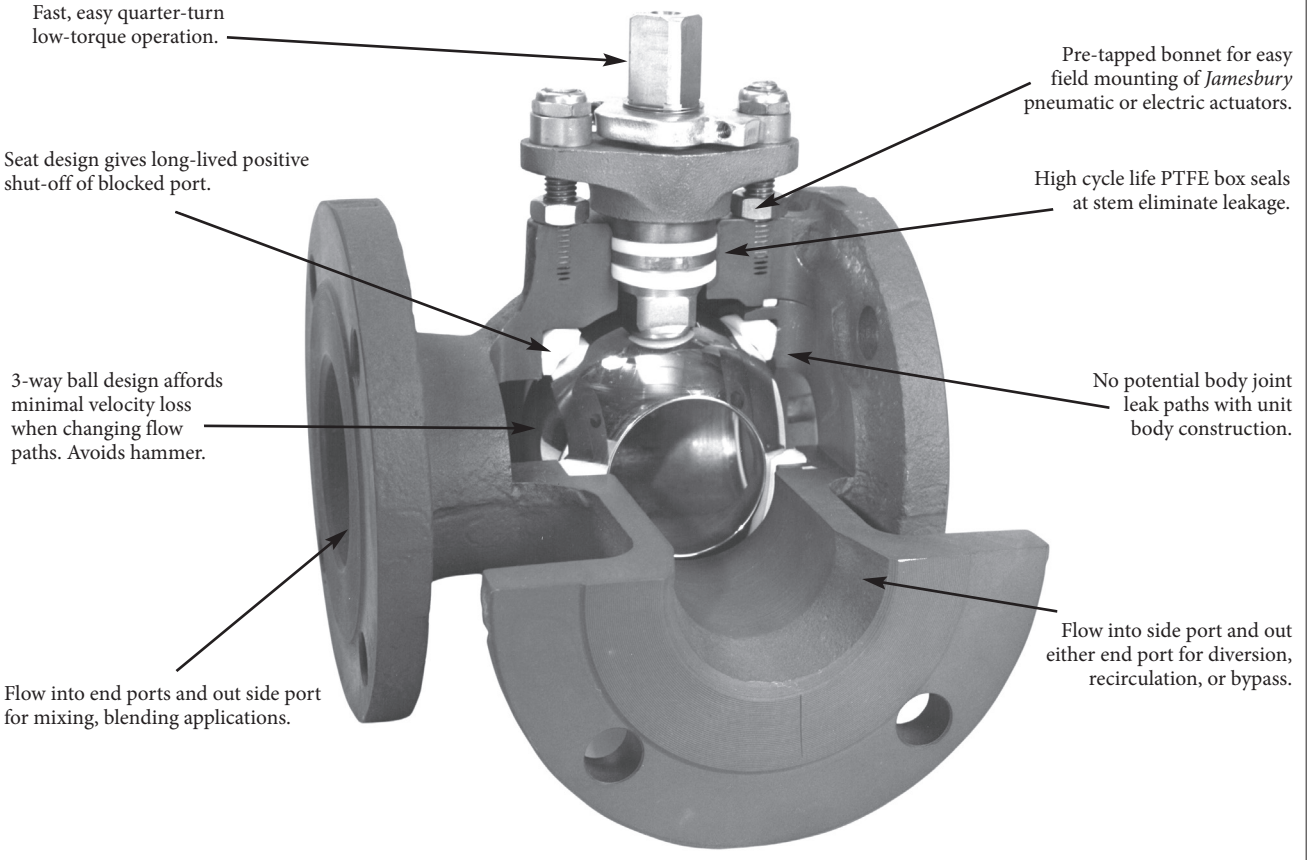
### Single piece body

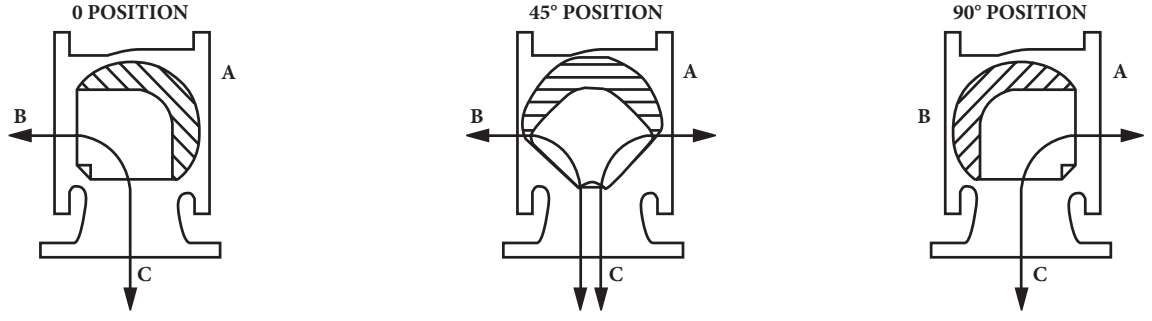
- A unit body design in sizes 2” – 10” (DN 50 – 250) provides high structural strength, assures overall piping rigidity, and minimizes potential leak paths.

### Easy automation

- For automatic valve operation, any of these 3-way valves may be ordered with a Jamesbury pneumatic or electric actuator, providing single source responsibility.
- Each valve is manufactured with its bonnet surface machined and tapped to permit rigid, positively aligned field mounting of an actuator directly onto the valve.

# Application




(Letter designations are stamped on tops of flanges)

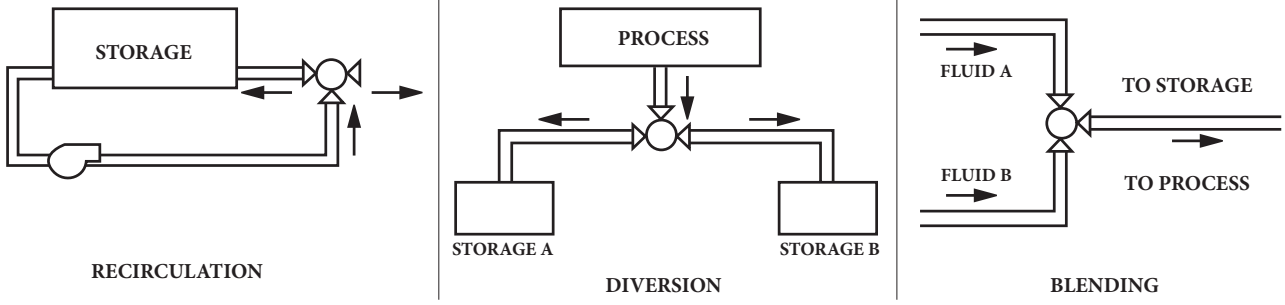



Figure 1

# Specifications

## Valve body ratings

These are maximum working pressure ratings of the valve body only. The seat ratings shown in Figure 2 below, determine the practical pressure limitations according to actual service conditions. Test pressures are for hydrostatic test with ball half open.

| Temperature °F | Carbon Steel psi | 316 Stainless Steel psi |
|---|---|---|
| -20 to 100 | 285 | 275 |
| 200 | 260 | 235 |
| 300 | 230 | 215 |
| 400 | 200 | 195 |
| 500 | 170 | 170 |
| Test Pressure | 450 | 425 |

| Temperature °C | Carbon Steel bar | 316 Stainless Steel bar |
|---|---|---|
| -29 to +38 | 19.6 | 19.0 |
| 100 | 17.7 | 16.2 |
| 150 | 15.8 | 14.8 |
| 200 | 13.8 | 13.7 |
| 250 | 12.1 | 12.1 |
| Test Pressure | 30 | 29 |

## Flow data

The table below provides friction loss information on 3- way valves. The $C_v$ values represent the flow of water at +60°F through the valve in U.S. gallons per minute at a pressure drop of 1 psi. The metric equivalent, $K_v$, is the flow of water at 16°C through the valve in cubic meters per hour at a pressure drop of 1 kg/cm$^2$. To convert $C_v$ to $K_v$, multiply by 0.8569. Values are for flow through either end port or through the common side port.

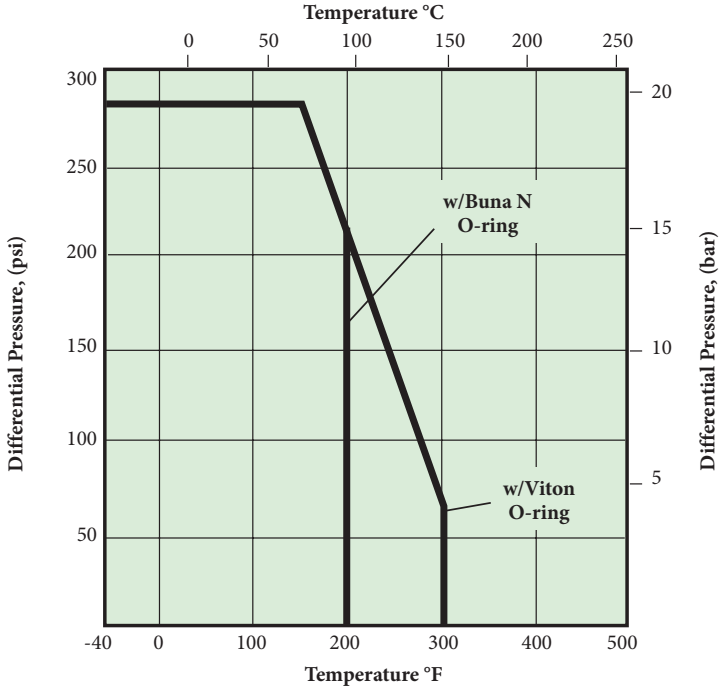
| Valve size | | $C_v$ |
|---|---|---|
| inches | DN | |
| 2 | 50 | 50 |
| 3 | 80 | 155 |
| 4 | 100 | 270 |
| 6 | 150 | 440 |

| Valve size | | $C_v$ |
|---|---|---|
| inches | DN | |
| 8 | 200 | 880 |
| 10 | 250 | 1500 |
| 12 | 300 | 2300 |

# Valve seat ratings

Seat ratings, indicated by solid lines in the charts, are based on differential pressure with the valve ball in the fully closed position and refer to seats only.

Maximum working pressures for Class 150 steel valve bodies are shown in the tables on the previous page.

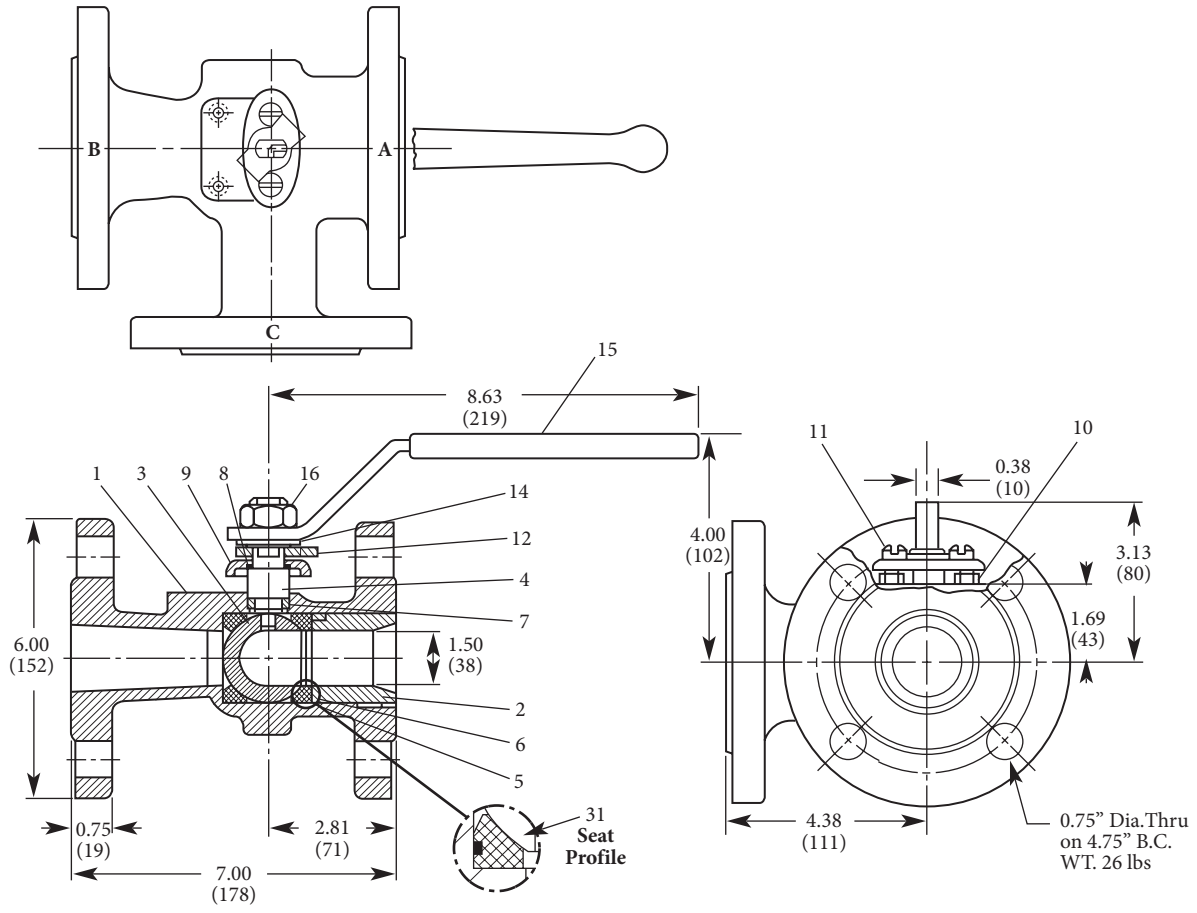



Valves are equipped with double block seats and the rating of the elastomer is the limiting factor insofar as temperature is concerned. Rating for standard elastomer Buna-N® material is -40°F to +200°F (-40°C to +93°C). Rating for Viton® elastomer is 0°F to 300°F (-17°C to +149°C). The standard DBB seat material is Filled PTFE.

Figure 2

## Dimensions

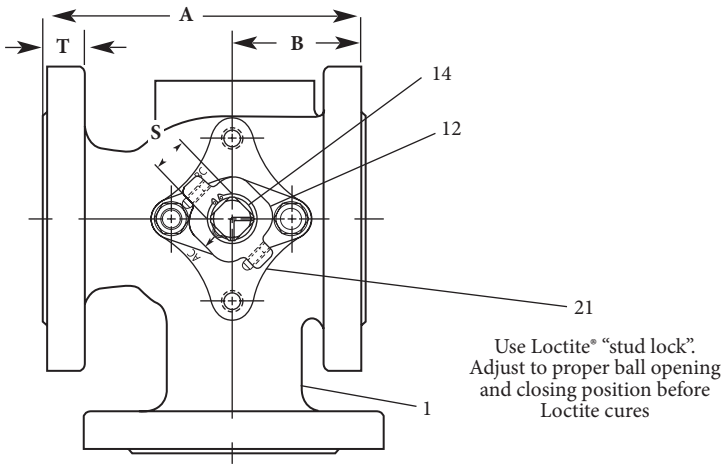
Series AM150FD 2” (DN 50) – inches (mm)

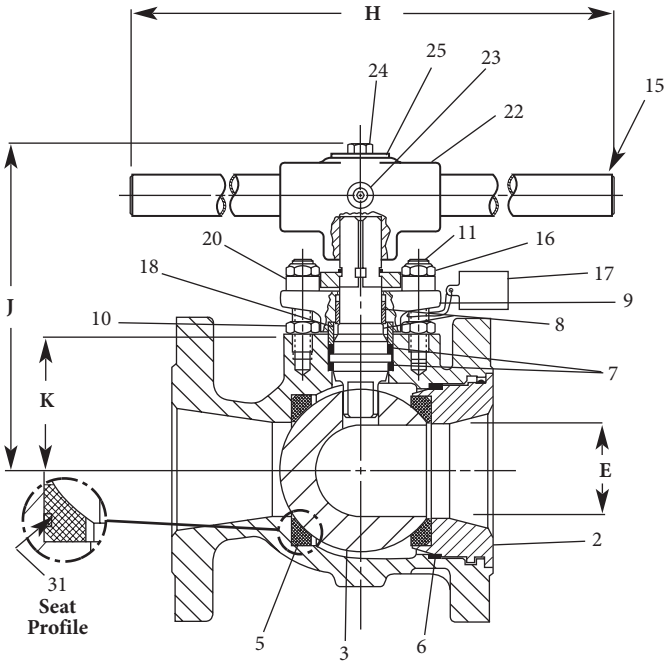



| BILLS OF MATERIALS AND PARTS LIST | | | |
|---|---|---|---|
| 2” (DN 50) AM150FD | | | |
| Part no. | Part name | Body material | |
| | | Carbon steel (22) | 316 Stainless steel (36) |
| 1 | Body | Carbon steel ASTM A216 Type WCB | 316 Stainless steel ASTM A351 Type CF8M |
| 2 | Insert | Carbon steel | 316 Stainless steel Flash Chrome Plated |
| 3 | Ball | 316 Stainless steel | |
| 4 | Stem | 316 Stainless steel – Hard Chrome Plated | |
| 5 | Seat | Elastomer Backed Filled PTFE | |
| 6 | Body Seal | PTFE | |
| 7 | Stem Seal | PTFE | |
| 8 | Stem Bearing | Nylon | |
| 9 | Bonnet Plate | 302 Stainless steel | |
| 10 | Hex Nut | Carbon steel | |
| 11 | Bonnet Screw | 300 Series Stainless steel | |
| 12 | Indicator Stop | 302 Stainless steel | |
| 14 | Retaining Ring | Carbon steel | |
| 15 | Handle | Carbon steel | |
| 16 | Stem Nut | Carbon steel | |

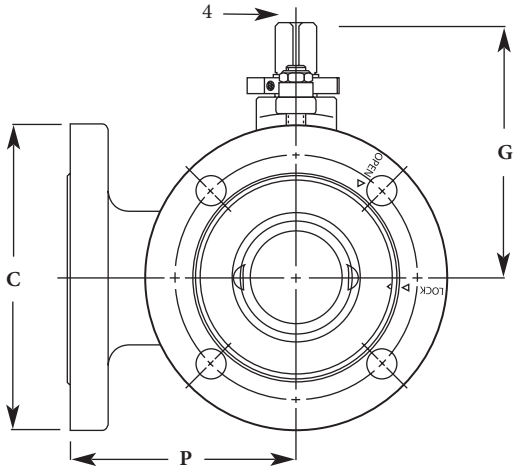
# Dimensions

## 3” & 4” (DN 80 & 100) AM150FD




**D** = Bolt Circle
**L** = Size of Hole
**M** = No. of Holes



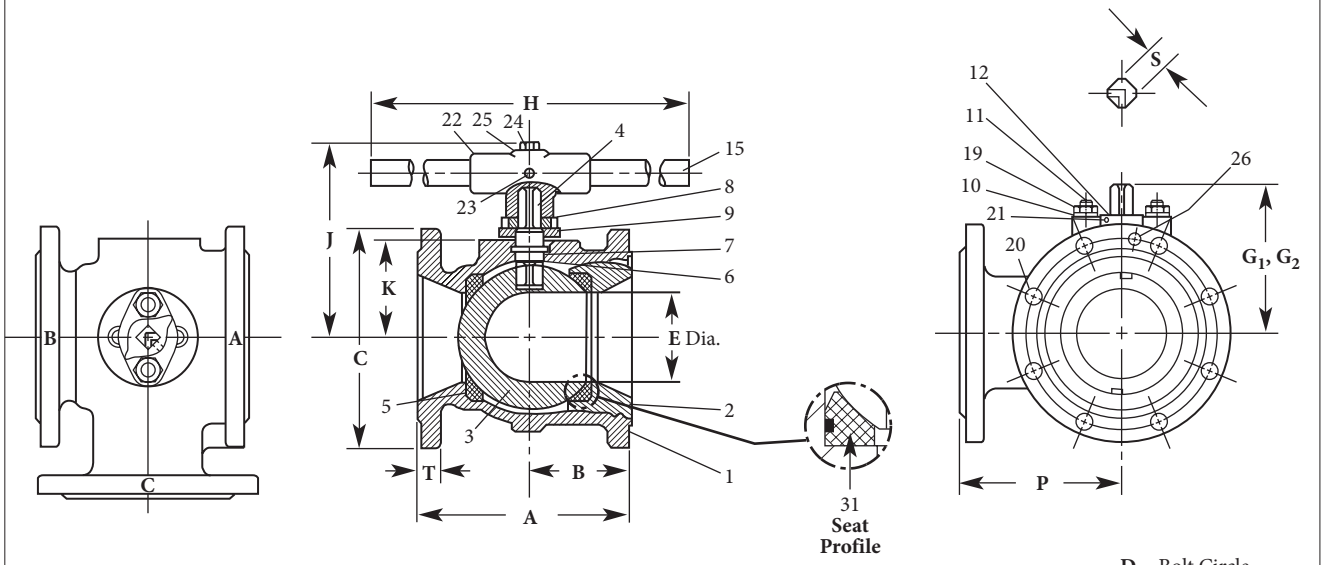

| Approximate dimensions - inches | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Valve size inches | A | B | C | D | E | G | H | J | K | L | M | P | S | T | Approx. weight lbs |
| 3 | 8.00 | 3.25 | 7.50 | 6.00 | 2.31 | 6.25 | 21.50 | 8.25 | 3.38 | 0.75 | 4.00 | 5.75 | 0.88 | 0.75 | 74 |
| 4 | 9.00 | 4.00 | 9.00 | 7.50 | 3.13 | 6.88 | 21.50 | 8.88 | 4.00 | 0.75 | 8.00 | 6.50 | 0.88 | 0.94 | 95 |

| Approximate dimensions - mm | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Valve size DN | A | B | C | D | E | G | H | J | K | L | M | P | S | T | Approx. weight kg |
| 80 | 203 | 83 | 191 | 152 | 59 | 159 | 546 | 210 | 86 | 19 | 4 | 146 | 22 | 19 | 34 |
| 100 | 229 | 102 | 229 | 191 | 80 | 175 | 546 | 226 | 102 | 19 | 8 | 165 | 22 | 24 | 43 |

| BILLS OF MATERIALS AND PARTS LIST | | | |
|---|---|---|---|
| 3” & 4” (DN 80 & 100) AM150 | | | |
| Part no. | Part name | Body material | |
| | | Carbon steel (22) | 316 Stainless steel (36) |
| 1 | Body | Carbon steel ASTM A216 Type WCB | 316 Stainless steel ASTM A351 Type CF8M |
| 2 | Insert | Carbon steel ASTM A216 Type WCB | 316 Stainless steel ASTM A351 Type CF8M |
| 3 | Ball | 316 Stainless steel | |
| 4 | Stem | 316 Stainless steel | |
| 5 | Seat | Elastomer Backed Filled PTFE | |
| 6 | Body Seal | PTFE | |
| 7 | Stem Seal | PTFE | |
| 8 | Stem Bearing | Filled PTFE | |
| 9 | Compression Plate | Carbon steel | Stainless steel |
| 10 | Hex Jam Nut | Carbon steel | |
| 11 | Bonnet Stud | 300 Series Stainless steel | |
| 12 | Indicator Stop | Carbon steel | Stainless steel |
| 14 | Retaining Ring | 300 Series Stainless steel | |
| 15 | Handle | Carbon steel | |
| 16 | Stop Nut | 300 Series Stainless steel | |
| 17 | Identification Tag | 300 Series Stainless steel | |
| 18 | Compression Ring | 300 Series Stainless steel | |
| 20 | Spacer | 300 Series Stainless steel | |
| 21 | Set Screw | 300 Series Stainless steel | |
| 22 | “T” Handle Adapter | Malleable Iron | |
| 23 | Set Screw | 300 Series Stainless steel | |
| 24 | Stem Screw | Carbon steel | |
| 25 | Washer | Carbon steel | |
| 31 | O-Ring | Buna-N,Viton A (as specified) | |

# Dimensions

Series DM150FD 6” – 10” (DN 150 – 250)




**D** = Bolt Circle
**L** = Size of Hole
**M** = No. of Holes

| Valve size inches | Approximate dimensions – inches | | | | | | | | | | | | | | | Approx. weight lbs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | $G_1$* | $G_2$* | H | J | K | L | M | P | S | T | |
| 6 | 10.50 | 5.00 | 11.00 | 9.50 | 4.50 | 7.50 | 9.44 | 30.00 | 9.81 | 4.88 | 0.88 | 8 | 8.00 | 1.00 | 1.06 | 168 |
| 8 | 11.50 | 5.75 | 13.50 | 11.75 | 6.00 | 8.69 | 10.69 | 30.00 | 11.13 | 6.19 | 0.88 | 8 | 9.75 | 1.00 | 1.19 | 265 |
| 10 | 13.00 | 6.50 | 16.00 | 14.75 | 7.38 | 10.44 | 12.25 | 72.00 | 13.31 | 7.50 | 1.00 | 12 | 13.00 | 1.31 | 1.25 | 520 |

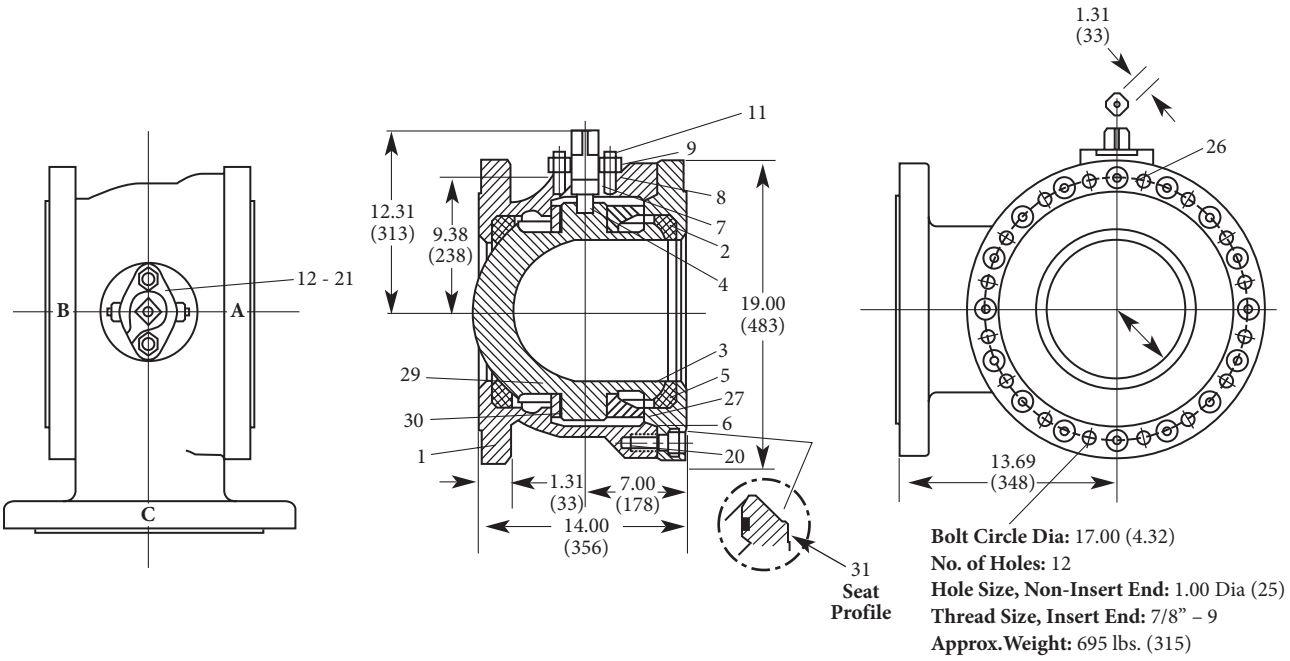
| Valve size DN | Approximate dimensions – mm | | | | | | | | | | | | | | | Approx. weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | $G_1$* | $G_2$* | H | J | K | L | M | P | S | T | |
| 150 | 267 | 127 | 279 | 241 | 114 | 191 | 240 | 762 | 249 | 124 | 22 | 8 | 203 | 25 | 27 | 76 |
| 200 | 146 | 146 | 343 | 298 | 152 | 221 | 272 | 762 | 283 | 157 | 22 | 8 | 248 | 25 | 30 | 120 |
| 250 | 330 | 165 | 406 | 362 | 187 | 265 | 311 | 1829 | 338 | 197 | 25 | 12 | 331 | 33 | 32 | 236 |

* Dimension $G_1$ is for manually operated valve. Dimension $G_2$ is for valve to be equipped with an actuator.

| BILLS OF MATERIALS AND PARTS LIST | | | |
|---|---|---|---|
| 6” – 10” (DN 150 – 250) DM150FD | | | |
| Part no. | Part name | Body material | |
| | | Carbon steel (22) | 316 Stainless steel (36) |
| 1 | Body | Carbon steel ASTM A216 Type WCB | 316 Stainless steel ASTM A351 Type CF8M |
| 2 | Insert | Carbon steel ASTM A216 Type WCB | 316 Stainless steel ASTM A351 Type CF8M |
| 3 | Ball | 316 Stainless steel | |
| 4 | Stem | 316 Stainless steel | |
| 5 | Seat | Elastomer Backed Filled PTFE | |
| 6 | Body Seal | PTFE | |
| 7 | Stem Seal | PTFE | |
| 8 | Stem Bearing | Filled PTFE | |
| 9 | Bonnet Plate | Carbon steel | Stainless steel |
| 10 | Hex Jam Nut | Carbon steel | |
| 11 | Bonnet Stud or Cap Screw | 300 Series Stainless steel | |
| 12 | Indicator Stop | Carbon steel | Stainless steel |
| 15 | Handle | Carbon steel | |
| 17 | Identification Tag | 300 Series Stainless steel | |
| 19 | Lockwasher | 300 Series Stainless steel | |
| 21 | Set Screw | 300 Series Stainless steel | |
| 22 | “T” Handle Adapter | Malleable Iron | |
| 23 | Set Screw | 300 Series Stainless steel | |
| 24 | Stem Screw | Carbon steel | |
| 25 | Washer | Carbon steel | |
| 26 | Roll Pin | 300 Series Stainless steel | |
| 31 | O-Ring | Buna-N,Viton A (as specified) | |

# Dimensions

Series DM150FD 12” (DN 300) – inches (mm)




**Bolt Circle Dia:** 17.00 (4.32)
**No. of Holes:** 12
**Hole Size, Non-Insert End:** 1.00 Dia (25)
**Thread Size, Insert End:** 7/8” – 9
**Approx.Weight:** 695 lbs. (315)

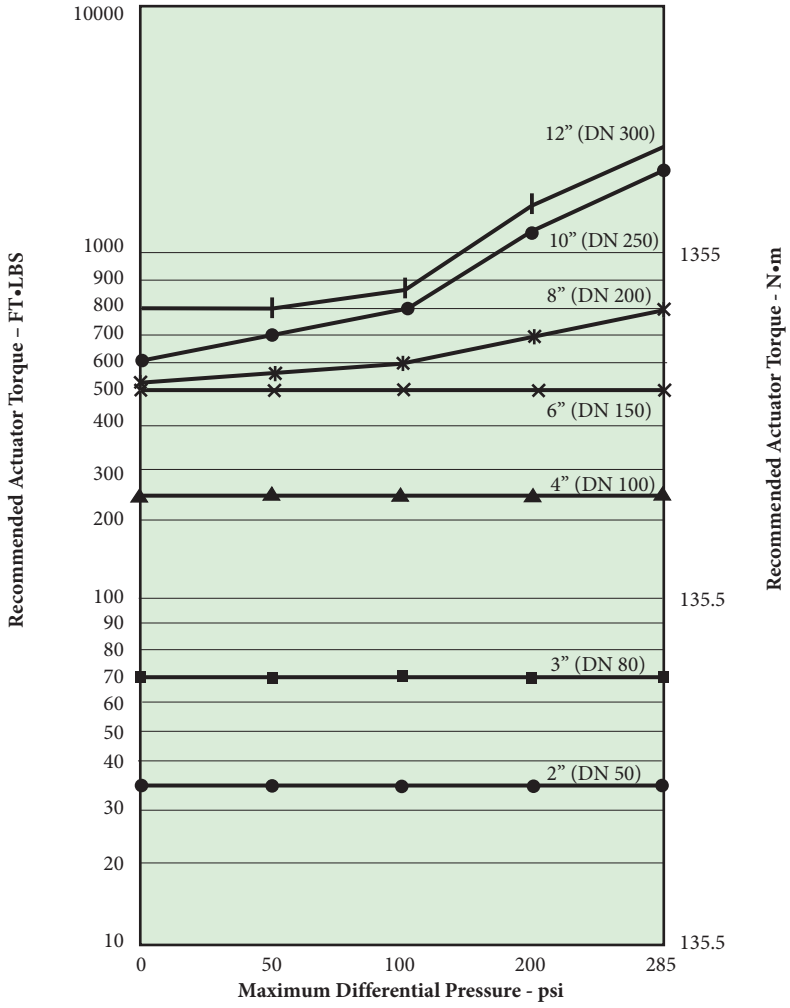
| BILLS OF MATERIALS AND PARTS LIST – 12” (DN 300) Valves | | | |
|---|---|---|---|
| Part no. | Part name | Body material | |
| | | Carbon steel (22) | 316 Stainless steel (36) |
| 1 | Body | Carbon steel ASTM A216 Type WCB | 316 Stainless steel ASTM A351 Type CF8M |
| 2 | Insert 3” – 10” (DN 80 – 250)<br>Body Cap 12” (DN 300) | Carbon steel | 316 Stainless steel |
| 3 | Ball | 316 Stainless Steel | |
| 4 | Stem | 316 Stainless Steel – Hard Chrome Plated (3” – 10” [DN 80 – 250])<br>17-4 PH Stainless steel (12” [DN 300]) | |
| 5 | Seat | Elastomer Backed Filled PTFE | |
| 6 | Body Seal | PTFE | |
| 7 | Stem Seal | PTFE | |
| 8 | Stem Bearing 3”, 4”, 10”, 12”<br>(DN 80, 100, 250, 300) | Filled PTFE | |
| 9 | Bonnet Plate | Carbon steel | Stainless steel |
| 10 | Hex Nut 3” – 4” (DN 80 – 100) | Carbon steel | |
| 11 | Bonnet Stud or Screw | 300 Series Stainless steel | |
| 14 | Retaining Ring 3”– 4” (DN 80 – 100) | 300 Series Stainless steel | |
| 16 | Bonnet Nut 3” – 4” (DN 80 – 100) | 300 Series Stainless steel | |
| 18 | Compression Ring 3”– 4”(DN 80 – 100) | 300 Series Stainless steel | |
| 20 | Spacer 3” – 4” (DN 80 – 100) | 300 Series Stainless steel | |
| 24 | Stem Screw | Carbon steel | |
| 26 | Roll Pin 12” (DN 300) only | 300 Series Stainless steel | |
| 27 | Trunnion Plate 12” (DN 300) only | Carbon steel | 316 Stainless steel |
| 29 | Trunnion Bearings 12”(DN 300) only | Other Materials Available On Application | |
| 30 | Trunnion Thrust Bearing 12”(DN 300) | Filled PTFE - Metal Backed Filled PTFE | |
| 31 | O-Ring | Buna-N or Viton (as specified) | |

## Valve torque data

These torque charts for valves equipped with filled PTFE Double Block and Bleed seats are to be used as a guide for actuator selection. **Note:** with these 3-way valves, differential pressure will exist only when one of the side ports is blocked. An actuator should be selected that provides the same or greater torque output than that shown in the chart below. Refer to bulletins on Jamesbury pneumatic and electric actuators for torque output values and actuator selection tables.

Additional requirements may be imposed by media characteristics, trim, and frequency of valve operation. For clean lubricating fluid service, required torque may be reduced 33% when the valve is equipped with corrosion resistant trim. For difficult services (slurries, semi-solids) increase values by 50%. If in doubt, select the next larger actuator.

**2” – 12” (DN 50 – 300) 3-Way DB&B Seat Torque Values**




## Actuators

Pneumatic actuators that include both double-acting and spring-return types are available for all valves. Electric actuators are available in both watertight and hazardous location models.

For description of actuator types, see the following bulletins:

| Actuator | Bulletin |
|---|---|
| Manual Gear Actuators | A100-1 |
| Spring Diaphragm Rotary Actuators | A110-4 |
| VPVL Rack & Pinion Actuators | A111-5 |
| V-Series Electric Actuators | V200-1 |
| ADC-Series Electric Actuators | V201-1 |
| I-Series Electric Actuators | V206-1 |
| QX-Series Electric Actuators | V207-1 |

**WARNING:**

As the use of the valve is application specific, a number of factors should be taken into account when selecting a valve for a given application. Therefore, some of the situations in which the valves are used are outside the scope of this manual. If you have any questions concerning the use, application or compatibility of the valve with the intended service, contact Valmet for more information.

## How to order

To specify a Jamesbury 3-way valve it is necessary only to determine the size and material required for a particular service.
Then make a selection from each of the categories below to complete the proper catalog code.

**EXAMPLE:** (Code in Parenthesis)

4” Class 150 3-way flanged valve (AM150) w/Double Block and Bleed Seats, Carbon Steel Body (22), 316 stainless steel trim (36), filled PTFE seats (M), PTFE seals (T) and Buna-N O-Rings (52) is written: 4” AM150FDDBB2236MT52.

| 1 | | 2 | 3 | 4 | 5 | | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 4” | — | AM | 150 | FD | DBB | — | 2236 | M | T | 52 |

| 1 | Size | | | | | | |
|---|---|---|---|---|---|---|---|
| inches | 2 | 3 | 4 | 6 | 8 | 10 | 12 |
| DN | 50 | 80 | 100 | 150 | 200 | 250 | 300 |

| 2 | Body style<br>inches (DN) |
|---|---|
| AM | 2” – 4” (DN 50 – 100) |
| DM | 6” – 12” (DN 150 – 300) |

| 3 | Body rating |
|---|---|
| 150 | Class 150 |

| 4 | Configuration |
|---|---|
| FD | Side ported flanged body |

| 5 | Configuration |
|---|---|
| DBB | Double Block and Bleed Seat |

| 6 | Body/Trim material |
|---|---|
| 2236 | Carbon steel body/316 stainless steel trim |
| 3600 | 316 Stainless steel body/316 stainless steel trim |

| 7 | Seat material |
|---|---|
| M | Filled PTFE |

| 8 | Seal material |
|---|---|
| T | PTFE |

| 9 | O-Ring / Stem selection<br>2” thru 10” |
|---|---|
| 52 | Buna N |
| 53 | Viton |
| | 6” thru 12” |
| AO | Buna N with operating stem |
| DO | Viton with operating stem |

**Valmet Flow Control Oy**
Vanha Porvoontie 229, 01380 Vantaa, Finland.
Tel. +358 10 417 5000.
www.valmet.com/flowcontrol