

# Design Features

## Online Maintenance

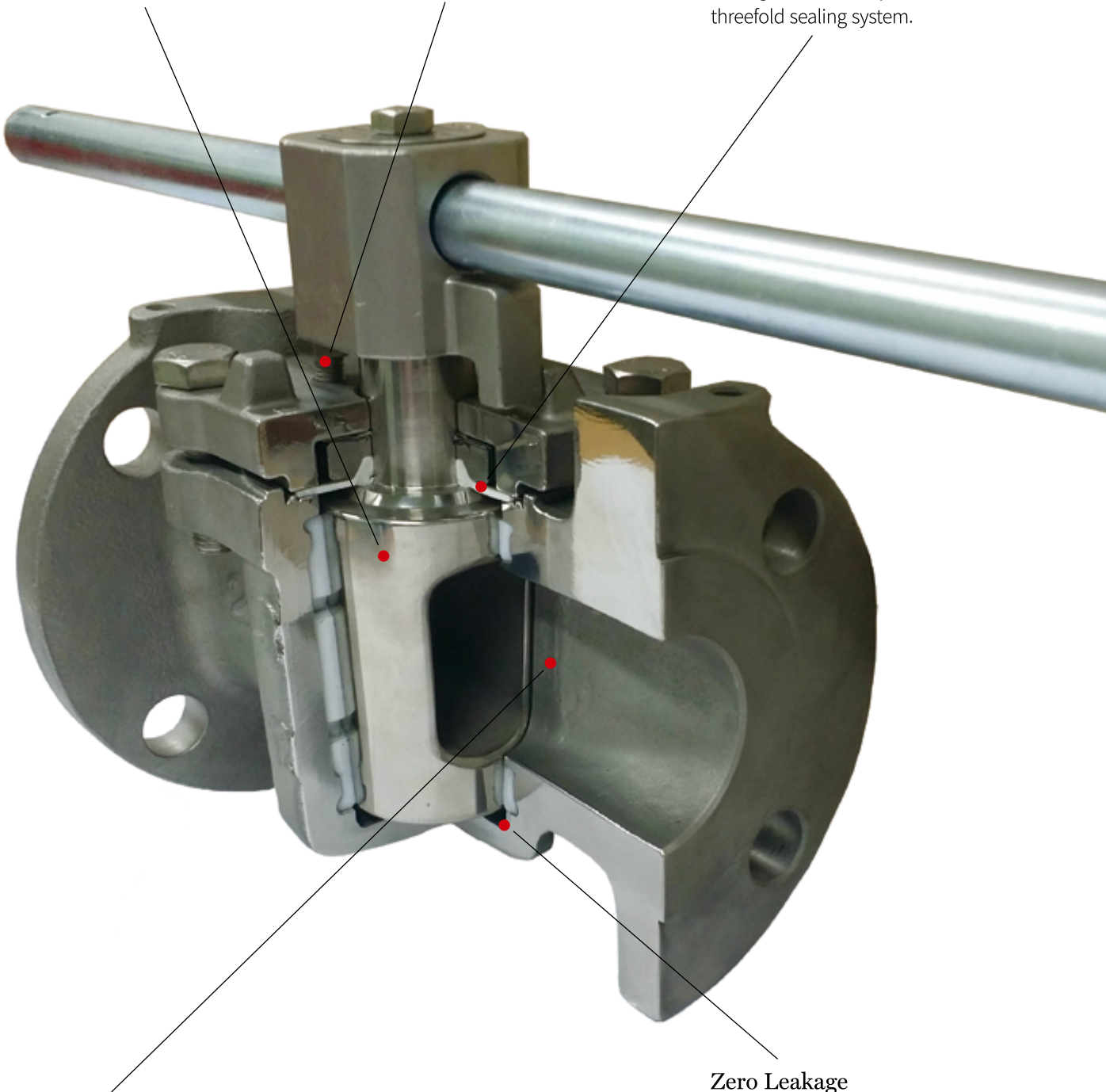
Repair is possible on the line without disassembling from the pipeline, since it is top entry type.

## Zero Maintenance

Adjustment bolts make the tight sleeve sealing as if it is a brand new.

## External Leakage Prevention Design

The zero leakage stem sealing is achieved by a threefold sealing system.



## Zero Dead Space

There are no unnecessary cavities in the body

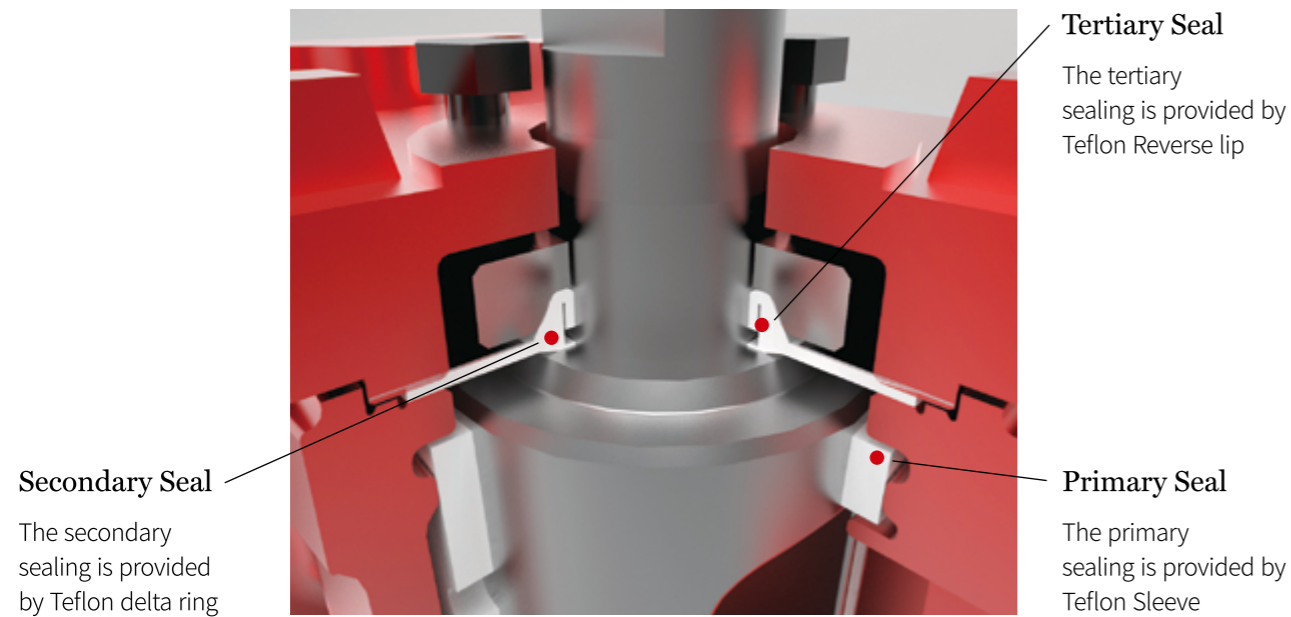
## Zero Leakage

Sealing is established by circumferential surface area of Teflon sleeve & Pressure Ribs.

# Design Features

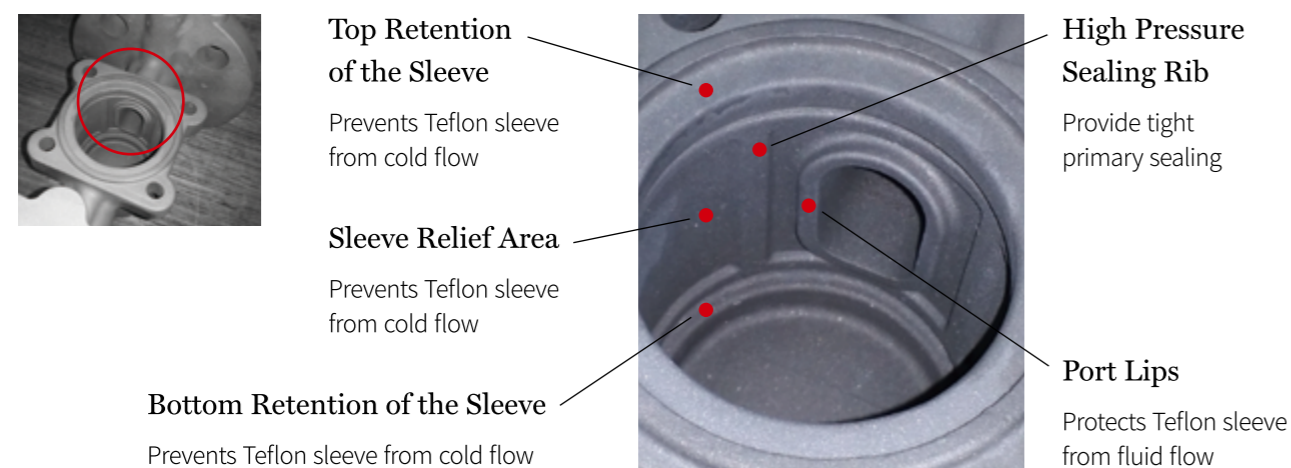
## Threefold Sealing System

The zero leakage stem sealing is achieved by a threefold sealing system. The primary sealing is provided by the Teflon sleeve. The secondary and tertiary sealing (top seal package) are provided by Teflon delta ring and Reverse lip.



## Sleeve Body Design

All plastics are subject to cold flow (volume increase) at higher temperature. And it tends to escape to the low pressure area and do not return to its original shape, even after temperature and pressure are removed. But, 3Z valve body is designed to confine sleeve mechanically, cold flow would not be occurred.



# Fire Tested Valves

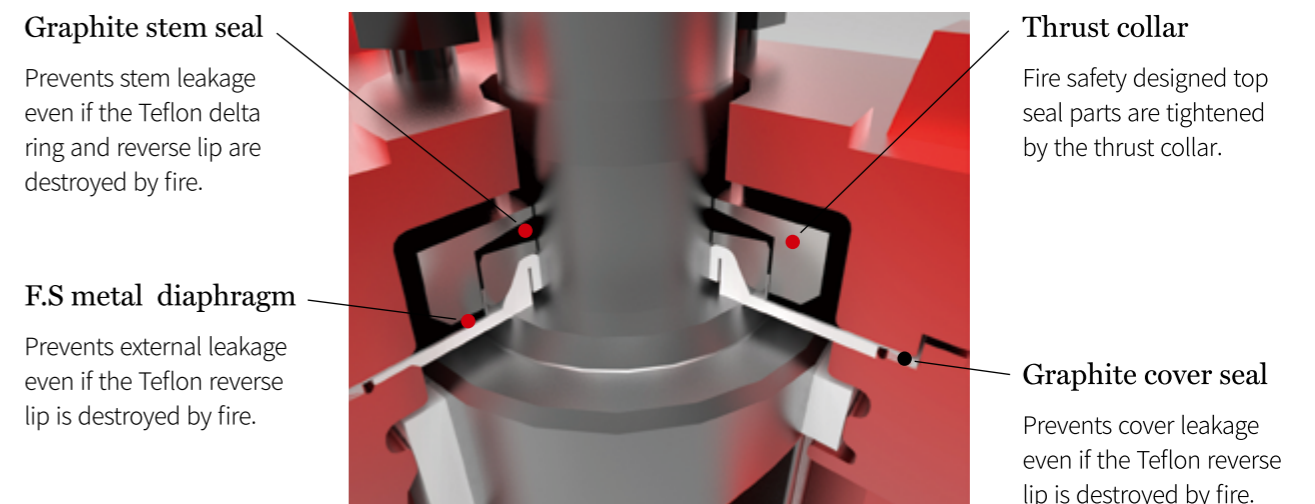
## API 607 Standards

Tested and approved as per API 607 standards. A external leakage is prevented even after the Teflon sealing parts are destroyed by fire.



## Fire Safety Design Top Seal

Fire safety top seal is designed with the purpose of preventing external leakage. A graphite stem seal, flexible graphite cover seal and F.S metal diaphragm all prevent external leakage from fire.



# Multiport valves

## Multiport valves

Multiport valves are used in purpose of blending, diverting and segregation. It is more economical to use only one piece of 3-way valve instead of three pieces of 2-way valves. Multiport valves make piping simple and minimal.



## 3 - way Port Arrangement

The variety of flow arrangements make these valves ideal for many types of piping systems, which handling liquids, gases, slurries or other applications.



| Type    | Plug | 0 Position | 90 Position | 180 Position |
|---------|------|------------|-------------|--------------|
| Type A  |      |            |             |              |
| Type Ax |      |            |             |              |
| Type C  |      |            |             |              |
| Type D  |      |            |             |              |

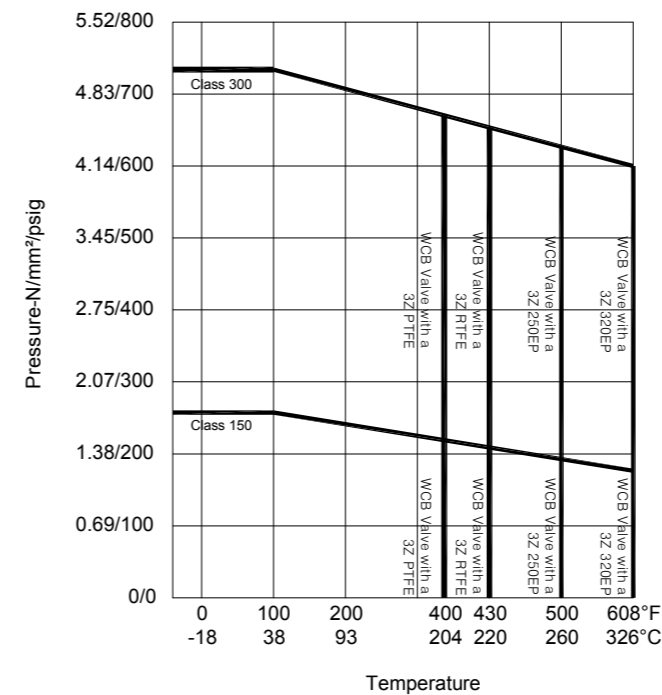
# High Temperature Service

## 250EP / 320EP

250EP/320EP greatly extends the temperature range of PTFE, even exceeds the operating range of glass-filled PTFE(RTFE).(see Fig.1). This is the result of improved thermo-mechanical properties, improved cold-flow properties, and improved toughness. Fig .1illustrates the pressure / temperature range of 3Z 250EP/320EP in a WCB body, also provides similar or greater pressure / temperature ranges in other body materials.



Fig. 1 Pressure / Temperature Ranges



## Feature of 250EP / 320EP

The 3Z 250EP/320EP has a much more dense and a more homogeneous micro-structure than PTFE (see Fig. 2). In Fig.2, the photomicrographs on the right demonstrate the positive difference in porosity. PTFE is clearly more porous than The 3Z 250EP/320EP. Reduced porosity means greater resistance to permeation.

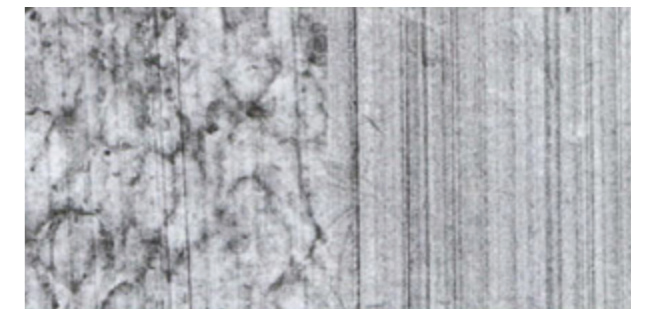


Fig. 2 Reduced Porosity

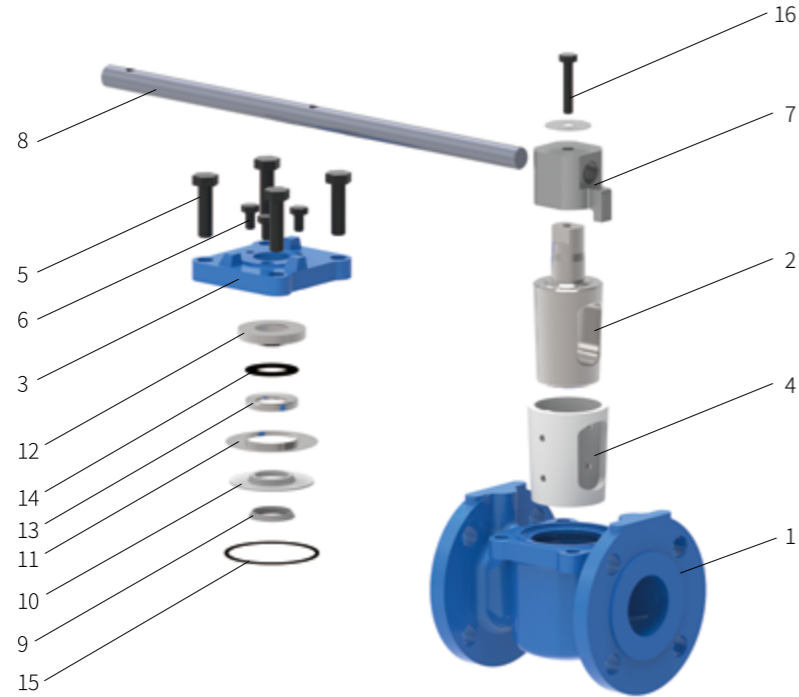
Left PTFE(1<sup>st</sup> generation)

Right 3Z 250EP/320EP; the boundaries of the secondary particles have disappeared.

# Parts and Materials

## Construction Materials

A variety of materials are available such as carbon steel, stainless steel, duplex stainless steel and special alloys. Materials are subject to change without notice. Other materials and combinations are also available.



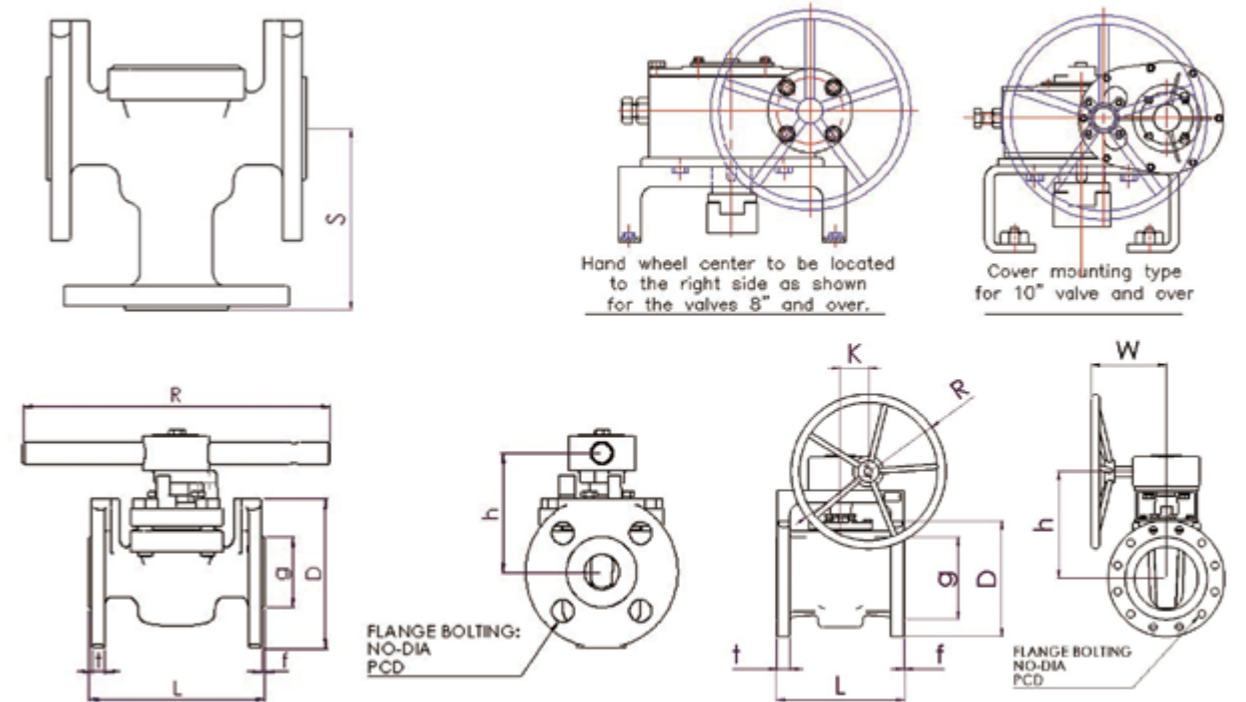
## Sample Construction of Material

| Carbon Steel (PTFE) |                   |                | 316 Stainless (RTFE) |                |    | Hastelloy - C (320EP) |    |                   |
|---------------------|-------------------|----------------|----------------------|----------------|----|-----------------------|----|-------------------|
| No                  | Parts             | Specification  | No                   | Specification  | No | Specification         | No | Specification     |
| 1                   | Body              | ASTM A216 WCB  | 1                    | ASTM A351 CF8M | 1  | ASTM A494 CW-12MW     | 1  | ASTM A494 CW-12MW |
| 2                   | Plug              | ASTM A351 CF8M | 2                    | ASTM A351 CF8M | 2  | ASTM A494 CW-12MW     | 2  | ASTM A494 CW-12MW |
| 3                   | Cover             | ASTM A216 WCB  | 3                    | ASTM A351 CF8  | 3  | ASTM A494 CW-12MW     | 3  | ASTM A494 CW-12MW |
| 4                   | Sleeve            | PTFE           | 4                    | RTFE           | 4  | 320EP                 | 4  | 320EP             |
| 5                   | Cover Bolt        | ASTM A193 B7   | 5                    | ASTM A193 B8   | 5  | ASTM A193 B8          | 5  | ASTM A193 B8      |
| 6                   | Adjusting Bolt    | AISI 304       | 6                    | AISI 304       | 6  | AISI 304              | 6  | AISI 304          |
| 7                   | Hub               | ASTM A351 CF8  | 7                    | ASTM A351 CF8  | 7  | ASTM A351 CF8         | 7  | ASTM A351 CF8     |
| 8                   | Wrench            | AISI 1045      | 8                    | AISI 1045      | 8  | AISI 1045             | 8  | AISI 1045         |
| 9                   | Delta Ring        | RTFE           | 9                    | RTFE           | 9  | 320EP                 | 9  | 320EP             |
| 10                  | Reverse Lip       | RTFE           | 10                   | RTFE           | 10 | 320EP                 | 10 | 320EP             |
| 11                  | Metal Diaphragm   | AISI 316       | 11                   | AISI 316       | 11 | AISI 316              | 11 | AISI 316          |
| 12                  | Top Thrust Collar | AISI 304       | 12                   | AISI 304       | 12 | AISI 304              | 12 | AISI 304          |
| 13                  | BTM Thrust Collar | AISI 304       | 13                   | AISI 304       | 13 | AISI 304              | 13 | AISI 304          |
| 14                  | Grafoil Diaphragm | Graphite       | 14                   | Graphite       | 14 | Graphite              | 14 | Graphite          |
| 15                  | Cover Seal        | Graphite       | 15                   | Graphite       | 15 | Graphite              | 15 | Graphite          |
| 16                  | Hub Bolt          | AISI 304       | 16                   | AISI 304       | 16 | AISI 304              | 16 | AISI 304          |

- If additional materials are required, please consult the factory when ordering.

# Standard Type Dimensions - Class 150

Figure No. 120 - Class 150 / Size 0.5"~24" / Raised Face Flange



Unit : mm

| Size  | L     | D   | PCD   | NO | DIA | g     | t    | f | h   | R   | K   | W   | S<br>(3way) | Weight<br>(kg) |
|-------|-------|-----|-------|----|-----|-------|------|---|-----|-----|-----|-----|-------------|----------------|
| 0.5   | 108   | 90  | 60.3  | 4  | 16  | 34.9  | 8    | 2 | 115 | 150 | -   | -   | 70          | 3              |
| 0.75  | 117   | 100 | 69.9  | 4  | 16  | 42.9  | 8.9  | 2 | 115 | 150 | -   | -   | 73          | 3              |
| 1     | 127   | 110 | 79.4  | 4  | 16  | 50.8  | 9.6  | 2 | 85  | 222 | -   | -   | 89          | 5              |
| 1.5   | 165   | 125 | 98.4  | 4  | 16  | 73    | 12.7 | 2 | 105 | 318 | -   | -   | 105         | 8              |
| 2     | 178   | 150 | 120.7 | 4  | 19  | 92.1  | 14.3 | 2 | 110 | 458 | -   | -   | 114         | 13             |
| 2.5   | 190   | 180 | 139.7 | 4  | 19  | 104.8 | 15.9 | 2 | 125 | 597 | -   | -   | -           | 18             |
| 3     | 203   | 190 | 152.4 | 4  | 19  | 127   | 17.5 | 2 | 125 | 597 | -   | -   | 130         | 19             |
| 4     | 229   | 230 | 190.5 | 8  | 19  | 157.2 | 22.3 | 2 | 165 | 746 | -   | -   | 156         | 32             |
| 6     | 267   | 280 | 241.3 | 8  | 22  | 215.9 | 23.9 | 2 | 285 | 400 | 75  | 280 | 191         | 66             |
| *8    | 292   | 345 | 298.5 | 8  | 22  | 269.9 | 27   | 2 | 335 | 500 | 95  | 320 | 229         | 107            |
| **10  | 330   | 405 | 362   | 12 | 25  | 323.8 | 28.6 | 2 | 400 | 500 | 25  | 340 | 279         | 158            |
| **12  | 356   | 485 | 431.8 | 12 | 25  | 381   | 30.2 | 2 | 440 | 560 | 45  | 370 | 330         | 240            |
| ***14 | 381   | 535 | 476.3 | 12 | 29  | 412.8 | 33.4 | 2 | 510 | 630 | 35  | 440 | -           | 360            |
| 16    | 762   | 595 | 539.8 | 16 | 29  | 469.9 | 35   | 2 | 550 | 630 | 35  | 440 | -           | 520            |
| 18    | 864   | 635 | 577.9 | 16 | 32  | 533.4 | 38.1 | 2 | 640 | 710 | 180 | 505 | -           | 850            |
| 20    | 914   | 700 | 635   | 20 | 32  | 584.2 | 41.3 | 2 | 695 | 800 | 230 | 576 | -           | 970            |
| 24    | 1,067 | 815 | 749.3 | 20 | 35  | 692.2 | 46.1 | 2 | 734 | 800 | 230 | 600 | -           | 1,500          |

- 0.5"~4"(Wrench Operated) / 6"~24"(Gear Operated)

\* 2 top holes in flanges are tapped for 3/4-10UNC (Stud Bolt Length 100mm)

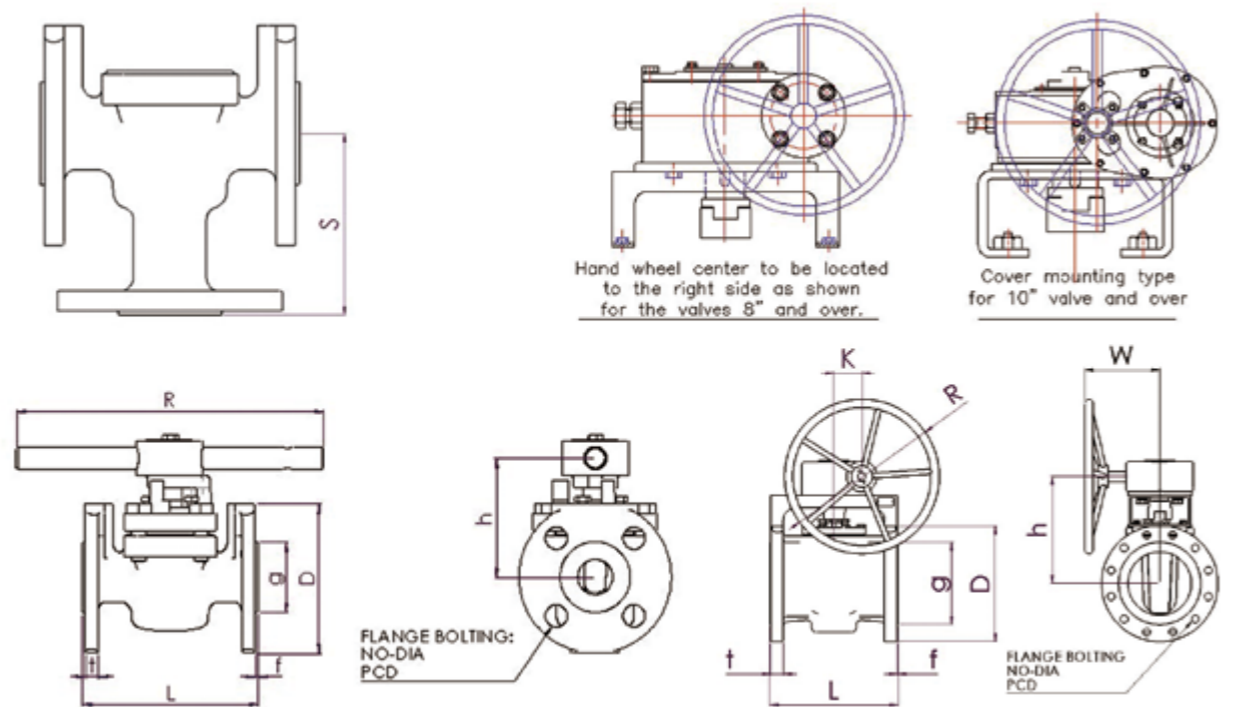
\*\* 2 top holes in flanges are tapped for 7/8-9UNC (Stud Bolt Length 95mm & 105mm)

\*\*\* 2 top holes in flanges are tapped for 1-8UNC (Stud Bolt Length 110mm)

- If additional classes and sizes are required, please consult the factory when ordering.

# Standard Type Dimensions - Class 300

Figure No. 320 - Class 300 / Size 0.5" - 24" / Raised Face Flange



Unit : mm

| Size | L    | D   | PCD   | NO | DIA | g     | t    | f | h   | R   | K   | W   | S<br>(3way) | Weight<br>(kg) |
|------|------|-----|-------|----|-----|-------|------|---|-----|-----|-----|-----|-------------|----------------|
| 0.5  | 140  | 95  | 66.7  | 4  | 16  | 34.9  | 12.7 | 2 | 115 | 150 | -   | -   | 73          | 3              |
| 0.75 | 152  | 115 | 82.6  | 4  | 19  | 42.9  | 14.3 | 2 | 115 | 150 | -   | -   | 85          | 4              |
| 1    | 165  | 125 | 88.9  | 4  | 19  | 50.8  | 15.9 | 2 | 85  | 222 | -   | -   | 95          | 7              |
| 1.5  | 190  | 155 | 114.3 | 4  | 22  | 73    | 19.1 | 2 | 105 | 318 | -   | -   | 111         | 11             |
| 2    | 216  | 165 | 127   | 8  | 19  | 92.1  | 20.7 | 2 | 110 | 458 | -   | -   | 121         | 16             |
| 3    | 282  | 210 | 168.3 | 8  | 22  | 127   | 27   | 2 | 125 | 597 | -   | -   | 160         | 26             |
| 4    | 305  | 255 | 200   | 8  | 22  | 157.2 | 30.2 | 2 | 165 | 746 | -   | -   | 171         | 42             |
| 6    | 403  | 320 | 269.9 | 12 | 22  | 215.9 | 35   | 2 | 305 | 400 | 75  | 280 | 216         | 100            |
| 8    | 419  | 380 | 330.2 | 12 | 25  | 269.9 | 39.7 | 2 | 360 | 500 | 95  | 320 | 270         | 150            |
| 10   | 457  | 445 | 387.4 | 16 | 29  | 323.8 | 46.1 | 2 | 400 | 500 | 25  | 340 | 305         | 230            |
| 12   | 502  | 520 | 450.8 | 16 | 32  | 381   | 49.3 | 2 | 450 | 560 | 45  | 370 | -           | 315            |
| 14   | 762  | 585 | 514.4 | 20 | 32  | 412.8 | 52.4 | 2 | 515 | 630 | 35  | 440 | -           | 530            |
| 16   | 838  | 650 | 571.5 | 20 | 35  | 469.9 | 55.6 | 2 | 565 | 630 | 35  | 440 | -           | 640            |
| 18   | 914  | 710 | 628.6 | 24 | 35  | 533.4 | 58.8 | 2 | 600 | 710 | 180 | 505 | -           | 990            |
| 20   | 991  | 775 | 685.8 | 24 | 35  | 584.2 | 62.0 | 2 | 720 | 800 | 230 | 605 | -           | 1,340          |
| 24   | 1143 | 915 | 812.8 | 24 | 41  | 692.2 | 68.3 | 2 | 745 | 900 | 280 | 660 | -           | 1,960          |

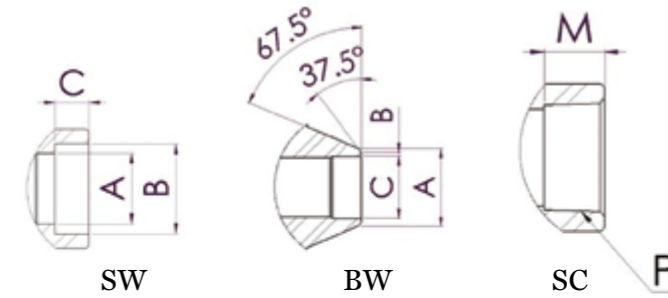
- 0.5"~ 4"(Wrench Operated) / 6"~24"(Gear Operated)

- If additional classes and sizes are required, please consult the factory when ordering.

# SW, BW, SC Type Dimensions

Figure No.

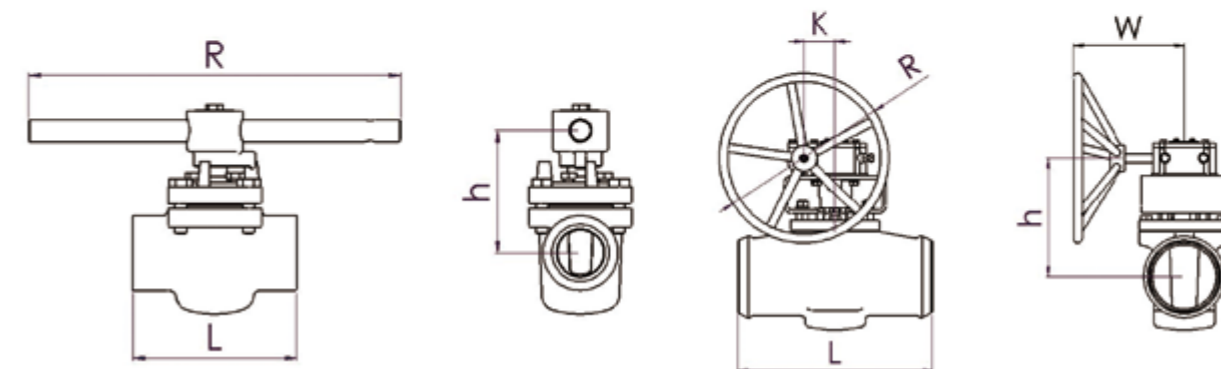
122S SW - Class 150 / Size 0.5" - 2" / Socket weld  
 322S SW - Class 300 / Size 0.5" - 2" / Socket weld  
 122S SC - Class 150 / Size 0.5" - 2" / Screw type  
 322S SC - Class 300 / Size 0.5" - 2" / Screw type  
 122 BW - Class 150 / Size 0.5" - 16" / Butt weld  
 322 BW - Class 300 / Size 0.5" - 16" / Butt weld



SW

BW

SC



Unit : mm

| Type                  | Fig           | Size | L   | h   | R   | K   | W   | A     | B    | C     | M    | P                         | Weight<br>(kg) |
|-----------------------|---------------|------|-----|-----|-----|-----|-----|-------|------|-------|------|---------------------------|----------------|
| Socket Weld/<br>Screw | 122S<br>/322S | 0.5  | 83  | 115 | 150 | -   | -   | 15.8  | 22   | 9.5   | 14.3 | 1/2 - 14 NPT              | 2.0            |
|                       |               | 0.75 | 83  | 115 | 150 | -   | -   | 21    | 27.4 | 12.5  | 14.3 | 3/4 - 14 NPT              | 2.0            |
|                       |               | 1    | 118 | 85  | 222 | -   | -   | 26.7  | 34.1 | 12.5  | 18.3 | 1-11.1/2 NPT              | 4.0            |
|                       |               | 1.5  | 140 | 105 | 318 | -   | -   | 40.9  | 49   | 12.5  | 20   | 1.1/2 - 11.1/2 NPT        | 6.5            |
|                       |               | 2    | 165 | 110 | 458 | -   | -   | 52.5  | 61.4 | 16    | 19.8 | 2-11.1/2 NPT              | 10             |
| Butt Weld             | 122<br>/322   | 0.5  | 165 | 115 | 150 | -   | -   | 21.3  | 1.6  | 15.8  | -    | Standard :<br>Schedule 40 | 2.5            |
|                       |               | 0.75 | 165 | 115 | 150 | -   | -   | 26.7  | 1.6  | 20.9  | -    |                           | 2.5            |
|                       |               | 1    | 165 | 85  | 222 | -   | -   | 33.4  | 1.6  | 26.6  | -    |                           | 4.5            |
|                       |               | 1.5  | 190 | 105 | 318 | -   | -   | 48.3  | 1.6  | 40.9  | -    |                           | 7.0            |
|                       |               | 2    | 267 | 110 | 458 | -   | -   | 60.3  | 1.6  | 52.5  | -    |                           | 10             |
|                       |               | 3    | 330 | 125 | 597 | -   | -   | 91.2  | 1.6  | 77.9  | -    |                           | 15             |
|                       |               | 4    | 356 | 165 | 746 | -   | -   | 117.4 | 1.6  | 102.3 | -    |                           | 26             |
|                       |               | 6G   | 457 | 285 | 400 | 75  | 280 | 172   | 1.6  | 154   | -    |                           | 61             |
|                       |               | 8G   | 521 | 335 | 500 | 95  | 320 | 223   | 1.6  | 203   | -    |                           | 105            |
|                       |               | 10G  | 559 | 400 | 500 | 25  | 340 | 278   | 1.6  | 254.5 | -    |                           | 135            |
|                       |               | 12G  | 635 | 440 | 560 | 45  | 370 | 329   | 1.6  | 303   | -    |                           | 245            |
|                       |               | 14G  | 762 | 510 | 630 | 35  | 440 | 362   | 1.6  | 333.5 | -    |                           | 350            |
| 16G                   | 838           | 550  | 630 | 35  | 440 | 413 | 1.6 | 381   | -    | 430   |      |                           |                |

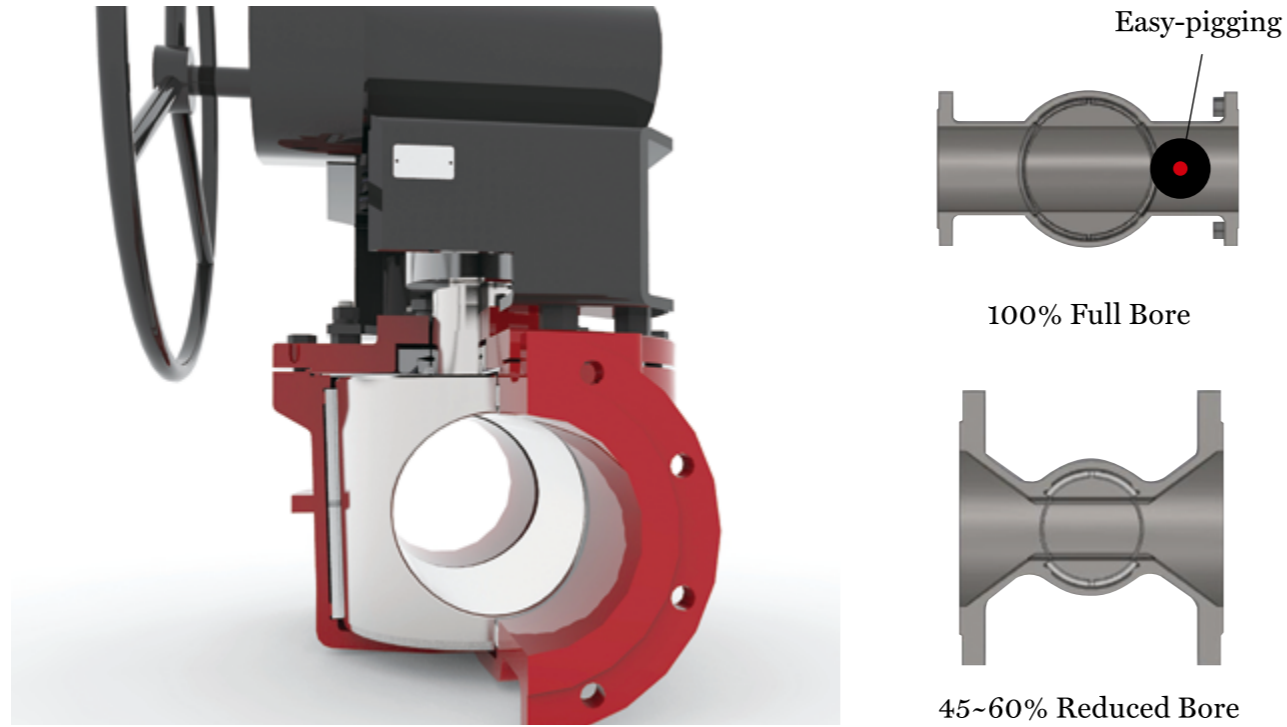
- 0.5"~ 4"(Wrench Operated) / 6"~24"(Gear Operated)

- If additional classes and sizes are required, please consult the factory when ordering.

# Full Port Valves

## Feature

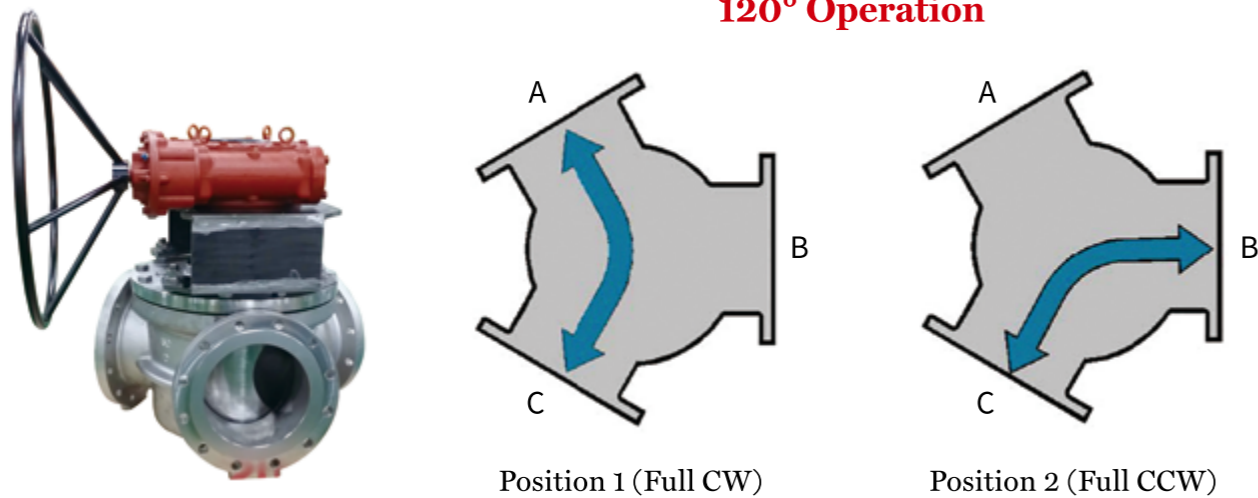
There is no diminished flow with the full bore port, and also easy to pigging. For application such as high viscosity condensable media, high efficiency is demonstrated with full bore port.



## 120° 3 - way Full Port

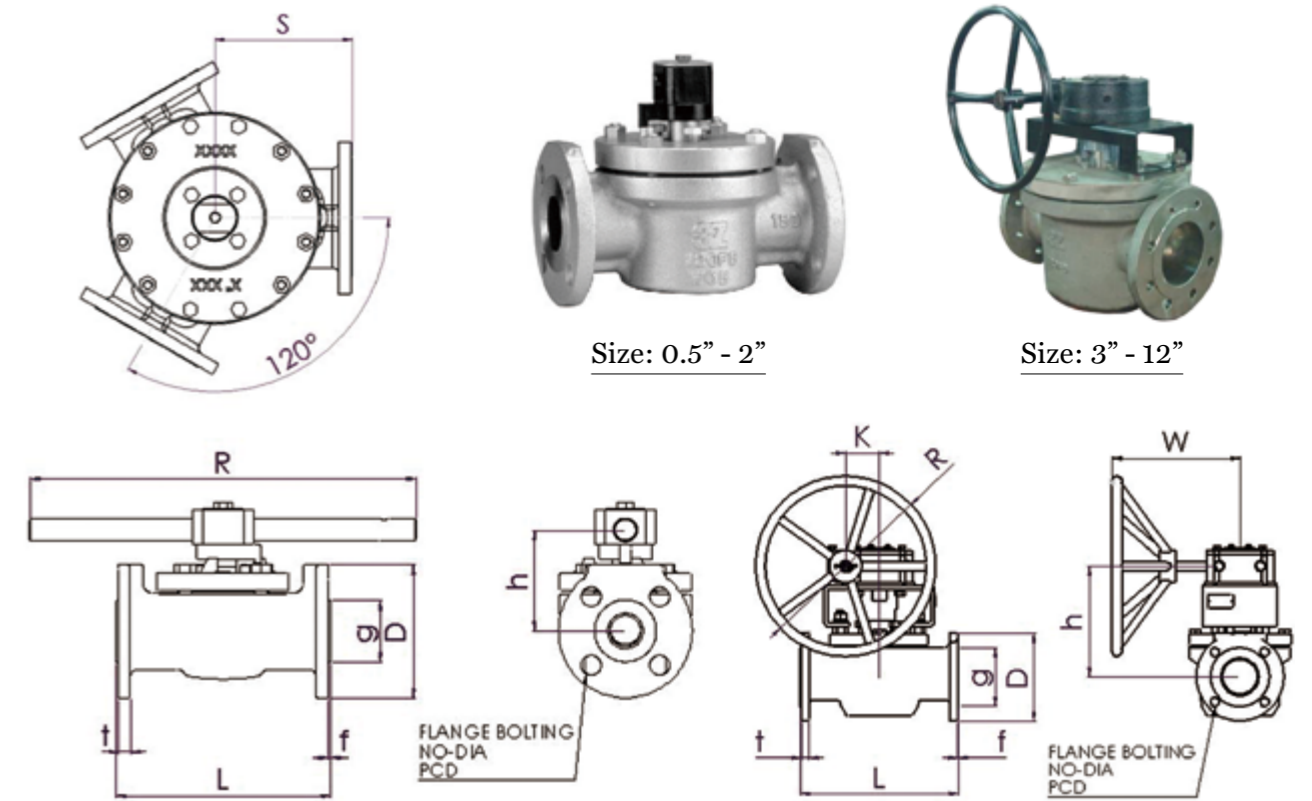
The 3Z 120° Full port 3-way sleeve plug valve provides greater flow efficiency than the 90° 3-way valves and easy configuration for cleaning with a mechanical pig when requested

### 120° Operation



# Full Port Type Dimensions - Class 150

Figure No. 120FB - Class 150 / Size 0.5" - 16" / Raised Face Flange



Unit : mm

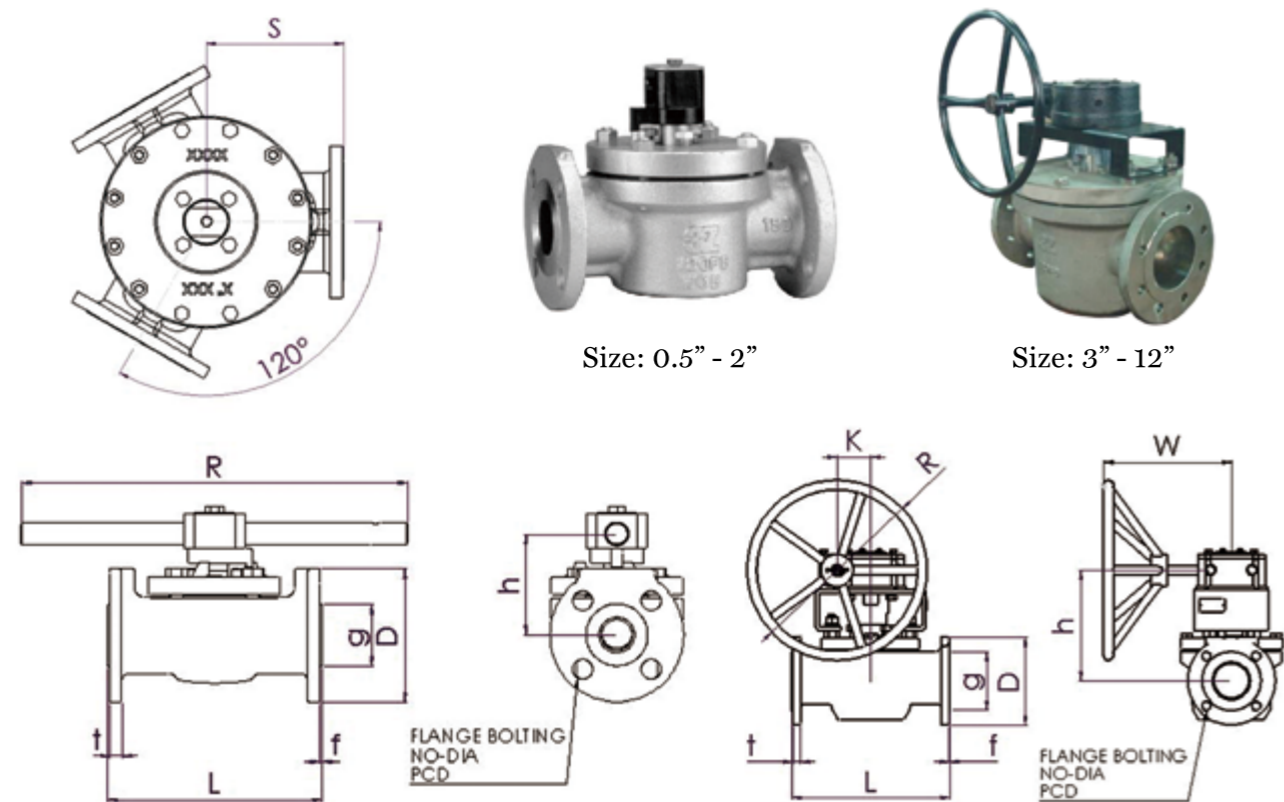
| Size | L     | D   | PCD   | NO | DIA | g     | t    | f | h   | R   | K   | W   | S<br>(3way) | Weight<br>(kg) |
|------|-------|-----|-------|----|-----|-------|------|---|-----|-----|-----|-----|-------------|----------------|
| 0.5  | 108   | 90  | 60.3  | 4  | 16  | 34.9  | 8    | 2 | 115 | 150 | -   | -   | -           | 3              |
| 0.75 | 152.4 | 100 | 69.9  | 4  | 16  | 42.9  | 8.9  | 2 | 100 | 222 | -   | -   | -           | 5              |
| 1    | 176   | 110 | 79.4  | 4  | 16  | 50.8  | 9.6  | 2 | 90  | 318 | -   | -   | 88          | 8              |
| 1.5  | 222   | 125 | 98.4  | 4  | 16  | 73    | 12.7 | 2 | 100 | 458 | -   | -   | 111         | 13             |
| 2    | 267   | 150 | 120.7 | 4  | 19  | 92.1  | 14.3 | 2 | 140 | 746 | -   | -   | 134         | 26             |
| 3    | 343   | 190 | 152.4 | 4  | 19  | 127   | 17.5 | 2 | 250 | 400 | 75  | 280 | 172         | 65             |
| 4    | 432   | 230 | 190.5 | 8  | 19  | 157.2 | 22.3 | 2 | 270 | 500 | 95  | 320 | 216         | 100            |
| 6    | 546   | 280 | 241.3 | 8  | 22  | 215.9 | 23.9 | 2 | 360 | 560 | 45  | 370 | 273         | 211            |
| 8    | 622   | 345 | 298.5 | 8  | 22  | 269.9 | 27   | 2 | 470 | 630 | 160 | 480 | 311         | 430            |
| 10   | 660   | 405 | 362   | 12 | 25  | 323.8 | 28.6 | 2 | 530 | 710 | 180 | 510 | 330         | 690            |
| 12   | 762   | 485 | 431.8 | 12 | 25  | 381   | 30.2 | 2 | 630 | 800 | 230 | 605 | 381         | 1,055          |
| 14   | 870   | 535 | 476.3 | 12 | 29  | 412.8 | 33.4 | 2 | 680 | 900 | 280 | 660 | 435         | 1,570          |
| 16   | 960   | 595 | 539.6 | 16 | 29  | 469.9 | 35   | 2 | 730 | 900 | 280 | 660 | 480         | 1,870          |

- 0.5"~ 2"(Wrench Operated) / 3"~16"(Gear Operated)

- If additional classes and sizes are required, please consult the factory when ordering.

# Full Port Type Dimensions - Class 300

Figure No. 320FB - Class 300 / Size 0.5" - 12" / Raised Face Flange



Unit : mm

| Size | L     | D   | PCD   | NO | DIA | g     | t    | f | h   | R   | K   | W   | S<br>(3way) | Weight<br>(kg) |
|------|-------|-----|-------|----|-----|-------|------|---|-----|-----|-----|-----|-------------|----------------|
| 0.5  | 140   | 95  | 66.7  | 4  | 16  | 34.9  | 12.7 | 2 | 115 | 150 | -   | -   | -           | 3              |
| 0.75 | 152.4 | 115 | 82.6  | 4  | 19  | 42.9  | 14.3 | 2 | 100 | 222 | -   | -   | -           | 11             |
| 1    | 190   | 125 | 88.9  | 4  | 19  | 50.8  | 15.9 | 2 | 90  | 318 | -   | -   | 95          | 14             |
| 1.5  | 241   | 155 | 114.3 | 4  | 22  | 73    | 19.1 | 2 | 100 | 458 | -   | -   | 121         | 22             |
| 2    | 282   | 165 | 127   | 8  | 19  | 92.1  | 20.7 | 2 | 140 | 746 | -   | -   | 141         | 34             |
| 3    | 387   | 210 | 168.3 | 8  | 22  | 127   | 27   | 2 | 250 | 400 | 75  | 280 | 194         | 81             |
| 4    | 457   | 255 | 200   | 8  | 22  | 157.2 | 30.2 | 2 | 270 | 500 | 95  | 320 | 229         | 108            |
| 6    | 559   | 320 | 269.9 | 12 | 22  | 215.9 | 35   | 2 | 360 | 560 | 45  | 370 | 280         | 244            |
| 8    | 686   | 380 | 330.2 | 12 | 25  | 269.9 | 39.7 | 2 | 470 | 630 | 160 | 480 | 343         | 505            |
| 10   | 826   | 445 | 387.4 | 16 | 29  | 323.8 | 46.1 | 2 | 530 | 710 | 180 | 510 | 413         | 832            |
| 12   | 965   | 520 | 450.8 | 16 | 32  | 381   | 49.3 | 2 | 630 | 900 | 280 | 660 | 483         | 1,542          |

- 0.5"~2"(Wrench Operated) / 3"~12"(Gear Operated)

- If additional classes and sizes are required, please consult the factory when ordering.

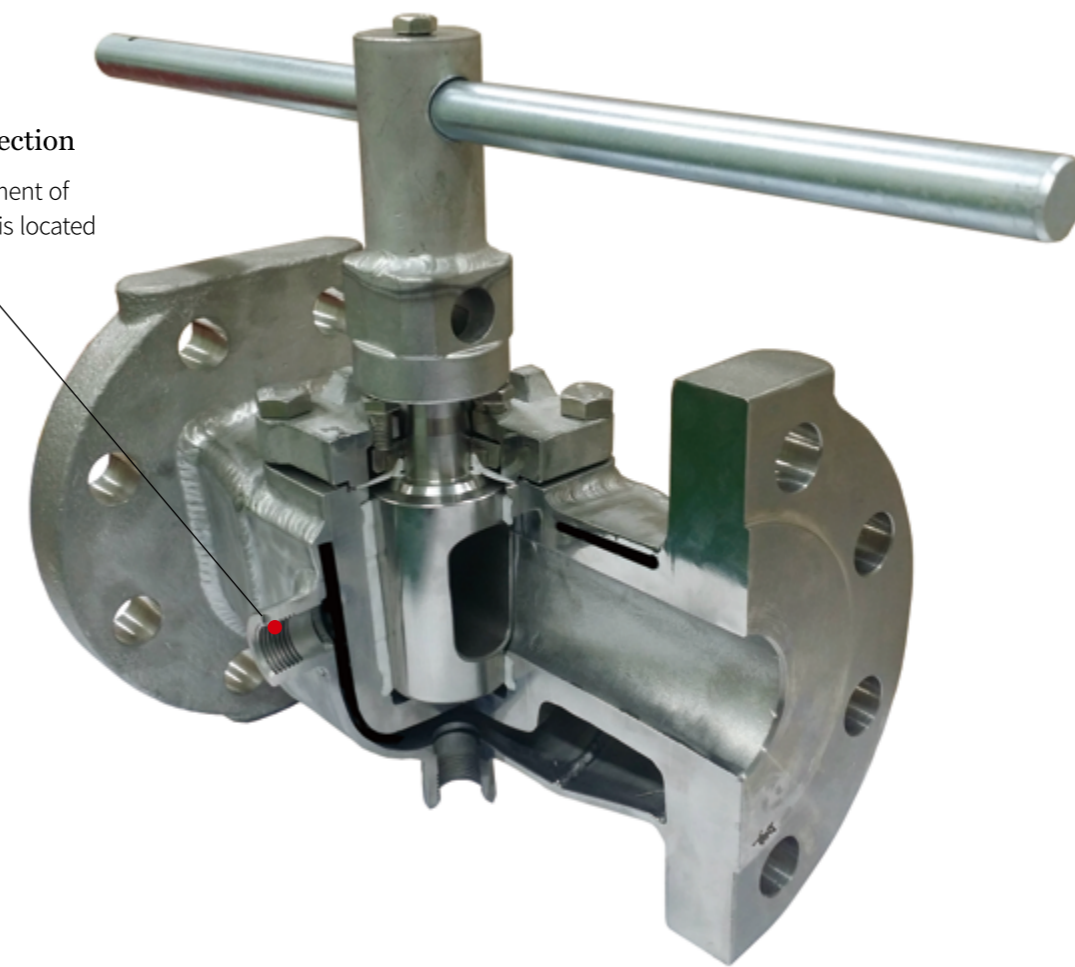
# Jacketed Valves

## Jacketed Plug Valve

3Z steam jacketed plug valves are designed to control special chemical service where media has to be required within a specified temperature range. The steam jacketed design prevents the media in the body from cooling down. If cool media become solid, the trim parts, plug and stem will be very hard to operate. The steam jacket keep maintaining required temperature of the valve.

### Jacketed Connection

Standard arrangement of jacket connection is located side and bottom.

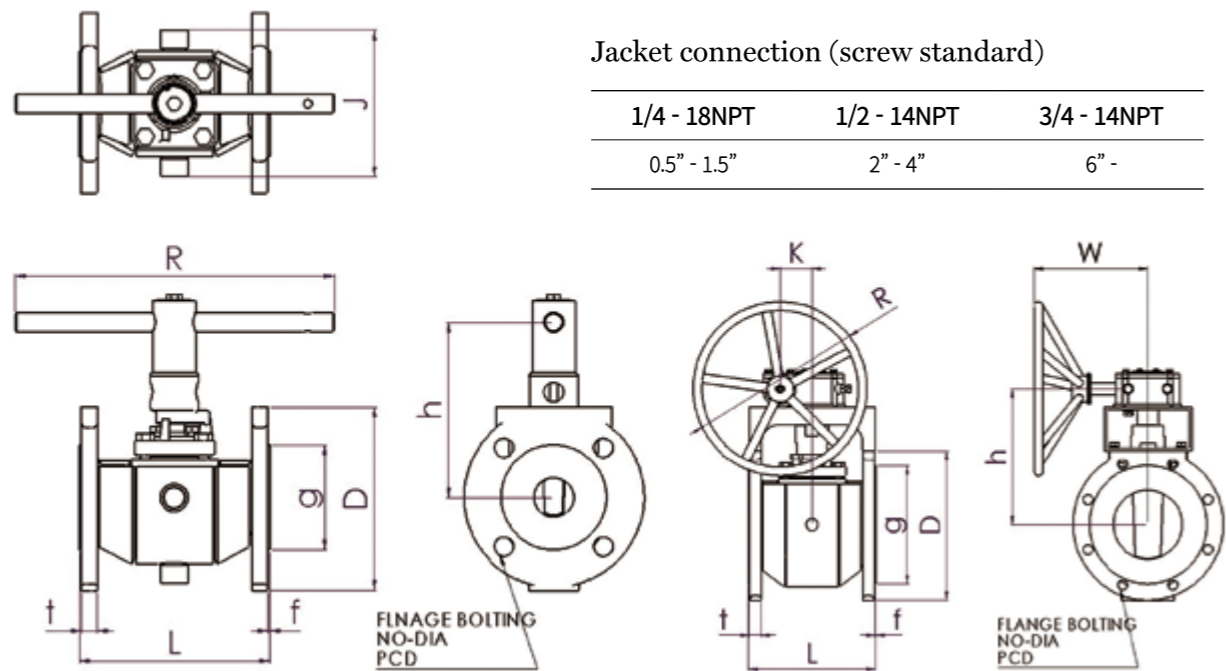


## 3Z steam jacketed plug valves

supply the full jacket and partial type. Full jacket is covered body and flow passage by jacket and partial jacket is covered only body.

# Jacketed Valve Dimensions - Class 150

Figure No. 120FJ - Class 150 / Size 0.5" - 24" / Raised Face Flange



Unit : mm

| Size<br>(flange x body) | L     | D   | PCD   | NO | DIA | g     | t    | f | h   | R   | K   | W   | J<br>(SC) | J<br>(FL) | Weight<br>(kg) |
|-------------------------|-------|-----|-------|----|-----|-------|------|---|-----|-----|-----|-----|-----------|-----------|----------------|
| 1.5 x 0.5               | 165   | 125 | 98.4  | 4  | 16  | 73    | 12.7 | 2 | 145 | 180 | -   | -   | 120       | 240       | 5              |
| 1.5 x 0.75              | 165   | 125 | 98.4  | 4  | 16  | 73    | 12.7 | 2 | 145 | 180 | -   | -   | 120       | 240       | 5              |
| 2 x 1                   | 178   | 150 | 120.7 | 4  | 19  | 92.1  | 14.3 | 2 | 165 | 222 | -   | -   | 135       | 250       | 11             |
| 2.5 x 1.5               | 190   | 180 | 139.7 | 4  | 19  | 104.8 | 15.9 | 2 | 175 | 318 | -   | -   | 135       | 255       | 16             |
| 3 x 1.5                 | 203   | 190 | 152.4 | 4  | 19  | 127   | 17.5 | 2 | 175 | 318 | -   | -   | 135       | 250       | 18             |
| 3 x 2                   | 203   | 190 | 152.4 | 4  | 19  | 127   | 17.5 | 2 | 180 | 458 | -   | -   | 165       | 265       | 21             |
| 4 x 3                   | 229   | 230 | 190.5 | 8  | 19  | 157.2 | 22.3 | 2 | 190 | 597 | -   | -   | 165       | 280       | 31             |
| 6 x 3                   | 267   | 280 | 241.3 | 8  | 22  | 215.9 | 23.9 | 2 | 190 | 597 | -   | -   | 170       | 280       | 41             |
| 6 x 4                   | 267   | 280 | 241.3 | 8  | 22  | 215.9 | 23.9 | 2 | 215 | 746 | -   | -   | 185       | 300       | 50             |
| 8 x 6                   | 292   | 345 | 298.5 | 8  | 22  | 269.9 | 27   | 2 | 315 | 400 | 75  | 280 | 235       | 330       | 97             |
| 10 x 8                  | 330   | 405 | 362   | 12 | 25  | 323.8 | 28.6 | 2 | 370 | 500 | 95  | 320 | 310       | 405       | 145            |
| *12 x 10                | 356   | 485 | 431.8 | 12 | 25  | 381   | 30.2 | 2 | 400 | 500 | 25  | 340 | 340       | 435       | 221            |
| **14 x 12               | 381   | 535 | 476.3 | 12 | 29  | 412.8 | 33.4 | 2 | 440 | 560 | 45  | 370 | 360       | 455       | 296            |
| 16 x 14                 | 762   | 595 | 539.8 | 16 | 29  | 469.9 | 35   | 2 | 510 | 630 | 35  | 440 | 440       | 535       | 550            |
| 18 x 14                 | 864   | 635 | 577.9 | 16 | 32  | 533.4 | 38.1 | 2 | 510 | 630 | 35  | 440 | 440       | 535       | 580            |
| 18 x 16                 | 864   | 635 | 577.9 | 16 | 32  | 533.4 | 38.1 | 2 | 550 | 630 | 35  | 440 | 500       | 595       | 670            |
| 20 x 16                 | 914   | 700 | 635   | 20 | 32  | 584.2 | 41.3 | 2 | 550 | 630 | 35  | 440 | 515       | 595       | 777            |
| 24 x 20                 | 1,067 | 815 | 749.3 | 20 | 35  | 692.2 | 46.1 | 2 | 650 | 710 | 180 | 505 | 700       | 755       | 1,250          |
| 30 x 24                 | 1,295 | 985 | 914.4 | 28 | 35  | 857   | 73.1 | 2 | 760 | 900 | 280 | 650 | 750       | 845       | 1,750          |

- 0.5"~ 4"(Wrench Operated) / 6"~24"(Gear Operated)

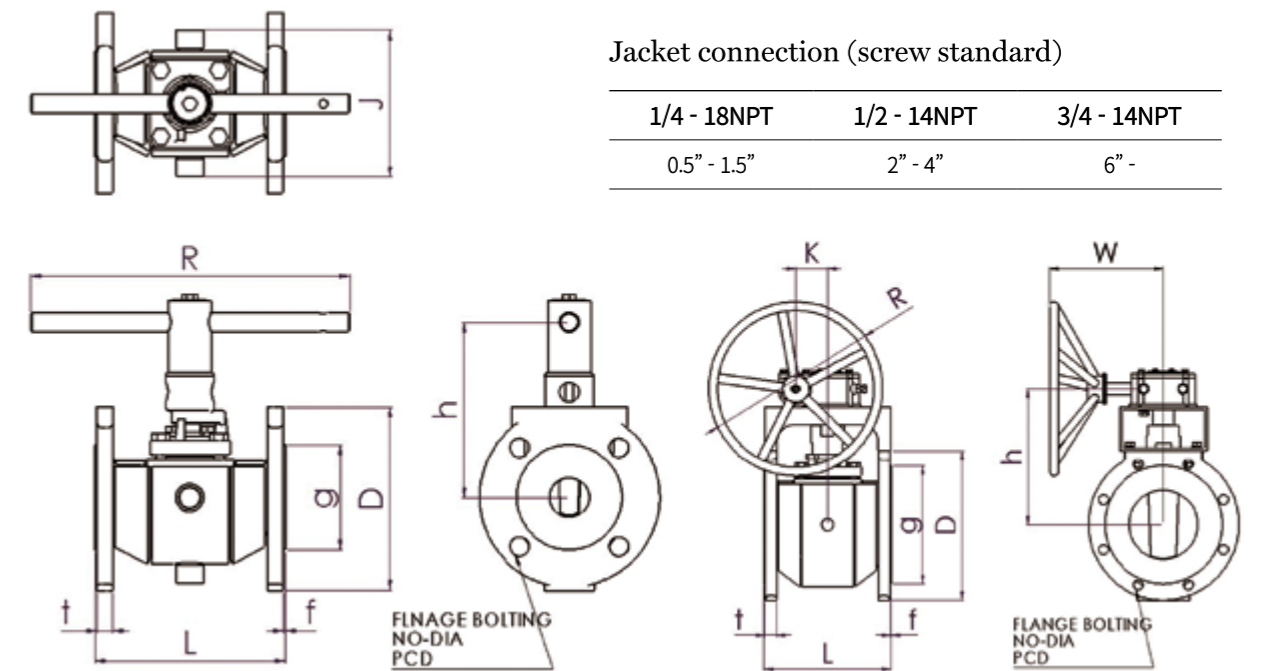
\* 2 top holes in flanges are tapped for 7/8-9UNC (Stud Bolt Length 110mm)

\*\* 2 top holes in flanges are tapped for 1-8UNC (Stud Bolt Length 120mm)

- If additional classes and sizes are required, please consult the factory when ordering.

# Jacketed Valve Dimensions - Class 300

Figure No. 320FJ - Class 300 / Size 0.5" - 24" / Raised Face Flange



Unit : mm

| Size<br>(flange x body) | L    | D     | PCD   | NO | DIA | g     | t    | f | h   | R   | K   | W   | J<br>(SC) | J<br>(FL) | Weight<br>(kg) |
|-------------------------|------|-------|-------|----|-----|-------|------|---|-----|-----|-----|-----|-----------|-----------|----------------|
| 1.5 x 0.5               | 190  | 155   | 114.3 | 4  | 22  | 73    | 19.1 | 2 | 145 | 180 | -   | -   | 120       | 240       | 9              |
| 1.5 x 0.75              | 190  | 155   | 114.3 | 4  | 22  | 73    | 19.1 | 2 | 165 | 180 | -   | -   | 120       | 240       | 9              |
| 2 x 1                   | 216  | 165   | 127.0 | 8  | 19  | 92.1  | 20.7 | 2 | 165 | 222 | -   | -   | 140       | 255       | 15             |
| 3 x 1.5                 | 282  | 210   | 168.3 | 8  | 22  | 127   | 27   | 2 | 175 | 318 | -   | -   | 140       | 250       | 25             |
| 3 x 2                   | 282  | 210   | 168.3 | 8  | 22  | 127   | 27   | 2 | 180 | 458 | -   | -   | 175       | 275       | 30             |
| 4 x 3                   | 305  | 255   | 200   | 8  | 22  | 157.2 | 30.2 | 2 | 190 | 597 | -   | -   | 175       | 275       | 44             |
| 6 x 4                   | 403  | 320   | 269.9 | 12 | 22  | 215.9 | 35   | 2 | 215 | 746 | -   | -   | 190       | 295       | 75             |
| 8 x 6                   | 419  | 380   | 330.2 | 12 | 25  | 269.9 | 39.7 | 2 | 330 | 400 | 75  | 280 | 275       | 370       | 101            |
| 10 x 8                  | 457  | 445   | 387.4 | 16 | 29  | 323.8 | 46.1 | 2 | 390 | 500 | 95  | 320 | 310       | 405       | 210            |
| 12 x 10                 | 502  | 520   | 450.8 | 16 | 32  | 381   | 49.3 | 2 | 400 | 500 | 25  | 340 | 340       | 435       | 295            |
| 16 x 12                 | 838  | 650   | 571.5 | 20 | 35  | 469.9 | 55.6 | 2 | 450 | 560 | 45  | 370 | 390       | 485       | 550            |
| 16 x 14                 | 838  | 650   | 571.5 | 20 | 35  | 469.9 | 55.6 | 2 | 515 | 630 | 35  | 440 | 420       | 535       | 600            |
| 18 x 16                 | 914  | 710   | 628.6 | 24 | 35  | 533.4 | 58.8 | 2 | 565 | 630 | 35  | 440 | 490       | 595       | 780            |
| 24 x 20                 | 991  | 915   | 812.8 | 24 | 41  | 692.2 | 68.3 | 2 | 720 | 800 | 230 | 605 | 700       | 800       | 1,500          |
| 30 x 24                 | 1143 | 1,090 | 997.0 | 28 | 48  | 857   | 90.5 | 2 | 745 | 900 | 280 | 660 | 750       | 860       | 2,100          |

- 0.5"~ 4"(Wrench Operated) / 6"~24"(Gear Operated)

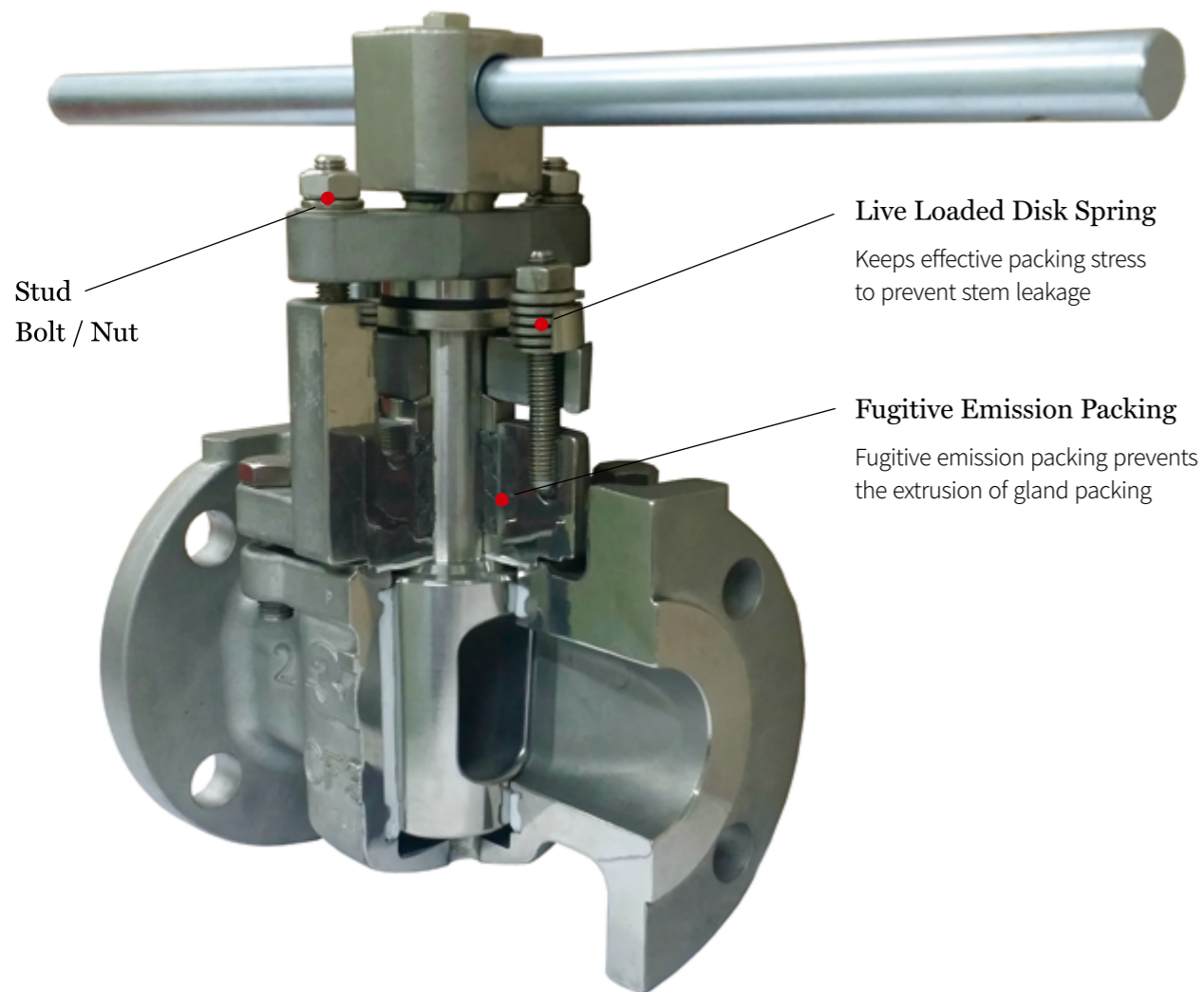
- If additional classes and sizes are required, please consult the factory when ordering.



# Live Loaded Valves

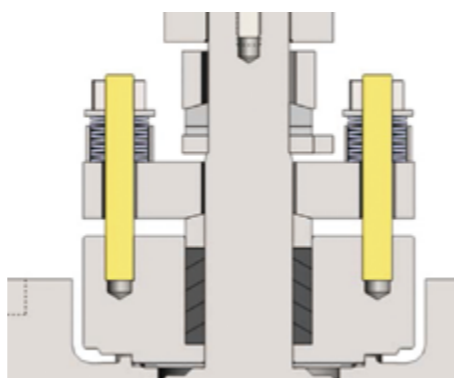
## Feature of Live loaded plug valves

Enhance stem sealing against external leakage by using live loaded disk spring and fugitive emission packing, and Live loaded plug valve is certified by ISO-15848 (Industrial valves-Measurement, test and qualification procedures for fugitive Emissions)



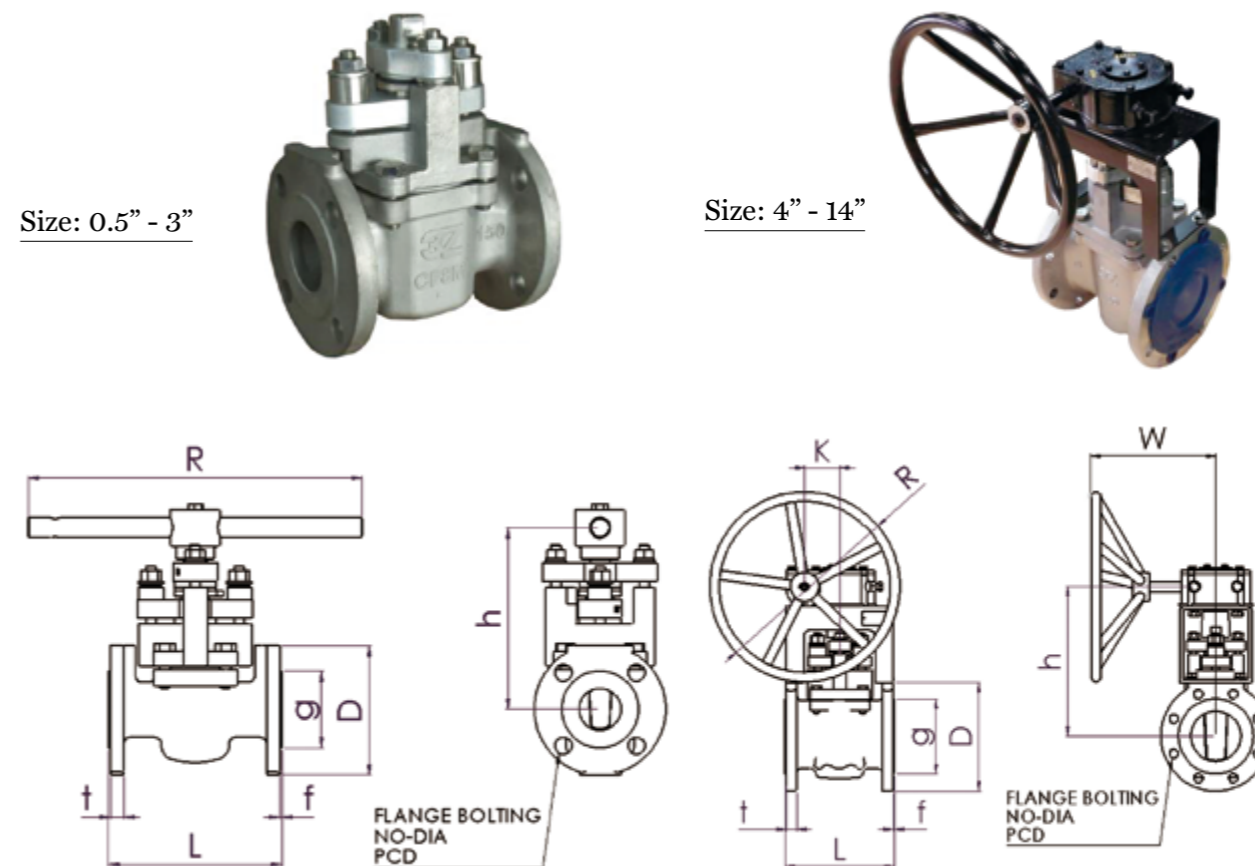
## Live loaded disk spring

If a valve is frequently cycled, the packing around the stem will be worn and the stress on the packing will be reduced and eventually stem leakage will be occurred. Normally, frequent retightening of the packing gland bolts is required to prevent stem leakage. 3Z live loaded plug valves with a disk spring provide an effective way to control the amount of stress in the packing set and eliminate the need of constant retightening.



# Live Loaded Valve Dimensions - Class 150

Figure No. 120LL - Class 150 / Size 0.5" - 14" / Raised Face Flange



Unit : mm

| Size  | L   | D   | PCD   | NO | DIA | g     | t    | f | h   | R   | K  | W   | Weight (kg) |
|-------|-----|-----|-------|----|-----|-------|------|---|-----|-----|----|-----|-------------|
| 0.5   | 108 | 90  | 60.3  | 4  | 16  | 34.9  | 8    | 2 | 175 | 150 | -  | -   | 6           |
| 0.75  | 117 | 100 | 69.9  | 4  | 16  | 42.9  | 8.9  | 2 | 175 | 150 | -  | -   | 6           |
| 1     | 127 | 110 | 79.4  | 4  | 16  | 50.8  | 9.6  | 2 | 165 | 318 | -  | -   | 10          |
| 1.5   | 165 | 125 | 98.4  | 4  | 16  | 73    | 12.7 | 2 | 175 | 318 | -  | -   | 13          |
| 2     | 178 | 150 | 120.7 | 4  | 19  | 92.1  | 14.3 | 2 | 185 | 458 | -  | -   | 20          |
| 3     | 203 | 190 | 152.4 | 4  | 19  | 127   | 17.5 | 2 | 200 | 597 | -  | -   | 25          |
| 4     | 229 | 230 | 190.5 | 8  | 19  | 157.2 | 22.3 | 2 | 320 | 400 | 75 | 280 | 57          |
| 6     | 267 | 280 | 241.3 | 8  | 22  | 215.9 | 23.9 | 2 | 380 | 400 | 75 | 280 | 83          |
| *8    | 292 | 345 | 298.5 | 8  | 22  | 269.9 | 27   | 2 | 440 | 500 | 95 | 320 | 132         |
| **10  | 330 | 405 | 362   | 12 | 25  | 323.8 | 28.6 | 2 | 510 | 560 | 45 | 370 | 200         |
| **12  | 356 | 485 | 431.8 | 12 | 25  | 381   | 30.2 | 2 | 560 | 560 | 45 | 370 | 277         |
| ***14 | 381 | 535 | 476.3 | 12 | 29  | 412.8 | 33.4 | 2 | 650 | 630 | 35 | 440 | 400         |

- 0.5"~ 3"(Wrench Operated) / 4"~14"(Gear Operated)

\* 2 top holes in flanges are tapped for 3/4-10UNC (Stud Bolt Length 100mm)

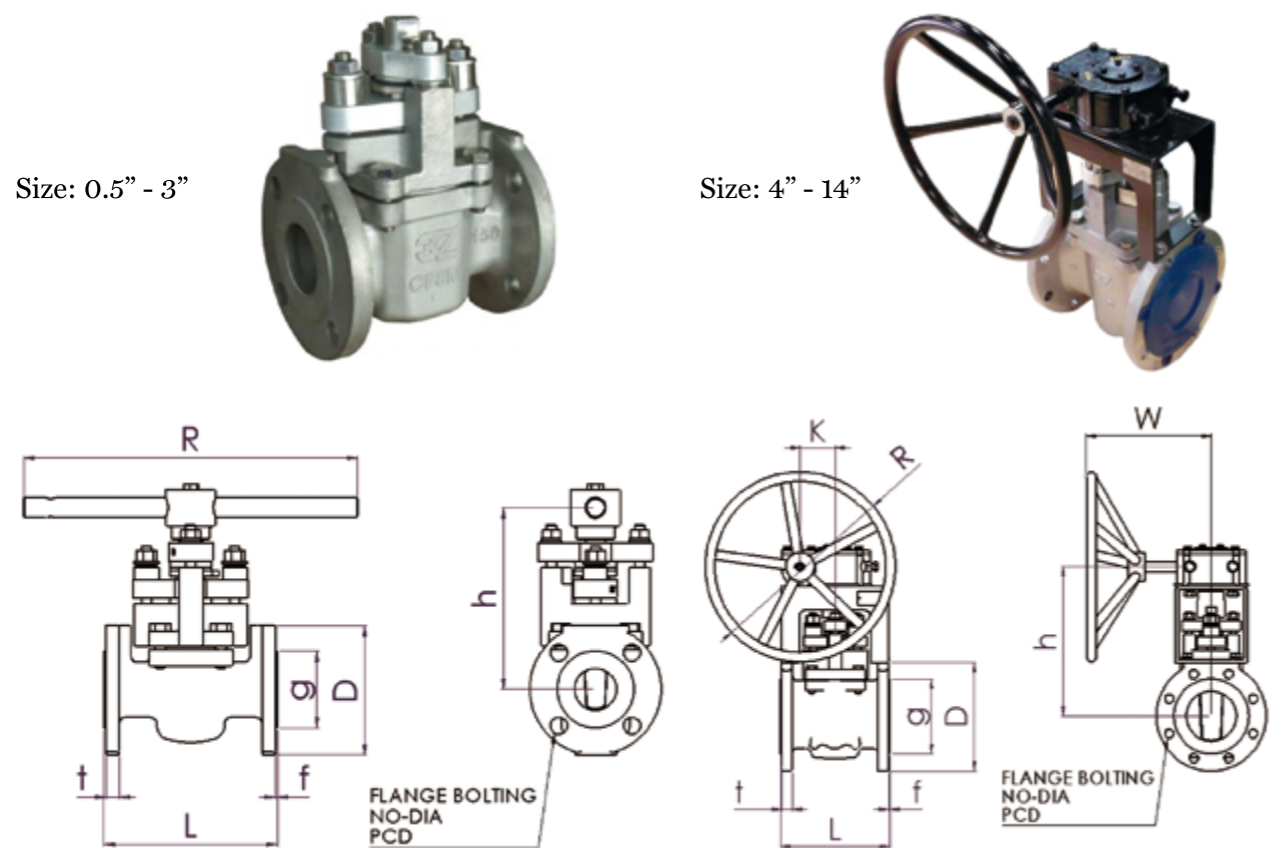
\*\* 2 top holes in flanges are tapped for 7/8-9UNC (Stud Bolt Length 95mm & 105mm)

\*\*\* 2 top holes in flanges are tapped for 1-8UNC (Stud Bolt Length 110mm)

- If additional classes and sizes are required, please consult the factory when ordering.

# Live Loaded Valve Dimensions - Class 300

Figure No. 320LL - Class 300 / Size 0.5" - 14" / Raised Face Flange



Unit : mm

| Size | L   | D   | PCD   | NO | DIA | g     | t    | f | h   | R   | K  | W   | Weight (kg) |
|------|-----|-----|-------|----|-----|-------|------|---|-----|-----|----|-----|-------------|
| 0.5  | 140 | 95  | 66.7  | 4  | 16  | 34.9  | 12.7 | 2 | 175 | 150 | -  | -   | 6           |
| 0.75 | 152 | 115 | 82.6  | 4  | 19  | 42.9  | 14.3 | 2 | 175 | 150 | -  | -   | 7           |
| 1    | 165 | 125 | 88.9  | 4  | 19  | 50.8  | 15.9 | 2 | 165 | 318 | -  | -   | 12          |
| 1.5  | 190 | 155 | 114.3 | 4  | 22  | 73    | 19.1 | 2 | 175 | 318 | -  | -   | 16          |
| 2    | 216 | 165 | 127   | 8  | 19  | 92.1  | 20.7 | 2 | 185 | 458 | -  | -   | 22          |
| 3    | 283 | 210 | 168.3 | 8  | 22  | 127   | 27   | 2 | 200 | 597 | -  | -   | 33          |
| 4    | 305 | 255 | 200   | 8  | 22  | 157.2 | 30.2 | 2 | 320 | 400 | 75 | 280 | 68          |
| 6    | 403 | 320 | 269.9 | 12 | 22  | 215.9 | 35   | 2 | 380 | 400 | 75 | 280 | 113         |
| 8    | 419 | 380 | 330.2 | 12 | 25  | 269.9 | 39.7 | 2 | 440 | 500 | 95 | 320 | 172         |
| 10   | 457 | 445 | 387.4 | 16 | 29  | 323.8 | 46.1 | 2 | 510 | 560 | 45 | 370 | 259         |
| 12   | 502 | 520 | 450.8 | 16 | 32  | 381   | 49.3 | 2 | 560 | 560 | 45 | 370 | 351         |
| 14   | 762 | 585 | 514.4 | 20 | 32  | 412.8 | 52.4 | 2 | 650 | 630 | 35 | 440 | 559         |

- 0.5"~ 3"(Wrench Operated) / 4"~14"(Gear Operated)

- If additional classes and sizes are required, please consult the factory when ordering.

# Class 600 High Pressure Plug Valves

## High Pressure Plug Valve

3Z high pressure plug valves are designed for requirements of ASME B16.34 Class 600 and especially for 4" and over sized valves with top and bottom trunnion design. They securely operate against high differential pressure without excessive sleeve compression. 3Z high pressure plug valves are available in Reverse Osmosis (RO) Service.

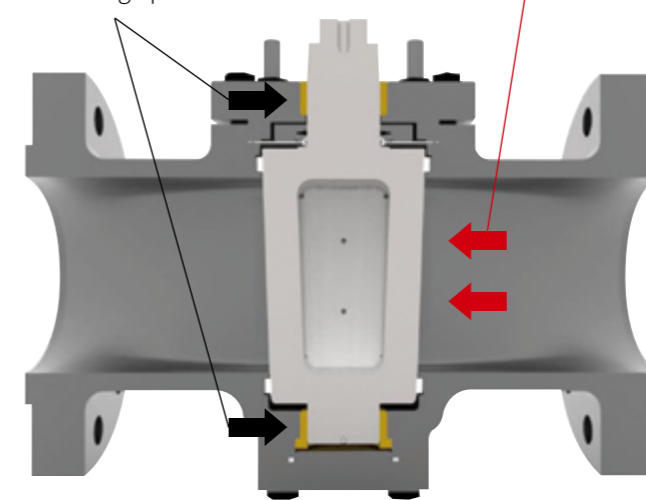


### Trunnion Stem

Keeps operating stably against Class 600 high pressure

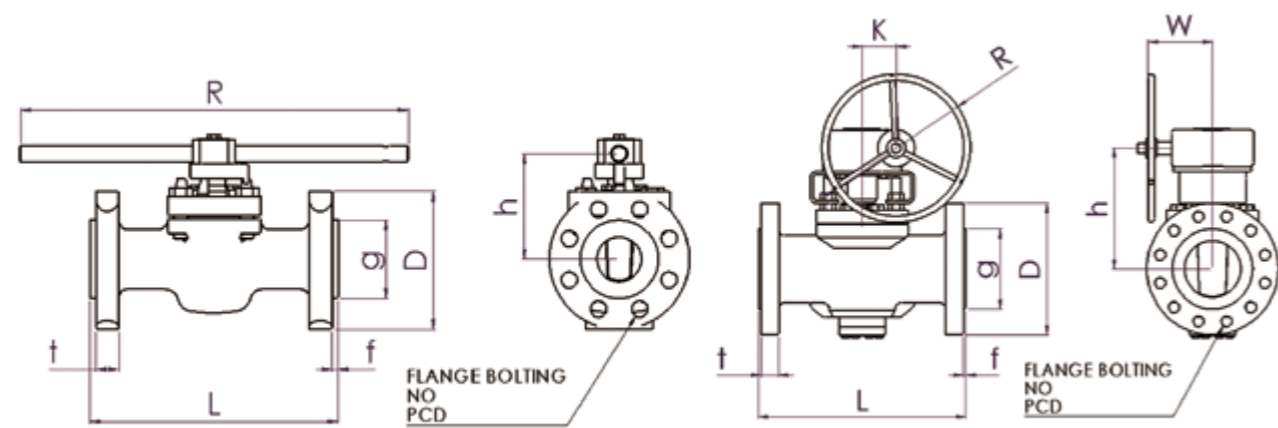
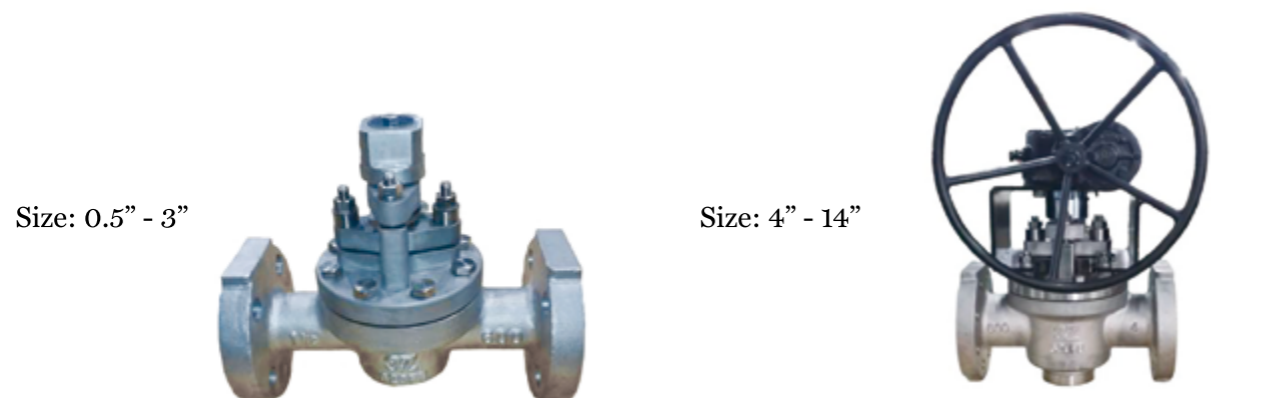
### High Pressure

Class 600 high pressure



# High Pressure Valve Dimensions - Class 600

Figure No. 620 - Class 600 / Size 0.5" - 16" / Raised Face Flange



Unit : mm

| Size | L   | D   | PCD   | NO | DIA | g     | t    | f | h   | R   | K   | W   | Weight (kg) |
|------|-----|-----|-------|----|-----|-------|------|---|-----|-----|-----|-----|-------------|
| 0.5  | 165 | 95  | 66.7  | 4  | 16  | 34.9  | 14.3 | 7 | 115 | 150 | -   | -   | 4           |
| 0.75 | 190 | 115 | 82.6  | 4  | 19  | 42.9  | 15.9 | 7 | 115 | 150 | -   | -   | 5           |
| 1    | 216 | 125 | 88.9  | 4  | 19  | 50.8  | 17.5 | 7 | 95  | 222 | -   | -   | 9           |
| 1.5  | 241 | 155 | 114.3 | 4  | 22  | 73    | 22.3 | 7 | 110 | 318 | -   | -   | 13          |
| 2    | 292 | 165 | 127   | 8  | 19  | 92.1  | 25.4 | 7 | 125 | 458 | -   | -   | 20          |
| 3    | 356 | 210 | 168.3 | 8  | 22  | 127   | 31.8 | 7 | 145 | 597 | -   | -   | 38          |
| 4    | 432 | 275 | 215.9 | 8  | 25  | 157.2 | 38.1 | 7 | 235 | 400 | 75  | 280 | 94          |
| 6    | 559 | 355 | 292.1 | 12 | 29  | 215.9 | 47.7 | 7 | 330 | 500 | 23  | 335 | 186         |
| 8    | 660 | 420 | 349.2 | 12 | 32  | 269.9 | 55.6 | 7 | 405 | 560 | 45  | 370 | 300         |
| 10   | 787 | 510 | 431.8 | 16 | 35  | 323.8 | 63.5 | 7 | 490 | 630 | 35  | 440 | 520         |
| 12   | 838 | 560 | 489   | 20 | 35  | 381   | 66.7 | 7 | 530 | 630 | 160 | 480 | 700         |
| 14   | 889 | 605 | 527   | 20 | 38  | 412.8 | 69.9 | 7 | 605 | 630 | 180 | 505 | 960         |
| 16   | 991 | 685 | 603.2 | 20 | 41  | 469.9 | 76.2 | 7 | 630 | 710 | 180 | 505 | 1,325       |

- 0.5"~3"(Wrench Operated) / 4"~16"(Gear Operated)

- If additional classes and sizes are required, please consult the factory when ordering.

# Nuclear Valves

Designed for nuclear power plant application. Standard Sleeve material is "UHMWPE"

Port 2-3 way  
Class 150 / 300 / 600  
Size 0.5" - 6"  
Temperature Range -30°C ~ 260°C



Nuclear Power Plant



3Z FIG 322N.BW BUTT WELD END NUCLEAR PLUG VALVE

· 2-way  
· Class 150 / 300  
· 0.5" - 6"



3Z FIG 322N.P PUP WELDED NUCLEAR PLUG VALVE

· 2-way  
· Class 150 / 300  
· 0.5" - 6"  
· Pup Welded



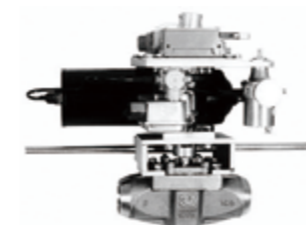
3Z FIG 322N.SW SOCKET WELD END NUCLEAR PLUG VALVE

· 2-way  
· Class 150/300  
· 0.5" - 2"



3Z FIG 332N BUTT WELD END NUCLEAR PLUG VALVE

· 3-way  
· Class 150 / 300  
· 0.5" - 6"



3Z FIG 322N.CV PNEUMATIC NUCLEAR CONTROL PLUG VALVE

Double Acting Type  
· 2-way  
· Class 150 / 300  
· 0.5" - 6"



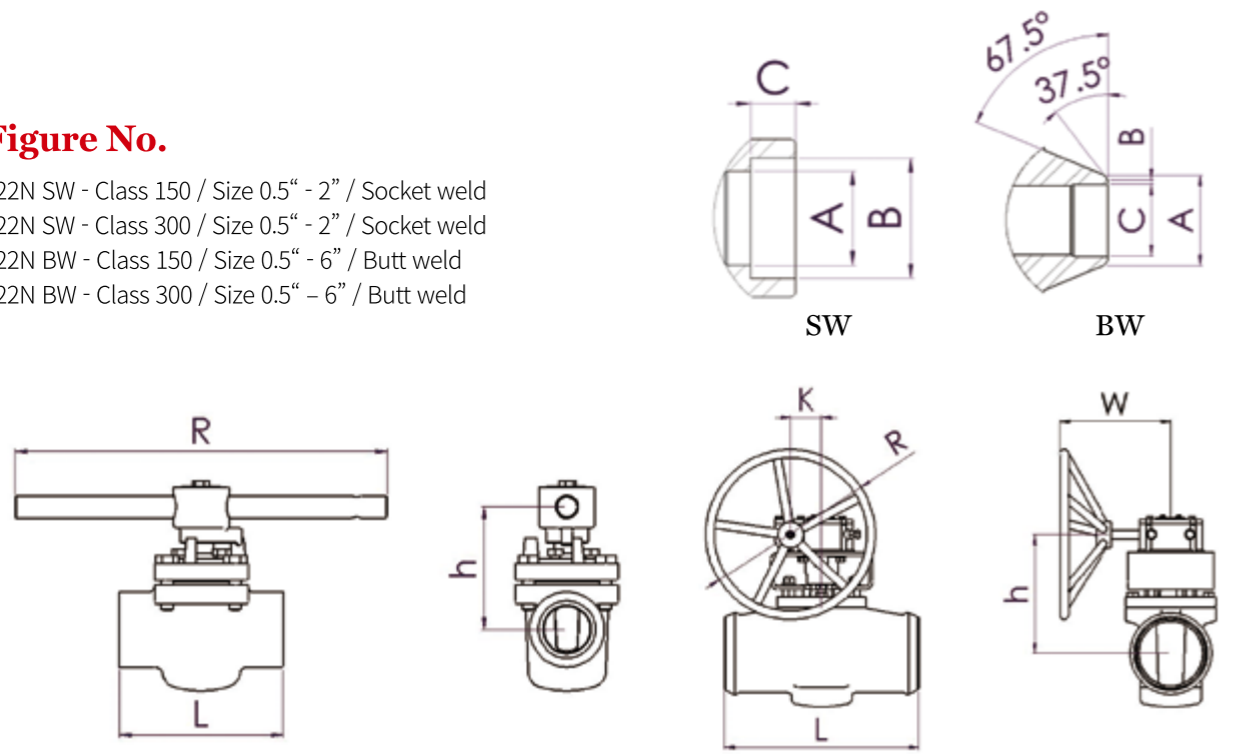
3Z FIG 322N.CV PNEUMATIC NUCLEAR CONTROL PLUG VALVE

· Spring Return Type  
· 2-way  
· Class 150 / 300  
· 0.5" - 6"

# Nuclear Valves Dimensions

## Figure No.

122N SW - Class 150 / Size 0.5" - 2" / Socket weld  
 322N SW - Class 300 / Size 0.5" - 2" / Socket weld  
 122N BW - Class 150 / Size 0.5" - 6" / Butt weld  
 322N BW - Class 300 / Size 0.5" - 6" / Butt weld



Unit : mm

| Class     | End           | Size      | OP.           | L   | H   | R   | K    | W     | A     | B     | C     | S<br>(3way) | Weight<br>(kg) |    |   |
|-----------|---------------|-----------|---------------|-----|-----|-----|------|-------|-------|-------|-------|-------------|----------------|----|---|
| 150 / 300 | BW<br>(SCH40) | 0.5       | W             | 165 | 115 | 150 | -    | -     | 21.3  | 1.6   | 15.7  | 99          | 3              |    |   |
|           |               |           | G             | 165 | 115 | 150 | -    | -     | 26.67 | 1.6   | 20.67 | 99          | 3              |    |   |
|           |               | 0.75      | W             | 165 | 135 | 200 | 41   | 161   | 26.67 | 1.6   | 20.67 | 99          | 7              |    |   |
|           |               |           | G             |     | 80  | 222 | -    | -     | 33.4  | 1.6   | 26.6  | 108         | 5              |    |   |
|           |               | 1         | W             | 165 | 155 | 200 | 41   | 161   | 33.4  | 1.6   | 26.6  | 108         | 10             |    |   |
|           |               |           | G             |     | 190 | 90  | 318  | -     | -     | 48.3  | 1.6   | 40.9        | 111            | 7  |   |
|           |               | 1.5       | W             | 267 | 110 | 458 | -    | -     | 60.3  | 1.6   | 52.5  | 121         | 13             |    |   |
|           |               |           | G             |     | 205 | 300 | 63   | 245.5 | 60.3  | 1.6   | 52.5  | 121         | 16             |    |   |
|           |               | 2         | W             | 305 | 120 | 597 | -    | -     | 73    | 1.6   | 62.7  | 121         | 15             |    |   |
|           |               |           | G             |     | 226 | 300 | 53   | 245.5 | 73    | 1.6   | 62.7  | 121         | 35             |    |   |
|           |               | 2.5       | W             | 330 | 120 | 597 | -    | -     | 88.9  | 1.6   | 77.9  | 152         | 19             |    |   |
|           |               |           | G             |     | 223 | 400 | 66.7 | 260   | 88.9  | 1.6   | 77.9  | 152         | 39             |    |   |
|           |               | 3         | W             | 356 | 150 | 746 | -    | -     | 114.3 | 1.6   | 102.3 | 190.5       | 32             |    |   |
|           |               |           | G             |     | 223 | 400 | 66.7 | 280   | 114.3 | 1.6   | 102.3 | 190.5       | 49             |    |   |
|           |               | 4         | W             | 457 | 310 | 915 | 28.5 | 168.3 | 1.6   | 154.1 | 254   | 75          |                |    |   |
|           |               |           | G             |     | 310 | 500 | 91.5 | 28.5  | 168.3 | 1.6   | 154.1 | 254         | 75             |    |   |
|           |               | 150 / 300 | SW<br>(#3000) | 0.5 | W   | 165 | 115  | 150   | -     | -     | 15.8  | 22          | 12.5           | 99 | 3 |
|           |               |           |               |     | G   | 165 | 115  | 150   | -     | -     | 21    | 27.4        | 12.5           | 99 | 3 |
| 0.75      | W             |           |               | 165 | 135 | 200 | 41   | 161   | 21    | 27.4  | 12.5  | 99          | 7              |    |   |
|           | G             |           |               |     | 80  | 222 | -    | -     | 26.7  | 34.1  | 12.5  | 108         | 5              |    |   |
| 1         | W             |           |               | 165 | 155 | 200 | 41   | 161   | 26.7  | 34.1  | 12.5  | 108         | 10             |    |   |
|           | G             |           |               |     | 190 | 90  | 318  | -     | -     | 40.9  | 49.0  | 12.5        | 111            | 7  |   |
| 1.5       | W             |           |               | 267 | 110 | 458 | -    | -     | 52.5  | 61.4  | 16    | 121         | 14             |    |   |
|           | G             |           |               |     | 205 | 300 | 63   | 245.5 | 52.5  | 61.4  | 16    | 121         | 17             |    |   |

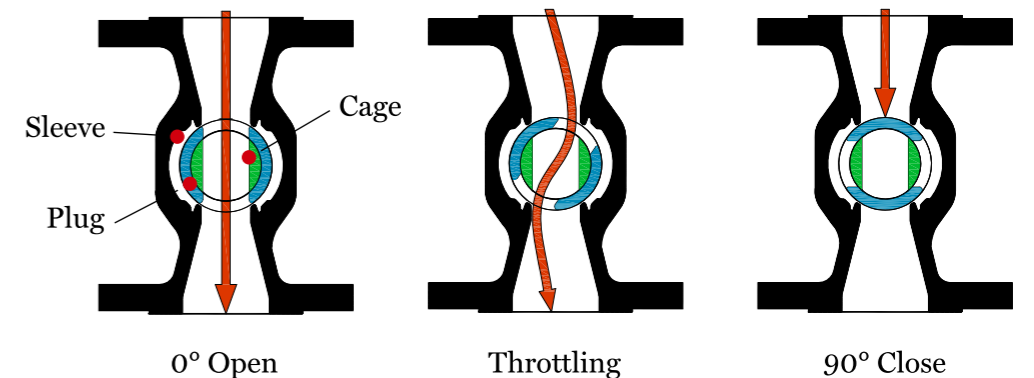
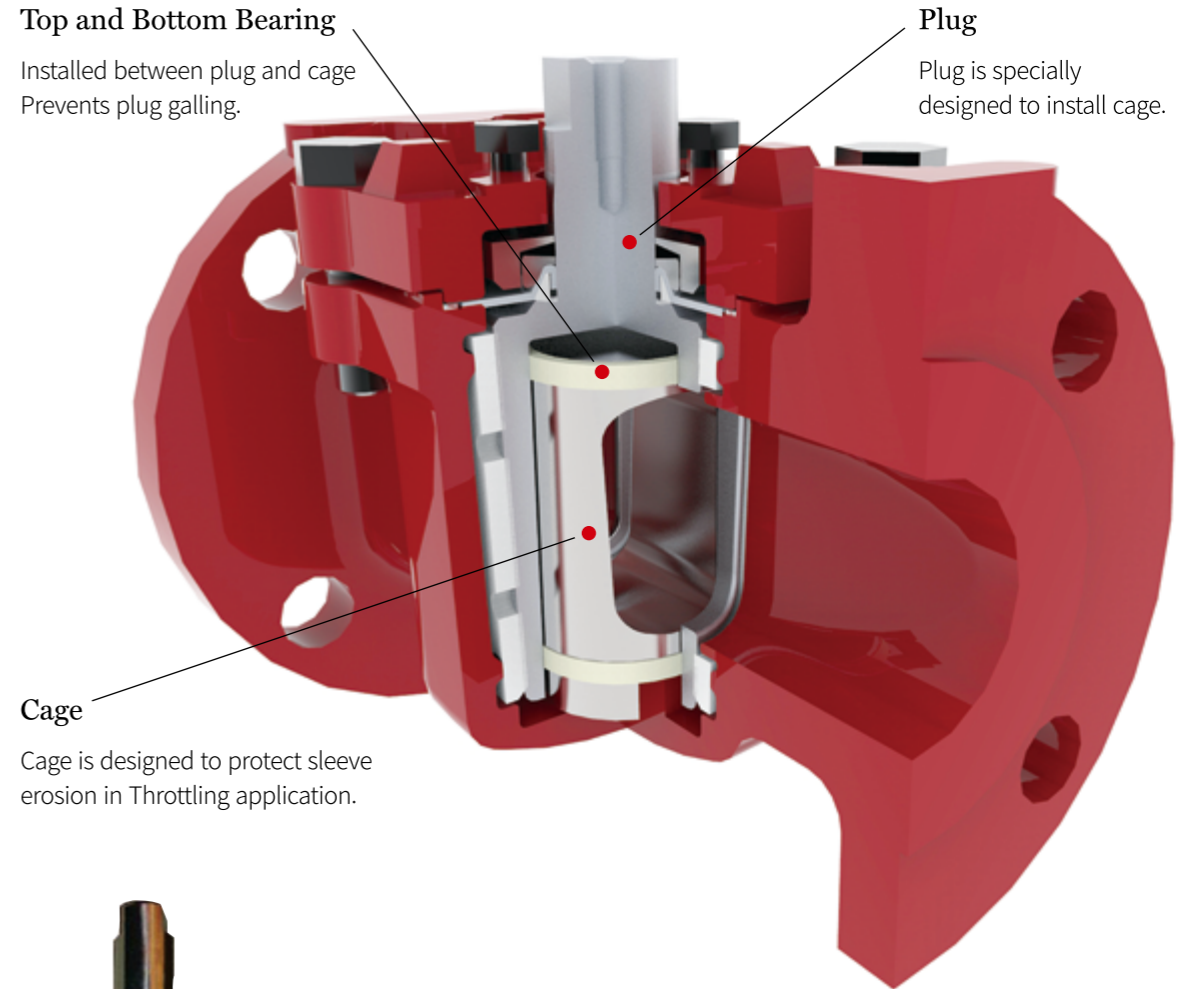
- OP. : W(Wrench) / G(Gear)

- If additional classes and sizes are required, please consult the factory when ordering.

# Caged Plug Valves

## Features and Benefits

3Z caged plug valves are designed for the requirements in throttling application and high pressure drops service. The cage fixed in the body protects sleeve from erosion during valve operation from open to close.



# Severe Service Valves

## Features and Benefits

3Z severe service plug valves are designed for maximum performance of external sealing. Especially the lantern ring between the top packing and the bottom packing provides an effective way to control the amount of stress in the packing set against packing wear and stem leakage.

### Disk Spring

Provides an effective way to control the amount of stress in the packing set and eliminates the need for constant retightening.

### Monitoring Port (optional)

Able to monitor stem leakage and input sealant for sealing

### Fugitive Emission Packing

Top and bottom fugitive emission packing prevents extrusion of gland packing

### Lantern Ring

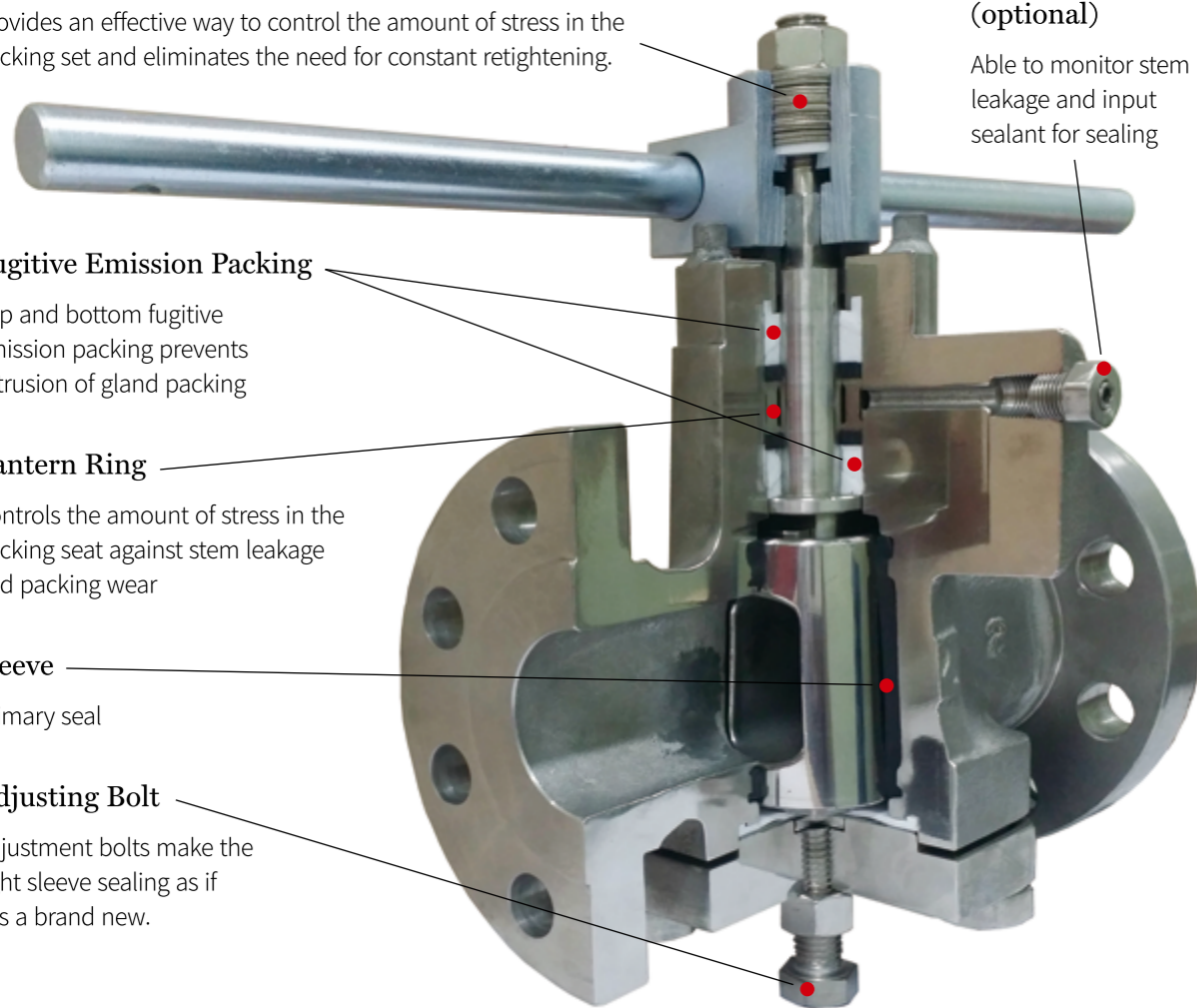
Controls the amount of stress in the packing seat against stem leakage and packing wear

### Sleeve

Primary seal

### Adjusting Bolt

Adjustment bolts make the tight sleeve sealing as if it is a brand new.



Size: 0.5" - 3"



Size: 4" - 12"



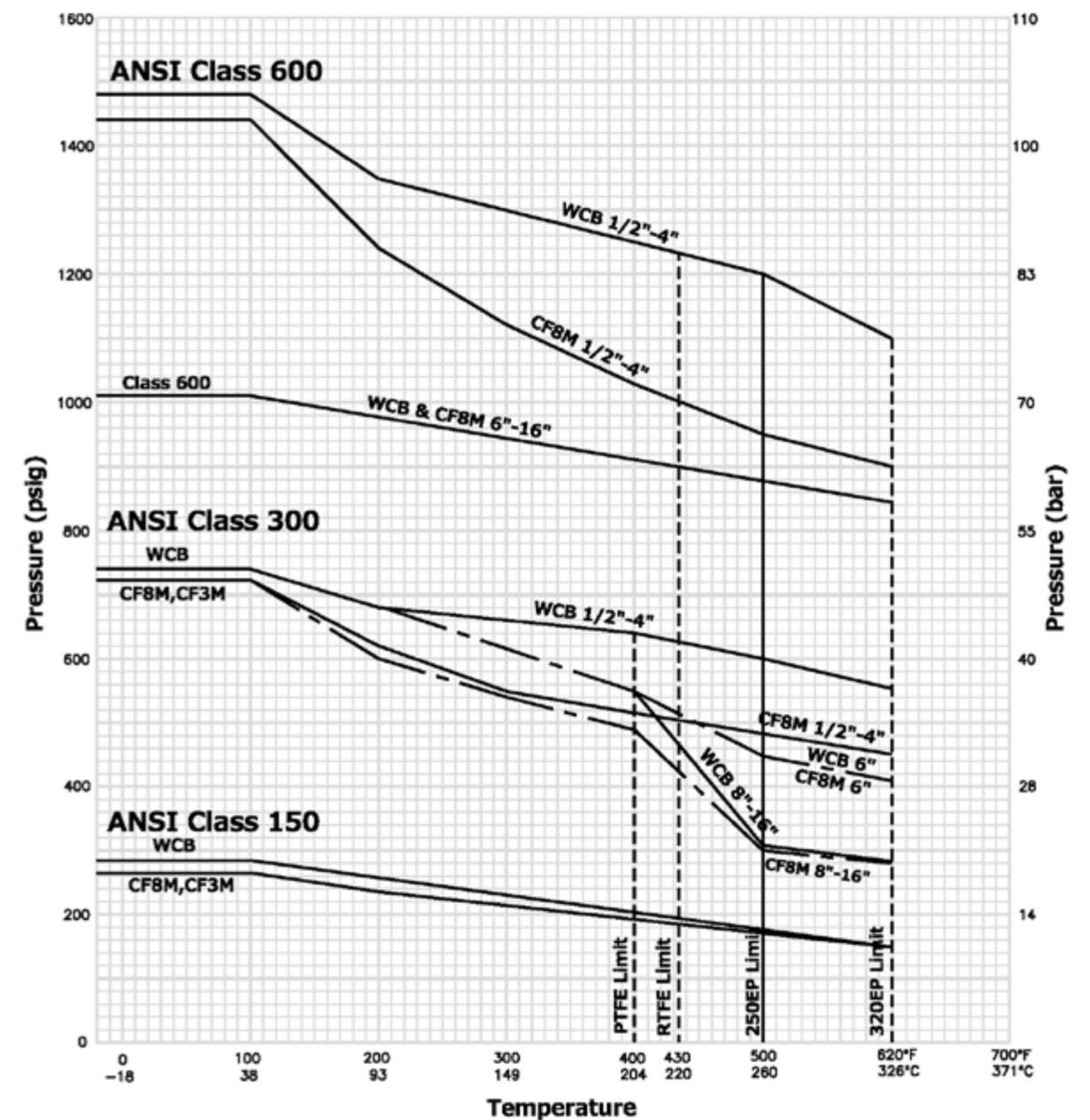
# Pressure-temperature Ratings

## Pressure -temperature Ratings

3Z sleeved plug valves are in accordance with ASME B16.34 standards, which request pressure-temperature rating for shell material. And according to ASME B16.34 and API 599, seals parts, such as sleeves and diaphragms may be used in limited pressures and temperature range.

### Seal Parts Maximum High Temperature

| PTFE          | RTFE          | 250EP         | 320EP         |
|---------------|---------------|---------------|---------------|
| -29°C ~ 204°C | -29°C ~ 220°C | -29°C ~ 250°C | -29°C ~ 326°C |



# Technical Data

## Operating Torque (N.M)

Class 150 & 300 / PTFE Sleeve  
2-way - Standard Type

| Fig     | Size | Break  | Running | Seating |
|---------|------|--------|---------|---------|
| 120/320 | 0.5  | 20     | 12      | 16      |
| 120/320 | 0.75 | 20     | 12      | 16      |
| 120/320 | 1    | 50     | 30      | 40      |
| 120/320 | 1.5  | 90     | 55      | 70      |
| 120/320 | 2    | 130    | 80      | 100     |
| 120/320 | 3    | 150    | 90      | 120     |
| 120/320 | 4    | 290    | 170     | 230     |
| 120/320 | 6    | 570    | 340     | 460     |
| 120/320 | 8    | 980    | 590     | 780     |
| 120/320 | 10   | 1,670  | 1,000   | 1,330   |
| 120/320 | 12   | 2,360  | 1,420   | 1,900   |
| 120/320 | 14   | 3,440  | 2,070   | 2,750   |
| 120     | 16   | 4,650  | 2,790   | 3,720   |
| 120     | 18   | 6,780  | 4,070   | 5,430   |
| 120     | 20   | 10,100 | 6,080   | 8,100   |
| 120     | 24   | 13,900 | 8,350   | 11,100  |
| 320     | 16   | 6,430  | 3,860   | 5,150   |
| 320     | 18   | 10,200 | 6,150   | 8,200   |
| 320     | 20   | 12,200 | 7,340   | 9,790   |
| 320     | 24   | 26,000 | 15,600  | 20,800  |

## Operating Torque (N.M)

Class 600 / RTFE Sleeve  
2-way - Standard Type

| Fig | Size | Break | Running | Seating |
|-----|------|-------|---------|---------|
| 620 | 0.5  | 20    | 12      | 16      |
| 620 | 0.75 | 20    | 12      | 16      |
| 620 | 1    | 60    | 35      | 45      |
| 620 | 1.5  | 120   | 70      | 100     |
| 620 | 2    | 170   | 100     | 140     |
| 620 | 3    | 210   | 120     | 170     |
| 620 | 4    | 420   | 250     | 330     |
| 620 | 6    | 1,280 | 770     | 1,030   |
| 620 | 8    | 2,020 | 1,210   | 1,620   |
| 620 | 10   | 3,360 | 2,020   | 2,690   |
| 620 | 12   | 5,850 | 3,510   | 4,680   |

## CV Factor

Class 150 & 300  
2-way - Standard Type

| Fig     | Size | CV Factor |
|---------|------|-----------|
| 120/320 | 0.5  | 15        |
| 120/320 | 0.75 | 15        |
| 120/320 | 1    | 40        |
| 120/320 | 1.5  | 70        |
| 120/320 | 2    | 140       |
| 120/320 | 3    | 230       |
| 120/320 | 4    | 400       |
| 120/320 | 6    | 890       |
| 120/320 | 8    | 1,500     |
| 120/320 | 10   | 2,300     |
| 120/320 | 12   | 2,950     |
| 120/320 | 14   | 4,050     |
| 120     | 16   | 5,500     |
| 120     | 18   | 6,300     |
| 120     | 20   | 8,090     |
| 120     | 24   | 11,850    |
| 320     | 16   | 5,600     |
| 320     | 18   | 6,350     |
| 320     | 20   | 8,160     |
| 320     | 24   | 11,940    |

## CV Factor

Class 600  
2-way - Standard Type

| Fig | Size | CV factor |
|-----|------|-----------|
| 620 | 0.5  | 15        |
| 620 | 0.75 | 15        |
| 620 | 1    | 40        |
| 620 | 1.5  | 70        |
| 620 | 2    | 150       |
| 620 | 3    | 230       |
| 620 | 4    | 410       |
| 620 | 6    | 940       |
| 620 | 8    | 1,590     |
| 620 | 10   | 2,430     |
| 620 | 12   | 3,130     |

# Technical Data

## Operating Torque (N.M)

Class 150 / PTFE Sleeve  
2-way - Full Bore Type

| Fig   | Size | Break  | Running | Seating |
|-------|------|--------|---------|---------|
| 120FB | 0.75 | 17     | 12      | 14      |
| 120FB | 1    | 60     | 40      | 50      |
| 120FB | 1.5  | 120    | 90      | 100     |
| 120FB | 2    | 200    | 140     | 160     |
| 120FB | 3    | 590    | 410     | 470     |
| 120FB | 4    | 870    | 610     | 700     |
| 120FB | 6    | 2,210  | 1,550   | 1,770   |
| 120FB | 8    | 4,730  | 3,310   | 3,790   |
| 120FB | 10   | 9,710  | 6,800   | 7,770   |
| 120FB | 12   | 15,600 | 10,900  | 12,500  |
| 120FB | 14   | 22,600 | 15,800  | 18,000  |
| 120FB | 16   | 31,200 | 21,800  | 25,000  |

## CV Factor

Class 150 & 300  
2-way - Full Bore Type

| Fig         | Size | CV factor |
|-------------|------|-----------|
| 120FB/320FB | 0.75 | 60        |
| 120FB/320FB | 1    | 115       |
| 120FB/320FB | 1.5  | 290       |
| 120FB/320FB | 2    | 530       |
| 120FB/320FB | 3    | 1,150     |
| 120FB/320FB | 4    | 2,130     |
| 120FB/320FB | 6    | 5,050     |
| 120FB/320FB | 8    | 9,780     |
| 120FB/320FB | 10   | 14,600    |
| 120FB/320FB | 12   | 21,500    |
| 120FB/320FB | 14   | 26,600    |
| 120FB/320FB | 16   | 35,200    |

## Operating Torque (N.M)

Class 300 / PTFE Sleeve  
2-way - Full Bore Type

| Fig   | Size | Break  | Running | Seating |
|-------|------|--------|---------|---------|
| 320FB | 0.75 | 17     | 12      | 14      |
| 320FB | 1    | 60     | 40      | 50      |
| 320FB | 1.5  | 120    | 90      | 100     |
| 320FB | 2    | 200    | 140     | 160     |
| 320FB | 3    | 590    | 410     | 470     |
| 320FB | 4    | 870    | 610     | 700     |
| 320FB | 6    | 2,210  | 1,550   | 1,770   |
| 320FB | 8    | 4,730  | 3,310   | 3,790   |
| 320FB | 10   | 11,400 | 7,980   | 9,120   |
| 320FB | 12   | 18,400 | 12,900  | 14,700  |

## Operating Torque (N.M)

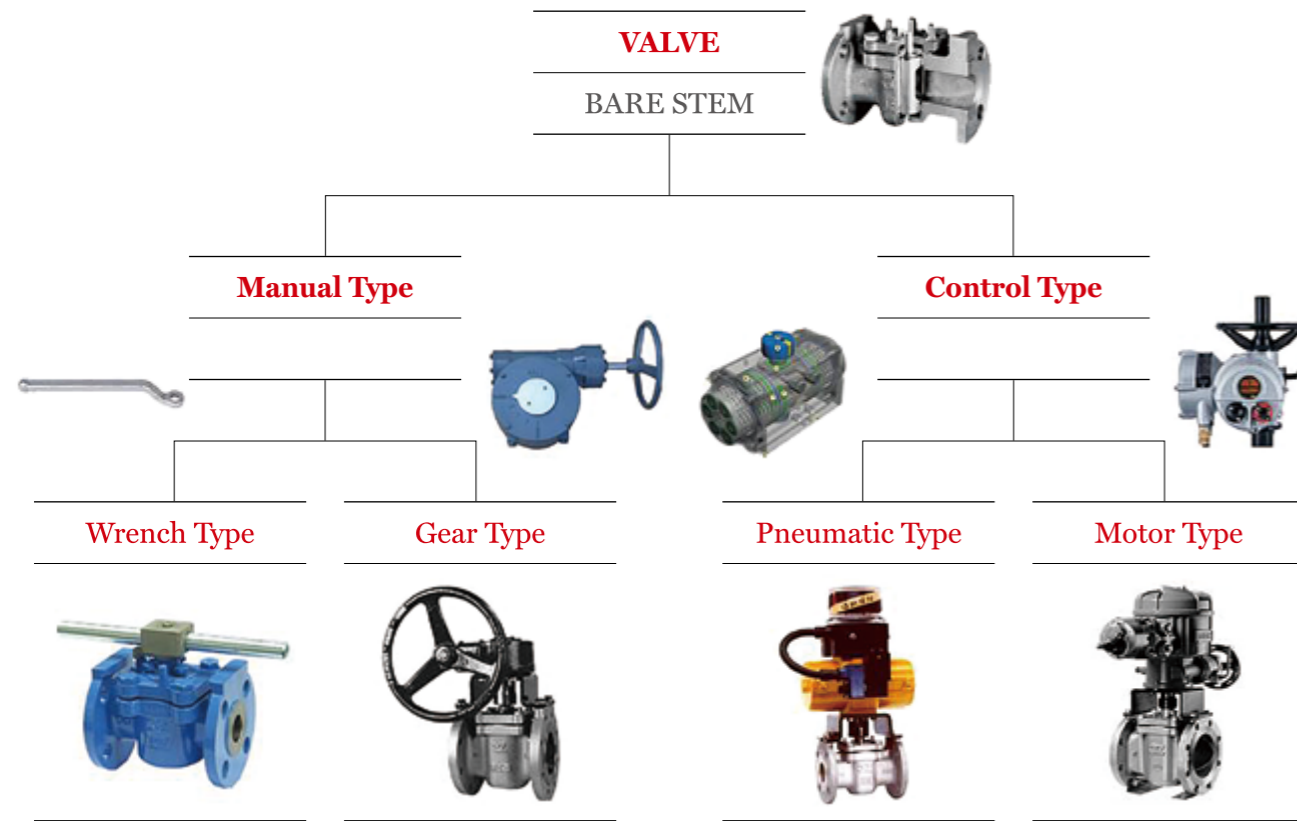
Class 150 / PTFE Sleeve  
2-way - Live Loaded Type

| Fig    | Size | Break | Running | Seating |
|--------|------|-------|---------|---------|
| 120 LL | 0.5  | 30    | 22      | 26      |
| 120 LL | 0.75 | 30    | 22      | 26      |
| 120 LL | 1    | 70    | 50      | 60      |
| 120 LL | 1.5  | 130   | 90      | 110     |
| 120 LL | 2    | 180   | 120     | 150     |
| 120 LL | 3    | 190   | 130     | 160     |
| 120 LL | 4    | 420   | 300     | 360     |
| 120 LL | 6    | 890   | 660     | 770     |
| 120 LL | 8    | 1,300 | 910     | 1,100   |

# Operators

## 3Z Operation

3Z sleeved plug valves are designed to operate by wrench, handle, gear or actuator. 3Z valves can supply variable operators as per customer`s requirements.



## Locking Device

Locking device are available as per customer`s requirement.



## Long Stem

3Z special extended long stems are available as per customer`s requirement.

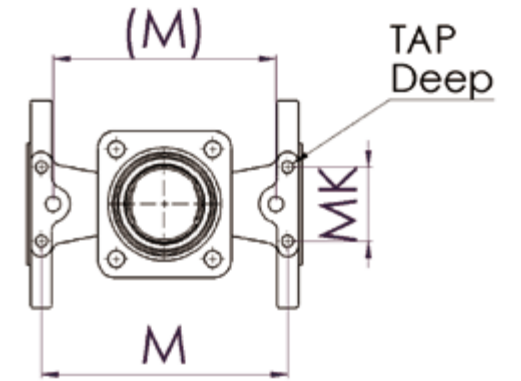


# Actuator Mounting Hole Configurations

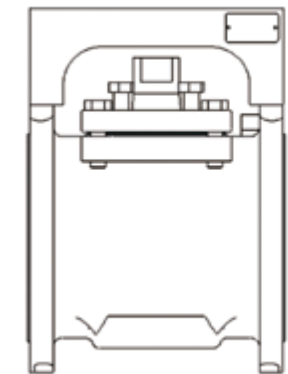
## Mounting Hole Dimensions (mm)

Class 150 2-way - Standard

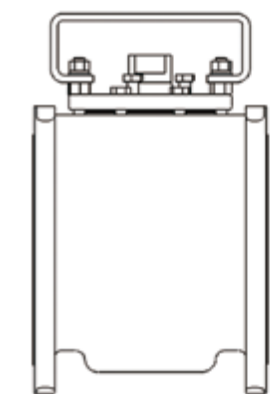
| Fig | Size | M     | MK    | NO | TAP | Deep |
|-----|------|-------|-------|----|-----|------|
| 120 | 0.5  | 92    | -     | 2  | M8  | 12   |
| 120 | 0.75 | 95.3  | -     | 2  | M8  | 12   |
| 120 | 1    | 106.5 | 44.5  | 4  | M6  | 10   |
| 120 | 1.5  | 146   | 44.5  | 4  | M8  | 12   |
| 120 | 2    | 160.3 | 57.2  | 4  | M8  | 12   |
| 120 | 2.5  | 170.5 | 88.9  | 4  | M10 | 14   |
| 120 | 3    | 181.1 | 88.9  | 4  | M10 | 14   |
| 120 | 4    | 203.2 | 101.6 | 4  | M12 | 16   |
| 120 | 6    | 239.8 | 101.6 | 4  | M12 | 16   |
| 120 | 8    | 258.8 | 152.4 | 4  | M12 | 16   |
| 120 | 10   | 293.6 | 152.4 | 4  | M12 | 16   |
| 120 | 12   | 318.3 | 152.4 | 4  | M16 | 20   |
| 120 | 14   | 340   | 170   | 4  | M16 | 16   |



2 - 4 Hole Actuator Mounting



Flange Mounting Type



Cover Mounting Type

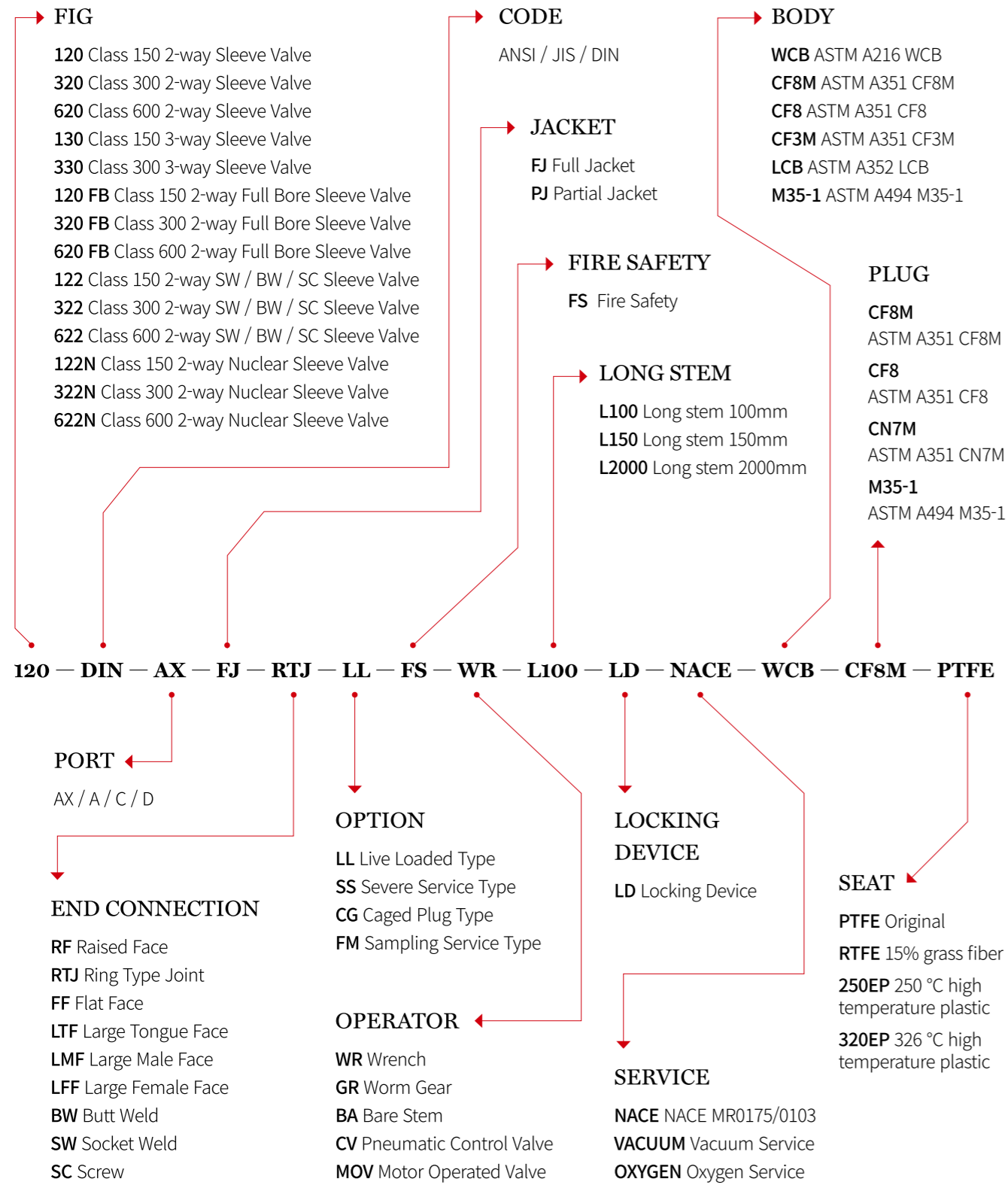
## Mounting Hole Dimensions (mm)

Class 300 2-way - Standard

| Fig | Size | M     | MK    | NO | TAP | Deep |
|-----|------|-------|-------|----|-----|------|
| 320 | 0.5  | 118   | -     | 2  | M8  | 12   |
| 320 | 0.75 | 128   | -     | 2  | M8  | 12   |
| 320 | 1    | 146.1 | 44.5  | 4  | M8  | 12   |
| 320 | 1.5  | 168.4 | 44.5  | 4  | M8  | 12   |
| 320 | 2    | 192   | 57.2  | 4  | M8  | 12   |
| 320 | 3    | 252.5 | 88.9  | 4  | M10 | 14   |
| 320 | 4    | 271.5 | 101.6 | 4  | M12 | 16   |
| 320 | 6    | 355.6 | 101.6 | 4  | M12 | 16   |
| 320 | 8    | 371.6 | 152.4 | 4  | M12 | 16   |
| 320 | 10   | 398.5 | 152.4 | 4  | M12 | 16   |
| 320 | 12   | 441.5 | 152.4 | 4  | M12 | 16   |

# How to Order

# Memo



- If additional information is required, please consult the factory when ordering.