

# 3Z



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Homepage [www.3zvalve.com](http://www.3zvalve.com)

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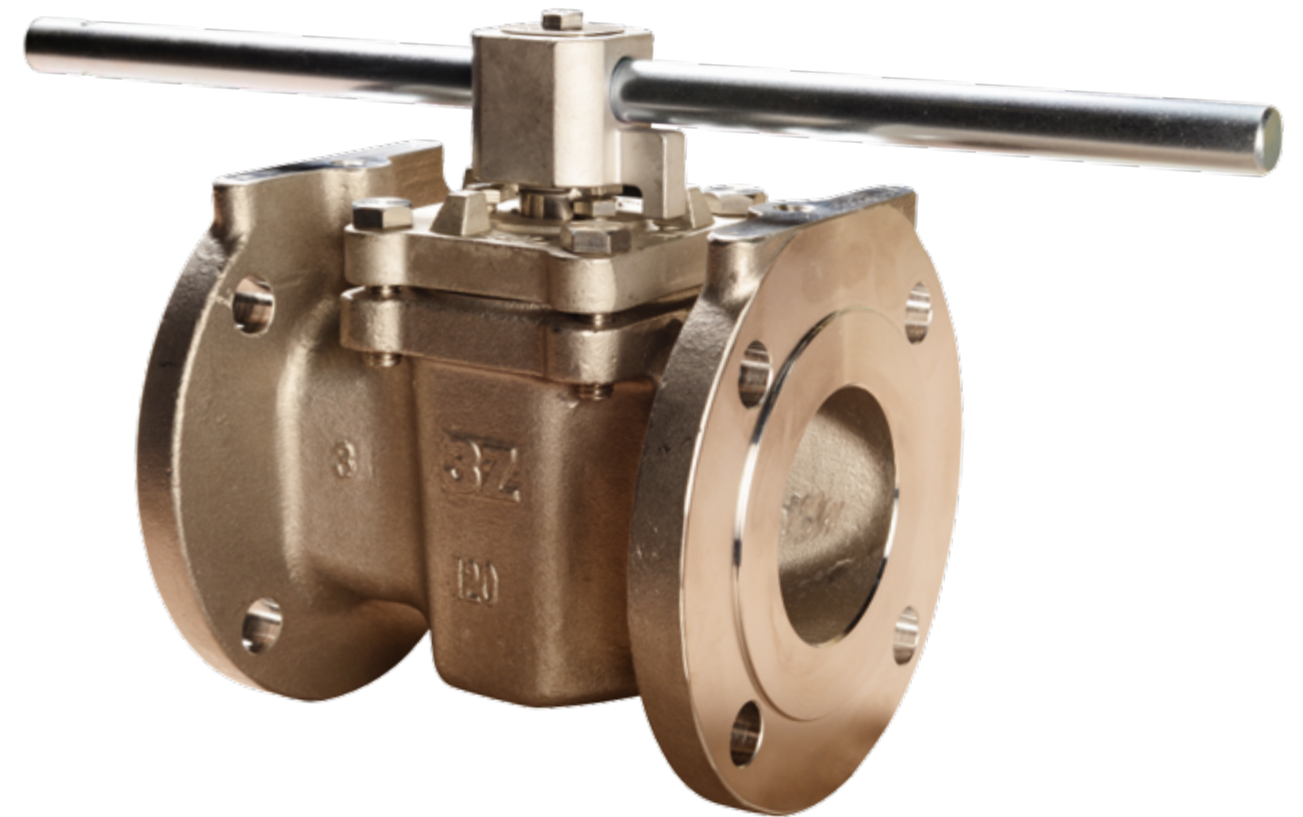
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# 3Z

## **Sleeved Plug Valves**



**Plug Valve Specialists**  
Strong Company! Good Company!

[WWW.3ZVALVE.COM](http://WWW.3ZVALVE.COM)

# Design Features

## Online Maintenance

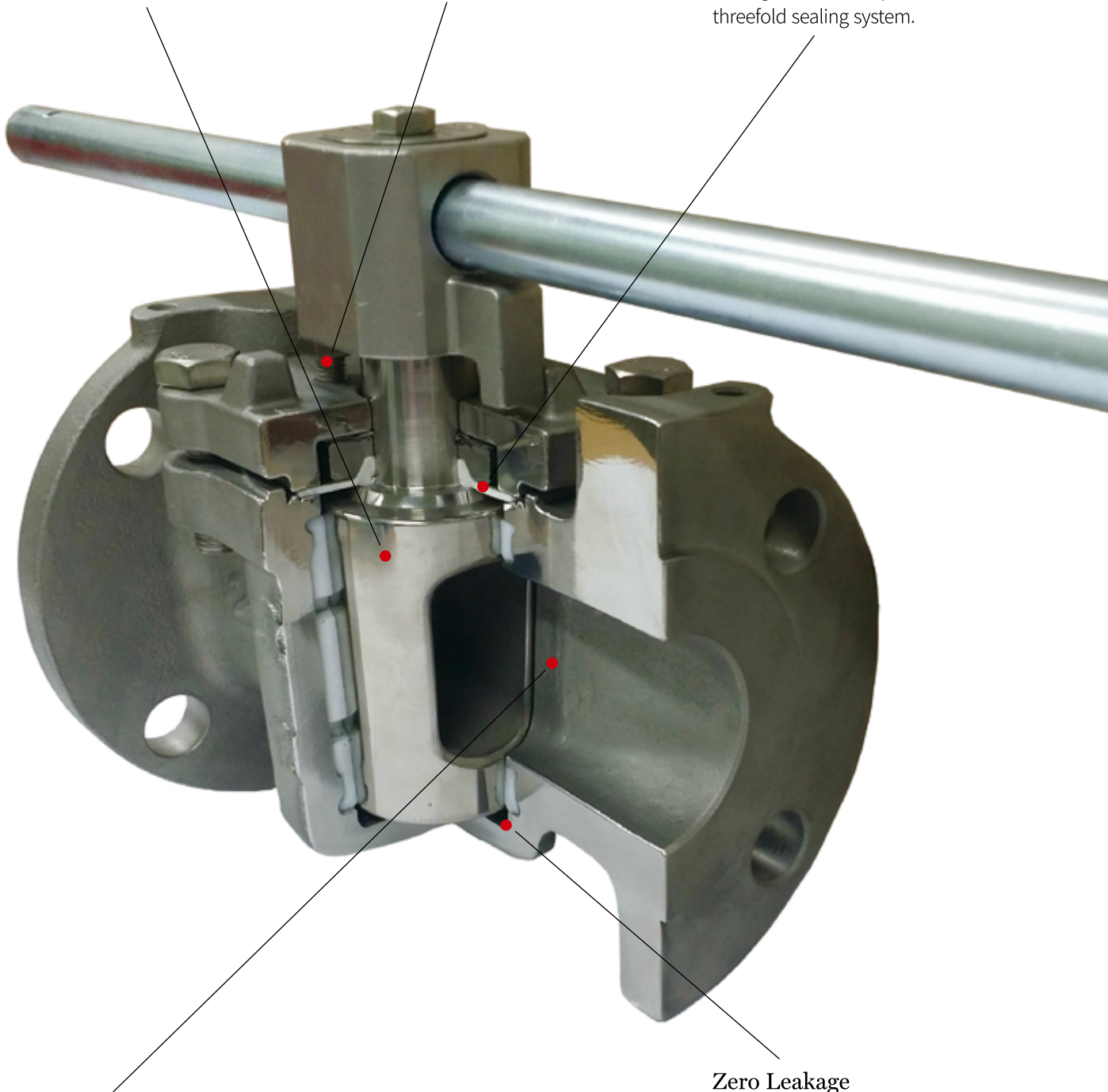
Repair is possible on the line without disassembling from the pipeline, since it is top entry type.

## 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

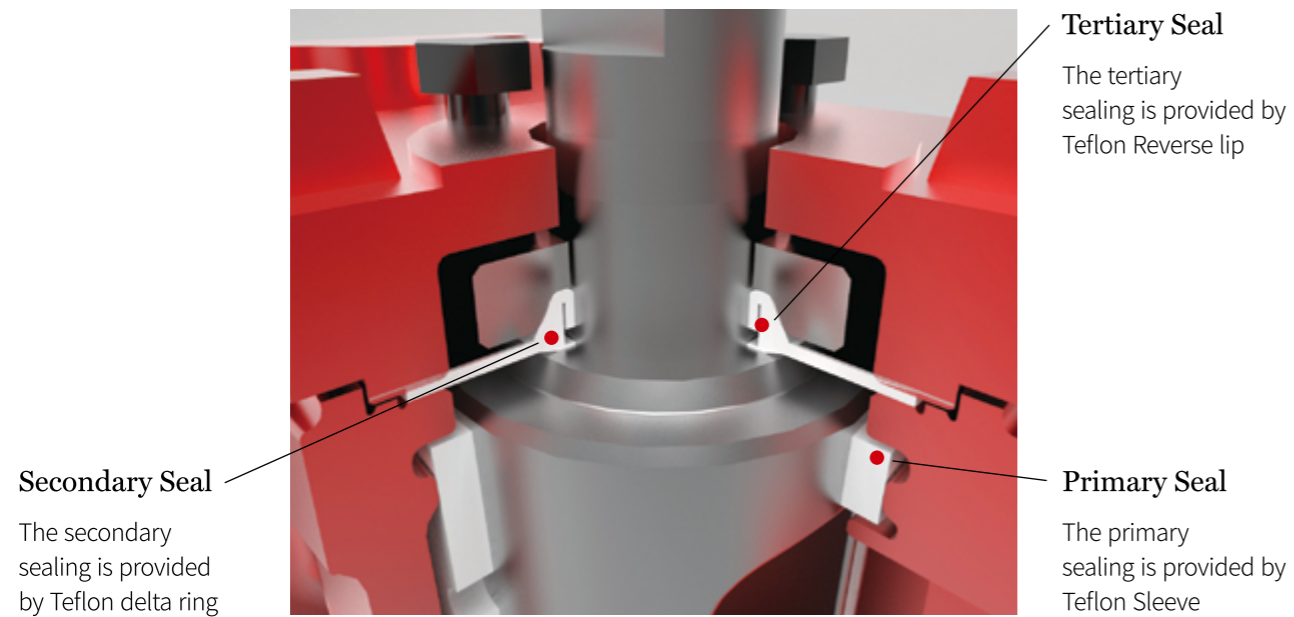
Sealing is established by circumferential surface area of Teflon sleeve & Pressure Ribs.



# Design Features

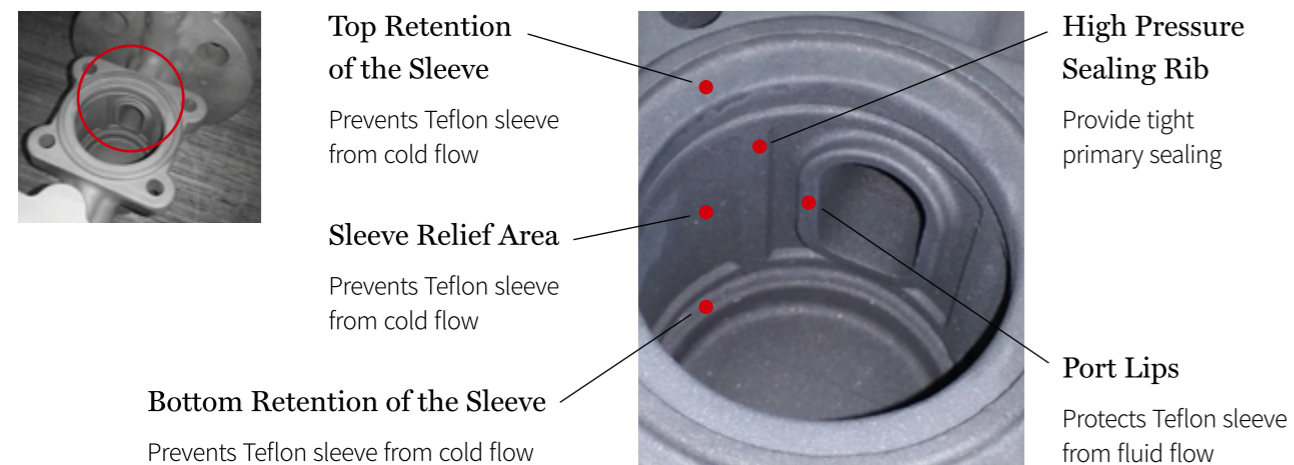
## Threefold Sealing System

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

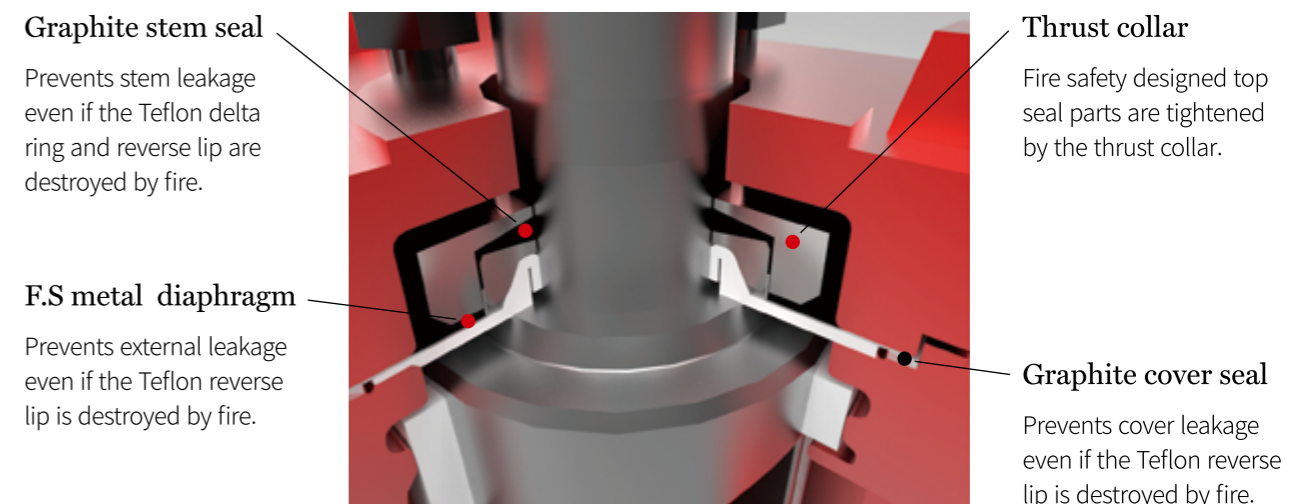
## API 607 Standards

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				

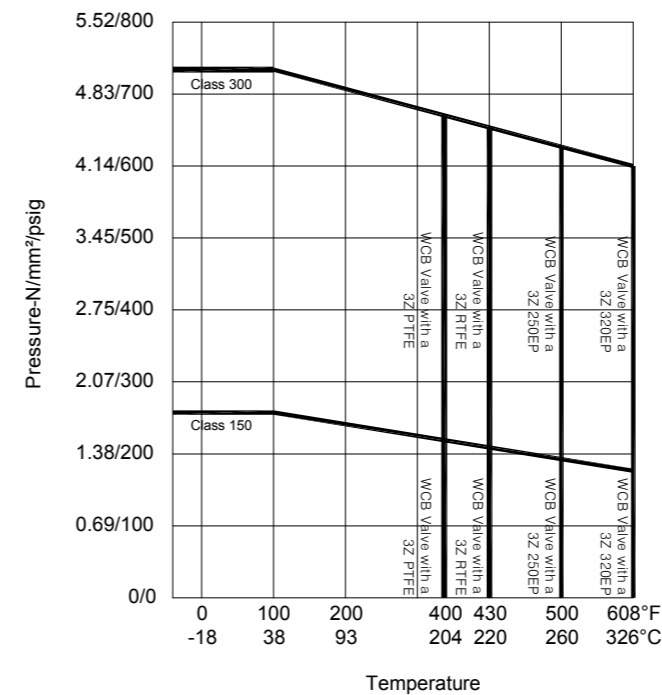
# High Temperature Service

## 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.

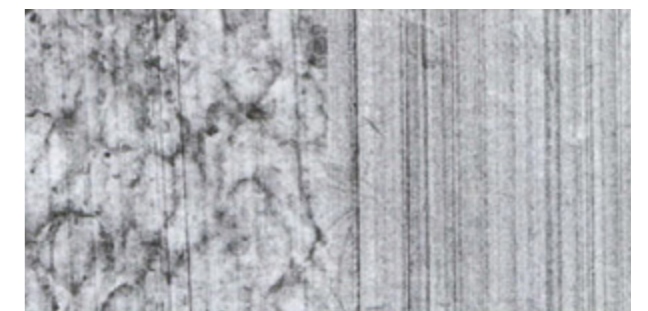


Fig. 2 Reduced Porosity

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

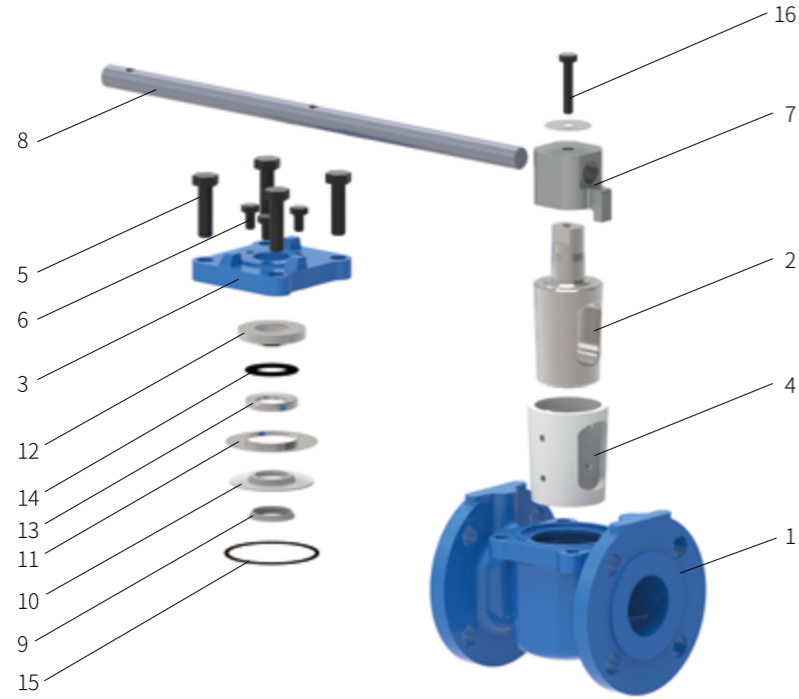
Right 3Z 250EP/320EP; the boundaries of the secondary particles have disappeared.



# 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.



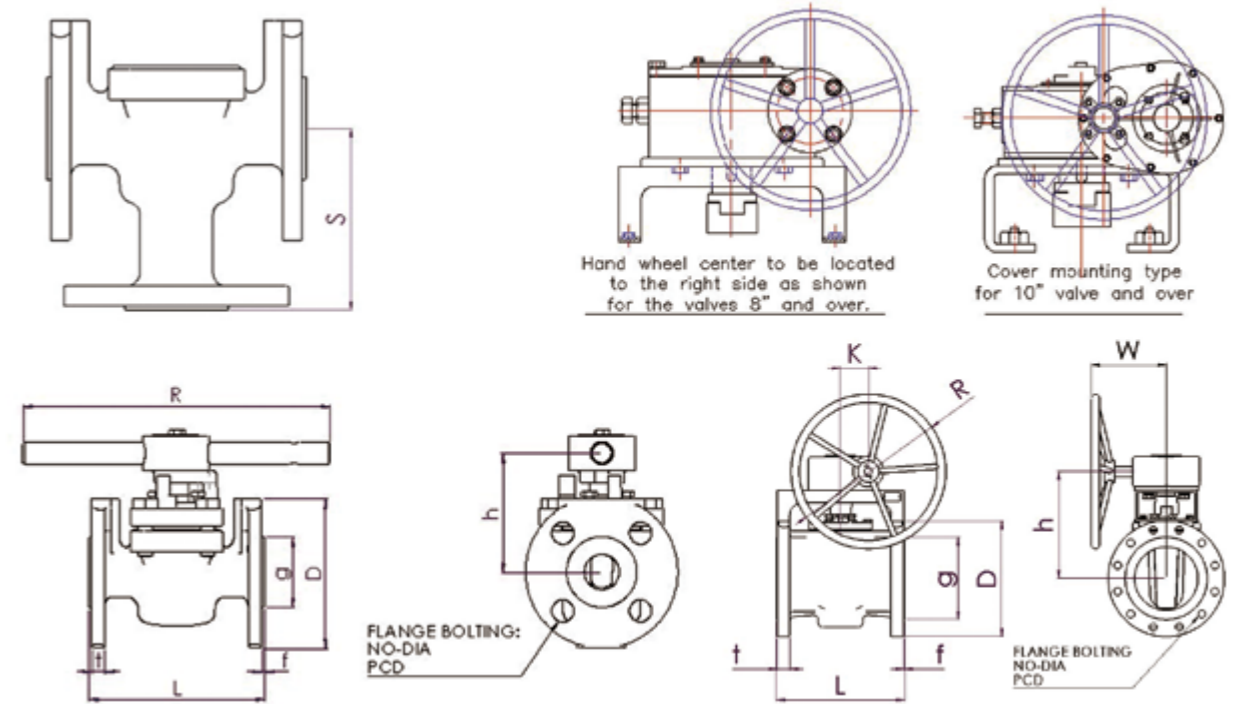
## Sample Construction of Material

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 (3way)	Weight (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)

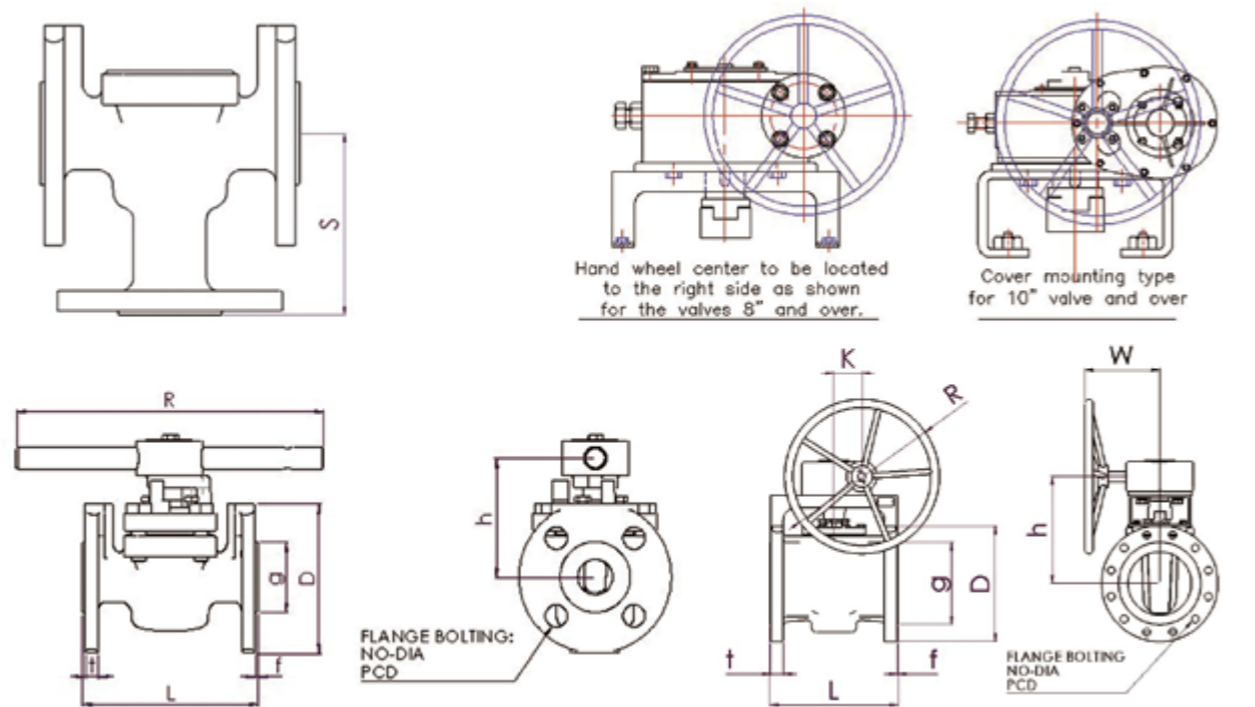
\*\* 2 top holes in flanges are tapped for 7/8-9UNC (Stud Bolt Length 95mm & 105mm)

\*\*\* 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 (3way)	Weight (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

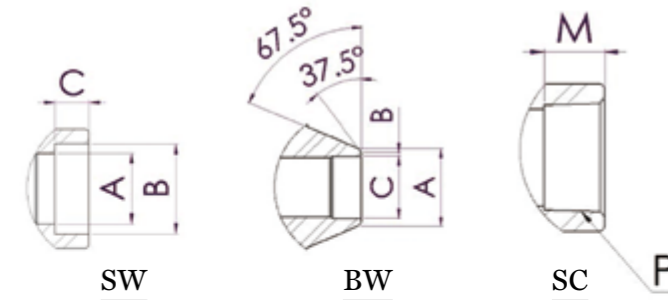
- 0.5"~ 4"(Wrench Operated) / 6"~24"(Gear Operated)

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

# SW, BW, SC Type Dimensions

Figure No.

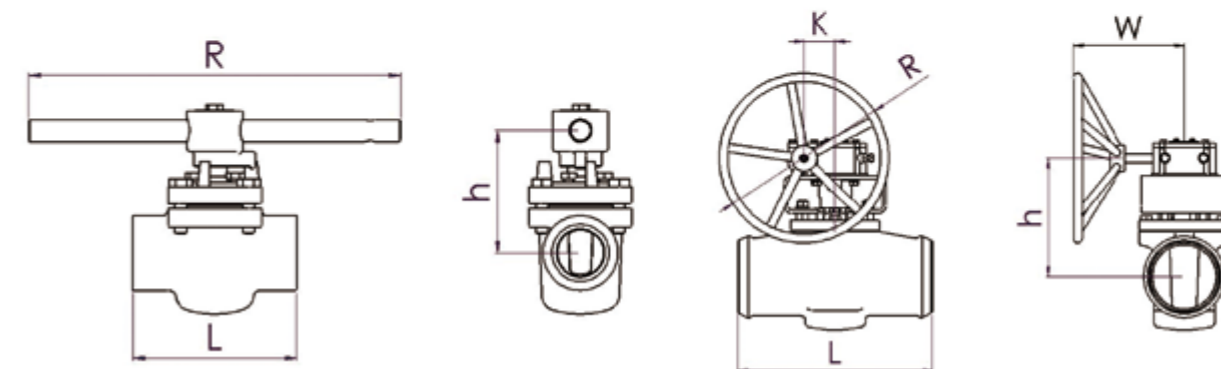
122S SW - Class 150 / Size 0.5" - 2" / Socket weld  
 322S SW - Class 300 / Size 0.5" - 2" / Socket weld  
 122S SC - Class 150 / Size 0.5" - 2" / Screw type  
 322S SC - Class 300 / Size 0.5" - 2" / Screw type  
 122 BW - Class 150 / Size 0.5" - 16" / Butt weld  
 322 BW - Class 300 / Size 0.5" - 16"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



SW

BW

SC



Unit : mm

Type	Fig	Size	L	h	R	K	W	A	B	C	M	P	Weight (kg)
Socket Weld/ Screw	122S /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 /322	0.5	165	115	150	-	-	21.3	1.6	15.8	-	Standard : 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)

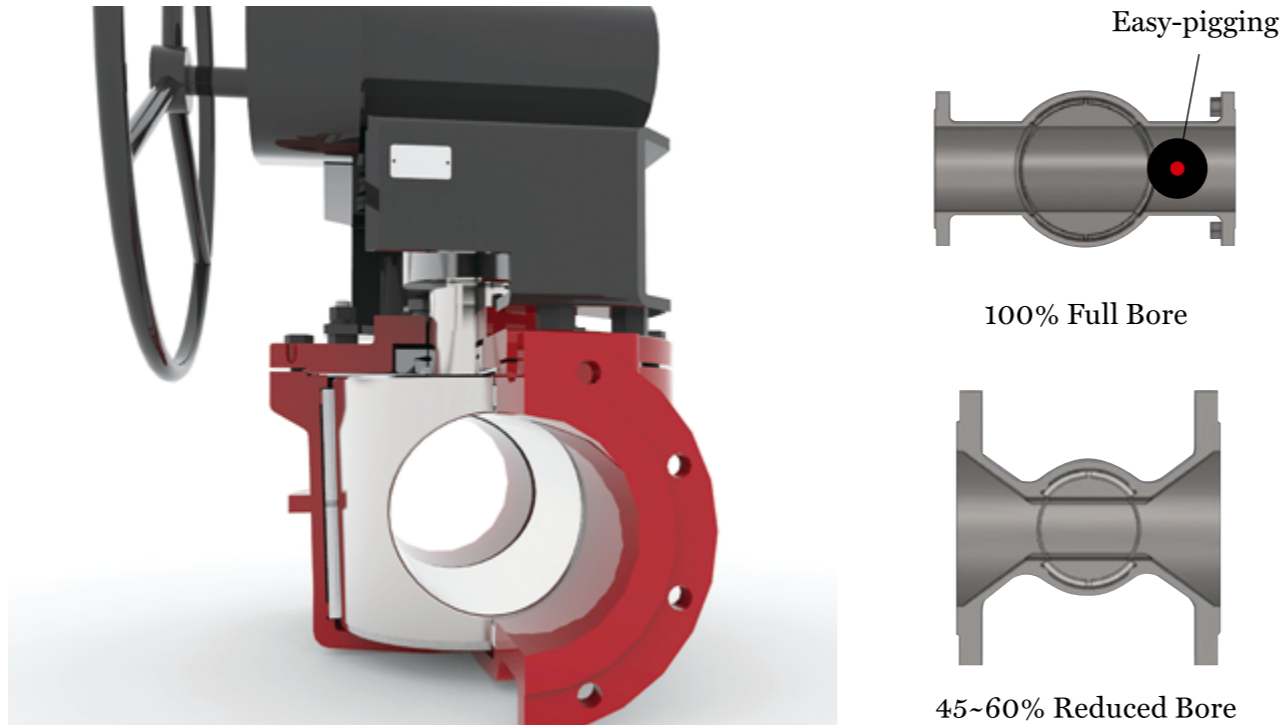
- If additional classes and sizes are required, please consult the factory when ordering.



# Full Port Valves

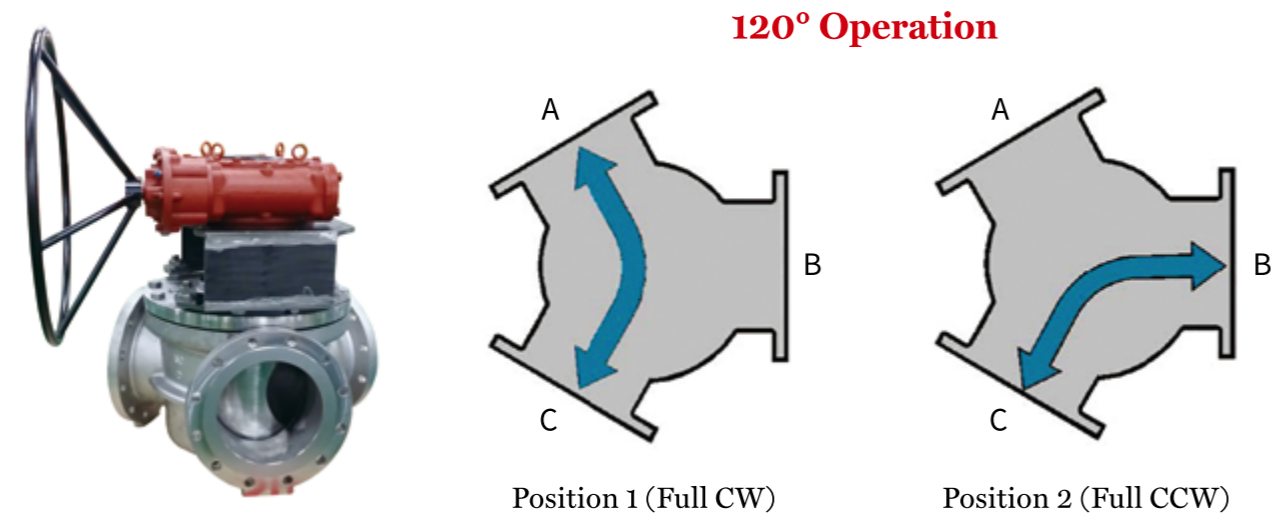
## Feature

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.



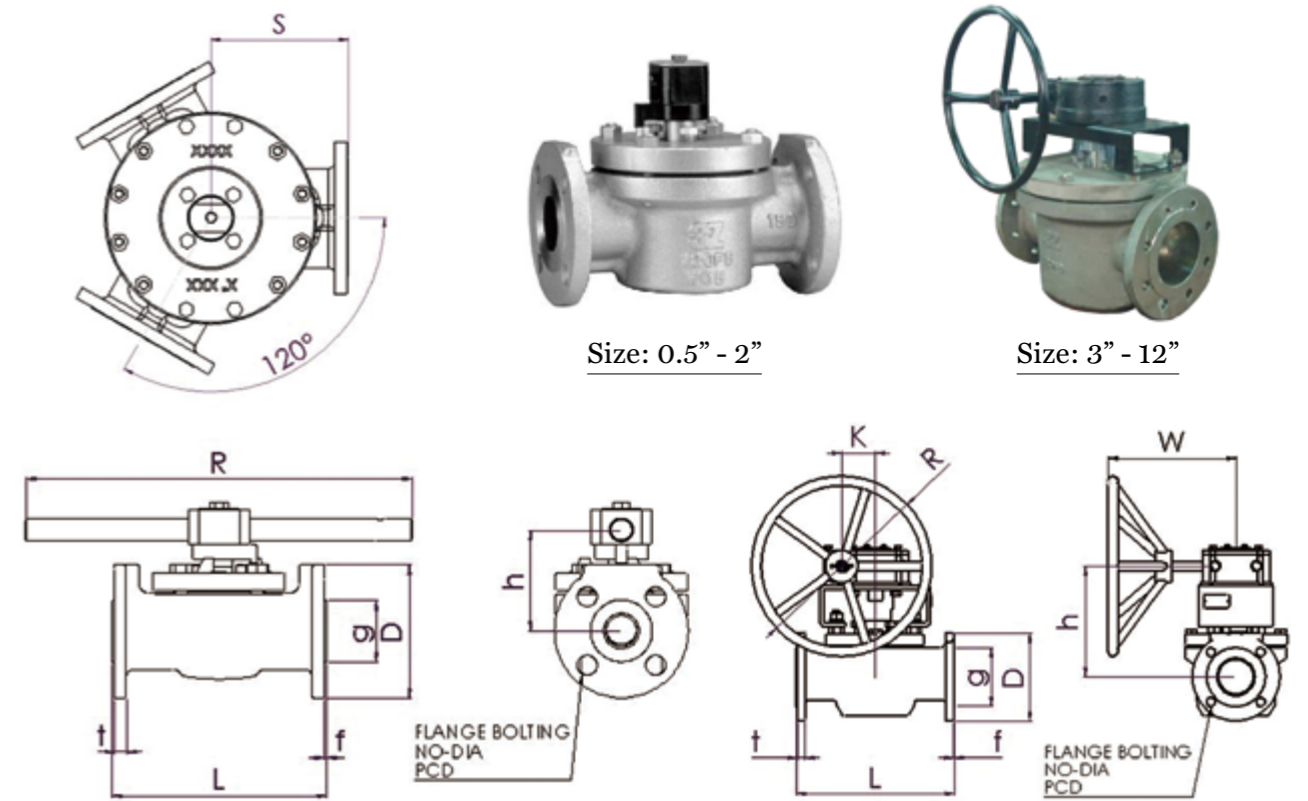
## 120° 3 - way Full Port

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



# Full Port Type Dimensions - Class 150

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



Unit : mm

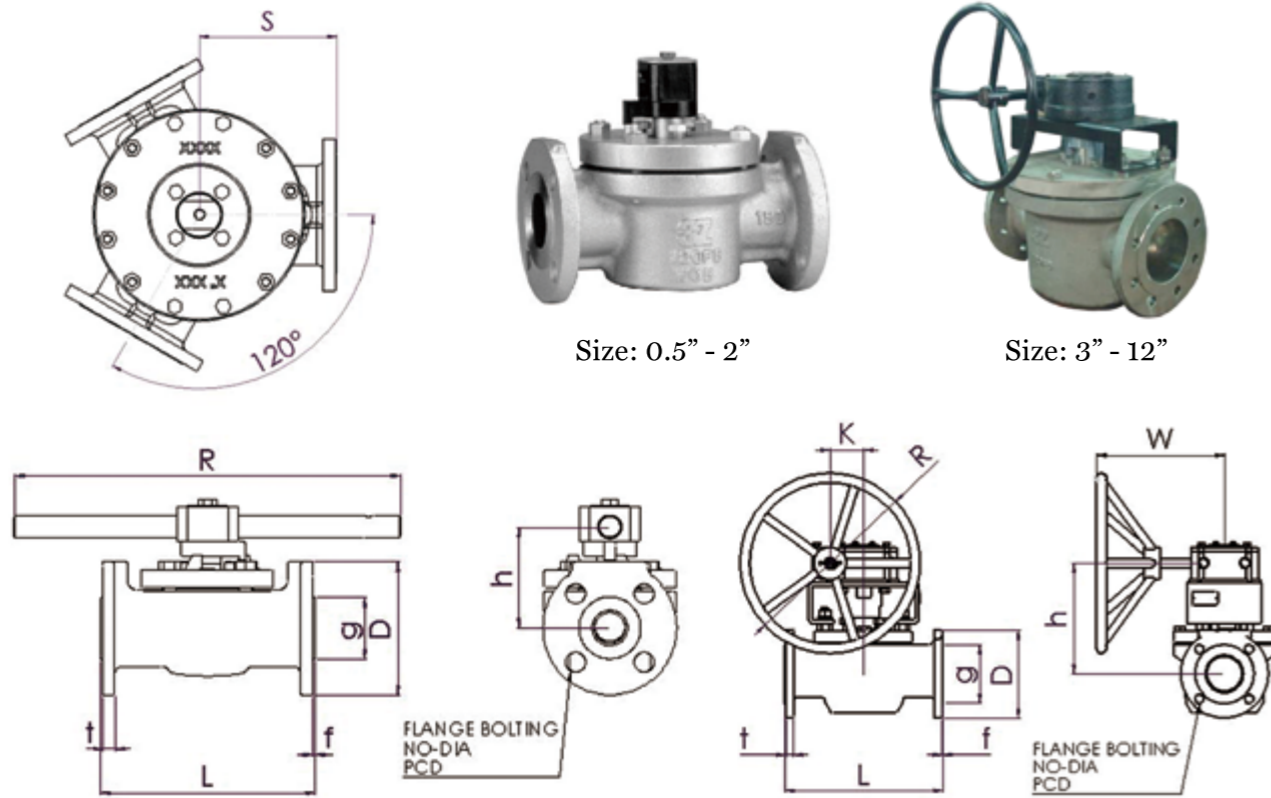
Size	L	D	PCD	NO	DIA	g	t	f	h	R	K	W	S (3way)	Weight (kg)
0.5	108	90	60.3	4	16	34.9	8	2	115	150	-	-	-	3
0.75	152.4	100	69.9	4	16	42.9	8.9	2	100	222	-	-	-	5
1	176	110	79.4	4	16	50.8	9.6	2	90	318	-	-	88	8
1.5	222	125	98.4	4	16	73	12.7	2	100	458	-	-	111	13
2	267	150	120.7	4	19	92.1	14.3	2	140	746	-	-	134	26
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



Size: 0.5" - 2"

Size: 3" - 12"

Unit : mm

Size	L	D	PCD	NO	DIA	g	t	f	h	R	K	W	S (3way)	Weight (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.



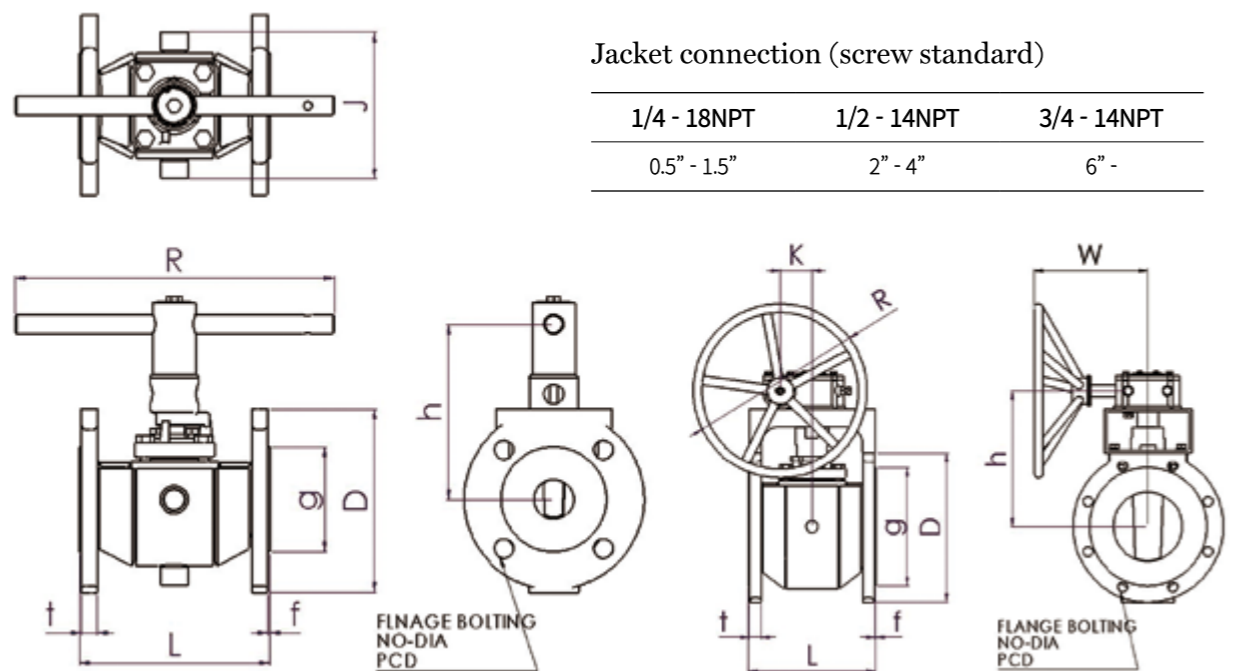
## 3Z steam jacketed plug valves

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 (flange x body)	L	D	PCD	NO	DIA	g	t	f	h	R	K	W	J (SC)	J (FL)	Weight (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)

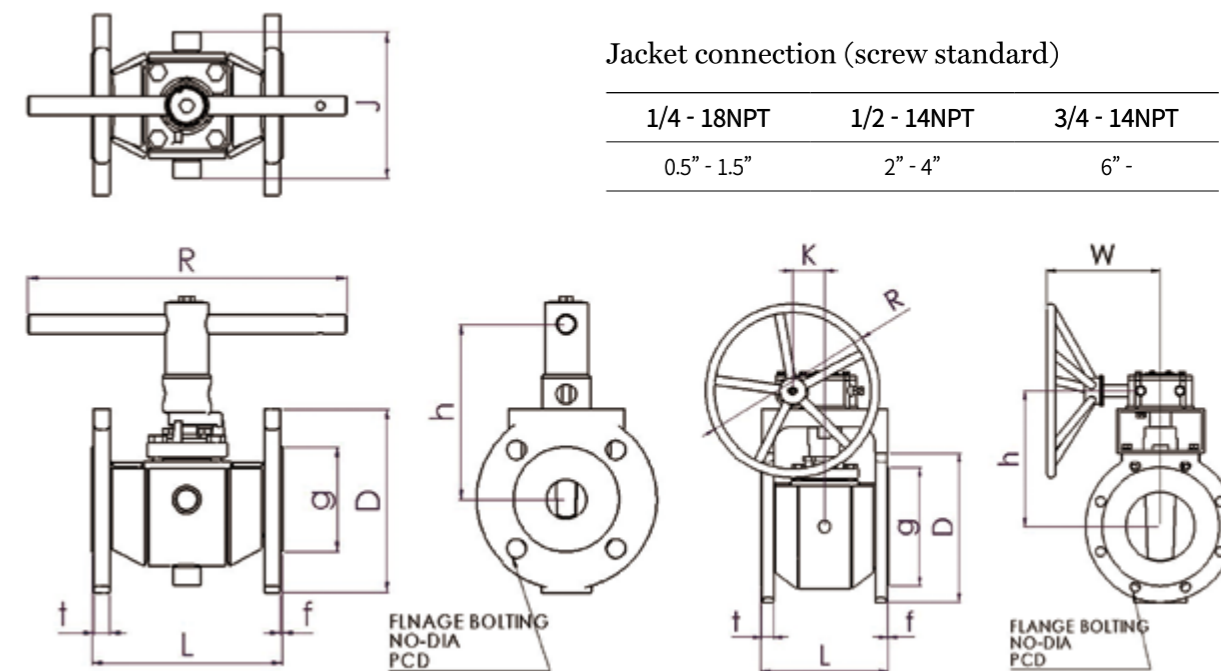
\* 2 top holes in flanges are tapped for 7/8-9UNC (Stud Bolt Length 110mm)

\*\* 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 (flange x body)	L	D	PCD	NO	DIA	g	t	f	h	R	K	W	J (SC)	J (FL)	Weight (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	1,143	1,090	997.0	28	48	857	90.5	2	745	900	280	660	750	860	2,100

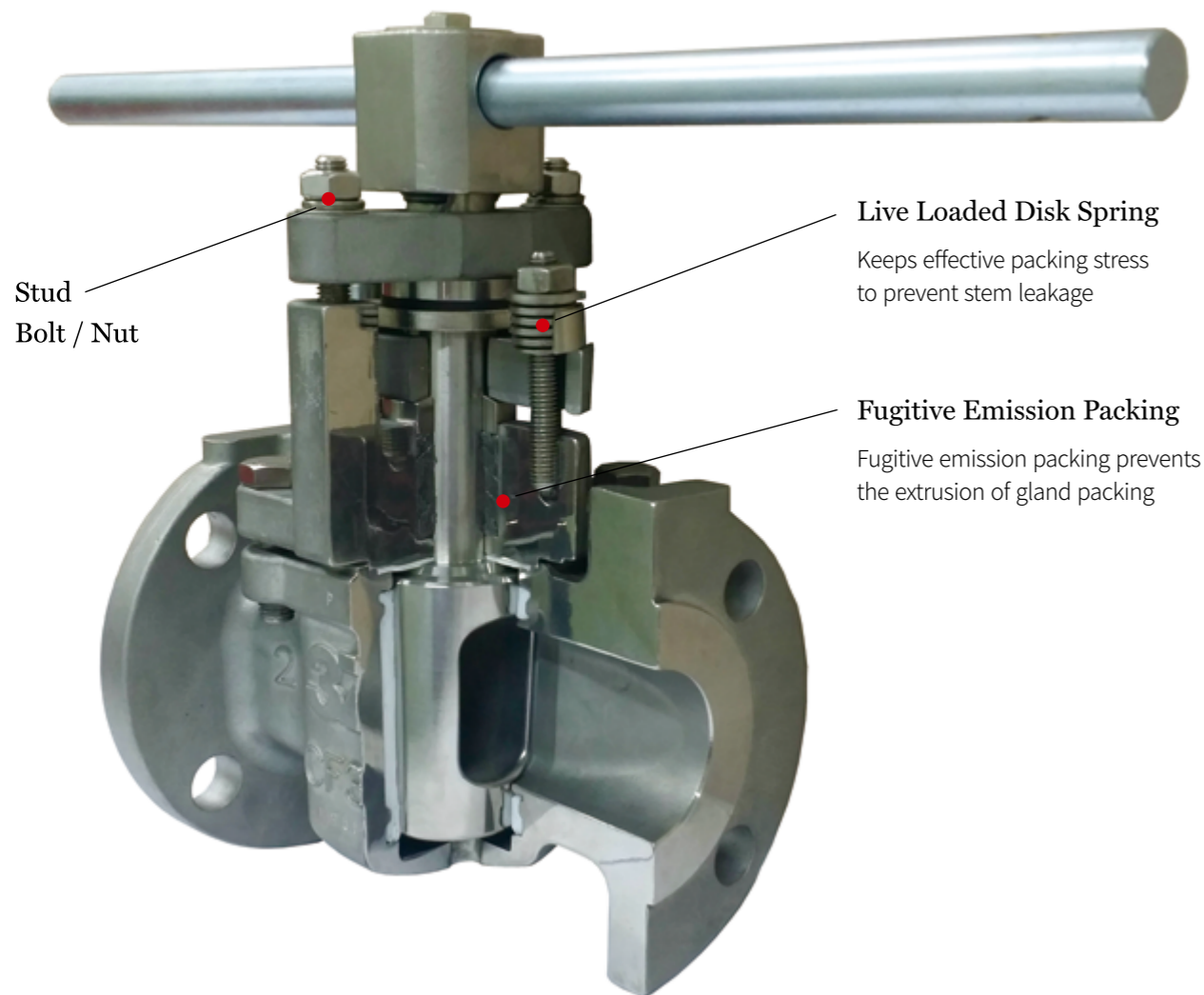
- 0.5"~ 4"(Wrench Operated) / 6"~24"(Gear Operated)

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

# Live Loaded Valves

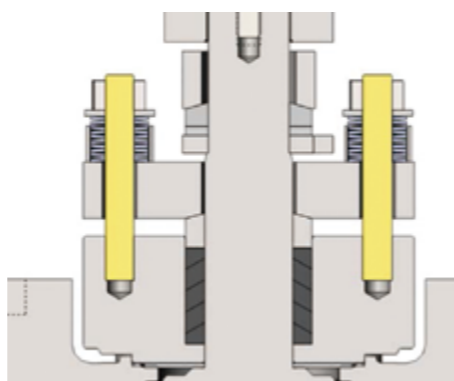
## Feature of Live loaded plug valves

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)



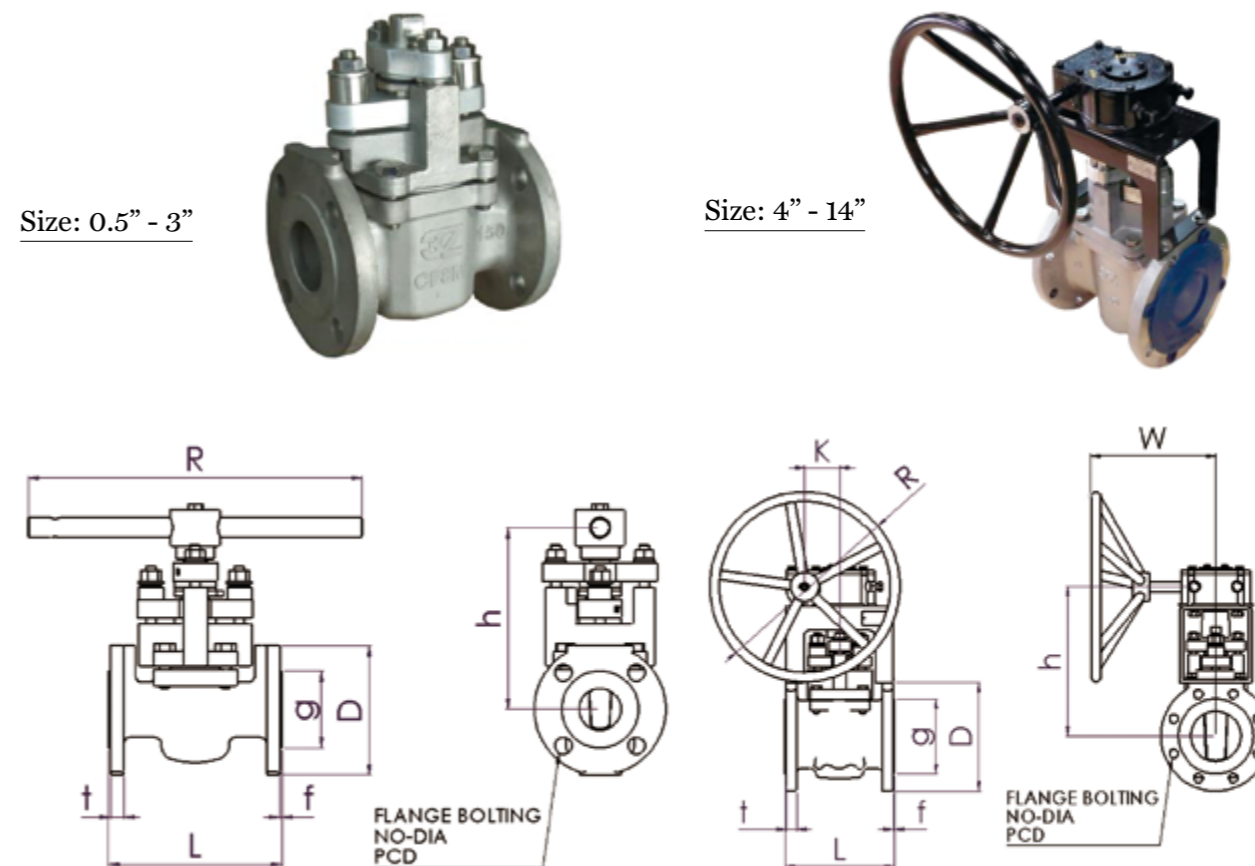
## Live loaded disk spring

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)

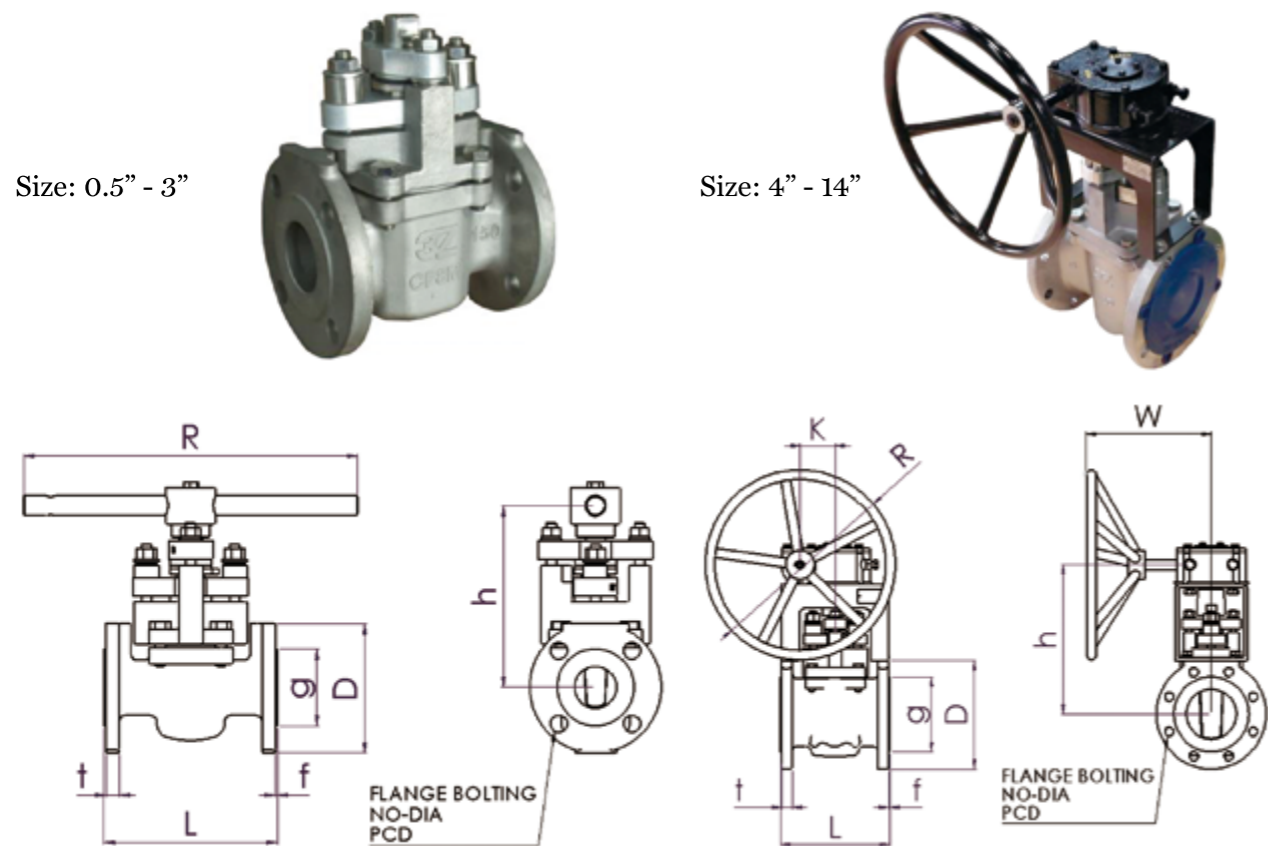
\*\*\* 2 top holes in flanges are tapped for 1-8UNC (Stud Bolt Length 110mm)

- 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.

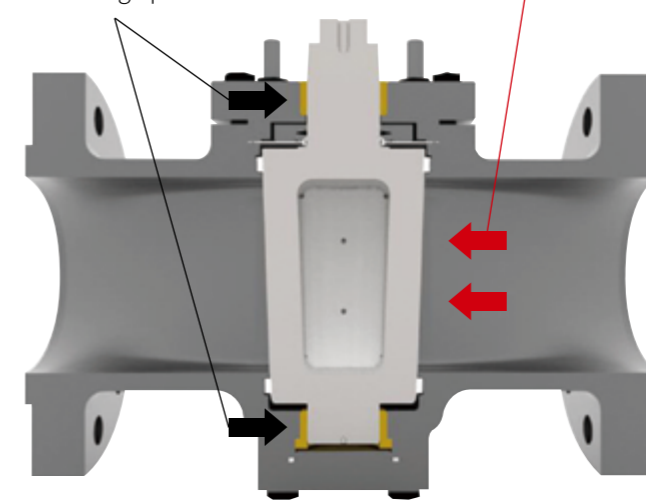


### Trunnion Stem

Keeps operating stably against Class 600 high pressure

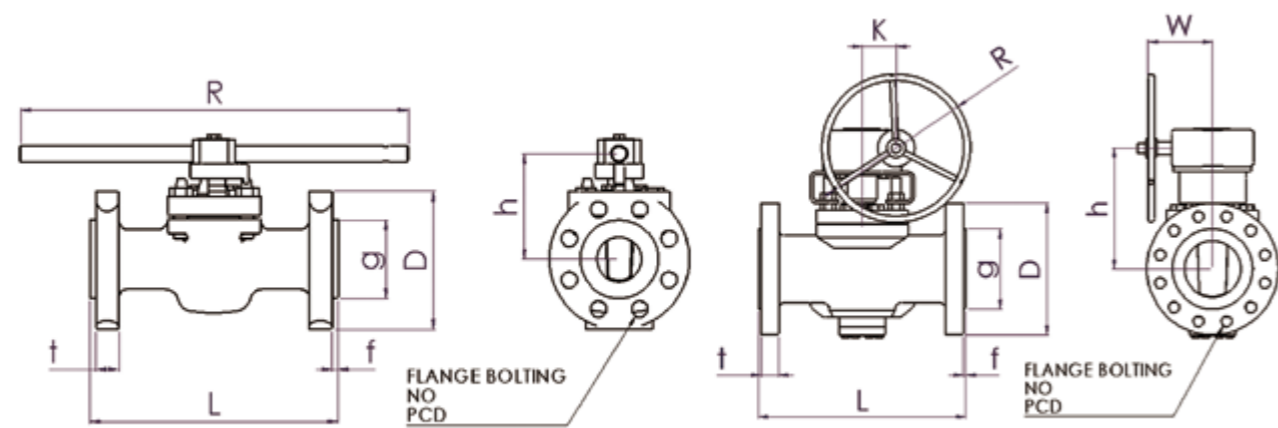
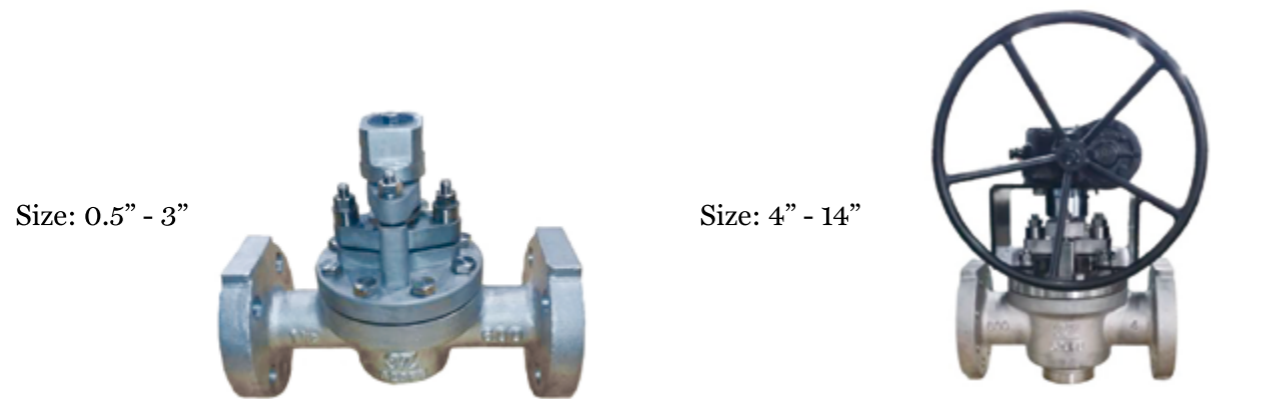
### High Pressure

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

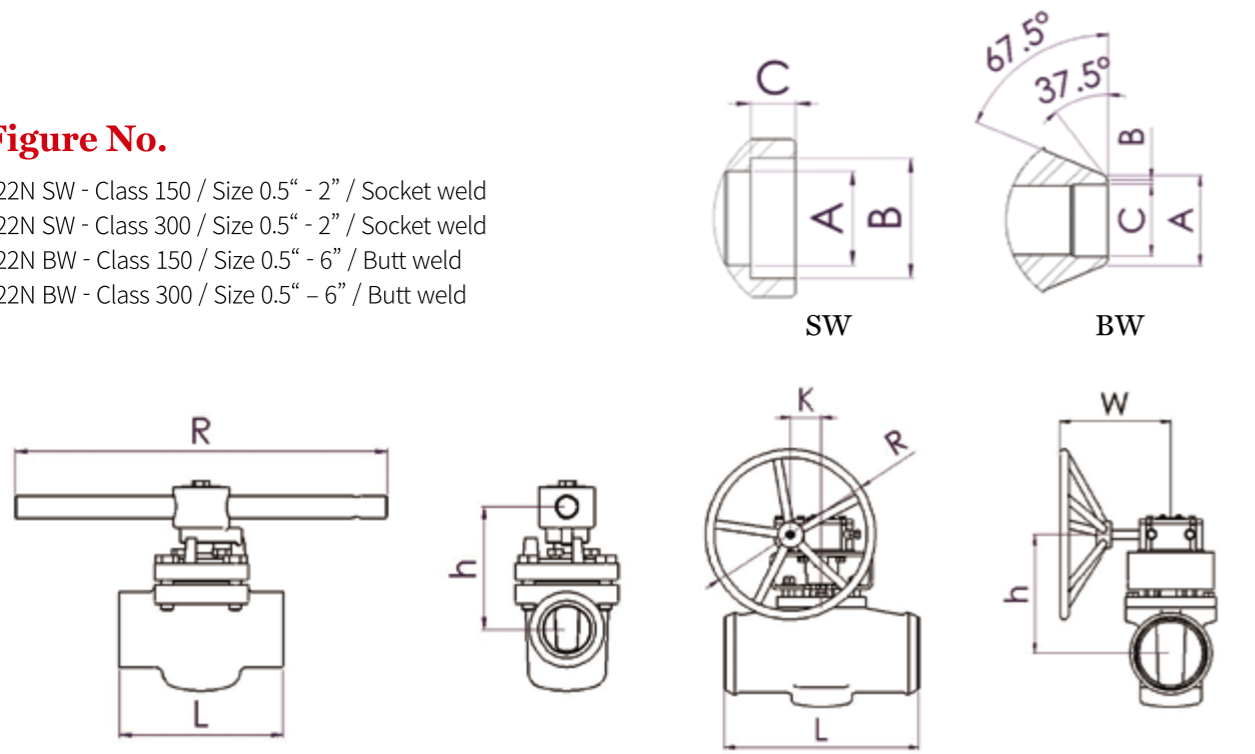
	<p><b>3Z FIG 322N.BW BUTT WELD END NUCLEAR PLUG VALVE</b></p> <ul style="list-style-type: none"> <li>· 2-way</li> <li>· Class 150 / 300</li> <li>· 0.5" - 6"</li> </ul>		<p><b>3Z FIG 322N.P PUP WELDED NUCLEAR PLUG VALVE</b></p> <ul style="list-style-type: none"> <li>· 2-way</li> <li>· Class 150 / 300</li> <li>· 0.5" - 6"</li> <li>· Pup Welded</li> </ul>
	<p><b>3Z FIG 322N.SW SOCKET WELD END NUCLEAR PLUG VALVE</b></p> <ul style="list-style-type: none"> <li>· 2-way</li> <li>· Class 150/300</li> <li>· 0.5" - 2"</li> </ul>		<p><b>3Z FIG 332N BUTT WELD END NUCLEAR PLUG VALVE</b></p> <ul style="list-style-type: none"> <li>· 3-way</li> <li>· Class 150 / 300</li> <li>· 0.5" - 6"</li> </ul>
	<p><b>3Z FIG 322N.CV PNEUMATIC NUCLEAR CONTROL PLUG VALVE</b></p> <p>Double Acting Type</p> <ul style="list-style-type: none"> <li>· 2-way</li> <li>· Class 150 / 300</li> <li>· 0.5" - 6"</li> </ul>		<p><b>3Z FIG 322N.CV PNEUMATIC NUCLEAR CONTROL PLUG VALVE</b></p> <ul style="list-style-type: none"> <li>· Spring Return Type</li> <li>· 2-way</li> <li>· Class 150 / 300</li> <li>· 0.5" - 6"</li> </ul>



# 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 (3way)	Weight (kg)
150 / 300	BW (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	80	222	-	-	33.4	1.6	26.6	108	5
			G	165	155	200	41	161	33.4	1.6	26.6	108	10
		1	W	190	90	318	-	-	48.3	1.6	40.9	111	7
			G	190	110	458	-	-	60.3	1.6	52.5	121	13
		1.5	W	267	110	458	-	-	60.3	1.6	52.5	121	16
			G	267	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	305	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	330	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	356	223	400	66.7	280	114.3	1.6	102.3	190.5	49
		4	W	457	150	746	-	-	114.3	1.6	102.3	190.5	32
			G	457	223	400	66.7	280	114.3	1.6	102.3	190.5	49
		6	W	457	310	500	91.5	28.5	168.3	1.6	154.1	254	75
			G	457	310	500	91.5	28.5	168.3	1.6	154.1	254	75
150 / 300	SW (#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	165	135	200	41	161	21	27.4	12.5	99	7
		1	W	165	80	222	-	-	26.7	34.1	12.5	108	5
			G	165	155	200	41	161	26.7	34.1	12.5	108	10
		1.5	W	190	90	318	-	-	40.9	49.0	12.5	111	7
			G	190	110	458	-	-	52.5	61.4	16	121	14
		2	W	267	110	458	-	-	52.5	61.4	16	121	14
			G	267	205	300	63	245.5	52.5	61.4	16	121	17

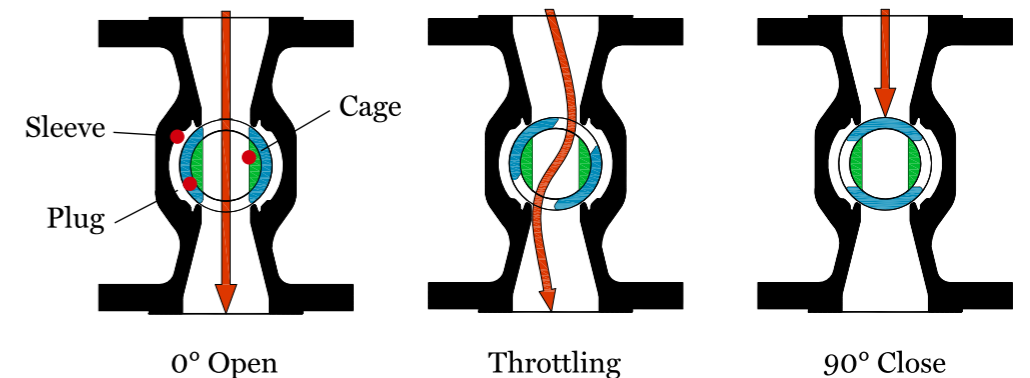
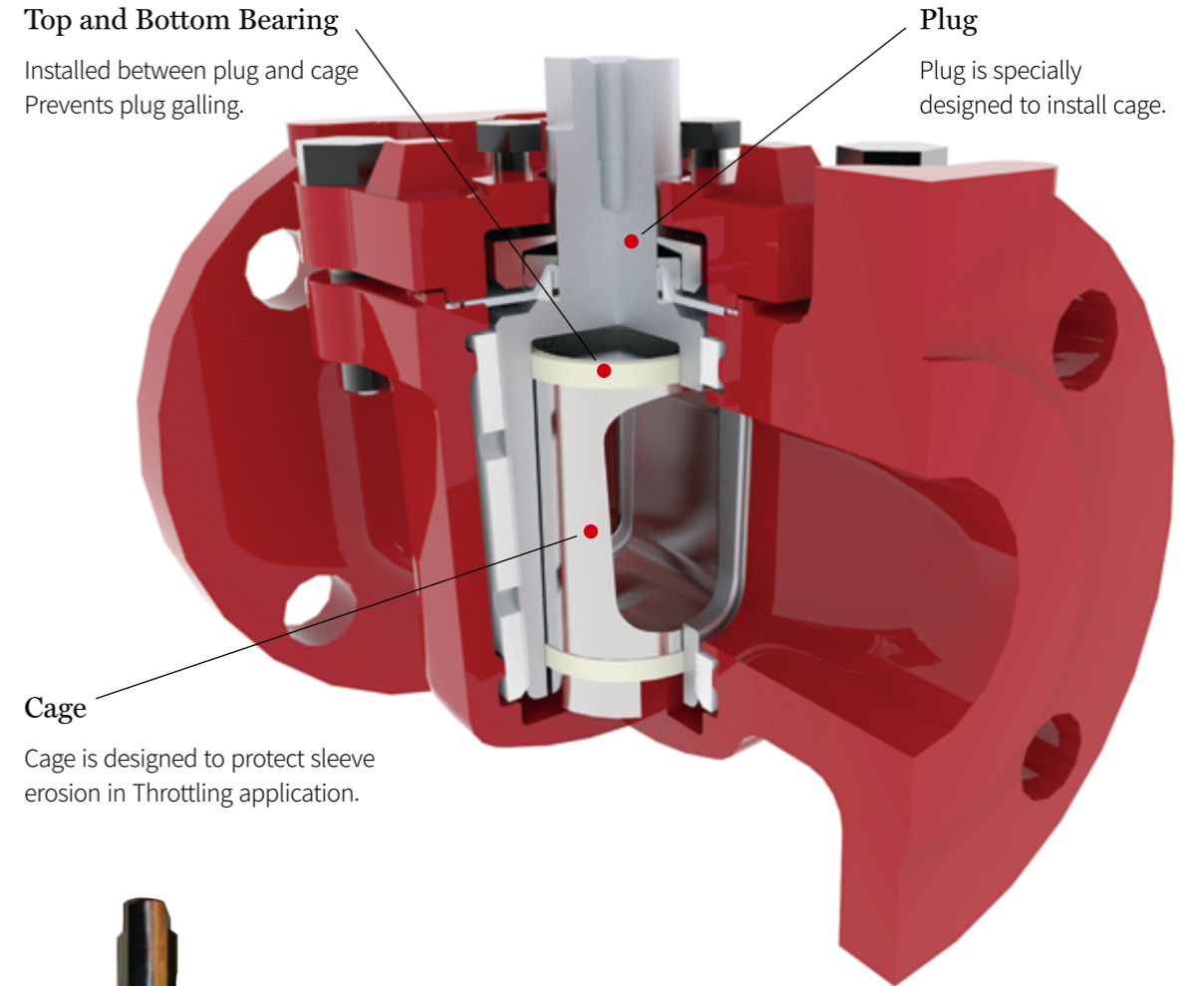
- OP. : W(Wrench) / G(Gear)

- 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

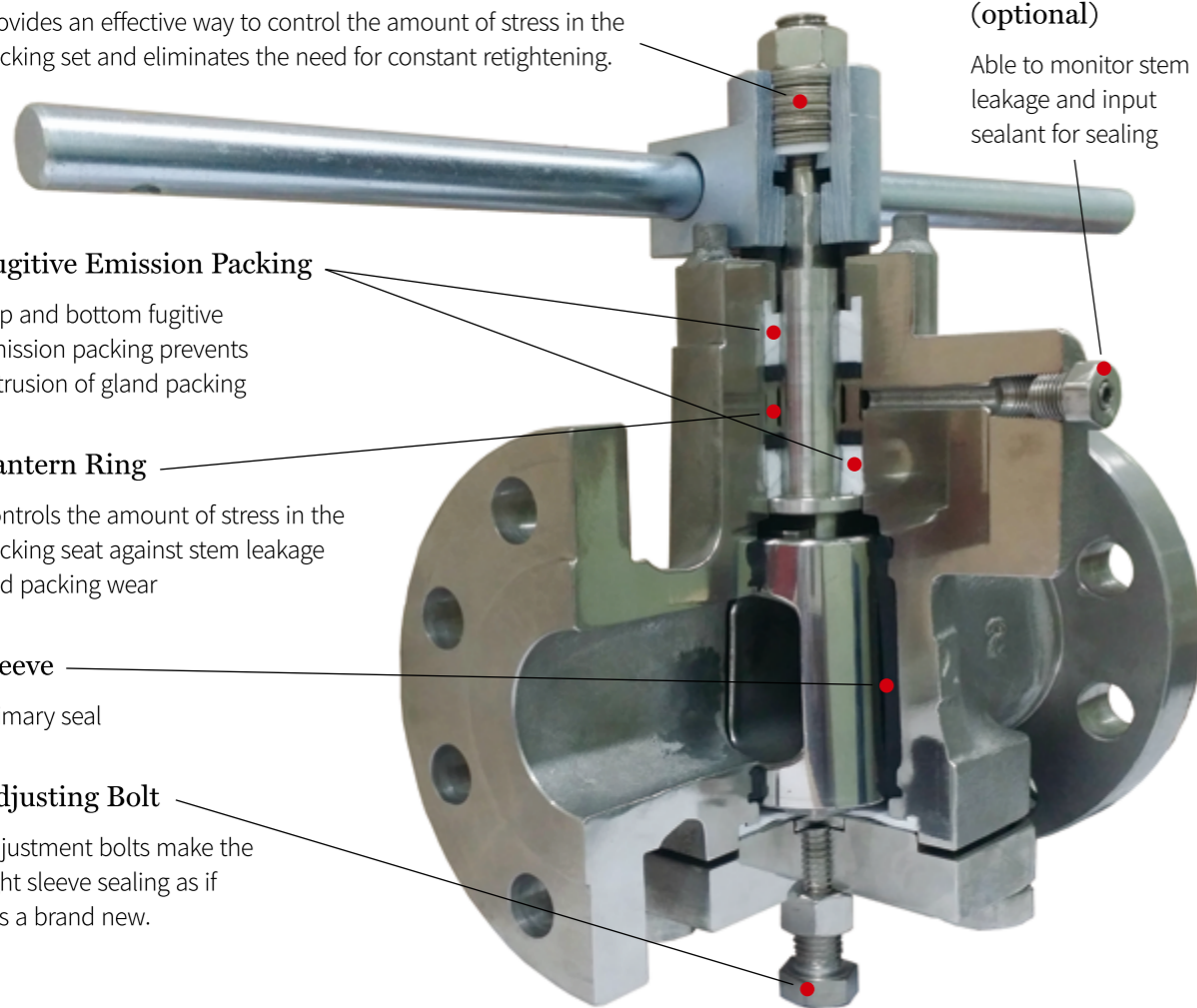
Controls the amount of stress in the packing seat against stem leakage and packing wear

### 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"



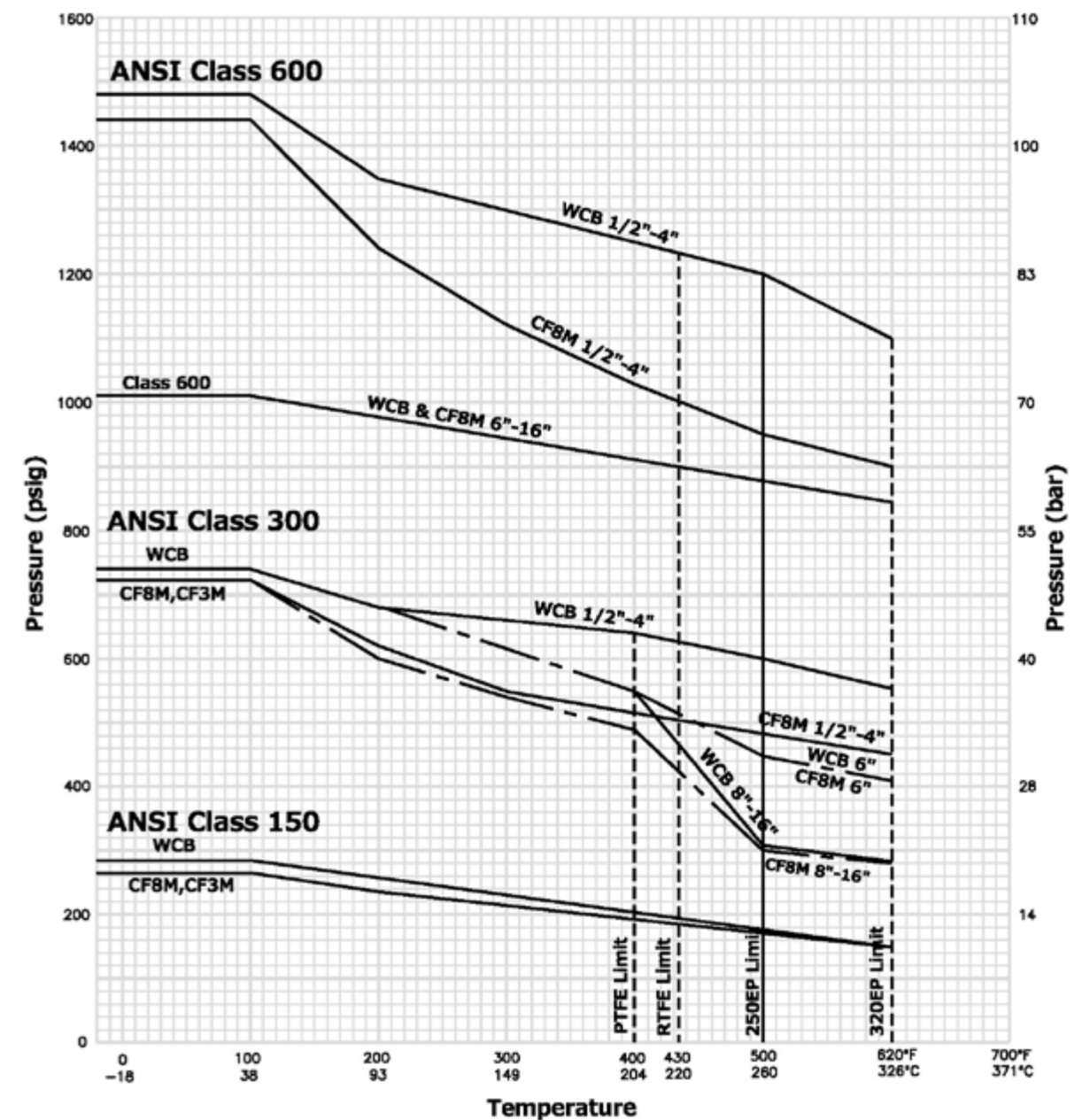
# Pressure-temperature Ratings

## 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)

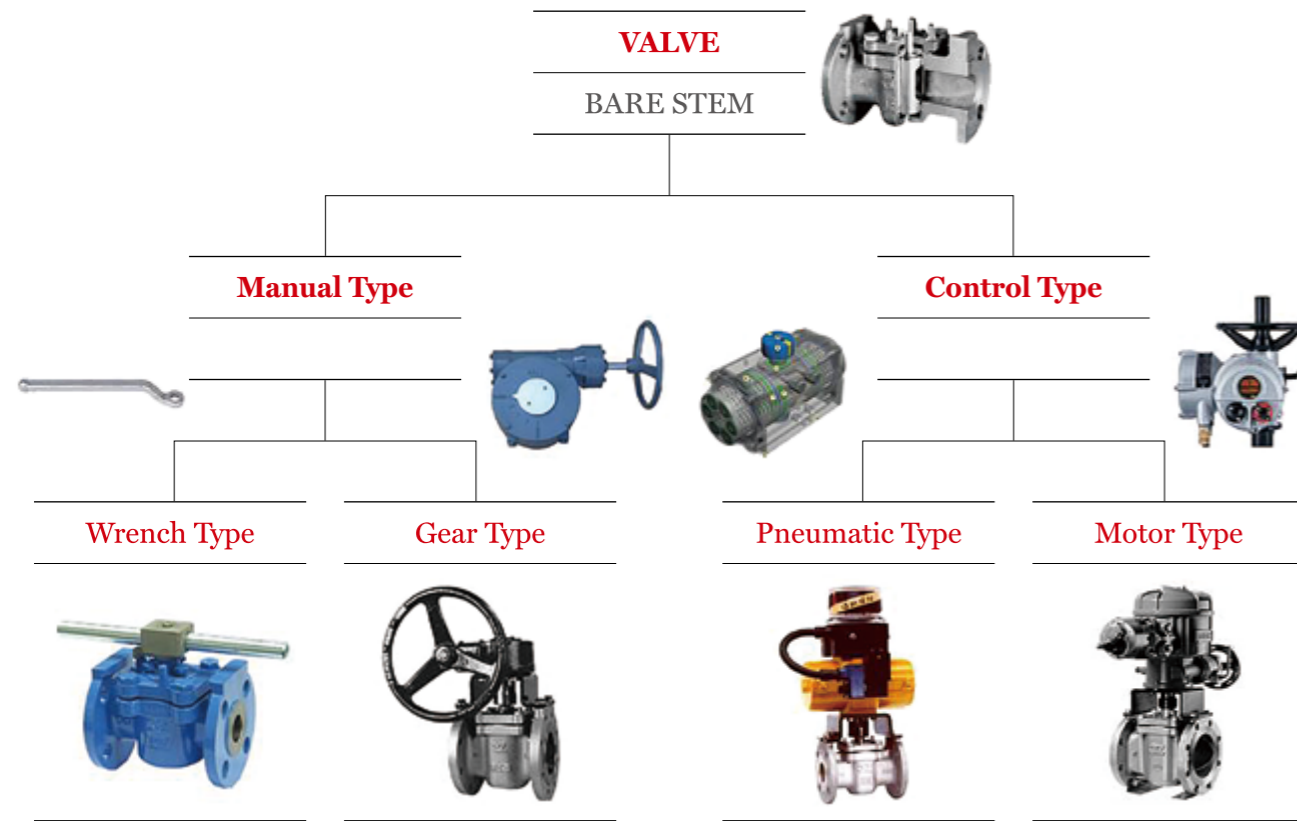
Class 150 / PTFE Sleeve  
2-way - Live Loaded Type

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.

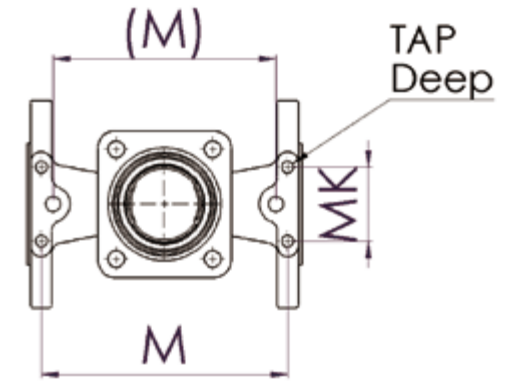


# Actuator Mounting Hole Configurations

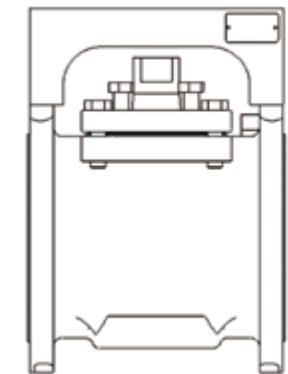
## Mounting Hole Dimensions (mm)

Class 150 2-way - Standard

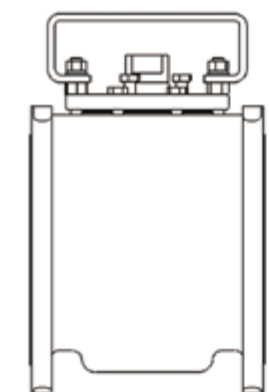
Fig	Size	M	MK	NO	TAP	Deep
120	0.5	92	-	2	M8	12
120	0.75	95.3	-	2	M8	12
120	1	106.5	44.5	4	M6	10
120	1.5	146	44.5	4	M8	12
120	2	160.3	57.2	4	M8	12
120	2.5	170.5	88.9	4	M10	14
120	3	181.1	88.9	4	M10	14
120	4	203.2	101.6	4	M12	16
120	6	239.8	101.6	4	M12	16
120	8	258.8	152.4	4	M12	16
120	10	293.6	152.4	4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

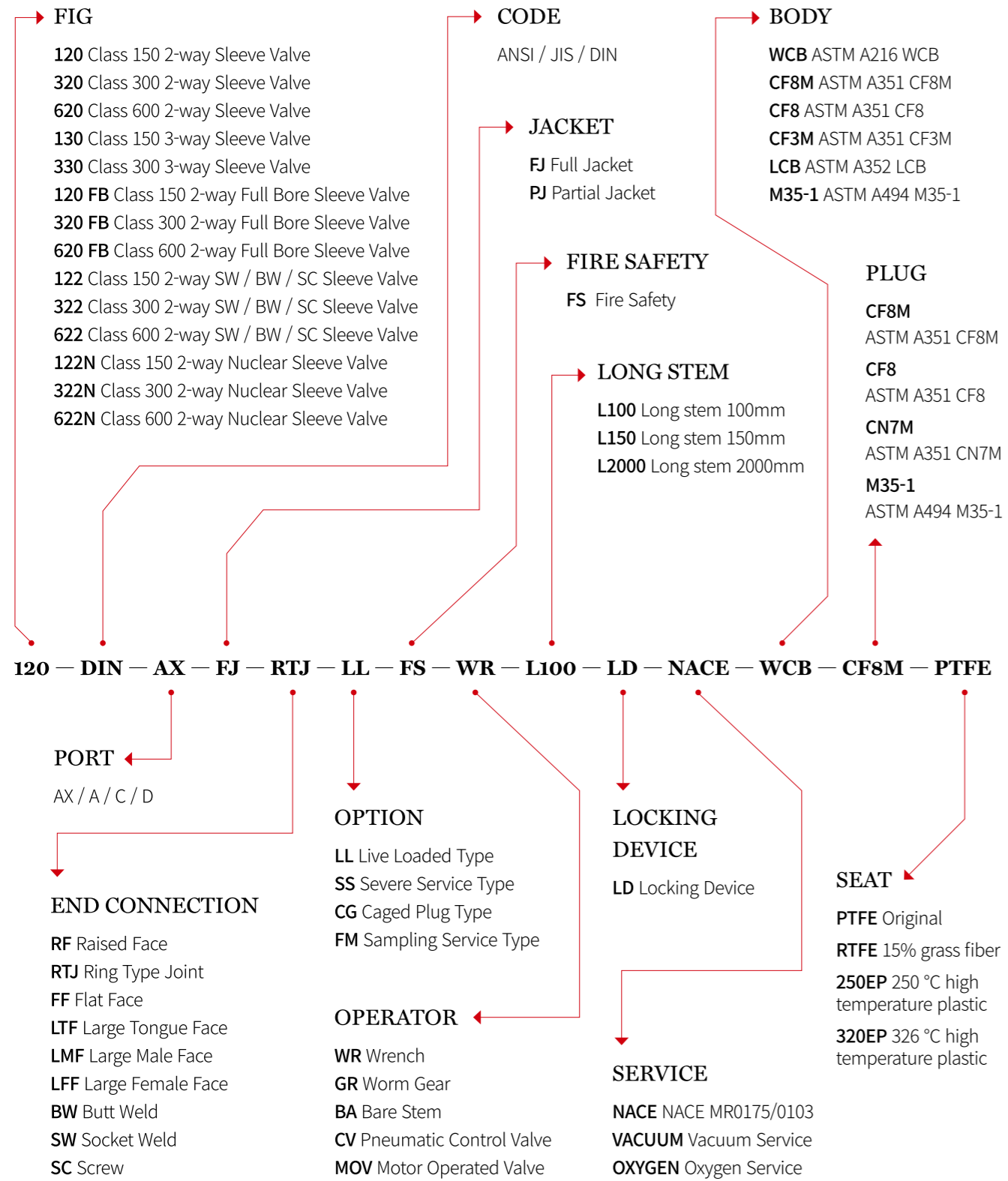
Class 300 2-way - Standard

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.

# Memo