

KOFLOW



**LUBRICATED TAPERED PLUG
VALVE acc. to ASME**

PLUG VALVE

Figure Coding System for Plug Valves



① Nominal Diameter Symbols

A××in value is used to ASME, D××mm value is used to DIN, and G××mm value being for GB.

② Valve Type Symbols

X—Plug Valve

③ Symbol for Actuation Methods (For handle or lever drive, this code can be omitted.)

3—Manual Operator; 6—Pneumatic; 6S—Pneumatic Spring Return; 9—Electric

④ Valve Connection/Ends Symbol

RF—Raised Face Flange; FF—Fully Flat Face Flange; MFM—Male and Female Flange; TG—Tongued and Grooved Flange;
RJ—Ring Junction Flange; BW—Butt Welding; SW—Socket Welding; NPT—Threaded Connection

⑤ Structure Type Symbols

Stuffing Airproof:

3—straight way (flow bore); 4T—T Type 3-way; 4L—L Type 3-way; 5—4-way

Pressure balance type lubricated:

7—straight way (flow bore); 8T—T Type 3-way; 8L—L Type 3-way;

Other type:

7L—Lift type; 7E—Eccentric structure 7D—Double flush structure; 7c—Double isolation structure

⑥ Nominal Pressure Symbols

1—PN16 class150; 2—PN25; 3—class300; 4—PN40 class400; 6—PN64 class600

9—class900; 10—PN100; 15—class1500; 16—PN160; 20—PN200; 25—class2500;

⑦ Body Material Symbols

C—WCB; C5—C5; C6—WC6; C9—WC9; BL—LCB; CL—LCC

8—CF8; 8M—CF8M; 3—CF3; 3M—CF3M; ML—MONEL

⑧ Symbols of Sealing Surfaces and Lined Material

F—PTFE; F3—PCTFE; F46—FEP; PA—PFA;

H—Cr13 Series Stainless Steel; Y—Stellite; R—Austenitic Stainless Steel; M—MONEL alloy

Given demonstration: A8" X3RF31CF denotes API 8" x 150Lb sleeve type plug valves, worm gear actuated, RF, straight way with body material of WCB and lined material of F4.

Technical Specifications of Plug Valve

Technical Specifications	API Serials	GB Serials
Design Specifications	API6D, API599, BS5353	GB/T19672
Pressure and Temperature Class	ASME B16.34	GB/T9124
Face-to-face	ASME B16.10	GB/T12221、GB/T15188.1
Flange Type and Dimensions	ASME B16.5、ASME B16.47	GB/T9113、JB/T79
Butt-welding connection	ASME B16.25	GB/T12224
Socket-welded connection	ASME B16.11	/
Threaded-welding connection	ASME B16.1.20	/
Inspection and Test	API598、API6D	JB/T9092、GB/T13927

SUMMARIZATION OF PLUG VALVE

Summarization

Plug valve is a circumrotating valve with its closure part as a plug, which turns 90° with its through bore connecting to or apart from the same of the body to realize opening or closing. The figure of the valve plug can be made as column or taper.

Of the column plug valve, the flow bore gets rectangle in general, and that of the taper type plug valve, the flow bore is of trapezium. The figures mentioned have made the structure of plug valves legerity, however, certain loss is at the same time generated.

The plug valve is mostly suitable for cutting off, turning on and distributing the flow medium. Sometime it can also be used for throttling based upon suitable medium and the erosion resistance property of the sealing surfaces. Due to the friction action between the sealing surfaces of the plug valve, whereas contact with flow medium can be completely avoided as the valve is fully opened. In this respect, the plug valve can also be used for the medium with suspend grains.

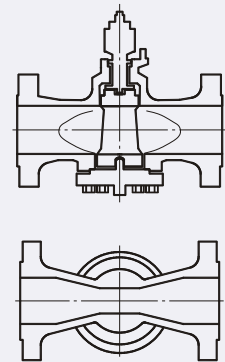
One of the important characteristics of the plug valve is that it is prone to fitting multi-center structure, so that one single plug valve can be designed with two, three, and even four different flow bores. In this way, the design of the pipeline system can be simplified, and both valve quantity and piping fittings can be reduced. The plug valves are widely used in the applications of oil field exploitation, transportation, and refinery facility, while being extensively used for such general industries as petrochemical, chemistry, gas, nature gas, liquefied oil gas, and warming & traffics.

Lined plug valves without lubricant are used for applications of petrochemical and chemistry industries, especially being used for the medium that is not allowed to be with lubricants.

Straight Way Flow Bore Patterns

The straight way flow bore of plug valves manufactured by Shanghai KOFLOW Machinery Co., Ltd. are of many patterns, there are venturi pattern, standard pattern with straight bore, short pattern, regular pattern and standard camber pattern with straight bore, among which the principal difference is the face-to-face dimensions, diameter and the plug figure.

VENTURI Pattern: The face-to-face dimensions of these valves are designed according to Britain and American standards to ensure inter-replacing of valves among different standards. The plug bore of these valves are of reduced bore area, however, the center line position of the plug valves does not change, which generates in the valve body a Venturi action to increase the loss of flow velocity with big percent. The result generated by this action is a corresponding low pressure drop. In this respect, the plug valves can be used in general pipelines, especially used for big sized pipelines to reduce application cost.

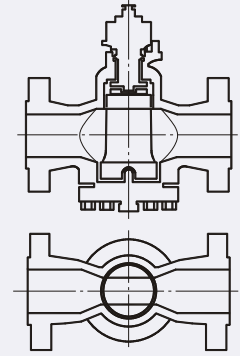


Venturi pattern

SUMMARIZATION OF PLUG VALVE

Straight Way Flow Bore Patterns

Standard Plug Valves with straight bore: The face-to-face dimensions of these valves are designed according to Britain and American standards to ensure farthest inter-replacing of valves among different types of valves. The figure of plug bore looks like a rectangle structure. There is an area echoing to the valve ends, which is with lowest pressure drop. The conversion from body end to the rectangle end-face is even, it will not appear the condition of sudden change of shape or part. Otherwise, the flow medium in the pipeline would generate sudden shake-up of flow velocity or direction.

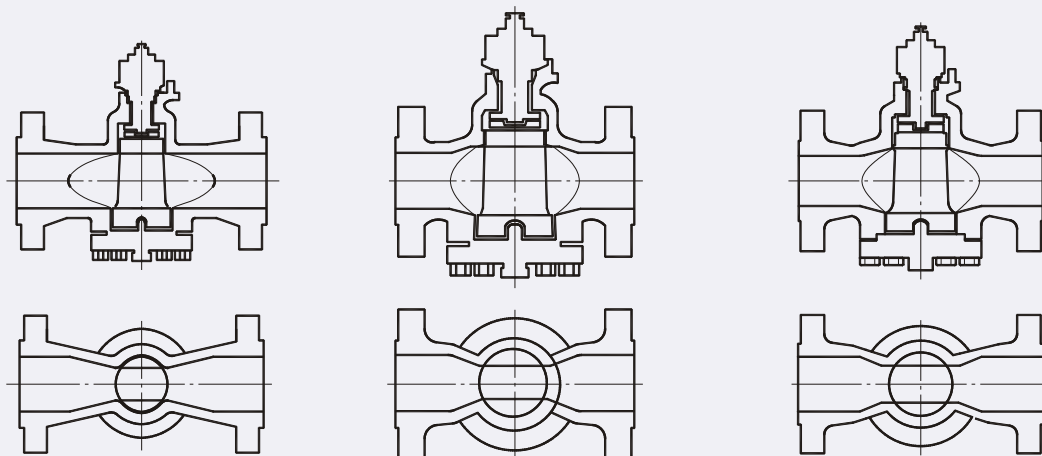


**Standard plug valves
With straight bore**

Short Pattern: The face-to-face dimensions of these plug valves equal to that of the gate valves designed according to ASME B16.10 CLASS125、150、250 and 300 Lb (NPS1 1/2~NPS12). In order to obtain correspondingly short face-to-face dimension, the diameter of the plug is reduced one with a small cone of rectangle.

Regular Pattern: These valves are designed according to Britain and American standards to ensure farthest inter-replacing of valves among different types of valves and different types of connection ends. There is a rectangle figure of the plug bore being with a tiny cone figure on its side face, where there is an area bigger than that of Venturi. The conversion from body end to the rectangle end-face is even, it will not appear the condition of sudden change of shape or part. Otherwise, the flow medium in the pipeline would generate sudden shake-up of flow velocity or direction. The flow bore area of the regular pattern plug valves is bigger than that of Venturi (reduced bore).

Standard Camber Plug Valves with Straight Bore: The diameter of these valves equals to the inside diameter of pipes. The design of the plug valve is mainly for the purpose that some scraping tools or other tools can get through the valve body, and that the valve can be used for some special occasions. The face-to-face dimensions of the plug valve are longer than that of standard pattern one, however, meeting the requirement of Britain and American standards. These plug valves are especially suitable for use in the slurry occasions of sewage disposal factory and for the branches of steam tubes.



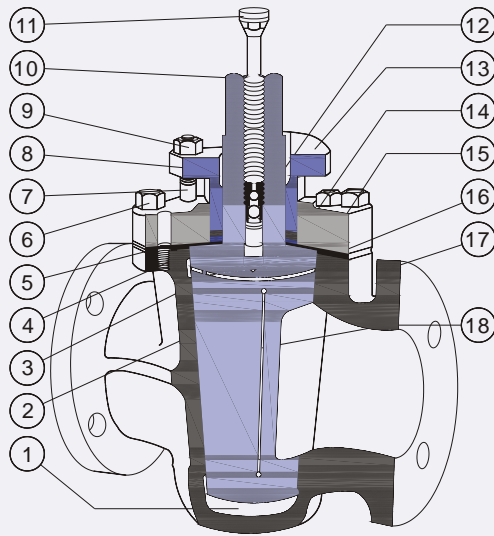
Regular Pattern

Short Pattern

**Standard Camber Plug Valves
with Straight Bore**

LUBRICATED TAPER PLUG VALVE ACC.TO ASME

Structure Drawing (Straight Bore)



- ① Sealant Chamber
- ② Plug
- ③ Sealant Duct
- ④ Packing Ring
- ⑤ Packing
- ⑥ Cover Bolts
- ⑦ Bolts
- ⑧ Gland
- ⑨ Gland Nuts
- ⑩ Indicator
- ⑪ Sealant Injector
- ⑫ Check Valve
- ⑬ Stop
- ⑭ Cover
- ⑮ Shim
- ⑯ Gasket
- ⑰ Body
- ⑱ Sealant Grooves

Material List

No.	Part Name	C.I.		C.S.		S.S.		S.S. With Lowest Carbon	
		Z		C		P	R	PL	RL
2	Plug	A216 WCB A105 MONEL/alloy A351 CF8 CF8M CF3 CF3M							
4	Packing Ring	A182 F6			A182 F304/F316				
5	Packing	PTFE/Graphite							
6	Cover Bolts	A193 B7			A193 B8M				
7	Bolts	A193 B7			A193 B8M				
8	Packing Gland	A126 CI35A	A216 WCB	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M		
9	Nuts	A194 2H			A194 8				
10	Indicator	A216 WCB/A105							
11	Injector	A105			A182 F316				
12	Check Valve	A105			A182 F316				
13	Stop	A105							
14	Cover	A126 CI35A	A216 WCB	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M		
15	Shim	SS							
16	Gasket	PTFE/Non-metal							
17	Body	A126 CI35A	A216 WCB	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M		

Note: Specific material can be selected according to requirement.

LUBRICATED TAPER PLUG VALVE ACC.TO ASME

Description of Products Structure

Lubricated taper plug valves are suitable for use in pipelines with various kinds of working conditions with nominal pressure of CLASS150-300Lb and working temperature of -25-325°C in such industries as petroleum, chemistry, pharmacy, chemical fertilizer, and power plant etc. to cut off or turn on the flow medium in pipelines.

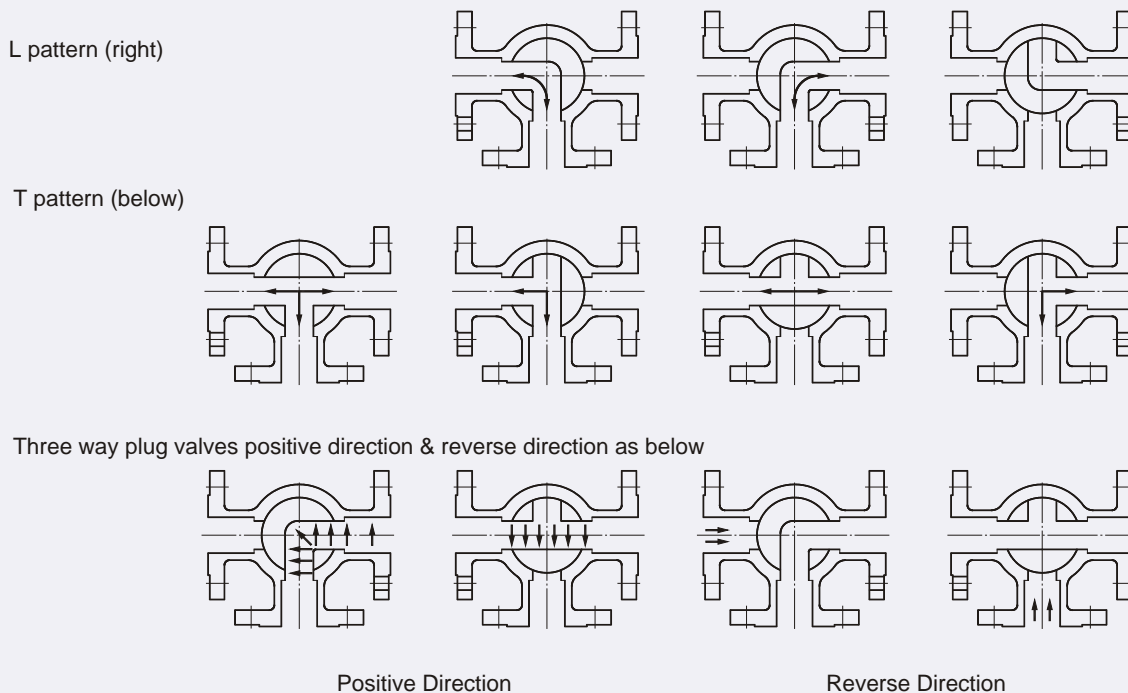
Grease sealed structure has been adopted for the inlet and outlet of the valve body, which is especially suitable for the pipelines with grain slurry. There is a grease chimb in the plug surface, where the grease gets in with higher pressure than that of the slurry in pipelines, thus it forms an oil film to isolate slurry with the plug of rest state from getting into the gap between valve core and valve wall, which avoids the rubbing. Under the dynamic state of the plug, it generates high speed oil flow to impact slurry and prevent it from entering the gap, ensuring normal operation of the plug valves, which has enhanced the economic function of slurry pipeline transportation engineering.

Main structure Features

- 1.The tightness function is realized by injecting grease from outside.
- 2.There is no cavity in the valve for accumulation of the medium.
- 3.The applicable temperature for the plug valve depends on the grease used.
The selection of the grease should be managed based on the pipeline medium.
It is of bi-directional flow, being more convenient for installation and usage.
- 4.The valve flow bore are mainly the patterns of regular, venduri, short, and
- 5.Three-way etc., which can meet the requirement for various kinds of pipelines.

Plug Flow Patterns of Lubricated 3-way Plug Valves

There are two flow patterns of 3-way plug valves, i.e. T patterns & L patterns.



LUBRICATED TAPER PLUG VALVE ACC.TO ASME

Technical Specification

Structure Type	Straight Way Patterns, 3-way Patterns
Actuation Methods	Manual, gear operated, pneumatic operator, electric actuator (Can be selected according to requirements)
Design Standard	API599, API6D, BS5353
Face-to-face Dimensions	ASME B16.10
Ends Connection	Flange according to ASME B16.5; Screw Thread according to ASME B1.20.1
Test and Inspection	API598.API6D

Note: Valve connection flanges can be designed and manufactured according to customers' requirement.

Products Performance Specification

Nominal Pressure	Shell Testing Pressure	Tightness Testing Pressure	Applicable Temperature	Applicable Medium
150	3.0	2.2	≤ 325°C	medium containing grain and slurry etc.
300	7.5	5.5		

Products Range

Flow Bore Patterns	Testing Pressure	Connecting Type	Spec.											
			15	20	25	40	50	65	80	100	150	200	250	300
			1/2"	3/4"	1"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"	10"	12"

Straight way

Regular	ANSI 150	Flange	★	★	★	★	★	★	★	★	★			
		Screw Thread	★	★	★	★	★	★	★					
Short	ANSI 150	Flange					★	★	★	★	★	★	★	★
	ANSI 300	Flange	★	★	★	★	★	★	★	★				
	ANSI 300	Screw Thread	★	★	★	★	★	★	★					
Wenturi	ANSI 300	Flange									★	★	★	★

3-Way

Regular	ANSI 150	Flange			★	★	★		★	★				
	ANSI 300	Flange			★	★	★		★	★				

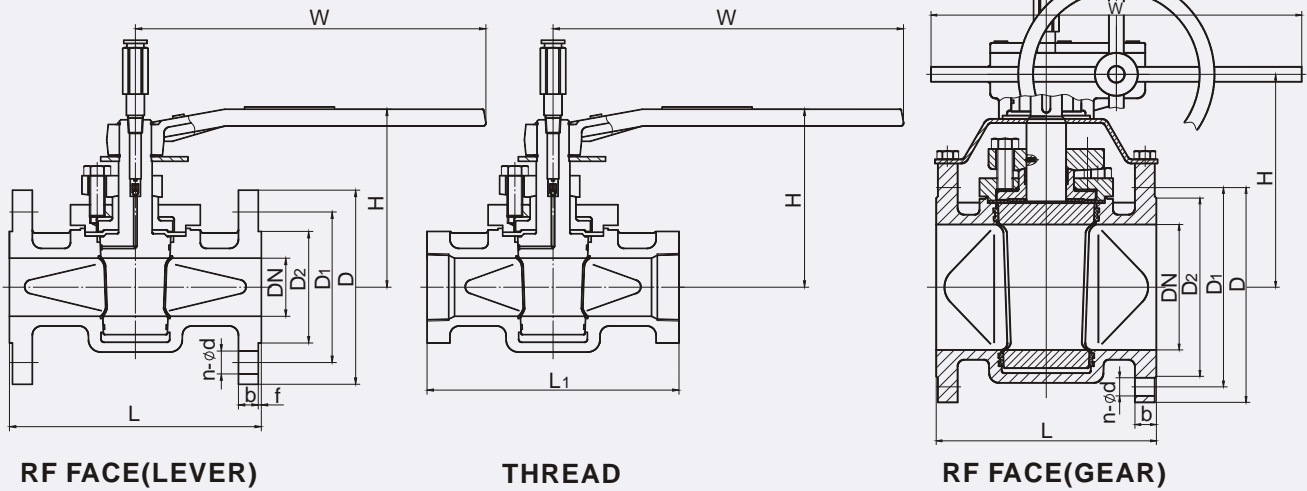
Approximative Flow Coefficients of Plug Valve

Diameter	NPS	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
	DN	15	20	25	32	40	50	65	80	100	125	150
CV		7.4	19.5	48.8	/	83.5	153	/	322	555	/	955

LUBRICATED TAPER PLUG VALVE ACC.TO ASME

Straight Way

CLASS150



Main Outline Sizes

Nominal Diameter		Standard Value								Reference Value			
DN (mm)	NPS (inch)	L	L ₁	D	D ₁	D ₂	f	b	Z-d	W	H	G(kg)	
CLASS150 Regular Pattern											RF	Th	
15	1/2	130	95	89	60.5	35	2	11	4-φ15	120	100	3.6	3.2
20	3/4	130	95	98	70	43	2	11	4-φ15	140	100	3.6	3.2
25	1	140	111	108	79.5	51	2	12	4-φ15	140	114	6.3	5.0
40	1 1/2	165	133	127	98.5	73	2	15	4-φ15	250	152	10	8.1
50	2	203	165	152	120.5	92	2	16	4-φ19	250	176	19	13
65	2 1/2	222	191	178	139.5	105	2	18	4-φ19	300	207	25	23
80	3	241	203	190	152.5	127	2	19	4-φ19	300	229	32	27
100	4	305	/	229	190.5	157	2	24	8-φ19	350	245	54	/
150	6	394	/	279	241.5	216	2	26	8-φ22	200*	327	104	/

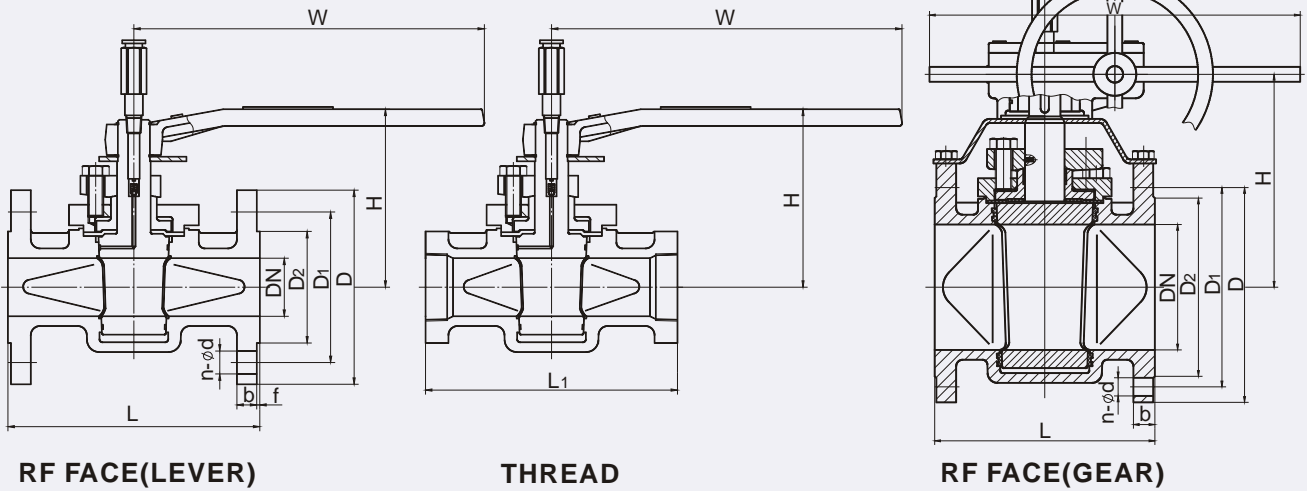
Nominal Diameter		Standard Value								Reference Value			
DN (mm)	NPS (inch)	L	L ₁	D	D ₁	D ₂	f	b	Z-d	W	H	G(kg)	
CLASS150 Short Pattern											Lever	Gear	
50	2	178	/	152	120.5	92	2	16	4-φ19	250	176	13	/
65	2 1/2	191	/	178	139.5	105	2	18	4-φ19	300	207	18	/
80	3	203	/	190	152.5	127	2	19	4-φ19	300	229	25	/
100	4	229	/	229	190.5	157	2	24	8-φ19	350	245	36	/
150	6	267	/	279	241.5	216	2	26	8-φ22	350	293	86	/
200	8	292	/	345	298.5	270	2	29	8-φ22	420/200*	327/486*	118	150
250	10	330	/	405	362	324	2	31	12-φ25	470/250*	364/536*	181	200
300	12	356	/	485	432	381	2	32	12-φ25	350	597	/	277

Note: * being the sizes of gear operators.

LUBRICATED TAPER PLUG VALVE ACC.TO ASME

Straight Way

CLASS300



Main Outline Sizes

Nominal Diameter		Standard Value								Reference Value			
DN (mm)	NPS (inch)	L	L ₁	D	D ₁	D ₂	f	b	Z-φd	W	H	G(kg)	
												CLASS300 Short Pattern	
15	1/2	140	95	95	66.5	35	2	15	4-φ15	160	85	3.6	3.2
20	3/4	140	95	117	82.5	43	2	16	4-φ19	160	95	3.6	3.2
25	1	159	111	124	89	51	2	18	4-φ19	200	105	6.3	4.5
40	1 1/2	191	133	156	114.5	73	2	21	4-φ22	250	125	14	8.2
50	2	216	165	165	127	92	2	23	8-φ19	300	140	18	13
65	2 1/2	241	191	190	149	105	2	26	8-φ22	300	150	27	23
80	3	283	203	210	168.5	127	2	29	8-φ22	350	185	38	27
100	4	305	/	254	200	157	2	32	8-φ22	350	200	75	/

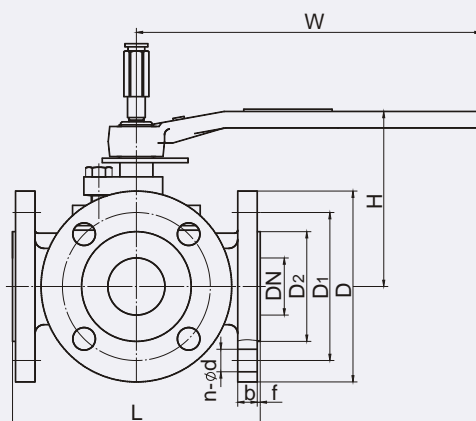
Nominal Diameter		Standard Value							Reference Value			
DN (mm)	NPS (inch)	L	D	D ₁	D ₂	f	b	Z-φd	W	H	G(kg)	
											CLASS300 Venturi Pattern	
150	6	403	318	270	216	2	37	12-φ22	520*/350	403*/468	111	136
200	8	419	381	330	270	2	42	12-φ25	450	506	/	213
250	10	457	445	387.5	324	2	48	16-φ29	450	525	/	240
300	12	502	521	451	381	2	51	16-φ32	450	564	/	346

Note: * being the sizes of gear operators.

LUBRICATED TAPER PLUG VALVE ACC.TO ASME

3-Way type

CLASS150-300



RF FACE(LEVER)

Main Outline Sizes

Nominal Diameter		Standard Value								Reference Value	
DN (mm)	NPS (inch)	L	L ₁	D	D ₁	D ₂	f	b	n-φd	W	H
CLASS150 Regular Pattern											
25	1	184	92	108	79.5	51	2	12	4-φ15	140	105
40	1 1/2	235	118	127	98.5	73	2	15	4-φ15	250	125
50	2	241	121	152	120.5	92	2	16	4-φ19	250	140
80	3	362	131	190	152.5	127	2	19	4-φ19	300	185
100	4	400	200	229	190.5	157	2	24	8-φ19	350	200

Nominal Diameter		Standard Value								Reference Value	
DN (mm)	NPS (inch)	L	L ₁	D	D ₁	D ₂	f	b	n-φd	W	H
CLASS300 Regular Pattern											
25	1	191	95	124	89	51	2	18	4-φ19	200	105
40	1 1/2	241	121	156	114.5	73	2	21	4-φ22	250	125
50	2	248	124	165	127	92	2	23	8-φ19	300	140
80	3	375	188	210	168.5	127	2	29	8-φ22	350	185
100	4	413	207	254	200	157	2	32	8-φ22	350	200