KOFLOW

PLUG VALVE

Figure Coding System for Plug Valves

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

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); 4_T—T Type 3-way; 4_L—L Type 3-way; 5—4-way
Pressure balance type lubricated:
7—straight way (flow bore); 8_T—T Type 3-way; 8_L—L Type 3-way;
Other type:
7_L—Lift type; 7_E—Eccentric structure 7_D—Double flush structure； 7_C—Double isolation structure

⑥Nominal 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.

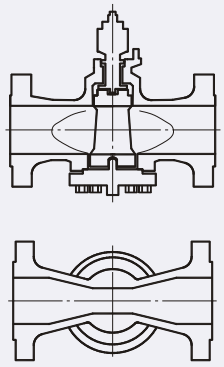
One of the important characteristics of the plug valve is that it is prone to fitting multi-center structure, so that one single plug valve can be designed with two, three, and even four different flow bores. In this way, the design of the pipeline system can be simplified, and both valve quantity and 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.

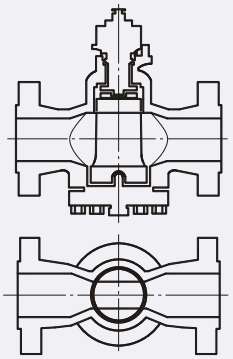


Venturi pattern

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.

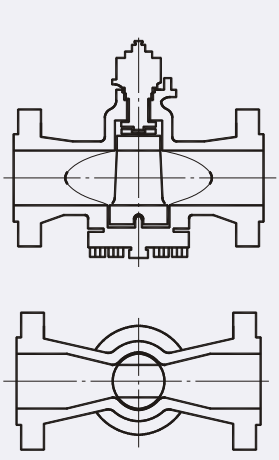


Standard plug valves With straight bore

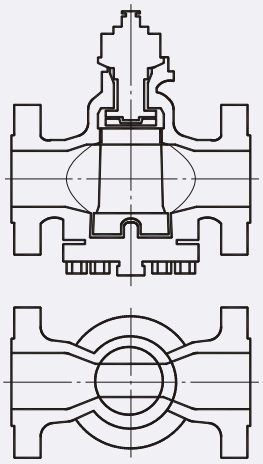
Short Pattern: The face-to-face dimensions of these plug valves equal to that of the gate valves designed according to ASME B16.10 CLASS125、150、250 and 300 Lb (NPS1 1/2~NPS12. In order to obtain correspondingly short face-to-face dimension, the diameter of the plug is reduced one with a small cone of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

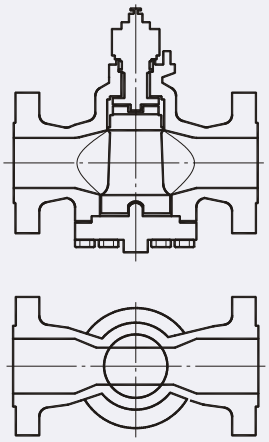
Standard Camber Plug Valves with Straight Bore: The diameter of these valves equals to the inside diameter of pipes. The design of the plug valve is mainly for the purpose that some scraping tools or other tools can get through the valve body, and that the valve can be used for some special occasions. 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



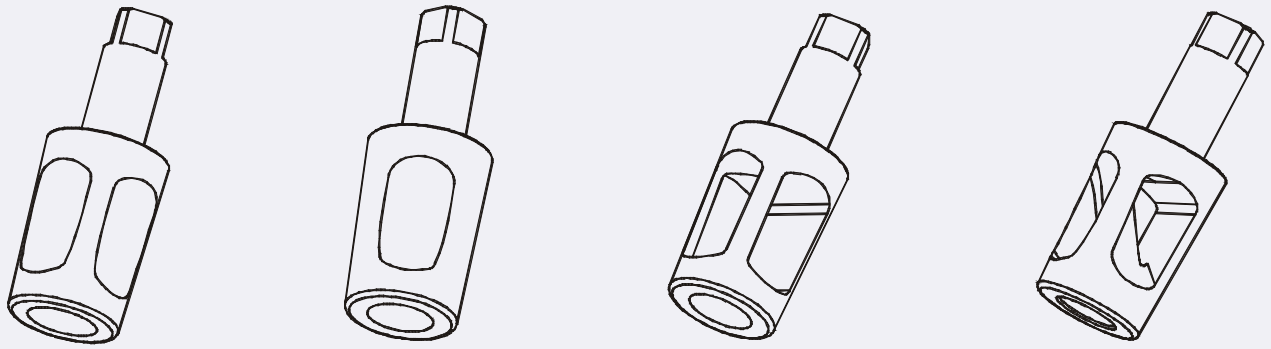
Short Pattern



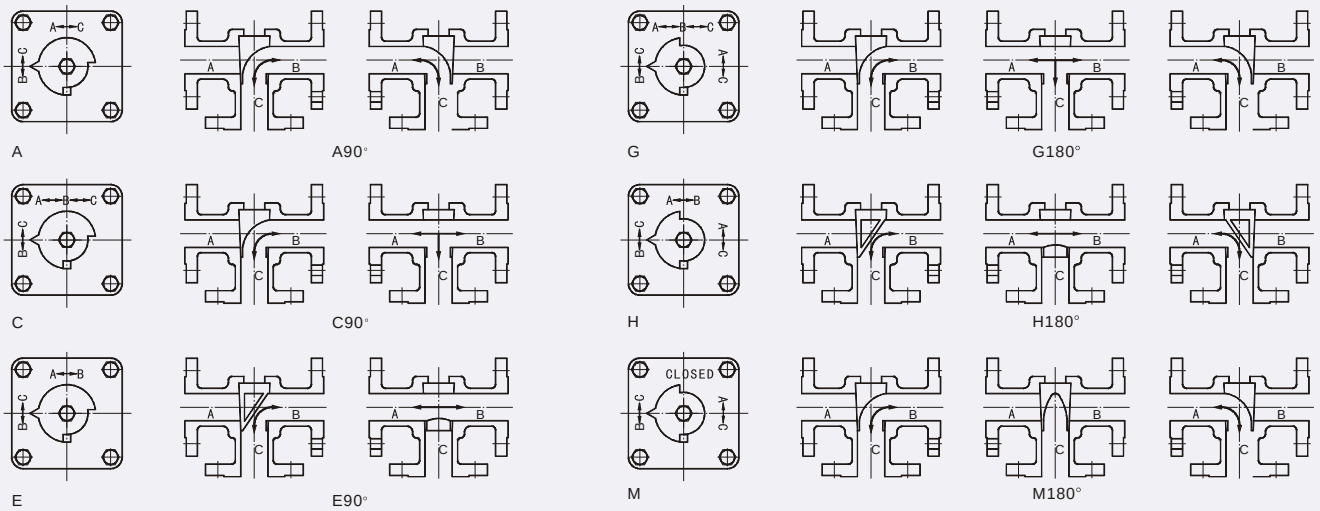
Standard Camber Plug Valves with Straight Bore

SLEEVE TYPE SOFT SEALING 3-WAY PLUG VALVE ACC.TO ASME

Patterns of Sleeve Type Plug Valve With Three Way Structure



Flow medium directions are as below according to the structure patterns of plug valves:



Technical Specification

Structure Type	L Type 3-way; T Type 3-way;
Actuation Methods	manual, gear operated, pneumatic operator, electric actuator
Design Standard	API599, API6D
Face-to-face Dimensions	ASME B16.10
Connecting Flanges	ASME B16.5
Inspection & Testing	API598.API6D

Note: Sizes of the valve connection flanges can be designed and manufactured according to customers' requirement.

Products Performance Specification

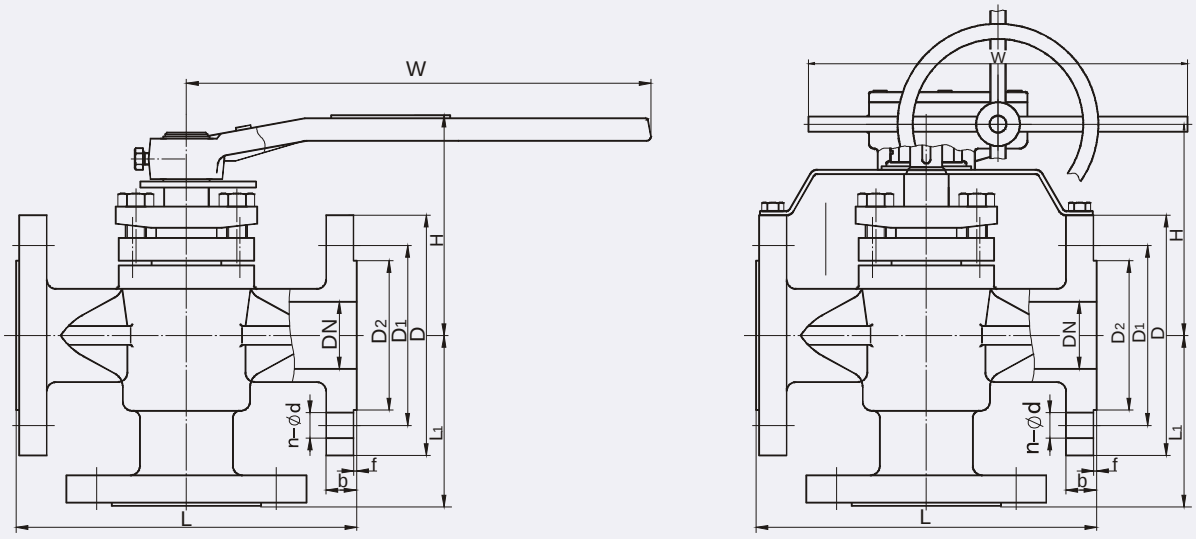
Normal Pressure	Shell Testing Pressure	Tightness Testing Pressure	Applicable Temperature	Applicable Medium
150	3.0	2.2	⩽150℃	water, steam, and oil etc.
300	7.5	5.5		

* Refer to the front 2-way structures for the material list, operation torque and CV value.

SLEEVE TYPE SOFT SEALING 3-WAY PLUG VALVE ACC.TO ASME

Flange Connection

CLASS150-300



Main Outline Sizes

Nominal Diameter		Standard Value								Reference Value		
DN (mm)	NPS (inch)	L	L1	D	D1	D2	f	b	n-ϕd	W	H	G(kg)
		CLASS150										
15	1/2	108	76	89	60.5	35	2	11	4-ϕ15	120	85	2.8
20	3/4	117	76	98	70	43	2	11	4-ϕ15	140	95	4.2
25	1	127	89	108	79.5	51	2	12	4-ϕ15	140	105	6.3
32	1 1/4	140	98	117	89	64	2	13	4-ϕ15	200	115	7.3
40	1 1/2	165	105	127	98.5	73	2	15	4-ϕ15	250	125	10.5
50	2	178	114	152	120.5	92	2	16	4-ϕ19	250	140	15.4
65	2 1/2	190	124	178	139.5	105	2	18	4-ϕ19	300	150	23.9
80	3	203	130	190	152.5	127	2	19	4-ϕ19	300	185	25.2
100	4	229	152	229	190.5	157	2	24	8-ϕ19	350	200	47.6
125	5	254	170	254	216	186	2	24	8-ϕ22	200*	275	54.6
150	6	267	190	279	241.5	216	2	26	8-ϕ22	200*	455	95.2
200	8	292	229	343	298.5	270	2	29	8-ϕ22	240*	495	161
250	10	330	311	406	362	324	2	31	12-ϕ25	280*	555	273

Gear operator for those of NPS ⩾ 6

Nominal Diameter		Standard Value								Reference Value		
DN (mm)	NPS (inch)	L	L1	D	D1	D2	f	b	n-ϕd	W	H	G(kg)
		CLASS300										
15	1/2	140	76	95	66.5	35	2	15	4-ϕ15	160	85	3.5
20	3/4	152	76	117	82.5	43	2	16	4-ϕ19	160	95	5.6
25	1	165	95	124	89	51	2	18	4-ϕ19	200	105	7
32	1 1/4	178	102	133	98.5	64	2	19	4-ϕ19	250	115	8.4
40	1 1/2	190	111	156	114.5	73	2	21	4-ϕ22	250	125	11.9
50	2	216	121	165	127	92	2	23	8-ϕ19	300	140	18.2
65	2 1/2	241	130	190	149	105	2	26	8-ϕ22	300	150	21
80	3	283	141	210	168.5	127	2	29	8-ϕ22	350	185	33.6
100	4	305	171	254	200	157	2	32	8-ϕ22	350	200	37.8
125	5	381	190	279	235	186	2	35	8-ϕ22	400	225	56
150	6	403	216	318	270	216	2	37	12-ϕ22	200*	460	91
200	8	419	254	381	330	270	2	42	12-ϕ25	240*	495	203
250	10	457	311	445	387.5	324	2	48	16-ϕ29	280*	560	357

Gear operator for those of NPS ⩾ 6