



API Inverted Lubricated Pressure Balance Plug Valve

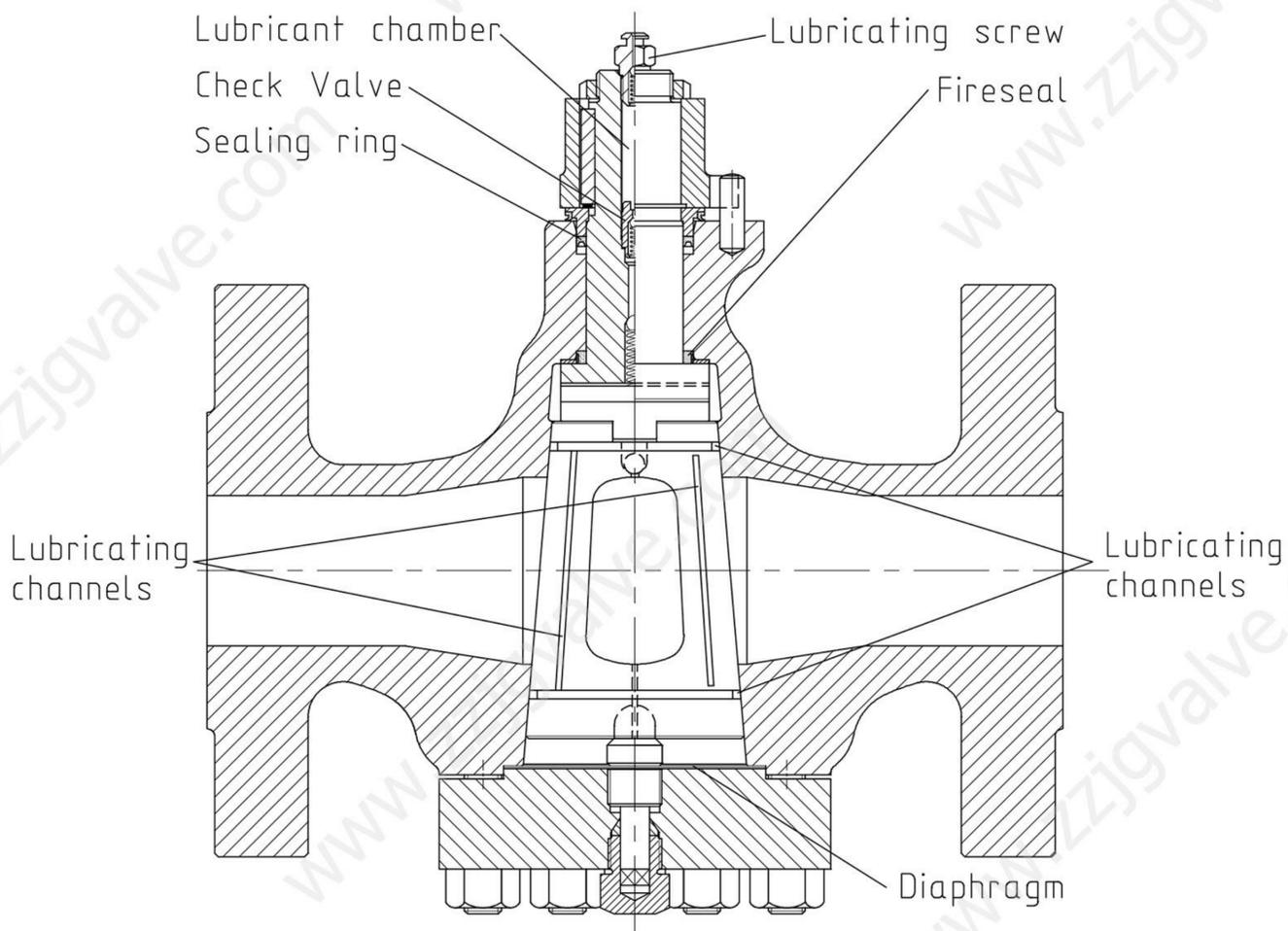
Overview

The inverted pressure balanced lubricated plug valve is a high-performance valve designed for critical applications. Its hollow plug design equalizes internal pressure, ensuring remarkably low operating torque. Combined with a forced grease lubrication system that provides a reliable seal and reduces friction, this valve is exceptionally durable and ideal for demanding services in oil & gas, petrochemicals, and pipelines.



Feature

The Pressure Balanced Lubricated Plug Valve is designed for isolating or connecting pipeline media in industries including petroleum, chemical, and power. It is suitable for nominal pressures from CLASS 150 to 2500 and operating temperatures ranging from -46°C to 550°C.





■ API Inverted Lubricated Pressure Balance Plug Valve

Operation

For the Inverted Pressure Balanced Lubricated Plug Valve, the simplest method of operation is via a hand lever. For straight-through valves, opening and closing is achieved through a 90° rotation. For three-way valves, the flow direction is determined by different rotation angles, such as 90°, 180°, 270°, or 360°. The hand lever can be mounted in any of eight different positions, maximizing space efficiency during installation. Additionally, the hand lever is typically used for relatively smaller valves, as specified in the valve's dimensional drawings.

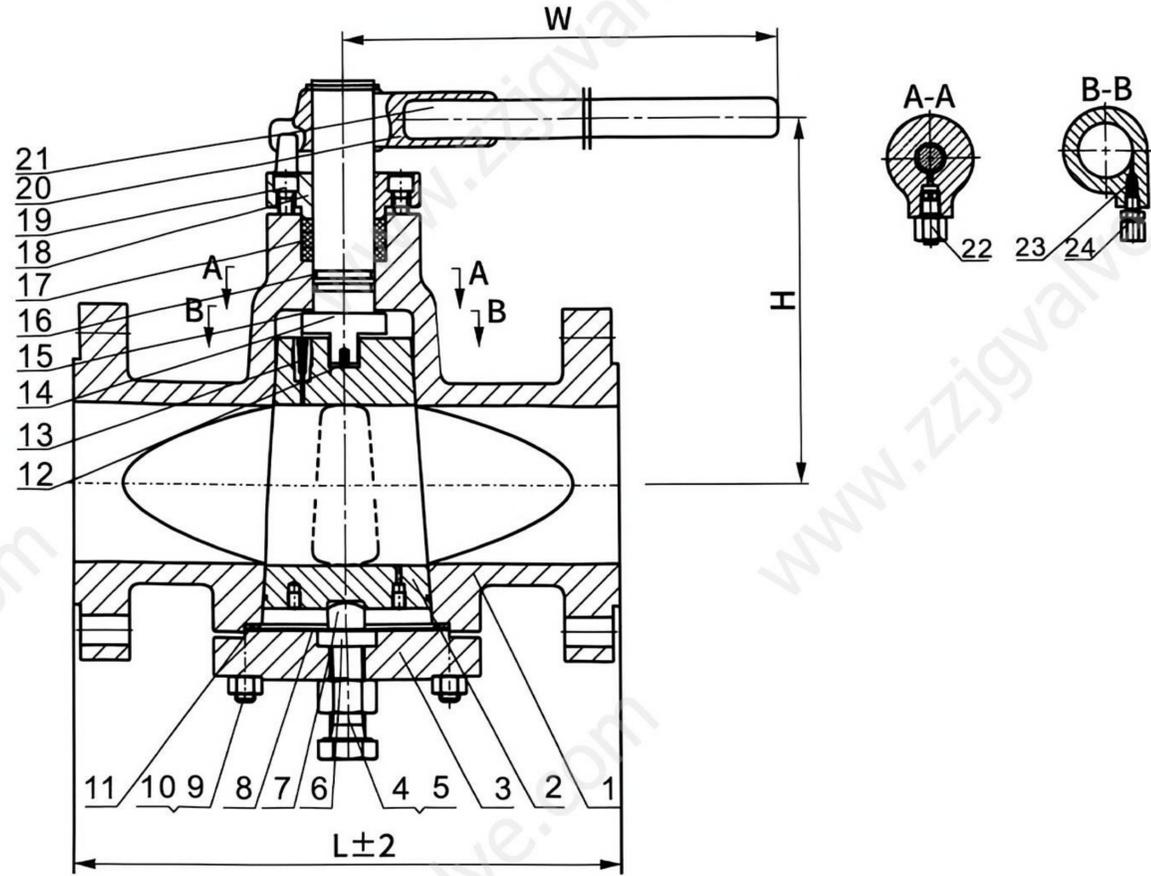
Installation Instructions

1. **Pre-Installation Setup.** Position the plug in the "Open" position before installation.
2. **Orientation.** The valve may be installed in any required orientation (horizontal, vertical, etc.).
3. **Passageway Inspection.** Ensure the valve passageway is free of trapped materials before installing it into the piping system. Remove any debris if present.
4. **Avoid Pipe Stress.** The piping layout should be designed to minimize stresses, and the valve must not be subjected to excessive pipe tension.
5. **Accessibility.** Lubrication points on the valve must remain easily accessible after installation.
6. **Operation and Maintenance Clearance.** Sufficient space must be provided for valve operation and future maintenance, including removal of the bottom cover.
7. **Lubricant Screw Care.** Avoid damaging the lubricant screw. If damaged, replace it before proceeding.
8. **Lifting Guidelines**
 - Large, heavy valves should be lifted using the dedicated lifting lugs on the valve body.
 - Smaller valves without lugs may be lifted with soft lifting straps wrapped around the body.
 - Important: If the valve is fitted with an actuator or extension, never lift the assembly by the actuator. The main lift must always be applied to the valve body. Straps on the actuator should only be used for positioning control. Soft straps are recommended to avoid damaging the valve coating.
9. **Pre-Pressure Test Lubrication.** Relubricate the valve before pressure testing. Even after initial factory lubrication, minor air pockets may remain, which could cause leaks. Therefore, re-lubrication prior to testing is required.





API Inverted Lubricated Pressure Balance Plug Valve



NO.	Part name	Material
1	Body	A216 WCB
2	Plug	A217 CA15+N
3	Cover	A216 WCB
4	Bolt	A193 B7
5	Nut	A1942H
6	Adjustment block	A276410
7	Adjustment block	A276410
8	Metal diaphragm	SS304
9	Bolt	A193 B7
10	Nut	A1942H
11	Spiral gasket	SS304+flexible graphite
12	Spring	SS304
13	Check valve	UCA
14	Stem	A182F6a
15	Gasket	PTFE
16	O-ring	Viton
17	Packing	graphite
18	Gland	A216 WCB
19	Bolt	A193 B7
20	The pipe	A570
21	Handle	A216 WCB
22	Sealing emergency device	UCA
23	Check valve	UCA
24	Grease valve	UCA





API Inverted Lubricated Pressure Balance Plug Valve

Technical Performance Specification											
Design Standard		GB/T19672				API599, API6D, BS5353					
Pressure-Temperature Rating		GB/T12224				API609, ASME B16.34					
Face-Face		GB/T12221				API609, ISO5752, ASME B16.10, API 6D					
Flange Ends		GB/T9113, JB/T79				ASME B16.5\B16.47					
Inspection &Test		JB/T9092, GB/T13927, GB/T19672				API598, AP 6D					
Nominal Pressure		PN				CLASS					
		1.6	2.5	4.0	6.3	150	300	600	900	1500	2500
Test Pressure (MPa)	Shell Test	2.4	3.75	6.0	9.45	2.93	7.58	15.3	23.0	38.3	63.8
	High Pressure Seal Teat	1.76	2.75	4.4	6.93	2.07	5.52	11.03	16.8	28.0	46.8
	Low Pressure Seal Teat	0.6				0.6					
Applicable Temperature		Different raw material for different work temperature									
Applicable Medium		Water, oil, gas and other causticity medium(Different raw material for different medium)									

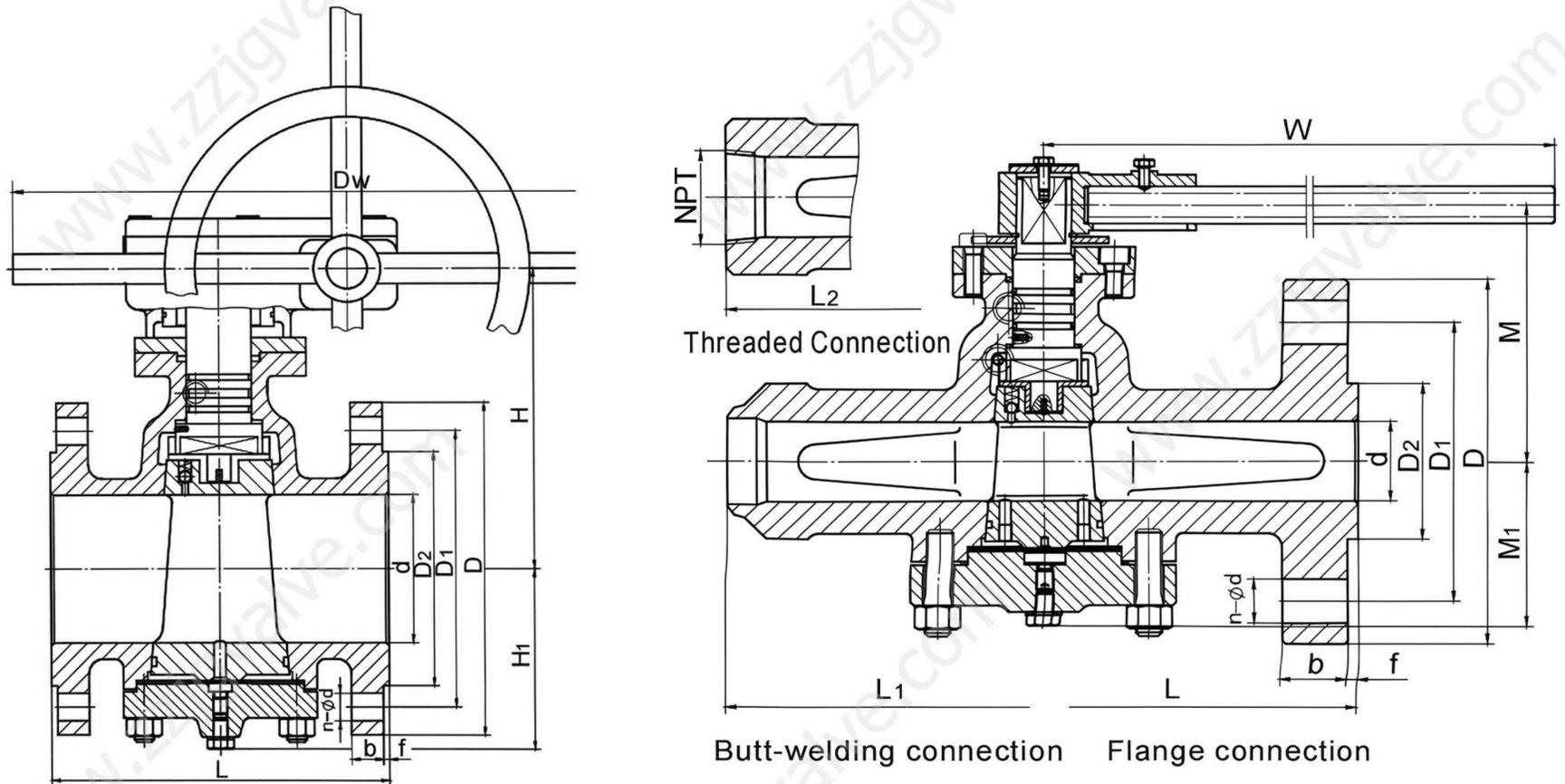
Note: Pressure testing value in the above list will be determined based upon the pressure temperature rating for WCB.

INVERTED PRESSURE BALANCE LUBRICATED PLUG VALVE														
Stem Torques(NM)of Plug Valve (Product Range)														
Size	Class 150			Class 300			Class 600		Class 900		Class 1500		Class2500	Size
	Short	Regular	Venturi	Short	Regular	Venturi	Regular	Venturi	Regular	Venturi	Regular	Venturi	Regular	
15	/	/	/	/	/	/	47	/	54	/	54	/	244	1/2
20	/	/	/	/	/	/	61	/	69	/	74	/	515	3/4
25	/	/	/	/	/	/	81	/	96	/	101	/	691	1
40	/	/	/	81	/	/	149	/	157	/	162	/	976	1 1/2
50	67	67	/	94	/	/	189	/	212	/	216	/	2400	2
80	162	162	/	230	/	/	366	/	474	/	542	/	6640	3
100	237	237	/	338	/	/	677	/	705	/	745	/	△	4
150	296	570	/	/	610	423	1080	677	1490	/	2400	1090	△	6
200	949	1360	/	/	1220	610	2030	1080	2710	/	/	3250	/	8
250	1360	1650	/	/	1900	1220	2580	2030	4730	/	/	△	/	10
300	1900	2510	/	/	2200	2440	4070	2980	△	4390	/	△	/	12
350	/	/	1900	/	/	3120	/	4070	/	△	/	△	/	14
400	/	/	2510	/	/	3800	/	5420	/	5400	/	△	/	16
450	/	/	2710	/	/	4610	/	6620	/	△	/	△	/	18
500	/	/	2850	/	/	5420	/	9450	/	8100	/	/	/	20
600	/	/	3660	/	/	6750	/	12150	/	△	/	/	/	24
650	/	/	/	/	/	/	/	△	/	/	/	/	/	26
750	/	/	△	/	/	△	/	△	/	/	/	/	/	30
900	/	/	△	/	/	△	/	△	/	/	/	/	/	36

Note: Safety factor should be taken into consideration when selecting actuators;
 △ means that customers can consult with interrelated department of our company;
 / means that there is no answer.



API Inverted Lubricated Pressure Balance Plug Valve



Main Dimensions

Nominal Diameter		Standard Value									Reference Value					
DN (mm)	NPS (inch)	L	L1	L	D	D1	Dz	f	b	Z-d	W	M	Dw	H	W(kg)	
		CLASS150									Short Pattern		RF	Th		
15	1/2	108	/	89	89	60.5	35	2	11	4-Φ15	400	180	/	/	10	2.5
20	3/4	117	/	133	98	70	43	2	11	4-Φ15	400	180	/	/	12	6.8
25	1	127	/	133	108	79.5	51	2	12	4-Φ15	500	185	/	/	14	6.8
32	1 1/4	140	/	/	120	89	64	2	13	4-Φ15	500	200	/	/	17	/
40	1 1/2	165	/	229	127	98.5	73	2	15	4-Φ15	600	210	/	/	19	22
50	2	178	267	229	152	120.5	92	2	16	4-Φ19	600	215	/	/	21	24.5
65	2 1/2	190	305	/	178	139.5	105	2	18	4-Φ19	820	250	/	/	29	/
80	3	203	330	/	190	152.5	127	2	19	4-Φ19	820	270	/	/	33	/
100	4	229	356	/	229	190.5	157	2	24	8-Φ19	/	/	300	300	48	/
125	5	254	/	/	255	216	186	2	24	8-Φ22	/	/	300	340	75	/
150	6	267	457	/	279	241.5	216	2	26	8-Φ22	/	/	320	365	98	/
200	8	292	521	/	345	298.5	270	2	29	8-Φ22	/	/	320	400	158	/
250	10	330	559	/	405	362	324	2	31	12-Φ25	/	/	350	450	171	/
300	12	356	635	/	485	432	381	2	32	12-Φ25	/	/	380	510	245	/
350	14	381	/	/	535	476	413	2	35	12-Φ29	/	/	380	590	370	/

Note: When NPS > 4", being for gear actuator sizes. Screw thread connection being regular pattern.



API Inverted Lubricated Pressure Balance Plug Valve

Nominal Diameter		Standard Value								Reference Value				
DN (mm)	NPS (inch)	L	L1	D	D1	D2	f	b	Z-d	W	M	Dw	H	W(kg)
CLASS150 Regular Paterm														RF
50	2	203	/	152	120.5	92	2	16	4-Φ19	600	215	/	/	22
80	3	241	/	190	152.5	127	2	19	4Φ19	820	270	/	/	38
100	4	305	/	229	190.5	157	2	24	8-Φ19	1050	287	/	/	60
150	6	394	/	279	241.5	216	2	26	8-Φ22	/	/	350	495	92
200	8	457	/	345	298.5	270	2	29	8-Φ22	/	/	400	685	182
250	10	533	/	405	362	324	2	31	12-Φ25	/	/	450	685	282
300	12	610	/	485	432	381	2	32	12-Φ25	/	/	450	913	403

Note:When NPS>4", being for gearacuator sizes.

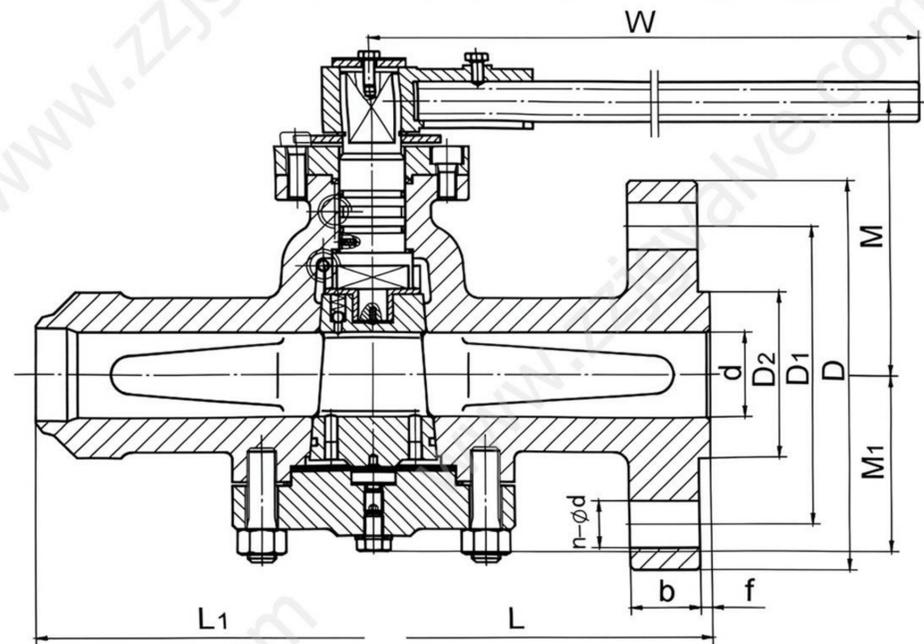
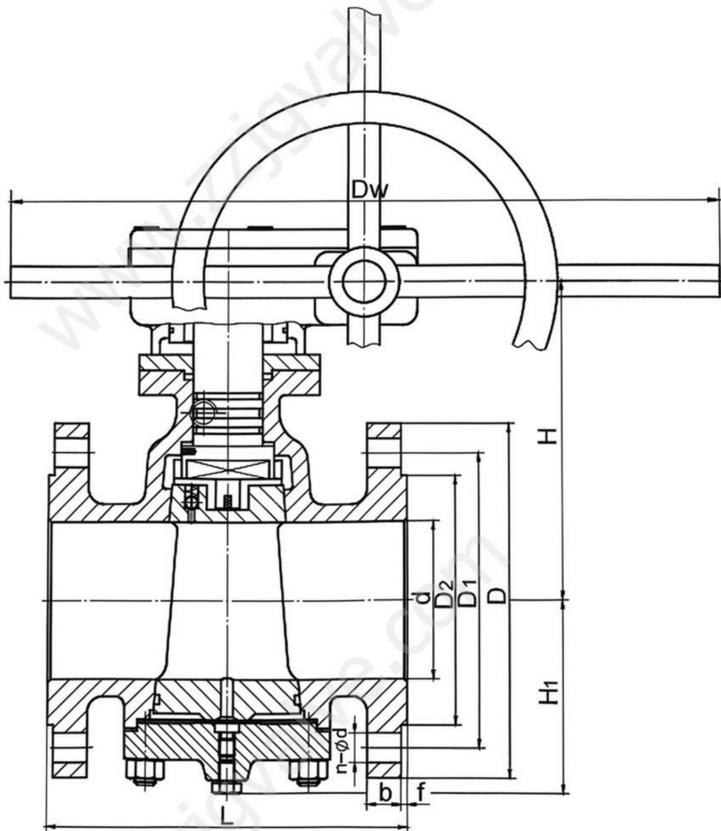
Nominal Diameter		Standard Value									Reference Value		
DN (mm)	NPS (inch)	L	L1	LRJ	D	D1	D2	f	b	Z-d	Dw	H	W(kg)
CLASS150 VenturiPaterm													RF
250	10	533	533	546	405	362	324	2	31	12-Φ25	600	40B	350
300	12	610	610	622	485	432	381	2	32	12-Φ25	800	457	475
350	14	686	686	699	535	476	413	2	35	12-Φ29	800	49B	670
400	16	762	762	775	600	540	470	2	37	16-Φ29	800	525	785
450	18	864	864	876	635	578	533	2	40	16-Φ32	560	565	885
500	20	914	914	927	700	635	584	2	43	20-Φ32	560	590	966
600	24	1067	1067	1080	815	749.5	692	2	48	20-Φ35	560	635	1856
750	30	1295	1295	/	984	914.4	857	2	75	28-Φ35	800	/	/
900	36	1600	1600	/	116B	1086	1022	2	90	32-Φ41	800	/	/

Note:NPS>24" Flanges diameter and thickness comply with MSSSP-44.





API Inverted Lubricated Pressure Balance Plug Valve



Butt-welding connection Flange connection

Main Dimensions

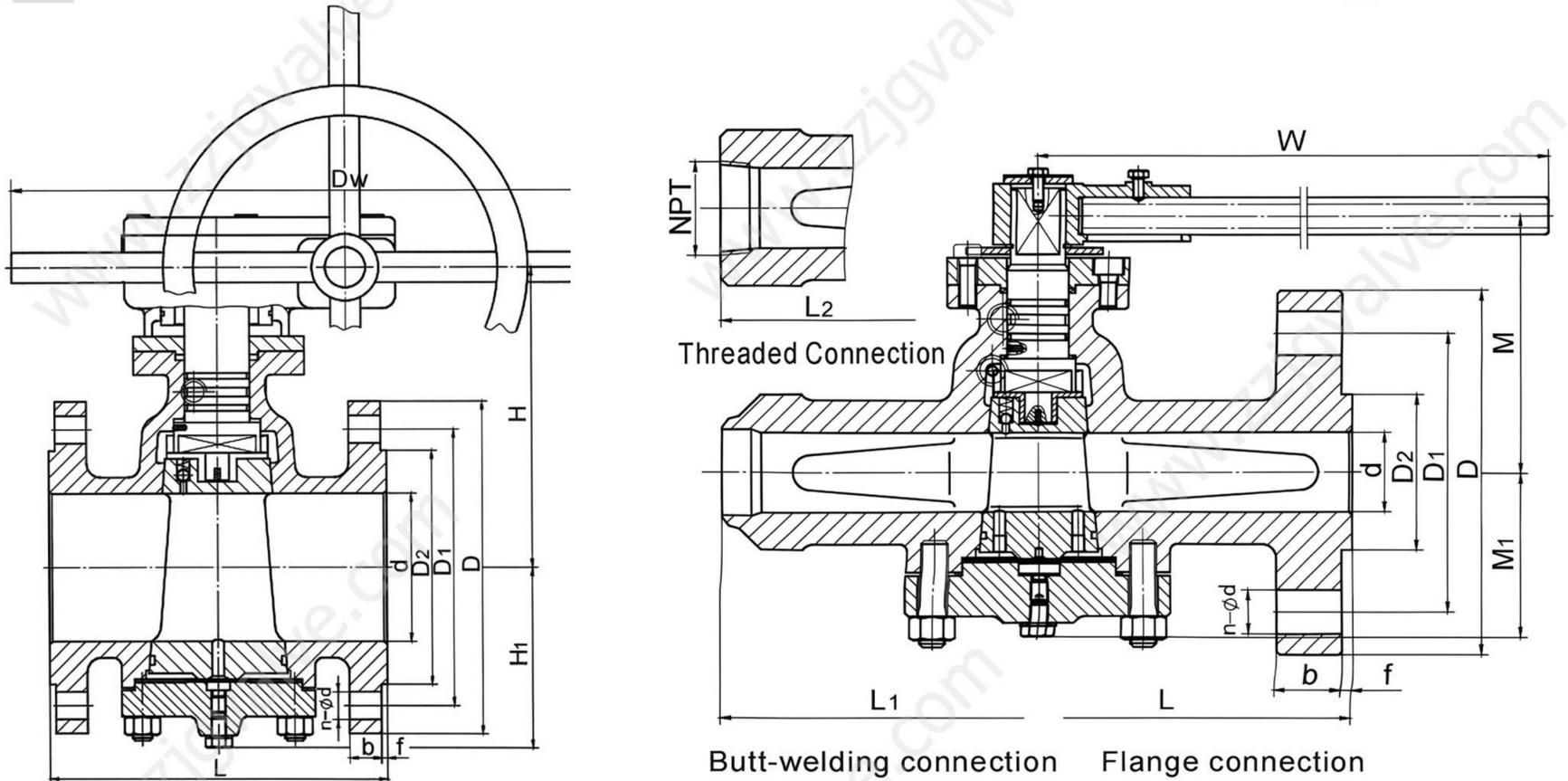
Nominal Diameter		Standard Value							Reference Value		
DN (mm)	NPS (inch)	L	D	D1	D2	f	b	Z-φd	W	M	W(kg)
CLASS300 Short Pattern											
40	1 1/2	190	156	114.5	73	2	21	4-φ22	610	169	16
50	2	216	165	127	92	2	23	8-φ19	610	178	21
80	3	283	210	168.5	127	2	29	8-φ22	860	219	38
100	4	305	254	200	157	2	32	8-φ22	940	235	60

Nominal Diameter		Standard Value							Reference Value		
DN (mm)	NPS (inch)	L	D	D1	D2	f	b	Z-φd	Dw	H	W(kg)
CLASS300 Short Pattern											
150	6	403	318	270	216	2	37	12-φ22	560	578	178
200	8	502	381	330	270	2	42	12-φ25	560	624	276
250	10	568	445	387.5	324	2	48	16-φ29	610	738	356
300	12	711	521	451	381	2	51	16-φ32	610	761	508

Nominal Diameter		Standard Value									Reference Value		
DN (mm)	NPS (inch)	L	L1	LRJ	D	D1	D2	f	b	Z-φd	Dw	H	W(kg)
CLASS300 Venturi Patten													
150	6	403	457	457	318	270	216	2	37	12-φ22	500	509	121
200	8	419	521	521	381	330	270	2	42	12-φ25	500	579	192
250	10	457	559	559	445	387.5	324	2	48	16-φ29	5000	614	281
300	12	502	635	635	521	451	381	2	51	16-φ32	750	685	508
350	14	762	762	762	584	514.5	413	2	54	20-φ32	750	720	796
400	16	838	838	838	650	571.5	470	2	58	20-φ35	560	755	902
450	18	914	914	914	710	628.5	533	2	61	24-φ35	560	765	1097
500	20	991	991	991	775	686	584	2	64	24-φ35	800	940	1576
600	24	1143	1143	1143	915	813	692	2	70	24-φ41	800	970	2060
750	30	1397	1397	1397	1092	997	857	2	92	28-φ48	800	1080	/
900	36	1727	1727	1727	1270	1168.4	1022	2	105	32-φ54	800	1270	/



API Inverted Lubricated Pressure Balance Plug Valve



Main Dimensions

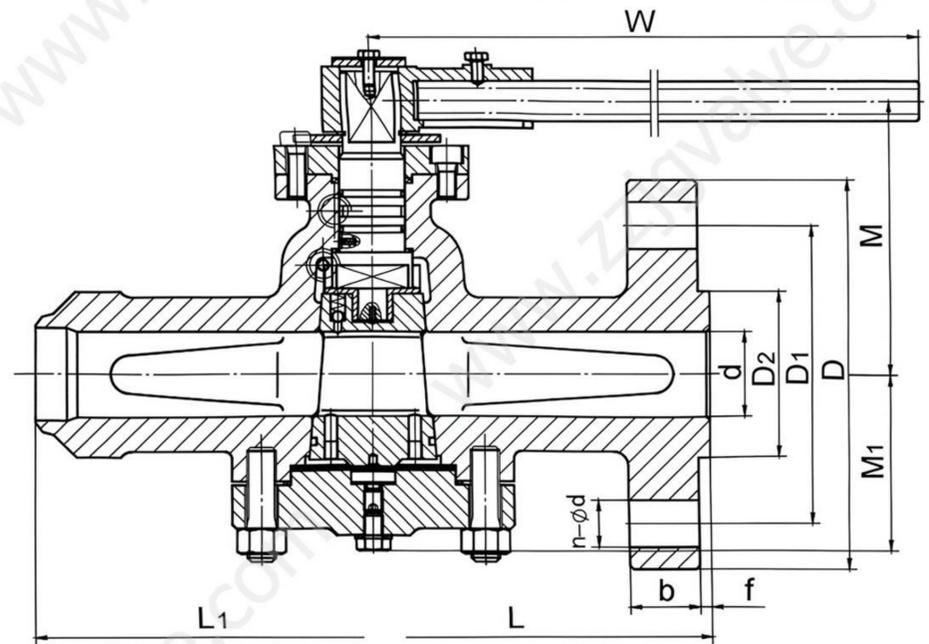
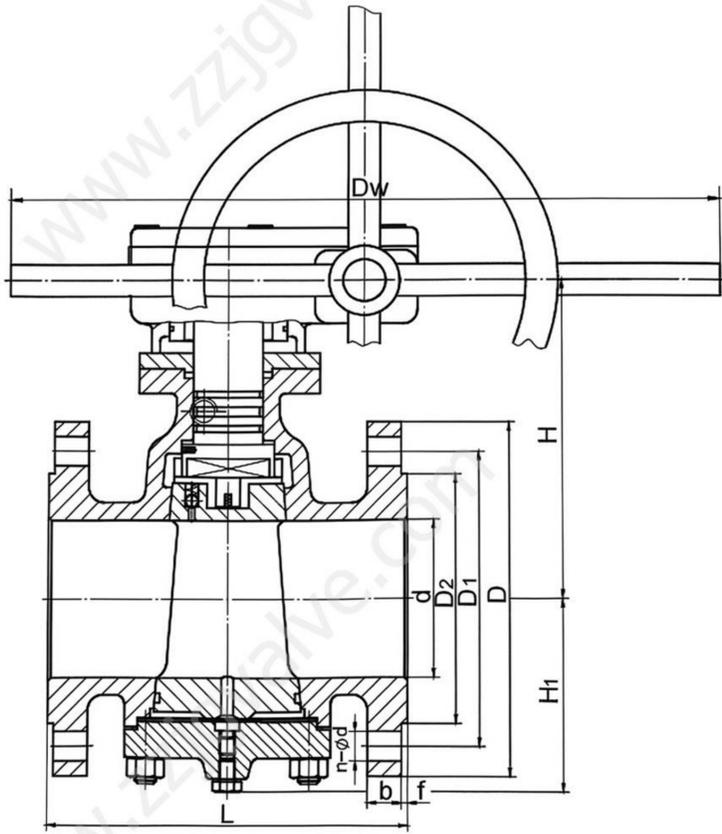
Nominal Diameter		Standard Value									Reference Value			
DN (mm)	NPS (inch)	L	L2	LRJ	D	D1	D2	f	b	Z-φd	W	M	W(kg)	
CLASS600 Regular Pattern													RF	Th
15	1/2	165	89	165	95	66.7	35	6.4	15	4-φ16	400	104	5.3	2.5
20	3/4	190	133	190	120	82.5	43	6.4	16	4-φ19	450	127	9	6.8
25	1	216	133	216	124	89	51	6.4	18	4-φ19	500	127	10	6.8
40	1 1/2	241	229	241	156	114.5	73	6.4	23	4-φ22	600	176	22	10
50	2	292	229	295	165	127	92	6.4	26	8-φ19	600	196	24.5	21

Nominal Diameter		Standard Value									Reference Value					
DN (mm)	NPS (inch)	L	L1	LRJ	D	D1	D2	f	b	Z-φd	W	M	Dw	H	W(kg)	
CLASS600 Regular Pattern													RF	BW		
50	2	292	292	295	165	127	92	6.4	26	8-φ19	600	196	/	/	24.5	21
80	3	356	356	359	210	168	127	6.4	32	8-φ22	800	217	/	/	46	41
100	4	432	432	435	273	216	157	6.4	38	8-φ25	950	232	/	/	85	51
150	6	559	559	562	355	292	216	6.4	48	12-φ29	/	/	560	568	254	168
200	8	660	660	664	420	349.2	270	6.4	56	12-φ32	/	/	560	704	406	284
250	10	787	787	791	510	431.8	324	6.4	64	16-φ35	/	/	650	745	584	412
300	12	838	838	841	560	489	381	6.4	67	20-φ35	/	/	650	775	620	486

Nominal Diameter		Standard Value									Reference Value			
DN (mm)	NPS (inch)	L	L1	LRJ	D	D1	D2	f	b	Z-φd	DW	H	W(kg)	
CLASS600 Venturi Pattern													RF	
150	6	559	559	562	355	292	216	6.4	48	12-φ29	560	568	150	
200	8	660	660	664	420	349.2	270	6.4	56	12-φ32	560	704	304	
250	10	787	787	791	510	431.8	324	6.4	64	16-φ35	650	745	437	
300	12	838	838	841	560	489	381	6.4	67	20-φ35	650	775	616	
350	14	889	889	892	605	527	413	6.4	70	20-φ39	800	825	864	
400	16	991	991	994	685	603.2	470	6.4	77	20-φ42	800	845	1168	
450	18	1092	1092	1095	745	654	533	6.4	83	20-φ45	800	870	1653	
500	20	1194	1194	1200	815	723.9	584	6.4	89	24-φ45	800	900	1850	
600	24	1397	1397	1407	940	838.2	692	6.4	102	24-φ51	650	945	2161	
650	26	1448	1448	1460	1016	914.4	749	6.4	108	28-φ5	650	978	/	
750	30	1651	1651	1664	1130	1022.4	857	6.4	114	28-φ55	650	1022	/	
900	36	2083	2083	2098	1314	1194	1022	6.4	124	28-φ67	650	1055	/	



API Inverted Lubricated Pressure Balance Plug Valve



Butt-welding connection Flange connection

Main Dimensions

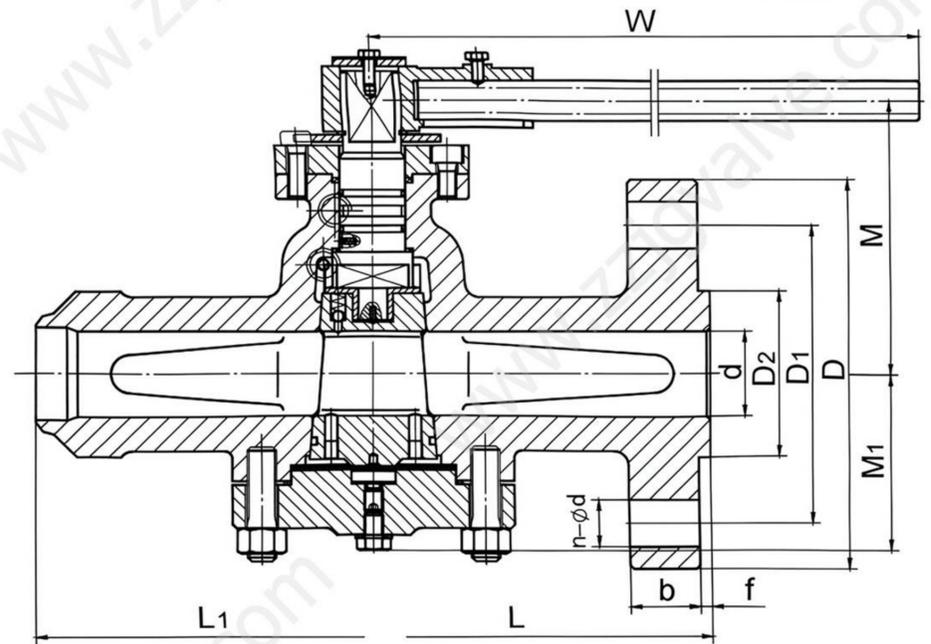
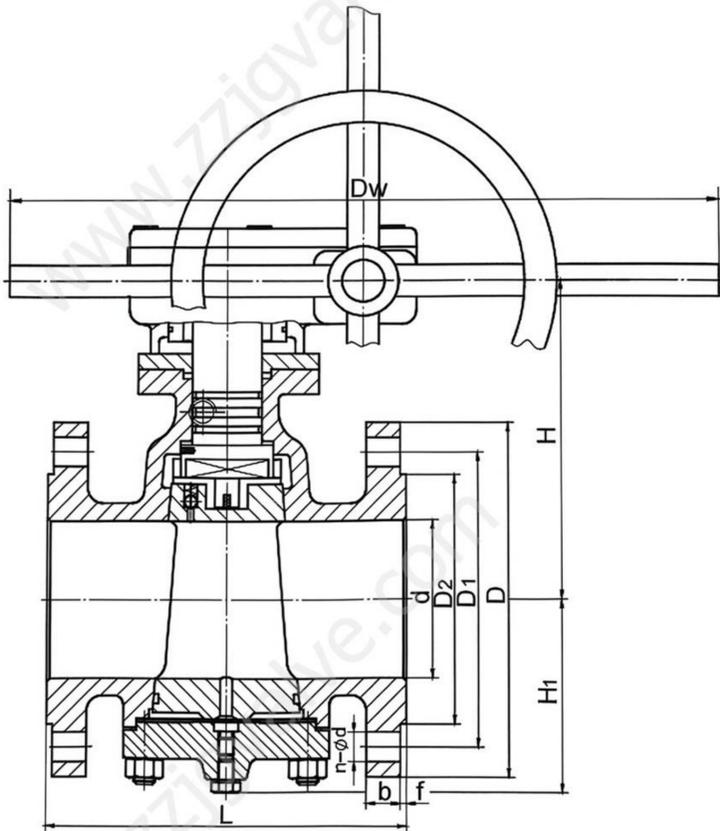
Nominal Diameter		Standard Value								Reference Value		
DN (mm)	NPS (inch)	L	LRJ	D	D1	D2	f	b	Z-Ød	Dw	H	W(kg)
CLASS900 Regular Pattern												
												RF
80	3	381	384	240	190.5	127	6.4	38.5	8-Ø26	650	217	114
100	4	457	460	290	235	157	6.4	44.5	8-Ø32	650	232	125
150	6	610	613	380	317.5	216	6.4	56	12-Ø32	800	595	264
200	8	737	740	470	393.7	270	6.4	63.5	12-Ø39	800	657	591
250	10	838	841	545	469.9	324	6.4	70	16-Ø39	800	725	662
300	12	965	968	610	533.4	381	6.4	79.5	20-Ø39	800	775	/

Nominal Diameter		Standard Value								Reference Value		
DN (mm)	NPS (inch)	L	LRJ	D	D1	D2	f	b	Z-Ød	Dw	H	W(kg)
CLASS900 Regular Pattern												
												RF
300	12	965	968	610	533.4	381	6.4	79.5	20-Ø39	650	775	/
350	14	1029	1038	640	558.8	413	6.4	86	20-Ø42	800	825	/
400	16	1130	1140	705	616	470	6.4	89	20-Ø45	800	845	/
450	18	1219	1232	785	685.8	533	6.4	102	20-Ø51	800	870	/
500	20	1321	1334	855	749.3	584	6.4	108	20-Ø55	800	900	/
600	24	1549	1568	1040	901.7	692	6.4	140	20-Ø68	650	945	/





API Inverted Lubricated Pressure Balance Plug Valve



Butt-welding connection Flange connection

Main Dimensions

Nominal Diameter		Standard Value								Reference Value				
DN (mm)	NPS (inch)	L	LRJ	D	D1	D2	f	b	Z-φd	W	M	Dw	H	W(kg)
CLASS1500 Regular Pattern														
15	1/2	216	216	120	82.6	35	6.4	22.5	4-φ22	500	104	/	/	4.5
20	3/4	229	229	130	88.9	43	6.4	25.5	4φ22	500	127	/	/	8.5
25	1	254	254	150	101.6	51	6.4	29	4-φ26	600	127	/	/	13.5
40	1 1/2	305	305	180	123.8	73	6.4	32	4-φ29	600	164	/	/	16
50	2	368	372	215	165.1	92	6.4	38.5	8-φ26	800	174	/	/	68
80	3	470	473	265	203.2	127	6.4	48	8-φ32	800	212	/	/	118
100	4	546	549	310	241.3	157	6.4	54	8-φ35	/	/	560	508	161
150	6	705	711	395	317.5	216	6.4	83	12-φ39	/	/	560	556	/

Note:When NPS>4",being for gear actuator sizes.

Nominal Diameter		Standard Value											
DN (mm)	NPS (inch)	L	LRJ	D	D1	D2	f	b	Z-φd	Dw	H	W(kg)	
CLASS1500Venturi Pattern													
150	6	705	711	395	317.5	216	6.4	83	12-φ39	650	653	257	
200	8	832	841	485	393.7	270	6.4	92	12-φ45	650	720	521	
250	10	991	1000	585	482.6	324	6.4	108	12-φ51	650	755	/	
300	12	1130	1146	675	571.5	381	6.4	124	16-φ55	800	775	/	
350	14	1257	1276	750	635	413	6.4	133.5	16-φ60	800	825	/	
400	16	1384	1407	825	704.8	470	6.4	146.5	16-φ68	800	845	/	
450	18	1537	1559	915	774.7	533	6.4	162	16-φ74	800	870	/	



