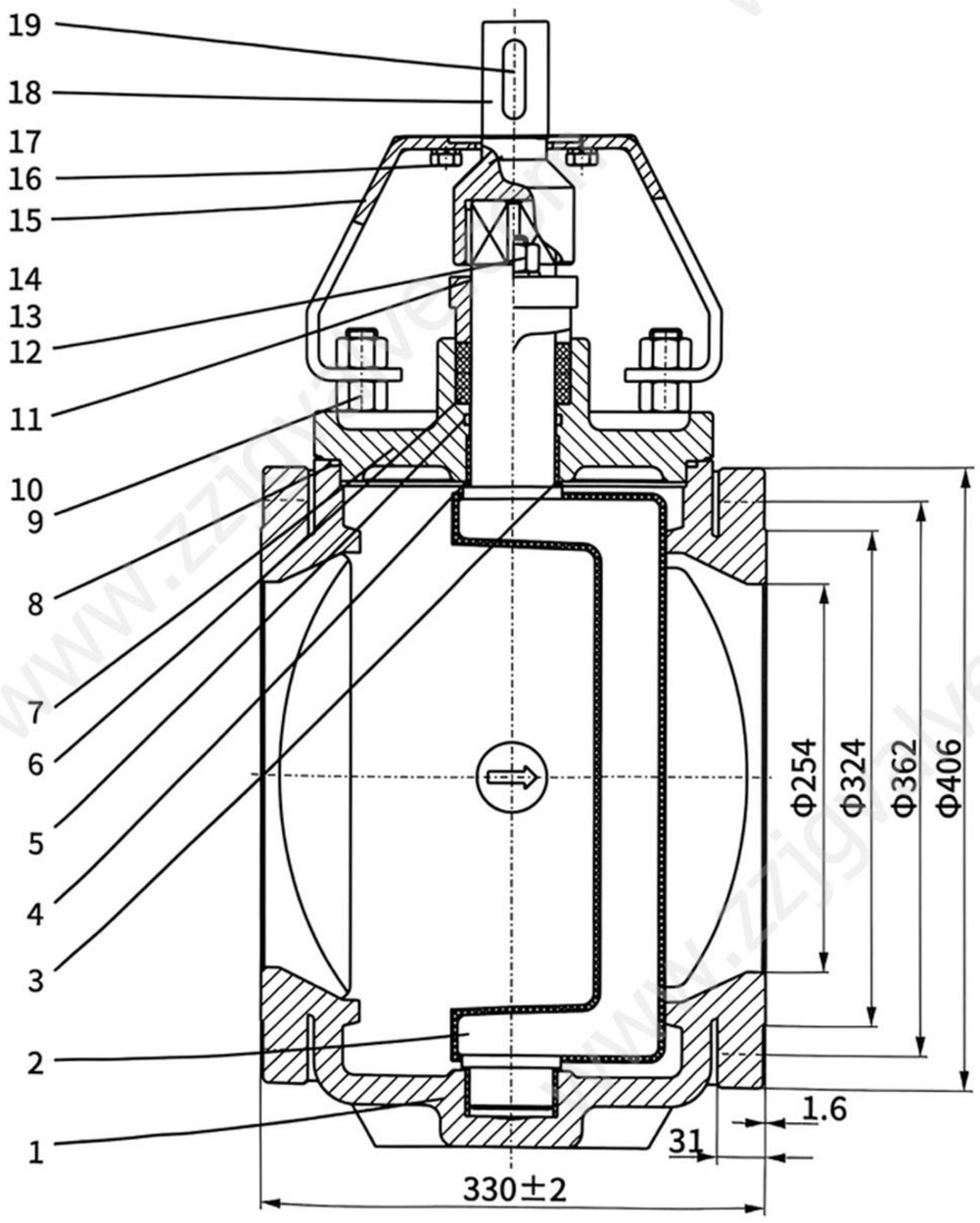
API Elastic Seat Eccentric Plug Valve

Overview

Elastic-seat eccentric plug valves are a new type of plug valve designed for large-diameter pipelines (DN200 and above) and applications such as sewage or slurry transport. They provide excellent sealing and corrosion resistance, feature low operating torque and minimal flow resistance, and offer a long service life. These characteristics make them an ideal choice for regulation or shut-off in wastewater, sludge, or clean water systems.

Structure Type

The elastic-seat eccentric plug valve incorporates a streamlined, fully rubber-coated plug with a curved shaft. The seat can be constructed either by overlay welding a corrosion-resistant alloy or by being cast as an integral part of the valve body. The sealing surfaces utilize an eccentric offset design, and the flow passage features a rectangular cross-section.



MAIN PARTS MATERIALS	
NO.	Part Name
1	Body
2	Plug+NBR
3	Gasket
4	Sliding Bearing
5	O-ring
6	Packing
7	Cover
8	O-ring
9	Stud
10	Nut
11	Packing gland
12	Flat gasket
13	Stud
14	Nut
15	Bracket
16	Bolt
17	Spring washer
18	Connecting rod
19	Flat key

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Overview

This flexible-seat eccentric plug valve utilizes a crank-shaft eccentric mechanism. The plug is designed with an aerodynamically streamlined profile and is entirely encased in rubber through hot-vulcanization molding. This ensures excellent adhesion, a uniform surface finish, accurate sealing dimensions, and improved performance in corrosion resistance, sealing integrity, and part interchangeability.

Featuring a compact sealing interface and an eccentric alignment relative to the plug's sealing center, the valve seat is available in either corrosion-resistant alloy cladding or as a solid construction. This design guarantees leak-tight sealing, lowers operational torque, and increases service longevity. The rectangular flow channel enables near-linear control characteristics when used for throttling applications.

Operation relies on a dual-offset motion: the plug is eccentrically positioned relative to the valve body center, while the seat is offset from the plug's rotational axis. In the fully open position, the plug retracts completely from the flow path, offering unimpeded media passage with minimal pressure loss. During flow modulation, the plug gradually obstructs the passage to regulate throughput. When closed, the plug and seat achieve full surface contact. The eccentric rotation eliminates sliding friction between the plug, seat, and body, thereby preventing wear and seizure—a design particularly advantageous for automated control systems. Sealing force is amplified by both actuation torque and line pressure, further ensuring dependable sealing performance.

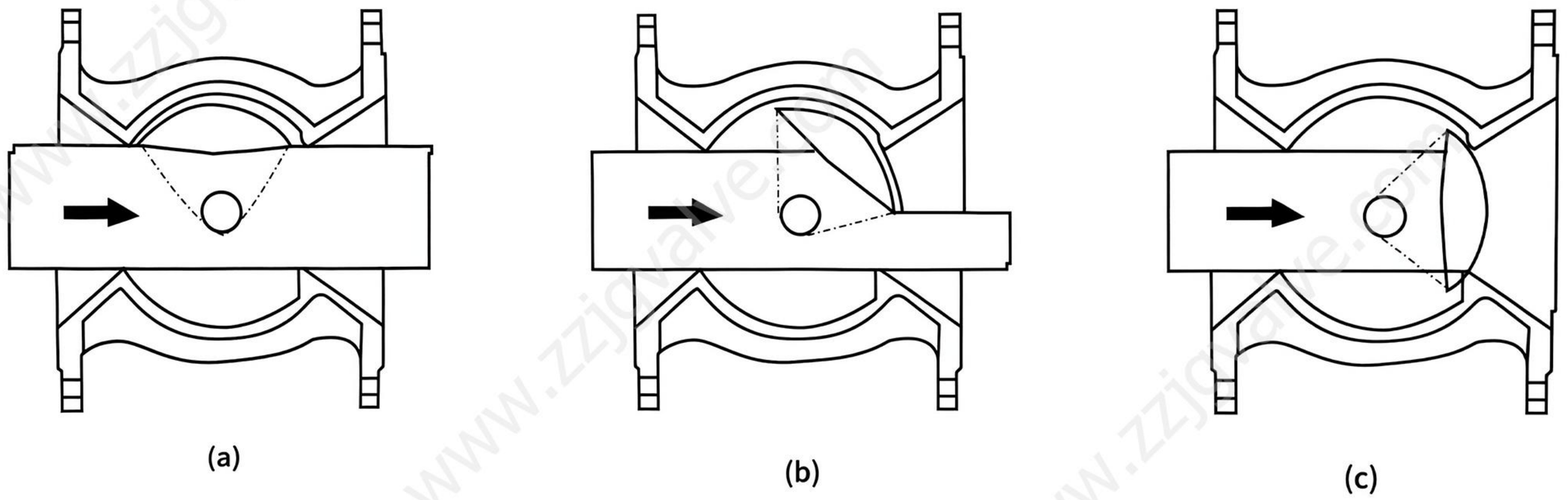

Figure 2. Working principle
(a)Fully-opened position (b) Regulating position(c)Fully-closed position

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Feature

1. Elastic Sealing – Rubber-coated plug with corrosion-resistant seat ensures zero leakage.
2. Eccentric Design – Low operating torque, no wear, self-compensating seal.
3. Full Rubber Encapsulation – Superior corrosion/erosion resistance across all sizes.
4. Interchangeable Seat – Durable welded seat allows easy plug replacement.
5. Rectangular Flow Path – Low head loss, excellent linear flow control.
6. Integral Arched Stem – High strength, retracts fully when open, lightweight.
7. Removable Cover – Enables in-line maintenance without valve removal.
8. Ductile Iron Body – High strength, pressure-resistant, lighter than gray iron.
9. Wide Temperature Range – Suitable for –29 °C to 150 °C fluids, including hot/cold water.
10. Custom Surface Treatment – Adaptable protection for harsh/corrosive environments.

Application

It is an ideal upgrade for handling industrial wastewater, municipal sewage, sludge, and media with high solids content, and is widely used in water and wastewater treatment and industrial systems worldwide.

In clean water applications, the valve can be installed horizontally or vertically. For sewage or raw water systems, it must be installed horizontally with the plug positioned at the top of the pipeline (see Figure 3) to prevent clogging and allow solids to be flushed through.

Installation should be in the forward direction (seat facing the flow) for clean water. For media containing solids, horizontal installation with the plug oriented upward is required. The valve has limited reverse-pressure resistance; only forward sealing is guaranteed. Consult the manufacturer if reverse pressure capability is required.

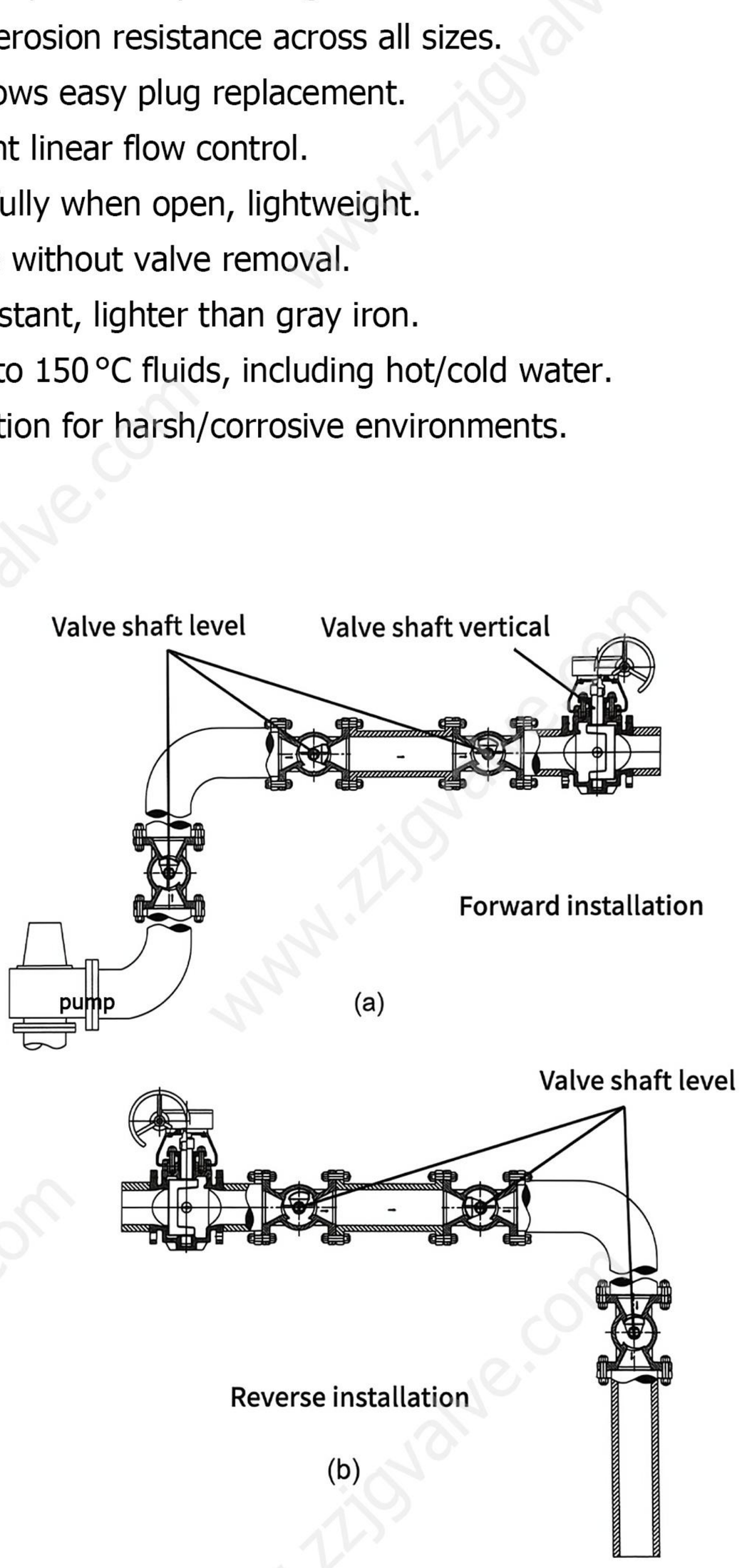

Figure 4 installation method

Forward installation Reverse installation

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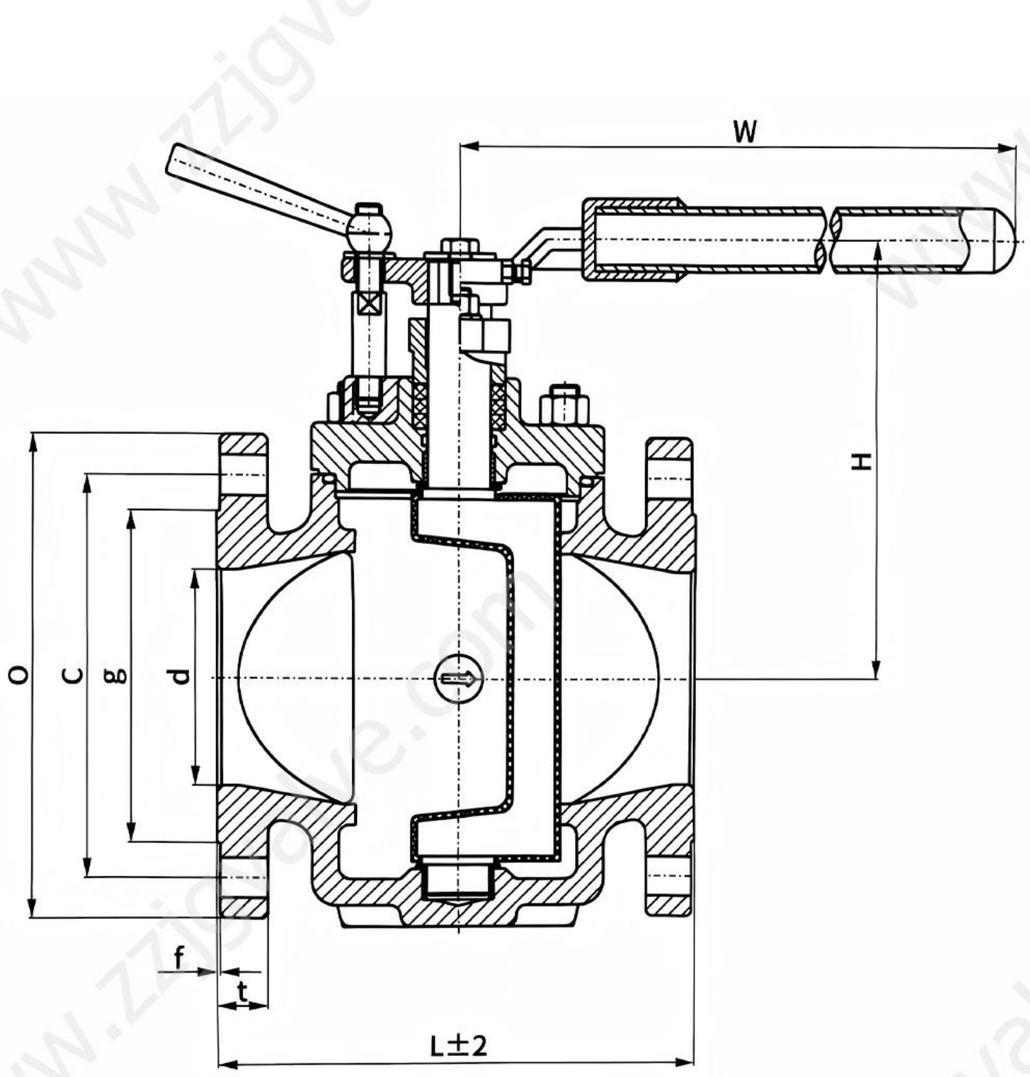

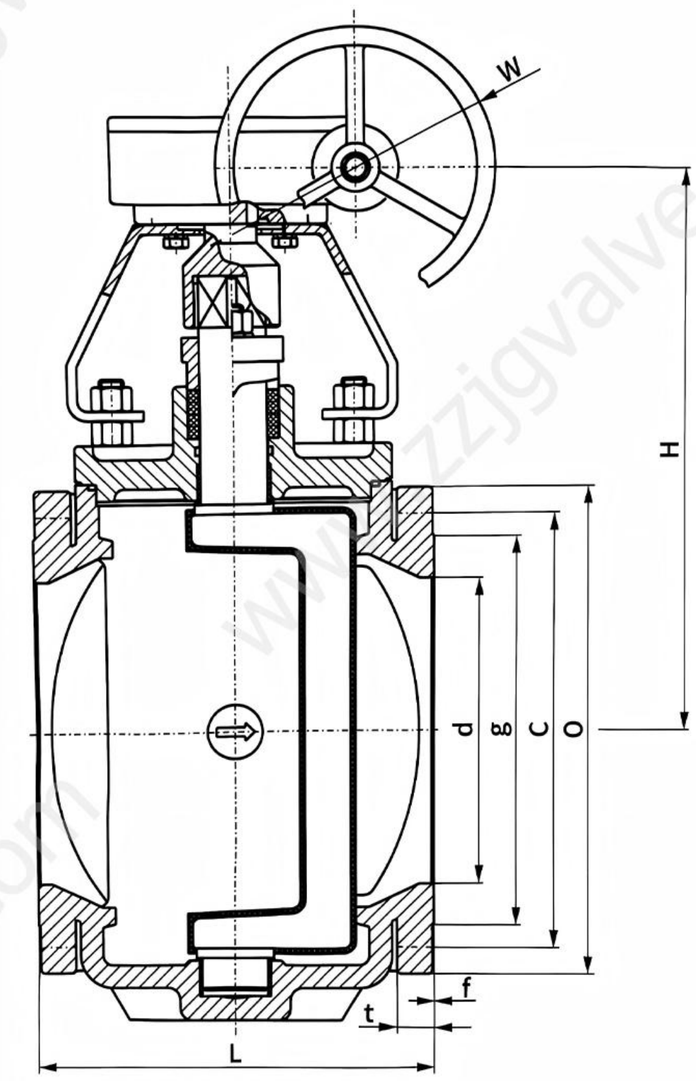

MAIN DIMENSIONS OF GB OR DIN ECCENTRIC PLUG
PN10 REDUCED BORE, HANDWHEEL, TURBINE OPERATED

Model	Size(DN)	L	O	C	g	d	t	f	H	W	n-d
PLVX43X	50	178	Φ165	Φ125	Φ102	51	18	3	145	Φ300	4-Φ18
PLVX43X	80	203	Φ200	Φ160	Φ138	76	20	3	180	Φ350	8-Φ18
PLVX43X	100	229	Φ220	Φ180	Φ158	102	20	3	207	Φ450	8-Φ18
PLVX43X	150	267	Φ285	Φ240	Φ212	152	22	3	280	Φ800	8-Φ22
PLVX343X	200	292	Φ340	Φ295	Φ268	203	24	3	382	Φ300	8-Φ22
PLVX343X	250	330	Φ395	Φ350	Φ320	254	26	3	455	Φ400	12-Φ22
PLVX343X	300	356	Φ445	Φ400	Φ370	305	26	4	480	Φ400	12-Φ22
PLVX343X	350	432	Φ505	Φ460	Φ430	337	26	4	515	Φ400	16-Φ22
PLVX343X	400	450	Φ565	Φ515	Φ482	387	26	4	560	Φ500	16-Φ26
PLVX343X	450	546	Φ615	Φ565	Φ532	438	28	4	620	Φ500	20-Φ26
PLVX343X	500	597	Φ670	Φ620	Φ585	489	28	4	690	Φ500	20-Φ26
PLVX343X	600	813	Φ780	Φ725	Φ685	591	30	5	817	Φ600	20-Φ30
PLVX343X	700	900	Φ895	Φ840	Φ800	692	35	5	900	Φ600	24-Φ30
PLVX343X	800	1000	Φ1015	Φ950	Φ905	779	38	5	950	Φ650	24-Φ33
PLVX343X	900	1321	Φ1115	Φ1050	Φ1005	874	38	5	1100	Φ700	28-Φ33

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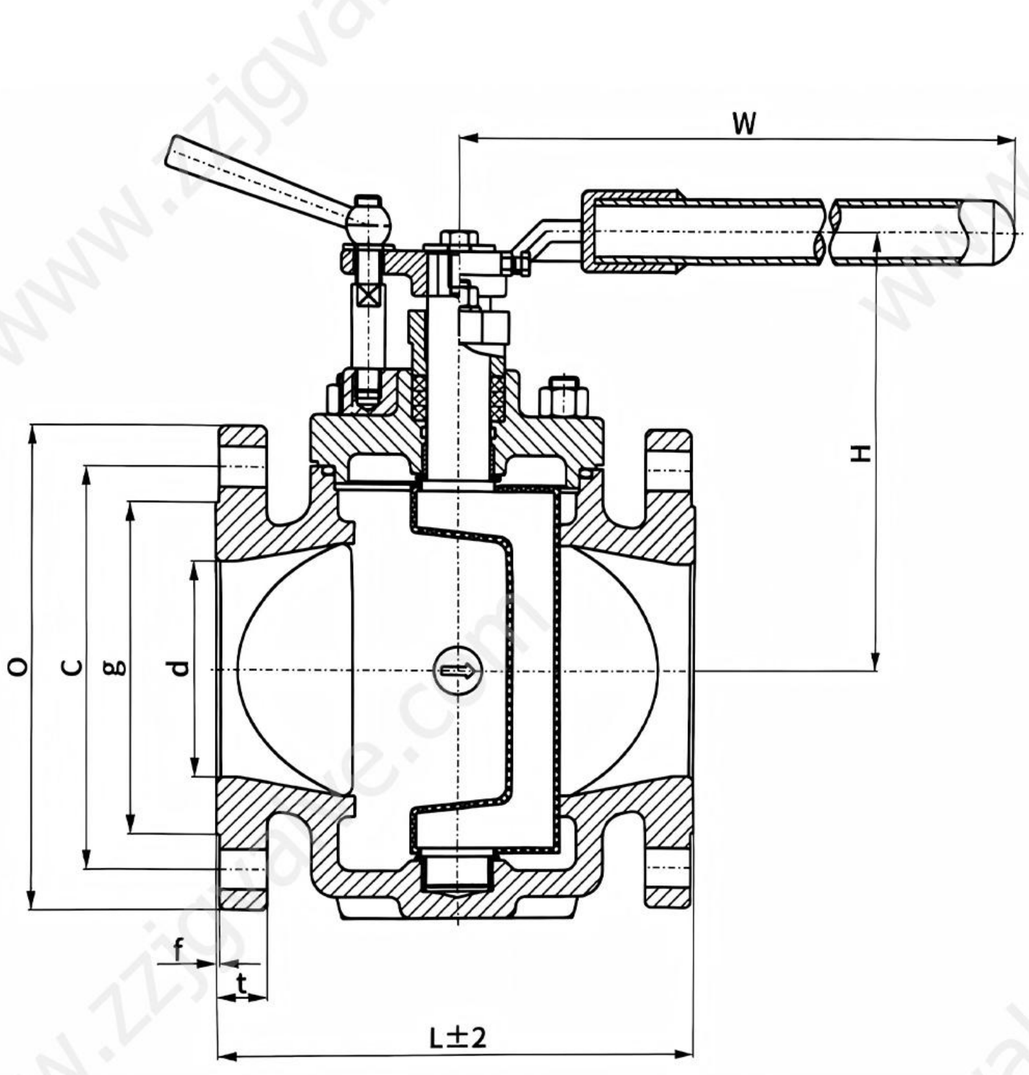

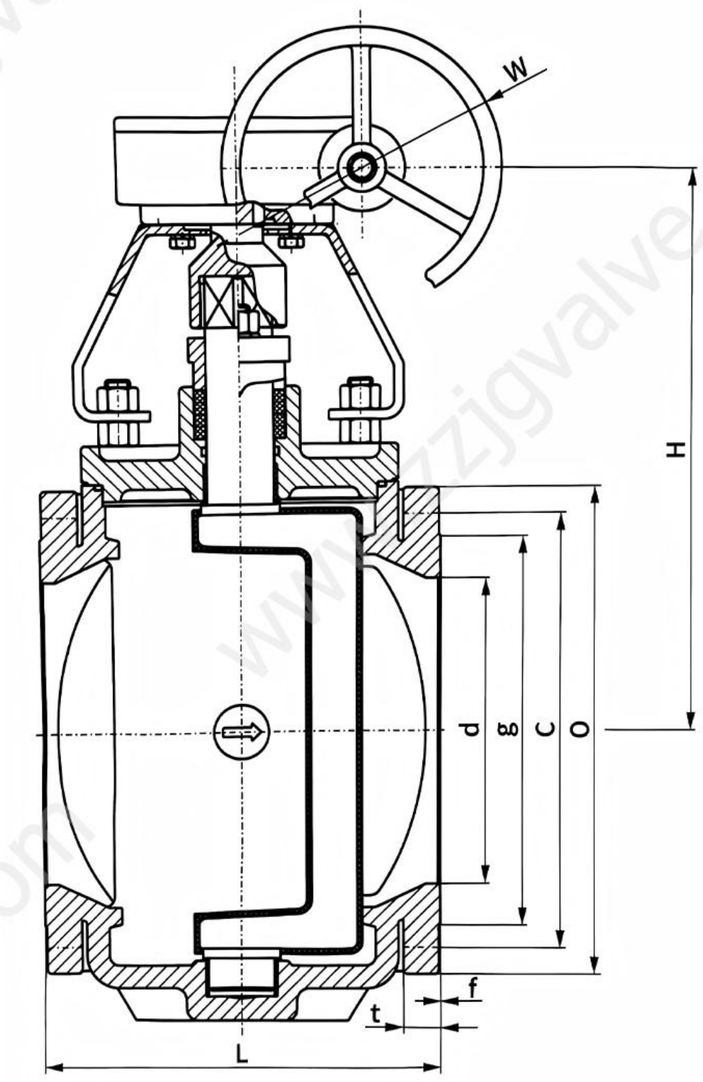

MAIN DIMENSIONS OF GB OR DIN ECCENTRIC PLUG
PN16 REDUCED BORE, HANDWHEEL, TURBINE OPERATED

Model	Size(DN)	L	0	C	g	d	t	f	H	W	n-d
PLVX43X	50	178	Φ165	Φ125	Φ102	51	18	3	145	Φ300	4-Φ18
PLVX43X	80	203	Φ200	Φ160	Φ138	76	20	3	180	Φ350	8-Φ18
PLVX43X	100	229	Φ220	Φ180	Φ158	102	20	3	207	Φ450	8-Φ18
PLVX43X	150	267	Φ285	Φ240	Φ212	152	22	3	280	Φ800	8-Φ22
PLVX343X	200	292	Φ340	Φ295	Φ268	203	24	3	382	Φ300	12-Φ22
PLVX343X	250	330	Φ405	Φ355	Φ320	254	26	3	455	Φ400	12-Φ26
PLVX343X	300	356	Φ460	Φ410	Φ378	305	28	4	480	Φ400	12-Φ26
PLVX343X	350	432	Φ520	Φ470	Φ438	337	30	4	515	Φ400	16-Φ26
PLVX343X	400	450	Φ580	Φ525	Φ490	387	32	4	560	Φ500	16-Φ30
PLVX343X	450	546	Φ640	Φ585	Φ550	438	34	4	620	Φ500	20-Φ30
PLVX343X	500	597	Φ715	Φ650	Φ610	489	36	4	690	Φ500	20-Φ33
PLVX343X	600	813	Φ840	Φ770	Φ725	591	40	5	817	Φ600	20-Φ36
PLVX343X	700	900	Φ910	Φ840	Φ795	692	40	5	900	Φ600	24-Φ36
PLVX343X	800	1000	Φ1025	Φ950	Φ900	779	41	5	950	Φ650	24-Φ39
PLVX343X	900	1321	Φ1125	Φ1050	Φ1000	874	48	5	1100	Φ700	28-Φ39

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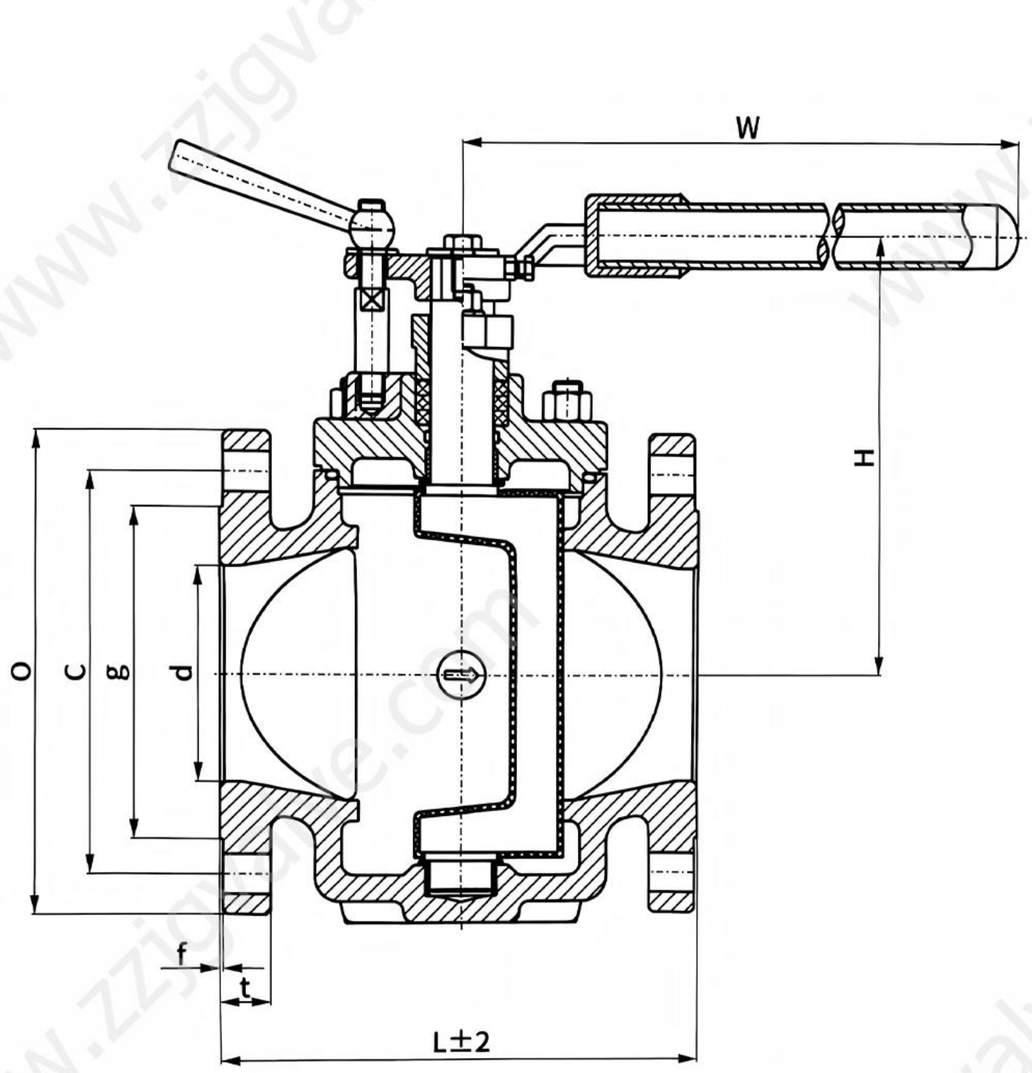

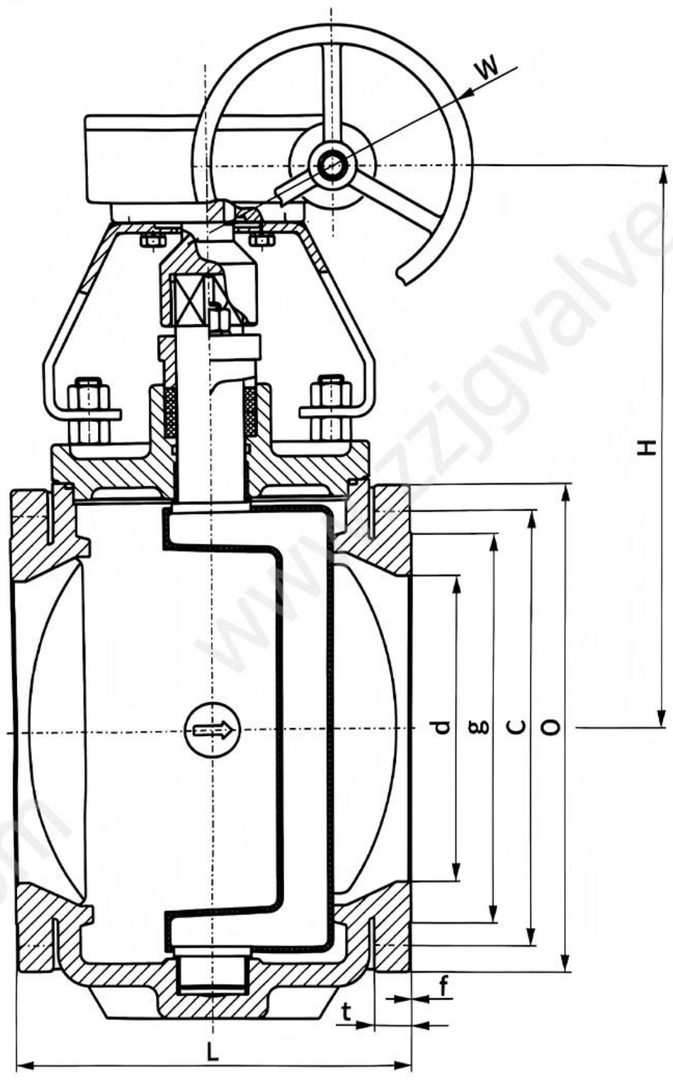

MAIN DIMENSIONS OF GB OR DIN ECCENTRIC PLUG
CLASS150 REDUCED BORE, HANDWHEEL, TURBINE OPERATED

Model	Size(DN)	L	0	C	g	d	t	f	H	W	n-d
PLVX43X	2	178	Φ150	Φ120.5	Φ92	51	16.3	2	145	Φ300	4-Φ19
PLVX43X	3	203	Φ190	Φ152.5	Φ127	76	19.5	2	180	Φ350	4-Φ19
PLVX43X	4	229	Φ230	Φ190.5	Φ157	102	24.3	2	207	Φ450	8-Φ19
PLVX43X	6	267	Φ280	Φ241.5	Φ216	152	26	2	280	Φ800	8-Φ22
PLVX343X	8	292	Φ345	Φ298.5	Φ270	203	29	2	382	Φ300	8-Φ22
PLVX343X	10	330	Φ405	Φ362	Φ324	254	31	2	455	Φ400	12-Φ25
PLVX343X	12	356	Φ485	Φ432	Φ381	305	32.2	2	480	Φ400	12-Φ25
PLVX343X	14	432	Φ535	Φ476	Φ413	337	35	2	515	Φ400	12-Φ29
PLVX343X	16	450	Φ595	Φ540	Φ470	387	37	2	560	Φ500	16-Φ29
PLVX343X	18	546	Φ635	Φ577.9	Φ533	438	40.1	2	620	Φ500	16-Φ32
PLVX343X	20	597	Φ700	Φ635	Φ584	489	43.3	2	690	Φ500	20-Φ32
PLVX343X	24	813	Φ815	Φ749.3	Φ692	591	48.1	2	817	Φ600	20-Φ35
PLVX343X	28	900	Φ925	Φ863.6	Φ800	692	71.9	2	900	Φ600	28-Φ35
PLVX343X	30	1000	Φ985	Φ914.4	Φ857	779	75.1	2	950	Φ650	28-Φ35
PLVX343X	36	1321	Φ1170	Φ1085.8	Φ1022	874	90.9	2	1100	Φ70oel:	32-Φ41