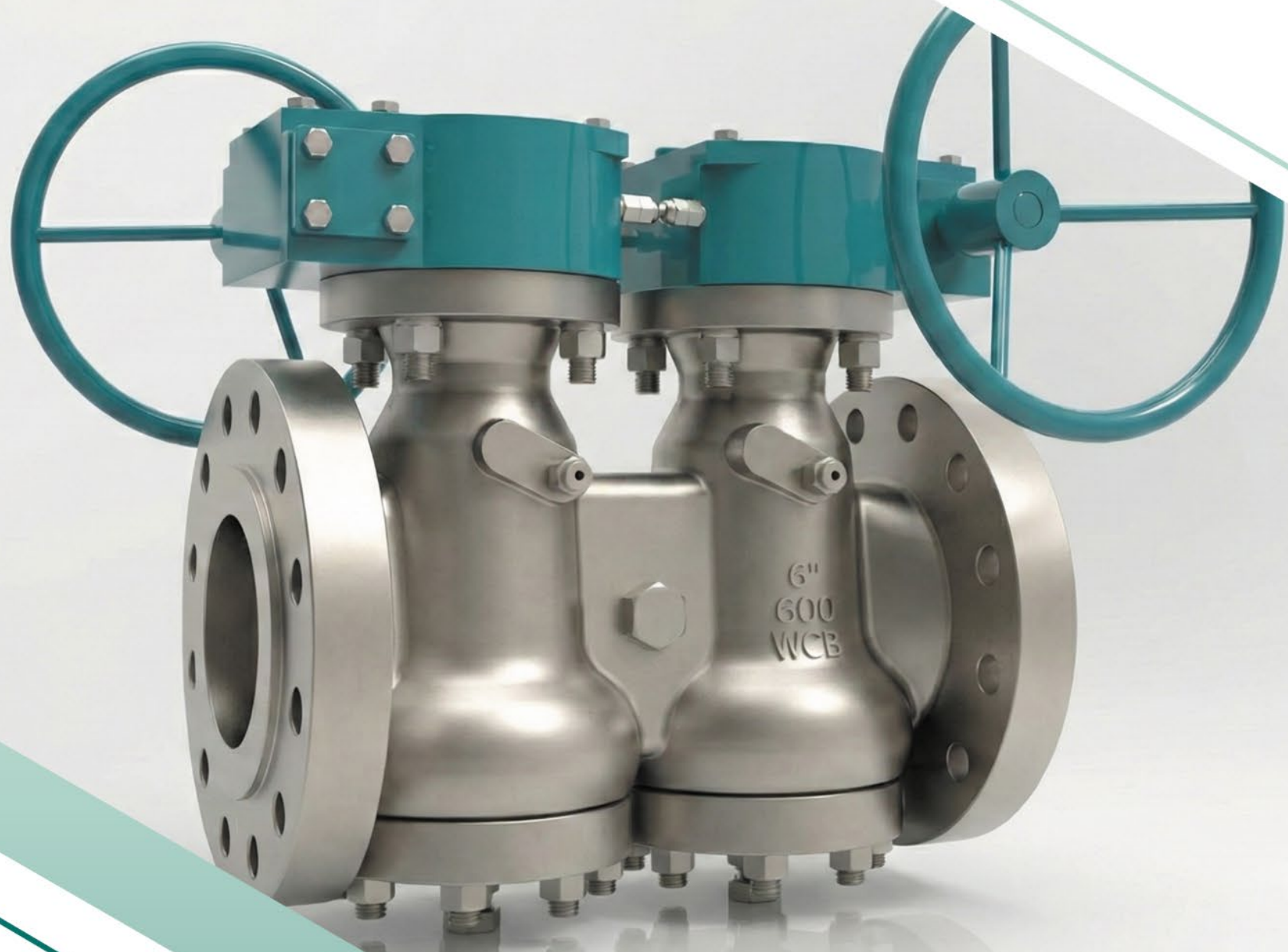
APPROVED CE APPROVED

CONVALVE

SPECIALIST IN VALVE AUTOMATION



DBB PLUG VALVE

OUR STANDARD YOUR GUARANTEE

- ISO 9001 Quality
- ISO 14001 Environment
- OHSAS 18001 Health & Safety

DBB PLUG VALVE

DESCRIPTION

The **DBB (Double Block and Bleed) Plug Valve** is designed to provide safe and reliable double isolation in pipeline systems handling hazardous and high-permeability media. Its guided rail-type plug structure reduces sealing surface wear and ensures long service life. The double sealing design effectively prevents leakage, while the self-locking operating mechanism allows smooth and stable operation. Special surface treatments improve corrosion and wear resistance. Integrated cavity pressure relief systems enhance operational safety.

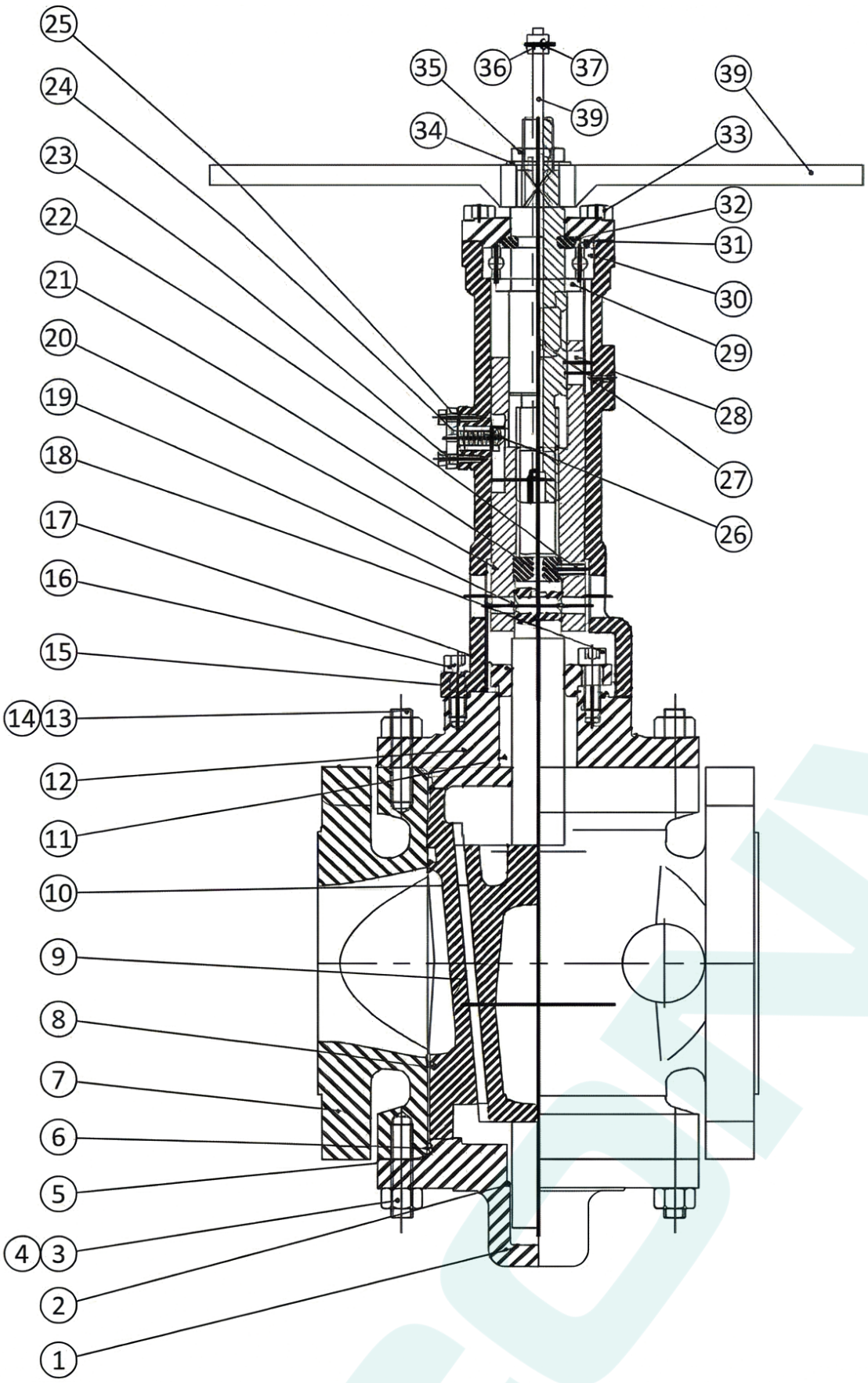
OPERATING PRINCIPLE

The connection between the sealing element (slide block) and the plug adopts a guide-rail structure. During valve opening, the drive mechanism first lifts the plug to a designed height, allowing the two slide blocks to gradually move toward the plug center and completely disengage from the body sealing surfaces, forming the required clearance before the plug rotates 90° to open the valve. During valve closing, the drive mechanism first rotates the plug 90° together with the slide blocks, and then pushes the plug downward, causing the slide blocks to move outward and press evenly against both sides of the body sealing surfaces, until the elastic sealing rings are uniformly compressed and a stable, reliable seal is formed.

FEATURES

1. **Middle flange double seal structure** The middle flange double seal structure rail plug valve is mostly used for aviation kerosene, natural gas, liquefied petroleum gas, product oil, etc. Because aviation kerosene and other media have strong permeability and are flammable and explosive, in order to prevent leakage of the medium, the middle flange uses an O-ring and winding gasket double seal structure.
2. **Packing seal structure** The orbital plug valve spool moves both vertically and rotationally during the valve switching process. Considering the particularity of the medium, in order to ensure the packing seal is safe and reliable, a combination of O-ring and packing seal is used.
3. **Operating mechanism of the valve and self-locking** The plug valve operating mechanism (screw type) adopts a unique L-shaped slot structure. It allows the plug to move axially and rotate 90° separately, making the valve operation flexible and lightweight.
4. **Special processing of key parts Valve body cavity:** Mechanically processed (grinding) and treated with hard chrome plating, making the valve cavity resistant to corrosion, erosion, and wear.
    - **Slide block:** After mechanical processing (before pressing fluorine rubber), the slide block metal sealing surface is treated with hard chrome plating, providing corrosion, erosion, and wear resistance.
    - **Plug:** After mechanical processing, nickel plating is applied, improving corrosion resistance of the plug and the upper and lower shafts.
    - **Valve stem:** After rough machining, the valve stem is tempered, and the surface hardness after finishing is no less than 900 HV, improving anti-galling and wear resistance of the screw sleeve.
    - **Guide groove and key:** The L-shaped guide groove and the guide key head on the screw sleeve are processed and quenched to no less than 45 HRC, improving wear resistance and ensuring that the guide key can slide freely in the guide groove.
5. **Online adjustment and maintenance of packing** The track plug has windows for adjustment and maintenance of packing on both sides of the support.
6. **Integral plug structure** The plug of the track plug valve adopts an integral casting structure. The plug is integrated with the upper and lower axes. When unidirectional compression is applied, it ensures that the upper and lower axes have enough rigidity, strength, and bending resistance.
7. **Valve cavity overpressure relief function** The pressure difference is caused by changes in environmental temperature. A double-sealed valve in the closed state experiences volume expansion of the medium as ambient temperature rises, gradually increasing pressure. If the pressure difference is not released in time, it can seriously impact valve operation or even cause valve cracking, posing a hidden safety risk. Rail plug valves usually have three relief systems:
    - **Manual pressure relief system** For manual operation of the valve. Usually, needle-type valves are mounted on the valve body. When the valve is closed, open the pressure relief valve in the middle chamber to release the medium to the upstream pipeline or atmosphere (to check the sealing effect if releasing to the atmosphere).
    - **Differential pressure relief system** For manual and electric operation of valves. A piping system with a check valve is used. The isolation valve is usually open. When the valve is closed, the one-way valve (check valve) in the body relieves pressure to the upstream valve and pipe. At the same time, the manual release valve can be opened to test the sealing effect. When the valve is opened, the manual release valve must be closed.
    - **Automatic pressure relief system** For electrically operated valves. When the valve is closed, the pressure relief valve will open automatically through the operating mechanism, connecting the valve chamber with the upstream pipeline or the outside.

CONSTRUCTION



NO	PART NAME	MATERIAL
1	BOTTOM COVER	A216 WCB/A351 CF8/CF8M/CF3/CF3M
2	COMPOSITE BEARING	SF
3	BOLT	A193 B7/8/8M
4	NUT	A194 2H/8/8M
5	GASKET	SS304+Graphite
6	O-RINGS	Viton
7	BODY	A216 WCB/A351 CF8/CF8M/CF3/CF3M
8	SEALING RING	Viton
9	WEDGE	A216 WCB/A351 CF8/CF8M/CF3/CF3M
10	PLUG	A216 WCB/A351 CF8/CF8M/CF3/CF3M
11	PACKING	Graphite
12	TOP COVER	A216 WCB/A351 CF8/CF8M/CF3/CF3M
13	BOLT	A193 B7/8/8M
14	NUT	A194 2H/8/8M
15	YOKE	A216 WCB
16	HEXAGON SOCKET SCREW	A193 B7
17	GLAND	A216 WCB/A351 CF8/CF8M/CF3/CF3M
18	HEXAGON SOCKET SCREW	A193 B7
19	HORIZONTAL PIN	410/4140
20	STEM NUT	D2
21	CHOCK	SS
22	SCREW	A193 B7
23	HEXAGON SOCKET SCREW	A193 B7
24	BLOCK	C. S.
25	SPRING	SS304
26	GUIDE PIN	SS410/4140
27	STEM	SS410/
28	BALL GUIDE	SS410/
29	ADJUSTMENT PLATE	SS410/
30	BEARING	Assembly
31	COVER PLATE	A216 WCB
32	SPLIT RING	SS410
33	SCREW	A193 B7
34	GASKET	SS304
35	LOCK NUT	1035
36	POINTER	SS304
37	SET SCREW	SS304
38	POINTER ROD	SS
39	HANDWHEEL	A216 WCB

TECHNICAL DATA AND SPECIFICATIONS

THE TECHNICAL SPECIFICATION

ITEM	SPECIFICATION
Structure Form	BC
Drive Mode	Manual, Electric, Pneumatic
Design Criteria	API 6D / API 599 / BS 5353 / GB/T 22130
Structural Length Standard	API 6D / ASME B16.10 / EN 558
Flange Connection Standard	ASME B16.5 / EN 1092 / HG/T 20592
Welding Connection Standard	ASME B16.25 / ASME B36.10
NPT Connection Standard	ASME B1.20.1
Pressure Temperature Rating	ASME B16.34
Inspection Standard	API 6D / API 598
Fire Protection Standard	API 607

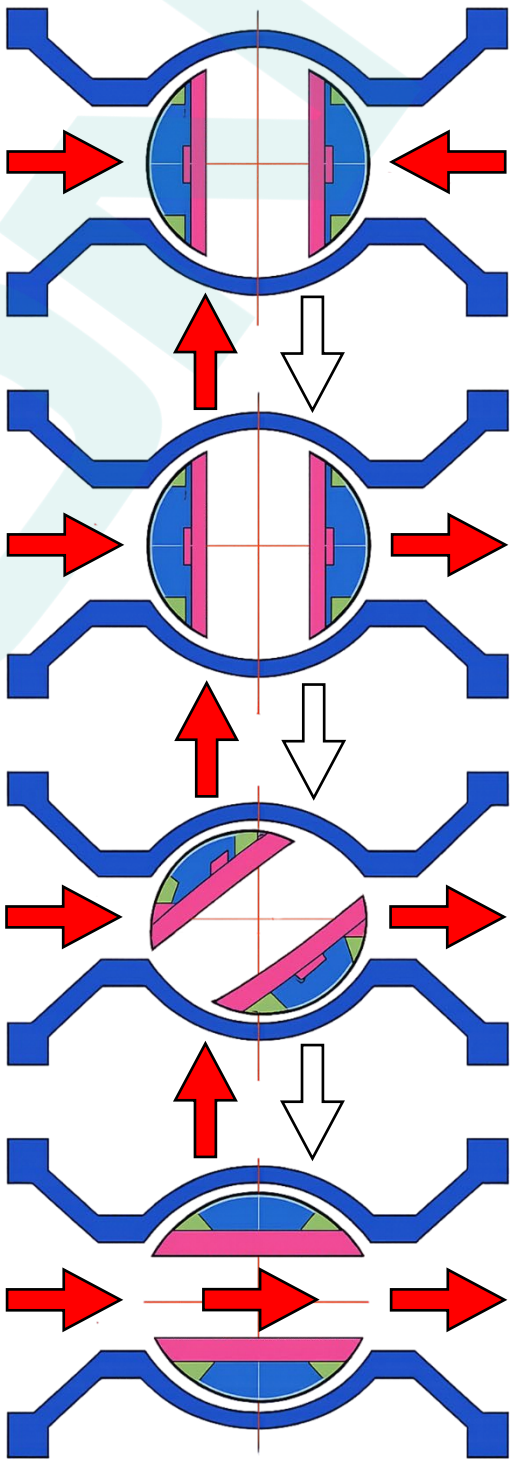
PRODUCT PERFORMANCE SPECIFICATION

NOMINAL PRESSURE (LB)	SHELL TEST PRESSURE (MPA)	SEAL TEST PRESSURE (MPA)	SUITABLE TEMPERATURE (°C)	APPLICABLE MEDIUM
150	3.0	2.2	< 180°C	Water, Steam, Oil
300	7.5	5.5		
600	15.0	11.0		
900	22.5	16.5		

SCHEMATIC DIAGRAM OF WORKING PRINCIPLE

Full closed state: Wedge plug bottom support, disc sealing surface and valve body sealing surface close fit, medium is cut off.

Counterclockwise rotation of the handwheel, wedge plug rise and drive disc retraction, disc sealing surface and valve body sealing surface gradually separated.

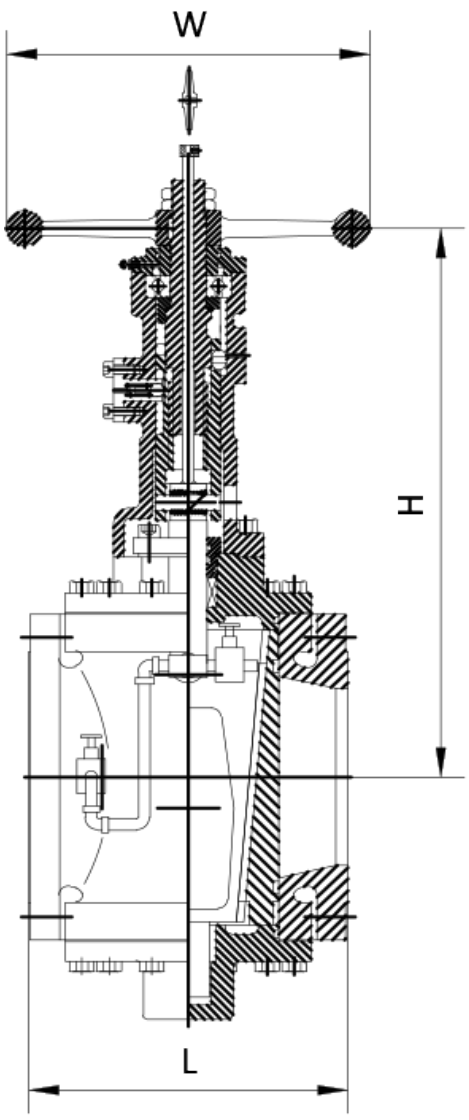


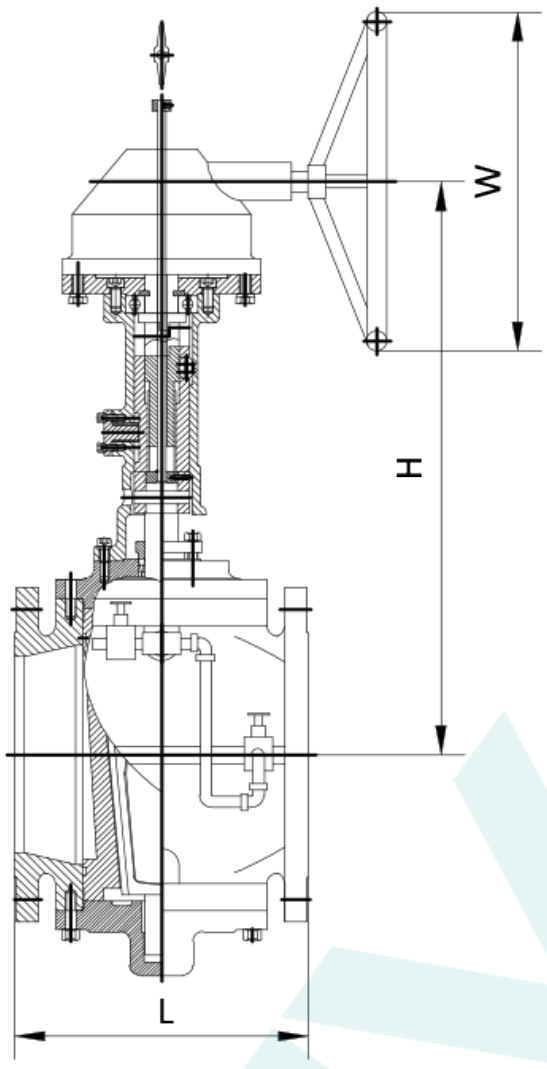
Continue to rotate handwheel, wedge plug turns to 90°, the disc sealing face and body sealing face is. The wedge plug begins to fall, gradually opening the disc.

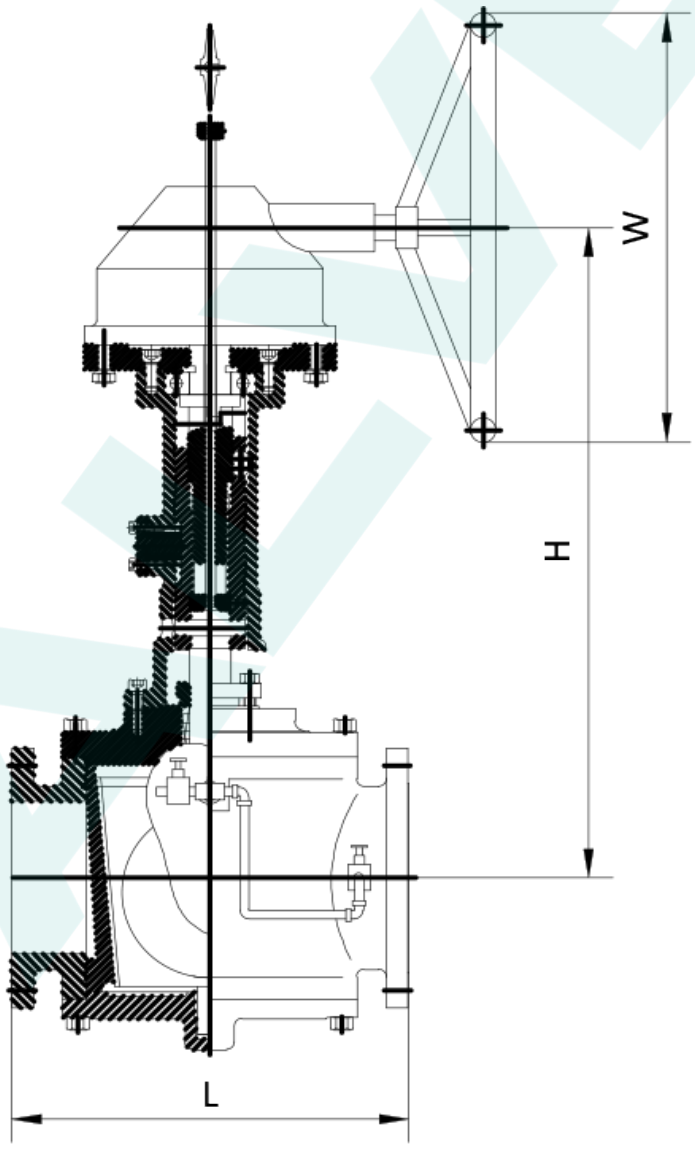
Continuing to rotate the handwheel, the wedge drives the disc to open through the dovetail groove connection.

Turn handwheel clockwise, wedge and disc to close.

Fully open: wedge plug rotation to 90°, the body channels and wedge plug overlap, the valve fully open, unimpeded circulation medium.







SIZE		DBB PLUG VALVE - 150LB					DBB PLUG VALVE - 300LB				
		L			H	W	L			H	W
INC	DN	SHORT PATTERN	REDUCED BORE	FULL BORE			SHORT PATTERN	REDUCED BORE	FULL BORE		
2"	50	178	-	267	365	250	216	-	283	365	250
3"	80	203	-	343	385	250	283	-	387	385	250
4"	100	229	-	432	406	300	305	-	457	406	300
6"	150	267	-	546	483	380	403	-	559	483	380
8"	200	292	-	622	650	460	419	-	686	650	460
10"	250	330	-	660	730	460	457	-	826	730	460
12"	300	356	-	762	750	460	502	-	965	750	460
14"	350	381	-	-	810	460	-	762	-	810	460
16"	400	406	-	-	850	500	-	838	-	850	500
18"	450	-	864	-	920	600	-	914	-	920	600
20"	500	-	914	-	960	600	-	991	-	960	600
24"	600	-	1067	-	1120	600	-	1320	-	1120	600

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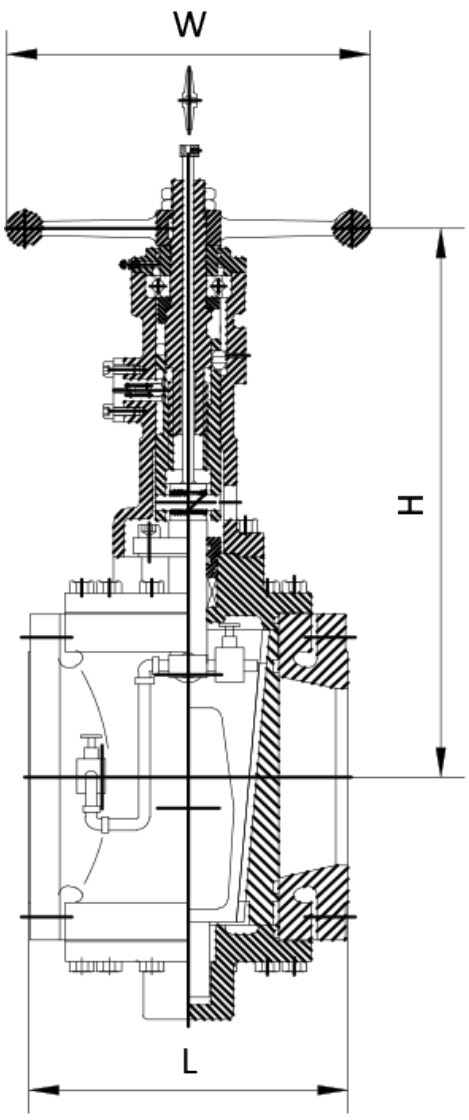

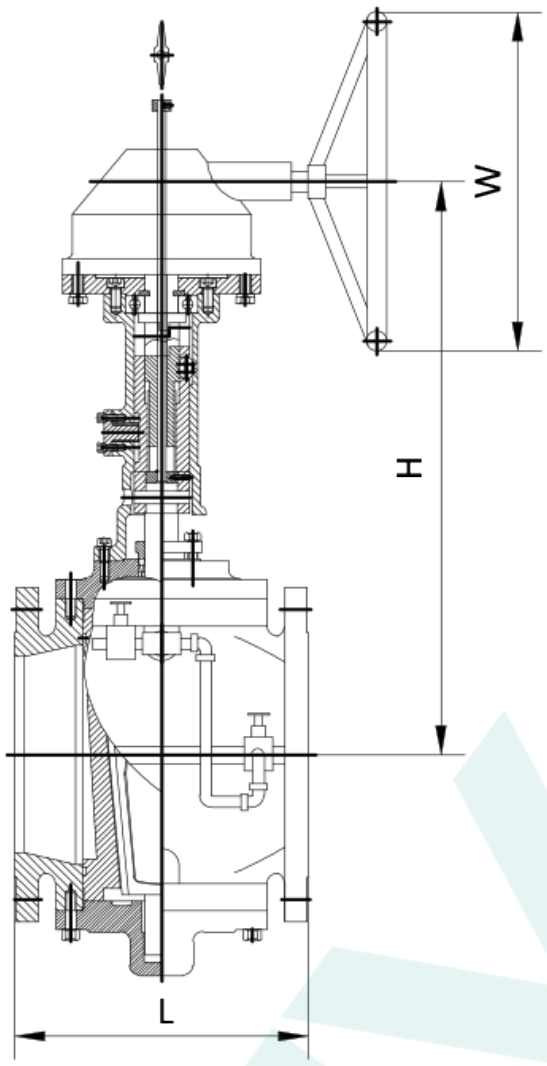

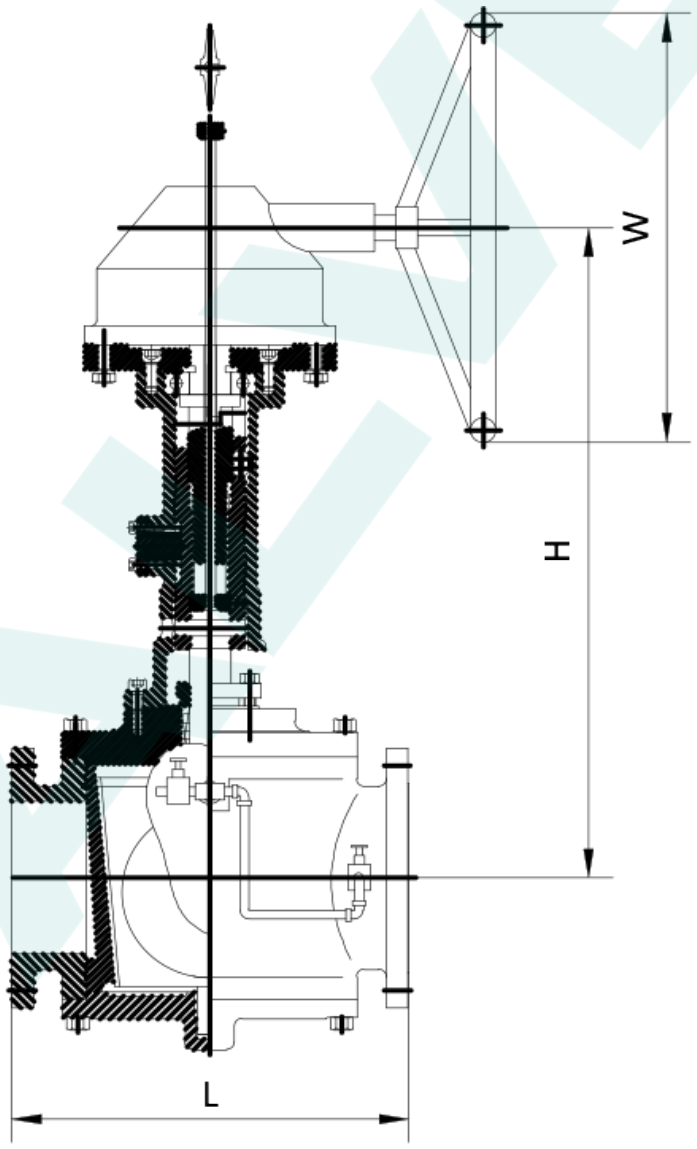

SIZE		DBB PLUG VALVE - 600LB					DBB PLUG VALVE - 900LB				
		L			H	W	L			H	W
INC	DN	SHORT PATTERN	REDUCED BORE	FULL BORE			SHORT PATTERN	REDUCED BORE	FULL BORE		
2"	50	50	292	-	330	430	320	368	-	-	515
3"	80	80	356	-	445	445	320	381	-	-	580
4"	100	100	432	-	508	525	320	457	-	-	625
6"	150	150	559	-	660	655	460	610	-	-	710
8"	200	200	660	-	794	760	460	737	-	-	905
10"	250	250	-	787	940	920	720	838	-	-	1065
12"	300	300	-	838	1067	950	720	-	-	-	-
14"	350	350	-	889	-	965	720	-	-	-	-
16"	400	400	-	991	-	1130	860	-	-	-	-
18"	450	450	-	1029	-	1150	860	-	-	-	-
20"	500	500	-	1194	-	1330	860	-	-	-	-
24"	600	600	-	1397	-	1405	860	-	-	-	-

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