

TOP ENTRY BALL VALVE

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1. Application

Top entry valves are employed primarily in the crude oil and natural gas industries as well as in refineries and in chemical engineering. These valves provide reliable and tight-shut-off and are of robust construction to withstand external forces. Pipeline valves which are welded in the pipeline or have difficult access and must nevertheless permit on-site maintenance or repair.

The valve incorporates facilities for replacing both the seals and the ball or for repairing such components without the need for removing the valve body from the pipeline.

All component parts can be fitted without the need for special tools. The through bore has no gaps or shoulders and all seals feature simple geometrical shapes, e. g. O-rings. The valves are pigable.

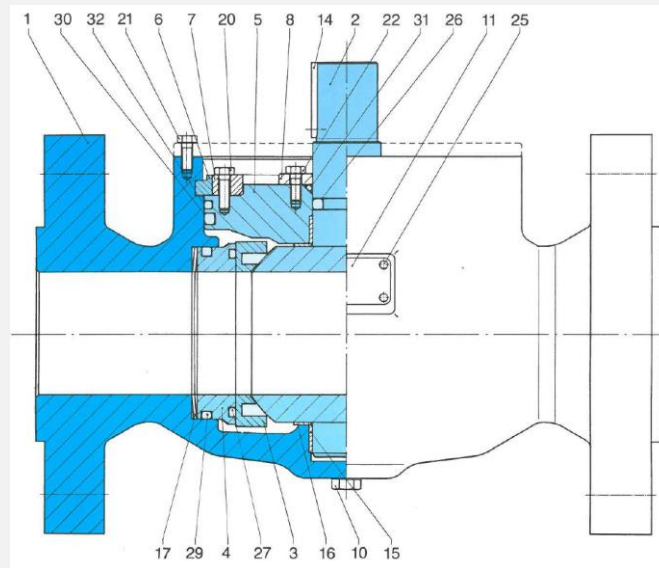
They have an official API monogram on pipeline valves. Thus, materials, inspection and dimensions follow the API 6D Specifications.

2. Function

The ball (2) together with the seat rings (3) can be fitted into or removed from the single piece body (1) from the top. The body of the valve has an aperture of adequate size which permits effortless assembly. The bonnet (5) is secured to housing (1) by a 4section ring (6) and retainer ring (7), the necessary seal being produced by a O-ring (30).

When assembling, the two thrust rings (4) together with the springs (17) are inserted first. When the plug (2) is introduced together with the very short seat rings (3) the thrust rings (4) are pushed apart thus preloading the springs (17). These springs provide a sealing force of approx. five bar in the pressure less state. When the plug (2) is rotated, the seat rings (3) are supported by the housing (1). The thrust rings (4) are sealed by O-rings (27 + 29) to body (1) and to the seat rings (3). The ball (2) is located in bearings (15 + 16) at top and bottom. Sealing towards outside is affected by a O-ring (26) on the ball stem (2). The O-ring seals (26 + 30) on bonnet and stem are supplemented towards the outside by special sealing rings (31 + 32) to provide tight shut off in the event of a fire.

The drain plug (10) with integrated relief bore serves for venting or emptying the housing (1). Ball valve actuation can be affected by hand lever on the smaller internal diameters and pressure or by gear with handwheel in case of larger diameters and high pressure. Power actuators can also be incorporated to provide automatic operation.



1	Body	10	Drain plug	22	Hexagon screw
2	Ball	11	Name plate	25	Notched pin
3	Seat ring	14	Feather key	26	O-ring
4	Thrust ring	15	Radial bearing	27	O-ring
5	Bonnet	16	Axial bearing	29	O-ring
6	Segment ring	17	Spring	30	O-ring
7	Retainer ring	20	Hexagon screw	31	O-ring
8	Lid	21	Hexagon screw	32	Fire safe seal

3. Sizes and pressure ratings

According to ASME/API 6D		According to EN	
Diameters NPS	Pressure class	Diameters	Pressure class
1" up to 36"	150# up to 900#	DN 25 p to DN 900	PN 16 up to PN 160
1" up to 24"	1500#	DN 25 up to DN 450	PN250
1" up to 16"	2500#		

According to API 6A	
Diameters NPS	Pressure classes
1" up to 6"	2000 / 3000 psi
1" up to 4"	5000 / 10000 psi

4. Operating temperatures

Standard version: -10°C up to +150°C

Low temperature version: -46°C up to +150°C

5. Materials

All materials are in accordance with NACE MR-01-75.

Self-lubricated low friction PTFE is used for stem bearings and seat inserts and gives predictable operating torque for the life of the valve.

5.1 Standard materials

Pos	Component	Standard material
1	Body	A216 WCB / A487 1 C
2	Ball	A487 CA15M
3	Seat ring	AISI 410
4	Thrust ring	AISI 410
5	Bonnet	AISI 1020 / AISI 4130
17	Spring	AISI 301
15/16	Bearings	PTFE
Seals	O-rings	FKM / FPM

5.2 Alternative materials for low temperature service

Cast steels: A352 LCB / A757 C1Q / A352 CA6NM

Forged steels: A350 LF2 / A350 LF6 / AISI 414

5.3 Alternative materials for corrosive media

Cast steels: A487 CA6NM / A351 CF8M / A743 CD4MCu

Forged steels: A182 F6NM / AISI 316 / A182 F51

6. Connections to the pipe

- Flanged ends (RF, RTJ, or other) According to ASME B16.5, ASME B16.47.
- Butt welding ends (BW) according to ASME B16.25.

7. Operation

Top entry ball valves can be actuated with following types of actuators:

- Manual (lever)
- Manual with gear operator
- Electric actuator
- Pneumatic actuator
- Hydraulic actuator
- Gas over oil actuator
- Others

All actuators can be supplied with the corresponding automation components.

For more details see the description of the different types of actuators.

8. Design Features

- trunnion mounted ball
- soft or metal seated
- anti blow-out stem
- double-block-and-bleed
- drain port
- anti-static design
- firesafe design
- suitable for sour gas service

Optional Features

Secondary sealant injection for stem and seat rings

9. Disassembling of the valve



