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Joint Venture

TOP ENTRY TRUNNION MOUNTED BALL VALVE CATALOGUE



API 6D - 1473
API Q1 - 2345
API QR - 2470 (9001)
API 6A - 0842



CHEVRON
APPROVED



BP APPROVED



SHELL TAT TAMAP
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PETRONAS
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API 607 5th, 6th & 7th Ed.
ISO 10497 Firesafe Certified



ISO 15848-1 & API 641
Fugitive Emission Certified



API 6D - 1473
API Q1 - 2345
API QR - 2470 (9001)
API 6A - 0842



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LLOYDS
FZV - CE/PED
2014/68/EU

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Catalogue information is current at time of publication, subject to change without notice



INDUSTRIAL PIPELINE CONTROL EXPERT

FANGZHENG VALVE GROUP



We (FZV) commit ourselves to manufacturing excellent valves and achieving our customer satisfaction based on the principles of quality assurance and continual improvement.

We are specialized in supplying a wide range of API 6D, API 609, API600, API 602, API 608, API 594, API 6A products and wellhead equipment.

FZV was formally established in 1992, and so far, FZV has been approved by well-known international and domestic End-users and EPC companies.

FZV has set up three factories based in Shanghai and Wenzhou city with total area 76000 m² and maximum production capacity up to 32000 tons.

To enhance engineering designs and manufacture high-end products, FZV has in-house laboratory equipped with various facilities and test equipment to check and verify the product quality. The following tests are conducted in-house:

- Chemical analysis
- Mechanical test, Hardness, and impact test
- Non-destructive examination
- Salt spray test
- Fugitive emission test(ISO 15848-1 & 2)
- Design validation testing (DVT) as per SHELL(MESC SPE 77/300)
- High temperature (Up to 550°C) and Cryogenic test (Up to -196°C)

FZV is certified by ISO 9001, ISO 14001, OHSAS 18001, API6D, API600, API609, API594, API607, API6A, API6A-PR2, API Spec.Q1, ABS, CCS, DNV, ATEX, and CE/PED, etc.

FZV Main Products Range:

Product types: Ball Valve, Gate Valve, Globe Valve, Check Valve, Butterfly Valve, Slab Gate Valve, Pipe Fitting, Cryogenic Valve, API6A Valve, Wellhead Equipment, Manifold & Christmas tree, etc.

Implemented Standards: ISO, API, BS, etc.

Casting material: WCB, LCB, WC6, WC9, C5, C12, CF3, CF3M, CF8, CF8M, C95500, 4A, 5A, Monel 400/500, Inconel 825/625, Titanium Alloy, etc.

Forging material: A105, LF2, F11, F12, F304, F321, F347, F316, 304L, 316L, C61900, F51, F53, F55, Inconel, Titanium Alloy, etc.

Nominal diameter: NPS 1/2"-68"(DN 15-DN 1,700)

Nominal pressure: API600 & API6D: CLASS 150~CLASS 2,500 (PN16~PN420) API 6A: 2,000PSI~15,000PSI

Temperature range: -196°C-550°C

Applications: Onshore oil and gas exploitation and transportation, offshore oil and gas platform and FPSO / FLNG / FSRU, natural gas purification and liquefaction unit, LNG receiving station and vaporization unit, refining, chemical industry and chemistry, coal to gas (oil) and coal chemical industry, air separation, power station, aerospace, military industry and new energy (solar power generation, hydrogen energy, etc.) etc.

Mission: Providing Complete Control Solutions For Industrial Pipelines.

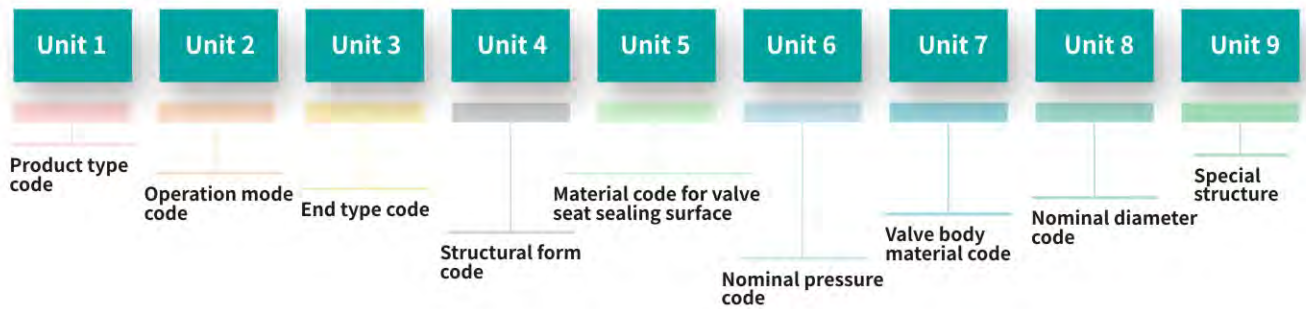
Our Advantages:

1. Strict quality management system to ensure excellent product quality;
2. Excellent production management system to ensure the shortest delivery;
3. Competitive price;
4. Responsive after-sales service.



IDENTIFICATION NUMBERING SYSTEM FOR BALL VALVE PRODUCTS

A ball valve's identification number consists of 8 units as the following:



Unit 1

Table.1 indicates the number of codes used to categorize Ball valve type.

Unit 2

Table.2 indicates the number of codes used to categorize Ball valve's operation type.

Unit 3

Table.3 indicates the number of codes used to categorize Ball valve's End flange type.

Unit 4

Table.4 & 5 indicates the number of codes used to specify Ball valve's structural design.

Unit 5

Table.6 indicates the number of codes used to specify Ball valve's seat material.

Unit 6

Table.7 indicates the number of codes used to specify Ball valve's nominal pressure.

Unit 7

Table.8 indicates the number of codes used to specify Ball valve's body material.

Unit 8

Table.7 indicates the number of codes used to specify Ball valve's nominal diameter.

Unit 9

The special structure is described in parentheses, and multiple requirements in the description are separated by "/". Examples include (DIB-2), (PTFE), (PTFE/G), (non extension), etc.

BALL VALVE CATEGORY CODE
Table 1

CATEGORY	CODE	CATEGORY	CODE	CATEGORY	CODE
Floating ball valve Shaft type Trunnion mounted ball valve	Q	High temperature ball valve	HQ	Integrated ball valve (side entry)	Qs
Fixed plate structure	Qg	A standard ball valve	MQ	Fully welded ball valve	Qw
Shell 2008 Structure	Qm	Orbit ball valve	QD	Shell standard cavity overlay	Qmn
-46°C low temperature	DQ	Oxygen ball valve	YQ		
-101°C and below	CDQ	Internal cavity welding	Qn		

VALVE OPERATION MODE CODE
Table 2

OPERATION MODE	CODE	OPERATION MODE	CODE	OPERATION MODE	CODE	OPERATION MODE	CODE
Bare shaft	0	Worm gear	3	Pneumatic	6	Motor	9
Lever/Handwheel	N/A	Spur gear	4	Hydraulic/ Gas over oil	7		
Impact type handwheel	2	Bevel gear	5	Chain wheel	8		

Note: (1) For pneumatic or hydraulic valves, 6K and 7K are used for normally open valves, and 6B and 7B are used for normally closed valves.

(2) Explosion proof electric is represented by 9B.

END TYPE CODE
Table 3

END TYPE	CODE	END TYPE	CODE	END TYPE	CODE	END TYPE	CODE
Male Threaded (SD)	1	Raised flange (RF)	4	Wafer (WR)	7	Flat flange (FF)	0
Groove surface (G)	2	Ring type flange (RTJ)	5	Clamp (CP)	8	One side Female threaded /another side Socket weld	1/9
Concave flange (FM)	3	Butt welding (BW)	6	Socket weld (SW)	9		

STRUCTURAL FORM CODE
Table 4
**STRUCTURAL FORM CODE OF
ORBIT BALL VALVE**
Table 5

CODE	STRUCTURAL FORM	CODE	STRUCTURAL FORM	CODE	STRUCTURAL FORM	CODE	STRUCTURAL FORM
0	Tope entry trunnion mounted ball	5	T type floating three way	1	Integral valve stem, closed type valve cover	3	Integral valve stem, OS&Y
1	Two pieces floating ball valve	6	Two pieces trunnion mounted ball valve			4	Two section valve stem, OS&Y
2	Integral reduce bore floating ball valve	7	Three pieces trunnion mounted ball valve	2	Two section valve stem, sealed type valve cover		
3	Three pieces floating ball valve	8	L type trunnion mounted three way				
4	L type floating three way	9	T type trunnion mounted three way				

MATERIAL CODE FOR VALVE SEAT SEALING SURFACE
Table 6

SEALING SURFACE MATERIAL	CODE	SEALING SURFACE MATERIAL	CODE	SEALING SURFACE MATERIAL	CODE
Tin based bearing alloy	B	Nylon	N	Lined with fluorine	J
18-8 series stainless steel	P	Mo2Ti series stainless steel	R	Body (integral valve seat)	W
Fluoroplastic	F	Copper alloy	T	Multi lay composite	HF
Cr13 series stainless steel /alloy steel	H	Rubber	X		
Monel	M	Hard faced alloy	Y		

Note: General drawing design: F for soft seat,Y for metal seat.

BALL VALVE PRODUCT PRESSURE - TRUNNION RANGE - FIXED BALL VALVE (INCLUDING DIAMETER AND REDUCED DIAMETER)

Table 7

NOMINAL DIAMETER NPS	CL 150	CL 300	CL 600	CL 900	CL 1500	CL 2500
2	●	●	●	●	●	●
3	●	●	●	●	●	●
4	●	●	●	●	●	●
6	●	●	●	●	●	●
8	●	●	●	●	●	●
10	●	●	●	●	●	●
12	●	●	●	●	●	●
14	●	●	●	●	●	●
16	●	●	●	●	●	●
18	●	●	●	●	●	●
20	●	●	●	●	●	●
24	●	●	●	●	●	●
28	●	●	●	●	●	●
30	●	●	●	●	●	●
32	●	●	●	●	●	●
36	●	●	●	●	●	●
42	●	●	●	●	●	●
48	●	●	●	●	●	●

BALL VALVE PRODUCT PRESSURE - SIZE RANGE - FLOATING BALL VALVE (INCLUDING FULL BORE AND REDUCE BORE)

NOMINAL DIAMETER NPS	CL 150	CL 300	CL 600	CL 900	CL 1500	CL 2500
1/2	●	●	●	●	●	●
3/4	●	●	●	●	●	●
1	●	●	●	●	●	●
1 1/2	●	●	●	●	●	●
2	●	●	●	●	●	●
3	●	●	●	●	●	●
4	●	●	●	●	●	●
6	●	●	●	●	●	●
8	●	●	●	●	●	●
10	●	●	●	●	●	●

VALVE BODY MATERIAL CODE

Table 8

BODY MATERIAL	CODE	BODY MATERIAL	CODE	BODY MATERIAL	CODE	BODY MATERIAL	CODE
WCB	C	Ductile iron	Q	A105	A	F304L	F4
18-8 series stainless steel	P	Mo2Ti series stainless steel	R	LF2/LF1	LF	F316	F6
Chromium molybdenum steel	I	Copper and copper alloys	B	F11	F1	F316L	F7
Malleable iron	K	Chromium molybdenum vanadium steel	V	F22	F2	LCB/LCC	LC
Cr13 series stainless steel	H	Grey cast iron	Z	F304	F3	C5	C5
WC6	C6	WC9	C9	CF3	S3	CF3M	S4
Cf8	S8	CF8M	S9				

Note: (1) For national and German standard valves, when $PN \leq 1.6\text{MPa}$ uses gray cast iron valve bodies and $PN \geq 2.5\text{MPa}$ uses carbon cast steel valve bodies, codes Z and C can be omitted.

(2) When using carbon cast steel valve bodies for American and British standard valves, the code C can be omitted.

(3) Universal drawing design, forging valve body uniformly uses A, omitting code for cast steel valves, specific material details are executed according to BOM.

(4) The main types of valve body materials are shown in Table 8.1: Types of main body materials.

(5) Common combinations of internal materials: see Tables 9-1 to 9-3 for combinations of internal materials.

TYPE OF MAIN MATERIAL
Table 8.1

ITEM	01	02	03	04	05	06	07
MATERIAL GRADE	A105	WCB	WCA	WCC	WCI	Wc4	Wc5
MATERIAL TYPE	Carbon steel forging				Heat-resistant cast steel		
ITEM	08	09	10	11	12	13	14
MATERIAL GRADE	WC6	WC9	C5	C12	CF3	CF3M	CF8
MATERIAL TYPE	Heat-resistant cast steel				Stainless steel casting		
ITEM	15	16	17	18	19	20	21
MATERIAL GRADE	CF8M	LF1	LF2	LF3	LFA	LCB	LCC
MATERIAL TYPE	Stainless steel casting	Low temperature forged steel			Low temperature cast steel		
ITEM	22	23	24	25	26	27	28
MATERIAL GRADE	LC1	LC2	LC3	F304	F304L	F316	F316L
MATERIAL TYPE	Low temperature cast steel				Stainless steel forging		
ITEM	29	30	31	32	33	34	35
MATERIAL GRADE	410	17-4PH	IRON	STEEL	C95800	MONEL	INCONEL625
MATERIAL TYPE	Martensitic stainless steel	Precipitation stainless steel	Soft iron	Cast steel, cold-rolled steel	Copper	Special materials	
ITEM	36	37	38	39	40	41	42
MATERIAL GRADE	20#	Hastelloy B	Hastelloy C	4140	CA15	A105+ENP	WCB+ENP
MATERIAL TYPE	Special materials			Alloy steel	Heat-resistant steel	Surface treatment	
ITEM	43	44	45	46	47	48	49
MATERIAL GRADE	STEELITE	A105N	4A	F51	INCONEL825	LF2+ENP	WCB+DSS
MATERIAL TYPE	Wear resistant material	Surface treatment	Special materials		(CU5MCUC)	Surface treatment	
ITEM	50	51	52	53	54	55	56
MATERIAL GRADE	HT200	F11	F22	A 105N+ENP	54	Organic glass	F12
MATERIAL TYPE	Grey cast iron	High temperature steel		Surface treatment	F44	Special treatment	High temperature steel
ITEM	57	58	59	60	61	62	63
MATERIAL GRADE	WCB+PFA	F55	F91	C95200	61	C61900	
MATERIAL TYPE	Carbon steel lining	Special materials	High temperature steel	Copper alloy	C95500	Copper alloy	

Copper alloy

TRIM MATERIAL COMBINATION TRUNNION MOUNTED BALL VALVE

Table 9-1

Explanation: The materials in the table can be combined arbitrarily according to the working conditions, and if there are no specified ones, they will be according to the factory standards

ITEM	BALL	SEAT	STEM	SUPPORT PLATE/ LOWER COVER	SEAL RING	BODY FASTENER
1	A105+ENP	A105+ENP	A105+ENP	A105+ENP	PTFE	B7/2H
2	4140+ENP	4140+ENP	4140+ENP	4140+ENP	RPTFE	B7M/2HM
3	F6a(ENP)/410(ENP)	F6a(ENP)/410(ENP)	F6a(ENP)/410(ENP)	F6a(ENP)/410(ENP)	NYLON	B8/8(A)
4	304	304	304	304	NYLON 12	B8M/8M(A)
5	304L	304L	304L	304L	NYLON 66	L7/7
6	316	316	316	316	PEEK	L7M/7M
7	316L	316L	316L	316L	DEVLON V	B8T/8T
8	LF2+ENP	LF2+ENP	LF2+ENP	LF2+ENP	MOLON	L7/4L
9	WCB+ENP	F316+ENP	17-4PH	17-4PH	PARA POLYSTYRENE	B16/4
10	4A/F51	F51	F51	F51	TEFLON	
11	Alloy 825	Alloy 825	Alloy 825	Alloy 825	POM	
12	CF8M	F6a	F6a	F6a	PCTFE	
13	CF8	F55	F56	F57		
14	INCONEL625	INCONEL625	INCONEL625	INCONEL625		
15	MONEL400	MONEL400	MONEL400	MONEL400		
16	MONEL500	MONEL500	MONEL500	MONEL500		
17	Alloy 20	Alloy 20	Alloy 20	Alloy 20		
18	A105N/ENP	A105N/ENP	A105N/ENP	A105N/ENP		
19	F55			ORGANIC GLASS		
20	F44	F44	F44	F44		

Note: The ENP thickness is usually specified as 0.03mm, and can be 0.075mm as needed.

The FZV trunnion ball valves have been engineered to meet both general service and heavy duty applications including petroleum, petro-chemical, and industrial. Valves are designed in accordance with API 6D, they are available in a variety of configurations and materials to meet your specific operational needs. FZV valves not only meet but exceed industry standards.

FEATURES

- Valve body, closures, ball and seat carriers are manufactured from forged steel to ensure high strength, dependable service life in high pressure or severe applications.
- Available seat configurations include self-relieving (single piston effect), DIB-1 (double piston effect) and DIB-2 (single piston one side, double piston one side) options.
- DIB-1 valves are provided with drilled, tapped, plugged ports for ease of thermal relief piping as necessary.
- The primary seat design utilises TEFLON, DEVLON, or PEEK as standard dependent on pressure class, the secondary metal seat ring will provide sealing should the primary be eliminated by fire per API 607.
- All seat rings and O-rings include graphite secondary seals to achieve firesafe requirements for API 607.
- All O-rings are anti-explosive decompression style.
- All sizes/ANSI classes are double block and bleed capable in accordance with API 6D.
- The drain valve can be for block and bleed function or to check seat integrity during maintenance.
- Valve stems are anti-blowout, designed in accordance with API 6D to ensure the body cavity pressure cannot eject stem.
- The design incorporates two springs to assure electric continuity between the stem/body/ball to eliminate static build-up.
- The mounting pad provided is standard to ISO 5211 for ease of automation.

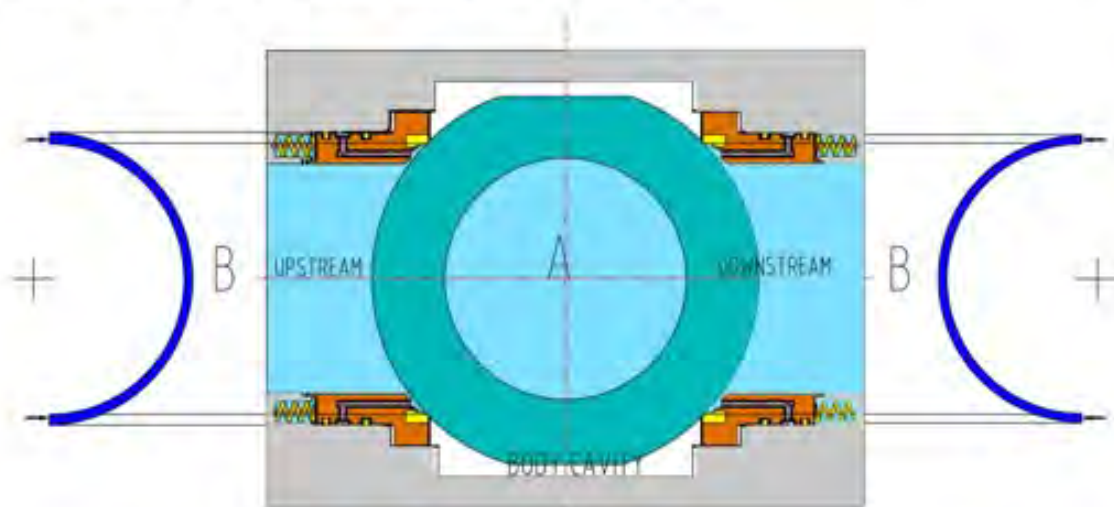
ADDITIONAL OPTIONS

- Cryogenic designs and test capabilities are available.
- For severe service (high temperature or abrasive media), metal seated design options can be provided.
- Valves are provided with factory enamel coating, custom coating or colours can be offered based upon specific needs.
- Additional testing or documentation is available and can be offered as required.

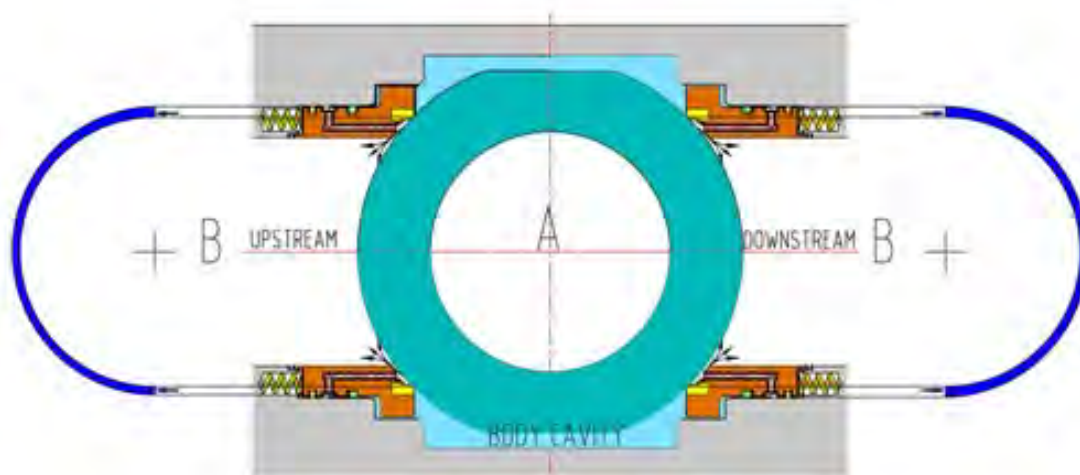
SELF-RELIEVING, DIB-1, AND DIB-2 SEAT DESIGN

SELF-RELIEVING (SINGLE PISTON EFFECT) DOUBLE BLOCK & BLEED

For this design, the seat retains tight contact with the ball in one direction. The line pressures upstream and downstream act upon the back of the seat retainers to force each of the seat rings more tightly against the ball. In the event that the body cavity pressure exceeds either the upstream or downstream line pressure, the body pressure will create a thrust that will push the seat ring away from the ball and allow the pressure to equalize between the cavity and the line. This overpressure release can occur in either the full open or close valve position. This style of valve is fully bi-directional for installation.



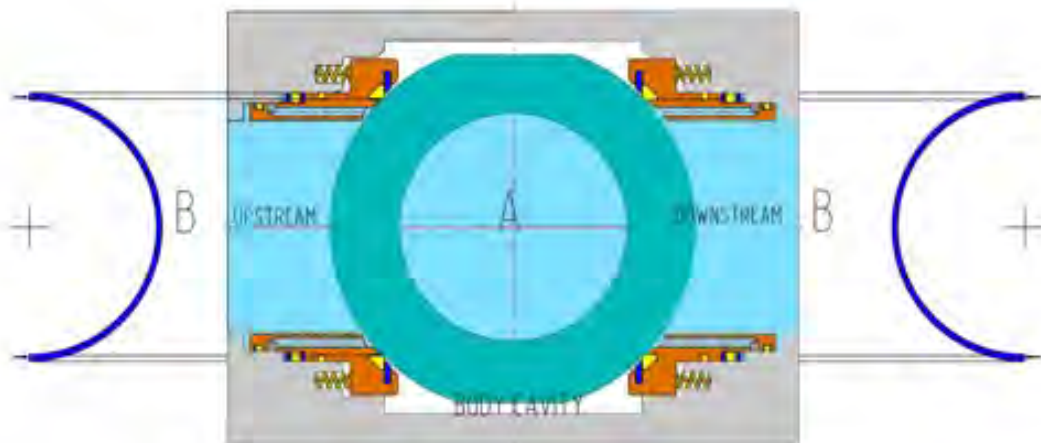
PRESSURE ACTING UPSTREAM AND/OR DOWNSTREAM
PRESSURE $B > A$
A=BODY CAVITY PRESSURE, B=LINE PRESSURE



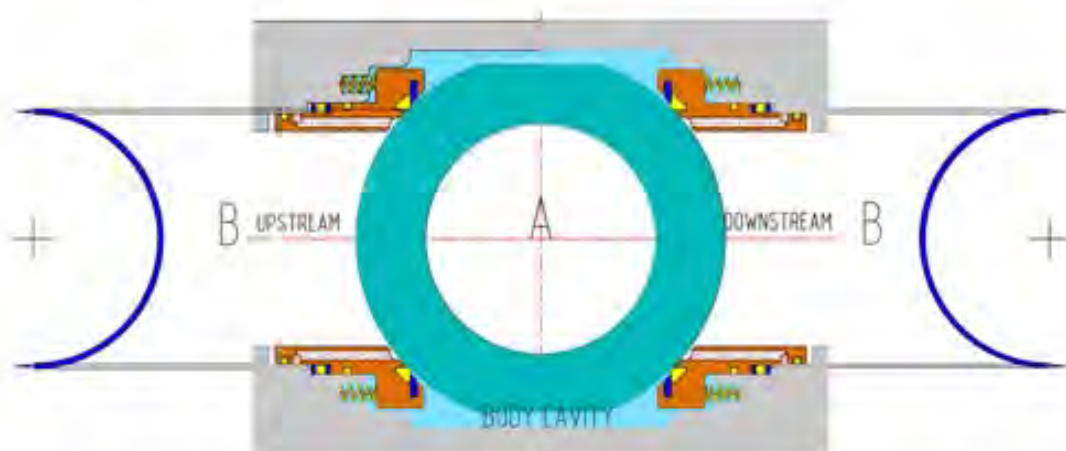
PRESSURE ACTING IN THE BODY CAVITY
PRESSURE $A > B$
A=BODY CAVITY PRESSURE, B=LINE PRESSURE

DIB-1 (DOUBLE PISTON EFFECT)

In the double piston effect design, the seat remains in tight contact with the ball in both directions. The line pressures upstream, downstream and in the body cavity will all act to increase the thrust forcing the seats into the ball. Therefore in full open or closed positions, the media in the body cavity will always be fully isolated from the line media. Dependent upon the application, this design of valve may require additional pressure relief devices to protect the valve in case of over-pressure of the body cavity. A common example of this requirement would be a liquid service where the media is subject to thermal expansion. This valve is also fully bi-directional for installation purposes, though if provided with cavity pressure relief piped to the flange, the valve would need to be installed so the media pressure release discharges to the upstream or downstream side based upon site requirements.



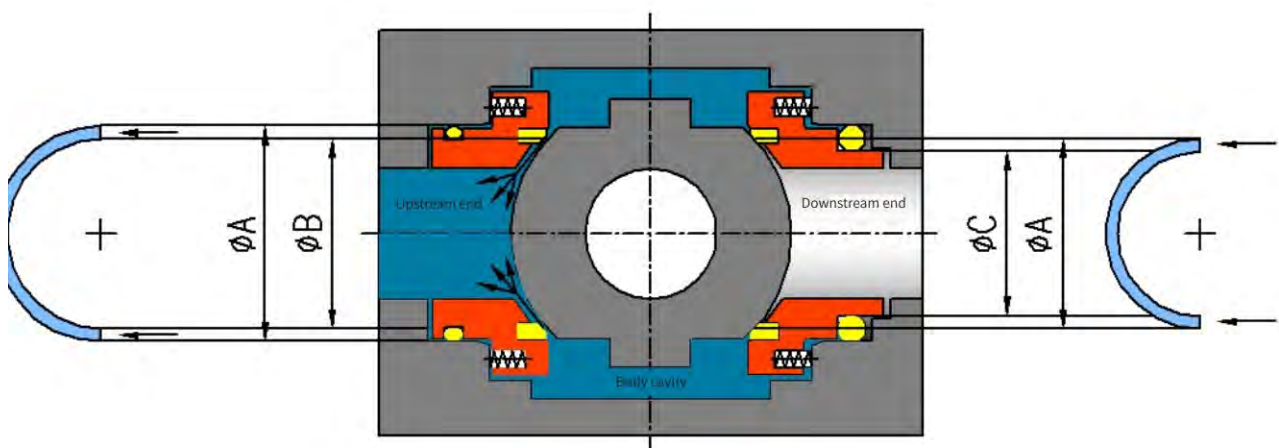
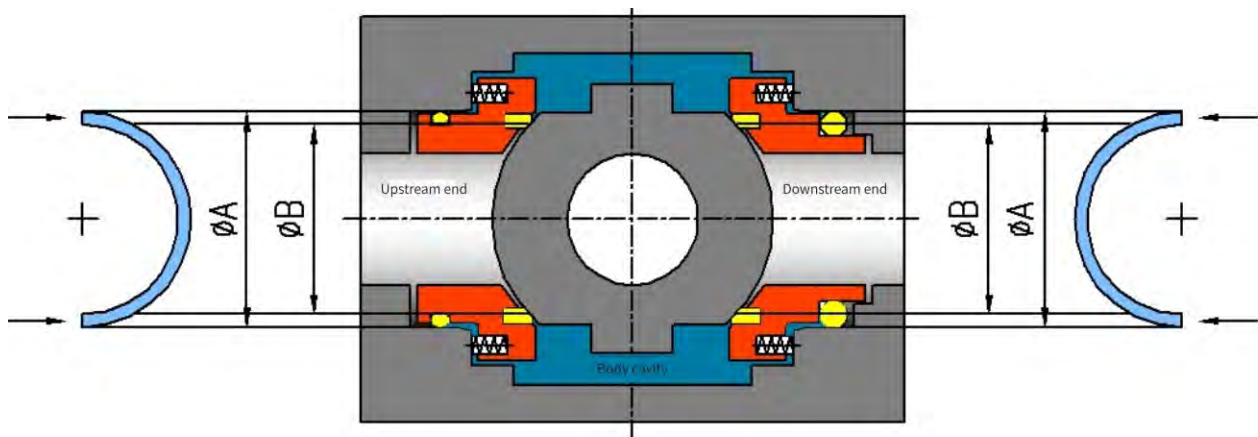
PRESSURE ACTING UPSTREAM AND/OR DOWNSTREAM
PRESSURE $B > A$
A=BODY CAVITY PRESSURE, B=LINE PRESSURE



PRESSURE ACTING IN THE BODY CAVITY
PRESSURE $A > B$
A=BODY CAVITY PRESSURE, B=LINE PRESSURE

DIB-2 (ONE SINGLE PISTON SEAT + ONE DOUBLE PISTON EFFECT SEAT)

The DIB-2 design incorporates one of each seat in the valve construction. This will create a unidirectional valve with the double piston effect seat typically protecting the downstream line. In the case of body cavity pressure exceeding the line pressure, the single piston effect seat will allow for pressure to relieve (typically upstream) and equalise. There is no need to provide for additional pressure relief with this design, as it provides for the relief through the single piston effect seat.



INTRODUCTION OF TRUNNION MOUNTED BALL VALVE PRODUCTS

A. PURPOSE Trunnion mounted ball valves are essential components to control the flow of fluids or gases in a pipeline, particularly in high-pressure applications, by utilising a fixed ball mounted on trunnions which provide stability and allow for tight sealing with minimal operating torque, making them ideal for demanding industrial settings like oil and gas operations, chemical processing, and power generation plants.

B. CHARACTERISTIC

1. Double block and bleed: A “double block and bleed” (DBB) is a valve configuration used to completely isolate a section of a pipeline or system by employing two isolation valves (“blocks”) with a bleed valve situated between them, allowing for the safe release of any trapped fluid or gas before maintenance or repairs are performed thus enhancing safety during operations by preventing pressure build-up and potential leaks.
2. Anti-static structure
3. Firesafe structure
4. The valve seat and stem are equipped with a grease injection system and are fire-resistant.
5. The valve stem has anti blowout function.
6. The ISO 5211 standard top flange design can meet the requirements of changing manual valves to worm gear or motor operation modes.
7. Locking device, manual worm gear operation, can be equipped with a padlock device to prevent operation of the valve.

C. DESIGN, MANUFACTURING, AND INSPECTION STANDARDS

Design and manufacturing: API 6D, ASME B16.34, API 608, ISO 17292

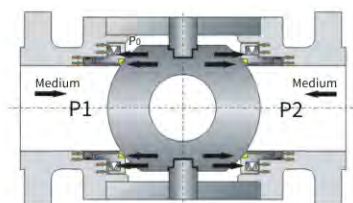
End connection dimensions: ASME B16.5, EN1092, GB/T12221, JB/T79, GB/T 9113

Fire safe design: API 6D, JB/T 6899

Inspection and testing: API 6D, ISO 5208, API 598, GB/T 18927, GB/T 9092

Sulfur resistant materials: NACE MR 0175

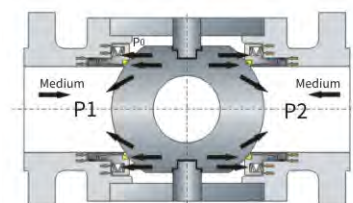
DOUBLE BLOCK AND BLEED



$P_o \leq P_1 (\leq P_N)$

$P_o \leq P_2 (\leq P_N)$

When the body cavity is open to the atmosphere or emptied of the medium, the flow of the medium at both ends of the valve cavity is blocked.



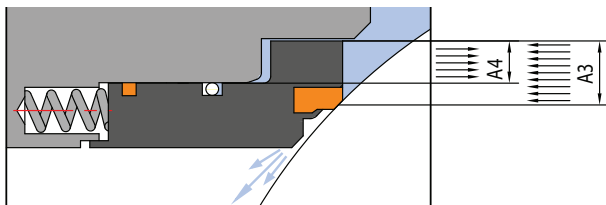
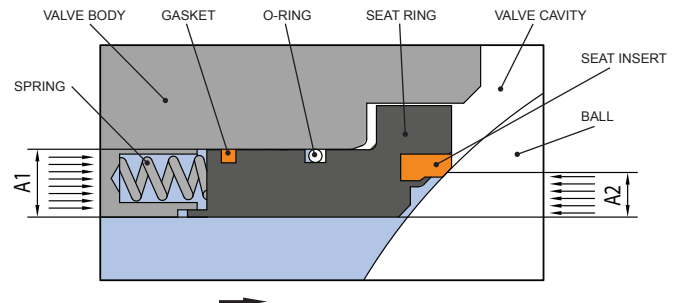
$P_o \leq 1.33 P_N (P_1, P_2 \leq P_N)$

The valve seat automatically retracts under pressure, releasing the pressure in the cavity.

DOUBLE BLOCK AND BLEED VS. DOUBLE ISOLATION AND BLEED

How Do Single Piston Effect Seats Work?

1. During normal operation, upstream or downstream pressure in combination with force created by the seat springs pushes the seat ring against the ball creating positive shutoff ($A1 > A2$).



Pressure acting in the body cavity allows "self relieving" of the seat

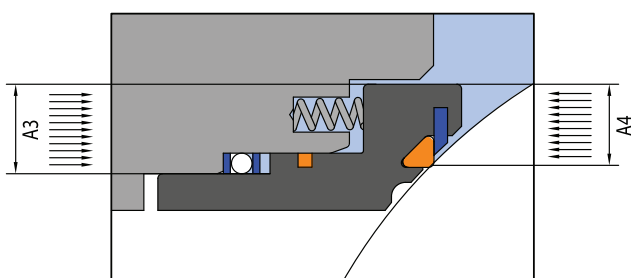
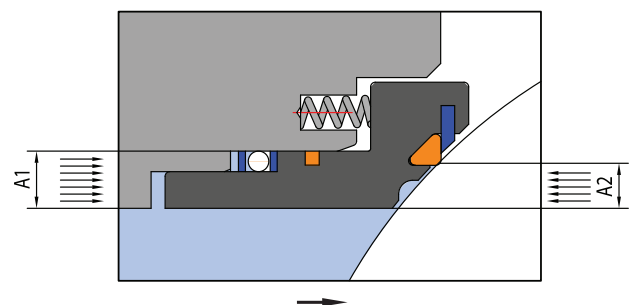
2. With media trapped in the body cavity any increase in media pressure attempts to push the seat ring away from the ball ($A3$). As pressure in the cavity continues to increase a point is reached where the pressure in the cavity can now overcome the spring force and any other forces ($A4$).

The resultant force pushes the seat assembly away from the ball ($A3 > A4$). Seat assemblies with this feature are referred to as "self relieving".

A valve with two single piston effect seats has a double block and bleed (DBB) design.

How Do Double Piston Effect Seats Work?

1. During normal operation, upstream or downstream pressure in combination with force created by the seat springs pushes the seat ring against the ball creating positive shutoff ($A1 > A2$).



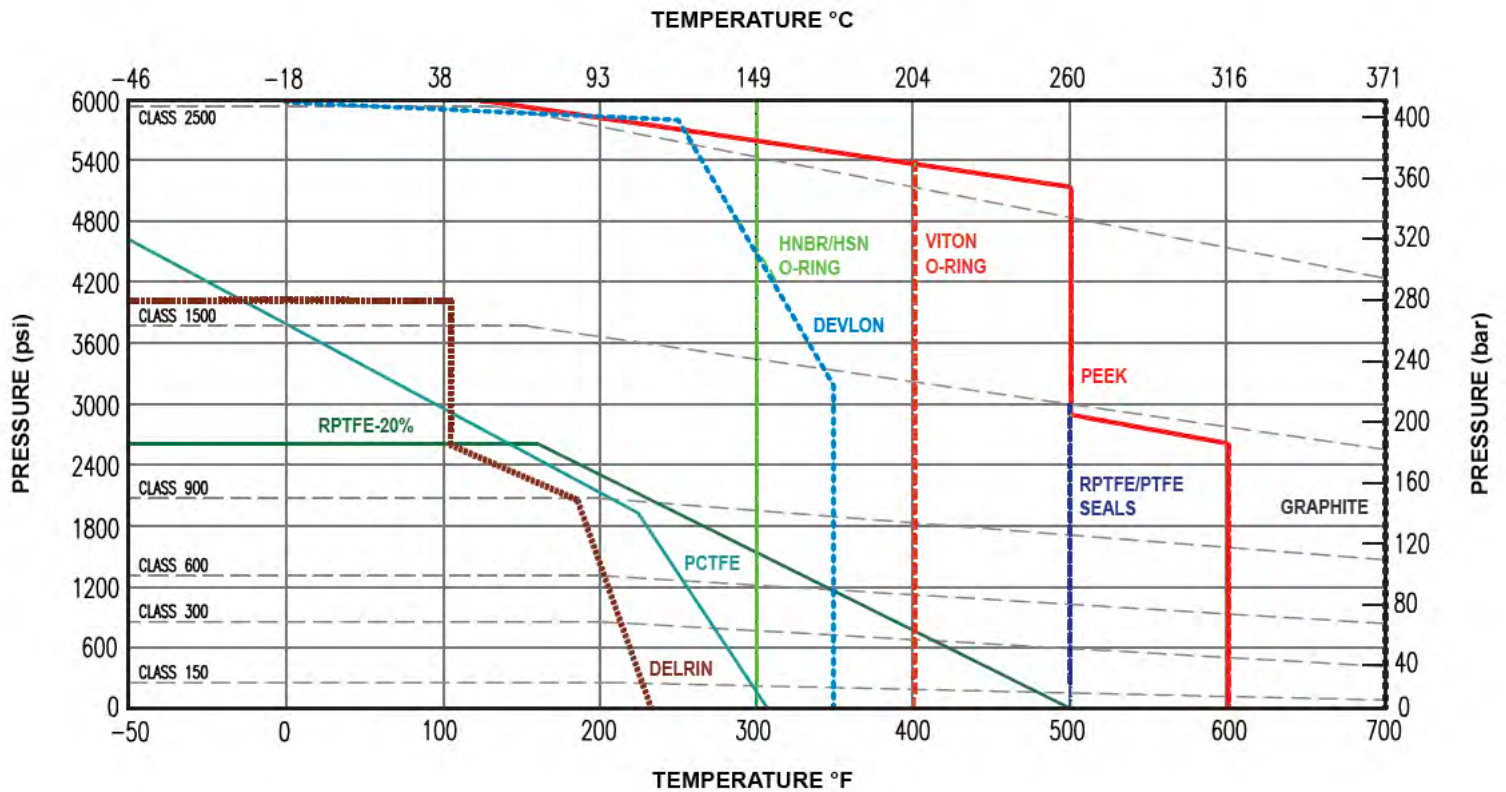
Resultant pressure acting in the body cavity pushes seat against the ball.

2. With media trapped in the body cavity any increase in media pressure acts to push the seat ring against the ball ($A3$). As a result, regardless of whether the pressure is from upstream, downstream or within the body cavity, the seat ring is always pushed against the ball.

The movement of the seat ring against the ball is created due to differences in the effective pressure influenced area of the upstream and downstream side of the seat assembly ($A3 > A4$). Seat assemblies with this feature are not self relieving.

A valve with two double piston effect seats has a double isolation and bleed (DIB-1) design.

PRESSURE & TEMPERATURE CHART FOR TYPICAL SEAT & SEAL MATERIALS



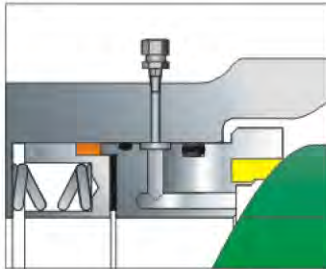
DESIGN AND TEST STANDARDS

DESIGN	API 6D, API 608, ISO 17292, CSAB 51
PRESSURE/TEMPERATURE	ASME B16.34
FACE TO FACE	ASME B16.10
END FLANGES	RF/RTJ: ASME B16.5, >24"; B16.47/MSS SP-44, BW:B16.25
FIRESAFE	API 607
SOUR SERVICE	NACE MR0175/ISO 15156
TOP FLANGE	ISO 5211
INSPECTION	API 598
TESTING	API 6D
MARKING	MSS SP-25, API 6D
QUALITY	MSS SP-55
DOCUMENTATION	BS EN 1020403.1

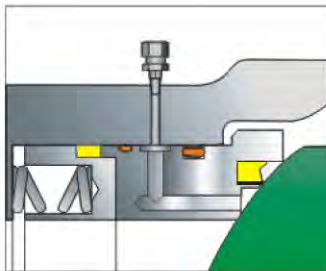
FZV DESIGN OVERVIEW

FZV TWO TYPES OF VALVE SEAT FIRE SAFE FIG

Type A

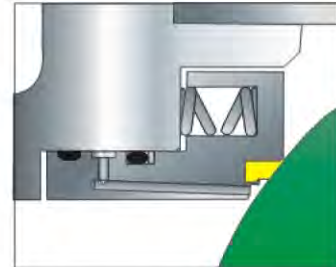


The ball and valve seat are sealed under pressure, the PTFE gasket of the secondary valve seat is tightly pressed, the graphite gasket of the secondary valve seat is loose, and the valve seat moves well.

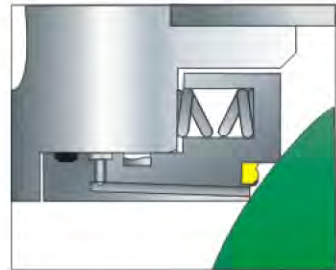


When a fire occurs, soft seat burns out, PTFE gasket as the secondary sealing starts to melt, and the flexible graphite is compressed to reduce the leakage. A metal to metal seal with the ball reduces the leakage when the seal housing is pushed against the ball, by the line pressure.

Type B

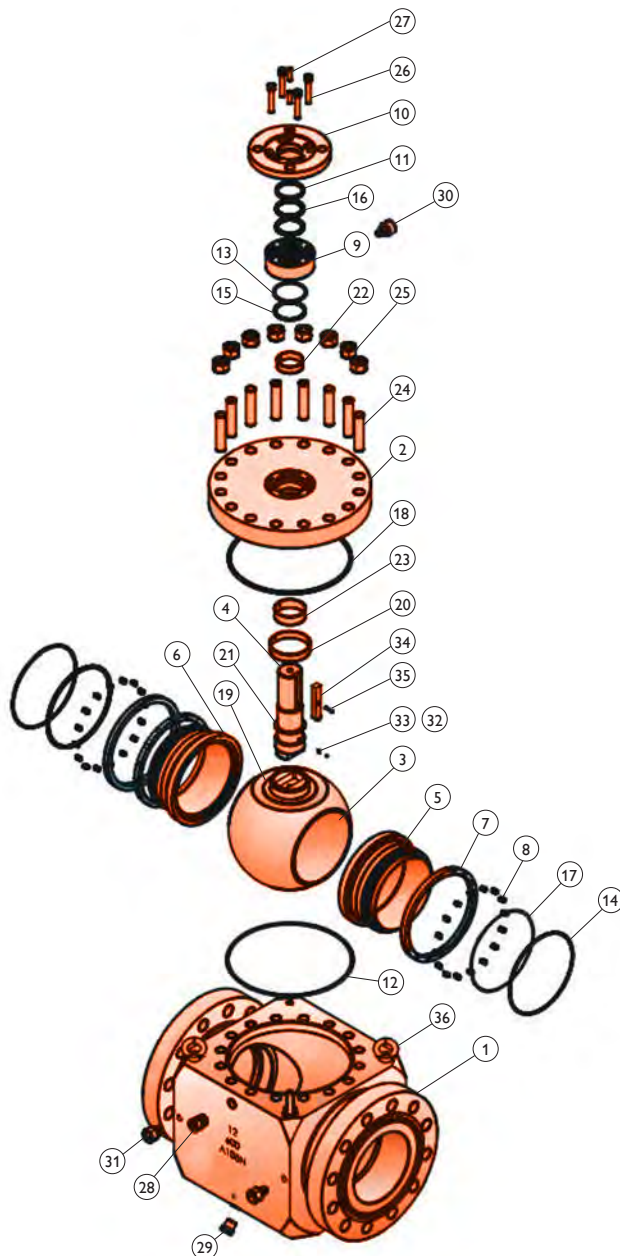


The ball and valve seat are sealed under normal pressure.



When a fire occurs, soft seat and O-ring start to melt. O-ring leakage path has a graphite gasket to restrict the oil / gas flowing to the atmosphere. A metal to metal seal with the ball reduces the leakage when the seal housing is pushed against the ball, by the line pressure.

TOP ENTRY FORGED STEEL BALL VALVE TRUNNION MOUNTED



Range of Material

FZV's top entry ball valves have complete flexibility in the use of materials for body, trim and seal gasket selection.

For this reason, they can be trimmed to meet your most severe applications.

Body/Bonnet Material

- Carbon steel
- Stainless Steel
- Duplex Stainless Steel
- Nickel Alloy
(Inconel, Incoloy, Hastelloy, Monel)

Trim Material

- Carbon steel+ (Overlay or Hard facing)
- Stainless Steel
- Duplex Stainless Steel
- Nickel Alloy
(Inconel, Incoloy, Hastelloy, Monel)

Material for Seat Inserts

Material for seat inserts are selected among the best polymers in order to meet the critical conditions of temperature, pressure and corrosive fluids.

- PTFE, PEEK, Devlon, Viton, Metal

Hard Facing options

Stellite, HVOF (TCC, CCC, others)

Self Fluxing Alloy Powder Coating (Ni Base)



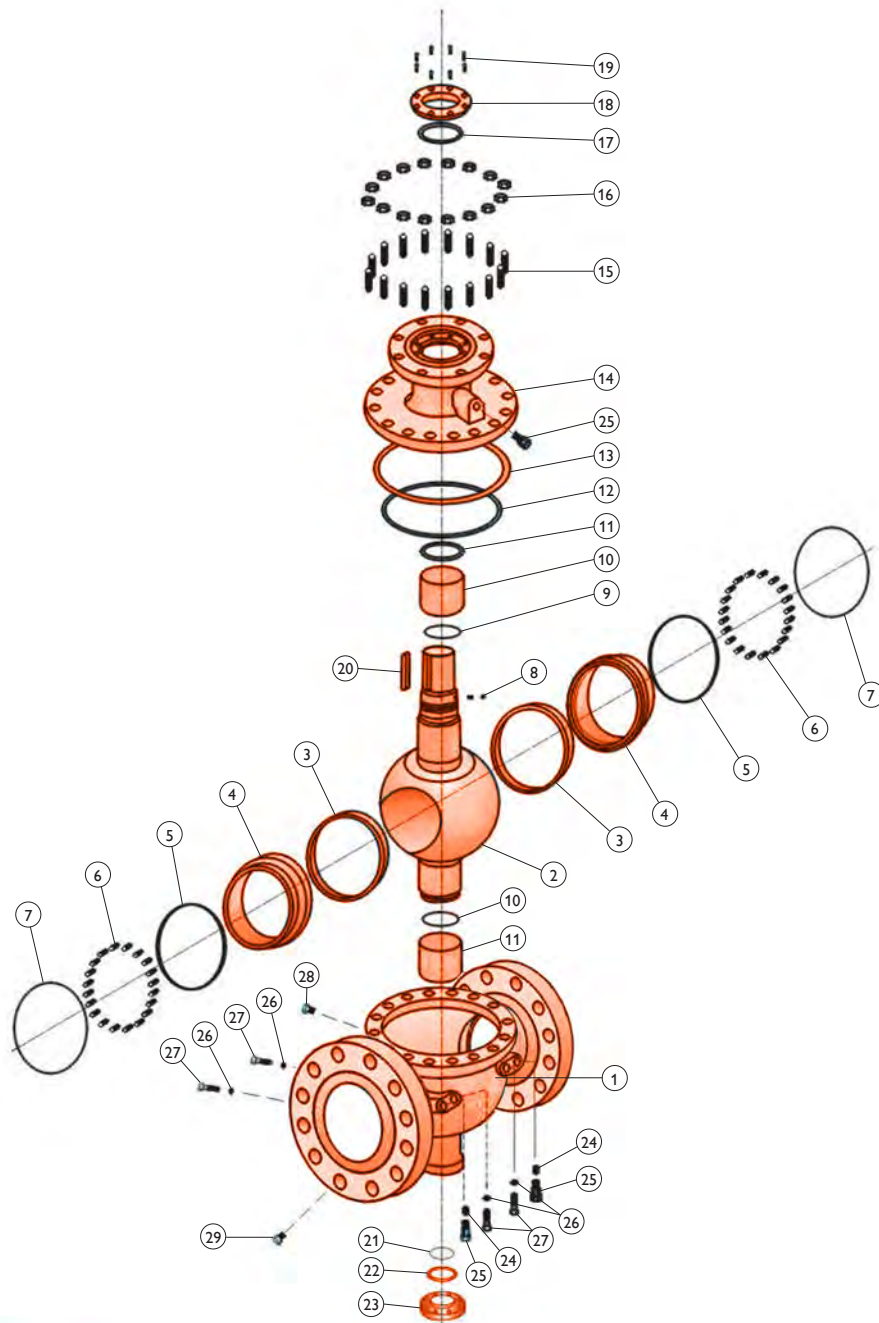
TOP ENTRY FORGED STEEL BALL VALVE

BILL OF MATERIALS

Item	Part Name	Material	Material	Material
		A105N-316	A105N - ENP	F316
1	Body	ASTM A105N	ASTM A105N	ASTM A182 F316
2	End Adapter	ASTM A105N	ASTM A105N	ASTM A182 F316
3	Ball	ASTM A182 F316	ASTM A105N+ENP	ASTM A182 F316
4	Stem	ASTM A182 F316	ASTM A105N+ENP	ASTM A182 F316
5	Seat Ring	ASTM A182 F316	ASTM A105N+ENP	ASTM A182 F316
6	Seat Insert	RPTFE	RPTFE	RPTFE
7	Spring Plate	ASTM A182 F316	ASTM A105N+ENP	ASTM A182 F316
8	Spring	Inconel X750	Inconel X750	Inconel X750
9	Gland	ASTM A105N	ASTM A105N	ASTM A182 F316
10	Gland Plate	ASTM A105N	ASTM A105N	ASTM A182 F316
11	Stem Packing	Graphite	Graphite	Graphite
12	Anti-fire Gasket	SW.316+Graphite	SW.316+Graphite	SW.316+Graphite
13	Anti-fire Gasket	SW.316+Graphite	SW.316+Graphite	SW.316+Graphite
14	O-ring	Viton	Viton	Viton
15	O-ring	Viton	Viton	Viton
16	O-ring	Viton	Viton	Viton
17	O-ring	Viton	Viton	Viton
18	O-ring	Viton	Viton	Viton
19	Ball Thrust Bearing	AISI 1045 + PTFE	AISI 1045 + PTFE	AISI 1045 + PTFE
20	Ball DU Bearing	AISI 1045 + PTFE	AISI 1045 + PTFE	AISI 1045 + PTFE
21	Stem Thrust Bearing	AISI 1045 + PTFE	AISI 1045 + PTFE	AISI 1045 + PTFE
22	Stem DU Bearing	AISI 1045 + PTFE	AISI 1045 + PTFE	AISI 1045 + PTFE
23	End Adapter DU Bearing	AISI 1045 + PTFE	AISI 1045 + PTFE	AISI 1045 + PTFE
24	Body Stud	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8
25	Body Nut	ASTM A194 2H	ASTM A194 2H	ASTM A194 8
26	Gland Screw	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8
27	Pin	AISI 1045	AISI 1045	AISI 1045
28	Vent Valve	ASTM A105N	ASTM A105N	ASTM A182 F316
29	Plug	SS316	SS316	SS316
30	Sealant Injection Fitting Assembly	ASTM A105N	ASTM A105N	ASTM A182 F316
31	Sealant Injection Fitting Assembly	ASTM A105N	ASTM A105N	ASTM A182 F316
32	Anti-static Ball	SS316	SS316	SS316
33	Anti-static Spring	SS316	SS316	SS316
34	Key	SS316	SS316	SS316
35	Spring Pin Slotted	SS316	SS316	SS316
36	Lug	Carbon Steel	Carbon Steel	Carbon Steel

Indicative only, refer to as built drawing

TOP ENTRY CAST STEEL BALL VALVE TRUNNION MOUNTED



Range of Material

FZV's top entry ball valves have complete flexibility in the use of materials for body, trim and seal gasket selection. For this reason, they can be trimmed to meet your most severe applications.

Body/Bonnet Material

- Carbon steel
- Stainless Steel
- Duplex Stainless Steel
- Nickel Alloy
(Inconel, Incoloy, Hastelloy, Monel)

Trim Material

- Carbon steel+ (Overlay or Hard facing)
- Stainless Steel
- Duplex Stainless Steel
- Nickel Alloy
(Inconel, Incoloy, Hastelloy, Monel)

Material for Seat Inserts

Material for seat inserts are selected among the best polymers in order to meet the critical conditions of temperature, pressure and corrosive fluids.

- PTFE, PEEK, Devlon, Viton, Metal

Hard Facing options

Stellite, HVOF (TCC, CCC, others)

Self Fluxing Alloy Powder Coating (Ni Base)



TOP ENTRY CAST STEEL BALL VALVE

BILL OF MATERIALS

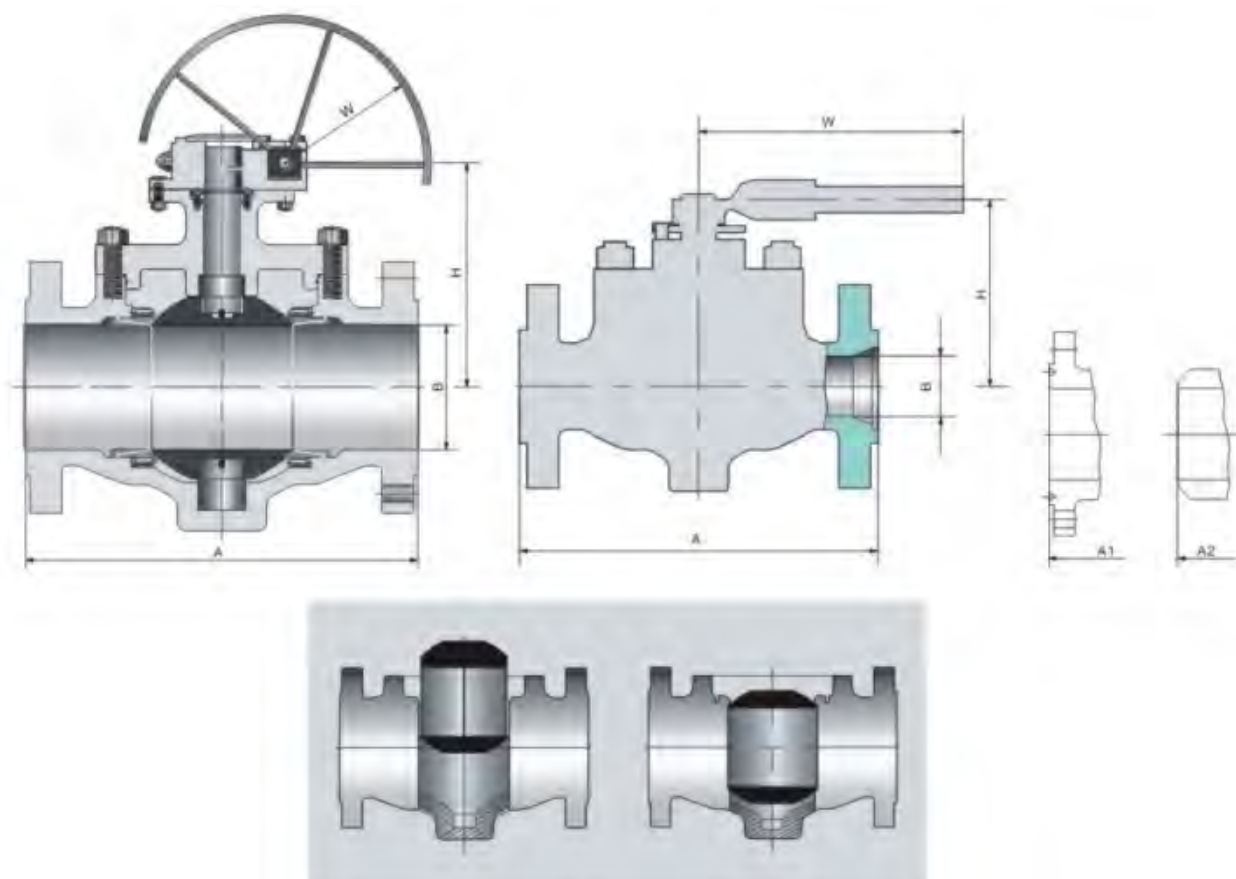
No.	Part Name	Material				
		Carbon Steel	Stainless Steel			
1	Body	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A351 CF3	ASTM A351 CF3M
2	Ball	ASTM A105 • ENP	ASTM A182 304	ASTM A182 316	ASTM A182 304L	ASTM A182 316L
3	Seat	PTFE/NYLON/PEEK/PPL/DEVLON/DELTRIN				
4	Seat ring	ASTM A105 • ENP	ASTM A182 304	ASTM A182 316	ASTM A182 304L	ASTM A182 316L
5	O-ring	Viton/HNBR				
6	Spring	Inconel X750				
7	Firesafe packing	Graphite				
8	Firesafe device	Assembly	Assembly	Assembly	Assembly	Assembly
9	O-ring	Viton/HNBR				
10	Sliding bearing	Metal+PTFE	Metal+PTFE	Metal+PTFE	Metal+PTFE	Metal+PTFE
11	Thrust bearing	PTFE				
12	O-ring	Viton/HNBR				
13	Firesafe gasket	SST+Graphite				
14	End Adapter	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A351 CF3	ASTM A351 CF3M
15	Stud	A193 B7M	A320 B8	A320 B8M	A320 B8	A320 B8M
16	Hexagon Nut	A194-2HM	A194-8	A194-8M	A194-8	A194-8M
17	Packing	Graphite				
18	Packing Gland	ASTM A105 • ENP	ASTM A182 304	ASTM A182 316	ASTM A182 304L	ASTM A182 316L
19	Socket head cap screw	A193 B7M	A320 B8	A320 B8M	A320 B8	A320 B8M
20	Fly key	ANSI 1045	ANSI 1045	ANSI 1045	ANSI 1045	ANSI 1045
21	Thrust bearing	PTFE				
22	Anti-fire gasket	SST+Graphite				
23	Lower cover	ASTM A05 • ENP	ASTM A182 304	ASTM A182 316	ASTM A182 304L	ASTM A182 316L
24	Check Valve	Assembly	Assembly	Assembly	Assembly	Assembly
25	Sealant injection valve	Assembly	Assembly	Assembly	Assembly	Assembly
26	Sealing gasket	SST+Graphite				
27	Socket head cap screw	A193 B7M	A320 B8M	A320 B8	A320 B8	A320 B8M
28	Air release valve	Assembly	Assembly	Assembly	Assembly	Assembly
29	Drainage valve	Assembly	Assembly	Assembly	Assembly	Assembly
Design Manufacturing		API 6D				
Face-to-face dimensions		ASME B16.10, API 6D, JIS B2002				
Type of connection		Flange	ASME B16.5/ASME B16.47		Butt Welding	ASME B16.25
Pressure test		API 6D				

Indicative only, refer to as built drawing





TOP ENTRY CAST STEEL BALL VALVE SERIES TRUNNION MOUNTED - MAIN DIMENSIONS AND WEIGHTS



• The ball can be installed directly from above for easy disassembly and can be repaired directly on the pipeline

MAIN DIMENSIONS AND WEIGHT (MANUAL)

CLASS 150																	
DN mm	A mm	A1 mm	A2 mm	B mm	H mm	W mm	WT kg	T N.m	DN mm	A mm	A1 mm	A2 mm	B mm	H mm	W mm	WT kg	T N.m
2	292	295	292	49	195	500	30	50	*20	1194	1200	1194	487	775	600	1930	6016
3	356	359	356	74	240	600	58	65	*24	1397	1407	1397	589	840	600	3200	9750
4	432	435	432	100	280	650	100	151	*28	1549	1562	1549	684	885	750	4600	14540
*6	559	562	559	150	340	460	215	320	*30	1651	1664	1651	735	940	750	5630	18005
*8	660	664	660	201	375	460	410	1020	*32	1778	1794	1778	779	990	750	7085	21350
*10	787	791	787	252	415	460	560	1085	*36	2083	2099	2083	874	1085	750	9100	17000
*12	838	841	838	303	465	600	710	1262	*40	2337	2337	2337	976	1180	750	12790	37000
*14	889	892	889	334	505	600	760	2426	*42	2437	2437	2437	1020	1240	750	15100	39000
*16	991	994	991	385	590	600	1100	3018	*48	2540	2540	2540	1166	1400	750	22600	42776
*18	1092	1095	1092	436	700	600	1510	4574									

*worm gear operation

CLASS 300

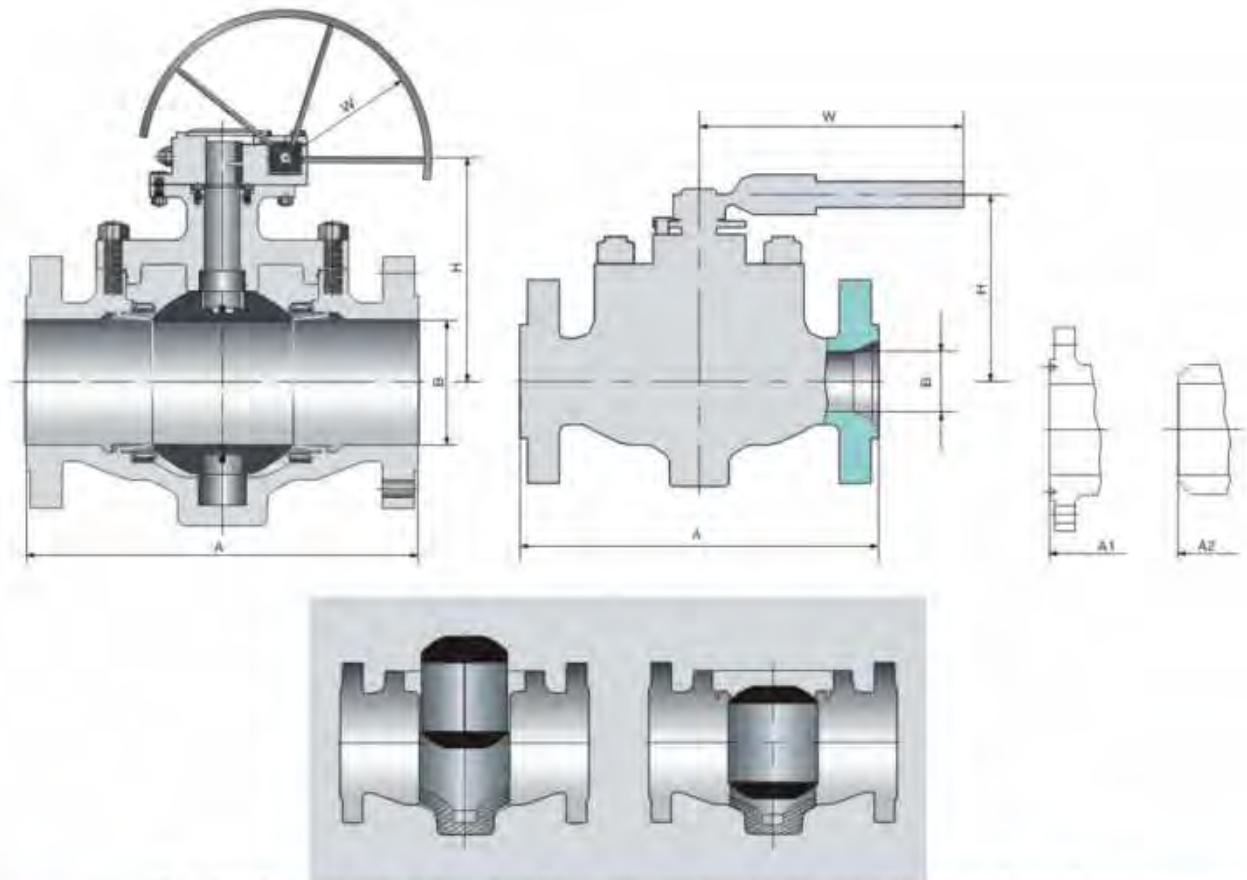
DN mm	A mm	A1 mm	A2 mm	B mm	H mm	W mm	WT kg	T N.m	DN mm	A mm	A1 mm	A2 mm	B mm	H mm	W mm	WT kg	T N.m
2	292	295	292	49	195	500	35	86	*20	1194	1200	1194	487	775	600	1960	10610
3	356	359	356	74	240	600	62	110	*24	1397	1407	1397	589	840	600	3235	17280
4	432	435	432	100	280	650	105	270	*28	1549	1562	1549	684	885	750	4640	25102
*6	559	562	559	150	340	460	220	544	*30	1651	1664	1651	735	940	750	5680	31664
*8	660	664	660	201	375	460	413	1620	*32	1778	1794	1778	779	990	750	7145	32586
*10	787	791	787	252	415	460	568	1824	*36	2083	2099	2083	874	1085	750	9160	35170
*12	838	841	838	303	465	600	718	2632	*40	2337	2337	2337	976	1180	750	12850	39115
*14	889	892	889	334	505	600	768	4280	*42	2437	2437	2437	1020	1240	750	15170	42414
*16	991	994	991	385	590	600	1120	5376	*48	2540	2540	2540	1166	1400	750	22680	71868
*18	1092	1095	1092	436	700	600	1535	8000									

*worm gear operation

CLASS 600

NPS inch	A mm	A1 mm	A2 mm	B mm	H mm	W mm	WT kg	T N.m
2	292	295	292	49	195	500	45	148
3	356	359	356	74	245	600	80	200
4	432	435	432	100	285	650	150	460
*6	559	562	559	150	380	460	245	908
*8	660	664	660	201	385	460	438	2560
*10	787	791	787	252	430	600	600	3048
*12	838	841	838	303	485	600	625	4300
*14	889	892	889	334	525	600	1230	7255
*16	991	994	991	385	615	600	1535	9174
*18	1092	1095	1092	436	730	600	2135	13520
*20	1194	1200	1194	487	805	600	2640	18034
*24	1397	1407	1397	589	870	600	3960	29512
*28	1549	1562	1549	684	915	750	5060	42264
*30	1651	1664	1651	735	975	750	6195	53814
*32	1778	1794	1778	779	1025	750	7795	71720
*36	2083	2099	2083	874	1125	750	10050	95000
*40	2337	2337	2337	976	1220	750	14070	109900
*42	2437	2437	2437	1020	1290	750	16620	121165
*48	2540	2540	2540	1166	1450	750	24860	145345

*worm gear operation

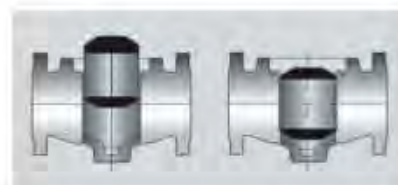
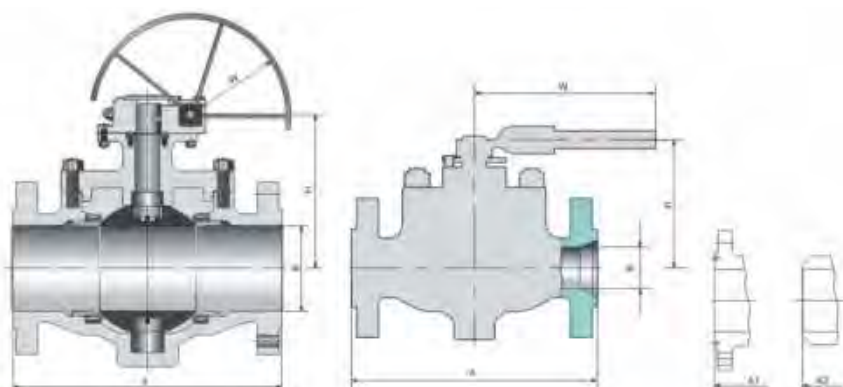


* The ball can be installed directly from above for easy disassembly and can be repaired directly on the pipeline

CLASS 900

NPS inch	A mm	A1 mm	A2 mm	B mm	H mm	W mm	WT kg	T N.m
*2	368	371	368	49	255	360	67	208
*3	381	384	381	74	295	460	110	280
*4	457	460	457	100	335	460	185	650
*6	610	613	610	150	410	600	380	1298
*8	737	740	737	201	510	600	620	3596
*10	838	841	838	252	560	600	880	4306
*12	965	968	965	303	600	600	1360	6000
*14	1029	1038	1029	322	700	600	1910	10220
*16	1130	1140	1130	373	780	600	2790	12968
*18	1219	1232	1219	423	830	600	3740	19054
*20	1321	1334	1321	471	870	600	4600	25452
*24	1549	1568	1549	570	900	750	7250	43276
*28	1753	1775	1753	665	930	800	10500	59410
*30	1880	1902	1880	712	980	800	12850	76000
*32	2032	2054	2032	760	1050	800	15860	90195
*36	2286	2315	2286	855	1130	800	20680	101500

*worm gear operation



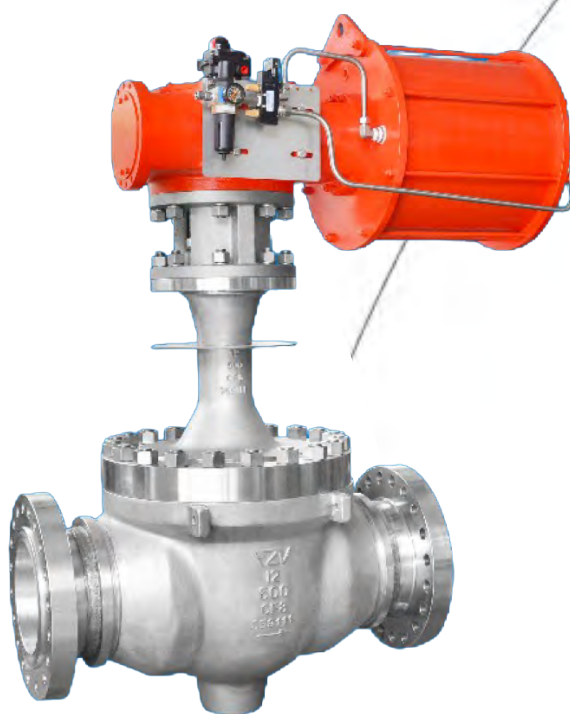
*The ball is installed directly from top for easy disassembly and can be repaired directly on the pipeline

CLASS 1500

NPS inch	A mm	A1 mm	A2 mm	B mm	H mm	W mm	WT kg	T N.m
2	368	371	368	49	255	360	67	330
3	470	473	470	74	325	460	155	440
4	546	549	546	100	360	600	280	1034
6	705	711	705	144	430	600	602	2084
8	832	841	832	192	530	600	1100	5496
10	991	1000	991	239	585	750	1440	9936
12	1130	1146	1130	287	670	750	2020	14175
14	1257	1276	1257	315	735	750	2615	21000
16	1384	1407	1384	360	820	750	3880	27000
18	1537	1559	1537	406	870	750	5120	34392
20	1664	1686	1664	454	920	750	6675	40918
24	1943	1972	1943	546	960	750	11600	65351

CLASS 2500

NPS inch	A mm	A1 mm	A2 mm	B mm	H mm	W mm	WT kg	T N.m
2	451	454	451	42	280	460	108	446
3	578	584	578	62	355	600	245	802
4	673	683	673	87	400	600	468	1588
6	914	927	914	131	490	600	935	5501
8	1022	1038	1022	179	600	600	1400	11785
10	1270	1292	1270	223	645	750	2580	13222
12	1422	1445	1422	265	760	750	4160	20075



Distributors/Agents



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Contact us: sales@globalsupplyline.com.au

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