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PROVIDING COMPLETE CONTROL SOLUTIONS
FOR INDUSTRIAL PIPELINES

API 6A TRUNNION MOUNTED BALL VALVE

WWW.FZVGROUP.COM



FANGZHENG VALVE GROUP CO., LTD

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 specialize in supplying a wide range of API 6D, API 609, API 600, API 594, API 6A, and API 16C 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)
- Deign 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.

The Business purpose of FZV: 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. Reponsive after-sales service.

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SUMMARY OF API 6A METAL SEATED TRUNNION MOUNTED BALL VALVE

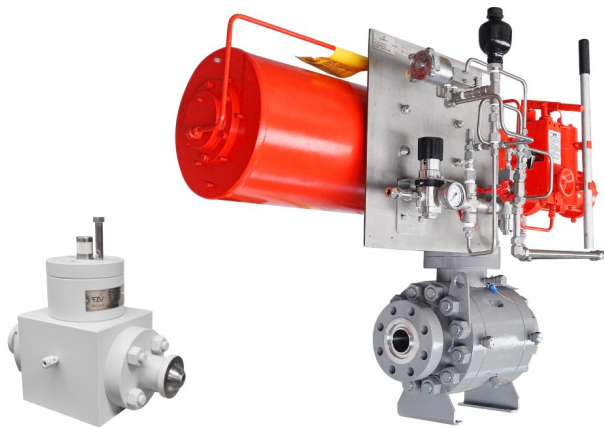


The API 6A metal seated trunnion mounted ball valve has the advantages of reliable sealing, smooth opening and closing, high safety performance, and long service life under high-pressure gas conditions. Therefore, it is applied to onshore wellheads and offshore platform wellheads, and is a key component in oil and gas extraction processes. It is an indispensable mechanical equipment for opening and closing pipelines, controlling flow direction, isolating and controlling conveying media.

The API 6A metal seated trunnion mounted ball valve produced by FZV have stable sealing, long service life, low maintenance cost, open -close fast, light torque value, and the sealing capability strictly complies with API 6A PSL 3G high-pressure gas testing standard.

True achievements:

- 1) Large size : maximum size 13 5/8 ";
- 2) High parameters: The operating pressure of the oil and gas drilling platform has reached 20000 psi (138 Mpa);
- 3) High performance: Natural gas molecules have small clusters and strong permeability, requiring strict sealing requirements for API 6A metal seated ball valve;
- 4) Emergency Shutdown (ESD) Function: The design of the ultra-high pressure metal seated ball valve shall ensure that the sealing performance is guaranteed under working pressure, while also ensuring low torque and smooth operation without jamming, saving installation space as much as possible, achieving safety and reliability, and reducing maintenance costs.



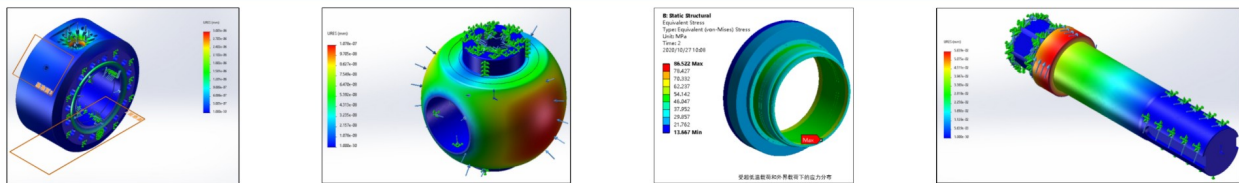
ADVANTAGES OF FZV PRODUCTS

FZV has been committed to improve the design, manufacturing, and research of high-pressure metal seated ball valves for a long time. With more than ten years of rich experience, of supplying the metal-seated ball valve to more than 20 countries around the world, FZV has acquired the satisfaction of more than 100 customers by continuously adopting advanced technologies from both domestic and oversea breakthroughs. FZV cooperates with universities and professional research institutions to continuously tackle the core technology of metal seated ball valves and develop advanced technologies for metal seated valves.

Further more, FZV's strong technical research and support team, sophisticated processing equipment, rigorous and meticulous quality work, comprehensive testing and inspection methods, and thoughtful after-sales service, will ensure the safety and reliability of FZV high-pressure metal seated ball valves.

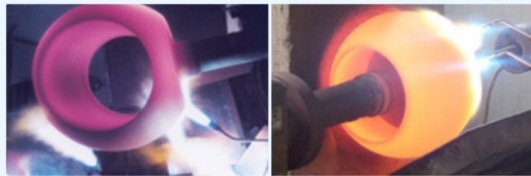
1. Advanced design:

Strictly control the design and development of API 6A metal seated ball valve;



2. HVOF (High Velocity Oxy-Fuel) spray process:

HVOF (High Velocity Oxy-Fuel) spray process is a thermal spray coating process which is used to hard face the ball and seat sealing surfaces by hard facing materials like tungsten carbide or chromium carbide. The maximum surface hardness of supersonic spraying is 1300HV, the coating thickness can reach 0.3mm, and the bonding strength is over 10000 Psi. The sealing surface material can withstand high temperatures up to 650 ° C and has extremely resistance against erosion, wear, and corrosion.



3. Measurement tools:

Special measuring tools and ring groove gauges are utilized for the inspection of BX series ring groove processing; Besides, these equipment are used to control the product quality including portable Brinell hardness testing equipment included Auto-Brinell Optical Measuring System, Leeb hardness tester, ferrite content tester, and tungsten carbide thickness measuring instrument.

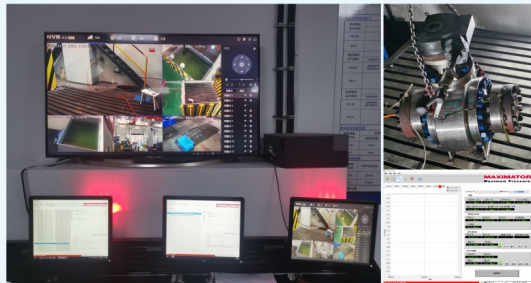


4. High-pressure testing equipment:

API6A ball valves are pressure tested in accordance with API6A where is surrounded by the concrete walls, and monitored the pressure testing process by cameras from a remote control room equipped with calibrated Measurement, Monitoring, and Recording Equipment.High pressure testing involves potential hazards, so appropriate safety precautions have been provided.

High-pressure gas testing is tightly conducted at ambient temperature as per the requirement of API6A-PSL 3G, and the tested valve is completely submerged into a water bath.

The pressure increment, pressure holding period are all recorded, and the tested valve is qulaified when its leakage rate complied with acceptance criteria.



PRODUCT PRESSURE - SIZE RANGE

Nominal Diameter NPS	3000psi (20.7MPa)	5000psi (34.5MPa)	10000psi (69MPa)	15000Psi (103.5MPa)
Threaded end				
3/8	●	●	●	
1/2	●	●	●	
3/4	●	●		
1	●	●		
1-1/2	●	●		
Flange end				
1-13/16			●	●
2-1/16	●	●	●	●
2-9/16	●	●	●	●
3-1/16			●	●
3-1/8	●	●		
4-1/16	●	●	●	●
4-1/8				
5-1/8	●	●	●	●
7-1/16	●	●	●	●
9		●	●	●
11		●	●	●
13-5/8			●	

EXAMPLE OF MATERIAL COMBINATION

Material Grade	Body	Cover	Ball	Stem	Seat
AA	A29 4130	A29 4130	A29 4130+TC	A29 4130+N	A29 4130+TC
BB	A29 4130	A29 4130	410+TC	17-4PH	410+TC
CC	410	410	410+TC	17-4PH	410+TC
DD	A29 4130	A29 4130	A29 4130+TC	A29 4130+N	A29 4130+TC
EE	A694 F60	A694 F60	A182 F51+TC	A182 F53	A182 F51+TC
FF	A182 F51	A182 F51	A182 F51+TC	A182 F53	A182 F51+TC
	A182 F51	A182 F51	A182 F51+TC	INCONEL X-718	A182 F51+TC
HH	A694 F60+625	A694 F60+625	B564 N06625+TC	B564 N06625	B564 N06625+TC
	A694 F60+625	A694 F60+625	INCONEL X-718+TC	INCONEL X-718	INCONEL X-718+TC

API 6A METAL SEATED TRUNNION MOUNTED BALL VALVE (FLANGE END)

PURPOSE

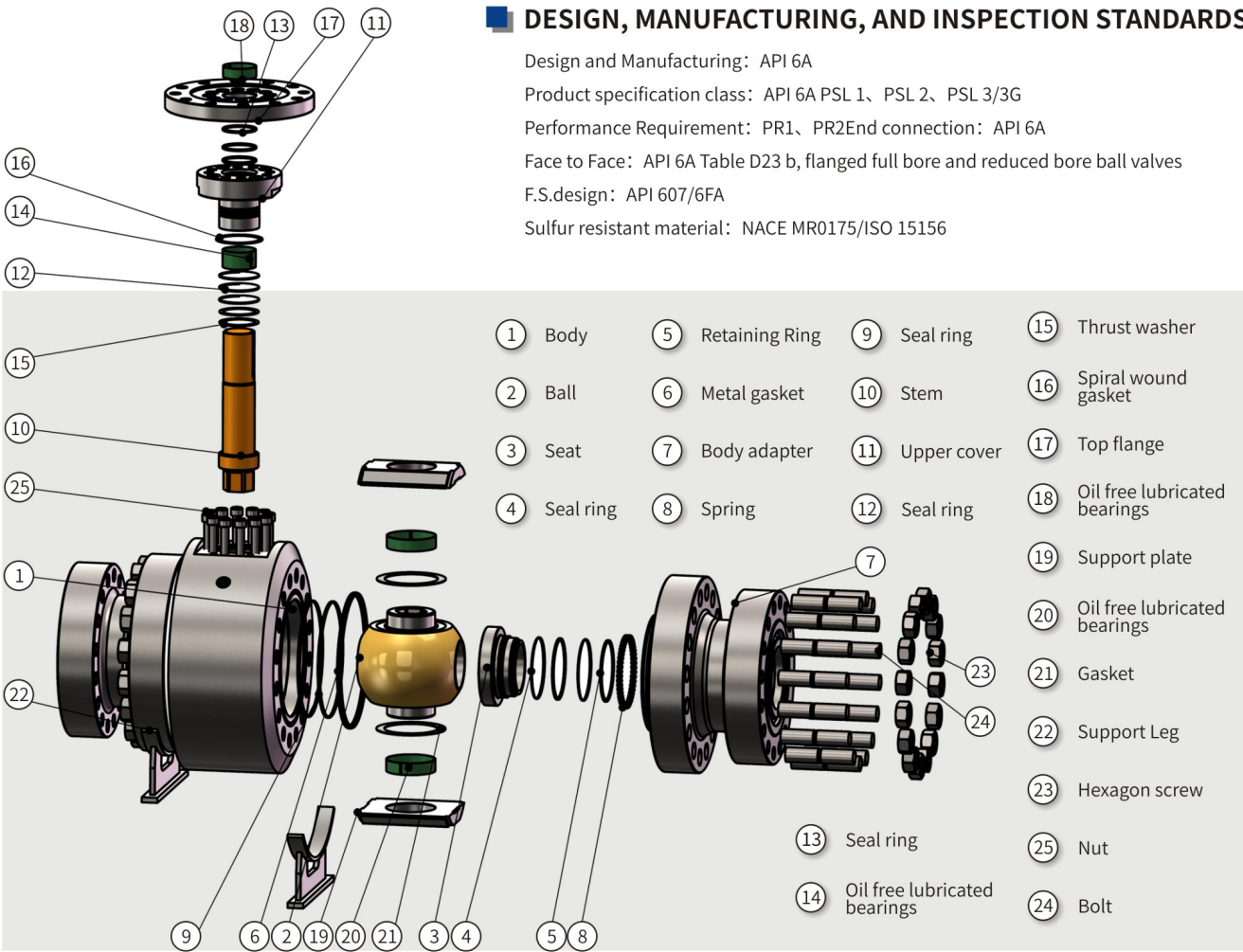
The API 6A high-pressure metal seated ball valve (Flange end) has the advantages of reliable sealing, smooth opening and closing, high safety performance, and long service life under high-pressure gas 15000Psi (103.5MPa) conditions, and is used for opening and closing pipelines ,controlling flow direction, isolating and controlling the conveying medium are key components in oil and gas extraction processes.

DESIGN FEATURES

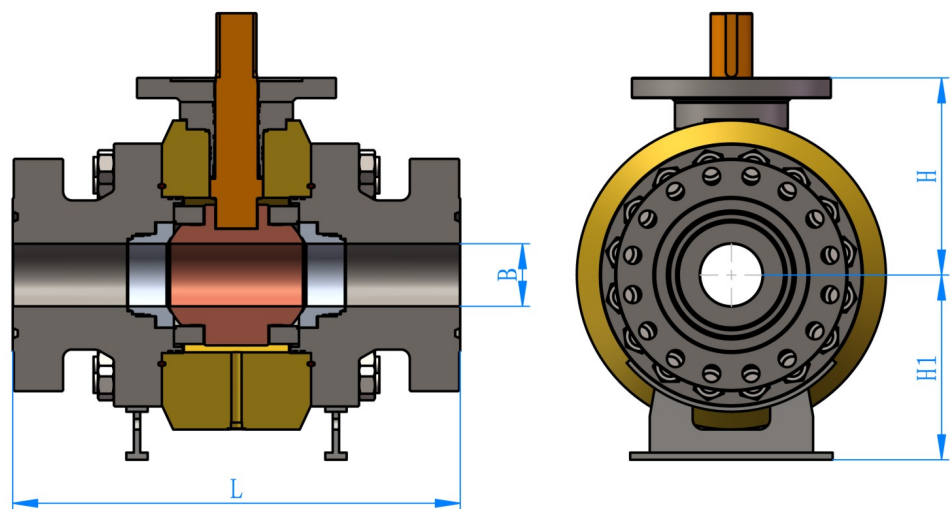
- 1) The valve is designed for self-relieving seat with double block and bleed functions. This feature is effective to relieve the extra cavity pressure to the downstream side;
- 2) The body seal is provided by a radial and end face combination sealing structure, with two seals installed in the radial sealing direction and a metal seal installed on the end face. This structural design ensures the stability of the body seal, and effectively avoids leakage of the body caused by strain due to high-pressure medium and pipeline stress;
- 3) The valve body and cover are sealed with multiple seals including sealing rings and fire-safe graphite spiral wounded gaskets. The valve stem seal is provided by a lip seal ring component and graphite dual seal, which has high pressure resistance and fire-safe functions;
- 4) Valve stem anti blowout structure: Under the pressure inside the valve cavity, the valve stem tends to move outward, and the outward axial thrust is transmitted to the cover and valve body through the valve stem shoulder and thrust pad;
- 5) The valve meets the testing requirements of API 6A standard under high-pressure gas seal test conditions.

DESIGN, MANUFACTURING, AND INSPECTION STANDARDS

Design and Manufacturing: API 6A
Product specification class: API 6A PSL 1、PSL 2、PSL 3/3G
Performance Requirement: PR1、PR2End connection: API 6A
Face to Face: API 6A Table D23 b, flanged full bore and reduced bore ball valves
F.S.design: API 607/6FA
Sulfur resistant material: NACE MR0175/ISO 15156



MAIN DIMENSIONS OF API 6A FLANGE END METAL SEATED TRUNNION MOUNTED BALL VALVE



3000psi(20.7MPa)						5000psi(34.5MPa)					
SIZE inch	L mm	B(Max.) ^a mm	H ^c mm	H1 ^c mm	WT Kg	SIZE inch	L mm	B(Max.) ^a mm	H ^c mm	H1 ^c mm	WT Kg
2-1/16	371	52.3	135	140	295	2-1/16	371	52.3	180	160	355
2-9/16	422	65	165	155	352	2-9/16	473	65	190	170	412
3-1/8	384	79.3	185	165	489	3-1/8	473	79.3	195	185	586
4-1/16	460	103.1	210	200	620	4-1/16	569	103.1	240	240	760
5-1/8	530	130.1	295	270	910	5-1/8	650	130.1	350	320	1010
7-1/16	613	179.3	340	320	1798	7-1/16	711	179.3	425	400	2038

10000psi(69MPa)						15000psi(103.5MPa)					
SIZE inch	L mm	B(Max.) ^a mm	H ^c mm	H1 ^c mm	WT Kg	SIZE inch	L mm	B(Max.) ^a mm	H ^c mm	H1 ^c mm	WT Kg
1-13/16	464	46	205	200	154	1-13/16	457	46	225	220	208
2-1/16	521	52.3	245	210	340	2-1/16	483	52.3	265	230	452
2-9/16	565	65	255	230	480	2-9/16	533	65	285	250	648
3-1/16	619	77.7	300	270	745	3-1/16	598	77.7	325	300	995
4-1/16	670	103.1	370	360	950	4-1/16	737	103.1	400	380	1280
5-1/8	737	130.1	435	405	1265	5-1/8	889	130.1	465	445	1813
7-1/16	889	179.3	515	480	2300	7-1/16	1041	179.3	550	510	3050
9	PMR ^b	228.6	560	525	3580	9	PMR ^b	228.6	595	550	4733
11	PMR ^b	280.2	620	550	4165	11	PMR ^b	280.2	680	605	5750
13-5/8	PMR ^b	347	700	610	5895						

Note:
a. B value is the maximum value specified by the standard, and production is based on the size of the pipeline;
b. Out of the standard specifications, it shall be according to the design dimensions of the manufacturer;
c. The dimension is a reference value,the actually value according to the design dimension of the manufacturer.

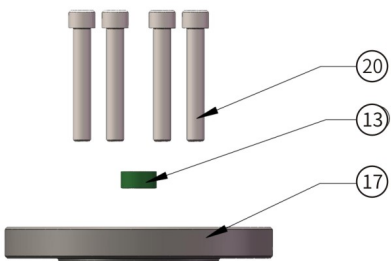
API 6A METAL SEATED TRUNNION MOUNTED BALL VALVE
(THREADED END)

PURPOSE

The API 6A high-pressure metal seated ball valve (threaded end) has the advantages of reliable sealing, smooth opening and closing, high safety performance, and long service life under high-pressure gas conditions of 10000Psi (69MPa). It is used for opening and closing pipelines, controlling flow direction, isolating and controlling conveying media, and is a key component in oil and gas extraction processes.

DESIGN FEATURES

- 1) The ball valve includes a forged three piece top entry structure and a ball-stem integrated structure, which is installed from the top side of the body, exempt the drill the hole on the body for the trunnion, increasing the strength of the high-pressure ball valve body, reducing the possibility of leakage, making the valve structure tight and the sealing performance better;
- 2) The sealing surface of the valve seat is made by a metal to metal seat structure, and the back of the valve seat is sealed by an O-ring sealing structure;
- 3) The rounded transition between the inner and outer sealing surfaces of the valve seat reduces damage to the sealing surface caused by sealing pressure;
- 4) The fixed support method for the ball is designed by a combination structure of ball, upper cover, and valve stem, which increases the stiffness and ensures the accurate position of the ball;
- 5) Low torque sliding bearings made of composite materials are used between the ball and stem to increase wear resistance and reduce friction torque.

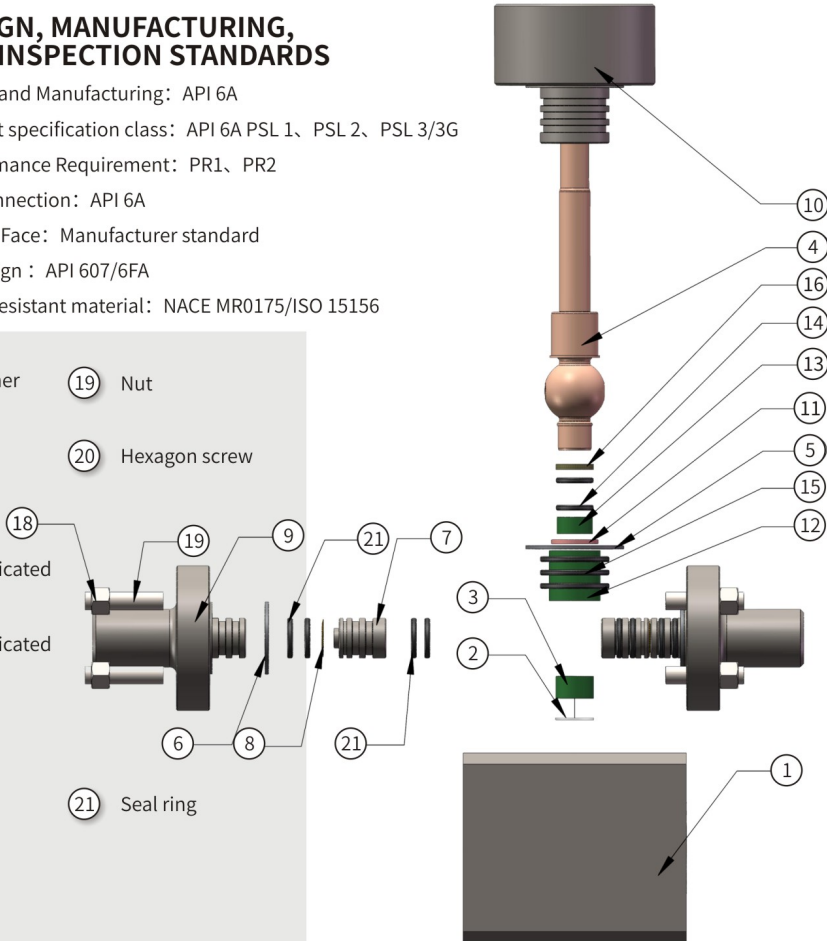


DESIGN, MANUFACTURING, AND INSPECTION STANDARDS

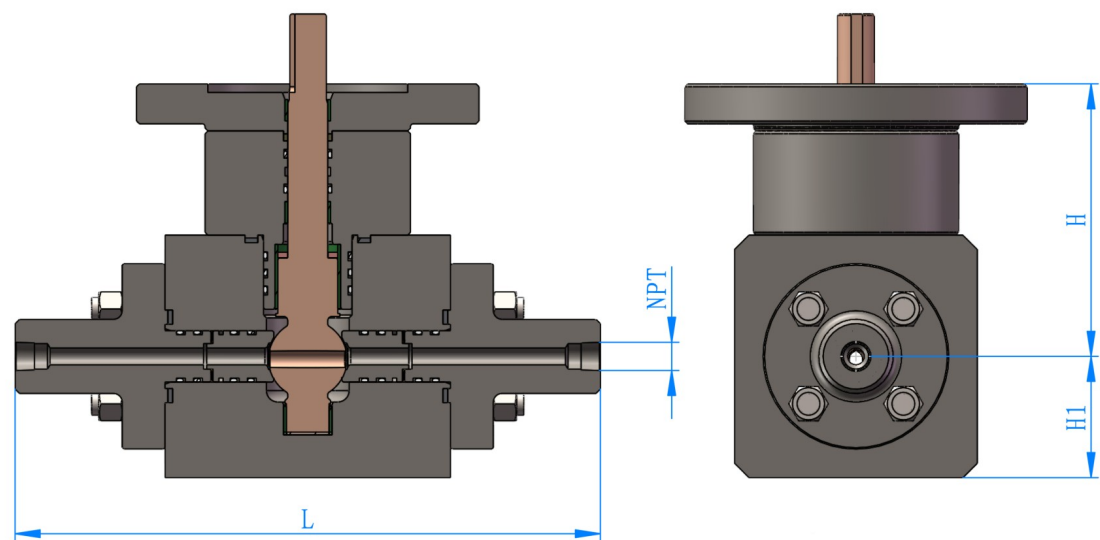
Design and Manufacturing: API 6A
Product specification class: API 6A PSL 1、PSL 2、PSL 3/3G
Performance Requirement: PR1、PR2
End connection: API 6A
Face to Face: Manufacturer standard
F.S.design : API 607/6FA
Sulfur resistant material: NACE MR0175/ISO 15156

- ① Body
- ② Gasket
- ③ Oil free lubricated bearings
- ④ Ball-Stem Integrated
- ⑤ piral wound gasket
- ⑥ piral wound gasket
- ⑦ Seat
- ⑧ Disc spring
- ⑨ Body adapter
- ⑩ Stem
- ⑪ Upper cover

- ⑫ Thrust washer
- ⑬ Seal ring
- ⑭ Oil free lubricated bearings
- ⑮ Oil free lubricated bearings
- ⑯ Seal ring
- ⑰ Seal ring
- ⑱ Nut
- ⑳ Hexagon screw
- ㉑ Seal ring



MAIN DIMENSIONS OF API 6A THREADED END METAL SEATED TRUNNION MOUNTED BALL VALVE



3000psi(20.7MPa)						5000psi(34.5MPa)					
SIZE inch	L ^a mm	NPT	H ^a mm	H1 ^a mm	WT Kg	SIZE inch	L ^a mm	NPT	H ^a mm	H1 ^a mm	WT Kg
3/8	380	3/8	170	75	48	3/8	400	3/8	180	80	51
1/2	380	1/2	170	75	54	1/2	400	1/2	180	80	59
3/4	390	3/4	180	80	66	3/4	420	3/4	190	85	76
1	400	1	185	80	89	1	440	1	200	90	125
1-1/2	420	1 1/2	190	85	110	1-1/2	480	1 1/2	215	100	148

10000psi(69MPa)					
SIZE inch	L ^a mm	NPT	H ^a mm	H1 ^a mm	WT Kg
3/8	400	3/8	180	80	64
1/2	420	1/2	190	85	72

a. The dimension is a reference value,the actually value according to the design dimension of the manufacturer.

