

Metal-Seated Ball Valve Catalog



Antiwear (Suzhou) Industrial Intelligent Technology Co.,Ltd.





Leading Manufacturer and Designer of Full Ranges of Industrial Valves

Antiwear Group, as a leader in designing and manufacturing of full ranges of industrial valves, from general use applications to severe conditions, supplies ball valve, butterfly valve, plug valve, gate valve, globe valve, check valve, piston valve, regulating valve, rotating disc valve and labyrinth control valve, which are widely used in refinery, oil & gas, power generation, water treatment, petrochemical, urban construction, paper & pulp, pipeline transferring and other industries. The performance of above valves supplied by Antiwear is appreciated by more and more end users worldwide.

Antiwear firmly believes that honesty is not just a virtue, but also a working and living attitude. In the high-speed development of Antiwear, the company has gradually formed "It's reliable" corporate culture, which means reliable products, reliable people and reliable service. Antiwear Group has completed the quality assurance system certification and passed a series of certificates, including ISO9001, ISO14000, ISO18000, TS, API6D, API607, ISO15848, PED, API 6A and so on.

Antiwear Group boasts manufacturing workshops in Suzhou, Wenzhou, and Shanghai, China and will establish localized warehouses, sales and distributors around the world. Through Internet + production, it can quickly respond to customer's requests. Antiwear's ultimate goal is to "help you enjoy good life"

Best Solution

In the spirit of excellence, continuous improvement, Antiwear keeps on improving the quality of the valve. Besides general use application, Antiwear has done fruitful research on critical service conditions including high temperature, high pressure, strong corrosion, crystallized, high frequently operated and other severe conditions in silicon chemical industry, coal gasification, petrochemical, hydrometallurgical, etc. and summed up the excellent solution in a large number of practice.

- High temperature and high pressure pure oxygen or hydrogen conditions ---- oxygen and hydrogen metal-seated ball valve, globe valve, check valve
- Solid abrasive material conditions ----- metal seated ball valve, rotating disc valve, rotating twin-disc valve
- High temperature exceeding 450°C conditions ----- Ball valve, disc valve, gate valve



- PP/PE facilities annual operating cycles reaching 1.6 million ---- PDS high-frequency metal and soft seated ball valve
- Solid abrasive particles at high pressure differential breeding and regulating conditions ---- slide plating valve
- Corrosive working conditions ----- plug valve, ball valve
- Fiber and pulp working conditions ----eccentric semi-ball valve
- High temperature solid particles bi-directional seated ball valve- S ZORB ball valve

- Flushing, flashing, cavitation conditions ---- angle control valve
- Zero-leakage request with gas medium at large pipe size ---- triple-offset butterfly valve
- Slurry conditions ---- Y-type globe valve
- Crystallization or slurry conditions ----- plug valve, eccentric semi-ball valve
- Precipitation conditions ---- piston valve
- Multi-level buck and flash conditions ---- labyrinth control valve

Overall solution

- Full range of valves
- All industry applications
- Application of all conditions
- Customize for customers
- Excellent performance under critical conditions
- Extensive R&D and experience

Best quality

- 100% parts inspection critical
- 100% finished product inspection
- 100% supplier certification
- 100% process tracking
- Advanced processing and testing equipment
- Complete quality control system and certification

Internet + production model

- Online sales and service
- Personalized customization
- Specialized small intelligent factory
- Online development, design, procurement, production

Five advantages of Antiwear

Quick response

- 24 hours fast response
- Global warehousing
- Global sales and distributors
- Quick inquiry / quote in one minute
- Order information bar code query system

Reliable culture

- Reliable product
- Trustworthy person
- Timely service
- Help you enjoy good life

Product under Severe Working Conditions



Metal seated ball valve

Applying for quantitative compression, dual-bearings, Belleville spring design and many different hard coatings. Widely used at abrasive fluid and high temperature conditions.
 Nominal Size: DN15~DN600, 1/2"~24"
 Temperature range: -196° C~850° C
 Pressure rating: PN10~PN670,
 Class 150~Class 4500



Oxygen service metal-seated ball valve

Completely overcome metal to metal "bite" under high pressure and temperature condition with ultra-high pure gas fluid. On/off operating smoothly without any jam. Valve is fireproof and anti-static design with fully derosination. Internal leakage rate meets and exceeds Class VI of ASME B16.104.
 Nominal Size: DN15~DN600, 1/2"~20"
 Temperature range: -196° C~500° C
 Pressure rating: PN10~PN670,
 Class 150~Class 4000



Triple-offset butterfly valve

No friction between plate and seat while operating the valve. Normally the valve is single directional sealed. And di-directional sealing is also available.
 Nominal Size: DN50~DN4500, 2"~180"
 Temperature range: -196° C~600° C
 Pressure rating: PN10~PN420,
 Class 150~Class 2500



High temperature and high pressure differential ball valve

Specially designed at high temperature and high pressure differential condition with solid catalyst particles fluid.
 Nominal Size: DN50~DN300, 2"~12"
 Temperature range: ≤650° C
 Pressure rating: PN10~PN260,
 Class 150~Class 1500



Rotating disc valve

Mainly used in coal chemical and polysilicon industry. Excellent performance and long working life under abrasive fluid conditions at block and venting system.
 Nominal Size: DN25~DN1200, 1"~48"
 Temperature range: -196° C~850° C
 Pressure rating: PN10~PN260,
 Class 150~Class 1500



High temperature double-wedge gate valve

Double-wedge design for high temperature and frequently operating application. Excellent sealing performance and long service life.
 Nominal Size: DN200~DN1400, 8"~56"
 Temperature range: ≤816° C
 Pressure rating: PN10~PN420,
 Class 150~Class 2500



High frequently operated PDS ball valve

Designed for quick on/off cycling and high frequently operated applications with solid fluid at system. Widely used in various applications where frequently operated is necessary, especially at PDS system of polyethylene and polypropylene facilities.
 Nominal Size: DN15~DN400, 1/2"~16"
 Temperature range: -46° C~450° C
 Pressure rating: PN10~PN260,
 Class 150~Class 1500



Rotating twin disc valve

Specially designed for block, venting, balance valve at lock hopper system with solid fluid. Excellent sealing performance and much longer service life than ball valve. Widely used at coal chemical industry.
 Nominal Size: DN40~DN600, 1.5"~24"
 Temperature range: -196° C~850° C
 Pressure rating: PN10~PN260,
 Class 150~Class 1500



Labyrinth control valve

Up to 24 stages labyrinth discs design for high pressure differential adjusting and regulating application. Excellent performance and long service life at many industries, especially at power plant field.
 Nominal Size: DN25~DN600, 1"~24"
 Temperature range: ≤700° C
 Pressure rating: PN10~PN760,
 Class 150~Class 4500

Patents



Certificates

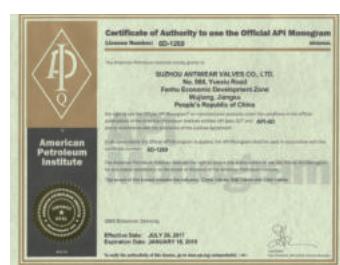
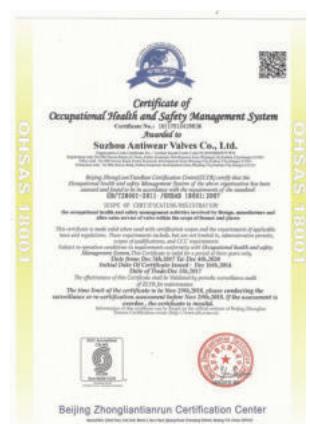


ISO9001

API607

API6FA

PED



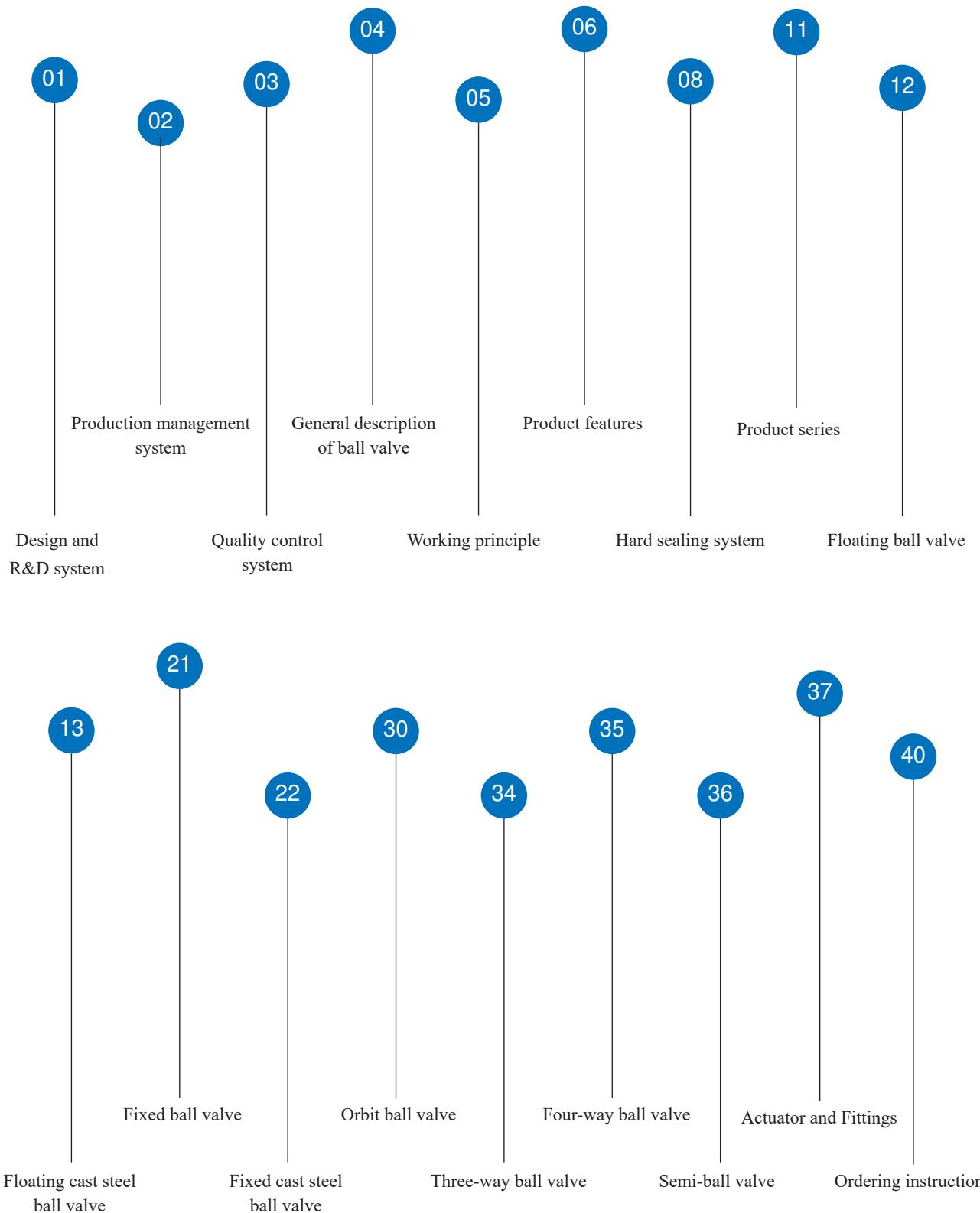
ISO14001

OHSAS18001

ISO15848

API6D

Content

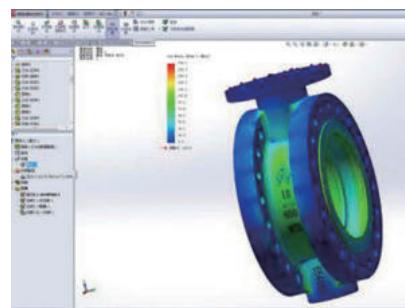
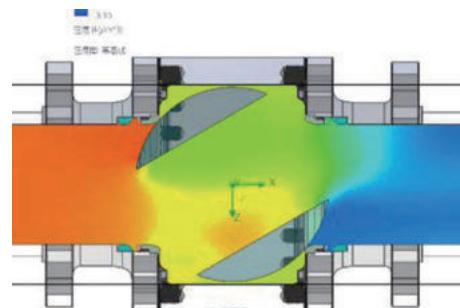
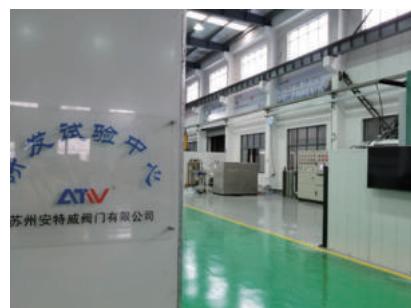


Design and R&D system

Since the establishment of Antiwear, it has been dedicated to research and development with more than 10% of its sales volume on R&D. Targeting conventional conditions and harsh conditions, it develops a variety of generic and targeted products, which earns credits for Antiwear for times.

Design center applies standardized and modular design to achieve interchange between parts. When Antiwear designs new products, it uses three-dimensional simulation, finite element analysis and other technical methods to simulate the verification of the rationality of product design to ensure the reliability and stability of the final product before the new designed product is put into mass production.

Our staff is committed to continuous development of innovative, improved production and technical capabilities. Antiwear boasts a team of professional engineers, technical sellers and certified service technicians. Antiwear firmly believes that creation and innovation is the source of the company's development and is the foundation of excellent enterprise.





Production management system

Antiwear applies a comprehensive and traceable production management system to record the data from the purchase of raw materials, parts processing to conduct assembly test through the central database. In the same time, the central database, through data analysis, optimizes the entire production system;

The planning center obtains the design BOM and the process BOM from the PLM through the ERP system and uses the optimal plan given by the central database to release the production plan and the task. The data between the various factories of Antiwear Group are read through the central database to achieve the optimal allocation of resources.

Procurement center, machine center and assembly center follow the ERP and MES system data and production instructions to conduct material procurement and processing assembly. Quality control center controls the whole process of procurement, machine processing, assembly to ensure each step of the data accuracy and traceability of parts developed from work-blank to finished product and timely summarize the data to the ERP and MES. Test Center follows the test requirements instructed from ERP and MES to conduct test and feed back the test results to the ERP and MES to facilitate lead time customer inquiries for product order information.

Quality control system

Antiwear pursues advanced scientific research technology and strict quality control and firmly believes that the quality matters is the most important matter in the enterprise development. Through the effective control of ERP and MES software system, all parts and products of Antiwear are recorded in the system with 100% traceability to achieve continuous quality management improvement.

Antiwear has established physical and chemical laboratory and boasts a roundness meter, metal chromatograph, multi-functional metal mechanical tester, carbon and sulfur analyzer, coordinate measuring instrument, Rockwell Vickers hardness tester, ultrasonic flaw detector, ultrasonic thickness Instrument, automatic pressure test device and torque tester and other advanced equipment.

Antiwear has a good quality assurance system to confirm the quality of the product is fulfill with ASME / API / ISO / PED and other relevant international standards. Antiwear is pleased to offer products and quality assurance superior over other valve manufacturers. We aim to fully satisfy customers and provide "a better life" for them.



General description of ball valve

Ball valve is a compact and reliable on/off valve, and is used in various applications. However, under certain extremely severe conditions, the common “soft” seal will be subject to certain application restrictions. For example, high temperature, high pressure, abrasion, corrosion and crystallizable medium may become quick and effective killers for soft seal. Nevertheless, the use of hard seal will help to resolve such problems. Even under the most severe service conditions such as high temperature, high pressure, high-frequency action and abrasive material conveyance system, hard-seal ball valve can also ensure free on-off control, stable torque, long service life and reliable sealing.



Application

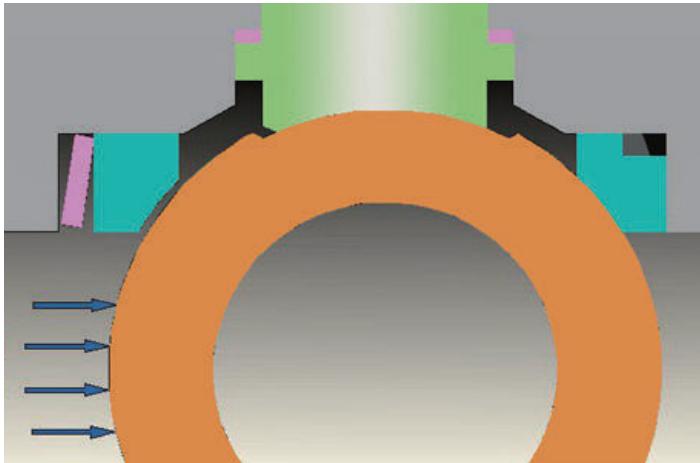
Hard-seal ball valve has such favorable performances as long service life, high service temperature and strong abrasion resistance. It is extensively used in various equipments and pipelines. For the various severe working conditions such as high temperature, high pressure, abrasion, corrosion, crystallizability and high-frequency action, hard-seal ball valve is your best choice.

- Power
- Petroleum, petrochemical and chemical industry
- Silicon chemical and nonferrous metallurgy
- Coal chemical
- Hydrocarbon, alkene and aldehyde
- Paper making
- Mining



Working principle

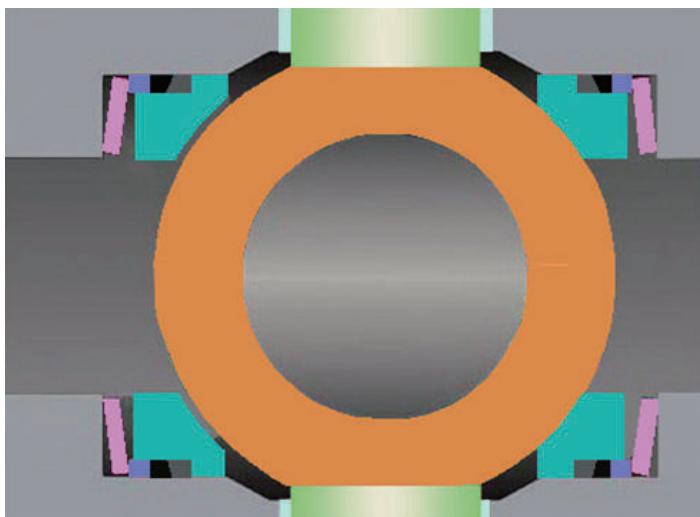
Sealing principle of floating ball valve



The ball of the ball valve is floating. Under the action of the medium, the ball will displace and press tightly against the sealing face of the outlet end to ensure its tightness. The floating ball valve features simple structure and good sealing performance.

The floating ball valve is suitable for light-duty small-ball valve.

Sealing principle of fixed ball valve



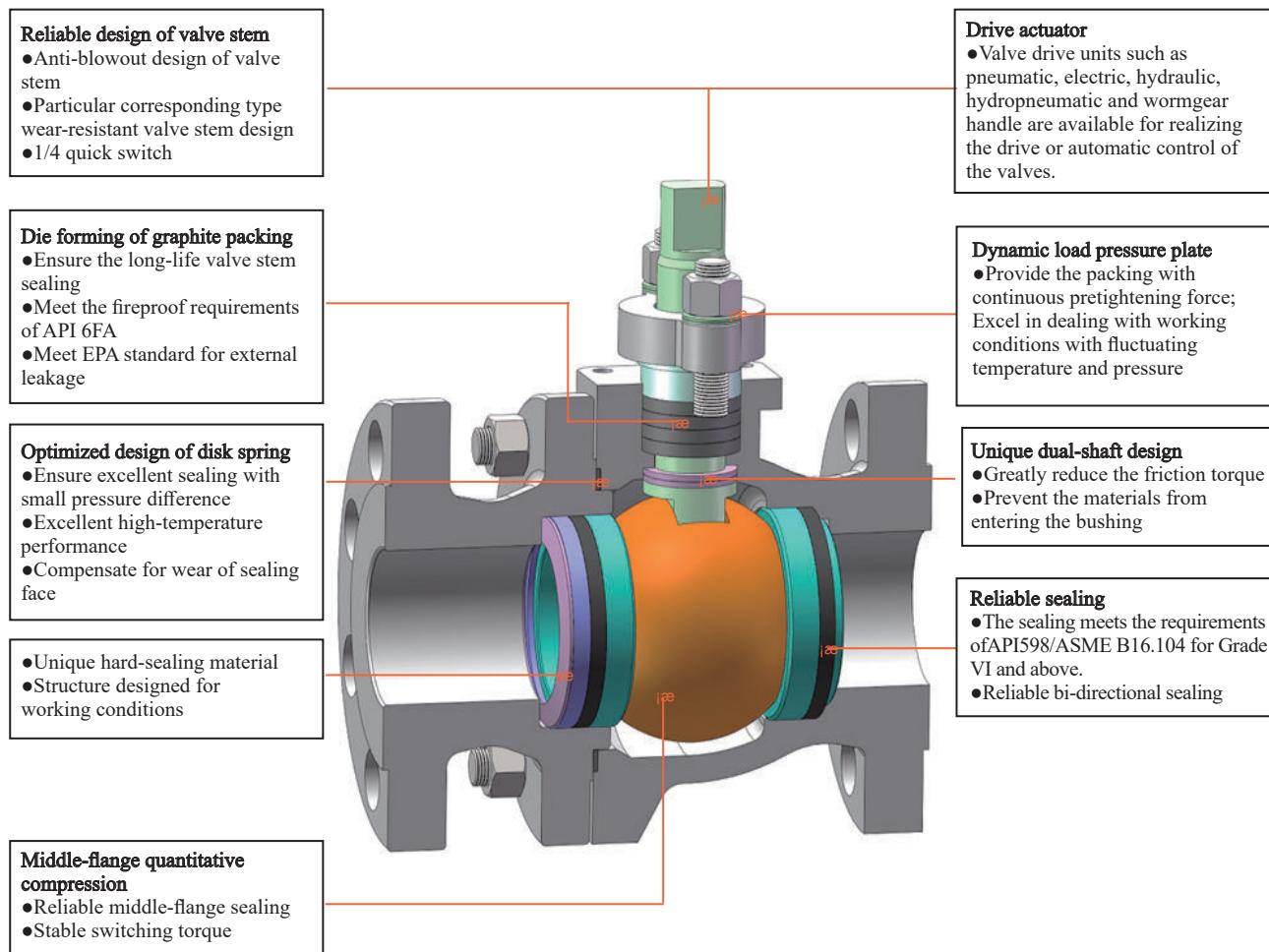
The ball of the ball valve is fixed and will not move when it is pressed. On the other hand, the valve seat is floating and will displace when it is pressed so that the sealing face of the valve seat is pressed tightly on the ball to ensure the tightness. The upper and lower shafts of the valve are provided with bearings. The operation torque is low, and it is thus easy to realize the bidirectional sealing.

Fixed ball valve is more suitable for heavy-duty large-ball valve.

Product features

Design features

Advanced design concept is used in Antiwear hard-sealing wear-proof ball valve. Compared with the similar products, it has such advantages as low torque, reliable sealing, good wear resistance, high pertinency and long service life. Especially, the hard-sealing system of Antiwear is established on the large quantity of test and research, and has excellent wear resistance and reliability.

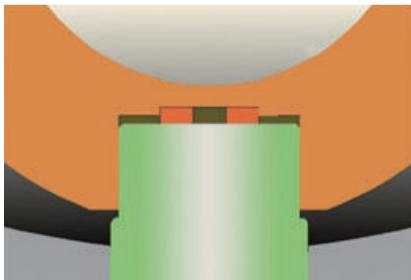


Design standards

The product materials of the company meet the material requirements of ASTM. The structure is designed in accordance with the ball valve standards such as API 6D/API608/BS 5351. The flanged ends are designed in accordance with ASME B16.5 and the butt-welded ends are designed in accordance with ASME B16.25. For the product serialization, the temperature& pressure levels for various materials specified in ASME B16.34 are observed strictly. The pressure test is carried out in accordance with API598/ASME B16.104 to ensure the quality of the products.

The connection ends can also be customized in accordance with other standards or the requirements of the customers.

Other features



- Natural static-proof structure design

The metal parts such as valve body, valve seat, ball and valve stem of the hard-sealing ball valve contact tightly to form an electrostatic channel naturally. Metal hard-sealing ball valve is of a natural static-proof structure.



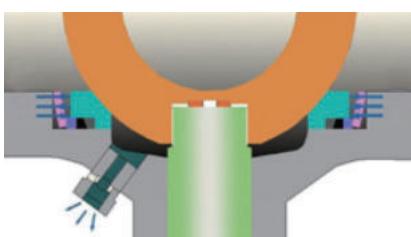
- Automatic pressure relieving design of middle cavity

When the pressure of the middle cavity of the valve rises abnormally, the withdrawal valve seat design can ensure that the pressure in the middle cavity can push the valve seat to realize automatic pressure relieving and guarantee the safety of the valve.

- Fireproof structure design

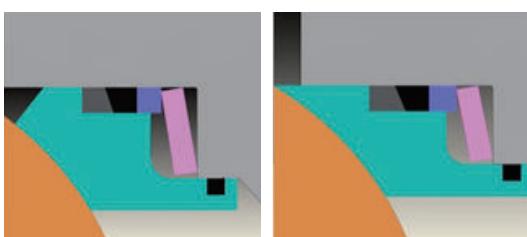
The sealing face of the valve is of metal-to-metal hard sealing structure and the packing is of flexible graphite structure. Therefore, even when the valve is under fire conditions, the reliable sealing can be ensured.

Optional features



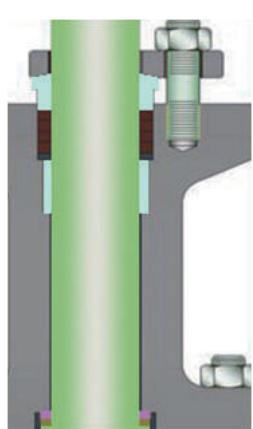
- Dual-blockage and discharge functions

Pre-ball valve seat sealing is used. The two valve seats fixing the ball valve can cut off the medium at the inlet and outlet independently, realizing dual-blockage function. When the ball valve is closed, even if the valve is pressurized both at the inlet and outlet, the middle cavity of the valve can be blocked from the passages in the two ends and the residual medium can be discharged through the discharge valve.



- Self-cleaning blade valve seat design

The unique blade valve seat design can deal with the working conditions such as slurry material with dregs, alkenematerial with strong adhesion, powder material, large-particle material, etc. It can prevent the medium from adhering to the sealing face, ensuring the sealing reliability and prolonging the service life of the valve.



- Prolonged valve stem design

In case of working conditions such as high temperature, low temperature and burial ground, the prolonged valve stem can be designed.

- Optional PTFE packing (<200°C)
- Reduced diameter design
- Drum bottom valve design
- Jacket thermal insulation design
- Discharge, blowing design, etc.

Hard sealing system

The hard sealing system of the ball valve is mainly composed of valve ball and valve seat. To fabricate the hard sealing system properly, Antiwear has performed deep study on hard sealing system and materials, carried out extensive experiments, and standardized 40 kinds of hard-sealing material and structure designs. They have excellent working-condition pertinency, wear resistance and reliability.

Damage mechanism

There are 6 main mechanisms for damage of the hard sealing system:

Adhesion	Micro-welding between valve ball and valve seat
Friction oxidization	A phenomenon that the valve ball or valve seat is activated due to the friction and reacts with the flow medium
Wearing	Micro-cutting between valve ball and valve seat and between valve spool and medium
Flushing	Micro-cutting of the flow medium to the valve spool caused by the kinetic energy. It is one type of wearing.
Corrosion	Integral corrosion, pitting corrosion, contact corrosion, intergranular corrosion and stress corrosion
Surface damage	Material fatigue of the sealing face caused by the alternation of thermal stress and mechanical stress



Damage of adhesion, corrosion and flushing to the hard sealing system

Under different working conditions, any one of the above six mechanisms may be a fatal “killer” to the hard sealing system. They may even exist concurrently and interact with each other, thus accelerating the damage of the hard sealing system.

Material selection

Hard sealing material is composed of hard coating material and base material. The base material must have excellent processing performance, excellent high- or low-temperature mechanical performances and sufficient resistance to corrosion. The hard coating must have wear resistance, corrosion resistance, high binding force, low porosity and low friction performances. Moreover, different coating processes will be needed for different base materials to ensure that the performances of the base materials will not be affected.

To prevent the flow medium from penetrating the coating and intruding into the relatively soft base materials, different coating thickness shall be employed for different working conditions and different hard coatings. We even need composite coatings for some extremely severe working conditions.

Antiwear has standardized 20 types of unique hard sealing materials for different working conditions:

Hard alloy	Application temperature(°C)	Hardness	Basic ingredient	Coating thickness (um)	Treatment mode	Base material
FSLLOY2	<850	84.5 ~ 89.5(HRA)	W-C-Co	--	Solid sintering (a)	--
FSLLOY4	<680	45 ~ 55(HRC)	W-Cr-C-Co	120 ~ 220	Supersonic spraying(b)	Cr13, SS, F51
FSLLOY6	<315	51 ~ 57(HRC)	Cr-Mo	--	Bar machining	--
FSLLOY8	<550	55 ~ 59(HRC)	W-Cr-Si-Ni	400 ~ 600	High temperature spray welding(c)	SS, F51
FSLLOY10	<550	59 ~ 65(HRC)	W-Cr-Si-Ni-C	400 ~ 600	High temperature spray welding	SS, F51
FSLLOY12	<550	62 ~ 67(HRC)	W-Cr-Si-Ni-C	400 ~ 600	High temperature spray welding	SS, F51
FSLLOY14	<450	68 ~ 74(HRC)	W-C-Co	120 ~ 220	Supersonic spraying	Cr13, SS, F51
FSLLOY16	<800	65 ~ 72(HRC)	Cr-C-Ni	120 ~ 220	Supersonic spraying	Cr13, SS, F51
FSLLOY18	<450	68 ~ 72(HRC)	W-Cr-C-Co	120 ~ 220	Supersonic spraying	Cr13, SS, F51
FSLLOY20	<300	82.5 ~ 85.5(HRA)	Al-O-Zr	--	Solid sintering	--
FSLLOY22	<650	68 ~ 74(HRC)	W-Cr-Si-Ni-C	120 ~ 220	Supersonic spraying	Cr13, SS, F51
FSLLOY24	<650	68 ~ 74(HRC)	W-C-Co	120 ~ 220	Supersonic spraying	Cr13, SS, F51
FSLLOY26	<850	Oxygen and nitrogen valve only, Confidential			Supersonic spraying	SS, Inconel
FSLLOY28	<450	PSD valve only, Confidential			--	SS, F51
FSLLOY30	<450	PSD valve only, Confidential			--	SS, F51
FSLLOY32	<850	S Zorb Ball valve only, Confidential			Supersonic spraying	Cr13, SS, Inconel

Note: Other hard alloys such as STELLITE 1#, 6#, 20#, Ni60 and hard chrome are optional.

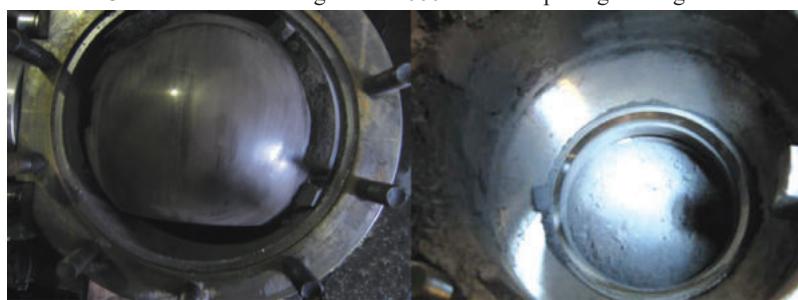
a. Integral sintering means that the whole workpiece is made from hard alloy by die-casting, molding, mechanical processing and high-temperature sintering. It has porosity of <1% with best strength and hardness as well as longest service life.

b. For supersonic spraying, supersonic flame air flow (temperature up to 3000 °C and speed up to 1400~1700m/s) is formed due to the high temperature and high pressure generated in the combustion chamber by the fuel gas (e.g. propane). As driven by the high-speed flame air flow, the hard alloy powder is sprayed onto the workpiece in high speed. The coating generated has such advantages as low porosity (Type A porosity <1%), high-bond strength (>70MPa, up to 83MPa), low residual stress and good surface smoothness, etc.

c. Spray-welding at high-temperature is a method for forming molten layer hard alloy surface by hot spraying onto preheated substrate and then integral heating for the coating to be re-melted on the surface of the substrate. The coating formed is a welded layer of a metal and the substrate material rather than a pure cover coating. So it has the advantages of high-bond strength (up to 400MPa) low residual stress, and good resistance to corrosion, thermal impact and mechanical impact. The coating will not come off.



Valve ball and seat with Cr13+FSLLOY14 coating after 12000 times of opening/closings with silicon powder medium



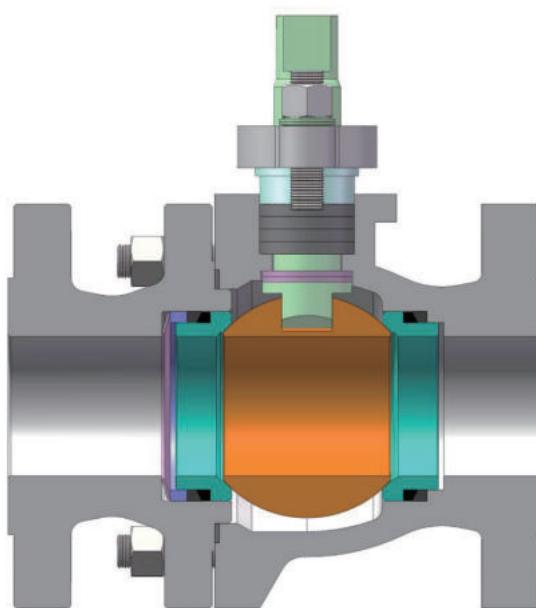
Valve ball and seat with F51+FSLLOY12 coating after 100000 times of opening/closings with dry coal powder medium

Valve ball and seat made of FSLLOY material are suitable for various extremely severe application conditions.

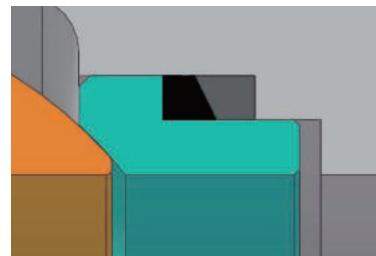
Standard valve seat design and process control

Hard sealing system is composed of valve ball and valve seat, which must withstand the main abrasive and corrosive attack. Therefore, high-quality valve ball and valve seat are critical for the hard sealing system.

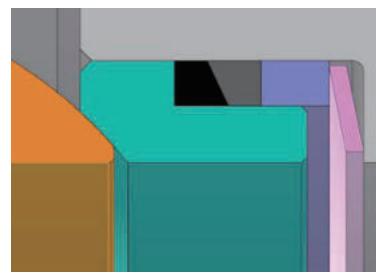
- Select appropriate base material, and control the sources and quality of the materials strictly.
- Finite element analysis and 3D structure design
- Select different hard sealing coating materials and coating processes depending on the conditions
- Control the hardness, thickness, bonding force and porosity strictly
- Ensure the roundness and finish of the valve ball by means of sophisticated equipment



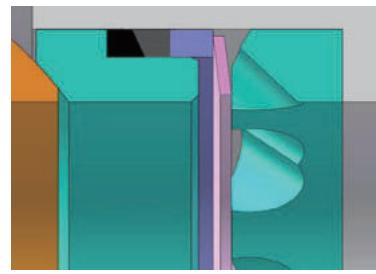
Standard valve seat design



Back Seal on the Seat



Front Sealing Seat



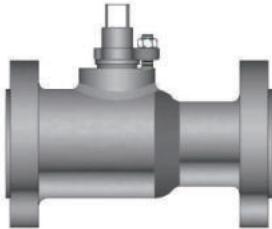
Ash Hopper Structure (special used for solid contained working condition)

In addition, for high-speed flow medium and high voltage step-down system, the damage of high-speed flushing to the hard sealing system is fatal, while flushing in the valve on-off process is inevitable. For this reason, how to ensure the quick opening/closing to position of the valve becomes one of the few options for reducing the flushing. Therefore, the hard sealing system in broad sense not only includes the valve ball and valve seat but also includes all the components related to the opening/closing of the valve, such as valve stem, bushing, packing, bearing, spring, bolt, actuator and their auxiliary parts. That is to say, it almost includes all the components of the ball valve.

Based on the deep understanding of the hard sealing system, Antiwear controls every link of the design, material, coating, processing, assembly and inspection to ensure the wear resistance and reliability of the hard sealing system.

Product series

As classified according to the valve body structure, hard sealing wear-proof ball valve is available in the following models:



Model F1: small-bore floating ball valve, full diameter structure design, integrally cast valve body, no external leakage



Model F2: Floating ball valve, 2-part cast valve body, full diameter structure design. The sealing of the middle flange is realized through the quantitative compression of the reliable sealing ring.



Model F3: Large bore floating ball valve, 3-partcast valve body, full diameter structure design, integrated packing box, and no external leakage at the packing box, quantitative compression for sealing of middle flange.



Model F2: floating ball valve, 2-part forged valve body, full C structure design, quantitative compression for middle flange and packing box, and no external leakage. The strength of forged valve body is higher than that of the cast one.



Model F3: floating ball valve, 3-part forged valve body, full diameter structure design, quantitative compression for middle flange and packing box, and no external leakage.



Model T2: fixed ball valve, 2-partcast valve body, full diameter structure design, integrated packing box, quantitative compression at middle flange, and no external leakage.



Model T3: fixed ball valve, 3-partcast valve body, full diameter structure design, quantitative compression at middle flange and packing box, and no external leakage.



Model T2: fixed ball valve, 2-partcast valve body, full diameter structure design, quantitative compression at middle flange, packing box and trunnion, and no external leakage.



Model T3: fixed ball valve, 3-partcast valve body, full diameter structure design, quantitative compression at middle flange, packing box and trunnion, and no external leakage.

Other valve models include orbit ball valve OB, three-way ball valve TL/TT, four-way ball valve FW and semi-ball valve SB.

Note: The above structures can all be customized for reduced diameter structure as per the requirements of the customer.

Floating ball valve

Floating ball valve is widely used in many industries such as silicon chemical, coal chemical, electricity, metallurgy, petroleum, petrochemical, etc. Single-direction or double-direction sealing can be realized according to the requirements. It can deal with severe working conditions, and has long service life and good sealing performance. It is available in several structures such as F11, F21, F22, F31 and F32.

Scope of products

NPS\CLASS	150	300	600	900	1500	2500
0.5"						
0.75"						
1"						
1.5"						
2"						
2.5"						
3"						
4"						
5"						
6"						
8"						
10"						
12"						
14"						
16"						
18"						
20"						

Model F11

NPS\CLASS	150	300	600	900	1500	2500
0.5"						
0.75"						
1"						
1.5"						
2"						
2.5"						
3"						
4"						
5"						
6"						
8"						
10"						
12"						
14"						
16"						
18"						
20"						

Model F21/F22

NPS\CLASS	150	300	600	900	1500	2500
0.5"						
0.75"						
1"						
1.5"						
2"						
2.5"						
3"						
4"						
5"						
6"						
8"						
10"						
12"						
14"						
16"						
18"						
20"						

Model F31

NPS\CLASS	150	300	600	900	1500	2500
0.5"						
0.75"						
1"						
1.5"						
2"						
2.5"						
3"						
4"						
5"						
6"						
8"						
10"						
12"						
14"						
16"						
18"						
20"						

Model F32

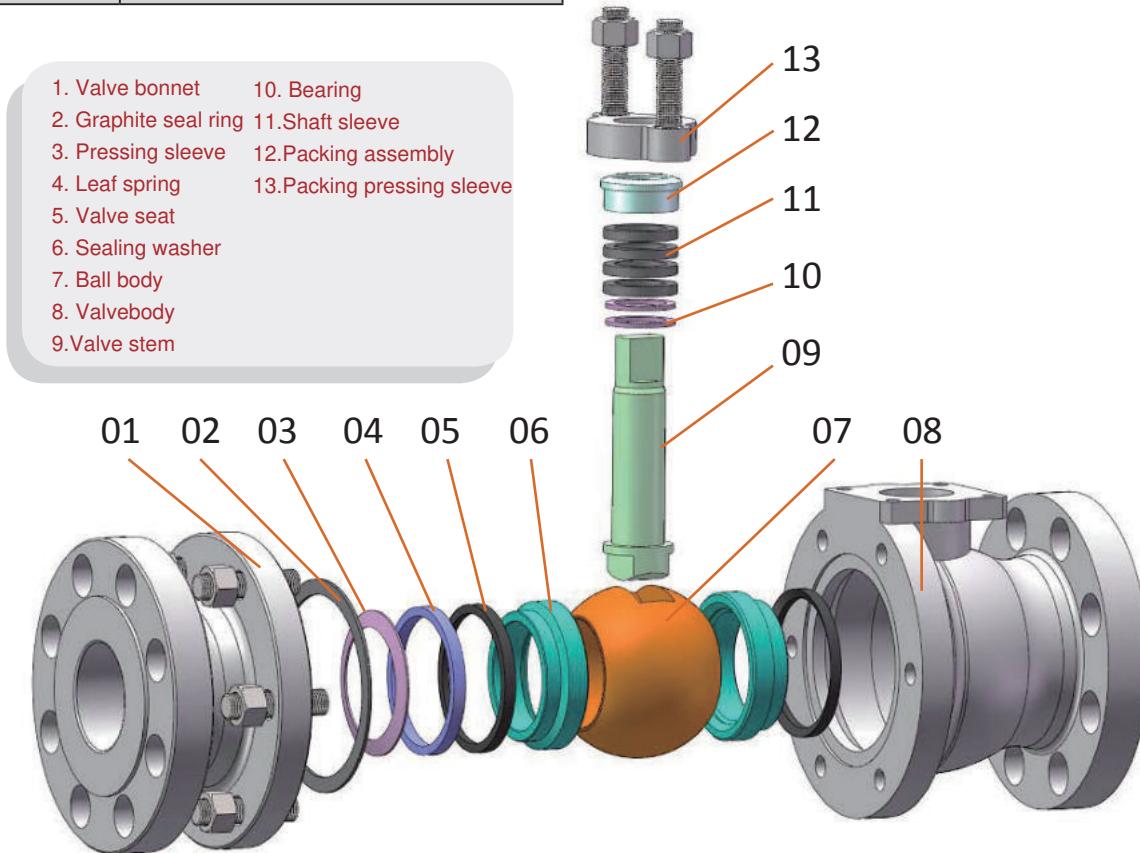


Floating cast steel ball valve

Type: Model F1/F2/F3

Technical specification

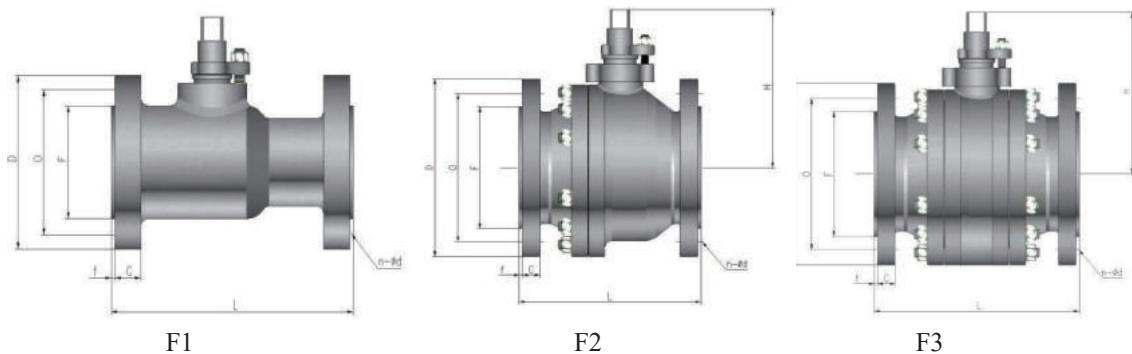
Design standard	API 608/API 6D/ASME B16.34
Structure length	ASME B16.10
Flange size	ASME B16.5
Inspection & test	API 598/ASME B16.104



Materials of main parts:

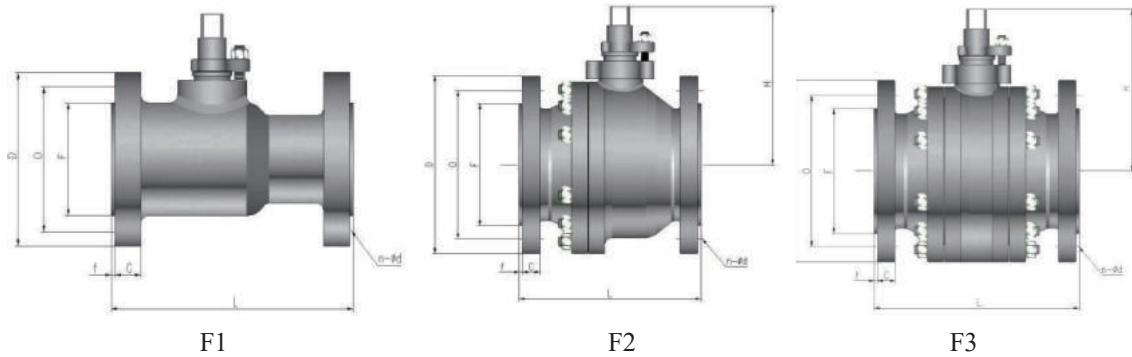
Part name	Valve body	Valve stem	Valve body	Valve seat	Packing	Bolt
Material category	Carbon steel Stainless steel Biphase steel	Stainless steel Biphase steel PH stainless steel High-temperature alloy	Stainless steel Biphase steel	Stainless steel Biphase steel	Plastic Compressed packing Braided packing	Carbon steel Stainless steel
Commonly used materials	A105/A350 LF2 A182 F304/F316 A182 F51	A182 F6a A182 F316 /XM-19 A182 F51 17-4PH Inc.718	ANSI 410 ANSI 304 ANSI 316 A182 F51	ANSI 410 ANSI 304 ANSI 316 A182 F51	PTFE/PEEK Graphite Reinforced graphite	A193 B7/A320 L7 A193 B8/B8M A320 B8/B8M

Note: For other optional materials, please refer to the ordering instructions.



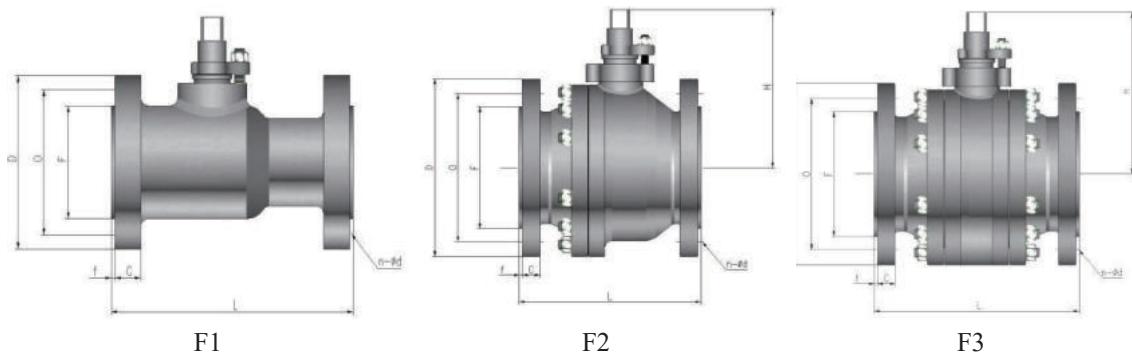
Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)
		L		H	D	O	F	f	C	
	NPS	RF	RJ							
Class150	0.5	108	119	85	90	60.3	35	2	9.6	4-16 3
	0.75	117	130	90	100	69.9	43	2	11.2	4-16 4
	1	127	140	99	110	79.4	51	2	12.7	4-16 5
	1.5	165	178	126	125	98.4	73	2	15.9	4-16 9
	2	178	191	140	150	120.7	92	2	17.5	4-18 13
	2.5	190	203	165	180	139.7	105	2	20.7	4-18 20
	3	203	216	178	190	152.4	127	2	22.3	4-18 24
	4	229	242	230	230	190.5	157	2	22.3	8-18 40
	5	356	369	280	255	215.9	186	2	22.3	8-22 77
	6	394	407	310	280	241.3	216	2	23.9	8-22 102
	8	457	470	350	345	298.5	270	2	27	8-22 135
	10	533	546	420	405	362.0	324	2	28.6	12-26 217
	12	610	623	470	485	431.8	381	2	30.2	12-26 356
	14	686	699	520	535	476.3	413	2	33.4	12-30 487
	16	762	775	580	595	539.8	467	2	35.0	16-30 670
	18	864	877	650	635	577.9	533.5	2	38.1	16-33 865
	20	914	927	720	700	635.0	584	2	41.3	20-33 1112

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
	NPS	RF	RJ								
Class300	0.5	140	151	85	95	66.7	35	2	12.7	4-16	4
	0.75	152	165	90	115	82.6	43	2	14.3	4-18	7
	1	165	178	99	125	88.9	51	2	15.9	4-20	9
	1.5	190	203	126	155	114.3	73	2	19.1	4-22	15
	2	216	232	140	165	127.0	92	2	20.7	8-18	19
	2.5	241	257	165	190	149.2	105	2	23.9	8-22	29
	3	282	298	178	210	168.3	127	2	27.0	8-22	41
	4	305	321	230	255	200.0	157	2	30.2	8-22	66
	5	381	397	280	280	235.0	186	2	33.4	8-22	99
	6	403	419	310	320	269.9	216	2	35.0	12-22	137
	8	502	518	350	380	330.2	270	2	39.7	12-26	180
	10	568	584	420	445	387.4	324	2	46.1	16-30	280
	12	648	664	470	520	450.8	381	2	49.3	16-33	435
	14	762	778	520	585	514.4	413	2	52.4	20-33	647
	16	838	854	580	650	571.5	467	2	55.6	20-36	879
	18	914	930	650	710	628.6	533.5	2	58.8	24-36	1144
	20	991	997	720	775	685.8	584.2	2	62	24-32	1477



Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		RF	RJ								
Class600	0.5	165	163	98	95	66.7	35	7	14.3	4-16	
	0.75	190	190	105	115	82.6	43	7	15.9	4-18	
	1	216	216	110	125	88.9	51	7	17.5	4-18	
	1.5	241	241	130	155	114.3	73	7	22.3	4-22	
	2	292	295	156	165	127	92	7	25.4	8-18	
	2.5	330	333	172	190	149.2	105	7	28.6	8-22	
	3	356	359	220	210	168.3	127	7	31.8	8-22	
	4	432	435	250	275	215.9	157	7	38.1	8-26	
	5	508	511	320	330	266.7	186	7	44.5	8-30	
	6	559	562	365	355	292.1	216	7	47.7	12-30	
	8	660	663	440	420	349.2	270	7	55.6	12-33	
	10	787	790	520	510	431.8	324	7	63.5	16-36	
	12	838	841	580	560	489.0	381	7	66.7	20-36	
	14	889	892	620	605	527.0	413	7	69.9	20-39	
	16	991	994	690	685	603.2	467	7	76.2	20-42	
	18	1092	1095	760	745	654.0	533.5	7	82.6	20-45	
										1504	

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		RF	RJ								
Class900	0.5	216	216	98	120	82.6	35	7	22.3	4-22	
	0.75	229	229	105	130	88.9	43	7	25.4	4-22	
	1	254	254	110	150	101.6	51	7	28.6	4-26	
	1.5	305	305	130	180	123.8	73	7	31.8	4-30	
	2	368	371	156	215	165.1	92	7	38.1	8-26	
	2.5	419	422	172	245	190.5	105	7	41.3	8-30	
	3	381	384	220	240	190.5	127	7	38.1	8-26	
	4	457	461	250	290	235.0	157	7	44.5	8-33	
	5	559	562	320	350	279.4	186	7	50.8	8-36	
	6	610	613	365	380	317.5	216	7	55.6	12-33	
	8	737	740	440	470	393.7	270	7	63.5	12-39	
	10	838	841	520	545	469.9	324	7	69.9	16-39	
										618	



Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class1500	0.5	216	216	98	120	82.6	35	7	22.3	4-22	10
	0.75	229	229	105	130	88.9	43	7	25.4	4-22	13
	1	254	254	110	150	101.6	51	7	28.6	4-26	19
	1.5	305	305	130	180	123.8	73	7	31.8	4-30	33
	2	368	371	160	215	165.1	92	7	38.1	8-26	72
	2.5	419	422	180	245	190.5	105	7	41.3	8-30	118
	3	470	473	230	265	203.2	127	7	47.7	8-33	162
	4	546	549	280	310	241.3	157	7	54	8-36	243
	5	673	676	345	375	292.1	186	7	73.1	8-42	405
	6	705	711	375	395	317.5	216	7	82.6	12-39	486
	8	832	842	450	485	393.7	270	7	92.1	12-45	795
	10	991	1001	560	585	482.6	324	7	108	12-51	1350

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class2500	0.5	264	264	98	135	88.9	35	7	30.2	4-22	15
	0.75	273	273	105	140	95.2	43	7	31.8	4-22	23
	1	308	308	110	160	108	51	7	35	4-26	32
	1.5	384	387	130	205	146	73	7	44.5	4-33	45
	2	451	454	160	235	171.4	92	7	50.9	8-30	72
	2.5	508	540	180	265	196.8	105	7	57.2	8-33	159
	3	578	584	230	305	228.6	127	7	66.7	8-36	239
	4	673	683	280	355	273	157	7	76.2	8-42	367
	5	794	807	345	420	323.8	186	7	50.9	8-48	914
	6	914	927	375	485	368.3	216	7	108	8-55	1265
	8	1022	1038	450	550	438.2	270	7	127	12-55	2348
	10	1270	1292	560	675	539.8	324	7	165.1	12-68	3258

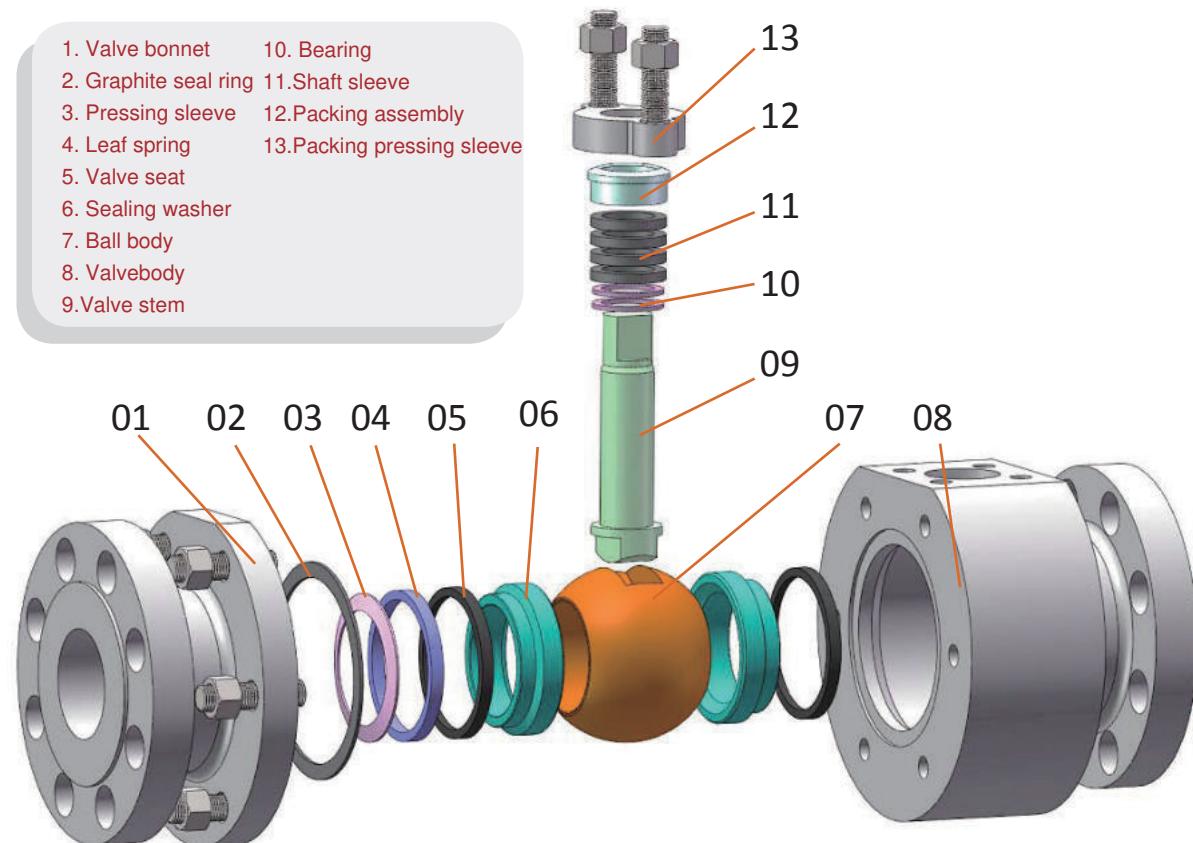
Note:

1. The structure lengths in this table are based on the long-series dimensions in ASME B 16.10 standard.
2. The flanges in this table are based on the dimensions in ASME B16.5.
3. According to the requirements of the customer, the structure length and connection flange can be customized according to the national standards and other standards.
4. All the dimensions and weights are for reference only. The factory reserves the right to make any modifications.

Type: F2/Model F3

Technical specification

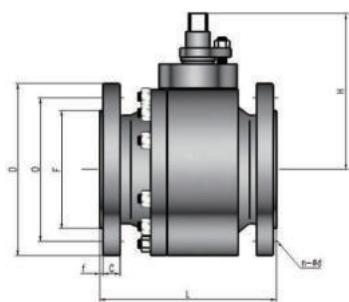
Design standard	API 608/API 6D/ASME B16.34
Structure length	ASME B16.10
Flange size	ASME B16.5
Inspection & test	API 598/ASME B16.104



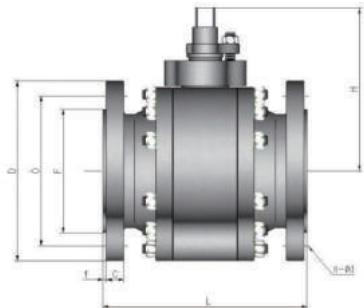
Materials of main parts:

Part name	Valve body	Valve stem	Valve body	Valve seat	Packing	Bolt
Material category	Carbon steel Stainless steel Biphase steel	Stainless steel Biphase steel PH stainless steel High-temperature alloy	Stainless steel Biphase steel	Stainless steel Biphase steel	Plastic Compressed packing Braided packing	Carbon steel Stainless steel
Commonly used materials	A105/A350 LF2 A182 F304/F316 A182 F51	A182 F6a A182 F316 /XM-19 A182 F51 17-4PH Inc.718	ANSI 410 ANSI 304 ANSI 316 A182 F51	ANSI 410 ANSI 304 ANSI 316 A182 F51	PTFE/PEEK Graphite Reinforced graphite	A193 B7/A320 L7 A193 B8/B8M A320 B8/B8M

Note: For other optional materials, please refer to the ordering instructions.



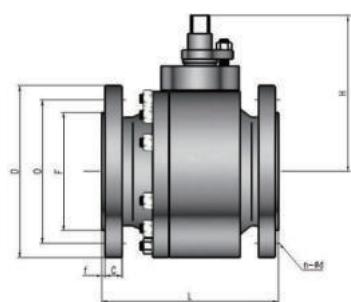
F2



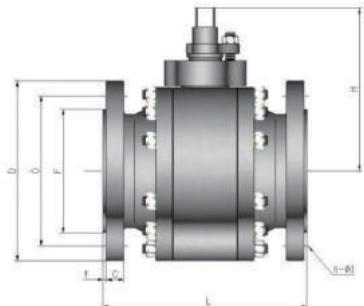
F3

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class150	0.5	108	119	85	90	60.3	35	2	9.6	4-16	
	0.75	117	130	90	100	69.9	43	2	11.2	4-16	
	1	127	140	99	110	79.4	51	2	12.7	4-16	
	1.5	165	178	126	125	98.4	73	2	15.9	4-16	
	2	178	191	140	150	120.7	92	2	17.5	4-18	
	2.5	190	203	165	180	139.7	105	2	20.7	4-18	
	3	203	216	178	190	152.4	127	2	22.3	4-18	
	4	229	242	230	230	190.5	157	2	22.3	8-18	
	5	356	369	280	255	215.9	186	2	22.3	8-22	
	6	394	407	310	280	241.3	216	2	23.9	8-22	
	8	457	470	350	345	298.5	270	2	27.0	8-22	
	10	533	546	420	405	362.0	324	2	28.6	12-26	
	12	610	623	470	485	431.8	381	2	30.2	12-26	
	14	686	699	520	535	476.3	413	2	33.4	12-30	
	16	762	775	580	595	539.8	467	2	35.0	16-30	
	18	864	877	650	635	577.9	533.5	2	38.1	16-33	
	20	914	927	720	700	635.0	584	2	41.3	20-33	
										1389	

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class300	0.5	140	151	85	95	66.7	35	2	12.7	4-16	
	0.75	152	165	90	115	82.6	43	2	14.3	4-18	
	1	165	178	99	125	88.9	51	2	15.9	4-20	
	1.5	190	203	126	155	114.3	73	2	19.1	4-22	
	2	216	232	140	165	127.0	92	2	20.7	8-18	
	2.5	241	257	165	190	149.2	105	2	23.9	8-22	
	3	282	298	178	210	168.3	127	2	27.0	8-22	
	4	305	321	230	255	200.0	157	2	30.2	8-22	
	5	381	397	280	280	235.0	186	2	33.4	8-22	
	6	403	419	310	320	269.9	216	2	35.0	12-22	
	8	502	518	350	380	330.2	270	2	39.7	12-26	
	10	568	584	420	445	387.4	324	2	46.1	16-30	
	12	648	664	470	520	450.8	381	2	49.3	16-33	
	14	762	778	520	585	514.4	413	2	52.4	20-33	
	16	838	854	580	650	571.5	467	2	55.6	20-36	
	18	914	930	650	710	628.6	533.5	2	58.8	24-36	
	20	991	1110	720	775	685.8	584	2	62.0	24-36	
										1847	



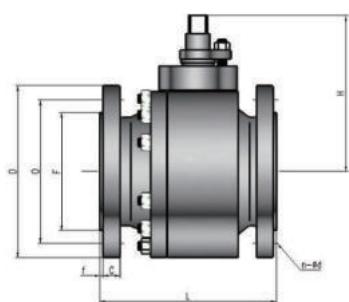
F2



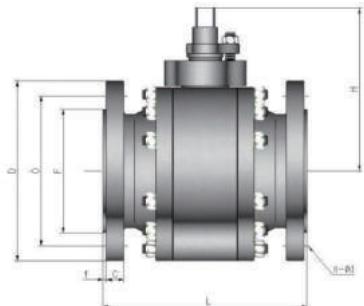
F3

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class600	0.5	165	163	98	95	66.7	35	7	14.3	4-16	6
	0.75	190	190	105	115	82.6	43	7	15.9	4-18	10
	1	216	216	110	125	88.9	51	7	17.5	4-18	14
	1.5	241	241	130	155	114.3	73	7	22.3	4-22	24
	2	292	295	156	165	127	92	7	25.4	8-18	33
	2.5	330	333	172	190	149.2	105	7	28.6	8-22	49
	3	356	359	220	210	168.3	127	7	31.8	8-22	65
	4	432	435	250	275	215.9	157	7	38.1	8-26	135
	5	508	511	320	330	266.7	186	7	44.5	8-30	229
	6	559	562	365	355	292.1	216	7	47.7	12-30	280
	8	660	663	440	420	349.2	270	7	55.6	12-33	361
	10	787	790	520	510	431.8	324	7	63.5	16-36	635
	12	838	841	580	560	489.0	381	7	66.7	20-36	815
	14	889	892	620	605	527.0	413	7	69.9	20-39	1009
	16	991	994	690	685	603.2	467	7	76.2	20-42	1443
	18	1092	1095	760	745	654.0	533.5	7	82.6	20-45	1880

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class900	0.5	216	216	98	120	82.6	35	7	22.3	4-22	13
	0.75	229	229	105	130	88.9	43	7	25.4	4-22	16
	1	254	254	110	150	101.6	51	7	28.6	4-26	24
	1.5	305	305	130	180	123.8	73	7	31.8	4-30	41
	2	368	371	156	215	165.1	92	7	38.1	8-26	70
	2.5	419	422	172	245	190.5	105	7	41.3	8-30	90
	3	381	384	220	240	190.5	127	7	38.1	8-26	103
	4	457	461	250	290	235.0	157	7	44.5	8-33	153
	5	559	562	320	350	279.4	186	7	50.8	8-36	283
	6	610	613	365	380	317.5	216	7	55.6	12-33	364
	8	737	740	440	470	393.7	270	7	63.5	12-39	505
	10	838	841	520	545	469.9	324	7	69.9	16-39	772



F2



F3

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class1500	0.5	216	216	98	120	82.6	35	7	22.3	4-22	13
	0.75	229	229	105	130	88.9	43	7	25.4	4-22	16
	1	254	254	110	150	101.6	51	7	28.6	4-26	24
	1.5	305	305	130	180	123.8	73	7	31.8	4-30	41
	2	368	371	160	215	165.1	92	7	38.1	8-26	90
	2.5	419	422	180	245	190.5	105	7	41.3	8-30	131
	3	470	473	230	265	203.2	127	7	47.7	8-33	180
	4	546	549	280	310	241.3	157	7	54	8-36	270
	5	673	676	345	375	292.1	186	7	73.1	8-42	450
	6	705	711	375	395	317.5	216	7	82.6	12-39	540
	8	832	842	450	485	393.7	270	7	92.1	12-45	955
	10	991	1001	560	585	482.6	324	7	108	12-51	1620

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class2500	0.5	264	264	98	135	88.9	35	7	30.2	4-22	22
	0.75	273	273	105	140	95.2	43	7	31.8	4-22	30
	1	308	308	110	160	108	51	7	35	4-26	40
	1.5	384	387	130	205	146	73	7	44.5	4-33	53
	2	451	454	160	235	171.4	92	7	50.9	8-30	136
	2.5	508	540	180	265	196.8	105	7	57.2	8-33	191
	3	578	584	230	305	228.6	127	7	66.7	8-36	286
	4	673	683	280	355	273	157	7	76.2	8-42	441
	5	794	807	345	420	323.8	186	7	50.9	8-48	1096
	6	914	927	375	485	368.3	216	7	108	8-55	1518
	8	1022	1038	450	550	438.2	270	7	127	12-55	2818
	10	1270	1292	560	675	539.8	324	7	165.1	12-68	3909

Note:

1. The structure lengths in this table are based on the long-series dimensions in ASME B 16.10 standard.
2. The flanges in this table are based on the dimensions in ASME B16.5.
3. According to the requirements of the customer, the structure length and connection flange can be customized according to the national standards and other standards.
4. All the dimensions and weights are for reference only. The factory reserves the right to make any modifications.

Fixed ball valve

Fixed ball valve is widely used in many industries such as silicon chemical, coal chemical, metallurgy, electricity, petrochemical, petroleum, etc. Double-direction sealing ensures good sealing performance and long service life. It is available in several structures such as T21/T22 and T31/T32.

Scope of products

NPS\CLASS	150	300	600	900	1500	2500
1"						
1.5"						
2"						
2.5"						
3"						
4"						
5"						
6"						
8"						
10"						
12"						
14"						
16"						
18"						
20"						
24"						

Model T2

NPS\CLASS	150	300	600	900	1500	2500
1"						
1.5"						
2"						
2.5"						
3"						
4"						
5"						
6"						
8"						
10"						
12"						
14"						
16"						
18"						
20"						
24"						

Model T3

NPS\CLASS	150	300	600	900	1500	2500
1"						
1.5"						
2"						
2.5"						
3"						
4"						
5"						
6"						
8"						
10"						
12"						
14"						
16"						
18"						
20"						
24"						

Model T2

NPS\CLASS	150	300	600	900	1500	2500
1"						
1.5"						
2"						
2.5"						
3"						
4"						
5"						
6"						
8"						
10"						
12"						
14"						
16"						
18"						
20"						
24"						

Model T3



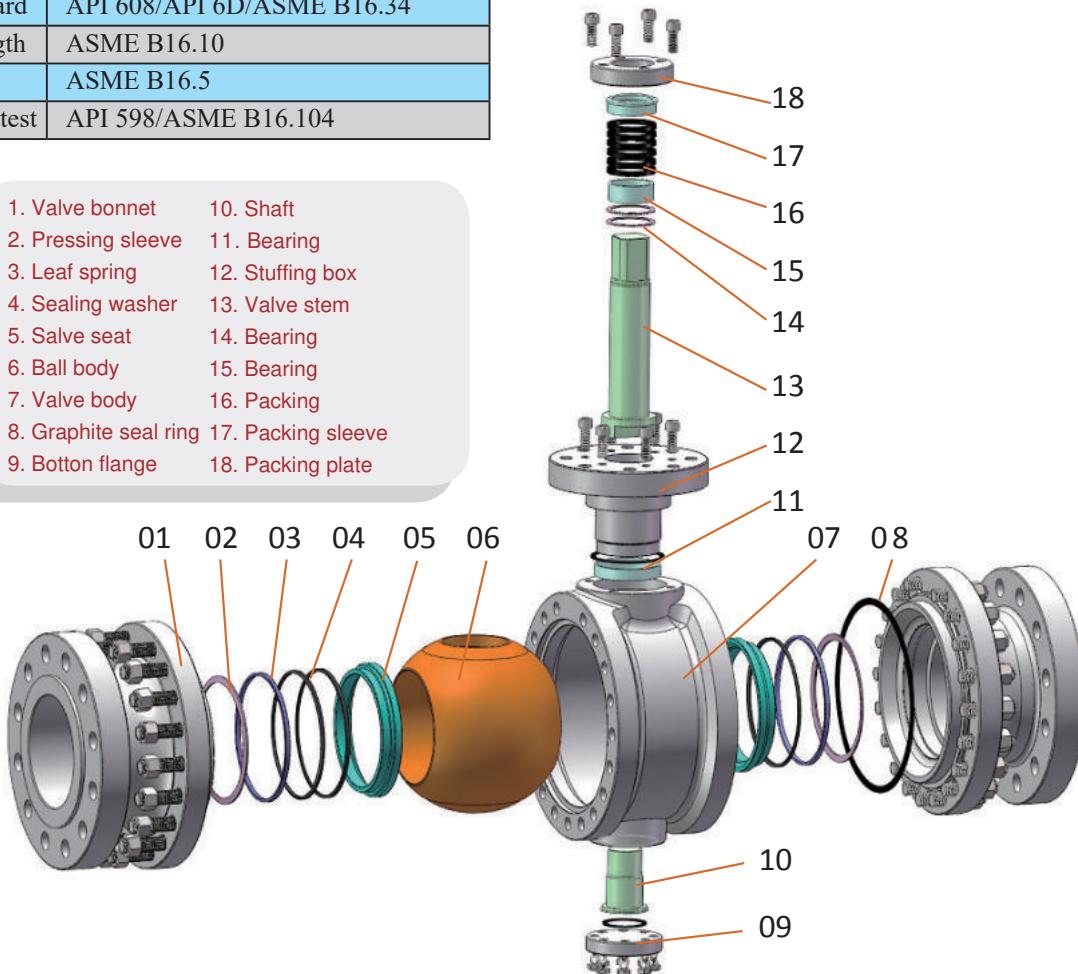
Fixed cast steel ball valve

Type: T2/Model T3

Technical specification

Design standard	API 608/API 6D/ASME B16.34
Structure length	ASME B16.10
Flange size	ASME B16.5
Inspection & test	API 598/ASME B16.104

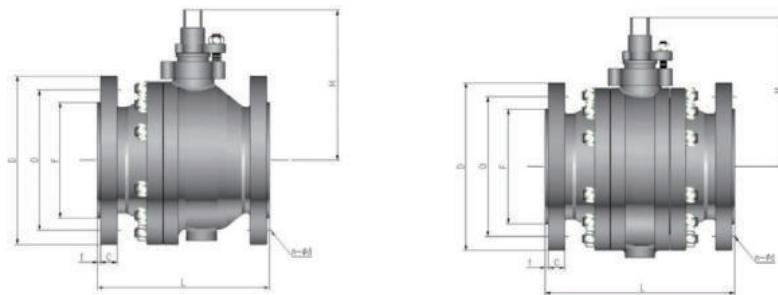
1. Valve bonnet	10. Shaft
2. Pressing sleeve	11. Bearing
3. Leaf spring	12. Stuffing box
4. Sealing washer	13. Valve stem
5. Valve seat	14. Bearing
6. Ball body	15. Bearing
7. Valve body	16. Packing
8. Graphite seal ring	17. Packing sleeve
9. Bottom flange	18. Packing plate



Materials of main parts:

Part name	Valve body	Valve stem	Valve body	Valve seat	Packing	Bolt
Material category	Carbon steel Stainless steel Biphase steel	Stainless steel Biphase steel PH stainless steel High-temperature alloy	Stainless steel Biphase steel	Stainless steel Biphase steel	Plastic Compressed packing Braided packing	Carbon steel Stainless steel
Commonly used materials	A216 WCB/ A352 LCB A351 CF8/CF8M A890 4A	A182 F6a A182 F316 /XM-19 A182 F51 17-4PH Inc.718	ANSI 410 ANSI 304 ANSI 316 A182 F51	ANSI 410 ANSI 304 ANSI 316 A182 F51	PTFE/PEEK Graphite Reinforced graphite	A193 B7/A320 L7 A193 B8/B8M A320 B8/B8M

Note: For other optional materials, please refer to the ordering instructions.

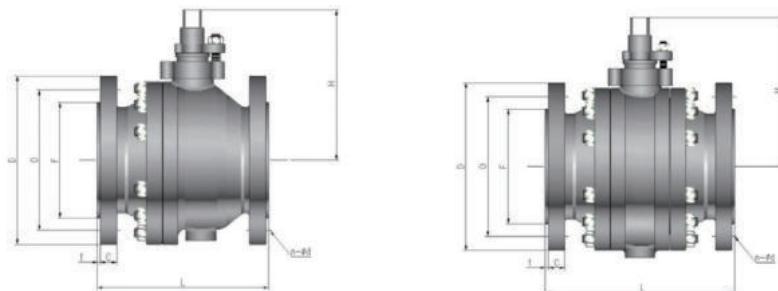


T2

T3

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class150	2	178	191	140	150	120.7	92	2	17.5	4-18	15
	2.5	190	203	165	180	139.7	105	2	20.7	4-18	25
	3	203	216	178	190	152.4	127	2	22.3	4-18	31
	4	229	242	230	230	190.5	157	2	22.3	8-18	48
	5	356	369	280	255	215.9	186	2	22.3	8-22	90
	6	394	407	310	280	241.3	216	2	23.9	8-22	120
	8	457	470	350	345	298.5	270	2	27.0	8-22	179
	10	533	546	420	405	362.0	324	2	28.6	12-26	269
	12	610	623	470	485	431.8	381	2	30.2	12-26	440
	14	686	699	520	535	476.3	413	2	33.4	12-30	558
	16	762	775	580	595	539.8	467	2	35.0	16-30	758
	18	864	877	650	635	577.9	533.5	2	38.1	16-33	918
	20	914	927	720	700	635.0	584	2	41.3	20-33	1138
	24	1067	1080	900	815	749.3	692	2	46.1	20-36	1750

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class300	2	216	232	140	165	127.0	92	2	20.7	8-18	20
	2.5	241	257	165	190	149.2	105	2	23.9	8-22	28
	3	282	298	178	210	168.3	127	2	27.0	8-22	44
	4	305	321	230	255	200.0	157	2	30.2	8-22	72
	5	381	397	280	280	235.0	186	2	33.4	8-22	100
	6	403	419	310	320	269.9	216	2	35.0	12-22	136
	8	502	518	350	380	330.2	270	2	39.7	12-26	260
	10	568	584	420	445	387.4	324	2	46.1	16-30	382
	12	648	664	470	520	450.8	381	2	49.3	16-33	580
	14	762	778	520	585	514.4	413	2	52.4	20-33	831
	16	838	854	580	650	571.5	467	2	55.6	20-36	1118
	18	914	930	650	710	628.6	533.5	2	58.8	24-36	1429
	20	991	1110	720	775	685.8	584	2	62.0	24-36	1778
	24	1143	1165	900	915	812.8	692	2	68.3	24-42	2800

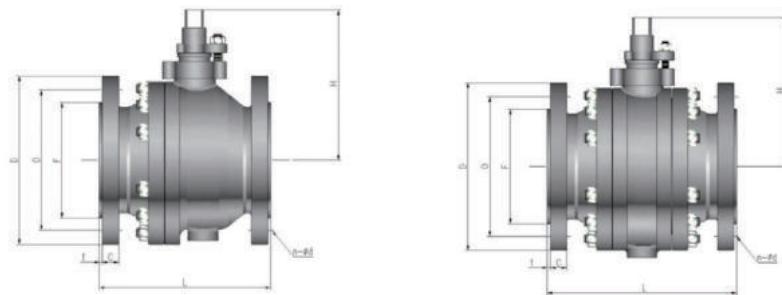


T2

T3

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class600	1.5	241	241	130	155	114.3	73	7	22.3	4-22	
	2	292	295	156	165	127	92	7	25.4	8-18	
	2.5	330	333	172	190	149.2	105	7	28.6	8-22	
	3	356	359	220	210	168.3	127	7	31.8	8-22	
	4	432	435	250	275	215.9	157	7	38.1	8-26	
	5	508	511	320	330	266.7	186	7	44.5	8-30	
	6	559	562	365	355	292.1	216	7	47.7	12-30	
	8	660	663	440	420	349.2	270	7	55.6	12-33	
	10	787	790	520	510	431.8	324	7	63.5	16-36	
	12	838	841	580	560	489.0	381	7	66.7	20-36	
	14	889	892	620	605	527.0	413	7	69.9	20-39	
	16	991	994	690	685	603.2	467	7	76.2	20-42	
	18	1092	1095	760	745	654.0	533.5	7	82.6	20-45	
	20	1194	1200	820	815	723.9	584	7	88.9	24-45	
	24	1397	1407	960	940	838.2	692	7	101.6	24-51	
										3880	

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class900	1	254	254	110	150	101.6	51	7	28.6	4-26	
	1.5	305	305	130	180	123.8	73	7	31.8	4-30	
	2	368	371	156	215	165.1	92	7	38.1	8-26	
	2.5	419	422	172	245	190.5	105	7	41.3	8-30	
	3	381	384	220	240	190.5	127	7	38.1	8-26	
	4	457	461	250	290	235.0	157	7	44.5	8-33	
	5	559	562	320	350	279.4	186	7	50.8	8-36	
	6	610	613	365	380	317.5	216	7	55.6	12-33	
	8	737	740	440	470	393.7	270	7	63.5	12-39	
	10	838	841	520	545	469.9	324	7	69.9	16-39	
	12	965	968	580	610	533.4	381	7	79.4	20-39	
	14	1029	1039	620	640	558.8	413	7	85.8	20-42	
	16	1130	1140	690	705	616.0	467	7	88.9	20-45	
	18	1219	1232	760	785	685.8	533.5	7	101.6	20-51	
	20	1321	1334	820	855	749.3	584	7	108.0	20-55	
	24	1549	1568	960	1040	901.7	692	7	139.7	20-68	
										5580	



T2

T3

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class1500	1	254	254	110	150	101.6	51	7	28.6	4-26	
	1.5	305	305	130	180	123.8	73	7	31.8	4-30	
	2	368	371	160	215	165.1	92	7	38.1	8-26	
	2.5	419	422	180	245	190.5	105	7	41.3	8-30	
	3	470	473	230	265	203.2	127	7	47.7	8-33	
	4	546	549	280	310	241.3	157	7	54	8-36	
	5	673	676	345	375	292.1	186	7	73.1	8-42	
	6	705	711	375	395	317.5	216	7	82.6	12-39	
	8	832	842	450	485	393.7	270	7	92.1	12-45	
	10	991	1001	560	585	482.6	324	7	108	12-51	
	12	1130	1146	620	675	571.5	381	7	123.9	16-55	
	14	1257	1276	700	750	635.0	413	7	133.4	16-60	
	16	1384	1406	780	825	704.8	467	7	146.1	16-68	
	18	1537	1559	830	915	774.7	533.5	7	162.0	16-74	
	20	1664	1686	900	985	831.8	584	7	177.8	16-80	
	24	1943	1971	1050	1170	990.6	692	7	203.2	16-94	
										8370	

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class2500	1	308	308	110	160	108	51	7	35	4-26	
	1.5	384	387	130	205	146	73	7	44.5	4-33	
	2	451	454	160	235	171.4	92	7	50.9	8-30	
	2.5	508	540	180	265	196.8	105	7	57.2	8-33	
	3	578	584	230	305	228.6	127	7	66.7	8-36	
	4	673	683	280	355	273	157	7	76.2	8-42	
	5	794	807	345	420	323.8	186	7	50.9	8-48	
	6	914	927	375	485	368.3	216	7	108	8-55	
	8	1022	1038	450	550	438.2	270	7	127	12-55	
	10	1270	1292	560	675	539.8	324	7	165.1	12-68	
	12	1422	1445	620	760	619.1	381	7	184.2	12-74	
										4320	

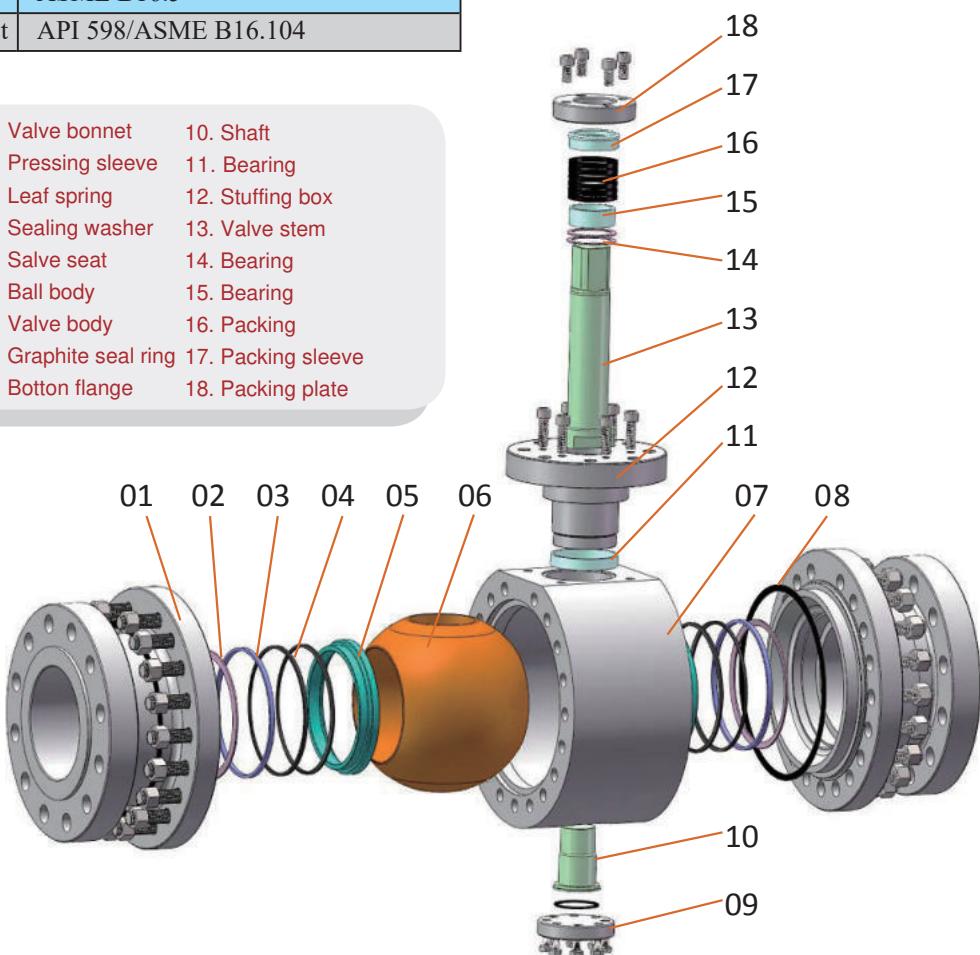
Note:

1. The structure lengths in this table are based on the long-series dimensions in ASME B 16.10 standard.
2. The flanges in this table are based on the dimensions in ASME B16.5.
3. According to the requirements of the customer, the structure length and connection flange can be customized according to the national standards and other standards.
4. All the dimensions and weights are for reference only. The factory reserves the right to make any modifications.

Type: T2/Model T3
Technical specification

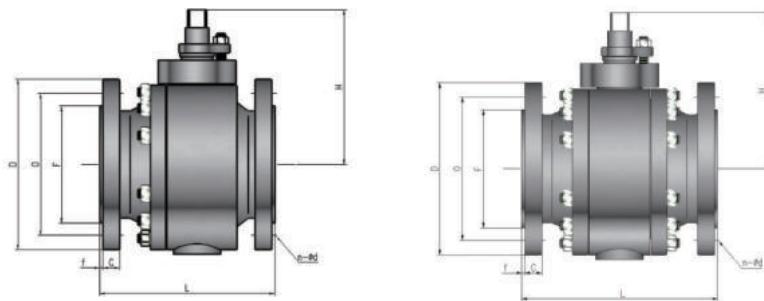
Design standard	API 6D/ASME B16.34
Structure length	ASME B16.10
Flange size	ASME B16.5
Inspection & test	API 598/ASME B16.104

1. Valve bonnet	10. Shaft
2. Pressing sleeve	11. Bearing
3. Leaf spring	12. Stuffing box
4. Sealing washer	13. Valve stem
5. Valve seat	14. Bearing
6. Ball body	15. Bearing
7. Valve body	16. Packing
8. Graphite seal ring	17. Packing sleeve
9. Bottom flange	18. Packing plate


Materials of main parts:

Part name	Valve body	Valve stem	Valve body	Valve seat	Packing	Bolt
Material category	Carbon steel Stainless steel Biphase steel	Stainless steel Biphase steel PH stainless steel High-temperature alloy	Stainless steel Biphase steel	Stainless steel Biphase steel	Plastic Compressed packing Braided packing	Carbon steel Stainless steel
Commonly used materials	A105/A350 LF2 A182 F304/F316 A182 F51	A182 F6a A182 F316 /XM-19 A182 F51 17-4PH Inc.718	ANSI 410 ANSI 304 ANSI 316 A182 F51	ANSI 410 ANSI 304 ANSI 316 A182 F51	PTFE/PEEK Graphite Reinforced graphite	A193 B7/A320 L7 A193 B8/B8M A320 B8/B8M

Note: For other optional materials, please refer to the ordering instructions.

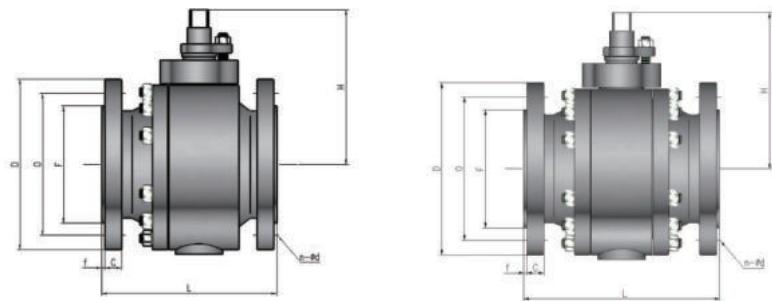


T2

T3

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		RF	RJ								
Class150	2	178	191	140	150	120.7	92	2	17.5	4-18	
	2.5	190	203	165	180	139.7	105	2	20.7	4-18	
	3	203	216	178	190	152.4	127	2	22.3	4-18	
	4	229	242	230	230	190.5	157	2	22.3	8-18	
	5	356	369	280	255	215.9	186	2	22.3	8-22	
	6	394	407	310	280	241.3	216	2	23.9	8-22	
	8	457	470	350	345	298.5	270	2	27.0	8-22	
	10	533	546	420	405	362.0	324	2	28.6	12-26	
	12	610	623	470	485	431.8	381	2	30.2	12-26	
	14	686	699	520	535	476.3	413	2	33.4	12-30	
	16	762	775	580	595	539.8	467	2	35.0	16-30	
	18	864	877	650	635	577.9	533.5	2	38.1	16-33	
	20	914	927	720	700	635.0	584	2	41.3	20-33	
	24	1067	1080	900	815	749.3	692	2	46.1	20-36	
										2100	

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		RF	RJ								
Class300	2	216	232	140	165	127	92	2	20.7	8-19	
	2.5	241	257	165	190	149.2	105	2	23.9	8-22	
	3	283	299	178	210	168.3	127	2	27	8-22	
	4	305	321	230	255	200	157	2	30.2	8-22	
	5	381	397	280	280	235	186	2	33.4	8-22	
	6	403	419	310	320	269.9	216	2	35	12-22	
	8	502	518	350	380	330.2	270	2	39.7	12-25	
	10	568	584	420	445	387.4	324	2	46.1	16-28	
	12	648	664	470	520	450.8	381	2	49.3	16-31	
	14	762	778	520	585	514.4	413	2	52.4	20-31	
	16	838	854	580	650	571.5	467	2	55.6	20-35	
	18	914	930	650	710	628.6	533.5	2	58.8	24-35	
	20	991	997	720	775	685.8	584.2	2	62	24-35	
	24	1143	1165	900	915	813	692	2	68.3	24-41	
										3500	

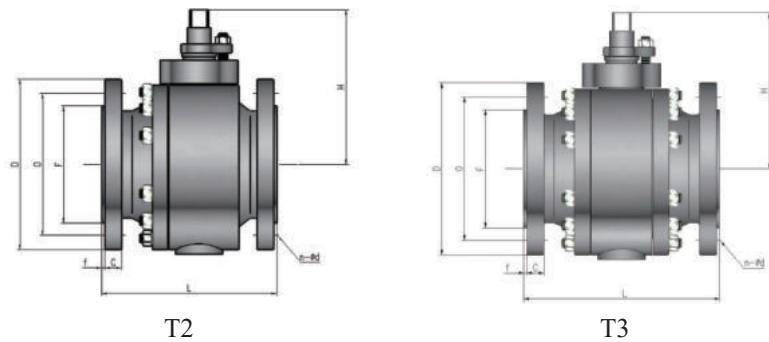


T2

T3

Pressure leve	Nominal diameter	External dimensions(mm)									Valve weight (kg)
		L		H	D	O	F	f	C	n·φd	
	NPS	RF	RJ								
Class600	1.5	241	241	130	155	114.3	73	7	22.3	4-22	28
	2	292	295	156	165	127	92	7	25.4	8-18	40
	2.5	330	333	172	190	149.2	105	7	28.6	8-22	65
	3	356	359	220	210	168.3	127	7	31.8	8-22	80
	4	432	435	250	275	215.9	157	7	38.1	8-26	140
	5	508	511	320	330	266.7	186	7	44.5	8-30	250
	6	559	562	365	355	292.1	216	7	47.7	12-30	290
	8	660	663	440	420	349.2	270	7	55.6	12-33	470
	10	787	790	520	510	431.8	324	7	63.5	16-36	850
	12	838	841	580	560	489.0	381	7	66.7	20-36	1050
	14	889	892	620	605	527.0	413	7	69.9	20-39	1360
	16	991	994	690	685	603.2	467	7	76.2	20-42	2000
	18	1092	1095	760	745	654.0	533.5	7	82.6	20-45	2500
	20	1194	1200	820	815	723.9	584	7	88.9	24-45	3200
	24	1397	1407	960	940	838.2	692	7	101.6	24-51	4660

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
	NPS	RF	RJ								
Class900	1	254	254	110	150	101.6	51	7	28.6	4-26	30
	1.5	305	305	130	180	123.8	73	7	31.8	4-30	48
	2	368	371	156	215	165.1	92	7	38.1	8-26	80
	2.5	419	422	172	245	190.5	105	7	41.3	8-30	100
	3	381	384	220	240	190.5	127	7	38.1	8-26	115
	4	457	461	250	290	235.0	157	7	44.5	8-33	170
	5	559	562	320	350	279.4	186	7	50.8	8-36	320
	6	610	613	365	380	317.5	216	7	55.6	12-33	450
	8	737	740	440	470	393.7	270	7	63.5	12-39	760
	10	838	841	520	545	469.9	324	7	69.9	16-39	1230
	12	965	968	580	610	533.4	381	7	79.4	20-39	1700
	14	1029	1039	620	640	558.8	413	7	85.8	20-42	1980
	16	1130	1140	690	705	616.0	467	7	88.9	20-45	2530
	18	1219	1232	760	785	685.8	533.5	7	101.6	20-51	3320
	20	1321	1334	820	855	749.3	584	7	108.0	20-55	4195
	24	1549	1568	960	1040	901.7	692	7	139.7	20-68	5580



T2

T3

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class1500	1	254	254	110	150	101.6	51	7	28.6	4-26	
	1.5	305	305	130	180	123.8	73	7	31.8	4-30	
	2	368	371	160	215	165.1	92	7	38.1	8-26	
	2.5	419	422	180	245	190.5	105	7	41.3	8-30	
	3	470	473	230	265	203.2	127	7	47.7	8-33	
	4	546	549	280	310	241.3	157	7	54	8-36	
	5	673	676	345	375	292.1	186	7	73.1	8-42	
	6	705	711	375	395	317.5	216	7	82.6	12-39	
	8	832	842	450	485	393.7	270	7	92.1	12-45	
	10	991	1001	560	585	482.6	324	7	108	12-51	
	12	1130	1146	620	675	571.5	381	7	123.9	16-55	
	14	1257	1276	700	750	635.0	413	7	133.4	16-60	
	16	1384	1406	780	825	704.8	467	7	146.1	16-68	
	18	1537	1559	830	915	774.7	533.5	7	162.0	16-74	
	20	1664	1686	900	985	831.8	584	7	177.8	16-80	
	24	1943	1971	1050	1170	990.6	692	7	203.2	16-94	
										8370	

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		L		H	D	O	F	f	C		
		NPS	RF								
Class2500	1	308	308	110	160	108	51	7	35	4-26	
	1.5	384	387	130	205	146	73	7	44.5	4-33	
	2	451	454	160	235	171.4	92	7	50.9	8-30	
	2.5	508	540	180	265	196.8	105	7	57.2	8-33	
	3	578	584	230	305	228.6	127	7	66.7	8-36	
	4	673	683	280	355	273	157	7	76.2	8-42	
	5	794	807	345	420	323.8	186	7	50.9	8-48	
	6	914	927	375	485	368.3	216	7	108	8-55	
	8	1022	1038	450	550	438.2	270	7	127	12-55	
	10	1270	1292	560	675	539.8	324	7	165.1	12-68	
	12	1422	1445	620	760	619.1	381	7	184.2	12-74	
										4320	

Note:

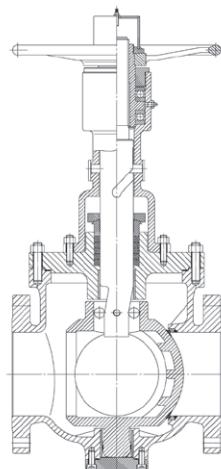
1. The structure lengths in this table are based on the long-series dimensions in ASME B 16.10 standard.
2. The flanges in this table are based on the dimensions in ASME B16.5.
3. According to the requirements of the customer, the structure length and connection flange can be customized according to the national standards and other standards.
4. All the dimensions and weights are for reference only. The factory reserves the right to make any modifications.

Orbit ball valve

Type: Model OB

Technical specification

Design standard	API6D/ASME B16.34
Structure length	ASME B16.10
Flange size	ASME B16.5
Inspection & test	API 598/ASME B16.104



Product features

- Zero leakage
- Built-in fireproof design
- On-line maintenance possible
- Double-direction sealing
- No friction in opening/closing
- No spring and piston movements
- No local flushing of high-speed fluid to the sealing face during the opening/closing
- Low influence of temperature/pressure fluctuation and mechanical vibration on the sealing performances

Drive mode

manual, electric

Materials of main parts:

Part name	Valve body	Valve stem	Valve body	Valve seat	Packing	Bolt
Material category	Carbon steel Stainless steel Biphase steel	Stainless steel Biphase steel PH stainless steel High-temperature alloy	Stainless steel Biphase steel	Stainless steel Biphase steel	Plastic Compressed packing Braided packing	Carbon steel Stainless steel
Commonly used materials	A216 WCB/ A352 LCB A351 CF8/CF8M A890 4A	A182 F6a A182 F316 /XM-19 A182 F51 17-4PH Inc.718	ANSI 410 ANSI 304 ANSI 316 A182 F51	ANSI 410 ANSI 304 ANSI 316 A182 F51	PTFE/PEEK Graphite Reinforced graphite	A193 B7/A320 L7 A193 B8/B8M A320 B8/B8M

Note: For other optional materials, please refer to the ordering instructions.

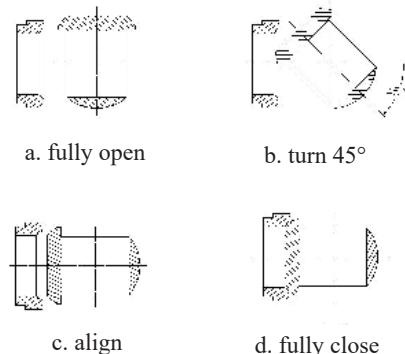
Working principle

Closing process:

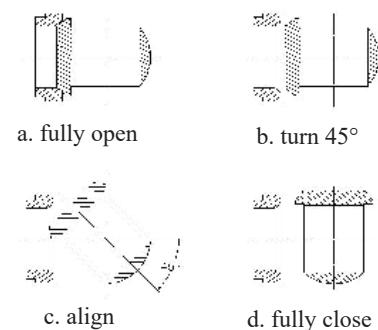
- When the valve is fully open, turn the handwheel clockwise. The valve stem starts to go down, driving the ball to rotate.
- Continue to turn the handwheel. The rail on the valve stem interacts with the guide pin embedded in it, driving the ball to turn clockwise.
- When the valve is nearly closed, the valve stem drives the ball to turn for 90° under the condition that no friction exists with the sealing face of the valve seat.
- Continue to turn the handwheel. The declining valve stem presses the ball tightly onto the valve seat, realizing the sealing effect.

Opening process:

- When the valve is fully closed, turn the handwheel counterclockwise. The valve stem starts to rise, driving the ball to rotate.
- Continue to turn the handwheel. The valve stem, while rising, drives the ball to depart from the valve seat.
- When the valve starts to open, the rail on the valve stem interacts with the guide pin embedded in it, driving the ball to turn counterclockwise under the condition that no friction exists with the sealing face of the valve seat.
- Continue to turn the handwheel. When the valve stem rises to the limit position, the ball has rotated for 90° and the valve is in fully open position.



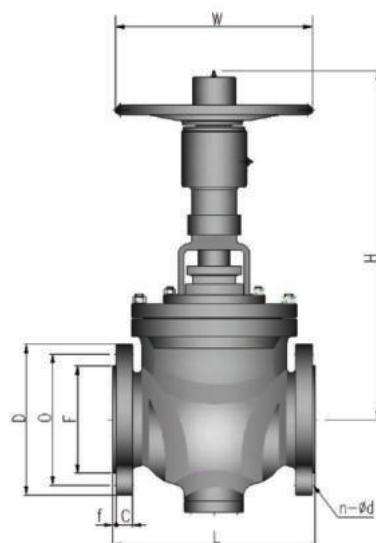
Closing process



Opening process

Working principle

in\CLASS	150	300	600	900
2				
2½"				
3"				
4"				
5"				
6"				
8"				
10"				
12"				
14"				
16"				
18"				
20"				



Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		NPS	H	W	L	D	O	F	f		
Class150	2	385	200	178	150	120.7	92	2	17.5	4-18	28
	2.5	393	300	190	180	139.7	105	2	20.7	4-18	43
	3	402	300	203	190	152.4	127	2	22.3	4-18	58
	4	510	300	229	230	190.5	157	2	22.3	8-18	75
	5	600	400	356	255	215.9	186	2	22.3	8-22	103
	6	690	400	394	280	241.3	216	2	23.9	8-22	133
	8	785	500	457	345	298.5	270	2	27.0	8-22	225
	10	995	600	533	405	362.0	324	2	28.6	12-26	345
	12	1183	600	610	485	431.8	381	2	30.2	12-26	440
	14	1254	650	686	535	476.3	413	2	33.4	12-30	775
	16	1565	650	762	595	539.8	467	2	35.0	16-30	833
	18	1637	700	864	635	577.9	533.5	2	38.1	16-33	1110
	20	1705	700	914	700	635.0	584	2	41.3	20-33	1240

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		NPS	H	W	L	D	O	F	f		
Class300	2	385	200	216	165	127.0	92	2	20.7	8-18	30
	2.5	393	300	241	190	149.2	105	2	23.9	8-22	45
	3	402	300	282	210	168.3	127	2	27.0	8-22	66
	4	510	300	305	255	200.0	157	2	30.2	8-22	78
	5	600	400	381	280	235.0	186	2	33.4	8-22	110
	6	690	400	403	320	269.9	216	2	35.0	12-22	152
	8	785	500	502	380	330.2	270	2	39.7	12-26	230
	10	995	600	568	445	387.4	324	2	46.1	16-30	375
	12	1183	600	648	520	450.8	381	2	49.3	16-33	446
	14	1254	650	762	585	514.4	413	2	52.4	20-33	795
	16	1565	650	838	650	571.5	467	2	55.6	20-36	950
	18	1637	700	914	710	628.6	533.5	2	58.8	24-36	1130
	20	1705	700	991	775	685.8	584	2	62.0	24-36	1270

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		NPS	H	W	L	D	O	F	f		
Class600	2	430	300	292	165	127	92	7	25.4	8-18	60
	2.5	465	400	330	190	149.2	105	7	28.6	8-22	86
	3	515	500	356	210	168.3	127	7	31.8	8-22	103
	4	572	600	432	275	215.9	157	7	38.1	8-26	110
	5	650	600	508	330	266.7	186	7	44.5	8-30	197
	6	773	600	559	355	292.1	216	7	47.7	12-30	287
	8	967	650	660	420	349.2	270	7	55.6	12-33	520
	10	1225	650	787	510	431.8	324	7	63.5	16-36	770
	12	1350	700	838	560	489.0	381	7	66.7	20-36	910
	14	1490	700	889	605	527.0	413	7	69.9	20-39	1045
	16	1590	750	991	685	603.2	467	7	76.2	20-42	1880

Pressure leve	Nominal diameter	External dimensions(mm)								Valve weight (kg)	
		NPS	H	W	L	D	O	F	f		
Class600	2	480	300	368	215	165.1	92	7	38.1	8-26	60
	2.5	500	300	419	245	190.5	105	7	41.3	8-230	86
	3	560	360	381	240	190.5	127	7	38.1	8-26	103
	4	575	400	457	290	235.0	157	7	44.5	8-33	110
	5	720	450	559	350	279.4	186	7	50.8	8-36	202
	6	780	450	610	380	317.5	216	7	55.6	12-33	287
	8	980	500	737	470	393.7	270	7	63.5	12-39	520
	10	1170	550	838	545	469.9	324	7	69.9	16-39	770
	12	1330	550	965	610	533.4	381	7	79.4	20-39	910

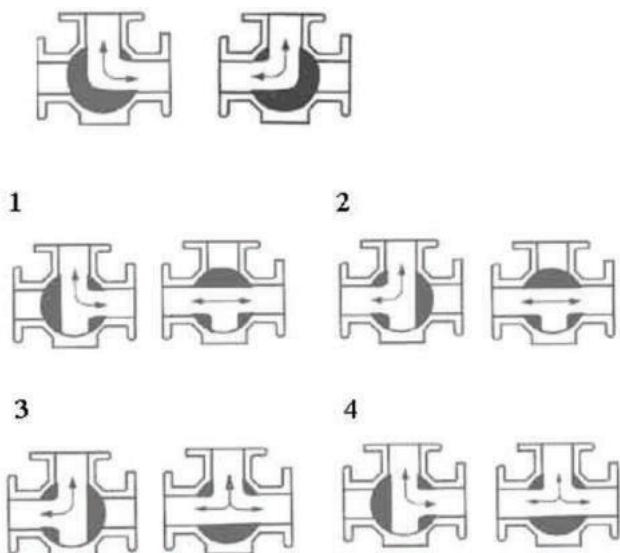
Three-way ball valve

Type: Model TL/TT

Technical specification

Design standard	API 608/API 6D/ASME B16.34
Structure length	ASME B16.10
Flange size	ASME B16.5
Inspection & test	API 598/ASME B16.104

Three-way ball valve is classified into two types as Model L and Model T. Being able to make two perpendicular passages connected, Model L three-way ball valve is applicable for switching of medium flow direction. Model T three-way ball valve is applicable to shunting, merging and flow direction switching. The T duct allows 3 passages or two of them to be connected. Normally three-way valve is of 2-seat structure, or of 4-seat structure as needed by the user, ensuring no leakage at any passage opening.



Product features

- Three-way ball valve is of integral structure with little flange connection, realizing high reliability and light weight.
- It is characterized by long service life, high passing capacity and low resistance.

Materials of main parts:

Part name	Valve body	Valve stem	Valve body	Valve seat	Packing	Bolt
Material category	Carbon steel Stainless steel Biphase steel	Stainless steel Biphase steel PH stainless steel High-temperature alloy	Stainless steel Biphase steel	Stainless steel Biphase steel	Plastic Compressed packing Braided packing	Carbon steel Stainless steel
Commonly used materials	A216 WCB/ A352 LCB A351 CF8/CF8M A890 4A	A182 F6a A182 F316 /XM-19 A182 F51 17-4PH Inc.718/750	ANSI 410 ANSI 304 ANSI 316 A182 F51	ANSI 410 ANSI 304 ANSI 316 A182 F51	PTFE/PEEK Graphite Reinforced graphite	A193 B7/A320 L7 A193 B8/B8M A320 B8/B8M

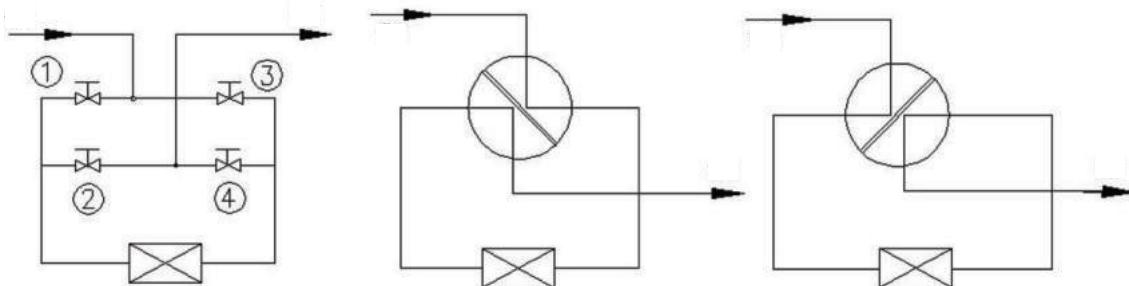
Note: For other optional materials, please refer to the ordering instructions.

Four-way ball valve

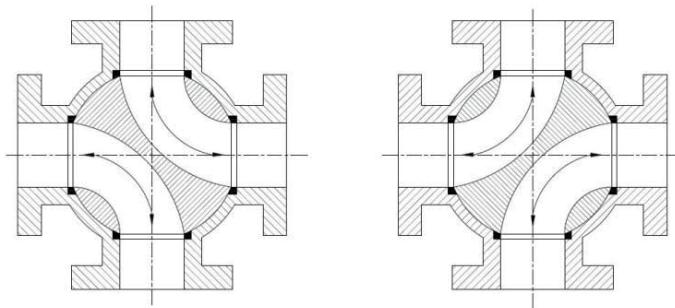
Type: Model FW

Technical specification

Design standard	API 608/API 6D/ASME B16.34
Structure length	ASME B16.10
Flange size	ASME B16.5
Inspection & test	API 598/ASME B16.104



Four-way ball valve can realize positive and negative medium switching. Every time when it turns for 90°, the flow mode is switched once. The previous four valves can be replaced with only one four-way ball valve, being economic and convenient for operation.



Materials of main parts:

Part name	Valve body	Valve stem	Valve body	Valve seat	Packing	Bolt
Material category	Carbon steel Stainless steel Biphase steel	Stainless steel Biphase steel PH stainless steel High-temperature alloy	Stainless steel Biphase steel	Stainless steel Biphase steel	Plastic Compressed packing Braided packing	Carbon steel Stainless steel
Commonly used materials	A216 WCB/ A352 LCB A351 CF8/CF8M A890 4A	A182 F6a A182 F316 /XM-19 A182 F51 17-4PH Inc.718	ANSI 410 ANSI 304 ANSI 316 A182 F51	ANSI 410 ANSI 304 ANSI 316 A182 F51	PTFE/PEEK Graphite Reinforced graphite	A193 B7/A320 L7 A193 B8/B8M A320 B8/B8M

Note: For other optional materials, please refer to the ordering instructions.

Semi-ball valve

Type: Model EB

Technical specification

Design standard	API 608/API 6D/ASME B16.34
Structure length	ASME B16.10
Flange size	ASME B16.5
Inspection & test	API 598/ASME B16.104



By using the eccentric valve body, eccentric ball and valve seat, the valve stem can be centered automatically in the common track during its rotation. In the closing process, it becomes tighter and tighter, achieving the excellent sealing effect. During the opening/closing, the ball departs from the valve seat completely, reducing the wear of the sealing face, overcoming the problem in the traditional ball valve that the valve seat always abrades with the ball sealing face. It is applicable to the media such as iron & steel, nonferrous metallurgy, fiber, micro-solid particle, pulp, coal ash, petroleum gas, etc.

Product features

- No friction occurs during the opening/closing. Because of the eccentric structure, during the closing of the valve, the ball closes up to the valve seat gradually until they contact completely at the closed position. When the valve is opened, the ball departs completely once it leaves the sealing position, and so the starting torque is low.
- The sealing face is self-cleaning. When the ball departs from the valve seat, the medium can flush off the deposits on the seal. For crystallizable medium, the ball can cut the crystal of the medium during the closing, so as to achieve the sealing target and avoid the malpractice of blocking in the other valves under similar working conditions.

Materials of main parts:

Part name	Valve body	Valve stem	Valve body	Valve seat	Packing	Bolt
Material category	Carbon steel Stainless steel Biphase steel	Stainless steel Biphase steel PH stainless steel High-temperature alloy	Stainless steel Biphase steel	Stainless steel Biphase steel	Plastic Compressed packing Braided packing	Carbon steel Stainless steel
Commonly used materials	A216 WCB/ A352 LCB A351 CF8/CF8M A890 4A	A182 F6a A182 F316 /XM-19 A182 F51 17-4PH Inc.718	ANSI 410 ANSI 304 ANSI 316 A182 F51	ANSI 410 ANSI 304 ANSI 316 A182 F51	PTFE/PEEK Graphite Reinforced graphite	A193 B7/A320 L7 A193 B8/B8M A320 B8/B8M

Note: For other optional materials, please refer to the ordering instructions.

Actuator and Fittings

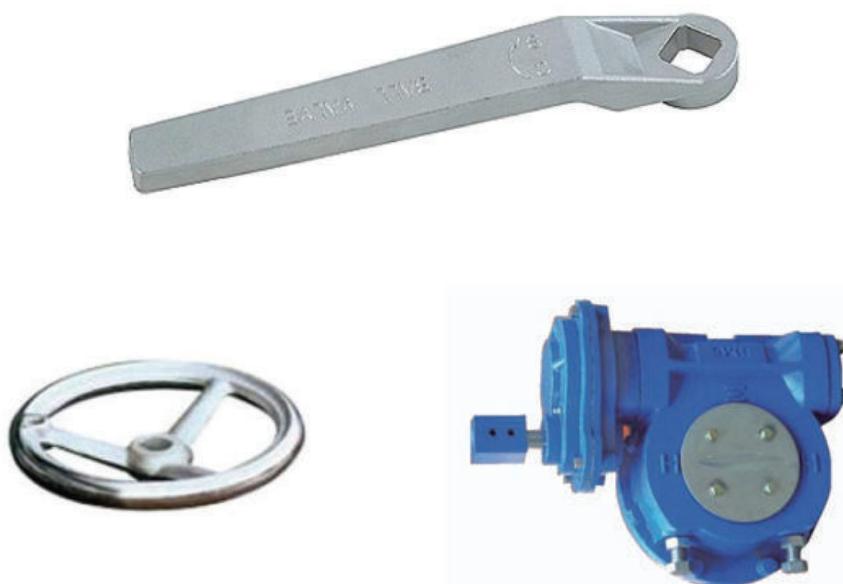
All the valves can be driven in the modes of handle, handwheel, wormgear, pneumatic, electric, hydraulic, etc.

The company provides with the supportive and type selection service for the attachments such as solenoid valve, limit switch, air-controlled valve, filtration pressure-reducing valve, etc.

The commonly used pneumatic actuators includerack and pinion pneumatic actuator and shifting yokepneumatic actuator.

Manual drive device

The commonly used drive modes include handle, handwheel, wormgear, etc.

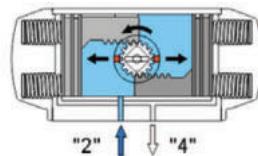
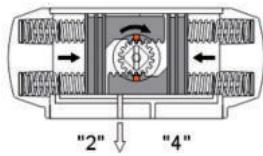


Shifting-yoke pneumatic actuator



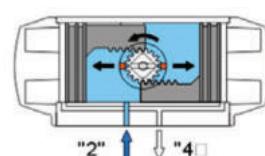
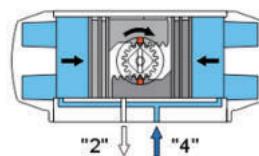
Actuator and Fittings

Single-action working principle



When the air supply pressure enters through Port 2, it forces the piston to detach and move to the end cover direction. In the meantime, it compresses the spring and the air is discharged out of Port 4, therefore obtaining the counterclockwise rotation.

Double-action working principle



When the air supply pressure enters through Port 2, it forces the piston to detach and move to the end cover direction. Air is discharged out of Port 4, therefore obtaining the counterclockwise rotation. When the air supply pressure enters through Port 4, it forces the piston to close. Air is discharged out of Port 2, therefore obtaining the clockwise rotation.

Pneumatic actuator

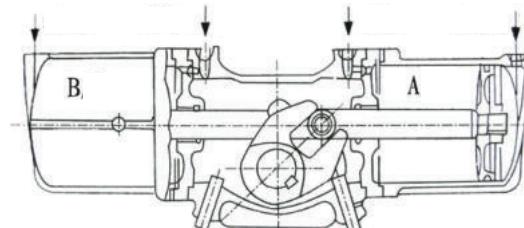
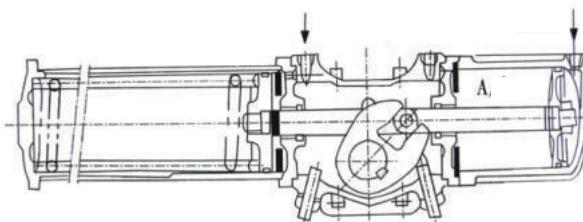


Single-action

Single-compressed air enters Chamber A, pushing the piston and piston rod to move along a straight line. The piston and piston rod drive the pivoted arm to rotate, allowing the output shaft to rotate. The output end of the output shaft is connected with the output shaft of the valve, accomplishing the opening action of the valve. When the air supply is cut off, the valve closes under the action of the spring.

Double-action

When compressed air enters Chamber A, pushing the piston and piston rod to move along a straight line. The piston and piston rod drive the pivoted arm to rotate, allowing the output shaft to rotate. The output end of the output shaft is connected with the output shaft of the valve, accomplishing the opening action of the valve. Contrarily, compressed air enters Chamber B to accomplish the closing action of the valve.



Actuator and Fittings

Electric actuator

Electric actuator can be selected to drive the valve.



Commonly used fittings

The commonly used fittings include solenoid valve, air-controlled valve, limit switch, filtration pressure-increasing valve, etc.



Ordering instructions

Model designation



1. Product code: AB—ball valve

2. Structure form

F1	Floating integral ball valve	TT	Three-way Model T ball valve	OB	Orbit ball valve
F2	Floating 2-part ball valve	TL	Three-way Model L ball valve	FW	Four-way ball valve
F3	Floating 3-part ball valve	TY	Three-way Model Y ball valve	EB	Eccentric semi-ball valve
T2	Fixed 2-part ball valve	TB	Top entry ball valve		
T3	Fixed 3-part ball valve	DF	Split ball valve		

3. Pressure level

Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
150	300	600	900	1500	2500

4. Nominal diameter

NPS	0.5	0.75	1	1.25	1.5	2	2.5	3	4	5	6
NPS	8	10	12	14	16	18	20	24			

5. End connection

Raised face flange end	Flat face flanged end	Female face	Male face	Tongue face	Groove face	Wafer
RF	FF	FM	M	T	G	WAF

6. Special option

Reduced diameter(RB)	Insulation jacket	Tunnel lined	Tunnel harden	Extended stem	Other
AN	BN	CN	DN	EN	NN

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