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Double Block  
and Bleed



Cast Steel  
Floating Ball Valve



Forged Steel  
Floating Ball Valve



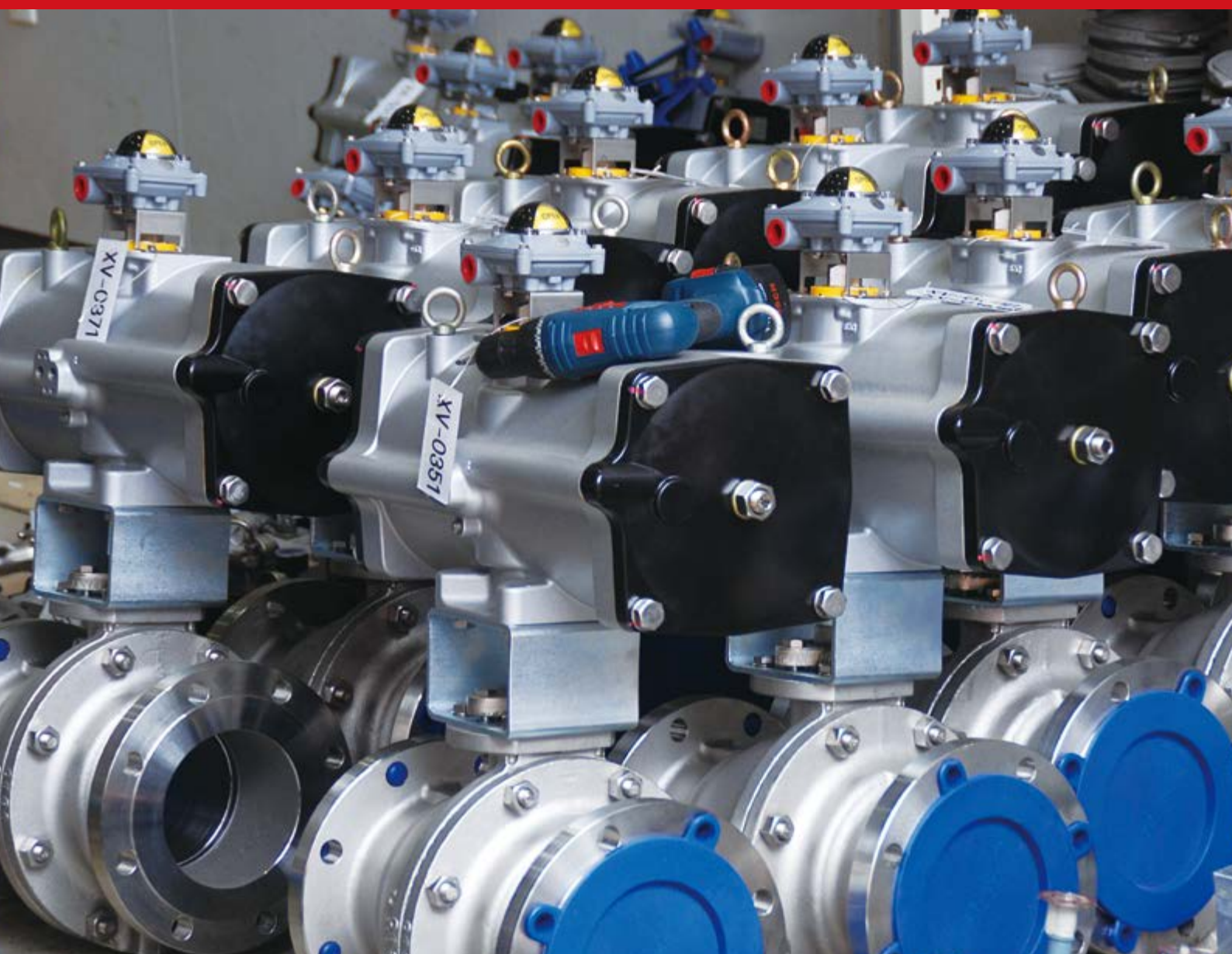
Cast Steel  
Trunnion-Mounted Ball Valve



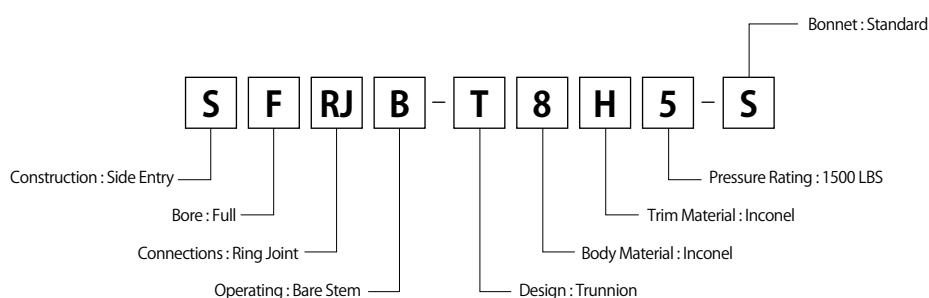
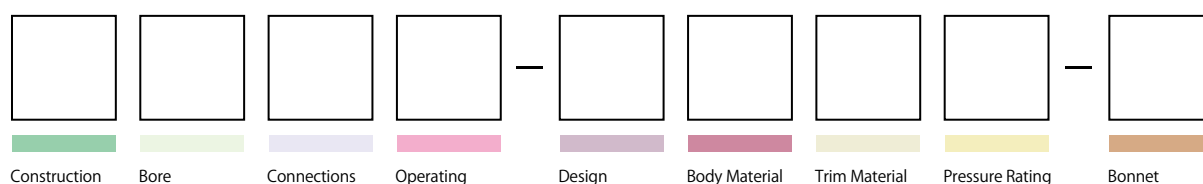
Forged Steel  
Trunnion-Mounted Ball Valve

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**UA Valve supplies**  
**ball valves for all kinds of industrial plants,**  
**and especially for oil & gas and**  
**petro-chemical markets.**



## Numbering System



### Construction

- T** Top Entry
- S** Side Entry

### Bore

- F** Full
- R** Reduced

### Connections

- RF** Raised Face
- RJ** Ring Joint
- SW** Socket Weld
- BW** Butt Weld
- TH** Threaded
- SP** Special

### Operating

- P** Pneumatic Actuator
- M** Motor Actuator
- G** Gear Operating
- L** Lever Handle
- B** Bare Stem
- X** Special

### Design

- F** Floating
- T** Trunnion

### Body Material

- 1** A105 / WCB
- 2** LF2 / LCC
- 3** CF8
- 4** CF8M
- 5** Duplex
- 6** Al-Bronze
- 7** Alloy 20
- 8** Hastelloy
- 9** Inconel

### Trim Material

- A** CS + ENP
- B** 304 SS
- C** 316 SS
- D** Duplex
- E** Al-Bronze
- F** 316 SS + TC
- G** Alloy 20
- H** Hastelloy
- I** Inconel
- S** Special

### Pressure Rating

- 1** 150 LBS
- 2** 300 LBS
- 3** 600 LBS
- 4** 900 LBS
- 5** 1500 LBS
- 6** 2500 LBS
- 7** 4500 LBS

### Bonnet

- S** Standard
- E** Extension





With total valve solutions and service, UA Valve is a new leader in design, manufacturing and service of ball valves for all kinds of industries.

We are specialized in industrial valve applications with high pressure, extreme temperature, critical media and etc.

UA valve has solutions for special safety requirements.

Our comprehensive range of quality standards cater for most applications. We also provide engineering, development and manufacturing solutions for strict specifications.



Our valves for high-grade and general plants are made to highest safety standards. Specifications are subject to ongoing review incorporating technical advances.

UA Valves play an important part in all processing stages of power plants, oil and gas, petrochemical plants and other processing applications.

We cooperate closely with planners, plant manufacturers, operators and investors for optimum cost effectiveness, technical perfection and durability.

Our aim is to be a good partners to our customers.



# UA VALVE A NEW LEADER

**in design, manufacturing and support of various ball valves for all industries.**

## About the company

UA Valve has been inspiring our employees to think from outside of the box and to come up with innovative ideas.

When we first started this new business, we promised ourselves that we would create and produce products that all customers can trust. To continue this, we constantly need to be on the edge of ourselves and create high quality products that we can be proud of.

## Technology

The goal for UA Valve is to put a quality product in every field.

We produce our Valves only with the highest quality materials, so that we can guarantee that all of our products will have a long sustainability.

We can offer a good competitive price to the market using our efficient technology and relationship with other collaborators.

## Manufacturing

UA Valve is manufactured on modern machine tools and efficient production lines in order to offer high volume capacity.

Besides, we also put a genuine effort to assure the highest possible quality of the valves. In every step of the manufacturing processes, all our products are put through strict inspections according to ASME so that we can meet the very demanding requirements of our clients.



## Torque Table (Cast Steel Floating & Trunnion-Mounted Ball Valve)

UNIT(N/m)

Valve Rating		150	300	600	900	1500	2500
Valve Max. W.P.		275 psi 19bar	720 psi 50bar	1440 psi 100bar	2160 psi 150bar		
1 1/2"	40	40	50	80	140	240	420
2"	50	50	72	119	202	322	590
3"	80	60	93	185	349	466	1,130
4"	100	226	298	466	781	1,116	1,800
6"	150	640	789	1,046	1,479	2,456	
8"	200	1,021	1,388	2,309	3,293	5,462	
10"	250	1,458	2,027	3,057	4,699	8,847	
12"	300	2,004	2,788	4,483	7,193	12,698	
14"	350	2,218	3,795	6,826	9,124	16,103	
16"	400	3,095	5,300	8,686	13,023	20,546	
18"	450	4,166	6,956	13,012	19,207	31,062	
20"	500	5,320	9,442	17,562	26,008	40,282	
22"	550	8,036	11,020	19,411	32,002	46,074	
24"	600	8,795	14,792	26,238	40,151	66,290	
26"	650	11,950	20,341	33,987	47,634		
28"	700	14,513	25,609	42,238	59,407		
30"	750	16,671	24,918	44,105	51,708		

## Trunnion-Mounted Ball Valve Ball Valve Flow Coefficient Cv Specification Table

### Method of Calculation Flow

The flow coefficient Cv of a valve is the flow rate of water(gallons/minute) through a fully opened valve with a pressure drop of 1 psi across the valve.

To find the flow of liquid through the valve from the valve from the Cv, use the following formulas.

### Liquid Flow

$$QL = Cv(P/G)^{1/2}$$

$\Delta P$  = Differential pressure across the valve (psig)

QL = Flow rate of liquid(gal./min)

G = Specific gravity of liquid (for water, G=1)

### Gas Flow

$$Qg = 61Cv(P_2/P)^{1/2} \text{ (For non-critical flow, } P_2/P < 1.0)$$

$P_2$  = Outlet pressure(psia)

QL = Flow rate of gas (CFH at STP)

G = Specific gravity of gas (for air, g=1.0)

Size		Pressure Grade					
mm	in	150	300	600	900	1500	2500
15	1/2	25	25	22	20	20	24
20	3/4	55	55	47	44	44	53
25	1	94	94	78	74	74	92
40	1 1/2	260	260	260	188	188	211
50	2	441	406	376	351	351	283
80	3	1,103	973	933	883	833	600
100	4	2,012	1,762	1,687	1,642	1,562	1,160
150	6	3,721	3,719	3,396	3,841	3,635	2,590
200	8	7,061	6,876	6,381	7,253	6,759	4,795
250	10	11,476	11,266	10,281	11,801	10,860	7,410
300	12	17,027	16,722	15,527	17,407	15,512	10,433
350	14	20,836	20,196	19,316	21,032	19,490	
400	16	28,060	27,258	25,950	28,591	26,164	
450	18	36,253	35,638	33,798	37,718	34,973	
500	20	46,330	45,188	42,723	48,672	45,658	
550	22	56,388	56,378	55,788	40,184	35,860	
600	24	69,399	67,919	63,874	47,884	41,733	
650	26	59,012	59,012	59,012	56,076		
700	28	94,436	92,111	88,191	65,110		
750	30	110,672	108,047	102,562	74,610		
800	32	124,879	120,734	115,084	84,977		
850	34	101,307	101,307	101,307	96,020		
900	36	158,878	152,651	144,018	107,487		
1000	40	194,341	194,341	189,571			
1050	42	275,260	275,260	275,260			
1200	48	364,180	364,180	347,080			
1400	55	529,430	529,430	520,500			

Notes 1. All the sizes are in full port  
2. Pressure ratings are according to API 6D

# Trunnion Mounted Ball Valves Main Features

## Why Trunnion Mounted ball?

On a ball with a free floating ball, the ball is forced against the down-stream seat by the fluid pressure acting on the entire surface of the ball.

Since the resulting torque is a product of the friction force and the seat-ball contact radius, the break to open torque increases substantially with the increasing of the differential pressure and/or the size of the valve.

This means that above a certain size and/or a certain differential pressure the required break to open torque will be so high that it will be impossible to operate the valve.

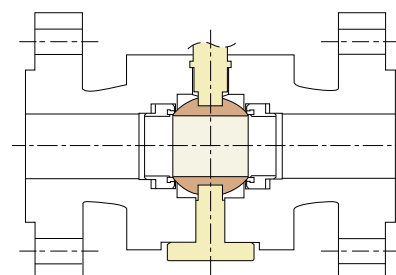
On a trunnion mounted ball valve, where the ball is fixed and the seat rings are floating, the fluid load due to the differential pressure acting on the surface of the ball is carried by the bearing, while the necessary seating action is obtained by the action of the fluid pressure on a relatively small annular area of the seat rings.

Therefore the resulting break to open torque is much smaller and can be controlled by increasing or decreasing the annular active area of the seat rings.

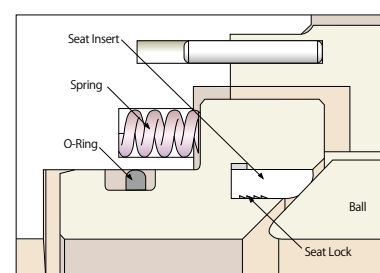
Regardless of size, pressure range and material, the design of UA Side entry, Top entry and welded body ball valves Provides a one piece forged solid ball mounted on trunnions.

Perfect machining and over-sizing of trunnions and trunnion housing in the valve body grant the perfect alignment of lower and upper trunnions.

The trunnions rotate on PTFE impregnated sleeve bearings, thus minimizing the friction caused by the side thrust resulting from the action of the line pressure on the ball.



**Trunnion Mounted Ball**



**Seat Ring**

## Seat Rings

Two independent seat rings assure the required bi-directional tightness at every pressure in the pressure range of the valve.

The seat rings are spring loaded to grant the required tightness even at very low pressure.



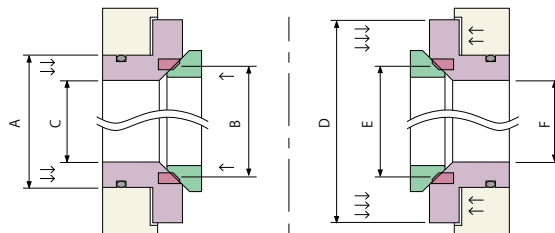
# “Self Relieving”, allowing any over pressure acting in the body cavity to be discharged in the line.

## Single piston effect.

In the standard design of UAV trunnion mounted ball valves, each seat ring performs the “Single Piston” action.

In this case the pressure acting on the external side of the seat ring results in a force pushing the same against the ball while the pressure acting on the internal side of the seat rings results in a force pushing the same away from the ball.

Therefore while both seat rings grant the required tightness when the pressure is applied on their external side, they are “Self Relieving”, allowing any over pressure acting in the body cavity to be discharged in the line as soon as the force caused by the pressure overcomes the one provided by the springs.



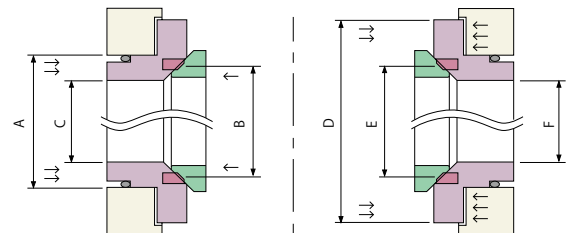
## Double piston effect.

On request, the seat rings design may be modified to perform the “Double Piston Effect” action.

In this case the pressure acting on both the external and internal side of the seat rings, results in a force pushing the same against the ball.

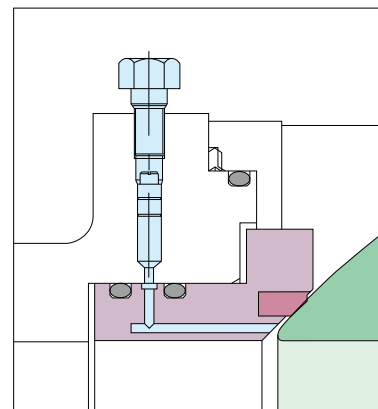
Therefore each seat rings grants the required tightness even if the pressure is applied in the body cavity.

This feature adds an extra sealing feature to the valve, but to release the possible over pressure developed into the body cavity it is necessary to use an external safety relief valve.



## Emergency sealant injection

The design and the built-in quality of UA Trunnion Mounted ball valves do not require the use of a sealant injection to grant the perfect tightness, and therefore the provision for emergency grease injection in the seat sealing area is considered as an option available on customer request only.



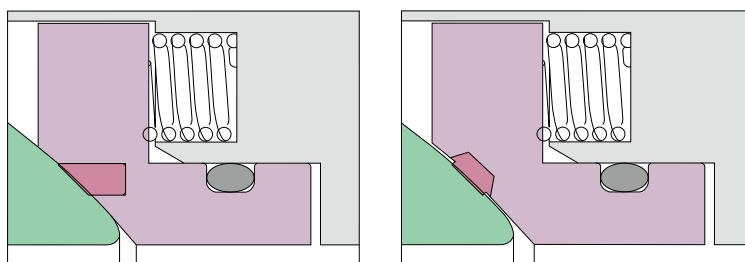


# On soft seated ball valves a resilient seat seal is inserted into the seat ring to provide a secondary soft seating.

## Soft seated valves

On soft seated ball valves a resilient seat seal is inserted into the seat ring to provide a secondary soft seating in addition to the primary metal to metal seating between the ball and the seat. The sealing between the seat and the seat housing shoulders is achieved by means of O-ring.

Graphite gaskets and/or special spring energized lip seal O-rings are used for special applications.

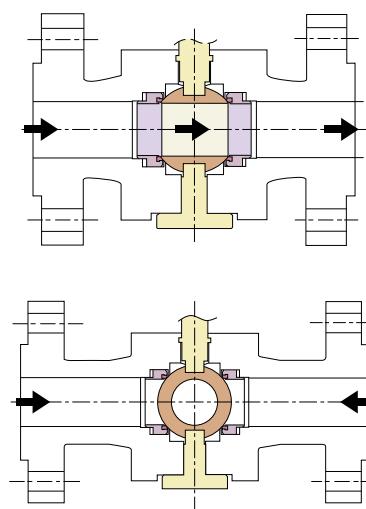


## Metal to metal seated valves

UA Trunnion mounted ball valves designed for abrasive service, feature a metal to metal sealing between the ball and seat rings, while the sealing between the seat and the seat housing shoulders is achieved by means of O-ring graphite gaskets lip seal O-ring or bellows seals depending on service conditions.

The ball and the seat rings are hard-faced using different coating mediums such as Electroless Nickel, Chrome Carbide, Tungsten Carbide and Stellite depending on fluid to be handled.

A specially designed seat ring avoids the inclusion of sand or other debris in the spring recess. Special flushing systems for the seat pocket area are available on request for valves to be used in extremely "dirty" services.



# Using CVD process to improve the wear life of metal components.

## CVD(Chemical Vapor Deposition)

This is not for a simple coating on the material surface but for a surface penetration. So, CVD treated material has no flaking which usually takes place in the coated material such as in Titanium Carbide and Tungsten Carbide Coating etc.,

CVD is a thermochemical surface treatment in which metal atoms are diffused into the surface of a workpiece to form CVD layer with the base material.

CVD has been proven to more than several the wear life of metal parts that were previously tungsten and titanium carbide coating, carburized, nitrided, nitrocarburized or hard chrome plated in numerous applications.



## FEATURES

Excellent wear resistance from surface hardness of 1,700~2,300 HV achieved on steel and nickel, cobalt based alloys, tungsten carbide, titanium carbide.

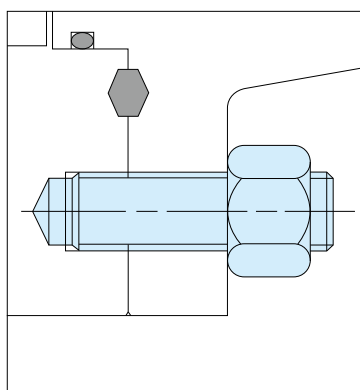
Hardness is retained at high service temperatures 650°C and CVD increases acid corrosion resistance for hydrochloric, sulfuric and phosphoric acids in particular.



### Emission free valves

The accurate machining of stem and bonnet sealing areas of UA Trunnion mounted ball valves assures the compliance with the regulations relevant to the so called "emission free" valve.

Bellows seals on stem and canopy seals on bonnet to body joints, specially designed to reach the "zero" fugitive emission condition are available on request.

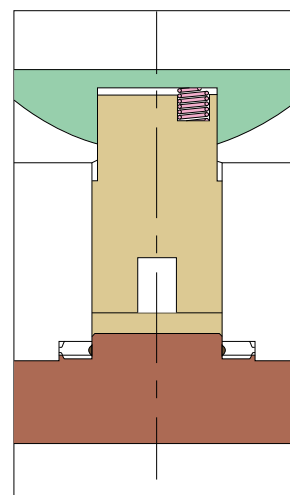


### Anti blow-out stem

Stem-body joint is designed to assure the antiblowout condition of the stem.

### Anti-static design

Electrical conductance continuity between all the metallic components of the trim and the body is granted by a spring loaded device.



**UA Trunnion mounted ball valves have been designed to comply with the fire safety standards.**

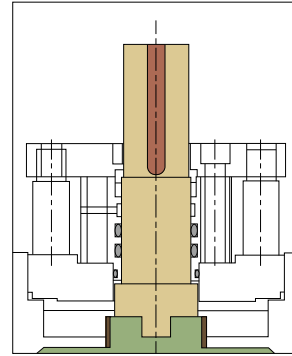
### Fire safe design

UA Trunnion mounted ball valves have been designed to comply with the fire safety standards of API 6FA and API 607, fire safe qualification tests witnessed by independent inspection authorities covering all the production range.

Qualification tests to other fire safety standards may be performed on request.

### Stem Sealing

The stem is separated from the ball, so that the stem itself is not affected by the side thrust created by the line pressure acting on the ball; this contributes to minimize the operational torque and eases the achievement of bubble tight sealing through the stem-body joint. The perfect sealing is granted by the use, as a standard feature, of two O-rings and a graphite gasket retained by the gland plate.



**The stem is separated from the ball, so that the stem itself is not affected by the side thrust.**

An emergency sealant injection facility is provided between the upper O-ring and the graphite gasket. The graphite gasket can be replaced with the valve in line and the ball in any position by removing the gland plate, after having released through the grease injection fitting hole, the possible pressure existing in the space between the upper O-ring and the graphite gasket. The stem seals can be replaced with the valve in line, providing that the ball is in the fully closed or fully open position and the pressure in the body cavity has been completely released.

Special stem sealing systems which require the use of lip seal O-rings or special gaskets are available for different service conditions.

The provision for emergency grease injection in the stem sealing area is supplied as a standard feature.

### Body Sealing

Perfect sealing and fire safe features are granted by the double sealing action of O-rings and graphite gaskets in all the static joints of the body components.





## Materials

Forgings	Casting
A105N	A216 WCB
A350 LF2	A216 WCC
A350 LF3	A352 LCB
AISI 4140	A352 LCC
AISI 1040	A352 LC2
A694 F60	A352 LC3
A694 F60 Impact tested.	A352 CA6NM
A694 F65	A351 CF8M
API 6A 60K	A351 - UNS S31803
A182 F6A - UNS S41000	A351 - UNS S31254
A182 F6NM - UNS S41500	A890 - UNS J93370
A182 F304 - UNS S30400	A890 - UNS J92205
A182 F316 - UNS S31600	
A182 F316LMN - UNS S31653	
A564 630 - UNS S17400	
A182 F44 - UNS S31254	
A182 F51 - UNS S31803	
A182 - UNS S32550	
A182 F53 - UNS S32750	
A182 F55 - UNS S32760	
B446 - UNS S06625	
UNS N08825	
UNS N 08925	



**UA Trunnion Mounted ball valves  
are available in a wide range of  
materials. Such as.**

# Double Block and Bleed



## Double Block and Bleed Valves

Both in valves adopting the single piston effect or double piston effect seat design, UA Trunnion Mounted ball valves permit the body cavity to be bled through the drain plug valve with the ball in the fully closed or fully open position.

This permits the checking of the seating integrity without the need to turn the ball in its fully closed position, this avoided out generating troubles for the operation of the line.

The range can be integrated with a range of pneumatic / electric actuators and complete flow control packages.

These valves service a wide spectrum of industries such as chemical, petrochemical, oil, gas and pharmaceutical industries and provide an easy and convenient way of providing 2 separate isolations and a visual confirmation of a tight seal.

<b>Size Range</b>	1/2" - 56" (DN 25 - DN 1400) Double Block and Bleed Valves
<b>Design / Features</b>	Gate Type, Ball Type, Floating & Trunnion Mounted, End Entry, Top Entry, Subsea, Full / Reduced Bore, Cryogenic, Firesafe Certified, Anti-static, Blow-out proof stems.
<b>Design Codes</b>	API 6D, API 6A, BS5351, BS 6755 / BS EN 12266, NACE MR 01 75, ANSI, ISO & API standards
<b>End Connections</b>	Flanged, Screwed, Butt Weld, Hub, SW
<b>Pressure Class</b>	ANSI 150 lbs - 4500 lbs
<b>Seat Design</b>	Soft Seated, Metal to Metal, Single & Double Piston effect.
<b>Operator</b>	Lever / Gear / Pneumatic / Hydraulic / Electric / Gas over Oil / Quarter Turn / Rack and Pinion / Scotch Yoke.

## Why a Double Block and Bleed Valves?

The Double Block and Bleed Valve can perform the tasks of 3 separate valves (2 separate isolations and 1 drain valve) which apart from being hugely Space saving can also save on weight and time due to Installation and Maintenance practices requiring much less work and the operator being able to locate and operate all 3 valves in one location.

It has been customary for manifold systems and other process piping, where inter-contamination of products was undesirable, to position two valves back to back with a small

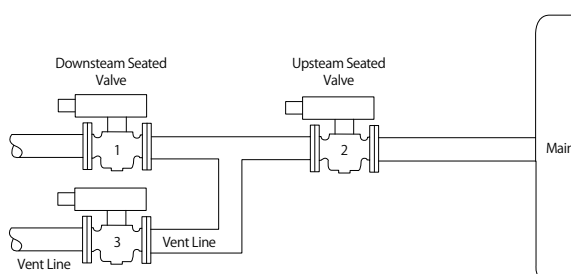
bleed valve located between them. This is commonly referred to as a "Double Block and Bleed System" or "Block and Bleed Service." Using TFE or RTFE as a seat material has permitted the substitution of a single valve for the two valves which made up the previous system.

A bleed valve is required and is connected to the body cavity around the ball of the ball valve. A Double Block and Bleed application requires that both seats be tight and act as upstream seals when there is pressure on one or both sides of the valve, with the cavity

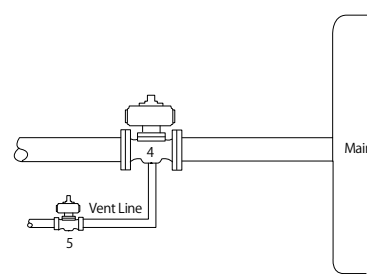
around the ball being bled to atmosphere by opening the body drain valve. Design Features A special Block and Bleed seat design has been developed in valve sizes 3/4" through 8" inclusive, which will act as an upstream seat without impairing its ability to act also as a downstream seat. Refer to Figure 3 (back) for a cross-sectional view of this design. In a standard floating ball type of valve such as the McCannaseal, it is always the downstream seat which is tight.

The line pressure provides the necessary seating force by pressing the ball

**Fig. 1 Traditional Shutoff System**



**Fig. 2 UA Valves Shutoff System**



Double block and bleed ball valve with upstream and downstream seats

# Cast Steel Floating Ball Valve



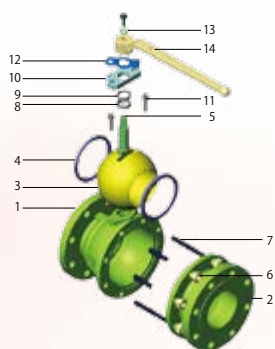
## Technical Specification

- Design Standard : API 608
- Face to Face : ASME B 16.10
- Flanged Size : ASME B 16.5
- Test & Inspection : API 598

## Notes

The sizes of serial valve connecting Flange and butt-welding terminal can be designed according to customer's requirement

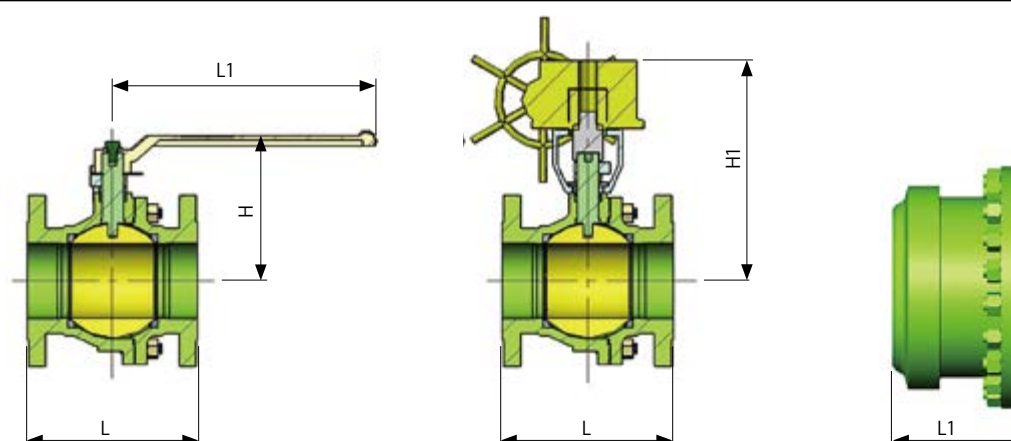
## Parts and Material List



No	Accessory Name	Material		
		Carbon Steel Series	Stainless Steel Series	Cryogenic Steel Series
1	Body	A216-WCB	A351-CF8, CF8M, CF3, CF3M	A352-LCB, LCC
2	Bonnet	A216-WCB	A351-CF8, CF8M, CF3, CF3M	A352-LCB, LCC
3	Ball	A105+HCr/ENP	A351-CF8, CF8M, CF3, CF3M	A352-LCB, LCC+ENP
4	Seat	PTFE, RPTFE, Sintering carbon fibre, Metal+Rubber groupware		
5	Stem	A182-F6a	A182-F304, 316	A182-F6a
6	Nut	A194-2H	A194-8M	A194-4
7	Stud	INCONEL 750		
8	Gasket	A182-F6a	Flexible Graphite + Stainless Steel	A182-F6a
9	Packing Gasket	Flexible Graphite, PTFE		
10	Gland	A216-WCB	A351-CF8, CF8M	A351-CF8
11	Screw Nail	A193-B7	A193-B8, B8M	A320-L7
12	Indicator	GB/T700 Q235A+Zn(Cr)		
13	Ring	A216-WCB		
14	Lever	GB/T 1222 65Mn		

- Notes**
- Ball : The Material of this part about the anti-sulphur type valve is ASTM(A182-304+NiP)
  - Stem : The material of this part about the anti-sulphur type valve is ASTM(A276-321) Major parts of the valve series and materials of sealing surface differ according to actual working condition and customer's special requirement.





## Dimensions and Weights

### PN1.6MPa CLASS 150

DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	½	¾	1	1 ½	2	2 ½	3	4	5	6	8
Flange	L	108	117	127	165	178	190	203	229	356	394	457
Butt Welding	L1	140	152	165	190	216	241	282	305	381	403	419
Hand-Operated	H	59	63	75	95	108	142	152	178	252	272	342
	W	130	130	160	230	203	350	400	500	750	750	900
	Kg	2.3	3.0	4.5	7.0	9.5	15.0	19.0	33.0	58.0	93.0	1600
Worm Gear Operated	H										292	398
	W										400	600
	Type										A	B
	Kg										180	240

### PN2.5 4.0MPa CLASS 300

DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	½	¾	1	1 ½	2	2 ½	3	4	5	6	8
Flange	L	140	152	165	190	216	241	282	305	381	403	502
Butt Welding	L1	140	152	165	190	216	241	282	305	381	403	502
Hand-Operated	H	59	63	75	95	167	142	152	178	252	272	342
	W	130	130	160	230	230	350	400	500	750	750	900
	Kg	2.5	3.5	5.5	10.5	14.5	23.5	30.0	55.0	81.0	118	200
Worm Gear Operated	H										292	398
	W										400	600
	Type										A	B
	Kg										220	365

### PN10MPa CLASS 600

DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	½	¾	1	1 ½	2	2 ½	3	4	5	6	8
Flange	L	165	190	216	241	292	330	356	406 (432)			
Butt Welding	L1	165	190	216	241	292	330	356	406 (432)			
Hand-Operated	H	59	63	75	95	167	180	198	198			
	W	160	160	230	400	400	650	650	1050			
	Kg	6.5	9.0	13.0	16.5	25.0	30.0	55.0	66.0			
Worm Gear Operated	H							292	398			
	W							400	600			
	Type							A	B			
	Kg							72	85			

# Forged Steel Floating Ball Valve



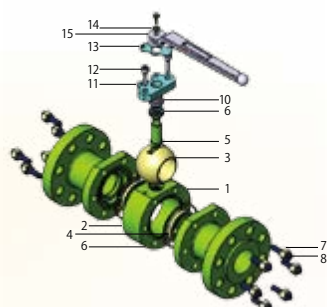
## Technical Specification

- Design Standard : API 608
- Face to Face : ASME B 16.10
- Flanged Size : ASME B 16.5
- Test & Inspection : API 598

## Notes

The sizes of serial valve connecting Flange and butt-welding terminal can be designed according to customer's requirement

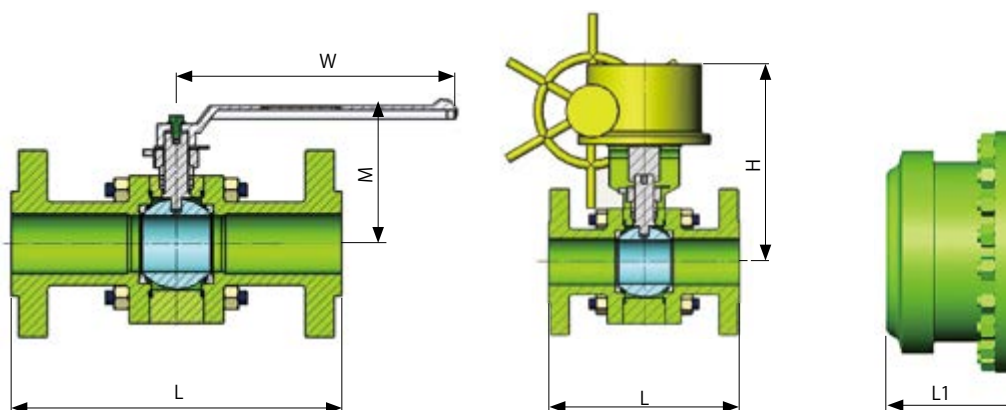
## Parts and Material List



No	Accessory Name	Material
		ASTM
1	Body	A105
2	Bonnet	A105
3	Ball	A105+ENP
4	Seat	PTFE
5	Stem	A182-F6a
6	Gasket	Graphite+Stainless Steel
7	Nut	A194-2H
8	Stud	A193-B7

No	Accessory Name	Material
		ASTM
9	Gasket	PTFE
10	Packing	Graphite
11	Gland	A216-WCB
12	Bolt	A193-B7
13	Indicator	Carbon Steel
14	Ring	AISI 1566
15	Lever	Stainless Steel

- Notes**
- **Ball** : The Material of this part about the anti-sulphur type valve is ASTM(A182-304+Ni.P)
  - **Stem** : The material of this part about the anti-sulphur type valve is ASTM(A276-321) Major parts of the valve series and materials of sealing surface differ according to actual working condition and customer's special requirement.



## Dimensions and Weights

### PN1.6MPa CLASS 150

DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	½	¾	1	1 ½	2	2 ½	3	4	5	6	8
Flange	L	108	117	127	165	178	190	203	229	356	394	457
Butt Welding	L1	140	152	165	190	216	241	282	305	381	403	419
Hand-Operated	H	73	78	86	102	130	142	191	200	226	242	285
	W	130	130	160	180	230	400	400	460	750	750	900
	Kg	3.0	4.0	6.0	12.0	15.0	19.0	22.0	46.0	65.0	85.0	127.0
Worm Gear Operated	H										260	300
	W										400	600
	Type										A	B
	Kg										110	175

### PN2.5 4.0MPa CLASS 300

DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	½	¾	1	1 ½	2	2 ½	3	4	5	6	8
Flange	L	140	152	165	190	216	241	282	305	381	403	502
Butt Welding	L1	140	152	165	190	216	241	282	305	381	403	502
Hand-Operated	H	73	80	86	102	136	164	191	223	240	253	307
	W	140	140	180	230	240	400	400	750	750	900	1000
	Kg	4.0	6.0	6.8	11.2	18.3	32.0	38.0	78.0	85.0	102.0	125.0
Worm Gear Operated	H										325	387
	W										400	600
	Type										A	B
	Kg										148	196

### PN10MPa CLASS 600

DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	½	¾	1	1 ½	2	2 ½	3	4	5	6	8
Flange	L	165	190	216	241	292	330	356	406 (432)			
Butt Welding	L1	165	190	216	241	292	330	356	406 (432)			
Hand-Operated	H	73	80	86	110	142	171	185	220			
	W	160	160	230	400	400	650	650	800			
	Kg	4.5	6.2	7.5	12.5	26.1	38.0	44.0	65.0			
Worm Gear Operated	H							182	217			
	W							280	400			
	Type							O	A			
	Kg							50	95			

# Cast Steel Trunnion- Mounted Ball Valve



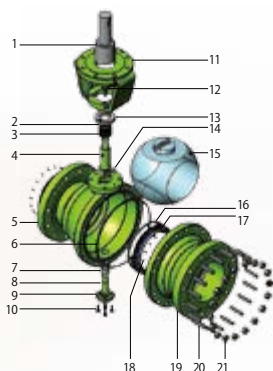
## Technical Specification

- Design Standard : API 6D
- Face to Face : API 6D / ASME B 16.10
- Flanged Size : ASME B 16.5  
ASME B 16.47
- Test & Inspection : API 598 / API 6D

## Notes

1. The sizes of serial valve connecting flange ends can be designed according to customer's requirement.
2. DN>1000(40"), the design standard is accordance with 「Specification of the length pipe valve」

## Parts and Material List

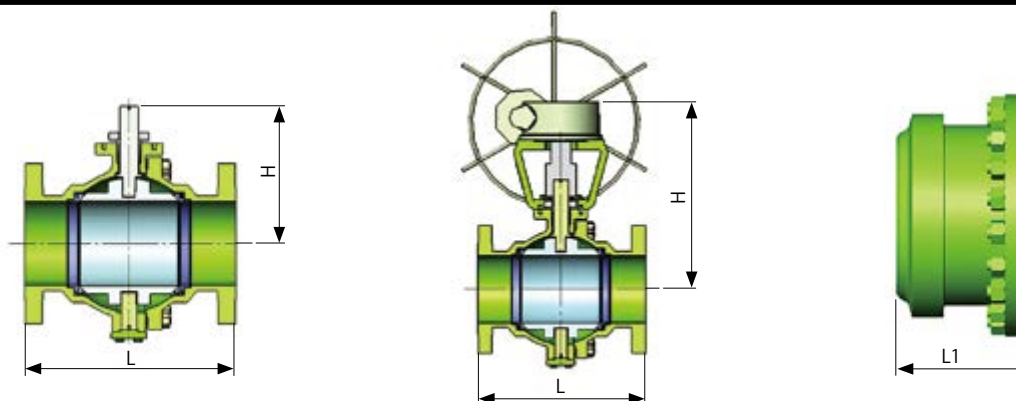


No	Accessory Name	Material
		ASTM
1	Connector	A182-F304L
2	Gland	A276-410
3	Packin	PTFE
4	Stem	A276-316
5	Body	A182-F304L
6	Gasket	Graphite
7	Sleeve	A276-410
8	Trunnion	A276-316
9	Trunnion Cover	A351-CF8M
10	Bolt	A193-B7
11	Yoke	A216-WCB

No	Accessory Name	Material
		ASTM
12	Bolt	A193-B7
13	Gland Flange	A351-CF8M
14	Pin	A581-303
15	Ball	A182-F316
16	O-Ring	Viton
17	Seat	PTFE
18	Spring	Inconel X-750
19	Connector	A182-F304L
20	Bolt	A193-B7
21	Nut	A194-7

- Notes**
- Ball : The Material of this part about the anti-sulphur type valve is ASTM(A276-321)
  - Stem : The material of this part about the anti-sulphur type valve is ASTM(A182-304, CF8+Ni(P))
- Major parts of the valve series and materials of sealing surface differ according to actual working condition and customer's special requirement.





## Dimensions and Weights

### PN1.6MPa CLASS 150

DN	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1050	1200	1400	1500
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	40	42	48	56	60
Flange	L	178	191	203	229	356	394	457	533	610	686	762	864	914	1067	1245	1372	1524	1721	1829	2180	2300	2400
Butt Welding	L1	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346	1524	1727	1930	1689	2100	2250	2400
Hand-Operated	H	107	125	152	178	300	330																
	W	230	400	400	450	700	750																
	Kg	9.5	15.0	19.0	33.0	58.0	93.0																
Worm Gear Operated	H							398	495	580	625	670	698	840	1050	1100	1150	1230	1320	1480	1610	1780	1865
	W							600	600	800	800	800	800	800	800	800	800	800	800	800	800	800	800
	Type							B	B	C	C	D	D	DA	DA	DB	DC	DC	DD	DD	DD	DH	HD
	Kg							160	180	240	390	510	750	1190	2600	3000	4490	7800	12560	14280	21900	34100	46200

### PN2.5 4.0MPa CLASS 300

DN	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1050	1200	1400	1500
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	40	42	48	56	60
Flange	L	216	241	283	305	381	403	502	568	648	762	838	914	991	1143	1346	1524	1727	2083	2050	2180	2300	2400
Butt Welding	L1	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346	1524	1727	2083	1960	2020	2250	2400
Hand-Operated	H	107	125	152	178	300	330																
	W	230	400	400	450	700	800																
	Kg	20.9	42.5	52.9	92.0	145	182																
Worm Gear Operated	H							398	495	580	625	670	698	840	1050	1100	1150	1230	1320	1480	1610	1780	1865
	W							600	600	800	800	800	800	800	800	800	800	800	800	800	800	800	800
	Type							B	B	C	C	D	D	DA	DB	DC	DC	DD	DD	DD	DH	DH	HD
	Kg							278	500	733	1029	1418	1592	2195	3460	5770	7932	10093	13775	16105	24060	38155	52350

### PN10MPa CLASS 600

DN	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1050	1200	1400	1500
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	32	40	42	48	56	60
Flange	L	292	330	356	432	559	660	787	838	889	991	1092	1194	1397	1549	1178	2083	2337	2100	2400	2400	2700
Butt Welding	L1	292	330	356	432	559	660	787	838	889	991	1092	1194	1397	1549	1178	2083	2337	2050	2180	2300	2400
Hand-Operated	H	108	155	197																		
	W	400	650	650																		
	Kg	31	54	62																		
Worm Gear Operated	H				235	300	374	445	512	550	615	750	810	1050	1180	1250	1315	1420	1540	1680	1840	1915
	W				600	600	800	800	800	800	800	800	800	800	800	800	800	800	1000	1000	1000	1000
	Type				B	C	C	D	D	DA	DA	DB	DC	DD	DH	DH	DH	DH	DJ	DJ	DK	DK
	Kg				133	253	485	758	1067	1083	1525	2095	2638	4736	6758	9138	13298	18335	21356	31195	47483	65200

### PN15.0MPa CLASS 900

DN	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	750	800	900	1000	1050	1200
NPS	in	2	2½	3	4	6	8	10	12	14	16	18	20	24	30	32	36	40	48	
Flange	L	368	419	381	457	610	737	838	965	1092	1130	1219	1321	1549	1780	2050	2050	2180	2600	
Butt Welding	L1	368	419	381	457	610	737	838	965	1092	1130	1219	1321	1549	1780	2050	2180	2600	2376	
Hand-Operated	H	217	241	295																
	W	650	650	650																
	Kg	48	55	85																
Worm Gear Operated	H				297	364	394	502	572	675	762	866	894	965	1210	1290	1360	1480	1630	
	W				600	800	800	800	800	800	800	800	800	800	800	800	1000	1000	1000	1000
	Type				B	C	C	D	D	DA	DB	DC	DD	DH	DH	DH	DJ	DJ	DK	DK
	Kg				145	360	580	1010	1510	1450	2150	2820	4200	6800	10180	11820	18900	21500	47500	

### PN25.0MPa CLASS 1500

DN	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
NPS	in	2	2½	3	4	6	8	10	12	14	16	18	20	24
Flange	L	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	2043
Butt Welding	L1	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	2043
Hand-Operated	H	217	241	259										
	W	650	650	650										
	Kg	45	56	82										
Worm Gear Operated	H	217	241	259	297	364	475	578	696	761	831	900	950	1080
	W	600	600	600	600	800	800	800	800	800	800	800	800	800
	Type	A	A	B	B	C	D	D	DA	DB	DC	DD	DH	DH
	Kg	50	72	97	198	480	820	1500	2250	2850	4070	6195	9075	14280

### PN45.0MPa CLASS 2500

DN	mm	50	80	100	150	200	250	300
NPS	in	2	3	4	6	8	10	12
Flange	L	451	578	673	914	1022	1270	1422
Butt Welding	L1	451	578	673	914	1022	1270	1422
Worm Gear Operated	H	220	275	325	360	480	550	615
	W	800	800	800	800	800	800	800
	Kg	90	200	385	778	1352	2137	3267

# Forged Steel Trunnion-Mounted Ball Valve



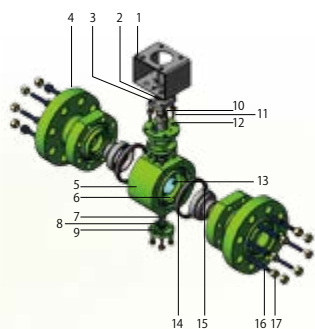
## Technical Specification

- Design Standard : API 6D
- Face to Face : API 6D / ASME B 16.10
- Flanged Size : ASME B 16.5  
ASME B 16.47
- Test & Inspection : API 598 / API 6D

## Notes

1. The sizes of serial valve connecting flange ends can be designed according to customer's requirement.
2. DN>1000(40"), the design standard is accordance with 「Specification of the length pipe valve」

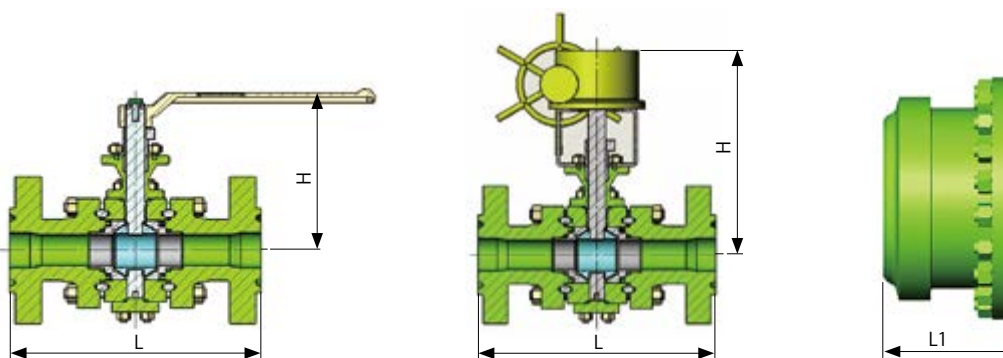
## Parts and Material List



No	Accessory Name	Material
		ASTM
1	Mount Flange	A182-F304
2	Gland	A276-304
3	Gland Flange	A276-304
4	Connector	A182-F304L
5	Body	A182-F304L
6	Spring	Inconel X-750
7	Trunnion	A276-316
8	Gasket	Graphite
9	Trunnion Cover	A276-316

No	Accessory Name	Material
		ASTM
10	Stem	A276-316
11	Packing	Graphite
12	Gland Flange	A276-304
13	Ball	A276-316
14	Gasket	Graphite
15	Seat	A182-F304L + TC
16	Bolt	A193-B7
17	Nut	A194-7

- Notes**
- Ball : The Material of this part about the anti-sulphur type valve is ASTM(A182-304+Ni.P)
  - Stem : The material of this part about the anti-sulphur type valve is ASTM(A276-321) Major parts of the valve series and materials of sealing surface differ according to actual working condition and customer's special requirement.



## Dimensions and Weights

### PN1.6MPa CLASS 150

No	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1050	1200	1400	1500
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	40	42	48	56	60
Flange	L	178	191	283	329	356	394	457	553	610	686	762	864	914	1067	1245	1372	1524	1721	1829	2180	2300	2400
Butt Welding	L1	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346	1524	1727	1930	1689	2100	2250	2400
Hand-Operated	H	130	142	191	200	226	242																
	W	230	350	400	450	750	750																
	Kg	12	28	33	50	78	93																
Worm Gear Operated	H							337	385	414	447	545	545	585	663	723	923	986	1061	1420	1530	1640	1710
	W							600	600	800	800	800	800	800	800	800	800	800	800	800	800	800	800
	Type							B	B	C	C	D	D	DA	DA	DA	DB	DC	DD	DD	DC	DD	HD
	Kg							250	390	578	770	1100	1250	1800	2400	4500	6900	9700	13000	15000	23000	37000	39500

### PN2.5 4.0MPa CLASS 300

No	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1050	1200	1400	1500
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	40	42	48	56	60
Flange	L	216	241	283	305	381	403	502	568	648	762	838	914	991	1143	1346	1524	1727	2083	2050	2180	2300	2400
Butt Welding	L1	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346	1524	1727	2083	1960	2020	2250	2400
Hand-Operated	H	136	164	191	223	240	253																
	W	240	400	400	600	750	800																
	Kg	32	37	58	110	157	180																
Worm Gear Operated	H							337	385	414	447	545	545	585	663	723	923	986	1061	1420	1530	1640	1710
	W							600	600	800	800	800	800	800	800	800	800	800	800	800	800	800	800
	Type							B	B	C	C	D	D	DA	DB	DC	DC	DD	DD	DD	DD	DD	HD
	Kg							280	410	760	1100	1600	1700	2300	3500	6000	8000	11000	14000	17000	25000	39500	45300

### PN10MPa CLASS 600

No	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	700	800	900	1000	1050	1200	1400	1500
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	32	40	42	48	56	60
Flange	L	292	330	356	432	559	660	787	838	889	991	1092	1194	1397	1549	1178	2083	2337	2100	2400	2400	2700
Butt Welding	L1	292	330	356	432	559	660	787	838	889	991	1092	1194	1397	1549	1178	2083	2337	2050	2180	2300	2400
Hand-Operated	H	136	164	191																		
	W	500	650	650																		
	Kg	35	42	66																		
Worm Gear Operated	H				244	309	361	412	475	502	533	636	675	759	836	915	987	1212	1460	1600	1760	1845
	W				600	600	800	800	800	800	800	800	800	800	800	800	800	800	1000	1000	1000	1000
	Type				B	C	C	D	D	DA	DA	DB	DC	DD	DH	DH	DH	DH	DJ	DJ	DK	DK
	Kg				180	270	500	780	1100	1200	1600	2160	2700	5000	7000	9800	14000	19000	22000	32000	49000	56000

### PN15.0MPa CLASS 900

No	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	750	800	900	1000	1200
NPS	in	2	2½	3	4	6	8	10	12	14	16	18	20	24	30	32	36	40	48
Flange	L	368	419	381	457	610	737	838	965	1092	1130	1219	1321	1549	1780	2050	2050	2180	2600
Butt Welding	L1	368	419	381	457	610	737	838	965	1092	1130	1219	1321	1549	1700	1780	1960	2100	2376
Hand-Operated	H	148	191	216															
	W	650	650	650															
	Kg	50	55	80															
Worm Gear Operated	H				270	384	435	518	657	693	762	866	894	965	1160	1240	1310	1450	1530
	W				600	800	800	800	800	800	800	800	800	800	800	1000	1000	1000	1000
	Type				B	C	C	D	D	DA	DB	DC	DD	DH	DH	DJ	DJ	DK	DK
	Kg				150	360	620	1100	1600	1850	2200	2800	4250	7000	12500	14500	18000	22000	32000

### PN25.0MPa CLASS 1500

No	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
NPS	in	2	2½	3	4	6	8	10	12	14	16	18	20	24
Flange	L	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	2043
Butt Welding	L1	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	2043
Hand-Operated	H	175	191	216										
	W	650	650	750										
	Kg	60	70	85										
Worm Gear Operated	H	175	91	216	247	329	492	428	640	670	700	755	830	952
	W	400	400	600	600	800	800	800	800	800	800	800	800	800
	Type	A	A	B	B	C	D	D	DA	DB	DC	DD	DH	DH
	Kg	65	82	100	210	500	850	1600	2300	2950	4200	5000	5600	2200

### PN45.0MPa CLASS 2500

DN	mm	50	80	100	150	200	250	300
NPS	in	2	3	4	6	8	10	12
Flange	L	451	578	673	914	1022	1270	1422
Butt Welding	L1	451	578	673	914	1022	1270	1422
Worm Gear Operated	H	220	275	325	360	480	550	615
	W	800	800	800	800	800	800	800
	Kg	90	200	385	778	1352	2137	3267

# Product System

- Chemical Plants
- Fats, Oils, Fatty Acid and Detergent Plants
- Power Plants-Fossil Fuel
- Breweries & Distilleries
- Electrical Component Plants
- Foundries
- Power Plant-Nuclear
- Coke By-Products Plants
- Food Processing Plants
- Paint & Paint Product Plants
- Textile Industry
- Steel & Other Metal Processing Plants
- Rubber & Synthetic Rubber Products Plants
- Petroleum Products & Handling Systems
- Pulp & Paper Plants
- Pharmaceutical Plants
- Water Treatment-Purification

※ The product is subject to change for technical development and quality improvement without prior notice.



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