



BALL VALVES

TIANSHENG VALVE

HIGH QUALITY INDUSTRIAL VALVES



ZHEJIANG TIANSHENG VALVE CO.,LTD



Ball valves (BV) has been available since the 1950s...

With the continuous improvement of production and management structures, this kind of architecture quickly developed into a kind of reference in the valves world. In the future, the use of ball valves will constantly increase, considering the reliability level reached for application spreading from low to high temperature at pressure exceeding today 10.000 psi.

PURPOSE

Regular ball valves in a line are used for switching (on/off) the medium flow. BV is not a control valve in the sense that it cannot be maintained partially open during normal operations. It is open or closed by a simple 90° rotation of the command stem, which can be done manually or actuated depending the operating pressure and the valve bore.

USE

Today ball valve are widely used in petroleum extraction, refining, distribution, in chemical industry, paper mill, pharmacy, water distribution, power plants and whatsoever.

BENEFITS

- Low pressure loss, due to continuity of section
- Simple structure which allows compactness and reliability.
- Absence of erosion of the seats, due to separation with the flow.
- High valve tightness whatever could be the media and the pressure (from vacuum to 10.000 psi), due to excellent contact between metal ball and fluorine plastic used for seals.
- Large scope of accessible operating pressures and temperatures depending of the metallurgy and the seats technology (soft or metal seated).
- Easy operating, convenient for a far control.
- Easy maintenance, due to its simple structure.

TWO MAIN ARCHITECTURES

Ball valve concept has been declined in several families according to operational constraints:

Floating ball valves

The simplest architecture which adopts two pieces (or "split type") or an integral body design, according to the API 6D or ISO 17292 standard. It is adapted to low pressure conditions (150-300 lbs), and to temperatures ranging from -196 to 350°C, depending the seal types (soft or metal). This whole series of valves is made according to fire prevention design and fulfilled API607 and AP16FA fireproof tests.

Trunnion mounted ball valves

Which can be design in two or three parts, depending their bodies are casted or forged, which fit more demanding constraints of pressure and diameter.

SPECIAL ARCHITECTURES

Inspired from regular BV, but dedicated to special uses and constraints:

- Double Block and Bleed
- Top Entry
- Full Welded
- Cryogenic
- Buried
- Eccentric
- "V" Type
- Three ways
- Vacuum

Other valves types on request : Ceramic, Fluorine Lined, pinch valves...

► BALL VALVES MAIN DESIGN FEATURES



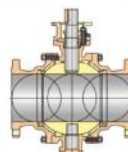
MATERIAL

All current metallurgies (see dedicated page at the end) are available:
- carbon steel, stainless steel, duplex, special alloys
- casted or forged

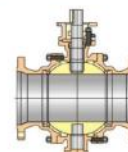
All materials are compliant with NACE MR 0175

BORE

All TSV products are available in Full or Reduce bore



FULL BORE



REDUCE BORE

BODY CONSTRUCTION

Depending on the bore, class pressure and material, TSV valves can be designed in two or three parts.

Casted carbon steel valves are generally designed in two pieces. TSV can adapt to customer's request in most case.



Two Parts



Three Parts

END CONNECTION

TSV products are available with current (flanged, welded or threaded) connections, which are designed according to:

- Flanged: ASME B16.5 - B16.34 - B16.44 (including MSS-SP 44)
- BW: ASME B16.25 - GB/T 12224
- SW: ASME B16.11
- Threaded/Screwed: ASME B1.20.1

Dimensions are compliant with specifications of ASME B16.10 - GB/T 12221 or 19672

MANEUVER-ACTUATOR INTERFACE

Depending the bore, pressure class and customer's expectations, TSV valves can be delivered with lever, worm gear, bare-stem with ISO plate, or any specific interface respecting ISO 5511 guidelines.



HANDLE



ELECTRIC



PNEUMATIC OR
ELECTRO-HYDRAULIC



WORM-GEAR



PNEUMATIC

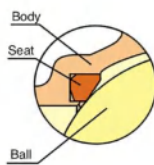
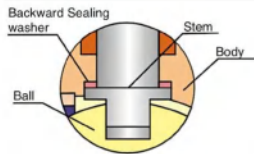
► BALL VALVES MAIN DESIGN FEATURES



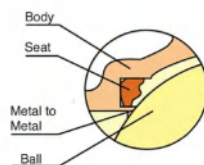
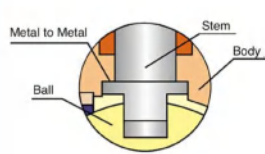
FIRE PROOF DESIGN

Most TSV ball valves are certified « fire proof » according to API 607 and/or 6FA or ISO 10497

Before Fire

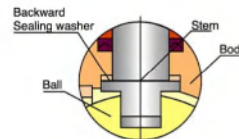


After Fire

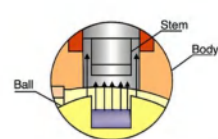


BLOW-OUT PROOF STEM

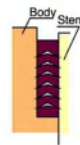
Stem is positioned from the inside of the valve body, and its shape is designed with retainer, in order to be blocked by the bonnet in case of over pressure of the fluid inside the cavity.



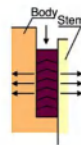
Lower Loading Construction with Backward Sealing



Lower Loading Construction without Backward Sealing



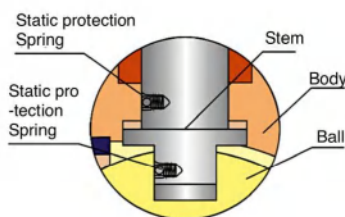
Before forcing against the stuffing



Stuffing Forced Against

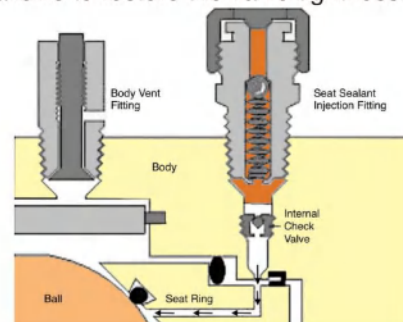
ANTI-STATIC DESIGN

Electric continuity between fixed and moving parts is assumed by springs and metal balls embedded in the design of our valves. Consequently, there is no static charges accumulation as far the BV/pipe are correctly grounded. TSV products are "ATEX" compliant and can be used in potentially explosive atmosphere.



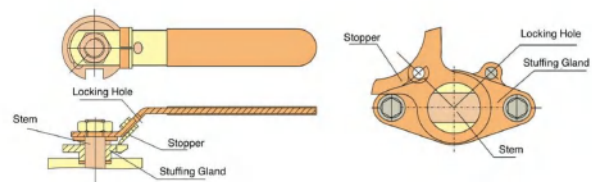
SEALANT INJECTION

According to customer's request, trunnion ball valves are equipped (DN≥150 or NPS≥6) with sealant injection devices for urgency purposes. In case of accident damage of seat, stem or ring, this device allows to restore the valve tightness.



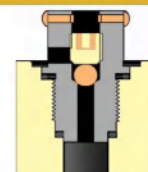
LOCKING DEVICE

In fully open and fully closed position of manual operated ball valves, a locking device can be design and applied on. In this case, it can prevent miss-operation and unexpected open/close caused by pipeline vibrations, especially in transmission line of flammable medium such as oil and chemical. It is a better choice when the valve is for outdoor installation.



VENT AND DRAIN PROVISION

Standard TSV products are equipped with vent and drain. It can be tailor-made according to specific requirement.

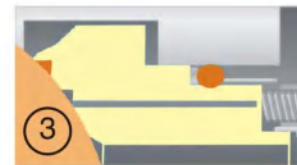
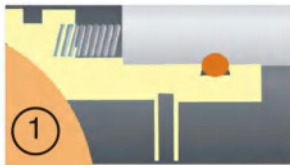


► BALL VALVES MAIN DESIGN FEATURES



SEAT

TSV valve sealing can be achieved with metal / metal seals (1), flexible seals (2), or a combination of both (3 - also designated as Primary Metal Secondary Soft seals « PMSS »)



SEALING CONSTRUCTION OF VALVE SEAT

TSV valve seals shape are designed to have minimal wear while providing a perfect tightness over the entire pressure range. For trunnion mounted, the spring load is adjusted accordingly.

FLOATING BALL VALVE



Non-Pressure



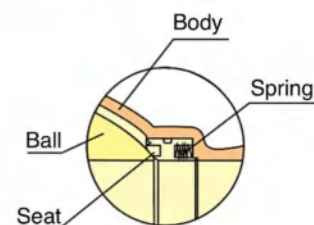
Low-Pressure



High-Pressure

Fluid-Abrasion Protecting
Construction of Valve Seat

TRUNNION MOUNTED BALL VALVE

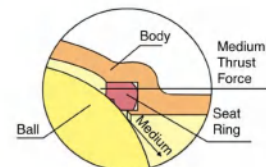
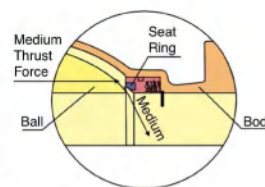


LIMITATION OF INTERNAL PRESSURE IN DEAD ZONE

Depending the valve architecture (Floating or Trunnion mounted), seals are designed for releasing the over-pressure in case of evaporation of the fluid in the dead zone.

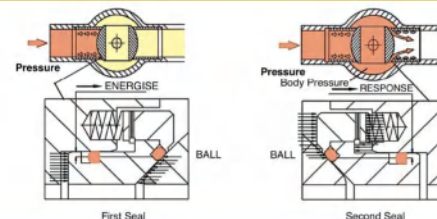
In **floating architecture**, the flexibility of the seal material allows the fluid to escape by sliding between the sphere and the seal in case of over-pressure

In **trunnion architecture**, the pressure release is assumed by the seal holders remoteness whether it is SPE or DPE (see here-below).



STANDARD SINGLE PISTON EFFECT SEAT (SPE)

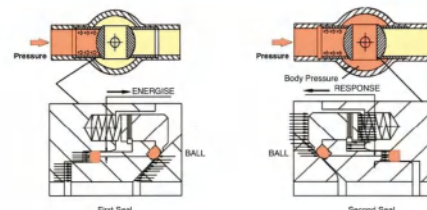
Single piston effect seats (SPE) are designed to automatically release cavity over-pressure into the pipeline.



OPTIONAL DOUBLE PISTON EFFECT (DPE)

With DPE seat option, if a leakage occurs in the upstream seat, the pressure entering the body cavity pushes the downstream seat against the ball, to compensate the default of the upstream seat, allowing more valve tightness reliability.

An external body relief valve must be installed to protect the body cavity from excess pressure which can be vented to atmosphere or recycled back to the upstream side of the valve.



► FLOATING BALL VALVES



Forged steel



Cast steel

PURPOSE

Cutting or allowing fluid flow in a pipe with all the ball valve structure advantages at a limited price.

DESIGN

It is adapted to low pressure conditions (150-300 lbs), and to temperatures ranging from -196 to 350°C, depending the seal types (soft or metal).

USE

Ancillaries in industry: power generation, petroleum and/or chemical industry, metallurgy, marine, gas, pharmaceutical, water supply...

STANDARD PRODUCTS

CLASS	DN (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250
	NPS (in)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"
150 LB														
300 LB														
400 LB														
600LB														
900 LB														
1500 LB														
2500 LB														

Size : DN : 50 up to 250 mm

NPS : 2" up to 64"

Pressure : Class : 150 up to 600 LB

PN : 16 up to 110

Temperatures : - 196 up to 350°C

APPLICABLE STANDARDS

Design :	API 6D – API 608 – ASME B 16.34 ISO 14313 – GB/T 12237 – GB/T19672
Face-to-Face :	AMSE B 16.10 manufacturers standard GB/T 12221 – GB/T 19672
End Connection :	
Flanged :	ASME B 16.5 – ASME B 16.47 MSS-SP44 – GB/T 9113
BW :	ASME B 16.25 – GB/T 12224
SW :	ASME B 16.11
Threaded/Screw :	ASME B 1.20.1
Fire Test :	API 6FA – API 607 – GB/T 6899
Test and Inspection :	API 6D – API 598 – GB/T 19672 – JB/T 9092

AVAILABLE DESIGNS

Antistatic Feature

Blow out proof stem design

Fire safe design

Locking device

Construction Body : Split - two pieces - three pieces

Construction Ball : Floating ball - bi-directionnal

Bore Type : Full – Reduced – V-port

Seat : Metal – Soft

Operator : Manual - Actuated

► TRUNNION MOUNTED BALL VALVES



PURPOSE

Cutting or allowing fluid flow in a pipe even in extremely demanding conditions: flow, pressure, temperature...

DESIGN

They can be design in two or three parts, depending their bodies are casted or forged, which fit more demanding constraints of pressure and diameter.



USE

Main flows in industry: power generation, petroleum and/or chemical industry, metallurgy, marine, gas, pharmaceutical, water supply...

STANDARD PRODUCTS

Size : DN : 50 up to 1500 mm
NPS : 2" up to 60"

Pressure : **Class :** 150 up to 2500 LB
PN : 16 up to 420

Temperatures : -196 up to 350°C

CLASS	DN (mm)	50	65	80	100	125	150	200	250	300	350	400	450	500	600	650	700	750	800	850	900	1000	1050	1200	1350	1400	1500
	NPS (in)	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	26"	28"	30"	32"	34"	36"	40"	42"	48"	54"	56"	60"
150 LB																											
300 LB																											
400 LB																											
600LB																											
900 LB																											
1500 LB																											
2500 LB																											

APPLICABLE STANDARDS

Design : API 6D – API 608 – ASME B 16.34 - ISO 14313 - GB/T 12237 – GB/T19672

Face-to-Face : AMSE B 16.10 manufacturers standard
GB/T 12221 – GB/T 19672

End Connection :
Flanged : ASME B 16.5 – ASME B 16.47 MSS-SP44 - GB/T 9113
BW : ASME B 16.25 - GB/T 12224
SW : ASME B 16.11
Threaded/Screw : ASME B 1.20.1

Fire Test : API 6FA – API 607 – GB/T 6899

Test and Inspection : API 6D – API 598 – ASME B 16.34 GB/T 19672 – JB/T 9092

AVAILABLE DESIGNS

Antistatic Feature

Blow out proof stem design

Fire safe design

Stem lubrication provision

Vent and Drain Provision

Locking device

Construction Body : Split - two pieces - three pieces

Construction Ball : Floating/Trunnion supported ball - bi-directionnal

Bore Type : Full – Reduced

Seat : Metal - Soft

Operator : Manual - Actuated

► DOUBLE BLOCK AND BLEED



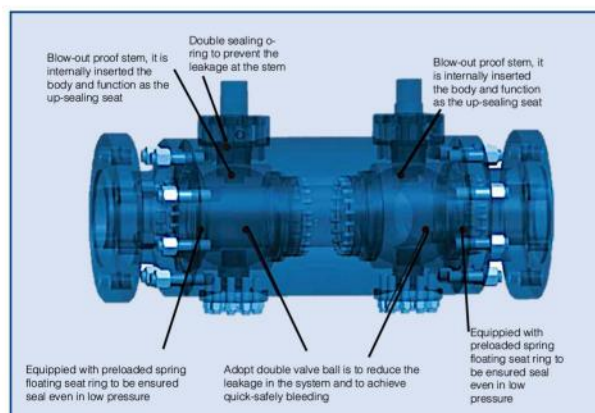
PURPOSE

Double Block and Bleed (DBB) ball valves are designed in order to replace the multiple valves connection complexity in traditional pipeline. Furthermore, DBB reduces the risks of leakages and simplify maintenance operations.

DBB ball valves provides compacity, improves reliability and saves CAPEX and OPEX as well.

DESIGN

DBB basically associates two ball valves (floating or trunnion) in the same body. A drain can be installed in the middle if requested.



USE

Recommended for industries dealing with hazardous fluids: oil and gas, petrochemical, marine, pharmaceutical...

STANDARD PRODUCTS

Size : DN : 15 up to 600 mm
NPS : 1/2" up to 24"

Pressure : Class : 150 up to 2500 LB
PN : 16 up to 420

Temperatures : -196 up to 350°C

CLASS	DN (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
	NPS (in)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
150 LB																				
300 LB																				
600LB																				
900 LB																				
1500 LB																				
2500 LB																				

APPLICABLE STANDARDS

Design : API6D, API608, ASME B16.34, ISO 14313

Face-to-Face : ASME B16.10, manufacturers standard

End Connection :

- Flanged : ASME B16.5, ASME B16.47
- BW : ASME B 16.25 - GB/T 12224
- SW : ASME B 16.11
- Threaded/Screw : ASME B 1.20.1

Steel Valve : ASME B 16.34

Fire Test : API 6FA – API 607 – GB/T 6899

Test and Inspection : API 6D, API 598

AVAILABLE DESIGNS

Antistatic Feature

Blow out proof stem design

Fire safe design

Stem lubrication provision

Vent and Drain Provision

Locking device

Construction Body : Split - two pieces - three pieces

Construction Ball : Floating/Trunnion supported ball - bi-directional

Bore Type : Full – Reduced

Seat : Metal - Soft

Operator : Manual - Actuated

► TOP ENTRY BALL VALVES



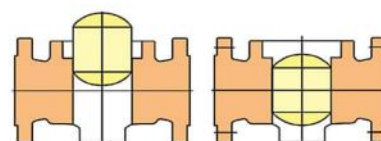
PURPOSE

Top Entry (TE) ball valves are designed in order to allow maintenance from the top, when it is made necessary due to the valve physical environment.

DESIGN

Trim and seals are removable from the top, without damaging seals, in order to repair or change.

During maintenance, TE body and flanges remain installed on the pipe.



The ball is fitted into the valve body from the top, thus for repair work.

USE

Recommended for installation in hardly accessible environment: underground, subsea...

STANDARD PRODUCTS

Size : DN : 15 up to 300 mm
NPS : 1/2" up to 12"

Pressure : **Class :** 150 up to 2500 LB
PN : 16 up to 420

Temperatures : - 196 up to 350°C

CLASS	DN (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
	NPS (in)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
150 LB																				
300 LB																				
600LB																				
900 LB																				
1500 LB																				
2500 LB																				

APPLICABLE STANDARDS

Design : API6D, API608, ASME B16.34, ISO 14313

Face-to-Face : ASME B16.10, manufacturers standard

End Connection :

- Flanged : ASME B16.5, ASME B16.47
- BW : ASME B 16.25 - GB/T 12224
- SW : ASME B 16.11
- Threaded/Screw : ASME B 1.20.1

Fire Test : API 607 - API 6FA

Test and Inspection : API 6D, API 598

AVAILABLE DESIGNS

Antistatic Feature

Blow out proof stem design

Fire safe design

Stem lubrication provision

Vent and Drain Provision

Locking device

Construction Body : Split - two pieces - three pieces

Construction Ball : Floating/Trunnion supported ball - bi-directional

Bore Type : Full – Reduced

Seat : Metal - Soft

Operator : Manual - Actuated

► FULL WELDED BALL VALVES



PURPOSE

Full Welded Ball Valves (FW) are designed to improve reliability by:

- Avoiding leakage risks due to gaps between flanges and body
- Having higher stiffness regarding bending moments issued from connected pipe, while reducing weight

DESIGN

- Fully welded structure
- Removable stem seals even when under maximum pressure.
- Modular design enabling to provide various stem seal structures to meet customers' specific requirements.
- Floating self centering seats with pre-tensioned spring
- Trunnion-mounted ball types
- Low torques
- Maintenance free sealing



USE

All uses requiring high reliability level: long distance pipes, hazardous fluids...

STANDARD PRODUCTS

Size : DN : 50 up to 1500 mm
NPS : 2" up to 60"

Pressure : Class : 150 up to 2500 LB
PN : 16 up to 420

Temperatures : - 196 up to 350°C

CLASS	DN (mm)	50	65	80	100	125	150	200	250	300	350	400	450	500	600	650	700	750	800	850	900	1000	1050	1200	1400	1500
	NPS (in)	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	26"	28"	30"	32"	34"	36"	40"	42"	48"	56"	60"
150 LB																										
300 LB																										
400 LB																										
600 LB																										
900 LB																										
1500 LB																										
2500 LB																										

APPLICABLE STANDARDS

Design : API6D, API608, ASME B16.34, ISO 14313

Face-to-Face : ASME B16.10, manufacturers standard

End Connection :

- Flanged : ASME B16.5, ASME B16.47
- BW : ASME B 16.25 - GB/T 12224
- SW : ASME B 16.11
- Threaded/Screw : ASME B 1.20.1

Fire Test : API 607 - API6FA - BS 6755

Test and Inspection : API 6D, API 598

AVAILABLE DESIGNS

Antistatic Feature

Blow out proof stem design

Fire safe design

Stem lubrication provision

Vent and Drain Provision

Locking device

Construction Body : Welded

Construction Ball : Trunnion supported ball - bi-directional

Bore Type : Full – Reduced

Seat : Metal - Soft

Operator : Manual - Actuated

► CRYOGENIC BALL VALVES

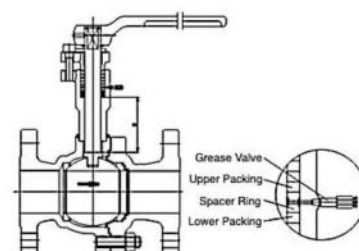


PURPOSE

Control highly unstable cold fluids which can exist simultaneously under liquid and gas phases.

DESIGN

Cryogenic ball valves require specific design and process, due to extreme operating conditions. Under pressure parts must resist constraints due to large temperature variations of the fluid, and the processing of these parts take this into account, by cooling down parts at -196°C for two hours (twice) during machining.



USE

Cryogenic ball valves are mainly used in the chemical and gas industries (ethylene, LPG, hydrogen, oxygen ...)

STANDARD PRODUCTS

CLASS	DN (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300
	NPS (in)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
150 LB															
300 LB															
600 LB															
900 LB															
1500 LB															
2500 LB															

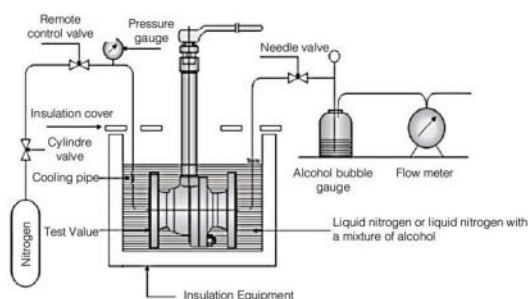
Size : DN : 15 up to 300 mm
NPS : 1/2" up to 12"

Pressure : Class : 150 up to 2500 LB
PN : 16 up to 420

Temperatures : -196°C up to -29°C

TEST PRESSURE

Test are conducted according to applicable standards both at low and ambient temperatures.



Nominal size		Neck dimension (mm)			Pressure		
DN	NPS	≥60°C	≥100°C	≤100°C	PN 16 - 100	Class 150 - 300	
15	1/2	90	110	130			
20	3/4	100	110	140			
25	1	100	120	150			
32	1 1/4	110	120	150			
40	1 1/2	110	130	160			
50	2	110	130	170			
65	2 1/2	120	140	180			
80	3	120	150	190			
100	4	130	160	200			
125	5	130	160	200			
150	6	140	170	220			
200	8	140	170	220			
250	10	150	180	240			
300	12	150	180	240			
350	14	160	190	250			
400	16	160	190	250			

APPLICABLE STANDARDS

Design :	API6D, API608, ASME B16.34, ISO 14313 - GB/T 12227
Face-to-Face :	ASME B16.10, manufacturers standard - GB/T 12224
End Connection :	
Flanged :	ASME B16.5, ASME B16.47
BW :	ASME B 16.25 - GB/T 12224
SW :	ASME B 16.11
Threaded/Screw :	ASME B 1.20.1
Fire Test :	API 6FA - API 607 - GB/T 6899
Cryogenic Technology :	JB/T7794 - BS6364
Test and Inspection :	API 6D - API598 - JB / T9092

AVAILABLE DESIGNS

Antistatic Feature	
Blow out proof stem design	
Fire safe design	
Stem lubrication provision	
Vent and Drain Provision	
Locking device	
Construction Body :	Split - two pieces - three pieces
Construction Ball :	Floating/Trunnion supported ball - bi-directional
Bore Type :	Full - Reduced
Seat :	Metal - Soft
Operator :	Manual - Actuated

► DIRECT BURRIED BALL VALVES



PURPOSE

Buried Ball Valves are designed in order to be fully operated from above the ground without dedicated civil work.

To operate properly, not only stem is extended, but also sealant injection ports and vents.

DESIGN

These valves are full-welded, and are protected by specific tar coating or by epoxy. All the valves have a cathodic protection.

This type of structure is well adapted for large diameters (up to DN 1400).

USE

Underground pipes for oil, gas and chemical.



STANDARD PRODUCTS

Size : DN : 15 up to 600
NPS : 1/2" up to 24"

Pressure : Class : 150 up to 2500 LB
PN : 16 up to 420

Temperatures : - 196 up to 350°C

CLASS	DN (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400
	NPS (in)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"
150 LB																										
300 LB																										
600 LB																										
900 LB																										
1500 LB																										
2500 LB																										

APPLICABLE STANDARDS

Design : API6D, API608, ASME B16.34, ISO 14313

Face-to-Face : ASME B16.10, manufacturers standard

End Connection :

- Flanged : ASME B16.5, ASME B16.47
- BW : ASME B 16.25 - GB/T 12224
- SW : ASME B 16.11
- Threaded/Screw : ASME B 1.20.1

Fire Test : API 607 - API6FA - BS 6755

Test and Inspection : API 6D, API 598

AVAILABLE DESIGNS

Antistatic Feature

Blow out proof stem design

Fire safe design

Stem lubrication provision

Vent and Drain Provision

Locking device

Construction Body : Split - two pieces - three pieces

Construction Ball : Floating/Trunnion supported ball - bi-directional

Bore Type : Full – Reduced

Seat : Metal - Soft

Operator : Manual - Actuated

► ECCENTRIC HALF BALL VALVES



PURPOSE

Eccentric semi ball valve (also called “eccentric half ball valve”) is a special type, used for two-phase media, especially when there is a risk of scaling.

It is a single direction valve.

It can be also helpfull for saving actuator costs by reducing breaking torque.

DESIGN

The eccentric semi-ball valve is composed of a one piece body, an eccentric shaft, a bonnet, a spherical cap, removable seat. With 90 degree rotation by eccentric shaft, the valve achieves open and close function. The eccentricity avoids the friction between the seat and the spherical cap and allows the washing of the seat during all the time the valve is not closed. Dislike usual ball valves, eccentric half ball valve has no dead zone where the media is maintained isolated from the main stream.

Its structure reduces the torque for opening and closing, allows the use of fluid with suspended particles, prevents from the potential risks linked to the existence of a dead zone. Its maintenance is simple: sealing can be replaced easily.



USE

Same as trunnion ball valves when bidirectionnal flow is not needed.

The absence of dead zone makes it also suitable for nuclear industry.

STANDARD PRODUCTS

Size : DN : 15 up to 600 mm
NPS : 1/2" up to 24"

Pressure : Class : 150 up to 2500 LB
PN : 16 up to 420

Temperatures : - 196 up to 350°C

CLASS	DN (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
	NPS (in)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"
150 LB																								
300 LB																								
600 LB																								
900 LB																								
1500 LB																								
2500 LB																								

APPLICABLE STANDARDS

Design : API6D, API608, ASME B16.34, ISO 14313 - GB/T 12237

Face-to-Face : ASME B16.10, manufacturers standard - GB/T 12221

End Connection :

- Flanged : ASME B16.5, ASME B16.47 - GB/T 9113
- BW : ASME B 16.25 - GB/T 12224
- SW : ASME B 16.11
- Threaded/Screw : ASME B 1.20.1

Fire Test : API 607 - API6FA - BS 6755

Test and Inspection : API 6D - API 598 - JB/T 9092

AVAILABLE DESIGNS

Antistatic Feature

Blow out proof stem design

Fire safe design

Stem lubrication provision

Vent and Drain Provision

Locking device

Construction Body : Split - two pieces - three pieces

Construction Ball : Floating/Trunnion supported ball - bi-directionnal

Bore Type : Full – Reduced

Seat : Metal - Soft

Operator : Manual - Actuated

► V-TYPE BALL VALVES



PURPOSE

V

notch ball valves is a quarter turn control valve mainly recommended for throttling services, even if they are also convenient as switching valves. The ability of this type of valve to remain clean and its strong cutting power makes it especially suitable for control of fluids containing fibres and tiny solids.

DESIGN

The ball and seats contact is maintained constant by pre tightened spring loads. Seats can be metallic or soft, depending the fluid and the temperature.

The V notch ball valve allows an effective flow control (see curve here-after) through opening. To achieve an accurate control and a strong cutting ability, upper and lower shafts are guided by double composite bearings, which loaded surfaces are coated with abrasion resistant and self-lubricating material.



APPLICATION

V-Type are widely used in control systems in paper industry, petrochemistry, chemical fibers, metallurgy, pharmacy

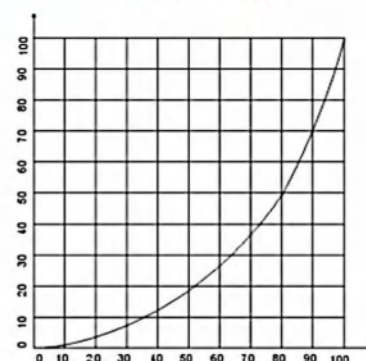
MAXIMUM ALLOWABLE LEAKAGE

DN	Metal-seated ml/min	PTFE-seated ml/min
25	2.0	0.20
32	2.4	0.24
40	3.0	0.30
50	3.8	0.38
65	5.2	0.52
80	6.2	0.62
100	7.6	0.76
125	9.6	0.96
150	12.0	1.20
200	15.4	1.54
250	19.2	1.92
300	24.0	2.40
350	30.0	3.00
400	34.0	3.40

MAXIMUM ALLOWABLE DIFFERENTIAL PRESSURE

DN	Wafer connection (Bar)		Flanged connection (Bar)		Rated Cv
	Max.s hut off dp	Max.control dp	Max.s hut off dp	Max.control I dp	
25	50	35	40	35	27
32	50	35	40	35	47
40	50	35	40	35	70
50	50	35	40	35	110
65	50	35	40	35	170
80	50	35	40	35	180
100	40	25	40	25	410
125	40	25	40	25	750
150	40	25	40	25	980
200	35	25	35	25	1720
250	35	20	35	20	2900
300			30	10	3800
350			30	10	7000
400			30	10	9800
450			30	10	12000
500			30	10	23000

EQUAL PERCENTAGE INHERENT FLOW CHARACTERISTIC



STANDARD PRODUCTS

CLASS	DN (mm)		15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
	NPS (in)		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
150 LB																					
300 LB																					
600 LB																					
900 LB																					

Size : DN : 15 up to 600 mm
NPS : 1/2" up to 24"

Pressure : Class : 150 up to 900 LB
PN : 16 up to 160

Temperatures : - 196 up to 350°C

APPLICABLE STANDARDS

Design :	API6D, API608, ASME B16.34, ISO 14313 - GB/T 12237
Face-to-Face :	ASME B16.10, manufacturers standard - GB/T 12221
End Connection :	
Flanged :	ASME B16.5, ASME B16.47 - GB/T 9113
BW :	ASME B 16.25 - GB/T 12224
SW :	ASME B 16.11
Threaded/Screw :	ASME B 1.20.1
Fire Test :	API 607 - API6FA - BS 6755
Test and Inspection :	API 6D - API 598 - JB/T 9092

AVAILABLE DESIGNS

Antistatic Feature
Blow out proof stem design
Fire safe design
Stem lubrication provision
Vent and Drain Provision
Locking device
Construction Body : Split - two pieces - three pieces
Construction Ball : Floating/Trunnion supported ball - bi-directional
Bore Type : Full - Reduced
Seat : Metal - Soft
Operator : Manual - Actuated

► THREE WAYS BALL VALVES



PURPOSE

Three way ball valves are used for switching, mixing or separating flow of fluids (corrosive or not) from -46 ° C to + 200 ° C. Five types of flow connection (see figures here-after) are available, depending requirements. Valves can be maneuvered by hand or actuated.

DESIGN

There is no fundamental difference with regular BV but:

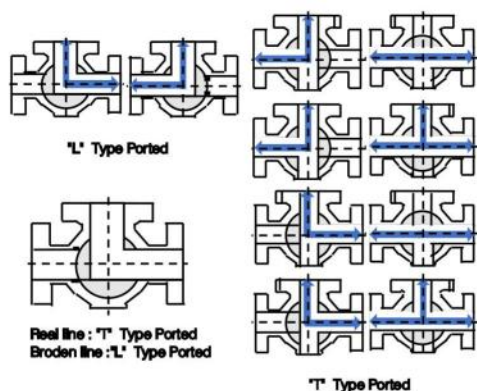
- The ball which can be "L" or "T" type, allowing different connection
- An additional flange fixed to the body



USE

Same as ball valves.

DIAGRAM OF MEDIUM CIRCULATION OF THREE WAY BALL VALVES



STANDARD PRODUCTS

Size : DN : 15 - 600mm
NPS : 1/2" - 24"

Pressure : Class : 150 - 2500 LB
PN : 16 up to 420

Temperatures : - 196 up to 350°C

CLASS	DN (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
	NPS (in)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
150 LB																				
300 LB																				
600 LB																				
900 LB																				
1500 LB																				
2500 LB																				

APPLICABLE STANDARDS

Design : API6D, API608, ASME B16.34, ISO 14313 - GB/T 12237

Face-to-Face : ASME B16.10, manufacturers standard - GB/T 12221

End Connection :

Flanged : ASME B16.5, ASME B16.47 - GB/T 9113

BW : ASME B 16.25 - GB/T 12224

SW : ASME B 16.11

Threaded/Screw : ASME B 1.20.1

Fire Test : API 607 - API6FA - BS 6755

Test and Inspection : API 6D - API 598 - JB/T 9092

AVAILABLE DESIGNS

Antistatic Feature

Blow out proof stem design

Fire safe design

Stem lubrication provision

Vent and Drain Provision

Locking device

Construction Body : Split - two pieces - three pieces

Construction Ball : Floating/Trunnion supported ball - bi-directional

Bore Type : Full - Reduced

Seat : Metal - Soft

Operator : Manual - Actuated

► VACUUM BALL VALVES



PURPOSE

This kind of ball valve is dedicated to the switching of fluids (alkaline or acid) under very low pressures (range: 0.6 . 106 to 1.3 . 10⁻⁴ Pa). Three connection types are available: lap joint flange, quick release connections, and threaded connections.

DESIGN

The use of leap seals eliminate the usual disadvantages of traditional seats, i.e. high torques for open and close, and limited fluid tightness as far as the internal pressure off the valve is low.



USE

These valves are used in following activities: refrigeration, medicine, solar energy, environmental protection, electronic industry, scientific research, aero space ...

STANDARD PRODUCTS

Size : DN : 10 up to 500 mm
NPS : 3/8" up to 20"

Pressure : Class : 150 LB
PN : 20

Temperatures : -30~+150°C / -30~+150°C
(PPL Seal)

Valve Leak rate : ≤1.3x10⁻⁴Pa.L/S

Applicable medium : Atmosphere non
corrosive gas

CLASS	DN (mm)	10	16	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500
	NPS (in)	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"
150LB																				

TEST PRESSURE

Loose Flange	Applicable pressure range (Pa)
(GB6070, JB919)	0.6x10 ⁶ ~.3x10 ⁻⁴
(GB6070, JB919)	1.6x10 ⁶ ~.3x10 ⁻⁴
(GB4962)	0.1x10 ⁶ ~.3x10 ⁻⁴
Threaded Connection	1.6x10 ⁶ ~.3x10 ⁻⁴

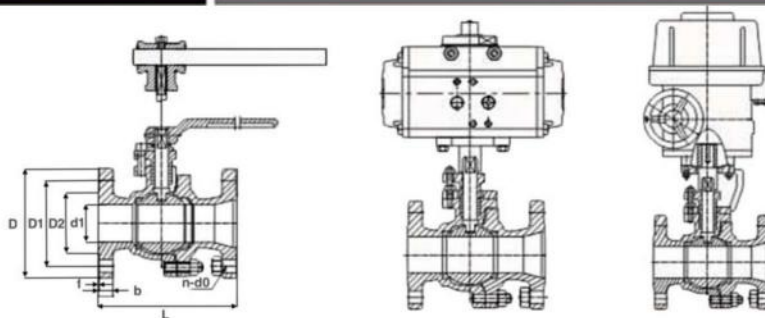
APPLICABLE STANDARDS

Design : API6D, API608, ASME B16.34, ISO 14313
Face-to-Face : ASME B16.10, manufacturers standard
End Connection :
Flanged : ASME B16.5, ASME B16.47 - GB/T 6070
BW : ASME B 16.25 - GB/T 12224
SW : ASME B 16.11
Threaded/Screw : ASME B 1.20.1 - GB/T 4982
Fire Test : API 607 - API6FA - BS 6755
Test and Inspection : API 6D - API 598 - JB/T 9092

AVAILABLE DESIGNS

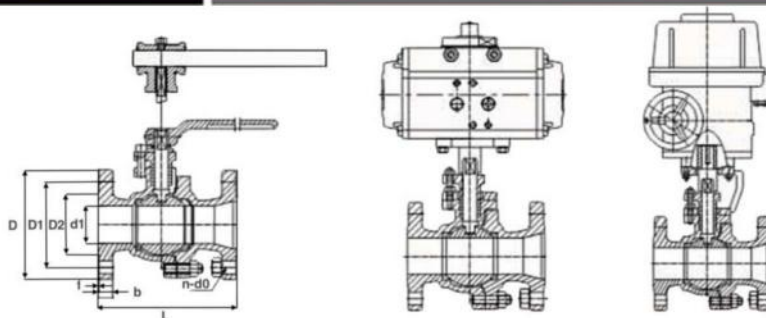
Antistatic Feature
Blow out proof stem design
Fire safe design
Stem lubrication provision
Vent and Drain Provision
Locking device
Construction Body : Split - two pieces - three pieces
Construction Ball : Floating/Trunnion supported ball - bi-directional
Bore Type : Full - Reduced
Seat : Metal - Soft
Operator : Manual - Actuated

► FLOATING BALL VALVES



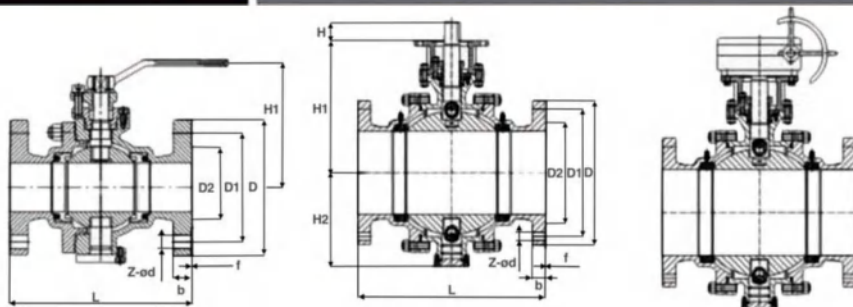
PN CLASS	NPS (in)	DN (mm)	Size (mm)										
			d1	L			D	D1	D2	b	f	n-d0	H
				RF	BW	RTJ							
PN 16	3/4	20	20	130			105	75	55	14	2	4-14	75
	1	25	25	140			115	85	65	14	2	4-14	85
	1 1/4	32	32	165			140/135	100	78	16	2	4-18	110
	1 1/2	40	40	165			150/145	110	85	16	3	4-18	135
	2	50	50	203			165/160	125	100	16	3	4-18	142
	2 1/2	65	65	222			185/180	145	120	18	3	4-18	173
	3	80	80	241			200/195	160	135	20	3	8-18	183
	4	100	100	305			220/215	180	155	20	3	8-18	255
	5	125	125	356			250/245	210	185	22	3	8-18	264
	6	150	150	394			285/280	240	210	24	3	8-23	290
PN 20 CLASS 150	8	200	200	457			340/335	295	265	26	3	12-23	395
	1/2	15	15	108			89	60.5	35	11.5	1.6	4-16	63
	3/4	20	20	117			98	70	43	11.5	1.6	4-16	63
	1	25	25	127			108	79.5	51	12	1.6	4-16	82
	1 1/4	32	32	140			117	89	64	13	1.6	4-16	94
	1 1/2	40	38	165			127	98.5	73	15	1.6	4-16	98
	2	50	50	178	216	191	152	120.5	92	16	1.6	4-19	108
	2 1/2	65	65	191	241	203	178	139.5	105	18	1.6	4-19	139.5
	3	80	76	203	283	216	190	152.5	127	19	1.6	4-19	145
	4	100	100	229	305	241	229	190.5	157	24	1.6	8-19	200
	5	125	125	356			254	216	186	24	1.6	8-22	221
PN 25	6	150	150	394	457	406	279	241.5	216	26	1.6	8-22	256
	8	200	200	457	521	470	343	298.5	270	29	1.6	8-22	334
	10	250	250	533	559	546	406	362	324	31	1.6	12-25	490
	3/4	20	20	152			105	75	55	16	2	4-14	75
	1	25	25	165			115	85	65	16	2	4-14	85
	1.25	32	32	178			140/135	100	78	18	2	4-18	110
	1.5	40	40	190			150/145	110	85	18	3	4-18	135
	2	50	50	216			165/160	125	100	20	3	4-18	142
	2.5	65	65	241			185/180	145	120	22	3	8-18	173
	3	80	80	283			200/195	160	135	22	3	8-18	183
	4	100	100	305			230	190	160	24	3	8-23	250
PN 40	5	125	125	381			270	220	188	28	3	8-25	315
	6	150	150	403			300	250	218	30	3	8-25	340
	8	200	200	502			360	310	310	34	3	12-25	395
	3/4	20	20	130			105	75	55	16	2	4-14	75
	1	25	25	140			115	85	65	16	2	4-14	85
	1.25	32	32	165			140/135	100	78	18	2	4-18	110
	1.5	40	40	165			150/145	110	85	18	3	4-18	135
	2	50	50	203			165/160	125	100	20	3	4-18	142
	2.5	65	65	222			185/180	145	120	22	3	8-18	173
	3	80	80	241			200/195	160	135	22	3	8-18	183
	4	100	100	305			235/230	190	160	24	3	8-23	255
	5	125	125	356			270	220	188	28	3	8-25	264
	6	150	150	394			300	250	218	30	3	8-25	290
	8	200	200	457			375	320	282	38	3	12-30	395

► FLOATING BALL VALVES



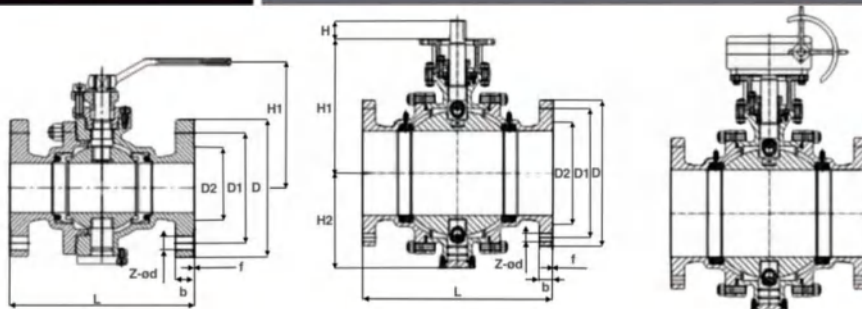
PN CLASS	NPS (in)	DN (mm)	Size (mm) S										
			d1	L			D	D1	D2	b	f	n-d0	H
				RF	BW	RTJ							
PN 50 CLASS 300	1/2	15	15	140			95	66.5	35	15	1.6	4-16	63
	3/4	20	20	152			117	82.5	43	16	1.6	4-19	63
	1	25	25	165			124	89	51	18	1.6	4-19	82
	1 1/4	32	32	178			133	98.5	64	19	1.6	4-19	94
	1 1/2	40	38	190			156	114.5	73	21	1.6	4-22	98
	2	50	50	216	216	232	165	127	92	23	1.6	8-19	108
	2 1/2	65	65	241	241	257	190	149	105	26	1.6	8-22	139.5
	3	80	46	283	283	298	210	168.5	127	29	1.6	8-22	145
	4	100	100	305	305	321	254	200	157	32	1.6	8-22	200
	5	125	125	381			279	235	186	35	1.6	8-22	221
	6	150	150	403	403	419	318	270	216	37	1.6	12-22	256
PN 64	8	200	200	502	521	518	381	330	270	42	1.6	12-25	334
	3/4	20	20	190			130/125	90	68	20	2	4-18	75
	1	25	25	216			140/135	100	78	22	2	4-18	85
	1.25	32	32	229			155/150	110	82	24	2	4-23	110
	1.5	40	40	241			170/165	125	95	24	3	4-23	135
	2	50	50	292			180/175	135	105	26	3	4-23	142
	2 1/2	65	65	330			205/200	160	130	28	3	8-23	173
	3	80	80	356			215/210	170	140	30	3	8-23	183
	4	100	100	406			250	200	168	32	3	8-25	250
	5	125	125	-			295	240	202	36	3	8-30	315
PN 110 CLASS 600	6	150	150	495			345/340	280	240	38	3	8-34	340
	8	200	200	597			405	345	300	44	3	12-34	395
	1/2	15	15	165			95	66.5	35	15	6.4	4-16	63
	3/4	20	20	190			118	82.5	43	16	6.4	4-19	63
	1	25	25	216			124	89	51	18	6.4	4-19	96
	1 1/4	32	32	229			133	98.5	64	21	6.4	4-19	105
	1 1/2	40	38	241			156	114.5	73	23	6.4	4-22	135
	2	50	50	292	292	295	165	127	92	26	6.4	8-19	153
	2 1/2	65	65	330	330	333	190	149	105	29	6.4	8-22	182
	3	80	76	356	356	359	210	168	127	32	6.4	8-22	205
	4	100	100	432	432	435	273	216	157	38	6.4	8-25	235

► TRUNNION MOUNTED BALL VALVES



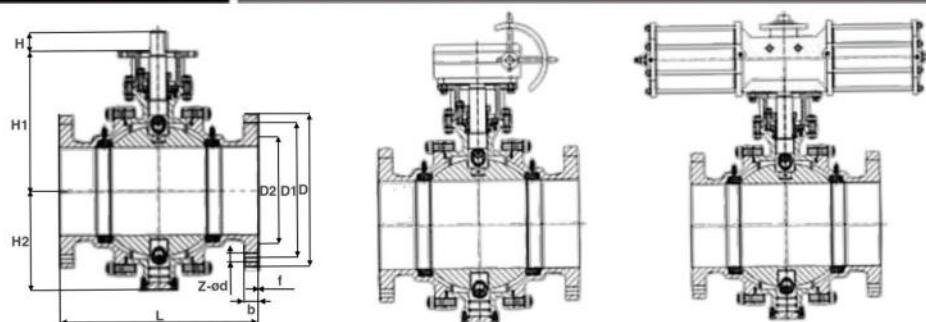
PN CLASS	NPS (in)	DN (mm)	Size (mm)											
			RF	L BW	RTJ	D	D1	D2	b	f	Z-od	H	H1	H2
PN16	2	50	203			165	125	102	18	3	4-18	20	96	92
	2 1/2	65	222			185	145	122	18	3	8-18	25	125	105
	3	80	241			200	160	138	20	3	8-18	25	150	120
	4	100	305			220	180	158	20	3	8-18	30	200	160
	5	125	356			250	210	188	22	3	8-18	40	220	200
	6	150	394			285	240	212	22	3	8-22	45	245	210
	8	200	457			340	295	268	24	3	12-22	50	280	224
	10	250	533			405	355	320	26	3	12-26	60	320	278
	12	300	610			460	410	378	28	4	12-26	70	337	306
	14	350	686			520	470	438	30	4	16-26	75	374	334
	16	400	762			580	525	490	32	4	16-30	75	408	358
	18	450	864			640	585	550	40	4	20-30	80	439	390
	20	500	914			715	650	610	44	4	20-33	90	492	434
	24	600	1067			840	770	725	54	4	20-36	105	588	523
	28	700	1245			910	840	795	58	4	24-36	115	644	658
	32	800	1372			1025	950	900	62	4	24-39	125	742	746
	36	900	1524			1125	1050	1000	64	4	28-39	140	812	807
	40	1000	1753			1255	1170	1115	68	4	28-42	150	900	898
	48	1200	2134			1485	1390	1330	78	4	32-48	170	1097	1066
	56	1400	2388			1685	1590	1530	84	4	36-48	200	1302	1253
PN20 CLASS 150	2	50	178	216	191	150	120.7	92.1	14.3	2	4-19	20	96	92
	2 1/2	65	191	241	203	180	139.7	104.8	15.9	2	4-19	25	125	105
	3	80	203	283	216	190	152.4	127	17.5	2	4-19	25	150	120
	4	100	229	305	241	230	190.5	157.2	22.3	2	8-19	30	200	160
	5	125	356			255	215.9	185.7	22.3	2	8-22	40	220	200
	6	150	394	457	406	280	241.3	215.9	23.9	2	8-22	45	245	210
	8	200	457	521	470	345	298.5	269.9	27	2	8-22	50	280	224
	10	250	533	559	546	405	362	323.8	28.6	2	12-26	60	320	278
	12	300	610	635	622	485	431.8	381	30.2	2	12-26	70	337	306
	14	350	686	762	699	535	476.3	412.8	33.4	2	12-29	75	374	334
	16	400	762	838	775	595	539.8	469.9	35	2	16-29	75	408	358
	18	450	864	914	876	635	577.9	533.4	38.1	2	16-32	80	439	390
	20	500	914	991	927	700	635	584.2	41.3	2	20-32	90	492	434
	24	600	1067	1143	1080	815	749.3	692.2	46.1	2	20-35	105	588	523
	26	650	1143	1245		870	806.4	749	66.7	2	24-35	110	627	564
	28	700	1245	1346		925	863.6	800	69.9	2	28-35	115	644	658
	30	750	1295	1397		985	914.4	857	73.1	2	28-35	120	691	704
	32	800	1372	1524		1060	977.9	914	79.4	2	28-41	125	742	746
	34	850	1473	1626		1110	1028.7	965	81	2	32-41	135	759	773
	36	900	1524	1727		1170	1085.8	1022	88.9	2	32-41	140	812	807
	40	1000	1753			1290	1200.2	1124	88.9	2	36-41	150	900	898
	42	1050	1855			1345	1257.3	1194	95.3	2	36-41	160	943	937
	48	1200	2134			1510	1422.4	1359	106.4	2	44-41	170	1097	1066
	54	1350	2325			1685	1593.8	1511	119.1	2	44-48	185	1150	1120
	56	1400	2388			1745	1651	1575	122.3	2	48-48	200	1302	1253

► TRUNNION MOUNTED BALL VALVES



PN CLASS	NPS (in)	DN (mm)	Size (mm)											
			L			D	D1	D2	b	f	Z-od	H	H1	H2
			RF	BW	RTJ									
PN 25	2	50	216			165	125	102	20	3	4-18	20	96	92
	2 1/2	65	241			185	145	122	22	3	8-18	25	125	105
	3	80	283			200	160	138	24	3	8-18	25	150	120
	4	100	305			235	190	158	24	3	8-22	30	200	160
	5	125	381			270	220	188	26	3	8-26	40	220	200
	6	150	403			300	250	218	28	3	8-26	45	245	210
	8	200	502			360	310	278	30	3	12-26	50	280	224
	10	250	568			425	370	335	32	3	12-30	60	320	278
	12	300	648			485	430	395	34	4	16-30	70	337	306
	14	350	762			555	490	450	38	4	16-33	75	374	334
	16	400	838			620	550	505	40	4	16-36	75	408	358
	18	450	914			670	600	555	46	4	20-36	80	439	390
	20	500	991			730	660	615	48	4	20-36	90	492	434
	24	600	1143			845	770	720	58	5	20-39	105	588	523
	28	700	1346			960	875	820	60	5	24-42	115	644	658
	32	800	1524			1085	990	930	66	5	24-48	125	742	746
PN 40	36	900	1727			1185	1090	1030	70	5	28-48	140	812	807
	40	1000	1930			1320	1210	1140	74	5	28-56	150	900	898
	48	1200	2388			1530	1420	1350	86	5	32-56	170	1097	1066
	56	1400	2642			1755	1640	1560	92	5	36-62	200	1302	1253
	2	50	216			165	125	102	20	3	4-18	25	100	95
	2 1/2	65	241			185	145	122	22	3	8-18	25	125	105
	3	80	283			200	160	138	24	3	8-18	30	150	120
	4	100	305			235	190	158	24	3	8-22	40	200	160
	5	125	381			270	220	188	26	3	8-26	45	220	200
	6	150	403			300	250	218	28	3	8-26	50	245	210
	8	200	502			375	320	285	34	3	12-30	65	275	230
	10	250	568			450	385	345	38	3	12-33	75	330	295
	12	300	648			515	450	410	42	4	16-33	85	355	330
	14	350	762			580	510	465	46	4	16-36	90	390	345
	16	400	838			660	585	535	50	4	16-39	90	430	390
	18	450	914			685	610	560	57	4	20-39	100	455	410
	20	500	991			755	670	615	57	4	20-42	115	500	465
	24	600	1143			890	895	735	72	5	20-48	135	590	545
PN 50	2	50	216	216	232	165	127	92.1	20.7	2	8-19	25	100	95
	2 1/2	65	241	241	257	190	149.2	104.8	23.9	2	8-22	25	125	105
	3	80	283	283	298	210	168.3	127	27	2	8-22	30	150	120
	4	100	305	305	321	255	200	157.2	30.2	2	8-22	40	200	160
	5	125	381	381		280	235	185.7	33.4	2	8-22	45	220	200
	6	150	403	403	419	320	269.9	215.9	35	2	12-22	50	245	210
	8	200	502	502	518	380	330.2	269.9	39.7	2	12-26	65	275	230
	10	250	568	568	584	445	387.4	323.8	46.1	2	16-29	75	330	295
	12	300	648	648	664	520	450.8	381	49.3	2	16-32	85	355	330
	14	350	762	762	778	585	514.4	412.8	52.4	2	20-32	90	390	345
	16	400	838	838	854	650	571.5	469.9	55.6	2	20-35	90	430	390
	18	450	914	914	930	710	628.6	533.4	58.8	2	24-35	100	455	410
	20	500	991	991	1010	775	685.8	584.2	62	2	24-35	115	500	465
	24	600	1143	1143	1165	915	812.8	692.2	68.3	2	24-42	135	590	545
	26	650	1245	1245	1270	970	876.3	749	77.8	2	28-45	145	630	580
	28	700	1346	1346	1372	1035	939.8	800	84.2	2	28-45	150	640	665
CLASS 300	30	750	1397	1397	1422	1090	997	857	90.5	2	28-48	155	700	730
	32	800	1524	1524	1553	1150	1054.1	914	96.9	2	28-51	160	745	765
	34	850	1626	1626	1654	1205	1104.9	965	100.1	2	32-51	175	760	800
	36	900	1727	1727	1756	1270	1168.4	1022	103.2	2	32-54	190	805	825
	40	1000	1930			1240	1155.7	1086	1240	2	32-45	210	?	920
	42	1050	2032			1290	1206.5	1137	1290	2	32-45	215	968	950
	48	1200	2388			1465	1372	1302	1465	2	32-51	235	1100	1100
	54	1350	2578			1660	1549	1467	1660	2	28-60	250	1225	1210
	56	1400	2642			1710	1600	1518	1710	2	28-60	275	1285	1270

► TRUNNION MOUNTED BALL VALVES



PN CLASS	NPS (in)	DN (mm)	Size (mm)											
			L			D	D1	D2	b	f	Z-od	H	H1	H2
			RF	BW	RTJ									
PN 63	2	50	292			180	135	102	26	3	4-22	25	102	98
	2 1/2	65	330			205	160	122	26	3	8-22	25	130	115
	3	80	356			215	170	138	28	3	8-22	30	165	128
	4	100	406			250	200	158	30	3	8-26	40	210	160
	5	125	432			295	240	188	34	3	8-30	45	230	180
	6	150	495			345	280	218	36	3	8-33	50	250	200
	8	200	597			415	345	285	42	3	12-36	50	288	255
	10	250	673			470	400	345	46	3	12-36	55	330	308
	12	300	762			530	460	410	52	4	16-36	70	378	348
	14	350	826			600	525	465	56	4	16-39	85	394	360
	16	400	902			670	585	535	60	4	16-42	95	430	410
	2	50	292			165	127	92.1	25.4	7	8-19	25	102	98
PN 64 CLASS 400	2 1/2	65	330			190	149.2	104.8	28.6	7	8-22	25	130	115
	3	80	356			210	168.3	127	31.8	7	8-22	30	165	128
	4	100	406	406	410	255	200	157.2	35	7	8-22	40	210	160
	5	125	457	457		280	235	185.7	38.1	7	8-22	45	230	180
	6	150	495	495	498	320	269.9	215.9	41.3	7	12-22	50	250	200
	8	200	597	597	600	380	330.2	269.9	47.7	7	12-26	50	288	255
	10	250	673	673	676	445	387.4	323.8	54	7	16-29	55	330	308
	12	300	762	762	765	520	450.8	381	57.2	7	16-32	70	378	348
	14	350	826	826	829	585	514.4	412.8	60.4	7	20-32	85	394	360
	16	400	902	902	905	650	571.5	469.9	63.5	7	20-35	95	430	410
	18	450	978	978	981	710	628.6	533.4	66.7	7	24-35	110	467	430
	20	500	1054	1054	1060	775	685.8	584.2	69.9	7	24-38	120	500	492
	24	600	1232	1232	1241	915	812.8	692.2	76.2	7	24-45	130	594	570
	26	650	1308	1308	1321	970	876.3	749	88.9	7	28-48	150	630	618
	28	700	1397	1397	1410	1035	939.8	800	95.3	7	28-51	180	665	692
	30	750	1524	1524	1537	1090	997	857	101.6	7	28-54	190	741	800
	32	800	1651	1651	1667	1150	1054.1	914	108	7	28-54	205	756	804
	34	850	1778	1778	1794	1205	1104.9	965	111.2	7	28-54	215	782	817
	36	900	1880	1880	1895	1270	1168.4	1022	114.3	7	32-54	225	869	945
	40	1000	-			1270	1174.8	1092	130.2	7	32-51	235	916	980
	42	1050	-			1320	1225.6	1143	133.4	7	32-51	255	995	1110
	48	1200	-			1510	1403.4	1308	152.4	7	28-60	280	1132	1265
	54	1350	-			1700	1581.2	1470	169.9	7	28-67	300	1200	1280
	56	1400	-			1755	1632	1527	174.7	7	32-67	325	1290	1350
	60	1500	-			1885	1752.6	1635	185.8	7	32-73	360	1380	1420

► TRUNNION MOUNTED BALL VALVES



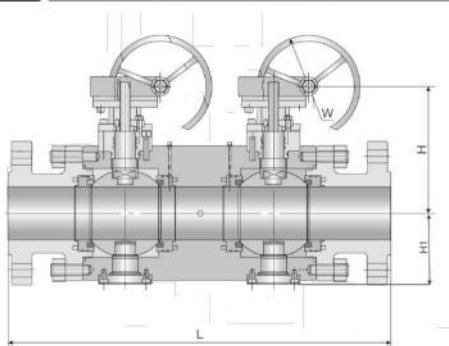
PN CLASS	NPS (in)	DN (mm)	Size (mm)											
			L			D	D1	D2	b	f	Z-od	H	H1	H2
			RF	BW	RTJ									
PN 100	2	50	292			195	145	102	30	3	4-26	30	102	98
	2.5	65	330			220	170	122	34	3	8-26	35	130	115
	3	80	356			230	180	138	36	3	8-26	40	165	128
	4	100	432			265	210	158	40	3	8-30	45	210	160
	5	125	508			315	250	188	40	3	8-33	50	230	180
	6	150	559			355	290	218	44	3	12-33	55	250	200
	8	200	660			430	360	285	52	3	12-36	70	288	255
	10	250	787			505	430	345	60	3	12-39	85	330	308
	12	300	838			585	500	410	68	4	16-42	95	378	348
14	350	889			655	560	465	74	4	16-48	110	394	360	
PN 110	2	50	292	292	295	165	127	92.1	25.4	7	8-19	30	102	98
	2.5	65	330	330	333	190	149.2	104.8	28.6	7	8-22	35	130	115
	3	80	356	356	359	210	168.3	127	31.8	7	8-22	40	165	128
	4	100	432	432	435	275	215.9	157.2	38.1	7	8-26	45	210	160
	5	125	508	508		330	266.7	185.7	44.5	7	8-29	50	230	180
	6	150	559	559	562	355	292.1	215.9	47.7	7	12-29	55	250	200
	8	200	660	660	664	420	349.2	269.9	55.6	7	12-32	70	288	255
	10	250	787	787	791	510	431.8	323.8	63.5	7	16-35	85	330	308
	12	300	838	838	841	560	489	381	66.7	7	20-35	95	378	348
CLASS 600	14	350	889	889	892	605	527	412.8	69.9	7	20-39	110	394	360
	16	400	991	991	994	685	603.2	469.9	76.2	7	20-42	120	430	410
	18	450	1092	1092	1095	745	654	533.4	82.6	7	20-45	130	467	430
	20	500	1194	1194	1200	815	723.9	584.2	88.9	7	20-45	150	500	492
	24	600	1397	1397	1407	940	838.2	692.2	101.6	7	24-51	180	594	570
	26	650	1448	1448	1461	1015	914.4	749	108	7	28-51	190	630	618
	28	700	1549	1549	1562	1075	965.2	800	111.2	7	28-54	205	665	692
	30	750	1651	1651	1664	1130	1022.1	857	114.3	7	28-54	215	741	800
	32	800	1778	1778	1794	1195	1079.5	914	117.5	7	28-60	225	756	804
	34	850	1930	1930	1946	1245	1130.3	965	120.7	7	28-60	235	782	817
	36	900	2083	2083	2099	1315	1193.8	1022	123.9	7	28-67	255	869	945
	40	1000	2337			1320	1212.8	1111	158.8	7	32-60	280	916	980
	42	1050	2387			1405	1282.7	1168	168.3	7	28-67	300	995	1110
	48	1200	2540			1595	1460.5	1334	189	7	32-73	325	1132	1265
	54	1350	2635			1780	1632	1492	209.6	7	32-80	360	1200	1280
	56	1400	2667			1855	1695.4	1543	217.5	7	32-86	395	1290	1350
	60	1500	2950			1995	1822.4	1657	233.4	7	28-92	450	1380	1420
PN 150	2	50	368	368	371	215	165.1	92.1	38.1	7	8-26	40	104	103
	2.5	65	419	419	422	245	190.5	104.8	41.3	7	8-29	40	135	115
	3	80	381	381	384	240	190.5	127	38.1	7	8-26	45	163	132
	4	100	457	457	460	290	235	157.2	44.5	7	8-32	50	211	169
	5	125	-	-		350	279.4	185.7	50.8	7	8-35	60	235	185
	6	150	610	610	613	380	317.5	215.9	55.6	7	12-32	70	259	213
	8	200	737	737	740	470	393.7	269.9	63.5	7	12-39	95	297	264
	10	250	838	838	841	545	469.9	323.8	69.9	7	16-39	95	342	333
	12	300	965	965	968	610	533.4	381	79.4	7	20-39	110	384	379
	14	350	1029	1029	1038	640	558.8	412.8	85.8	7	20-42	120	398	368
	16	400	1130	1130	1140	705	616	469.9	88.9	7	20-45	145	436	437
	18	450	1219	1219	1232	785	685.8	533.4	101.6	7	20-51	165	484	497
	20	500	1321	1321	1334	855	749.3	584.2	108	7	20-54	200	532	503
	24	600	1549	1549	1568	1040	901.7	692.2	139.7	7	20-67	220	617	633
	26	650	1651			1085	952.5	749	139.7	7	20-73	230	645	660
	28	700	1753			1170	1022.4	800	142.9	7	20-80	245	674	706
	30	750	1880			1230	1085.8	857	149.3	7	20-80	260	723	777
	32	800	2032			1315	1155.7	914	158.8	7	20-86	270	784	809
	34	850	2159			1395	1225.6	965	165.1	7	20-92	285	807	852
	36	900	2286			1460	1289	1022	171.5	7	20-92	300	848	898
	40	1000	2410			1510	1339.8	1162	196.9	7	24-92	330	920	960
	42	1050	2515			1560	1390.8	1213	206.4	7	24-92	350	1000	1060
	48	1200	2620			1785	1587.5	1384	233.4	7	24-105	400	1140	1200

► TRUNNION MOUNTED BALL VALVES



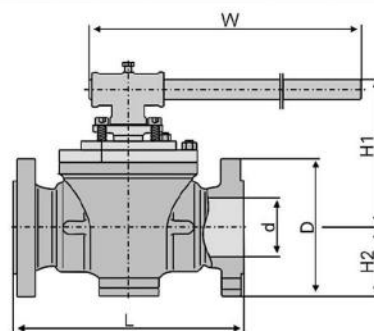
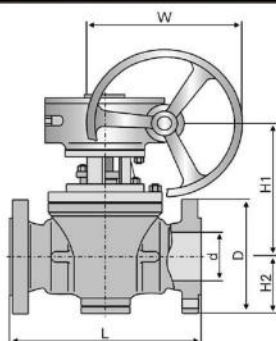
PN CLASS	NPS (in)	DN (mm)	Size (mm)											
			L			D	D1	D2	b	f	Z-od	H	H1	H2
			RF	BW	RTJ									
PN 160	2	50	368			195	145	102	30	3	4-26	40	104	103
	2.5	65	419			220	170	122	34	3	8-26	40	135	115
	3	80	381			230	180	138	36	3	8-26	45	163	132
	4	100	457			265	210	158	40	3	8-30	50	211	169
	5	125	559			315	250	188	44	3	8-33	60	235	185
	6	150	610			355	290	218	50	3	12-33	70	259	213
	8	200	737			430	360	285	60	3	12-36	95	297	264
	10	250	838			515	430	345	68	3	12-42	95	342	333
	12	300	965			585	500	410	78	4	16-42	110	384	379
PN 250	2	50	368			200	150	102	38	3	8-26	40	106	104
	2.5	65	419			230	180	122	42	3	8-26	45	135	115
	3	80	470			255	200	138	46	3	8-30	50	167	128
	4	100	546			300	235	158	54	3	8-33	65	179	170
	5	125	673			340	275	188	60	3	12-33	70	210	203
	6	150	705			390	320	218	68	3	12-36	80	260	233
	8	200	832			485	400	285	82	3	12-42	105	304	290
	10	250	991			585	490	345	100	3	16-48	130	363	352
	12	300	1130			690	590	410	120	4	16-52	145	419	425
PN 260 CLASS 1500	2	50	368	368	371	215	165.1	92.1	38.1	7	8-26	40	106	104
	2.5	65	419	419	422	245	190.5	104.8	41.3	7	8-29	45	135	115
	3	80	470	470	473	265	203.2	127	47.7	7	8-32	50	167	128
	4	100	546	546	549	310	241.3	157.2	54	7	8-35	65	179	170
	5	125	-	-	-	375	292.1	185.7	73.1	7	8-42	70	210	203
	6	150	705	705	711	395	317.5	215.9	82.6	7	12-39	80	260	233
	8	200	832	832	841	485	393.7	269.9	92.1	7	12-45	105	304	290
	10	250	991	991	1000	585	482.6	323.8	108	7	12-51	130	363	352
	12	300	1130	1130	1146	675	571.5	381	123.9	7	16-55	145	417	425
	14	350	1257	1257	1276	750	635	412.8	133.4	7	16-60	165	437	426
	16	400	1384	1384	1407	825	704.8	469.9	146.1	7	16-68	185	475	493
	18	450	1537			915	774.7	533.4	162	7	16-74	200	563	608
PN 320	20	500	1664			985	931.8	584.2	177.8	7	16-80	220	617	645
	24	600	1943			1170	990.6	692.2	203.2	7	16-94	245	698	724
	2	50	451			210	160	102	42	3	8-26	45	120	127
	2.5	65	508			255	200	122	51	3	8-30	50	145	153
	3	80	578			275	220	138	55	3	8-30	60	177	198
	4	100	673			335	265	158	65	3	8-36	75	227	233
	5	125	-			380	310	188	75	3	12-36	85	245	245
	6	150	914			425	350	218	84	3	12-39	105	264	252
	8	200	1022			525	440	285	103	3	16-42	130	383	339
PN 420 CLASS 2500	10	250	1270			640	540	345	125	3	16-52	155	453	433
	2	50	451			235	180	102	52	3	8-30	45	120	127
	2.5	65	508			290	225	122	64	3	8-33	50	145	153
	3	80	578			305	240	138	68	3	8-33	60	177	198
	4	100	673			370	295	158	80	3	8-39	75	227	233
	5	125	-			415	340	188	92	3	12-39	85	245	245
	6	150	914			475	390	218	105	3	12-42	105	264	252
	8	200	1022			585	490	285	130	3	16-48	130	383	339
	2	50	451	451	454	235	171.4	92.1	50.9	7	8-29	45	120	127
	2.5	65	508	508	540	265	196.8	104.8	57.2	7	8-32	50	145	153
	3	80	578	578	584	305	228.6	127	66.7	7	8-35	60	177	198
	4	100	673	673	683	355	273	157.2	76.2	7	8-42	75	227	233
	5	125	-	-	-	420	323.8	185.7	92.1	7	8-48	85	245	245
	6	150	914	914	927	485	368.3	215.9	108	7	8-54	105	264	252
	8	200	1022	1022	1038	550	438.2	269.9	127	7	12-54	130	383	339
	10	250	1270	1270	1292	675	539.8	323.8	165.1	7	12-67	155	453	422
	12	300	1422	1422	1445	760	619.1	381	184.2	7	12-73	175	520	482

► DOUBLE BLOCK AND BLEED



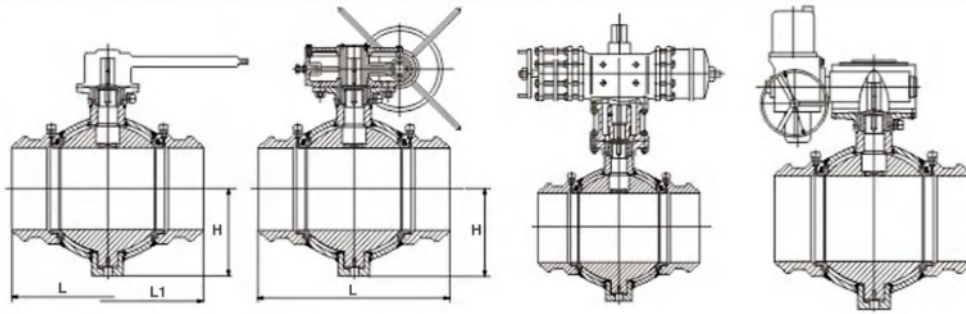
PN CLASS	NPS (in)	DN (mm)	Size (mm)					Weight (lbs)
			L			H	H1	
			RF	BWE	RTJ			
CLASS 150	2	50	312	378	334	98	105	81
	3	80	355	495	378	127	130	165
	4	100	401	534	422	165	130	330
	6	150	690	800	711	235	288	455
	8	200	800	912	823	239	288	660
	10	250	933	978	956	277	326	1056
	12	300	1068	1111	1089	316	364	1518
	14	350	1201	1334	1223	341	395	2031
	16	400	1334	1467	1356	383	437	2886
	18	450	1512	1600	1533	417	471	3480
	20	500	1600	1734	1622	354	508	4473
	24	600	1867	2000	1890	529	590	6961
CLASS 300	2	50	378	378	406	102	120	92
	3	80	495	495	522	148	164	176
	4	100	534	534	562	165	130	374
	6	150	705	800	733	206	237	583
	8	200	879	912	907	239	288	770
	10	250	994	978	1022	277	326	1166
	12	300	1134	1111	1162	316	364	1681
	14	350	1334	1334	1362	341	395	2321
	16	400	1467	1467	1495	383	437	3247
	18	450	1600	1600	1628	432	486	4490
	20	500	1734	1734	1768	478	532	5925
	24	600	2000	2000	2039	578	640	6961
CLASS 600	2	50	511	511	516	105	129	99
	3	80	623	623	628	147	164	176
	4	100	756	756	761	165	184	462
	6	150	978	978	984	212	237	693
	8	200	1155	1155	1162	254	304	1100
	10	250	1377	1377	1384	303	359	1980
	12	300	1467	1467	1472	330	378	2347
	14	350	1556	1556	1561	360	414	2974
	16	400	1734	1734	1740	401	455	4385
	18	450	1911	1911	1916	449	503	5775
	20	500	2090	2090	2100	485	543	7445
	24	600	2445	2445	2462	584	646	12269

► TOP ENTRY BALL VALVES



CLASS	NPS (in)	DN (mm)	Size (mm)					Weight (Kg)
			G	L	H1	H2	W	
Class 150	2	50	51	292	170	76	285	46
	3	80	76	356	21	95	285	83
	4	100	102	432	250	115	400	156
	6	150	152	559	265	140	*400	256
	8	200	203	660	355	172	*400	453
	10	250	254	787	385	203	*600	622
	12	300	305	838	400	242	*600	747
	14	350	337	889	450	267	*600	959
	16	400	387	991	510	299	*600	1220
	18	450	438	1092	565	318	*600	1640
	20	500	489	1194	620	349	*600	2118
	24	600	591	1397	680	407	*700	2950
Class 300	2	50	51	292	170	83	285	49
	3	80	76	356	21	105	285	87
	4	100	102	432	250	127	400	164
	6	150	152	559	265	159	*400	272
	8	200	203	660	355	191	*400	479
	10	250	254	787	385	222	*600	657
	12	300	305	838	400	261	*600	783
	14	350	337	889	450	292	*600	1007
	16	400	387	991	510	324	*600	1281
	18	450	438	1092	565	256	*600	1722
	20	500	489	1194	620	388	*600	2224
	24	600	591	1397	680	457	*760	3100

FULL WELDED TRUNNION PIPELINE BALL VALVES

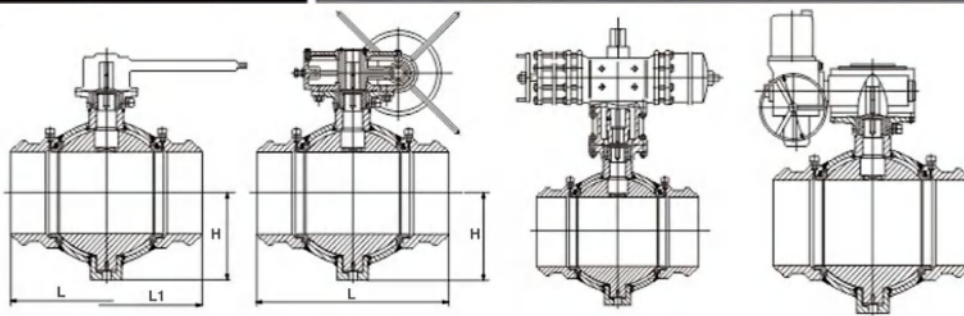


PN CLASS	NPS (in)	DN (mm)	Size (mm)				Weight (kg)		Torque (N-M)
			L	L1	L2	H	Flange	BW	
			(RF)	(BW)	(RTJ)				
PN 16 PN 20 CLASS 150	2	50	178	216	191	100	18	20	57
	2 1/2	65	191	241	203	110	22	24.5	71
	3	80	203	283	216	130	28	34	95
	4	100	229	305	241	151	52	45	192
	6	150	394	457	406	201	91	102	485
	8	200	457	521	470	254	194	204	832
	10	250	533	559	546	308	320	295	1105
	12	300	610	635	622	368	549	499	1655
	14	350	686	762	699	372	603	558	2695
	16	400	762	838	775	407	749	703	3164
	18	450	864	914	876	489	1055	998	3793
	20	500	914	991	927	529	1501	1252	5500
	22	550	991	1092		566	1578	1592	6650
	24	600	1067	1143	1080	602	2096	1932	7529
	26	650	1143	1245		673	2903	2540	8693
	28	700	1245	1346		708	3266	2948	10770
	30	750	1295	1397		750	4309	3992	12365
	32	800	1372	1524		786	5060	4598	14070
	34	850	1473	1626		817	6123	5443	21148
	36	900	1524	1727		858	6972	6577	22987
	40	1000	1753	1956		1020	8222	7476	26059
	42	1050	1855	2083		1061	9595	8709	28149
	48	1200	2134	2388		1166	13556	12437	42776
	56	1400	2489	2489		1280	21301	19773	65654
	60	1500	2640	2640		1350	-	-	85654

SPHERICAL BODY TYPE

PN CLASS	NPS (IN)	DN (MM)	Size (mm)				Weight (kg)		Torque (N-M)
			L	L1	L2	H	Flange	BW	
			(RF)	(BW)	RTJ				
PN 25 PN 40 PN 50 CLASS 300	2	50	216	216	232	100	23	20	99
	2 1/2	65	241	241	257	110	27	29	124
	3	80	283	283	298	130	36	34	212
	4	100	305	305	321	151	57	45	335
	6	150	403	457	419	201	113	102	544
	8	200	502	521	518	254	206	204	1250
	10	250	568	559	584	308	340	295	1736
	12	300	648	635	664	368	578	499	2388
	14	350	762	762	778	372	621	558	3224
	16	400	838	838	854	407	782	703	5139
	18	450	914	914	930	489	1225	998	7970
	20	500	991	991	1010	529	1542	1252	10570
	22	550	1092	1092	1114	566	1837	1592	12140
	24	600	1143	1143	1165	602	2445	1932	17240
	26	650	1245	1245	1270	673	3005	2540	20340
	28	700	1346	1346	1372	708	3504	2948	25069
	30	750	1397	1397	1422	750	4536	3992	27640
	32	800	1524	1524	1553	786	5402	4598	29550
	34	850	1626	1626	1654	817	6668	5443	31558
	36	900	1727	1727	1756	858	7494	7031	35170
	40	1000	1956	1956		1020	9584	8776	39115
	42	1050	2083	2083		1061	11084	9709	42414
	48	1200	2170	2170		1166	15092	13037	71868
	56	1400	2743	2743		1280	22905	20773	108550

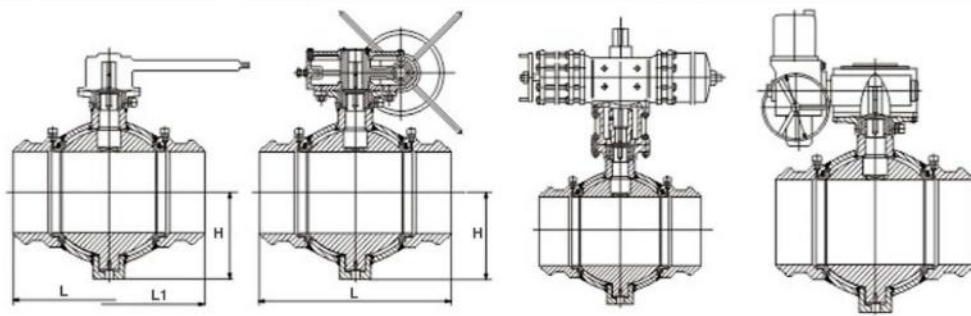
FULL WELDED TRUNNION PIPELINE BALL VALVES



SPHERICAL BODY TYPE

PN CLASS	NPS (in)	DN (mm)	Size (mm)				Weight (kg)		Torque (N-M)
			L	L1	L2	H	Flange	BW	
			(RF)	(BW)	(RTJ)				
PN 63 PN 64 CLASS 400	2	50	292	292	295	100	27	20	124
	2 1/2	65	330	330	333	112	31	27	155
	3	80	356	356	359	130	39	34	265
	4	100	406	406	410	151	68	45	467
	6	150	495	495	498	201	136	102	650
	8	200	597	597	600	254	249	204	1806
	10	250	673	673	676	308	386	295	2638
	12	300	762	762	765	368	635	499	2929
	14	350	826	826	829	382	748	558	3971
	16	400	902	902	905	453	1009	803	6307
	18	450	978	978	981	489	1293	998	9165
	20	500	1054	1054	1060	562	1701	1361	12155
	22	550	1143	1143	1153	600	2155	1792	15175
	24	600	1232	1232	1241	636	2540	2155	21550
	26	650	1308	1308	1321	673	3221	2540	25426
	28	700	1397	1397	1410	708	3883	2948	31336
	30	750	1524	1524	1537	750	4808	4002	34550
	32	800	1651	1651	1667	822	5925	4983	36937
	34	850	1778	1778	1794	894	6985	5679	39447
	36	900	1880	1880	1895	935	8165	7131	43962
40	1000	1981	1981	-	1020	11567	10092	48894	
42	1050	2057	-	-	1061	13041	11226	50300	
48	1200	2311	-	-	1219	17592	15286	80302	
PN 100 PN 110 CLASS 600	2	50	292	292	295	100	27	20	168
	2 1/2	65	330	330	333	112	31	25	210
	3	80	356	356	359	130	39	34	360
	4	100	432	432	435	151	75	45	572
	6	150	559	559	562	201	163	102	912
	8	200	660	660	664	254	295	204	2177
	10	250	787	787	791	308	454	295	3093
	12	300	838	838	841	368	685	499	4282
	14	350	889	889	892	382	866	558	7458
	16	400	991	991	994	453	1089	803	9310
	18	450	1092	1092	1095	489	1340	998	14693
	20	500	1194	1194	1200	562	1860	1361	20011
	22	550	1295	1295	1305	600	2449	1792	24785
	24	600	1397	1397	1407	636	2971	2155	31226
	26	650	1448	1448	1461	673	3538	2540	35184
	28	700	1549	1549	1562	784	4309	3039	38987
	30	750	1651	1651	1664	826	5443	4137	41832
	32	800	1778	1778	1794	860	6285	4850	63865
	34	850	1930	1930	1946	894	7269	5579	71720
	36	900	2083	2083	2099	935	8664	7031	89020
40	1000	2337	2337	2366	1067	12143	10433	109900	
42	1050	2439	2439	2467	1109	13835	11567	121165	
48	1200	2540	2540	2540	1300	18511	15011	145345	
56	1400	2949	2949	2949	1505	27858	25358	169230	

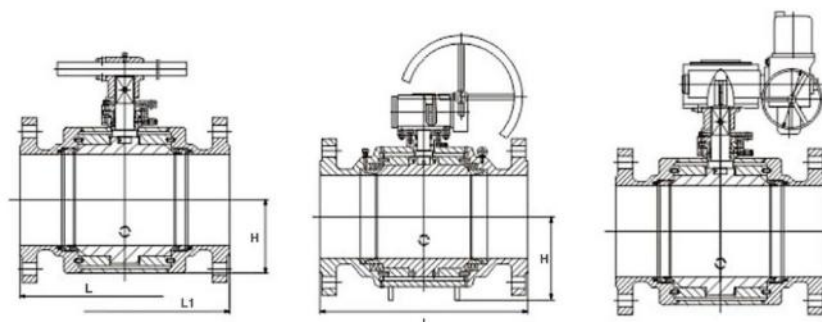
FULL WELDED TRUNNION PIPELINE BALL VALVES



SPERICAL BODY TYPE

PN CLASS	NPS (in)	DN (mm)	Size (mm)				Weight (kg)		Torque (N-M)
			L	L1	L2	H	Flange	BW	
			(RF)	(BW)	(RTJ)				
PN 150 PN 160 CLASS 900	2	50	368	368	371	100	45	20	228
	2 1/2	65	419	419	422	110	53	35	263
	3	80	381	381	384	124	64	54	512
	4	100	457	457	460	172	113	86	946
	6	150	610	610	613	213	238	186	1784
	8	200	737	737	740	254	549	268	4116
	10	250	838	838	841	327	601	458	5910
	12	300	965	965	968	368	1021	612	10137
	14	350	1029	1029	1038	442	1474	977	14141
	16	400	1130	1130	1140	483	1814	1111	18866
	18	450	1219	1219	1232	524	2404	1782	22400
	20	500	1321	1321	1334	615	3221	2381	28544
	22	550	-	-	-	-	-	-	-
	24	600	1549	1549	1568	713	4763	2926	43276
	26	650	1651	1651	1673	743	5285	3245	48580
	28	700	1753	1753	1775	880	6511	4230	60000
	30	750	1880	1880	1902	826	7938	5216	76000
	32	800	2032	2032	2054	905	9037	6355	90195
	34	850	2159	2159	2188	940	10357	7486	100460
	36	900	2286	2286	2315	981	11612	8538	131875
PN 250 PN 260 CLASS 1500	2	50	368	368	371	100	45	20	390
	2 1/2	65	419	419	422	110	62	35	448
	3	80	470	470	473	124	82	54	931
	4	100	546	546	549	172	136	86	1524
	6	150	705	705	711	213	324	186	2934
	8	200	832	832	841	278	703	488	7215
	10	250	991	991	1000	385	907	714	10990
	12	300	1130	1130	1146	440	1474	828	16103
	14	350	1257	1257	1276	442	1905	1157	24518
	16	400	1384	1384	1407	483	2449	1338	29630
	18	450	1537	1537	1559	576	2880	2325	34392
	20	500	1664	1664	1686	615	4200	2733	40918
	22	55	-	-	-	-	-	-	-
	24	600	-	-	1972	713	7371	4264	65351
PN 420 CLASS 2500	2	50	451	451	454	115	52	43	589
	2 1/2	65	508	508	540	128	78	62	736
	3	80	578	578	584	144	107	85	1577
	4	100	673	673	683	184	214	173	1965
	6	150	914	914	927	248	428	334	5501
	8	200	1022	1022	1038	326	950	760	11786
	10	250	1270	1270	1292	378	1325	983	13222
	12	300	1422	1422	1445	423	2044	1478	20075

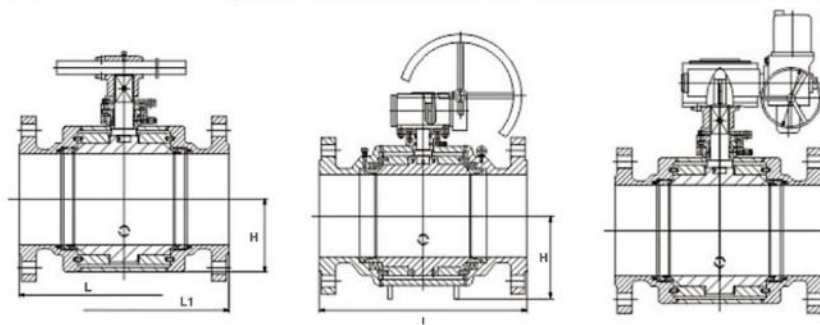
FULL WELDED TRUNNION PIPELINE BALL VALVES



TUBE SHAPE BODY

PN CLASS	NPS (in)	DN (mm)	Size (mm)				Weight (Kg)	Torque (N-M)
			L	L1	L2	H		
			(RF)	(BW)	RTJ			
PN16/20 CLASS 150	2	50	178	216	191	100	28	57
	2 1/2	65	191	241	203	110	39	71
	3	80	203	283	216	125	49	95
	4	100	229	305	241	160	88	192
	6	150	394	457	406	185	160	485
	8	200	457	521	470	222	248	832
	10	250	533	559	546	280	379	1105
	12	300	610	635	622	303	571	1655
	14	350	686	762	699	330	759	2695
	16	400	762	838	775	355	1150	3164
	18	450	864	914	876	390	1192	3793
	20	500	914	991	927	430	1769	5500
	22	550	991	1092		475	2367	6650
	24	600	1067	1143	1080	520	3450	7529
	26	650	1143	1245		560	4050	8693
	28	700	1245	1346		650	4830	10770
	30	750	1295	1397		700	5960	12365
	32	800	1372	1524		745	7480	14070
	34	850	1473	1626		775	8032	21148
	36	900	1524	1727		805	9100	22987
	40	1000	1753	1956		900	14100	26059
	42	1050	1790	2083		935	15320	28149
	48	1200	1995	2388		1070	22000	42776
	56	1400	2489	2489		1250	34150	65654
	60	1500	2640	2640		1350	42500	85654
	64	1600	-			-	-	-
PN25/40/50 CLASS 300	2	50	216	216	232	100	29	99
	2 1/2	65	241	241	257	110	40	124
	3	80	283	283	298	125	57	212
	4	100	305	305	321	160	97	335
	6	150	403	403	419	203	185	544
	8	200	502	521	518	232	287	1250
	10	250	568	559	584	298	507	1736
	12	300	648	635	664	333	740	2388
	14	350	762	762	778	350	1038	3224
	16	400	838	838	854	398	1452	5139
	18	450	914	914	930	410	1648	7970
	20	500	991	991	1010	470	2207	10570
	22	550	1092	1092	1114	485	2797	12140
	24	600	1143	1143	1165	550	3940	17240
	26	650	1245	1245	1270	585	4670	20340
	28	700	1346	1346	1372	670	5780	15069
	30	750	1397	1397	1422	730	6600	27640
	32	800	1524	1524	1553	770	7940	29550
	34	850	1626	1626	1654	800	9100	31558
	36	900	1727	1727	1756	825	10150	35170
	40	1000	1956	1956		920	13800	39115
	42	1050	2083	2083		955	16120	42414
	48	1200	2170	2170		1105	24070	71868
	56	1400	2743	2743		1275	38200	108550

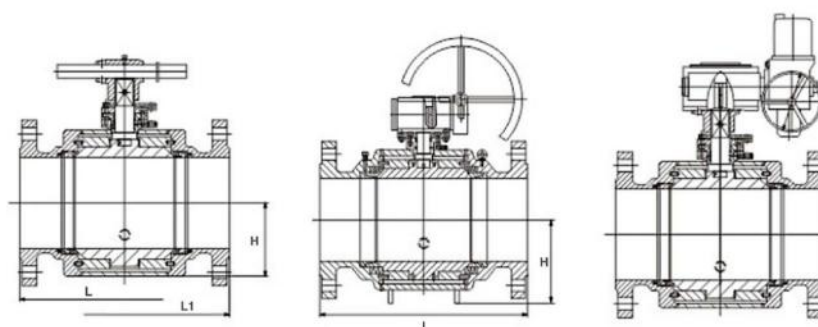
FULL WELDED TRUNNION PIPELINE BALL VALVES



TUBE SHAPE BODY

PN CLASS	NPS (in)	DN (mm)	Size (mm)				Weight (Kg)	Torque (N-M)
			L	L1	L2	H		
			(RF)	(BW)	(RTJ)			
PN 63 PN 64 CLASS 400	2	50	292	292	295	100	25	124
	2 1/2	65	330	330	333	115	35	155
	3	80	356	356	359	130	56	265
	4	100	406	406	410	162	90	467
	6	150	495	495	498	203	249	650
	8	200	597	597	600	257	458	1806
	10	250	673	673	676	310	676	2638
	12	300	762	762	765	350	939	2929
	14	350	826	826	829	360	1166	3971
	16	400	902	902	905	413	1397	6307
	18	450	978	978	981	430	1960	9165
	20	500	1054	1054	1060	490	2649	12155
	22	550	1143	1143	1153	510	3286	15175
	24	600	1232	1232	1241	570	3936	21550
	26	650	1308	1308	1321	620	4990	25426
	28	700	1397	1397	1410	690	5718	31336
	30	750	1524	1524	1537	750	6850	34550
	32	800	1651	1651	1667	780	7766	36937
	34	850	1778	1778	1794	815	9507	39447
	36	900	1880	1880	1895	840	11077	43962
40	1000	2250	2250	-	940	14138	48894	
42	1050	-	-	-	980	16679	50300	
48	1200	-	-	-	1120	23179	80302	
PN 100 PN 110 CLASS 600	2	50	292	292	295	100	33	168
	2 1/2	65	330	330	333	115	43	210
	3	80	356	356	359	130	64	360
	4	100	432	432	435	162	124	572
	6	150	559	559	562	203	255	912
	8	200	660	660	664	257	487	2177
	10	250	787	787	791	310	760	3093
	12	300	838	838	841	350	984	4282
	14	350	889	889	892	360	1266	7458
	16	400	991	991	994	413	1532	9310
	18	450	1092	1092	1095	430	2097	14693
	20	500	1194	1194	1200	490	2640	20011
	22	550	1295	1295	1305	510	3790	24785
	24	600	1397	1397	1407	570	4740	31226
	26	650	1448	1448	1461	620	5650	35184
	28	700	1549	1549	1562	690	6760	38987
	30	750	1651	1651	1664	750	8380	41832
	32	800	1778	1778	1794	780	9740	63865
	34	850	1930	1930	1946	815	11340	71720
	36	900	2083	2083	2099	840	13300	89020
40	1000	2337	2337	2366	940	18340	109900	
42	1050	2439	2439	2467	980	21550	121165	
48	1200	2540	2540	2540	1120	31500	145345	
56	1400	2949	2949	2949	1275	48050	169230	

FULL WELDED TRUNNION PIPELINE BALL VALVES



TUBE SHAPE BODY

PN CLASS	NPS (in)	DN (mm)	Size (mm)				Weight (Kg)	Torque (N-M)
			L	L1	L2	H		
			(RF)	(BW)	(RTJ)			
PN 150 PN 160 CLASS 900	2	50	368	368	371	100	50	228
	2 1/2	65	419	419	422	118	61	263
	3	80	381	381	384	130	76	512
	4	100	457	457	460	167	150	946
	6	150	610	610	613	251	367	1784
	8	200	737	737	740	280	600	4116
	10	250	838	838	841	340	1027	5910
	12	300	965	965	968	390	1558	10137
	14	350	1029	1029	1038	442	1765	14141
	16	400	1130	1130	1140	490	2157	18866
	18	450	1219	1219	1232	500	2860	22400
	20	500	1321	1321	1334	500	4220	28544
	22	550	-	-	-	-	-	-
	24	600	1549	1549	1568	630	7150	43276
	26	650	1651	1651	1673	650	8040	48580
	28	700	1753	1753	1775	710	10840	60000
	30	750	1880	1880	1902	780	12210	76000
	32	800	2032	2032	2054	810	14992	90195
	34	850	2159	2159	2188	850	17230	100460
	36	900	2286	2286	2315	900	19920	131875
40	1000	2283	2100	2311	980	24251	-	
42	1050	2438	2200	2461	990	28660	-	
48	1200	2769	2300	2797	1199	36156	-	
PN 250 PN 260 CLASS 1500	2	50	368	368	371	105	53	390
	2 1/2	65	419	419	422	120	63	448
	3	80	470	470	473	130	98	931
	4	100	546	546	549	167	200	1524
	6	150	705	705	711	270	485	2934
	8	200	832	832	841	300	827	7215
	10	250	991	991	1000	360	1507	10990
	12	300	1130	1130	1146	423	2272	16103
	14	350	1257	1257	1276	460	2880	24518
	16	400	1384	1384	1407	510	4120	29630
	18	450	1537	1537	1559	600	6260	34392
	20	500	1664	1664	1686	650	9120	40918
	22	550	-	-	-	-	-	-
	24	600	-	-	1972	720	14320	65351
PN 420 CLASS 2500	2	50	451	451	454	125	90	589
	2 1/2	65	508	508	540	160	152	736
	3	80	578	578	584	200	200	1577
	4	100	673	673	683	230	385	1965
	6	150	914	914	927	250	778	5501
	8	200	1022	1022	1038	340	1352	11786
	10	250	1270	1270	1292	425	2137	13222
	12	300	1422	1422	1445	480	3267	20075

► CRYOGENIC BALL VALVES



EXTENDED NECK DIMENSIONS (for reference)

DN	NPS	≥-60°C	≥-100°C	≤-100°C	Electric	Pneumatic	Lever
15	1/2	90	110	130		x	x
20	3/4	100	110	140		x	x
25	1	100	120	150		x	x
32	1 1/4	110	120	150		x	x
40	1 1/2	110	130	160		x	x
50	2	110	130	170	x	x	x
65	2 1/2	120	140	180	x	x	x
80	3	120	150	190	x	x	x
100	4	130	160	200	x	x	x
125	5	130	160	200	x	x	x
150	6	140	170	220	x	x	x
200	8	140	170	220	x	x	x
250	10	150	180	240	x	x	x
300	12	150	180	240	x	x	x
350	14	160	190	250	x	x	x
400	16	160	190	250	x	x	x

DIRECT BURIED STYLE FULLY WELDED BALL VALVES

PN CLASS	NPS (in)	DN (mm)	BW (mm)		Flanges (mm)						
			L	A	L	D	D1	D2	b	f	n-ø d
PN 16	2	50	216	65	178	165	125	99	16	2	4-18
	2 1/2	65	241	80	191	185	145	118	18	2	4-18
	3	80	283	95	203	200	160	132	20	2	8-18
	4	100	305	115	229	220	180	156	22	2	8-18
	6	150	457	165	394	285	240	211	24	2	8-22
	8	200	521	225	457	340	295	266	24	2	12-22
	10	250	559	280	533	405	355	319	26	2	12-26
	12	300	635	330	610	460	410	370	28	2	12-26
	14	350	762	385	686	520	470	429	30	2	16-26
	16	400	838	440	762	580	525	480	32	2	16-26
	18	450	914	490	864	640	585	548	40	2	16-30
	20	500	991	550	914	715	650	609	44	2	20-30
	24	600	1143	660	1067	715	650	609	44	2	20-33
	28	700	1346	765	1245	960	820	820	50	5	20-36
	32	800	1524	870	1372	1085	928	928	54	5	24-36
	36	900	1727	970	1524	1185	1028	1028	58	5	24-39
	40	1000	1780	1080	1721	1320	1140	1140	62	5	28-39
	48	1200	2100	1290	2032	1530	1350	1350	70	5	28-42
	56	1400	2250	1500	2300	1755	1560	1560	76	5	32-48

► ECCENTRIC BALL VALVES



PN CLASS	NPS (in)	DN (mm)	Size (mm)						
			L	D	D1	D2	f	b	n-od
PN 6	2	50	178	140	110	90	3	16	4-14
	2 1/2	65	190	160	130	110	3	16	4-14
	3	80	203	185	150	125	3	18	4-18
	4	100	229	205	170	145	3	18	4-18
	5	125	254	235	200	175	3	20	8-18
	6	150	267	260	225	200	3	20	8-18
	8	200	292	315	280	255	3	22	8-18
	10	250	330	370	335	310	3	24	12-18
	12	300	502	435	395	362	4	24	12-23
	14	350	575	485	445	412	4	26	12-23
	16	400	610	535	495	462	4	28	16-23
	18	450	660	590	550	518	4	28	16-23
	20	500	711	640	600	568	4	30	16-23
	24	600	787	755	705	670	5	30	20-26
	28	700	990	860	810	775	5	32	24-26
	32	800	1000	975	920	880	5	32	24-30
PN 10	2	50	178	160	125	100	3	18	4-18
	2 1/2	65	190	180	145	120	3	20	4-18
	3	80	203	195	160	135	3	20	4-18
	4	100	229	215	180	155	3	22	8-18
	5	125	254	245	210	185	3	24	8-18
	6	150	267	280	240	210	3	24	8-23
	8	200	292	335	295	265	3	24	8-23
	10	250	330	390	350	320	3	26	12-23
	12	300	502	440	400	368	4	28	12-23
	14	350	572	500	460	428	4	28	16-23
	16	400	610	565	515	482	4	30	16-26
	18	450	660	615	565	532	4	30	20-26
	20	500	711	670	620	585	4	32	20-26
	24	600	787	780	725	685	5	36	20-30
	28	700	900	895	840	800	5	38	24-30
	32	800	1000	1010	950	905	5	42	24-34

► ECCENTRIC BALL VALVES



PN CLASS	NPS (in)	DN (mm)	Size (mm)								
			L	D	D1	D2	D6	f	t	b	n-od
PN 16	2	50	178	160	125	100		3		16	4-18
	2 1/2	65	190	180	145	120		3		18	4-18
	3	80	203	195	160	135		3		20	8-18
	4	100	229	215	180	155		3		20	8-18
	5	125	254	248	210	185		3		22	8-18
	6	150	267	280	240	210		3		24	8-23
	8	200	267	335	295	265		3		26	12-23
	10	250	292	405	355	320		3		30	12-26
	12	300	330	460	410	375		4		30	12-26
	14	350	502	520	470	435		4		34	16-26
	16	400	572	580	525	485		4		36	16-30
	18	450	610	640	585	545		4		40	20-30
	20	500	660	705	650	608		5		44	20-34
	24	600	711	840	770	718		5		48	20-41
	28	700	787	910	840	788		5		50	24-41
	32	800	900	1020	950	898		5		52	24-41
PN 25	36	900	1000	1120	1050	998		5		54	28-41
	40	1000	1100	1255	1170	1110		5		56	28-42
	2	50	178	160	125	100		3		20	4-18
	2 1/2	65	190	180	145	120		3		22	8-18
	3	80	203	195	160	135		3		22	8-18
	4	100	229	230	190	160		3		24	8-23
	5	125	254	270	220	188		3		28	8-26
	6	150	267	300	250	218		3		30	8-26
	8	200	292	360	310	278		3		34	12-26
	10	250	330	425	370	332		3		36	12-30
	12	300	502	485	430	390		4		40	16-30
	14	350	572	550	490	448		4		44	16-34
	16	400	610	610	550	505		4		48	16-34
	18	450	660	660	600	555		4		50	20-34
	20	500	711	730	660	610		4		52	20-41
	24	600	787	840	770	718		5		56	20-41
PN 40	28	700	900	955	875	815		5		60	24-48
	32	800	1000	1070	990	930		5		64	24-48
	36	900	1100	1180	1090	1025		5		66	28-48
	40	1000	1200	1305	1210	1140		5		68	28-58
	2	50	178	160	125	100	88	3	4	20	4-18
	2 1/2	65	190	180	145	120	110	3	4	22	8-18
	3	80	203	195	160	135	121	3	4	22	8-18
	4	100	229	230	190	160	150	3	4.5	24	8-23
	5	125	254	270	220	188	176	3	4.5	28	8-26
	6	150	267	330	250	218	204	3	4.5	30	8-26
	8	200	292	375	320	282	260	3	4.5	38	12-30
	10	250	330	445	385	345	313	3	4.5	42	12-34
	12	300	502	510	450	405	364	4	4.5	46	16-34
	14	350	572	570	510	465	422	4	5	52	16-34
	16	400	610	655	585	535	474	4	5	58	16-41
	18	450	660	680	610	560	524	4	5	60	20-41
	20	500	711	755	670	612	576	4	5	62	20-48
	24	600	787	890	795	730	678	5	6	62	20-54
	28	700	900	995	900	835	768	5	6	68	24-54
	32	800	1000	1135	1030	960	876	5	6	76	24-58

► V-TYPE BALL VALVES



NPS	DN	Outline Dimensions (mm)						Connection Dimensions (mm)							
(In)	(mm)	A	H	L	H1	oD	oB	Q1	B1	B	K	S1	S	Q	T
1	25	50	190	115	87	38	64	M8x2	45	32	5	50	63	M8x4	95
1 1/4	32	60	197	117	87	42	78	M10x2	45	35	5	65	76	M8x4	100
1 1/2	40	60	200	115	87	50	82	M10x2	45	35	5	65	76	M8x4	100
2	50	75	200	115	97	60	100	M10x2	45	35	5	65	76	M8x4	100
2 1/2	65	85	220	110	112	75	120	M12x2	50	36	5	75	79	M8x4	100
3	80	100	239	124	112	94	130	M12x2	50	41	6	75	94	M8x4	120
4	100	115	252	122	122	110	158	M12x2	55	42	6	80	95	M10x4	125
5	125	135	262	123	142	135	180	M14x2	55	53	8	90	108	M10x4	130
6	150	160	307	128	165	165	216	M16x2	65	56	10	95	112	M12x4	140
8	200	200	330	130	195	210	268	M16x2	65	55	10	100	120	M12x4	150
10	250	240	380	145	237	260	325	M16x2	75	55	12	100	120	M12x4	150

► THREE WAYS BALL VALVES



PN CLASS	NPS (in)	DN (mm)	Size (mm)				Weight (mm)	
			L	d0	H	H1	PN 16/20 Class 150	PN25/40 Class 300
PN 16 PN 20 PN 25 PN 40 Class 150 Class 300	1/2	15	140	13	90	70	3	3
	3/4	20	150	15	106	86	4	4
	1	25	160	25	109	88	6	6.5
	1 1/4	32	-	32	125	106	10	11
	1 1/2	40	210	38	149	132	14	15
	2	50	220	51	154	137	20	21.5
	2 1/2	65	250	64	189	162	25	-
	3	80	260	76	198	170	32	35
	4	100	330	102	254	229	45	49
	5	125	430	127	273	247	-	-
	6	150	510	152	-	-	-	-
	8	200	580	203	-	-	-	-
	10	250	670	250	-	-	-	-

► MATERIALS



Code	C ≤	Mn ≤	P ≤	S ≤	Si ≤"	Cr ≤	Mo ≤	Ni ≤	Cu ≤	V ≤	Nb ≤	Tensile MPa ≥	Yield Mpa ≥	Elonga- tion % ≥	Reduce % ≥	Brinell HB ≥	J ≥
A105	0.35	2.00	0.035	0.040	0.10 ~ 0.35	0.30	1.12	0.4	0.40	0.08	0.02	485	250	30	30	187	
A182F11	0.05 ~ 0.15	2.00	0.03	0.03	0.50~1	1.00 ~ 1.50	0.44 ~ 0.65					415	205	20	45	121~ 174	
A182F22	0.05~0.15	2.0	0.04	0.04	0.50	2.00 ~	0.87 ~	8.0~11.0				415	205	20	35	170	
A182F304	0.08	2.00	0.045	0.03	1.00	18.0 ~ 20.0		8.0~13.0				515	205	30	50		
A182F304L	0.030	2.00	0.045	0.03	1.00	18.0 ~ 20.0	2.00 ~ 3.00	10.0 ~ 14.0				485	170	30	50		
A182F316	0.08	1.00	0.045	0.03	1.00	16.0 ~ 18.0	2.00 ~ 3.00	10.0 ~ 15.0				515	205	30	50		
A182F316L	0.030	0.60 ~ 1.05	0.045	0.03	1.00	16.0 ~ 18.0	2.5~3.5	4.5~6.5				485	170	30	50		
A182F51	0.030	0.30 ~ 0.60	0.030	0.02	1.00	21.0 ~ 23.0		0.50				620	450	25	45		
A182F6a	0.15	2.00	0.040	0.03	1.00	11.5 ~ 13.5	0.15 ~ 0.25					585	380	18	35	167 ~ 229	
A193B7	0.37~0.49	2.00	0.035	0.04	0.15 ~ 0.35	0.75 ~ 1.20	0.15 ~ 0.25	8.0~11.0				860	720	16	50	321	
A193B7M	0.37~0.49	0.30 ~ 0.60	0.035	0.04	0.15 ~ 0.35	0.75 ~ 1.20		10.0 ~ 14.0		0.25 ~ 0.35		690	550	18	50	235	
A193B8	0.08	1.00	0.045	0.03	1.00	18.0 ~ 20.0	2.00 ~ 3.00					515	205	30	50	223	
A193B8M	0.08	1.00	0.045	0.03	1.00	16.0 ~ 18.0	0.50 ~ 0.65					515	205	30	50	223	
A193B16	0.36~0.47	2.00	0.035	0.04	0.15 ~	0.80 ~						860	720	18	50	321	
A1942H	≥0.40	2.00	0.040	0.05	0.04	18.0 ~		8.0~11.0								248 ~	
A1942HM	≥0.40	1.00	0.040	0.05	0.04	16.0 ~ 18.0		10.0 ~ 14.0								159 ~ 237	
A1948	0.08	1.20	0.045	0.03	1.00		2.00 ~ 3.00									126 ~ 300	
A1948M	0.08	0.65 ~ 1.10	0.045	0.03	1.00		0.20	0.50	0.30	0.03		485 ~ 655				126 ~ 300	
A216WCB	0.30	1.00	0.04	0.045	0.60	0.50	0.20	0.50	0.30	0.03		485~655	250	22	35		
A216WCC	0.25	0.65 ~ 1.10	0.04	0.045	0.60	0.50	0.45 ~ 0.65	0.50				620~795	275	22	35		
A217C5	0.20	0.45 ~ 0.70	0.04	0.045	0.75	4.00 ~ 6.50	0.50	1.00	0.50			620~795	415	18	35		
A217CA15	0.15	1.00	0.040	0.040	1.50	11.5 ~ 14.0	0.45 ~ 0.65	0.50	0.50			485~655	450	18	30		
A217WC6	0.05~0.20	1.00	0.04	0.045	0.60	1.00 ~	0.90 ~		0.50			485~655	275	20	35		
A217WC9	0.05~0.18	0.40 ~ 0.70	0.04	0.045	0.60	2.00 ~ 2.75							275	20	35		
A276410	0.08~0.15	0.50 ~	0.040	0.030	1.00	11.5 ~						480	275	20	45		
A276420	≥0.15	0.40 ~	0.040	0.030	1.00	12.0 ~	0.15 ~									241	
A320L7	0.38~0.048	0.75 ~ 1.00	0.035	0.040	0.15 ~ 0.35	0.80 ~ 1.10	0.15 ~ 0.25					860	725	16	50		Avg 27, min 20
A320L7M	0.38~0.048	0.75 ~	0.035	0.040	0.15 ~	0.80 ~	0.90 ~					690	550	18	50	235	Avg 27,
A336F22	0.05~0.15	1.50	0.025	0.025	0.50	2.00 ~ 2.50	0.12	0.40	0.40	0.08	0.02	515~690	310	19	40		
A350LF1	0.30	1.50	0.035	0.040	0.15 ~	0.30	0.12	0.40	0.40	0.08	0.02	415~585	205	28	38		Avg 18,
A350LF2	0.30	1.50	0.035	0.040	0.15 ~	0.30	0.50	8.0~12.0				485~655	250	30	30		Avg 20,
A351CF3	0.03	1.50	0.040	0.040	2.00	17.0 ~	2.00 ~	9.0~13.0				485	205	35			
A351CF3M	0.03	1.50	0.040	0.040	1.50	17.0 ~	0.5	8.0~11.0				485	205	30			
A351CF8	0.08	1.50	0.040	0.040	2.00	18.0 ~ 21.0	2.00 ~ 3.00	9.0~12.0	0.30 ~ 4.0			485	205	35			
A351CF8M	0.08	0.30 ~ 0.60	0.040	0.040	1.50	18.0 ~ 21.0	0.5	9.0 ~ 12.0				485	205	30			
A351CF8C	0.08	0.60 ~	0.040	0.040	2.00	18.0 ~						485	205	30			
A351CN7M	0.07	0.60 ~ 1.35	0.040	0.040	1.50	19.0 ~ 22.0	2.00 ~ 3.00	27.5 ~ 30.5				425	170	35			
A352LC1	0.25	1.00	0.40	0.045	0.60		0.45 ~					450~620	240	24	35		
A352LC2	0.25	1.20	0.40	0.045	0.60			2.00~3.0				485~655	275	24	35		Avg 18
A352LC3	0.15	0.50~0.8	0.40	0.045	0.60			3.00~4.0				485~655	275	24	35		Avg 20
A352LCB	0.30	0.50~0.8	0.40	0.045	0.60	0.50		0.50	0.30	0.03		450~620	240	24	35		Avg 20
A352LCC	0.25	0.50~0.8	0.40	0.045	0.60	0.50		0.50		0.03		485~655	275	22	35	139~20 2	Avg 18 min 14
A439D2	3.00	0.70 ~	0.08		1.50 ~	1.75 ~		18.00 ~				400	207	8.0			Avg 20



TS

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