

GWC ITALIA

Proven technology
for individual valve solutions
worldwide



TRUNNION MOUNTED BALL VALVES

API 6D - API 6DSS - API 6A

MANUAL- MOV- ESDV

TBV-1005



GWC ITALIA

Worldwide Network

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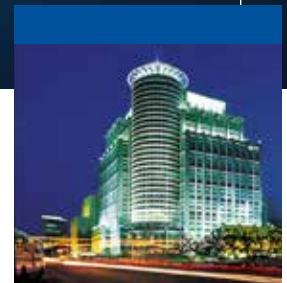
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GWC Italia SpA with its Headquarters in Milan, Italy fully designs, manufactures and markets valves with one of the most extensive Trunnion Mounted Ball Valve lines you will find in the Industry today. GWC Italia which was founded by an Italian Group & USA Entrepreneurial Management team has a history of building and managing successful valve Manufacturing companies over the past 40 years. GWC Italia Valves are used in major applications for Upstream, Downstream & Transportation Segments of the Oil & Gas Industry, E&P, Petrochemical, Chemical, Mining/Minerals, Power, Marine and Industrial markets.

GWC Italia's extensive line of valve and flow control products include:

- Trunnion Mounted Ball Valves (soft & metal seated)
 - Split Body
 - Top Entry
 - Welded Body
 - Subsea
 - Cryogenic & High Temperature
 - Compact Body (Twin Ball)
- Floating Ball Valves
- Pipeline Check Valves
- Gate, Globe and Check Valves including Cast & Forged
- Needle & Gauge Valves



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CERTIFICATIONS & STANDARDS

American Standards

American Petroleum Institute

API-6D	Specification for Pipeline Valves
API-6D SS	Specification for Subsea Pipeline Valves
API-6A	Specification for Wellhead and Christmas Tree Equipment
API-6FA	Specification for Fire Test for Valves
API-607	Fire Test for Soft-Seated Quarter-Turn Valves
API-608	Metal Ball Valves - Flanged, Threaded, and Welding End
API-Q1	Specification for Quality Programs for the Petroleum, Petrochemical & Natural Gas

International Standards

ISO 9001:2008	Quality Management Systems
ISO 14001	Environmental Management
OHSAS 18001:2007	Occupational Health and Safety Management System
ISO/TS 29001	Petroleum, Petrochemical and Natural Gas Industries - Sector Specific Quality Management Systems
CE/PED	Pressure Equipment Directive
CU-TR	Technical Reglament Conformity Certificate TRCU
CRN	Canadian Registration Number
Z245.15.96	Pipeline Steel Valves
ATEX	European for explosive atmosphere
SIL3	Measurement of performance required for safety instrument function
ABS	American Bureau of Shipping



MANUFACTURING CAPABILITIES

GWC Italia SpA, is a leading provider of flow control products for the Oil & Gas, Process, and Power industries. Our core business is the design and manufacturing of Trunnion Mounted Ball Valves, both Manual and Automated. Our near - perfect ball valve design is the result of almost 50 years of engineering evolution.

Headquartered in Italy, with state-of-the-art manufacturing facilities in Milan, Italy, Bakersfield, CA, USA and Shanghai, China – GWC Italia's key executives and engineers have been working together for decades behind some of the

most successful ball valves companies in the world.

GWC Italia has made substantial investments to design and create manufacturing facilities that are prepared to grow along with the ever-increasing demands of the market. Lean manufacturing processes have been implemented to improve efficiency and ensure a smooth workflow.

GWC Italia being a license holder of API 6D, API 6DSS and API 6A has incorporated stringent industry norms and requirements, as well as the latest fire-safe and fugitive emissions standards.



IN-HOUSE CAPABILITIES

Test benches are fully enclosed by reinforced concrete bunkers. For safety reasons, test monitoring is done remotely from outside the bunker through a sophisticated set of remote controls, cameras and monitors.



GWC Italia's own 20,000 Liter (5,284 Gallon) liquid nitrogen tank, degasification system and cryogenic pump.



In-house welding area fully equipped with MIG and SAW robots operated by highly qualified welders.

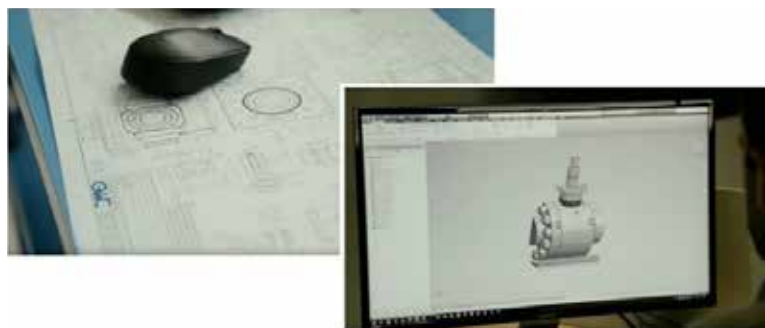


R & D DEPARTMENT

In today's fast changing industrial landscape, GWC Italia strives to remain at the forefront of valve technology and innovative materials. To aid the development of new valve products, and the continuous improvement of existing ones, GWC Italia conducts extensive tests and studies in its own state-of-the-art R&D facilities.



GWC Italia's R&D Dept. has designed and built its own Hyperbaric Test Chamber for Subsea Valves



Our Engineering Department analyses each project's particular operational requirements to offer the most compliant and affordable technical solution.

API 6D, API 6DSS, API 6A TRUNNION MOUNTED BALL VALVES

DESIGNS

- Side Entry Bolted Body
- Welded Body
- Top Entry



API 6D Trunnion Mounted Ball Valve
Side Entry Bolted Body
42" Class 600



Trunnion Mounted
Ball Valve DBB
Twin Ball Design
8" Class 2500 with
Hydraulic On/Off
Operator



API 6D Trunnion Mounted Ball Valve
Side Entry Bolted Body
36" Class 600



API 6D Trunnion Mounted Ball Valve
Side Entry Welded Body
10" Class 600



API 6D Trunnion Mounted Ball Valve
Side Entry Welded Body
36" Class 600

SHUTDOWN (SDV) /EMERGENCY SHUTDOWN VALVES (ESDV)

Shut Down Valves (SDV) or Emergency Shutdown Valves (ESDV) also referred as ESV and ESD, are actuated valves designed to provide protection by stopping the flow of a fluid upon the detection of a dangerous event.

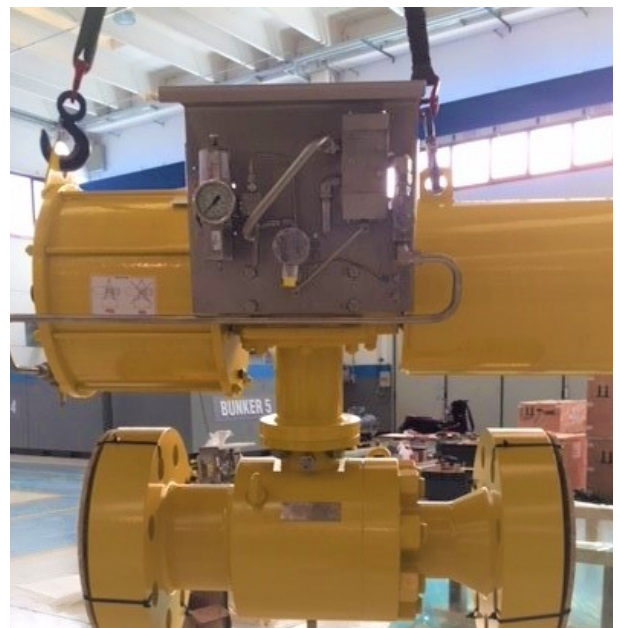
These valves need to offer a much higher level of performance and reliability than typical actuated valves; thanks to its consolidated expertise, GWC Italia engineers the best SDV / ESDV Ball Valves for the application.



Pneumatic ESDV 24" Class 600 Top Entry



Pneumatic SDV
8" Class 600 Top Entry



Pneumatic FC SDV
6" Class 2500 Side Entry Bolted
Body

CRYOGENIC BALL VALVES

GWC Italia has developed a special range of high performance Cryogenic Ball Valves for LNG Applications. GWC Italia's cryogenic valve design ensures reliable functionality at cryogenic temperatures, efficient sealing during thermal swings, and long term performance.



GWC Italia's Milan Plant has two modern Cryogenic Test Benches, that are remotely operated and monitored from outside their bunkers.

GWC Italia Cryogenic Valves may be used in processes involving cryogenic fluids, or that have exposure to extreme low temperature conditions; -50°C to -200°C (-58°F to -328°F).



Cryogenic Trunnion Mounted Ball Valves

SUBSEA BALL VALVES

Main Shallow and Deep Water

Applications Include: Subsea Pipelines, Large diameter manifold (PLEM), Inline Tee Assembly (ITA), or Pipeline End Termination (PLET) headers, On/off non-critical service on Remotely Operated Vehicle (ROV) panels and large diameter flowlines.

Subsea Valves are typically

Custom-Made Engineered Products.

These are some of the main factors GWC Italia's engineers take into consideration when designing the proper Subsea valve for the application:

- Type of Service
- Frequency of operation
- Water Depth
- Easiness of access to operations

- Type of operation required

- Water Depth

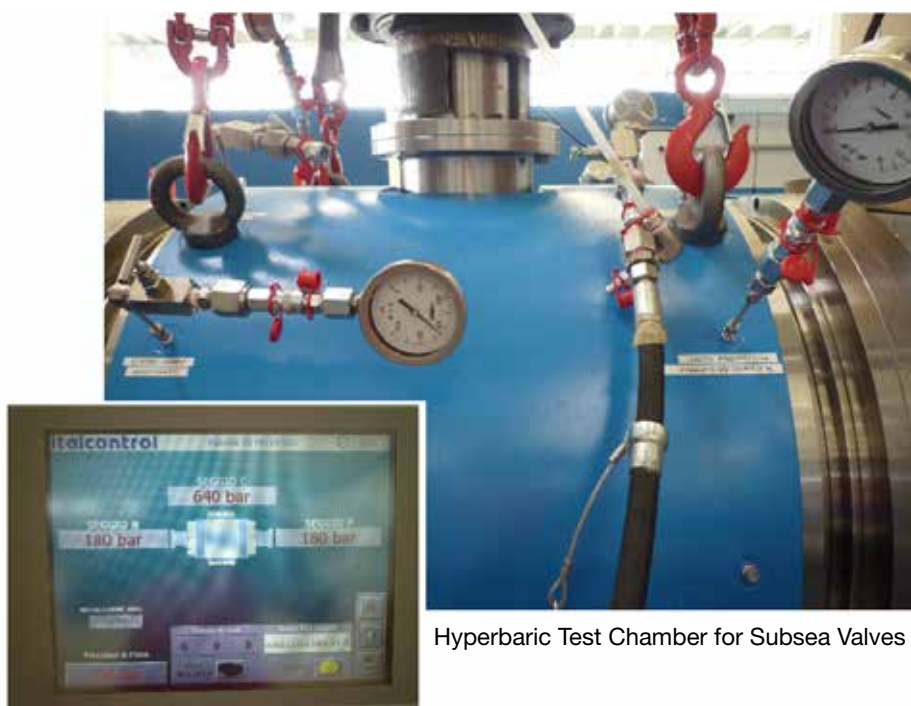
- Easiness of access to operations

- Type of operation required

The development of our Subsea Valves follows API 6DSS and API 6A requirements, plus additional design considerations added by GWC Italia and its customers.



API 6A-17D Subsea Ball Valves 2" 5000psi



Hyperbaric Test Chamber for Subsea Valves

PRODUCT OVERVIEW

API Licenses:

- API 6D
- API 6DSS
- API 6A-PSL4

Size Range: 1" to 56"

Pressure Class:

ASME 150-2500
API 2000-15000

Service Type:

- Standard Temperature: -29°C to 220°C / -20°F to 428°F
- Low Temperature: -46°C to 150°C / -50°F to 302°F
- Cryogenic Temperature: -47°C to -196°C / -52°F to -320°F
- Subsea (Shallow & Deep Water)
- Underground
- High Temperature: Above 220°C / 428°F



MODEL F & FF
SIDE ENTRY BOLTED BODY

SERVICE	API 6D Size (in/mm) - Pressure Range				API 6A Size (in/mm) - Pressure Range		
	ASME 150-600	ASME 900	ASME 1500	ASME 2500	API 2000-5000	API 10000	API 15000
Standard	2"-56" 50-1400	2"-48" 50-1200	2"-42" 50-1050	2"-24" 50-600	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Low Temperature	2"-56" 50-1400	2"-48" 50-1200	2"-42" 50-1050	2"-24" 50-600	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Cryogenic	2"-36" 50-900	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	*	*
Subsea	2"-56" 50-1400	2"-48" 50-1200	2"-42" 50-1050	2"-24" 50-600	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Underground	2"-56" 50-1400	2"-48" 50-1200	2"-42" 50-1050	2"-24" 50-600	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
High Temperature	2"-36" 50-900	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	*	*



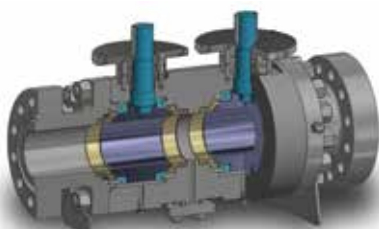
MODEL FW
SIDE ENTRY WELDED BODY

SERVICE	API 6D Size (in/mm) - Pressure Range				API 6A Size (in/mm) - Pressure Range		
	ASME 150-600	ASME 900	ASME 1500	ASME 2500	API 2000-5000	API 10000	API 15000
Standard	2"-56" 50-1400	2"-36" 50-900	2"-30" 50-750	*	*	*	*
Low Temperature	2"-56" 50-1400	2"-36" 50-900	2"-30" 50-750	*	*	*	*
Cryogenic	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subsea	2"-56" 50-1400	2"-36" 50-900	2"-30" 50-750	*	*	*	*
Underground	2"-56" 50-1400	2"-36" 50-900	2"-30" 50-750	*	*	*	*
High Temperature	N/A	N/A	N/A	N/A	N/A	N/A	N/A



MODEL FT
TOP ENTRY BOLTED BONNET

SERVICE	API 6D Size (in/mm) - Pressure Range				API 6A Size (in/mm) - Pressure Range		
	ASME 150-600	ASME 900	ASME 1500	ASME 2500	API 2000-5000	API 10000	API 15000
Standard	2"-56" 50-1400	2"-48" 50-1200	2"-42" 50-1050	2"-24" 50-600	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Low Temperature	2"-56" 50-1400	2"-48" 50-1200	2"-42" 50-1050	2"-24" 50-600	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Cryogenic	2"-36" 50-900	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	*	*
Subsea	2"-56" 50-1400	2"-48" 50-1200	2"-42" 50-1050	2"-24" 50-600	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Underground	2"-56" 50-1400	2"-48" 50-1200	2"-42" 50-1050	2"-24" 50-600	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
High Temperature	2"-36" 50-900	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	*	*



MODEL FC
COMPACT BODY (TWIN BALL)

SERVICE	API 6D Size (in/mm) - Pressure Range				API 6A Size (in/mm) - Pressure Range		
	ASME 150-600	ASME 900	ASME 1500	ASME 2500	API 2000-5000	API 10000	API 15000
Standard	2"-30" 50-750	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Low Temperature	2"-30" 50-750	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Cryogenic	2"-30" 50-750	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	*	*
Subsea	2"-30" 50-750	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
Underground	2"-30" 50-750	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	1 13/16"-11" 46-280	1 13/16"-7 1/16" 46-179
High Temperature	2"-30" 50-750	2"-24" 50-600	2"-16" 50-400	2"-12" 50-300	1 13/16"-11" 46-280	*	*

* - Available upon request, please consult factory

ORDERING GUIDE

Example: 12" Figure # FF600-1-CF-E1-GO

FF
60
0
-
1
-
CF
-
E
1
-
GO

1. 2. 3. 4. 5. 6. 7. 8.

12" CLASS 600 TRUNNION BALL VALVE, FULL BORE, 3-PC, FLG-RF, SINGLE PISTON EFFECT, A105 BODY X A105 + (0.003) ENP TRIM, DEVLON SEAT INSERTS, HNBR AED O-RINGS, NACE, FIRESAFE, GEAR OP.

1. MODEL

F - TRUNNION BALL, 2 PIECE, SPLIT BODY, FULL BORE	GT - TRUNNION BALL, 1 PIECE, TOP ENTRY, REDUCED BORE
G - TRUNNION BALL, 2 PIECE, SPLIT BODY, REDUCED BORE	FW - TRUNNION BALL, FULLY WELDED BODY, FULL BORE
FF - TRUNNION BALL, 3 PIECE, SPLIT BODY, FULL BORE	GW - TRUNNION BALL, FULLY WELDED BODY, REDUCED BORE
GG - TRUNNION BALL, 3 PIECE, SPLIT BODY, REDUCED BORE	FC - TRUNNION TWIN BALL, COMPACT BODY, FULL BORE
FT - TRUNNION BALL, 1 PIECE, TOP ENTRY, FULL BORE	GC - TRUNNION TWIN BALL, COMPACT BODY, REDUCED BORE

2. RATING

15 - CLASS 150	90 - CLASS 900	200 - API 2000	1000- API 10000
30 - CLASS 300	150 - CLASS 1500	300 - API 3000	1500- API 15000
60 - CLASS 600	250 - CLASS 2500	500 - API 5000	

3. END CONNECTION

0 - RF FLANGED	8 - BUTTWELD X RF ENDS	X - SPECIAL
7 - BUTTWELD (SCHEDULE REQUIRED)	9 - RING JOINT	

4. TYPE

1 - SINGLE PISTON EFFECT (SPE)	3 - SINGLE X DOUBLE PISTON EFFECT (SPE x DPE)
2 - DOUBLE PISTON EFFECT (DPE)	

5. MATERIAL (BODY + TRIM)

AC - WCB + 304	GC - LCC + 316	NF - F316L + 316L
AF - A105 + 304	GF - LF2 + 316	OC - CN7M + A/20
BC - WCB + 316	HC - LCB + LF2/ENP (.003)	OF - A/20 + A/20
BF - A105 + 316	IC - LCB + F6A/13CR	PC - A890-4A + F51
CC - WCB + A105/ENP (.003)	JC - LCB + 316	PF - F51 + F51
CF - A105 + A105/ENP (.003)	KC - CF8 + 304	QC - A890-5A + F53
DC - WCB + F6A/13CR	KF - F304 + 304	QF - F53 + F53
DF - A105 + F6A/13CR	LC - CF8M + 316	RC - A890-6A + F55
EC - LCC + LF2/ENP (.003)	LF - F316 + 316	RF - F55 + F55
EF - LF2 + LF2/ENP (.003)	MC - CF3 + 304L	X - SPECIAL
FC - LCC + F6A/13CR	MF - F304L + 304L	
FF - LF2 + F6A/13CR	NC - CF3M + 316L	

6. MATERIAL (SEAT)

B - NYLON 12	F - VITON AED	U - PCTFE (KEL-F)®
C - NYLON 6	G - RTFE	V - PEEK
E - DEVLON	M - METAL TO METAL	X - SPECIAL

7. MATERIAL (O-RING SEAL)

1 - HNBR AED	3 - VITON GLT AED	5 - AFLAS	7 - PTFE + ELGILOY
2 - VITON AED	4 - EPDM	6 - HNBR AED (Low Temp)	X - SPECIAL

8. OPERATOR

L - LEVER	GO - GEAR	B - BARE STEM
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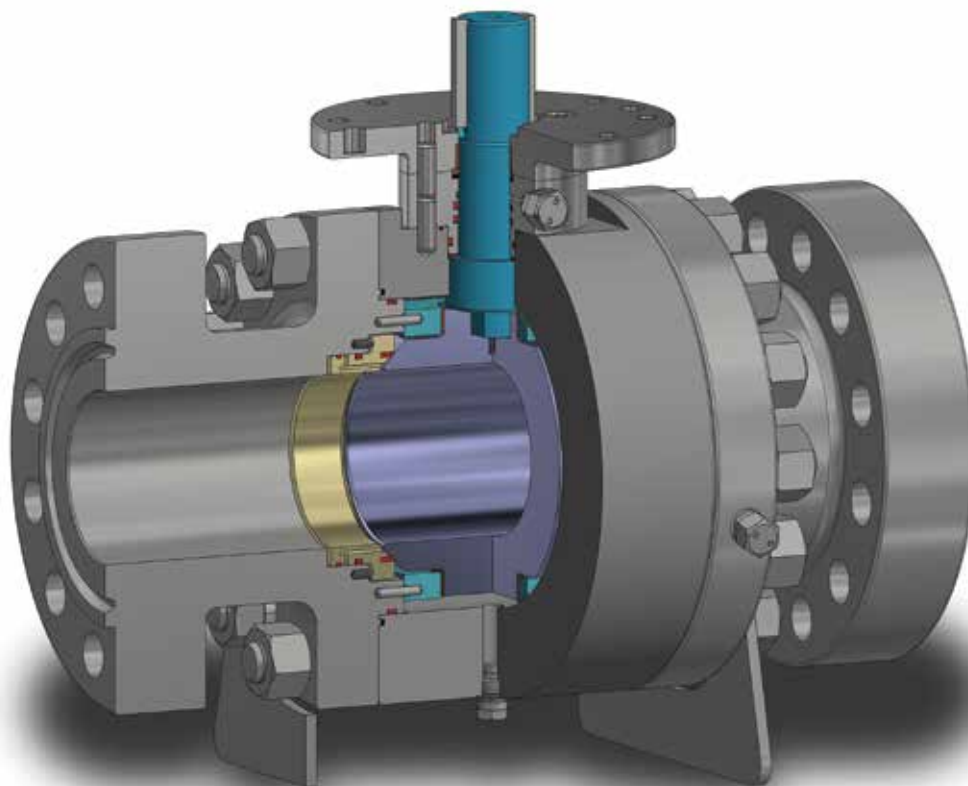
9. SPECIAL REQUIREMENTS

S - SUPPLY COMPLETE INFORMATION

NOTE: For Cryogenic application ordering guide, refer to GWC catalog #CTBV-1001
 For Subsea application ordering guide, refer to GWC catalog #SSBV-1001

MODEL F & FF FORGED SIDE ENTRY BOLTED BODY

- GWC ITALIA Side Entry ball valves are used in pipelines, pumping and compression stations, offshore, onshore, subsea and cryogenic as well as abrasive and high temp applications.
- The extensive size range and pressure class are available in a variety of materials including Carbon, Alloy & Stainless steel suitable for general to severe service conditions.



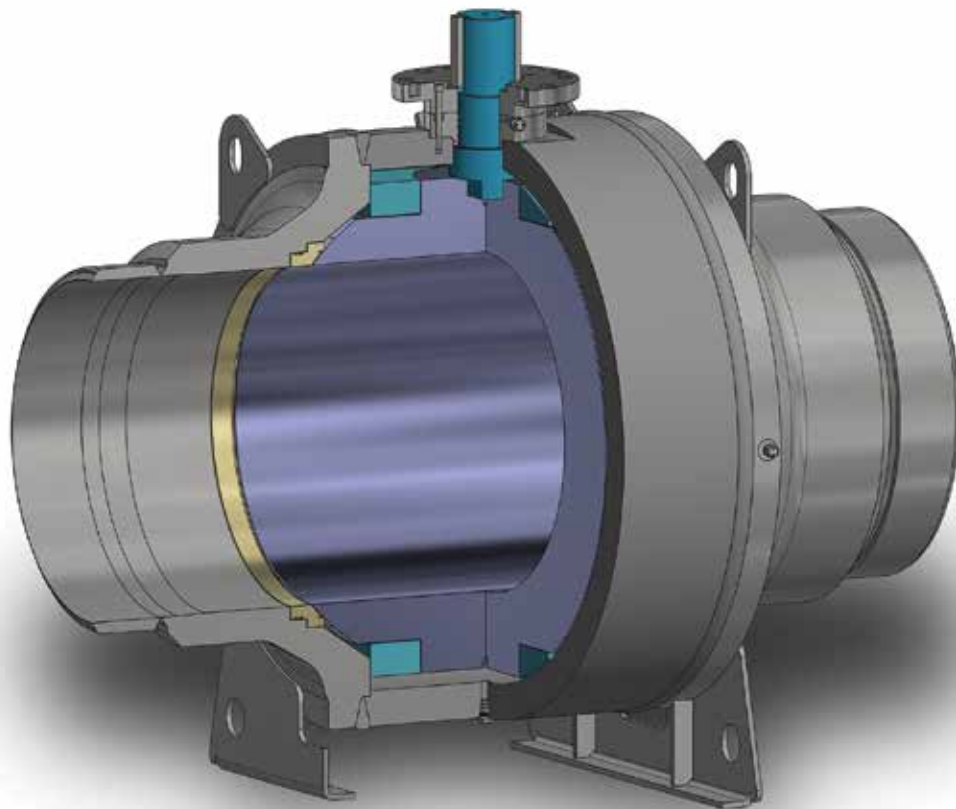
SIZE RANGE:	2" - 56"
PRESSURE CLASS:	ASME 150 - 2500
	API 2000 - 15000
API STANDARDS:	6D, 6DSS & 6A
ASME:	B16.34

FEATURES

- ▶ 2-3 PIECE BODY
- ▶ FULL AND REDUCED BORE
- ▶ TRUNNION MOUNTED
- ▶ DOUBLE BLOCK AND BLEED
- ▶ SINGLE OR DOUBLE PISTON EFFECT DESIGN
- ▶ ANTI-BLOW OUT STEM
- ▶ ANTI-STATIC DEVICE
- ▶ FIRESAFE TO API-607 / 6FA / ISO 10497
- ▶ SPRING LOADED SEATS
- ▶ SEALANT INJECTION ON REQUEST
- ▶ NACE MR-01-75

MODEL FW FORGED SIDE ENTRY WELDED BODY

- GWC ITALIA Fully Welded Body Valves are used in pipelines and pumping compression stations as well as subsea applications.
- Our welded design reduces the leakage path and makes the valves ideal for underground and subsea installations.
- Welding of the two or three piece body parts are performed with a special technique so that post welding heat treatment is not required and soft seals are not subject to damage during the welding.
- The extensive size range and pressure class are available in a variety of materials including Carbon, Alloy & Stainless steel suitable for general to severe service conditions.



SIZE RANGE:	2" - 56"
PRESSURE CLASS:	ASME 150 - 1500
API STANDARDS:	6D & 6DSS
ASME:	B16.34

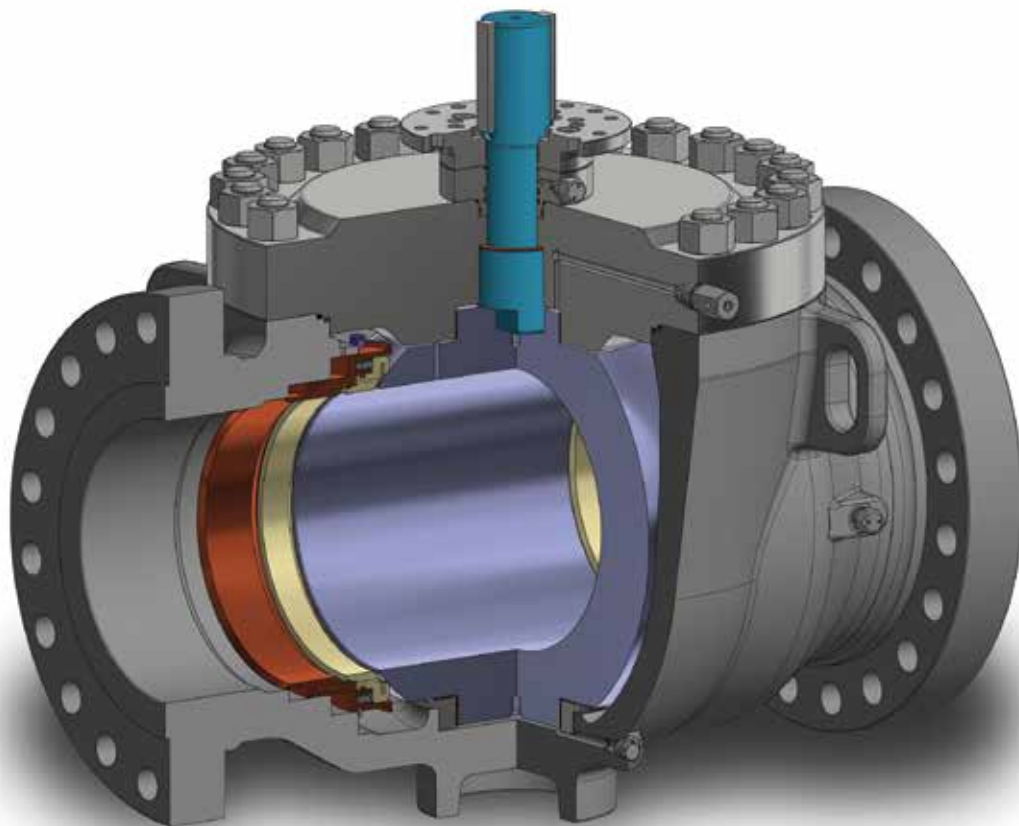
FEATURES

- ▶ 1 PIECE BODY
- ▶ FULL AND REDUCED BORE
- ▶ TRUNNION MOUNTED
- ▶ DOUBLE BLOCK AND BLEED
- ▶ SINGLE OR DOUBLE PISTON EFFECT DESIGN
- ▶ ANTI-BLOW OUT STEM
- ▶ ANTI-STATIC DEVICE
- ▶ FIRESAFE TO API-607 / 6FA / ISO 10497
- ▶ SPRING LOADED SEATS
- ▶ SEALANT INJECTION
- ▶ NACE MR-01-75

MODEL FT

TOP ENTRY BOLTED BONNET

- GWC ITALIA Top Entry ball valves are used in pipelines, pumping and compression stations, offshore, onshore, subsea and cryogenic as well as abrasive and high temp applications.
- The Top Entry design permits full repair in line and also allows the valve to be welded in line allowing easy maintenance.
- The cast or forged one piece body and bolted bonnet allows for the use of a full range of materials including Carbon, Alloy & Stainless steel suitable for general to severe service conditions.



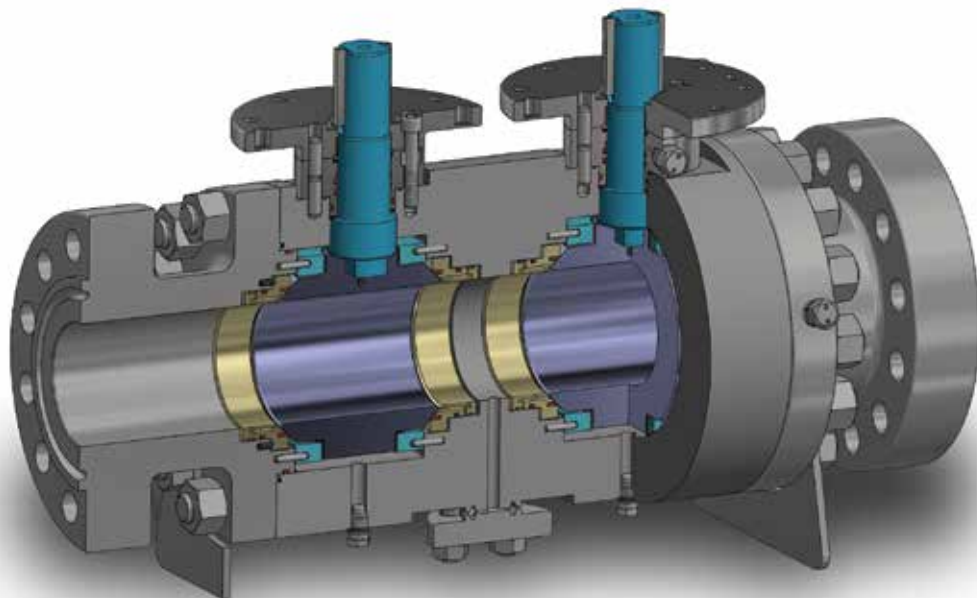
SIZE RANGE:	2" - 56"
PRESSURE CLASS:	ASME 150 - 2500
	API 5000-15000
API STANDARDS:	6D & 6A
ASME:	B16.34

FEATURES

- ▶ 1-PIECE BODY
- ▶ FULL AND REDUCED BORE
- ▶ TRUNNION MOUNTED
- ▶ DOUBLE BLOCK AND BLEED
- ▶ SINGLE OR DOUBLE PISTON EFFECT DESIGN
- ▶ ANTI-BLOW OUT STEM
- ▶ ANTI-STATIC DEVICE
- ▶ FIRESAFE TO API-607 / 6FA / ISO 10497
- ▶ SPRING LOADED SEATS
- ▶ SEALANT INJECTION ON REQUEST
- ▶ NACE MR-01-75

MODEL FC FORGED COMPACT BODY (DB&B)

- GWC ITALIA Twin ball design are used in pipelines, pumping and compression stations, offshore, onshore, subsea and cryogenic as well as abrasive and high temp applications.
- This ultimate trunnion mounted ball valve double block & bleed feature is achieved by two ball valves housed in a single body.
- This ultimate double block & bleed feature is achieved by two ball valves housed in a single body.
- Each valve maintains all the standard and optional features of a side entry valve with floating independent seat rings, SPE or DPE seat rings, soft or metal seats, Internal overlay and extended stem if required.
- The space between the two valves houses a drain valve, the upstream and down stream side of the valve are completely isolated.
- The two valves can be operated with any type of actuation.
- The main advantages of the twin ball valve are reduced face to face, weight, costs savings and increased line structure.



SIZE RANGE:	1" - 36"
PRESSURE CLASS:	ASME 150 - 2500
API:	DESIGN ACCORDING TO API 6D
ASME:	B16.34

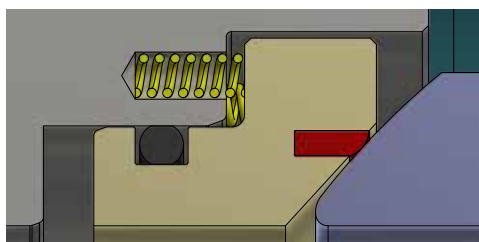
FEATURES

- ▶ 1-3 PIECE BODY
- ▶ FULL AND REDUCED BORE
- ▶ TRUNNION MOUNTED
- ▶ DOUBLE BLOCK AND BLEED
- ▶ SINGLE OR DOUBLE PISTON EFFECT DESIGN
- ▶ ANTI-BLOW OUT STEM
- ▶ ANTI-STATIC DEVICE
- ▶ FIRESAFE TO API-607 / 6FA / ISO 10497
- ▶ SPRING LOADED SEATS
- ▶ SEALANT INJECTION ON REQUEST
- ▶ NACE MR-01-75

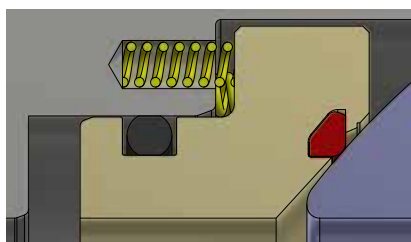
TRUNNION MOUNTED FEATURES - SEAT FEATURES

GWC ITALIA SpA can supply a range of seat types and configurations to meet specific process needs:

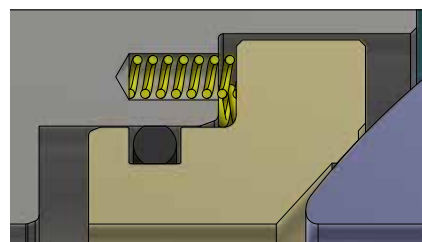
GWC ITALIA trunnion mounted ball valves standard seat rings are soft-seated by the use of a thermoplastic or elastomeric or Metal Seats – Tungsten / Chrome carbide / ENP



Thermoplastic



Elastomeric



Metal

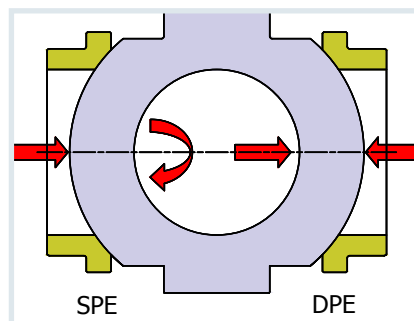
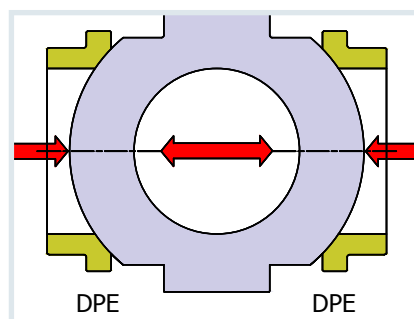
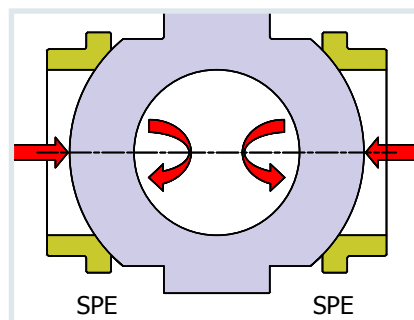
Single Piston (SPE) , Double Piston effect (DPE) and Combination (SPE x DPE) seats are available.

Seat Principle:

- Two independent seat rings grant the sealing barrier against the line pressure acting on the upstream and downstream sides of the valve which allows the valve to be bidirectional.
- A set of coil springs acting between the upstream side of each seat ring and the body, generate an uniform thrust on the seat which push the same against the ball and grant the sealing feature with no or very low pressure in the line, when the line pressure increase the thrust acting on the seat increases proportionally and the sealing feature is granted throughout the full pressure range.
- The GWC ITALIA SpA trunnion mounted ball valves are available with Double Block & Bleed independent of the seat type.

Valve seating variations:

Seat Design	Single piston effect (SPE)	Double piston effect (DPE) - DIB 1	Combined DIB 2
Bi-directional sealing	Yes	Yes	Yes
Body - Cavity Self relieving	Yes	No	Yes
Double Barrier	No	Yes	Yes (preferred direction only)



SINGLE PISTON EFFECT

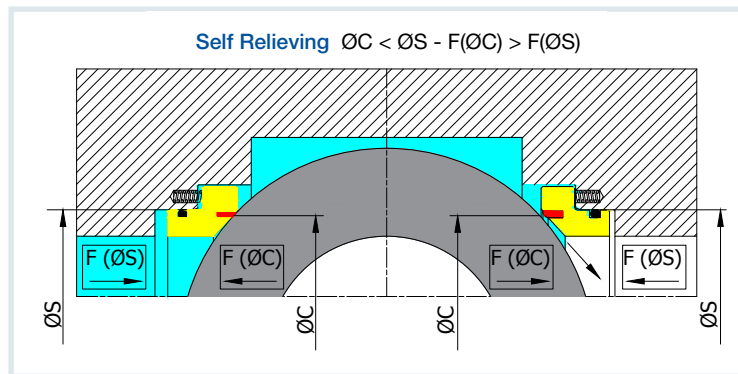
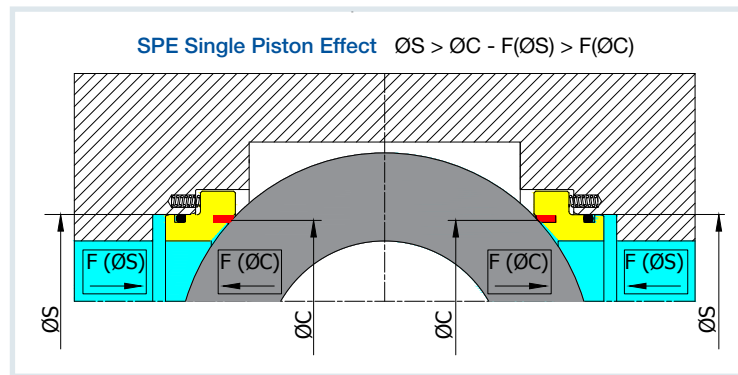
Single piston effect (SPE) is the standard feature for the seat rings of the GWC ITALIA SpA trunnion mounted ball valves.

On a SPE seat ring:

The pressure acting on the upstream side of the seat ring generates a force which push the seat towards the ball.

The pressure acting on the downstream side of the seat ring generates a force which pull the seat away from the ball.

Any overpressure which may be generated by the thermal expansion of the fluid trapped in the body cavity with the ball in fully closed position, will be automatically discharged in the line on the lower pressure side.



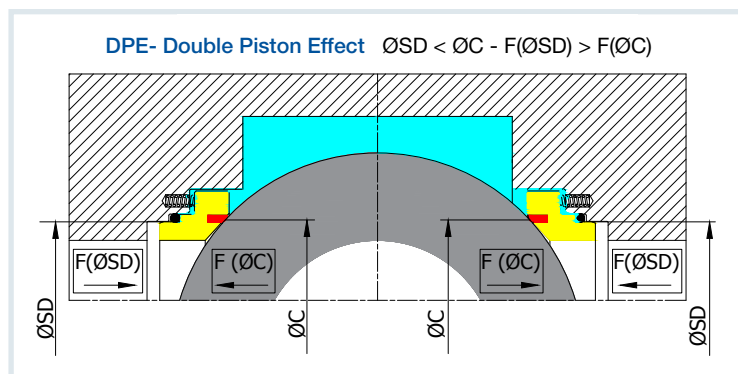
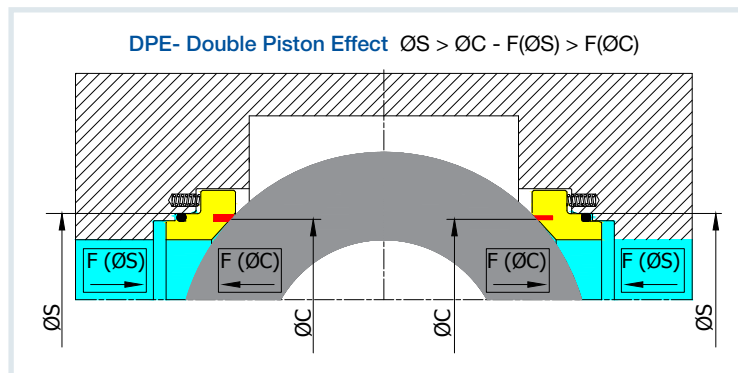
DOUBLE PISTON EFFECT

Double piston effect (DPE) is a standard feature for the seat rings of the GWC ITALIA SpA trunnion mounted ball valves & recommended for welded body valves. On a DPE seat ring, both the pressure acting on the upstream side of the seat ring and the pressure acting on the down stream side of the seat ring, generate a force which push the seat towards the ball.

With this type of seat ring, the eventual overpressure which may be generated by the thermal expansion of the fluid trapped in the body cavity with the ball in fully closed position, can be discharged by the use of:

- An external safety relief device.

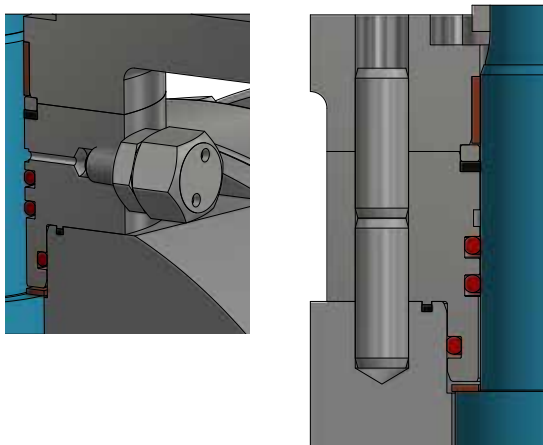
The Double Piston Effect grants a double sealing feature, if the upstream seat ring is damaged, the down stream seat grant the sealing feature of the valve.



TRUNNION MOUNTED BALL VALVES STANDARD FEATURES

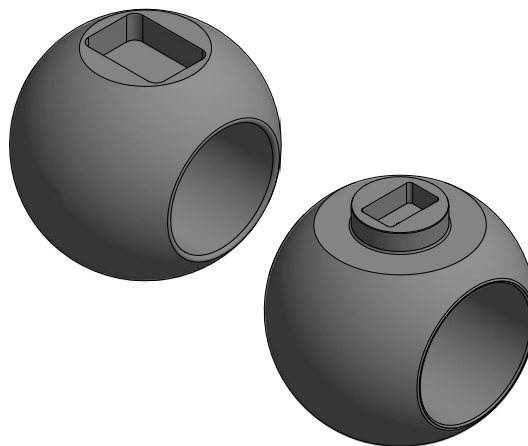
Stem

- The stem is independent from the ball and is not subject to the side load generated by the line pressure acting on the ball.
- Two O-Rings and a graphite gasket grant a triple barrier and the fire safe sealing on the stem.
- A built in stem sealant injection system is provided as a standard feature.
- The standard anti blow-out feature of the stem is in accordance to API 6D and is granted by the body cover. By removing the gland bushing the upper stem gasket can be replaced for maintenance with the valve in service.



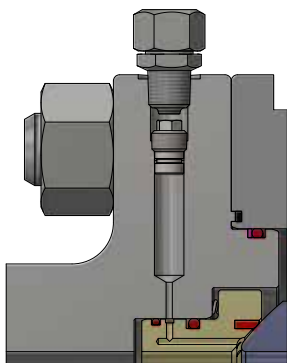
Ball

- In side entry valves 4" and smaller the ball is kept in position by an upper and a lower trunnion, housed in the primary body.
- In side entry valves 6" and larger the ball is kept in position by an upper and a lower trunnion housed in two bearing blocks.
- Both the trunnions absorb the side load generated by the line pressure acting on the ball, without affecting the rotation of the stem.
- Large diameter trunnions minimize the torque required to operate the valve.
- The trunnions rotate into metal-backed self-lubricating bearings.



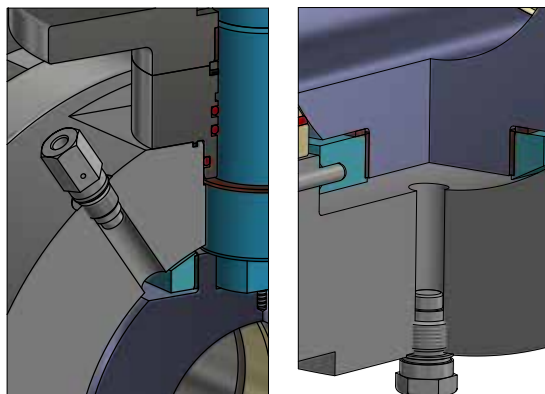
Emergency Seat Injection

- Emergency grease injection fitting for seat rings are standard for 6" and larger valves and as option on sizes 2"-4".
- A needle valve, complete with non return check valve is screwed in the body and connected to the seat rings.
- The emergency sealant injection can temporarily solve leakage problems, seats shall be repaired at the first opportunity.
- For valves smaller than 6" seat sealant injection fitting can be provided in the body cavity.



Body Vent & Drain

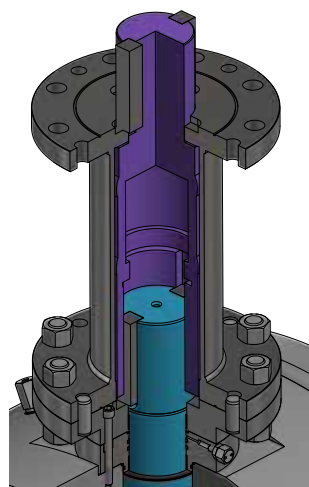
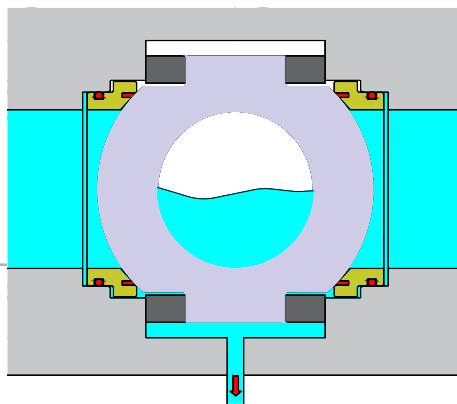
- All GWC ITALIA SpA TMBV are complete with a screwed NPT Plug, located in the lower side of the body complete draining of the body cavity.
- For valves up to size 4" the drain and vent are combined in one port.



TRUNNION MOUNTED FEATURES

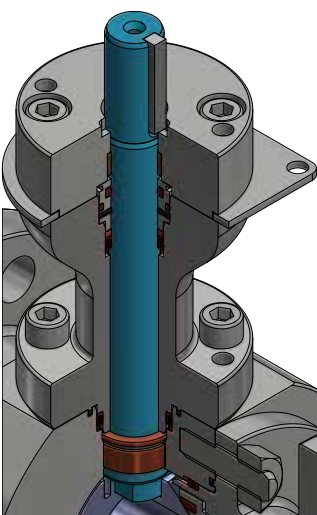
Double Block and Bleed

This feature permits to check the integrity of the seats without interfering with the operation of the line and the replacement of the upper stem seal with the valve in line. The body cavity can be drained and depressurized with the ball in fully closed position, this feature which is available with all type of seats (SPE, DPE or Combination) permits.



Extended Stem

- Extended stem is supplied for Underground installation.
- The stem seals are located in the body Gland Plate.
- The stem extension is not affected by eventual stem seal failure.

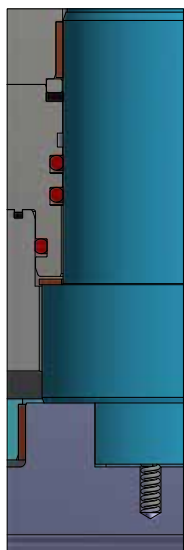


Extended Bonnet

Extended bonnets are available for Cryogenic or high temperature service or special applications requiring this facility features.



TRUNNION MOUNTED FEATURES



Low Emission Stem Sealing:

GWC ITALIA SpA Standard stem sealing arrangement offers Low Emission using a triple barrier arrangement certified to the latest ISO 15848 standard.



Anti-Blowout Proof Stem:

Stem is retained by the cover, the gland plate can be removed with valve in fully closed position with the body cavity vented to atmosphere. The upper stem O-ring can be replaced for maintenance with valve in service.

Anti-Static Device:

All GWC ITALIA SpA Trunnion Mounted Ball Valves, are equipped with an anti-static device to assure the total electrical conductance between all metal parts of the valves.



Fire Safe:

All GWC ITALIA's complete range of Side entry, Top Entry and Welded body ball valves are certified fire safe according to API 607 / ISO 10497 - API 6 FA

Valves Ends:

Valves are available with:
Flanged Ends (RF or RTJ) to ASME B16.5 or ASME B16.47
Welding Ends to ASME B16.25
Hub Ends
Customer specific

Bore:

Valve can be supplied with Full or Reduced bore in accordance with table 1 of API 6D, unless otherwise required or advised.

Valves with special Bore are available.

Face to Face/End to End:

Dimensions are in accordance with API 6D and ASME B16.10.

Special dimensions are available.



Painting:

Standard external painting is Sky Blue Ral 5015, and system is suitable to protect the valve external surface during transportation and storage. Other types of painting are available on request.

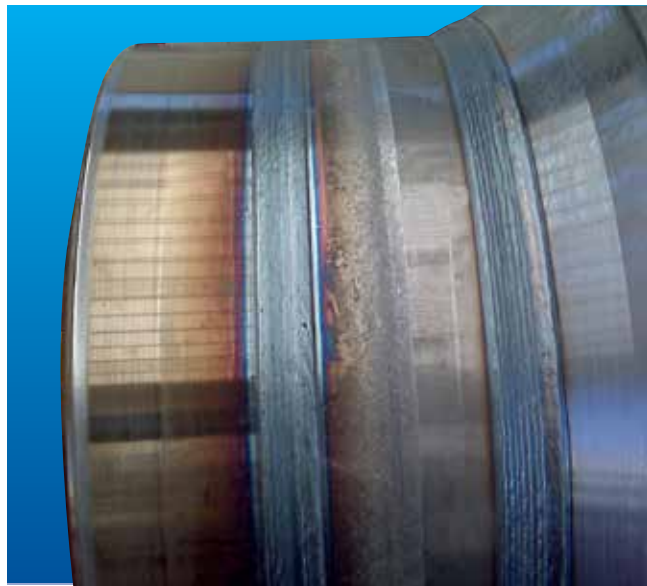
TRUNNION MOUNTED FEATURES

Valve Transition Pieces:

Transition pieces (pups), can be supplied for Welding Ends Valves to facilitate the welding of the valve to the line for:

- Material compatibility.
- Excessive difference in strengths and thickness between valve closures and line pipe (limit is 1,5 times).
- Avoiding damages to the valve soft seals.

Important note: when transition pieces are supplied by the customers, it is imperative to verify if the strength of the same, suitable to undergo the hydro-test of the valve without damages or deformations (1,5 times the valve maximum rated pressure).



Weld Overlays:

Welded overlays, with Stainless Steel, Duplex and Inconel are available on request for:

- All wetted parts
- Body wetted parts
- Seat rings housing pocket
- Stem sealing area
- Balls

MATERIALS

Body, Ball, Seats & Stem Materials

Carbon Steel & Low Temperature Carbon Steel (Forged)

- A105N, AISI 4140, AISI4130, API 60K, API 65K, A350LF2, A350LF3, A350LF6, A694F52
- A694F60, A694F65

Carbon Steel & Low Temperature Carbon Steel (Cast)

- A216 WCB, A352LCB, A352LCC

Martensitic Stainless Steel (Forged)

- A182F6A, A182F6NM

Austenitic Stainless Steel (Forged)

- A182F304, A182F316, A182F316L, A316LN-Mod A182F321, A182F347, XM19 (Nitronic 50)

Precipitation Hardening Stainless Steel (Forged)

- 17.4PH (A705-S17400)

Austenitic Stainless Steel (Cast)

- A351CF8, A351CF8M, A351CF3M

Super Austenitic Stainless Steel (Forged)

- A182F44 (6MO)

Super austenitic Stainless Steel (Cast)

- A351CK3MCUN

Duplex & Super Duplex (Forged)

- A182F51 (S32205), A182F53 (S32750), A182F55 (S32760)

Duplex & Super Duplex (Cast)

- A890-J92205, A8905A (A351CD4MCU)

Nickel Alloy (Forged)

- Incoloy 800 (B564-N0880), Incoloy 825 (B564-N08825), Inconel 600 (B564-N06600), Inconel 625 (B564-N006625)

Nickel Alloy (Cast)

- Incoloy 825 (A494-CU5MCUC), Inconel 600 (A94-CY40), Inconel 625 (A694-CW6MC)

Nickel-Copper Alloys (Forged)

- Monel 400(B56-N04400), Monel 500 (B564-N05500)

Nickel-Copper Alloys (Cast)

- Monel 400 (A94-M35-1)

High Alloys (Forged)

- Hastelloy C (B564-N10276)

Bolts & Nuts Materials

Carbon Steel & Low Temperature Carbon Steel

- ASTM A193 GR B7 – A194 GR 2H
- ASTM A193 GR B7M – A194 GR 2HM (NACE)
- ASTM A193 GR L7 – A194 GR 4, A193 GR L7 – A194 GR 7
- ASTM A193 GR L7M – A194 GR4M, A193 GR L7M – A194 GR 7M (NACE)

Austenitic Stainless Steel

- ASTM A320 GR B8 – A194 GR 8
- ASTM A320 GR B8M – A194 GR 8M

Duplex Stainless Steel

- ASTM A 453 GR 660

Seals & Seat Inserts – Seals & Seat Inserts – Elastomerics Materials "Temperature Limit"

Material	Use	Seal Type	Design Temperature		Max Rating
			°C	°F	
HNBR	Seal	O-Ring	-29 / 150	-20 / 300	2500
HNBR - LT	Seal	O-Ring	-46 / 150	-50 / 300	2500
Viton AED	Seal	O-Ring	-29 / 200	-20 / 390	2500
Viton GLT AED	Seal	O-Ring	-46 / 200	-50 / 390	2500
PTFE+ELGILOY	Seal	Lip Seal	-196 / 200	-320 / 390	2500
Viton AED	Insert	Delta Ring	-29 / 150	-20 / 300	600

Seat Insert - Thermoplastic Materials "Temperature Capabilities"

Seat Inserts – Seat Insert - Thermoplastic Materials "Temperature Capabilities"

Material	Use	Design Temperature		Max Rating
		°C	°F	
Nylon 6	Insert	-40 / 90	-40 / 195	2500
Nylon 6 Mos2	Insert	-40 / 120	-40 / 250	2500
Nylon 12	Insert	-50 / 120	-60 / 250	2500
Devlon V-API	Insert	-100 / 150	-150 / 300	2500
PEEK®	Insert	-100 / 230	-150 / 445	2500
PTFE (Reinforced)	Insert	-100 / 220	-150 / 430	300
PCTFE (KEL-F)®	Insert	-196 / 150	-320 / 300	1500

"* The above data are given for reference only and can vary based on the application, the type of service and supplier. The scope of the table is to give an indication about the seal material which could be appropriate for a certain temperature range only. Proper selection shall include service conditions such as pressure, fluid etc. etc.

TEST PRESSURE & CV DATA

RATING AND TEST PRESSURES AT AMBIENT TEMPERATURE												
ASME CLASS	RATING ⁽¹⁾			BODY TEST			H.P. SEAT TEST			AIR SEAT TEST		
	Psi	Bar	MPa	Psi	Bar	MPa	Psi	Bar	MPa	Psi	Bar	MPa
150	285	19,6	2.0	427.5	29.4	2.9	313.5	21.6	2.2	100	7	0.7
300	740	51,1	5.1	1110	76.7	7.7	814	56.2	5.6	100	7	0.7
600	1480	102,1	10.2	2220	153.2	15.3	1628	112.3	11.2	100	7	0.7
900	2220	153,2	15.3	3330	229.8	23.0	2442	168.5	16.9	100	7	0.7
1500	3705	255,3	25.5	5557.5	383.0	38.3	4075.5	280.8	28.1	100	7	0.7
2500	6170	425,5	42.6	9255	638.3	63.8	6787	468.1	46.8	100	7	0.7
API 3000	3000	207	20.7	4500	310.5	31.1	3000	207.0	20.7	100	7	0.7
API 5000	5000	345	34.5	7500	517.5	51.8	5000	345.0	34.5	100	7	0.7
API 10000	10000	690	69.0	15000	1035	103.5	10000	690.0	69.0	100	7	0.7
API 15000	15000	1035	103.5	22500	1552.5	155.25	15000	1035	103.5	100	7	0.7

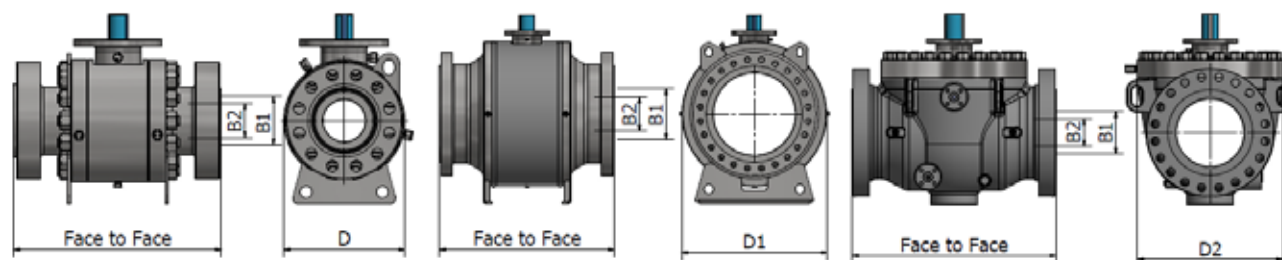
⁽¹⁾ Ratings for Group 1.1 Materials of ASME B16.34

Cv FLOW COEFFICIENTS (API6D)						
BORE (INCHES)	ASME CLASSES					
	150	300	600	900	1500	2500
	[gal/min]					
2	490	430	360	320	320	190
3 x 2	320	290	260	260	240	150
3	1300	1060	930	900	800	460
4 x 3	760	700	630	620	590	360
4	2620	2220	1820	1770	1610	1020
6 x 4	1330	1320	1200	1170	1110	740
6	5540	5470	4570	4370	3650	2510
8 x 6	3130	3070	2880	2800	2470	1870
8	10970	10430	9000	8490	7100	5350
10 x 8	5890	5820	5430	5350	4640	3690
10	18080	17470	14690	14220	11410	8440
12 x 10	9710	9600	9120	8840	7560	6100
14 x 10	9120	8940	8680	8450	7120	-
12	27170	26300	22960	21330	17160	-
14 x 12	16440	16050	15460	16300	12520	-
16 x 12	13530	13310	12900	12740	10680	-
14	33200	31400	28960	24490	20900	-
16 x 14	18330	18010	17410	15500	14280	-
16	45160	42960	39350	33960	27990	-
18 x 16	25230	24960	24070	21850	19210	-
20 x 16	22230	21950	21250	19470	17130	-
18	58410	56710	51690	45270	36260	-
20 x 18	33860	33340	32080	29500	25180	-
20	75730	72600	65910	57540	46620	-
24 x 20	37260	36870	35660	32520	-	-
24	113360	109380	98610	86160	-	-
30 x 24	53330	52760	51400	46770	-	-
26	132120	126410	116940	102550	-	-
28	154110	148030	137710	125230	-	-
30	182380	175390	160980	139120	-	-
36 x 30	87620	86030	83440	75850	-	-
36	264700	248260	225600	203660	-	-

Cv FLOW COEFFICIENTS (API6A)			
BORE (INCHES)	CLASSES		
	3000	5000	10000
	[gal/min]		
1 13/16	270	270	240
2 1/16	370	370	310
3 1/8	1060	950	880
4 1/16	1910	1730	1560
5 1/8	2770	2770	2710
7 1/16	5890	5890	5690

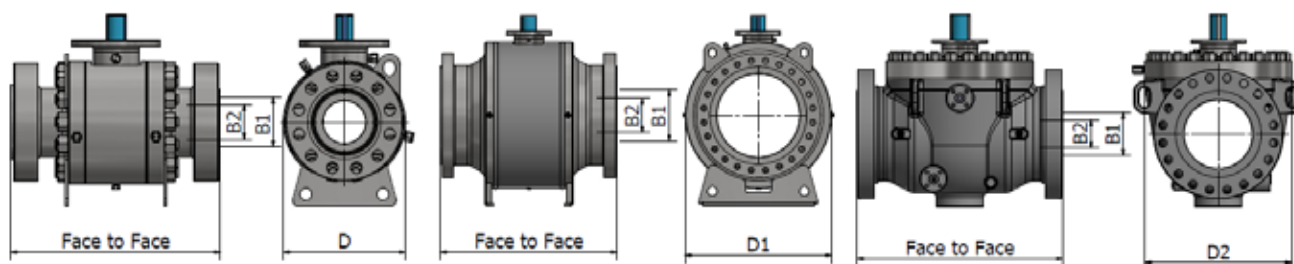
Cv = flow rate of water expresses in gallons per minute, at 60°F, with a pressure drop of one psig across the valve.

DIMENSIONS: CLASS 150 - FULL PORT



SIZE	BORE		SIDE ENTRY								TOP ENTRY				
			MODEL / FACE TO FACE				D in/mm	D1 in/mm	WEIGHT		MODEL / FACE TO FACE			D2 in/mm	WEIGHT Model FT lb/kg
NPS/DN	B1 in/mm	B2 in/mm	FF,FW RF in/mm	FF,FW RTJ in/mm	FF BWE in/mm	FW BWE in/mm			Model FF lb/kg	Model FW lb/kg	FT RF in/mm	FT RTJ in/mm	FT BWE in/mm		
2"	1.94	1.94	7.00	7.50	8.50	11.0 ●	6.5	6.5	53	53	11.50	11.63	11.50	7.5	110
50	49	49	178	191	216	279 ●	166	166	24	24	292	295	292	190	50
3"	2.94	2.94	8.00	8.50	11.13	12.5 ●	7.8	7.8	79	79	14.00	14.13	14.00	9.4	254
80	74	74	203	216	283	318 ●	198	198	36	36	356	359	356	240	115
4"	3.94	3.94	9.00	9.50	12.00	14.0 ●	9.8	9.8	132	132	17.00	17.13	17.00	11.4	474
100	100	100	229	241	305	356 ●	249	249	60	60	432	435	432	290	215
6"	5.94	5.94	15.50	16.00	18.00	18.0	12.9	13.0	364	357	22.00	22.13	22.00	14.6	573
150	150	150	394	406	457	457	328	329	165	162	559	562	559	370	260
8"	7.94	7.94	18.00	18.50	20.50	21.5 ●	15.7	15.4	575	549	26.00	26.13	26.00	16.3	1235
200	201	201	457	470	521	546 ●	400	392	261	249	660	664	660	415	560
10"	9.94	9.94	21.00	21.50	22.00	23.5 ●	18.4	18.0	869	805	31.00	31.13	31.00	19.9	1146
250	252	252	533	546	559	597 ●	468	456	394	365	787	791	787	505	520
12"	11.94	11.94	24.00	24.50	25.00	26.5 ●	22.8	22.1	1594	1455	33.00	33.13	33.00	22.6	1455
300	303	303	610	622	635	673 ●	580	562	723	660	838	841	838	575	660
14"	13.19	13.19	27.00	27.50	30.00	28.5 ■	23.8	23.4	1852	1711	35.00	35.13	35.00	26.4	1169
350	334	334	686	699	762	724 ■	604	595	840	776	889	892	889	670	530
16"	15.19	15.19	30.00	30.50	33.00	30.5 ■	27.2	26.8	2617	2575	39.00	39.13	39.00	28	2734
400	385	385	762	775	838	775 ■	690	680	1187	1168	991	994	991	712	1240
18"	17.19	17.19	34.00	34.50	36.00	33.5 ■	30.4	29.5	3417	3241	43.00	43.13	43.00	29.8	3638
450	436	436	864	876	914	851 ■	773	750	1550	1470	1092	1095	1092	757	1650
20"	19.19	19.19	36.00	36.50	39.00	35.5 ■	33.4	33.1	4480	4310	47.00	47.25	47.00	36.4	4652
500	487	487	914	927	991	902 ■	848	842	2032	1955	1194	1200	1194	925	2110
22"	21.19	21.19	39.00*	N/A	43.0*	38.5 ■	36.5	36.2	5370	5260	51.00	N/A	51.00	37.3	6614
550	538	538	991*	N/A	1092*	978 ■	926	920	2436	2386	1295	N/A	1295	947	3000
24"	23.19	23.19	42.00	42.50	45.00	42.0 ■	39.5	39.2	7046	6826	55.00	55.40	55.00	42.5	7716
600	589	589	1067	1080	1143	1067 ■	1004	995	3196	3096	1397	1407	1397	1080	3500
26"	24.94	24.94	45.00	N/A	49.00	44.5 ■	43.3	42.7	8334	8203	57.00	N/A	57.00	43.7	8598
650	633	633	1143	N/A	1245	1130 ■	1099	1085	3780	3721	1448	N/A	1448	1110	3900
28"	26.94	26.94	49.00	N/A	53.00	47.0 ■	46.5	46.1	10406	10296	61.00	N/A	61.00	45.1	10362
700	684	684	1245	N/A	1346	1194 ■	1180	1170	4720	4670	1549	N/A	1549	1146	4700
30"	28.94	28.94	51.00	N/A	55.00	49.0 ■	49.0	48.5	13098	12999	65.00	N/A	65.00	54.3	12456
750	735	735	1295	N/A	1397	1245 ■	1245	1232	5941	5896	1651	N/A	1651	1380	5650
32"	30.69	30.69	54.00	N/A	60.00	N/A	51.7	51.5	15055	14923	70.00	N/A	70.00	55.9	15653
800	779	779	1372	N/A	1524	N/A	1314	1308	6829	6769	1778	N/A	1778	1420	7100
34"	32.69	32.69	58.00	N/A	64.00	54.5 ■	55.3	55.0	17659	17549	76.00	N/A	76.00	59.1	17417
850	830	830	1473	N/A	1626	1384 ■	1405	1398	8010	7960	1930	N/A	1930	1500	7900
36"	34.44	34.44	60.00	N/A	68.00	56.5 ■	58.3	57.8	21231	21101	82.00	N/A	82.00	61.8	20521
900	874	874	1524	N/A	1727	1435 ■	1480	1467	9630	9571	2083	N/A	2083	1570	9308
40"	38.44	38.44	69.0*	N/A	77.0*	65.0 ■	62.8	62.2	26279	26125	86.60	N/A	86.60	66.9	28330
1000	976	976	1753*	N/A	1956*	1651 ■	1594	1581	11920	11850	2200	N/A	2200	1700	12850
42"	40.19	40.19	73.0*	N/A		66.5 ■	66.9	66.3	31956	31692	84.10	N/A	84.10	71.7	34988
1050	1020	1020	1855.0*	N/A		1689 ■	1700	1685	14495	14375	2390	N/A	2390	1820	15870
48"	45.94	45.94	75.6*	N/A		76.0 ■	76.4	75.6	39705	39474	106.30	N/A	106.30	86.6	49604
1200	1166	1166	1920.0*	N/A		1930 ■	1940	1920	18010	17905	2700	N/A	2700	2200	22500
Weight and dimensions for larger valve sizes up to 64" available on request															

DIMENSIONS: CLASS 150 - REDUCED PORT



SIZE	BORE		SIDE ENTRY								TOP ENTRY					
			MODEL / FACE TO FACE				D in/mm	D1 in/mm	WEIGHT		MODEL / FACE TO FACE			D2 in/mm	WEIGHT Model GT lb/kg	
NPS/DN	B1 in/mm	B2 in/mm	GG,GW RF in/mm	GG,GW RTJ in/mm	GG BWE in/mm	GW BWE in/mm			Model GG lb/kg	Model GW lb/kg	GT RF in/mm	GT RTJ in/mm	GT BWE in/mm			
2"x1.1/2"	1.94	1.50	7.00	7.50	8.50	11.0 ●	6.1	6.1	51	51	11.50	11.63	11.50	5.9	55	
50X40	49	38	178	191	216	279 ●	156	156	23	23	292	295	292	150	25	
3"x2"	2.94	1.94	8.00	8.50	11.13	12.5 ●	7.5	7.5	68	68	14.00	14.13	14.00	7.5	132	
80x50	74	49	203	216	283	318 ●	191	191	31	31	356	359	356	190	60	
4"x3"	3.94	2.94	9.00	9.50	12.00	14.0 ●	9.1	9.1	104	104	17.00	17.13	17.00	9.4	276	
100x80	100	74	229	241	305	356 ●	231	231	47	47	432	435	432	240	125	
6"x4"	5.94	3.94	15.50	16.00	18.00	18.0	11.0	11.0	198	198	22.00	22.13	22.00	11.4	485	
150x100	150	100	394	406	457	457	280	280	90	90	559	562	559	290	220	
8"x6"	7.94	5.94	18.00	18.50	20.50	21.5 ●	13.6	13.6	401	394	26.00	26.13	26.00	14.6	595	
200x150	201	150	457	470	521	546 ●	346	346	182	179	660	664	660	370	270	
10"x8"	9.94	7.94	21.00	21.50	22.00	23.5 ●	15.9	15.9	635	606	31.00	31.13	31.00	16.3	1058	
250x200	252	201	533	546	559	597 ●	405	405	288	275	787	791	787	415	480	
12"x10"	11.94	9.94	24.00	24.50	25.00	26.5 ●	19.1	19.1	972	901	33.00	33.13	33.00	20.7	1213	
300x250	303	252	610	622	635	673 ●	486	486	441	408	838	841	838	525	550	
14"x10"	13.19	11.94	27.00	27.50	30.00	28.5 ■	21.1	21.1	1045	968	35.00	35.13	35.00	21.1	1587	
350x250	334	252	686	699	762	724 ■	536	536	474	439	889	892	889	535	720	
14"x12"	13.19	11.94	27.00	27.50	30.00	28.5 ■	22.8	22.1	1702	1592	35.00	35.13	35.00	22.6	1786	
350x300	334	303	686	699	762	724 ■	580	562	772	722	889	892	889	575	810	
16"x12"	15.19	11.94	30.00	30.50	33.00	30.5 ■	23.5	23.5	1801	1644	39.00	39.13	39.00	23.4	2028	
400x300	385	303	762	775	838	775 ■	596	596	817	745	991	994	991	595	920	
20"x16"	19.19	15.19	36.00	36.50	39.00	35.5 ■	27.6	27.6	2892	2846	47.00	47.25	47.00	28	3638	
500x400	487	385	914	927	991	902 ■	701	701	1312	1290	1194	1200	1194	712	1650	
24"x20"	23.19	19.19	42.00	42.50	45.00	42.0 ■	33.4	33.4	4848	4664	55.00	55.40	55.00	36.4	5578	
600x500	589	487	1067	1080	1143	1067 ■	848	848	2199	2115	1397	1407	1397	925	2530	
28"x24"	26.94	23.19	49.00	N/A	53.00	47.0 ■	39.5	39.2	7386	7165	61.00	N/A	61.00	42.5	8708	
700x600	684	589	1245	N/A	1346	1194 ■	1004	995	3350	3250	1549	N/A	1549	1080	3950	
30"x24"	28.94	23.19	51.00	N/A	55.00	49.0 ■	39.5	39.2	7893	7677	65.00	N/A	65.00	42.5	9260	
750x600	735	589	1295	N/A	1397	1245 ■	1004	995	3580	3482	1651	N/A	1651	1080	4200	
34"x30"	32.69	28.94	58.00	N/A	64.00	54.5 ■	49.0	48.5	13753	13669	76.00	N/A	76.00	54.3	14771	
850x750	830	735	1473	N/A	1626	1384 ■	1245	1232	6238	6200	1930	N/A	1930	1380	6700	
36"x30"	34.44	28.94	60.00	N/A	68.00	56.5 ■	49.0	48.5	14220	14099	82.00	N/A	82.00	54.3	15653	
900x750	874	735	1524	N/A	1727	1435 ■	1245	1232	6450	6395	2083	N/A	2083	1380	7100	
	Weight and dimensions for larger valve sizes up to 64" available on request															

Weight and dimensions for larger valve sizes up to 64" available on request

Dimension: mm/kg – inch/lb

Note:

Face to Face dimensions for Top Entry ball valves class 150 and 300 are the same as class 600

D, D1 & D2 is the greater between body diameter and line flange diameter

●: Length exceeds specified dimension in API 6D / ISO 14313; ■: Short Pattern - Manufacturer Standard

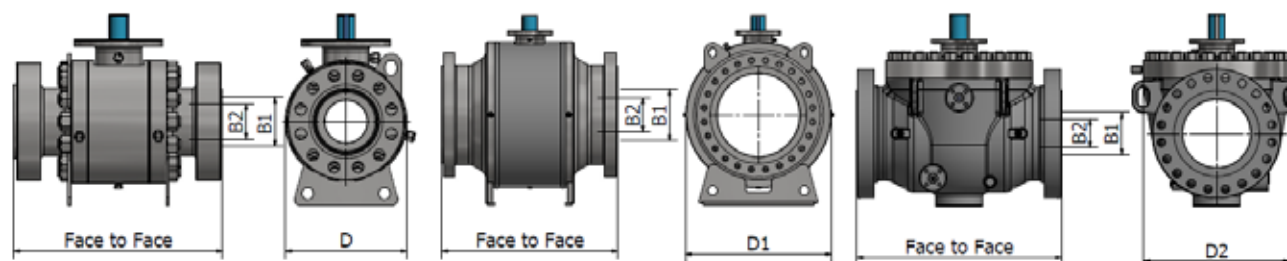
All dimensions not related to international standards are indicative

Abbreviation:

* - Not a standard dimension

N/A - Not Applicable

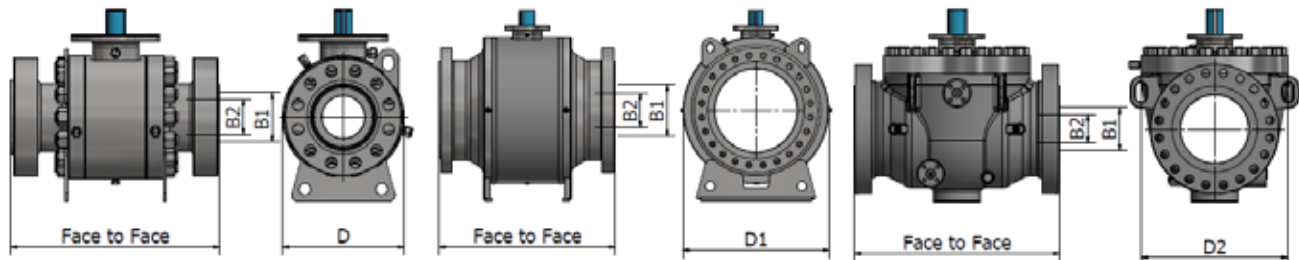
DIMENSIONS: CLASS 300 - FULL PORT



SIZE	BORE	SIDE ENTRY								TOP ENTRY					
		MODEL / FACE TO FACE				D		WEIGHT		MODEL / FACE TO FACE			D2		WEIGHT
		FF,FW RF	FF,FW RTJ	FF BWE	FW BWE					FT RF	FT RTJ	FT BWE			
NPS/DN	B1 in/mm	B2 in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	Model FF lb/kg	Model FW lb/kg	in/mm	in/mm	in/mm	in/mm	Model FT lb/kg
2"	1.94	1.94	8.50	9.13	8.50	11.0 ●	6.5	6.5	60	60	11.50	11.63	11.50	7.5	121
50	49	49	216	232	216	279 ●	166	166	27	27	292	295	292	190	55
3"	2.94	2.94	11.13	11.75	11.13	12.5 ●	8.5	8.5	132	132	14.00	14.13	14.00	9.4	276
80	74	74	283	298	283	318 ●	216	216	60	60	356	359	356	240	125
4"	3.94	3.94	12.00	12.63	12.00	14.0 ●	10.1	10.1	179	179	17.00	17.13	17.00	11.4	507
100	100	100	305	321	305	356 ●	256	256	81	81	432	435	432	290	230
6"	5.94	5.94	15.88	16.50	18.00	18.0	12.9	12.9	408	397	22.00	22.13	22.00	14.6	606
150	150	150	403	419	457	457	328	328	185	180	559	562	559	370	275
8"	7.94	7.94	19.75	20.38	20.50	21.5 ●	16.3	15.9	688	659	26.00	26.13	26.00	16.3	1124
200	201	201	502	518	521	546 ●	413	404	312	299	660	664	660	415	510
10"	9.94	9.94	22.38	23.00	22.00	23.5 ●	19.1	18.5	1038	977	31.00	31.13	31.00	19.9	1279
250	252	252	568	584	559	597 ●	485	470	471	443	787	791	787	505	580
12"	11.94	11.94	25.50	26.13	25.00	26.5 ●	23.6	22.8	1883	1713	33.00	33.13	33.00	22.6	1609
300	303	303	648	664	635	673 ●	600	580	854	777	838	841	838	575	730
14"	13.19	13.19	30.00	30.63	30.00	28.5 ■	24.0	23.4	2130	1962	35.00	35.13	35.00	26.4	2072
350	334	334	762	778	762	724 ■	610	595	966	890	889	892	889	670	940
16"	15.19	15.19	33.00	33.63	33.00	30.5 ■	27.6	26.8	3031	2785	39.00	39.13	39.00	28.0	3087
400	385	385	838	854	838	775 ■	700	680	1375	1263	991	994	991	712	1400
18"	17.19	17.19	36.00	36.63	36.00	33.5 ■	31.1	30.7	4145	4012	43.00	43.13	43.00	29.8	4079
450	436	436	914	930	914	851 ■	790	780	1880	1820	1092	1095	1092	757	1850
20"	19.19	19.19	39.00	39.75	39.00	35.5 ■	34.1	33.6	5236	4996	47.00	47.25	47.00	36.4	5181
500	487	487	991	1010	991	902 ■	865	854	2375	2266	1194	1200	1194	925	2350
22"	21.19	21.19	43.00	43.88	43.00	38.5 ■	37.1	36.6	6371	6129	51.00	51.38	51.00	37.3	7341
550	538	538	1092	1114	1092	978 ■	943	930	2890	2780	1295	1305	1295	947	3330
24"	23.19	23.19	45.00	45.88	45.00	42.0 ■	40.6	40.2	8380	7963	55.00	55.38	55.00	42.5	8598
600	589	589	1143	1165	1143	1067 ■	1031	1020	3801	3612	1397	1407	1397	1080	3900
26"	24.94	24.94	49.00	50.00	49.00	44.5 ■	43.4	42.9	10847	10450	57.00	57.50	57.00	43.7	10141
650	633	633	1245	1270	1245	1130 ■	1103	1090	4920	4740	1448	1461	1448	1110	4600
28"	26.94	26.94	53.00	54.00	53.00	47.0 ■	46.5	45.7	13451	13184	61.00	61.50	61.00	45.1	12214
700	684	684	1346	1372	1346	1194 ■	1180	1160	6101	5980	1549	1562	1549	1146	5540
30"	28.94	28.94	55.00	56.00	55.00	49.0 ■	50.0	49.2	15362	14782	65.00	65.50	65.00	54.3	14771
750	735	735	1397	1422	1397	1245 ■	1270	1250	6968	6705	1651	1664	1651	1380	6700
32"	30.69	30.69	60.00	61.13	60.00	N/A	52.7	52.0	18409	17902	70.00	70.63	70.00	55.9	18519
800	779	779	1524	1553	1524	N/A	1339	1320	8350	8120	1778	1794	1778	1420	8400
34"	32.69	32.69	64.00	65.13	64.00	54.5 ■	56.3	55.3	21870	21187	76.00	76.63	76.00	59.1	20503
850	830	830	1626	1654	1626	1384 ■	1430	1405	9920	9610	1930	1946	1930	1500	9300
36"	34.44	34.44	68.00	69.13	68.00	56.5 ■	59.4	58.9	25292	24516	82.00	82.63	82.00	61.8	24141
900	874	874	1727	1756	1727	1435 ■	1510	1495	11472	11120	2083	2099	2083	1570	10950
40"	38.44	38.44	77.00*	N/A	77.00*	65.0 ■	63.7	62.9	28704	28109	86.60*	N/A	86.60*	66.9	33577
1000	976	976	1956*	N/A	1956*	1651 ■	1618	1598	13020	12750	2200*	N/A	2200*	1700	15230
42"	40.19	40.19	70.00*	N/A	70.00*	66.5 ■	68.0	66.9	31107	30755	94.10*	N/A	94.10*	71.7	41712
1050	1020	1020	1780*	N/A	1780*	1689 ■	1727	1700	14110	13950	2390*	N/A	2390*	1820	18920
48"	45.94	45.94	81.50*	N/A	81.50*	76.0 ■	77.2	76.4	44115	42329	106.30*	N/A	106.30*	86.6	58423
1200	1166	1166	2070*	N/A	2070*	1930 ■	1960	1940	20010	19200	2700*	N/A	2700*	2200	26500

Weight and dimensions for larger valve sizes up to 64" available on request

DIMENSIONS: CLASS 300 - REDUCED PORT



SIZE	BORE		SIDE ENTRY								TOP ENTRY				
			MODEL / FACE TO FACE						WEIGHT		MODEL / FACE TO FACE				WEIGHT
NPS/DN	B1 in/mm	B2 in/mm	GG, GW RF in/mm	GG, GW RTJ in/mm	GG BWE in/mm	GW BWE in/mm	D in/mm	D1 in/mm	Model GG lb/kg	Model GW lb/kg	GT RF in/mm	GT RTJ in/mm	GT BWE in/mm	D2 in/mm	Model GT lb/kg
2"x1.1/2"	1.94	1.50	8.50	9.13	8.50	11.0 ●	6.5	6.5	57	57	11.50	11.63	11.50	6.5	66
50X40	49	38	216	232	216	279 ●	166	166	26	26	292	295	292	166	30
3"x2"	2.94	1.94	11.13	11.75	11.13	12.5 ●	8.3	8.3	88	88	14.00	14.13	14.00	8.3	143
80x50	74	49	283	298	283	318 ●	211	211	40	40	356	359	356	210	65
4"x3"	3.94	2.94	12.00	12.63	12.00	14.0 ●	10.1	10.1	154	154	17.00	17.13	17.00	10.0	298
100x80	100	74	305	321	305	356 ●	256	256	70	70	432	435	432	255	135
6"x4"	5.94	3.94	15.90	16.50	18.00	18.0	12.6	12.6	251	251	22.00	22.13	22.00	12.6	551
150x100	150	100	403	419	457	457	321	321	114	114	559	562	559	320	250
8"x6"	7.94	5.94	19.80	20.38	20.50	21.5 ●	15.0	15.0	481	468	26.00	26.13	26.00	15.0	661
200x150	201	150	502	518	521	546 ●	381	381	218	212	660	664	660	381	300
10"x8"	9.94	7.94	22.40	23.00	22.00	23.5 ●	17.6	17.6	769	737	31.00	31.13	31.00	17.5	1191
250x200	252	201	568	584	559	597 ●	446	446	349	334	787	791	787	445	540
12"x10"	11.94	9.94	25.50	26.13	25.00	26.5 ●	20.5	20.5	1164	1095	33.00	33.13	33.00	20.5	1367
300x250	303	252	648	664	635	673 ●	521	521	528	496	838	841	838	520	620
14"x10"	13.19	11.94	30.00	30.63	30.00	28.5 ■	23.1	23.1	1340	1261	35.00	35.13	35.00	23.0	1764
350x250	334	252	762	778	762	724 ■	586	586	608	572	889	892	889	585	800
14"x12"	13.19	11.94	30.00	30.63	30.00	28.5 ■	23.6	23.1	2134	1942	35.00	35.13	35.00	23.0	1984
350x300	334	303	762	778	762	724 ■	600	586	968	881	889	892	889	585	900
16"x12"	15.19	11.94	33.00	33.63	33.00	30.5 ■	25.6	25.6	2236	2034	39.00	39.13	39.00	25.6	2161
400x300	385	303	838	854	838	775 ■	651	651	1014	922	991	994	991	650	980
20"x16"	19.19	15.19	39.00	39.75	39.00	35.5 ■	30.6	30.6	3446	3166	47.00	47.25	47.00	30.5	4057
500x400	487	385	991	1010	991	902 ■	776	776	1563	1436	1194	1200	1194	775	1840
24"x20"	23.19	19.19	45.00	45.88	45.00	42.0 ■	36.1	36.1	5792	5525	55.00	55.38	55.00	36.4	6371
600x500	589	487	1143	1165	1143	1067 ■	916	916	2627	2506	1397	1407	1397	925	2890
28"x24"	26.94	23.19	53.00	54.00	53.00	47.0 ■	40.7	40.7	9083	8631	61.00	61.50	61.00	AOR	9877
700x600	684	589	1346	1372	1346	1194 ■	1035	1035	4120	3915	1549	1562	1549	1080	4480
30"x24"	28.94	23.19	55.00	56.00	55.00	49.0 ■	43.0	43.0	9650	9169	65.00	65.50	65.00	42.9	10582
750x600	735	589	1397	1422	1397	1245 ■	1091	1091	4377	4159	1651	1664	1651	1090	4800
34"x30"	32.69	28.94	64.00	65.13	64.00	54.5 ■	50.0	50.0	16623	16167	76.00	76.63	76.00	54.3	17417
850x750	830	735	1626	1654	1626	1384 ■	1270	1270	7540	7333	1930	1946	1930	1380	7900
36"x30"	34.44	28.94	68.00	69.13	68.00	56.5 ■	50.0	50.0	17439	16892	82.00	82.63	82.00	54.3	18475
900x750	874	735	1727	1756	1727	1435 ■	1270	1270	7910	7662	2083	2099	2083	1380	8380

Weight and dimensions for larger valve sizes up to 64" available on request

Dimension: mm/kg – inch/lb

Note:

Face to Face dimensions for Top Entry ball valves class 150 and 300 equals to class 600

D, D1 & D2 is the greater between body diameter and line flange diameter

●: Length exceeds specified dimension in API 6D / ISO 14313; ■: Short Pattern - Manufacturer Standard

All dimensions not related to international standards are indicative

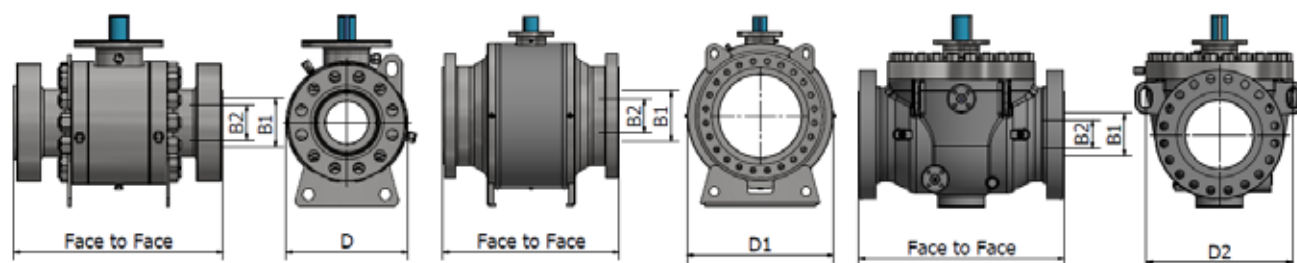
Abbreviation:

* - Not a standard dimension

AOR - Available on Request

N/A not applicable

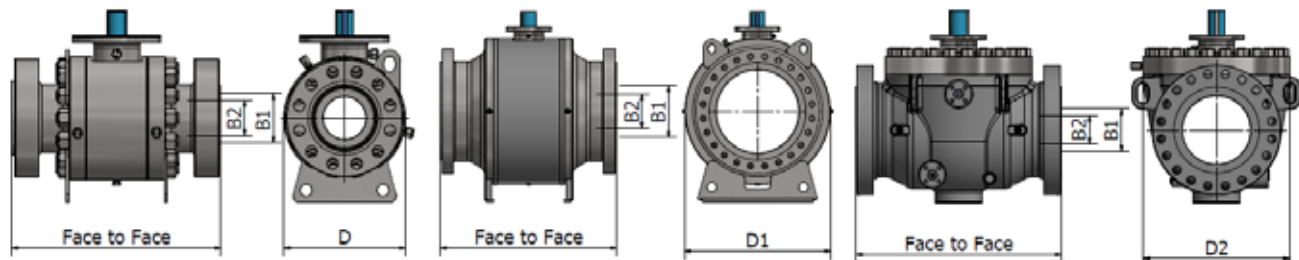
DIMENSIONS: CLASS 600 - FULL PORT



SIZE	BORE		SIDE ENTRY								TOP ENTRY				
			MODEL / FACE TO FACE				D	D1	WEIGHT		MODEL / FACE TO FACE			D2	WEIGHT
NPS/DN	B1 in/mm	B2 in/mm	FF,FW RF in/mm	FF,FW RTJ in/mm	FF BWE in/mm	FW BWE in/mm			Model FF lb/kg	Model FW lb/kg	FT RF in/mm	FT RTJ in/mm	FT BWE in/mm		
2"	1.94	1.94	11.50	11.63	11.50	11.0 ■	6.5	6.5	79	79	11.50	11.63	11.50	7.5	132
50	49	49	292	295	292	279 ■	166	166	36	36	292	295	292	190	60
3"	2.94	2.94	14.00	14.13	14.00	12.5 ■	8.5	8.5	154	154	14.00	14.13	14.00	9.4	287
80	74	74	356	359	356	318 ■	216	216	70	70	356	359	356	240	130
4"	3.94	3.94	17.00	17.13	17.00	14.0 ■	10.9	10.9	254	254	17.00	17.13	17.00	11.4	529
100	100	100	432	435	432	356 ■	276	276	115	115	432	435	432	290	240
6"	5.94	5.94	22.00	22.13	22.00	18.0 ■	14.0	14.0	573	501	22.00	22.13	22.00	14.6	628
150	150	150	559	562	559	457 ■	356	356	260	227	559	562	559	370	285
8"	7.94	7.94	26.00	26.13	26.00	21.5 ■	16.6	16.6	917	827	26.00	26.13	26.00	20.5	1235
200	201	201	660	664	660	546 ■	421	421	416	375	660	664	660	521	560
10"	9.94	9.94	31.00	31.13	31.00	23.5 ■	20.6	20.2	1636	1504	31.00	31.13	31.00	20.1	1852
250	252	252	787	791	787	597 ■	523	512	742	682	787	791	787	510	840
12"	11.94	11.94	33.00	33.13	33.00	26.5 ■	24.0	23.4	2412	2200	33.00	33.13	33.00	22.6	2028
300	303	303	838	841	838	673 ■	610	595	1094	998	838	841	838	575	920
14"	13.19	13.19	35.00	35.13	35.00	28.5 ■	25.0	24.2	2723	2436	35.00	35.13	35.00	26.4	2602
350	334	334	889	892	889	724 ■	635	615	1235	1105	889	892	889	670	1180
16"	15.19	15.19	39.00	39.13	39.00	30.5 ■	28.5	27.4	3860	3382	39.00	39.13	39.00	28.0	3748
400	385	385	991	994	991	775 ■	725	696	1751	1534	991	994	991	712	1700
18"	17.19	17.19	43.00	43.13	43.00	33.5 ■	32.3	31.4	5379	4755	43.00	43.13	43.00	29.8	5291
450	436	436	1092	1095	1092	851 ■	820	798	2440	2157	1092	1095	1092	757	2400
20"	19.19	19.19	47.00	47.25	47.00	35.5 ■	35.4	35.2	6945	6442	47.00	47.25	47.00	36.4	6724
500	487	487	1194	1200	1194	902 ■	900	893	3150	2922	1194	1200	1194	925	3050
22"	21.19	21.19	51.00	51.38	51.00	38.5 ■	38.6	38.0	9039	8708	51.00	51.38	51.00	37.3	9524
550	538	538	1295	1305	1295	978 ■	980	965	4100	3950	1295	1305	1295	947	4320
24"	23.19	23.19	55.00	55.38	55.00	42.0 ■	42.5	40.5	11279	9965	55.00	55.38	55.00	42.5	11751
600	589	589	1397	1407	1397	1067 ■	1080	1028	5116	4520	1397	1407	1397	1080	5330
26"	24.94	24.94	57.00	57.50	57.00	44.5 ■	45.7	44.3	13051	11530	57.00	57.50	57.00	43.7	13206
650	633	633	1448	1461	1448	1130 ■	1160	1125	5920	5230	1448	1461	1448	1110	5990
28"	26.94	26.94	61.00	61.50	61.00	47.0 ■	48.6	47.2	15675	14881	61.00	61.50	61.00	45.1	16204
700	684	684	1549	1562	1549	1194 ■	1235	1200	7110	6750	1549	1562	1549	1146	7350
30"	28.94	28.94	65.00	65.50	65.00	49.0 ■	52.5	50.3	18742	15988	65.00	65.50	65.00	54.3	19886
750	735	735	1651	1664	1651	1245 ■	1334	1277	8501	7252	1651	1664	1651	1380	9020
32"	30.69	30.69	70.00	70.63	70.00	52.0 ■	55.1	52.8	21936	19842	70.00	70.63	70.00	55.9	24251
800	779	779	1778	1794	1778	1321 ■	1400	1340	9950	9000	1778	1794	1778	1420	11000
34"	32.69	32.69	76.00	76.63	76.00	54.5 ■	58.3	56.1	26566	24229	76.00	76.63	76.00	59.1	26676
850	830	830	1930	1946	1930	1384 ■	1482	1425	12050	10990	1930	1946	1930	1500	12100
36"	34.44	34.44	82.00	82.63	82.00	56.5 ■	62.4	59.2	31019	25916	82.00	82.63	82.00	61.8	31967
900	874	874	2083	2099	2083	1435 ■	1585	1504	14070	11755	2083	2099	2083	1570	14500
40"	38.44	38.44	81.90*	81.90*	81.90*	65.0 ■	67.6	65.0	34811	32254	86.60*	86.60*	86.60*	66.9	40499
1000	976	976	2080*	2080*	2080*	1651 ■	1716	1650	15790	14630	2200*	2200*	2200*	1700	18370
42"	40.19	40.19	85.60*	85.60*	85.60*	66.5 ■	69.6	66.9	39683	36817	84.10*	84.10*	84.10*	71.7	52294
1050	1020	1020	2175*	2175*	2175*	1689 ■	1767	1700	18000	16700	2390*	2390*	2390*	1820	23720
48"	45.94	45.94	95.90*	95.90*	95.90*	76.0 ■	81.5	78.7	56483	49825	106.30*	106.30*	106.30*	86.6	69997
1200	1166	1166	2435*	2435*	2435*	1930 ■	2070	2000	25620	22600	2700*	2700*	2700*	2200	31750

Weight and dimensions for larger valve sizes to 64" available on request

DIMENSIONS: CLASS 600 - REDUCED PORT



SIZE	BORE		SIDE ENTRY								TOP ENTRY				
			MODEL / FACE TO FACE				D		D1		WEIGHT		MODEL / FACE TO FACE		
			GG, GW	GG, GW	GG	GW					Model GG	Model GW	GT	GT	GT
NPS/DN	B1	B2	RF	RTJ	BWE	BWE	in/mm	in/mm	in/mm	in/mm	lb/kg	lb/kg	RF	RTJ	BWE
2"x1.1/2"	1.94	1.50	11.50	11.63	11.50	11.0 ■	6.5	6.5	68	68	11.50	11.63	11.50	6.5	77
50x40	49	38	292	295	292	279 ■	166	166	31	31	292	295	292	166	35
3"x2"	2.94	1.94	14.00	14.13	14.00	12.5 ■	8.3	8.3	110	110	14.00	14.13	14.00	8.3	154
80x50	74	49	356	359	356	318 ■	211	211	50	50	356	359	356	211	70
4"x3"	3.94	2.94	17.00	17.13	17.00	14.0 ■	10.9	10.9	209	209	17.00	17.13	17.00	10.9	309
100x80	100	74	432	435	432	356 ■	276	276	95	95	432	435	432	276	140
6"x4"	5.94	3.94	22.00	22.13	22.00	18.0 ■	14.0	14.0	386	386	22.00	22.13	22.00	14.0	584
150x100	150	100	559	562	559	457 ■	356	356	175	175	559	562	559	356	265
8"x6"	7.94	5.94	26.00	26.13	26.00	21.5 ■	16.6	16.6	690	603	26.00	26.13	26.00	16.6	750
200x150	201	150	660	664	660	546 ■	421	421	313	273	660	664	660	421	340
10"x8"	9.94	7.94	31.00	31.13	31.00	23.5 ■	20.1	20.1	1120	1010	31.00	31.13	31.00	20.1	1323
250x200	252	201	787	791	787	597 ■	511	511	508	458	787	791	787	511	600
12"x10"	11.94	9.94	33.00	33.13	33.00	26.5 ■	22.1	22.1	1746	1605	33.00	33.13	33.00	22.1	1984
300x250	303	252	838	841	838	673 ■	561	561	792	728	838	841	838	561	900
14"x10"	13.19	11.94	35.00	35.13	35.00	28.5 ■	23.9	23.9	1878	1727	35.00	35.13	35.00	23.9	2535
350x250	334	252	889	892	889	724 ■	606	606	852	783	889	892	889	606	1150
14"x12"	13.19	11.94	35.00	35.13	35.00	28.5 ■	23.9	23.9	2469	2253	35.00	35.13	35.00	23.9	2756
350x300	334	303	889	892	889	724 ■	606	606	1120	1022	889	892	889	606	1250
16"x12"	15.19	11.94	39.00	39.13	39.00	30.5 ■	27.0	27.0	2877	2625	39.00	39.13	39.00	27.0	3197
400x300	385	303	991	994	991	775 ■	686	686	1305	1190	991	994	991	686	1450
20"x16"	19.19	15.19	47.00	47.25	47.00	35.5 ■	32.1	32.1	4577	4010	47.00	47.25	47.00	32.1	4872
500x400	487	385	1194	1200	1194	902 ■	816	816	2076	1819	1194	1200	1194	816	2210
24"x20"	23.19	19.19	55.00	55.38	55.00	42.0 ■	37.0	37.0	7886	7315	55.00	55.38	55.00	37.0	7628
600x500	589	487	1397	1407	1397	1067 ■	941	941	3577	3318	1397	1407	1397	941	3460
28"x24"	26.94	23.19	61.00	61.50	61.00	47.0 ■	42.5	42.3	12103	10693	61.00	61.50	61.00	AOR	12743
700x600	684	589	1549	1562	1549	1194 ■	1080	1075	5490	4850	1549	1562	1549	1080	5780
30"x24"	28.94	23.19	65.00	65.50	65.00	49.0 ■	44.5	44.5	12899	11397	65.00	65.50	65.00	AOR	13779
750x600	735	589	1651	1664	1651	1245 ■	1131	1131	5851	5169	1651	1664	1651	1130	6250
34"x30"	32.69	28.94	76.00	76.63	76.00	54.5 ■	52.5	50.3	20172	17417	76.00	76.63	76.00	AOR	21760
850x750	830	735	1930	1946	1930	1384 ■	1334	1277	9150	7900	1930	1946	1930	1380	9870
36"x30"	34.44	28.94	82.00	82.63	82.00	56.5 ■	52.5	51.8	21438	18288	82.00	82.63	82.00	AOR	24251
900x750	874	735	2083	2099	2083	1435 ■	1334	1315	9724	8295	2083	2099	2083	1380	11000

Weight and dimensions for larger valve sizes up to 64" available on request

Dimension: mm/kg – inch/lb

Note:

D, D1 & D2 is the greater between body diameter and line flange diameter

■: Short Pattern - Manufacturer Standard

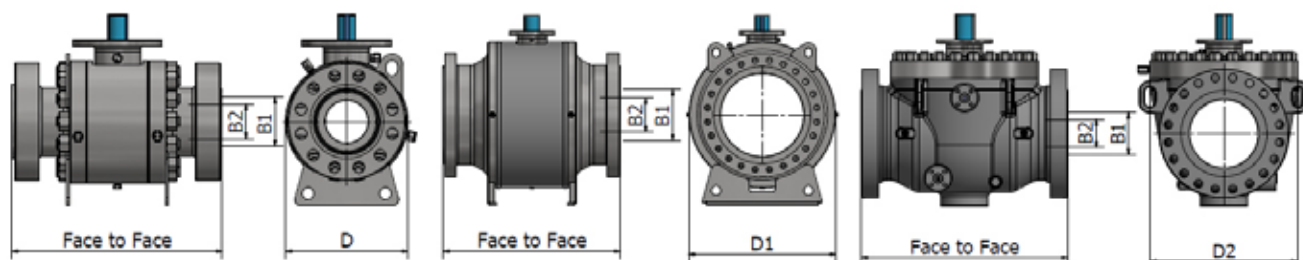
All dimensions not related to international standards are indicative

Abbreviation:

* - Not a standard dimension

AOR - Available on Request

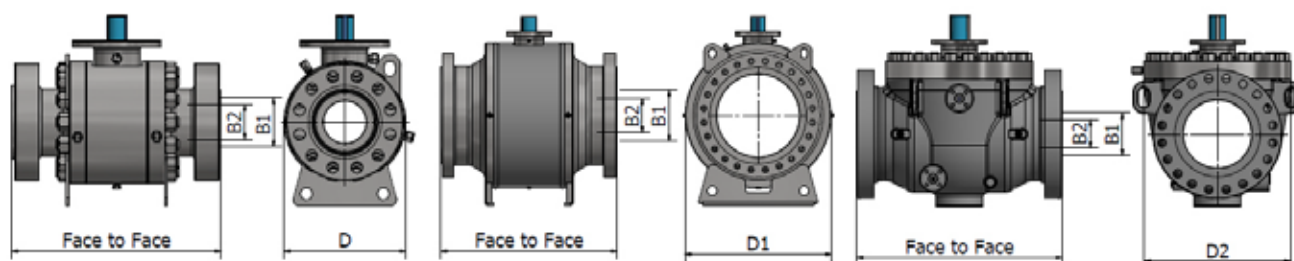
DIMENSIONS: CLASS 900 - FULL PORT



SIZE	BORE		SIDE ENTRY								TOP ENTRY				
			FACE TO FACE			D		D1			FACE TO FACE			D2	WEIGHT
			RF	RTJ	BWE						RF	RTJ	BWE		
NPS/DN	B1 in/mm	B2 in/mm	in/mm	in/mm	in/mm	in/mm	in/mm	Model FF lb/kg	Model FW lb/kg		in/mm	in/mm	in/mm	in/mm	Model FT lb/kg
2"	1.94	1.94	14.50	14.63	14.50	8.5	8.5	137	137		14.50	14.63	14.50	8.5	121
50	49	49	368	371	368	216	216	62	62		368	371	368	216	55
3"	2.94	2.94	15.00	15.13	15.00	9.5	9.5	205	205		15.00	15.13	15.00	9.5	243
80	74	74	381	384	381	241	241	93	93		381	384	381	241	110
4"	3.94	3.94	18.00	18.13	18.00	11.5	11.5	337	337		18.00	18.13	18.00	11.5	474
100	100	100	457	460	457	291	291	153	153		457	460	457	291	215
6"	5.94	5.94	24.00	24.13	24.00	15.0	15.0	750	750		24.00	24.13	24.00	15.0	1091
150	150	150	610	613	610	381	381	340	340		610	613	610	381	495
8"	7.94	7.94	29.00	29.13	29.00	18.9	18.5	1482	1433		29.00	29.13	29.00	18.5	1874
200	201	201	737	740	737	480	470	672	650		737	740	737	470	850
10"	9.94	9.94	33.00	33.13	33.00	21.5	21.5	2061	2017		33.00	33.13	33.00	21.5	2205
250	252	252	838	841	838	546	546	935	915		838	841	838	545	1000
12"	11.94	11.94	38.00	38.13	38.00	25.0	24.0	3098	2976		38.00	38.13	38.00	24.4	2976
300	303	303	965	968	965	635	610	1405	1350		965	968	965	620	1350
14"	12.69	12.69	40.50	40.88	40.50	26.5	25.2	3825	3638		40.50	40.88	40.50	29.7	4035
350	322	322	1029	1038	1029	673	640	1735	1650		1029	1038	1029	755	1830
16"	14.69	14.69	44.50	44.88	44.50	29.8	28.5	4985	4630		44.50	44.88	44.50	33.9	5732
400	373	373	1130	1140	1130	757	725	2261	2100		1130	1140	1130	860	2600
18"	16.69	16.69	48.00	48.50	48.00	33.9	31.5	6834	5842		48.00	48.50	48.00	34.3	7937
450	423	423	1219	1232	1219	862	800	3100	2650		1219	1232	1219	870	3600
20"	18.56	18.56	52.00	52.50	52.00	38.0	36.2	9462	8708		52.00	52.50	52.00	38.6	10406
500	471	471	1321	1334	1321	965	920	4292	3950		1321	1334	1321	980	4720
24"	22.44	22.44	61.00	61.75	61.00	45.9	43.3	16579	15432		61.00	61.75	61.00	43.7	16755
600	570	570	1549	1568	1549	1165	1100	7520	7000		1549	1568	1549	1110	7600
28"	26.19	26.19	68.00*	68.00*	68.00*	50.5	48.0	22598	21936		68.00*	68.00*	68.00*	48.8	24229
700	665	665	1726*	1726*	1726*	1282	1220	10250	9950		1726*	1726*	1726*	1240	10990
30"	28.06	28.06	74.00	74.88	74.00	54.1	51.2	28550	26456		74.00	74.88	74.00	57.1	32232
750	712	712	1880	1902	1880*	1375	1300	12950	12000		1880	1902	1880*	1450	14620
32"	29.94	29.94	80.00*	80.90*	80.00*	57.1	53.1	29101	27338		80.00*	80.90*	80.00*	59.8	35715
800	760	760	2032*	2054*	2032*	1450	1350	13200	12400		2032*	2054*	2032*	1520	16200
34"	31.81	31.81	85.00*	86.10*	85.00*	59.8	55.9	37920	35495		85.00*	86.10*	85.00*	64.6	38361
850	808	808	2159*	2188*	2159*	1520	1420	17200	16100		2159*	2188*	2159*	1640	17400
36"	33.69	33.69	90.00	91.13	90.00	65.0	60.6	43762	38713		90.00	91.13	90.00	66.9	46297
900	855	855	2286	2315	2286*	1650	1540	19850	17560		2286	2315	2286*	1700	21000

Weight and dimensions for larger valve sizes up to 56" available on request

DIMENSIONS: CLASS 900 - REDUCED PORT



SIZE	BORE		SIDE ENTRY							TOP ENTRY				
			FACE TO FACE			D in/mm	D1 in/mm	WEIGHT		FACE TO FACE			D2 in/mm	WEIGHT Model FT lb/kg
			RF in/mm	RTJ in/mm	BWE in/mm			Model GG lb/kg	Model GW lb/kg	RF in/mm	RTJ in/mm	BWE in/mm		
2"x1.1/2"	1.93	1.50	14.50	14.63	14.50	8.5	8.5	108	108	14.50	14.63	14.50	8.5	110
50x40	49	38	368	371	368	216	216	49	49	368	371	368	216	50
3"x2"	2.94	1.94	15.00	15.13	15.00	9.5	9.5	150	150	15.00	15.13	15.00	9.5	159
80x50	74	49	381	384	381	241	241	68	68	381	384	381	241	72
4"x3"	3.94	2.94	18.00	18.13	18.00	11.5	11.5	254	254	18.00	18.13	18.00	11.5	320
100x80	100	74	457	460	457	291	291	115	115	457	460	457	291	145
6"x4"	5.94	3.94	24.00	24.13	24.00	15.0	15.0	481	481	24.00	24.13	24.00	15.0	595
150x100	150	100	610	613	610	381	381	218	218	610	613	610	381	270
8"x6"	7.94	5.94	29.00	29.13	29.00	18.5	18.5	948	948	29.00	29.13	29.00	18.5	1257
200x150	201	150	737	740	737	471	471	430	430	737	740	737	471	570
10"x8"	9.94	7.94	33.00	33.13	33.00	21.5	21.5	1700	1654	33.00	33.13	33.00	21.5	2050
250x200	252	201	838	841	838	546	546	771	750	838	841	838	545	930
12"x10"	11.94	9.94	38.00	38.13	38.00	24.1	24.1	2355	2293	38.00	38.13	38.00	24.4	243
300x250	303	252	965	968	965	611	611	1068	1040	965	968	965	620	110
14"x10"	12.69	9.94	40.50	40.88	40.50	25.2	25.2	2573	2513	40.50	40.88	40.50	25.2	3307
350x250	322	252	1029	1038	1029	641	641	1167	1140	1029	1038	1029	641	1500
14"x12"	12.69	11.94	40.50	40.88	40.50	25.2	25.2	3329	3219	40.50	40.88	40.50	25.2	3968
350x300	322	303	1029	1038	1029	641	641	1510	1460	1029	1038	1029	641	1800
16"x12"	14.69	11.94	44.50	44.88	44.50	27.8	27.8	3611	3472	44.50	44.88	44.50	27.8	4630
400x300	373	303	1130	1140	1130	706	706	1638	1575	1130	1140	1130	706	2100
20"x16"	18.56	14.69	52.00	52.50	52.00	33.7	33.7	6614	6283	52.00	52.50	52.00	33.9	7716
500x400	471	373	1321	1334	1321	855	855	3000	2850	1321	1334	1321	860	3500
24"x20"	22.44	18.56	61.00	61.75	61.00	41.0	41.0	11422	10472	61.00	61.75	61.00	40.9	12126
600x500	570	471	1549	1568	1549	1041	1041	5181	4750	1549	1568	1549	1040	5500

Weight and dimensions for larger valve sizes up to 56" available on request

Dimension: mm/kg – inch/lb

Note:

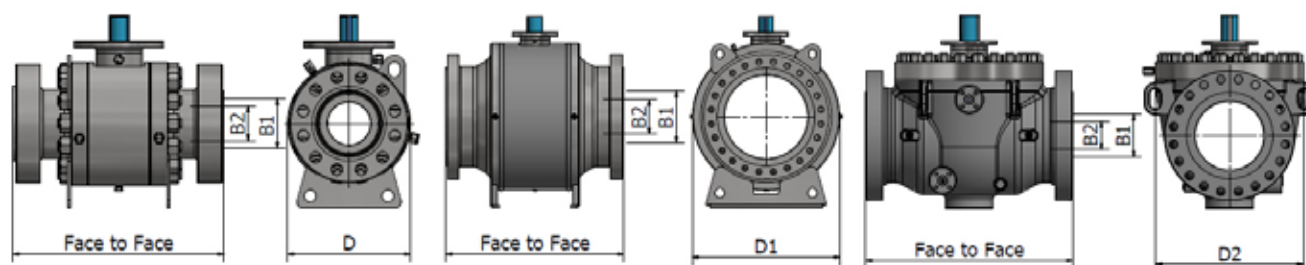
D, D1 & D2 is the greater between body diameter and line flange diameter

All dimensions not related to international standards are indicative

Abbreviation:

* - Not a standard dimension

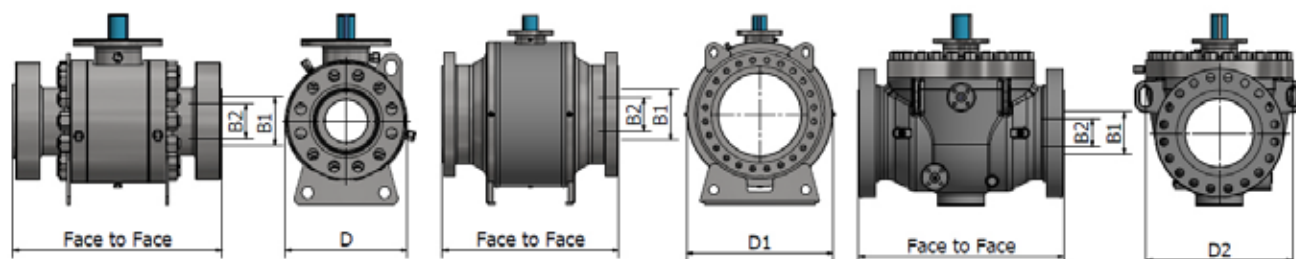
DIMENSIONS: CLASS 1500 - FULL PORT



SIZE	BORE		SIDE ENTRY						TOP ENTRY					
			FACE TO FACE			D in/mm	D1 in/mm	WEIGHT		FACE TO FACE			D2 in/mm	WEIGHT
NPS/DN	B1 in/mm	B2 in/mm	RF in/mm	RTJ in/mm	BWE in/mm			Model FF lb/kg	Model FW lb/kg	RF in/mm	RTJ in/mm	BWE in/mm		Model FT lb/kg
2"	1.94	1.94	14.50	14.63	14.50	8.5	8.5	137	132	14.50	14.63	14.50	8.5	121
50	49	49	368	371	368	216	216	62	60	368	371	368	216	55
3"	2.94	2.94	18.50	18.63	18.50	10.5	10.5	260	254	18.50	18.63	18.50	10.5	331
80	74	74	470	473	470	266	266	118	115	470	473	470	267	150
4"	3.94	3.94	21.50	21.63	21.50	12.2	12.2	439	397	21.50	21.63	21.50	12.2	606
100	100	100	546	549	546	311	311	199	180	546	549	546	311	275
6"	5.69	5.69	27.75	28.00	27.75	16.3	16.3	1113	1102	27.75	28.00	27.75	15.6	1389
150	144	144	705	711	705	415	415	505	500	705	711	705	396	630
8"	7.56	7.56	32.75	33.13	32.75	20.2	20.2	1931	1907	32.75	33.13	32.75	19.1	2557
200	192	192	832	841	832	512	512	876	865	832	841	832	486	1160
10"	9.44	9.44	39.00	39.38	39.00	23.6	23.6	3175	3087	39.00	39.38	39.00	23.0	3263
250	239	239	991	1000	991	600	600	1440	1400	991	1000	991	585	1480
12"	11.31	11.31	44.50	45.13	44.50	27.4	27.4	4806	4740	44.50	45.13	44.50	27.9	4475
300	287	287	1130	1146	1130	695	695	2180	2150	1130	1146	1130	709	2030
14"	12.44	12.44	49.50	50.25	49.50	30.1	30.1	6440	6393	49.50	50.25	49.50	30.1	5842
350	315	315	1257	1276	1257	765	765	2921	2900	1257	1276	1257	765	2650
16"	14.19	14.19	54.50	55.38	54.50	34.6	34.6	9451	9370	54.50	55.38	54.50	33.4	8642
400	360	360	1384	1407	1384	880	880	4287	4250	1384	1407	1384	848	3920
18"	16.00	16.00	60.50	61.38	60.50*	37.2	37.2	13779	13559	60.50	61.38	60.50*	38.6	11641
450	406	406	1537	1559	1537*	945	945	6250	6150	1537	1559	1537*	980	5280
20"	17.88	17.88	65.50	66.38	65.50*	42.1	42.1	20062	19842	65.50	66.38	65.50*	40.0	14551
500	454	454	1664	1686	1664*	1070	1070	9100	9000	1664	1686	1664*	1015	6600
24"	21.50	21.50	77.60*	77.63	77.60*	49.6	49.6	30865	29542	77.60*	77.63	77.60*	50.9	24251
600	546	546	1972*	1972	1972*	1260	1260	14000	13400	1972*	1972	1972*	1293	11000

Weight and dimensions for larger valve sizes up to 48" available on request

DIMENSIONS: CLASS 1500 - REDUCED PORT



SIZE	BORE		SIDE ENTRY							TOP ENTRY				
			FACE TO FACE			D in/mm	D1 in/mm	WEIGHT		FACE TO FACE			D2 in/mm	WEIGHT Model FT lb/kg
NPS/DN	B1 in/mm	B2 in/mm	RF in/mm	RTJ in/mm	BWE in/mm			Model GG lb/kg	Model GW lb/kg	RF in/mm	RTJ in/mm	BWE in/mm		
2"x1.1/2"	1.94	1.50	14.50	14.63	14.50	8.5	8.5	108	101	14.50	14.63	14.50	8.5	110
50x40	49	38	368	371	368	216	216	49	46	368	371	368	216	50
3"x2"	2.94	1.94	18.50	18.63	18.50	10.5	10.5	187	181	18.50	18.63	18.50	10.5	212
80x50	74	49	470	473	470	266	266	85	82	470	473	470	267	96
4"x3"	3.94	2.94	21.50	21.63	21.50	12.2	12.2	320	309	21.50	21.63	21.50	12.2	441
100x80	100	74	546	549	546	311	311	145	140	546	549	546	311	200
6"x4"	5.69	3.94	27.75	28.00	27.75	15.6	15.6	648	639	27.75	28.00	27.75	15.6	827
150x100	144	100	705	711	705	396	396	294	290	705	711	705	396	375
8"x6"	7.56	5.69	32.75	33.13	32.75	19.1	19.1	1374	1345	32.75	33.13	32.75	19.1	1565
200x150	192	144	832	841	832	486	486	623	610	832	841	832	486	710
10"x8"	9.44	7.56	39.00	39.38	39.00	23.1	23.1	2388	2359	39.00	39.38	39.00	23.1	2866
250x200	239	192	991	1000	991	586	586	1083	1070	991	1000	991	586	1300
12"x10"	11.31	9.44	44.50	45.13	44.50	26.6	26.6	3708	3682	44.50	45.13	44.50	26.6	3527
300x250	287	239	1130	1146	1130	676	676	1682	1670	1130	1146	1130	676	1600
14"x10"	12.44	9.44	49.50	50.25	49.50	29.6	29.6	4301	4277	49.50	50.25	49.50	29.6	4740
350x250	315	239	1257	1276	1257	751	751	1951	1940	1257	1276	1257	751	2150
14"x12"	12.44	11.31	49.50	50.25	49.50	29.6	29.6	5291	5247	49.50	50.25	49.50	29.6	6063
350x300	315	287	1257	1276	1257	751	751	2400	2380	1257	1276	1257	751	2750
16"x12"	14.19	11.31	54.50	55.38	54.50	32.5	32.5	6158	6085	54.50	55.38	54.50	32.5	6945
400x300	360	287	1384	1407	1384	826	826	2793	2760	1384	1407	1384	826	3150
20"x16"	17.88	14.19	65.50	66.38	65.50*	38.8	38.8	11550	11464	65.50	66.38	65.50*	38.8	11023
500x400	454	360	1664	1686	1664*	986	986	5239	5200	1664	1686	1664*	986	5000
24"x20"	21.50	17.88	77.60*	77.63	77.60*	46.1	46.1	22553	22465	77.60*	77.63	77.60*	46.1	16314
600x500	546	454	1972*	1972	1972*	1170	1170	10230	10190	1972*	1972	1972*	1170	7400

Weight and dimensions for larger valve sizes up to 48" available on request

Dimension: mm/kg – inch/lb

Note:

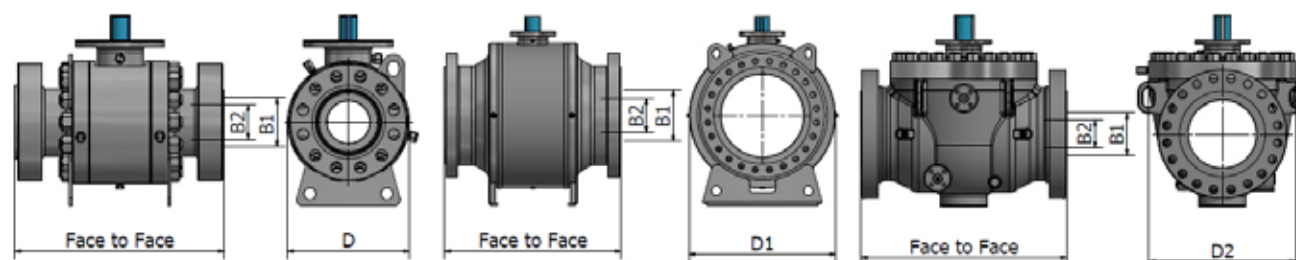
D, D1 & D2 is the greater between body diameter and line flange diameter

All dimensions not related to international standards are indicative

Abbreviation:

* - Not a standard dimension

DIMENSIONS: CLASS 2500 - FULL PORT



SIZE	BORE		SIDE ENTRY							TOP ENTRY				
			FACE TO FACE			D	D1	WEIGHT		FACE TO FACE			D2	WEIGHT
			RF	RTJ	BWE			Model FF	Model FW	RF	RTJ	BWE		
NPS/DN	B1	B2	in/mm	in/mm	in/mm	in/mm	in/mm	lb/kg	lb/kg	in/mm	in/mm	in/mm	in/mm	lb/kg
2"	1.69	1.69	17.75	17.88	17.75	9.3	AOR	234	AOR	17.75	17.88	17.75	9.3	276
50	42	42	451	454	451	236	AOR	106	AOR	451	454	451	235	125
3"	2.44	2.44	22.75	23.00	22.75	12.0	AOR	525	AOR	22.75	23.00	22.75	12.6	573
80	62	62	578	584	578	306	AOR	238	AOR	578	584	578	319	260
4"	3.44	3.44	26.50	26.88	26.50	14.0	AOR	844	AOR	26.50	26.88	26.50	14.3	1058
100	87	87	673	683	673	356	AOR	383	AOR	673	683	673	364	480
6"	5.19	5.19	36.00	36.50	36.00	20.9	AOR	2381	AOR	36.00	36.50	36.00	19.1	2425
150	131	131	914	927	914	530	AOR	1080	AOR	914	927	914	486	1100
8"	7.06	7.06	40.25	40.88	40.25	26.8	AOR	3885	AOR	40.25	40.88	40.25	21.7	3527
200	179	179	1022	1038	1022	680	AOR	1762	AOR	1022	1038	1022	550	1600
10"	8.81	8.81	50.00	50.88	50.00	31.1	AOR	6808	AOR	50.00	50.88	50.00	26.6	6173
250	223	223	1270	1292	1270	790	AOR	3088	AOR	1270	1292	1270	675	2800
12"	10.44	10.44	56.00	56.88	56.00	34.6	AOR	9864	AOR	56.00	56.88	56.00	30.1	9921
300	265	265	1422	1445	1422	880	AOR	4474	AOR	1422	1445	1422	765	4500

Weight and dimensions for larger valve sizes up to 30" available on request

DIMENSIONS: CLASS 2500 - REDUCED PORT

SIZE	BORE		SIDE ENTRY							TOP ENTRY				
			FACE TO FACE			D	D1	WEIGHT		FACE TO FACE			D2	WEIGHT
			RF	RTJ	BWE			Model GG	Model GW	RF	RTJ	BWE		
NPS/DN	B1	B2	in/mm	in/mm	in/mm	in/mm	in/mm	lb/kg	lb/kg	in/mm	in/mm	in/mm	in/mm	lb/kg
2"x1.1/2"	1.69	1.50	17.75	17.88	17.75	9.3	AOR	190	AOR	17.75	17.88	17.75	9.4	176
50x40	42	38	451	454	451	236	AOR	86	AOR	451	454	451	240	80
3"x2"	2.44	1.69	22.75	23.00	22.75	12.0	AOR	335	AOR	22.75	23.00	22.75	12.0	364
80x50	62	42	578	584	578	306	AOR	152	AOR	578	584	578	305	165
4"x3"	3.44	2.44	26.50	26.88	26.50	14.0	AOR	626	AOR	26.50	26.88	26.50	14.0	750
100x80	87	62	673	683	673	356	AOR	284	AOR	673	683	673	356	340
6"x4"	5.19	3.44	36.00	36.50	36.00	19.1	AOR	1307	AOR	36.00	36.50	36.00	19.1	1521
150x100	131	87	914	927	914	486	AOR	593	AOR	914	927	914	486	690
8"x6"	7.06	5.19	40.25	40.88	40.25	21.7	AOR	2734	AOR	40.25	40.88	40.25	21.7	2866
200x150	179	131	1022	1038	1022	551	AOR	1240	AOR	1022	1038	1022	551	1300
10"x8"	8.81	7.06	50.00	50.88	50.00	26.8	AOR	4943	AOR	50.00	50.88	50.00	26.6	5071
250x200	223	179	1270	1292	1270	680	AOR	2242	AOR	1270	1292	1270	676	2300
12"x10"	10.44	8.81	56.00	56.88	56.00	31.1	AOR	7734	AOR	56.00	56.88	56.00	29.9	7716
300x250	265	223	1422	1445	1422	790	AOR	3508	AOR	1422	1445	1422	760	3500

Weight and dimensions for larger valve sizes up to 30" available on request

Dimension: mm/kg – inch/lb

D, D1 & D2 is the greater between body diameter and line flange diameter

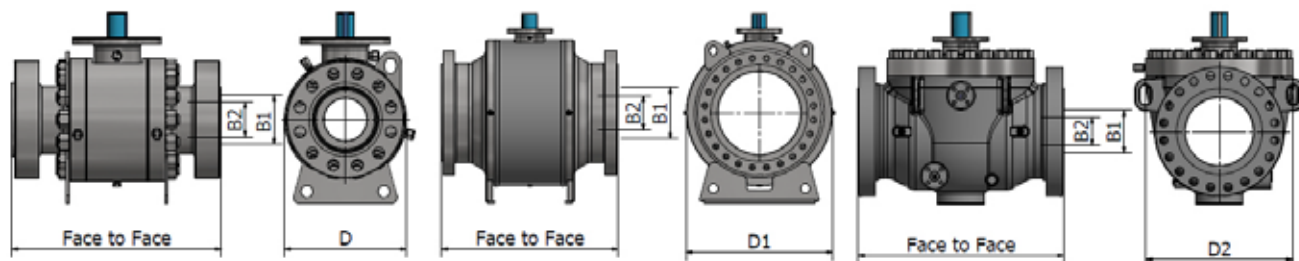
All dimensions not related to international standards are indicative

Abbreviation:

* - Not a standard dimension

AOR - Available on Request

DIMENSIONS: API 6A



	SIZE	BORE		SIDE ENTRY			TOP ENTRY		
				FACE TO FACE	D	WEIGHT	FACE TO FACE	D2	WEIGHT
	Bore/NS	B1 in/mm	B2 in/mm	End RTJ 6B in/mm	in/mm	Model FF lb/kg	End RTJ 6B in/mm	in/mm	Model FT lb/kg
API 3000 Full Port	2 1/16	2.06	2.06	14.62	8.5	128	14.6	8.5	209
	52	52.4	52.4	371	215	58	371	215	95
	3 1/8	3.12	3.12	15.12	9.5	221	15.1	9.4	375
	79	79.4	79.4	384	240	100	384	240	170
	4 1/16	4.06	4.06	18.12	11.4	397	18.1	11.4	882
	103	103.2	103.2	460	290	180	460	290	400
	5 1/8	5.12	5.12	24.10*	13.78	1058	24.10*	13.8	1720
	130	130.2	130.2	613*	350	480	613*	350	780
API 5000 Full Port	7 1/16	7.06	7.06	28.10*	14.96	1587	28.10*	15.0	2205
	179	179.4	179.4	714*	380	720	714*	380	1000
	2 1/16	2.06	2.06	14.62	8.5	139	14.6	8.5	265
	52	52.4	52.4	371	215	63	371	215	120
	3 1/8	3.12	3.12	18.62	10.4	302	18.6	11.8	463
	79	79.4	79.4	473	265	137	473	300	210
	4 1/16	4.06	4.06	21.62	12.2	573	21.6	13.8	1102
	103	103.2	103.2	549	310	260	549	350	500
API 10000 Full Port	5 1/8	5.12	5.12	28.60*	16.7	1323	28.60*	17.7	1984
	130	130.2	130.2	727*	425	600	727*	450	900
	7 1/16	7.06	7.06	32.00*	21.3	2205	32.00*	21.7	3197
	179	179.4	179.4	813*	540	1000	813*	550	1450
	2 1/16	2.06	2.06	20.50	9.8	304	20.5	11.0	551
	52	52.4	52.4	521	250	138	521	280	250
	3 1/16	3.06	3.06	24.38	14.2	750	24.4	15.0	1058
	78	77.8	77.8	619	360	340	619	380	480
API 10000 Full Port	4 1/16	4.06	4.06	26.38	15.9	1014	26.4	17.7	1874
	103	103.2	103.2	670	405	460	670	450	850
	5 1/8	5.12	5.12	29.00	21.3	1863	29.0	19.7	2877
	130	130.2	130.2	737	540	845	737	500	1305
	7 1/16	7.06	7.06	35.00	33.5	5291	35.0	24.8	5071
	179	179.4	179.4	889	850	2400	889	630	2300

Weight and dimensions for larger valve sizes up to 11" full or reduced port available on request

Dimension: mm/kg – inch/lb

D, D1 & D2 is the greater between body diameter and line flange diameter

All dimensions not related to international standards are indicative

Abbreviation:

* - Not a standard dimension



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