

**SITINDUSTRIE VALVO VALVES**

**BALL VALVES**

**TECHNICAL CATALOGUE**

Ed. 01/NOV-2004

We are pleased to introduce you to the ball valves manufactured by **Valvometal**, branch of Sitindustrie Equipment, under the VALVO® trademark.

**SITINDUSTRIE** started manufacturing valves for the industry in 1955, at its plant in Valduggia, Italy.

Today, it is regarded as a reputed supplier of cast steel gate, globe and check valves, in both bolted and pressure seal bonnet.

Ball valves and through conduit gate valves have been added to the product range of the Company, being capable to offer full packages of valves as a total manufacturer. The primary markets served are the oil and gas exploration, production, petrochemical, refining, pipelines and power generation.

The Company adheres to a Quality Program in accordance with ISO 9001:2000 and also has accreditations for API 6D, API Q1, European Directive 97/23/CE (PED), UDT, Stoomwezen and other Third Party Agencies (Bureau Veritas, TUV, RINA, Lloyd's Register,

and other). Design and manufacturing are carried out in accordance with the main international standards, i.e. ISO, API, ASME, ANSI, ASTM, NACE, BS, AFNOR, DIN and other.

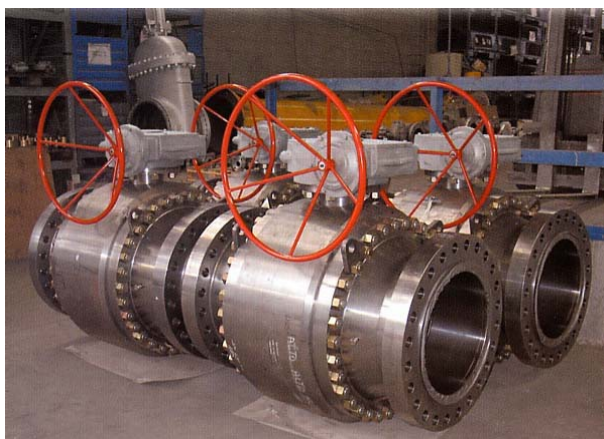
Materials offered includes carbon steel, alloy and stainless steel, and non ferrous alloys.

A wide selection of materials is available for internal components.

A lengthy reference list, containing the most respected names in the industries in which we serve, guarantees the strength of the Company in developing the capabilities in the areas of projects and specialities.

The strength of the new solutions for projects and special valves is within our technical capabilities linked with full customer satisfaction.

Furthermore, **SITINDUSTRIE** has launched a "zero-emission" design range of gate and globe valves, called ECO-VALVO, in response to industry requirement, to satisfy the most stringent and demanding applications of our customers worldwide.



## APPLICATIONS

The ball valves are primarily used in transmission pipelines, onshore terminals, offshore platforms, sub sea installations and liquefied natural gas plant.

## MEDIA

Ball valves are used in a wide range of flow media; they can be designed for use of corrosive fluids, cryogenic liquids, viscous fluids and slurries, in addition to normal liquids and gases.

## ADVANTAGES

Ball valves produce a minimal pressure drop, are light weight compared to other equivalent valve types, and require only a quick quarter turn to operate.



## PRODUCT RANGE

Sitindustrie manufactures ball valves in a wide range of diameters, pressure classes, materials, and style of constructions. Top entry style valves are also available, upon request.

Side entry ball valves are available either in three pieces (forged execution) or two pieces (cast execution), bolted construction, full and reduced bore.

Top entry ball valves are produced in one-piece cast body, bolted cover, trunnion mounted ball, full and reduced bore, class 600 and higher.

| FIGURE No. | TYPE OF VALVES         | CONSTRUCTION STYLE | BORE    | SIZE RANGE | PRESSURE CLASS |
|------------|------------------------|--------------------|---------|------------|----------------|
| 905        | Side Entry, Split Body | Trunnion Ball      | Full    | 2" ÷ 60"   | 150            |
| 910        | Side Entry, Split Body | Trunnion Ball      | Full    | 2" ÷ 60"   | 300            |
| 920        | Side Entry, Split Body | Trunnion Ball      | Full    | 2" ÷ 60"   | 600            |
| 925        | Side Entry, Split Body | Trunnion Ball      | Full    | 2" ÷ 36"   | 900            |
| 930        | Side Entry, Split Body | Trunnion Ball      | Full    | 2" ÷ 24"   | 1500           |
| 935        | Side Entry, Split Body | Trunnion Ball      | Full    | 2" ÷ 12"   | 2500           |
| 906        | Side Entry, Split Body | Trunnion Ball      | Reduced | 2" ÷ 60"   | 150            |
| 911        | Side Entry, Split Body | Trunnion Ball      | Reduced | 2" ÷ 60"   | 300            |
| 921        | Side Entry, Split Body | Trunnion Ball      | Reduced | 2" ÷ 60"   | 600            |
| 926        | Side Entry, Split Body | Trunnion Ball      | Reduced | 2" ÷ 36"   | 900            |
| 931        | Side Entry, Split Body | Trunnion Ball      | Reduced | 2" ÷ 24"   | 1500           |
| 936        | Side Entry, Split Body | Trunnion Ball      | Reduced | 2" ÷ 12"   | 2500           |

Size: from 2" to 60"

ANSI Rating Class : 150 to 2,500

API Pressure Rating : 2,000 to 10,000 psi

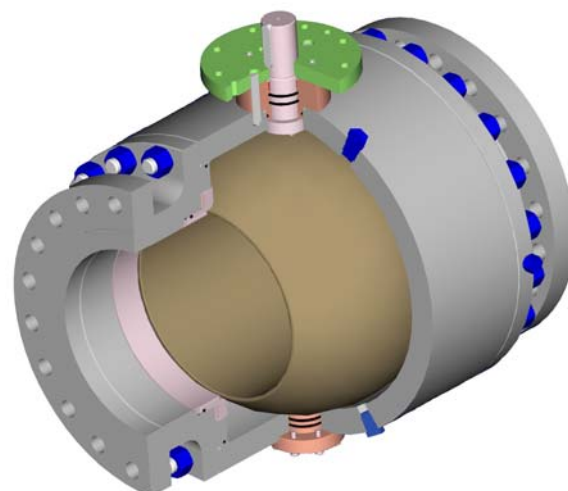
Interpolated ratings also available

Trunnion mounted design starting from 2"

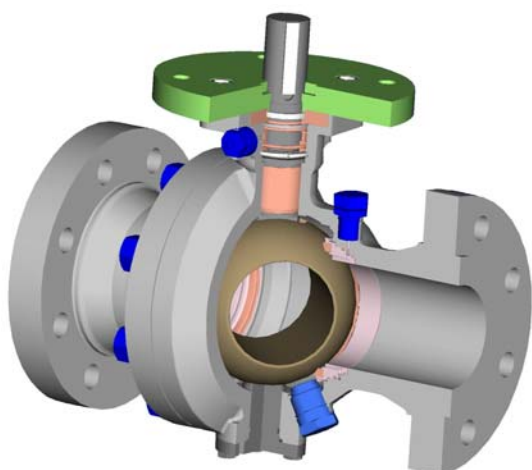
Seat supported floating ball valve design available for low pressure and small sizes

Side-Entry or Top-Entry body construction

Manual, gear, or power assisted operation



Side Entry, Split Body, Three-piece



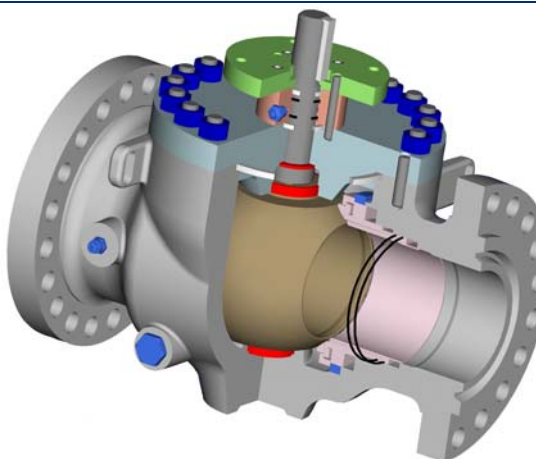
Side Entry, Split Body, Two-piece

#### STANDARD FEATURES

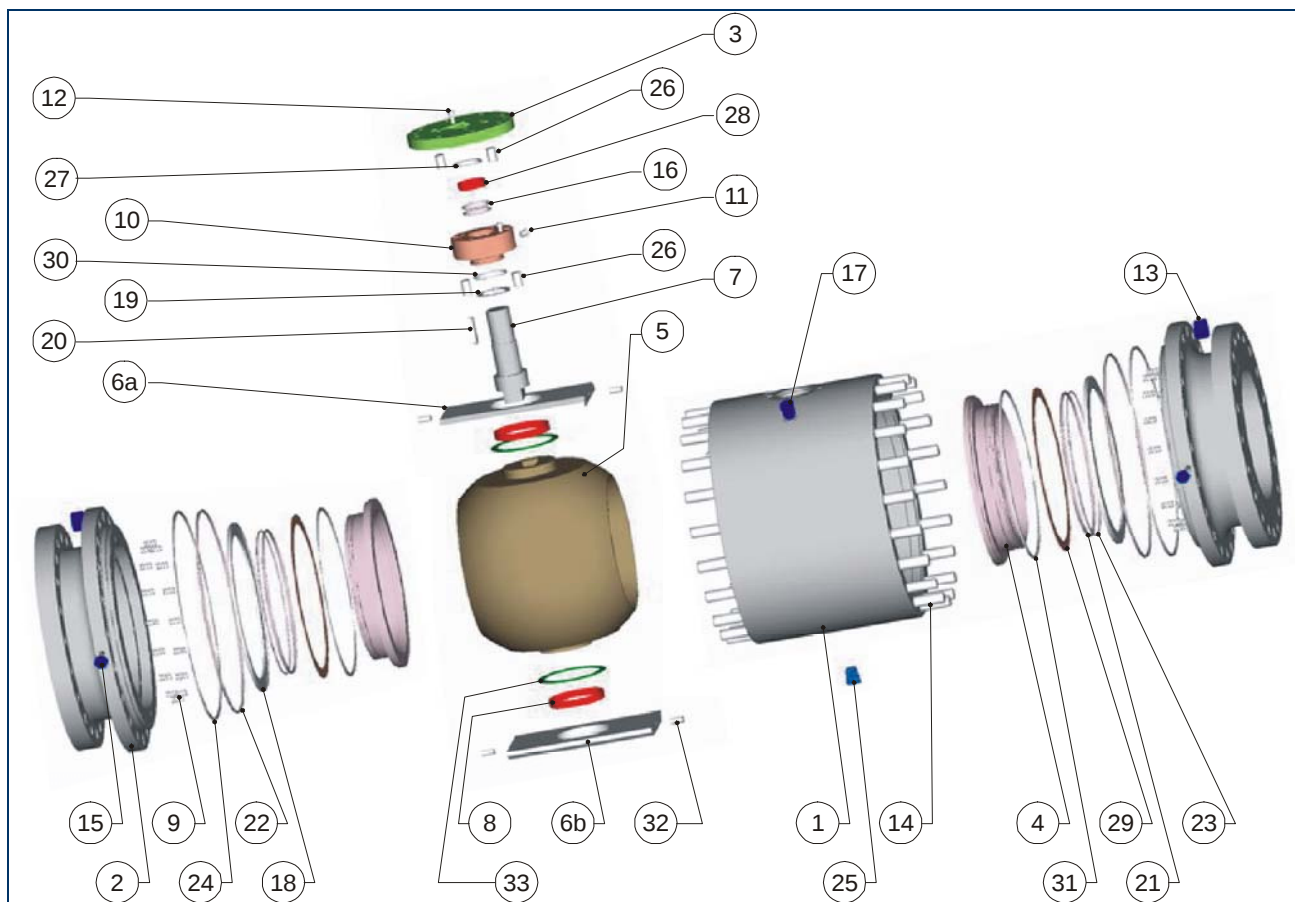
- Split body, side-entry, 2 or 3-piece body
- Full and reduced bore
- Bidirectional
- Upstream seal
- Soft seated
- Bubble tight seal
- Stem sealant injection
- Automatic body pressure relief
- Blow out proof stem
- Anti static device

#### OPTIONAL FEATURES

- Fire safe design
- Double block and bleed
- Double piston effect
- Dual seat design
- Seat sealant injection
- Metal to metal sealing
- Anti explosive decompression seals
- Stem extension
- Valves with electric, or pneumatic or hydraulic actuators
- Locking device



Top Entry, one-piece Body

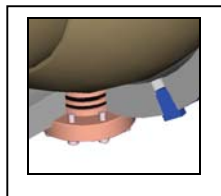


### Identification of the Valve Parts

|    |                |  |    |                    |
|----|----------------|--|----|--------------------|
| 1  | Body           |  | 17 | Vent plug          |
| 2  | Closure        |  | 18 | Seat follower      |
| 3  | Adapter flange |  | 19 | Thrust washer      |
| 4  | Seat ring      |  | 20 | Key                |
| 5  | Ball           |  | 21 | Seat O-ring        |
| 6a | Upper support  |  | 22 | Closure O-ring     |
| 6b | Lower support  |  | 23 | Grease O-ring      |
| 7  | Stem           |  | 24 | Fire Safe Gasket   |
| 8  | Bearing        |  | 25 | Drain valve        |
| 9  | Spring         |  | 26 | Pin                |
| 10 | Gland plate    |  | 27 | Gasket             |
| 11 | Grease fitting |  | 28 | Bearing            |
| 12 | Capscrew       |  | 29 | Disc               |
| 13 | Body stud nut  |  | 30 | Gland plate O-ring |
| 14 | Body stud      |  | 31 | Disc               |
| 15 | Grease fitting |  | 32 | Pin                |
| 16 | Stem O-ring    |  | 33 | Ball spacer        |

## TRUNNION MOUNTED BALL

Trunnion mounted ball type valves are recommended, rather than valves with seat supported floating ball, which are reliable for small sizes and low pressure only.



This is due to the technical superiority of the trunnion mount design in keeping the ball perpendicular to the flow and eliminating thrust from the ball onto the downstream seat ring.

The one piece ball is mounted on trunnion or supported by plates with low friction bearings to torque.

The ball's spherical surface is machined, ground to close tolerance, then plated with electroless nickel and polished to a mirror finish to further reduce torque.

When the ball is in the fully closed position, the trunnion supports the ball and counter the thrust generated by line pressure.

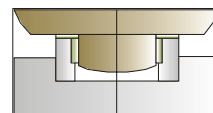
No excessive force is placed on the downstream seat ring.

The seat rings float, minimizing both friction and wear when the valve is operated.

The ball supported by two plates is a preferred option for larger sizes and higher pressure.

## Plate Supported Ball

Unless differently specified, the design criteria is chosen by the manufacturer.



## BLOW OUT PROOF STEM DESIGN

Stem is separate from the ball.

The independent stem maximizes the safety by its blow out proof design.

If the valve is under pressure and the stem retainer is removed, the stem cannot be ejected from the valve.

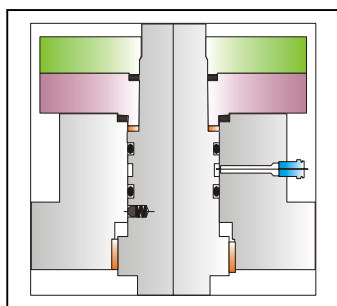
Sealant injection fitting is available to temporarily renew the seal, in emergency conditions.

## FIRE SAFE DESIGN

Fire safe design may substantially prevent leakage through the elastomeric/polymeric seals when exposed to high temperatures of fires. Upon request, we can provide a fire safe design which can pass fire tests conducted in accordance with API 6FA, BS6755, API 607.

## ANTISTATIC DEVICE

Antistatic continuity between body, ball and stem is provided by a spring made of Inconel.



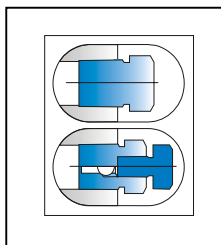
## STEM EXTENSION

A stem extension is required for underground installation or for valves which are not easily accessible.

A variety of stem extensions for manual, gear or power assisted operation may be offered. Also available are piping and fitting extension for gaining access to body vent, body drain, and the emergency sealant injection fittings.

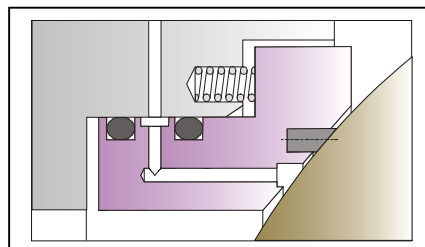
### BODY VENT AND DRAIN

The valve body incorporates a drain plug, located at the bottom of the cavity, and a bleed valve located at the highest possible position of the cavity.



### SEAT SEALANT INJECTION

If the seat seal becomes damaged, the emergency sealant injection system may be used to temporarily renew the seal until the repair can be scheduled.



### FLOATING SEAT RINGS

The seat rings are located at each side of the ball in such a way as to align the ball port with the internal bore of seat rings when the valve is fully open.

The seat rings are forced against the ball by coil springs, whose quantity depends on the seat size. In both seats an insert in PTFE, Nylon or other suitable material guarantees a proper sealing against the ball.

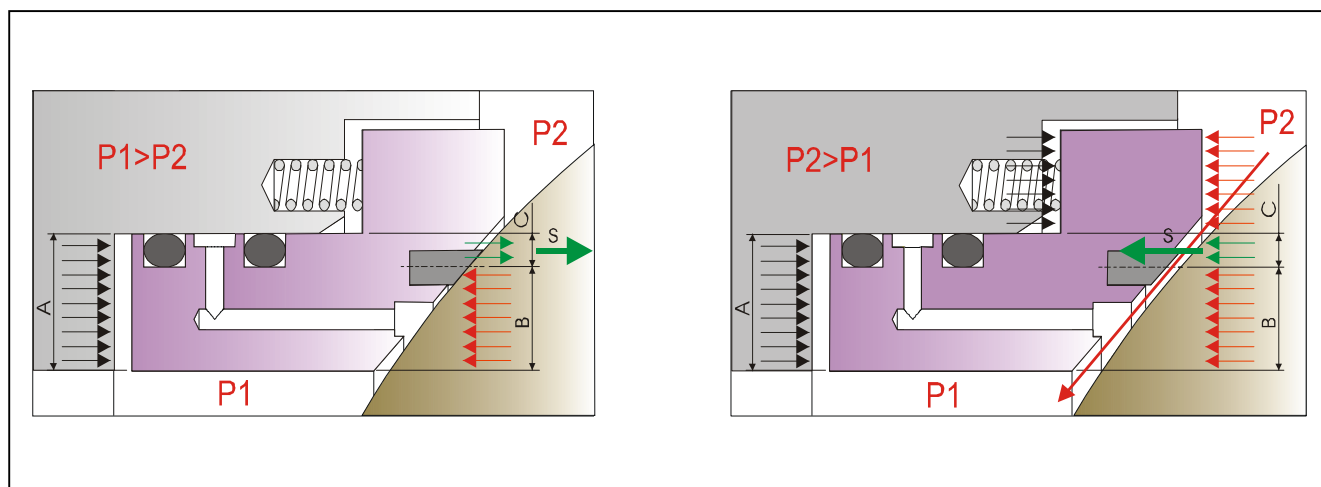
The purpose of the springs is to activate sealing at low pressure, when the "piston action" is not yet effective.

### SINGLE PISTON EFFECT

As line pressure increases, the seat differential area  $C = A - B$  creates a piston effect forcing the seat against the ball. Consequently a tight seal comes into effect on the contact circle. The higher the line pressure, the greater the piston action.

### SELF RELIEVING

The piston action reverses automatically if pressure grows up into the body cavity to a preset level, relieving the excess of pressure to the line: for this purpose the seat is designed in such a way that the differential area  $C = B - A$  has greater force than the spring load.



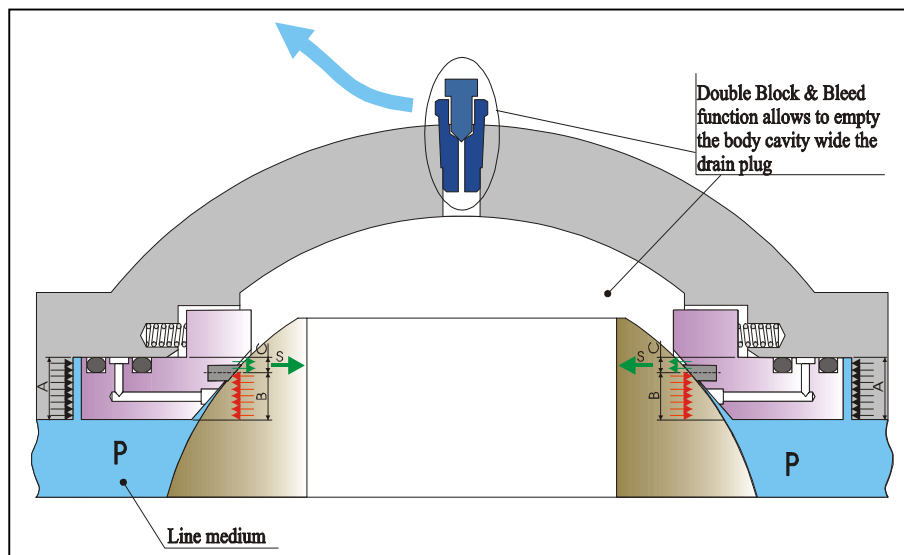
Single Piston Effect

Self Relieving

## DOUBLE BLOCK AND BLEED

Because the floating seats seal both upstream and downstream simultaneously, double block and bleed can be performed, on application.

With the valve under pressure, the body cavity may be vented to the atmosphere through the bleed valve.



**Double Block & Bleed**

## DOUBLE PISTON EFFECT

The seat rings may be specially designed to offer the feature of the "double piston effect" as an optional feature.

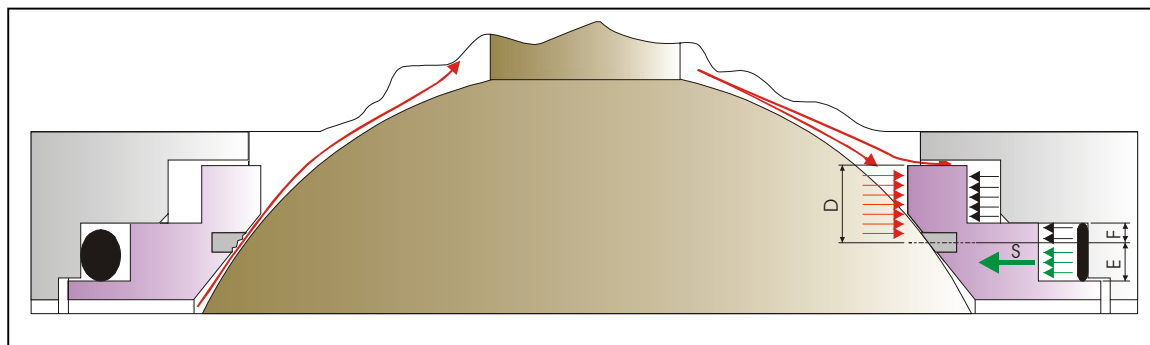
While the standard feature of the single piston effect produces the seal at the seat exposed to line pressure, the downstream seat vents pressure.

It means that, if the upstream seat fails, the valve may leak: consequently, it may be required the downstream seat as a back up seal to the primary upstream seat seal.

The outer diameter of the seat is designed with a double piston profile, exposing more surface area to cavity pressure than a standard floating seat: in the case of an upstream leak, this enhances the contact pressure between the downstream seat and the ball.

The differential area  $E = D - F$  creates a piston effect forcing the seat against the ball.

It is recommended to install an automatic pressure relief valve to protect the body cavity from excess of pressure.



**Double Piston Effect**

The following chart is intended as a general guide for use by piping engineers for the selection of valve component materials for the listed services.

This chart lists material combinations which are considered the most common in the valve industry. Alternate combinations of materials may also satisfy the respective services listed.

Final material selection review and concurrence by both manufacturer and client is recommended.

In general, material selection is made by the end user or client, based on their experience and requirements.

Our applications engineers are available to provide assistance in order to select the materials appropriate for specified service conditions.

**NOTE :**

Prior to making a final selection we suggest that all working parameters and fluid conditions are available and taken into consideration.

| Service                                            | Temperature °C | ANSI Class              | Body / Closure | Internals   | Seat Inserts    | Seals (*) (**) |
|----------------------------------------------------|----------------|-------------------------|----------------|-------------|-----------------|----------------|
| General<br>Non corrosive                           | -29° to 150°   | 150 – 600<br>900 – 2500 | A105           | A105 ENP    | PTFE<br>Nylon   | Viton™         |
| As above<br>high temp.                             | -29° to 250°   | 150 – 600<br>900 – 2500 | A105           | A105 ENP    | Peek™<br>Peek™  | PTFE           |
| Moderate<br>Corrosive                              | -29° to 150°   | 150 – 600<br>900 – 2500 | A105           | F316        | PTFE<br>Nylon   | Viton™         |
| Low temp.<br>Non corrosive                         | -46° to 150°   | 150 – 600<br>900 – 2500 | A350-LF2       | LF2 ENP     | PTFE<br>Devlon™ | Viton™         |
| Highly<br>Corrosive                                | -29° to 150°   | 150 – 600<br>900 – 2500 | A182-F316      | F316 or F51 | PTFE<br>Nylon   | Viton™         |
| Sour service<br>(Nace) H <sub>2</sub> S            | -29° to 150°   | 150 – 600<br>900 – 2500 | A105           | A105 ENP    | PTFE<br>Nylon   | Viton™         |
| Sour service<br>H <sub>2</sub> S + CO <sub>2</sub> | -29° to 120°   | 150 – 600<br>900 – 2500 | A105           | F6NM        | PTFE<br>Nylon   | Viton™         |
| Offshore corrosive<br>marine envir.                | -29° to 150°   | 150 – 600<br>900 – 2500 | A182-F51       | A182-F51    | PTFE<br>Nylon   | PTFE           |
| Offshore corrosive<br>marine envir.                | -29° to 150°   | 150 – 600<br>900 – 2500 | A182-F53       | A182-F53    | PTFE<br>Nylon   | PTFE           |
| Seawater<br>corrosive                              | -29° to 150°   | 150 – 600<br>900 – 2500 | A182-F44       | A182-F44    | PTFE<br>Nylon   | PTFE           |

(\*) Explosive Decompression Resistant Seals, upon request - (\*\*) Graphite gaskets are used as additional seals for fire safe applications

Above mentioned body materials refer to forged products.

Equivalent cast grades are the following :

A105 = A216-WCB

A350-LF2 = A352-LCB

A182-F316 = A351-CF8M

A182-F51 = A890-J92205 (UNS S31803)

A182-F53 = A890-J93404 (UNS S32750)

A182-F44 = A351-CK3MCuN (UNS S31254)

Equivalent grades according to DIN standards are also available.

For better protection and extended life in corrosion service, **internal cladding of Inconel 625** or other material can be provided on application.

**O-Rings** are used for body/closure, body/seats and stem seals.

Material for O-rings are the following:

- Viton (fluor elastomer) of various grades
- NBR (nitrilic rubber)
- HNBR (hydrogenated nitrilic rubber), plus

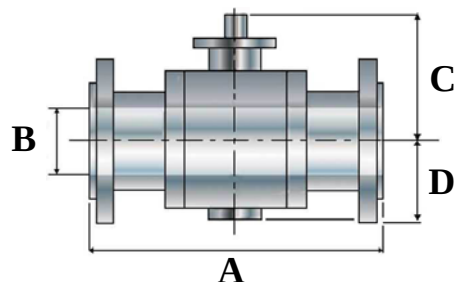
various trademarks (Elastolion, Aflas, FR-58, etc...)

**Lip Seals** are used when elastomers are not suitable for given service conditions of pressure, temperature, and fluid. Lip seals are self-energized seals made of a plastic material cover (reinforced PTFE or other) and a spring made of a corrosion resistant material.

When soft seat inserts are not suitable for the service, ball and seats can be hardened by Tungsten Carbide coating, achieving metal-to-metal sealing of the valve.

## ANSI CLASS 150 Lbs (PN 20)

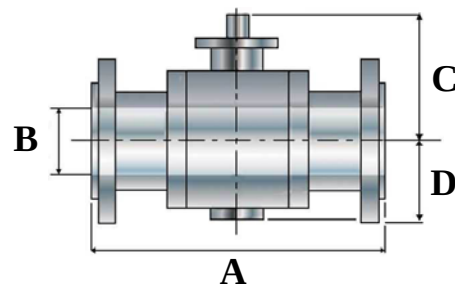
Working Pressure 275 psi (19 bar) CWP  
Hydrostatic Shell Test 420 psi (29 bar)



| NOMINAL SIZE |           | END TO END<br>API 6D-B 16.10 |      |         |      |         |      | VALVE BORE<br>API 6D |      | CENTERLINE<br>TO BOTTOM |      | CENTERLINE<br>TO TOP STEM |      |
|--------------|-----------|------------------------------|------|---------|------|---------|------|----------------------|------|-------------------------|------|---------------------------|------|
|              |           | A (RF)                       |      | A (RTJ) |      | A (BW)  |      | B                    |      | D                       |      | C                         |      |
| inches       | mm        | inches                       | mm   | inches  | mm   | inches  | mm   | inches               | mm   | inches                  | mm   | inches                    | mm   |
| 2            | 50        | 7"                           | 178  | 7 1/2"  | 191  | 8 1/2"  | 216  | 1.93"                | 49   | 4 1/8"                  | 105  | 5 1/2"                    | 140  |
| 3 x 2        | 80 x 50   | 8"                           | 203  | 8 1/2"  | 216  | 11 1/8" | 283  | 1.93"                | 49   | 4 1/8"                  | 105  | 5 1/2"                    | 140  |
| 3            | 80        | 8"                           | 203  | 8 1/2"  | 216  | 11 1/8" | 283  | 2.91"                | 74   | 5"                      | 127  | 6 1/2"                    | 165  |
| 4 x 3        | 100 x 80  | 9"                           | 229  | 9 1/2"  | 241  | 12"     | 305  | 2.91"                | 74   | 5"                      | 127  | 6 1/2"                    | 165  |
| 4            | 100       | 9"                           | 229  | 9 1/2"  | 241  | 12"     | 305  | 3.94"                | 100  | 6"                      | 152  | 7"                        | 178  |
| 6 x 4        | 150 x 100 | 15 1/2"                      | 394  | 16"     | 406  | 18"     | 457  | 3.94"                | 100  | 6"                      | 152  | 7"                        | 178  |
| 6            | 150       | 15 1/2"                      | 394  | 16"     | 406  | 18"     | 457  | 5.9"                 | 150  | 8"                      | 203  | 9 1/2"                    | 241  |
| 8 x 6        | 200 x 150 | 18"                          | 457  | 18 1/2" | 470  | 20 1/2" | 521  | 5.9"                 | 150  | 8"                      | 203  | 9 1/2"                    | 241  |
| 8            | 200       | 18"                          | 457  | 18 1/2" | 470  | 20 1/2" | 521  | 7.9"                 | 201  | 9 1/2"                  | 241  | 11"                       | 280  |
| 10 x 8       | 250 x 200 | 21"                          | 533  | 21 1/2" | 546  | 22"     | 559  | 7.9"                 | 201  | 9 1/8"                  | 241  | 11"                       | 280  |
| 10           | 250       | 21"                          | 533  | 21 1/2" | 546  | 22"     | 559  | 9.92"                | 252  | 11"                     | 280  | 12"                       | 305  |
| 12 x 10      | 300 x 250 | 24"                          | 610  | 24 1/2" | 622  | 25"     | 635  | 9.92"                | 252  | 11 1/8"                 | 282  | 12 1/2"                   | 318  |
| 12           | 300       | 24"                          | 610  | 24 1/2" | 622  | 25"     | 635  | 11.93"               | 303  | 13"                     | 330  | 14"                       | 356  |
| 14 x 12      | 350 x 300 | 27"                          | 686  | 27 1/2" | 699  | 30"     | 762  | 11.93"               | 303  | 13"                     | 330  | 14"                       | 356  |
| 14           | 350       | 27"                          | 686  | 27 1/2" | 699  | 30"     | 762  | 12.68"               | 334  | 14 1/2"                 | 368  | 16"                       | 406  |
| 16 x 12      | 400 x 300 | 30"                          | 762  | 30 1/2" | 775  | 33"     | 838  | 11.93"               | 303  | 13"                     | 330  | 16"                       | 406  |
| 16 x 14      | 400 x 350 | 30"                          | 762  | 30 1/2" | 775  | 33"     | 838  | 12.68"               | 334  | 14 1/2"                 | 368  | 16"                       | 406  |
| 16           | 400       | 30"                          | 762  | 30 1/2" | 775  | 33"     | 838  | 15.16"               | 385  | 16 1/2"                 | 419  | 18"                       | 457  |
| 18 x 16      | 450 x 400 | 34"                          | 864  | 34 1/2" | 876  | 36"     | 914  | 15.16"               | 385  | 16 1/2"                 | 419  | 20"                       | 508  |
| 18           | 450       | 34"                          | 864  | 34 1/2" | 876  | 36"     | 914  | 17.16"               | 436  | 18"                     | 457  | 20"                       | 508  |
| 20 x 16      | 500 x 400 | 36"                          | 914  | 36 1/2" | 927  | 39"     | 991  | 15.16"               | 385  | 16 1/2"                 | 419  | 18"                       | 457  |
| 20 x 18      | 500 x 450 | 36"                          | 914  | 36 1/2" | 927  | 39"     | 991  | 17.16"               | 436  | 18"                     | 457  | 20"                       | 508  |
| 20           | 500       | 36"                          | 914  | 36 1/2" | 927  | 39"     | 991  | 19.17"               | 487  | 21 1/2"                 | 546  | 23"                       | 584  |
| 24 x 20      | 600 x 500 | 42"                          | 1067 | 42 1/2" | 1080 | 45"     | 1143 | 19.17"               | 487  | 21 1/2"                 | 546  | 23"                       | 584  |
| 24           | 600       | 42"                          | 1067 | 42 1/2" | 1080 | 45"     | 1143 | 23.19"               | 589  | 26"                     | 660  | 28"                       | 711  |
| 26           | 650       | 45"                          | 1143 | -       | -    | 49"     | 1245 | 24.92"               | 633  | 28"                     | 711  | 30"                       | 762  |
| 28           | 700       | 49"                          | 1245 | (1)     | (1)  | 53"     | 1346 | 26.93"               | 684  | 30"                     | 762  | 32"                       | 813  |
| 30           | 750       | 51"                          | 1295 | (1)     | (1)  | 55"     | 1397 | 28.94"               | 735  | 31 1/2"                 | 800  | 34"                       | 864  |
| 32           | 800       | 54"                          | 1372 | (1)     | (1)  | 60"     | 1524 | 30.67"               | 779  | 33.23"                  | 844  | 35.51"                    | 902  |
| 36           | 900       | 60"                          | 1524 | (1)     | (1)  | 68"     | 1727 | 34.41"               | 874  | 35.78"                  | 909  | 38"                       | 965  |
| 40           | 1000      | (1)                          | (1)  | (1)     | (1)  | (1)     | (1)  | 38.43"               | 976  | 39.37"                  | 1000 | 41.93"                    | 1065 |
| 42           | 1050      | (1)                          | (1)  | (1)     | (1)  | (1)     | (1)  | 40.16"               | 1020 | 40.75"                  | 1035 | 45"                       | 1143 |
| 46           | 1150      | (1)                          | (1)  | (1)     | (1)  | (1)     | (1)  | 44"                  | 1118 | 44.68"                  | 1135 | 50.4"                     | 1280 |
| 48           | 1200      | (1)                          | (1)  | (1)     | (1)  | (1)     | (1)  | 45.9"                | 1166 | 46.46"                  | 1180 | 52.28"                    | 1328 |
| 56           | 1400      | (1)                          | (1)  | (1)     | (1)  | (1)     | (1)  | 53.54"               | 1360 | 52.8"                   | 1340 | 58.27"                    | 1480 |
| 60           | 1500      | (1)                          | (1)  | (1)     | (1)  | (1)     | (1)  | 57.4"                | 1458 | 56.3"                   | 1430 | 61.8"                     | 1570 |

## ANSI CLASS 300 Lbs (PN 50)

Working Pressure 740 psi (51 bar) CWP  
Hydrostatic Shell Test 1100 psi (75 bar)

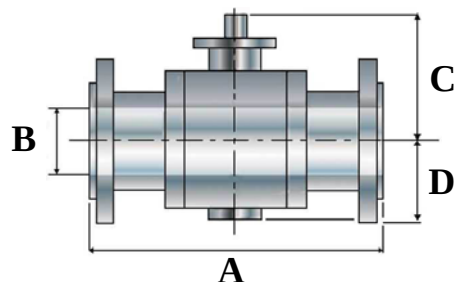


| NOMINAL SIZE |           | END TO END<br>API 6D-B 16.10 |      |         |      |        |      | VALVE BORE<br>API 6D |      | CENTERLINE<br>TO BOTTOM |      | CENTERLINE<br>TO TOP STEM |      |
|--------------|-----------|------------------------------|------|---------|------|--------|------|----------------------|------|-------------------------|------|---------------------------|------|
|              |           | A (RF)                       |      | A (RTJ) |      | A (BW) |      | B                    |      | D                       |      | C                         |      |
| inches       | mm        | inches                       | mm   | inches  | mm   | inches | mm   | inches               | mm   | inches                  | mm   | inches                    | mm   |
| 2            | 50        | 8"1/2                        | 216  | 9"1/8   | 232  | 8"1/2  | 216  | 1.93"                | 49   | 5"                      | 127  | 6"                        | 152  |
| 3 x 2        | 80 x 50   | 11"1/8                       | 282  | 11"3/4  | 298  | 11"1/8 | 282  | 1.93"                | 49   | 5"                      | 127  | 6"                        | 152  |
| 3            | 80        | 11"1/8                       | 282  | 11"3/4  | 298  | 11"1/8 | 282  | 2.91"                | 74   | 6"                      | 152  | 7"                        | 178  |
| 4 x 3        | 100 x 80  | 12"                          | 305  | 12"5/8  | 321  | 12"    | 305  | 2.91"                | 74   | 6"                      | 152  | 7"                        | 178  |
| 4            | 100       | 12"                          | 305  | 12"5/8  | 321  | 12"    | 305  | 3.94"                | 100  | 7"                      | 178  | 8"                        | 203  |
| 6 x 4        | 150 x 100 | 15"7/8                       | 403  | 16"1/2  | 419  | 15"7/8 | 457  | 3.94"                | 100  | 7"                      | 178  | 8"                        | 203  |
| 6            | 150       | 15"7/8                       | 403  | 16"1/2  | 419  | 15"7/8 | 457  | 5.9"                 | 150  | 8"1/2                   | 216  | 10"                       | 254  |
| 8 x 6        | 200 x 150 | 19"3/4                       | 502  | 20"3/8  | 518  | 19"3/4 | 502  | 5.9"                 | 150  | 8"1/2                   | 216  | 10"                       | 254  |
| 8            | 200       | 19"3/4                       | 502  | 20"3/8  | 518  | 19"3/4 | 502  | 7.9"                 | 201  | 9"1/2                   | 241  | 11"                       | 280  |
| 10 x 8       | 250 x 200 | 22"3/8                       | 568  | 23"     | 584  | 22"3/8 | 568  | 7.9"                 | 201  | 9"1/2                   | 241  | 11"                       | 280  |
| 10           | 250       | 22"3/8                       | 568  | 23"     | 584  | 22"3/8 | 568  | 9.92"                | 252  | 10"                     | 254  | 12"                       | 305  |
| 12 x 10      | 300 x 250 | 25"1/2                       | 648  | 26"1/8  | 664  | 25"1/2 | 648  | 9.92"                | 252  | 10"                     | 254  | 12"                       | 305  |
| 12           | 300       | 25"1/2                       | 648  | 26"1/8  | 664  | 25"1/2 | 648  | 11.93"               | 303  | 11"1/2                  | 292  | 14"                       | 355  |
| 14 x 12      | 350 x 300 | 30"                          | 762  | 30"5/8  | 778  | 30"    | 762  | 11.93"               | 303  | 11"1/2                  | 292  | 14"                       | 355  |
| 14           | 350       | 30"                          | 762  | 30"5/8  | 778  | 30"    | 762  | 12.68"               | 334  | 13"                     | 343  | 16"                       | 406  |
| 16 x 12      | 400 x 300 | 33"                          | 838  | 33"5/8  | 854  | 33"    | 838  | 11.93"               | 303  | 11"1/2                  | 292  | 14"                       | 355  |
| 16           | 400       | 33"                          | 838  | 33"5/8  | 854  | 33"    | 838  | 15.16"               | 385  | 16"                     | 406  | 18"                       | 457  |
| 18 x 16      | 450 x 400 | 36"                          | 914  | 36"5/8  | 930  | 36"    | 914  | 15.16"               | 385  | 172                     | 432  | 19"1/2                    | 495  |
| 18           | 450       | 36"                          | 914  | 36"5/8  | 930  | 36"    | 914  | 17.16"               | 436  | 172                     | 432  | 19"1/2                    | 495  |
| 20 x 16      | 500 x 400 | 39"                          | 991  | 39"3/4  | 1010 | 39"    | 991  | 15.16"               | 385  | 16"                     | 406  | 18"                       | 457  |
| 20           | 500       | 39"                          | 991  | 39"3/4  | 1010 | 39"    | 991  | 19.17"               | 487  | 23"                     | 584  | 25"                       | 635  |
| 24 x 20      | 600 x 500 | 45"                          | 1143 | 45"7/8  | 1270 | 45"    | 1143 | 19.17"               | 487  | 23"                     | 584  | 25"                       | 635  |
| 24           | 600       | 45"                          | 1143 | 45"7/8  | 1270 | 45"    | 1143 | 23.19"               | 589  | 27"                     | 686  | 302                       | 762  |
| 26           | 650       | 49"                          | 1245 | 50"     | 1270 | 49"    | 1245 | 24.92"               | 633  | 29"                     | 737  | 32"                       | 813  |
| 28           | 700       | 53"                          | 1346 | 54"     | 1372 | 53"    | 1346 | 26.93"               | 684  | 30.5"                   | 775  | 34"                       | 864  |
| 30           | 750       | 55"                          | 1397 | 56"     | 1422 | 55"    | 1397 | 28.94"               | 735  | 33"                     | 838  | 36"                       | 914  |
| 36           | 900       | 68"                          | 1727 | 69"     | 1756 | 68"    | 1727 | 34.41"               | 874  | 35.78"                  | 909  | 41.14"                    | 1045 |
| 40           | 1000      |                              | (1)  |         | (1)  |        | (1)  | 38.43"               | 976  | 36.61"                  | 930  | 43.31"                    | 1100 |
| 42           | 1050      |                              | (1)  |         | (1)  |        | (1)  | 40.16"               | 1020 | 37.40"                  | 950  | 49.21"                    | 1250 |
| 48           | 1200      |                              | (1)  |         | (1)  |        | (1)  | 45.9"                | 1166 | 41.34"                  | 1050 | 53.15"                    | 1350 |
| 56           | 1400      |                              | (1)  |         | (1)  |        | (1)  | 53.54"               | 1360 | 50.20"                  | 1275 | 62.20"                    | 1580 |

## DIMENSIONS

### ANSI CLASS 600 Lbs (PN 100)

Working Pressure 1480 psi (102 bar) CWP  
Hydrostatic Shell Test 2175 psi (149 bar)

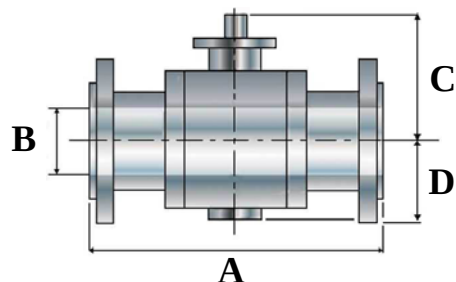


| NOMINAL SIZE |           | END TO END<br>API 6D-B 16.10 |      |         |      |        |      | VALVE BORE<br>API 6D |      | CENTERLINE<br>TO BOTTOM |      | CENTERLINE<br>TO TOP STEM |      |
|--------------|-----------|------------------------------|------|---------|------|--------|------|----------------------|------|-------------------------|------|---------------------------|------|
|              |           | A (RF)                       |      | A (RTJ) |      | A (BW) |      | B                    |      | D                       |      | C                         |      |
| inches       | mm        | inches                       | mm   | inches  | mm   | inches | mm   | inches               | mm   | inches                  | mm   | inches                    | mm   |
| 2            | 50        | 11"1/2                       | 292  | 11"5/8  | 295  | 11"1/2 | 292  | 1.93"                | 49   | 4"3/8                   | 110  | 5"1/2                     | 140  |
| 3 x 2        | 80 x 50   | 14"                          | 356  | 14"1/8  | 359  | 14"    | 356  | 1.93"                | 49   | 4"3/8                   | 110  | 5"1/2                     | 140  |
| 3            | 80        | 14"                          | 356  | 14"1/8  | 359  | 14"    | 356  | 2.91"                | 74   | 5"3/8                   | 135  | 6"3/4                     | 170  |
| 4 x 3        | 100 x 80  | 17"                          | 432  | 17"1/8  | 435  | 17"    | 432  | 2.91"                | 74   | 5"3/8                   | 135  | 6"3/4                     | 170  |
| 4            | 100       | 17"                          | 432  | 17"1/8  | 435  | 17"    | 432  | 3.94"                | 100  | 6"1/4                   | 160  | 7"1/4                     | 185  |
| 6 x 4        | 150 x 100 | 22"                          | 559  | 22"1/8  | 562  | 22"    | 559  | 3.94"                | 100  | 6"1/4                   | 160  | 7"1/4                     | 185  |
| 6            | 150       | 22"                          | 559  | 22"1/8  | 562  | 22"    | 559  | 5.9"                 | 150  | 7"7/8                   | 200  | 9"1/2                     | 240  |
| 8 x 6        | 200 x 150 | 26"                          | 660  | 26"1/8  | 664  | 26"    | 660  | 5.9"                 | 150  | 7"7/8                   | 200  | 9"1/2                     | 240  |
| 8            | 200       | 26"                          | 660  | 26"1/8  | 664  | 26"    | 660  | 7.9"                 | 201  | 10"1/4                  | 260  | 12"1/4                    | 310  |
| 10 x 8       | 250 x 200 | 31"                          | 787  | 31"1/8  | 791  | 31"    | 787  | 7.9"                 | 201  | 10"1/4                  | 260  | 12"1/4                    | 310  |
| 10           | 250       | 31"                          | 787  | 31"1/8  | 791  | 31"    | 787  | 9.92"                | 252  | 12"1/4                  | 300  | 13"3/4                    | 350  |
| 12 x 10      | 300 x 250 | 33"                          | 838  | 33"1/8  | 841  | 33"    | 838  | 9.92"                | 252  | 12"1/4                  | 300  | 13"3/4                    | 350  |
| 12           | 300       | 33"                          | 838  | 33"1/8  | 841  | 33"    | 838  | 11.93"               | 303  | 13"3/8                  | 340  | 15"3/4                    | 400  |
| 14 x 12      | 350 x 300 | 35"                          | 889  | 35"1/8  | 892  | 35"    | 889  | 11.93"               | 303  | 13"3/8                  | 340  | 15"3/4                    | 400  |
| 14           | 350       | 35"                          | 889  | 35"1/8  | 892  | 35"    | 889  | 12.68"               | 334  | 15"3/8                  | 390  | 17"                       | 430  |
| 16 x 12      | 400 x 300 | 39"                          | 991  | 39"1/8  | 994  | 39"    | 991  | 11.93"               | 303  | 13"3/8                  | 340  | 15"3/4                    | 400  |
| 16           | 400       | 39"                          | 991  | 39"1/8  | 994  | 39"    | 991  | 15.16"               | 385  | 18"1/2                  | 470  | 20"1/2                    | 520  |
| 18 x 16      | 450 x 400 | 43"                          | 1092 | 43"1/8  | 1095 | 43"    | 1092 | 15.16"               | 385  | 19"3/4                  | 500  | 22"                       | 560  |
| 18           | 450       | 43"                          | 1092 | 43"1/8  | 1095 | 43"    | 1092 | 17.16"               | 436  | 19"3/4                  | 500  | 22"                       | 560  |
| 20 x 16      | 500 x 400 | 47"                          | 1194 | 47"1/4  | 1200 | 47"    | 1194 | 15.16"               | 385  | 18"1/2                  | 470  | 20"1/2                    | 520  |
| 20           | 500       | 47"                          | 1194 | 47"1/4  | 1200 | 47"    | 1194 | 19.17"               | 487  | 23"1/4                  | 590  | 26"                       | 660  |
| 24 x 20      | 600 x 500 | 55"                          | 1397 | 55"3/8  |      | 55"    | 1397 | 19.17"               | 487  | 23"1/4                  | 590  | 26"                       | 660  |
| 24           | 600       | 55"                          | 1397 | 55"3/8  | 1407 | 55"    | 1397 | 23.19"               | 589  | 25"5/8                  | 650  | 29"1/2                    | 750  |
| 26           | 650       | 57"                          | 1448 | 57"1/2  | 1461 | 57"    | 1448 | 24.92"               | 633  | 27.16"                  | 690  | 31.5"                     | 800  |
| 28           | 700       | 61"                          | 1549 | 61"1/2  | 1562 | 61"    | 1549 | 26.93"               | 684  | 29.53"                  | 750  | 33.86"                    | 860  |
| 30           | 750       | 65"                          | 1651 | 65"1/2  | 1664 | 65"    | 1651 | 28.94"               | 735  | 33.1"                   | 840  | 37"                       | 940  |
| 36           | 900       | 82"                          | 2083 | 82"5/8  | 2099 | 82"    | 2083 | 34.41"               | 874  | 40.16"                  | 1020 | 43.31"                    | 1100 |
| 40           | 1000      |                              | (1)  |         | (1)  |        | (1)  | 38.43"               | 976  | 43.5"                   | 1105 | 45.35"                    | 1152 |
| 42           | 1050      |                              | (1)  |         | (1)  |        | (1)  | 40.16"               | 1020 | 49.25"                  | 1251 | 51.34"                    | 1304 |
| 46           | 1150      |                              | (1)  |         | (1)  |        | (1)  | 44"                  | 1118 | 51.18"                  | 1300 | 54.72"                    | 1390 |
| 48           | 1200      |                              | (1)  |         | (1)  |        | (1)  | 45.9"                | 1166 | 53.27"                  | 1353 | 58.31"                    | 1481 |
| 54           | 1350      |                              | (1)  |         | (1)  |        | (1)  | 51.65"               | 1312 | 55.51"                  | 1410 | 60.71"                    | 1542 |

## DIMENSIONS

### ANSI CLASS 900 Lbs (PN 150)

Working Pressure 2220 psi (152 bar) CWP  
Hydrostatic Shell Test 3250 psi (223 bar)

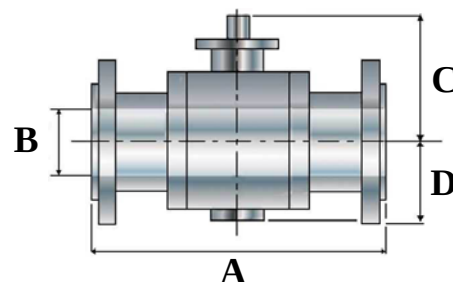


| NOMINAL SIZE |           | END TO END<br>API 6D-B 16.10 |      |         |      |        |      | VALVE BORE<br>API 6D |     | CENTERLINE<br>TO BOTTOM |     | CENTERLINE<br>TO TOP STEM |      |
|--------------|-----------|------------------------------|------|---------|------|--------|------|----------------------|-----|-------------------------|-----|---------------------------|------|
|              |           | A (RF)                       |      | A (RTJ) |      | A (BW) |      | B                    |     | D                       |     | C                         |      |
| inches       | mm        | inches                       | mm   | inches  | mm   | inches | mm   | inches               | mm  | inches                  | mm  | inches                    | mm   |
| 2            | 50        | 14"1/2                       | 368  | 14"5/8  | 371  | 14"1/2 | 368  | 1.93"                | 49  | 4"3/8                   | 110 | 5"1/2                     | 140  |
| 3 x 2        | 80 x 50   | 15"                          | 381  | 15"1/8  | 384  | 15"    | 381  | 1.93"                | 49  | 4"3/8                   | 110 | 5"1/2                     | 140  |
| 3            | 80        | 15"                          | 381  | 15"1/8  | 384  | 15"    | 381  | 2.91"                | 74  | 5"3/8                   | 135 | 6"3/4                     | 170  |
| 4 x 3        | 100 x 80  | 18"                          | 457  | 18"1/8  | 460  | 18"    | 457  | 2.91"                | 74  | 5"3/8                   | 135 | 6"3/4                     | 170  |
| 4            | 100       | 18"                          | 457  | 18"1/8  | 460  | 18"    | 457  | 3.94"                | 100 | 6"1/4                   | 160 | 7"1/4                     | 185  |
| 6 x 4        | 150 x 100 | 24"                          | 610  | 24"1/8  | 613  | 24"    | 610  | 3.94"                | 100 | 6"1/4                   | 160 | 7"1/4                     | 185  |
| 6            | 150       | 24"                          | 610  | 24"1/8  | 613  | 24"    | 610  | 5.9"                 | 150 | 7"1/8                   | 200 | 9"1/2                     | 240  |
| 8 x 6        | 200 x 150 | 29"                          | 737  | 29"1/8  | 740  | 29"    | 737  | 5.9"                 | 150 | 7"1/8                   | 200 | 9"1/2                     | 240  |
| 8            | 200       | 29"                          | 737  | 29"1/8  | 740  | 29"    | 737  | 7.9"                 | 201 | 10"1/4                  | 260 | 12"1/4                    | 310  |
| 10 x 8       | 250 x 200 | 33"                          | 838  | 33"1/8  | 841  | 33"    | 838  | 7.9"                 | 201 | 10"1/4                  | 260 | 12"1/4                    | 310  |
| 10           | 250       | 33"                          | 838  | 33"1/8  | 841  | 33"    | 838  |                      | 252 | 12"1/4                  | 300 | 13"3/4                    | 350  |
| 12 x 10      | 300 x 250 | 38"                          | 965  | 38"1/8  | 968  | 38"    | 965  | 9.92"                | 252 | 12"1/4                  | 300 | 13"3/4                    | 350  |
| 12           | 300       | 38"                          | 965  | 38"1/8  | 968  | 38"    | 965  | 11.93"               | 303 | 13"3/8                  | 340 | 15"3/4                    | 400  |
| 14 x 12      | 350 x 300 | 40"1/2                       | 1029 | 40"7/8  | 1038 | 40"1/2 | 1029 | 11.93"               | 303 | 13"3/8                  | 340 | 15"3/4                    | 400  |
| 14           | 350       | 40"1/2                       | 1029 | 40"7/8  | 1038 | 40"1/2 | 1029 | 12.68"               | 322 | 16"3/8                  | 415 | 18"                       | 455  |
| 16 x 12      | 400 x 300 | 44"1/2                       | 1130 | 44"7/8  | 1140 | 44"1/2 | 1130 | 11.93"               | 303 | 13"3/8                  | 340 | 15"3/4                    | 400  |
| 16           | 400       | 44"1/2                       | 1130 | 44"7/8  | 1140 | 44"1/2 | 1130 | 14.68"               | 373 | 19"1/2                  | 495 | 21"1/2                    | 545  |
| 18 x 16      | 450 x 400 | 48"                          | 1219 | 48"1/2  | 1232 | 48"    | 1219 | 14.68"               | 373 | 21"                     | 583 | 23"1/2                    | 597  |
| 18           | 450       | 48"                          | 1219 | 48"1/2  | 1232 | 48"    | 1219 | 16.65"               | 423 | 21"                     | 583 | 23"1/2                    | 597  |
| 20 x 16      | 500 x 400 | 52"                          | 1321 | 52"1/2  | 1334 | 52"    | 1321 | 14.68"               | 373 | 19"1/2                  | 495 | 21"1/2                    | 545  |
| 20           | 500       | 52"                          | 1321 | 52"1/2  | 1334 | 52"    | 1321 | 18.5"                | 471 | 25"                     | 635 | 28"                       | 711  |
| 24 x 20      | 600 x 500 | 61"                          | 1549 | 61"3/4  | 1568 | 61"    | 1549 | 20.5"                | 522 | 25"                     | 635 | 28"                       | 711  |
| 24           | 600       | 61"                          | 1549 | 61"3/4  | 1568 | 61"    | 1549 | 22.44"               | 570 | 28"                     | 711 | 32"                       | 813  |
| 26           | 650       | 65"                          | 1650 |         |      | 65"    | 1650 | 24.3"                | 617 | 31.7"                   | 805 | 34.25"                    | 870  |
| 28           | 700       | 70"                          | 1778 |         |      | 70"    | 1778 | 26.18"               | 665 | 32.1"                   | 815 | 36.42"                    | 925  |
| 30           | 750       | 74"                          | 1880 |         |      | 74"    | 1880 | 28.03"               | 712 | 36.42"                  | 925 | 39.37"                    | 1000 |
| 36           | 900       | 90"                          | 2286 |         |      | 90"    | 2286 | 33.66"               | 855 | 37.2"                   | 945 | 43.9"                     | 1115 |

## DIMENSIONS

### ANSI CLASS 1500 Lbs (PN 250)

Working Pressure 3705 psi (255 bar) CWP  
Hydrostatic Shell Test 5400 psi (372 bar)

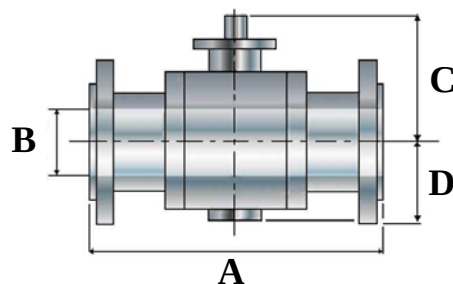


| NOMINAL SIZE |           | END TO END<br>API 6D-B 16.10 |      |         |      |        |      | VALVE BORE<br>API 6D |     | CENTERLINE<br>TO BOTTOM |     | CENTERLINE<br>TO TOP STEM |      |
|--------------|-----------|------------------------------|------|---------|------|--------|------|----------------------|-----|-------------------------|-----|---------------------------|------|
|              |           | A (RF)                       |      | A (RTJ) |      | A (BW) |      | B                    |     | D                       |     | C                         |      |
| inches       | mm        | inches                       | mm   | inches  | mm   | inches | mm   | inches               | mm  | inches                  | mm  | inches                    | mm   |
| 2            | 50        | 14"1/2                       | 368  | 14"5/8  | 371  | 14"1/2 | 368  | 1.93"                | 49  | 4"3/8                   | 110 | 5"1/2                     | 140  |
| 3 x 2        | 80 x 50   | 18"1/2                       | 470  | 18"5/8  | 473  | 18"1/2 | 470  | 1.93"                | 49  | 4"3/8                   | 110 | 5"1/2                     | 140  |
| 3            | 80        | 18"1/2                       | 470  | 18"5/8  | 473  | 18"1/2 | 470  | 2.91"                | 74  | 5"3/8                   | 135 | 6"3/4                     | 170  |
| 4 x 3        | 100 x 80  | 21"1/2                       | 546  | 21"5/8  | 549  | 21"1/2 | 546  | 2.91"                | 74  | 5"3/8                   | 135 | 6"3/4                     | 170  |
| 4            | 100       | 21"1/2                       | 546  | 21"5/8  | 549  | 21"1/2 | 546  | 3.94"                | 100 | 6"1/4                   | 160 | 7"1/4                     | 185  |
| 6 x 4        | 150 x 100 | 27"3/4                       | 705  | 28"     | 711  | 27"3/4 | 705  | 3.94"                | 100 | 6"1/4                   | 160 | 7"1/4                     | 185  |
| 6            | 150       | 27"3/4                       | 705  | 28"     | 711  | 27"3/4 | 705  | 5.67"                | 144 | 10"1/4                  | 260 | 11"                       | 280  |
| 8 x 6        | 200 x 150 | 32"3/4                       | 832  | 33"1/8  | 841  | 32"3/4 | 832  | 5.67"                | 144 | 10"1/4                  | 260 | 11"                       | 280  |
| 8            | 200       | 32"3/4                       | 832  | 33"1/8  | 841  | 32"3/4 | 832  | 7.56"                | 192 | 12"3/4                  | 324 | 16"1/2                    | 420  |
| 10 x 8       | 250 x 200 | 39"                          | 991  | 39"3/8  | 1000 | 39"    | 991  | 7.56"                | 192 | 12"3/4                  | 324 | 16"1/2                    | 420  |
| 10           | 250       | 39"                          | 991  | 39"3/8  | 1000 | 39"    | 991  | 9.41"                | 239 | 17"3/8                  | 440 | 18"1/2                    | 470  |
| 12 x 10      | 300 x 250 | 44"1/2                       | 1130 | 45"1/8  | 1146 | 44"1/2 | 1130 | 9.41"                | 239 | 13"7/8                  | 353 | 20"1/2                    | 520  |
| 12           | 300       | 44"1/2                       | 1130 | 45"1/8  | 1146 | 44"1/2 | 1130 | 11.3"                | 287 | 13"7/8                  | 353 | 20"1/2                    | 520  |
| 14 x 12      | 350 x 300 | 49"1/2                       | 1257 | 50"1/4  | 1276 | 49"1/2 | 1257 | 11.3"                | 287 | 13"7/8                  | 353 | 20"1/2                    | 520  |
| 14           | 350       | 49"1/2                       | 1257 | 50"1/4  | 1276 | 49"1/2 | 1257 | 12.4"                | 315 | 16"1/2                  | 420 | 23"5/8                    | 600  |
| 16 x 12      | 400 x 300 | 54"1/2                       | 1384 | 55"3/8  | 1407 | 54"1/2 | 1384 | 12.4"                | 287 | 18"7/8                  | 477 | 20"1/2                    | 520  |
| 16           | 400       | 54"1/2                       | 1384 | 55"3/8  | 1407 | 54"1/2 | 1384 | 14.17"               | 360 | 20"                     | 508 | 27"1/2                    | 700  |
| 18 x 16      | 450 x 400 | 60"1/2                       | 1537 | 61"3/8  | 1559 | 60"1/2 | 1537 | 14.17"               | 360 | 24"                     | 610 | 35"                       | 890  |
| 18           | 450       | 60"1/2                       | 1537 | 61"3/8  | 1559 | 60"1/2 | 1537 | 16.14"               | 410 | 24"                     | 610 | 35"                       | 890  |
| 20 x 16      | 500 x 400 | 65"1/2                       | 1664 | 66"3/8  | 1686 | 65"1/2 | 1664 | 14.17"               | 360 | 20"                     | 508 | 27.5"                     | 700  |
| 20           | 500       | 65"1/2                       | 1664 | 66"3/8  | 1686 | 65"1/2 | 1664 | 17.95"               | 456 | 24.8"                   | 630 | 37"                       | 940  |
| 24 x 20      | 600 x 500 | 76"1/2                       | 1943 | 77"5/8  | 1972 | 76"1/2 | 1943 | 17.95"               | 456 | 24.8"                   | 630 | 37"                       | 940  |
| 24           | 600       | 76"1/2                       | 1943 | 77"5/8  | 1972 | 76"1/2 | 1943 | 21.57"               | 548 | 29.5"                   | 750 | 45"                       | 1143 |

## DIMENSIONS

### ANSI CLASS 2500 Lbs (PN 420)

Working Pressure 6170 psi (424 bar) CWP  
 Hydrostatic Shell Test 9000 psi (630 bar)



| NOMINAL SIZE |           | END TO END<br>API 6D-B 16.10 |      |         |      |        |      | VALVE BORE<br>API 6D |     | CENTERLINE<br>TO BOTTOM |     | CENTERLINE<br>TO TOP STEM |     |
|--------------|-----------|------------------------------|------|---------|------|--------|------|----------------------|-----|-------------------------|-----|---------------------------|-----|
|              |           | A (RF)                       |      | A (RTJ) |      | A (BW) |      | B                    |     | D                       |     | C                         |     |
| inches       | mm        | inches                       | mm   | inches  | mm   | inches | mm   | inches               | mm  | inches                  | mm  | inches                    | mm  |
| 2            | 50        | 17"3/4                       | 451  | 17"6/7  | 454  | 17"3/4 | 451  | 1.65"                | 42  | 6"1/4                   | 156 | 9"1/4                     | 235 |
| 3 x 2        | 80 x 50   | 22"3/4                       | 578  | 23"     | 584  | 22"3/4 | 578  | 1.65"                | 42  | 8"1/8                   | 205 | 9"1/4                     | 235 |
| 3            | 80        | 22"3/4                       | 578  | 23"     | 584  | 22"3/4 | 578  | 2.44"                | 62  | 8"1/8                   | 205 | 12"                       | 300 |
| 4 x 3        | 100 x 80  | 26"1/2                       | 673  | 26"7/8  | 683  | 26"1/2 | 673  | 2.44"                | 62  | 9"                      | 229 | 12"1/4                    | 300 |
| 4            | 100       | 26"1/2                       | 673  | 26"7/8  | 683  | 26"1/2 | 673  | 3.42"                | 87  | 9"                      | 229 | 13"1/2                    | 343 |
| 6 x 4        | 150 x 100 | 36"                          | 914  | 36"1/2  | 927  | 36"    | 914  | 3.42"                | 87  | 10"1/2                  | 267 | 13"1/2                    | 343 |
| 6            | 150       | 36"                          | 914  | 36"1/2  | 927  | 36"    | 914  | 5.16"                | 131 | 10"1/2                  | 267 | 17"1/2                    | 445 |
| 8 x 6        | 200 x 150 | 40"1/4                       | 1022 | 40"7/8  | 1038 | 40"1/4 | 1022 | 5.16"                | 131 | 14"                     | 356 | 17"1/2                    | 445 |
| 8            | 200       | 40"1/4                       | 1022 | 40"7/8  | 1038 | 40"1/4 | 1022 | 7.05"                | 179 | 14"                     | 356 | 20"                       | 508 |
| 10 x 8       | 250 x 200 | 50"                          | 1270 | 50"7/8  | 1292 | 50"    | 1270 | 7.05"                | 179 | 15"                     | 381 | 20"                       | 508 |
| 10           | 250       | 50"                          | 1270 | 50"7/8  | 1292 | 50"    | 1270 | 8.78"                | 223 | 15"                     | 381 | 23"                       | 584 |
| 12 x 10      | 300 x 250 | 56"                          | 1422 | 56"7/8  | 1445 | 56"    | 1422 | 8.78"                | 223 | 18"                     | 457 | 23"                       | 584 |
| 12           | 300       | 56"                          | 1422 | 56"7/8  | 1445 | 56"    | 1422 | 10.43"               | 265 | 18"                     | 457 | 27"                       | 686 |

## FLOW COEFFICIENT – CV VALUES

$C_v$  is defined as the quantity of water in gallons per minute that will pass through a valve with a pressure drop of 1 psi .

The table here below gives the CV values valid for ball valves in full open position.

### FLOW COEFFICIENT OF BALL VALVES IN FULL OPEN POSITION

| SIZE   |      | ANSI CLASS |         |         |         |          |          | SIZE      | ANSI    |
|--------|------|------------|---------|---------|---------|----------|----------|-----------|---------|
| inches | mm   | 150 lbs    | 300 lbs | 600 lbs | 900 lbs | 1500 lbs | 2500 lbs | inches    | (*)     |
| 2      | 50   | 500        | 470     | 400     | 360     | 360      | 300      |           |         |
| 3      | 80   | 1,300      | 1,100   | 1,000   | 1,000   | 900      | 800      | 3" x 2"   | 190     |
| 4      | 100  | 2,300      | 2,200   | 1,800   | 1,800   | 1,600    | 1,500    | 4" x 3"   | 500     |
| 6      | 150  | 5,400      | 5,400   | 4,500   | 4,300   | 4,000    | 3,500    | 6" x 4"   | 760     |
| 8      | 200  | 10,000     | 10,000  | 8,900   | 8,400   | 7,900    | 7,000    | 8" x 6"   | 2,000   |
| 10     | 250  | 17,800     | 17,100  | 14,500  | 14,000  | 13,000   | 11,000   | 10" x 8"  | 4,000   |
| 12     | 300  | 26,000     | 25,000  | 22,000  | 21,000  | 19,000   | 17,000   | 12" x 10" | 7,200   |
| 14     | 350  | 32,000     | 31,000  | 28,000  | 26,000  | 24,000   |          | 14" x 12" | 9,000   |
| 16     | 400  | 44,000     | 42,000  | 39,000  | 36,000  | 33,000   |          | 16" x 12" | 10,000  |
| 18     | 450  | 58,000     | 56,000  | 51,000  | 47,500  | 42,000   |          | 18" x 14" | 15,000  |
| 20     | 500  | 75,000     | 72,000  | 66,000  | 60,000  | 52,000   |          | 20" x 16" | 21,000  |
| 24     | 600  | 111,200    | 102,000 | 92,000  | 86,000  | 81,000   |          | 24" x 20" | 27,000  |
| 28     | 700  | 143,000    | 123,000 | 122,000 | 112,000 |          |          | 28" x 24" | 34,900  |
| 30     | 750  | 164,000    | 151,000 | 148,000 | 130,000 |          |          | 30" x 24" | 36,000  |
| 36     | 900  | 235,000    | 218,000 | 206,500 | 195,000 |          |          | 36" x 30" | 63,000  |
| 40     | 1000 | 267,000    | 256,000 | 250,000 |         |          |          | 40" x 36" | 151,000 |
| 42     | 1050 | 321,000    | 308,000 | 280,000 |         |          |          |           |         |
| 48     | 1200 | 368,000    | 360,000 | 350,000 |         |          |          |           |         |

(\*) All ratings : listed values are average values valid for all ratings

## POWER ASSISTED VALVES

When a valve needs to be power assisted, we will provide any kind of actuator (electric, pneumatic, or hydraulic) upon specific request.

We are available to take full responsibility for sizing the actuator to match the valve and operating conditions, assembling the actuator onto the valve, fitting the travel stops, and stroking the valve to check the performance on the valve/actuator system.

To properly size an actuator, the following information is required:

- valve size and rating
- maximum differential pressure
- closing/opening time
- power supply
- mode of failure
- local or remote control
- position indicator
- auxiliary equipment

For any information please contact:

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