

TRUNNION BALL VALVES



SUD ROBINETTERIE
industrie

PREAMBLE

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Chronology :

| Date | Document | Version | Object |
|-------------|-----------------|----------------|---|
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TRUNNION BALL VALVE

SRi proposes a large range of dimensions in every standard pressure class using "trunnion" technology which supplies excellent mechanical and functional endurance and reliability expected in industrial installations. SRi uses the most sophisticated means of conception, designing, testing, manufacturing and creation of its products. All SRi parts and components are controlled and tested prior to manufacture of the valve.

This assures :

- total conformity with standards, codes and specifications.
- great reliability as proven by decades of supplying various industries and successfully passing numerous tests.
- the guarantee of conception and manufacturing managed in the framework of ISO 9001 quality standard.
- High performances in sealing systems, manoeuvrability and reliability.
- a large selection of optional equipment and automatic systems.
- a constant supply of spare parts and technical assistance to our customers.

SRi is



PED 97/23/EC
ATEX 94/9/EC



6D-0232
6A-0731

RANGE OF PRODUCTS

Type W and A trunnion mounted ball valves are **3 parts** steel bolted assemblies. Both types employ the same internal components standardized by nominal diameter (DN) and pressure class. Standardization includes the parts for the blocking system, the joints, the sealing system (seats), the nuts and bolts and the topworks.

DIMENSIONS

(API6D/ISO14313 Classes and ISO PN Classes¹)

| NPS | DN | 10/16/20 | 25/40/50 | 63/64/100 | 150 | 250 | 420 |
|-----|------|----------|----------|-----------|-----|------|------|
| | | 150 | 300 | 400/600 | 900 | 1500 | 2500 |
| ½" | 15 | | | | | | |
| ¾" | 20 | | | | | | |
| 1" | 25 | | | | | | |
| 1½" | 40 | | | | | | |
| 2" | 50 | | | | | | |
| 3" | 80 | | | | | | |
| 4" | 100 | | | | | | |
| 6" | 150 | | | | | | |
| 8" | 200 | | | | | | |
| 10" | 250 | | | | | | |
| 12" | 300 | | | | | | |
| 14" | 350 | | | | | | |
| 16" | 400 | | | | | | |
| 18" | 450 | | | | | | |
| 20" | 500 | | | | | | |
| 22" | 550 | | | | | | |
| 24" | 600 | | | | | | |
| 26" | 650 | | | | | | |
| 28" | 700 | | | | | | |
| 30" | 750 | | | | | | |
| 32" | 800 | | | | | | |
| 36" | 900 | | | | | | |
| 38" | 950 | | | | | | |
| 40" | 1000 | | | | | | |

Dimensions covered by Type A and Type W

Dimensions covered only by Type W

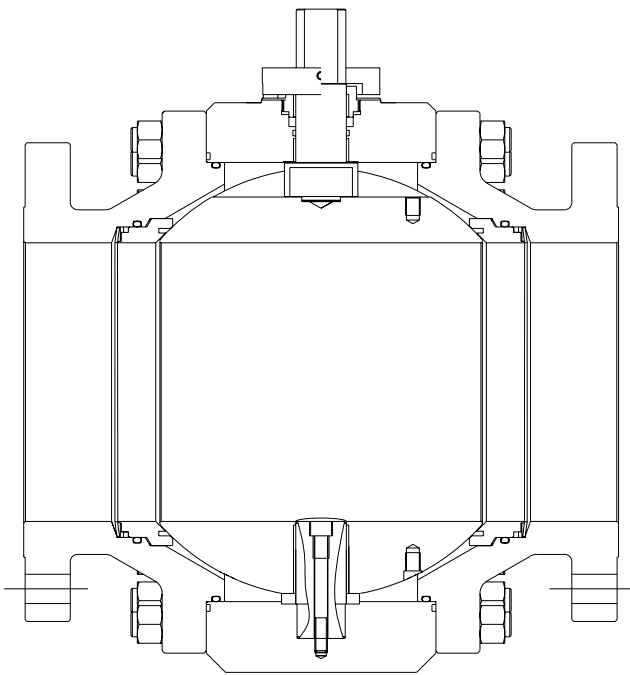
¹ Dimensions for API6A classes can be obtained on request to our sales department.

TYPE A & W – CHARACTERISTICS AND OPTIONAL EQUIPMENTS

Type A and Type W designs share the following characteristics :

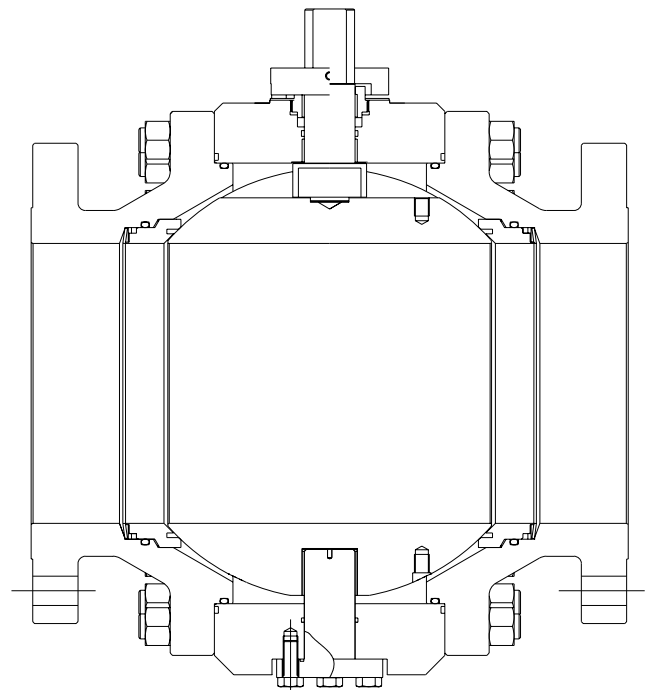
- **Metric bolting.** Threaded blind hole protected from corrosion. Controlled tightening.
- **API6D/ISO14313 bores²**
- **Double block and bleed** function in the "closed" position
- **Unidirectional** seats (standard) or **bidirectional** seats ("Double effect" option)
- Soft seats (plastic inserts) or Metal/metal seats (hardening treatment) or Metal seats + seal (combination of the first two technical solutions)
- **Anti-blow-out** stem and with a weak point outside the body pressure boundary
- **ISO 5211** Topworks on all the valves allowing to mount a position control device after installation of the valve
- **Anti-static** device (electric continuity between the parts)
- **Primary sealing** with an elastomeric O-ring (standard) or a polymeric lipseal (optional)
- Secondary sealing with a graphite packing ring to ensure the **fire safe** function.

Type A :



Design with a solid anti-blow-out lower stem.

Type W :



Design allowing to achieve the Double block and bleed function in the "open" position as well as in the "closed" position.

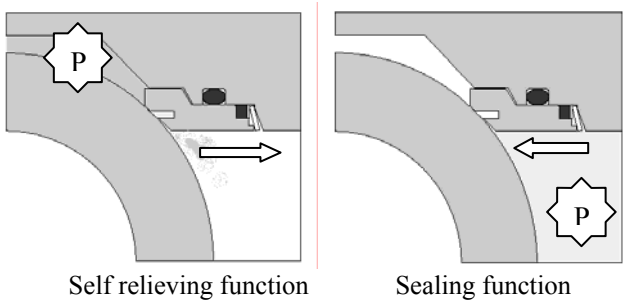
² Except 2500 series for NPS under 2"

IN LINE SEALING SYSTEM

SRI makes the in line sealing system two different ways according to the application, both of which are double block and bleed :

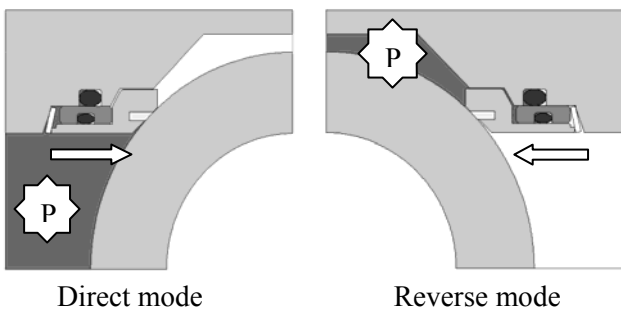
Double sealing - Double self relieving

Each seat is **unidirectional** with regard to the difference in pressure. This creates a seal in both directions of the flow using one seat for each pressure direction. Self relieving of the internal volume (cavity) is assured by the seat on the side with the lowest pressure.



Double sealing

Each seat works for **both directions** according to the pressure drop. It insures the sealing in both flow directions due to the simultaneous action of the 2 seats. The seats do not decompress the internal volume (cavity). If the ball valve is equipped with 2 identical seats, the internal decompression must be realised by a specific external system (external safety or bleed valve).



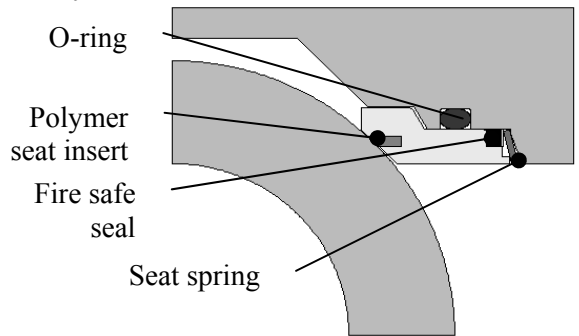
The standard model is Double sealing, Double self relieving.

Seat Construction

SRI offers 3 different technologies for the ball / seat sealing interface :

Soft seals :

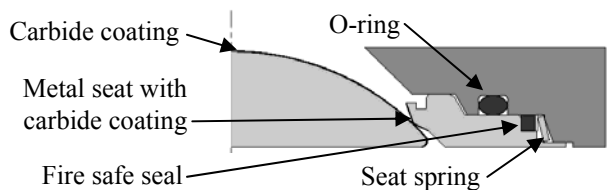
The sealing contact is polymer / metal, with different combinations of both according to specific needs with regard to temperatures, pressures and fluid aggressivity.



Metal seats :

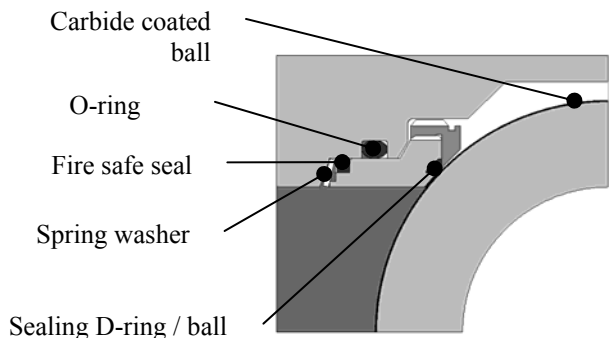
The sealing surface is made of projected carbide coating (tungsten, chromium, boron). This seat type is particularly adapted to the most restrictive service conditions, for example when fluids contain a high percentage of insoluble abrasives, or when many cycles are required.

This system must be associated with a seal criteria giving a leakage rate limit.



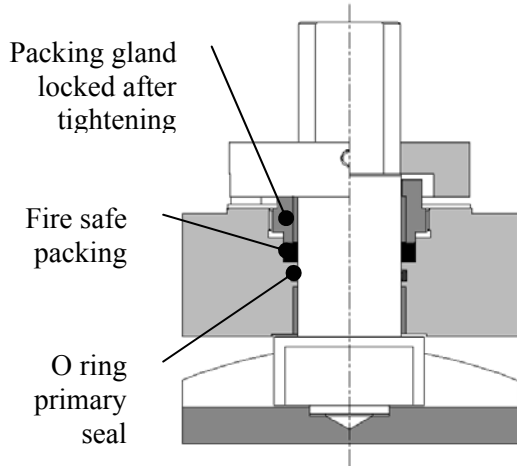
Metal + Soft :

This system combines mechanical resistance of metal to metal contact between seat and ball with a tight seal for gas due to the presence of an elastomer O-ring. The sealing surface is made of projected carbide coating (tungsten, chromium, boron). The triangular section D-ring is fitted in a groove to prevent extrusion. This system is particularly adapted to gas flows with few abrasive particles when a perfect and durable seal is required. Temperature range for use is limited due to the presence of the elastomer.



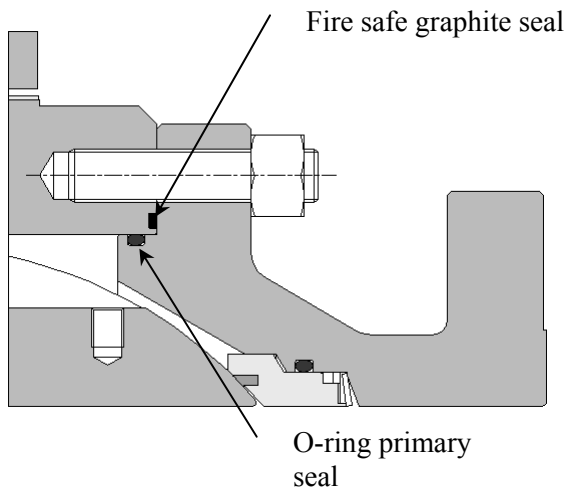
UPPER STEM SEALING SYSTEM

The graphite packing is protected by a primary O-ring and is not affected by fluids under pressure unless there is a failure or combustion of the O-ring. The packing gland is adjusted in the factory but it can be easily re-tightened when in use.



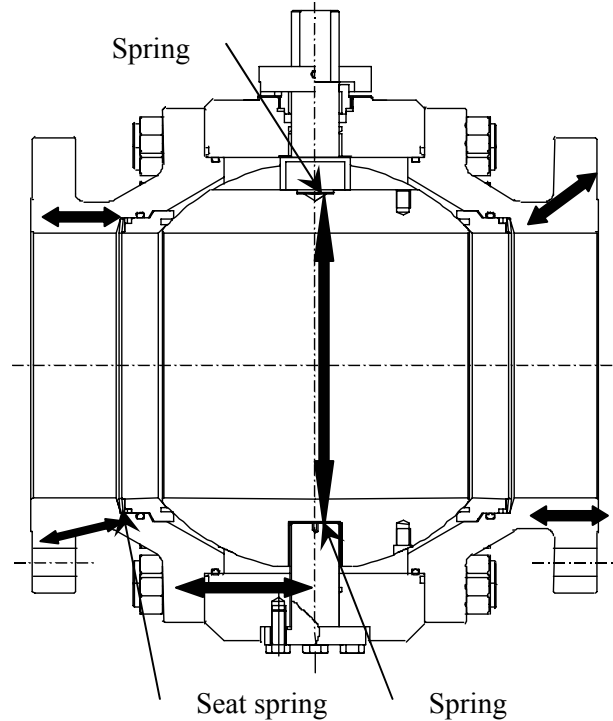
STATIC SEALING BETWEEN BODY AND FLANGES

Primary sealing is ensured by a polymer O-ring mounted on a piston in a closed groove. The fire safe graphite packing is fitted in a groove inside the valve body.



ANTI-STATIC DEVICE

Electric continuity principle is shown below (Types W and A). It does not rely on the conductive properties of the graphite packing :

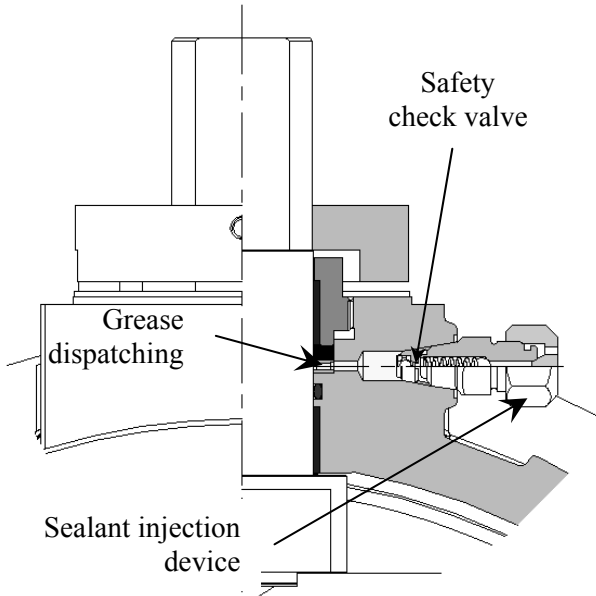


OPTIONAL EQUIPMENTS

Secondary sealing system on stem.

Sealant injection is not a definitive solution to restore sealing and must be repeated especially after each valve stroke.

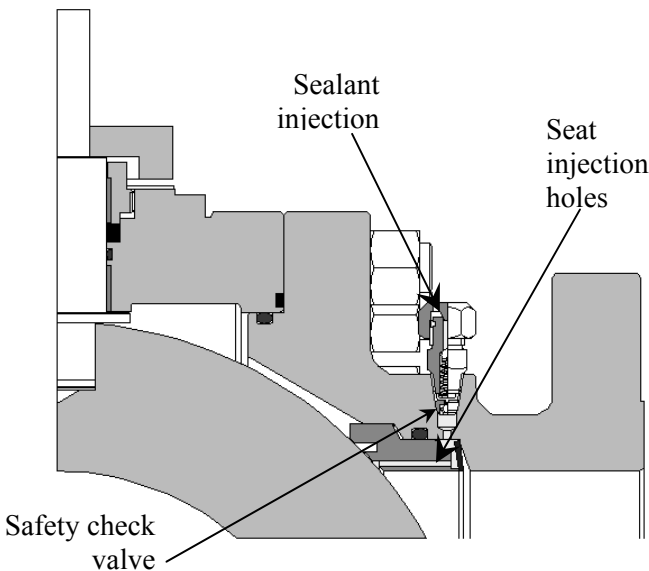
This device allows an external intervention in case of failure in the stem sealing system (destruction of O-ring and degradation of packing) by permitting injection of a sealant to minimize the problem until maintenance operation. This intervention can be performed in either the "open" or "closed" position on the valve.



Secondary sealing system on seats (NPS ≥ 6" DN150).

Sealant injection is not a definitive solution to restore sealing and must be repeated especially after each valve stroke because sealant is ejected during the opening valve operation.

This option allows an external intervention in case of a failure in the sealing system in line (destruction of seat insert or minor O-ring defects) by permitting sealant injection in the "closed" position to minimize the problem until maintenance operation.



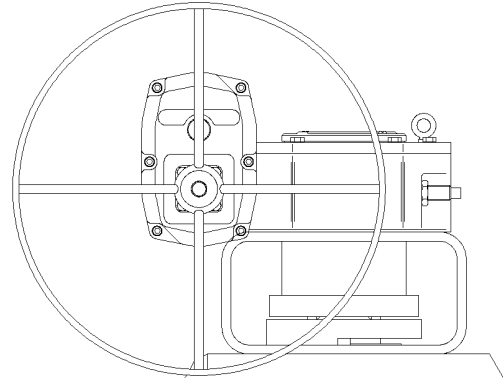
Caution !

The sealant used must be adapted to the real operating conditions especially with regard to actual temperatures observed during utilization and to the nature of the fluid (solvent, pollution ,chemical compatibility, etc.).

Lever

Lever is solid steel.
All levers can be furnished with a locking device in open / closed position.

Quarter turn gear



Assembly with opened spacer and coupling per ISO 5211. The standard gear box is irreversible with 1, 2, or 3 stages. It is greased for life. Grey cast iron housing. Protection IP 67. Handwheel is carbon steel.

Gearboxes can be equipped with locking devices and limit switches. **SRI** can supply different versions with specific protection for immersion in freshwater or seawater, housings made of carbon steel or ductile iron.

Actuators, Automatic actuating systems, Position detectors, Locking devices, Remote controls

All types are adaptable and can be supplied :

- Pneumatic or hydraulic actuators with single or double acting, with or without spring return,
- Electric actuators
- Fast opening systems
- Self closing device
- Remote controls by cables
- Interlocks
- Locks with a key or tabs

with all different configurations of control panels or warning systems. **SRI** is equipped with rig and panel to test the system operability under various differential pressures.



**VALVES IN
ACCORDANCE WITH
THE PRESSURE
EQUIPMENT
DIRECTIVE 97/23/EC**

SRi can provide trunnion ball valves in conformance with the European Pressure Equipment Directive : PED 97/23/EC.

SRi is approved **CE** for categories I to IV under the reference :

CE-PED-H-SRI-001-01-FRA

Except for particular requests, SRi provides materials whose classification conforms to the following :

Fluid Groups

The classification is based exclusively on the most restrictive application defined by the directive : Group 1³ fluids. By extension and without any changes, Group 2⁴ fluids are therefore also treated.

Categories

A valve is defined by its nominal diameter on ends⁵ (DN), and by the maximal working pressure as identified by the pressure class of the piping (flanges, ends, butt weld ends, etc...).

SRi classification is based on the combination of the product DN×Pressure. The Classification Tables taken into account are :

For gas :

-Tableau 6 : "Piping referred to in Article 3, section 1.3 (a)".

For liquids :

-Tableau 8 : "Piping referred to in Article 3, section 1.3 (b)".

Notes about Category "Article 3 § 3"

Some of the valves produced by SRi (DN≤25), submitted to the requirements of the European Directive enter into the definition as stipulated in article 3 point 3.

This category is never identified by a EC marking.

SRi has generalized the application of the following quality modules :

| Categories | Modules ⁶ | EC Marking |
|-------------------|----------------------|-----------------------------------|
| A3§3 ⁷ | - | Forbidden |
| I | A ⁸ | EC Logo |
| II | H ⁹ | EC Logo + NB ¹⁰ number |
| III | H ¹¹ | EC Logo + NB number |
| IV | H1 ¹² | EC Logo + Follow-up by NB |

Materials

Materials employed for the fabrication of valves and subjected to the requisitions of the european directive are among the grades that have been subjected to an European approbation or a particular one by the notified body.

For all the materials listed in the tables of this documentation, SRi has a particular approbation. For different grades, please consult SRi.

For each valve **CE**, SRi supplies the essential limits of use, including the different materials employed.

⁶ Directive 97/23/EC Appendix II

⁷ Valves from this category are manufactured according to the procedures AQ ISO9000 SRi

⁸ Directive 97/23/EC Appendix III Module A §1 to 3

⁹ The associated module is E1, but, for this category, SRi adopts module H in order to have only one system to manage.

¹⁰ NB=Notified Body

¹¹ Directive 97/23/EC Appendix III Module H §1 to 6

¹² Directive 97/23/EC Appendix IV Module H1 § 1 to 2

³ PED 97/23/EC Article 9 §2.1

⁴ PED 97/23/EC Article 9 §2.2

⁵ This classification is independent of the usual designations "reduced", "full", "venturi" for valves.

Trunnion Ball Valve Categories ¹³- Fluids Group 1
Nominal diameter refers to the largest piping connection.

Classification guide Table for Gases

| NPS | DN | Pressure Class PN | | | | | | | | | |
|--------|------|-------------------|------|------|------|------|------|------|------|------|------|
| | | 10 | 16 | 20 | 25 | 40 | 50 | 100 | 150 | 250 | 420 |
| 1/2" | 15 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 |
| 3/4" | 20 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 |
| 1" | 25 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 |
| 1 1/4" | 32 | I | I | I | I | II | II | II | II | II | II |
| 1 1/2" | 40 | I | I | I | I | II | II | II | II | II | II |
| 2" | 50 | I | I | I | II | II | II | II | II | II | II |
| 2 1/2" | 65 | I | II | II | II | II | II | II | II | II | II |
| 3" | 80 | I | II | II | II | II | II | II | II | II | II |
| 4" | 100 | I | II | II | II | II | II | II | II | II | II |
| 6" | 150 | II | II | II | III | III | III | III | III | III | III |
| 8" | 200 | II | II | III | III | III | III | III | III | III | III |
| 10" | 250 | II | III | III | III | III | III | III | III | III | III |
| 12" | 300 | II | III | III | III | III | III | III | III | III | III |
| 14" | 350 | II | III | III | III | III | III | III | III | III | III |
| 16" | 400 | III | III | III | III | III | III | III | III | III | III |
| 18" | 450 | III | III | III | III | III | III | III | III | III | III |
| 20" | 500 | III | III | III | III | III | III | III | III | III | III |
| 24" | 600 | III | III | III | III | III | III | III | III | III | III |
| 26" | 650 | III | III | III | III | III | III | III | III | III | III |
| 28" | 700 | III | III | III | III | III | III | III | III | III | III |
| 30" | 750 | III | III | III | III | III | III | III | III | III | III |
| 32" | 800 | III | III | III | III | III | III | III | III | III | III |
| 36" | 900 | III | III | III | III | III | III | III | III | III | III |
| 40" | 1000 | III | III | III | III | III | III | III | III | III | III |

Classification guide Table for Liquids

| NPS | DN | Pressure Class PN | | | | | | | | | |
|--------|------|-------------------|------|------|------|------|------|------|------|------|------|
| | | 10 | 16 | 20 | 25 | 40 | 50 | 100 | 150 | 250 | 420 |
| 1/2" | 15 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 |
| 3/4" | 20 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 |
| 1" | 25 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 | A383 |
| 1 1/4" | 32 | A383 | A383 | A383 | A383 | A383 | A383 | II | II | II | II |
| 1 1/2" | 40 | A383 | A383 | A383 | A383 | A383 | A383 | II | II | II | II |
| 2" | 50 | A383 | A383 | A383 | A383 | A383 | II | II | II | II | II |
| 2 1/2" | 65 | A383 | A383 | A383 | A383 | II | II | II | II | II | II |
| 3" | 80 | A383 | A383 | A383 | A383 | II | II | II | II | II | II |
| 4" | 100 | A383 | A383 | A383 | II | II | II | II | II | II | II |
| 6" | 150 | A383 | II | II | II | II | II | II | II | II | II |
| 8" | 200 | A383 | II | II | II | II | II | II | II | II | II |
| 10" | 250 | I | II | II | II | II | II | II | II | II | II |
| 12" | 300 | I | II | II | II | II | II | II | II | II | II |
| 14" | 350 | I | II | II | II | II | II | II | II | II | II |
| 16" | 400 | I | II | II | II | II | II | II | II | II | II |
| 18" | 450 | I | II | II | II | II | II | II | II | II | II |
| 20" | 500 | I | II | II | II | II | II | II | II | II | II |
| 24" | 600 | I | II | II | II | II | II | II | II | II | II |
| 26" | 650 | I | II | II | II | II | II | II | II | II | II |
| 28" | 700 | I | II | II | II | II | II | II | II | II | II |
| 30" | 750 | I | II | II | II | II | II | II | II | II | II |
| 32" | 800 | I | II | II | II | II | II | II | II | II | II |
| 36" | 900 | I | II | II | II | II | II | II | II | II | II |
| 40" | 1000 | I | II | II | II | II | II | II | II | II | II |

¹³ Stated pressures are maximal pressures defined for each standard class at ambient temperature and for the most restrictive referenced material. These values are in coherence with standard pressure test conditions of pressurized equipment. In general, maximal allowable pressures decrease while temperature increases.



VALVES FOLLOWING THE REQUISITIONS OF EUROPEAN DIRECTIVE ATEX 94/9/EC (EXPLOSIVE ATMOSPHERES)

SRI can supply Type A & W valves in conformity with the requisitions of the European directive 94/9/EC.

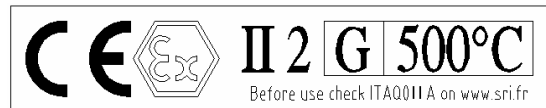
In the standard version, these valves are conform with the requisitions of the directive for Group II (surface) and category 2 atmosphere G (gas) which covers zones 1 and 2.

Opposite to the PED which applies for the whole European territory, ATEX directive only applies to zones classified as hazardous. Therefore, ATEX marking is realized only when specified on the order.

Marking :

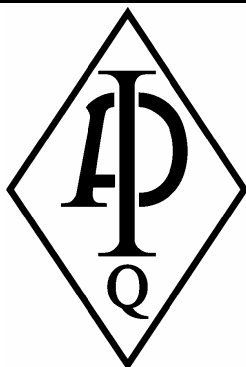
Valves subjected to ATEX are equipped with an additional specific identification plate, or an additional marking on the name plate.

This disposition could be cancelled without notification if the European authorities rule on the exclusion of valves from the application field of ATEX directive.



The temperature indicated on the plate is the maximum temperature that the valve can support. Depending on the service conditions, this temperature can be reached or not. The user must check that if this temperature can be reached under his service conditions, it is compatible with his potentially explosive atmosphere.

On the contrary, it is possible to limit this temperature to a value set by the customer. When this limitation reduces the range of the essential limits of 97/23/EC directive, the impact on the marking is then reported on the identification plate 97/23/EC or API6D (reduction of the maximum allowable temperature). Such dispositions must be taken before the production of the equipment.



AMERICAN PETROLEUM INSTITUTE LICENSING PROGRAM

SRi is licensed by the American Petroleum Institute and is therefore authorized to use the API logo on the relevant produced valves.

The homologation covers two specifications. The two licenses carry the following identification numbers :

- API 6D : License 0232
- API 6A : License 0731

API 6D : Petroleum and Natural Gas Industries – Pipeline Transportation Systems – Pipeline Valves. This specification is also edited under the reference of the international standard ISO 14313.

It settles conception, configuration, dimensions, performance and test criteria for valves employed on transport pipelines classified according to the following ANSI-ASME / PN pressure classes :

| Class | PN |
|-------|-----|
| 150 | 20 |
| 300 | 50 |
| 400 | 64 |
| 600 | 100 |
| 900 | 150 |
| 1500 | 250 |
| 2500 | 420 |

API 6D covers diameters from 15 to 1500mm of gate valves, plug valves, ball valves and check valves made of materials from ASME B16.34 or from an equivalent code.

API 6A : Specification for Wellhead and Christmas Tree Equipment.

This specification is also edited under the reference of the international standard ISO 10423.

It settles conception, configuration, dimensions, performance and test criteria for valves employed on Wellhead and Christmas tree equipments.

It is classified according to its own API pressure classes and nominal dimensions :

| Class | Pressure (bar) | Class | Pressure (bar) |
|-------|----------------|-------|----------------|
| 2000 | 138 | 10000 | 690 |
| 3000 | 207 | 15000 | 1034 |
| 5000 | 345 | 20000 | 1380 |

It covers the following diameters :

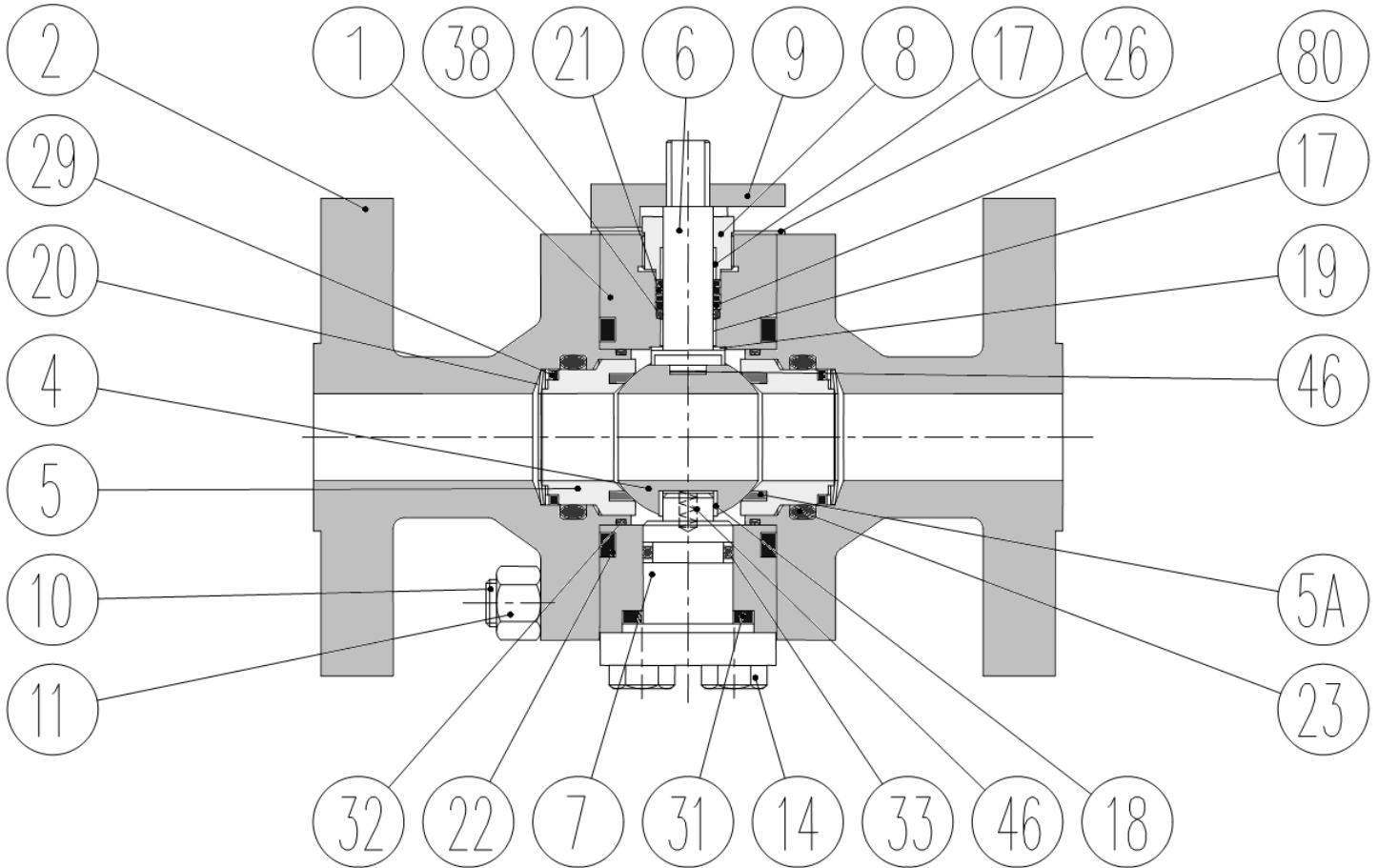
| DN | NPS | DN | NPS |
|-------------------|-----|------------------|-----|
| 1 $\frac{3}{8}$ | 35 | 6 $\frac{5}{8}$ | 168 |
| 1 $\frac{13}{16}$ | 46 | 7 $\frac{1}{16}$ | 179 |
| 2 $\frac{1}{16}$ | 52 | 9 | 228 |
| 2 $\frac{9}{16}$ | 65 | 11 | 279 |
| 3 $\frac{1}{8}$ | 78 | 13 $\frac{5}{8}$ | 346 |
| 4 $\frac{1}{16}$ | 103 | 16 $\frac{3}{4}$ | 425 |
| 4 $\frac{1}{4}$ | 108 | 18 $\frac{3}{4}$ | 476 |
| 5 $\frac{1}{8}$ | 130 | 21 $\frac{1}{4}$ | 540 |
| 6 | 152 | 26 $\frac{3}{4}$ | 680 |
| 6 $\frac{3}{8}$ | 162 | 30 | 762 |

MAIN REFERENCED NORMS

- AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
- AMERICAN PETROLEUM INSTITUTE SPECIFICATION 6D (API 6D) – ISO 14313
- AMERICAN PETROLEUM INSTITUTE SPECIFICATION 6A (API 6A) – ISO 10423
- STEEL BALL VALVES FOR THE PETROLEUM, PETROCHEMICAL AND ALLIED INDUSTRIES BS 5351
- PART TURN VALVE ACTUATOR ATTACHMENTS ISO 5211 Part 1, 2 & 3
- PRESSURE EQUIPMENT DIRECTIVE 97/23/EC May 29th, 1997
- EXPLOSIVE ATMOSPHERE DIRECTIVE 94/9/EC March 23rd, 1994
- ASME B16.10 FACE-TO-FACE AND END-TO-END DIMENSIONS OF VALVES
- NACE MR0175/ISO 15156 – PETROLEUM AND NATURAL GAS INDUSTRIES – MATERIAL FOR USE IN H₂S-CONTAINING ENVIRONMENTS IN OIL AND GAS PRODUCTION
- CODAP CODE DE CONSTRUCTION DES APPREILS A PRESSION
- EN 13445-3 RECIPIENTS SOUS PRESSION NON SOUMIS A LA FLAMME – PARTIE 3 CONCEPTION
- ASME B16.5 PIPE FLANGES AND FLANGED FITTINGS
- ASME B16.34 VALVES-FLANGED, THREADED AND WELDING END.

MATERIALS

Ball valves type A and W DN ≤ 1" ½ (40)



This general drawing shows the composition of a generic valve. Variants can be made for specific applications, for example :

- Stainless steel or nickel alloy weld overlay on static or dynamic seals housings.
- Electroless nickel plating on wetted surfaces.
- Special seats without dead zones.
- Lip seal between seats and flanges.
- Double stem ball valves.
- Flushing circuits of the inter seat cavity in opened or closed position.
- Valve equipped with standard seat (auto cavity relief) and with double piston effect seat.

Parts List

The following materials represent the principal standardized manufactured compositions. Other metallurgy can be realized. Contact our sales department. All materials can be provided in conformity with the NACE MR 0175 requirements.

| Rep | Part name | STANDARDISED COMPOSITIONS | | |
|-----|---------------------------------|---------------------------|-------------------------|-------------------------|
| | | CS-CSLT | SS1 | DUPLEX |
| 1 | BODY | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 2 | FLANGED END | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 4 | BALL | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 5 | SEAT | Note ⁸ | A182 F316L | A182 Gr F51 |
| 5A | SEAT INSERT | PTFE ¹ | PTFE ¹ | PTFE ¹ |
| 6 | UPPER STEM | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 7 | LOWER STEM | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 8 | PACKING GLAND | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 9 | STOP PLATE | A350 Gr LF2 | A182 F316L | A182 F316L |
| 10 | STUD BOLT | A193 Gr B7 ³ | A 193 Gr B8 | A 193 Gr B8 |
| 11 | NUT | A194 Gr 2H ³ | A194 Gr 8 | A194 Gr 8 |
| 14 | LOWER STEM SCREW | AISI 316 | A4-80 | A182 Gr F51 |
| 17 | UPPER SELF LUBRICATING BEARING | 304+PTFE ⁴ | 304+PTFE ⁴ | 304+PTFE ⁴ |
| 18 | LOWER SELF LUBRICATING BEARING | 304+PTFE ⁴ | 304+PTFE ⁴ | 304+PTFE ⁴ |
| 19 | UPPER STEM BEARING WASHER | 304+PTFE | 304+PTFE | 304+PTFE |
| 20 | SEAT LOADING WASHER | UNS S17400 ² | UNS S17400 ² | UNS N07750 ² |
| 21 | UPPER STEM PACKING | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 22 | FLANGE TO BODY FIRE GASKET | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 23 | SEAT TO FLANGE O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 26 | PACKING GLAND STOP PLATE | AISI 316L | AISI 316L | AISI 316L |
| 29 | SEAT FIRE GASKET | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 30 | FIRE GASKET SUPPORT WASHER | AISI 304 | AISI 304 | AISI 304 |
| 31 | LOWER STEM FIRE GASKET | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 32 | FLANGE TO BODY O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 33 | BODY TO LOWER STEM O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 38 | BODY TO UPPER STEM O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 46 | ANTI STATIC SPRING DEVICE | AISI 302 | AISI 302 | AISI 302 |
| 80 | LOWER PACKING RING | AISI 304 | AISI 304 | AISI 304 |
| 46 | UPPER ANTI STATIC SPRING DEVICE | AISI 302 | AISI 302 | AISI 302 |

NOTES :

1-PTFE+25%glass – Other materials on request. See graph Pressure/Temperature curves.

2-UNS S17400 H1150 for high pressure classes + impact test for low temperatures.

3-Zinc plated+Bichromated

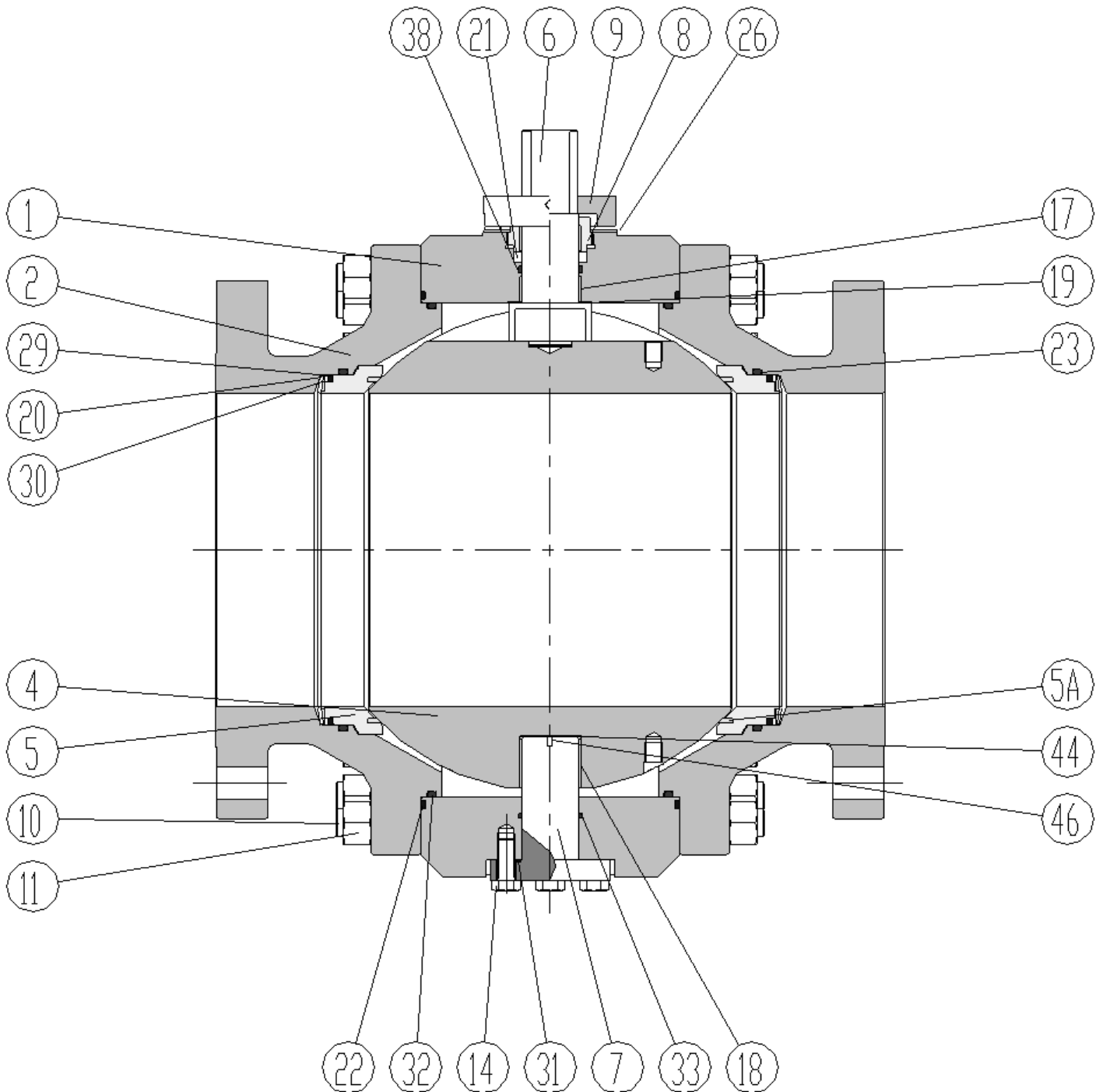
4-Self lubricating bearing PTFE

5-Expanded graphite Density 1.6 to 1.8. With corrosion inhibitor.

6-FKM = Fluoro elastomer –Several elastomer qualities are available according to fluids and temperatures.

7-UNS N07500 or UNS S17400 according to pressure class.

8-For use at low temperatures, resilient steels.

Ball valves type W DN $\geq 2''$ (50)

This general drawing shows the composition of a generic valve. Variants can be made for specific applications for example :

- Stainless steel or nickel alloy weld overlay on static or dynamic seals housings.
- Electroless nickel plating on wetted surfaces.
- Special seats without dead zones.
- Lip seal between seats and flanges.
- Double stem ball valves.
- Flushing circuits of the inter seat cavity in opened or closed position.
- Valve equipped with standard seat (auto cavity relief) and with double piston effect seat.

Parts List

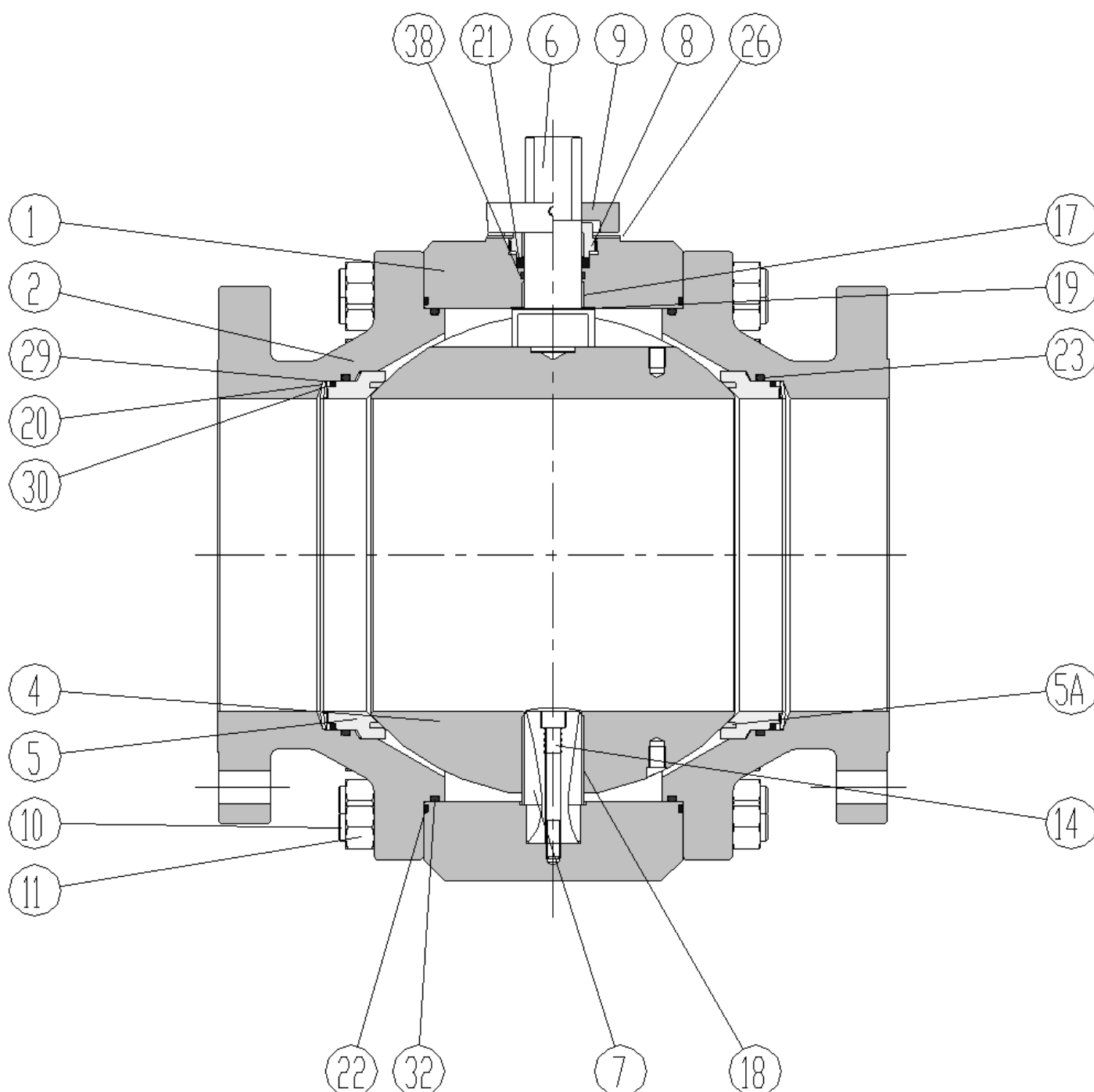
The following materials represent the principal standardized manufactured compositions. Other metallurgy can be realized. Contact our sales department. All materials can be provided in conformity with the NACE MR 0175 requirements.

| Rep | Part name | STANDARDISED COMPOSITIONS | | |
|-----|--------------------------------|---------------------------|-------------------------|-------------------------|
| | | CS-CSLT | SS1 | DUPLEX |
| 1 | BODY | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 2 | FLANGED END | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 4 | BALL | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 5 | SEAT | Note ⁸ | A182 F316L | A182 Gr F51 |
| 5A | SEAT INSERT | PTFE ¹ | PTFE ¹ | PTFE ¹ |
| 6 | UPPER STEM | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 7 | LOWER STEM | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 8 | PACKING GLAND | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 9 | STOP PLATE | A350 Gr LF2 | A182 F316L | A182 F316L |
| 10 | STUD BOLT | A193 Gr B7 ³ | A 193 Gr B8 | A 193 Gr B8 |
| 11 | NUT | A194 Gr 2H ³ | A194 Gr 8 | A194 Gr 8 |
| 14 | LOWER STEM SCREW | AISI 316 | A4-80 | A182 Gr F51 |
| 17 | UPPER SELF LUBRICATING BEARING | 304+PTFE ⁴ | 304+PTFE ⁴ | 304+PTFE ⁴ |
| 18 | LOWER SELF LUBRICATING BEARING | 304+PTFE ⁴ | 304+PTFE ⁴ | 304+PTFE ⁴ |
| 19 | UPPER STEM BEARING WASHER | 304+PTFE | 304+PTFE | 304+PTFE |
| 20 | SEAT LOADING WASHER | UNS S17400 ² | UNS S17400 ² | UNS N07750 ² |
| 21 | UPPER STEM PACKING | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 22 | FLANGE TO BODY FIRE GASKET | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 23 | SEAT TO FLANGE O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 26 | PACKING GLAND STOP PLATE | AISI 316L | AISI 316L | AISI 316L |
| 29 | SEAT FIRE GASKET | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 30 | FIRE GASKET SUPPORT WASHER | AISI 304 | AISI 304 | AISI 304 |
| 31 | LOWER STEM FIRE GASKET | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 32 | FLANGE TO BODY O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 33 | BODY TO LOWER STEM O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 38 | BODY TO UPPER STEM O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 44 | ANTI-FRICTION WASHER | PTFE | PTFE | PTFE |
| 46 | ANTI STATIC SPRING DEVICE | AISI 302 | AISI 302 | AISI 302 |

NOTES :

- 1-PTFE+25% glass for Classes ≤ ISO PN50 – PCTFE above.
Other materials on request. Cf. SRi Pressure/Temperature curves.
- 2-UNS S17400 H1150 for high pressures classes.
- 3-Zinc plated + Bichromated
- 4-Self lubricating bearing PTFE
- 5-Expanded graphite Density 1.6 to 1.8. With corrosion inhibitor.
- 6-FKM=Fluoroelastomer-Several elastomer qualities are available according to fluids and temperatures.
- 7-UNS N07500 or UNS S17400 according to pressure class.
- 8-For use at low temperatures, resilient steels.

Ball valves type A DN 2" (50) to 16" (400)



This general drawing shows the composition of a generic valve. Variants can be made for specific applications for example :

- Stainless steel or nickel alloy weld overlay on static or dynamic seals housings.
- Electroless nickel plating on wetted surfaces.
- Flushing circuits of the inter seat cavity in closed position.
- Valve equipped with standard seat (auto cavity relief) and with double piston effect seat.

Parts List

The following materials represent the principal standardized manufactured compositions. Other metallurgy can be realized. Contact our sales department. All materials can be provided in conformity with the NACE MR 0175 requirements.

| Rep | Part name | STANDARDISED COMPOSITION | | |
|-----|--------------------------------|--------------------------|-------------------------|-------------------------|
| | | CS-CSLT | SS1 | DUPLEX |
| 1 | BODY | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 2 | FLANGED END | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 4 | BALL | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 5 | SEAT | Note ⁸ | A182 F316L | A182 Gr F51 |
| 5A | SEAT INSERT | PTFE ¹ | PTFE ¹ | PTFE ¹ |
| 6 | UPPER STEM | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 7 | LOWER STEM | Note ⁸ | A182 F316L ⁷ | A182 Gr F51 |
| 8 | PACKING GLAND | A350 Gr LF2 | A182 F316L | A182 Gr F51 |
| 9 | STOP PLATE | A350 Gr LF2 | A182 F316L | A182 F316L |
| 10 | STUD BOLT | A193 Gr B7 ³ | A 193 Gr B8 | A 193 Gr B8 |
| 11 | NUT | A194 Gr 2H ³ | A194 Gr 8 | A194 Gr 8 |
| 14 | LOWER STEM SCREW | AISI 304 | AISI 304 | AISI 304 |
| 17 | UPPER SELF LUBRICATING BEARING | 304+PTFE ⁴ | 304+PTFE ⁴ | 304+PTFE ⁴ |
| 18 | LOWER SELF LUBRICATING BEARING | 304+PTFE ⁴ | 304+PTFE ⁴ | 304+PTFE ⁴ |
| 19 | UPPER STEM BEARING WASHER | 304+PTFE | 304+PTFE ⁴ | 304+PTFE ⁴ |
| 20 | SEAT LOADING WASHER | UNS S17400 ² | UNS S17400 ² | UNS N07750 ² |
| 21 | UPPER STEM PACKING | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 22 | FLANGE TO BODY FIRE GASKET | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 23 | SEAT TO FLANGE O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 26 | PACKING GLAND STOP PLATE | AISI 316L | AISI 316L | AISI 316L |
| 29 | SEAT FIRE GASKET | GRAPHITE ⁵ | GRAPHITE ⁵ | GRAPHITE ⁵ |
| 30 | FIRE GASKET SUPPORT WASHER | AISI 304 | AISI 304 | AISI 304 |
| 32 | FLANGE TO BODY O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 38 | BODY TO UPPER STEM O-RING | FKM ⁶ | FKM ⁶ | FKM ⁶ |
| 46 | ANTI STATIC SPRING DEVICE | AISI 302 | AISI 302 | AISI 302 |

NOTES :

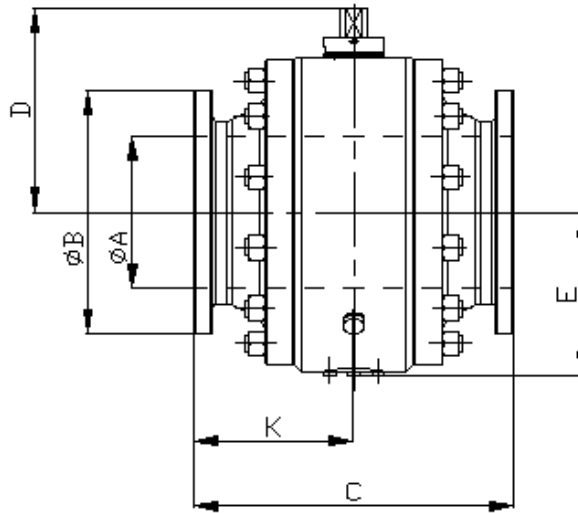
- 1-PTFE+25% glass for Classes ≤ ISO NP50 – PCTFE above.
Other materials on request. Cf. Pressure/Temperature curves.
- 2-UNS S17400 H1150 for high pressure classes.
- 3-Zinc plated + Bichromated
- 4-Self lubricating bearing PTFE
- 5-Expanded graphite Density 1.6 to 1.8 with corrosion inhibitor.
- 6-FKM=Fluoroelastomer-Several elastomeric qualities are available according to fluids and temperatures.
- 7-UNS N07500 or UNS S17400 according to pressure class.
- 8-For use at low temperatures, resilient steels.

TYPES A & W – FACE-TO-FACE DIMENSIONS

DIMENSIONS AND WEIGHT

CLASSES
ISO PN 10-16-25-40

| WORKING AND TEST PRESSURE | Materials Group 1-1 (Bar) | | | | Materials Group 2-3 (Bar) | | | |
|----------------------------------|---------------------------|-----|-----|-----|---------------------------|-----|-----|-----|
| | 10 | 16 | 25 | 40 | 10 | 16 | 25 | 40 |
| MAXIMUM WORKING PRESSURE | 10 | 16 | 25 | 40 | 8 | 13 | 21 | 33 |
| HYDROSTATIC PRESSURE TEST – BODY | 16 | 25 | 40 | 60 | 12 | 20 | 31 | 49 |
| HYDROSTATIC PRESSURE TEST – SEAT | 11 | 18 | 28 | 44 | 9 | 15 | 23 | 36 |
| AIR PRESSURE TEST – SEAT | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 |



TYPE A and W – FULL BORE

Lever sizes page 37

| DN | | ØA | DIMENSIONS (mm) | | | | | | | | WEIGHT (Kg) | | | |
|--------|-----|-------|-----------------|-------|-------|-------|---------------------|------|-------|-------|-------------|-------|-------|-------|
| Inches | mm | mm | ØB ¹ | | | | C ² | K | D | E | PN 10 | PN 16 | PN 25 | PN 40 |
| | | | PN 10 | PN 16 | PN 25 | PN 40 | | | | | | | | |
| ½ | 15 | 13 | 95 | 95 | 95 | 95 | 150 ⁽³⁾ | 75 | 69.5 | 60.5 | 5 | 5 | 5 | 5 |
| ¾ | 20 | 19 | 105 | 105 | 105 | 105 | 150 | 75 | 69.5 | 60.5 | 6 | 6 | 6 | 6 |
| 1 | 25 | 25 | 115 | 115 | 115 | 115 | 160 | 80 | 79.5 | 69.5 | 8 | 8 | 8 | 8 |
| 1 ½ | 40 | 38 | 150 | 150 | 150 | 150 | 200 | 100 | 93.5 | 83 | 14 | 14 | 15 | 15 |
| 2 | 50 | 50 | 165 | 165 | 165 | 165 | 230 | 115 | 115 | 95.5 | 19 | 19 | 22 | 22 |
| 3 | 80 | 76 | 200 | 200 | 200 | 200 | 310 | 155 | 135 | 120.5 | 37 | 37 | 39 | 39 |
| 4 | 100 | 100 | 220 | 220 | 235 | 235 | 350 | 175 | 167.5 | 140.5 | 60 | 60 | 65 | 65 |
| 6 | 150 | 150 | 285 | 285 | 300 | 300 | 480 | 240 | 227.5 | 190.5 | 150 | 150 | 170 | 170 |
| 8 | 200 | 201.4 | 340 | 340 | 360 | 375 | 600 | 300 | 268.5 | 227 | 280 | 280 | 290 | 295 |
| 10 | 250 | 252.4 | 395 | 405 | 425 | 450 | 730 | 365 | 339 | 272.5 | 470 | 480 | 485 | 500 |
| 12 | 300 | 303.4 | 445 | 460 | 485 | 515 | 850 | 425 | 406 | 329 | 830 | 840 | 860 | 880 |
| 14 | 350 | 336 | 505 | 520 | 555 | 580 | 980 | 490 | 445 | 353.5 | 1220 | 1240 | 1260 | 1280 |
| 16 | 400 | 388 | 565 | 580 | 620 | 660 | 1100 | 550 | 481.5 | 389 | 1640 | 1660 | 1680 | 1720 |
| 18 | 450 | 438 | 615 | 640 | 670 | 685 | 1200 | 600 | 568.5 | 492 | 2530 | 2550 | 2570 | 2590 |
| 20 | 500 | 489 | 670 | 715 | 730 | 755 | 1250 | 625 | 604 | 526 | 3100 | 3130 | 3160 | 3190 |
| 24 | 600 | 590 | 780 | 840 | 845 | 890 | 1450 | 725 | 691.1 | 608.5 | 4800 | 4850 | 4900 | 5000 |
| 28 | 700 | 685 | 895 | 910 | 960 | | 1650 ⁽⁴⁾ | 825 | | | | | | |
| 32 | 800 | 780 | 1015 | 1025 | 1085 | NA | 1850 ⁽⁴⁾ | 925 | | | | | | |
| 36 | 900 | 876 | 1115 | 1125 | 1185 | | 2050 ⁽⁴⁾ | 1025 | | | | | | |

Notes :

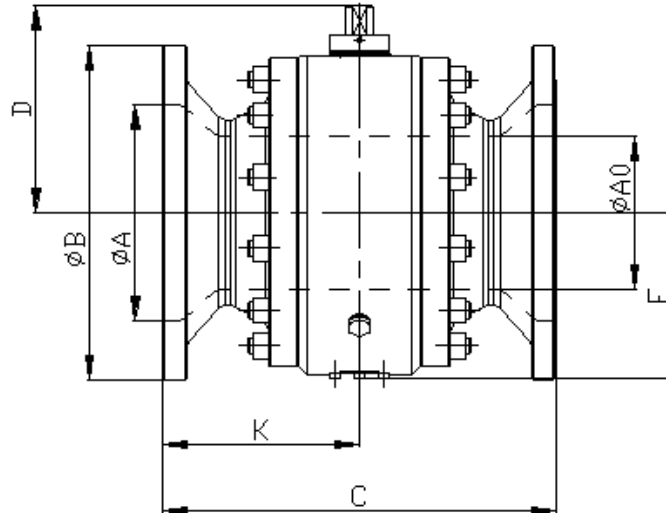
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) NF EN 1092-1.
- (2) NF EN 558-1 Table 6 serie 1
- (3) Face-to-face manufacturer (normalized face-to-face is 130mm)

- (4) Face-to-face dimensions not covered by Table 6 of NF EN 558-1
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)

DIMENSIONS AND WEIGHT

**CLASSES
ISO PN 10-16-25-40**

| WORKING AND TEST PRESSURE | Materials Group 1-1 (Bar) | | | | Materials Group 2-3 (Bar) | | | |
|----------------------------------|---------------------------|-----|-----|-----|---------------------------|-----|-----|-----|
| | 10 | 16 | 25 | 40 | 10 | 16 | 25 | 40 |
| MAXIMUM WORKING PRESSURE | 10 | 16 | 25 | 40 | 8 | 13 | 21 | 33 |
| HYDROSTATIC PRESSURE TEST – BODY | 16 | 25 | 40 | 60 | 12 | 20 | 31 | 49 |
| HYDROSTATIC PRESSURE TEST – SEAT | 11 | 18 | 28 | 44 | 9 | 15 | 23 | 36 |
| AIR PRESSURE TEST – SEAT | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 |



TYPE A and W – REDUCED BORE

Lever sizes page 37

| DN | | ØA | ØA ₀ | DIMENSIONS (mm) | | | | | | | | WEIGHT (Kg) | | | | |
|---------|------|-------|-----------------|-----------------|-------|-------|-------|---------------------|------|-------|-------|-------------|-------|-------|-------|--|
| Inches | mm | mm | mm | ØB ¹ | | | | C ² | K | D | E | PN 10 | PN 16 | PN 25 | PN 40 | |
| | | | | PN 10 | PN 16 | PN 25 | PN 40 | | | | | | | | | |
| 1 × ¼ | 25 | 25 | 19 | 115 | 115 | 115 | 115 | 160 | 80 | 69.5 | 60.5 | 6 | 6 | 6 | 6 | |
| 1 ½ × 1 | 40 | 38 | 25 | 150 | 150 | 150 | 150 | 200 | 100 | 79.5 | 69.5 | 10 | 10 | 11 | 11 | |
| 2 × 1 ½ | 50 | 50 | 38 | 165 | 165 | 165 | 165 | 230 | 115 | 93.5 | 83 | 17 | 17 | 18 | 18 | |
| 3 × 2 | 80 | 76 | 50 | 200 | 200 | 200 | 200 | 310 | 155 | 115 | 95.5 | 30 | 30 | 31 | 31 | |
| 4 × 3 | 100 | 100 | 76 | 220 | 220 | 235 | 235 | 350 | 175 | 135 | 120.5 | 45 | 45 | 52 | 52 | |
| 6 × 4 | 150 | 150 | 100 | 285 | 285 | 300 | 300 | 480 | 240 | 167.5 | 140.5 | 85 | 85 | 90 | 90 | |
| 8 × 6 | 200 | 201.4 | 150 | 340 | 340 | 360 | 375 | 600 | 300 | 227.5 | 190.5 | 210 | 215 | 220 | 225 | |
| 10 × 8 | 250 | 252.4 | 201.4 | 395 | 405 | 425 | 450 | 730 | 365 | 268.5 | 227 | 360 | 370 | 380 | 395 | |
| 12 × 10 | 300 | 303.4 | 252.4 | 445 | 460 | 485 | 515 | 850 | 425 | 339 | 272.5 | 605 | 615 | 630 | 660 | |
| 14 × 12 | 350 | 336 | 303.4 | 505 | 520 | 555 | 580 | 980 | 490 | 406 | 329 | 900 | 910 | 940 | 970 | |
| 16 × 12 | 400 | 388 | 303.4 | 565 | 580 | 620 | 660 | 1100 | 490 | 406 | 329 | 1150 | 1180 | 1220 | 1260 | |
| 16 × 14 | 400 | 388 | 336 | 565 | 580 | 620 | 660 | 1100 | 550 | 445 | 353.5 | 1300 | 1320 | 1340 | 1400 | |
| 18 × 16 | 450 | 438 | 388 | 615 | 640 | 670 | 685 | 1200 | 600 | 481.5 | 389 | 1750 | 1770 | 1800 | 1850 | |
| 20 × 16 | 500 | 489 | 388 | 670 | 715 | 730 | 755 | 1250 | 600 | 481.5 | 389 | 2120 | 2160 | 2200 | 2240 | |
| 20 × 18 | 500 | 489 | 438 | 670 | 715 | 730 | 755 | 1250 | 625 | 568.5 | 492 | 2680 | 2720 | 2760 | 2800 | |
| 24 × 20 | 600 | 590 | 489 | 780 | 840 | 845 | 890 | 1450 | 725 | 604 | 526 | 3200 | 3240 | 3300 | 3380 | |
| 28 × 24 | 700 | 685 | 590 | 895 | 910 | 960 | NA | 1650 ⁽³⁾ | 825 | | | | | | | |
| 32 × 28 | 800 | 780 | 685 | 1015 | 1025 | 1085 | | 1850 ⁽³⁾ | 925 | | | | | | | |
| 36 × 32 | 900 | 876 | 780 | 1115 | 1125 | 1185 | | 2050 ⁽³⁾ | 1025 | | | | | | | |
| 40 × 36 | 1000 | 978 | 876 | 1230 | 1255 | 1320 | | 2250 ⁽³⁾ | 1125 | | | | | | | |

Notes :

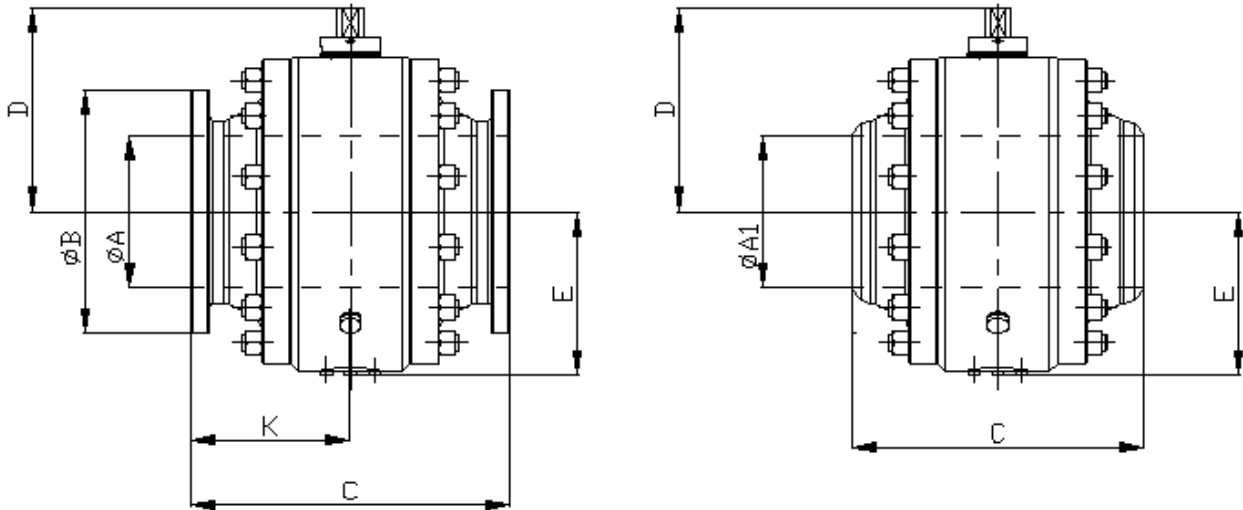
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) NF EN 1092-1.
- (2) NF EN 558-1 Table 6 serie 1

- (3) Face-to-face dimensions not covered by Table 6 of NF EN 558-1
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)

DIMENSIONS AND WEIGHT

CLASS ISO PN 20
ANSI 150 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|-----|---------------------|-----|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 20 | 285 | 16 | 230 |
| HYDROSTATIC PRESSURE TEST – BODY | 30 | 425 | 24 | 345 |
| HYDROSTATIC PRESSURE TEST – SEAT | 22 | 300 | 18 | 360 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – FULL BORE

Lever sizes page 37

| DN | | ØA mm | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|--------|-----|----------|----------------------|--------------------|--------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | RF | RTJ | WE ³ | | | | | | | |
| ½ | 15 | 13 | 152 ³ | 152 ³ | 150 | Symmetrical valves K=C/2 | 89 | 69.5 | 60.5 | 6 | 4 |
| ¾ | 20 | 19 | 152 ³ | 152 ³ | 150 | | 99 | 69.5 | 60.5 | 6 | 4 |
| 1 | 25 | 25 | 160 ³ | 172.7 ³ | 150 | | 108 | 79.5 | 69.5 | 7 | 5 |
| 1 ½ | 40 | 38 | 190 ³ | 202.7 ³ | 190 | | 127 | 93.5 | 83 | 13 | 10 |
| 2 | 50 | 50 | 178 | 191 | 198 | | 152 | 115 | 95.5 | 17 | 13 |
| 3 | 80 | 76 | 203 | 216 | 220 | | 190 | 135 | 120.5 | 31 | 24 |
| 4 | 100 | 100 | 229 | 241 | 270 | | 229 | 167.5 | 140.5 | 52 | 45 |
| 6 | 150 | 150 | 394 | 406 | 346 | | 279 | 227.5 | 190.4 | 145 | 125 |
| 8 | 200 | 201.4 | 457 | 470 | 430 | | 343 | 268.5 | 227 | 270 | 230 |
| 10 | 250 | 252.4 | 533 | 546 | 510 | | 406 | 339 | 272.3 | 460 | 420 |
| 12 | 300 | 303.4 | 610 | 622 | 620 | | 483 | 406.5 | 329 | 750 | 700 |
| 14 | 350 | 336 | 686 | 699 | 660 | | 533 | 445 | 353.5 | 1060 | 970 |
| 16 | 400 | 388 | 762 | 775 | 760 | | 597 | 481.5 | 389 | 1380 | 1250 |
| 18 | 450 | 438 | 864 | 876 | 830 | | 635 | 568.5 | 491.8 | 2000 | 1850 |
| 20 | 500 | 489 | 914 | 927 | 910 | | 698 | 604 | 525.5 | 2500 | 2200 |
| 24 | 600 | 590 | 1067 | 1080 | 1040 | | 813 | 691.1 | 608.3 | 4500 | 4100 |
| 28 | 700 | 685 | 1245 | 1258 | 1250 | | 927 | | | | |
| 30 | 750 | 737 | 1295 | 1308 | 1300 | | 985 | 841.6 | 716.8 | 7030 | 6410 |
| 32 | 800 | 780 | 1372 | 1385 | 1370 | | 1060 | | | | |
| 34 | 850 | 832 | 1473 | 1502 | 1485 | | 1111 | | | | |
| 36 | 900 | 876 | 1524 | 1537 | 1520 | 1168 | | | | | |

Notes :

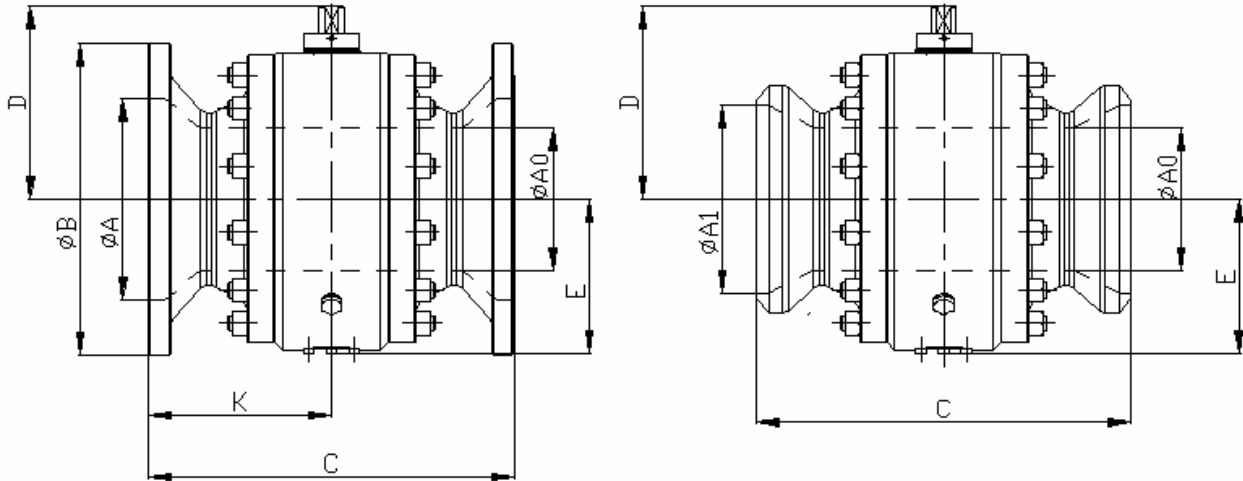
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

**CLASS ISO PN 20
ANSI 150 lbs**

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|-----|---------------------|-----|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 20 | 285 | 16 | 230 |
| HYDROSTATIC PRESSURE TEST – BODY | 30 | 425 | 24 | 345 |
| HYDROSTATIC PRESSURE TEST – SEAT | 22 | 300 | 18 | 360 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – REDUCED BORE

Lever sizes page 37

| DN | | ØA | ØA ₀ | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|---------|------|-------|-----------------|----------------------|--------------------|-----------------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | mm | mm | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | | | RF | RTJ | WE ³ | | | | | | |
| 1 x ¾ | 25 | 25 | 19 | 160 ³ | 172.7 ³ | 150 | Symmetrical valves K=C/2 | 108 | 69.5 | 60.5 | 7 | 4 |
| 1 ½ x 1 | 40 | 38 | 25 | 165 ³ | 202.7 ³ | 160 | | 127 | 79.5 | 69.5 | 10 | 6 |
| 2 x 1 ½ | 50 | 50 | 38 | 178 | 191 | 198 | | 152 | 93.5 | 83 | 15 | 12 |
| 3 x 2 | 80 | 76 | 50 | 203 | 216 | 220 | | 190 | 115 | 95.5 | 23 | 16 |
| 4 x 3 | 100 | 100 | 76 | 229 | 241 | 270 | | 229 | 135 | 120.5 | 40 | 27 |
| 6 x 4 | 150 | 150 | 100 | 394 | 406 | 346 | | 279 | 167.5 | 140.5 | 82 | 49 |
| 8 x 6 | 200 | 201.4 | 150 | 457 | 470 | 430 | | 343 | 227.5 | 190.4 | 180 | 130 |
| 10 x 8 | 250 | 252.4 | 201.4 | 533 | 546 | 510 | | 406 | 268.5 | 227 | 310 | 245 |
| 12 x 10 | 300 | 303.4 | 252.4 | 610 | 622 | 540 | | 483 | 339 | 272.3 | 540 | 450 |
| 14 x 12 | 350 | 336 | 303.4 | 686 | 699 | 620 | | 533 | 406 | 329 | 790 | 730 |
| 16 x 12 | 400 | 388 | 303.4 | 762 | 775 | 660 | | 597 | 406 | 329 | 990 | 920 |
| 16 x 14 | 400 | 388 | 336 | 762 | 775 | 660 | | 597 | 445 | 353.5 | 1130 | 1000 |
| 18 x 16 | 450 | 438 | 388 | 864 | 876 | 760 | | 635 | 481.5 | 389 | 1450 | 1300 |
| 20 x 16 | 500 | 489 | 388 | 914 | 927 | 800 | | 698 | 481.5 | 389 | 2060 | 1810 |
| 20 x 18 | 500 | 489 | 438 | 914 | 927 | 800 | | 698 | 568.5 | 491.8 | 2300 | 1950 |
| 24 x 20 | 600 | 590 | 489 | 1067 | 1080 | 910 | | 813 | 604 | 525.5 | 2650 | 2400 |
| 30 x 24 | 750 | 737 | 590 | 1295 | 1308 | 1040 | | 985 | 691.1 | 608.3 | 5530 | 4300 |
| 32 x 28 | 800 | 780 | 685 | 1372 | 1385 | 1370 | | 1060 | | | | |
| 36 x 30 | 900 | 876 | 737 | 1524 | 1537 | 1520 | | 1168 | 841.6 | 716.8 | | |
| 36 x 32 | 950 | 876 | 780 | 1524 | 1537 | 1520 | | 1168 | | | | |
| 36 x 34 | 900 | 876 | 832 | 1524 | 1537 | 1520 | 1168 | | | | | |
| 40 x 36 | 1000 | 975 | 876 | 1702 | 1730 | 1720 | 1289 | | | | | |

Notes :

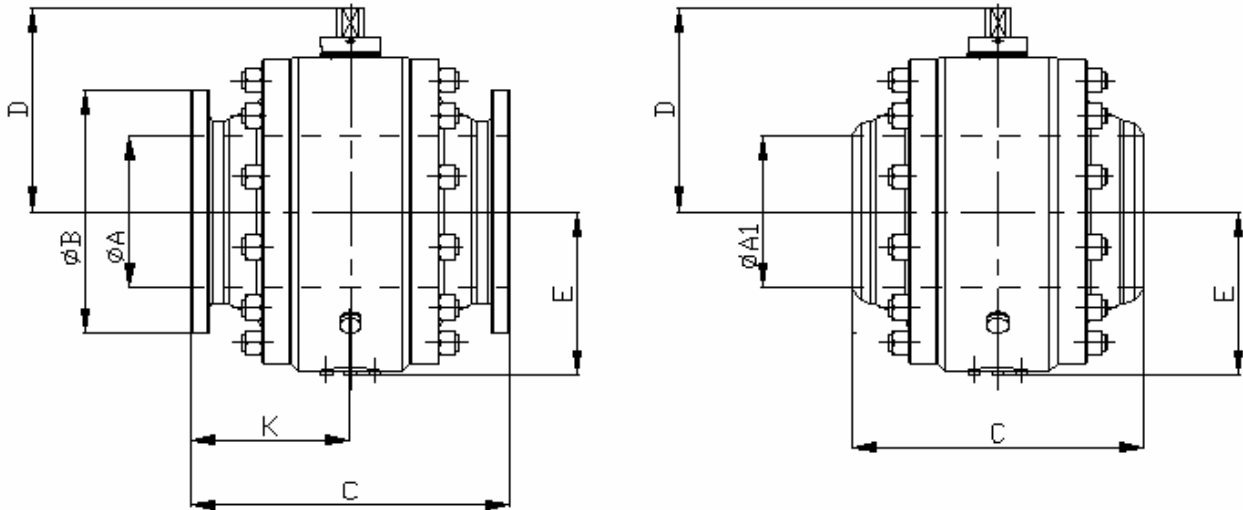
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 50
ANSI 300 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|-----|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 51 | 740 | 41 | 600 |
| HYDROSTATIC PRESSURE TEST – BODY | 78 | 1100 | 63 | 900 |
| HYDROSTATIC PRESSURE TEST – SEAT | 57 | 800 | 46 | 660 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – FULL BORE

Lever sizes page 37

| DN | | ØA mm | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|--------|-----|----------|----------------------|-----------------|--------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | RF | RTJ | WE ³ | | | | | | | |
| ½ | 15 | 13 | 152 | 163.2 | 150 | Symmetrical valves K=C/2 | 95 | 69.5 | 60.5 | 6 | 4 |
| ¾ | 20 | 19 | 152.4 | 165.1 | 150 | | 117 | 69.5 | 60.5 | 7 | 4 |
| 1 | 25 | 25 | 165 | 177.8 | 150 | | 124 | 79.5 | 69.5 | 8 | 5 |
| 1 ½ | 40 | 38 | 190.5 | 203.2 | 190 | | 156 | 93.5 | 83 | 15 | 10 |
| 2 | 50 | 50 | 216 | 231.7 | 198 | | 165 | 115 | 95.5 | 23 | 13 |
| 3 | 80 | 76 | 282.5 | 298.2 | 220 | | 210 | 135 | 120.5 | 43 | 24 |
| 4 | 100 | 100 | 304.8 | 320.6 | 270 | | 254 | 167.5 | 140.5 | 70 | 45 |
| 6 | 150 | 150 | 403.4 | 419.2 | 346 | | 318 | 227.5 | 190.4 | 165 | 125 |
| 8 | 200 | 201.4 | 501.7 | 517.5 | 430 | | 381 | 268.5 | 227 | 280 | 230 |
| 10 | 250 | 252.4 | 568.5 | 584.2 | 510 | | 444 | 339 | 272.3 | 500 | 420 |
| 12 | 300 | 303.4 | 647.7 | 663.5 | 620 | | 521 | 406.5 | 329 | 810 | 700 |
| 14 | 350 | 336 | 762 | 777.7 | 660 | | 584 | 445 | 353.5 | 1150 | 970 |
| 16 | 400 | 388 | 838.2 | 854 | 760 | | 648 | 481.5 | 389 | 1500 | 1250 |
| 18 | 450 | 438 | 914.4 | 930.2 | 830 | | 711 | 568.5 | 491.8 | 2300 | 1850 |
| 20 | 500 | 489 | 990.6 | 1009.7 | 910 | | 775 | 604 | 525.5 | 2700 | 2200 |
| 24 | 600 | 590 | 1143 | 1165.4 | 1040 | | 914 | 691.1 | 608.3 | 4800 | 4100 |
| 28 | 700 | 685 | 1346 | 1372 | 1250 | | 1035 | | | | |
| 30 | 750 | 737 | 1397 | 1422.4 | 1300 | | 1092 | 841.6 | 716.8 | 7500 | 6410 |
| 32 | 800 | 780 | 1524 | 1553 | 1370 | | 1149 | | | | |
| 34 | 850 | 832 | 1625 | 1654 | 1630 | | 1206 | | | | |
| 36 | 900 | 876 | 1727 | 1756 | 1520 | 1270 | | | | | |

Notes :

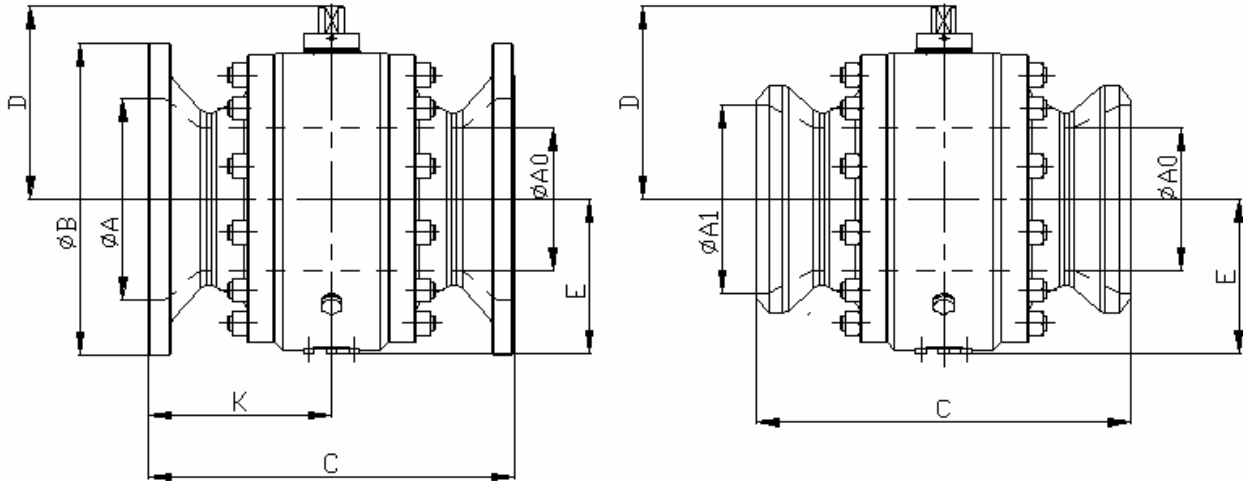
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 50
ANSI 300 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|-----|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 51 | 740 | 41 | 600 |
| HYDROSTATIC PRESSURE TEST – BODY | 78 | 1100 | 63 | 900 |
| HYDROSTATIC PRESSURE TEST – SEAT | 57 | 800 | 46 | 660 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – REDUCED BORE

Lever sizes page 37

| DN | | ØA | ØA ₀ | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|---------|-----|-------|-----------------|----------------------|--------|-----------------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | mm | mm | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | | | RF | RTJ | WE ³ | | | | | | |
| 1 × ¾ | 25 | 25 | 19 | 165 | 177.8 | 150 | Symmetrical valves K=C/2 | 124 | 69.5 | 60.5 | 7 | 4 |
| 1 ½ × 1 | 40 | 38 | 25 | 190.5 | 203.2 | 190 | | 156 | 79.5 | 69.5 | 11 | 6 |
| 2 × 1 ½ | 50 | 50 | 38 | 216 | 231.7 | 198 | | 165 | 93.5 | 83 | 18 | 12 |
| 3 × 2 | 80 | 76 | 50 | 282.5 | 298.2 | 220 | | 210 | 115 | 95.5 | 35 | 16 |
| 4 × 3 | 100 | 100 | 76 | 304.8 | 320.6 | 270 | | 254 | 135 | 120.5 | 58 | 27 |
| 6 × 4 | 150 | 150 | 100 | 403.4 | 419.2 | 346 | | 318 | 167.5 | 140.5 | 95 | 49 |
| 8 × 6 | 200 | 201.4 | 150 | 501.7 | 517.5 | 430 | | 381 | 227.5 | 190.4 | 210 | 130 |
| 10 × 8 | 250 | 252.4 | 201.4 | 568.5 | 584.2 | 510 | | 444 | 268.5 | 227 | 360 | 245 |
| 12 × 10 | 300 | 303.4 | 252.4 | 647.7 | 663.5 | 620 | | 521 | 339 | 272.3 | 600 | 450 |
| 14 × 12 | 350 | 336 | 303.4 | 762 | 777.7 | 660 | | 584 | 406.5 | 329 | 920 | 730 |
| 16 × 12 | 400 | 388 | 303.4 | 838.2 | 854 | 760 | | 648 | 406.5 | 329 | 1180 | 970 |
| 16 × 14 | 400 | 388 | 336 | 838.2 | 854 | 760 | | 648 | 445 | 353.5 | 1250 | 1000 |
| 18 × 16 | 450 | 438 | 388 | 914.4 | 930.2 | 830 | | 711 | 481.5 | 389 | 1650 | 1300 |
| 20 × 16 | 500 | 489 | 388 | 990.6 | 1009.7 | 910 | | 775 | 481.5 | 389 | 2130 | 1805 |
| 20 × 18 | 500 | 489 | 438 | 990.6 | 1009.7 | 910 | | 775 | 568.5 | 491.8 | 2500 | 1950 |
| 24 × 20 | 600 | 590 | 489 | 1143 | 1165.4 | 1040 | | 914 | 604 | 525.5 | 3100 | 2400 |
| 30 × 24 | 750 | 737 | 590 | 1397 | 1422.4 | 1300 | | 1092 | 691.1 | 608.3 | 5788 | 4400 |
| 32 × 28 | 800 | 780 | 685 | 1524 | 1553 | 1370 | | 1149 | | | | |
| 34 × 30 | 850 | 832 | 737 | 1625 | 1654 | 1630 | | 1206 | 841.6 | 716.8 | | |
| 36 × 30 | 900 | 876 | 737 | 1727 | 1756 | 1520 | | 1270 | 841.6 | 716.8 | | |
| 36 × 32 | 900 | 876 | 780 | 1727 | 1756 | 1520 | 1270 | | | | | |

Notes :

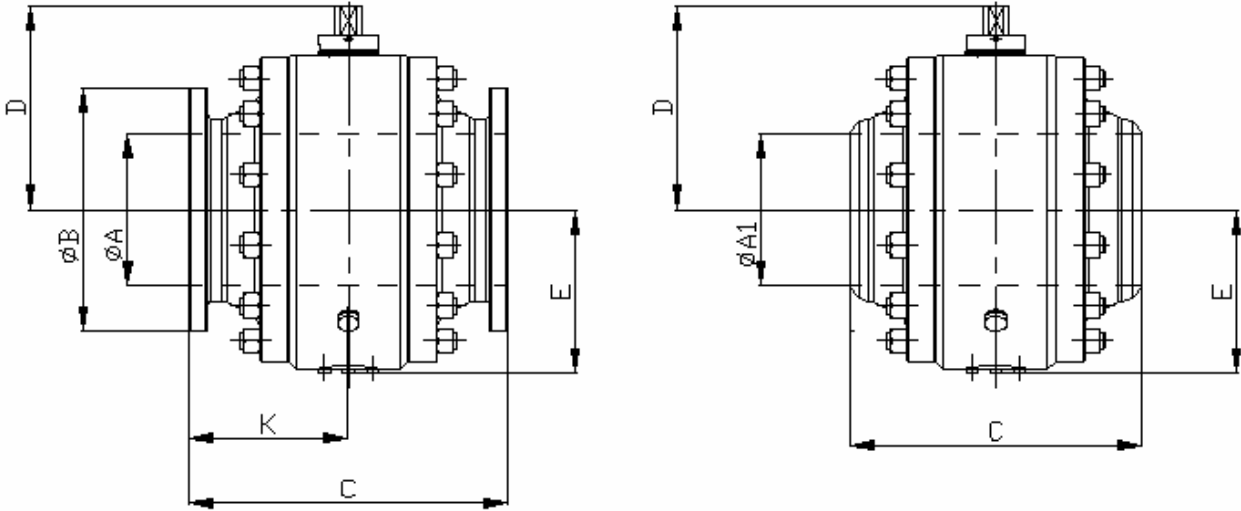
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 64
ANSI 400 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 69 | 980 | 56 | 800 |
| HYDROSTATIC PRESSURE TEST – BODY | 103 | 1450 | 84 | 1200 |
| HYDROSTATIC PRESSURE TEST – SEAT | 75 | 1060 | 61 | 870 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – FULL BORE

Lever sizes page 37

| DN | | ØA mm | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|--------|-----|----------|----------------------|-----------------|--------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | RF | RTJ | WE ³ | | | | | | | |
| ½ | 15 | 13 | 165.1 | 163.6 | 150 | Symmetrical valves K=C/2 | 95 | 69.5 | 52 | 7 | 4 |
| ¾ | 20 | 19 | 190.5 | 190.5 | 150 | | 117 | 69.5 | 52 | 7 | 4 |
| 1 | 25 | 25 | 215.9 | 215.9 | 150 | | 124 | 79.5 | 63 | 10 | 6 |
| 1 ½ | 40 | 38 | 241.3 | 241.3 | 190 | | 156 | 93.5 | 77 | 17 | 11 |
| 2 | 50 | 50 | 292.1 | 295.1 | 220 | | 165 | 115 | 85 | 31 | 20 |
| 3 | 80 | 76 | 355.6 | 358.6 | 270 | | 210 | 151 | 115.5 | 65 | 45 |
| 4 | 100 | 100 | 406.4 | 409.4 | 320 | | 254 | 192.5 | 141 | 115 | 85 |
| 6 | 150 | 150 | 495.3 | 498.3 | 400 | | 318 | 265 | 194 | 250 | 200 |
| 8 | 200 | 201.4 | 596.9 | 599.9 | 500 | | 381 | 334.5 | 246 | 450 | 380 |
| 10 | 250 | 252.4 | 673.1 | 676.1 | 540 | | 444 | 378.5 | 288 | 640 | 540 |
| 12 | 300 | 303.4 | 762 | 765 | 620 | | 521 | 445.5 | 354 | 1100 | 900 |
| 14 | 350 | 336 | 825.5 | 828.5 | 710 | | 584 | 501.5 | 408 | 1600 | 1400 |
| 16 | 400 | 388 | 901.7 | 904.7 | 762 | | 648 | 532 | 438 | 2000 | 1700 |
| 18 | 450 | 438 | 977.9 | 980.9 | 830 | | 711 | 592.5 | 508.5 | 2650 | 2300 |
| 20 | 500 | 489 | 1054.1 | 1060.5 | 910 | | 775 | 659 | 564 | 2950 | 2700 |
| 24 | 600 | 590 | 1231.9 | 1241.6 | 1040 | | 914 | 730.5 | 635.5 | 5600 | 4900 |
| 28 | 700 | 685 | | | | | | | | | |
| 30 | 750 | 737 | | | | | | | | | |
| 32 | 800 | 780 | | | | | | | | | |
| 36 | 900 | 876 | | | | | | | | | |

Notes :

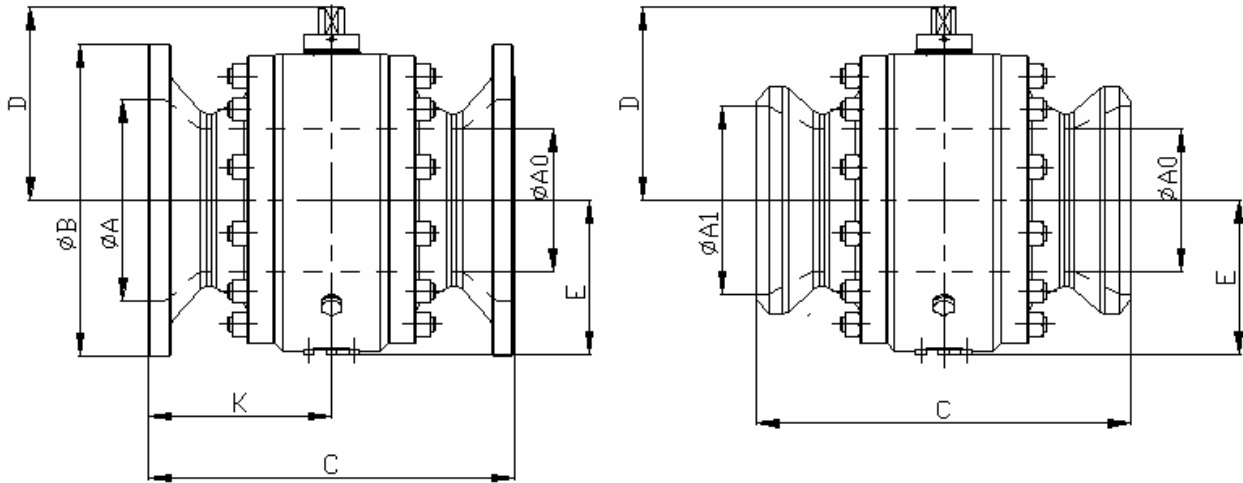
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 64
ANSI 400 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 69 | 980 | 56 | 800 |
| HYDROSTATIC PRESSURE TEST – BODY | 103 | 1450 | 84 | 1200 |
| HYDROSTATIC PRESSURE TEST – SEAT | 75 | 1060 | 61 | 870 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – REDUCED BORE

Lever sizes page 37

| DN | | ØA | ØA ₀ | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | | |
|---------|-----|-------|-----------------|----------------------|--------|-----------------|--------------------------|-----------------|-------|-------|-------------|------|--|
| Inches | mm | mm | mm | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW | |
| | | | | RF | RTJ | WE ³ | | | | | | | |
| 1 × ¾ | 25 | 25 | 19 | 215.9 | 215.9 | 150 | Symmetrical valves K=C/2 | 124 | 79.5 | 63 | 8 | 4 | |
| 1 ½ × 1 | 40 | 38 | 25 | 241.3 | 241.3 | 190 | | 156 | 93.5 | 77 | 13 | 6 | |
| 2 × 1 ½ | 50 | 50 | 38 | 292.1 | 295.1 | 220 | | 165 | 115 | 85 | 21 | 12 | |
| 3 × 2 | 80 | 76 | 50 | 355.6 | 358.6 | 270 | | 210 | 151 | 115.5 | 42 | 23 | |
| 4 × 3 | 100 | 100 | 76 | 406.4 | 409.4 | 320 | | 254 | 192.5 | 141 | 85 | 49 | |
| 6 × 4 | 150 | 150 | 100 | 495.3 | 498.3 | 400 | | 318 | 265 | 194 | 150 | 90 | |
| 8 × 6 | 200 | 201.4 | 150 | 596.9 | 599.9 | 500 | | 381 | 334.5 | 246 | 330 | 220 | |
| 10 × 8 | 250 | 252.4 | 201.4 | 673.1 | 676.1 | 540 | | 444 | 378.5 | 288 | 540 | 400 | |
| 12 × 10 | 300 | 303.4 | 252.4 | 762 | 765 | 620 | | 521 | 445.5 | 354 | 760 | 570 | |
| 14 × 12 | 350 | 336 | 303.4 | 825.5 | 828.5 | 710 | | 584 | 501.5 | 408 | 1150 | 950 | |
| 16 × 12 | 400 | 388 | 303.4 | 901.7 | 904.7 | 762 | | 648 | 501.5 | 408 | 1560 | 1210 | |
| 16 × 14 | 400 | 388 | 336 | 901.7 | 904.7 | 762 | | 648 | 532 | 438 | 1800 | 1450 | |
| 18 × 16 | 450 | 438 | 388 | 977.9 | 980.9 | 830 | | 711 | 592.5 | 508.5 | 2250 | 1800 | |
| 20 × 16 | 500 | 489 | 388 | 1054.1 | 1060.5 | 910 | | 775 | 592.5 | 508.5 | 2640 | 2120 | |
| 20 × 18 | 500 | 489 | 438 | 1054.1 | 1060.5 | 910 | | 775 | 659 | 564 | 2950 | 2400 | |
| 24 × 20 | 600 | 590 | 489 | 1231.9 | 1241.6 | 1040 | | 914 | 730.5 | 635.5 | 4100 | 3000 | |
| 30 × 24 | 750 | 737 | 590 | | | | | | | | | | |
| 32 × 28 | 800 | 780 | 685 | | | | | | | | | | |
| 36 × 30 | 900 | 876 | 780 | | | | | | | | | | |
| 36 × 32 | 950 | 876 | 780 | | | | | | | | | | |

Notes :

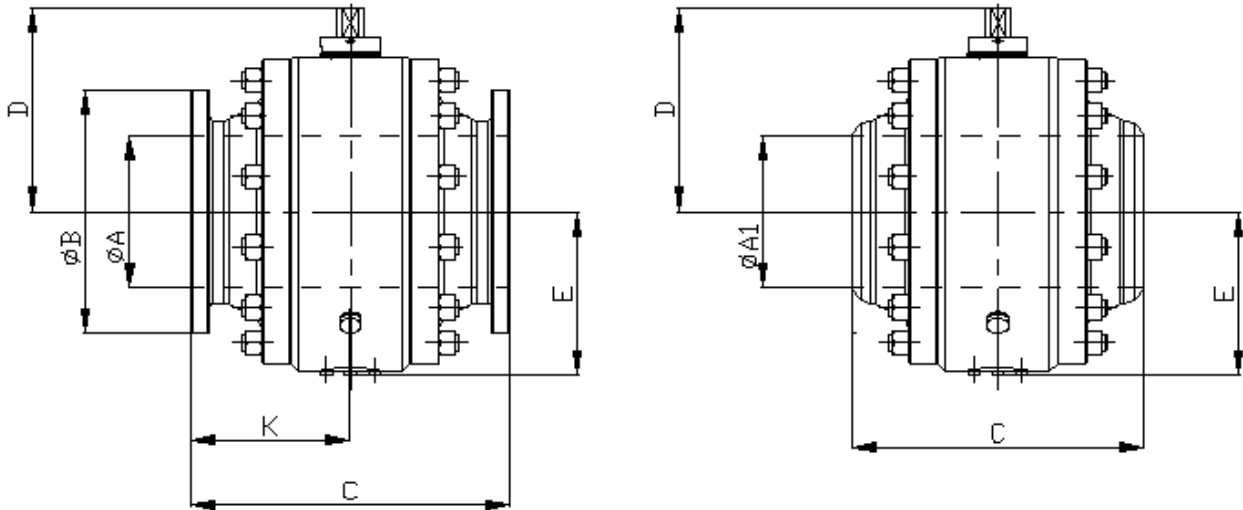
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 100
ANSI 600 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 102 | 1480 | 82.5 | 1200 |
| HYDROSTATIC PRESSURE TEST – BODY | 154 | 2175 | 125 | 1780 |
| HYDROSTATIC PRESSURE TEST – SEAT | 113 | 1600 | 92 | 1310 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – FULL BORE

Lever sizes page 37

| DN | | ØA | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|--------|-----|-------|----------------------|-----------------|--------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | RF | RTJ | WE ³ | | | | | | | |
| ½ | 15 | 13 | 165.1 | 163.6 | 150 | Symmetrical valves K=C/2 | 95 | 69.5 | 60.5 | 7 | 4 |
| ¾ | 20 | 19 | 190.5 | 190.5 | 150 | | 117 | 69.5 | 60.5 | 7 | 4 |
| 1 | 25 | 25 | 215.9 | 215.9 | 150 | | 124 | 79.5 | 69.5 | 10 | 6 |
| 1 ½ | 40 | 38 | 241.3 | 241.3 | 190 | | 156 | 93.5 | 83 | 17 | 11 |
| 2 | 50 | 50 | 292.1 | 295.1 | 220 | | 165 | 115 | 95.5 | 30 | 20 |
| 3 | 80 | 76 | 355.6 | 358.6 | 270 | | 210 | 151 | 126.3 | 65 | 45 |
| 4 | 100 | 100 | 431.8 | 434.8 | 320 | | 273 | 192.5 | 157 | 125 | 85 |
| 6 | 150 | 150 | 558.8 | 561.8 | 400 | | 356 | 265 | 198.8 | 280 | 200 |
| 8 | 200 | 201.4 | 660.4 | 663.4 | 500 | | 419 | 334.5 | 261 | 500 | 380 |
| 10 | 250 | 252.4 | 787.4 | 790.4 | 540 | | 508 | 378.5 | 307 | 750 | 540 |
| 12 | 300 | 303.4 | 838.2 | 841.2 | 620 | | 559 | 444.2 | 361 | 1150 | 900 |
| 14 | 350 | 336 | 889 | 892 | 710 | | 603 | 501.5 | 416.3 | 1650 | 1400 |
| 16 | 400 | 388 | 990.6 | 993.6 | 760 | | 686 | 532 | 452.8 | 2150 | 1700 |
| 18 | 450 | 438 | 1092.2 | 1095.2 | 890 | | 743 | 584.1 | 527 | 2850 | 2300 |
| 20 | 500 | 489 | 1193.8 | 1200.2 | 910 | | 813 | 656.6 | 580 | 3200 | 2700 |
| 24 | 600 | 590 | 1397 | 1406.7 | 1040 | | 940 | 728.1 | 621.5 | 6000 | 4900 |
| 28 | 700 | 685 | 1549 | 1562 | 1250 | | 1073 | | | | |
| 30 | 750 | 737 | 1651 | 1664 | 1350 | | 1130 | | | | |
| 32 | 800 | 780 | 1778 | 1794 | 1470 | | 1194 | | | | |
| 34 | 850 | 832 | 1930 | 1946 | 1620 | | 1245 | | | | |
| 36 | 900 | 876 | 2083 | 2099 | 1700 | 1315 | | | | | |

Notes :

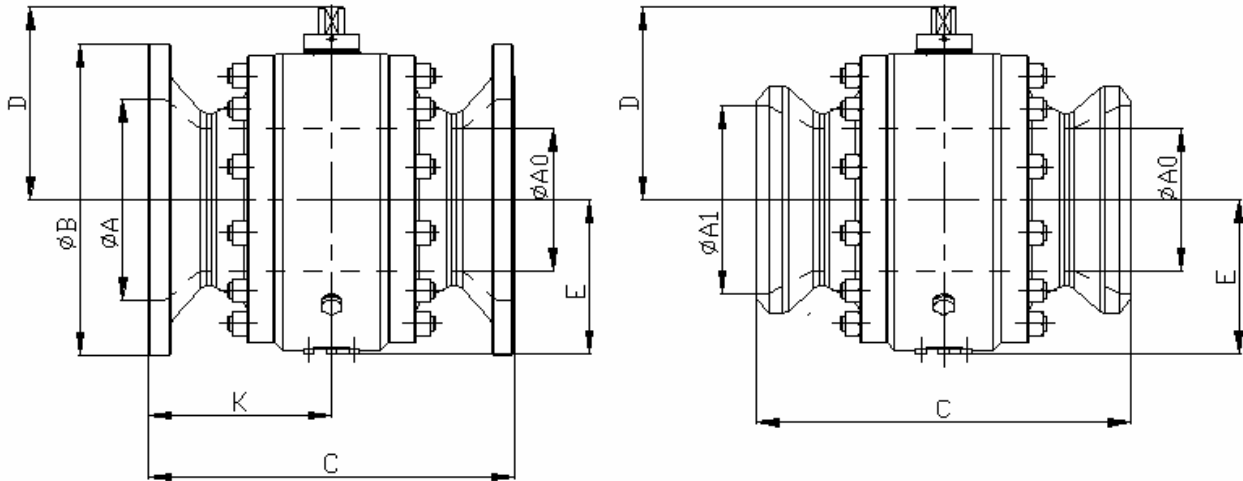
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 100
ANSI 600 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 102 | 1480 | 82.5 | 1200 |
| HYDROSTATIC PRESSURE TEST – BODY | 154 | 2175 | 125 | 1780 |
| HYDROSTATIC PRESSURE TEST – SEAT | 113 | 1600 | 92 | 1310 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – REDUCED BORE

Lever sizes page 37

| DN | | ØA | ØA ₀ | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|---------|-----|-------|-----------------|----------------------|--------|-----------------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | mm | mm | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | | | RF | RTJ | WE ³ | | | | | | |
| 1 × ¾ | 25 | 25 | 19 | 215.9 | 215.9 | 150 | Symmetrical valves K=C/2 | 124 | 69.5 | 60.5 | 8 | 4 |
| 1 ½ × 1 | 40 | 38 | 25 | 241.3 | 241.3 | 160 | | 156 | 79.2 | 69.5 | 13 | 6 |
| 2 × 1 ½ | 50 | 50 | 38 | 292.1 | 295.1 | 198 | | 165 | 93.2 | 83 | 21 | 12 |
| 3 × 2 | 80 | 76 | 50 | 355.6 | 358.6 | 270 | | 210 | 115 | 95.5 | 42 | 23 |
| 4 × 3 | 100 | 100 | 76 | 431.8 | 434.8 | 300 | | 273 | 150.8 | 126.3 | 92 | 49 |
| 6 × 4 | 150 | 150 | 100 | 558.8 | 561.8 | 400 | | 356 | 192.6 | 157 | 175 | 90 |
| 8 × 6 | 200 | 201.4 | 150 | 660.4 | 663.4 | 500 | | 419 | 265.1 | 198.8 | 350 | 220 |
| 10 × 8 | 250 | 252.4 | 201.4 | 787.4 | 790.4 | 540 | | 508 | 334.2 | 261 | 620 | 420 |
| 12 × 10 | 300 | 303.4 | 252.4 | 838.2 | 841.2 | 570 | | 559 | 378 | 307 | 850 | 600 |
| 14 × 12 | 350 | 336 | 303.4 | 889 | 892 | 620 | | 603 | 444.2 | 361 | 1250 | 950 |
| 16 × 12 | 400 | 388 | 303.4 | 990.6 | 993.6 | 620 | | 686 | 444.2 | 361 | 1610 | 1260 |
| 16 × 14 | 400 | 388 | 336 | 990.6 | 993.6 | 710 | | 686 | 501.5 | 416.3 | 1950 | 1480 |
| 18 × 16 | 450 | 438 | 388 | 1092.2 | 1095.2 | 760 | | 743 | 532 | 452.8 | 2450 | 1800 |
| 20 × 16 | 500 | 489 | 388 | 1193.8 | 1200.2 | 760 | | 813 | 532 | 452.8 | 2730 | 2120 |
| 20 × 18 | 500 | 489 | 438 | 1193.8 | 1200.2 | 890 | | 813 | 584.1 | 527 | 3100 | 2400 |
| 24 × 20 | 600 | 590 | 489 | 1397 | 1406.7 | 910 | | 940 | 656.6 | 580 | 4300 | 3000 |
| 30 × 24 | 750 | 737 | 590 | 1651 | 1664 | 1350 | | 1130 | | | | |
| 32 × 28 | 800 | 780 | 685 | 1778 | 1794 | 1470 | | 1194 | | | | |
| 34 × 30 | 850 | 832 | 737 | 1930 | 1946 | 1620 | | 1245 | | | | |
| 36 × 30 | 900 | 876 | 737 | 2083 | 2099 | 1700 | | 1314 | | | | |
| 36 × 32 | 950 | 876 | 780 | 2083 | 2099 | 1700 | 1314 | | | | | |

Notes :

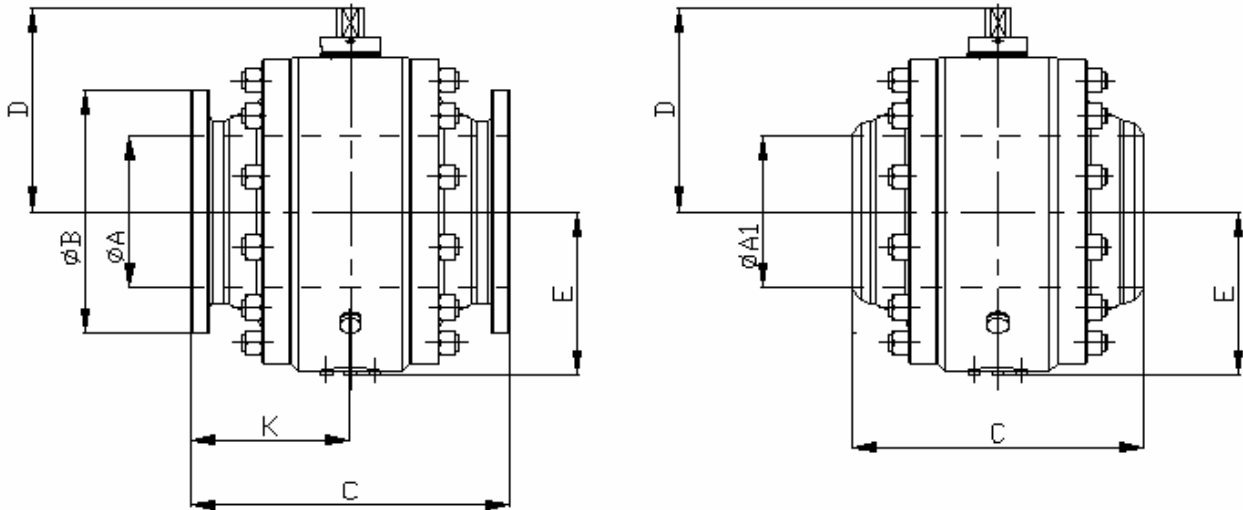
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 150
ANSI 900 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 153 | 2220 | 124 | 1800 |
| HYDROSTATIC PRESSURE TEST – BODY | 230 | 3250 | 187 | 2660 |
| HYDROSTATIC PRESSURE TEST – SEAT | 167 | 2400 | 137 | 1950 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – FULL BORE

Lever sizes page 37

| DN | | ØA | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|--------|-----|-------|----------------------|-----------------|--------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | RF | RTJ | WE ³ | | | | | | | |
| ½ | 15 | 13 | 215.9 | 215.9 | 150 | Symmetrical valves K=C/2 | 121 | 69.5 | 60.5 | 9 | 4 |
| ¾ | 20 | 19 | 228.6 | 228.6 | 150 | | 130 | 69.5 | 60.5 | 10 | 4 |
| 1 | 25 | 25 | 254 | 254 | 165 | | 149 | 84.5 | 76 | 18 | 9 |
| 1 ½ | 40 | 38 | 304.8 | 304.8 | 195 | | 178 | 102 | 95 | 30 | 15 |
| 2 | 50 | 50 | 368.3 | 371.3 | 220 | | 216 | 115 | 95.5 | 45 | 20 |
| 3 | 80 | 76 | 381 | 384 | 270 | | 241 | 151 | 126.3 | 70 | 45 |
| 4 | 100 | 100 | 457.2 | 460.2 | 320 | | 292 | 192.5 | 157 | 135 | 85 |
| 6 | 150 | 150 | 609.6 | 612.6 | 400 | | 381 | 265 | 198.8 | 310 | 200 |
| 8 | 200 | 201.4 | 736.6 | 739.6 | 500 | | 470 | 334.5 | 261 | 580 | 380 |
| 10 | 250 | 252.4 | 838.2 | 841.2 | 600 | | 546 | 403.2 | 335 | 900 | 700 |
| 12 | 300 | 303.4 | 965.2 | 968.2 | 700 | | 610 | 476 | 411 | 1700 | 1350 |
| 14 | 350 | 336 | 1028.7 | 1038.4 | 750 | | 641 | 519.5 | 449 | 2100 | 1650 |
| 16 | 400 | 388 | 1130.3 | 1140 | 880 | | 705 | 556 | 486 | 2600 | 2000 |
| 18 | 450 | 438 | 1219.2 | 1231.9 | 900 | | 787 | 656 | 572 | 3700 | 3000 |
| 20 | 500 | 489 | 1320.8 | 1333.5 | 1040 | | 857 | 692.5 | 607 | 4800 | 4000 |
| 24 | 600 | 590 | 1549.4 | 1568.5 | 1040 | | 1041 | 795 | 695 | 8000 | 6800 |
| 28 | 700 | 667 | 1707 | 1749 | 1420 | | 1168 | | | | |
| 30 | 750 | 714 | 1803 | 1825 | 1510 | | 1232 | | | | |
| 32 | 800 | 762 | 1905 | 1927 | 1615 | | 1314 | | | | |
| 36 | 900 | 857 | 2182 | 2210 | 1750 | | 1461 | | | | |

Notes :

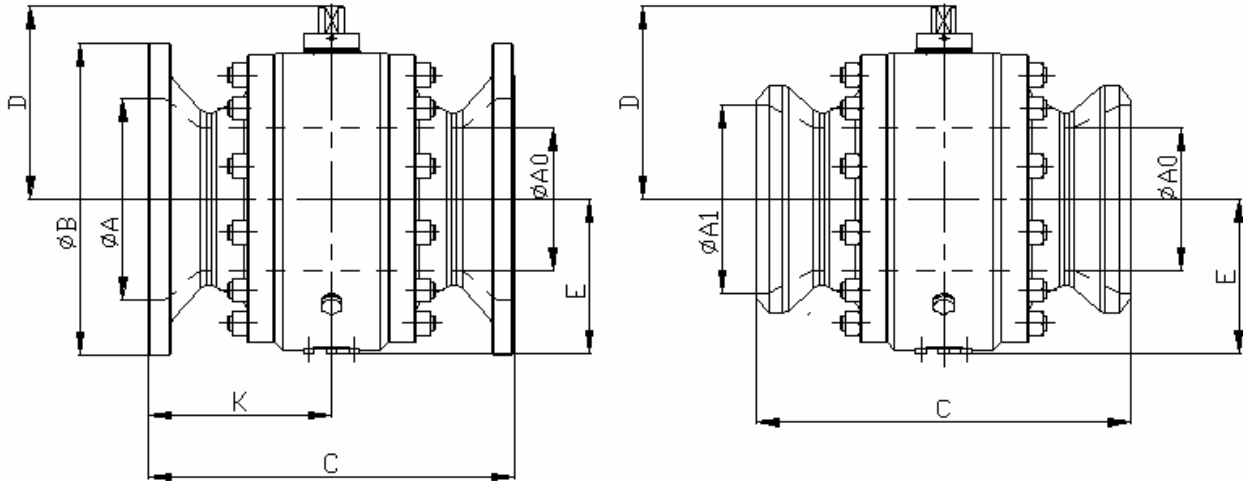
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness
- Face-to-face not covered by API 6D and ASME B16.10

DIMENSIONS AND WEIGHT

CLASS ISO PN 150
ANSI 900 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 153 | 2220 | 124 | 1800 |
| HYDROSTATIC PRESSURE TEST – BODY | 230 | 3250 | 187 | 2660 |
| HYDROSTATIC PRESSURE TEST – SEAT | 167 | 2400 | 137 | 1950 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – REDUCED BORE

Lever sizes page 37

| DN | | ØA | ØA ₀ | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|---------|-----|-------|-----------------|----------------------|--------|-----------------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | mm | mm | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | | | RF | RTJ | WE ³ | | | | | | |
| 1 × ¾ | 25 | 25 | 19 | 254 | 254 | 150 | Symmetrical valves K=C/2 | 149 | 69.5 | 60.5 | 12 | 4 |
| 1 ½ × 1 | 40 | 38 | 25 | 304.8 | 304.8 | 165 | | 178 | 84.5 | 76 | 22 | 9 |
| 2 × 1 ½ | 50 | 50 | 38 | 368.3 | 371.3 | 198 | | 216 | 102 | 95 | 43 | 17 |
| 3 × 2 | 80 | 76 | 50 | 381 | 384 | 270 | | 241 | 115 | 95.5 | 55 | 23 |
| 4 × 3 | 100 | 100 | 76 | 457.2 | 460.2 | 300 | | 292 | 151 | 126.3 | 100 | 49 |
| 6 × 4 | 150 | 150 | 100 | 609.6 | 612.6 | 400 | | 381 | 192.5 | 157 | 215 | 90 |
| 8 × 6 | 200 | 201.4 | 150 | 736.6 | 739.6 | 500 | | 470 | 265 | 198.8 | 430 | 220 |
| 10 × 8 | 250 | 252.4 | 201.4 | 838.2 | 841.2 | 540 | | 546 | 334.5 | 261 | 730 | 420 |
| 12 × 10 | 300 | 303.4 | 252.4 | 965.2 | 968.2 | 600 | | 610 | 403.2 | 335 | 1130 | 730 |
| 14 × 12 | 350 | 336 | 303.4 | 1028.7 | 1038.4 | 700 | | 641 | 476 | 411 | 1800 | 1350 |
| 16 × 12 | 400 | 388 | 303.4 | 1130.3 | 1140 | 750 | | 705 | 476 | 411 | 2020 | 1570 |
| 16 × 14 | 400 | 388 | 336 | 1130.3 | 1140 | 750 | | 705 | 519.5 | 449 | 2250 | 1750 |
| 18 × 16 | 450 | 438 | 388 | 1219.2 | 1231.9 | 880 | | 787 | 556 | 486 | 2850 | 2150 |
| 20 × 16 | 500 | 489 | 388 | 1320.8 | 1333.5 | 900 | | 857 | 556 | 486 | 3800 | 3510 |
| 20 × 18 | 500 | 489 | 438 | 1320.8 | 1333.5 | 900 | | 857 | 656 | 572 | 4100 | 3300 |
| 24 × 20 | 600 | 590 | 489 | 1549.4 | 1568.5 | 1040 | | 1041 | 692.5 | 607 | 5800 | 4400 |
| 30 × 24 | 750 | 714 | 590 | 1803 | 1825 | 1510 | | 1232 | 795 | 695 | | |
| 32 × 28 | 800 | 762 | 667 | 1905 | 1927 | 1615 | | 1314 | | | | |
| 36 × 30 | 900 | 857 | 714 | 2182 | 2210 | 1750 | | 1461 | | | | |
| 36 × 32 | 950 | 857 | 762 | 2182 | 2210 | 1750 | | 1461 | | | | |

Notes :

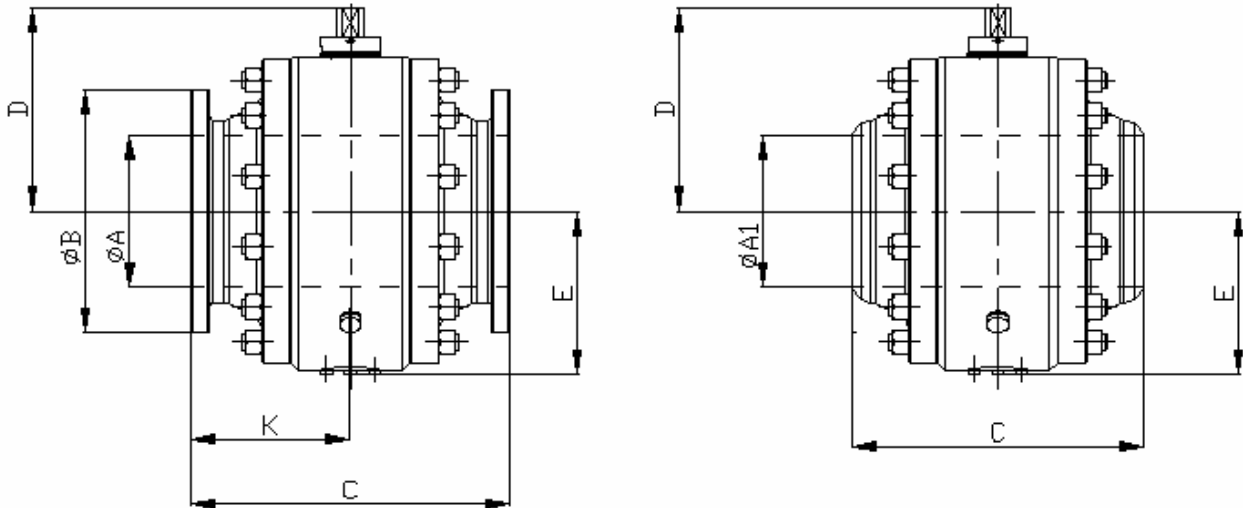
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness
- Face-to-face not covered by API 6D and ASME B16.10

DIMENSIONS AND WEIGHT

CLASS ISO PN 250
ANSI 1500 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 255 | 3705 | 206 | 3000 |
| HYDROSTATIC PRESSURE TEST – BODY | 383 | 5400 | 311 | 4425 |
| HYDROSTATIC PRESSURE TEST – SEAT | 281 | 4000 | 228 | 3245 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – FULL BORE

Lever sizes page 37

| DN | | ØA | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|--------|-----|-------|-------------------------------|-----------------|--------|--------------------------|-----------------|-------|------|-------------|------|
| Inches | mm | | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | RF | RTJ | WE ³ | | | | | | | |
| ½ | 15 | 13 | 215.9 | 215.9 | 155 | Symmetrical valves K=C/2 | 121 | 72.5 | 60.5 | 11 | 5 |
| ¾ | 20 | 19 | 228.6 | 228.6 | 160 | | 130 | 72.5 | 60.5 | 12 | 5 |
| 1 | 25 | 25 | 254 | 254 | 165 | | 149 | 84.5 | 76 | 18 | 9 |
| 1 ½ | 40 | 38 | 304.8 | 304.8 | 195 | | 178 | 102 | 95 | 30 | 15 |
| 2 | 50 | 50 | 368.3 | 371.3 | 260 | | 216 | 129.2 | 107 | 54 | 30 |
| 3 | 80 | 76 | 469.9 | 472.9 | 330 | | 267 | 182.5 | 152 | 120 | 75 |
| 4 | 100 | 100 | 546.1 | 549.1 | 380 | | 311 | 225 | 185 | 185 | 125 |
| 6 | 150 | 150 | 704.9 | 711.2 | 510 | | 394 | 304 | 235 | 450 | 340 |
| 8 | 200 | 201.4 | 831.8 | 841.5 | 600 | | 483 | 379.2 | 328 | 850 | 650 |
| 10 | 250 | 252.4 | 990.6 | 1000.3 | 715 | | 584 | 435 | 390 | 1550 | 1200 |
| 12 | 300 | 303.4 | 1130.3 | 1146 | 810 | | 673 | 494 | 460 | 2300 | 1750 |
| 14 | 350 | 318 | 1257.3 | 1276.4 | 900 | | 749 | 586 | 508 | 3300 | 2650 |
| 16 | 400 | 362 | 1384.3 | 1406.7 | 965 | | 826 | 622 | 569 | 4500 | 3700 |
| 18 | 450 | 438 | | | | | | | | | |
| 20 | 500 | 489 | Special flanges or connectors | | | | | | | | |
| 24 | 600 | 571 | | | | | | | | | |

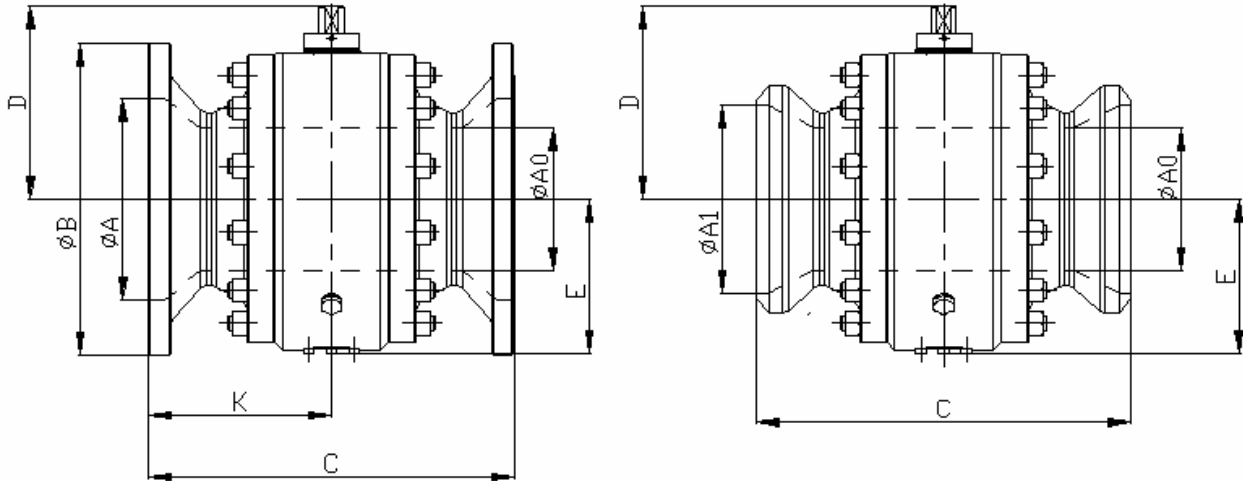
Notes :

- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5
- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 250
ANSI 1500 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|----------------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 255 | 3705 | 206 | 3000 |
| HYDROSTATIC PRESSURE TEST – BODY | 383 | 5400 | 311 | 4425 |
| HYDROSTATIC PRESSURE TEST – SEAT | 281 | 4000 | 228 | 3245 |
| AIR PRESSURE TEST – SEAT | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – REDUCED BORE

Lever sizes page 37

| DN | | ØA | ØA ₀ | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | | | | |
|---------|-----|-------|-----------------|-------------------------------|--------|-----------------|--------------------------|-----------------|-------|------|-------------|------|------|--|--|
| Inches | mm | mm | mm | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW | | | |
| | | | | RF | RTJ | WE ³ | | | | | | | | | |
| 1 × ¾ | 25 | 25 | 19 | 254 | 254 | 195 | Symmetrical valves K=C/2 | 149 | 72.5 | 60.5 | 12 | 5 | | | |
| 1 ½ × 1 | 40 | 38 | 25 | 304.8 | 304.8 | 235 | | 178 | 84.5 | 76 | 22 | 10 | | | |
| 2 × 1 ½ | 50 | 50 | 38 | 368.3 | 371.3 | 289 | | 216 | 102 | 95 | 43 | 17 | | | |
| 3 × 2 | 80 | 76 | 50 | 469.9 | 472.9 | 300 | | 267 | 129.2 | 107 | 75 | 34 | | | |
| 4 × 3 | 100 | 100 | 76 | 546.1 | 549.1 | 425 | | 311 | 182.5 | 152 | 140 | 80 | | | |
| 6 × 4 | 150 | 150 | 100 | 704.9 | 711.2 | 550 | | 394 | 225 | 185 | 310 | 135 | | | |
| 8 × 6 | 200 | 201.4 | 150 | 831.8 | 841.5 | 650 | | 483 | 304 | 235 | 600 | 360 | | | |
| 10 × 8 | 250 | 252.4 | 201.4 | 990.6 | 1000.3 | 770 | | 584 | 379.2 | 328 | 1050 | 700 | | | |
| 12 × 10 | 300 | 303.4 | 252.4 | 1130.3 | 1146 | 880 | | 673 | 435 | 390 | 1800 | 1300 | | | |
| 14 × 12 | 350 | 318 | 303.4 | 1257.3 | 1276.4 | 980 | | 749 | 494 | 460 | 2600 | 1900 | | | |
| 16 × 12 | 400 | 362 | 303.4 | 1384.3 | 1406.7 | 1080 | | 826 | 494 | 460 | 3250 | 2380 | | | |
| 16 × 14 | 400 | 362 | 318 | 1384.3 | 1406.7 | 1080 | | 826 | 586 | 508 | 3700 | 2850 | | | |
| 18 × 16 | 450 | 438 | 362 | Special flanges or connectors | | | | | | 622 | 569 | 5000 | 3900 | | |
| 20 × 16 | 500 | 489 | 362 | | | | | | | | | | | | |
| 20 × 18 | 500 | 489 | 438 | | | | | | | | | | | | |
| 24 × 20 | 600 | 571 | 489 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

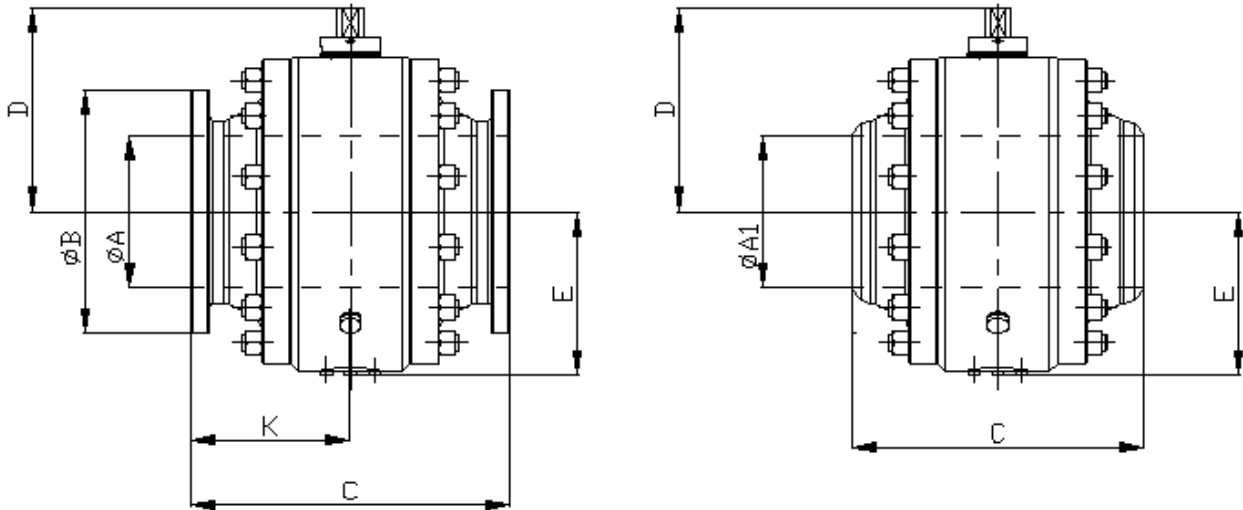
Notes :

- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5
- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 420
ANSI 2500 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|---------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 425 | 6170 | 344 | 5000 |
| BODY TEST PRESSURE | 639 | 9000 | 517 | 7360 |
| HIGH PRESSURE SEAT TEST | 468 | 6600 | 379 | 5395 |
| AIR SEAT TEST PRESSURE | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – FULL BORE

Lever sizes page 37

| ND | | ØA | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | | | |
|--------|-----|-----|-------------------------------|-----------------|--------------------------|-----------------|-----------------|-------|-------|-------------|------|--|--|
| Inches | mm | | Flanged ¹ | | To be welded | K | ØB ² | D | E | Flanges | BW | | |
| | | RF | RTJ | WE ³ | Symmetrical valves K=C/2 | | | | | | | | |
| ½ | 15 | 12 | 263.7 | 263.7 | 298 | 133 | 89.2 | 88 | 88 | 20 | 13 | | |
| ¾ | 20 | 16 | 273 | 273 | 298 | 140 | 89.2 | 88 | 88 | 21 | 13 | | |
| 1 | 25 | 21 | 307.8 | 307.8 | 308 | 159 | 99 | 95 | 95 | 29 | 16 | | |
| 1 ½ | 40 | 34 | 384 | 387 | 330 | 203 | 130.7 | 129.5 | 129.5 | 55 | 30 | | |
| 2 | 50 | 43 | 450.9 | 453.9 | 350 | 235 | 157.2 | 142.5 | 142.5 | 90 | 50 | | |
| 3 | 80 | 67 | 577.9 | 584.2 | 420 | 305 | 190.2 | 164.8 | 164.8 | 190 | 110 | | |
| 4 | 100 | 87 | 673.1 | 682.8 | 520 | 356 | 249.9 | 198 | 198 | 320 | 200 | | |
| 6 | 150 | 133 | 914.4 | 927.1 | 670 | 483 | 338.2 | 299 | 299 | 850 | 500 | | |
| 8 | 200 | 180 | 1022.4 | 1038.1 | 800 | 552 | 404.5 | 358 | 358 | 1500 | 1000 | | |
| 10 | 250 | 226 | 1270 | 1292.4 | 995 | 673 | 467 | 460 | 460 | 2600 | 1850 | | |
| 12 | 300 | 266 | 1422.4 | 1444.8 | 1115 | 762 | 590 | 553 | 553 | 4000 | 2900 | | |
| 14 | 350 | 292 | Special flanges or connectors | | | | | 659 | 612 | | | | |
| 16 | 400 | 326 | | | | | | | | 695 | 675 | | |
| 18 | 450 | | | | | | | | | | | | |
| 20 | 500 | | | | | | | | | | | | |
| 24 | 600 | | | | | | | | | | | | |

Notes :

- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5

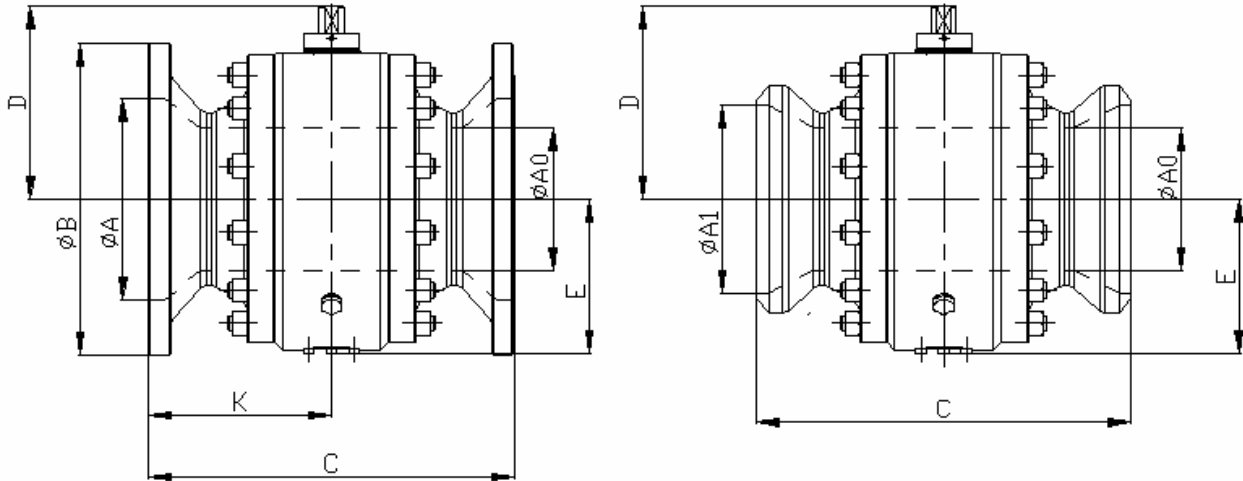
(3) Face-to-face manufacturer

- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

DIMENSIONS AND WEIGHT

CLASS ISO PN 420
ANSI 2500 lbs

| WORKING AND TEST PRESSURE | Materials Group 1-1 | | Materials Group 2-3 | |
|---------------------------|---------------------|------|---------------------|------|
| | Bar | Psi | Bar | Psi |
| MAXIMUM WORKING PRESSURE | 425 | 6170 | 344 | 5000 |
| BODY TEST PRESSURE | 639 | 9000 | 517 | 7360 |
| HIGH PRESSURE SEAT TEST | 468 | 6600 | 379 | 5395 |
| AIR SEAT TEST PRESSURE | 5.6 | 80 | 5.6 | 80 |



TYPE A and W – REDUCED BORE

Lever sizes page 37

| ND | | ØA | ØA ₀ | FACE TO FACE (mm) C | | | DIMENSIONS (mm) | | | | WEIGHT (Kg) | |
|---------|-----|-------|-----------------|-------------------------------|--------|-----------------|--------------------------|-----------------|-------|-------|-------------|------|
| Inches | mm | mm | mm | Flanged ¹ | | Welded | K | ØB ² | D | E | Flanges | BW |
| | | | | RF | RTJ | WE ³ | | | | | | |
| 1 × ¾ | 25 | 21 | 16 | 307.8 | 307.8 | 298 | Symmetrical valves K=C/2 | 159 | 89.2 | 88 | 23 | 14 |
| 1 ½ × 1 | 40 | 34 | 21 | 384 | 387 | 308 | | 203 | 99 | 95 | 44 | 18 |
| 2 × 1 ½ | 50 | 43 | 34 | 450.9 | 453.9 | 332 | | 235 | 130.7 | 129.5 | 70 | 33 |
| 3 × 2 | 80 | 67 | 43 | 577.9 | 584.2 | 392 | | 305 | 157.2 | 142.5 | 155 | 55 |
| 4 × 3 | 100 | 87 | 67 | 673.1 | 682.8 | 456 | | 356 | 190.2 | 164.8 | 225 | 120 |
| 6 × 4 | 150 | 133 | 87 | 914.4 | 927.1 | 620 | | 483 | 249.9 | 198 | 520 | 240 |
| 8 × 6 | 200 | 180 | 133 | 1022.4 | 1038.1 | 690 | | 552 | 338.2 | 299 | 1050 | 560 |
| 10 × 8 | 250 | 226 | 180 | 1270 | 1292.4 | 860 | | 673 | 404.5 | 358 | 2000 | 1100 |
| 12 × 10 | 300 | 266 | 226 | 1422.4 | 1444.8 | 964 | | 762 | 467 | 460 | 3100 | 2000 |
| 14 × 12 | 350 | 304.8 | 266 | Special flanges or connectors | | | | | 590 | 553 | | |
| 16 × 12 | 400 | 326 | 266 | | | | | | 590 | 553 | | |
| 16 × 14 | 400 | 326 | 292 | | | | | | 659 | 612 | | |
| 18 × 16 | 450 | 358 | 326 | | | | | | 695 | 675 | | |
| 20 × 16 | 500 | 396 | 326 | | | | | | | | | |
| 20 × 18 | 500 | 396 | 358 | | | | | | | | | |
| 24 × 20 | 600 | 465 | 396 | | | | | | | | | |

Notes :

- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5
- (3) Face-to-face manufacturer
- Materials :
 - o Group 1-1 : carbon steels (C, C- Si, C- Mn - Si, C-Mn, Si, V)
 - o Group 2-3 : austenitic steels (18Cr-8Ni, 16Cr-12Ni-2Mo)
- ØA₁ depending on the pipe thickness

PRESSURE TEMPERATURE RATINGS FOR SOFT SEATS

These curves are based on limits given by ASME B16.34 for standard classes and for group materials 1-1, 1-2, 1-3. For valves in conformity with the Specification API 6D "Pipeline Valves", maximum pressure class given for flanged ends and butt weld ends is in conformity with values of Sections 2.2a et 2.2b for temperatures between -20°F and +100°F (-29°C to +38°C).

The information stated in these curves is representative of the manufacturer's experience and adaptation of technical data's to **SRI** valves. This information cannot be used beyond the industrial application contracts and remains subject to SRI's approval.

Table 1

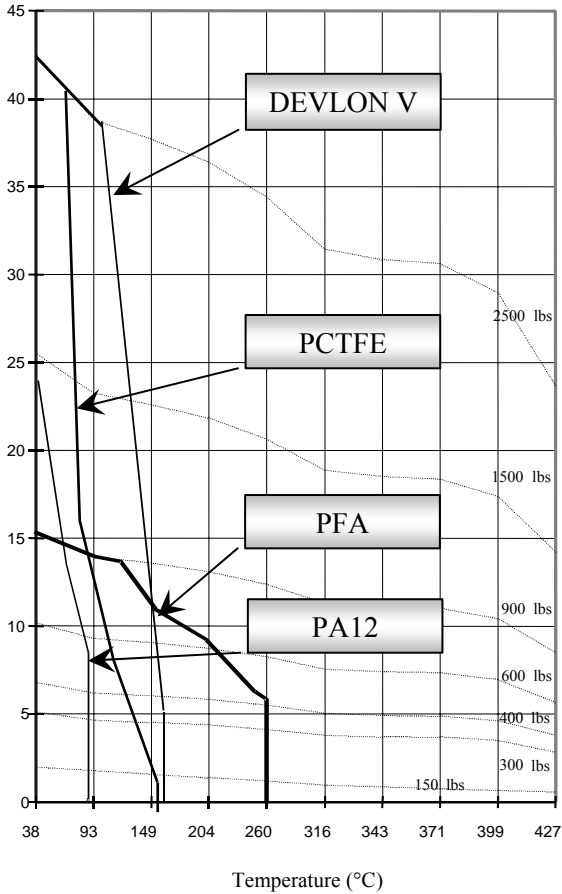
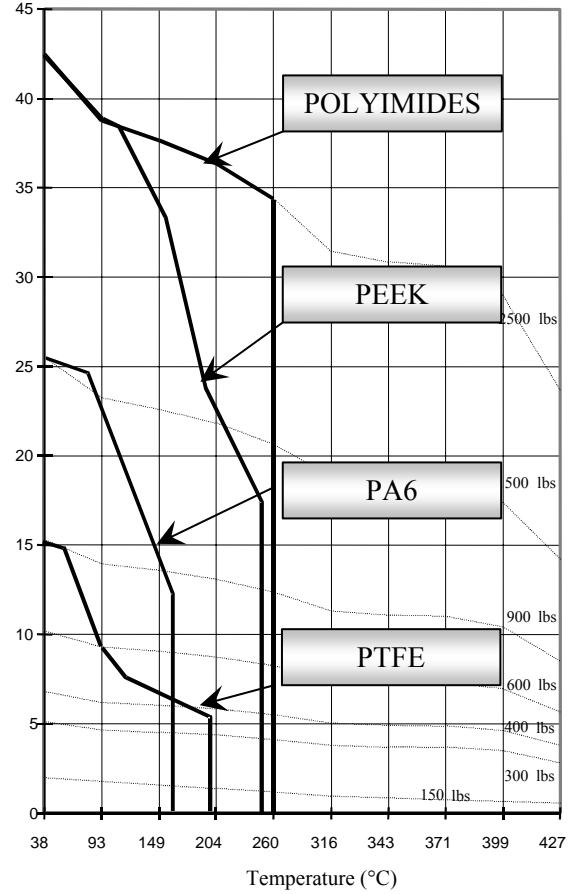


Table 2



| Seat insert material | Table Number | DN ² | ISO PN Class | | | | | |
|---------------------------|--------------|-----------------|--------------|----|-----|-----|-----|-----|
| | | | 20 | 50 | 100 | 150 | 250 | 420 |
| PEEK | 2 | All | | | | | | |
| POLYIMIDES | 2 | ½" to 8" | | | | | | |
| PTFE+25% fiber glass | 2 | ½" to 3" | | | | | | |
| | | 4" to 16" | | | | | | |
| PA6 et PA12 | 1 | > 18" | | | | | | |
| | | ½" to 14" | | | | | | |
| | | 16" to 24" | | | | | | |
| DEVLON V API ¹ | 1 | > 24" | | | | | | |
| | | ½" to 12" | | | | | | |
| | | 14" | | | | | | |
| PFA | 1 | All | | | | | | |
| PCTFE | 1 | All | | | | | | |

Notes : (1) Product DEVOL ENGINEERING
 (2) Ball bore diameter

ISO - TOPWORKS

Full Bore Valves

| ISO Nr | ASME Pressure Classes / ISO PN | | | | | | |
|--------|--------------------------------|-----------|------------|------------|------------|-------------|-------------|
| | 150 20 | 300 50 | 400 68 | 600 100 | 900 150 | 1500 250 | 2500 420 |
| F03 | 3/4" | | | | | | |
| F04 | 1" - 1" 1/2 | | | | 1" | | 3/4 " |
| F05 | 2" -3 " | | 2" | | | | 1" 1/2 |
| F05A | | | | | 1" 1/2 | | 1" |
| F07 | 4" | | 3" | | | 2" | |
| F10 | 6"-8" | | 4" | | | 3" | |
| F14 | 10" | | 6" | | | 4" | |
| F16 | 12"-14"-16" | | 8"-10"-12" | | 8"-10" | 6"-8" | 6" |
| F25 | 18"-20" | | 14"-16" | | 12" | 10" | 8" |
| F26 | 24" | | 18" | | 14"-16" | 12" | 10" |
| F30 | 30" | | 20"-24" | | | | |
| F35 | | | | 26"-28" | 18"-20" | 14"-16" | 12"-16" |

Note : F05A = Format specific to SRi

Reduced Bore Valves

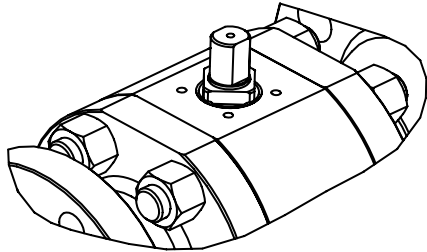
| ISO Nr | ASME Pressure Classes / ISO PN | | | | | | |
|--------|--------------------------------|-----------|-------------|------------|------------|-------------|-------------|
| | 150 20 | 300 50 | 400 68 | 600 100 | 900 150 | 1500 250 | 2500 420 |
| F03 | 1" | | | | | | |
| F04 | 1" 1/2 - 2" | | | | 1" 1/2 | | 1 " |
| F05 | 3" -4 " | | 3" | | | | 2" |
| F05A | | | | | 1" 1/2 | | 1" |
| F07 | 6" | | 4" | | | 3" | |
| F10 | 8"-10" | | 6" | | | 4" | |
| F14 | 12" | | 8" | | | 6" | |
| F16 | 14"-16"-18" | | 10"-12"-14" | | 10"-12" | 8"-10" | 8" |
| F25 | 20"-24" | | 16"-18" | | 14" | 12" | 10" |
| F26 | 28" | | 20" | | 16"-18" | 14" | 12" |
| F30 | 32" | | 24"-28" | | | | |
| F35 | | | | 28"-30" | 20"-24" | 16"-18" | 14"-18" |

Note : F05A = Format specific to SRi

Classes ISO PN10-16, and 25-40 are respectively associated with pressure classes ISO PN 20 and 50. For all ISO types the stem is made with 2 flats faces if no other requirement is specified in the order.

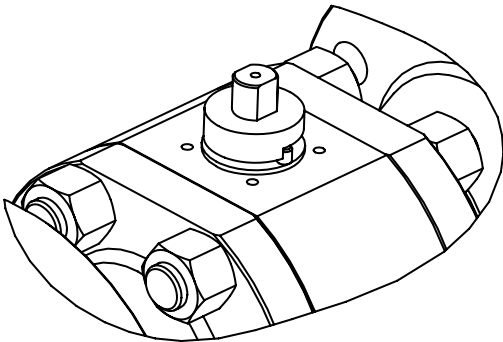
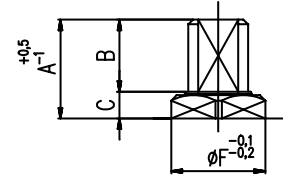
ISO Dimensions

ISO 5211 standard - Warning !
 Connecting devices for actuators should not exert any axial or radial loads on the valve stem.



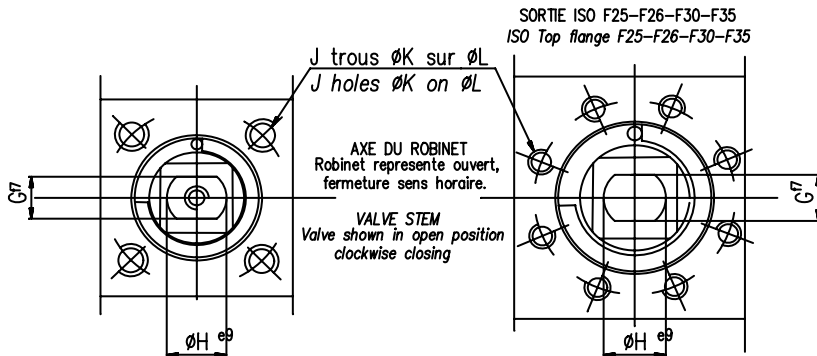
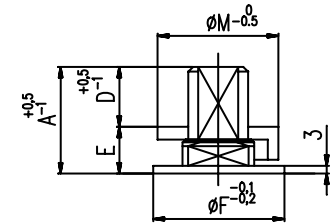
Robinet avec sortie ISO F03 – F04 – F05,
 la butee 1/4 de tour est enlevee dans le
 cas d'une motorisation

Valves With ISO top Flanges
 F03 – F04 – F05 – F05A
 Stop plate to be removed for actuation



Robinet avec une sortie ISO $\nabla 07$
 la butee 1/4 de tour reste sur
 le robinet

Valves with ISO top Flanges $\nabla 07$
 Stop plate is maintained on the valve



| ISO Type | Dimensions mm | | | | | | | | | | | |
|----------|---------------|----|------|------|------|-----|----|------|---|-----|-----|-----|
| | A | B | C | D | E | F | G | H | J | K | L | M |
| F03 | 22.5 | 15 | 7.5 | | | 25 | 8 | 11.5 | 4 | M6 | 36 | |
| F04 | 23.2 | 15 | 8.2 | | | 30 | 9 | 13 | 4 | M6 | 42 | |
| F05 | 36.2 | 26 | 10.2 | | | 35 | 17 | 21 | 4 | M6 | 50 | |
| F05A | 26 | 18 | 8 | | | 30 | 11 | 15.5 | 4 | M6 | 50 | |
| F07 | 48.2 | | | 22.1 | 26.1 | 55 | 19 | 24 | 4 | M8 | 70 | 53 |
| F10 | 59.6 | | | 33 | 26.6 | 70 | 27 | 33 | 4 | M10 | 102 | 68 |
| F14 | 81.9 | | | 47.9 | 34 | 100 | 36 | 44 | 4 | M16 | 140 | 98 |
| F16 | 102.4 | | | 64 | 38.4 | 130 | 40 | 54 | 4 | M20 | 165 | 128 |
| F25 | 114 | | | 71 | 43 | 200 | 60 | 85 | 8 | M16 | 254 | 196 |
| F26 | 122 | | | 71 | 51 | 230 | 70 | 105 | 8 | M16 | 254 | 224 |
| F30 | 136 | | | 80 | 56 | 260 | 80 | 120 | 8 | M20 | 298 | 254 |
| F35 | 154 | | | 90 | 64 | 300 | 90 | 135 | 8 | M30 | 356 | 294 |

Note : F05A = SRI specific format

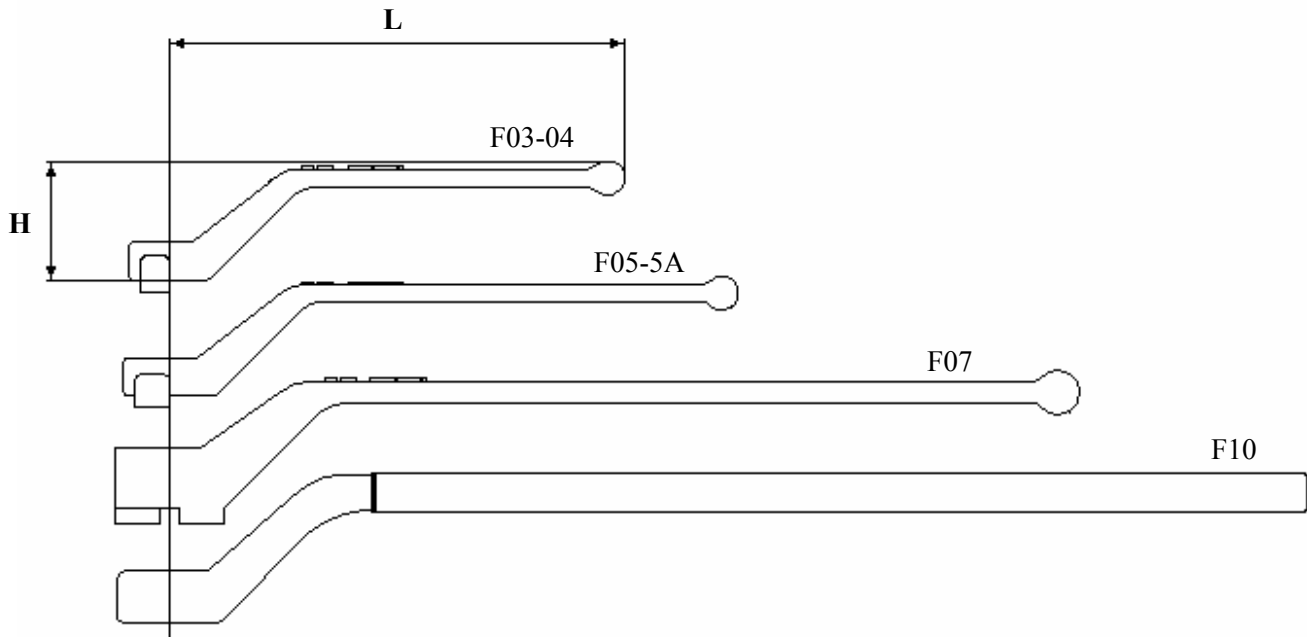
LEVERS - DIMENSIONS

Levers are made of carbon steel. They are shotblasted and painted.

They are fitted on the upper stem by a stainless steel screw. Length and valve applications are indicated in the table below and are defined to limit the tangential effort at break torque to 400N.

Conventional clockwise turn for closing is indicated on the lever.

Levers equipped with a locking device require special machining.



| ISO Types | Length L | Height H | Weight (kg) | Integrated stop | Allowable Torque ² Nm | Force at end N |
|-------------------|----------|----------|-------------|-----------------|----------------------------------|----------------|
| F03 | 200 | 52.5 | 0.4 | Yes | 32 | 160 |
| F04 | 250 | 52.5 | 0.5 | Yes | 63 | 252 |
| F05A ¹ | 250 | 67.5 | 0.6 | Yes | 100 | 400 |
| F05 | 400 | 61 | 1.2 | Yes | 125 | 312 |
| F07 | 500 | 83.9 | 1.9 | Yes | 200 | 400 |
| F10 | 800 | 76 | 2.5 | No | 320 | 400 |

Note 1 : F05A = SRi specific format

Note 2 : Torque given by max applicable force according to ISO 5211

FLOW CHARACTERISTICS

SRI can determine valve size to be installed upon given service conditions and evaluate pressure drop caused by a given valve.

Flow coefficient calculations are taken from the following references :

-NF EN 60534-2-2 June 1993 C 46-504

-NF E 29 312 December 1984

LIQUID

C_v = Flow coefficient
 q = Volumic flow (m³/h)
 W = Mass flow (ton / h) at flowing temperature
 ΔP = Pressure drop (bar)
 G_f = Liquid density related to water (1 at 15.6°C)

Volumic flow

$$C_v = 1.16 \times q \times \sqrt{\frac{G_f}{\Delta P}}$$

Mass flow

$$C_v = \frac{1.16 \times W}{\sqrt{G_f \times \Delta P}}$$

GAS

Q = Volumic flow (N m³/h)
 W = Mass flow (ton/h)
 G = Gas density at 15,6°C and 1013 mbar Compared to the air (=1)
 G_f = Gas density at flowing temperature condition and 1013 mbar compared to the air (=1)

$$= G \times \frac{288.75}{T}$$

 C_v = Flow coefficient
 ΔP = Pressure drop (bar)
 T = Absolute temperature of gas (K)
 P_1 = Upstream pressure (bar abs.)
 P_2 = Downstream Pressure (bar abs.)

Volumic flow

$$C_v = \frac{Q}{295} \times \sqrt{\frac{G \times T}{\Delta P \times (P_1 + P_2)}}$$

Mass flow

$$C_v = \frac{47.2 \times W}{\sqrt{\Delta P \times (P_1 + P_2) \times G_f}}$$

STEAM

C_v = Flow coefficient
 W = Mass flow (ton/h)
 ΔP = Pressure drop (bar)
 T_{sh} = Superheated temperature related to Saturated temperature (°C)
 P_1 = Upstream pressure (bar abs.)
 P_2 = Downstream Pressure (bar abs.)

Mass flow Saturated steam

$$C_v = \frac{72.4 \times W}{\sqrt{\Delta P \times (P_1 + P_2)}}$$

Mass flow Superheated steam

$$C_v = \frac{72.4 \times (1 + 0.00126 \times T_{sh}) \times W}{\sqrt{\Delta P \times (P_1 + P_2)}}$$

COMPUTED FLOW COEFFICIENT (CV)

Indicated flow coefficients are identical in both flow directions

Relations between flow coefficients Cv and Kv :

Cv = Water flow in US Gallons (3,78 liters) by minute for 1 psi constant pressure drop.

Kv = Water flow in m³ by hour for 1 bar constant pressure drop.

$$Kv = \frac{Cv}{1.16} \text{ and } Cv = 1.16 \times Kv$$

Full bore valve

| ASME / ANSI pressure classes | | | | | | | |
|------------------------------|--------|--------|--------|--------|-------|-------|-------|
| DN | 150 | 300 | 400 | 600 | 900 | 1500 | 2500 |
| ¾ | 52 | 52 | 46 | 46 | 42 | 42 | 29 |
| 1" | 115 | 113 | 99 | 99 | 91 | 91 | 53 |
| 1½" | 300 | 300 | 265 | 265 | 236 | 236 | 160 |
| 2 | 520 | 476 | 448 | 413 | 369 | 369 | 334 |
| 3 | 1405 | 1188 | 1140 | 1062 | 1023 | 924 | 835 |
| 4 | 2627 | 2276 | 1975 | 1924 | 1858 | 1700 | 1527 |
| 6 | 5549 | 5499 | 4959 | 4664 | 4460 | 4154 | 3645 |
| 8 | 10855 | 11364 | 9551 | 9062 | 8574 | 8075 | 7270 |
| 10 | 18043 | 17483 | 16058 | 14866 | 14398 | 13278 | 11690 |
| 12 | 27187 | 26373 | 24285 | 23216 | 21587 | 19907 | 17819 |
| 14 | 33297 | 31566 | 30344 | 29224 | 27187 | 24591 | |
| 16 | 45210 | 43072 | 41545 | 39610 | 37166 | 33602 | |
| 18 | 59262 | 57429 | 55596 | 52847 | | | |
| 20 | 76878 | 73925 | 71481 | 67205 | | | |
| 24 | 115062 | 111193 | 106916 | 121986 | | | |
| 28 | 156500 | 150600 | 147100 | 140850 | | | |
| 30 | 187900 | 181250 | 174100 | 114900 | | | |
| 34 | 242000 | 230500 | 220000 | 211000 | | | |
| 36 | 275000 | 269000 | 248000 | 236500 | | | |

Reduced Bore Valves

| ASME / ANSI pressure classes | | | | | | | |
|------------------------------|--------|--------|--------|--------|-------|-------|------|
| DN | 150 | 300 | 400 | 600 | 900 | 1500 | 2500 |
| 1"×¾" | 26 | 26 | 28 | 28 | 28 | 27 | 21 |
| 1½"×1" | 46 | 46 | 45 | 45 | 48 | 48 | 31 |
| 2"×1½" | 115 | 129 | 140 | 140 | 142 | 142 | 105 |
| 3×2 | 190 | 200 | 189 | 183 | 192 | 177 | 229 |
| 4×3 | 567 | 548 | 543 | 539 | 589 | 524 | 589 |
| 6×4 | 815 | 778 | 764 | 760 | 774 | 742 | 806 |
| 8×6 | 2021 | 2031 | 2296 | 2276 | 2118 | 2312 | 2368 |
| 10×8 | 4205 | 4205 | 4184 | 4368 | 4705 | 4664 | 4700 |
| 12×10 | 7348 | 7450 | 7317 | 7664 | 8103 | 9420 | 9328 |
| 14×12 | 13879 | 14094 | 14186 | 14396 | 13070 | 13564 | |
| 16×12 | 14100 | 14250 | 14484 | 14530 | 13120 | 13320 | |
| 16×14 | 15053 | 15308 | 14920 | 14829 | 14862 | 14464 | |
| 18×16 | 21176 | 21227 | 21687 | 22656 | | | |
| 20×16 | 23546 | 23810 | 24020 | 24150 | | | |
| 20×18 | 28371 | 28473 | 29290 | 30514 | | | |
| 24×20 | 27351 | 27351 | 27657 | 28473 | | | |
| 30×28 | 82600 | 82500 | 84500 | 88800 | | | |
| 36×30 | 62800 | 63800 | 65500 | 70100 | | | |
| 36×34 | 130000 | 129200 | 134300 | 139800 | | | |

Note: Classes 150-300-600 are respectively associated with pressure classes ISO PN 20-50-100.

OTHER PRODUCTS*Low temperature and cryogenic trunnion ball valves*

Size range from ½" to 36" full or reduced bore, classes ISO PN 20-50-100-250-420, PN 10-16-25-40.
 Standard cryogenic extension designed for fluids down to -196°C.
 Manual and motorised operations

High temperature trunnion ball valves

Size range from ½" to 36" full or reduced bore, classes ISO PN 20-50-100-150-250-420, PN 10-16-25-40.
 Thermal extension up to 450°C.
 Metal / metal seated and compressed expanded graphite.
 Stabilised actuator interface at 150° C maxi
 Manual and motorised operations

Multi-way trunnion ball valves L, T or X (3 or 4 ways) .

Size range from ½" to 36" full or reduced bore, classes ISO PN 20-50-100-150-250-420, PN 10-16-25-40
 Soft seats or metal / metal seats.
 4 seats ball valves and non transflow design on request.
 Manual and motorised operations

Pig launcher and / or receiver trunnion ball valves

Size range from 2" to 36" special bore, classes ISO PN 20-50-100-150-250, PN 10-16-25-40.
 Soft seats or metal / metal seats
 Direct access manual door or door mechanically supported (large size)
 Manual and motorised operations

Tandem trunnion ball valves (Type J)

Size range from 2" to 24" full or reduced bore, classes ISO PN 20-50-100-150-250, PN 10-16-25-40
 Soft seats or metal / metal seats.
 Same face-to-face dimensions as Standard trunnion ball valves of the same pressure class and NPS for classes > ISO PN50
 Manual and motorised operations

Double block and bleed twin trunnion ball valves (Type Y)

Size range from 2" to 24" full or reduced bore, classes ISO PN 20-50-100-150-250, PN 10-16-25-40
 Soft seats or metal / metal seats.
 Standard spare parts, internal parts identical as for Type A/W
 Equipped with a needle valve for the drain of the volume between the two valves
 Same connection possibilities as for Type A/W
 Manual and motorised operations

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