

TRUNNION BALL VALVES



SUD ROBINETTERIE
industrie

PREAMBLE

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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	10/16/20 150	25/40/50 300	63/64/100 400/600	150 900	250 1500	420 2500
1/2"	15						
3/4"	20						
1"	25						
1 1/2"	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						

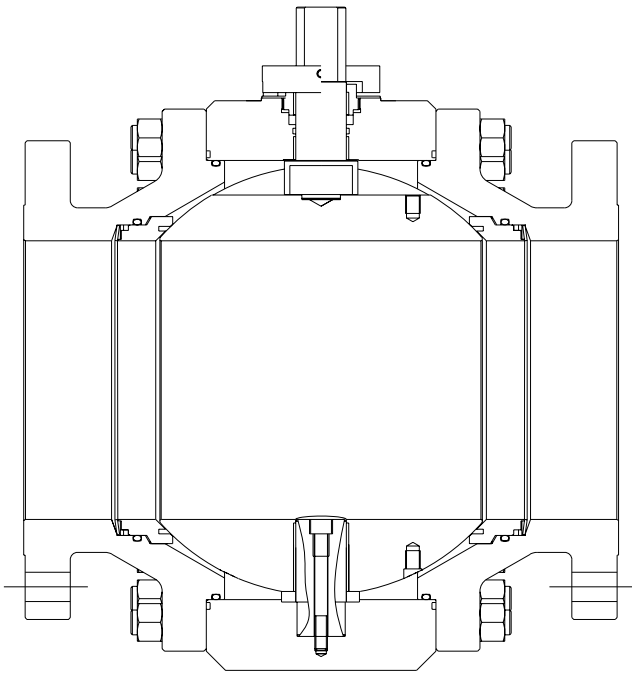
¹ Dimensions for API6A classes can be obtained on request to our sales department.

TYPE A & W – CHARACTERISTICS AND OPTIONAL EQUIPMENTS

Type A and Type W designs share the following characteristics :

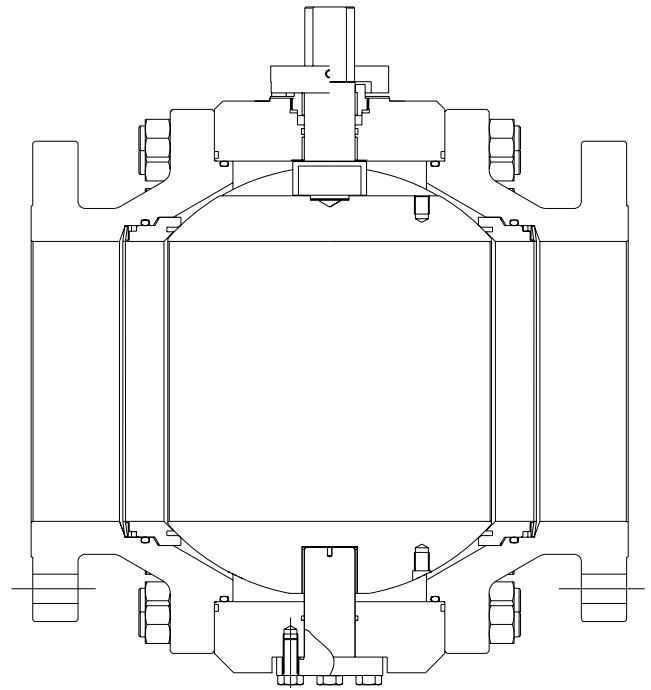
- **Metric bolting.** Threaded blind hole protected from corrosion. Controlled tightening.
- **API6D/ISO14313 bores²**
- **Double block and bleed** function in the "closed" position
- **Unidirectional** seats (standard) or **bidirectional** seats ("Double effect" option)
- Soft seats (plastic inserts) 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.

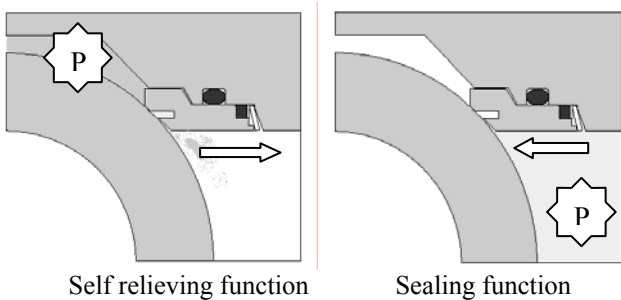
² Except 2500 series for NPS under 2"

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

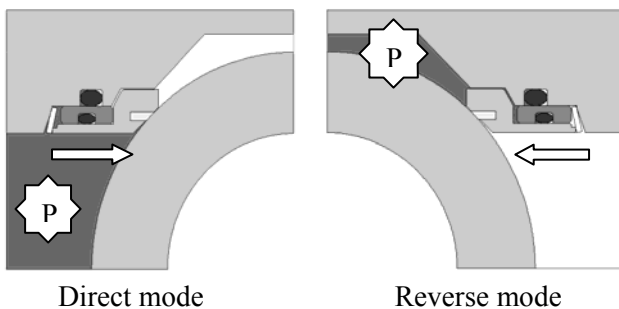
Each seat is **unidirectional** with regard to the difference in pressure. This creates a seal in both directions of the flow using one seat for each pressure direction. Self relieving of the internal volume (cavity) is assured by the seat on the side with the lowest pressure.



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).



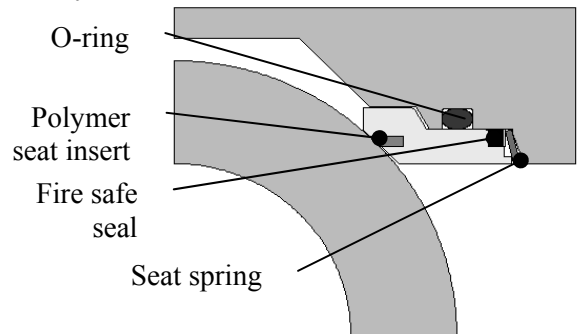
The standard model is Double sealing, Double self relieving.

Seat Construction

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

Soft seals :

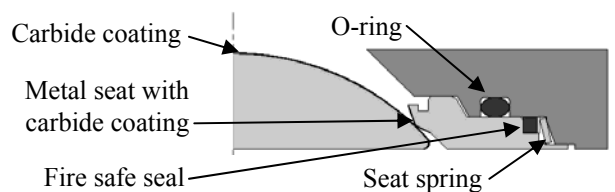
The sealing contact is polymer / metal, with different combinations of both according to specific needs with regard to temperatures, pressures and fluid aggressivity.



Metal seats :

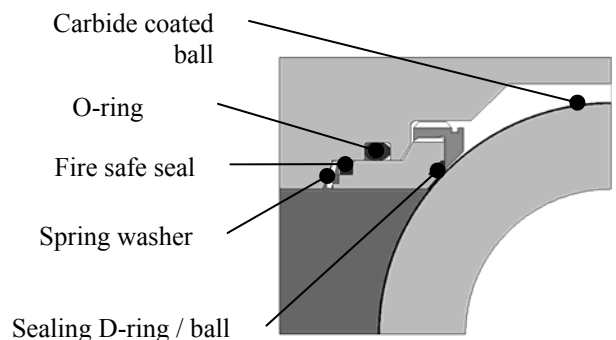
The sealing surface is made of projected carbide coating (tungsten, chromium, boron). This seat type is particularly adapted to the most restrictive service conditions, for example when fluids contain a high percentage of insoluble abrasives, or when many cycles are required.

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



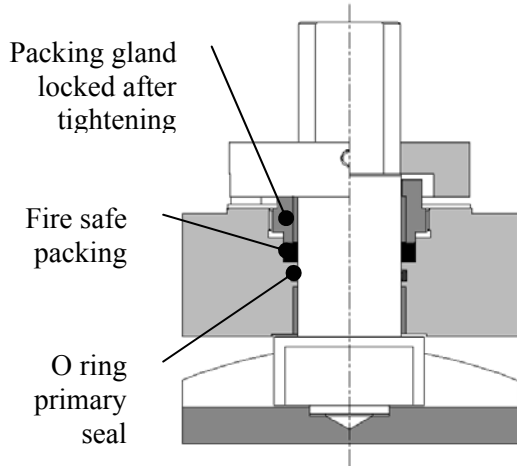
Metal + Soft :

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.



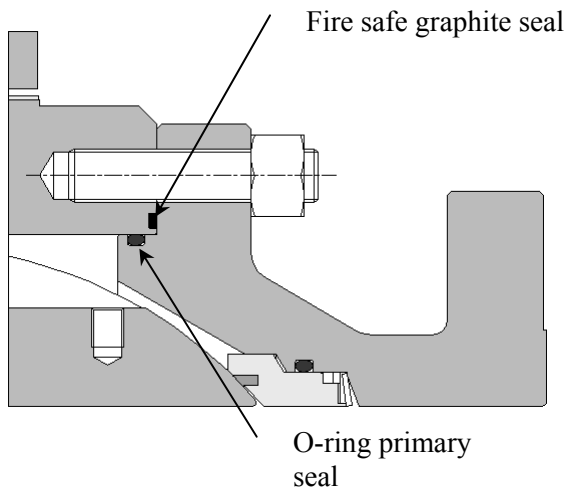
UPPER STEM SEALING SYSTEM

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.



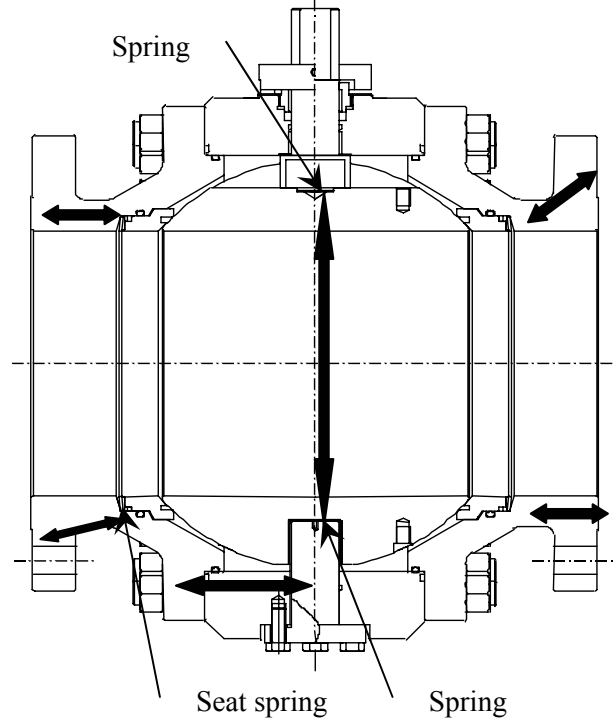
STATIC SEALING BETWEEN BODY AND FLANGES

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 :

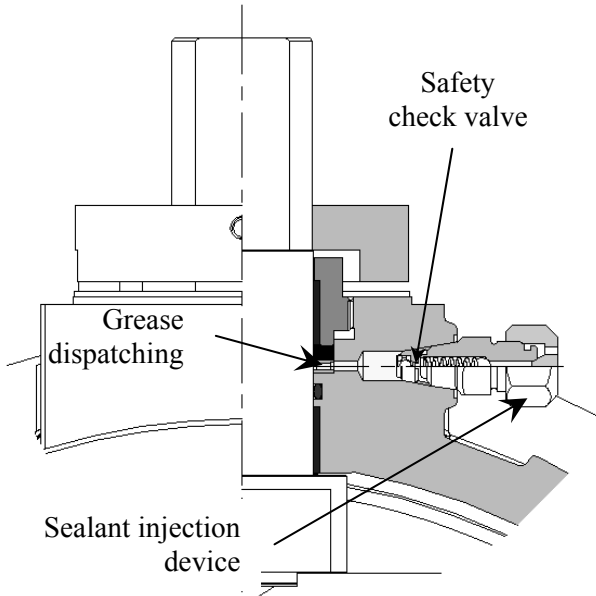


OPTIONAL EQUIPMENTS

Secondary sealing system on stem.

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

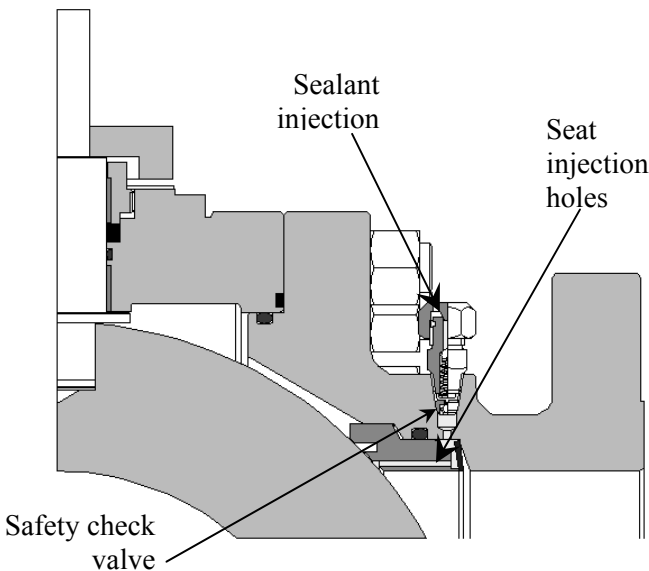
This device allows an external intervention in case of failure in the stem sealing system (destruction of O-ring and degradation of packing) by permitting injection of a sealant to minimize the problem until maintenance operation. This intervention can be performed in either the "open" or "closed" position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



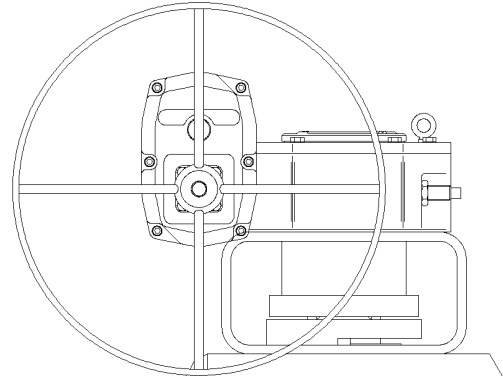
Caution !

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 (solving, 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	A383	II	II	II	II
2 1/2"	65	A383	A383	A383	A383	A383	A383	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 :

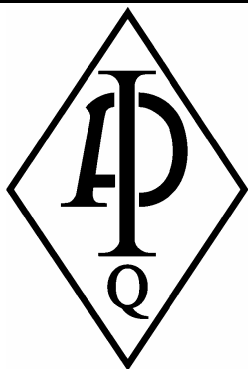
Valves subjected to ATEX are equipped with an additional specific identification plate, or an additional marking on the name plate.

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 :

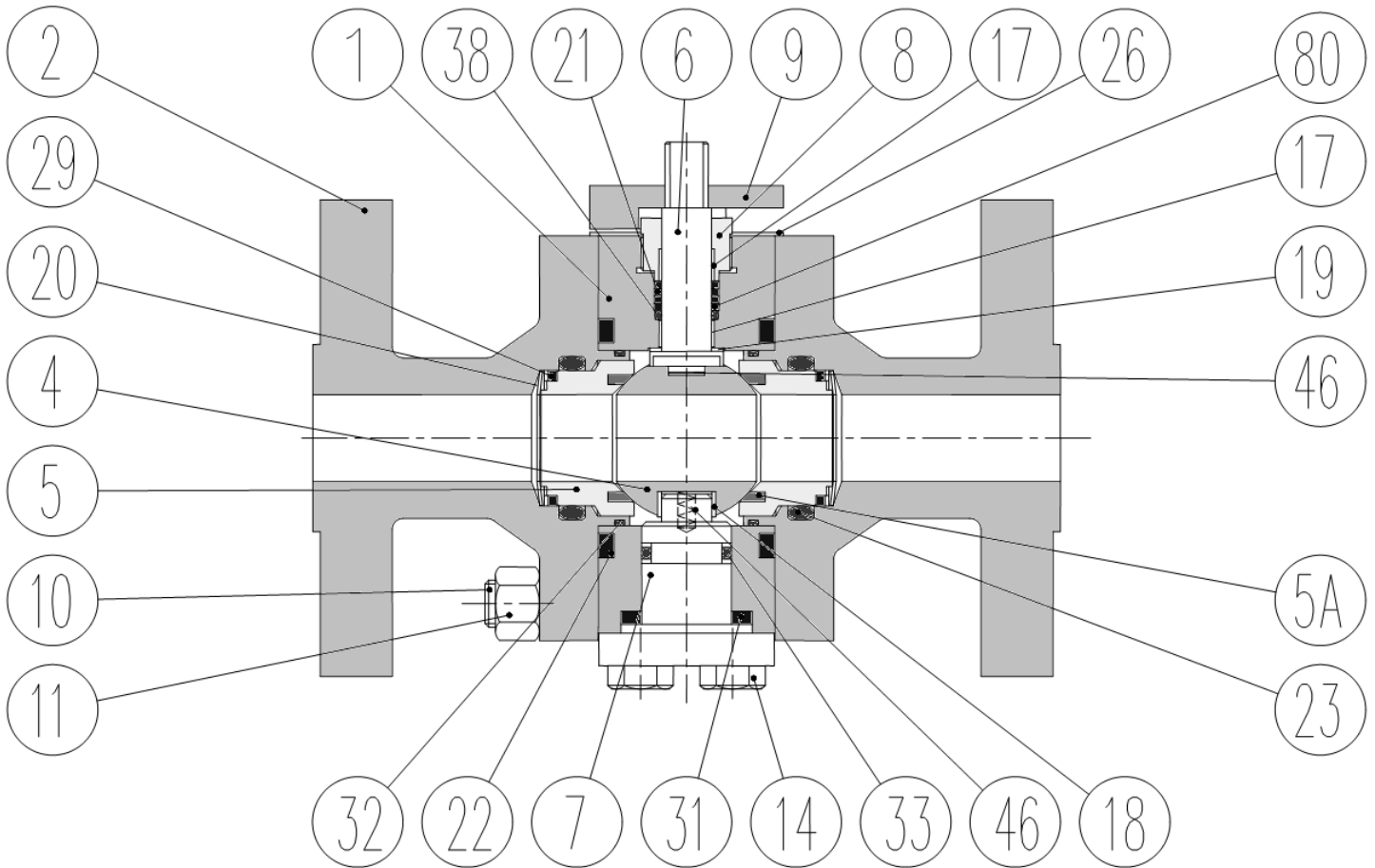
DN	NPS	DN	NPS
1 $\frac{3}{8}$	35	6 $\frac{5}{8}$	168
1 $\frac{13}{16}$	46	7 $\frac{1}{16}$	179
2 $\frac{1}{16}$	52	9	228
2 $\frac{9}{16}$	65	11	279
3 $\frac{1}{8}$	78	13 $\frac{5}{8}$	346
4 $\frac{1}{16}$	103	16 $\frac{3}{4}$	425
4 $\frac{1}{4}$	108	18 $\frac{3}{4}$	476
5 $\frac{1}{8}$	130	21 $\frac{1}{4}$	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.

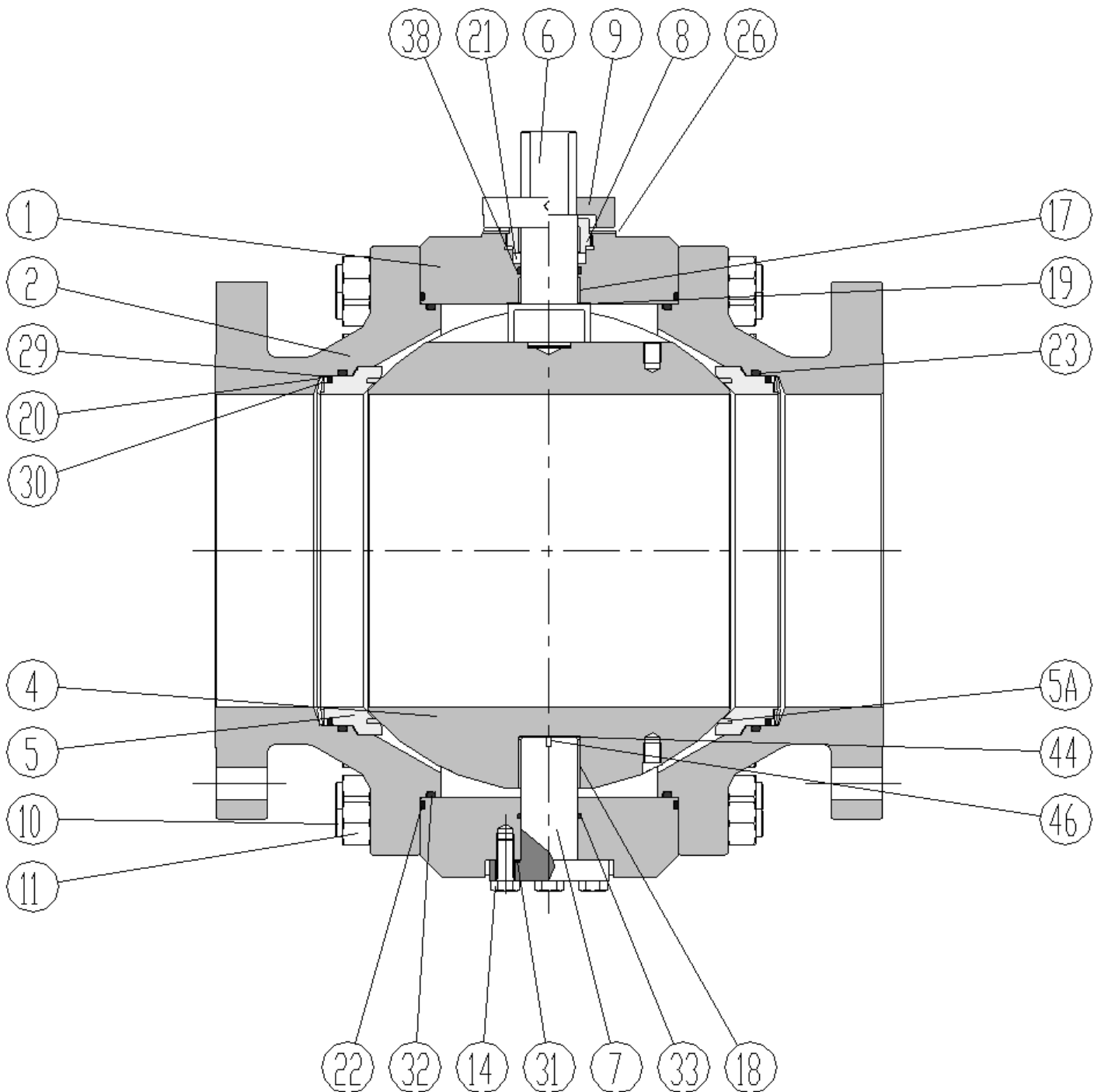
Parts List

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

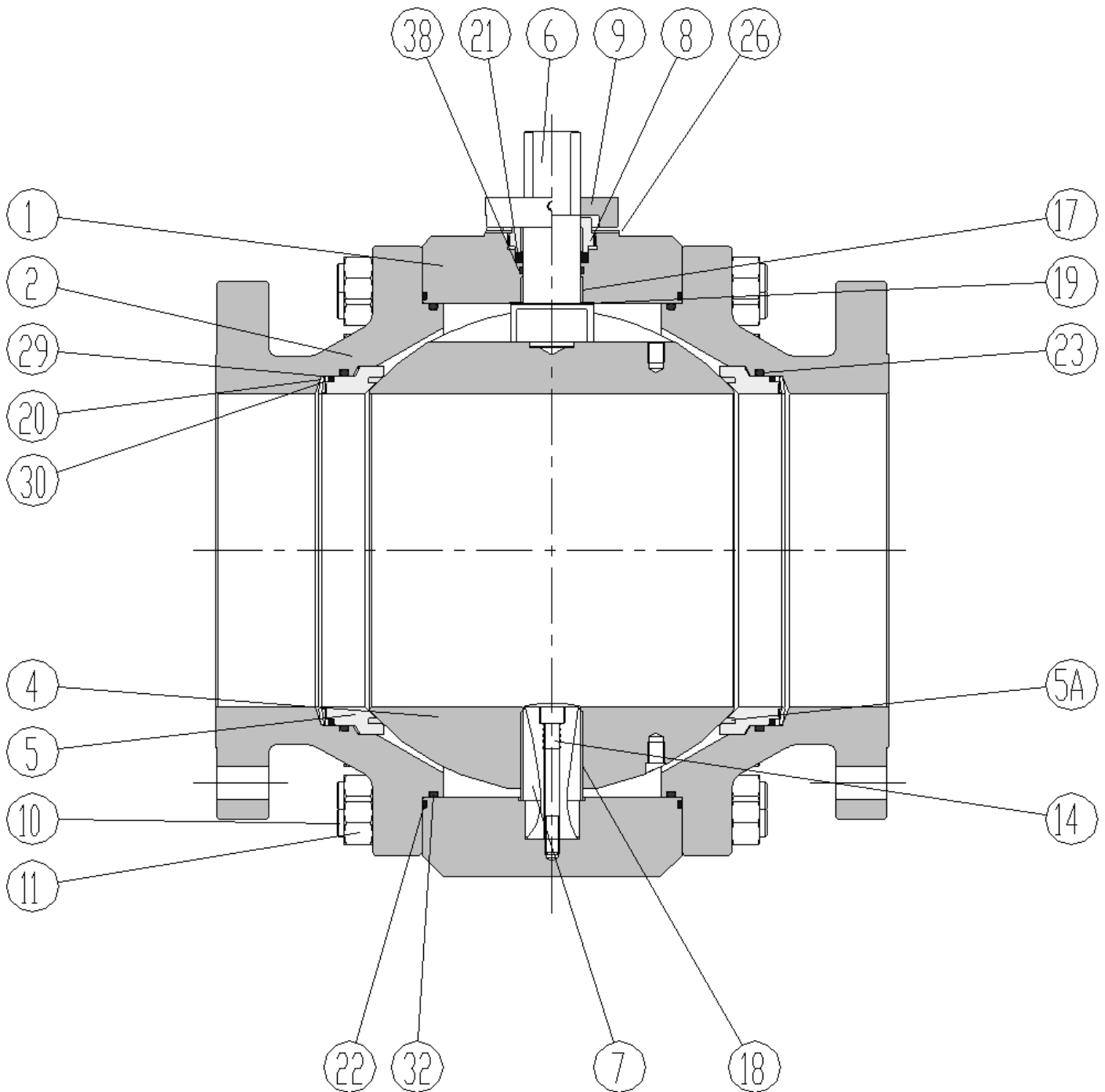
The following materials represent the principal standardized manufactured compositions. Other metallurgy can be realized. Contact our sales department. All materials can be provided in conformity with the NACE MR 0175 requirements.

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 :

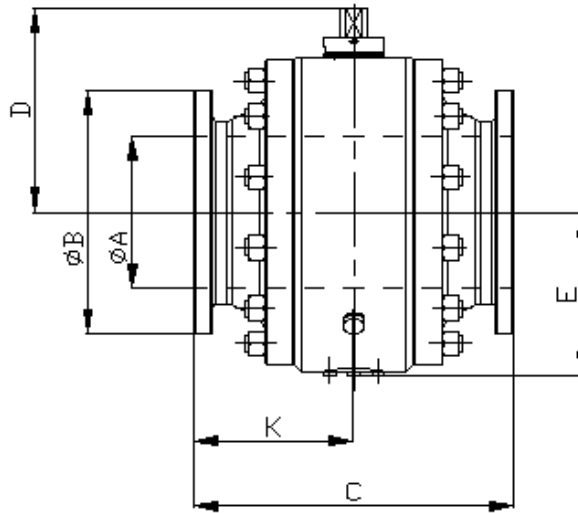
- 1-PTFE+25% glass for Classes ≤ ISO NP50 – PCTFE above.
Other materials on request. Cf. Pressure/Temperature curves.
- 2-UNS S17400 H1150 for high pressure classes.
- 3-Zinc plated + Bichromated
- 4-Self lubricating bearing PTFE
- 5-Expanded graphite Density 1.6 to 1.8 with corrosion inhibitor.
- 6-FKM=Fluoroelastomer-Several 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 :

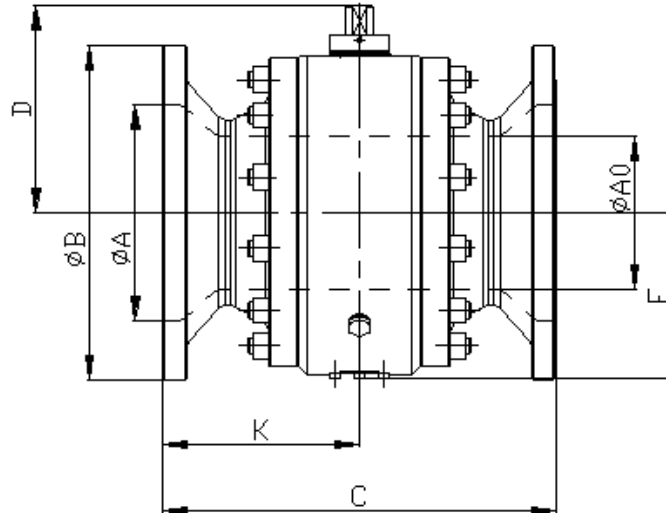
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) NF EN 1092-1.
- (2) NF EN 558-1 Table 6 serie 1
- (3) Face-to-face manufacturer (normalized face-to-face is 130mm)

- (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 :

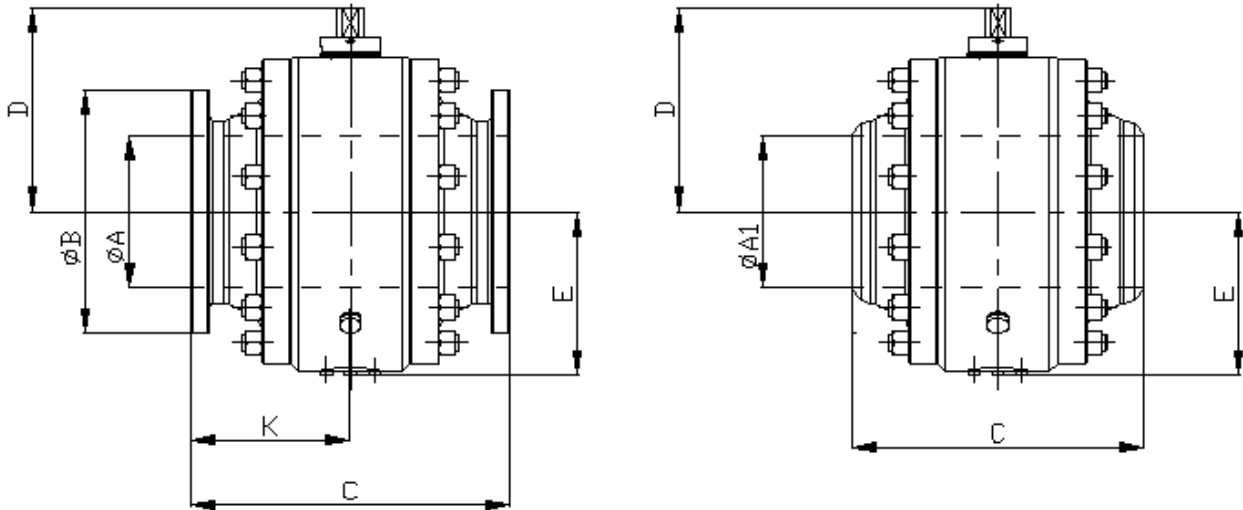
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) NF EN 1092-1.
- (2) NF EN 558-1 Table 6 serie 1

- (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 :

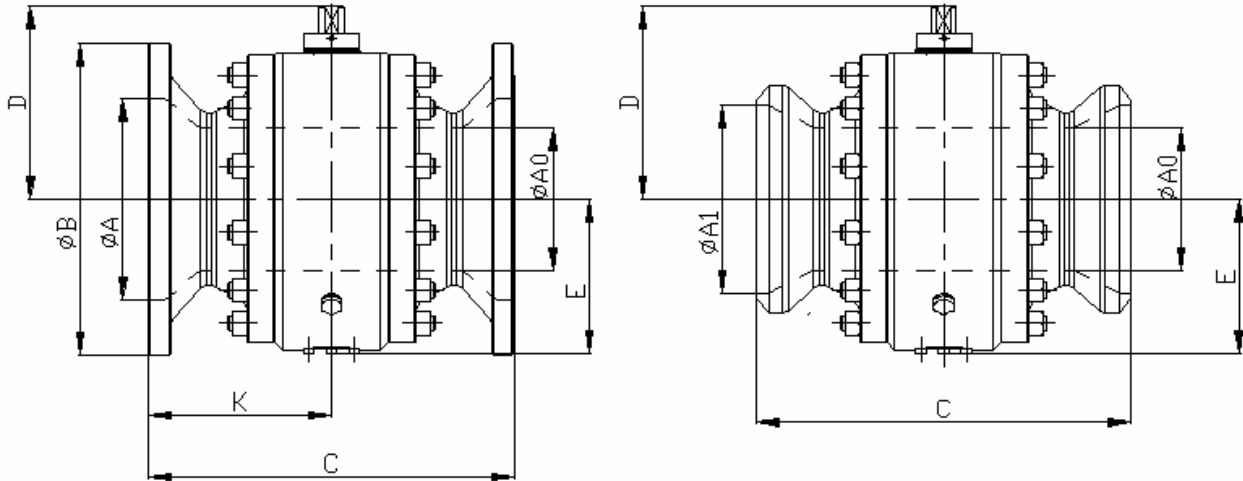
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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 :

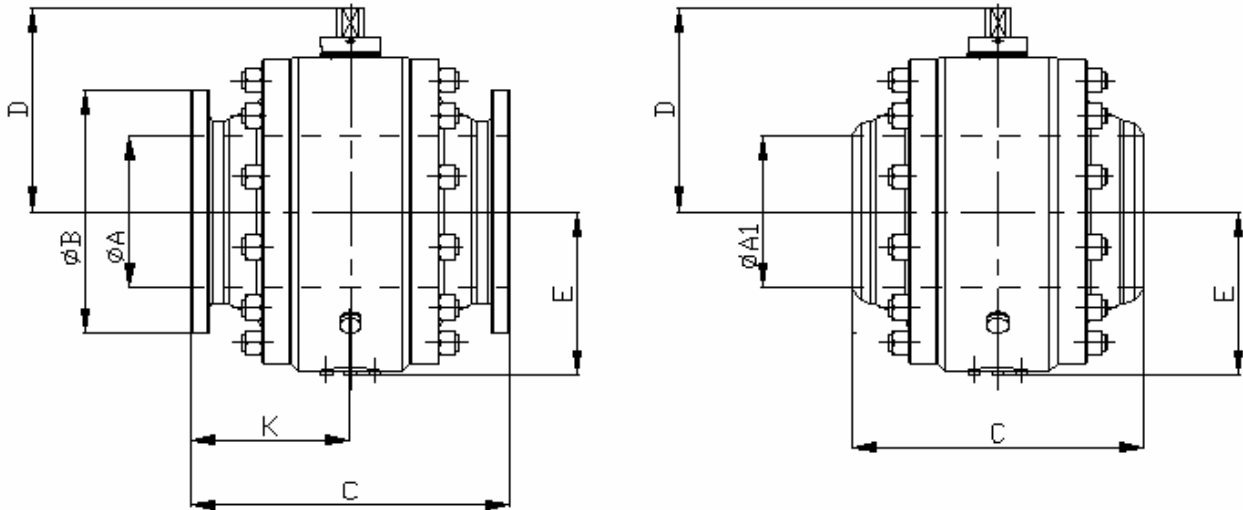
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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 :

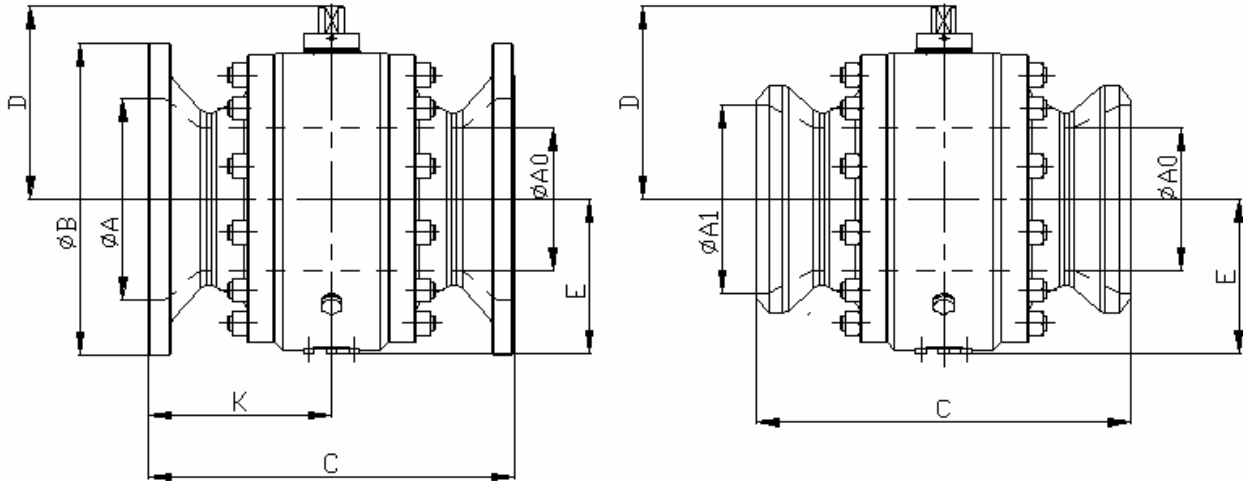
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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 :

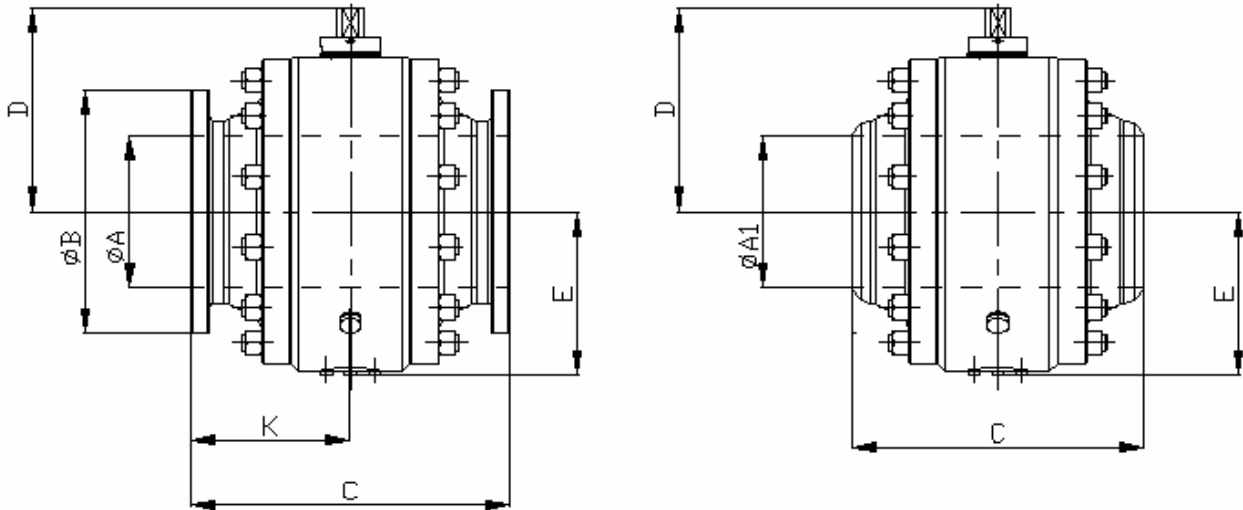
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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	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 :

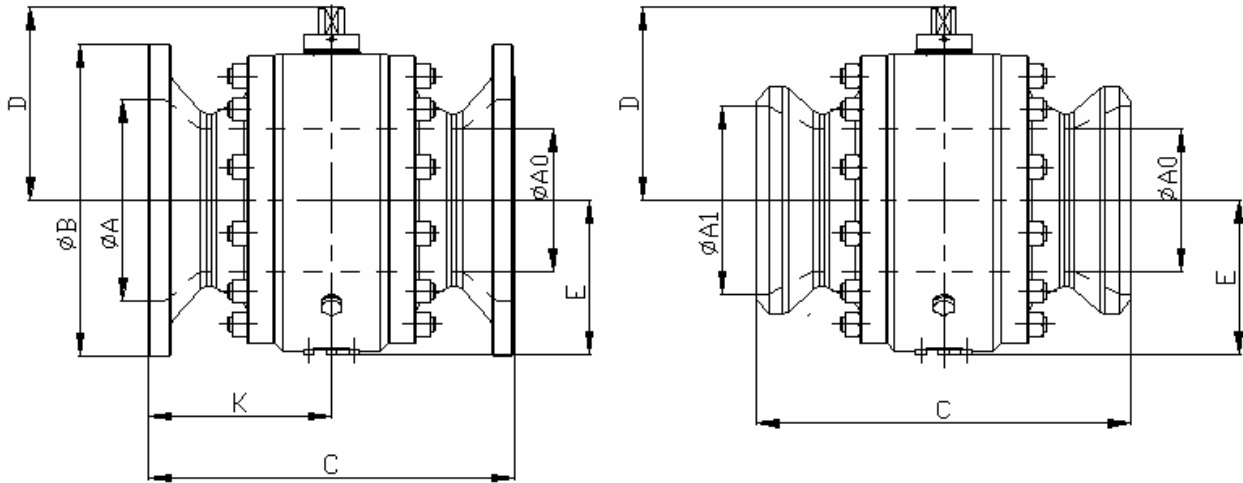
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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 :

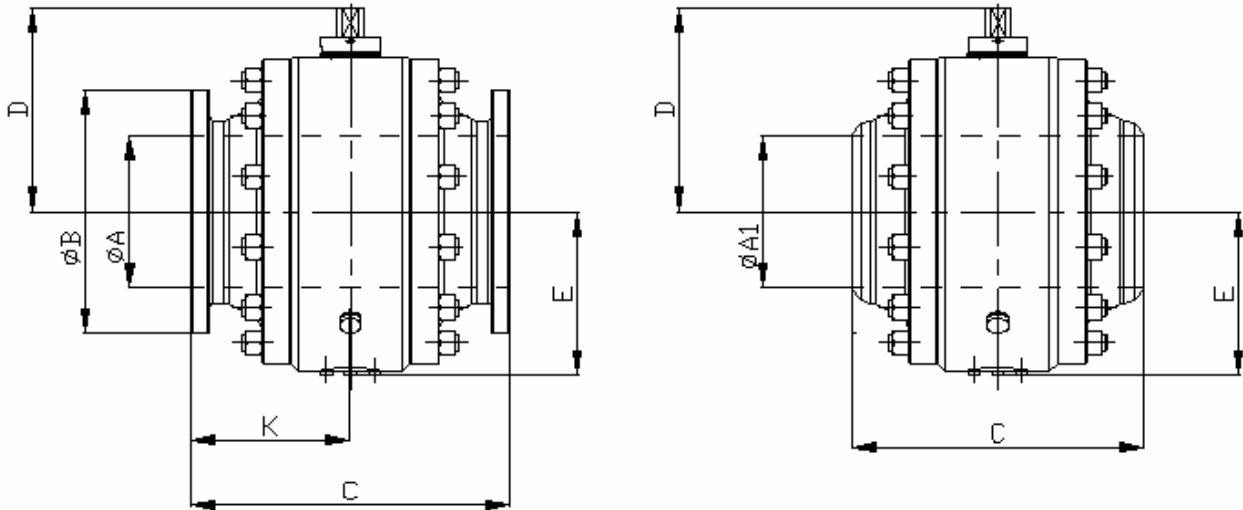
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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 :

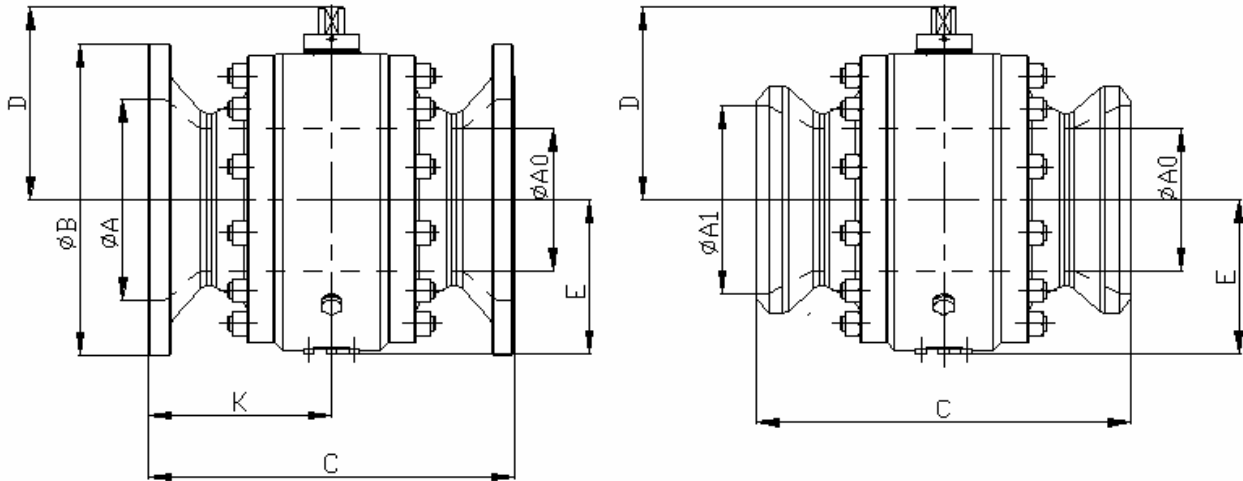
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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 :

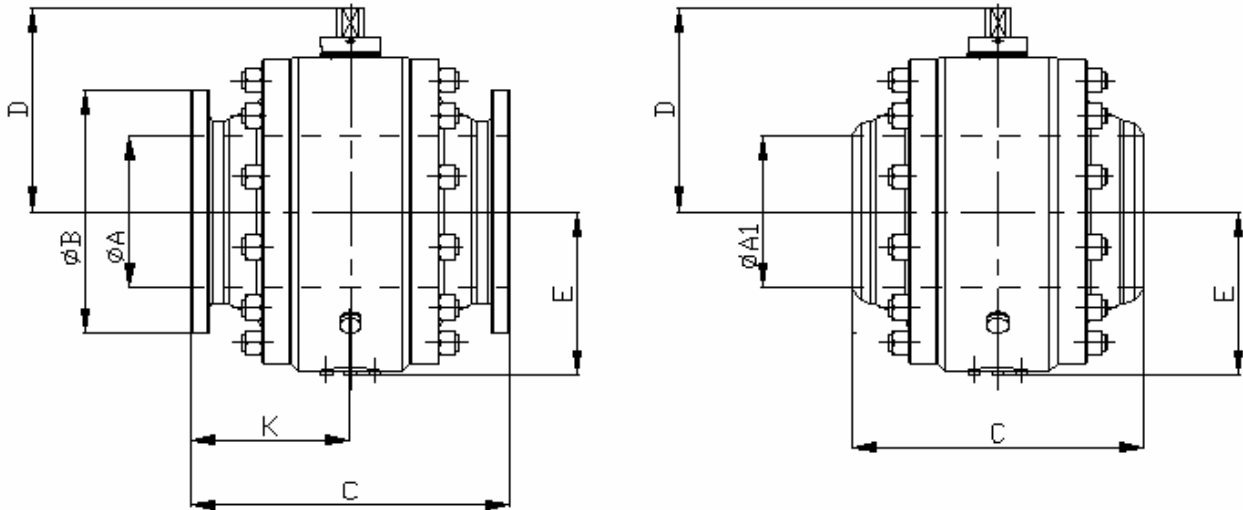
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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 :

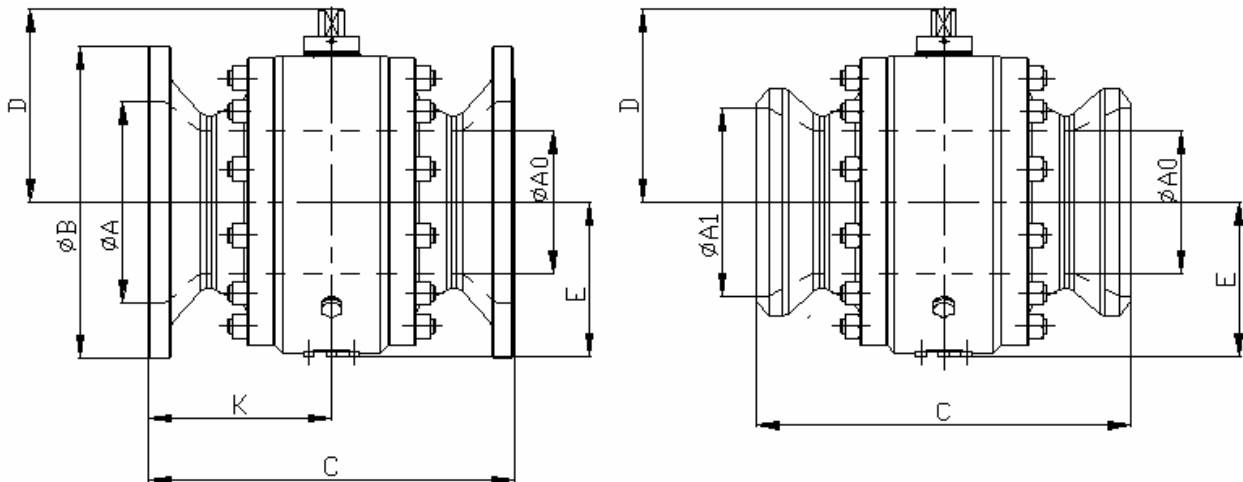
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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 :

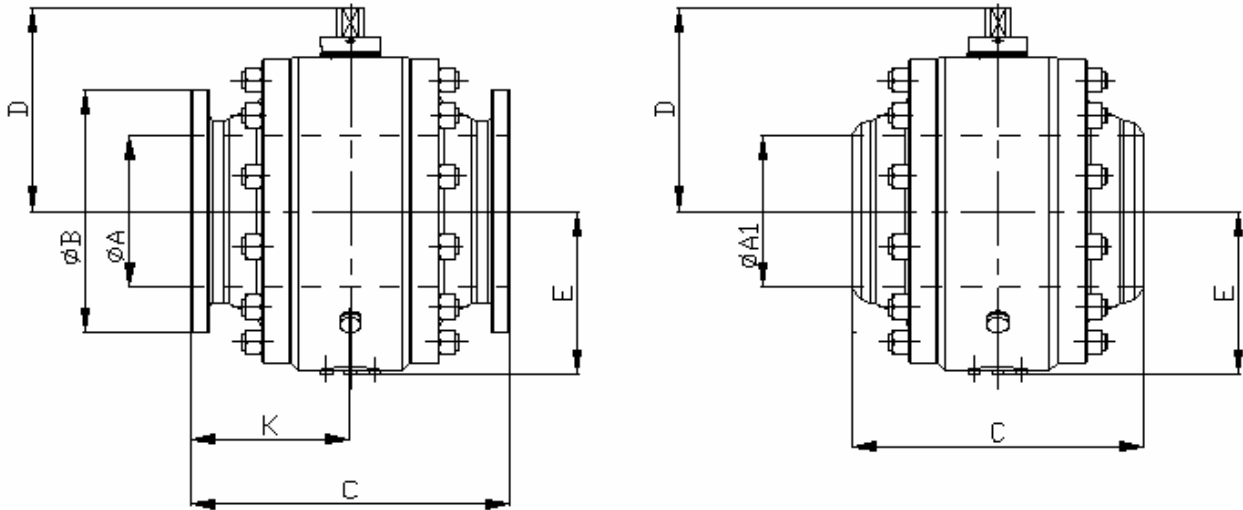
- Allowance on ØA : 0/+0.3
- Indicated weight is only for the bare stem valve.
- (1) API 6D Table 4 or ASME B16.10.
- (2) NFE 29-203 & ASME B16.5 for DN ≤ 600 and MSS SP44 / ASME B16.47 Serie A for DN > 600

- (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	Special flanges or connectors											
20	500	489												
24	600	571												

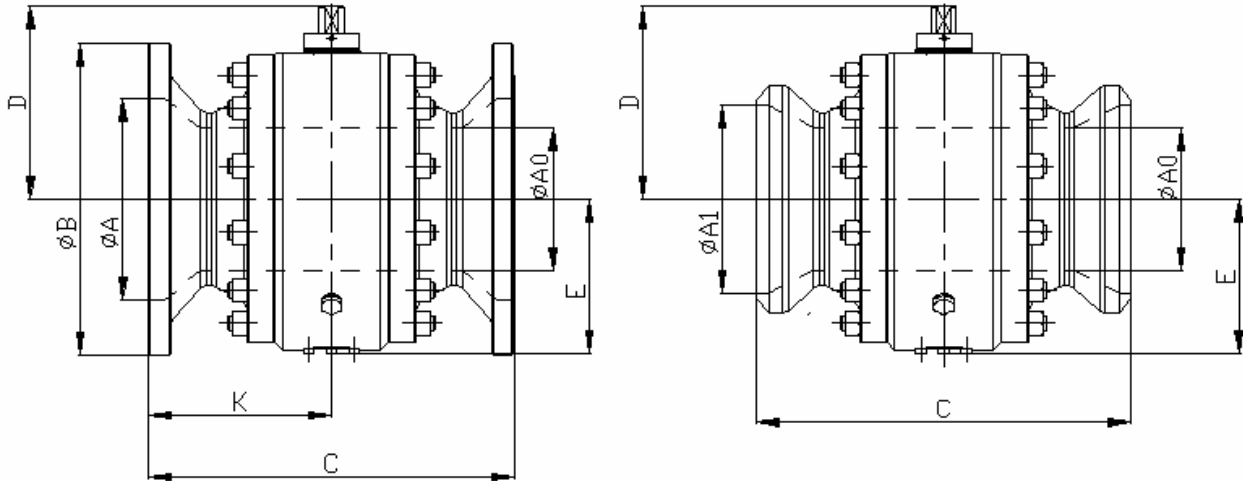
Notes :

- 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												

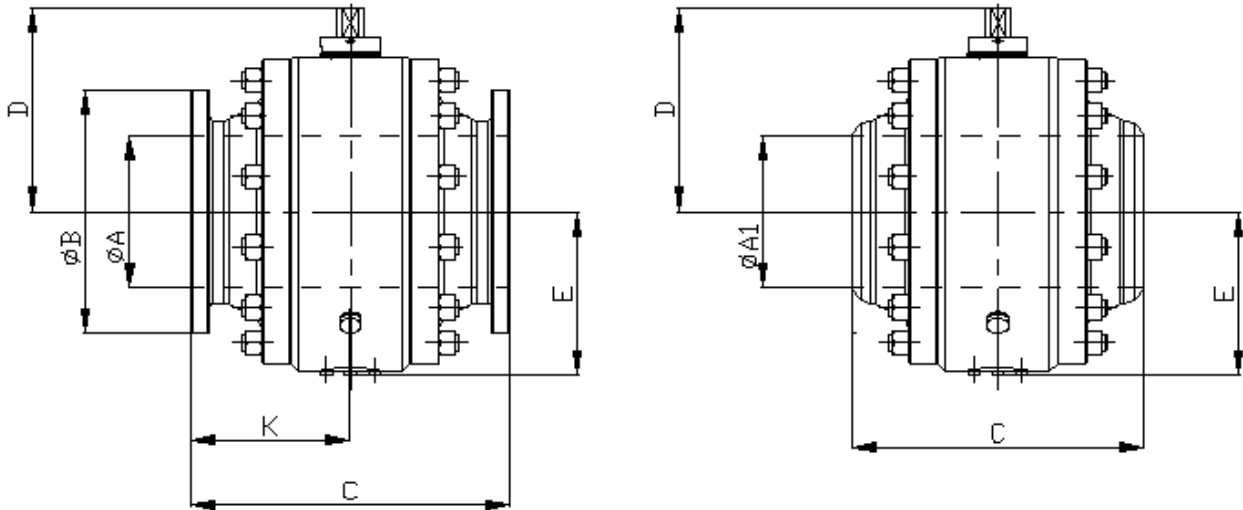
Notes :

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

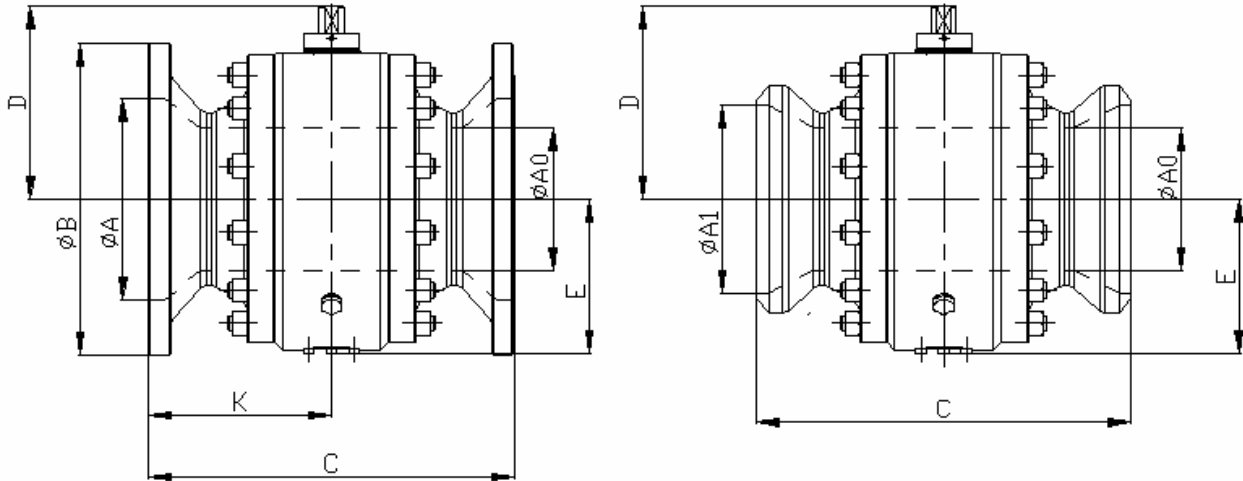
(3) Face-to-face manufacturer

- 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

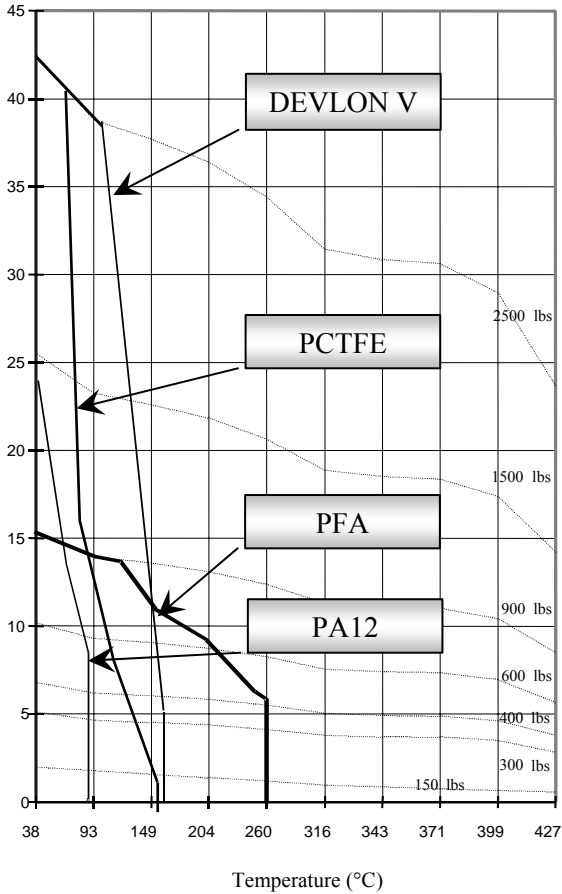
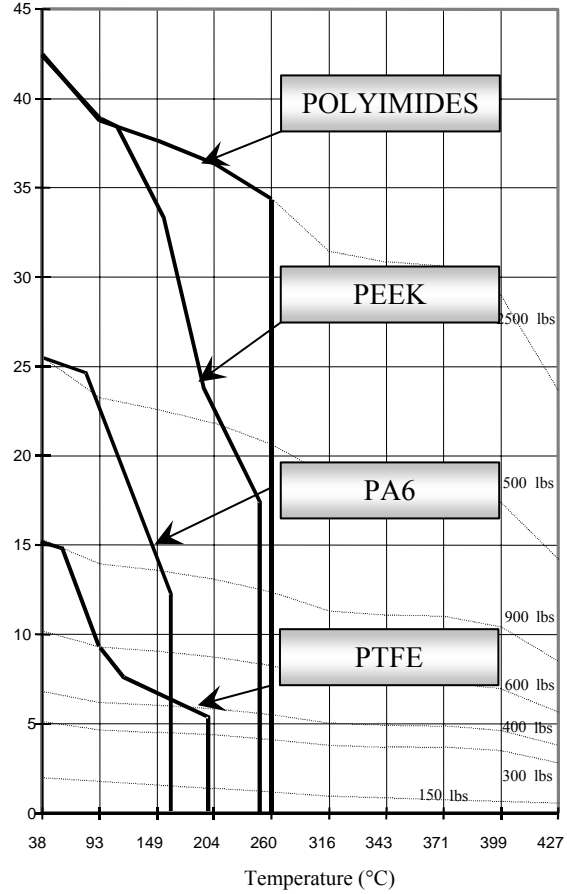


Table 2



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

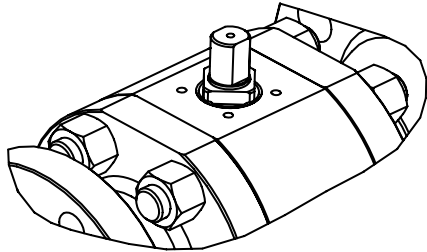
ISO Nr	ASME Pressure Classes / ISO PN						
	150 20	300 50	400 68	600 100	900 150	1500 250	2500 420
F03	1"						
F04	1" 1/2 - 2"				1" 1/2		1"
F05	3" -4 "		3"				2"
F05A					1" 1/2		1"
F07	6"		4"			3"	
F10	8"-10"		6"			4"	
F14	12"		8"			6"	
F16	14"-16"-18"		10"-12"-14"		10"-12"	8"-10"	8"
F25	20"-24"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

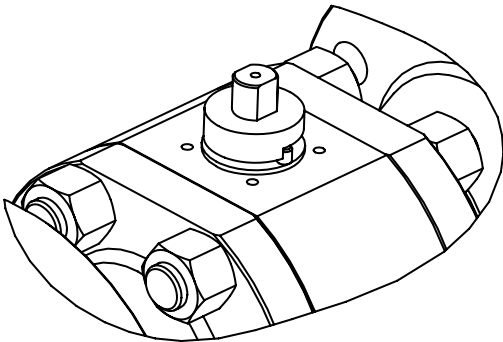
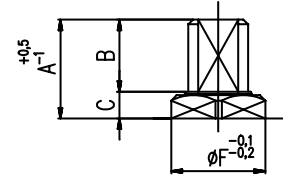
ISO Dimensions

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



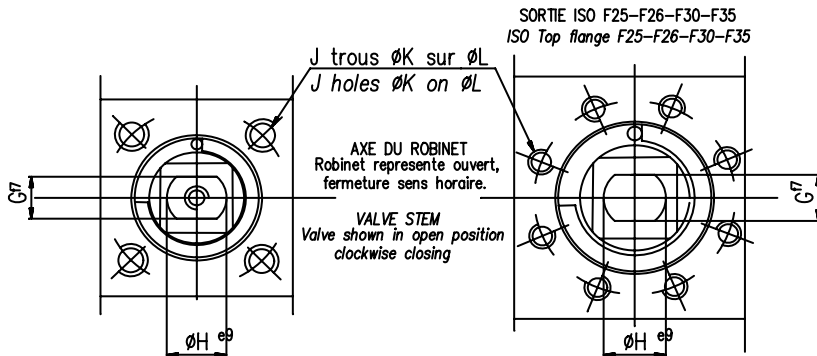
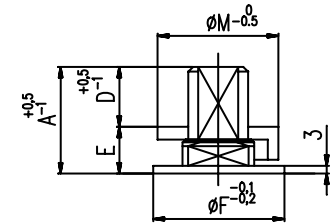
Robinet avec sortie ISO F03 – F04 – F05,
 la butee 1/4 de tour est enlevee dans le
 cas d'une motorisation

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



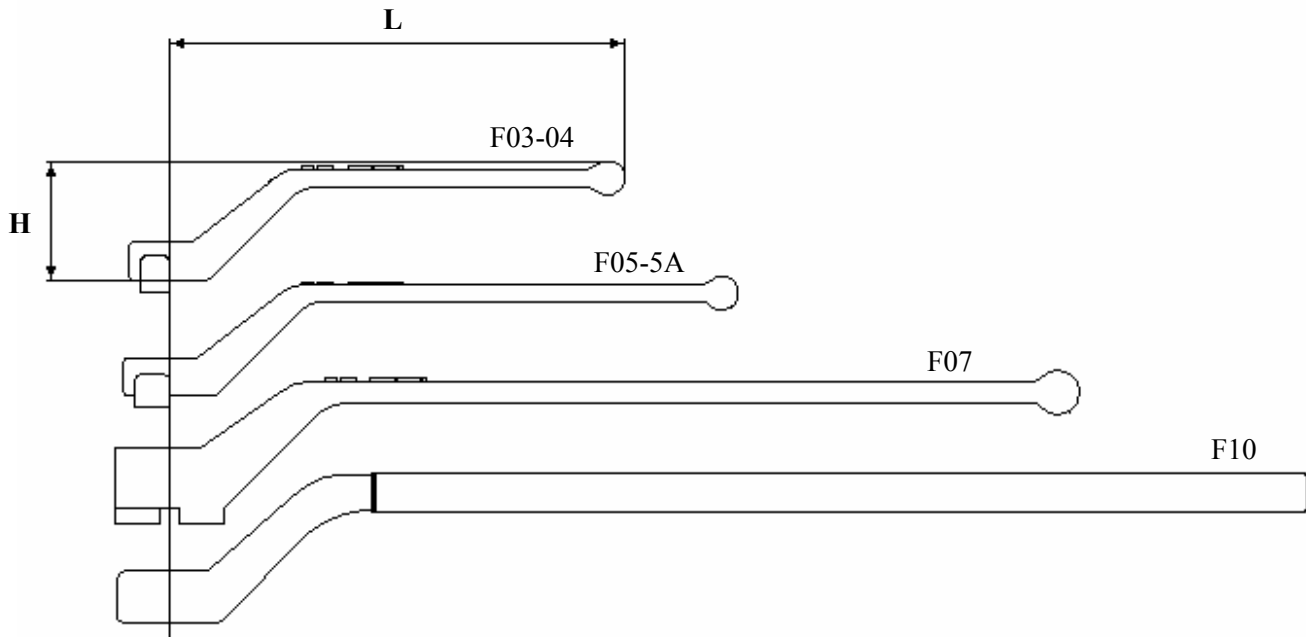
ISO Type	Dimensions mm											
	A	B	C	D	E	F	G	H	J	K	L	M
F03	22.5	15	7.5			25	8	11.5	4	M6	36	
F04	23.2	15	8.2			30	9	13	4	M6	42	
F05	36.2	26	10.2			35	17	21	4	M6	50	
F05A	26	18	8			30	11	15.5	4	M6	50	
F07	48.2			22.1	26.1	55	19	24	4	M8	70	53
F10	59.6			33	26.6	70	27	33	4	M10	102	68
F14	81.9			47.9	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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