

**SITINDUSTRIE**



**METAL**



**ITAL PARTS  
GROUP**

**M A D E I N I T A L Y**

**BALL VALVES  
TECHNICAL CATALOGUE**



# BALL VALVES TECHNICAL CATALOGUE

### VALVO METAL PRODUCTION UNIT

We are pleased to introduce to you the valves manufactured in our VALVOmetal production unit.

VALVOmetal started manufacturing valves for the industry in 1955 in its plant in Valduggia, Italy, and today is regarded as a very important supplier of ball valves in all its configuration, through conduit and wedge gate valves, globe and check valves in both bolted bonnet and pressure seal executions.

The complete range of valves can be produced both in forged and cast material depending on our standard or customer request. Addressed mainly to critical applications in oil & gas, petrochemical, power generation, nuclear, food and dairy industries.

The Company adheres to a Quality Management System in accordance with ISO 9001:2008 and API Q1. Its products follow the guidelines and are certified to API 6D, European Directive 97/23/CE (PED) and ATEX. Products can be tested by other Third Party Agencies like Bureau Veritas, TÜV, RINA, Lloyd's Register, Stoomwezen and other. Design and manufacturing are carried out in accordance with the main international stand-

ards, i.e. ISO, API, ASME, ANSI, ASTM, NACE, BS, AFNOR, DIN and other. Material offered includes carbon steel, stainless steel, exotics and special alloys.

SITINDUSTRIE VALVOMETAL is a manufacturer capable of offering different packages of valves. A lengthy reference list, containing the most respected names in the industries that we serve, guarantees the capabilities and strength of our company in developing and finding solutions in all project areas and specialities.

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

Furthermore, SITINDUSTRIE VALVOMETAL, in response to industry requirements, has launched a "low emission" design range of gate and globe valves, called ECO-VALVO, placing Sitindustrie Valvometal in a unique position, satisfying the most stringent and demanding applications of our customers, world-wide.



### BALL VALVES – GENERAL INFORMATION

#### APPLICATIONS

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

#### MEDIA

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

#### ADVANTAGES

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

#### PRODUCT RANGE

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



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

Top entry ball valves are produced in onepiece cast body, bolted cover, trunnion mounted ball, full and reduced bore.

<b>TRUNNION</b>						
<b>ENDS</b>	<b>R.F. - R.T.J. - B.W. - Full or Reduced Bore</b>					
<b>CLASS</b>	150	300	600	900	1500	2500
<b>NPS</b>	1/2"-60"	1/2"-60"	1/2"-60"	1/2"-48"	1/2"-36"	1/2"-30"

<b>FLOATING</b>						
<b>ENDS</b>	<b>R.F. - R.T.J. - B.W. - Full or Reduced Bore</b>					
<b>CLASS</b>	150	300	600	900	1500	2500
<b>NPS</b>	1/2"-10"	1/2"-8"	1/2"-4"	1/2"-2"	1/2"-1 1/2"	1/2"-1"

Other dimensions on request.

Size: from 1/2" to 60"

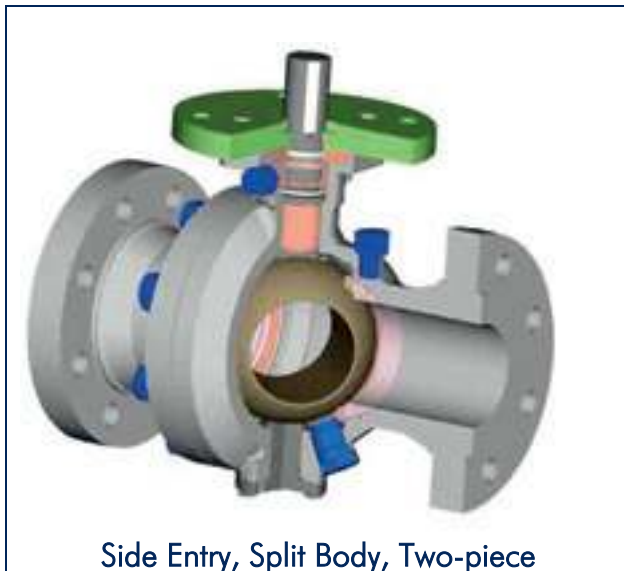
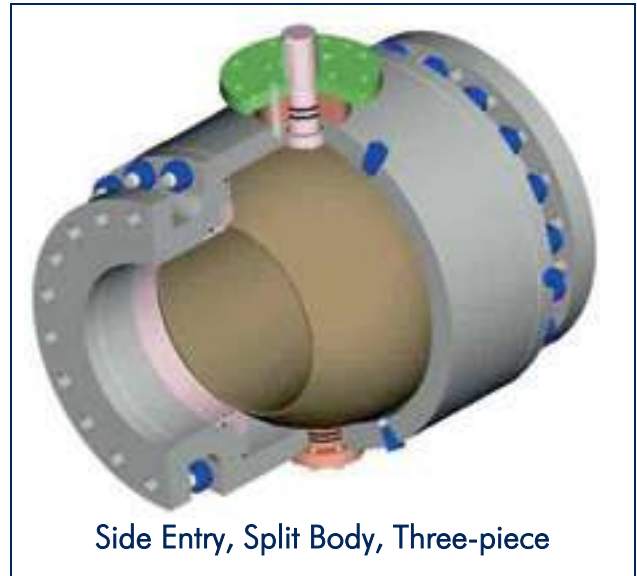
ANSI Rating Class : 150 to 2,500  
API Pressure Rating : 2,000 to 10,000 psi  
Interpolated ratings also available

Trunnion mounted design starting from 1/2"

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

Side-Entry, Top-Entry and Fully welded construction

Manual, gear, or power assisted operation

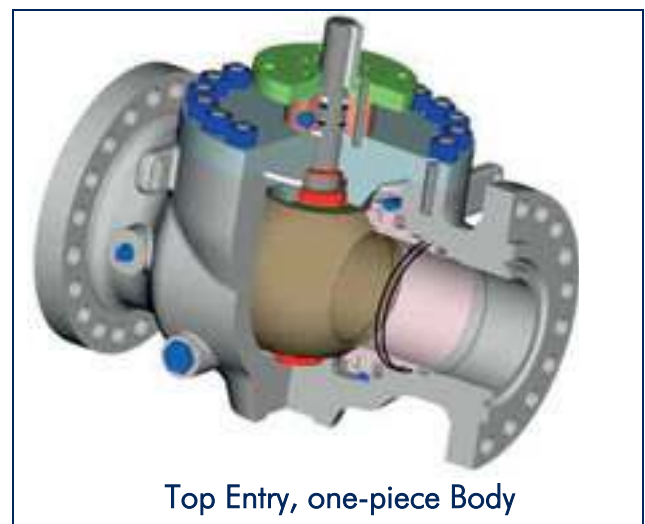


### STANDARD FEATURES

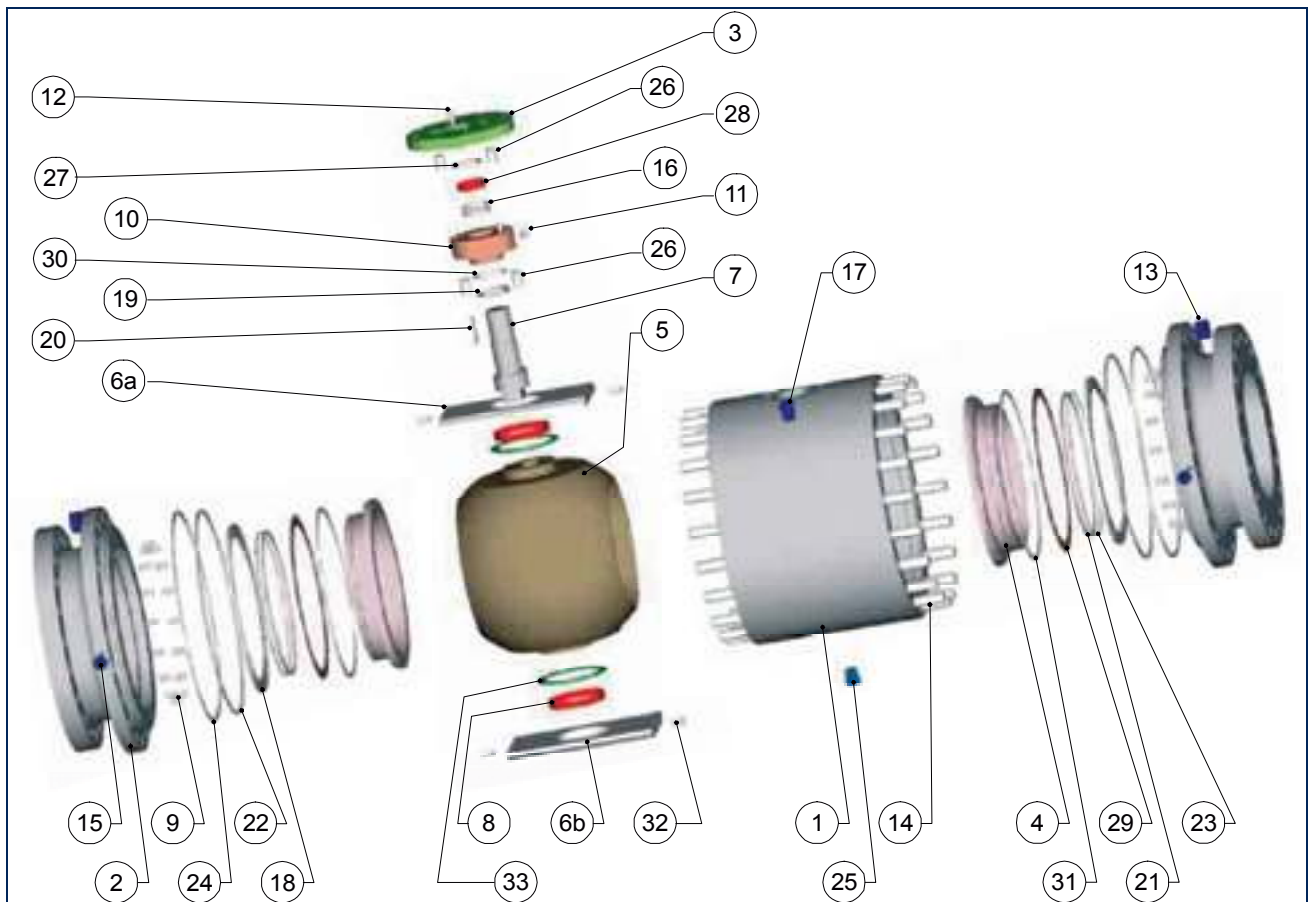
- Fire safe design
- Split body, side-entry, 2 or 3-piece body
- Full and reduced bore
- Bidirectional
- Upstream seal
- Soft seated
- Bubble tight seal
- Stem sealant injection
- Automatic body pressure relief
- Blow out proof stem
- Anti static device

### OPTIONAL FEATURES

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



### 3-PCE SPLIT BODY SIDE-ENTRY BALL VALVES



#### Identification of the Valve Parts

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

### TRUNNION MOUNTED BALL

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



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

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

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

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

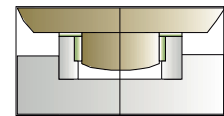
No excessive force is placed on the downstream seat ring.

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

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

### Plate Supported Ball

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



### BLOW OUT PROOF STEM DESIGN

Stem is separate from the ball.

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

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

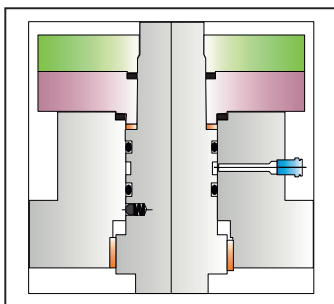
Sealant injection fitting is available to temporarily renew the seal, in emergency conditions.

### FIRE SAFE DESIGN

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

### ANTISTATIC DEVICE

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



### STEM EXTENSION

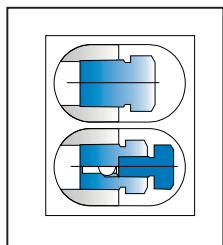
A stem extension is required for underground installation or for valves which are not easily accessible.

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



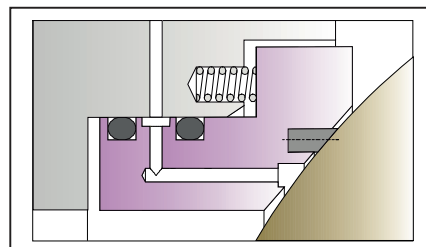
### BODY VENT AND DRAIN

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



### SEAT SEALANT INJECTION

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



### FLOATING SEAT RINGS

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

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

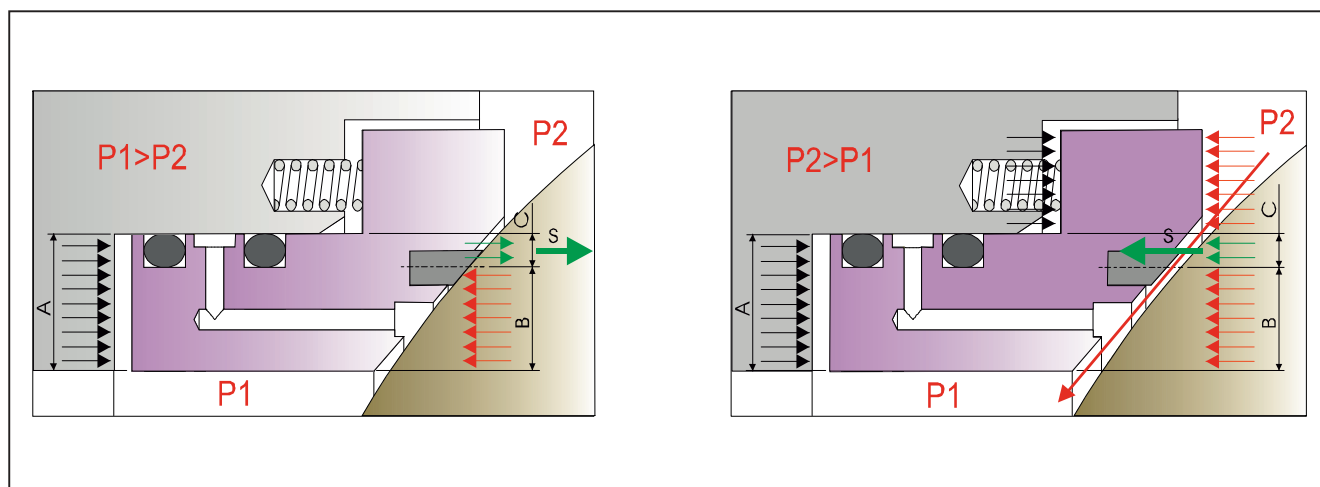
The purpose of the springs is to activate sealing at low pressure, when the "piston action" is not yet effective.

### SINGLE PISTON EFFECT

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

### SELF RELIEVING

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



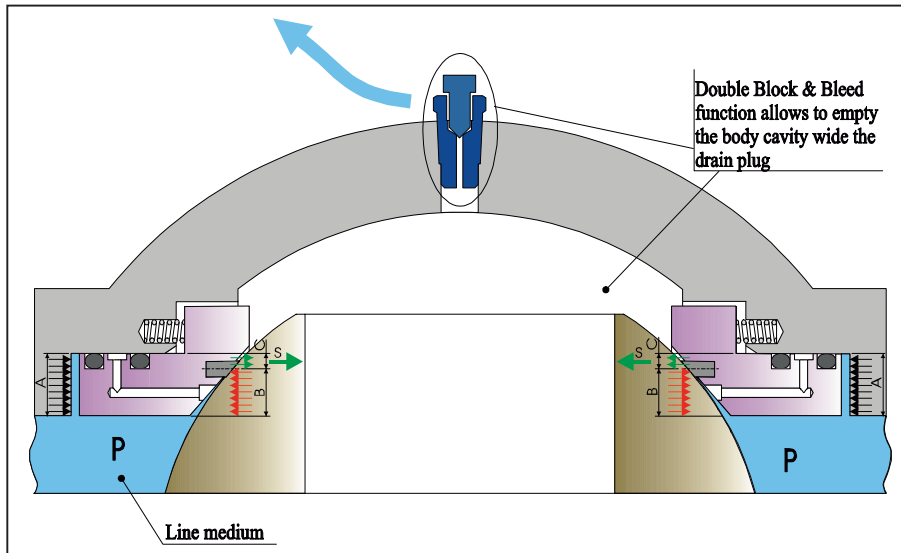
Single Piston Effect

Self Relieving

### DOUBLE BLOCK AND BLEED

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

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



Double Block & Bleed

### DOUBLE PISTON EFFECT

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

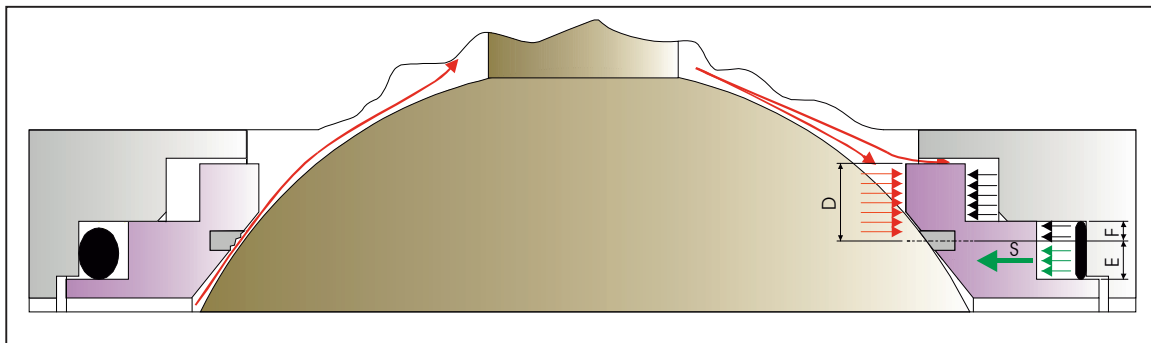
While the standard feature of the single piston effect produces the seal at the seat exposed to line pressure, the downstream seat vents pressure.

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

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

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

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



Double Piston Effect

### MATERIAL SELECTION GUIDE

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

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

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

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

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

#### NOTE :

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

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

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

Other materials and special alloy are available upon specific request.

Above mentioned body materials refer to forged products.

Equivalent cast grades are the following :

A105 = A216-WCB

A350-LF2 = A352-LCB

A182-F316 = A351-CF8M

A182-F51 = A890-J92205 (UNS S31803)

A182-F53 = A890-J93404 (UNS S32750)

A182-F44 = A351-CK3MCuN (UNS S31254)

Equivalent grades according to DIN standards are also available.

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

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

Material for O-rings are the following:

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

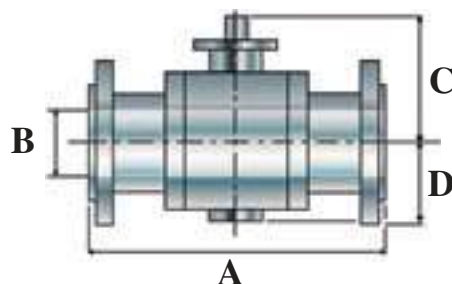
various trademarks (Elastolion, Aflas, FR-58, etc...)

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

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

### ANSI CLASS 150 Lbs (PN 20)

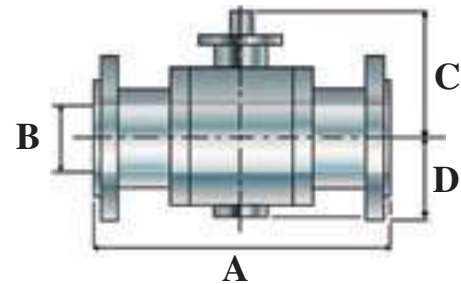
Working Pressure 275 psi (19 bar) CWP  
Hydrostatic Shell Test 420 psi (29 bar)



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

### ANSI CLASS 300 Lbs (PN 50)

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

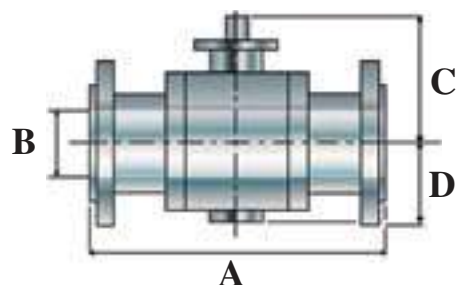


NOMINAL SIZE		END TO END API 6D-B 16.10						VALVE BORE API 6D		CENTERLINE TO BOTTOM		CENTERLINE TO TOP STEM	
		A (RF)		A (RTJ)		A (BW)		B		D		C	
inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	50	8"1/2	216	9"1/8	232	8"1/2	216	1.93"	49	5"	127	6"	152
3 x 2	80 x 50	11"1/8	282	11"3/4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

### DIMENSIONS

#### ANSI CLASS 600 Lbs (PN 100)

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

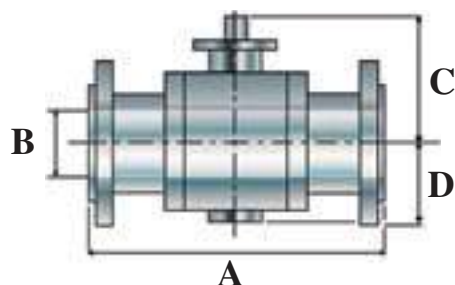


NOMINAL SIZE		END TO END API 6D-B 16.10						VALVE BORE API 6D		CENTERLINE TO BOTTOM		CENTERLINE TO TOP STEM	
		A (RF)		A (RTJ)		A (BW)		B		D		C	
inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	50	11"1/2	292	11"5/8	295	11"1/2	292	1.93"	49	4"3/8	110	5"1/2	140
3 x 2	80 x 50	14"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

### DIMENSIONS

#### ANSI CLASS 900 Lbs (PN 150)

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

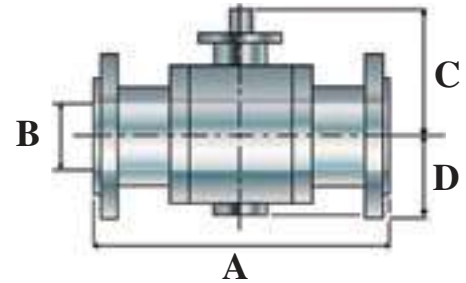


NOMINAL SIZE		END TO END API 6D-B 16.10						VALVE BORE API 6D		CENTERLINE TO BOTTOM		CENTERLINE TO TOP STEM	
		A (RF)		A (RTJ)		A (BW)		B		D		C	
inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	50	14"1/2	368	14"5/8	371	14"1/2	368	1.93"	49	4"3/8	110	5"1/2	140
3 x 2	80 x 50	15"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

### DIMENSIONS

#### ANSI CLASS 1500 Lbs (PN 250)

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



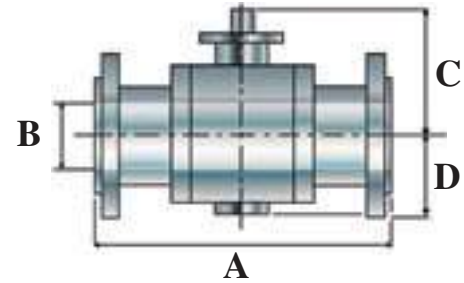
NOMINAL SIZE		END TO END API 6D-B 16.10						VALVE BORE API 6D		CENTERLINE TO BOTTOM		CENTERLINE TO TOP STEM	
		A (RF)		A (RTJ)		A (BW)		B		D		C	
inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	50	14"1/2	368	14"5/8	371	14"1/2	368	1.93"	49	4"3/8	110	5"1/2	140
3 x 2	80 x 50	18"1/2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



### DIMENSIONS

#### ANSI CLASS 2500 Lbs (PN 420)

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



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

### FLOW COEFFICIENT – CV VALUES

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

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

FLOW COEFFICIENT OF BALL VALVES IN FULL OPEN POSITION

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

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

### POWER ASSISTED VALVES

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

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

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

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





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