

Valbart

***API 6D & 6A Trunnion Mounted
Side Entry, Welded Body, & Top Entry Ball Valves***





Flowserve Valbart Main Office



Flowserve Valbart Engineering Office

Profile

Valbart was founded in 2003 as a joint venture. Since then, the company has witnessed tremendous growth and has been recognized as the fastest growing firm in its sector.

Acquired in 2010 by Flowserve Corporation following a long period of sustained growth, Valbart further expanded its technical resources and product offerings.

The company specializes in designing and manufacturing API 6A and API 6D Trunnion Mounted ball Valves. The company is driven by constant innovation to increase its existing range of products. Apart from being one of the leading suppliers of TMBV, Valbart is also recognized for its production of Trunnion Mounted Control Ball Valves, Cryogenic Valves, Twin Ball Double Block & Bleed Valves and Rising Stem Friction Free Ball Valves.

The technical know-how, design and experience in producing TMBV's are Valbart's strongest assets. The company continuously improves and builds on these assets. The employment of highly talented and experienced professionals in key technical management positions is proof of the Company's commitment to a continuous improvement.

With a highly equipped facility distributed in four buildings with a total internal area of 18,000 sqm (194,000 sq. ft), Valbart aims at continuing to produce and provide valves of the highest quality and with a growth reflecting the one experienced so far.

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Flowserve Valbart Testing and VAC Centre



Flowserve Valbart Warehouse

Product range

Core products		Special Applications
 <p>API 6D/6A Side Entry (Up to 64")</p>	 <p>Trunnion Mounted Control Ball Valve</p>	 <p>Cryogenic</p>
 <p>API 6D/6A Top Entry (Up to 56")</p>	<p>VALBART TRUNNION MOUNTED BALLVALVES API 6D & 6A Sizes: 1" - 64" Pressure class: 150# - 2500# API 2000 - API 15000</p>	 <p>Subsea</p>
 <p>API 6D/6A Welded Body (Up to 64")</p>	 <p>Rising Stem Ball Valve</p>	 <p>Double Block & Bleed</p>

Product range

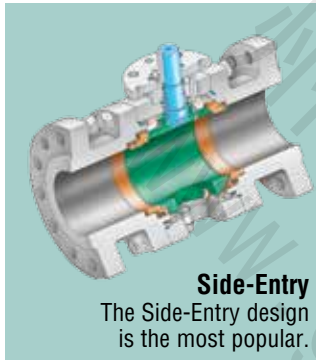
PRODUCT RANGE

API 6D

API 6A

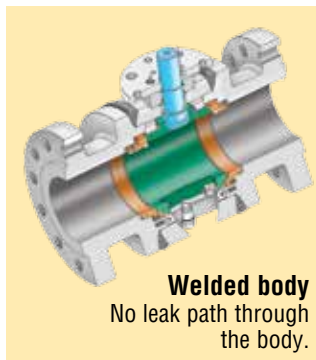
Service	Size (in/mm) – Pressure Range				Size (in/mm) – Pressure Range			
	ASME 150 - 600	ASME 900	ASME 1500	ASME 2500	API 2000	API 3000	API 5000	API 10000

SIDE ENTRY - MOD. VB2/VB3



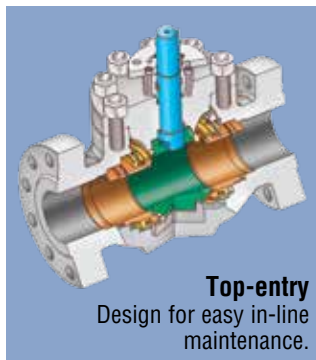
Standard -29°C to 220°C / -20°F to 428°F	1" - 64" 25 - 1600	1" - 56" 25 - 1400	1" - 42" 25 - 1050	1" - 24" 25 - 600	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280
Low temperature -46°C / -50°F	1" - 64" 25 - 1600	1" - 56" 25 - 1400	1" - 42" 25 - 1050	1" - 24" 25 - 600	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280
Cryogenic -47°C to -196°C / -52°F to -320°F	1" - 36" 25 - 900	1" - 36" 25 - 900	1" - 24" 25 - 600	1" - 12" 25 - 300	(1)	(1)	(1)	(1)
Sub sea	1" - 64" 25 - 1600	1" - 56" 25 - 1400	1" - 42" 25 - 1050	1" - 24" 25 - 600	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280
Underground	1" - 64" 25 - 1600	1" - 56" 25 - 1400	1" - 42" 25 - 1050	1" - 24" 25 - 600	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280
High temperature Above 220°C / 428°F	1" - 36" 25 - 900	1" - 36" 25 - 900	1" - 24" 25 - 600	1" - 12" 25 - 300	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280

WELDED BODY - MOD. VW1



Standard -29°C to 220°C / -20°F to 428°F	2" - 64" 50 - 1600	2" - 56" 50 - 1400	2" - 42" 50 - 1050	(1)
Low temperature -46°C / -50°F	2" - 64" 50 - 1600	2" - 56" 50 - 1400	2" - 42" 50 - 1050	(1)
Sub sea	2" - 64" 50 - 1600	2" - 56" 50 - 1400	2" - 42" 50 - 1050	(1)
Underground	2" - 64" 50 - 1600	2" - 56" 50 - 1400	2" - 42" 50 - 1050	(1)

TOP ENTRY - MOD. VT1



Standard -29°C to 220°C / -20°F to 428°F	2" - 64" 50 - 1600	2" - 56" 50 - 1400	2" - 42" 50 - 1050	2" - 24" 50 - 600	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280
Low temperature -46°C / -50°F	2" - 64" 50 - 1600	2" - 56" 50 - 1400	2" - 42" 50 - 1050	2" - 24" 50 - 600	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280
Cryogenic -47°C to -196°C / -52°F to -320°F	2" - 36" 50 - 900	2" - 36" 50 - 900	2" - 24" 50 - 600	2" - 12" 50 - 300	(1)	(1)	(1)	(1)
Sub sea	2" - 64" 50 - 1600	2" - 56" 50 - 1400	2" - 42" 50 - 1050	2" - 24" 50 - 600	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280
Underground	2" - 64" 50 - 1600	2" - 56" 50 - 1400	2" - 42" 50 - 1050	2" - 24" 50 - 600	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280
High temperature Above 220°C / 428°F	2" - 36" 50 - 900	2" - 36" 50 - 900	2" - 24" 50 - 600	2" - 12" 50 - 300	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280	1" - 11" 25 - 280

(1) - Please consult manufacturer. For higher sizes and/or higher pressure ratings, please consult manufacturer.

Manufacturing capabilities

Flowserve Valbart, located in Mezzago, Italy, is a world leader in industrial valve manufacturing, and a group of professional engineers with long standing experience in ball valve design and manufacturing.

R&D department

Flowserve Valbart's R&D facilities provide the company with extensive testing capabilities such as qualification tests to determine reliability and service life under critical operating conditions and pressure testing in accordance with the ASME code as well as the other industry standards (see page 32 for details).

In-house capabilities

We have a machining and welding shop in house.

The welding facility is equipped with hi-tech SAW robots operated by fully qualified welders.

The NDT examinations of the weld bevels and beams are carried out by our qualified QC personnel using our own ultrasonic, magnetic particle, and dye penetrant equipment.

Certification and approvals

The quality program is fully compliant with the industry's most stringent standards.

Inventory of finished components

Flowserve Valbart facilities have inventory of finished components stored in our workshop facility that are identified with a code number.

The storage area will keep expanding along with our company's growth.



Valbart In-house testing rigs and facilities



In-house testing facilities for valves up to 1600 mm (64")

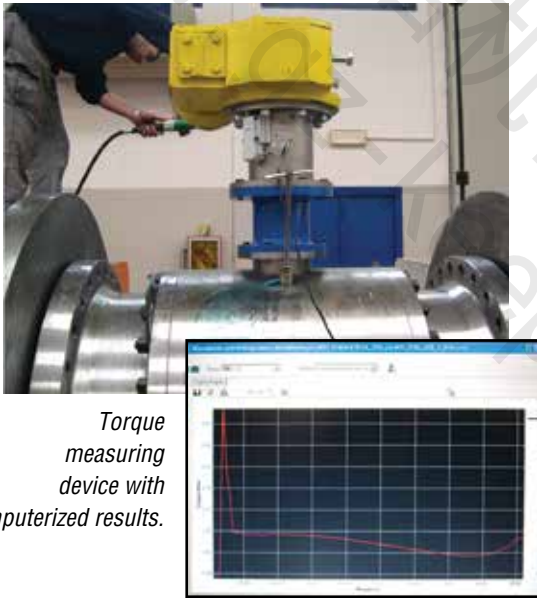
Engineered solutions

Flowserve Valbart has a strong Engineering Design Group with extensive experience in critical applications and hands-on expertise using advanced software and technology that meet the most demanding performance requirements.

Our R&D and testing facilities enable us to run the most comprehensive testing programs and accommodate valves up to 64" (1600 mm) in diameter and 40 tons in weight. In addition, given our proximity to major university and testing laboratories, we're well positioned to handle any extremely specialized tests – such as the hyperbaric test for sub-sea valves – that cannot be done in house.



*Cryogenic testing on a 16" (400 mm)
Class 1500 Top Entry Ball Valve*



*Torque
measuring
device with
computerized results.*



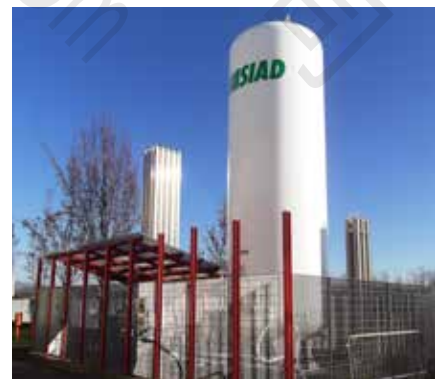
*Hydraulic Shell & Seat Test
on a 18" (450 mm)
Class 2500 Uprated valve*



*Hyperbaric testing through
external subcontractor*



High temperature valve testing



High Pressure System for Gas Testing

Machinery and equipment

Our production equipment uses the latest automation technology and is specially engineered to meet the requirements of advanced large valve manufacturing.

This includes large CNC horizontal and vertical boring mills with tool changers, NC lathes, and NC machining centers for valve bodies and parts. Valbart has qualified procedures, welders, and welding operators for all major weld processes.

The production testing equipment is designed to safely and efficiently test 100% of the current production of low- and high-pressure valves in strict accordance with industry codes and standards, as well as customer-imposed criteria.



SAW welding robot applying weld overlay on valve closure



Boring machine.



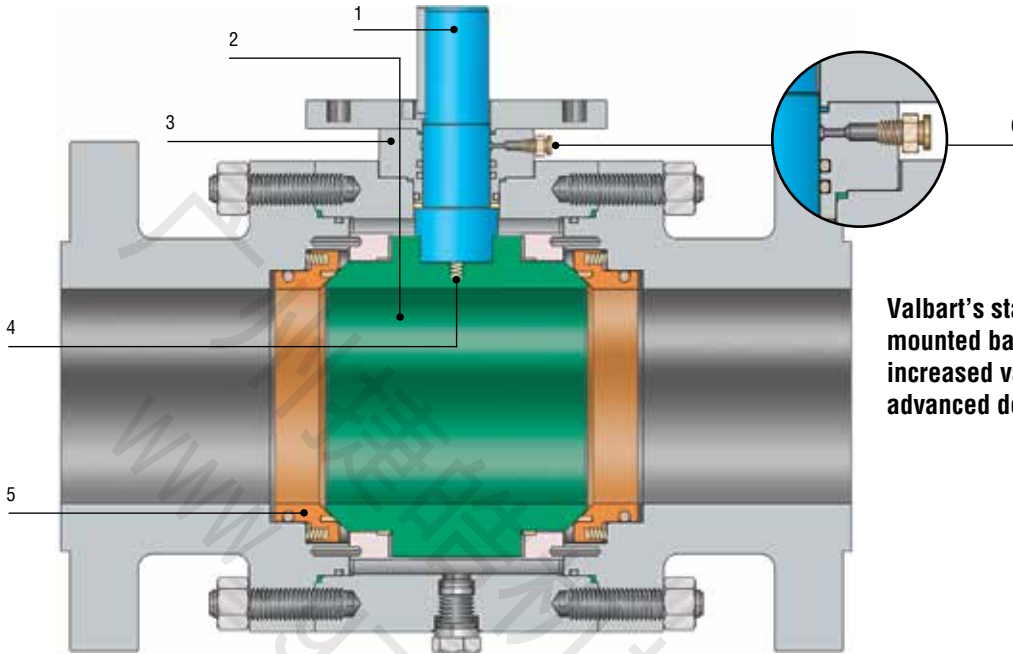
Lapping Cell



In-house Machining center



Horizontal (foreground) and vertical (background) lathes



Valbart's standard trunnion-mounted ball valves offer increased value by incorporating advanced design features.

Valbart trunnion-mounted ball valve design features

1 Independent ball and stem

The ball and stem are independent to minimize the effect of the side thrust generated by the pressure acting on the ball.

2 Trunnion-mounted ball

The ball is fixed and the seat rings are floating, free to move along the valve axis.

Side load generated by the pressure acting on the ball is absorbed by bearings.

At low pressure, the seat sealing action is achieved by the thrust of the springs acting on the seat rings.

As the pressure increases, the fluid pressure pushes the seat rings against the ball.

3 Anti-blowout stem

Stem is retained by the stem cover (other designs available on request).

4 Anti-static design

The electrical continuity between all the metallic components is guaranteed and certified.

5 Floating self-relieving seat rings

Two independent floating seat rings assure the bi-directional tightness of the valve. The seats are carefully designed to

minimize the torque required to operate the valves without losing sealing power, which is assured from zero differential pressure to the valve's maximum rated pressure.

Self-relieving seats are supplied as a standard feature.

Double piston or combination seats (self-relieving/upstream, double piston/down-stream) can be supplied upon request.

6 Emergency sealant injection

Each valve is supplied complete with emergency sealant injection feature located between the upper O-rings and the graphite gasket.

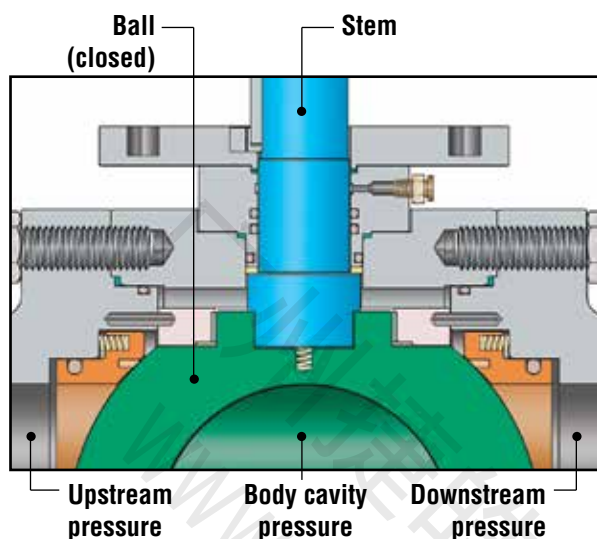
An emergency sealant injection feature on seats is available upon request only, for 6" full port and larger.

Emergency grease injection features are not recommended on low-and high-temperature valves.

Low emission valves

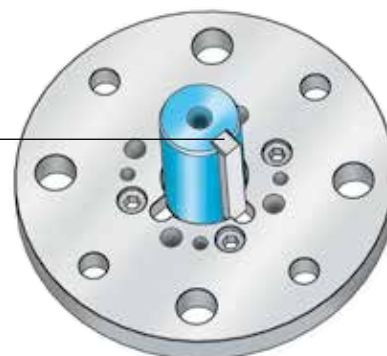
Accurate machining of stem and bonnet sealing surfaces ensures compliance with the most severe pollution-control regulations.





Ball seat alignment

Mechanical stops ensure control over ball rotation.



Double Block and Bleed

All Valbart trunnion-mounted ball valves are designed and manufactured to seal off both seats at the same time and allow bleeding of the entrapped cavity pressure (DBB) with the ball in the closed position to verify that the seats are sealing properly.

Both seats hold their respective pressures independent of the body cavity pressure. The double block and bleed feature makes it possible to do such things as flush the valve under pressure and verify that the seats are sealing properly.

Stem Sealing

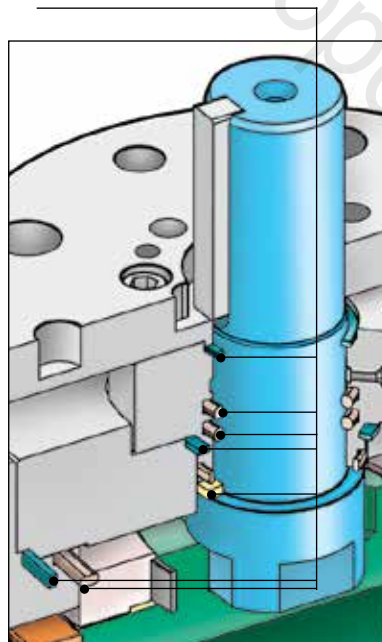
Stem sealing is ensured by two o-rings, while the top graphite gasket ensures fire resistance.

The graphite gasket can be replaced while the valve is under pressure, provided that the ball is in the fully closed position with the body cavity vented.

With no pressure in line, it is also possible to remove the gland plate for replacement of the two o-rings

Body Sealing

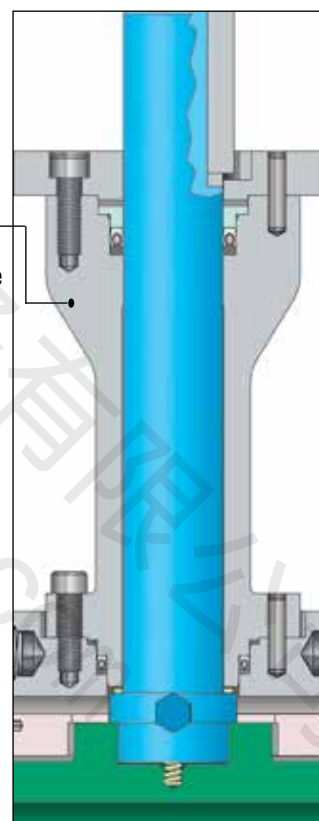
The double sealing action of O-rings and graphite gaskets in all the static joints of the body components ensures zero leakage and the Fire Safe feature.



Extended Bonnet

Valve designs are available with extended bonnets for applications in extreme temperature service.

Extended bonnets are recommended for service at temperatures below -50°C (-58°F) or above 220°C (428°F).



Soft-seated valves (primary metal, secondary soft)



Figure 1 – Soft seat with thermoplastic insert

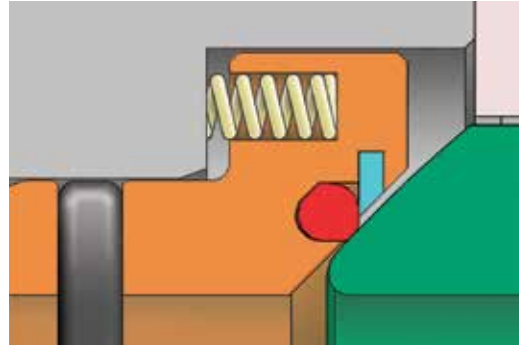


Figure 2 – Soft seat with elastomer (Primary metal secondary soft)

In standard services, soft seats are used. The soft sealing between the seats and the ball is obtained with a thermoplastic insert (figure 1) or an elastomeric o-ring (figure 2). While the thermoplastic design (figure 1) is a fully soft contact, the elastomeric design (figure 2) grants a primary metal secondary soft seal.

Metal-seated valves

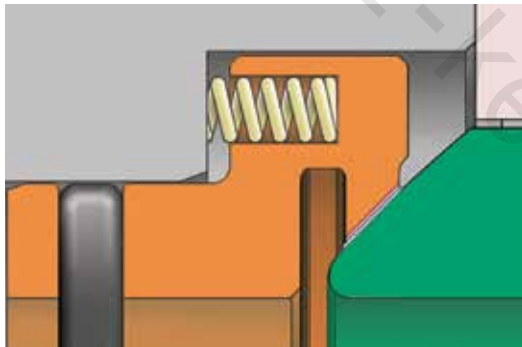


Figure 3 – Metal to metal seat

Whenever soft seat is no longer suitable due to high temperature, chemically aggressive media or dirty services, the contact area between the seats and the ball can be completely metal to metal. This is obtained by coating ball and seats with tungsten carbide, chrome carbide or ENP. Other coatings are available on request.

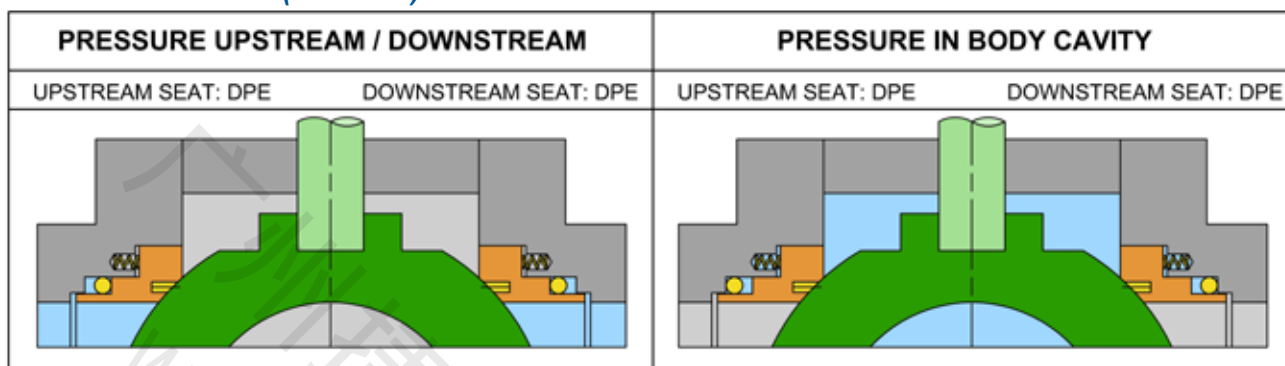
Standard Seat Configuration Single Piston Effect (SPE-SPE)

PRESSURE UPSTREAM / DOWNSTREAM		PRESSURE IN BODY CAVITY	
UPSTREAM SEAT: SPE	DOWNSTREAM SEAT: SPE	UPSTREAM SEAT: SPE	DOWNSTREAM SEAT: SPE

When pressure acts from upstream/downstream side, SPE seats are pushed against the ball by the piston effect, ensuring tight shutoff. When pressure acts from body cavity, SPE seats are designed to be pushed away from the ball, relieving cavity pressure in line. For such reason, SPE seats are also known as “self relieving”. With SPE-SPE configurations, cavity relief always takes place through lower pressure side.

Typical application: Pipeline ball valves in liquid services, to prevent pressure buildup in body cavity due to change in temperatures

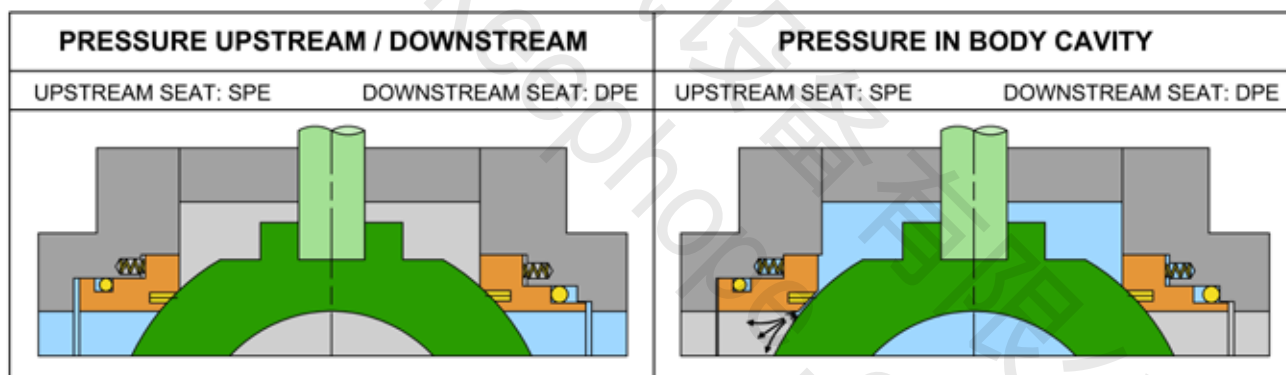
Optional Seat Configuration Double Piston Effect (DPE-DPE)



DPE seats are designed to be pushed against the ball in both cases, whether pressure comes from body cavity or from upstream/downstream side. Valve with DPE seats cannot perform cavity relief. For such reason -in liquid services- the use of a relief valve is recommended.

Typical application: Whenever it is necessary to create an additional safe barrier between the upstream and the downstream sides. Recommended in welded body valves, where seats maintenance is not foreseen.

Optional Seat Configuration Combined SPE-DPE



Upstream SPE seat ensures self relieving capability, while downstream DPE seat grants the double barrier in case of upstream seat damage. This configuration involves a preferred direction of installation with SPE seat facing upstream. With SPE-DPE configurations, cavity relief always takes place through SPE seat.

Typical application: Riser valves, pig launchers/receivers. DPE seat gives double isolation to the pig trap, allowing automatic relief of body cavity at the same time in case of pressure buildup

Fire safe

Valbart trunnion-mounted ball valves are designed and certified Fire Safe to API 6FA, API 607, and ISO 10497.

Extended stem

Valves installed underground or in remote locations can be operated with an optional extended stem.

All the drain, vent, and emergency sealant connections can be operated using extended connecting pipes firmly attached to the stem protective cover.

Ends

Valve ends can be manufactured to several configurations to comply with customer requests, such as:

Flanged RF or RTJ to ASME B16.5 up to 24" (MSS SP-44 for 22") and B16.47A for 26" and larger. Other flange designs are available on request.

Butt-weld ends to ASME B16.25. Others types of weld ends are available upon request.

Hub ends for clamped connections are available as per customer specification.

Actuation

Hand-operated valves are supplied either with a lever or gear operator.

The use of a wrench is limited to valves equal to or smaller than:

- 4" – Class 150 • 4" – Class 300
- 3" – Class 600 • 3" – Class 900
- 2" – Class 1500 • 1" – Class 2500

Actuated valves can be supplied with:

- Electric actuators
- Pneumatic actuators
- Hydraulic actuators
- Gas over oil actuators for ESDV, SDV, BDV, MOV, GOV, and HIPPS services



Actuated valves for testing in the in-house valve automation centre

Mounting operators valve automation center

Operator mounting should be made at the Valbart Valve Automation Center before shipment.

If the operators will be assembled on site, the mounting will be carried out before installing the valves in line, following Valbart instructions.

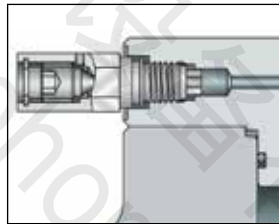
Mounting of operators on valves already installed in line is not recommended and will be performed only under the supervision of Valbart.

Operator mounting flanges are in accordance with ISO 5211-FF.

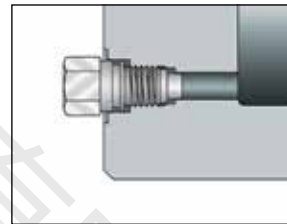
Vent valve and drain plug

Each valve 6" and larger is supplied complete with a 1/2" NPT vent valve located in the upper part of the body and complete with a drain plug located in the lower part of the body.

Each valve 6 x 4" and smaller is supplied complete with a 1/2" NPT vent/drain valve located in the lower part of the body.



1/2" NPT vent valve bleeder



1/2" NPT vent/drain plug

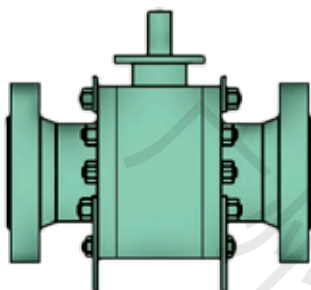


Welded body valve with extended stem

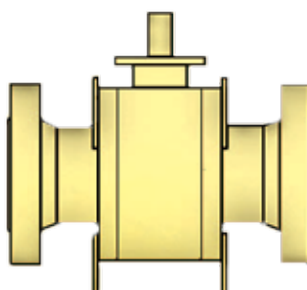


Fire safe testing

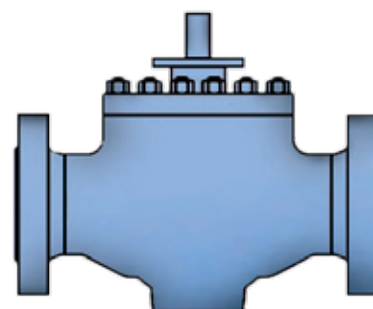
VB2/VB3



VW1

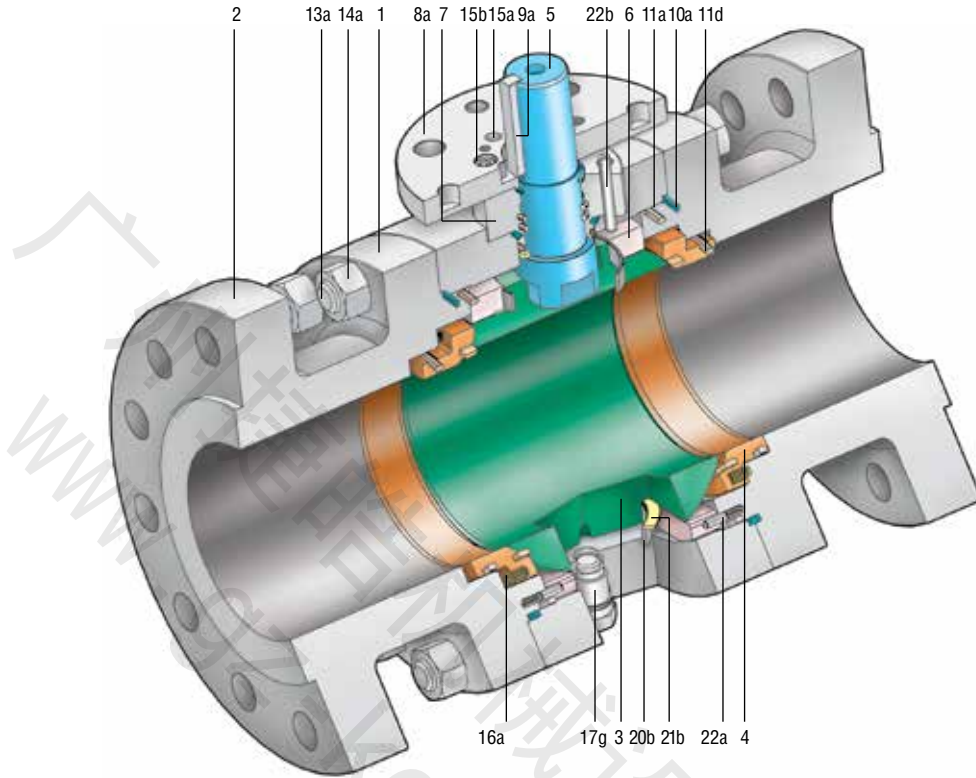


VT1



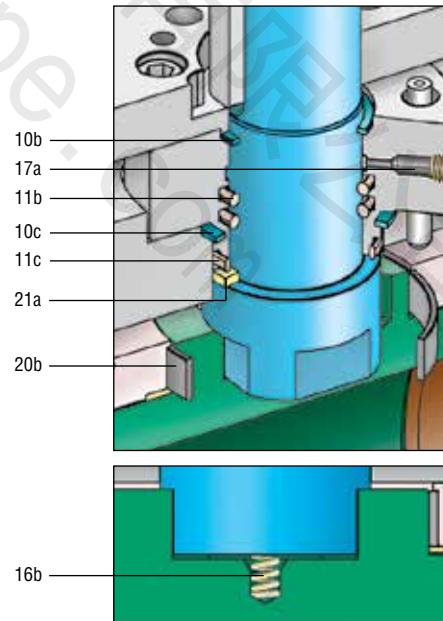
FEATURES	SIDE-ENTRY	WELDED BODY	TOP-ENTRY
Trunnion-mounted	Standard	Standard	Standard
Independent stem and ball	Standard	Standard	Standard
Independent floating seats	Standard	Standard	Standard
Primary soft seat - secondary metal seat	Standard	Standard	Standard
Primary metal seat - secondary soft seat	On request	On request	On request
Metal-to-metal seat	On request	On request	On request
Self relieving seats	Standard	Standard	Standard
Single piston seat effect	Standard	Standard	Standard
Double piston seat effect	On request	On request	On request
Combination (self relieving/double piston) seats	On request	On request	On request
API 6a or API 6d design and construction	As required	As required	As required
Face-to-face dimensions to API 6d and ANSI B16.10	Standard	Standard	Standard
Fire safe design to API 6fa - API 607 - BS 6755 part 2	Standard	Standard	Standard
Full, reduced or venturi port	As required	As required	As required
Flanged ends - welded ends - hub ends	As required	As required	As required
Transition pups for welded end valves	On request	On request	On request
Antistatic	Standard	Standard	Standard
Anti-blowout stem	Standard	Standard	Standard
Double block and bleed	As required	As required	As required
Possibility to check seat integrity in line with ball in closed position	Standard	Standard	Standard
Double body seals	Standard	N/A	Standard
Triple stem seals	Standard	Standard	Standard
Drain plug	Standard	Standard	Standard
Drain valve	On request	On request	On request
Vent valve (on 6" and larger)	Standard	Standard	Standard
Emergency sealant injection on stem	Standard	Standard	Standard
Emergency sealant injection on seats (on 6" and larger)	On request	On request	On request
Stem and seat pocket overlay	On request	On request	On request
All seal areas overlay	On request	On request	On request
All wetted parts overlay	On request	On request	On request
Body internal lining	On request	N/A	On request
Extended stem for underground installation	As required	As required	As required
Extended bonnet for low or high temperature	As required	N/A	As required
Locking device	On request	On Request	On request
Lifting lugs	Standard On 6" and larger	Standard On 6" and larger	Standard On 6" and larger
Supporting feet	Standard On 6" and larger	Standard On 6" and larger	Standard On 6" and larger
Manual or motorized operation	As required	As required	As required
In-line maintenance	N/A	N/A	Yes
On site maintenance	Yes	On stem & ancillaries only	Yes

Note: Other features are available on request.

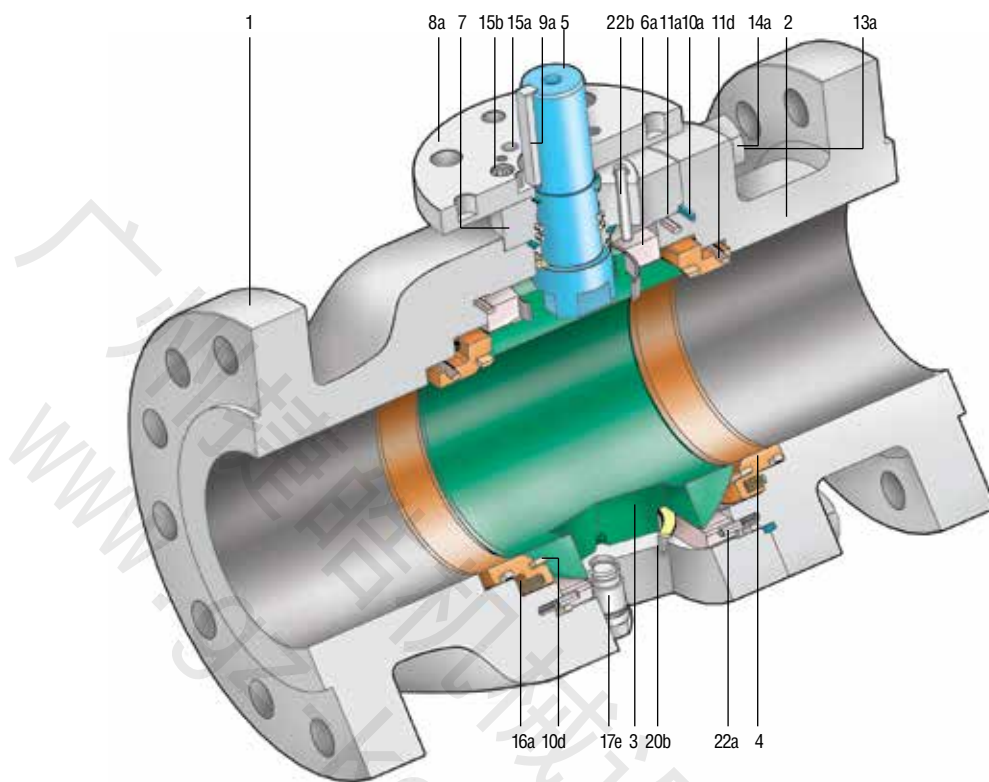


Bolted body side-entry 6" and larger - Mod VB3

PARTS LIST			
1	Body	14a	Body/closure nut
2	Closure	15a	Stem cover/body socket screw ⁽²⁾
3	Ball	15b	Operator flange/body socket screw
4	Seat	15d	Stop seat socket screw ⁽¹⁾⁽²⁾
5	Stem	16a	Seat spring
6	Bearing retainer	16b	Antistatic spring
7	Stem cover	17a	Stem greaser
8a	Operator flange	17e	Vent bleeder valve ⁽²⁾
9a	Stem key	17g	Drain plug
10a	Body gasket	20b	Ball bushing
10b	Stem gasket	21a	Stem thrust washer
10c	Stem cover gasket	21b	Ball thrust washer
11a	Body O-ring	22a	Bearing retainer pin
11b	Stem O-ring	22b	Operator flange/body pin
11c	Stem cover O-ring	23a	Lifting lug ⁽²⁾
11d	Seat O-ring	23b	Valve support ⁽²⁾
13a	Body/closure stud	24a	Stop seat washer ⁽¹⁾⁽²⁾



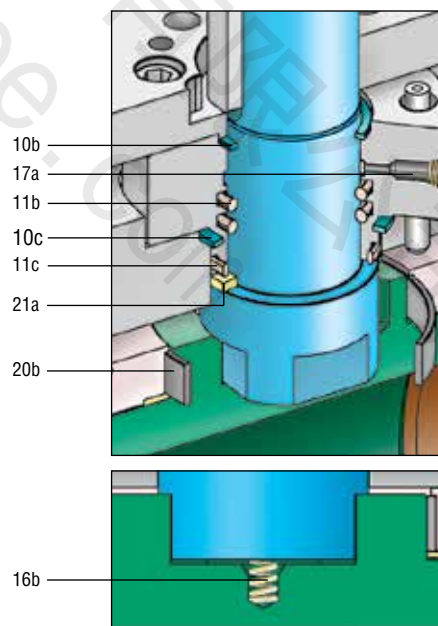
(1) Only for DN > 8" (2) Not visible in drawing opposite.

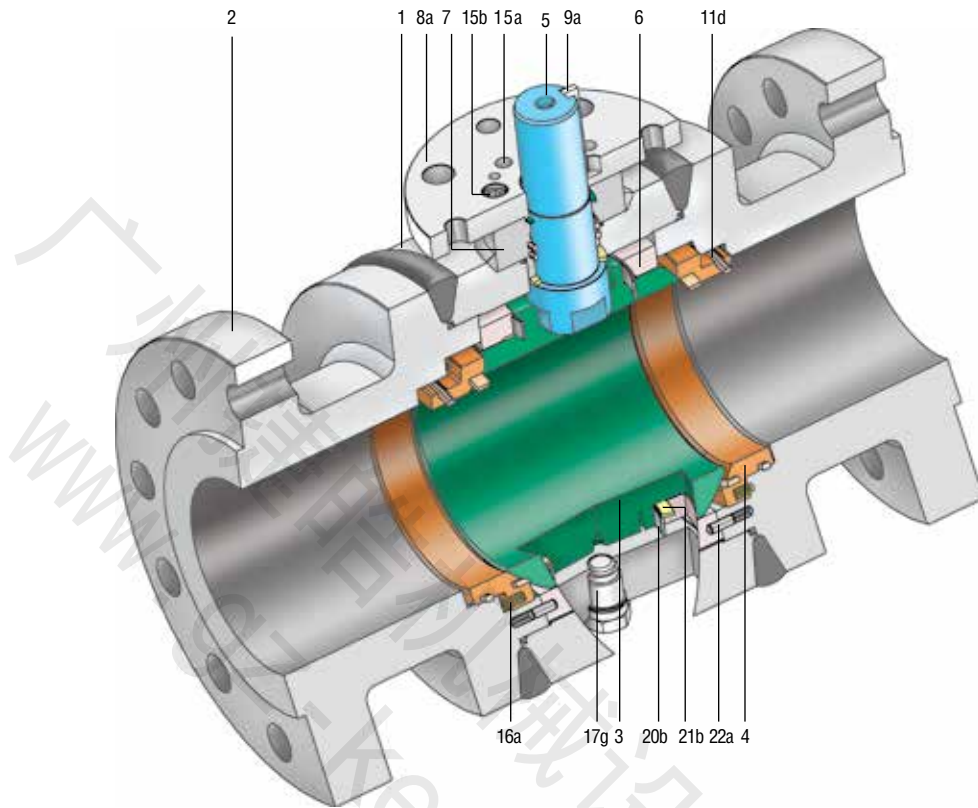


Bolted body side-entry 4" and smaller - Mod VB2

PARTS LIST			
1	Body	11c	Stem cover O-ring
2	Closure	11d	Seat O-ring
3	Ball	13a	Body/closure stud(1)
4	Seat	14a	Body/closure nut
5	Stem	15a	Stem cover/body socket screw(1)
6a	Trunnion	15b	Operator flange/body socket screw
7	Stem cover	16a	Seat spring
8a	Operator flange	16b	Antistatic spring
9a	Stem key	17a	Stem greaser
10a	Body gasket	17e	Vent bleeder valve
10b	Stem gasket	20b	Ball bushing
10d	Seat gasket	21a	Stem thrust washer
11a	Body O-ring	22a	Bearing retainer pin
11b	Stem O-ring	22b	Operator flange/body pin

(1) Not visible in drawing opposite.

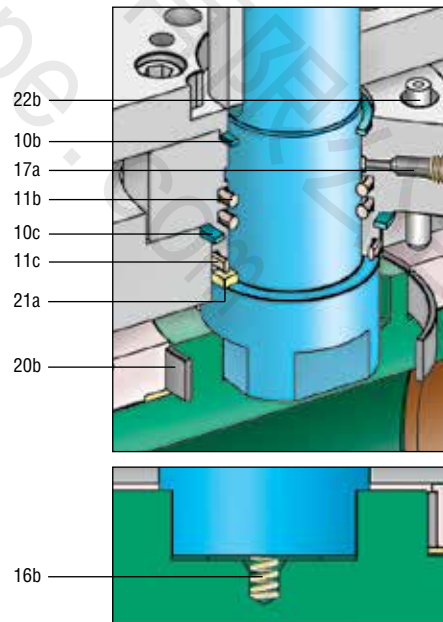


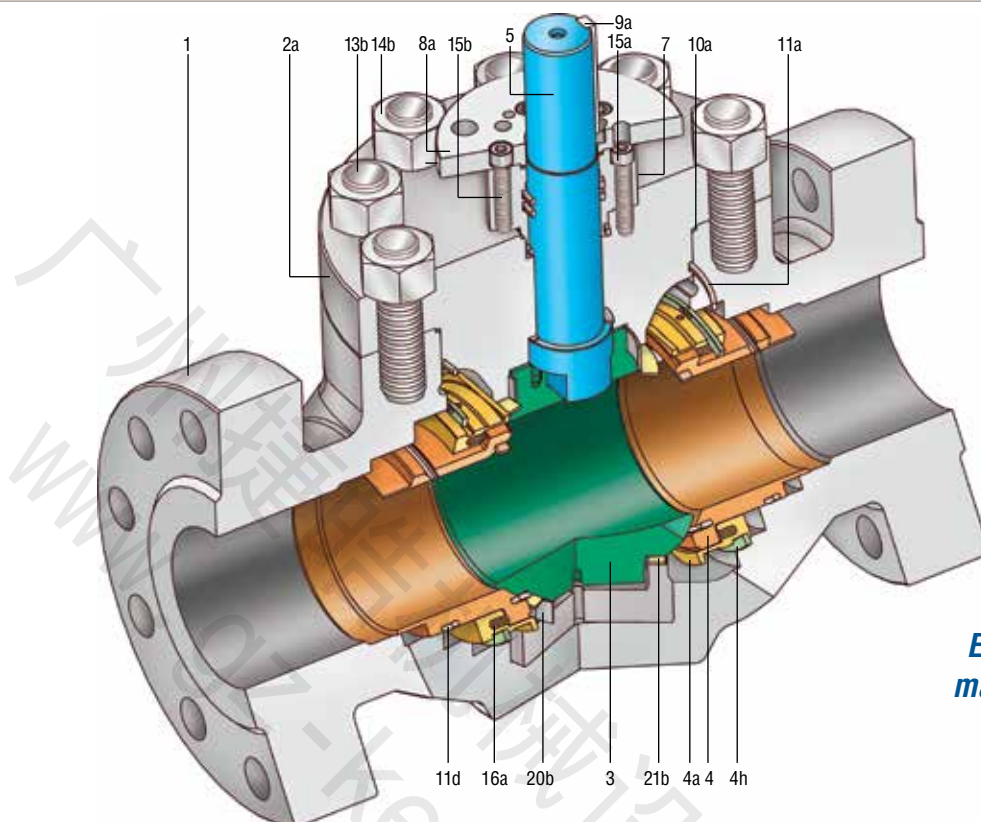


Welded body - Mod VW1

PARTS LIST			
1	Body	15b	Operator flange/body socket screw
2	Closure	15d	Stop seat socket screw ⁽¹⁾⁽²⁾
3	Ball	16a	Seat spring
4	Seat	16b	Antistatic spring
5	Stem	17a	Stem greaser
6	Bearing retainer	17e	Vent bleeder valve
7	Stem cover	17g	Drain plug
8a	Operator flange	20b	Ball bushing
9a	Stem key	21a	Stem thrust washer
10b	Stem gasket	21b	Ball thrust washer
10c	Stem cover gasket	22a	Bearing retainer pin
11b	Stem O-ring	22b	Operator flange/body pin
11c	Stem cover O-ring	23a	Lifting lug ⁽²⁾
11d	Seat O-ring	23b	Valve support ⁽²⁾
15a	Stem cover/body socket screw ⁽²⁾	24a	Stop seat washer ⁽¹⁾⁽²⁾

(1) Only for DN > 8" (2) Not visible in drawing opposite.



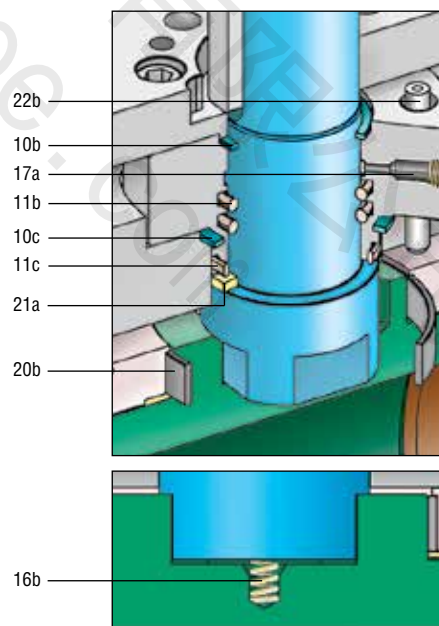


Easy in-line maintenance

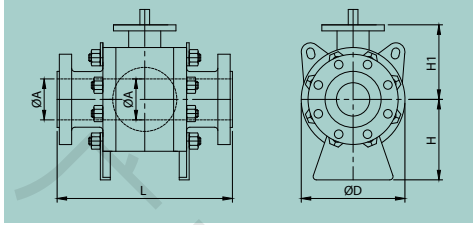
Top-entry - Mod VT1

PARTS LIST			
1	Body	11c	Stem cover O-ring
2a	Bonnet	11d	Seat O-ring
3	Ball	13b	Body/bonnet stud
4	Seat	14b	Body/bonnet nut
4a	Spring holder ring	15a	Stem cover/body socket screw
4h	Retaining ring	15b	Operator flange/body socket screw
5	Stem	16a	Seat spring
7	Stem cover	16b	Antistatic spring
8a	Operator flange	17a	Stem greaser
9a	Stem key	17e	Vent bleeder valve ⁽¹⁾
10a	Body gasket	17g	Drain plug ⁽¹⁾
10b	Stem gasket	20b	Ball bushing
10c	Stem cover gasket	21a	Stem thrust washer
11a	Body O-ring	21b	Ball thrust washer
11b	Stem O-ring	22b	Operator flange/body pin

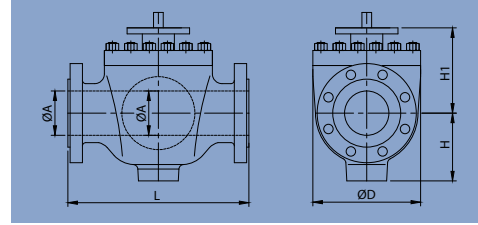
(1) Not visible in drawing opposite.



VB2/VB3



VT1



API CLASS 3000 (METRIC)

DN (mm)	PRESSURE CLASS	SIDE ENTRY						TOP ENTRY							
		Face To Face (mm)		ØA(2) (mm)	ØD (mm)	H (mm)	H1 (mm)	Weight (kg)	Face To Face (mm)		ØA(2) (mm)	ØD (mm)	H (mm)	H1 (mm)	Weight (kg)
		Flanged 6BX							Flanged 6BX						
50	3000	371	52.5	163	118	136	(1)	371	52.5	163	112	150	(1)		
70	3000	384	65.5	210	143	167	(1)	384	65.5	210	136	184	(1)		
80	3000	422	78	210	143	167	(1)	384	78	210	136	184	(1)		
100	3000	460	103.5	275	170	199	(1)	460	103.5	275	162	219	(1)		
150	3000	613	130.5	360	263	253	(1)	613	130.5	360	250	278	(1)		
200	3000	740	179.5	435	305	310	(1)	740	179.5	435	290	341	(1)		
250	3000	1000	229	600	400	371	(1)	1000	229	600	380	408	(1)		
300	3000	1146	280	675	453	411	(1)	1146	280	675	430	452	(1)		

API CLASS 5000 (METRIC)

DN (mm)	PRESSURE CLASS	SIDE ENTRY						TOP ENTRY							
		Face To Face (mm)		ØA(2) (mm)	ØD (mm)	H (mm)	H1 (mm)	Weight (kg)	Face To Face (mm)		ØA(2) (mm)	ØD (mm)	H (mm)	H1 (mm)	Weight (kg)
		Flanged 6BX							Flanged 6BX						
50	5000	371	52.5	208	150	154	(1)	371	52.5	208	143	169	(1)		
70	5000	473	65.5	305	200	200	(1)	473	65.5	305	190	220	(1)		
80	5000	473	78	375	219	240	(1)	473	78	375	208	264	(1)		
100	5000	549	103.5	415	280	296	(1)	549	103.5	415	266	326	(1)		
150	5000	711	130.5	455	340	352	(1)	711	130.5	455	323	387	(1)		
200	5000	841	179.5	630	400	400	(1)	841	179.5	630	380	440	(1)		
250	5000	1292	229	800	490	489	(1)	1292	229	800	466	538	(1)		
300	5000	1600	280	870	555	531	(1)	1600	280	870	527	584	(1)		

API CLASS 10000 (METRIC)

DN (mm)	PRESSURE CLASS	SIDE ENTRY						TOP ENTRY							
		Face To Face (mm)		ØA(2) (mm)	ØD (mm)	H (mm)	H1 (mm)	Weight (kg)	Face To Face (mm)		ØA(2) (mm)	ØD (mm)	H (mm)	H1 (mm)	Weight (kg)
		Flanged 6BX							Flanged 6BX						
40	10000	464	46	300	211	218	(1)	464	46	300	200	240	(1)		
50	10000	521	52.5	300	211	218	(1)	521	52.5	300	200	240	(1)		
70	10000	565	65.5	335	235	247	(1)	565	65.5	335	223	272	(1)		
80	10000	619	78	435	310	312	(1)	619	78	435	295	343	(1)		
100	10000	670	103.5	460	310	326	(1)	670	103.5	460	295	359	(1)		
150	10000	737	130.5	565	390	393	(1)	737	130.5	565	371	432	(1)		
200	10000	889	179.5	842	546	556	(1)	889	179.5	842	519	612	(1)		
250	10000	1292	229	900	618	607	(1)	1292	229	900	587	668	(1)		
300	10000	1600	280	1060	774	677	(1)	1600	280	1060	735	745	(1)		

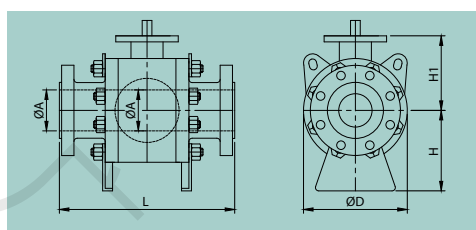
Notes

- (1) Please consult manufacturer.
- (2) Maximum bore. Some bore values may need to be reduced to stay within face to face dimension.

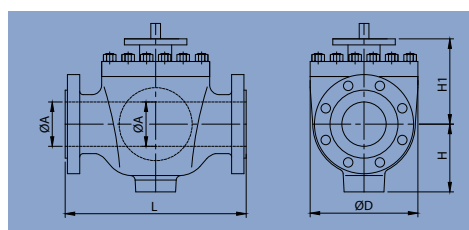
General Notes

For dimensions in larger sizes consult manufacturer.
 Dimensions D, H, H1 and weights may be subject to change without notice.
 Face to face dimensions not listed in industry standards may be subject to change without notice.

VB2/VB3



VT1



API CLASS 3000 (IMPERIAL)

DN	PRESSURE CLASS	SIDE ENTRY						TOP ENTRY						
		Face To Face (in)		ØA(2) (in)	ØD (in)	H (in)	H1 (in)	Weight (lb)	Face To Face (in)		ØD (in)	H (in)	H1 (in)	Weight (lb)
		Flanged 6BX							Flanged 6BX					
2" 1/16	3000	14.61	2.07	6.42	4.65	5.35	(1)	14.61	2.07	6.42	4.41	5.89	(1)	
2" 9/16	3000	15.12	2.58	8.27	5.63	6.57	(1)	15.12	2.58	8.27	5.35	7.23	(1)	
3" 1/8	3000	16.61	3.07	8.27	5.63	6.57	(1)	15.12	3.07	8.27	5.35	7.23	(1)	
4" 1/16	3000	18.11	4.07	10.83	6.69	7.83	(1)	18.11	4.07	10.83	6.36	8.62	(1)	
5" 1/8	3000	24.13	5.14	14.17	10.35	9.96	(1)	24.13	5.14	14.17	9.84	10.96	(1)	
7" 1/16	3000	29.13	7.07	17.13	12.01	12.20	(1)	29.13	7.07	17.13	11.41	13.43	(1)	
9"	3000	39.37	9.02	23.62	15.75	14.61	(1)	39.37	9.02	23.62	14.96	16.07	(1)	
11"	3000	45.12	11.02	26.57	17.83	16.18	(1)	45.12	11.02	26.57	16.94	17.80	(1)	

API CLASS 5000 (IMPERIAL)

DN	PRESSURE CLASS	SIDE ENTRY						TOP ENTRY						
		Face To Face (in)		ØA(2) (in)	ØD (in)	H (in)	H1 (in)	Weight (lb)	Face To Face (in)		ØD (in)	H (in)	H1 (in)	Weight (lb)
		Flanged 6BX							Flanged 6BX					
2" 1/16	5000	14.61	2.07	8.19	5.91	6.06	(1)	14.61	2.07	8.19	5.61	6.67	(1)	
2" 9/16	5000	18.62	2.58	12.01	7.87	7.87	(1)	18.62	2.58	12.01	7.48	8.66	(1)	
3" 1/8	5000	18.62	3.07	14.76	8.62	9.45	(1)	18.62	3.07	14.76	8.19	10.39	(1)	
4" 1/16	5000	21.61	4.07	16.34	11.00	11.65	(1)	21.61	4.07	16.34	10.45	12.82	(1)	
5" 1/8	5000	27.99	5.14	17.91	13.39	13.86	(1)	27.99	5.14	17.91	12.72	15.24	(1)	
7" 1/16	5000	33.11	7.07	24.80	15.75	15.75	(1)	33.11	7.07	24.80	14.96	17.32	(1)	
9"	5000	50.87	9.02	31.50	19.29	19.25	(1)	50.87	9.02	31.50	18.33	21.18	(1)	
11"	5000	62.99	11.02	34.25	21.85	20.91	(1)	62.99	11.02	34.25	20.76	23.00	(1)	

API CLASS 10000 (IMPERIAL)

DN	PRESSURE CLASS	SIDE ENTRY						TOP ENTRY						
		Face To Face (in)		ØA(2) (in)	ØD (in)	H (in)	H1 (in)	Weight (lb)	Face To Face (in)		ØD (in)	H (in)	H1 (in)	Weight (lb)
		Flanged 6BX							Flanged 6BX					
1" 3/16	10000	18.27	1.81	11.81	8.31	8.58	(1)	18.27	1.81	11.81	7.89	9.44	(1)	
2" 1/16	10000	20.51	2.07	11.81	8.31	8.58	(1)	20.51	2.07	11.81	7.89	9.44	(1)	
2" 9/16	10000	22.24	2.58	13.19	9.25	9.72	(1)	22.24	2.58	13.19	8.79	10.70	(1)	
3" 1/16	10000	24.37	3.07	17.13	12.20	12.28	(1)	24.37	3.07	17.13	11.59	13.51	(1)	
4" 1/16	10000	26.38	4.07	18.11	12.20	12.83	(1)	26.38	4.07	18.11	11.59	14.12	(1)	
5" 1/8	10000	29.02	5.14	22.24	15.35	15.47	(1)	29.02	5.14	22.24	14.59	17.02	(1)	
7" 1/16	10000	35.00	7.07	33.15	21.50	21.89	(1)	35.00	7.07	33.15	20.42	24.08	(1)	
9"	10000	50.87	9.02	35.43	24.33	23.90	(1)	50.87	9.02	35.43	23.11	26.29	(1)	
11"	10000	62.99	11.02	41.73	30.47	26.65	(1)	62.99	11.02	41.73	28.95	29.32	(1)	

Notes

(1) Please consult manufacturer.

(2) Maximum bore. Some bore values may need to be reduced to stay within face to face dimension.

General Notes

For dimensions in larger sizes consult manufacturer.

Dimensions D, H, H1 and weights may be subject to change without notice.

Face to face dimensions not listed in industry standards may be subject to change without notice.

API 6D & 6A trunnion-mounted ball valves

Bolted body side entry • Welded body • Top entry



24" (600 mm) Class 2500 Side Entry Valve with special vent & drain connections



48" (1200 mm) Class 600 valve with Electrohydraulic actuator



11" (250 mm) Class 10000 API 6A Ball Valve



24" (600 mm) Class 1500 Ball Valves with Gas Over Oil actuators



24" (600 mm) class 1500 side-entry



56" (1400 mm) Fully Welded, Class 600 valve



56" (1400 mm) Fully Welded valve



36" (900 mm) class 600 top-entry ball valves



34" Class 1500 Top Entry Ball Valve



20" (500 mm) class 300 side entry valves



GOV Actuated bolted body valves with RF and BW ends with pup piece

Engineered products for specialized applications

Control ball valve • Rising stem ball valve • Twin ball double block & bleed • Cryogenic • Subsea



24" (600 mm) Class 900# Top Entry Ball valve for Cryogenic service



12" (300 mm) Class 1500 Twin Ball Double Block & Bleed Valve



48" (1200 mm) class 300 ball valve for subsea service



20" (500 mm) Class 600 Twin Ball, Double Block & Bleed Valve



16" (400 mm) Class 600 Actuated Rising Stem Ball Valves



30" (750 mm) Class 600 Trunnion Control Ball Valve



30" (750 mm) Class 300 actuated control ball valve with anti cavitation trim



16" (400 mm) Class 900 Actuated Rising Stem Ball Valves



10" (250 mm) Class 150 actuated control ball valve with noise reduction trim

Engineering data

Valve testing

100% of valves manufactured by Valbart are tested in excess of API 6D requirements, prior to shipping.

Standard performance tests

- Visual and dimensional check
- High-pressure hydrostatic shell test
- High-pressure hydrostatic seats test
- Low-pressure air seats test
- Stem torque check

LEAKAGE RATES

ISO 5208 SEAT LEAKAGE RATES AS PER API 6D	Seat Test Type		
	HP Hydrostatic @ 1.1 rating pressure	LP Pneumatic @ 6 bars	HP Gas @ 1.1 rating pressure
Soft Seated valves	Rate A	Rate A	Rate B
Metal Seated valves	Rate D	Rate B	Rate D

Above mentioned leakage rates are standard. More stringent requirements are achievable upon request.

TESTING PRESSURES

ASME CLASS	Rating ⁽¹⁾			Body Test			H.P. seat test			Air Seat Test		
	psi	bar	kg/cm ²	psi	bar	kg/cm ²	psi	bar	kg/cm ²	psi	bar	kg/cm ²
150	275	19	19.3	413	28.5	29	303	20.9	21	100	6	7
300	720	50	51	1080	75	77	792	55	56	100	6	7
600	1440	99	101	2160	148.5	152	1584	108.9	111	100	6	7
900	2160	149	152	3240	223.5	228	2376	163.9	167	100	6	7
1500	3600	248	253	5400	372	380	3960	272.8	278	100	6	7
2500	5988	413	421	8982	619.5	632	6587	454.3	463	100	6	7
API 3000	3000	207	210	4500	310.5	315	3000	207	210	100	6	7
API 5000	5000	345	352	7500	517.5	528	5000	345	352	100	6	7
API 10000	10000	690	703	15000	1035	1055	10000	690	703	100	6	7

(1) Typical only - rating pressure may change for different materials.

Conversion factors 1 bar = 14.50 psi and 1 bar = 0,981 kg/cm² and 1 bar = 100 kpa 1 kg/cm² = 14.22 psi
 1°F = (1.8 x °C) +32 and 1°C = (°F -32) / 1.8

Quality standards

American Petroleum Institute – API

API 6D API 6D SS API 6FA API 598
 API 6A API 607 API 605

American Society of Mechanical Engineers – ASME

ASME B 16.5 ASME B 16.10 ASME B 16.25
 ASME B 16.34 ASME B 31.3 ASME B31.8
 ASME B 46.1 ASME B 16.47

International Organization for Standardisation – ISO

ISO 9001:2000 ISO 14313 ISO 14001

British Standards

BS EN 10222 BS EN 9000
 BS 1560 BS EN 10213
 BS 4504 BS EN 12266
 BS 5351

Manufacturers Standardization Society – MSS

MSS SP 6 MSS SP 25
 MSS SP 44 MSS SP 45
 MSS SP 55 MSS SP 61
 MSS SP 72

Compliant to CSA Z245



Fugitive emission testing



Valves in packing area after being tested

Materials

Body and trim material

Carbon Steel

A105N A216 WCB A216 WCC

Low temperature Carbon steel

A350 LF2 A352 LCB A352 LCC

Low alloy steel

AISI 4140 A694 F65 A694 F52

A694 F60 A350 LF3

API 6A 60K (A694 F60 Mod)

Martensitic Stainless Steel

A182 F6A A182 F6NM

A217 CA15 A487 CA6NM

Austenitic Stainless Steel

A182 F316 A182 F316L

A182 F316LN-Mod. A182 F347

A182 F44 (6% Mo) A182 FXM-19

(UNS S31254) (Nitronic 50)

A351 CF8M A351 CF3

A351 CF3M

Precipitation Hardening Stainless Steel

A564 Gr 630 H1150M (UNS S17400)

Duplex Stainless Steel

A181 F51 (UNS S31803)

A182 F53 (UNS S31750)

A182 F55 (UNS S31760)

A890-4A (UNS S31803)

A890-6A (UNS S32760)

Nickel Alloys

Incoloy 825 (UNS N08825)

Inconel 625 (UNS N06625)

Inconel 750 (UNS N07750)

Monel 400

Monel K500

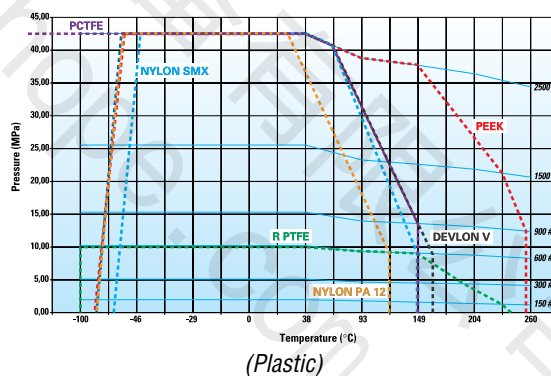
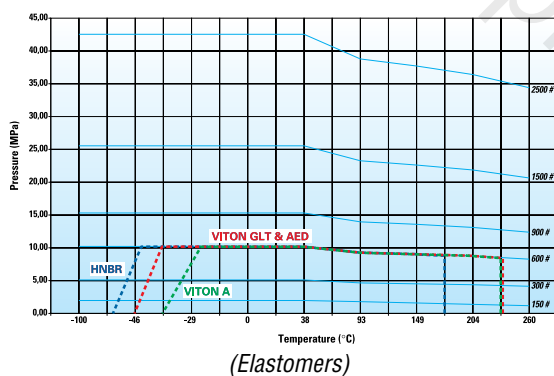
Incoloy 925 (UNS N09925)

Inconel 718 (UNS N07718)

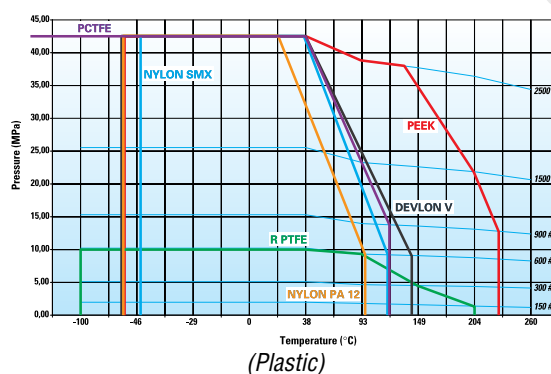
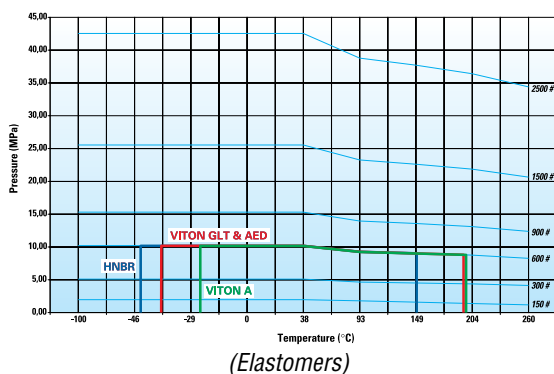
SEAT INSERT AND SEALS MATERIALS OPERATING (DYNAMIC) LIMITS*

Material	Temp. °C		Pressure Class		Size	
	Min.	Max.	Seat Insert	Seal	Seat Insert	Seal
Nylon SMX	-40	120	2500	N/A	64"	N/A
Lauramid (Nylon 12G)	-60	100	2500	N/A	64"	N/A
Devlon (Nylon 6)	-60	140	2500	N/A	64"	N/A
Peek	-60	220	2500	N/A	36"	N/A
PTFE Glass Filled (25%)	-100	200	600	N/A	24"	N/A
PTFE Carbon Filled (25%)	-100	180	300	N/A	24"	N/A
PCTFE	-196	150	2500	N/A	36"	N/A
HNBR-Therban	-40	150	600	2500	64"	64"
FKM A (Viton A)	-29	180	600	2500	64"	64"
FKM GLT (Viton GLT)	-40	180	600	2500	64"	64"
FKM AED	-29	180	600	2500	64"	64"
PTFE + Elgiloy Springs	-196	200	N/A	2500	N/A	36"

SEAT INSERTS – STATIC/SHORT PERIOD*



SEAT INSERTS – OPERATING CONDITION*



*Given as reference only.

Spare parts list



SIDE-ENTRY - MOD VB2/VB3

Part #	Part	DN < 4" (1) Spare parts quantity		DN 4" (1) Spare parts quantity		DN > 4" (1) Spare parts quantity	
		Start up	2 years op.	Start up	2 years op.	Start up	2 years op.
4	Seat	-	(3)	-	(3)	-	(3)
10a	Body gasket	(2)	(3)	(2)	(3)	(2)	(3)
10b	Stem gasket	(2)	(3)	(2)	(3)	(2)	(3)
10c	Stem cover gasket	(2)	(3)	(2)	(3)	(2)	(3)
10d	Seat gasket	(2)	(3)	(2)	(3)	Not applicable	Not applicable
10e	Trunnion gasket	(2)	(3)	Not applicable	Not applicable	Not applicable	Not applicable
11a	Body O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11b	Stem O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11c	Stem cover O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11d	Seat O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11e	Trunnion O-ring	(2)	(3)	Not applicable	Not applicable	Not applicable	Not applicable

WELDED BODY - MOD VW1

Part #	Part	DN < 4" (1) Spare parts quantity		DN 4" (1) Spare parts quantity		DN > 4" (1) Spare parts quantity	
		Start up	2 years op.	Start up	2 years op.	Start up	2 years op.
10b	Stem gasket	(2)	(3)	(2)	(3)	(2)	(3)
10c	Stem cover gasket	(2)	(3)	(2)	(3)	(2)	(3)
10e	Trunnion gasket	(2)	(3)	Not applicable	Not applicable	Not applicable	Not applicable
11b	Stem O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11c	Stem cover O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11e	Trunnion O-ring	(2)	(3)	Not applicable	Not applicable	Not applicable	Not applicable

TOP-ENTRY - MOD VT1

Part #	Part	DN < 4" (1) Spare parts quantity		DN 4" (1) Spare parts quantity		DN > 4" (1) Spare parts quantity	
		Start up	2 years op.	Start up	2 years op.	Start up	2 years op.
4	Seat	-	(3)	-	(3)	-	(3)
10a	Body gasket	(2)	(3)	(2)	(3)	(2)	(3)
10b	Stem gasket	(2)	(3)	(2)	(3)	(2)	(3)
10c	Stem cover gasket	(2)	(3)	(2)	(3)	(2)	(3)
10d	Seat gasket	(2)	(3)	(2)	(3)	Not applicable	Not applicable
10e	Trunnion gasket	(2)	(3)	Not applicable	Not applicable	Not applicable	Not applicable
10h	Spring holder ring gasket	(2)	(3)	(2)	(3)	Not applicable	Not applicable
11a	Body O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11b	Stem O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11c	Stem cover O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11d	Seat O-ring	(2)	(3)	(2)	(3)	(2)	(3)
11e	Trunnion O-ring	(2)	(3)	Not applicable	Not applicable	Not applicable	Not applicable

NOTES: (1) Reference to nominal port size - (2) One set per 10 valves - (3) One set per 1 valve

How to avoid problems

- Ball valves should be transported and stored with the ball in the fully open position
- Flanged ends and welded ends should be protected
- End protection should be removed only when the valve is installed in the line
- Valves should be handled using the proper lifting lugs
- Valves should be stored according to Valbart storage procedures. Long-term storage should be avoided
- In case of long storage, valves should be flushed and cycled a few times
- For welded-end valves, Valbart should be informed of any post-weld heat treatment (transition pups may be necessary to avoid damages to seals)
- The line should be flushed and cleaned before valve operation
- Make sure no line-testing fluid is left in the line and/or the valve body
- Avoid leaving the valve body filled with salt water to prevent internal corrosion
- During line-testing, valves will be left in the partially open position for the minimum possible amount of time
- Standard ball valves will be used for on-off service only. Throttling service (use of the valve with the ball partially open) can damage the seats
- Actual service conditions should be taken into consideration while selecting materials for O-rings and seat inserts
- Always specify anti-explosive decompression material for valves to be used in high-pressure gas service
- Make sure the selected actuator has been properly sized (an oversized actuator can be as dangerous as an undersized one)
- Advise Valbart of cycle frequency to ensure proper sizing of actuator
- Do not use the actuator to lift the valve

