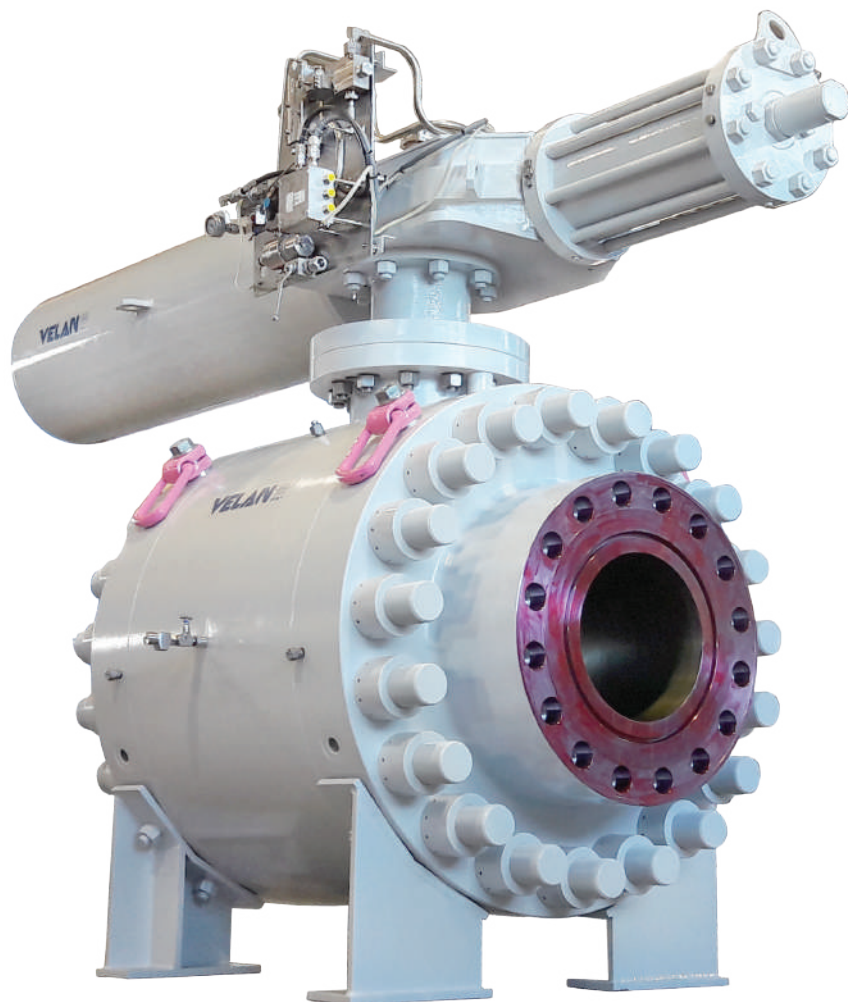


Velan ABV Side-entry ball valves are manufactured in accordance with API 6D standards. The whole range is designed in two or three bolted forged pieces with a solid double trunnion configuration and two independent seats for an easy bidirectional sealing, to ensure the greatest level of tightness and reliability under high pressure and temperature conditions in all critical isolation services.

Materials selection is fully customizable to meet customers project specifications and several unique features are available to offer an enhanced technical solution suitable to aggressive offshore environments and corrosive and abrasive fluids.



Features

- Full or reduce bore
- Double block & bleed design
- Fire safe and fire tested as per API 6FA/607
- Anti-static design, electrical resistance between metallic components ensured below 10 Ohm
- Materials for pressure containing and pressure controlling components in accordance with EN 10204
- Compliance with NACE MR0175 (on request)
- SIL 3 certification by independent third party as per IEC 61508
- Fugitive emission stem seal packing, certified as per ISO 15848 (on request)
- Low operating torque
- Manually operated handwheel or coupled with actuator

Applications

On/Off applications for isolation service

- Riser
- Blowdown
- Shutdown
- Surface safety valves (SSV) systems
- High-integrity pressure protection systems (HIPPS)
- Process
- Metering
- Low temperature applications

Specifications

Sizes	NPS 2 to 56 (DN 50–1400)
Pressure rating	ASME Classes 150 to 2500
Temperature range	-150 to 662°F (-101 to 350°C)
Face-to-face	As per API 6D standard
End connections	RF ⁽¹⁾ , RTJ ⁽¹⁾ , BW ⁽²⁾ , SW ⁽³⁾ , Hub connection

(1) As per B16.5 & B16.47 (2) As per B16.25 (3) As per B16.11

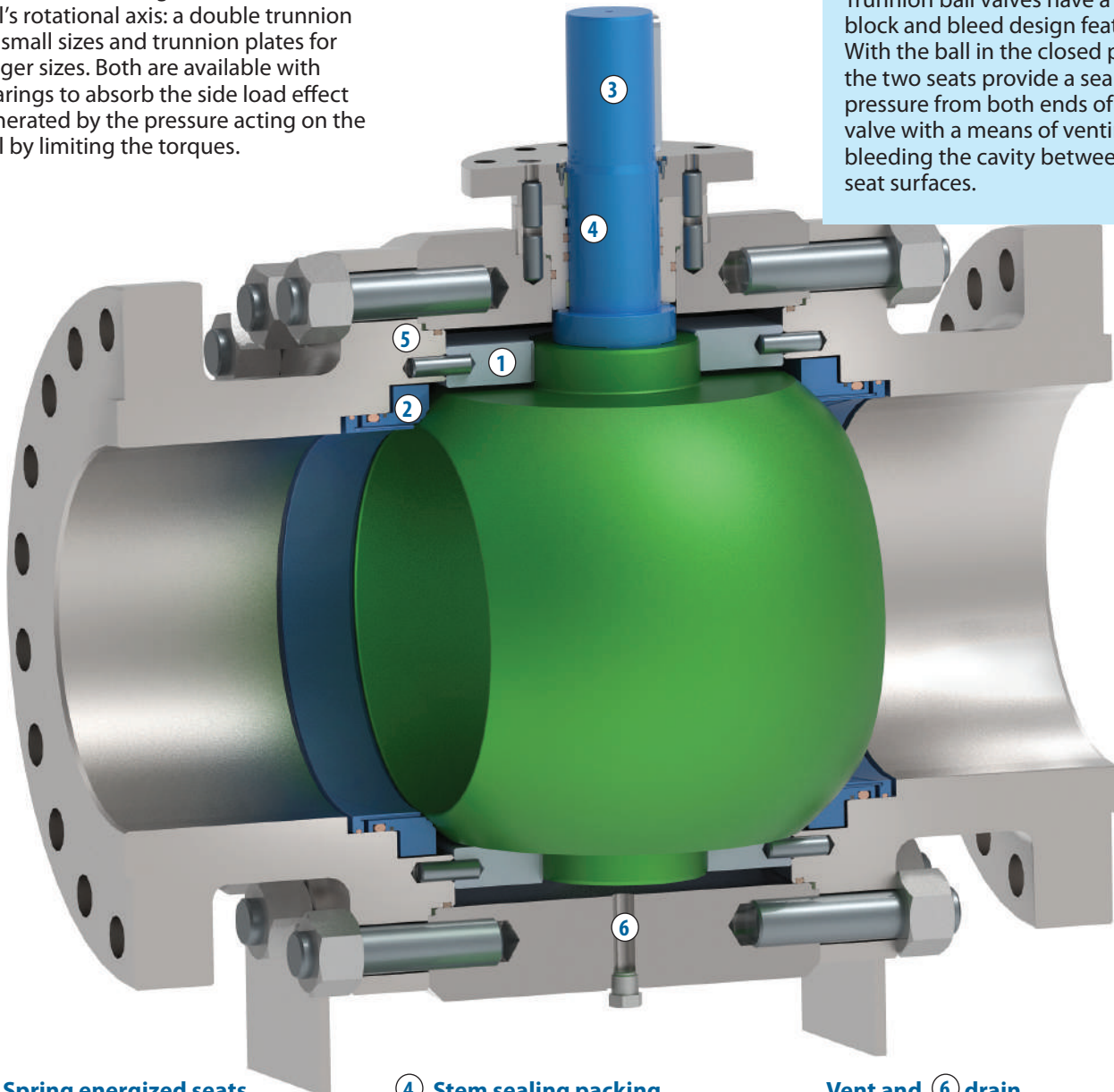
Design features

① Trunnion mounted design

Two available configurations to fix the ball's rotational axis: a double trunnion for small sizes and trunnion plates for bigger sizes. Both are available with bearings to absorb the side load effect generated by the pressure acting on the ball by limiting the torques.

Double block & bleed

Trunnion ball valves have a double block and bleed design feature. With the ball in the closed position, the two seats provide a seal against pressure from both ends of the valve with a means of venting/bleeding the cavity between the seat surfaces.



② Spring energized seats

The floating seats are free to move along the valve axis. The springs acting on the seat rings ensure an effective bi-directional tightness even at low differential pressures.

③ Anti-blowout stem

The stem is designed with an intrinsic retention feature to avoid stem ejection caused by internal pressure.

④ Stem sealing packing

A double pressure barrier of two o-rings provides a reinforced dynamic sealing protection—completed with one pure graphite gasket—to ensure fire safe protection. Lip seal configurations are available for high pressure classes or special services.

⑤ Body sealing

Static seals are designed to ensure zero leakage and fire safe protection.

Vent and ⑥ drain

Valves are completed with a vent valve located on the upper part of the body and a drain plug in the lower part of the body with NPT standard connection. Different connections, in accordance with customer specifications, can be provided.

Available seat designs

Self-relieving seats

Both seats are designed with the Single Piston Effect (SPE), capable of automatically releasing pressure from the body cavity by venting into the main line. This configuration is suitable for the Cavity Relief Test.

Double piston seats

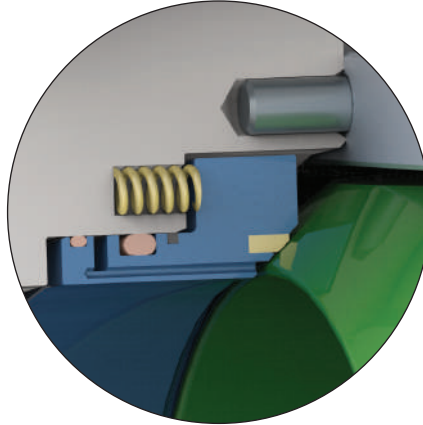
Both seats are designed to ensure Double Isolation and Bleed (DIB), allowing both the pressure in the line and in the body cavity to energize the seat by pressing them towards the ball. This provides a double barrier in both directions.

As per API 6D, a relief valve is placed in the body to relieve excess body pressure. This configuration is suitable for the DIB-1 Test.

Combination seats

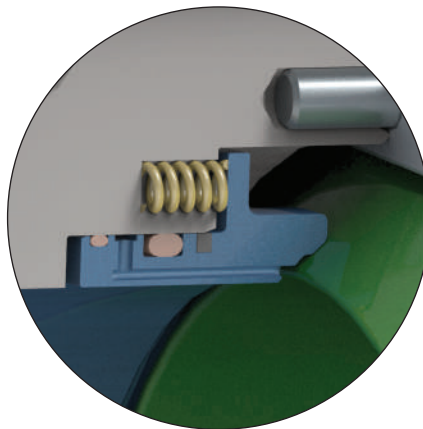
Double positive isolation in one direction is possible with this combination design of a self-relieving seat on the upstream side and a double sealing seat on the downstream side. This design also offers the capability of releasing excess body pressure via the upstream seat. This configuration is suitable for the DIB-2 Test.

Available seat contact types



Soft-seated

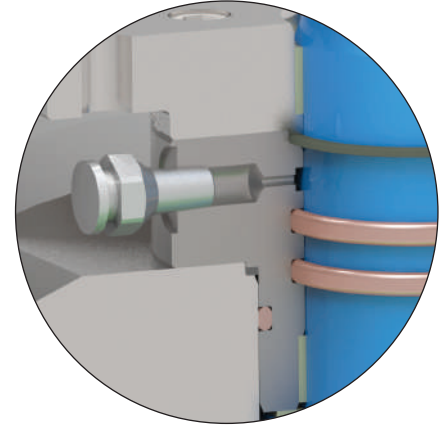
For general service, the seat is designed to hold an insert in resilient material for a soft sealing action on the ball. Different materials are available based on the media and the pressure/temperature range required. Zero leakage always ensured.



Metal-seated

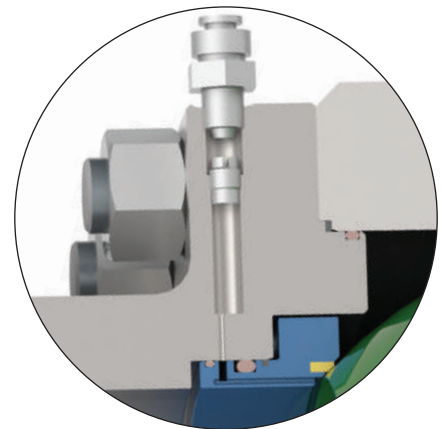
For high temperatures, abrasive services or highly corrosive fluids, the sealing surfaces of the ball and seats are coated with hard materials such as Tungsten carbide, Chrome Carbide or CoCr Alloy. This provides a sealing action by metal-to-metal contact between the ball and the seat rings. Leakage is in compliance with ISO 5208 at Rate D. Rate B is available with special lapping treatment on request.

Available emergency sealant injection



Stem sealant injection

Valves NPS 4 and larger can be equipped, on request, with an emergency stem sealant injection fitting located between the upper o-ring and the graphite gasket.



Seat sealant injection

Valves from NPS 6 and above can be manufactured with two emergency sealant injections in the seat's sealing area. As standard for isolation purposes, each injection point incorporates a primary and a secondary check valve.

During maintenance, the seat injection ports can also be used for flushing clean deposited impurities from the seating surfaces.

Valve design configuration

Summary of available features

Features	Side-entry design
API 6D monogram	On request
Fire safe design as per API 6FA - API 607 - BS 6755 part 2	Included
Face-to-face as per ASME B16.10	Included
Flange dimensions as per ASME B16.5 & B16.47	Included
Butt weld ends as per ASME B16.25	Included
Transition pups for welded ends	On request
Hub connections	On request
Trunnion mounted with two independent floating seats	Included
Double block and bleed design	Included
Independent ball and stem	Included
Anti-blowout stem	Included
Antistatic	Included
Extended bonnet for low temperature applications	As required
Spring energized seats	Included
Self-relieving seats (SPE)	Included
Both seats with Double Piston Effect (DPE) for DIB-1 Test	On request
Combination (SPE / DPE) seats for DIB-2 Test	On request
Soft seats	Included
Metal-to-metal seats	On request
Double body seals (one o-ring and one graphite gasket)	Included
Triple stem seals (two o-rings and one graphite gasket)	Included
Lip seal configurations for high pressure	On request
Full graphite configuration for high temperature	On request
Low fugitive emission stem packing	On request
Overlay on all dynamic sealing areas	On request
Overlay on all wetted parts	On request
Drain plug	Included
Vent valve (on NPS 6 and larger)	Included
Emergency sealant injection on stem	On request
Emergency sealant injection on seats (on NPS 6 and larger)	On request
Lifting lugs (over 250 kg)	Included
Supporting feet (on NPS 6 and larger)	Included
Manually operated by gear or lever	Basic
Locking device	On request
Bare stem	On request
Operated by quarter-turn actuator	On request

Actuation

Manually operated valves are provided either with a lockable wrench or gear operator.

The use of levers is limited to small valves for which the required force remains below the maximum allowable value of 360N, as per API standard.

Actuated valves can be supplied with the following quarter-turn actuators:

- Electric
- Pneumatic
- Hydraulic



Velan ABV cable drive pneumatic/hydraulic actuator

Velan ABV continuously seeks new technical solutions to meet our customer's needs by designing and manufacturing actuators that operate quarter-turn valves for extreme services.

Our innovative, patent-protected cable drive actuator maintains the robustness and the reliability of traditional scotch yoke actuators, while offering a revolutionary transmission system. This smart and simplified design has less components, less friction and therefore, less maintenance, while cutting costs and improving performance.

Talk to us to see why our latest developments in quarter-turn valves and actuation set us apart.

Technical specifications

Applicable international standards

API 6D

ASME B16.34

ASME VIII Div. I & II

API 6D / ISO 5208 / API 598

ASME B16.5 & B16.47

ASME B16.10

ASME B16.25

API 6FA / 607 / ISO 10497

NACE MR0 175

EN 10204

ATEX DIR 2014-34-EU

PED DIR 2014-68-EU

ISO 15848 / API 622

IEC 61508

Inspection and testing

100% of Velan valves are inspected and tested.

NDT certified personnel

Internal personnel, qualified as per ASNT SNT-TC-1A or ISO 9712, perform nondestructive testing (NDT) on valve components in compliance with all the major international standards.

- Visual and dimensional inspections
- Positive material identification
- Penetrant testing
- Magnetic particle testing
- Ultrasonic testing

Tested as per API 6D

Prior to shipment, all manufactured valves are tested following all the mandatory requirements as per API 6D.

- Hydrostatic shell test
- Hydrostatic seat test
- Factory acceptance test on actuated valves

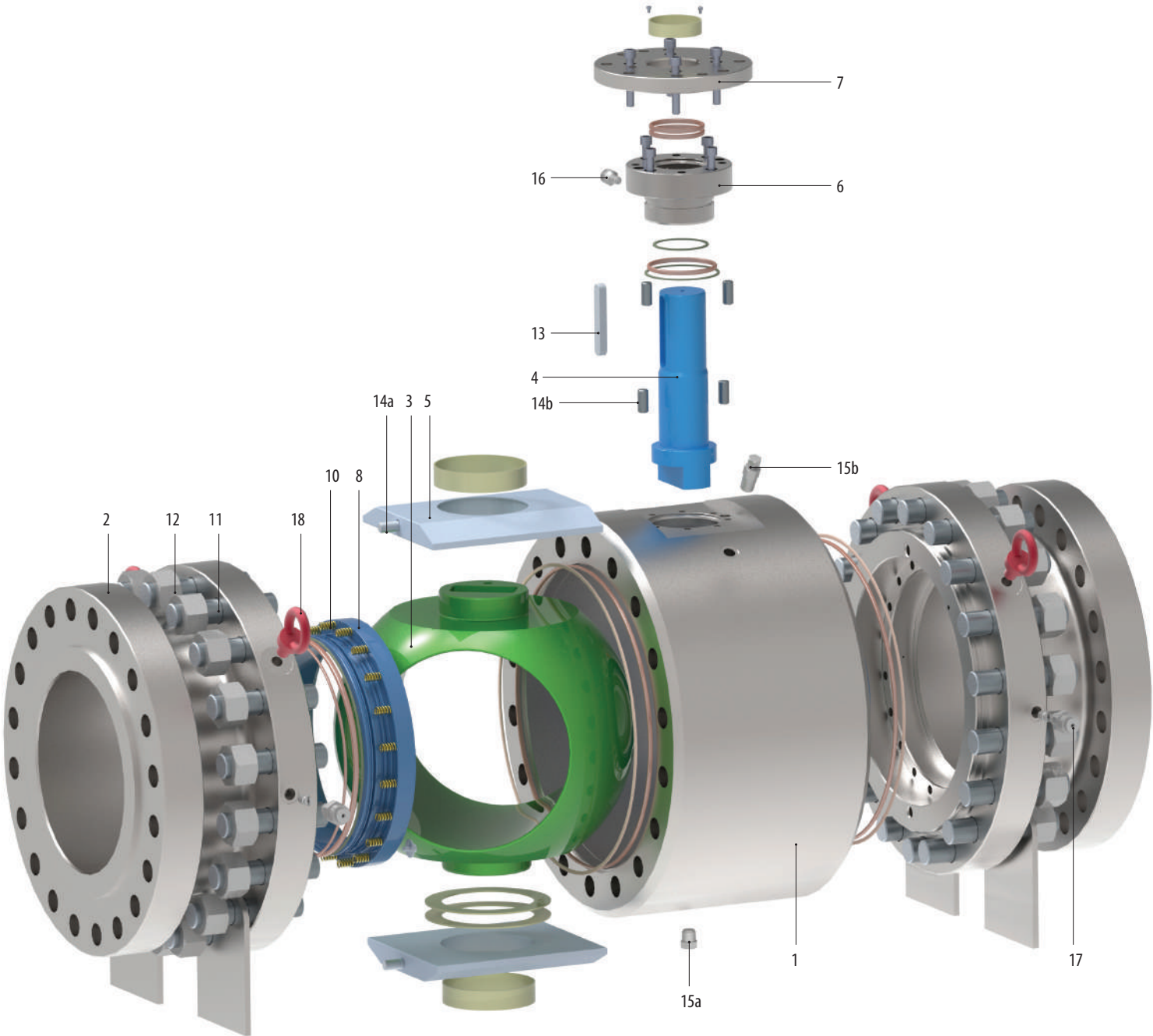
Supplementary tests as per API 6D

- High-pressure nitrogen gas tests
- DBB / DIB-1 / DIB-2
- Cavity relief test
- Drive train test
- Antistatic test
- Low-pressure pneumatic seat testing
- Valve torque testing at maximum differential pressure

Optional Qualification Tests

- Fugitive emission tests as per ISO 15848-1 & 2
- Low temperature tests as per BS6364
- Fire tests
- Endurance tests

Exploded view



Standard materials

PART		General service	Offshore service	Low temperature service	Sour service
1	Body	ASTM A350 LF2 CL.1	ASTM A182 F51	ASTM A182 F316/F316L	ASTM A350 LF2 CL.1+ CRA overlay
2	Closures	ASTM A350 LF2 CL.1	ASTM A182 F51	ASTM A182 F316/F316L	ASTM A350 LF2 CL.1+ CRA overlay
3	Ball	ASTM A182 F316/F316	ASTM A182 F51	ASTM A182 F316/F316L	Inconel 625
4	Stem	ASTM A564 630 Cond. H1150D	ASTM A182 F55	ASTM 276 XM19	Inconel 718
5	Trunnion plate	ASTM A350 LF2 CL.1+ENP	ASTM A182 F51	ASTM A182 F316/F316L	Inconel 625
6	Gland flange	ASTM A350 LF2 CL.1	ASTM A182 F51	ASTM A182 F316/F316L	Inconel 625
7	Adapter flange	ASTM A350 LF2 CL.1	ASTM A182 F51	ASTM A182 F316/F316L	Inconel 625
8	Seat ring	ASTM A182 F316/F316L	ASTM A182 F51	ASTM A182 F316/F316L	Inconel 625
9	Seat insert	RPTFE	PEEK	PTCFE	PEEK
10	Seat spring	Inconel X750	Inconel X750	Inconel X750	Inconel 718
11	Body stud	ASTM A320 L7M	ASTM A320 L7M (XYLAN 1070)	ASTM A320 B8M	ASTM A320 L7M (XYLAN 1070)
12	Body nuts	ASTM A194 Gr.7M	ASTM A194 Gr.7M (XYLAN 1070)	ASTM A194 Gr.8M	ASTM A194 Gr.7M (XYLAN 1070)
13	Stem key	Alloy steel	UNS 31803	AISI 316	UNS 31803
14a/ 14b	Body / trunnion pins	ASTM A564 630 Cond. H1150D	UNS 31803	ASTM 276 XM19	Inconel 718
15a/15b	Drain / bleeder	AISI 316	Inconel 625	AISI 316	Inconel 625
16	Stem sealing injector	AISI 316	Inconel 625	AISI 316	Inconel 625
17	Seat sealing injector	AISI 316	Inconel 625	AISI 316	Inconel 625
18	Eye bolt	AISI 1012	AISI 1012+ENP	AISI 1012+ENP	AISI 1012+ENP
	Sealing	O-rings - Viton B	O-rings: Viton B	Lip seals: PTFE+Elgiloy	Lip seals: PTFE+Elgiloy
	Gaskets	Graphite	Graphite	Graphite	Graphite
	Bushings	CS+PTFE	Inconel 625+PTFE	SS316+PTFE	Inconel 625+PTFE

Optional materials

Materials for sour service

All the materials of components in direct contact with the fluid, including bolting, studs, and nuts, are selected to be suitable for NACE MR0175 anti-corrosion requirements.

In addition, when it is required to improve the corrosion resistance of the base material and/or the mechanical performance of a component, a weld overlay of corrosion-resistant alloy (CRA) material (stainless steel or Inconel) can be placed on the sealing areas or on all the wetted parts.

The parts undergo a pre-machining process followed by the welding and final machining. The welding is carried out by qualified welders and is controlled by certified NDE personnel. At the end of the process, Velan ensures, as a standard, a minimum of 3 mm of CRA material over the base material.

Materials for clean gas service

Valves for clean gas service are manufactured with a combination of low temperature carbon steel materials, adding 25 microns of Electroless Nickel Plating (ENP) protection on all the trim component surfaces.

Materials for abrasive fluids

In valves for abrasive fluids, the soft-seated solution is substituted by a metal-to-metal contact in which the seat rings and the ball are hard-coated with at least 150 microns of Tungsten Carbide.

For critical services, the thickness is raised to 400 microns and if the temperature goes over 482°F (250°C), the coating material is changed to Chromium Carbide.

Engineering data

Flow Coefficient (Cv)

Size (in)	ASME 150	ASME 300	ASME 600	ASME 900	ASME 1500	ASME 2500
2	480	440	370	330	330	210
2½ x 2½	840	750	640	570	570	340
3x2	180	170	170	170	160	120
3	1290	1090	980	940	850	500
4x3	480	470	450	450	440	280
4	2540	2200	1850	1800	1640	1050
6x4	710	710	690	690	720	490
6	5420	5030	4550	4350	3660	2550
8x6	1960	1950	1900	1880	1710	1310
8	10370	9890	8630	8160	6860	5200
10x8	4160	4140	3990	3960	3570	2930
10	17400	16860	14320	13880	11190	8320
12x10	7560	7500	7270	7120	6220	5260
12	25700	24930	21930	20430	16500	12070
14x10	5670	5630	5560	5960	4860	-
14	30870	29290	27120	23010	19720	-
16x12	9130	9060	8920	9590	7910	-
16	41700	39760	36570	31650	26180	-
18x14	10310	10270	10120	9160	8900	-
18	53360	51880	47470	41670	33510	-
20x16	14940	14840	14600	13590	12310	-
20	68330	65620	59790	52300	42530	-
22x18	-	20500	20150	-	-	-
22	-	83140	76340	-	-	-
24x20	27640	27450	26860	24660	-	-
24	105390	101830	92110	80610	-	-
26	121850	116750	108260	95120	79760	-
28x24	47850	47390	46510	-	-	-
28	141630	136210	126970	-	-	-
30x24	36630	36420	35920	33030	-	-
30	166130	159950	147130	127380	-	-
32	186580	177030	163900	-	-	-
36x30	67600	66740	65310	58310	-	-
36	245510	230630	210000	189760	-	-

For additional sizes please contact our Engineering department.

Method of calculating liquid flow

$$\Delta p = SG \cdot \left(\frac{Q}{Cv \cdot 0,865} \right)^2$$

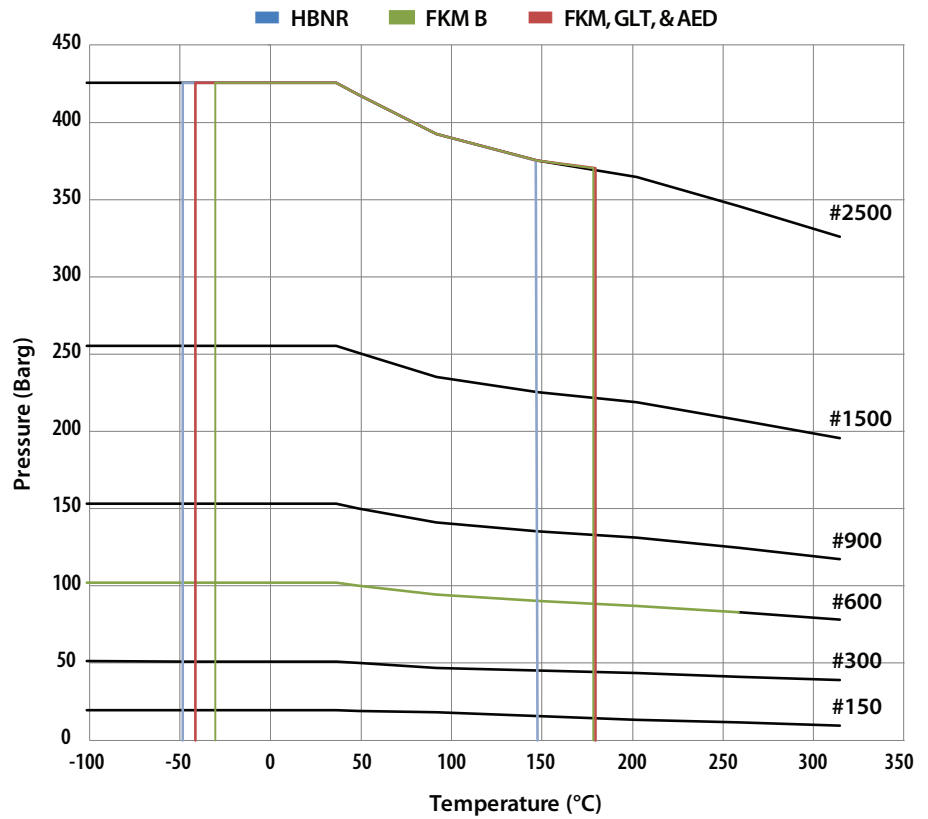
Where
 Q - Volumetric Flow [m3/h]
 SG - Standard gravity
 Δp - Pressure drop [bar]

Method of calculating gas flow

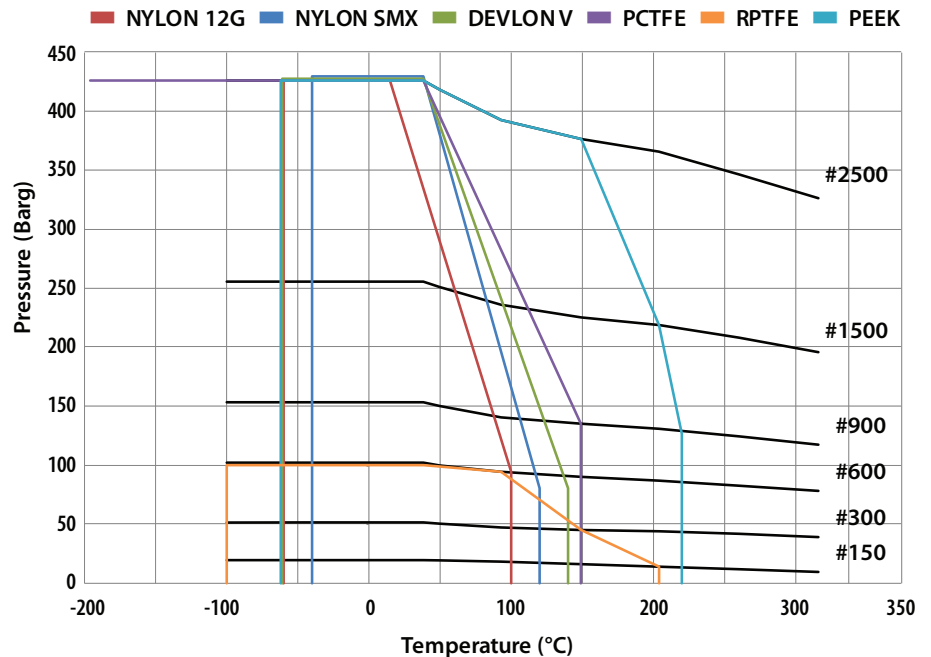
$$\Delta p = \frac{1}{\rho_1} \cdot \left(\frac{W}{Cv \cdot 27,3} \right)^2$$

Where
 ρ1 - Inlet density [kg/m3]
 Δp - Pressure drop [bar]
 W - Mass flow [kg/h]

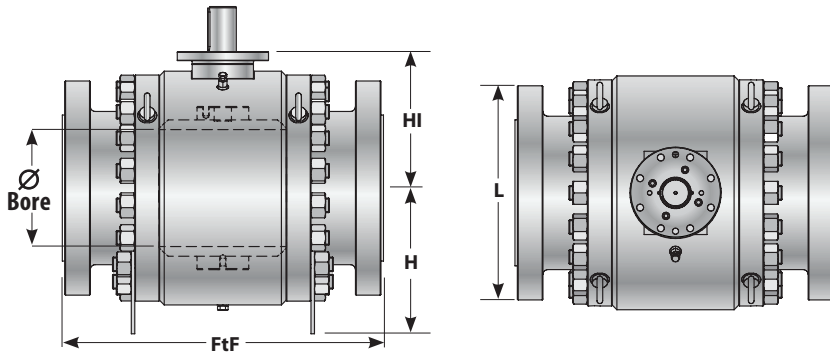
Seat sealing operating condition



Seat insert operating condition



Dimensions and weight: Full bore

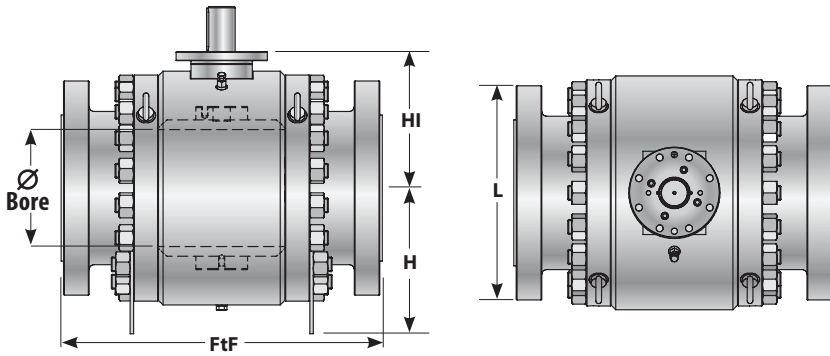


Size NPS DN	ASME 150						
	Ø Bore	FtF RF	FtF WE	L	Hi	H	Weight lb / kg
2	2.01	7.01	8.5	5.98	4.72	3.94	57
50	51	178	216	152	120	100	26
3	2.99	7.99	11.14	7.52	5.91	4.92	93
80	76	203	283	191	150	125	42
4	4.02	9.02	12.01	9.02	6.5	6.1	139
100	102	229	305	229	165	155	63
6	5.98	15.51	17.99	11.02	8.27	6.89	309
150	152	394	457	280	210	175	140
8	7.99	17.99	20.51	13.58	9.84	8.66	626
200	203	457	521	345	250	220	284
10	10	20.98	22.01	15.94	11.22	10.43	849
250	254	533	559	405	285	265	385
12	12.01	24.02	25	19.09	12.4	11.22	1376
300	305	610	635	485	315	285	624
14	13.23	27.01	30	21.06	15.75	12.99	2000
350	336	686	762	535	400	330	907
16	15.24	30	32.99	23.5	16.54	14.17	2590
400	387	762	838	597	420	360	1175
18	17.24	34.02	35.98	25	17.72	15.75	3512
450	438	864	914	635	450	400	1593
20	19.25	35.98	39.02	27.52	19.49	16.93	4850
500	489	914	991	699	495	430	2200
22	21.26	39.02	42.99	29.49	20.67	18.7	5600
550	540	991	1092	749	525	475	2540
24	23.27	42.01	45	32.01	23.03	20.47	7606
600	591	1067	1143	813	585	520	3450
26	25	45	49.02	34.25	24.8	22.05	9259
650	635	1143	1245	870	630	560	4200
28	27.01	48.98	53.03	36.5	25.39	25.59	11464
700	686	1244	1347	927	645	650	5200
30	29.02	50.98	55	38.74	27.17	27.56	12125
750	737	1295	1397	984	690	700	5500
32	30.75	53.98	60	41.77	29.13	29.33	16204
800	781	1371	1524	1061	740	745	7350
34	32.76	57.99	64.02	43.7	29.92	30.31	17857
850	832	1473	1626	1110	760	770	8100
36	34.49	60	68.03	45.98	31.89	31.69	21605
900	876	1524	1728	1168	810	805	9800
40	38.43	69.02	77.01	50.79	36.22	33.86	29762
1000	976	1753	1956	1290	920	860	13500
42	40.16	70.47	82.01	52.99	37.99	35.43	31967
1050	1020	1790	2083	1346	965	900	14500
48	45.91	78.54	94.02	59.45	43.31	41.34	48502
1200	1166	1995	2388	1510	1100	1050	22000
56	53.54	97.99	97.99	68.7	53.15	49.21	77162
1400	1360	2489	2489	1745	1350	1250	35000

Size NPS DN	ASME 300						
	Ø Bore	FtF RF	FtF WE	L	Hi	H	Weight lb / kg
2	2.01	8.5	8.5	6.5	4.72	3.94	66
50	51	216	216	165	120	100	30
3	2.99	11.14	11.14	8.27	5.91	4.92	121
80	76	283	283	210	150	125	55
4	4.02	12.01	12.01	10	6.5	6.1	159
100	102	305	305	254	165	155	72
6	5.98	15.87	15.87	12.52	8.27	6.89	346
150	152	403	403	318	210	175	157
8	7.99	19.76	19.76	15	9.84	8.66	622
200	203	502	502	381	250	220	282
10	10	22.36	22.36	17.52	11.22	10.43	1164
250	254	568	568	445	285	265	528
12	12.01	25.51	25.51	20.51	12.4	11.22	1488
300	305	648	648	521	315	285	675
14	13.23	30	30	22.99	15.75	12.99	2535
350	336	762	762	584	400	330	1150
16	15.24	32.99	32.99	25.51	16.54	14.17	3719
400	387	838	838	648	420	360	1687
18	17.24	35.98	35.98	27.99	17.72	15.75	4057
450	438	914	914	711	450	400	1840
20	19.25	39.02	39.02	30.51	19.49	16.93	5412
500	489	991	991	775	495	430	2455
22	21.26	42.99	42.99	32.99	20.67	18.7	6283
550	540	1092	1092	838	525	475	2850
24	23.27	45	45	35.98	23.03	20.47	8708
600	591	1143	1143	914	585	520	3950
26	25	49.02	49.02	38.27	24.8	22.05	10582
650	635	1245	1245	972	630	560	4800
28	27.01	52.99	52.99	40.75	25.39	25.59	13007
700	686	1346	1346	1035	645	650	5900
30	29.02	55	55	42.99	27.17	27.56	14804
750	737	1397	1397	1092	690	700	6715
32	30.75	60	60	45.24	29.13	29.33	17747
800	781	1524	1524	1149	740	745	8050
34	32.76	64.02	64.02	49.21	30.91	30.71	19930
850	832	1626	1626	1250	785	780	9040
36	34.49	67.99	67.99	58.66	31.89	31.69	26566
900	876	1727	1727	1490	810	805	12050
40	38.43	77.01	77.01	65.35	37.8	34.25	31967
1000	976	1956	1956	1660	960	870	14500
42	40.16	82.01	82.01	66.93	38.78	37.01	36376
1050	1020	2083	2083	1700	985	940	16500
48	45.91	85.43	85.43	76.77	42.91	41.34	55116
1200	1166	2170	2170	1950	1090	1050	25000
56	53.54	107.99	107.99	91.34	50.79	48.43	86421
1400	1360	2743	2743	2320	1290	1230	39200

Note: Dimensions shown in inches/mm.

Dimensions and weight: Full bore

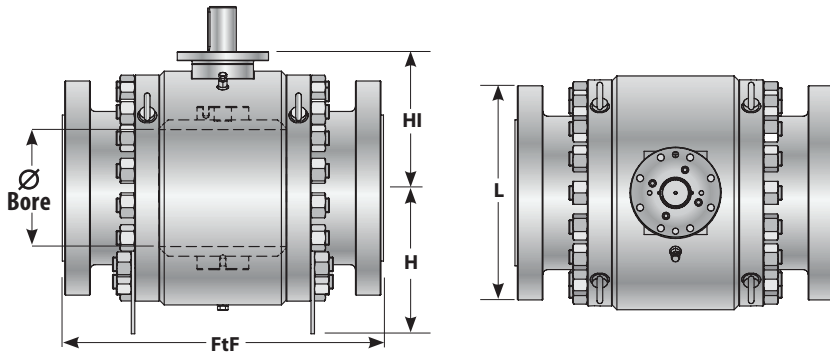


Size NPS DN	ASME 600							
	Ø Bore	FtF RF	FtF RTJ	FtF WE	L	Hi	H	Weight lb / kg
2	2.01	11.5	11.61	11.5	6.5	4.69	3.98	77
50	51	292	295	292	165	119	101	35
3	2.99	14.02	14.13	14.02	8.27	5.91	4.92	143
80	76	356	359	356	210	150	125	65
4	4.02	17.01	17.13	17.01	10.75	6.89	6.1	209
100	102	432	435	432	273	175	155	95
6	5.98	22.01	22.13	22.01	14.02	8.66	7.48	540
150	152	559	562	559	356	220	190	245
8	7.99	25.98	26.14	25.98	16.5	10.63	9.06	948
200	203	660	664	660	419	270	230	430
10	10	30.98	31.14	30.98	20	11.81	11.02	1521
250	254	787	791	787	508	300	280	690
12	12.01	32.99	33.11	32.99	22.01	13.39	11.81	2249
300	305	838	841	838	559	340	300	1020
14	13.23	35	35.12	35	23.74	16.93	13.78	2866
350	336	889	892	889	603	430	350	1300
16	15.24	39.02	39.13	39.02	27.01	18.11	15.55	4012
400	387	991	994	991	686	460	395	1820
18	17.24	42.99	43.11	42.99	29.25	18.9	17.32	5181
450	438	1092	1095	1092	743	480	440	2350
20	19.25	47.01	47.24	47.01	32.01	19.88	19.29	7363
500	489	1194	1200	1194	813	505	490	3340
22	21.26	51.02	51.38	51.02	34.25	21.46	20.08	8708
550	540	1296	1305	1296	870	545	510	3950
24	23.27	55	55.35	55	37.01	23.62	22.44	12302
600	591	1397	1406	1397	940	600	570	5580
26	25	57.01	57.48	57.01	40	25.39	24.41	14043
650	635	1448	1460	1448	1016	645	620	6370
28	27.01	60.98	61.5	60.98	42.24	27.36	26.18	18651
700	686	1549	1562	1549	1073	695	665	8460
30	29.02	66.3	66.81	66.3	44.49	29.53	27.95	19180
750	737	1684	1697	1684	1130	750	710	8700
32	30.75	70	70.63	70	47.01	30.91	29.72	26455
800	781	1778	1794	1778	1194	785	755	12000
34	32.76	75.98	76.61	75.98	49.21	32.68	31.1	32408
850	832	1930	1946	1930	1250	830	790	14700
36	34.49	82.01	82.6	82.01	51.77	33.46	32.13	36597
900	876	2083	2098	2083	1315	850	816	16600
40	38.43	81.89	85.43	81.89	52.01	38.39	35.04	43652
1000	976	2080	2170	2080	1321	975	890	19800
42	40.16	85.63	85.63	85.63	63.78	40.59	45.75	51147
1050	1020	2175	2175	2175	1620	1031	1162	23200
48	45.91	95.87	95.87	95.87	72.83	46.54	49.8	76280
1200	1166	2435	2435	2435	1850	1182	1265	34600
56	53.54	106.69	106.69	106.69	82.68	51.42	57.09	105822
1400	1360	2710	2710	2710	2100	1306	1450	48000

Size NPS DN	ASME 900							
	Ø Bore	FtF RF	FtF RTJ	FtF WE	L	Hi	H	Weight lb / kg
2	2.01	14.49	14.61	14.49	8.5	4.72	3.94	132
50	51	368	371	368	216	120	100	60
3	2.99	15	15.12	15	9.49	5.91	4.76	198
80	76	381	384	381	241	150	121	90
4	4.02	17.99	18.11	17.99	11.5	6.89	6.1	331
100	102	457	460	457	292	175	155	150
6	5.98	24.02	24.13	24.02	15	8.66	7.68	725
150	152	610	613	610	381	220	195	329
8	7.99	29.02	29.13	29.02	18.5	9.84	9.25	1224
200	203	737	740	737	470	250	235	555
10	10	32.99	33.11	32.99	21.5	14.96	12.2	1770
250	254	838	841	838	546	380	310	803
12	12.01	37.99	38.11	37.99	24.02	15.55	13.39	2701
300	305	965	968	965	610	395	340	1225
14	12.76	40.51	40.87	40.51	25.24	17.32	14.96	3638
350	324	1029	1038	1029	641	440	380	1650
16	14.76	44.49	44.88	44.49	27.76	18.9	16.34	5132
400	375	1130	1140	1130	705	480	415	2328
18	16.73	47.99	48.5	47.99	30.98	19.09	19.69	7326
450	425	1219	1232	1219	787	485	500	3323
20	18.62	52.01	52.52	52.01	33.74	21.06	19.69	10163
500	473	1321	1334	1321	857	535	500	4610
24	22.48	60.98	61.73	60.98	40.98	25.39	24.21	16184
600	571	1549	1568	1549	1041	645	615	7341
26	24.37	65	65.91	65	42.76	27.17	25.59	19180
650	619	1651	1674	1651	1086	690	650	8700
28	26.26	69.02	69.88	69.02	45.98	28.15	26.38	21164
700	667	1753	1775	1753	1168	715	670	9600
30	28.11	74.02	74.88	74.02	48.5	30.71	28.54	24410
750	714	1880	1902	1880	1232	780	725	11072
32	29.92	79.13	0	79.13	51.77	33.54	30.91	33510
800	760	2010	0	2010	1315	852	785	15200
34	31.81	85	86.14	85	58.66	34.25	37.4	37853
850	808	2159	2188	2159	1490	870	950	17170
36	33.66	89.76	91.14	89.76	57.52	39.76	36.22	42201
900	855	2280	2315	2280	1461	1010	920	19142

Note: Dimensions shown in inches/mm.

Dimensions and weight: Full bore

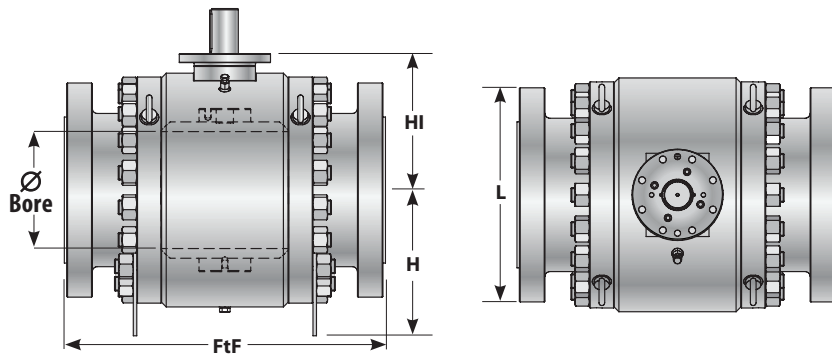


Size NPS DN	ASME 1500							
	Ø Bore	FtF RF	FtF RTJ	FtF WE	L	Hi	H	Weight lb / kg
2	2.01	14.49	14.61	14.49	8.5	4.68	3.74	132
50	51	368	371	368	216	118.9	95	60
3	2.99	18.5	18.62	18.5	10.51	6.1	5.12	243
80	76	470	473	470	267	155	130	110
4	4.02	21.5	21.61	21.5	12.24	7.09	6.3	441
100	102	546	549	546	311	180	160	200
6	5.75	27.76	27.99	27.76	15.43	10.24	8.27	1080
150	146	705	711	705	392	260	210	490
8	7.6	32.76	33.11	32.76	19.02	13.35	9.45	2110
200	193	832	841	832	483	339	240	957
10	9.49	39.02	39.37	39.02	22.99	14.17	12.6	3285
250	241	991	1000	991	584	360	320	1490
12	11.38	44.49	45.12	44.49	26.5	16.34	14.17	4777
300	289	1130	1146	1130	673	415	360	2167
14	12.52	49.49	50.24	49.49	29.49	19.29	16.14	6614
350	318	1257	1276	1257	749	490	410	3000
16	14.25	54.49	55.39	54.49	32.52	20.47	17.91	9381
400	362	1384	1407	1384	826	520	455	4255
18	16.02	60.51	61.38	60.51	35.98	21.65	23.62	12158
450	407	1537	1559	1537	914	550	600	5515
20	16.54	65.51	66.38	65.51	38.74	25.59	24.41	16623
500	420	1664	1686	1664	984	650	620	7540
24	19.69	76.5	77.64	76.5	45.98	28.74	26.97	32077
600	500	1943	1972	1943	1168	730	685	14550

Size NPS DN	ASME 2500							
	Ø Bore	FtF RF	FtF RTJ	FtF WE	L	Hi	Weight lb / kg	
2	1.73	17.76	17.87	17.76	9.25	6.22	276	
50	44	451	454	451	235	158	125	
3	2.48	22.76	22.99	22.76	12.01	7.4	529	
80	63	578	584	578	305	188	240	
4	3.5	26.5	26.89	26.5	14.02	9.06	855	
100	89	673	683	673	356	230	388	
6	5.24	35.98	36.5	35.98	19.02	12.99	2297	
150	133	914	927	914	483	330	1042	
8	7.13	40.24	40.87	40.24	21.73	15.55	3715	
200	181	1022	1038	1022	552	395	1685	
10	8.9	50	50.87	50	26.5	17.52	7134	
250	226	1270	1292	1270	673	445	3236	
12	10.51	55.98	56.89	55.98	30	18.31	9930	
300	267	1422	1445	1422	762	465	4504	

Note: Dimensions shown in inches/mm.

Dimensions and weight: Reduced bore

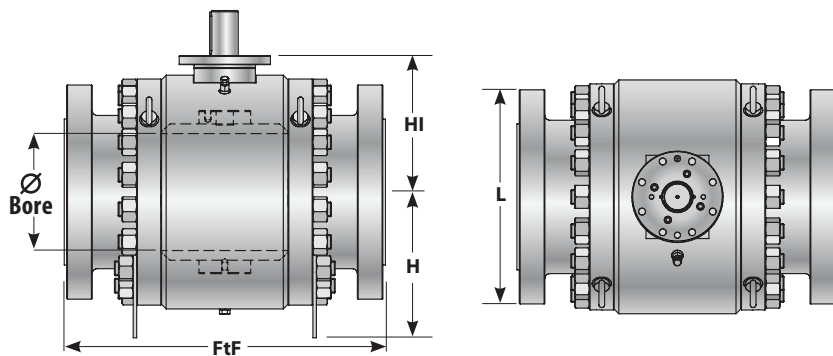


Size NPS DN	ASME 150						
	Ø Bore	FtF RF	FtF WE	L	Hi	H	Weight lb / kg
3x2 80x50	2.01 51	7.99 203	11.14 283	7.52 191	4.72 120	3.94 100	60 27
4x3 100x80	2.99 76	9.02 229	12.01 305	9.02 229	5.91 150	4.92 125	108 49
6x4 150x100	4.02 102	15.51 394	17.99 457	10.98 279	6.5 165	6.1 155	220 100
8x6 200x150	5.98 152	17.99 457	20.51 521	13.5 343	8.27 210	6.89 175	421 191
10x8 250x200	7.99 203	20.98 533	22.01 559	15.98 406	9.84 250	8.66 220	670 304
12x10 300x250	10 254	24.02 610	25 635	19.02 483	11.22 285	10.43 265	1030 467
14x10 350x250	9.92 252	27.01 686	30 762	18.58 472	11.85 301	12.4 315	1047 475
16x12 400x300	12.01 305	30 762	32.99 838	23.5 597	12.4 315	11.22 285	1839 834
18x14 450x350	13.27 337	34.02 864	35.98 914	25 635	15.75 400	12.99 330	2205 1000
20x16 500x400	15.24 387	35.98 914	39.02 991	27.52 699	16.54 420	14.17 360	3029 1374
24x20 600x500	19.17 487	42.01 1067	45 1143	33.31 846	19.69 500	20.87 530	5223 2369
30x24 750x600	23.19 589	50.98 1295	55 1397	39.29 998	22.91 582	24.41 620	8589 3896
36x30 900x750	28.94 735	60 1524	67.99 1727	49.02 1245	27.83 707	29.92 760	15260 6922

Size NPS DN	ASME 300						
	Ø Bore	FtF RF	FtF WE	L	Hi	H	Weight lb / kg
3x2 80x50	2.01 51	11.14 283	11.14 283	8.27 210	4.72 120	3.94 100	101 46
4x3 100x80	2.99 76	12.01 305	12.01 305	10 254	5.91 150	4.92 125	163 74
6x4 150x100	4.02 102	15.87 403	15.87 403	12.52 318	6.5 165	6.1 155	304 138
8x6 200x150	5.98 152	19.76 502	20.51 521	15 381	8.27 210	6.89 175	518 235
10x8 250x200	7.99 203	22.36 568	22.01 559	17.52 445	9.84 250	8.66 220	809 367
12x10 300x250	10 254	25.51 648	25 635	20.51 521	11.22 285	10.43 265	1276 579
14x10 350x250	9.92 252	30 762	30 762	19.57 497	12.87 327	13.5 343	1495 678
16x12 400x300	12.01 305	32.99 838	32.99 838	25.51 648	12.4 315	11.22 285	2147 974
18x14 450x350	13.27 337	35.98 914	35.98 914	27.99 711	15.75 400	12.99 330	2732 1239
20x16 500x400	15.24 387	39.02 991	39.02 991	30.51 775	16.93 430	14.17 360	3759 1705
24x20 600x500	19.17 487	45 1143	45 1143	34.13 867	20.28 515	21.06 535	6334 2873
30x24 750x600	23.19 589	55 1397	55 1397	40.31 1024	23.46 596	25 635	10714 4860
36x30 900x750	28.94 735	67.99 1727	67.99 1727	50.04 1271	29.17 741	30.51 775	19125 8675

Note: Dimensions shown in inches/mm.

Dimensions and weight: Reduced bore

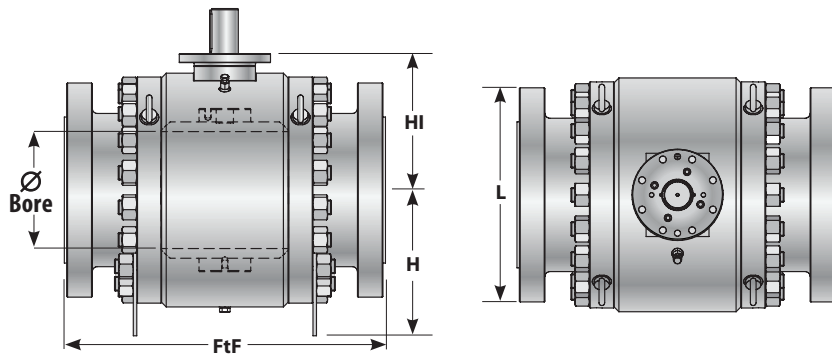


Size NPS DN	ASME 600							Weight lb / kg
	Ø Bore	FtF RF	FtF RTJ	FtF WE	L	Hi	H	
3x2 80x50	2.01 51	14.02 356	14.13 359	14.02 356	8.27 210	4.72 120	3.94 100	115 52
4x3 100x80	2.99 76	17.01 432	17.13 435	17.01 432	10.75 273	5.91 150	4.92 125	165 75
6x4 150x100	4.02 102	22.01 559	22.13 562	22.01 559	14.02 356	6.89 175	6.1 155	353 160
8x6 200x150	5.98 152	25.98 660	26.14 664	25.98 660	16.5 419	8.66 220	7.48 190	732 332
10x8 250x200	7.99 203	30.98 787	31.14 791	30.98 787	20 508	10.63 270	9.06 230	1248 566
12x10 300x250	10 254	32.99 838	33.11 841	32.99 838	22.01 559	11.81 300	11.02 280	1739 789
14x10 350x250	9.92 252	35 889	35.12 892	35 889	20.16 512	13.03 331	13.5 343	1964 891
16x12 400x300	12.01 305	39.02 991	39.13 994	39.02 991	27.01 686	13.39 340	11.81 300	2868 1301
18x14 450x350	13.27 337	42.99 1092	43.11 1095	42.99 1092	29.25 743	16.93 430	13.78 350	3882 1761
20x16 500x400	15.24 387	47.01 1194	47.24 1200	47.01 1194	32.01 813	18.11 460	15.55 395	5254 2383
24x20 600x500	19.17 487	55 1397	55.39 1407	55 1397	35.16 893	20.87 530	21.65 550	9057 4108
30x24 750x600	23.19 589	65 1651	65.51 1664	65 1651	41.73 1060	24.8 630	25.79 655	14407 6535
36x30 900x750	28.94 735	82.01 2083	82.64 2099	82.01 2083	50.39 1280	30.35 771	32.28 820	25724 11668

Size NPS DN	ASME 900							Weight lb / kg
	Ø Bore	FtF RF	FtF RTJ	FtF WE	L	Hi	H	
3x2 80x50	2.01 51	15 381	15.12 384	15 381	9.49 241	4.72 120	3.94 100	143 65
4x3 100x80	2.99 76	17.99 457	18.11 460	17.99 457	11.5 292	5.91 150	4.92 125	273 124
6x4 150x100	4.02 102	24.02 610	24.13 613	24.02 610	15 381	6.89 175	6.1 155	472 214
8x6 200x150	5.98 152	29.02 737	29.13 740	29.02 737	18.5 470	8.66 220	7.68 195	1027 466
10x8 250x200	7.99 203	32.99 838	33.11 841	32.99 838	21.5 546	9.84 250	9.25 235	1545 701
12x10 300x250	10 254	37.99 965	38.11 968	37.99 965	24.02 610	14.96 380	12.2 310	2249 1020
14x10 350x250	9.92 252	40.51 1029	40.87 1038	40.51 1029	20.87 530	13.35 339	14.88 378	2690 1220
16x12 400x300	12.01 305	44.49 1130	44.88 1140	44.49 1130	27.76 705	15.55 395	13.39 340	3801 1724
18x14 450x350	12.76 324	47.99 1219	48.5 1232	47.99 1219	30.98 787	17.32 440	14.96 380	5370 2436
20x16 500x400	14.69 373	52.01 1321	52.52 1334	52.01 1321	29.53 750	17.95 456	19.09 485	7414 3363
24x20 600x500	18.54 471	60.98 1549	61.73 1568	60.98 1549	37.36 949	22.72 577	23.62 600	13358 6059
30x24 750x600	22.44 570	74.02 1880	74.88 1902	74.02 1880	44.76 1137	27.32 694	27.36 695	18920 8582
36x30 900x750	28.03 712	90 2286	91.14 2315	90 2286	53.54 1360	33.03 839	33.46 850	34912 15836

Note: Dimensions shown in inches/mm.

Dimensions and weight: Reduced bore

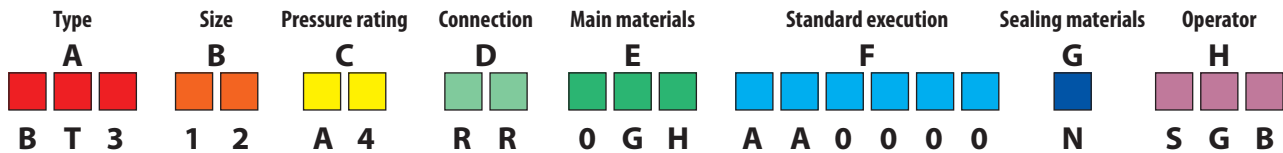


Size NPS DN	ASME 1500							
	Ø Bore	FtF RF	FtF RTJ	FtF WE	L	Hi	H	Weight lb / kg
3x2 80x50	2.01 51	18.5 470	18.62 473	18.5 470	10.51 267	4.72 120	4.13 105	181 82
4x3 100x80	2.99 76	21.5 546	21.61 549	21.5 546	12.24 311	6.1 155	5.12 130	309 140
6x4 150x100	4.02 102	27.76 705	27.99 711	27.76 705	15.51 394	7.09 180	6.3 160	683 310
8x6 200x150	5.75 146	29.02 737	29.13 740	29.02 737	19.02 483	8.66 220	7.68 195	1433 650
10x8 250x200	7.6 193	32.99 838	33.11 841	32.99 838	22.99 584	9.84 250	9.25 235	2601 1180
12x10 300x250	9.49 241	37.99 965	38.11 968	37.99 965	26.5 673	14.96 380	12.2 310	4079 1850
14x10 350x250	9.41 239	49.49 1257	50.24 1276	49.49 1257	23.62 600	14.61 371	15.75 400	4729 2145
16x12 400x300	11.38 289	54.49 1384	55.39 1407	54.49 1384	32.52 826	16.34 415	14.17 360	6305 2860
18x14 450x350	12.4 315	60.51 1537	61.38 1559	60.51 1537	29.72 755	18.15 461	20.28 515	8378 3800
20x16 500x400	14.17 360	65.51 1664	66.38 1686	65.51 1664	33.86 860	20.24 514	22.44 570	11321 5135
24x20 600x500	17.87 454	76.5 1943	77.64 1972	76.5 1943	42.13 1070	26.38 670	26.77 680	23975 10875

Size NPS DN	ASME 2500							
	Ø Bore	FtF RF	FtF RTJ	FtF WE	L	Hi	H	Weight lb / kg
3x2 80x50	1.73 44	22.76 578	22.99 584	22.76 578	12.01 305	5.91 150	4.92 125	408 185
4x3 100x80	2.48 63	26.5 673	26.89 683	26.5 673	14.02 356	7.28 185	6.1 155	855 388
6x4 150x100	3.5 89	35.98 914	36.5 927	35.98 914	19.02 483	9.06 230	7.68 195	1543 700
8x6 200x150	5.24 133	40.24 1022	40.87 1038	40.24 1022	21.73 552	12.99 330	10.43 265	2712 1230
10x8 250x200	7.13 181	50 1270	50.87 1292	50 1270	26.5 673	15.55 395	13.78 350	5401 2450
12x10 300x250	8.9 226	55.98 1422	56.89 1445	55.98 1422	30 762	17.52 445	16.54 420	8267 3750

Note: Dimensions shown in inches/mm.

How to order API 6D Side-entry trunnion ball valves



Example:

- A** Forged trunnion ball valve, three-piece bolted body
- B** NPS 12 (DN 300)
- C** ASME Class 600
- D** Raised face flanged
- E** Body and closures: A350 LF2 Cl.1, Ball: ASTM A182 F316-F316L, Stem: ASTM A564 630 Cond. H1150D, Bolting: ASTM A320 L7M-A194 Gr.7M,
- F** O-ring seals, soft self-relieving seats without emergency sealant injections on seats and stem
- G** Viton GLT, Seat inserts: RPTFE
- H** Standard gear box with padlocking

A TYPE

- BT3** Forged trunnion ball valve, three-piece bolted body
- BT2** Forged trunnion ball valve, two-piece bolted body

B SIZE shown in NPS/inch (DN/mm)

Full bore			Reduced bore		
02 2 (50)	16 16 (400)	32 32 (800)	3R 3x2 (80x50)	DC 16x12 (400x300)	
03 3 (80)	18 18 (450)	34 34 (850)	43 4x3 (100x80)	E1 18x14 (450x350)	
04 4 (100)	20 20 (500)	36 36 (900)	64 6x4 (150x100)	E3 20x16 (500x400)	
06 6 (150)	22 22 (550)	40 40 (1000)	86 8x6 (200x150)	E7 24x20 (600x500)	
08 8 (200)	24 24 (600)	42 42 (1050)	B8 10x8 (250x200)	E9 30x24 (750x600)	
10 10 (250)	26 26 (650)	48 48 (1200)	CB 12x10 (300x250)	M1 36x30 (900x750)	
12 12 (300)	28 28 (700)		PB 14x10 (350x250)		
14 14 (350)	30 30 (750)				

C PRESSURE RATING (ASME CLASS)

A1 150	A4 600	A7 1500
A2 300	A6 900	A8 2500

D END CONNECTION

HH Hub (HUB)	BB Butt weld (BW)	8A Compact flanged (CJ)
JJ Ring-type joint flanged (RTJ)	TT Butt weld (BW)+ nipples	
RR Raised face flanged (RF)	WW Socket weld (SW)	

E MAIN MATERIALS

Code	Body & closures	Ball	Stem	Bolting
07W	ASTM A350 LF2 CL.1	ASTM A350 LF2 CL.1+ENP	AISI 4140+ENP	ASTM A320 L7M - ASTM A194 Gr.7M
0GH	ASTM A350 LF2 CL.1	ASTM A182 F316/F316L	ASTM A564 630 Cond. H1150D	ASTM A320 L7M - ASTM A194 Gr.7M
15C	ASTM A350 LF2 CL.1	ASTM A182 F51	ASTM A564 630 Cond. H1150D	ASTM A320 L7M - ASTM A194 Gr.7M
05E	ASTM A350 LF2 CL.1	ASTM A182 F51	ASTM A182 F51	ASTM A320 L7M - ASTM A194 Gr.7M
479	ASTM A350 LF2 CL.1	ASTM A182 F51	ASTM B637 N07718	ASTM A320 L7M - ASTM A194 Gr.7M
02N	ASTM A182 F316/F316L	ASTM A182 F316/F316L	ASTM A182 F316/F316L	ASTM A193 B8M - ASTM A194 Gr.8M
439	ASTM A182 F316/F316L	ASTM A182 F316/F316L	ASTM A276 XM-19 Cond. A	ASTM A320 B8M - ASTM A194 Gr.8M
491	ASTM A182 F316/F316L	ASTM A182 F316/F316L	ASTM B637 N07718	ASTM A320 B8M - ASTM A194 Gr.8M
0H1	ASTM A182 F51	ASTM A182 F51	ASTM A182 F51	ASTM A320 L7M - ASTM A194 Gr.7M (Xylan 1070)
02M	ASTM A182 F51	ASTM A182 F51	ASTM B637 N07718	ASTM A320 L7M - ASTM A194 Gr.7M (Xylan coated 1070)
142	ASTM A182 F55	ASTM A182 F55	ASTM A182 F55	ASTM A320 L7M - ASTM A194 Gr.7M (Xylan coated 1070)
122	ASTM A182 F55	ASTM A182 F55	ASTM B637 N07718	ASTM A320 L7M - ASTM A194 Gr.7M (Xylan coated 1070)
9V0	ASTM A350 LF2 CL.1 +CRA overlay	ASTM A182 F51	ASTM A182 F51	ASTM A320 L7M - ASTM A194 Gr.7M (Xylan coated 1070)
0GY	ASTM B564 N06625	ASTM B564 N06625	ASTM B637 N07718	ASTM A320 L7M - ASTM A194 Gr.7M
A84	ASTM A350 LF2 CL.1 +CRA overlay	ASTM B564 N06625	ASTM B637 N07718	ASTM A320 L7M - ASTM A194 Gr.7M

F STANDARD EXECUTION

Code	Primary seals	Emergency sealant injection - seats	Emergency sealant injection - stem	Seat contact type	Seat design
UUTTMM	O-ring	Yes	Yes	Soft seat	Self-relieving
A500TT	O-ring	Yes	Yes	Metal seat	Self-relieving
VVTTMM	O-ring	Yes	Yes	Soft seat	Double piston
AFTT00	O-ring	Yes	Yes	Soft seat	Combination
VVTTKK	O-ring	Yes	Yes	Metal seat	Double piston
AFTTNN	O-ring	Yes	Yes	Metal seat	Combination
KKTTMM	Lip seal	Yes	Yes	Soft seat	Self-relieving
A5DDTT	Lip seal	Yes	Yes	Metal seat	Self-relieving
APDDTT	Lip seal	Yes	Yes	Soft seat	Double piston
AFDDTT	Lip seal	Yes	Yes	Soft seat	Combination
ASACTT	Lip seal	Yes	Yes	Metal seat	Double piston
ARLLTT	Lip seal	Yes	Yes	Metal seat	Combination
AA0000	O-ring	No	No	Soft seat	Self-relieving
UULLMM	O-ring	No	No	Metal seat	Self-relieving
VV00MM	O-ring	No	No	Soft seat	Double piston
AF0000	O-ring	No	No	Soft seat	Combination
VV00KK	O-ring	No	No	Metal seat	Double piston
AF00NN	O-ring	No	No	Metal seat	Combination
KK00MM	Lip seal	No	No	Soft seat	Self-relieving
KKLLMM	Lip seal	No	No	Metal seat	Self-relieving
APDD00	Lip seal	No	No	Soft seat	Double piston
AFDD00	Lip seal	No	No	Soft seat	Combination
APDDNN	Lip seal	No	No	Metal seat	Double piston
AFDDNN	Lip seal	No	No	Metal seat	Combination

G SEALING MATERIALS

Code	Seals	Seat inserts	Code	Seals	Seat inserts
F	Lip seal	PEEK	S	Viton B	PEEK
K	Lip seal	PCTFE	T	Viton GLT	PEEK
M	Viton B	RPTFE	U	HNBR	PEEK
N	Viton GLT	RPTFE	W	Lip seal	Metal
L	HNBR	RPTFE	X	Viton GLT	Metal
P	Viton B	Devlon V	Y	HNBR	Metal
O	Viton GLT	Devlon V	Z	Viton B	Metal
R	HNBR	Devlon V			

H OPERATOR

Code	Description
OFM	Bare stem
FML	Wrench flange with padlocking
FLL	Wrench flange
SGL	Standard gear box
SGB	Standard gear box with padlocking

Note: For additional features or different materials combination please contact our Sales Department

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