

VELAN

HIGH PRESSURE FORGED STEEL X-SERIES Bonnetless Globe Valves



***Oblique,
Vertical &
Angle Patterns***

***Sizes: 1/4 - 2" (8-50 mm)
ASME Classes: 600-2500***

• Power Generation • Oil & Gas • Refining & Petrochemical

VELAN BONNETLESS VALVES

General valve design (pressure/temperature ratings and body wall thickness) is in accordance with ASME B16.34. Special and Limited classes are available subject to service conditions. Valves conform to the European Pressure Equipment Directive 97/23/EC (the PED).

COMPLETE RANGE OF AUTOMATION CAPABILITIES

The sturdy valve yoke allows for easy adaptation to accept most electric, pneumatic or hydraulic actuators for automated processes.

DROP FORGED ONE-PIECE BODY

This feature removes the need for a separate bonnet and therefore eliminates:

- leakage path through gaskets
- seized bonnet fixings
- weld removal on welded bonnet designs.

The closed die forge process used for Velan valve bodies offers the advantage of a uniform metallic structure, greater density, higher strength integrity and higher fatigue resistance to creep when compared to castings. Forgings also eliminate the formation of 'pipe seams' found in bar stock construction and porosity in thin wall castings. Carbon steel valves are finished externally by a phosphating process to enhance protection against wear and corrosion. Other finishes are available to order.

TIGHT SEATING

The proportions of the valve and standard material selection combine to maintain seat tightness during cool-down and warm-up.

PERFECT ALIGNMENT

The use of purpose made machine tools ensures perfect alignment of all critical components and burnishing tools finish the packing chamber wall to 16RMS or better. The precision main seat is aligned with special tooling during the seal welding process ensuring perfect disc/stem function.

GLAND SEAL

The size and depth of the packing chamber together with tightly controlled machining tolerances on both body and stem provide the tightest possible seal. Live loading is available to order.

UNIVERSAL VALVE

These valves have many 'standardised' components which means that only the disc and stem need be changed to convert globe/stop valves to stop-check, needle or flow control. This results in reduced inventory and lower cost of stock and spares.

END CONNECTIONS

End connections are in accordance with ASME standards. The versatile nature of the design means that many other end connections (especially flange types) can be accommodated. Flanges and pipe pups are attached to the body by full penetration welds using ASME & BS EN approved welders and procedures. End to end and face to face dimensions are in accordance with ASME B16.10 or special to order.

HANDWHEEL

Manufactured from a malleable iron casting, the handwheel is generously proportioned to reduce operator effort when closing the valve.

YOKE BUSH

Manufactured as standard from high tensile bronze, this component provides a sturdy guide for the stem together with excellent anti-galling properties. Extra long stem thread engagement ensures perfect alignment. Other materials are available to order, especially when copper or copper bearing alloys are prohibited.

GLAND FIXINGS

The gland fixings consist of two all-thread studs, each complete with heavy series UNC nuts. Various materials are available, see page 6.

BACK SEAT & RETAINER

This feature enables the packing chamber to be completely isolated from line pressure when the valve is fully open. The hardened stainless steel self-aligning backseat is held in position by a threaded retainer (with left hand thread to prevent loosening when opening the valve) and forms a pressure tight seal with the body thanks to a precisely machined conical bevel. It also forms a pressure tight seal with the mating cone on the valve stem.

The back seat is pressure tested to confirm integrity with both body and stem.

Caution: Most valve standards and codes of practice caution users that successful completion of a back seat pressure test should not be construed as a recommendation by the manufacturer that the gland packing may be replaced with the valve under pressure.

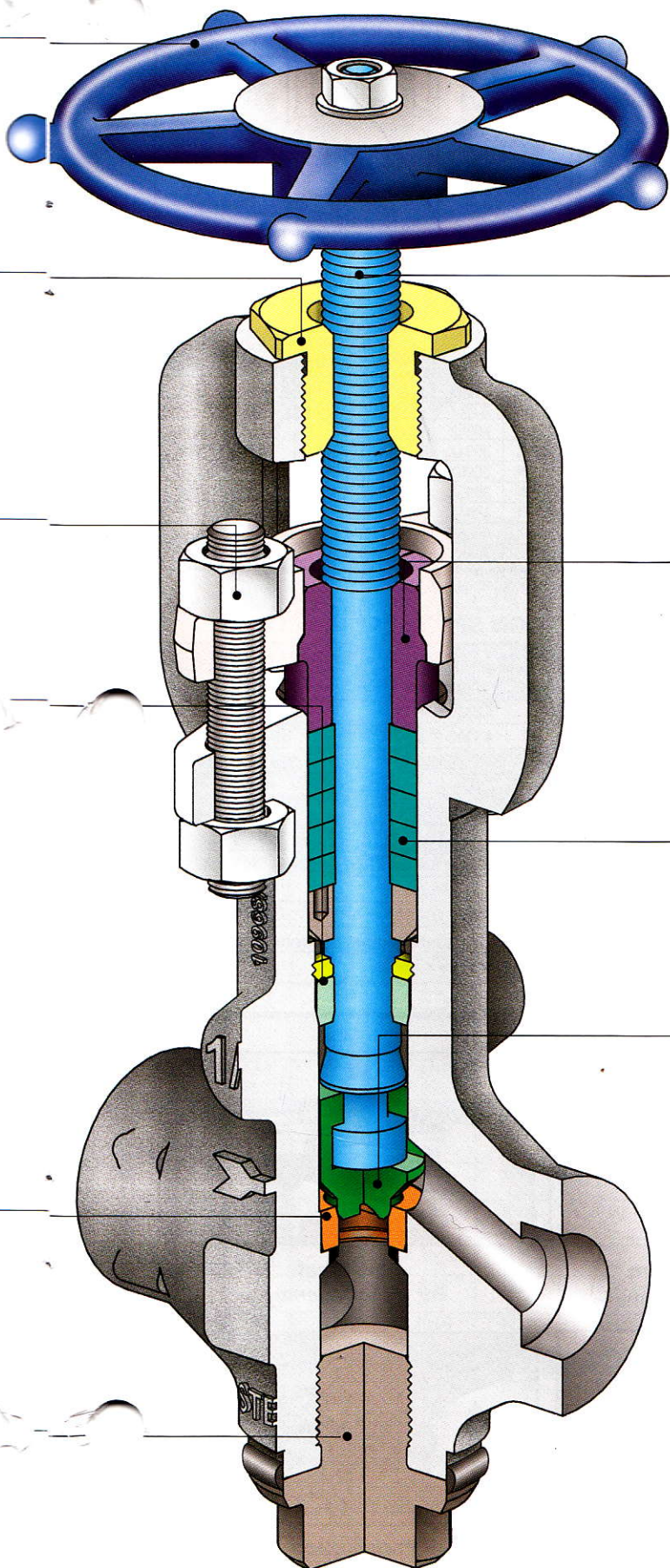
MAIN SEAT

Normally manufactured from 316 type stainless steel and provided with a heavy Stellite deposit, the main seat is a precision component vital for positive shut-off. In the unlikely event of seating surface damage, a sufficient depth of hardfacing allows the seat to be re-cut without the need for complete replacement.

BOTTOM SERVICE PLUG

This feature allows the main seat to be replaced while the valve is 'in line'. Standard bottom plugs are manufactured from the same material specification as the body and are screwed and seal welded. Gasketed plugs and 'full penetration' welded caps are also available to order (see pg. 6).

BONNETLESS GLOBE VALVE



STEM

Materials vary according to the 'trim' requirements but all stems are precision machined and have the following features:

- one piece anti blowout design with precision ground back seat cone.
- ground or burnished packing journal diameter giving 8 RMS or better.
- full depth ACME threads formed by either cutting or rolling, dependant upon trim and material.
- generously proportioned square for handwheel drive.
- domed 'button' T-head to provide adequate articulation of globe/stop discs and reduced closing torque.

SPLIT GLAND BUSH

In combination with the forged steel gland flange, this two piece 'gland follower' is generously proportioned to provide adequate packing compression. A raised lip prevents the bushing from complete entry into the packing chamber. Removal of the bushing set allows adequate access for packing replacement or withdrawal of the valve internals. A complete range of service tools is available to order.

GLAND PACKING

Standard material is a combination of braided and die-formed graphite (non-asbestos) rings and guarantees superior sealing. Other packing materials are available to order including 'chevron' styles.

DISC

Globe/stop discs are manufactured from solid Stellite investment castings. The seating face has line contact with the mainseat to ensure positive shut-off. The long engagement length with the body on globe/stop valves provides accurate self-aligned seating and minimizes chattering under throttling conditions. With the valve fully open, the disc retracts out of the flow path thus minimizing wear through reduced vibration. A T-slot or 'horseshoe' feature is used to connect the disc and stem on globe/stop valves, enabling quick and easy replacement. Ample clearance eliminates binding or seizure. See page 6 for standard disc designs.

The stem and disc on needle and continuous blow-down valves are of one-piece integral design making them ideal for services with high pressure drop.

Flow control discs are of 'V' port style to give approximately proportional flow through-out valve lift and are fully guided to minimize spinning under high flow conditions.

MATERIALS, SPECIFICATIONS & OPTIONS

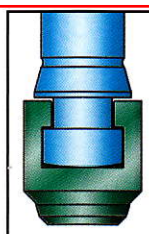
STANDARD MATERIALS

PART		MATERIAL				
		Code 02 ⁽¹⁾	Code 06 ⁽¹⁾	Code 13/10 ⁽¹⁾	Code 32 ⁽¹⁾	Code 34 ⁽¹⁾
Body		A105N (C. Max. 0.25)	A182 F22 (Class 3)	A182 F316/F316H	A182 F51	A182 F91
Bottom Plug						
Main Seat		Gr.316 Stellited			A182 F51 Stellited	Gr.316 Stellited
D I S C	Globe	Investment Cast - Stellite 6				
	Needle	Integral with stem				
	SDNR	Gr.316 Stellited				
	Flow Control	Gr.316 Stellited				
S T E M (2)	Globe	Gr.410 Hardened	Gr.316B	Gr.630	Gr.616 or Gr. 660	
	Needle	Gr.316B Stellited		F51 Stellited	Gr.316B Stellited	
	SDNR	Gr.410 Hardened	Gr.316B		Gr.616 or Gr. 660	
	Flow Control	Gr.410 Hardened	Gr.316B	Gr.630	Gr.616 or Gr. 660	
Backseat		BS.2S143				
Backseat Retainer		BS.3146 ANC20				
Packing Washer		Gr.316 Commercial				
GLAND	Ends	Braided Graphite, Inconel reinforced, split				
PACKING	Inners	Die formed Graphite, solid				
Split Gland Bush		BS.3146 CL1.1A	BS.3146 ANC4A	BS.3146 CL1.1A		
Gland Flange		A105N	F316	A105N		
Gland Stud		ASTM A194 B7	ASTM A194 B8M	ASTM A194 B7		
Gland Nut		ASTM A193 2H	ASTM A193 8M	ASTM A193 2H		
Yoke Bush		BS.2874 CZ114				
Handwheel		Malleable Iron ASTM A47				
Handwheel Nut		Carbon Steel - Commercial				
Nameplate		Aluminium - Commercial				

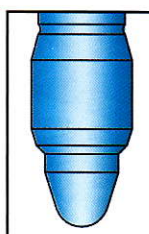
(1) See page 19 for Codes.

(2) Other materials available.

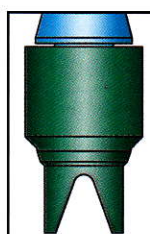
STANDARD DISC OPTIONS



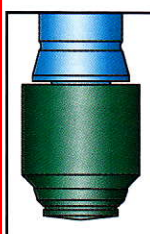
Globe
Stop



Needle
(integral)



Flow
Control



SDNR
(Stop-Check)

STANDARD FIGURE NUMBERS⁽¹⁾

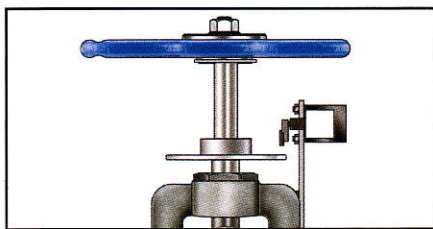
Class	Body Style	Globe	Needle	SDNR	Flow Control	Cont. B/down	Piston Check
600	Vertical	2074X	2094X	2084X	2014X	N/A	N/A
	Oblique	2076X	2096X	2086X	2016X	N/A	2036X
	Angle	2075X	2095X	2085X	2015X	2105X	N/A
1500	Vertical	3074X	3094X	3084X	3014X	N/A	N/A
	Oblique	3076X	3096X	3086X	3016X	N/A	3036X
	Angle	3075X	3095X	3085X	3015X	3105X	N/A
2500	Vertical	4074X	4094X	4084X	4014X	N/A	N/A
	Oblique	4076X	4096X	4086X	4016X	N/A	4036X
	Angle	4075X	4095X	4085X	4015X	4105X	N/A

(1) See sections C, D & E on page 19.

STANDARD DESIGN SPECIFICATION/CODES

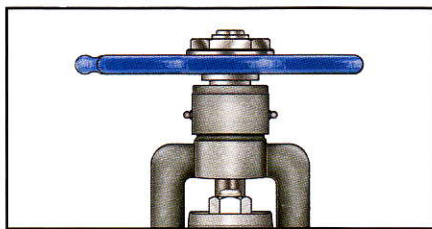
FEATURE	STANDARD	
	American	European Equivalent
Valve Design	ASME B16.34	BS EN 12516-1
Socketweld	ASME B16.11	BS EN 12760
Buttweld	ASME B16.25	BS EN 12627
Thread NPT	ASME B1.20.1	NONE
Flange	ASME B16.5	BS EN 1759-1
Marking	MSS-SP-25	BS EN 19
Pressure testing	ASME B16.34 & MSS SP-61	BS EN 12266
Welding	ASME IX	BS EN 287-1
End-to-End	ASME B16.10	BS EN 12982
Valves comply to European Pressure Equipment Directive 97/23/EC.		
For Sour Service NACE valves see page 13.		

OPTIONAL FEATURES



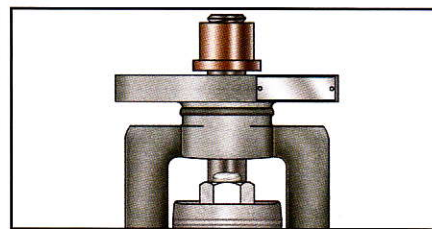
Limit Switch

For open and/or shut indication.



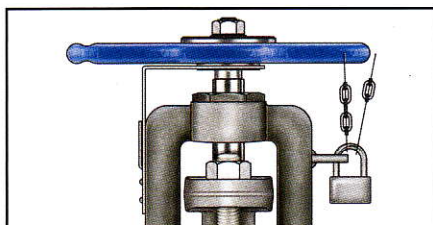
Non-Rotating Stem

With needle roller bearings.



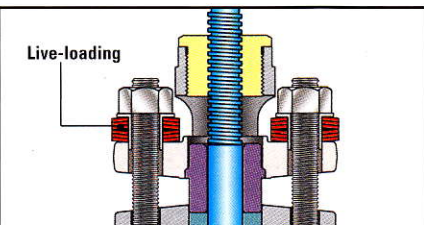
Bare Shaft

For motor operation.



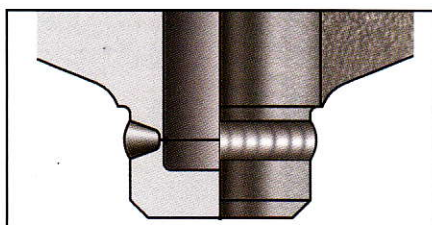
Locking Device Plus Indicator

For security and visual position monitoring.



Live-loading

For constant packing load.



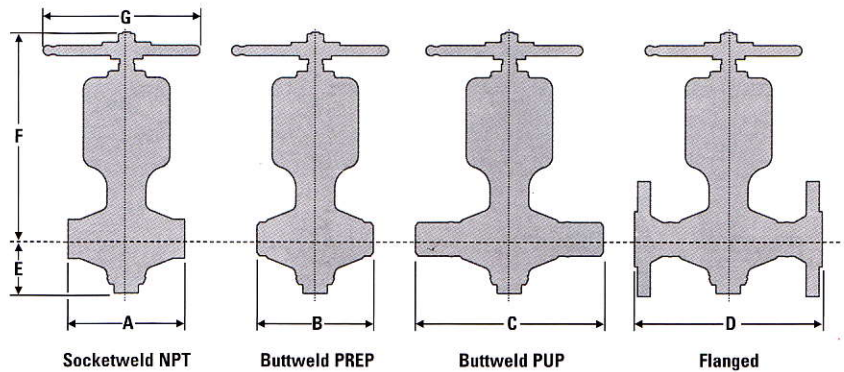
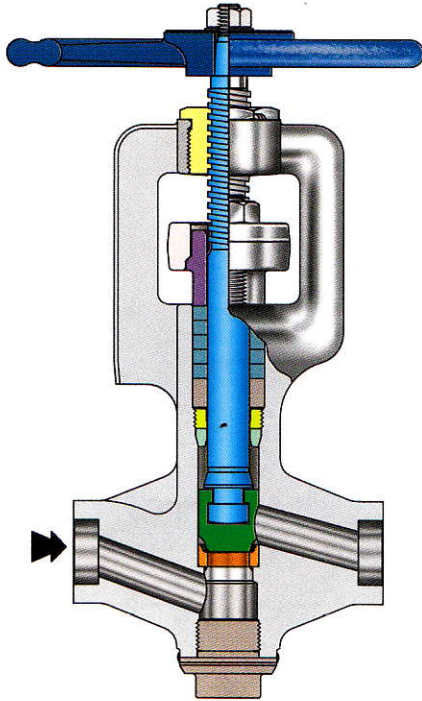
Full Penetration Cap

For elimination of bottom plug thread.



BONNETLESS GLOBE VALVES VERTICAL PATTERN

ASME CLASSES 600-2500, ½ - 2" (15-50 mm)
SOCKETWELD/NPT, BUTTWELD PREP,
BUTTWELD PUP & FLANGED



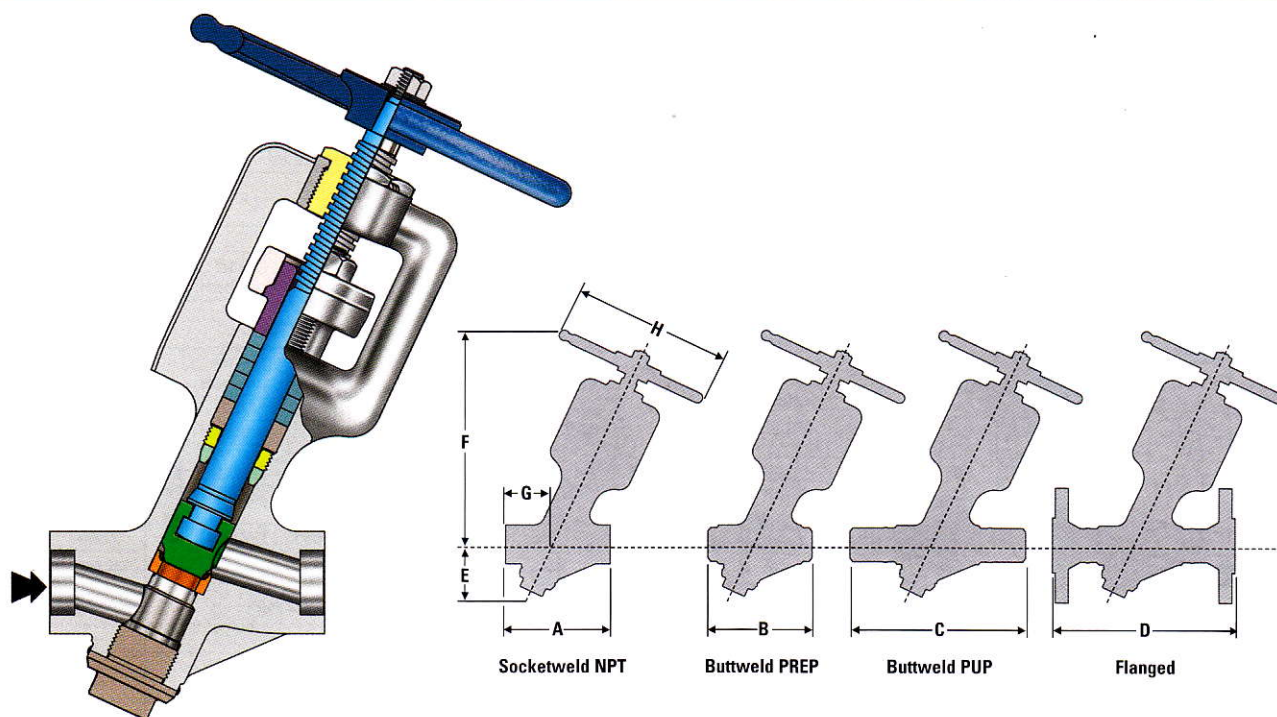
DIMENSIONS - VERTICAL

SIZE in/mm	Seat Bore	End-to-End			Face-to-Face		Center Bottom	Center -to-Top Open	Center -to-Top Shut	HW Diameter	Weight lb/kg		
		Socketweld NPT	Buttweld		Flange						SW/NPT BW PREP	BW PUP	Flange
			PREP	PUP	RF	RTJ							
Class 600													
½	0.44	3.62	3.62	6.50	6.50	6.44	2.19	8.46	8.03	4.00	6.0	7.7	14.8
15	11.18	92	92	165	165	164	56	215	204	102	2.7	3.5	6.7
¾	0.63	4.25	4.25	7.50	7.50	7.50	2.38	9.13	8.76	6.00	8.0	11.2	20.7
20	16.00	108	108	190	190	190	60	238	223	152	3.6	5.1	9.4
1	0.88	6.31	5.68	8.50	8.50	8.50	2.94	12.10	11.25	8.00	19.8	23.2	36.2
25	22.35	160	144	216	216	216	74	305	286	203	9.0	10.5	16.4
1¼	1.19	7.00	6.25	9.00	9.00	9.00	3.88	15.47	14.80	12.00	44.1	50.8	66.1
32	30.23	178	159	229	229	229	98	393	376	305	20	23.0	30
1½	1.19	7.00	6.75	9.50	9.50	9.50	3.88	15.47	14.80	12.00	44.1	50.8	70.6
40	30.23	178	171	241	241	241	98	393	376	305	20	23.0	32
2	1.50	10.00	10.00	11.50	11.50	11.63	4.63	17.60	16.42	12.00	77.2	84.2	97.2
50	38.10	254	254	292	292	295	117	447	417	305	35	38.2	44.1
Class 1500													
½	0.44	3.62	3.62	8.50	8.50	8.50	2.19	8.46	8.03	4.00	6.0	7.7	22.9
15	11.18	92	92	216	216	216	56	215	204	102	2.7	3.5	10.4
¾	0.63	4.25	4.25	9.00	9.00	9.00	2.38	9.13	8.76	6.00	8.0	11.2	24.0
20	16.00	108	108	229	229	229	60	238	223	152	3.6	5.1	10.9
1	0.88	6.31	5.68	10.00	10.00	10.00	2.94	12.10	11.25	8.00	19.8	23.2	45.0
25	22.35	160	144	254	254	254	74	305	286	203	9.0	10.5	20.4
1¼	1.19	7.00	6.25	11.00	11.00	11.00	3.88	15.47	14.80	12.00	44.1	50.8	76.1
32	30.23	178	159	279	279	279	98	393	376	305	20	23.0	34.5
1½	1.19	7.00	6.75	12.00	12.00	12.00	3.88	15.47	14.80	12.00	44.1	50.8	82.5
40	30.23	178	171	305	305	305	98	393	376	305	20	23.0	37.4
2	1.50	10.00	10.00	14.50	14.50	14.63	4.63	17.60	16.42	12.00	77.2	84.2	125.0
50	38.10	254	254	368	368	371	117	447	417	305	35	38.2	56.8
Class 2500													
½	0.44	4.25	4.25	10.38	10.38	10.38	2.38	8.68	8.26	6.00	8.0	9.9	24.0
15	11.18	108	108	264	264	264	60	220	210	152	3.6	4.5	10.9
¾	0.63	4.25	4.25	10.75	10.75	10.75	2.38	9.13	8.76	6.00	8.0	11.2	26.0
20	16.00	108	108	273	273	273	60	232	223	152	3.6	5.1	11.8
1	0.88	6.31	5.68	12.13	12.13	12.13	2.94	12.10	11.25	8.00	19.8	23.2	45.9
25	22.35	160	144	309	309	309	74	305	286	203	9.0	10.5	20.8
1¼	1.19	7.00	6.25	13.75	13.75	13.88	3.88	15.47	14.80	12.00	44.1	66.1	84.2
32	30.23	178	159	349	349	352	98	393	376	305	20.0	30.0	38.2
1½	1.19	7.00	6.75	15.13	15.13	15.25	3.88	15.47	14.80	12.00	44.1	66.1	100.0
40	30.23	178	171	384	384	387	98	393	376	305	20.0	30.0	45.5
2	1.50	10.00	10.00	17.75	17.75	17.88	4.63	17.60	16.42	12.00	77.2	88.6	162.0
50	38.10	254	254	451	451	454	117	447	417	305	35.0	40.2	73.2



BONNETLESS GLOBE VALVES OBLIQUE PATTERN

ASME CLASSES 600-2500, ½ - 2" (15-50 mm)
SOCKETWELD/NPT, BUTTWELD PREP,
BUTTWELD PUP & FLANGED



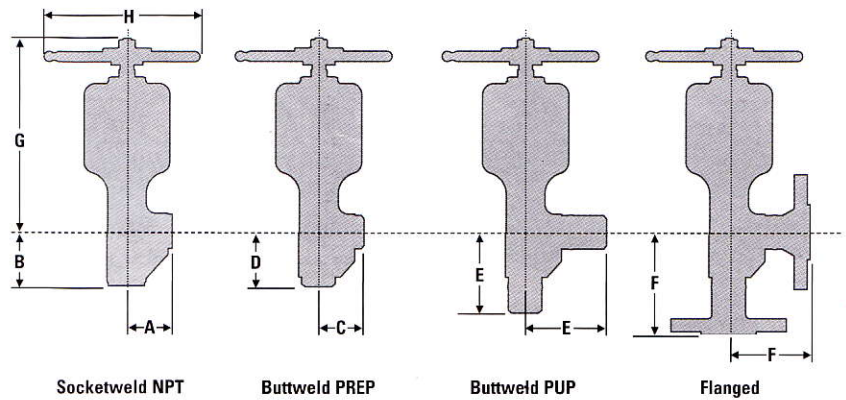
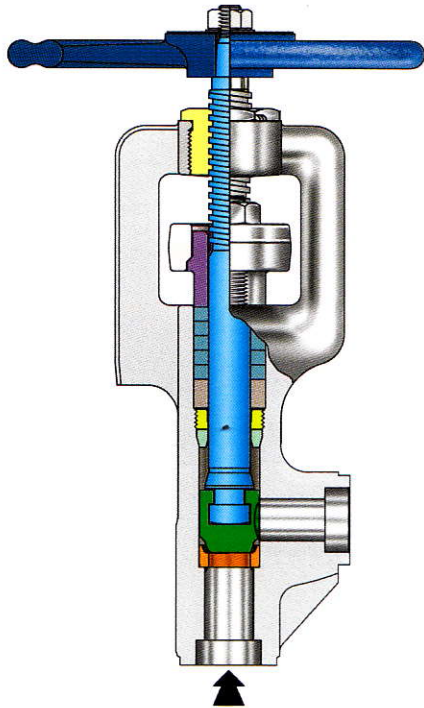
DIMENSIONS - OBLIQUE

SIZE in/mm	Seat Bore	End-to-End			Face-to-Face		Center Bottom	Center to-Top Open	Center to-Top Shut	Center to-End	HW Diameter	Weight lb/kg		
		Socketweld NPT	Buttweld		Flange							SW/NPT BW PREP	BW PUP	Flange
			PREP	PUP	RF	RTJ								
Class 600														
½ 15	0.44 11.18	3.62 92	3.62 92	6.50 165	6.50 165	6.44 164	2.19 56	8.03 204	7.85 194	1.63 41	4.00 102	6.0 2.7	7.7 3.5	14.8 6.7
¾ 20	0.63 16.00	4.25 108	4.25 108	7.50 190	7.50 190	7.50 190	2.59 66	8.96 228	8.63 220	1.81 96	6.00 152	8.0 3.6	11.2 5.1	20.7 9.4
1 25	0.88 22.35	6.31 160	5.68 144	8.50 216	8.50 216	8.50 216	2.87 73	12.10 307	11.39 289	2.62 67	8.00 203	19.8 9.0	23.2 10.5	36.2 16.4
1¼ 32	1.19 30.23	7.00 178	6.25 159	9.00 229	9.00 229	9.00 229	3.94 100	15.77 400	14.63 373	3.12 79	12.00 305	44.1 20	50.8 23.0	66.1 30
1½ 40	1.19 30.23	7.00 178	6.75 171	9.50 241	9.50 241	9.50 241	3.94 100	15.77 400	14.63 373	3.12 79	12.00 305	44.1 20	50.8 23.0	70.6 32
2 50	1.50 38.10	8.00 203	8.00 203	11.50 292	11.50 292	11.63 295	4.64 118	17.49 444	16.42 417	3.50 89	12.00 305	77.2 35	84.2 38.2	97.2 44.1
Class 1500														
½ 15	0.44 11.18	3.62 92	3.62 92	8.50 216	8.50 216	8.50 216	2.19 56	8.03 204	7.85 194	1.63 41	4.00 102	6.0 2.7	7.7 3.5	22.9 10.4
¾ 20	0.63 16.00	4.25 108	4.25 108	9.00 229	9.00 229	9.00 229	2.59 66	8.96 228	8.63 220	1.81 96	6.00 152	8.0 3.6	11.2 5.1	24.0 10.9
1 25	0.88 22.35	6.31 160	5.68 144	10.00 254	10.00 254	10.00 254	2.87 73	12.10 307	11.39 289	2.62 67	8.00 203	19.8 9.0	23.2 10.5	45.0 20.4
1¼ 32	1.19 30.23	7.00 178	6.25 159	11.00 279	11.00 279	11.00 279	3.94 100	15.77 400	14.63 373	3.12 79	12.00 305	44.1 20	50.8 23.0	76.1 34.5
1½ 40	1.19 30.23	7.00 178	6.75 171	12.00 305	12.00 305	12.00 305	3.94 100	15.77 400	14.63 373	3.12 79	12.00 305	44.1 20	50.8 23.0	82.5 37.4
2 50	1.50 38.10	8.00 203	8.00 203	14.50 368	14.50 368	14.63 371	4.84 118	17.49 444	16.42 417	3.50 89	12.00 305	77.2 35	84.2 38.2	125.0 56.8
Class 2500														
½ 15	0.44 11.18	4.25 108	4.25 108	10.38 264	10.38 264	10.38 264	2.50 64	8.68 220	8.26 210	1.81 46	6.00 152	8.0 3.6	9.9 4.5	24.0 10.9
¾ 20	0.63 16.00	4.25 108	4.25 108	10.75 273	10.75 273	10.75 273	2.59 66	8.96 228	8.63 220	1.81 46	6.00 152	8.0 3.6	11.2 5.1	26.0 11.8
1 25	0.88 22.35	5.68 144	5.68 144	12.13 309	12.13 309	12.13 309	3.04 77	12.10 305	11.39 289	2.62 67	8.00 203	19.8 9.0	23.2 10.5	45.9 20.8
1¼ 32	1.19 30.23	7.00 178	6.25 159	13.75 349	13.75 349	13.88 352	3.94 100	15.77 400	14.68 373	3.12 79	12.00 305	44.1 20.0	66.1 30.0	84.2 38.2
1½ 40	1.19 30.23	7.00 178	6.75 171	15.13 384	15.13 384	15.25 387	3.94 100	15.77 400	14.68 373	3.12 79	12.00 305	44.1 20.0	66.1 30.0	100.0 45.5
2 50	1.50 38.10	8.00 203	8.00 203	17.75 451	17.75 451	17.88 454	4.64 118	17.49 444	16.42 417	3.50 89	12.00 305	77.2 35.0	88.6 40.2	162.0 73.2



BONNETLESS GLOBE VALVES ANGLE PATTERN

ASME CLASSES 600-2500, ½ - 2" (15-50 mm)
SOCKETWELD/NPT, BUTTWELD PREP, BUTTWELD PUP
& FLANGED



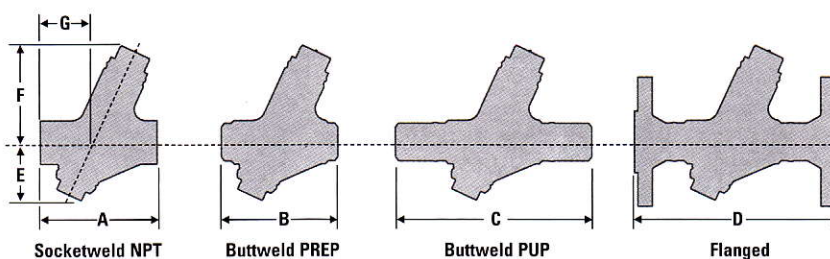
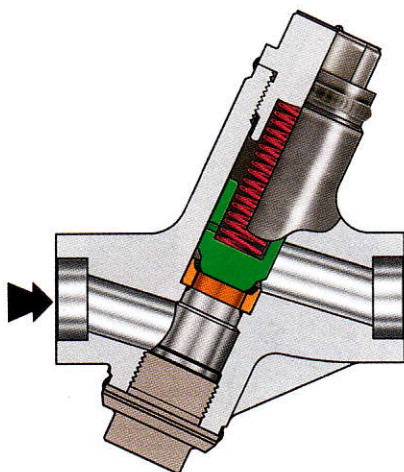
DIMENSIONS - ANGLE

SIZE in/mm	Seat Bore	Center-to-End					Center-to-Face		Center -to-Top Open	Center -to-Top Shut	HW Diameter	Weight lb/kg		
		Socketweld		Buttweld			Flange					SW/NPT BW PREP	BW PUP	Flange
		NPT		PREP		PUP	RF	RTJ						
		A	B	C	D	E	F							
Class 600														
½	0.44	1.63	2.06	1.68	1.68	3.25	3.25	3.22	7.83	7.41	4.00	5.7	7.5	14.5
15	11.18	41	52	43	43	83	83	82	199	188	102	2.6	3.4	6.6
¾	0.63	1.87	2.38	2.06	2.06	3.75	3.75	3.75	8.38	8.00	6.00	7.5	9.5	20.3
20	16.00	47	60	52	52	95	95	95	213	203	152	3.4	4.3	9.2
1	0.88	2.50	2.50	2.75	2.75	4.25	4.25	4.25	11.33	10.56	8.00	19.0	22.0	35.3
25	22.35	63	63	70	70	108	108	108	288	268	203	8.6	10.0	16.0
1¼	1.19	3.00	4.25	3.00	2.69	4.50	4.50	4.50	14.39	13.19	12.00	43.6	63.5	65.7
32	30.23	76	108	76	68	114	114	114	365	335	305	19.8	28.8	29.8
1½	1.19	3.00	4.25	3.38	3.00	4.75	4.75	4.75	14.39	13.19	12.00	43.6	63.5	70.1
40	30.23	76	108	86	76	121	121	121	365	335	305	19.8	28.8	31.8
2	1.50	3.56	5.00	3.63	3.63	5.75	5.75	5.81	16.10	14.92	12.00	76.5	88.0	96.6
50	38.10	90	127	92	92	146	146	148	409	379	305	34.7	40.0	43.8
Class 1500														
½	0.44	1.63	2.06	1.68	1.68	4.25	4.25	4.25	7.83	7.41	4.00	5.7	7.5	22.7
15	11.18	41	52	43	43	108	108	108	199	188	102	2.6	3.4	10.3
¾	0.63	1.87	2.38	2.06	2.06	4.50	4.50	4.50	8.38	8.00	6.00	7.5	9.5	23.6
20	16.00	47	60	52	52	114	114	114	213	203	152	3.4	4.3	10.7
1	0.88	2.50	2.50	2.75	2.75	5.00	5.00	5.00	11.33	10.56	8.00	19.0	22.0	44.1
25	22.35	63	63	70	70	127	127	127	288	268	203	8.6	10.0	20.0
1¼	1.19	3.00	4.25	3.00	2.69	5.50	5.50	5.50	14.39	13.19	12.00	43.6	63.5	75.6
32	30.23	76	108	76	68	140	140	140	365	335	305	19.8	28.8	34.3
1½	1.19	3.00	4.25	3.38	3.00	6.00	6.00	6.00	14.39	13.19	12.00	43.6	63.5	82.0
40	30.23	76	108	86	76	152	152	152	365	335	305	19.8	28.8	37.2
2	1.50	3.56	5.00	3.63	3.63	7.25	7.25	7.31	16.10	14.92	12.00	76.5	88.0	124.5
50	38.10	90	127	92	92	184	184	186	409	379	305	34.7	40.0	56.5
Class 2500														
½	0.44	1.87	2.38	2.12	2.12	5.18	5.18	5.18	7.92	7.50	4.00	7.5	9.5	23.6
15	11.18	47	60	54	54	132	132	132	201	190	102	3.4	4.3	10.7
¾	0.63	1.87	2.38	2.06	2.06	5.38	5.38	5.38	8.38	8.00	6.00	7.5	9.5	25.6
20	16.00	47	60	52	52	137	137	137	213	203	152	3.4	4.3	11.6
1	0.88	2.50	2.50	2.50	2.50	6.06	6.06	6.06	11.32	10.56	8.00	19.4	22.7	45.2
25	22.35	63	63	63	63	154	154	154	287	268	203	8.8	10.3	20.5
1¼	1.19	3.00	4.25	3.00	2.69	6.88	6.88	6.93	14.39	13.19	12.00	43.6	63.5	83.8
32	30.23	76	108	76	68	175	175	176	365	335	305	19.8	28.8	38.0
1½	1.19	3.00	4.25	3.38	3.00	7.56	7.56	7.63	14.39	13.19	12.00	43.6	63.5	99.4
40	30.23	76	108	86	76	192	192	194	365	335	305	19.8	28.8	45.1
2	1.50	3.56	5.00	3.63	3.63	8.88	8.88	8.94	16.10	14.92	12.00	76.5	88.0	161.0
50	38.10	90	127	92	92	225	225	227	409	379	305	34.7	40.0	72.9



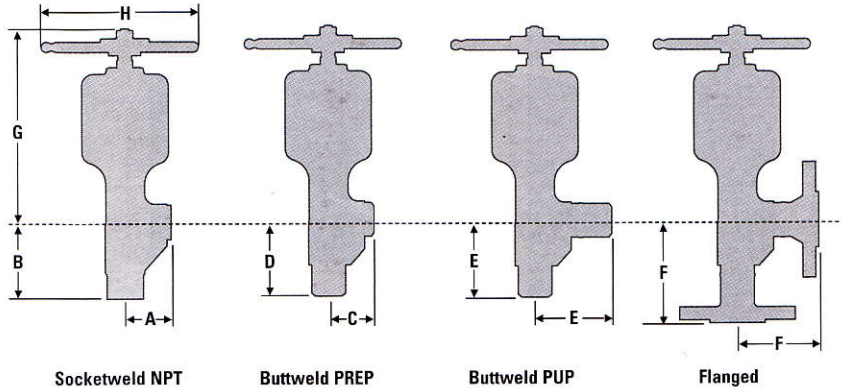
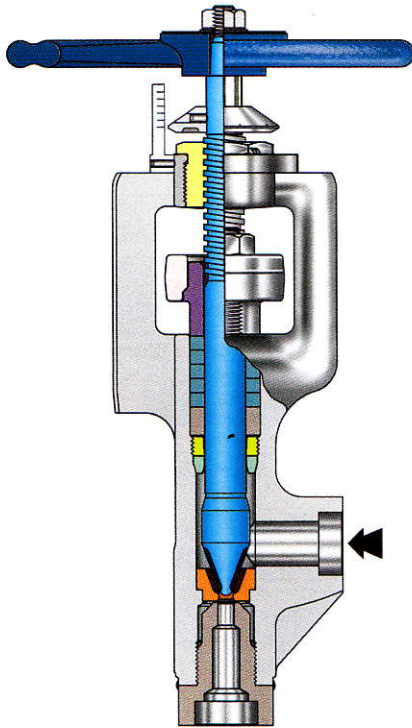
BONNETLESS GLOBE VALVES PISTON CHECK

ASME CLASSES 600-2500, ½ - 2" (15-50 mm)
SOCKETWELD/NPT, BUTTWELD PREP, BUTTWELD PUP
& FLANGED



DIMENSIONS - OBLIQUE CHECK

SIZE in/mm	Seat Bore	End-to-End			Face-to-Face		Center Bottom	Center -to- Top	Center -to- End	Weight lb/kg			
		Socketweld	Buttweld		Flange					SW/NPT BW PREP	BW PUP	Flange	
			NPT	PREP	PUP	RF							RTJ
Class 600													
½ 15	0.44 11.18	3.62 92	3.62 92	6.50 165	6.50 165	6.44 164	2.19 56	3.25 83	1.63 41	4.4 2.0	6.2 2.8	13.2 6.0	
¾ 20	0.63 16.00	4.25 108	4.25 108	7.50 190	7.50 190	7.50 190	2.59 66	3.75 96	1.81 46	5.5 2.5	8.8 4.0	18.3 8.3	
1 25	0.88 22.35	5.68 144	5.68 144	8.50 216	8.50 216	8.50 216	2.87 73	4.50 115	2.62 67	14.3 6.5	17.6 8.0	30.6 13.9	
1¼ 32	1.19 30.23	7.00 178	6.25 159	9.00 229	9.00 229	9.00 229	3.94 100	5.25 134	3.12 79	26.5 12.0	33.0 15.0	48.5 22.0	
1½ 40	1.19 30.23	7.00 178	6.75 171	9.50 241	9.50 241	9.50 241	3.94 100	5.25 134	3.12 79	26.5 12.0	33.0 15.0	26.0 24.0	
2 50	1.50 38.10	8.00 203	8.00 203	11.50 292	11.50 292	11.63 295	4.64 118	6.25 160	3.50 89	55.1 25.0	66.6 30.2	79.6 36.1	
Class 1500													
½ 15	0.44 11.18	3.62 92	3.62 92	8.50 216	8.50 216	8.50 216	2.19 56	3.25 83	1.63 41	4.4 2.0	6.2 2.8	21.4 9.7	
¾ 20	0.63 16.00	4.25 108	4.25 108	9.00 229	9.00 229	9.00 229	2.59 66	3.75 96	1.81 46	5.5 2.5	8.8 4.0	21.6 9.8	
1 25	0.88 22.35	5.68 144	5.68 144	10.00 254	10.00 254	10.00 254	2.87 73	4.50 115	2.62 67	14.3 6.5	17.6 8.0	34.5 17.9	
1¼ 32	1.19 30.23	7.00 178	6.25 159	11.00 279	11.00 279	11.00 279	3.94 100	5.25 134	3.12 79	26.5 12.0	33.0 15.0	58.4 26.4	
1½ 40	1.19 30.23	7.00 178	6.75 171	12.00 305	12.00 305	12.00 305	3.94 100	5.25 134	3.12 79	26.5 12.0	33.0 15.0	64.8 29.4	
2 50	1.50 38.10	8.00 203	8.00 203	14.50 368	14.50 368	14.63 371	4.64 118	6.25 160	3.50 89	55.1 25.0	66.6 30.2	107.6 48.8	
Class 2500													
½ 15	0.44 11.18	4.25 108	4.25 108	10.38 264	10.38 264	10.38 264	2.50 64	3.75 96	1.81 46	5.5 2.5	7.5 3.4	21.6 9.8	
¾ 20	0.63 16.00	4.25 108	4.25 108	10.75 273	10.75 273	10.75 273	2.59 66	3.75 96	1.81 46	5.5 2.5	8.8 4.0	23.6 10.7	
1 25	0.88 22.35	5.68 144	5.68 144	12.13 309	12.13 309	12.13 309	3.04 77	4.50 115	2.62 67	14.3 6.5	17.6 8.0	40.4 18.3	
1¼ 32	1.19 30.23	7.00 178	6.25 159	13.75 349	13.75 349	13.88 352	3.94 100	5.25 134	3.12 79	26.5 12.0	48.5 22.0	66.6 30.2	
1½ 40	1.19 30.23	7.00 178	6.75 171	15.13 384	15.13 384	15.25 387	3.94 100	5.25 134	3.12 79	26.5 12.0	48.5 22.0	82.7 37.5	
2 50	1.50 38.10	8.00 203	8.00 203	17.75 451	17.75 451	17.88 454	4.64 118	6.25 160	3.5 89	55.1 25.0	66.6 30.2	139.4 63.2	



DIMENSIONS - CONTINUOUS BLOWDOWN

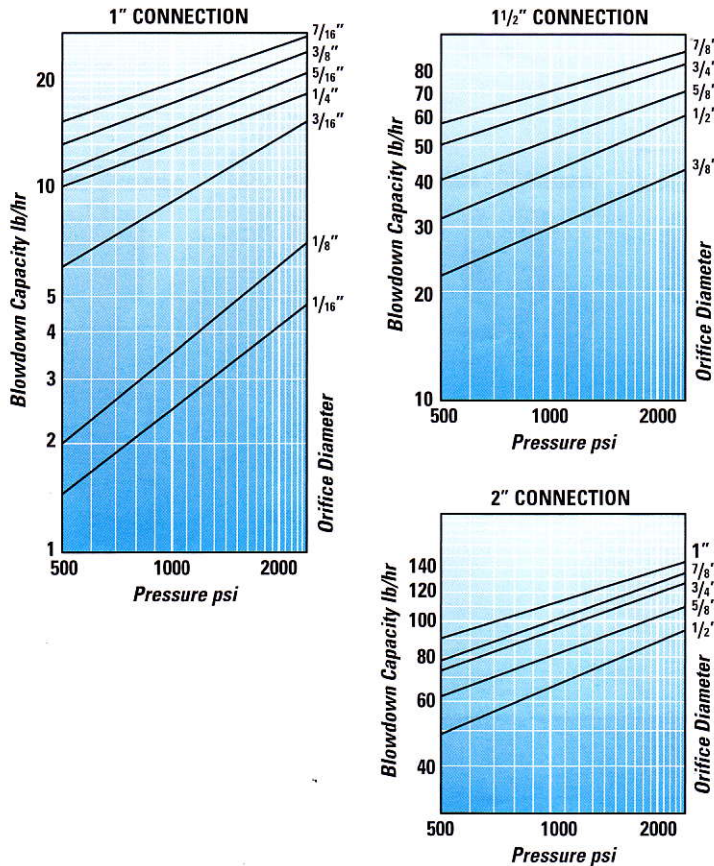
SIZE in/mm	Seat Bore	Center-to-End					Center-to-Face		Center -to-Top Open	Center -to-Top Shut	HW Diameter	Weight lb/kg		
		Socketweld		Buttweld			Flange					SW/NPT BW PREP	BW PUP	Flange
		NPT		PREP		PUP	RF	RTJ						
		A	B	C	D	E	F		G		H			
Class 600														
½ 15	(1)	1.63 41	3.23 82	1.68 43	3.25 83	3.25 83	3.25 83	3.22 82	8.50 216	7.75 197	4.00 102	5.9 2.7	7.7 3.5	14.8 6.7
¾ 20	(1)	1.87 47	3.62 92	2.06 52	3.62 92	3.75 95	3.75 95	3.75 95	9.25 235	8.58 218	6.00 152	7.7 3.5	9.7 4.4	20.5 9.3
1 25	(1)	2.50 63	4.25 108	2.75 70	4.25 108	4.25 108	4.25 108	4.25 108	12.25 311	11.42 290	8.00 203	19.6 8.9	22.3 10.1	35.5 16.1
1¼ 32	(1)	3.00 76	6.50 165	3.00 76	6.50 165	4.50 114	4.50 114	4.50 114	15.50 394	14.52 369	12.00 305	43.9 19.9	63.7 28.9	66.0 29.9
1½ 40	(1)	3.00 76	6.50 165	3.38 86	6.50 165	4.75 121	4.75 121	4.75 121	15.50 394	14.52 369	12.00 305	43.9 19.9	63.7 28.9	70.0 31.9
2 50	(1)	3.56 90	6.50 165	3.63 92	6.50 165	5.75 146	5.75 146	5.81 148	19.48 495	18.23 463	12.00 305	17.0 34.9	88.6 40.2	97.0 44.0
Class 1500														
½ 15	(1)	1.63 41	3.23 82	1.68 43	3.25 83	4.25 108	4.25 108	4.25 108	8.50 216	7.75 197	4.00 102	5.9 2.7	7.7 3.5	22.9 10.4
¾ 20	(1)	1.87 47	3.62 92	2.06 52	3.62 92	4.50 114	4.50 114	4.50 114	9.25 235	8.58 218	6.00 152	7.7 3.5	9.7 4.4	23.8 10.8
1 25	(1)	2.50 63	4.25 108	2.75 70	4.25 108	5.00 127	5.00 127	5.00 127	12.25 311	11.42 290	8.00 203	19.6 8.9	22.3 10.1	44.3 20.1
1¼ 32	(1)	3.00 76	6.50 165	3.00 76	6.50 165	5.50 140	5.50 140	5.50 140	15.50 394	14.52 369	12.00 305	43.9 19.9	63.7 28.9	75.8 34.4
1½ 40	(1)	3.00 76	6.50 165	3.38 86	6.50 165	6.00 152	6.00 152	6.00 152	15.50 394	14.52 369	12.00 305	43.9 19.9	63.7 28.9	82.2 37.3
2 50	(1)	3.56 90	6.50 165	3.63 92	6.50 165	7.25 184	7.25 184	7.31 186	19.48 495	18.23 463	12.00 305	17.0 34.9	88.6 40.2	125.0 56.7
Class 2500														
½ 15	(1)	1.87 47	3.62 92	2.12 54	3.62 92	5.18 132	5.18 132	5.18 132	9.25 235	8.58 218	6.00 152	7.7 3.5	9.7 4.4	23.8 10.8
¾ 20	(1)	1.87 47	3.62 92	2.06 52	3.62 92	5.38 137	5.38 137	5.38 137	9.25 235	8.58 218	6.00 152	7.7 3.5	9.7 4.4	25.8 11.7
1 25	(1)	2.50 63	4.25 108	2.50 63	4.25 108	6.06 154	6.06 154	6.06 154	12.25 311	11.42 290	8.00 203	19.6 8.9	22.9 10.4	45.4 20.6
1¼ 32	(1)	3.00 76	6.50 165	3.00 76	6.50 165	6.88 175	6.88 175	6.93 176	15.50 394	14.52 369	12.00 305	43.9 19.9	63.7 28.9	84.0 38.1
1½ 40	(1)	3.00 76	6.50 165	3.38 86	6.50 165	7.56 192	7.56 192	7.63 194	15.50 394	14.52 369	12.00 305	43.9 19.9	63.7 28.9	99.7 45.2
2 50	(1)	3.56 90	6.50 165	3.63 92	6.50 165	8.88 225	8.88 225	8.94 227	19.48 495	18.23 463	12.00 305	77.0 34.9	88.6 40.2	161.2 73.1

(1) Seat Bore - as per order.

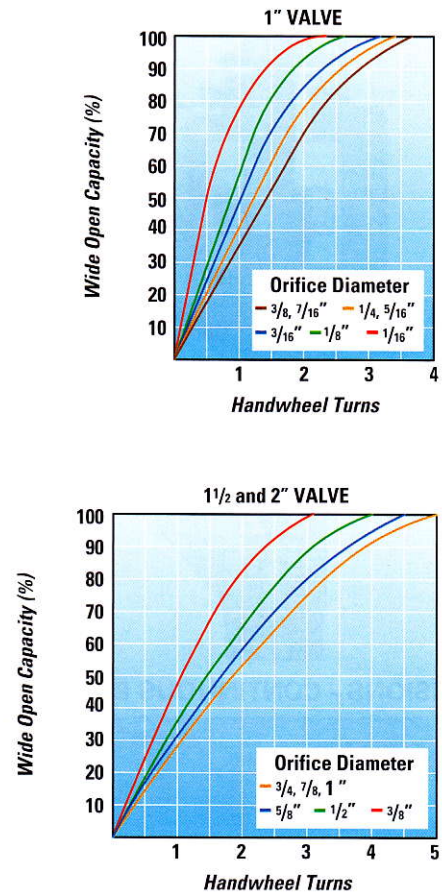
ENGINEERING DATA

CONTINUOUS BLOWDOWN CHARTS

WIDE OPEN CAPACITIES VERSUS BOILER PRESSURE



HANDWHEEL TURNS VERSUS % OF WIDE OPEN CAPACITIES



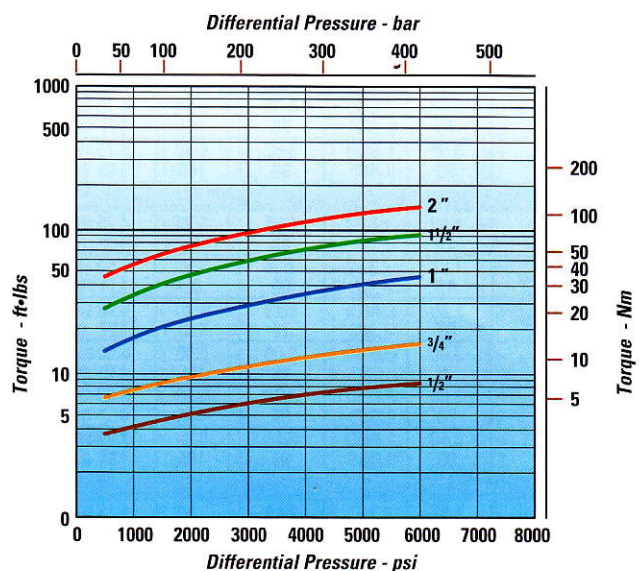
OPERATING TORQUE

The primary function of the valve is to close the disc tightly onto the main seat against the ΔP (differential pressure) across the valve. Manually operated valves achieve this by converting handwheel rim force into stem torque, which in turn converts to an axial stem force via the stem thread. The axial force is thus applied to the disc but must be sufficient to oppose the ΔP acting on the seating orifice. Many variables affect the estimation of operating torque.

These include:

- Stem thread form and diameter.
- Degree of thread lubrication.
- Stem diameter and surface finish in contact with the packing rings.
- Gland packing material, geometry and degree of compression.
- Seat/disc material, geometry and finish.
- Seat diameter.
- ΔP across the valve.

The following graph shows typical torque values for Velan bonnetless valves plotted against ΔP based on the use of graphite gland packing material and Stellite to Stellite seating surfaces.



* Values shown are for rotating stem design.

Please consult Velan Valves Ltd for guidance if other gland packing material is required.

Please note that the values shown are for guidance only and must not be used for final choice of actuators as many other factors could influence selection.

TANDEM UNITS

Bonnetless valves can be combined into virtually any arrangement of 'Tandem Unit' to suit customer needs. One valve can be offset at an angle to the second valve. Permutations are endless.

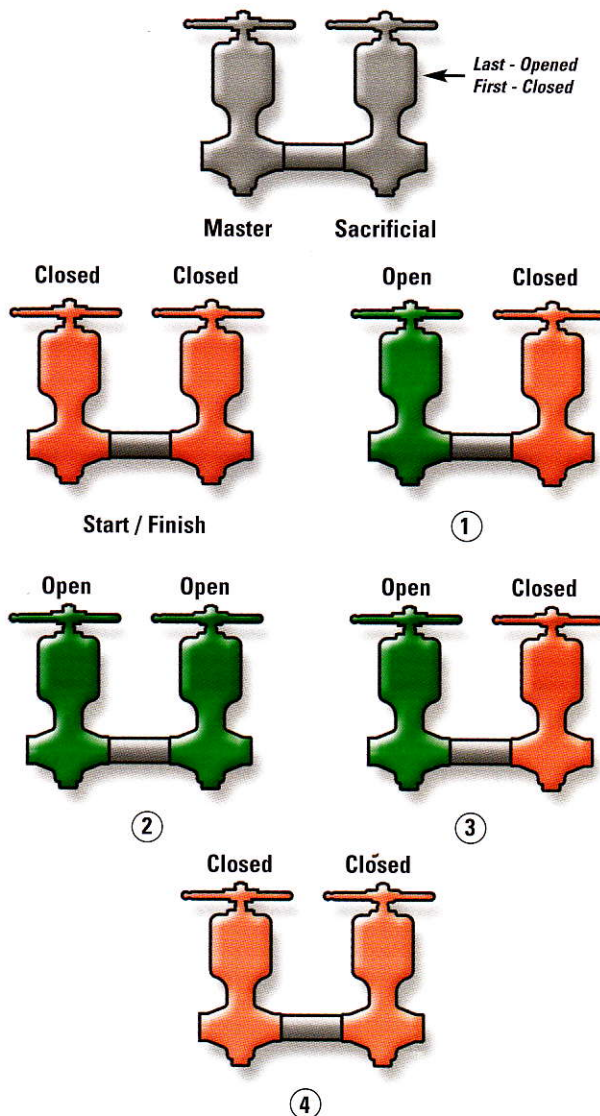
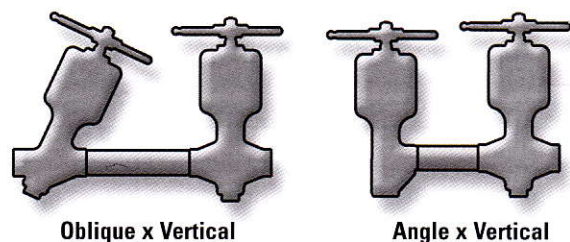
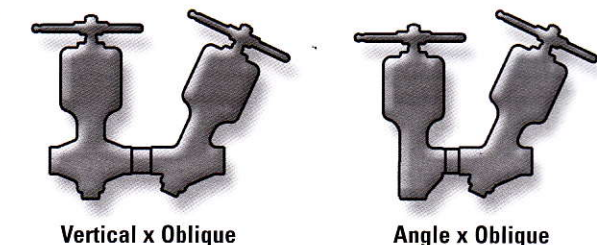
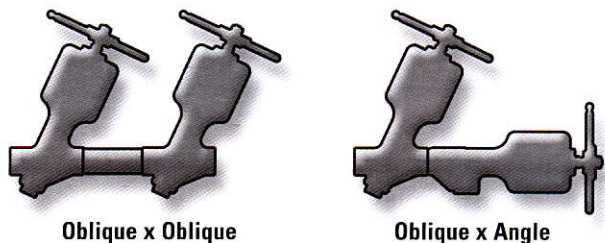
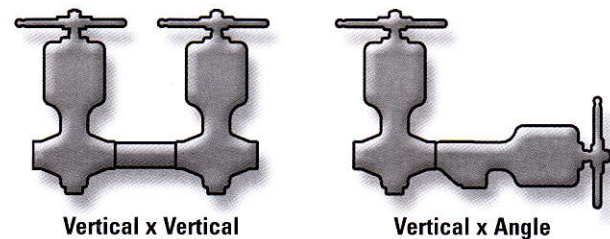
Combination ends can be accommodated with ease – e.g. Flanged inlet x Socketweld outlet or maybe Butt weld inlet x Threaded outlet.

See the illustrations below for some typical examples. The valves can be used as Double Isolation units where critical sealing is required.

THE DOUBLE ISOLATION PRINCIPAL:

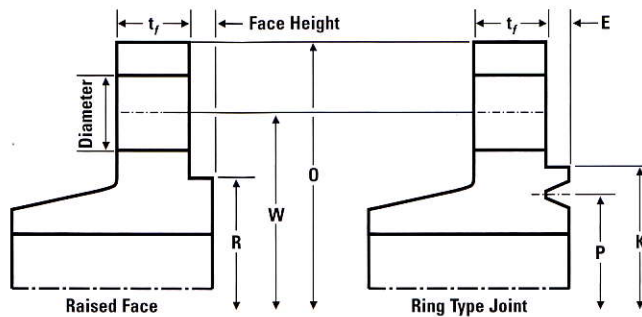
With the valves mounted in tandem, the upstream (Inlet) valve is the Master and downstream (Outlet) is the Sacrificial.

Assuming both valves are already closed on double isolation with pressure on the inlet (Master), the subsequent open - close sequence is:



- ① **Open Master**
If the Sacrificial has a good seal, no flow will be apparent.
- ② **Open Sacrificial**
The full flow is now controlled by this valve and it alone will be exposed to erosion.
- ③ **Close Sacrificial**
Again, any wear will take place on this valve as it alone controls the flow.
- ④ **Close Master**
Re-establishing double isolation.

FLANGE DIMENSIONS



RAISED FACE DIMENSIONS MEET ASME B16.5 : 2003 SPECIFICATIONS

Size in/mm	Class	Outside Diameter	Thickness	Face Dia.	Face Height	Holes		
		O	t _f	R		PCD W	Dia.	No.
1/2 15	600	3.75 95.0	0.56 14.3	1.38 34.9	0.25 7.0	2.62 66.7	0.62 15.9	4
	1500	4.75 120.0	0.88 22.3			3.25 82.6	0.88 22.3	
	2500	5.25 135.0	1.19 30.2			3.50 88.9	0.88 22.3	
3/4 20	600	4.62 115.0	0.62 15.9	1.69 42.9	0.25 7.0	3.25 82.6	0.75 19.0	4
	1500	5.12 130.0	1.00 25.4			3.50 88.9	0.88 22.3	
	2500	5.50 140.0	1.25 31.8			3.75 95.2	0.88 22.3	
1 25	600	4.88 125.0	0.69 17.5	2.00 50.8	0.25 7.0	3.50 88.9	0.75 19.0	4
	1500	5.88 150.0	1.12 28.6			4.00 101.6	1.00 25.4	
	2500	6.25 160.0	1.38 34.9			4.25 108.0	1.00 25.4	
1 1/4 32	600	5.25 135.0	0.81 20.7	2.50 63.5	0.25 7.0	3.88 98.4	0.75 19.0	4
	1500	6.25 160.0	1.12 28.6			4.38 111.1	1.00 25.4	
	2500	7.25 185.0	1.50 38.1			5.12 130.0	1.12 28.6	
1 1/2 40	600	6.12 155.0	0.88 22.3	2.88 73.0	0.25 7.0	4.50 114.3	0.88 22.3	4
	1500	7.00 180.0	1.25 31.8			4.88 123.8	1.12 28.6	
	2500	8.00 205.0	1.75 44.5			5.75 146.0	1.25 31.8	
2 50	600	6.50 165.0	1.00 25.4	3.62 92.1	0.25 7.0	5.00 127.0	0.75 19.0	8
	1500	8.50 215.0	1.50 38.1			6.50 165.1	1.00 25.4	
	2500	9.25 235.0	2.00 50.8			6.75 171.4	1.12 28.6	

RING TYPE JOINT DIMENSIONS MEET ASME B16.5 : 2003 SPECIFICATIONS

Size in/mm	Class	Outside Dia.	Thickness	Face Dia.	Holes			Ring Groove		
		O	t _f	K	PCD W	Dia.	No.	Pitch P	Depth E	Ring No.
1/2 15	600	3.75 95.0	0.56 14.3	2.00 50.8	2.62 66.7	0.62 15.9	4	1.344 34.14	0.219 5.54	R11
	1500	4.75 120.0	0.88 22.3	3.38 86.0	3.25 82.6	0.88 22.3		1.562 39.67	0.250 6.35	R12
	2500	5.25 135.0	1.19 30.2	2.56 65.0	3.50 88.9	0.88 22.3		1.688 42.88	0.250 6.35	R13
3/4 20	600	4.62 115.0	0.62 15.9	2.50 63.5	3.25 82.6	0.75 19.0	4	1.688 42.88	0.250 6.35	R13
	1500	5.12 130.0	1.00 25.4	2.62 66.5	3.50 88.9	0.88 22.3		1.750 44.45	0.250 6.35	R14
	2500	5.50 140.0	1.25 31.8	2.88 73.0	3.75 95.2	0.88 22.3		2.000 50.80	0.250 6.35	R16
1 25	600	4.88 125.0	0.69 17.5	2.75 70.0	3.50 88.9	0.75 19.0	4	2.000 50.80	0.250 6.35	R16
	1500	5.88 150.0	1.12 28.6	2.81 71.5	4.00 101.6	1.00 25.4		2.000 50.80	0.250 6.35	R16
	2500	6.25 160.0	1.38 34.9	3.25 82.5	4.25 108.0	1.00 25.4		2.375 60.33	0.250 6.35	R18
1 1/4 32	600	5.25 135.0	0.81 20.7	3.12 79.5	3.88 98.4	0.75 19.0	4	2.375 60.33	0.250 6.35	R18
	1500	6.25 160.0	1.12 28.6	3.19 81.0	4.38 111.1	1.00 25.4		2.375 60.33	0.250 6.35	R18
	2500	7.25 185.0	1.50 38.1	4.00 102.0	5.12 130.0	1.12 28.6		2.844 72.23	0.312 7.92	R21
1 1/2 40	600	6.12 155.0	0.88 22.3	3.56 90.5	4.50 114.3	0.88 22.3	4	2.688 68.27	0.250 6.35	R20
	1500	7.00 180.0	1.25 31.8	3.62 92.0	4.88 123.8	1.12 28.6		2.688 68.27	0.250 6.35	R20
	2500	8.00 205.0	1.75 44.5	4.50 114.3	5.75 146.0	1.25 31.8		3.250 82.55	0.312 7.92	R23
2 50	600	6.50 165.0	1.00 25.4	4.25 108.0	5.00 127.0	0.75 19.0	8	3.250 82.55	0.312 7.92	R23
	1500	8.50 215.0	1.50 38.1	4.88 124.0	6.50 165.1	1.00 25.4		3.750 95.25	0.312 7.92	R24
	2500	9.25 235.0	2.00 50.8	5.25 133.0	6.75 171.4	1.12 28.6		4.00 101.6	0.312 7.92	R26

STANDARD PIPE DIMENSIONS MEET ASME B36.10 & 36.19 SPECIFICATIONS

Size in/mm	Outside Dia.	Schedule							
		40 (Std.)		80 (XS)		160		XXS	
		Wall Thkns.	Bore	Wall Thkns.	Bore	Wall Thkns.	Bore	Wall Thkns.	Bore
1/4 8	0.540 13.72	0.088 2.24	0.364 9.25	0.119 3.02	0.302 7.67	-	-	-	-
3/8 10	0.675 17.14	0.091 2.31	0.493 12.53	0.126 3.20	0.423 10.74	-	-	-	-
1/2 15	0.840 21.34	0.109 2.77	0.622 15.80	0.147 3.73	0.546 13.87	0.188 4.78	0.464 11.78	0.294 7.47	0.250 6.40
3/4 20	1.050 26.67	0.113 2.87	0.824 20.93	0.154 3.91	0.742 18.85	0.219 5.56	0.612 15.55	0.308 7.82	0.434 11.02
1 25	1.315 33.40	0.133 3.38	1.049 26.64	0.179 4.55	0.957 24.30	0.250 6.35	0.815 20.70	0.358 9.09	0.599 15.21
1 1/4 32	1.660 42.16	0.140 3.56	1.380 35.05	0.191 4.85	1.278 32.46	0.250 6.35	1.160 29.46	0.382 9.70	0.896 22.76
1 1/2 40	1.900 48.26	0.145 3.68	1.610 40.89	0.200 5.08	1.500 38.10	0.281 7.14	1.337 33.96	0.400 10.16	1.100 27.94
2 50	2.375 60.32	0.154 3.91	2.067 52.50	0.218 5.54	1.939 49.25	0.344 8.74	1.687 42.85	0.436 11.07	1.503 38.18

* Dimensions meet ASME B16.10 & 36.19 specifications.

PRESSURE/TEMPERATURE TABLES

PRESSURE-TEMPERATURE RATINGS STANDARD CLASS VALVES, FLANGED & BUTT WELD END

FORGED ASTM MATERIAL SPECIFICATION (ASME B16.34 - 2004)

PSIG / °F, CLASSES 600 – 2500,

BAR / °C, CLASSES 600 – 2500

A 105 : B16.34 – Material Group 1.1

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - psi	2225	3350	5575	9275	2250	3375	5625	9375
Seat test - psi	1650	2450	4100	6800	1650	2475	4125	6875
TEMP. - °F	Standard Class				Special Class ⁽²⁾			
-20 to 100	1480	2220	3705	6170	1500	2250	3750	6250
200	1360	2035	3395	5655	1500	2250	3750	6250
300	1310	1965	3270	5450	1480	2220	3700	6170
400	1265	1900	3170	5280	1465	2220	3665	6105
500	1205	1810	3015	5025	1465	2220	3665	6105
600	1135	1705	2840	4730	1465	2220	3665	6105
650	1100	1650	2745	4575	1430	2145	3575	5960
700	1060	1590	2665	4425	1380	2075	3455	5760
750	1015	1520	2535	4230	1270	1905	3170	5285
800 ⁽¹⁾	825	1235	2055	3430	1030	1545	2570	4285

(1) Permissible, but not recommended for prolonged usage above 800°F (425°C).

(2) Special class ratings are not applicable to flanged ends.

A 105 : B16.34 – Material Group 1.1

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - bar	154	230	384	639	156	233	388	647
Seat test - bar	113	169	281	468	114	171	285	474
TEMP. - °C	Standard Class				Special Class			
-29 to +38	102.1	153.2	255.3	425.5	103.4	155.1	258.6	430.9
50	100.2	150.4	250.6	417.7	103.4	155.1	258.6	430.9
100	93.2	139.8	233.0	388.3	103.3	154.9	258.2	430.3
150	90.2	135.2	225.4	375.6	102.1	153.1	255.2	425.3
200	87.6	131.4	219.0	365.0	101.1	151.7	252.9	421.4
250	83.9	125.8	209.7	349.5	101.1	151.6	252.6	421.1
300	79.6	119.5	199.1	331.8	101.1	151.6	252.6	421.1
325	77.4	116.1	193.6	322.6	100.2	150.3	250.6	417.6
350	75.1	112.7	187.8	313.0	97.8	146.7	244.6	407.6
375	72.7	109.1	181.8	303.1	94.2	141.3	235.5	392.5
400	69.4	104.2	173.6	289.3	86.8	130.2	217.0	361.7
425 ⁽¹⁾	57.5	86.3	143.8	239.7	71.9	107.9	179.8	299.6

A 182 - F22 : B16.34 – Material Group 1.10

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - psi	2225	3375	5625	9375	2250	3375	5625	9375
Seat test - psi	1650	2475	4125	6875	1650	2475	4125	6875
TEMP. - °F	Standard Class				Special Class ⁽²⁾			
20 to 100	1500	2250	3750	6250	1500	2250	3750	6250
200	1500	2250	3750	6250	1500	2250	3750	6250
300	1455	2185	3640	6070	1480	2220	3695	6160
400	1410	2115	3530	5880	1455	2185	3640	6065
500	1330	1995	3325	5540	1450	2175	3620	6035
600	1210	1815	3025	5040	1440	2165	3605	6010
650	1175	1765	2940	4905	1430	2145	3580	5965
700	1135	1705	2840	4730	1415	2120	3535	5895
750	1065	1595	2660	4430	1415	2120	3535	5895
800	1015	1525	2540	4230	1415	2120	3535	5895
850	975	1460	2435	4060	1355	2030	3385	5645
900	900	1350	2245	3745	1200	1800	3000	5000
950	755	1160	1930	3220	945	1415	2360	3930
1000	535	800	1335	2230	670	1005	1670	2785
1050	350	525	875	1455	435	655	1095	1820
1100 ⁽¹⁾	220	330	550	915	275	410	685	1145
1150 ⁽¹⁾	135	205	345	570	170	255	430	715
1200 ⁽¹⁾	80	125	205	345	105	155	255	430

(1) Permissible, but not recommended for prolonged usage above 1100°F (595°C).

(2) Special class ratings are not applicable to flanged ends.

A 182 - F22 : B16.34 – Material Group 1.10

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - bar	156	233	388	647	156	233	388	647
Seat test - bar	114	171	285	474	114	171	285	474
TEMP. - °C	Standard Class				Special Class ⁽²⁾			
-29 to +38	103.4	155.1	258.6	430.9	103.4	155.1	258.6	430.9
50	103.4	155.1	258.6	430.9	103.4	155.1	258.6	430.9
100	103.0	154.6	257.6	429.4	103.2	154.9	258.1	430.2
150	100.3	150.6	250.8	418.2	101.9	152.9	254.8	424.6
200	97.2	145.8	243.4	405.4	100.4	150.7	251.1	418.5
250	92.7	139.0	231.8	386.2	100.0	149.9	249.9	416.5
300	85.7	128.6	214.4	357.1	99.6	149.3	248.9	414.8
325	82.6	124.0	206.6	344.3	99.2	148.8	248.0	413.3
350	80.4	120.7	201.1	335.3	98.4	147.6	246.0	410.0
375	77.6	116.5	194.1	323.2	97.5	146.3	243.8	406.3
400	73.3	109.8	183.1	304.9	97.5	146.3	243.8	406.3
425	70.0	105.1	175.1	291.6	97.5	146.3	243.8	406.3
450	67.7	101.4	169.0	281.8	94.4	141.4	235.8	393.1
475	63.4	95.1	158.2	263.9	85.5	128.2	213.7	356.3
500	56.5	84.7	140.9	235.0	71.5	107.1	178.6	297.5
538	36.9	55.3	92.2	153.7	46.1	69.1	115.2	192.1
550	31.3	46.9	78.2	130.3	39.1	58.6	97.7	162.8
575 ⁽¹⁾	21.1	31.6	52.6	87.7	26.3	39.5	65.8	109.7
600 ⁽¹⁾	13.8	20.7	34.4	57.4	17.2	25.8	43.0	71.7

A 182 - F91 : B16.34 – Material Group 1.15

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - psi	2225	3375	5625	9375	2250	3375	5625	9375
Seat test - psi	1650	2475	4125	6875	1650	2475	4125	6875
TEMP. - °F	Standard Class				Special Class ⁽¹⁾			
-20 to 100	1500	2250	3750	6250	1500	2250	3750	6250
200	1500	2250	3750	6250	1500	2250	3750	6250
300	1455	2185	3640	6070	1500	2250	3750	6250
400	1410	2115	3530	5880	1500	2250	3750	6250
500	1330	1995	3325	5540	1500	2250	3750	6250
600	1210	1815	3025	5040	1500	2250	3750	6250
650	1175	1765	2940	4905	1500	2250	3750	6250
700	1135	1705	2840	4730	1465	2200	3665	6110
750	1065	1595	2660	4430	1460	2185	3645	6070
800	1015	1525	2540	4230	1440	2160	3600	6000
850	975	1460	2435	4060	1355	2030	3385	5645
900	900	1350	2245	3745	1200	1800	3000	5000
950	775	1160	1930	3220	945	1415	2360	3930
1000	725	1090	1820	3030	840	1260	2105	3505
1050	720	1080	1800	3000	840	1260	2105	3505
1100	605	905	1510	2515	755	1130	1885	3145
1150	445	670	1115	1855	555	835	1395	2320
1200	290	430	720	1200	360	540	900	1500

(1) Special class ratings are not applicable to flanged ends.

A 182 - F91 : B16.34 – Material Group 1.15

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - bar	156	233	388	647	156	233	388	647
Seat test - bar	114	171	285	474	114	171	285	474
TEMP. - °C	Standard Class				Special Class ⁽¹⁾			
-29 to +38	103.4	155.1	258.6	430.9	103.4	155.1	258.6	430.9
50	103.4	155.1	258.6	430.9	103.4	155.1	258.6	430.9
100	103.0	154.6	257.6	429.4	103.4	155.1	258.6	430.9
150	100.3	150.6	250.8	418.2	103.4	155.1	258.6	430.9
200	97.2	145.8	243.4	405.4	103.4	155.1	258.6	430.9
250	92.7	139.0	231.8	386.2	103.4	155.1	258.6	430.9
300	85.7	128.6	214.4	357.1	103.4	155.1	258.6	430.9
325	82.6	124.0	206.6	344.3	103.4	155.1	258.6	430.9
350	80.4	120.7	201.1	335.3	102.8	154.3	257.1	428.6
375	77.6	116.5	194.1	323.2	101.0	151.5	252.5	420.9
400	73.3	109.8	183.1	304.9	100.6	150.6	251.2	418.3
425	70.0	105.1	175.1	291.6	99.3	148.9	248.2	413.7
450	67.7	101.4	169.0	281.8	94.4	141.4	235.8	393.1
475	63.4	95.1	158.2	263.9	85.5	128.2	213.7	356.3
500	56.5	84.7	140.9	235.0	71.5	107.1	178.6	297.5
538	36.9	55.3	92.2	153.7	57.9	86.9	145.1	241.7
550	49.8	74.8	124.9	208.0	57.9	86.9	145.1	241.7
575	47.9	71.8	119.7	199.5	57.1	85.7	143.0	238.3
600	39.0	58.5	97.5	162.5	48.7	73.1	121.9	203.1
625	29.2	43.8	73.0	121.7	36.5	54.8	91.3	152.1
650	19.9	29.8	49.6	82.7	24.8	37.2	62.1	103.4

PRESSURE/TEMPERATURE TABLES

A 182 - F304 : B16.34 – 2004 Material Group 2.1

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - psi	2175	3250	5400	9000	2250	3375	5625	9375
Seat test - psi	1600	2400	3975	6600	1650	2475	4125	6875
TEMP. - °F	Standard Class				Special Class ⁽²⁾			
-20 to 100	1440	2160	3600	6000	1500	2250	3750	6250
200	1200	1800	3000	5000	1340	2010	3350	5580
300	1075	1615	2690	4480	1200	1800	3000	5000
400	995	1490	2485	4140	1110	1665	2770	4620
500	930	1395	2330	3880	1040	1560	2600	4330
600	885	1325	2210	3680	985	1480	2465	4105
650	865	1295	2160	3600	965	1445	2410	4020
700	845	1265	2110	3520	945	1415	2355	3930
750	825	1240	2065	3440	920	1380	2305	3840
800 ⁽¹⁾	810	1215	2030	3380	905	1360	2265	3770
850	790	1190	1980	3300	885	1325	2210	3685
900	780	1165	1945	3240	870	1300	2170	3615
950	765	1145	1910	3180	850	1280	2130	3550
1000 ⁽¹⁾	710	1065	1770	2950	830	1245	2075	3460
1050 ⁽¹⁾	650	975	1630	2715	815	1220	2035	3395
1100 ⁽¹⁾	515	770	1285	2145	645	965	1605	2680
1150 ⁽¹⁾	410	615	1030	1715	515	770	1285	2145
1200 ⁽¹⁾	330	495	825	1370	410	615	1030	1715

(1) Not to be used above 1000°F (538°C) unless C% > 0.04.

(2) Special class ratings are not applicable to flanged ends.

A 182 - F304 : B16.34 – 2004 Material Group 2.1

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - bar	149	224	373	621	156	233	388	647
Seat test - bar	110	164	274	456	114	171	285	474
TEMP. - °C	Standard Class				Special Class ⁽²⁾			
-29 to +38	99.3	148.9	248.2	413.7	103.4	155.1	258.6	430.9
50	95.6	143.5	239.1	398.5	101.0	151.5	252.5	420.8
100	81.7	122.6	204.3	340.4	91.2	136.8	228.0	380.0
150	74.0	111.0	185.0	308.4	82.6	123.9	206.5	344.2
200	69.0	103.4	172.4	287.3	77.0	115.4	192.4	320.7
250	65.0	97.5	162.4	270.7	72.5	108.8	181.3	302.2
300	61.8	92.7	154.6	257.6	69.0	103.5	172.5	287.5
325	60.4	90.7	151.1	251.9	67.5	101.2	168.7	281.1
350	59.3	88.9	148.1	246.9	66.1	99.2	165.3	275.5
375	58.1	87.1	145.2	241.9	64.8	97.2	162.0	270.0
400	56.9	85.3	142.2	237.0	63.5	95.2	158.7	264.5
425	56.0	84.0	140.0	233.3	62.5	93.7	156.2	260.4
450	54.8	82.2	137.0	228.4	61.2	91.8	153.0	254.9
475	53.9	80.8	134.7	224.5	60.1	90.2	150.3	250.5
500	53.0	79.5	132.4	220.7	59.1	88.7	147.8	246.4
538 ⁽¹⁾	48.9	73.3	122.1	203.6	57.3	85.9	143.1	238.5
550 ⁽¹⁾	47.1	70.7	117.8	196.3	56.8	85.1	141.9	236.5
575 ⁽¹⁾	41.7	62.5	104.2	173.7	52.1	78.2	130.3	217.2
600 ⁽¹⁾	33.8	50.6	84.4	140.7	42.2	63.3	105.5	175.8
625 ⁽¹⁾	27.6	41.4	68.9	114.9	34.5	51.7	86.2	143.6
650 ⁽¹⁾	22.5	33.8	56.3	93.8	28.2	42.2	70.4	117.3

A 182 - F316 : B16.34 – 2004 Material Group 2.2

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - psi	2175	3250	5400	9000	2250	3375	5625	9375
Seat test - psi	1600	2400	3975	6600	1650	2475	4125	6875
TEMP. - °F	Standard Class				Special Class ⁽²⁾			
20 to 100	1440	2160	3600	6000	1500	2250	3750	6250
200	1240	1860	3095	5160	1380	2075	3455	5760
300	1120	1680	2795	4660	1250	1870	3120	5200
400	1025	1540	2570	4280	1145	1720	2865	4775
500	955	1435	2390	3980	1065	1600	2665	4440
600	900	1355	2255	3760	1005	1510	2520	4195
650	885	1325	2210	3680	985	1480	2465	4105
700	870	1305	2170	3620	970	1455	2425	4040
750	855	1280	2135	3560	955	1430	2385	3975
800	845	1265	2110	3520	945	1415	2355	3930
850	835	1255	2090	3480	930	1400	2330	3885
900	830	1245	2075	3460	925	1390	2315	3860
950	775	1160	1930	3220	915	1375	2290	3815
1000 ⁽¹⁾	725	1090	1820	3030	840	1260	2105	3505
1050 ⁽¹⁾	720	1080	1800	3000	840	1260	2105	3505
1100 ⁽¹⁾	610	915	1525	2545	765	1145	1905	3180
1150 ⁽¹⁾	475	710	1185	1970	590	885	1480	2465
1200 ⁽¹⁾	370	555	925	1545	465	695	1155	1930

(1) Not to be used above 1000°F (538°C) unless C% > 0.04.

(2) Special class ratings are not applicable to flanged ends.

A 182 - F316 : B16.34 – 2004 Material Group 2.2

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - bar	149	224	373	621	156	233	388	647
Seat test - bar	110	164	274	456	114	171	285	474
TEMP. - °C	Standard Class				Special Class ⁽²⁾			
-29 to +38	99.3	148.9	248.2	413.7	103.4	155.1	258.6	430.9
50	96.2	144.3	240.6	400.9	101.6	152.5	254.1	423.5
100	84.4	126.6	211.0	351.6	94.2	141.3	235.5	392.4
150	77.0	115.5	192.5	320.8	85.9	128.9	214.8	358.0
200	71.3	107.0	178.3	297.2	79.6	119.4	199.0	331.7
250	66.8	100.1	166.9	278.1	74.5	111.8	186.3	310.4
300	63.2	94.9	158.1	263.5	70.6	105.9	176.4	294.1
325	61.8	92.7	154.4	257.4	68.9	103.4	172.3	287.2
350	60.7	91.0	151.6	252.7	67.7	101.5	169.2	282.1
375	59.8	89.6	149.4	249.0	66.7	100.0	166.7	277.9
400	58.9	88.3	147.2	245.3	65.7	98.6	164.3	273.8
425	58.3	87.4	145.7	242.9	65.1	97.6	162.6	271.1
450	57.7	86.5	144.2	240.4	64.4	96.6	161.0	268.3
475	57.3	86.0	143.4	238.9	64.0	96.0	160.0	266.6
500	56.3	84.7	140.9	236.0	63.4	95.1	158.6	264.3
538 ⁽¹⁾	50.0	75.2	125.5	208.9	57.9	86.9	145.1	241.7
550 ⁽¹⁾	49.8	74.8	124.9	208.0	57.9	86.9	145.1	241.7
575 ⁽¹⁾	47.9	71.8	119.7	199.5	57.1	85.7	143.0	238.3
600 ⁽¹⁾	39.8	59.7	99.5	165.9	49.8	74.6	124.4	207.3
625 ⁽¹⁾	31.6	47.4	79.1	131.8	39.5	59.3	98.8	164.7
650 ⁽¹⁾	25.3	38.0	63.3	105.5	31.7	47.5	79.1	131.9

A 182 - F51 : B16.34 – 2004 Material Group 2.8

CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - psi	2225	3375	5625	9375	2250	3375	5625	9375
Seat test - psi	1650	2475	4125	6875	1650	2475	4125	6875
TEMP. - °F	Standard Class				Special Class ⁽²⁾			
20 to 100	1500	2250	3750	6250	1500	2250	3750	6250
200	1490	2230	3720	6200	1500	2250	3750	6250
300	1335	2000	3335	5560	1490	2235	3725	6205
400	1230	1845	3070	5120	1370	2055	3430	5715
500	1160	1740	2905	4840	1295	1945	3240	5400
600	1115	1670	2785	4640	1245	1865	3105	5180

(1) Not to be used above 600°F (315°C).

(2) Special class ratings are not applicable to flanged ends.

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CLASS	600	900	1500	2500	600	900	1500	2500
Shell test - bar	156	233	388	647	156	233	388	647
Seat test - bar	114	171	285	474	114	171	285	474
TEMP. - °C	Standard Class				Special Class ⁽²⁾			
-29 to +38	103.4	155.1	258.6	430.9	103.4	155.1	258.6	430.9
50	103.4	155.1	258.6	430.9	103.4	155.1	258.6	430.9
100	101.3	152.0	253.3	422.2	103.4	155.1	258.6	430.9
150	91.9	137.8	229.6	382.7	102.5	153.8	256.3	427.2
200	85.3	128.0	213.3	355.4	95.2	142.8	238.0	396.7
250	80.9	121.4	202.3	337.2	90.3	135.5	225.8	376.3
300	77.7	116.6	194.3	323.8	86.7	130.1	216.8	361.4
325	76.3	114.5	190.8	318.0	85.2	127.8	213.0	355.0

HOW TO ORDER

The figure numbers shown on this key are designed to cover essential features of Velan valves.
Please use figure numbers to ensure prompt and accurate processing of your order.
A detailed description must accompany any special orders.

TYPE OF CONNECTION	SIZE OF CONNECTION	PRESSURE RATING	TYPE	BODY/BONNET STYLE	BODY MATERIAL	TRIM
A	B	C	D	E	F	G
	 		 	 	 	 
W	0 5	3	0 7	4 X	0 2	T S

Example: Socketweld, 1", 1500 class, stop/globe, vertical pattern, forged A105 with standard Stellite trim.

A TYPE OF CONNECTION			
A - Butt weld		R - Flanged ANSI B16.5 Ring Type ⁽²⁾⁽⁶⁾	
B - Butt weld: direct profile ⁽³⁾⁽⁷⁾		S - Screwed NPT Female ⁽⁵⁾	
C - Combination Ends		U - Undrilled flanges	
D - Flanged DIN ⁽¹⁰⁾		X - Special to Order	
F - Flanged ANSI B16.5 RF ⁽²⁾		W - Socketweld ⁽⁴⁾	
G - Flanged Small Tongue & Groove		X - Welded Stubs, Socketweld ⁽¹⁰⁾	

B SIZE OF CONNECTION			
Customers have the choice of specifying valve size as part of the valve figure number (B) using the numbers below, or indicating valve size separately.			
EXAMPLES: W05-3074X-02TS (valve size is part of figure number) 1"W-3074X-02TS (valve size is shown separately)			
01 - ¼" (8 mm)	03 - ½" (15 mm)	05 - 1" (25 mm)	07 - 1½" (40 mm)
02 - ⅜" (10 mm)	04 - ¾" (20 mm)	06 - 1¼" (32 mm)	08 - 2" (50 mm)

C PRESSURE RATING			
0 - 150	2 - 600 or API 800 ⁽⁸⁾	4 - 2500	8 - 1690
1 - 300	3 - 1500	7 - 900	9 - 2690
D - BS10 Table D	H - BS10 Table H	M - PN 64	R - BS10 Table R
E - BS10 Table E	J - BS10 Table J	N - PN 100	S - BS10 Table S
F - BS10 Table F	K - BS10 Table K	P - PN 160	T - BS10 Table T
G - PN 16	L - PN 40	Q - PN 250	U - PN 400

D VALVE TYPE			
01 - Flow control	04 - Strainer	09 - Needle	
02 - Ball check	07 - Globe Stop	10 - Continuous Blowdown ⁽¹¹⁾	
03 - Piston check	08 - Stop check (SDNR)	99 - Special	

E BODY/BONNET STYLE			
4 - Vertical Pattern	6 - Oblique Y-Pattern		
5 - Angle Pattern	X - Bonnetless (Rotating Stem, Rising Handwheel)		

F BODY MATERIAL			
02 - A105	10 - F316H/F316 ⁽¹²⁾	32 - F51	
06 - F22	13 - F316 ⁽¹²⁾	34 - F91	
Other materials supplied by special arrangement.			

G TRIM (standard trims)					
CODE	TYPE	DISC SURFACE	SEAT SURFACE	STEM	API NO.
MS	Standard	Stellite-6	Stellite 6	SS Type 316	-
TS	Standard	Stellite 6	Stellite 6	SS Type 410 (13% CR)	5
NE	NACE ⁽⁹⁾	Stellite 6	Stellite 6	SS Type 410 (13% CR) HRC 22 max.	5
NG	NACE ⁽⁹⁾	Stellite 6 ⁽⁴⁾	Stellite 6 ⁽⁴⁾	SS Type 316	-
AA	Special	To Order	To Order	To Order	-

Footnotes:

- (1) Valves are designed in accordance with ASME B16.34 and tested to API598 / MSS SP61 unless requested otherwise.
- (2) Flange facings for class rated valves are supplied in accordance with ASME B16.5 with either raised face (A code F) or ring type joint (A code R)
- (3) Butt weld profiles in accordance with ASME B16.25.
- (4) Socket weld connections in accordance with ASME B16.11
- (5) NPT thread in accordance with ASME 1.20.1
- (6) End-to-End and Face-to-Face dimensions in accordance with ASME B16.10.
- (7) End-to-End dimension is Velan standard.
- (8) API class 800 applies only to Socket weld or screwed ends.
- (9) NACE service valves are supplied with materials conforming to either MR0175 2002 edition or MR103-2003. Please contact plant when NACE valves are required to be compliant to MR0175-2003.
- (10) Face-to-Face or End-to-End dimensions to order.
- (11) Available only in Angle pattern with flow over disc i.e. inlet from side and outlet in line with stem axis.
- (12) Material code "10" F316H/F316 (CF8M) has a minimum carbon content of 0.04 and is to be used if temperatures are over 1000°F (538°C). Material code "13" forged F316, is not suitable for temperatures over 1000°F (538°C) as it is dual certified (F316/F316L).