

VELAN *FORGED HIGH PRESSURE BONNETLESS* **Y-PATTERN GLOBE VALVES**



**ASME
CLASSES:
1690-4500**

**Sizes: 1/2-4"
(15-100 mm)**



U.S. Patent # 4356832

***Patented Easy
Maintenance!***



PROFILE

Velan is one of the world's leading manufacturers of industrial valves, supplying forged and cast steel gate, globe, check, ball, butterfly and knife gate valves for critical applications in the chemical, petrochemical, oil and gas, fossil and nuclear power, cogeneration, pulp and paper and cryogenic industries.

Founded in 1950, Velan earned a reputation for excellence as a major supplier of forged valves for nuclear power plants and the U.S. Navy. Velan Inc., pioneered many designs which became industry standards, including bellows seal valves, all stainless steel knife gate valves and forged valves up to 24" (600 mm).

Velan valves are manufactured in 12 specialized plants, including five in Canada, two in Korea and one each in the U.S., France, U.K., Portugal and Taiwan. We have a total of 1,090 employees in North America and 385 overseas.

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HEAD OFFICE AND PLANT 5



MONTREAL, CANADA 115,000 sq. ft. (10,683 m²)
2 – 60" (50 – 1500 mm) dual plate check valves, 3 – 48" (80 – 1200 mm) triple-offset butterfly valves,
3/8 – 2" (10 – 50 mm) metal and resilient seated ball valves

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HIGH PERFORMANCE FORGED

ONE-PIECE GLOBE VALVE

Designed for tough service

**QUICK AND EASY
DISASSEMBLY**

*High Pressure—temperature
Service with Low Fugitive
Emissions*

**Non-rotating stem
and non-rising
handwheel**

**NO WELDS
TO REMOVE**

U.S.A. PAT.
Number
4356832

076Z

22 DESIGN FEATURES

1	BODY	All pressure-containing parts in one vessel
2		No body-bonnet gasket or pressure seal
3		Self-draining waterways (no deposits)
4	SEAT	Double orifice to better dissipate erosive flow energy through main seat
5		Suitable for blow down and blow off services
6	DISC	Fully-guided disc (bottom & top)
7		Non-spinning disc
8	STEM	Disc seating, guiding and stem contact in Stellite 6
9		Non-rotating stem prevents torsional damage of packing and ensures low torque
10	STEM NUT	Stem threads protected from dirt, dust, sand
11		Fully enclosed and greased stem nut drive protected from dirt, dust, sand
12	PACKING CHAMBER	Stem nut riding on 2 needle bearings
13		Position indicator as standard
14	PACKING GLAND	Packing chamber burnished for tight seal
15		Packing rings individually pre-stressed
16	BACK SEAT	Optional live-loading of packing
17		Self aligning two-piece gland
18	SERVICING	Stellite 6 backseat
19		Backseating bevel on stem
20		No welds to cut for servicing
21		No threaded bonnet which can seize
22		One-step removal of all working parts including packing

**THE ONLY VALVE WITH 22 DESIGN FEATURES
FOR HIGH PRESSURE STEAM AND OTHER TOUGH SERVICES**

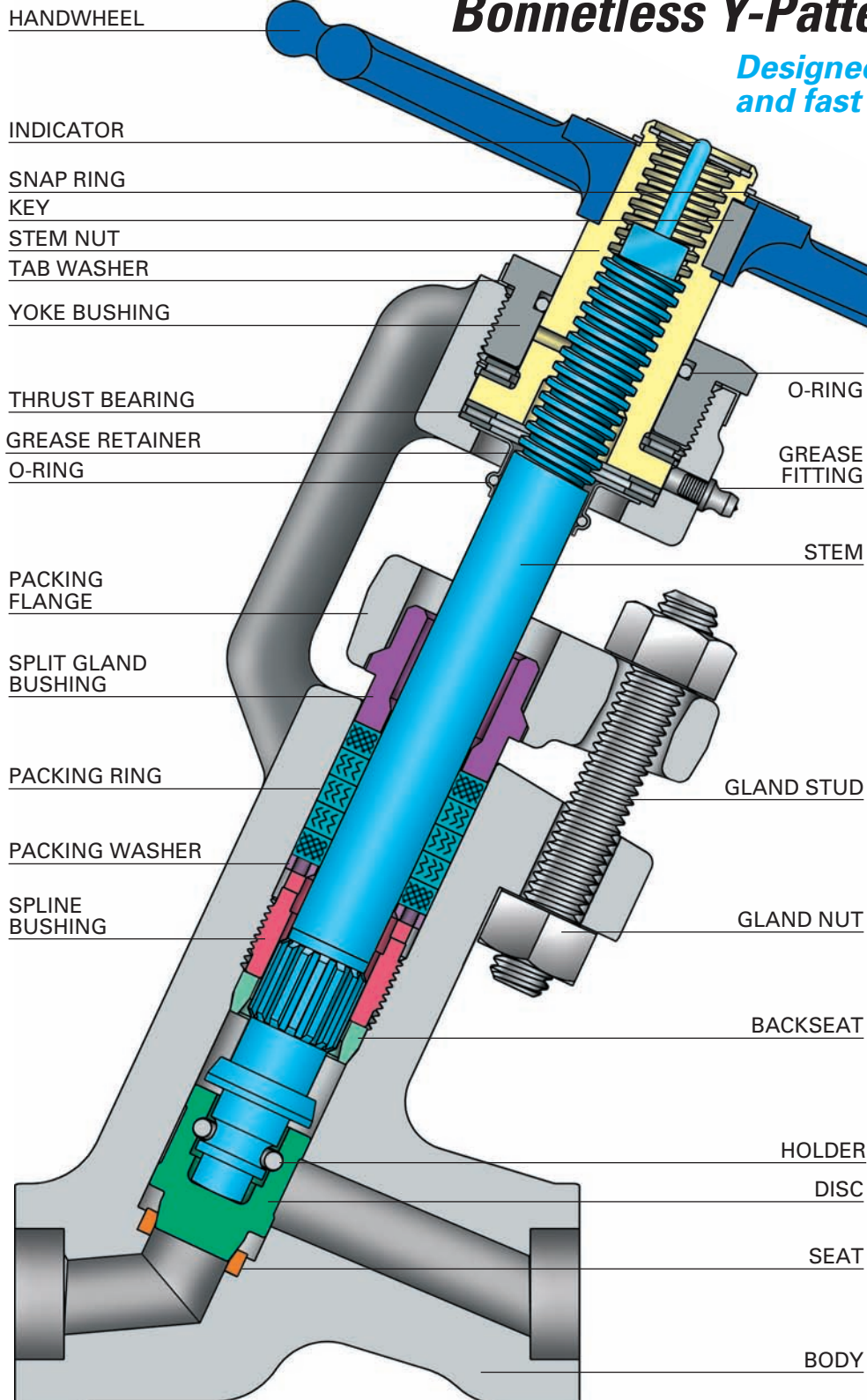
STANDARD GLOBE, NEEDLE OR STOP CHECK DISC

Bonnetless Y-Pattern Globe Valve

*Designed for low maintenance
and fast in-line internal repairs*

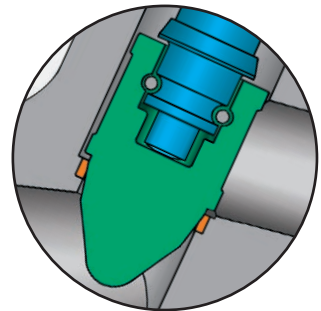
**with non-rotating stem
and non-rising
handwheel**

076Z

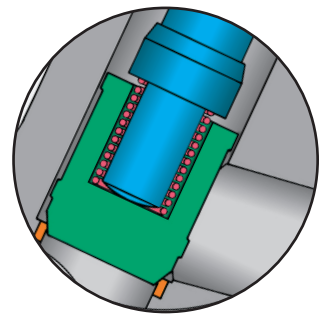


DISC OPTIONS

NEEDLE DISC



STOP CHECK DISC



NO OTHER VALVE OFFERS THIS COMBINATION OF FEATURES

VALVES PERFORM SUCCESSFULLY WHERE OTHER DESIGNS FAIL

Velan one-piece, forged, bonnetless globe valves have been proven in critical, tough service applications around the world for over 30 years. This includes high pressure drop, steam blow down, steam injection, fast acting isolation, 6,000 psi (414 bar) gas and super heated steam at 1,100°F (593°C). In 1981, after rigorous testing of valve performance and all its components, we redesigned the valve and added several new patented features. It is with pride that we offer to the user this outstanding, long-lasting, high performance valve for high pressure and tough applications.

ONE-PIECE FORGED BODY

- No pressure-retaining threads or bolts
- No welds to cut and reweld

Streamlined flow and self-draining waterways

- Eliminates deposits and corrosion
- 65° incline reduces pressure drop

HEAVY INTEGRAL STELLITE SEAT

- Tight shutoff
- Long valve life
- Easy refacing

Double orifice

- Protects seating faces because part of the erosive flow energy dissipates through second orifice
- Allows use of standard valves in high pressure drop blow down applications

NON-SPINNING, BODY-GUIDED SOLID STELLITE DISC

- Disc is guided at bottom and top
- Tight fit in body ensures disc-seat alignment and prevents side thrust on stem
- No galling of body, scoring or bending of stem
- Large clearance between stem and disc allows disc to move freely
- Cannot detach from stem, as not used for backseating
- Stop, stop check or needle control disc
- Non-spinning feature due to two flats in bottom area inside of the disc

The valve combines all these features:

- Best flow characteristics
- Best design and operational features
- Solid Stellite 6 guided, non-spinning disc
- Enclosed, dust and dirt protected stem
- Lowest operational torque
- Low maintenance cost
- Simplest and fastest method of in-line internal repairs

NON-ROTATING SPLINED STEM

Extra low operating and seating torques ensured by:

- Non-rotating stem
- No torsion applied to packing rings
- Stem guided linearly in a low friction spline
- No stem scoring or bending

TWO-PIECE POSITIVE BACKSEAT

- Separate Stellite ring lapped against the body and seated against the stem bevel for positive shutoff
- Threaded, splined bushing guides the stem and allows easy removal of all internals

LONG-LASTING, TIGHTER STEM PACKING FOR LOW FUGITIVE EMISSIONS

- Non-rotating stem
- Rings precompressed to approx. 4,000 psi (275 bar)
- Combination graphite rings
- Heavy packing flange and bolting
- Live-loading optional

UNIQUE, FULLY-ENCLOSED STEM NUT DRIVE

- Well lubricated stem nut, rotating on two thrust bearings
- 10,000 test cycles show no visible damage to parts
- Dust cover and sleeve protect stem threads from dirt, dust and sand

VALVES ALSO SUPPLIED WITH ELECTRIC, PNEUMATIC OR GEAR ACTUATORS. NEEDLE DISC FOR FLOW CONTROL.

LIVE-LOADED OPTION

WITH DOUBLE PACKING, LEAK-OFF & LIVE-LOADING

½–4" (15–100 mm)

ASME CLASSES 1690, 2680 & 4500

DESIGN FEATURES

- **NON-ROTATING STEM**

Non-rotating stem has close roundness and straightness tolerances and is burnished for a superior finish.

- **HEAVY TWO-PIECE GLAND**

Packing gland is built to withstand high stresses caused by live-loading.

- **LIVE-LOADING**

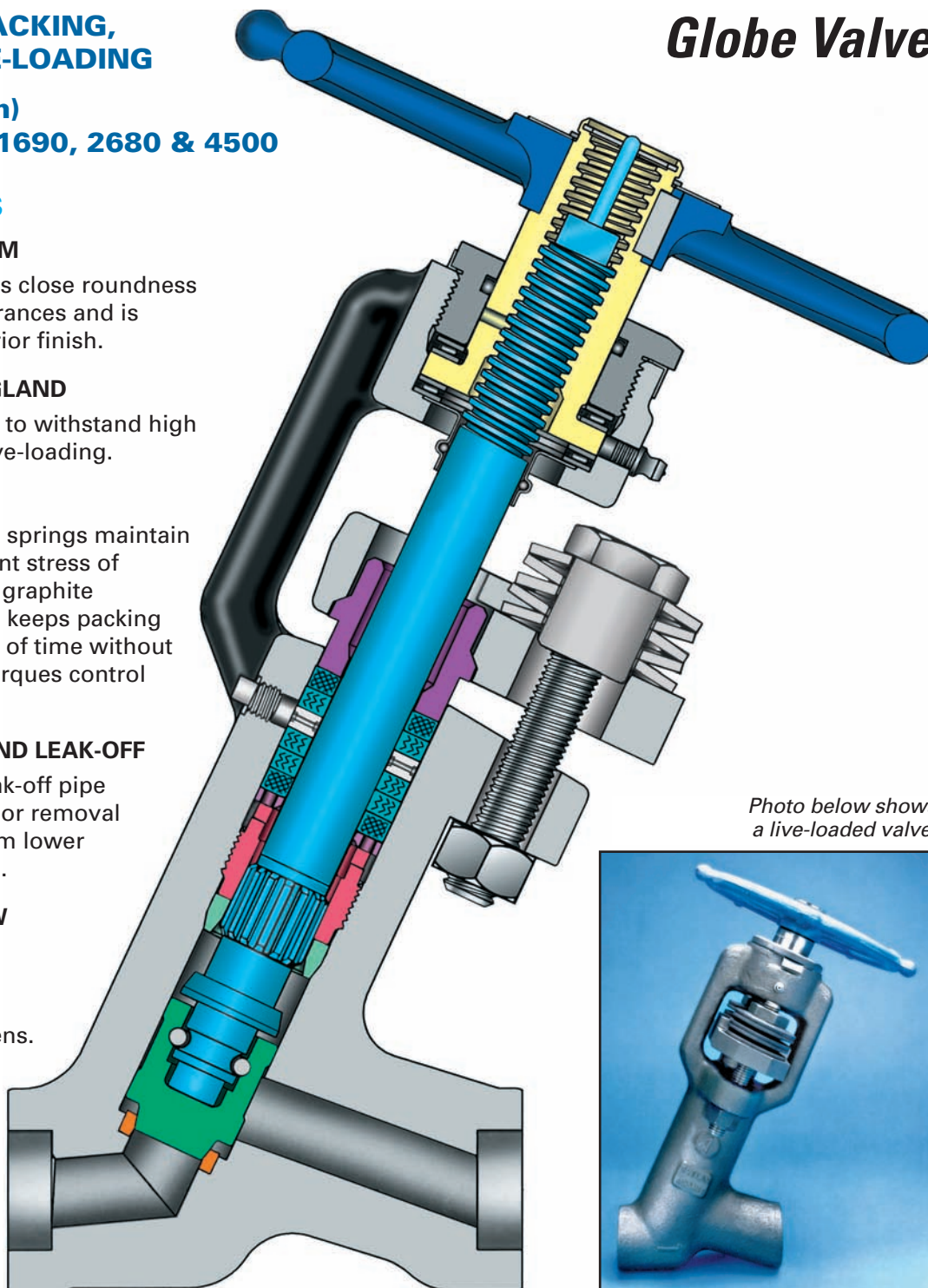
Two sets of Belleville springs maintain a minimum permanent stress of 4000 psi (275 bar) on graphite packing. Live-loading keeps packing tight for long periods of time without maintenance. Bolt torques control total spring load.

- **DOUBLE PACKING AND LEAK-OFF**

A lantern ring and leak-off pipe provide for detection or removal of leakage, if any, from lower packing set (optional).

- **SHORT AND NARROW PACKING CHAMBER**

Sealing effectiveness improves as overall packing length shortens. Chamber wall is burnished to a superior finish.



Bonnetless Y-Pattern Globe Valve

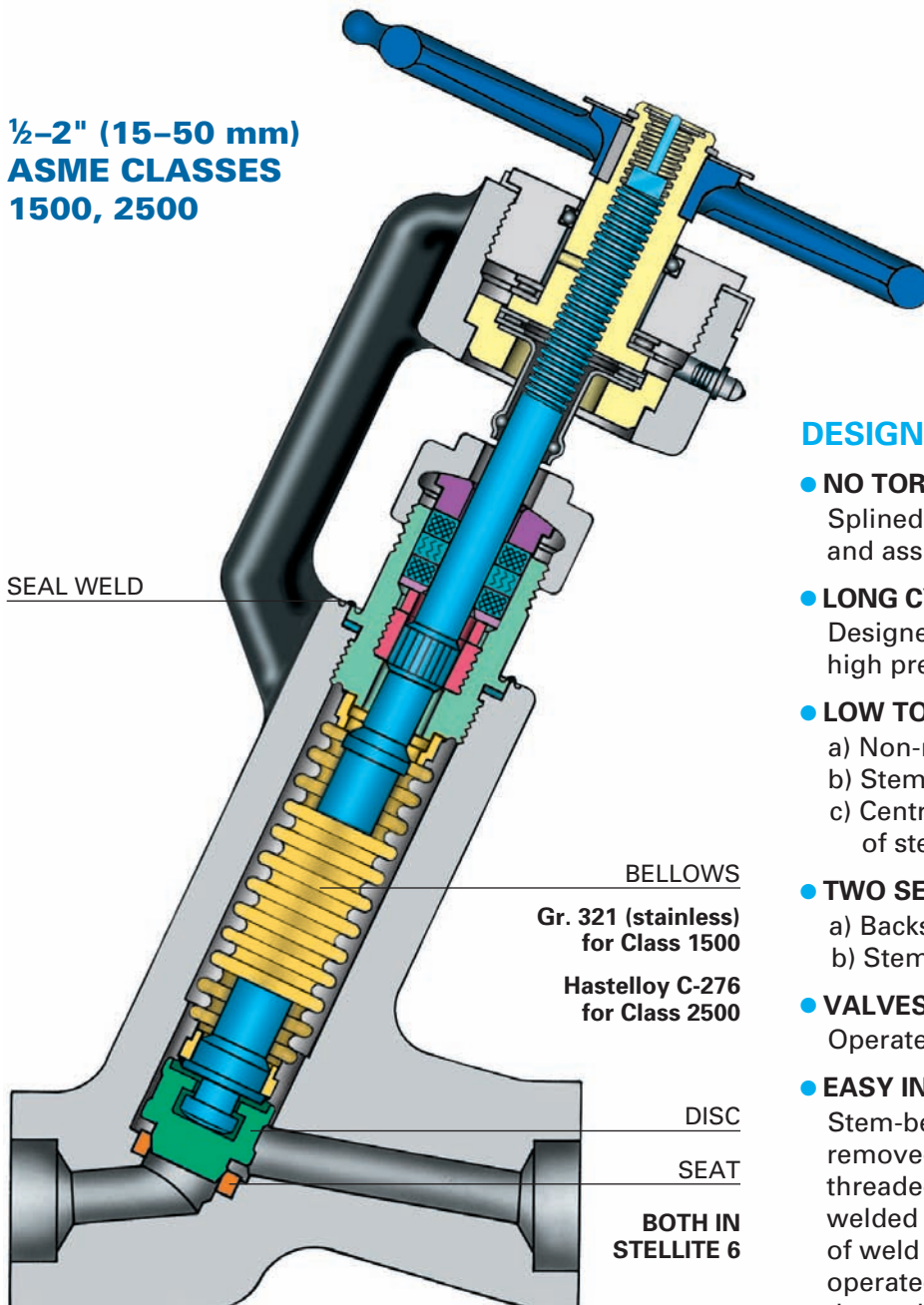
*Photo below shows
a live-loaded valve.*



BELLOWS SEAL OPTION

Hermetically-sealed Y-Pattern Globe Valve

**½–2" (15–50 mm)
ASME CLASSES
1500, 2500**

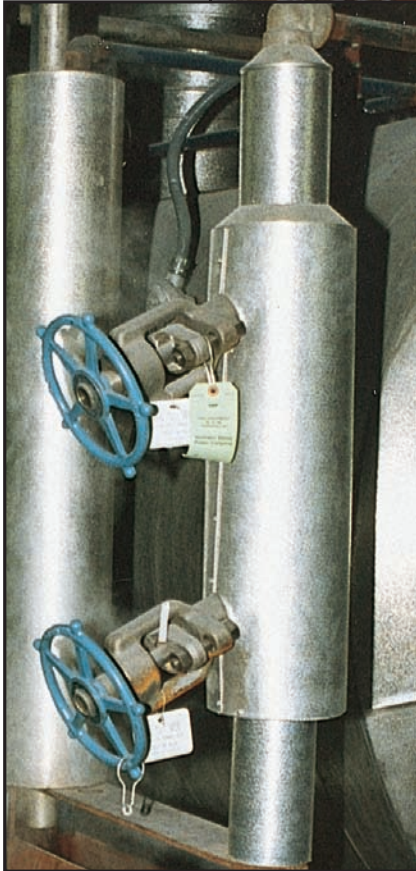


*In-service photo of Class 2500
hermetically-sealed
Y-pattern bellows seal valve.*

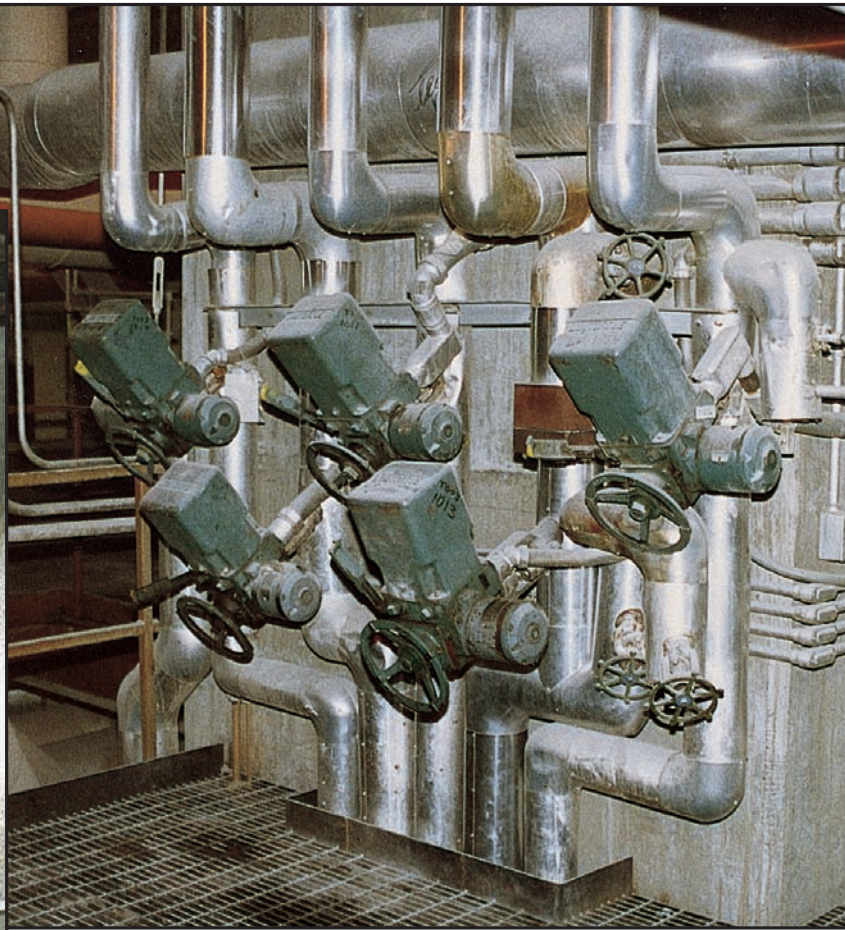
DESIGN FEATURES

- **NO TORSION OF BELLOWS**
Splined stem prevents torsion of bellows and assures long cycle life.
- **LONG CYCLE LIFE BELLOWS (5000 cycles)**
Designed for, and successfully tested in, high pressure–temperature conditions.
- **LOW TORQUE due to:**
 - a) Non-rotating stem
 - b) Stem nut thrust bearings
 - c) Central grease fitting for lubrication of stem nut.
- **TWO SECONDARY STEM SEALS**
 - a) Backseat
 - b) Stem packing.
- **VALVES ARE FIRE SAFE**
Operate normally during and after fire test.
- **EASY IN-LINE SERVICING**
Stem-bellows assembly can easily be removed and replaced on valves with threaded (O-ring seal) bonnet. On seal-welded valves, removal and replacement of weld is necessary. Special power operated tools are available for cutting the seal weld.

TYPICAL IN-SERVICE INSTALLATIONS



Top right photo:
*Electrically actuated Velan
bonnetless Y-pattern globe valves.*



*Class 2500
hermetically-sealed
Y-pattern bellows
sealed valves.*





FORGED STEEL Y-PATTERN BONNETLESS GLOBE VALVES

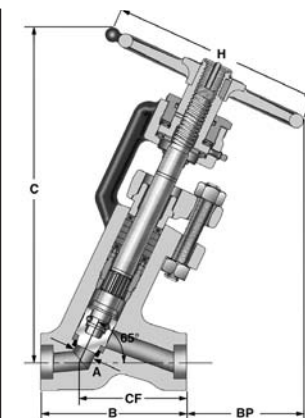
CONVENTIONAL PORT OPENING, THREADED, SOCKET WELD
OR BUTT WELD ½ – 4" (15 – 100 mm)
ASME CLASSES 1690, 2680, 4500

Part	Standard Materials		
Body	A105N	A 182 Gr. F22	A 182 Gr. F316
Seat (integral)	Stellite 6	Stellite 6	Stellite 6
Disc	Stellite 6	Stellite 6	Stellite 6
Stem	Gr. 410 (stainless)	Gr. 410 (stainless)	Gr. 316B (stainless)
Stem nut	A 439 Austenitic ductile iron Gr. D-2C		
Backseat	Stellite 6	Stellite 6	Stellite 6
Splined bushing	Gr. 630 (stainless)	Gr. 630 (stainless)	Gr. 630 (stainless)
Packing washer	Gr. 304 (stainless)	Gr. 304 (stainless)	Gr. 304 (stainless)
Packing	Graphite	Graphite	Graphite
Split gland bushing	Gr. CA15 (stainless)	Gr. CA15 (stainless)	Gr. CA15 (stainless)
Packing flange	A105	A105	A182 Gr. F304
Gland stud	Gr. B7	Gr. B6	Gr. B8M2
Gland nut	Gr. 2H	Gr. 2H	Gr. 8M
Yoke bushing	Gr. 1020 steel	Gr. 1020 steel	Gr. 1020 steel (nickel-plated)
Thrust bearing	Steel	Steel	Steel
Stem protector	Steel	Steel	Steel (nickel-plated)
O-ring	Nitrile rubber	Nitrile rubber	Nitrile rubber
Handwheel	Malleable iron (painted)	Malleable iron (painted)	Malleable iron (painted)
Snap ring	Steel	Steel	Steel
Name plate	Gr. 304 (stainless)	Gr. 304 (stainless)	Gr. 304 (stainless)

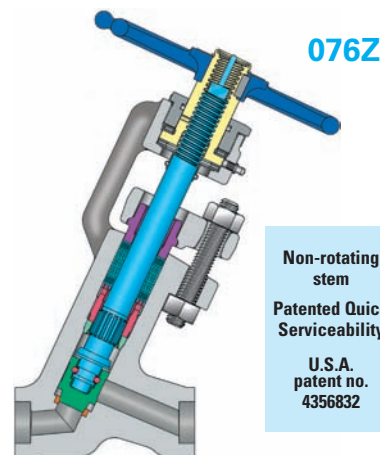
NOTE: Valves also supplied with impactor handle,
electric, pneumatic or gear actuators.

DIMENSIONS, WEIGHTS AND CV

Size in mm	A Port		B End to End		C Center to Top		H Handwheel		BP Clearance Open		CF Center to End		Weight lb kg		CV Flow Coefficient	
	1690 2680	4500	1690 2680	4500	1690 2680	4500	1690 2680	4500	1690 2680	4500	1690 2680	4500	1690 2680	4500	1690 2680	4500
1/4	0.559	0.375	4.88	5.75	9.63	11.75	6.00	6.00	3.63	3.25	3.20	4.19	15	27	1.3	1.0
8	14.2	9.5	124	146	245	298	152	152	92	83	81	106	7	12.2		
3/8	0.559	0.375	4.88	5.75	9.63	11.75	6.00	6.00	3.63	3.25	3.20	4.19	15	27	2.4	1.5
10	14.2	9.5	124	146	245	298	152	152	92	83	81	106	7	12.2		
1/2	0.559	0.375	4.88	5.75	9.63	11.75	6.00	6.00	3.63	3.25	3.20	4.19	15	27	2.9	1.5
15	14.2	9.5	124	146	245	298	152	152	92	83	81	106	7	12.2		
3/4	0.559	0.559	4.88	7.00	9.63	14.20	6.00	8.00	3.63	6.00	3.20	3.88	15	56	5.0	5.0
20	14.2	14.2	124	178	245	361	152	203	92	152	81	99	7	25		
1	0.833	0.559	5.75	7.00	13.19	14.20	8.00	8.00	5.13	6.00	4.19	3.88	33	56	9.8	5.0
25	21.2	14.2	146	178	335	361	203	203	130	152	106	99	15	25		
1 1/4	1.250	0.833	7.25	10.13	16.63	18.88	12.00	12.00	6.78	7.00	4.94	6.57	60	94	23	9.8
32	31.8	21.2	184	257	422	480	305	305	172	178	125	167	27.2	43		
1 1/2	1.250	1.125	7.25	12.00	16.63	20.75	12.00	18.00	6.78	8.00	4.94	8.00	60	148	25	20
40	31.8	28.6	184	305	422	527	305	457	172	203	125	203	27.2	67		
2	1.250	—	7.25	—	16.63	—	12.00	—	6.78	—	4.94	—	60	—	34	—
50	31.8	—	184	—	422	—	305	—	172	—	125	—	27.2	—		
2	1.688	1.125	10.13	12.00	19.88	20.75	12.00	18.00	7.50	8.00	6.57	8.00	110	148	60	26
50	42.9	28.6	257	305	505	527	305	457	190	203	167	203	50	67		
2 1/2 ⁽¹⁾	1.688	1.50	12.00	12.00	20.69	20.75	16.00 ⁽²⁾	16.00 ⁽²⁾	7.25	7.25	8.00	8.00	148 ⁽³⁾	148	60	47
65	42.9	38.1	305	305	526	527	406	406	184	184	203	203	67	67		
3 ⁽¹⁾	1.688	1.50	12.00	12.00	20.69	20.75	16.00 ⁽²⁾	16.00 ⁽²⁾	7.25	7.25	8.00	8.00	148 ⁽³⁾	148	60	47
80	42.9	38.1	305	305	526	527	406	406	184	184	203	203	67	67		
4	1.688	1.50	12.00	12.00	20.69	20.75	16.00 ⁽²⁾	16.00 ⁽²⁾	7.25	7.25	8.00	8.00	148	148	60	47
100	42.9	38.1	305	305	526	527	406	406	184	184	203	203	67	67		



- (1) For Classes 1690 & 2680, dimensions are as shown, or same as for 2" (50 mm) valve, depending on end connection.
- (2) Impactor handle.
- (3) For butt weld weight is 110 lbs (50 kg).



076Z

Non-rotating
stem
Patented Quick
Serviceability
U.S.A.
patent no.
4356832

FIGURE NUMBERS

THREADED, SOCKET WELD OR BUTT WELD CONNECTIONS			
CLASS	STOP VALVE	STOP CHECK VALVE	NEEDLE VALVE
1690	8076Z	8086Z	8096Z
2680	9076Z	9086Z	9096Z
4500	5076Z	5086Z	5096Z

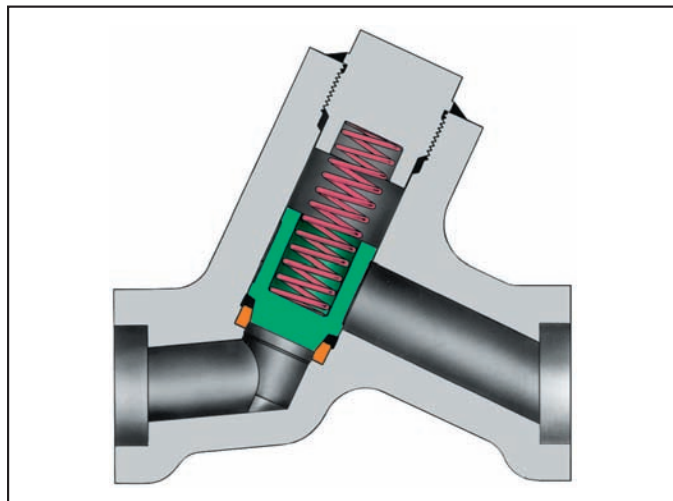
SPECIFICATIONS

DESIGN	ASME B16.34
Socket weld ends	ASME B16.11
Threaded ends	ASME B1.20.1
Butt weld ends	ASME B16.25
Testing	ASME B16.34 & MSS-SP-61
Marking	MSS-SP-25



FORGED STEEL PISTON CHECK VALVES FOR HORIZONTAL AND VERTICAL LINES

THREADED, SOCKET WELD OR BUTT WELD
ASME CLASSES 1690, 2680, 4500



Part	Standard Materials		
Body	A105N	A182 Gr. F22	A182 Gr. F316
Cover	A105N	A182 Gr. F22	A182 Gr. F316
Disc	Stellite 6		
Seat, integral	Stellite 6		
Spring	Gr. 302 (stainless)		

NOTE: Other materials available upon application.

FEATURES:

- Solid Stellite 6 disc, fully guided for fast and full seating, even without spring
- High C_v
- Self-draining waterways

Class	1690	2680	4500
Figure No.	8036W	9036W	5036W

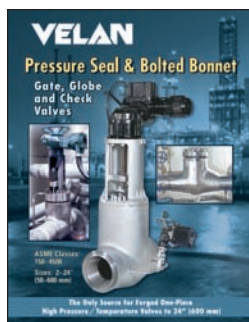
DIMENSIONS, WEIGHTS AND C_v

Size in mm	Port Opening		End to End		Center to Top		Socket Weld Bore	Socket Weld Depth	Approx. Weight lb kg		Cv Flow Coefficient	
	1690 & 2680	4500	1690 & 2680	4500	1690 & 2680	4500			1690 & 2680	4500	1690 & 2680	4500
1/4	0.559	—	4.88	—	3.61	—	0.555	0.375	6.5	—	1.0	—
8	14.2	—	124	—	92	—	14.1	9.5	3.0	—	—	—
3/8	0.559	0.375	4.88	5.75	3.61	4.26	0.690	0.375	6.3	10	1.8	1.5
10	14.2	9.5	124	146	92	108	17.5	9.5	2.9	4.5	—	—
1/2	0.559	0.559	4.88	7.00	3.61	4.75	0.855	0.375	6.1	25	2.1	2.1
15	14.2	14.2	124	178	92	121	21.7	9.5	3	11	—	—
3/4	0.559	0.559	4.88	7.00	3.61	5.25	1.065	0.500	5.7	25	4.3	4.3
20	14.2	14.2	124	178	92	133	27.1	12.7	2.6	11	—	—
1	0.833	0.559	5.75	7.00	4.88	5.25	1.330	0.500	5.0	25	8.4	4.3
25	21.2	14.2	146	178	124	133	33.8	12.7	2.3	11	—	—
1 1/4	1.250	0.833	7.25	10.13	5.88	6.88	1.675	0.500	18.5	42	17	—
32	31.8	21.2	184	257	150	175	42.5	12.7	8.4	19	—	—
1 1/2	1.250	1.125	7.25	10.13	5.88	6.88	1.915	0.500	18.5	42	19	18
40	31.8	28.6	184	257	150	175	48.6	12.7	8.4	19	—	—
2	1.250	—	7.25	—	5.88	—	2.406	0.625	26	—	26	—
50	31.8	—	184	—	150	—	61.1	15.9	12	—	—	—
2	1.688	1.50	10.13	12.00	7.19	8.44	2.406	0.625	36	87	45	36
50	42.9	38.1	257	305	183	214	61.1	15.9	16.3	40	—	—
2 1/2 ⁽¹⁾	1.688	1.50	12.00	12.00	8.44	8.44	2.906	0.625	94	110 ⁽³⁾	45	36
65	42.9	38.1	305	305	214	214	73.8	15.9	43	50	—	—
3 ⁽¹⁾	1.688	1.50	12.00	12.00	8.44	8.44	3.535	0.625	94	110 ⁽³⁾	45	36
80	42.9	38.1	305	305	214	214	89.8	15.9	43	50	—	—
4	1.688	1.50	12.00	12.00	8.44	8.44	(2)	(2)	94	110	45	36
100	42.9	38.1	305	305	214	214	(2)	(2)	43	50	—	—

(1) For Classes 1690 & 2680, dimensions are as shown, or same as for 2" (50 mm) valve, depending on end connection.

(2) 4" (100 mm) butt weld or flanged connection only.

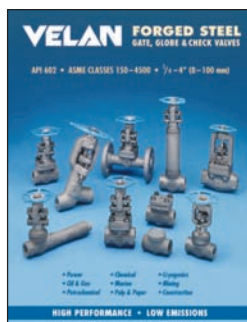
(3) For butt weld weight is 40 lbs. (18 kg).



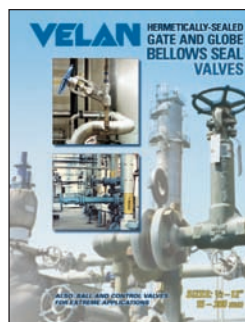
VEL-PS



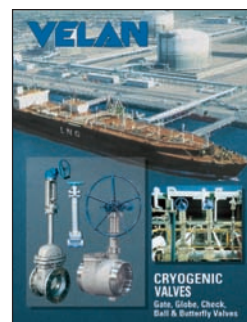
CAT-BG



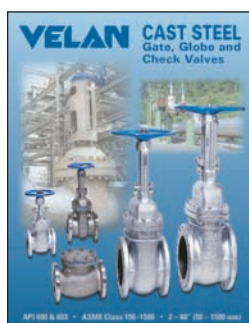
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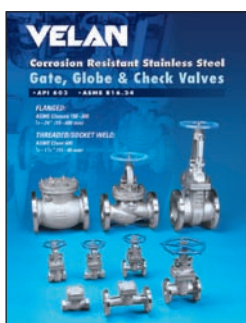
VEL-BS



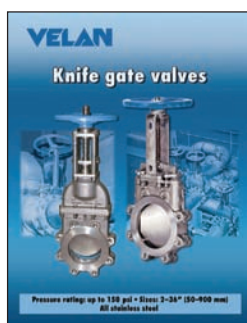
VEL-CRYO



VEL-CSV



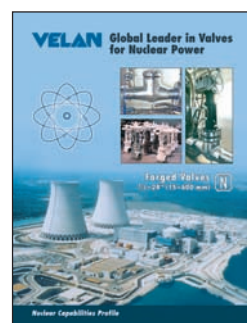
VEL-API-603



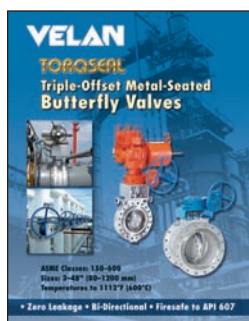
VEL-KGV



VEL-PQCV



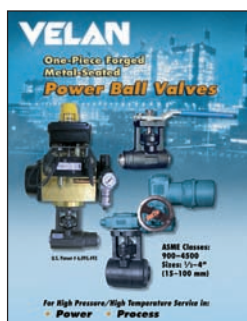
VEL-NCP



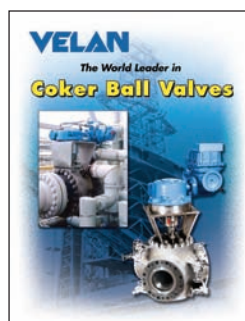
VEL-BF



VEL-MS



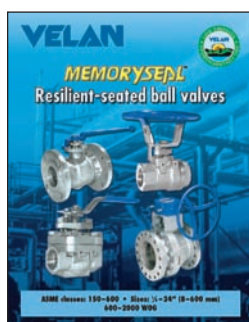
VEL-PBV



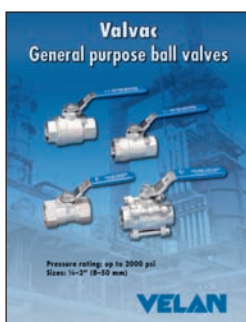
VEL-CBV



VEL-VTP



VEL-BV



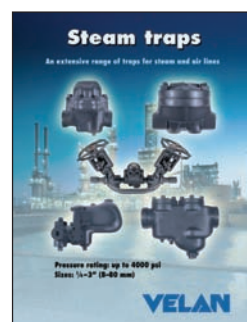
CAT-GPBV



CAT-SAS-CFLEX



CAT-SAS-CCON



CAT-ST

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