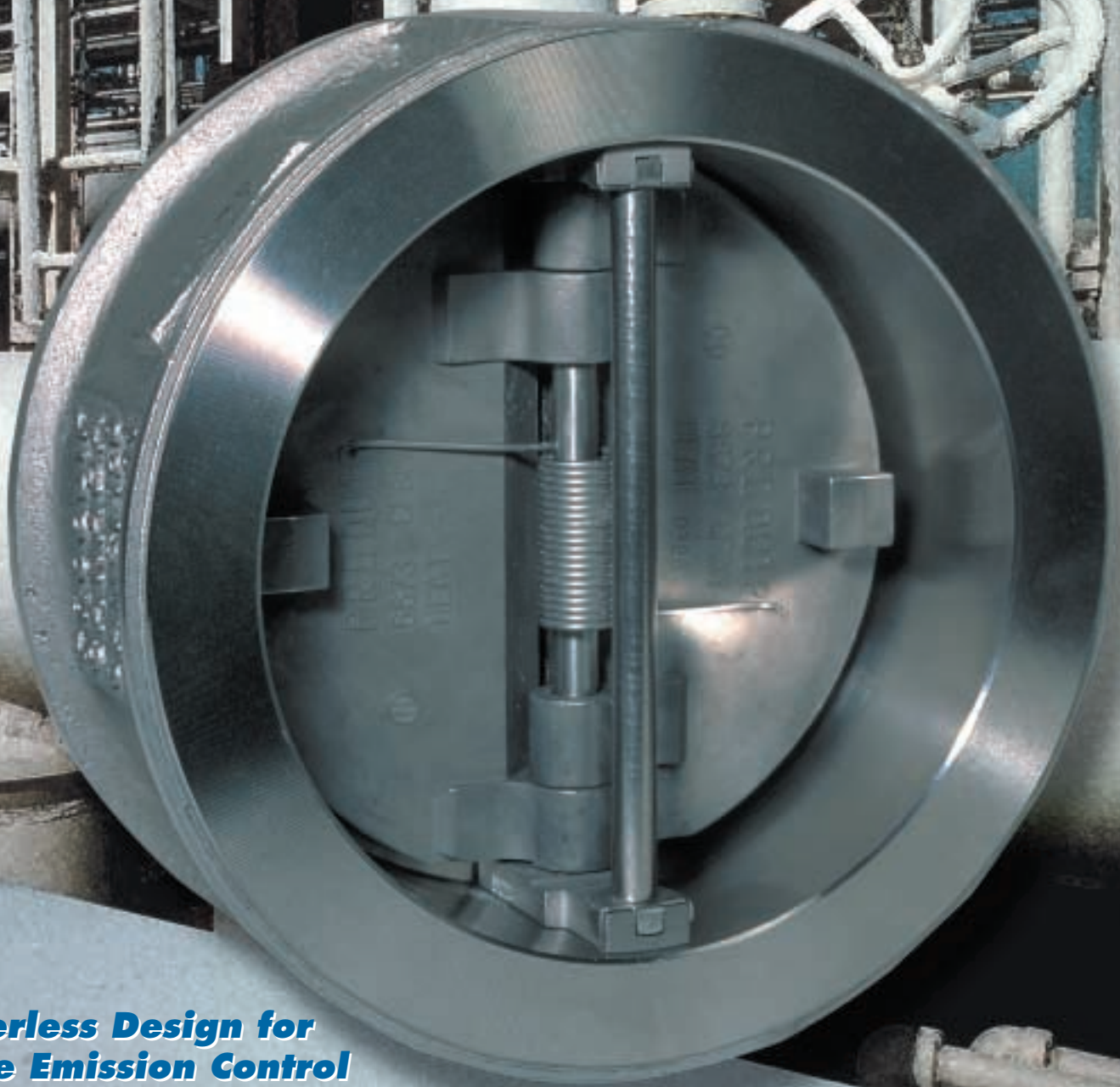


VELAN **PROQUIP**®

a subsidiary of Velan Inc.

High Performance Check Valves **V-Series**



**Retainerless Design for
Fugitive Emission Control**

Class 150 - API 10,000
Sizes 2" - 72" (50 - 3600mm)

Company Profile

Velan-Proquip Inc. is a world class manufacturer of wafer check valves & line blinds. The company, founded in 1955 and acquired by **Velan Inc.** in 1997, has a 65,000 sq. ft. plant located in Oakville, Ontario. This facility, certified to ISO 9001, includes in-house manufacturing, engineering and quality assurance groups. Since inception the company has worked with major engineering firms, oil companies, petrochemical and chemical manufacturers to supply their check valve requirements. The scope of product, extending to high pressure classes (*API 10000*) and special materials (*monel, inconel*) enables **Velan-Proquip** to meet today's application requirements.

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Aerial view of the **Velan-Proquip Inc.** facility, Oakville, Ontario.

Note:

The material in this catalog is for general information. For specific performance data and proper material selection, consult your **Velan-Proquip** representative. Although every attempt has been made to ensure that the information contained in this catalog is correct, **Velan-Proquip** reserves the right to change designs, materials or specifications without notice.

General Information

Telephone: (905) 842-1721
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For the latest Sales & Manufacturing information, visit the **Velan-Proquip Website** @ www.proquipvalve.com

Corporate Philosophy

The **Velan-Proquip** corporate philosophy is to bring to the market new and innovative valve designs with special emphasis on quality, safety, ease of operation, and most of all, long service life. All this combined with the use of high quality materials, advanced manufacturing technology and automation in all stages of manufacturing ensures the highest possible quality at a competitive price. **Velan-Proquip** is strongly committed to providing the highest level of customer service. The company's strengths in design, production and marketing enables it to be a leader, today and into the future.

Manufacturing Range

Sizes: • 2" to 72"

Pressures: • ANSI Class 150 to 2500
• API 2000# to 10000#

Temperatures: • Minus 400°F. to 1200°F.

Seating: • Resilient or Metal to Metal

Materials: • Cast or Forged

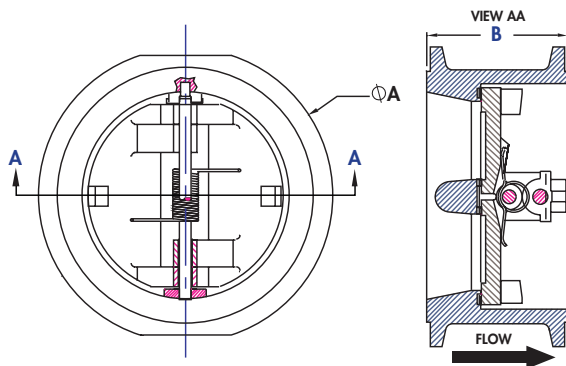
Body Styles: • Flanged
• Flangeless (Wafer Style)
• Lug (Drilled or Threaded)
• Butt Weld
• Hub End (for Clamp Joints)

Special Features: • Retainerless body
• Patented hinge design
• No gasket restrictions
• No fugitive emissions
• Lapped (metal) seats
• Extended Body

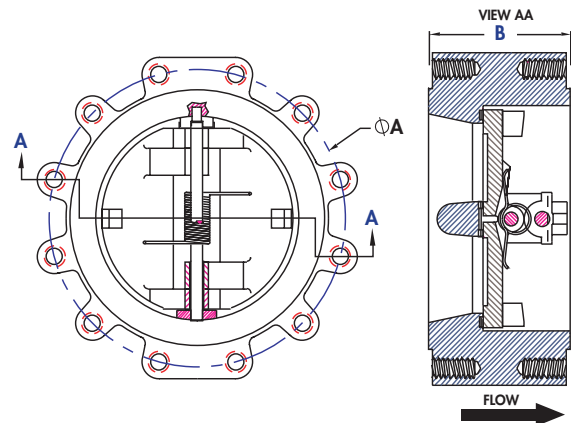
Design & Performance Standards

- ANSI B16.5 flange dimension
- ANSI B16.47 above 24", flange dimension
- API 594 – materials, design & face to face
- API 605 (B16.47), flange dimension
- API 6A – flange dimension & face to face
- API 6D – materials
- API 598 – testing
- ANSI B16.34 – materials, wall thickness

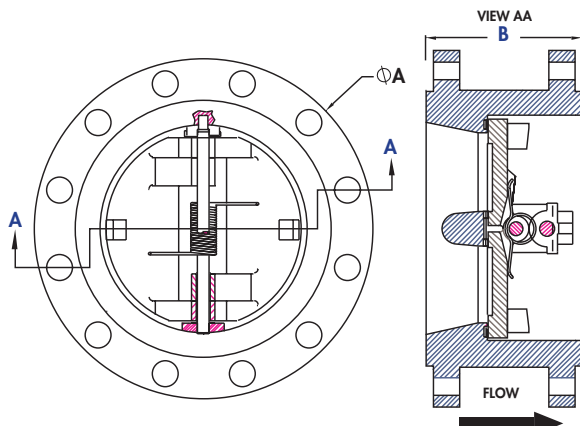
Wafer Type - Type VW



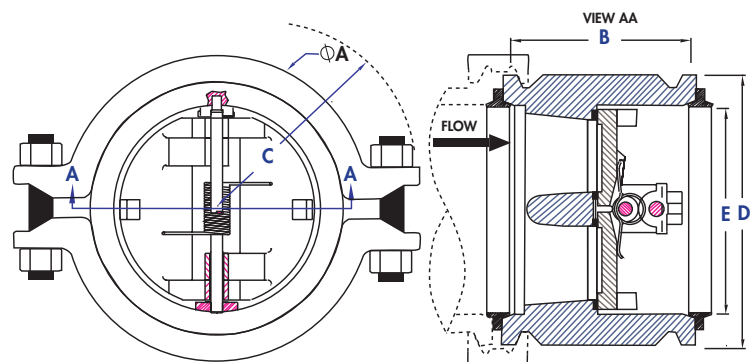
Lug Type - Type VL



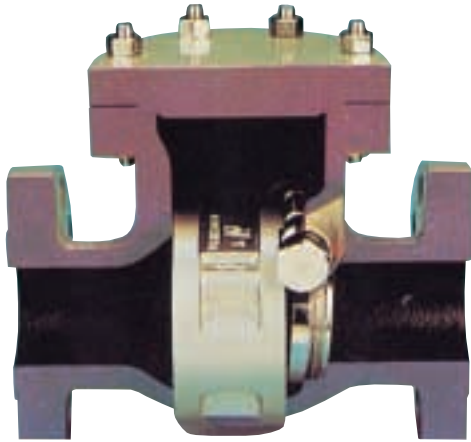
Flanged Type - Type VF



Hub End Type - Type VH



Advantages of Velan-Proquip Check Valves over Conventional Swing Checks



REDUCED SIZE - WEIGHT - COST:

The inherent design of the double flapper check valves results in a significantly reduced weight as compared to the conventional full bodied check valve. As the valves increase in size the **Velan-Proquip** valve will be as little as one fifth the weight of the full bodied unit. This results in savings in initial cost, space, and pipe support element installation.

REDUCED LINE SHOCK:

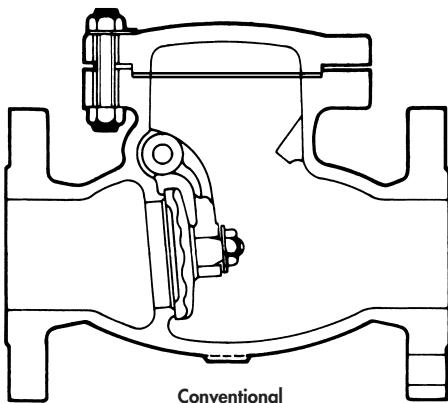
To minimize/eliminate line shock, check valves must close as quickly as possible prior to the flow having an opportunity to reverse. As each of the flappers in the **Velan-Proquip** check valve is only half the size of that of a full bodied check, they experience reduced fluid drag and can move more quickly to the closed position. Their swing radius is one half that of the conventional check valves. The leading edge distance from open to closed position is halved, in turn reducing the travel time by 50%.

The reduced weight of a dual disc valve flapper versus the full bodied swing check is a major factor in minimizing water hammer. The heavier full bodied disc has greater momentum when swinging closed, causing it to slam into the valve seat resulting in severe damage, (in large valve sizes the disc can weigh up to a ton).

For potentially severe applications, **Velan-Proquip** offers a high torsion spring to ensure the valve closes as quickly as possible.



LOWER PRESSURE DROP - REDUCED ENERGY COSTS:



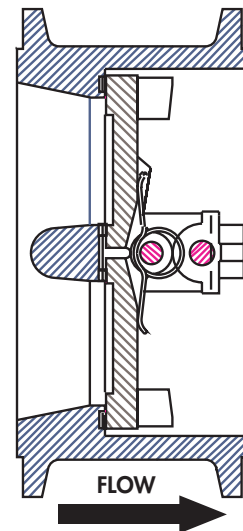
Conventional
Swing Check Valve

The two factors that affect pressure drop across any valve are:

- 1) The unobstructed flow area.
- 2) The energy required to maintain the valve in the open position.

Specifically, full-bodied swing check valves have a disc which is hinged at the top with gravity working to keep it in the closed position. Flow must provide sufficient energy to overcome this force of gravity and lift the disc. This energy requirement increases dramatically in larger sizes.

Velan-Proquip valves are installed such that the flappers are hinged at their sides like a door. Thus, the effect of gravity is eliminated. Consequently, very little energy is needed to open the valve and maintain this position, resulting in lower energy costs.



Velan-Proquip
Check Valve

Features of Velan-Proquip Wafer Style Twin Flapper Valves

Pin Retainers



Conventional Design

RETAINERLESS BODY DESIGN:

With growing concern over fugitive emissions, and potential environmental implications, **Velan-Proquip** has standardized on a retainerless, fugitive emission design. Alternate designs incorporating threaded or, threaded/seal welded pipe plug retainers have potential for leakage due to improper field assembly or corrosion at their threads.



Retainerless
Velan-Proquip design

LAPPED BODY/FLAPPER SEATS:

The heart of each valve is the seat/seal interface. **Velan-Proquip** utilizes the most updated machining methods and equipment to achieve maximum flatness with a fine lapped finish. The end result being product that easily meets and exceeds test requirements of API 598 for metal seated check valves.



Lapped
Sealing Faces



Shock Bumpers

SHOCK BUMPERS:

The **Velan-Proquip** design utilizes heavy duty "shock bumpers" on the back of each flapper. These bumpers meet when the valve is in the full open position (see illustration) thus preventing the flappers from striking the stop pin. This arrangement reduces the shock force on the hinges, ensuring internal components have an extended cycle life with minimal wear under the most severe service conditions.

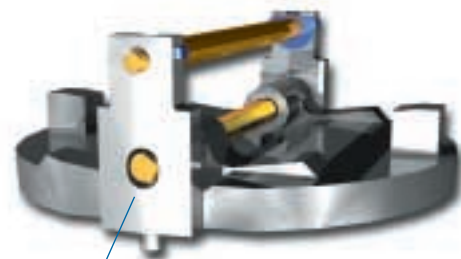
SUPERIOR HINGE DESIGN:

In order to eliminate seat wear during the opening cycle, all dual plate check valves incorporate clearance between the hinge pin and body bearings, or hinge pin and flapper bore. This allows the plate assembly to lift off the seat prior to flapper rotation preventing the heel of each flapper from scraping across the body seat. Competitive products have an oversize bore in the flappers or bearings. This weakness in the form of added clearance permits the flappers to move side to side allowing constant rattling 24 hours a day, leading to premature failure.

Velan-Proquip features a slot for the hinge pin, allowing it to move only in one axis. Flappers last longer and the useful life of the valve is extended, (covered by US patents 5246032,5381, and other patents globally).



Clearance causes rattling (competitor's design).



Slot permits movement in direction of flow only (no rattling).



Velan-Proquip design

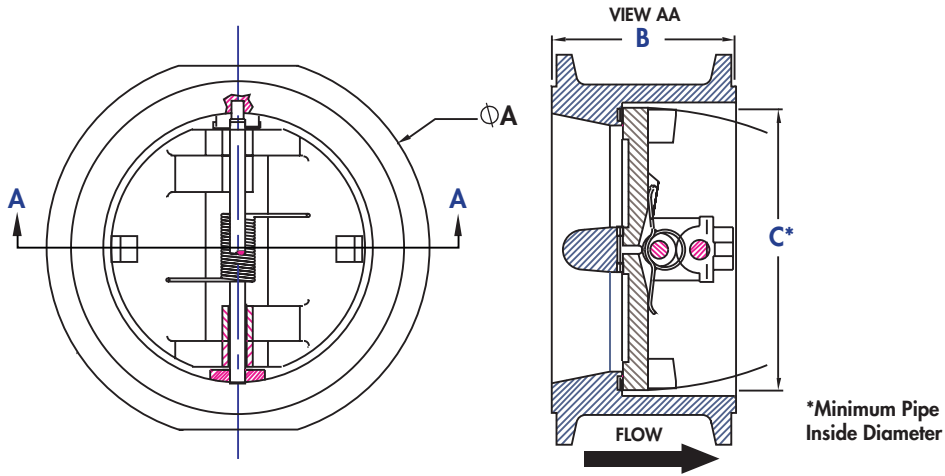
BODY WITH UNINTERRUPTED GASKET SURFACE:

Other retainerless designs have an internal retention method incorporating a special key and retaining screws. These components encroach on the serrated sealing face area and as well the screws can corrode making maintenance difficult. **Velan-Proquip** utilizes an internal retention method which does not encroach on the gasket sealing surface.



Competitor's retainerless design

Type VW Wafer Body Dimensions



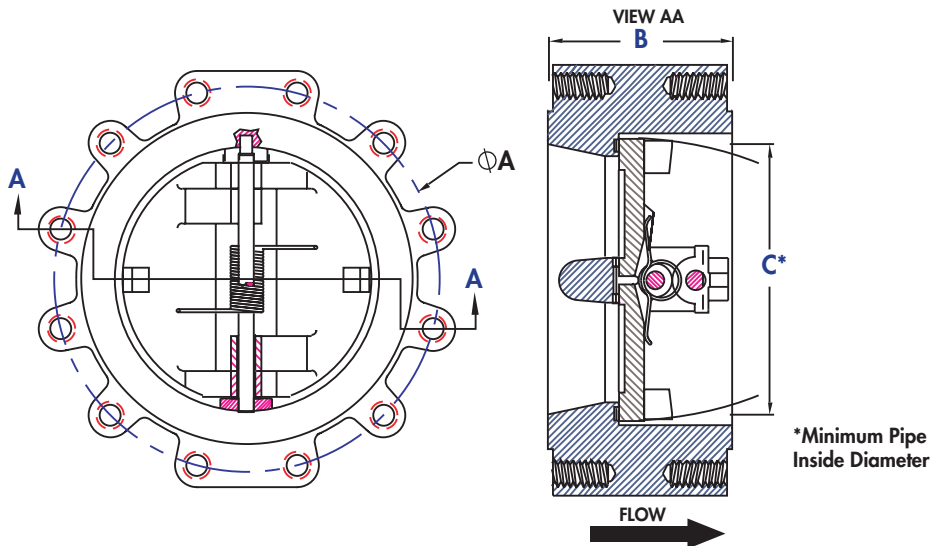
Type VW ANSI Class 150							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
2"	4-1/8	2-3/8	2	6	4	5/8	6
2-1/2"	4-7/8	2-5/8	2-3/8	10	4	5/8	6-1/4
3"	5-3/8	2-7/8	3	14	4	5/8	7
4"	6-7/8	2-7/8	3-7/8	17	8	5/8	7
5"	7-3/4	3-3/8	4-7/8	28	8	3/4	7-3/8
6"	8-3/4	3-7/8	5-7/8	36	8	3/4	8-1/4
8"	11	5	7-5/8	70	8	3/4	9-3/4
10"	13-3/8	5-3/4	9-5/8	110	12	7/8	11
12"	16-1/8	7-1/8	11-3/8	180	12	7/8	12
14"	17-3/4	7-1/4	12-1/2	210	12	1	12-3/4
16"	20-1/4	7-1/2	15	286	16	1	13-1/4
18"	21-5/8	8	16-7/8	315	16	1-1/8	14-1/4
20"	23-3/4	8-5/8	18-7/8	436	20	1-1/8	15
24"	28-1/4	8-3/4	22-5/8	650	20	1-1/4	15-3/4

Type VW ANSI Class 300							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
2"	4-3/8	2-3/8	2	6.5	8	7/8	6-7/8
2-1/2"	5-1/8	2-5/8	2-3/8	11	8	3/4	7-1/2
3"	5-7/8	2-7/8	2-7/8	15	8	3/4	8-1/8
4"	7-1/8	2-7/8	3-7/8	18	8	3/4	8-1/8
5"	8-1/2	3-3/8	4-7/8	31	8	3/4	8-1/8
6"	9-7/8	3-7/8	5-7/8	49	12	3/4	9-5/8
8"	12-1/8	5	7-5/8	81	12	7/8	11-1/4
10"	14-1/4	5-3/4	9-5/8	130	16	1	12-3/4
12"	16-5/8	7-1/8	11-3/8	210	16	1-1/8	14
14"	19-1/8	8-3/4	12-1/2	360	20	1-1/8	16
16"	21-1/4	9-1/8	14-3/8	440	20	1-1/4	17
18"	23-1/2	10-3/8	16-1/8	620	24	1-1/4	18-1/2
20"	25-3/4	11-1/2	17-7/8	770	24	1-1/4	19-3/4
24"	30-1/2	12-1/2	22-1/8	1,120	24	1-1/2	21-3/4

Type VW ANSI Class 600							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
2"	4-3/8	2-3/8	2	6.5	8	5/8	6-7/8
2-1/2"	5-1/8	2-5/8	2-3/8	11	8	3/4	7-1/2
3"	5-7/8	2-7/8	3	15	8	3/4	8-1/8
4"	7-5/8	3-1/8	3-7/8	27	8	7/8	9-1/2
6"	10-1/2	5-3/8	5-7/8	78	12	1	12-3/8
8"	12-5/8	6-1/2	7-5/8	140	12	1-1/8	14-1/2
10"	15-3/4	8-3/8	9-5/8	242	16	1-1/4	17-1/4
12"	18	9	11-3/8	325	20	1-1/4	18
14"	19-3/8	10-3/4	12-1/2	440	20	1-3/8	2-1/4
16"	22-1/4	12	14-3/8	630	20	1-1/2	22-1/4
18"	24-1/8	14-1/4	16-1/8	890	20	1-5/8	25-1/4
20"	26-7/8	14-1/2	18	1,190	24	1-5/8	26
24"	31-1/8	17-1/4	21-3/8	2,050	24	1-7/8	30-1/4
30"	38-1/4	19-7/8	22-5/8	3,100	28	2	29-3/8

Note: Higher pressure classes available.

Type VL Lug Body Dimensions



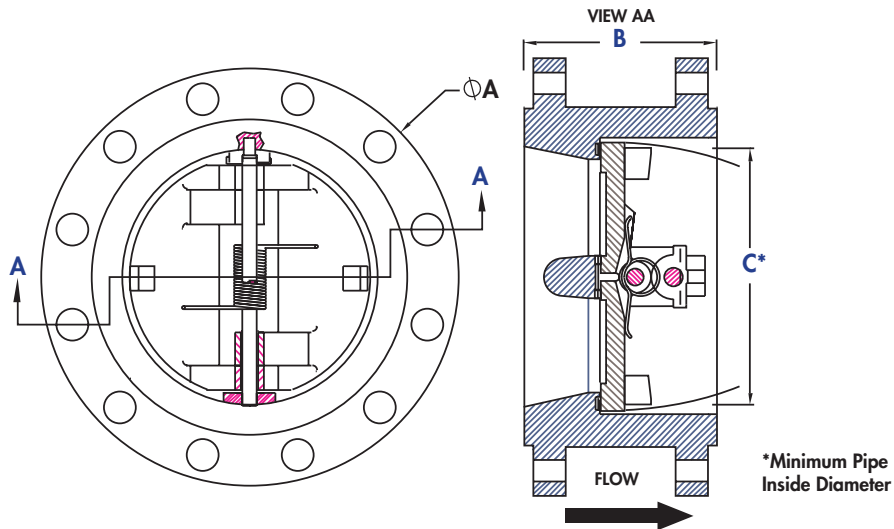
Type VL ANSI Class 150							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
2"	4-3/4	2-3/8	2	9	4	5/8	6
3"	6	2-7/8	3	18	4	5/8	7
4"	7-1/2	2-7/8	3-7/8	33	8	5/8	7
6"	9-1/2	3-7/8	5-7/8	53	8	3/4	8-1/4
8"	11-3/4	5	7-5/8	130	8	3/4	9-3/4
10"	14-1/2	5-3/4	9-5/8	216	12	7/8	11

Type VL ANSI Class 300							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
2"	5	2-3/8	2	18	8	5/8	6-7/8
3"	6-5/8	2-7/8	3	33	8	3/4	8-1/8
4"	7-7/8	2-7/8	3-7/8	55	8	3/4	8-1/8
6"	10-5/8	3-7/8	5-7/8	99	12	3/4	9-5/8
8"	13	5	7-5/8	143	12	7/8	11-1/4
10"	15-1/4	5-3/4	9-5/8	233	16	1	12-3/4

Type VL ANSI Class 600							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
2"	5	2-3/8	2	18	8	5/8	6-7/8
3"	6-5/8	2-7/8	3	33	8	3/4	8-1/8
4"	8-1/2	3-1/8	3-7/8	86	8	7/8	9-1/2
6"	11-1/2	5-3/8	5-7/8	172	12	1	12-3/8
8"	13-3/4	6-1/2	7-5/8	312	12	1-1/8	14-1/2
10"	17	8-3/8	9-5/8	515	16	1-1/4	17-1/8

Note: Higher pressure classes available.

Type VF Flanged Body Dimensions



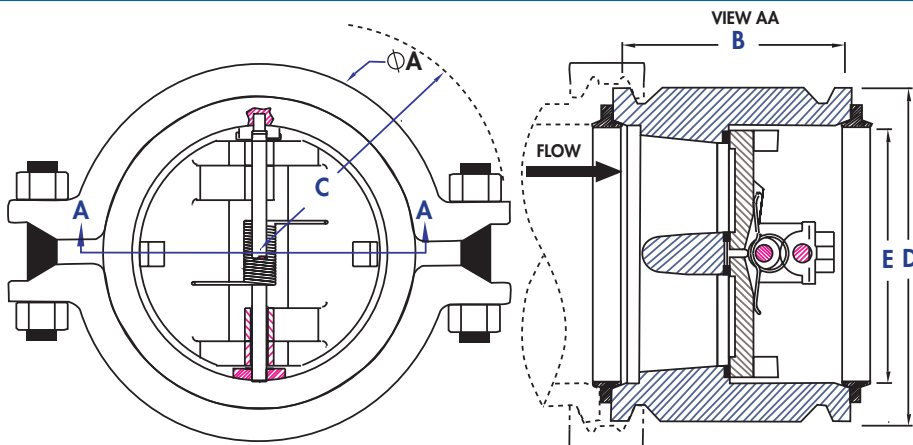
Type VF ANSI Class 150							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
12"	19	7-1/8	11-3/8	279	12	7/8	4-3/4
14"	21	7-1/4	12-1/2	319	12	1	5-1/4
16"	23-1/2	7-1/2	15	387	16	1	5-1/2
18"	25	8	16-7/8	460	16	1-1/8	6
20"	27-1/2	8-5/8	18-7/8	600	20	1-1/8	6-1/4
24"	32	8-3/4	22-5/8	862	20	1-1/4	7
30"	38-3/4	12	29-1/4	1,750	28	1-1/4	9-1/2
36"	46	14-1/2	35	2,525	32	1-1/2	11-1/4
42"	53	17	41	4,220	36	1-1/2	11-5/8

Type VF ANSI Class 300							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
12"	20-1/2	7-1/8	11-3/8	336	16	1-1/8	6-3/4
14"	23	8-3/4	12-1/2	431	20	1-1/8	7
16"	25-1/2	9-1/8	14-3/8	675	20	1-1/4	7-1/2
18"	28	10-3/8	16-1/8	850	24	1-1/4	7-3/4
20"	30-1/2	11-1/2	17-7/8	1,078	24	1-1/4	8-1/4
24"	36	12-1/2	22-1/8	1,965	24	1-1/2	9-1/4
30"	43	14-1/2	28-3/4	3,525	28	1-3/4	12
36"	50	19	34	4,700	32	2	12-3/4
42"	50-3/4	22-3/8	41	9,750	32	1-5/8	13-5/8

Type VF ANSI Class 600							
Size	A	B	C	Wt. Lbs.	Stud Details		
					No.	Dia.	Length
12"	22	9	11-3/8	550	20	1-1/4	8-3/4
14"	23-3/4	10-3/4	12-1/2	846	20	1-3/8	9-1/4
16"	27	12	14-3/8	1,010	20	1-1/2	10
18"	29-1/4	14-1/4	16-1/8	1,320	20	1-5/8	10-3/4
20"	32	14-1/2	18	1,700	24	1-5/8	11-1/2
24"	37	17-1/2	21-3/8	2,580	24	1-7/8	13
30"	44-1/2	19-7/8	28-3/4	5,390	28	2	16
36"	51-3/4	25	33-3/4	10,450	28	2-1/2	18-3/4
42"	55-1/4	27-5/8	39-1/2	11,700	28	2-1/2	19-1/2

Note: Higher pressure classes available.

Type VH Hub Body Dimensions



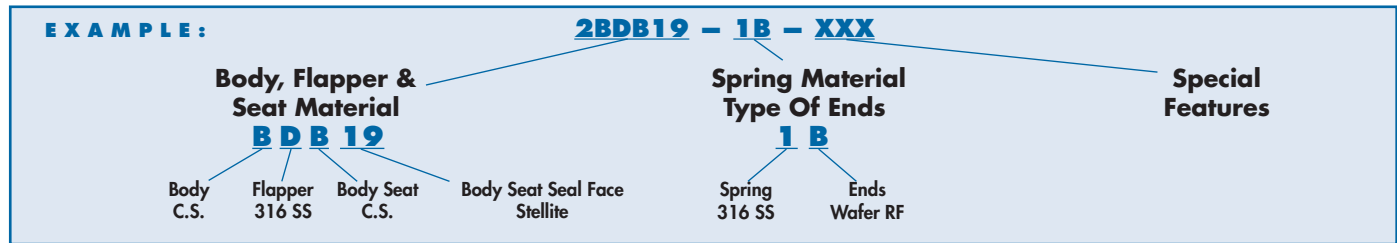
Type VH										
Size	Seal Ring No.	Max. CWP PSIG	Clamp O.D. A	Body Length B	Clamp Clearance C	Hub O.D. D	Seal I.D. E	Appr. Wt. Lbs.		
2"	8	6118	5-1/16	4-1/2	4-1/2	3-5/8	2.063	11		
	14	10855	5-1/16	4-1/2	4-1/2	3-5/8	1.160	11		
	27	4025	6-7/8	4-1/2	5-1/4	5	3.063	20		
3"	25	7797	6-7/8	4-1/2	5-1/4	5	2.672	20		
	20	1255	6-7/8	4-1/2	5-1/4	5	2.063	20		
	40	2576	8-1/8	5	6	6	4.063	24		
4"	34	4761	8-1/8	5	6	6	3.688	24		
	31	8119	8-1/8	5	6	6	3.250	24		
	25	12030	8-1/8	5	6	6	2.672	33		
	62	3262	12	6-1/4	8-3/4	9-1/4	6.065	77		
5"	52	6135	12	6-1/4	8-3/4	9-1/4	5.313	77		
	46	7610	12	6-1/4	8-3/4	9-1/4	4.750	77		
	40	10250	12	6-1/4	8-3/4	9-1/4	4.063	88		
	8"	82	2330	14-1/2	8-1/8	9-7/8	11-1/2	8.250	158	
76		3471	14-1/2	8-1/8	9-7/8	11-1/2	7.750	158		
72		4511	14-1/2	8-1/8	9-7/8	11-1/2	7.250	158		
62		6672	14-1/2	8-1/8	9-7/8	11-1/2	6.065	183		
52		9240	14-1/2	8-1/8	9-7/8	11-1/2	5.313	183		

Type VH										
Size	Seal Ring No.	Max. CWP PSIG	Clamp O.D. A	Body Length B	Clamp Clearance C	Hub O.D. D	Seal I.D. E	Appr. Wt. Lbs.		
8"	82	2330	14-1/2	8-1/8	9-7/8	11-1/2	8.250	158		
	76	3471	14-1/2	8-1/8	9-7/8	11-1/2	7.750	158		
	72	4511	14-1/2	8-1/8	9-7/8	11-1/2	7.250	158		
	62	6672	14-1/2	8-1/8	9-7/8	11-1/2	6.065	183		
	52	9240	14-1/2	8-1/8	9-7/8	11-1/2	5.313	183		
10"	H97	2493	17-5/8	9-3/4	12-3/4	13-5/8	9.875	242		
	H94	3215	17-5/8	9-3/4	12-3/4	13-5/8	9.500	242		
	H84	5918	17-5/8	9-3/4	12-3/4	13-5/8	8.500	308		
	H82X	6757	18-1/4	9-3/4	13-1/2	13-5/8	8.250	308		
	H72	8376	17-5/8	9-3/4	12-3/4	13-5/8	7.250	308		
	H62	11710	17-5/8	9-3/4	12-3/4	13-5/8	6.065	345		
12"	H62X	13000	18-1/4	9-3/4	13-1/2	13-5/8	6.065	345		
	M120	2400	20-1/4	12-1/2	14-1/2	16	12.000	389		
	M112	3402	20-1/4	12-1/2	14-1/2	16	11.250	389		
	M102	5664	20-1/4	12-1/2	14-1/2	16	10.250	502		
	M82	8568	20-1/4	12-1/2	14-1/2	16	8.250	590		
	M82X	11021	20-1/2	12-1/2	15-3/4	16	8.250	590		

Velan-Proquip Ordering Chart

Identification Code/Figure Number

The valve figure number consists of two groups of numbers and/or letters. The first group indicates the body, disc and seat materials. The second indicates the spring material and type of ends. Any non-standard construction such as different trim material, drain connections, etc., and any special features are indicated by a three digit suffix number.

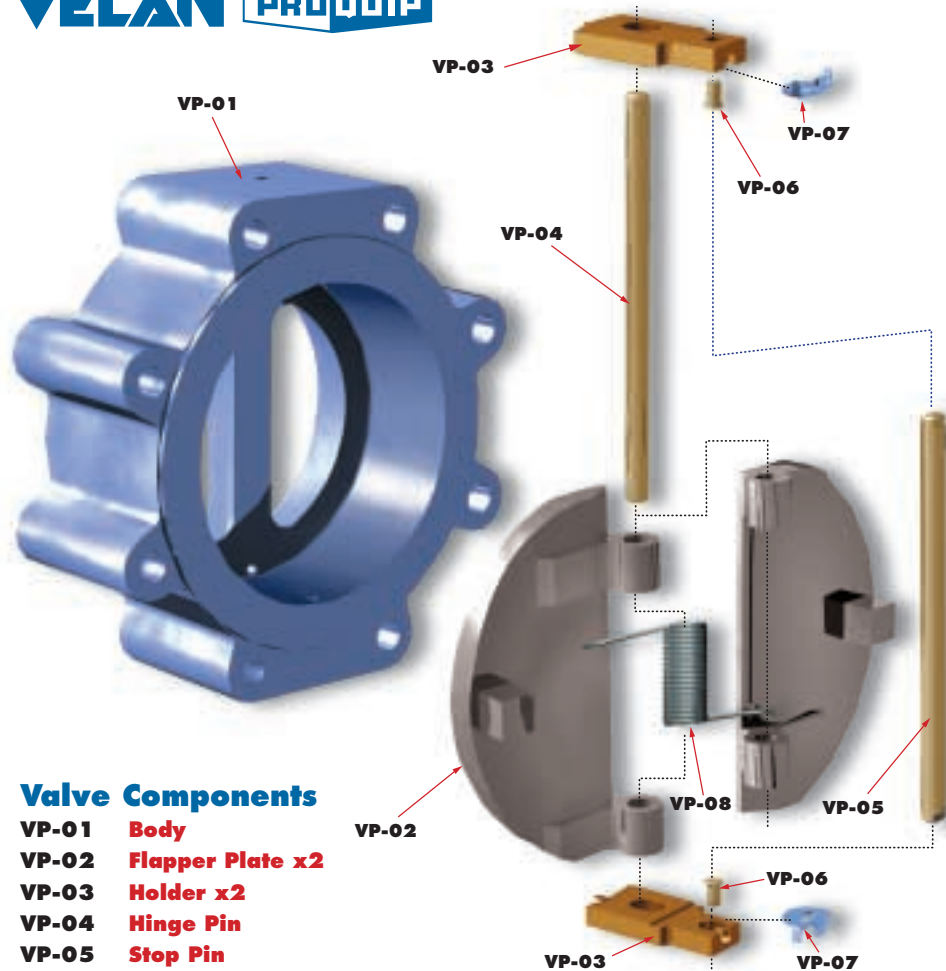


Materials

Code	Material	Specification	Code	Material	Specification
A	Cast Iron	A278 Class 30	M	Monel	A296 Gr. M 35 W
B	Carbon Steel	A216 Gr. WCB	Q	Alloy 20	A743 Gr. CN7M
C	Ductile Iron	A395	R	22% Cr Duplex Stainless	A890 Gr. 4A
D	316 Stainless	A351 Gr. CF8M	S	25% Cr Duplex Stainless	A890 Gr. 5A
E	410 Stainless	A217 Gr. CA15	T	304 Stainless	A351 Gr. CF8
F	Aluminum	B26 Alloy ZC81A	U	5% Cr-0.5 Mo Steel	A217 Gr. C5
G	Hastelloy C276	A 494 Gr. CW-12MW	V	9% Cr-1 Mo Steel	A217 Gr. C12
H	Aluminum Bronze	B148 Gr. 954	X	Per P.O.	See suffix no.
K	Titanium	R50400	Y	1.25% Cr-0.5 Mo Steel	A217-WC6
L	Low Temp Steel	A352 Gr. LCC/A350 LF2	Z	6% Moly (6 Mo)	

Seating Surfaces

Body Seat Seal Face		Flapper Seat Only		Body & Flapper Seat	
Code	Material	Code	Material	Code	Material
10	Same as Body	10	Same as Flapper	86	Bronze
11	Buna-N	41	Buna-N	87	316 SS
12	Neoprene	42	Neoprene	88	410 SS
13	Viton	43	Viton	89	Stellite
14	Silicone	44	Silicone	90	Monel
15	TFE	45	TFE	91	Hastelloy C
17	316 SS	47	316 SS		
18	410 SS	48	410 SS		
19	Stellite	49	Stellite		
20	Monel	50	Monel		
21	EPDM	51	EPDM		



Valve Components

- VP-01 Body**
- VP-02 Flapper Plate x2**
- VP-03 Holder x2**
- VP-04 Hinge Pin**
- VP-05 Stop Pin**
- VP-06 Retainer Pin x2**
- VP-07 Lock Clip x2**
- VP-08 Spring**

End Connections

Code	Connection
A	Special per P.O.
B	Wafer RF
C	Wafer RTJ
D	Lug Drilled RF
E	Lug Drilled RTJ
F	Flanged RF
G	Flanged RTJ
H	Hub for Clamp Joint (specify make)
L	Lug Threaded RF
M	Lug Threaded RTJ
N	Wafer Flat Face
P	Lug Flat Face
R	Flange Flat Face
W	Butt Weld (specify pipe wall T)

Springs

Code	Material	Maximum Temp °F	Maximum Temp °C
1	316 SS	250	121
2	Inconel	600	315
3	Inconel X-750	1000	537
4	Monel	400	204
5	317 LSS	250	121
6	Hastelloy	800	426
7	Inconel 625	1000	537
8	Alloy 20	250	121
0	Per P.O.		

WARRANTY

All valves manufactured by **Velan-Proquip Inc.** are warranted against defects in materials and workmanship providing the valves are properly installed and used within the service limits for which they were made. This warranty is limited to the replacement, without charge, of the parts found by **Velan-Proquip** to be defective and does not cover the cost of removing the valves from service or any other direct or indirect cost which may be attributed to the defect. The warranty does not cover normal deterioration and wear. Claims must be registered within one year after the valves have been placed in service or two years from date of invoice, whichever comes first. Valve serial number must be readable.

Velan-Proquip Inc.

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