

# VELAN



## TORQSEAL™

**Triple-Offset Cryogenic  
Butterfly Valves**

**ASME Classes: 150 to 900 (PN20 to PN150)  
Sizes: 3" to 80" (DN80 to DN2000)  
Temperatures: down to -425°F (-254°C)**



**Triple Offset . Emission free . Fire safe**

# The Key to Cryogenic Valve Solutions

## VELAN Inc Group

VELAN inc is one of the world's leading independent manufacturer of steel gate, globe, check, butterfly and ball valves. Founded in 1949 in Montreal - Canada, VELAN inc employs over 2.000 people and is located worldwide with 14 specialized manufacturing plants in Canada, USA, France, Portugal, Italy, Germany, UK, South Korea, Taiwan, China.

## Design & Technology

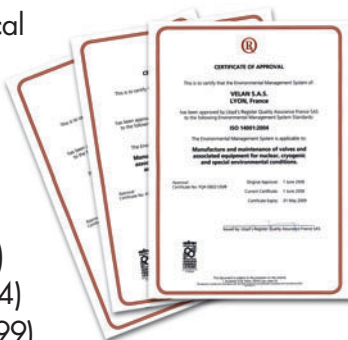


VELAN SAS has strong design, research & development capabilities to keep valves on the cutting edge of technology in the field of Nuclear Power and cryogenics. Our research laboratory is equipped with advanced facilities such as steam test loop, Cv loop, cryogenic test benches and CAD-FEM software.

## Quality Assurance

With 30 years of experience in the supply of valves for critical applications, VELAN SAS has a comprehensive Quality Management system including the following certifications :

- ISO 9001 (edition 2000)
- ISO 14001 (edition 2004)
- OSHAS 18001 (edition 1999)



## Maintenance & Customer Services

VELAN SAS has a fully integrated maintenance and services department able to carry out on-site servicing worldwide, that gives us a continuous feedback experience to improve valve performances.

The Maintenance & Customer Services department gathers all competences to handle large turnkey maintenance operation or specific on-site services in severe environments.

## VELAN S.A.S

Located in Lyon - France, in a modern 160.000 sq.ft. (16.000 m<sup>2</sup>) plant, VELAN SAS is a 100% subsidiary of VELAN inc group (Canada).

VELAN SAS is specialised in design and manufacture of high performance valves for Nuclear and Cryogenic applications.



Air Tech Photo

## High Performance Production Equipment

High performance production equipment such as CNC machining centers, plasma hard facing stations, 3D measuring machine, clean assembly room, enables us to provide to our customers a constant high level of quality.



## Worldwide Sales Network

VELAN SAS products are available worldwide through the sales network of VELAN inc group.



# Principle of operation

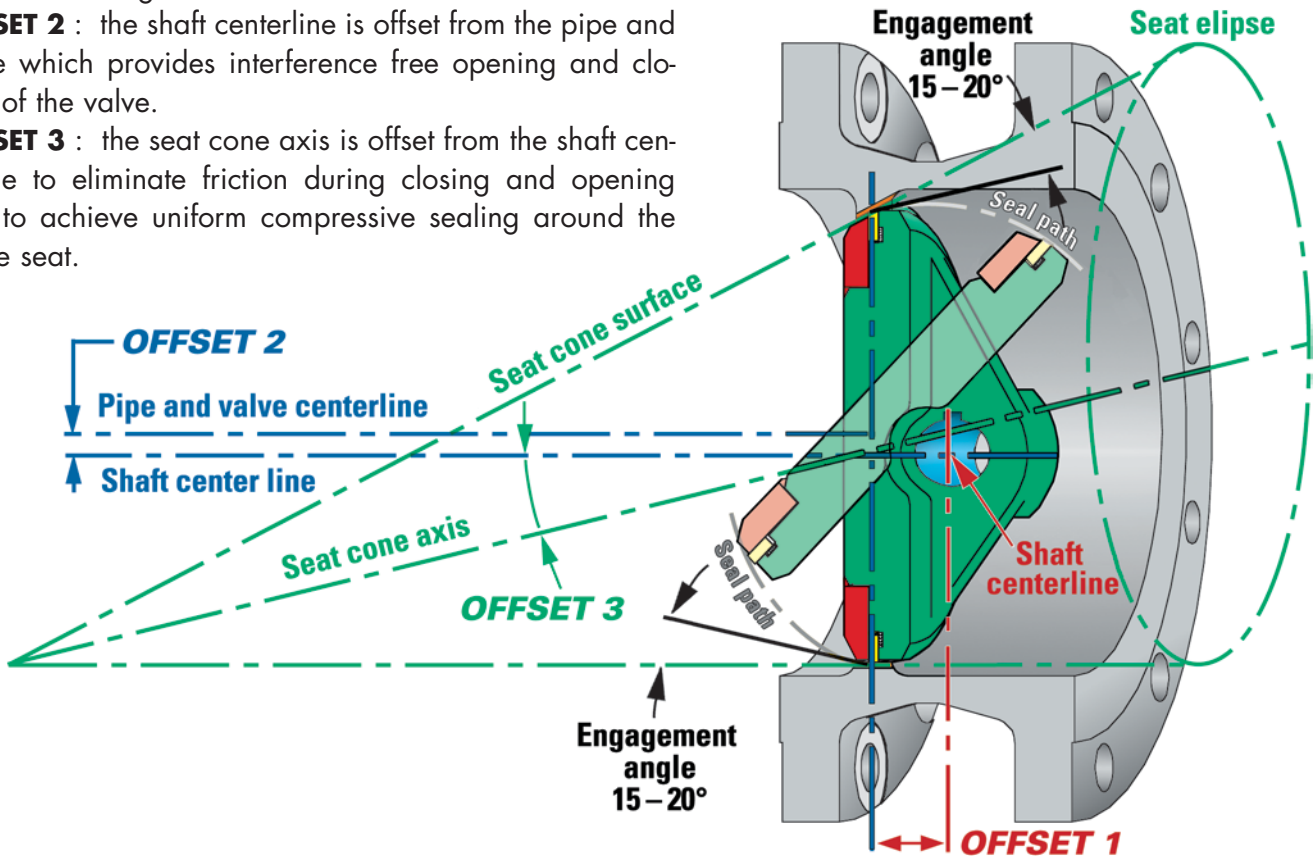
The **VELAN Triple-Offset Cryogenic Butterfly Valve** provides bi-directional flow capabilities. This geometry ensures that the disc seal contacts the body seat only at the final shut-off position without rubbing or galling, providing a torque generated resilient seal with sufficient "wedging" to ensure a uniform seal contact.

## The triple-offset geometry

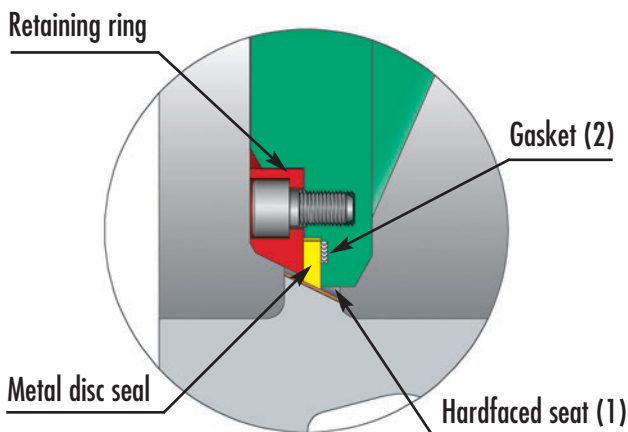
**OFFSET 1** : the shaft is offset behind the seat axis to allow complete sealing contact around the entire seat.

**OFFSET 2** : the shaft centerline is offset from the pipe and valve which provides interference free opening and closing of the valve.

**OFFSET 3** : the seat cone axis is offset from the shaft centerline to eliminate friction during closing and opening and to achieve uniform compressive sealing around the entire seat.



## Friction free sealing for long cycle life



**The metal disc seal:** torque seating during closing of the valve provides uniform forces around the entire circumference of the valve seat. The resilient seal flexes and energizes, assuming the shape of the seat. The compression forces equally distributed around the perimeter provide a tight bi-directional shut off. The resiliency of the seal allows the valve body and disc to contract or expand, without the risk of jamming due to temperature fluctuations. It is self-adjusting.

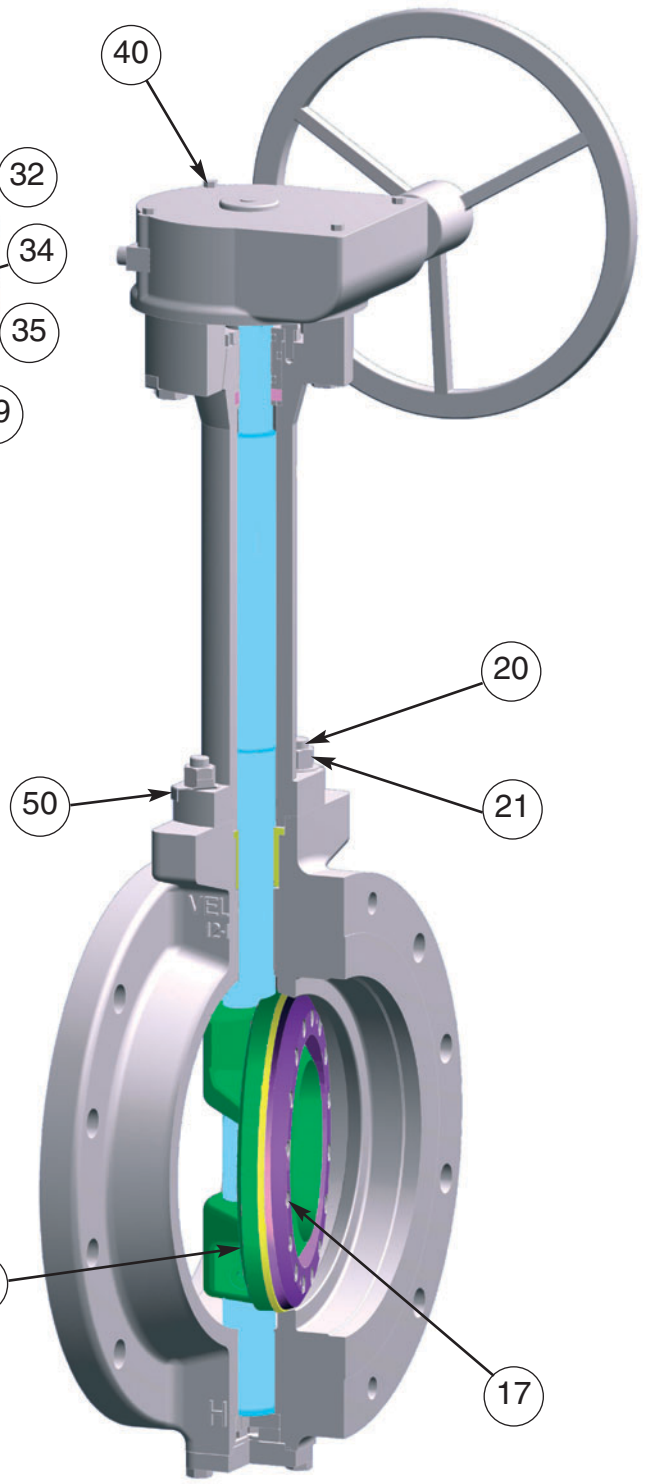
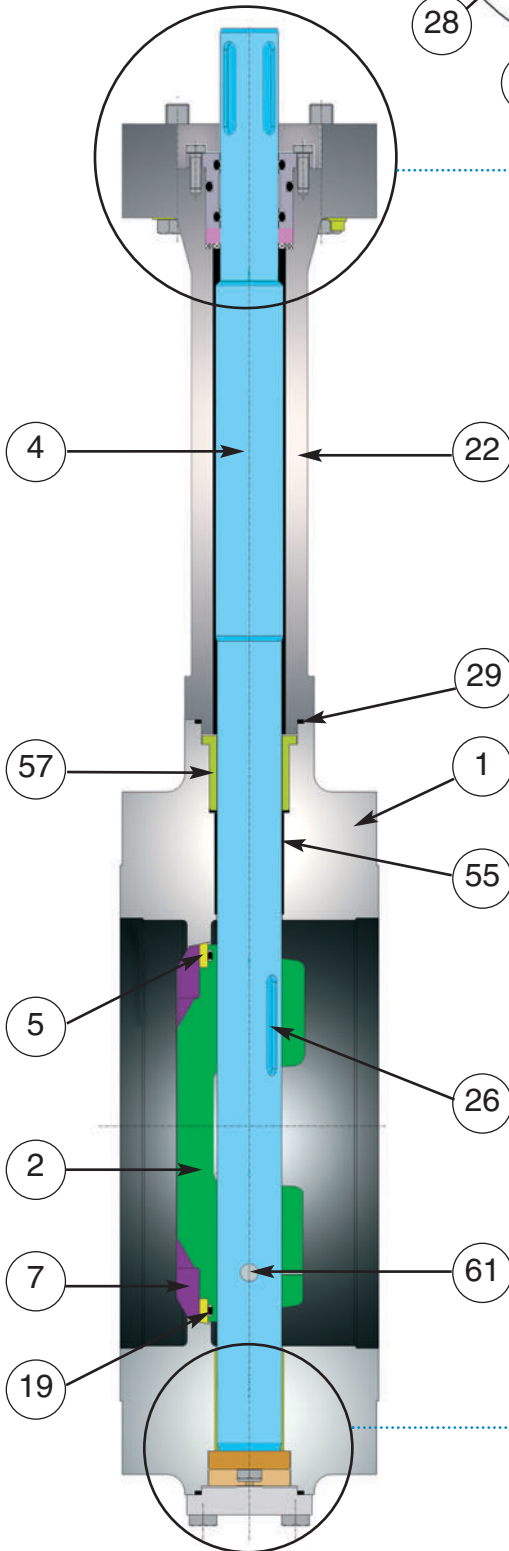
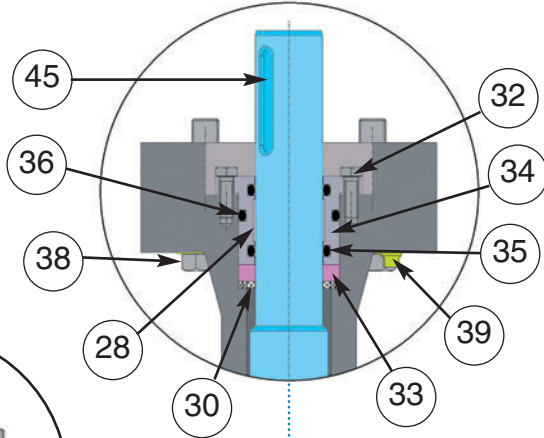


VELAN provides an extra rigid retaining ring with bolting, designed in response to ASME stress calculations.

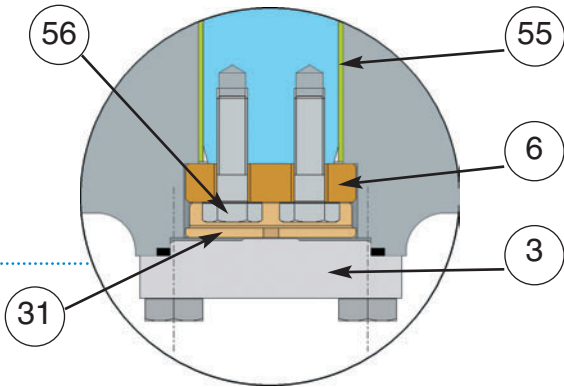
- (1) Seat is hardfaced as standard.
- (2) The gasket is spiral wound SS/Graphite for zero leakage.

# Valve parts

Detail A



Detail B



# Design Features & Materials

Item	Part	Material grade
1	Body	A351 Gr. CF8M
2	Disc	A351 Gr. CF8M or CF3M
3	Bottom cover	A479-316L
4	Shaft	A453 Gr. 660Cl. B Type 2
5	Metallic seal	Duplex
6	Thrust bearing	A479 XM19 Nitrided
7	Retaining ring	Duplex
16	Nut	A194 Gr. B8
17	Screw	A320 Gr. B8M
19	Spiral wound gasket	SS347 + Graphite
20	Bolt	A320 Gr. B8M Cl. 2
21	Nut	A194 Gr. B8
22	Extended bonnet	A351 Gr. CF3M or CF8M
26	Key	A182F316
28	Bushing	-
29	Graphite gasket	Graphite
30	Junk ring	A182F316 / Z6CNd 17-11
31	Locking plate	A479XM19 Nitrided
32	Screw	A320 Gr. B8M Cl. 2
33	Graphite ring	Graphite
34	Packing flange	A182F316 / Z6CNd 17-11
35	O-ring	Viton
36	O-ring	Viton
38	Screw	A320 Gr. B8M Cl. 2
39	Nut lock	A182F316 / X2CrNi 18-9
40	Gearbox	-
45	Key	X2CrNiMo 17-12-2
50	Nut lock	A182F316 / X2CrNi 18-9
55	Bushing	Stainless steel + DFN15
56	Screw	A320 Gr. B8M Cl. 2
57	Bushing END STOP	A182F316L
61	Taper pin	A182F316

- **Triple Offset Disc Rotation:** provides Bubble Tight sealing without rubbing or galling.
- **Cryogenic Stem packing** (detail A): composed of superposed Viton 'O' - Rings and expanded graphite rings (Fire safe approved).
- **Low fugitive emission** (detail A): in accordance with ISO 15848 / TA-LUFT.
- **No cavity** (detail B): no cavity to prevent build-up of solids.
- **Drainage possibility** (detail B): the bottom cover can be removed if drainage is required.
- **Internal Blow-out Protection** (detail B): prevents the shaft from blowing out under pressure.
- **Inherent Fire Safe Function:** stainless steel construction and metallic seal (item 5) provide inherent fire safe function.
- **Extended Bonnet** (item 22): with a sufficient gas column to keep the stem packing away from cold fluid. Extended bonnet length is qualified for use in LNG application with type approvals from major Classification Societies.
- **Actuator:** manual, pneumatic (single or double acting type), electric or hydraulic according to customer specification. ON / OFF or MODULATING function according to the application. Fast acting actuators for Emergency Shut Down function (ESD) also available.
- **High Quality castings:** radiographic control, dye penetrant test, ferrite content control, impact test at -196°C according to customer's requirements.
- **Reinforced stainless steel shaft bearings:** for high cycles and smooth operation at very low temperature (item 55).
- **High reliability:** Safety Integrity Level requirements according to IEC 61508.

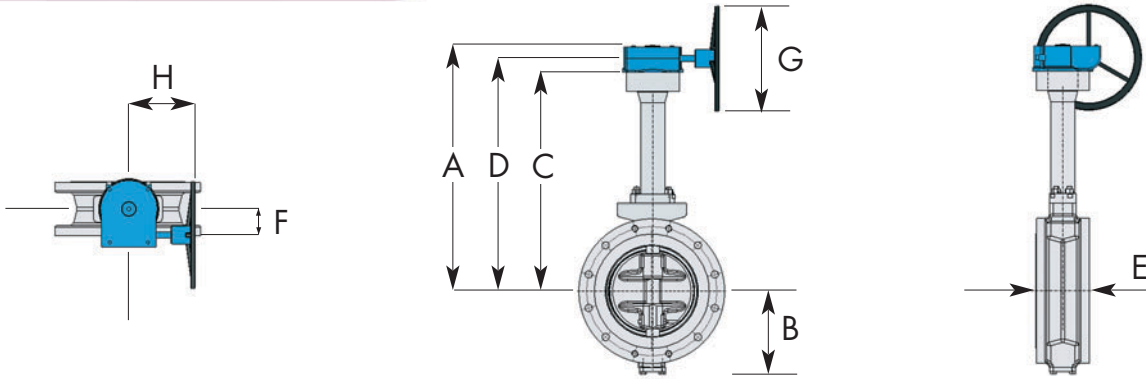
Alternative materials for body, disc and other parts are available upon request to meet specific requirements

# Flanged Type Metal Seated Cryogenic Butterfly Valves

## Design standards

- Design: ASME standard, CE marked (PED), ATEX certified.
- Face to face dimensions: ISO 5752 (Short Pattern).
- Ambient temperature testing: API 598 (other type of tests available upon request).
- Alternative Body types (ISO Long pattern, Wafer, LUG or Butt Welded) and sizes available upon request.
- Fire safe according to API 607 and ISO 10497.
- Flanges standard: ANSI B16.5 (Sizes from 3" to 24"), ANSI B16.47 series A or B (sizes from 26" to 60"), ASME VIII div.1 Appendix 2 (sizes > 60"). Other flanges standards available upon request.
- Cryogenic temperature testing: BS6364 (other type of tests available upon request).

## Dimensions & Weights Class 150



SIZE in/mm	GEARBOX MODEL	A	B	C	D	E	F	ØG	H	Weights lb/kg valve valve + gear	
3" DN80	AB550	25.08 637	4.92 125	21.65 550	23.39 594	4.49 114	2.80 71	5.91 150	11.02 280	62 28	80 37
4" DN100	AB550	25.87 657	5.79 147	22.44 570	24.17 614	5.00 127	2.80 71	5.91 150	11.02 280	82 37	100 46
6" DN150	AB550	26.65 677	6.54 166	23.23 590	24.96 634	5.51 140	2.80 71	7.87 200	11.02 280	108 49	127 58
8" DN200	AB550	28.66 728	7.83 199	25.28 642	26.97 685	5.98 152	2.80 71	11.81 300	12.40 315	152 69	171 78
10" DN250	AB550	30.20 767	9.41 239	26.77 680	28.50 724	6.50 165	2.80 71	19.69 500	13.78 350	232 105	250 114
12" DN300	AB880	32.28 820	10.06 255	28.68 729	30.47 774	7.01 178	3.39 86	19.69 500	13.78 350	331 150	362 164
14" DN350	AB1250	33.86 860	11.93 303	29.92 760	31.89 810	7.48 190	4.13 105	23.62 600	14.96 380	456 207	505 229
16" DN400	AB1250	35.43 900	13.31 338	31.50 800	33.46 850	8.50 216	4.13 105	27.56 700	14.96 380	584 265	633 287
18" DN450	AB1950	39.57 1005	15.00 381	34.65 880	37.13 943	8.74 222	8.31 211	19.69 500	19.09 485	761 345	860 390
20" DN500	AB1950	42.32 1075	16.10 409	37.40 950	39.88 1013	9.02 229	8.31 211	19.69 500	19.09 485	942 427	1041 472
24" DN600	AB6800	49.02 1245	19.49 495	42.72 1085	45.87 1165	10.51 267	10.35 263	23.62 600	21.18 538	1541 699	1696 769
30" DN750	IW72	55.71 1415	23.23 590	48.43 1230	52.07 1323	12.52 318	12.95 329	19.69 500	24.45 621	2485 1127	2820 1279
32" DN800	IW72	59.88 1521	24.49 622	53.23 1352	56.56 1437	12.52 318	12.95 329	23.62 600	24.45 621	2999 1360	3334 1512
36" DN900	IW82	64.37 1635	27.56 700	57.09 1450	60.73 1543	12.99 330	16.73 425	27.56 700	26.22 666	3786 1717	4275 1939
40" DN1000	IW9	69.45 1764	30.16 766	61.65 1566	65.55 1665	16.14 410	13.31 338	23.62 600	30.16 766	4902 2223	5541 2513
42" DN1050	IW9	70.87 1800	31.57 802	63.07 1602	66.97 1701	16.14 410	13.31 338	27.56 700	30.16 766	5497 2493	6137 2783
48" DN1200	IW10	75.47 1917	35.71 907	67.20 1707	71.34 1812	18.50 470	15.83 402	31.50 800	31.22 793	7532 3416	8432 3824
54" DN1350	IW11	84.96 2158	39.88 1013	75.31 1913	80.14 2036	20.87 530	17.32 440	27.56 700	31.85 809	9958 4516	11215 5086
56" DN1400	IW11	86.34 2193	41.26 1048	76.69 1948	81.52 2071	20.87 530	17.32 440	27.56 700	31.85 809	10860 4925	12116 5495
60" DN1500	IW12	93.58 2377	44.09 1120	83.46 2120	88.52 2249	23.62 600	13.11 333	27.56 700	40.94 1040	12802 5806	15492 7026
64" DN1600	IW12	96.30 2446	46.81 1189	86.18 2189	91.24 2318	23.62 600	13.11 333	27.56 700	40.94 1040	14943 6777	17633 7997
66" DN1650	IW13	97.76 2483	48.27 1226	87.64 2226	92.70 2355	24.02 610	13.11 333	31.50 800	43.31 1100	16090 7297	18780 8517
72" DN1800	IW13	105.79 2687	52.36 1330	95.67 2430	100.73 2559	26.38 670	13.11 333	31.50 800	43.31 1100	20948 9500	23638 10720
80" DN2000	IW13	116.42 2957	59.06 1500	106.30 2700	111.36 2829	29.92 760	13.11 333	39.37 1000	43.31 1100	27563 12500	30870 14000

# Flanged Type Metal Seated Cryogenic Butterfly Valves

## Dimensions & Weights Class 300

SIZE in/mm	GEARBOX MODEL	A	B	C	D	E	F	ØG	H	Weights lb/kg valve valve + gear	
3" DN80	AB550	25.08 637	4.92 125	21.65 550	23.39 594	4.49 114	2.80 71	5.91 150	11.02 280	66 30	85 39
4" DN100	AB550	25.94 659	5.79 147	22.52 572	24.23 616	5.00 127	2.80 71	11.81 300	12.40 315	97 44	116 53
6" DN150	AB550	27.72 704	7.56 192	24.29 617	26.00 661	5.50 140	2.80 71	11.81 300	12.40 315	152 69	171 78
8" DN200	AB880	30.31 770	9.29 236	26.77 680	28.54 725	5.98 152	3.39 86	19.69 500	13.78 350	225 102	256 116
10" DN250	AB1250	31.54 801	10.28 261	27.60 701	29.57 751	6.50 165	4.13 105	23.62 600	14.96 380	331 150	379 172
12" DN300	AB1950	35.24 895	11.69 297	30.31 770	32.78 833	7.01 178	8.31 211	15.75 400	18.31 465	437 198	536 243
14" DN350	AB1950	35.91 912	12.99 330	30.98 787	33.44 850	7.52 191	8.31 211	19.69 500	19.09 485	622 282	721 327
16" DN400	AB6800	38.70 983	14.21 361	32.40 823	35.55 903	8.50 216	10.35 263	19.69 500	21.18 538	829 376	983 446
18" DN450	AB6800	41.97 1066	16.02 407	35.67 906	38.82 986	8.74 222	10.35 263	23.62 600	21.18 538	1056 479	1211 549
20" DN500	IW7	45.31 1151	17.36 441	38.66 982	41.99 1067	9.02 229	12.99 330	19.69 500	24.41 620	1327 602	1663 754
24" DN600	IW8	50.63 1286	20.12 511	43.35 1101	46.99 1194	10.51 267	14.37 365	23.62 600	25.87 657	2073 940	2562 1162
30" DN750	IW9	57.40 1458	24.41 620	49.61 1260	53.50 1359	12.01 305	18.03 458	19.69 500	28.78 731	3779 1714	4419 2004
32" DN800	IW10	62.99 1600	25.98 660	54.72 1390	58.86 1495	12.52 318	15.83 402	23.62 600	31.18 792	4406 1998	5305 2406
36" DN900	IW11	66.14 1680	27.76 705	56.50 1435	61.32 1558	12.99 330	17.32 440	35.43 900	31.85 809	5627 2552	6884 3122

## Dimensions & Weights Class 600

SIZE in/mm	GEARBOX MODEL	A	B	C	D	E	F	ØG	H	Weights lb/kg valve valve + gear	
4" DN100	AB550	26.34 669	6.81 173	22.91 582	24.63 626	7.52 191	2.80 71	11.81 300	12.40 315	106 48	125 57
6" DN150	AB550	27.64 702	8.39 213	24.21 615	25.93 659	8.27 210	2.80 71	19.69 500	13.78 350	212 96	230 105
8" DN200	AB1250	35.59 904	10.00 254	31.65 804	33.62 854	9.06 230	4.13 105	23.62 600	14.96 380	265 120	313 142
10" DN250	AB1950	38.43 976	11.85 301	33.50 851	35.96 914	9.80 249	8.31 211	15.75 400	18.31 465	573 260	673 305
12" DN300	AB1950	47.32 1202	13.23 336	40.43 1027	43.88 1115	10.63 270	8.31 211	19.69 500	19.09 485	756 343	856 388
14" DN350	AB6800	48.23 1225	14.37 365	41.93 1065	45.08 1145	11.42 290	10.35 263	19.69 500	20.98 533	1036 470	1191 540
16" DN400	IW7	49.96 1269	15.75 400	43.31 1100	46.63 1185	12.20 310	12.95 329	19.69 500	24.45 621	1544 700	1879 852
18" DN450	IW72	51.34 1304	17.13 435	44.69 1135	48.01 1220	12.99 330	12.95 329	19.69 500	24.45 621	1874 850	2231 1012
20" DN500	IW8	53.54 1360	18.70 475	46.26 1175	49.90 1268	13.78 350	14.37 365	27.56 700	25.87 657	2403 1090	2893 1312
24" DN600	IW9	55.83 1418	20.47 520	48.03 1220	51.93 1319	15.35 390	18.03 458	19.69 500	28.78 731	3098 1405	3737 1695

## Dimensions & Weights Class 900

SIZE in/mm	GEARBOX MODEL	A	B	C	D	E	F	ØG	H	Weights lb/kg valve valve + gear	
6" DN150	AB880	29.21 742	9.84 250	25.67 652	27.44 697	8.86 225	3.39 86	19.69 500	13.35 339	364 165	395 179
8" DN200	AB1950	38.98 990	12.40 315	34.06 865	36.52 928	10.83 275	8.31 211	15.75 400	18.31 465	478 217	578 262
10" DN250	AB1950	41.38 1051	14.80 376	36.46 926	38.92 989	12.80 325	8.31 211	15.75 400	18.31 465	1025 465	1125 510
12" DN300	AB6800	50.04 1271	16.54 420	43.74 1111	46.89 1191	14.76 375	10.35 263	15.75 400	20.39 518	1429 648	1583 718
14" DN350	IW7	52.32 1329	18.11 460	45.67 1160	49.00 1245	16.73 425	12.95 329	19.69 500	24.45 621	1921 871	2256 1023
16" DN400	IW72	53.94 1370	19.72 501	47.28 1201	50.61 1286	18.70 475	12.95 329	19.69 500	24.45 621	2765 1254	3100 1406
18" DN450	IW82	56.30 1430	21.46 545	49.02 1245	52.66 1338	19.69 500	14.37 365	27.56 700	25.87 657	3565 1617	4033 1829
20" DN500	IW82	58.23 1479	23.39 594	50.94 1294	54.59 1387	22.64 575	14.37 365	31.50 800	25.87 657	4507 2044	4974 2256
24" DN600	IW10	61.42 1560	25.59 650	53.15 1350	57.28 1455	26.57 675	15.83 402	27.56 700	31.18 792	5980 2712	6880 3120

Dimensions are in inches/mm, weights are in lb/kg

**For more information regarding Valve Torques, Cv Values, Figure Numbers...  
please refer to VELAN TORQSEAL General catalogue (Reference VEL-BF) at :  
<http://www.velan.com/products/pdfs/vel-bf-web.pdf>**



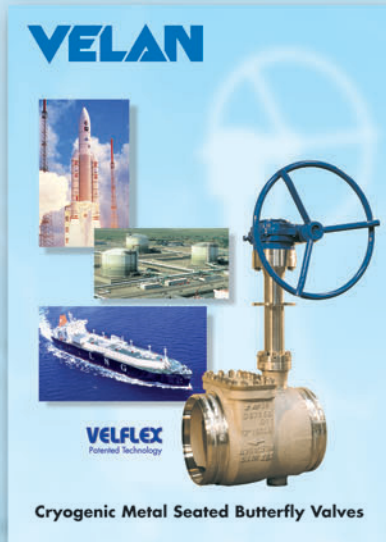
## Main Applications :

- LNG Liquefaction Plants
- LNG Receiving Terminals
- Air Separation Processes
- Petro-Chemical Processes
- Gas To Liquid (GTL)
- Aero-Space Storage Facilities

## Main Fluids :

Fluid	Boiling Point (°C)	Boiling Point (°F)
Propylene	-47.60	-53.68
CO2	-78.50	-109.30
Ethylene	-103.70	-154.66
LNG	-161.60	-258.88
Oxygen	-182.96	-297.33
Nitrogen	-195.80	-320.44
Hydrogen	-252.87	-423.17

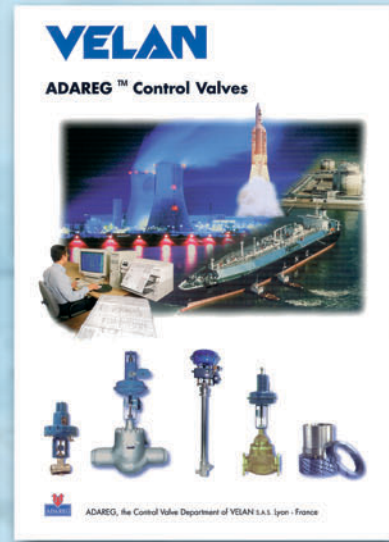
## VELAN's Cryogenic Valves Range:



**VELFLEX**



**VEL - CRYO**



**ADAREG CONTROL VALVES**

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Consult other VELAN valve lines on our web site: [www.velan.com](http://www.velan.com)