

CRYOGENIC VALVES



CORROSION RESISTANT VALVES **LADISH CO.**

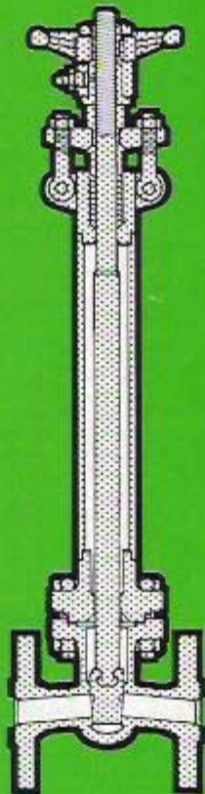
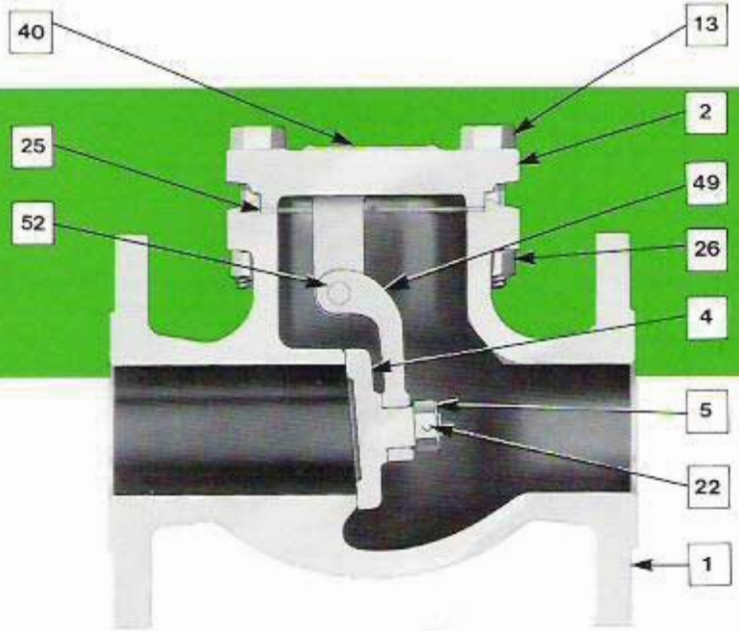
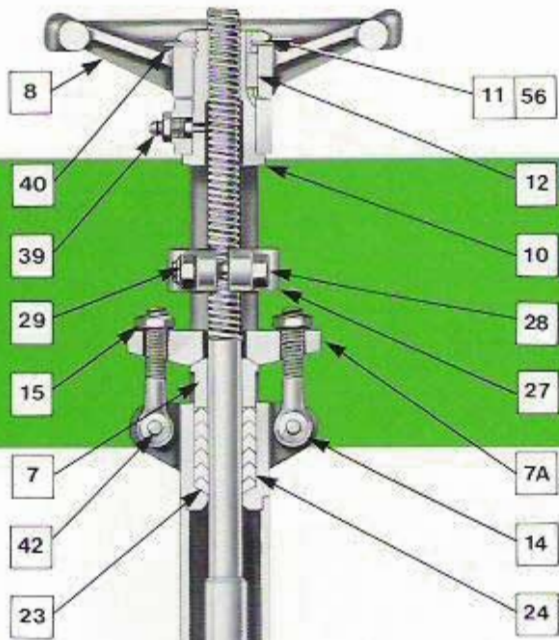
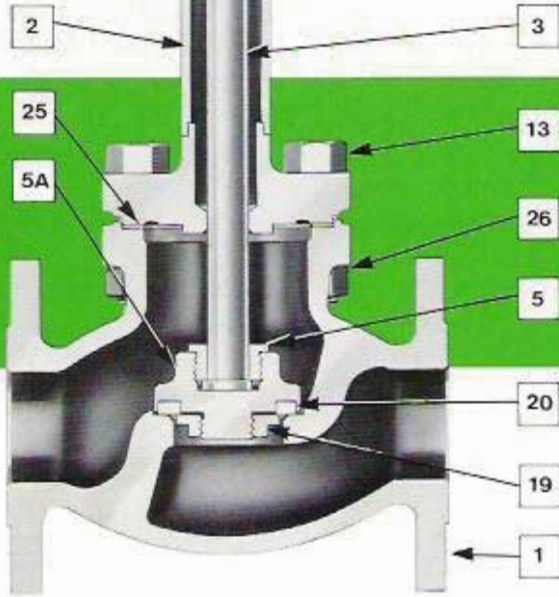


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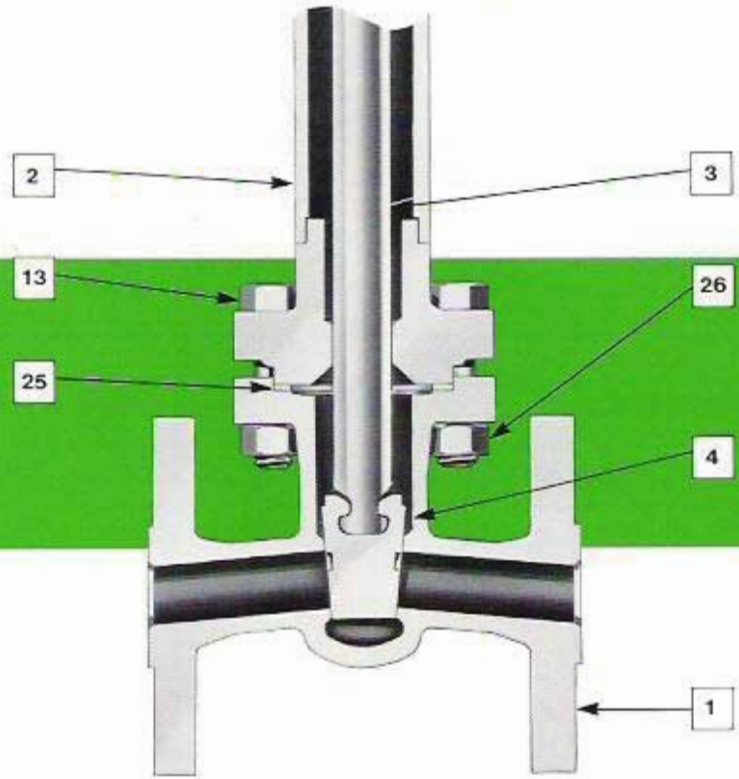
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TYPICAL CRYOGENIC SWING CHECK VALVE



TYPICAL CRYOGENIC GLOBE VALVE

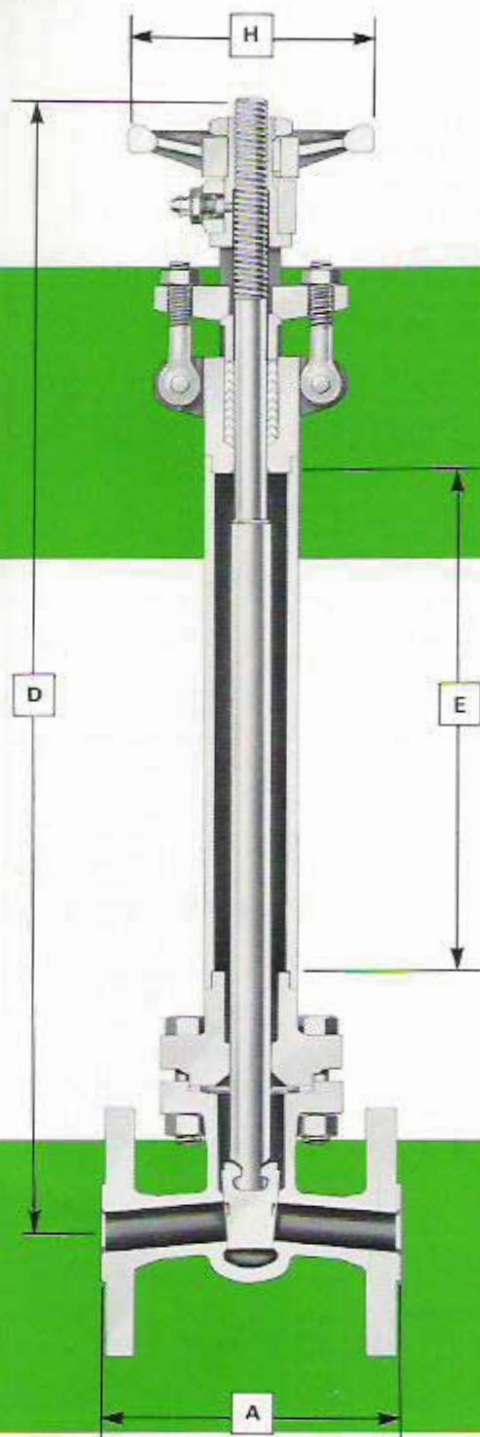


TYPICAL CRYOGENIC GATE VALVE

No.	Component	TYPICAL GATE, GLOBE AND SWING CHECK VALVE — CF8M†			
		GATE AND GLOBE VALVE		SWING CHECK VALVE	
		Material	Specification	Material	Specification
1	Body-Flanged end	316 SS	ASTM A351 CF8M	316 SS	ASTM A351 CF8M
1	Body-Threaded, socket or butt weld end	316L SS	ASTM A351 CF3M	316L SS	ASTM A351 CF3M
2	Bonnet Weld Assembly■	316 SS	ASTM A351 CF8M	—	—
2	Cover	—	—	316 SS	ASTM A351 CF8M
3	Stem	316 SS	ASTM A182 F316	—	—
4	Disc	316 SS	ASTM A351 CF8M	316 SS	ASTM A351 CF8M
5	Disc Nut	316 SS	ASTM A182 F316	316 SS	ASTM A182 F316
5A	Disc Holder	316 SS	ASTM A351 CF8M	—	—
7	Gland	316 SS	ASTM A182 F316	—	—
7A	Gland Yoke	304 SS	ASTM A351 CF8	—	—
8	Handwheel	Malleable Iron	ASTM A47	—	—
10	Stem Nut	303 SS	ASTM A582 T303	—	—
11	Stem Nut Lock Nut	304 SS	ASTM A351 CF8	—	—
12	Stem Nut Key	Carbon Steel	AISI C1018	—	—
13	Bonnet / Cover Bolt	304 SS	ASTM A320 Gr B8	304 SS	ASTM A320 Gr B8
14	Gland Eyebolt	304 SS	ASTM A193 Gr B8	—	—
15	Gland Eyebolt Nut	303 SS	ASTM A194 Gr 8F	—	—
19	Disc Holder Nut	316 SS	ASTM A182 F316	—	—
20*	Renewable Disc Insert	Teflon	Teflon	—	—
22	Disc Nut Lock Pin	—	—	316 SS	ASTM A182 F316
23*	Packing Adapter	Teflon	Teflon	—	—
24*	Packing	Teflon	Teflon	—	—
25*	Bonnet / Cover Gasket	Teflon	Teflon	Teflon	Teflon
26	Bonnet / Cover Bolt Nut	304 SS	ASTM A194 Gr 8A	304 SS	ASTM A194 Gr 8A
27	Stem Clamp	304 SS	ASTM A182 F304	—	—
28	Stem Clamp Bolt	304 SS	ASTM A193 Gr B8	—	—
29	Stem Clamp Nut	303 SS	ASTM A194 Gr 8F	—	—
39	Grease Fitting	Carbon Steel	AISI C1018	—	—
40	Identification Plate	Aluminum	Aluminum	Aluminum	Aluminum
42	Eyebolt Pin	303 SS	ASTM A582 T303	—	—
49	Arm	—	—	316 SS	ASTM A351 CF8M
52	Hinge Pin	—	—	316 SS	ASTM A182 F316
56	Set Screw	304 SS	ASTM A182 F304	—	—

†Specifications on other materials available on request.
*Recommended spare parts.

■ Extended Bonnet Fabrication Welds are made in accordance with ANSI/ASME B31.3 Provision.



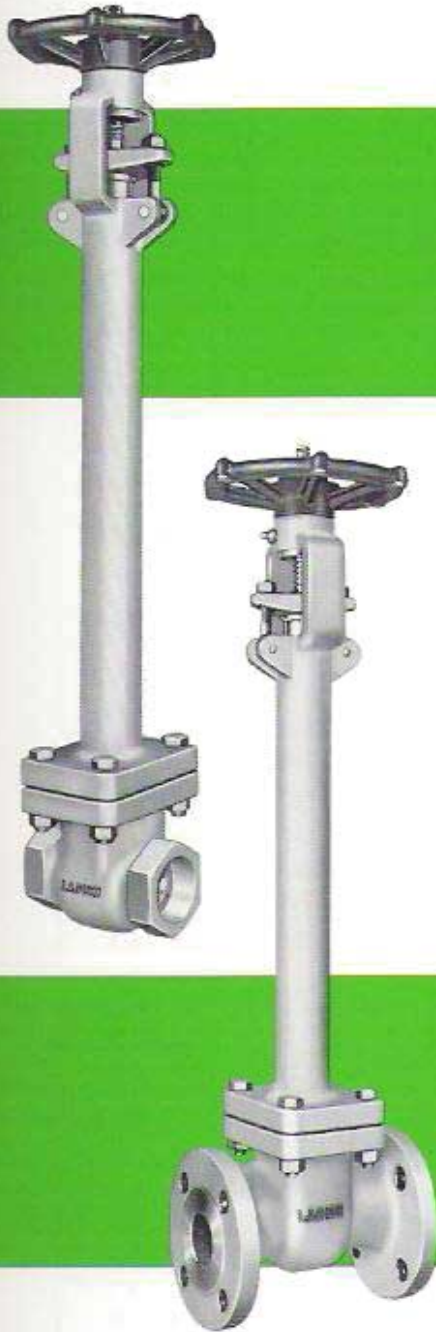
Split Wedge Disc



Solid Wedge Disc

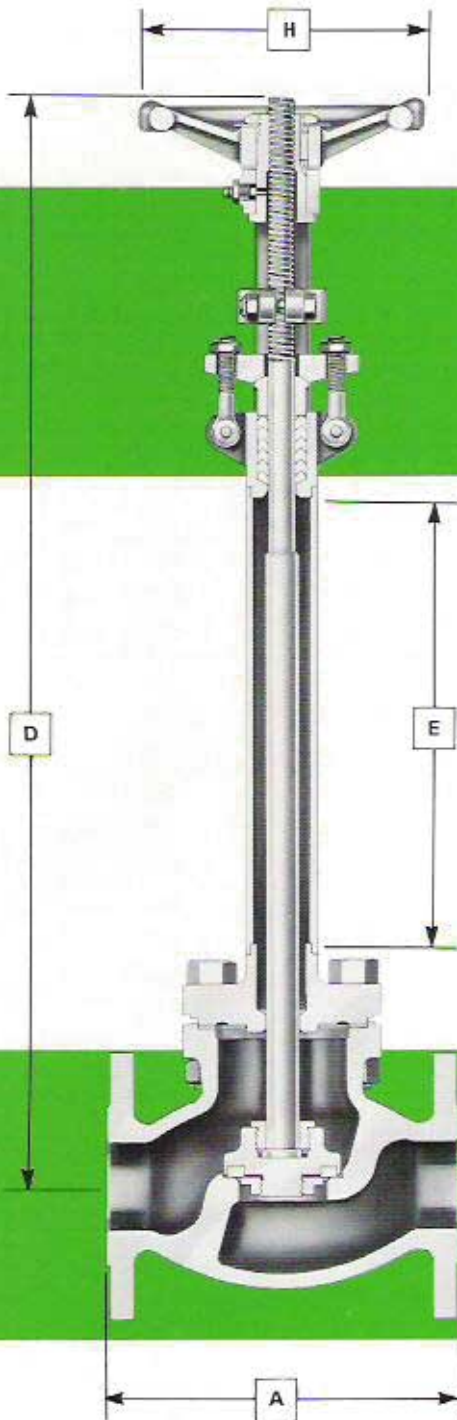
VALVE DESCRIPTION				
CRYOGENIC GATE VALVES O.S.&Y. EXTENDED BOLTED BONNET				
CLASS			END	DISC
150	300	600		
No. 8290	—	—	Threaded	Split Wedge
No. 8291	—	—	Socket Weld	Split Wedge
No. 8292	No. 8392	—	Flanged	Split Wedge
No. 8293	No. 8393	No. 8693	Threaded	Solid Wedge
No. 8294	No. 8394	No. 8694	Socket Weld	Solid Wedge
No. 8295	No. 8395	No. 8695	Flanged	Solid Wedge
No. 8296	—	—	Butt Weld	Split Wedge
No. 8299	—	—	Butt Weld	Solid Wedge

STANDARDS AND SPECIFICATIONS			
RATING	MATERIAL ASTM A351 CF8M (TYPE 316 SS)		
	Temperature Range of +100°F to -325°F		
	Class 150	Class 300	Class 600
	275 PSIG	720 PSIG	1440 PSIG
PACKING	Teflon packing rings are standard for service up to 500°F.		
GASKET	Teflon gasket is standard. Grafoil gaskets are optional. Teflon gaskets are furnished for service up to 500 F.		
MATERIAL	Normally stocked in CF8M (Type 316SS). Threaded, socket and butt weld end stainless steel valve bodies are low carbon grade material. Stainless steel stem nut and locknut is standard.		
STANDARDS	<p>Dimensions are in inches. Weights are in pounds. Pipe threads conform to ANSI B2.1. Socket weld end dimensions conform to ANSI B16.11. Butt weld ends conform to ANSI B16.25.</p> <p>End flange diameter, thickness, facing, diameter of bolt circle, number and diameter of bolt holes for Class 150 conform to MSS SP-42 for NPS ½ and NPS ¾, NPS 1 and larger for Class 150, and all sizes in Class 300 and 600 conform to ANSI B16.5.</p> <p>¼" raised face is standard for Class 150 and 300 flanged end valves. ½" raised face is standard for Class 600 flanged end valves. Gasket surface finish is spiral serrated per MSS SP-6. Other facings can be furnished.</p> <p>End-to-end dimensions for flanged and butt weld end valves conform to ANSI B16.10.</p>		
DESIGN	<p>Class 150 flanged end valves NPS ½ and NPS ¾ are designed in accordance with MSS SP-42 and are rated accordingly. Class 150 butt weld end valves NPS ½ and NPS ¾ are designed parallel to MSS SP-42 and are rated accordingly. Class 150 flanged and butt weld end valves NPS 1 and larger, and all Class 300 and 600 flanged end valves are designed in accordance with ANSI B16.34.</p> <p>Valves have non-rising handwheel.</p>		
GAS COLUMN	Unless otherwise specified, gas column length will be furnished as listed. Other gas column lengths can be furnished.		
OPTIONS	Other packings, gaskets and materials than listed above are available.		



CLASS	Nom. Pipe Size	End-to-End A			Open Height D	Gas Column E	Handwheel Diameter H	Weight		
		Threaded and Socket	Flanged	Butt Weld				Threaded and Socket	Flanged	Butt Weld
150	1/2	2 3/4	4 1/4	4 1/4	16 3/4	7	3 1/2	7	10	7
	3/4	2 7/8	4 5/8	4 5/8	16 3/4	7	3 1/2	7	11	8
	1	3 1/2	5	5	21	10	4 7/8	12	16	13
	1 1/2	4 1/4	6 1/2	6 1/2	24	10	6 1/2	22	28	20
	2	5	7	8 1/2	26 1/4	10	6 1/2	26	35	29
	2 1/2	—	7 1/2	9 1/2	30 1/4	12	7 1/2	—	52	42
	3	—	8	11 1/8	34 1/2	14	7 1/2	—	62	48
	4	—	9	12	44	16	9	—	102	83
	6	—	10 1/2	15 7/8	51	18	11	—	167	165
	8	—	11 1/2	16 1/2	60 1/2	21	13 1/2	—	323	255
	10	—	13	18	76 1/4	24	16	—	500	395
	12	—	14	19 3/4	85	27	19	—	720	568
300	1/2	2 3/4	5 1/2	—	20 3/4	7	4 7/8	12	19	—
	3/4	3 1/4	6	—	20 3/4	7	4 7/8	14	20	—
	1	3 3/4	6 1/2	—	24 3/4	10	6 1/2	21	32	—
	1 1/2	5	7 1/2	—	27 5/8	10	7 1/2	42	56	—
	2	5 3/4	8 1/2	—	28 7/8	10	7 1/2	57	68	—
	2 1/2	—	9 1/2	—	35	12	9	—	110	—
	3	—	11 1/8	—	39 1/2	14	11	—	145	—
	4	—	12	—	47 1/4	16	13 1/2	—	244	—
	6	—	15 7/8	—	57 1/2	18	16	—	400	—
	8	—	16 1/2	—	68 3/4	21	19	—	702	—
10	—	18	—	80 7/8	24	19	—	855	—	
12	—	19 3/4	—	90	27	23 1/2	—	1025	—	
600	1/2	2 3/4	6 1/2	—	20 1/2	7	4 7/8	13	19	—
	3/4	3 1/4	7 1/2	—	20 3/4	7	4 7/8	14	20	—
	1	3 3/4	8 1/2	—	23	10	6 1/2	21	32	—
	1 1/2	5	9 1/2	—	26 3/4	10	7 1/2	42	61	—
	2	5 3/4	11 1/2	—	28 3/4	10	7 1/2	57	74	—
	3	—	14	—	40 5/8	14	11	—	165	—
	4	—	17	—	47 3/4	16	13 1/2	—	256	—
	6	—	22	—	60 3/4	18	19	—	455	—
	8	—	26	—	74 3/8	21	23 1/2	—	862	—

CLASS	DISC	THREADED	SOCKET WELD	FLANGED	BUTT WELD
150	Split Wedge	No. 8290	No. 8291	No. 8292	No. 8296
	Solid Wedge	No. 8293	No. 8294	No. 8295	No. 8299
300	Split Wedge	—	—	No. 8392	—
	Solid Wedge	No. 8393	No. 8394	No. 8395	—
600	Split Wedge	—	—	—	—
	Solid Wedge	No. 8693	No. 8694	No. 8695	—



Metal Plug Disc



Renewable Disc

VALVE DESCRIPTION				
CRYOGENIC GLOBE VALVES O.S.&Y. EXTENDED BOLTED BONNET				
CLASS			END	DISC
150	300	600		
No. 7290	No. 7390	No. 7690	Threaded	Metal Plug
No. 7291	No. 7391	No. 7691	Socket Weld	Metal Plug
No. 7292	No. 7392	No. 7692	Flanged	Metal Plug
No. 7293	No. 7393	No. 7693	Threaded	Renewable
No. 7294	No. 7394	No. 7694	Socket Weld	Renewable
No. 7295	No. 7395	No. 7695	Flanged	Renewable
No. 7296	—	—	Butt Weld	Metal Plug
No. 7299	—	—	Butt Weld	Renewable

STANDARDS AND SPECIFICATIONS			
RATING	MATERIAL ASTM A351 CF8M (TYPE 316 SS)		
	Temperature Range of +100°F to -325°F		
	Class 150	Class 300	Class 600
	275 PSIG	720 PSIG	1440 PSIG
PACKING	Teflon packing rings are standard for service up to 500°F.		
GASKET	Teflon gasket is standard. Grafoil and Kel-F can be furnished as alternates.		
MATERIAL	Normally stocked in CF8M (Type 316SS). Threaded, socket and butt weld end stainless steel valve bodies are low carbon grade material. Stainless steel stem nut and locknut is standard. Renewable discs are a composite of the same grade material as the valve and a renewable disc insert of Teflon for service up to 500°F.		
STANDARDS	Dimensions are in inches. Weights are in pounds. Pipe threads conform to ANSI B2.1. Socket end dimensions conform to ANSI B16.11. Butt weld ends conform to ANSI B16.2F. End flange diameter, thickness, facing, diameter of bolt circle, number and diameter of bolt holes for Class 150 conform to MSS SP-42 for NPS ½ and NPS ¾, NPS 1 and larger for Class 150, and all sizes in Class 300 and 600 conform to ANSI B16.5. 1/16" raised face is standard for Class 150 and 300 flanged end valves. 1/4" raised face is standard for Class 600 flanged end valves. Gasket surface finish is spiral serrated per MSS SP-6. Other facings can be furnished. End-to-end dimensions for flanged and butt weld end valves conform to ANSI B16.10.		
DESIGN	Class 150 flanged end valves NPS ½ and NPS ¾ are designed in accordance with MSS SP-42 and are rated accordingly. Class 150 flanged and butt weld end valves NPS 1 and larger, and all Class 300 and 600 flanged end valves are designed in accordance with ANSI B16.34. Valves may have rising or non-rising handwheel.		
GAS COLUMN	Unless otherwise specified, gas column length will be furnished as listed. Other gas column lengths can be furnished.		
OPTIONS	Other packings, gaskets and materials than listed above are available.		

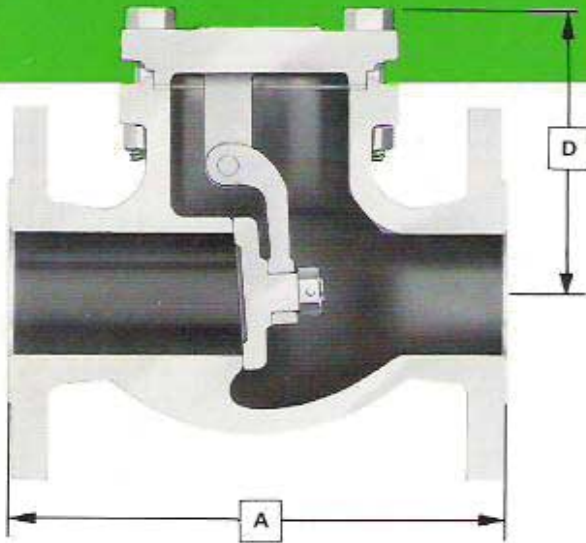


CLASS	Nom. Pipe Size	End-to-End A			Open Height D	Gas Column E	Handwheel Diameter H	Weight		
		Threaded and Socket	Flanged	Butt Weld				Threaded and Socket	Flanged	Butt Weld
150	1/2	3 3/8	4 1/4	—	18 5/8	7	3 1/2	9	12	—
	3/4	3 3/4	4 5/8	—	18 5/8	7	3 1/2	10	13	—
	1	4 1/4	5	5	24 1/4	10	4 7/8	17	21	15
	1 1/2	5 3/4	6 1/2	6 1/2	25	10	6 1/2	22	27	25
	2	6 1/4	8	8	26	10	6 1/2	32	33	30
	2 1/2	—	8 1/2	8 1/2	29	12	7 1/2	—	63	44
	3	—	9 1/2	9 1/2	33 1/2	14	7 1/2	—	84	72
	4	—	11 1/2	11 1/2	40 1/4	16	11	—	136	116
	6	—	16	16	45 1/2	18	13 1/2	—	275	230
	8	—	19 1/2	—	54	21	16	—	400	—
10	—	24 1/2	—	65	24	19	—	650	—	
300	1/2	3 3/4	6	—	20 1/4	7	4 7/8	11	15	—
	3/4	4 1/4	7	—	20 1/4	7	4 7/8	15	18	—
	1	5	8	—	24 3/8	10	6 1/2	18	27	—
	1 1/2	6	9	—	26 5/8	10	7 1/2	33	48	—
	2	7 1/4	10 1/2	—	28 1/2	10	7 1/2	47	61	—
	2 1/2	—	11 1/2	—	31	12	11	—	94	—
	3	—	12 1/2	—	33 3/8	14	13 1/2	—	120	—
	4	—	14	—	39 5/8	16	13 1/2	—	170	—
6	—	17 1/2	—	49	18	16	—	335	—	
600	1/2	3 3/4	6 1/2	—	20 1/4	7	4 7/8	12	16	—
	3/4	4 1/4	7 1/2	—	20 1/4	7	4 7/8	17	22	—
	1	5	8 1/2	—	24 3/8	10	6 1/2	22	29	—
	1 1/2	6	9 1/2	—	26 5/8	10	7 1/2	33	48	—
	2	7 1/4	11 1/2	—	28 1/2	10	7 1/2	47	76	—
	2 1/2	—	13	—	39	12	11	—	140	—
	3	—	14	—	40 1/2	14	13 1/2	—	160	—
	4	—	17	—	49	16	16	—	315	—
6	—	22	—	59	18	19	—	615	—	

CLASS	DISC	THREADED	SOCKET WELD	FLANGED	BUTT WELD
150	Metal Plug	No. 7290	No. 7291	No. 7292	No. 7296
	Renewable	No. 7293	No. 7294	No. 7295	No. 7299
300	Metal Plug	No. 7390	No. 7391	No. 7392	—
	Renewable	No. 7393	No. 7394	No. 7395	—
600	Metal Plug	No. 7690	No. 7691	No. 7692	—
	Renewable	No. 7693	No. 7694	No. 7695	—

VALVE DESCRIPTION				
CRYOGENIC SWING CHECK VALVES BOLTED COVER				
CLASS			END	DISC
150	300	600		
No. 5290	No. 5390	No. 5690	Threaded	Metal
No. 5291	No. 5391	No. 5691	Socket Weld	Metal
No. 5292	No. 5392	No. 5692	Flanged	Metal
No. 5293	No. 5393	No. 5693	Threaded	Renewable
No. 5294	No. 5394	No. 5694	Socket Weld	Renewable
No. 5295	No. 5395	No. 5695	Flanged	Renewable
No. 5296	—	—	Butt Weld	Metal
No. 5299	—	—	Butt Weld	Renewable

STANDARDS AND SPECIFICATIONS			
RATING	MATERIAL ASTM A351 CF8M (TYPE 316 SS)		
	Temperature Range of +100°F to -325°F		
	Class 150	Class 300	Class 600
	275 PSIG	720 PSIG	1440 PSIG
GASKET	Teflon gasket is standard. Grafoil and Kel-F can be furnished as alternate.		
MATERIAL	Normally stocked in CF8M (Type 316SS). Threaded, socket and butt weld end stainless steel valve bodies are low carbon grade material. Renewable discs are a composite of the same grade material as the valve and a renewable disc insert of Teflon for service up to 500°F.		
STANDARDS	Dimensions are in inches. Weights are in pounds. Pipe threads conform to ANSI B2.1. Socket weld end dimensions conform to ANSI B16.11. Butt weld ends conform to ANSI B16.25. End flange diameter, thickness, facing, diameter of bolt circle, number and diameter of bolt holes for Class 150 conform to MSS SP-42 for NPS ½ and NPS ¾. NPS 1 and larger for Class 150, and all sizes in Class 300 and 600 conform to ANSI B16.5. 1/16" raised face is standard for Class 150 and 300 flanged end valves. 1/4" raised face is standard for Class 600 flanged end valves. Gasket surface finish is spiral serrated per MSS SP-6. Other facings can be furnished. End-to-end dimensions for flanged and butt weld end valves conform to ANSI B16.10.		
DESIGN	Class 150 flanged end valves NPS ½ and NPS ¾ are designed in accordance with MSS SP-42 and are rated accordingly. Class 150 flanged and butt weld end valves NPS 1 and larger, and all Class 300 and 600 flanged end valves are designed in accordance with ANSI B16.34.		
OPTIONS	Other gaskets and materials than listed above are available.		



Metal Disc



Renewable Disc



CLASS	Nom. Pipe Size	End-to-End A			Center-to-Top D		Weight		
		Threaded and Socket	Flanged	Butt Weld	Threaded and Socket	Flanged and Butt Weld	Threaded and Socket	Flanged	Butt Weld
150	1/2	3 5/8	4 1/4	—	2 7/8	3	3	5	—
	3/4	3 5/8	4 5/8	—	2 7/8	3	3	5	—
	1	4	5	5	2 7/8	3	4	7	8
	1 1/2	5 7/8	6 1/2	6 1/2	4 3/8	4 3/8	12	17	13
	2	6 1/4	8	8	4 5/8	4 5/8	15	28	21
	2 1/2	—	8 1/2	8 1/2	—	5 1/4	—	43	29
	3	—	9 1/2	9 1/2	—	6 1/4	—	55	43
	4	—	11 1/2	11 1/2	—	7 1/4	—	87	63
	6	—	14	14	—	9	—	160	112
	8	—	19 1/2	—	—	9 7/8	—	348	—
10	—	24 1/2	—	—	12 1/2	—	590	—	
12	—	27 1/2	—	—	14 3/8	—	870	—	
300	1/2	3 5/8	6	—	3 1/4	3 1/2	7	10	—
	3/4	3 5/8	7	—	3 1/4	3 5/8	7	13	—
	1	4	8 1/2	—	3 1/2	3 7/8	9	17	—
	1 1/2	5 7/8	9 1/2	—	5 1/2	5 1/2	28	42	—
	2	6 1/4	10 1/2	—	6 1/4	5 1/2	30	43	—
	2 1/2	—	11 1/2	—	—	6 3/8	—	58	—
	3	—	12 1/2	—	—	6 3/4	—	86	—
	4	—	14	—	—	7 5/8	—	124	—
	6	—	17 1/2	—	—	10 1/2	—	260	—
	8	—	21	—	—	12 1/4	—	472	—
10	—	24 1/2	—	—	15	—	800	—	
12	—	28	—	—	17 1/4	—	1140	—	
600	1/2	3 5/8	6 1/2	—	3 1/4	3 5/8	7	10	—
	3/4	3 5/8	7 1/2	—	3 1/4	3 5/8	7	13	—
	1	4	8 1/2	—	3 1/2	3 7/8	9	17	—
	1 1/2	5 7/8	9 1/2	—	5 1/2	6	28	44	—
	2	6 1/4	11 1/2	—	6 1/4	6 1/4	30	47	—
	2 1/2	—	13	—	—	7 3/4	—	72	—
	3	—	14	—	—	8 7/8	—	136	—
	4	—	17	—	—	10 1/4	—	205	—
6	—	22	—	—	12 5/8	—	456	—	

CLASS	DISC	THREADED	SOCKET WELD	FLANGED	BUTT WELD
150	Metal	No. 5290	No. 5291	No. 5292	No. 5296
	Renewable	No. 5293	No. 5294	No. 5295	No. 5299
300	Metal	No. 5390	No. 5391	No. 5392	—
	Renewable	No. 5393	No. 5394	No. 5395	—
600	Metal	No. 5690	No. 5691	No. 5692	—
	Renewable	No. 5693	No. 5694	No. 5695	—