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CRYOFLO _{H₂}
Keeping Cryogenics Cool

TECHNICAL DATASHEET

CRYOFLO VALVES

Crane CRYOFLO®
High Performance
Globe Valves

CRANE

Crane ChemPharma & Energy

 www.cranecpe.com

Figure Number System

Globe & Check Valves

Figure number definition for CRYOFLO™ Globe & Check valves.

CF1H		T		3		A		Q		1		A		HW		V		ST	
1	Size	2	TYPE	3	MAWP	4	MOC	5	DISC TYPE	6	GASKET MOC	7	END CONNECTION	8	ACTUATION	9	JACKETING	10	SPECIAL FEATURE

Top headers identified as order example.

1	SIZE			
		in	mm	
		CF0H	½"	10
		CF0Q	¾"	20
		CF01	1"	25
		CF1Q	1 ¼"	30
		CF1H	1 ½"	40
		CF02	2"	50
		CF2H	2 ½"	65
		CF03	3"	80
		CF04	4"	100
		CF05	5"	125
		CF06	6"	150
2	VALVE TYPE	T	Bellow Seal T-Globe Valve	
		Y	Bellow Seal Y-Globe Valve	
		L	Lift Check Valve	
		R	Bellow Seal Angle Valve	
3	MAWP	1	150 psi	
		3	300 psi	
		6	600 psi	
4	MOC	A	CF8M body, 304ss Disc, 304/304L pipe	
		B	CF8M body, 304ss disc, 316/316L pipe	
		C	CF8M body, 316/316L disc & pipe	
		D	CF3M body, 316Lss disc & pipe	
5	DISC TYPE	Q	PCTFE	Quick opening
		L	PCTFE	Linear
		E	PCTFE	Equal Percent
6	GASKET MATERIAL	1	Graphite	
		2	PTFE	
7	END CONNECTION	A	Pipe Sch. 10	
		B	Pipe Sch. 5	
		C	Pipe Sch. 40	
		D	Pipe Sch. 80	
		S	Socket, pipe	
		T	Socket, tube	
		U	Butt Weld Schedule 5	
		V	Butt Weld Schedule 10	
		W	Butt Weld Schedule 40	
		Y	Butt Weld Schedule 80	
		R	RF Flanged, 125-250 Ra	
		F	Flat Face Flanged	
		H	Hub Ends	
		Z	RTJ	
X	Custom			
8	ACTUATION TYPE	HW	Handwheel	
		BS	Bare Stem	
		A1 to Z9	Pneumatic Actuators	
		01 to 99	Electric Actuators	
		00	None (Lift Check)	
9	JACKETING	N	Non-Jacketed	
10	SPECIAL FEATURE	ST	Manufacturer standard bonnet length, non-cold box	
		S2	Manufacturer standard bonnet length, non-cold box, O2 Clean	
		TW	Complete Top Works Cartridge Replacement	
		SG	Soft Goods Kit (Packing, Gaskets, Seals)	
		CB	Cold Box Cuff	
		AM	Actuator Mounting Kit	
		CL	Custom bonnet length, length included in extended description.	
		XX	Special or multiple custom requirements, included in extended Description.	
		MC	Cold box, non-O2 Clean	
M2	Cold box, O2 Clean			

T-Bellows Seal Globe Valves Overview

Overview

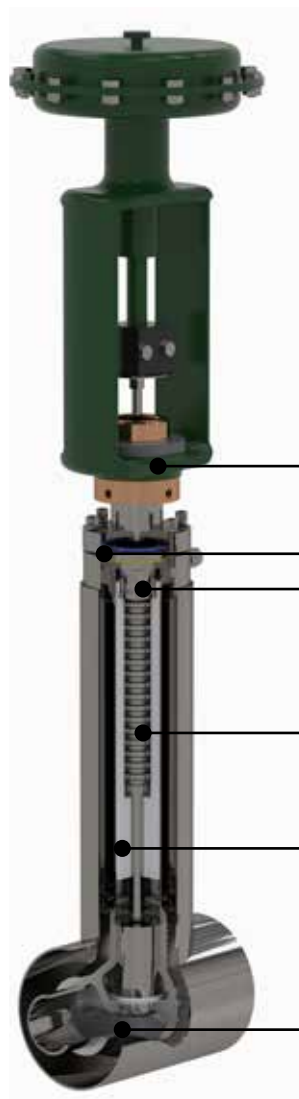
T-Bellows Seal Globe Valve

- Globe valves are normally installed with flow and pressure under the disc. Always consult with the factory before installing valves with flow in the other direction.
- Globe valves are suitable for most throttling applications; however, they should not be used for throttling at less than 10-20% open. This can cause excessive vibration, noise, and damage to disc and seats. Use of smaller valves with lower flow capacity may permit the valve to be open a greater percentage, thus avoiding damage.

Crane CRYOFLO® Bellows Seal T-Globe Valves minimize Hydrogen loss by improving heat transfer rates, reducing pipeline latency in liquid transfer applications and leveraging a robust zero-leak design.

Key features of the Bellows Seal Globe valve include:

- Enhanced engineered design offers best-in-class heat transfer, greatly reducing Hydrogen loss.
- Innovative valve internals deliver improved CV in your application, improving liquid transfer times
- Unique cartridge replacement system allows for in-line repair, reducing down-time and increasing productivity



Easily convert from manual handwheel to actuation.

Improved bonnet seal design to ensure zero fugitive emission

Unique cartridge replacement system for efficient in-line maintenance.

Proven bellows design for high life cycle.

Vacuum barrier and Improved design minimizes heat leak and media boil-off.

Innovative valve internals deliver improved CV while maintaining highest industry bubble-tight shut-off standards.

T-Globe & Y-Globe Bellows Seal Globe Valve Design Details

Styles

- T-Globe, Y-Globe

Size Range

- ½" - 6" NPS

Pressure Ratings

- 300 psi MAWP

Materials of Construction

- CF8M body, 304ss disc, 316/316L pipe
- CF8M body, 304ss disc, 304/304L pipe
- CF8M body, 316/316L disc & pipe
- CF3M body, 316Lss disc & pipe
- Other materials available upon request.

Design Standards & Compliance

- Designed and Tested to MSS-SP-134
- Designed to ISO-28921
- ASME B16.34
- Korean Gas Safety (KGS) Approval
- Canadian Registration (CRN)
- PED Approval
- Tested to API-598
- ISO 15848 Fugitive Emissions
- Oxygen clean option per CGA G-4.1
- Fire Safe Design

Temperature Range

- Designed for -256°C to 100°C (-452°F to 212°F)

End Connections

- Pipe ends with varied pipe schedules
- Socket Weld , Pipe
- Socket Weld , Tube
- Butt Weld ends with varied pipe fitting schedules

Assembly Configurations

- Vacuum Jacketed and Non-Jacketed
- Extended bonnet/stem per MSS-SP-134 and ISO 28921
- Customized stem length available

Valve Installation orientation

- Stem vertical with horizontal pipe
- Stem 45° to vertical with horizontal pipe

Sealing and Packaging

- Bellows design to eliminate stem/packing fugitive emissions
- Bellows tested to 10,000 cycles
- Self-Centering PCTFE Seat
- ANSI Class VI Leak Rate

Standard Features

- Proprietary PTFE insert design to limit bonnet dead volume
- Light weight design to limit cool down heat
- Spiral wound bonnet flange gasket for improved sealing

Actuator Mounting

- Easy conversion between handwheel and actuator
- Fits most common actuator solutions

Options

- Oxygen cleaning (Process clean standard for LH2 service) for Oxygen system compatibility per CGA G-4.1
- Cold Box Cuff
- Custom Extended Bonnet & Stem lengths available
- Replacement Cartridge System available
- Soft Goods Repair Kit available

Applications

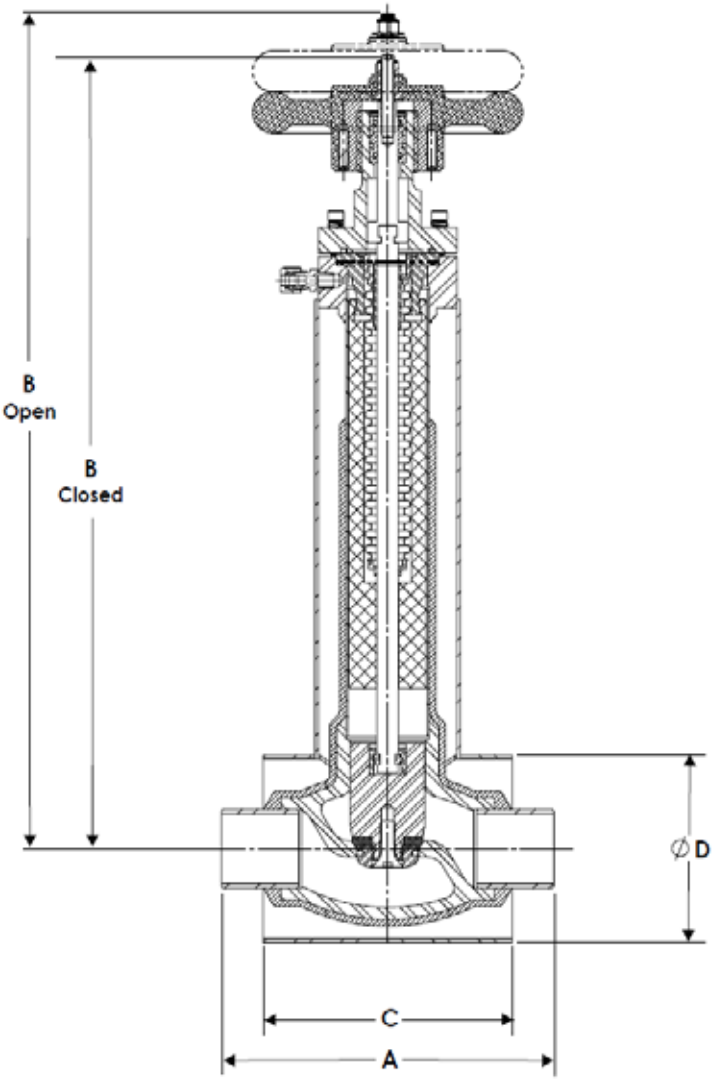
- Production, transportation, transfer, and storage of Liquid Hydrogen and other cryogenics
- Liquid Helium
- LIN, LAR, LOX, LNG, L-CO2

Technical Data T-Globe Valve

Bellows Seal T-Globe Valve

Materials of Construction

Description	Material
BODY	ASTM A351 CF8M
BODY STUB PIPE	ASTM A312 TP304
TOP PIPE FLANGE	ASTM A479 SS316
BODY NECK PIPE	ASTM A312 TP304
DISC	ASTM A479 SS304
SEAT	PTFE
PTFE SLEEVE	PTFE
METAL BELLOW	1.4404
SLEEVE HOLDER	ASTM A479 SS316
SPIRAL WOUND GASKET	SS316 + GRAPHITE + PTFE
BONNET	ASTM A276 SS304
SOCKET HEAD CAP SCREW	ASTM A320 B8 CL.2
O RING	VITON
HANDWHEEL	LM-25
HANDWHEEL NUT	SS 18-8



Dimensions

Size		Pipe Ends		(Open)		(Closed)						Weight (lbs)		Flow Coefficient	Heat Flux	
in	mm	A		B		B		C		ØD	Jacket Size NPS	Non Jacketed	Jacketed	Cv	(BTU/HR)	
½"	10	4.75	120.65	16.2	411.48	15.4	391.16	3.75	95.25	2.875	73.025	2.5	11.4	14	7.1	6.1
¾"	20	5.375	136.525	16.3	414.02	15.5	393.7	4.375	111.125	3.5	88.9	3	12.3	15.1	13	6.1
1"	25	6.0	152.4	16.3	414.02	15.5	393.7	5.0	127	3.5	88.9	3	12.7	16	15	7.9
1½"	40	8.0	203.2	20.0	508	19.1	485.14	6.0	152.4	4.5	114.3	4	19.7	25.3	34	8.6
2"	50	8.5	215.9	22.1	561.34	20.6	523.24	6.5	165.1	5.56	141.224	5	28.7	36	54	13.0
3"	80	14.0	355.6	28.0	711.2	26.0	660.4	12.0	304.8	5.56	141.224	5	71.5	95	136	-
4"	100	15.5	393.7	35.9	911.86	33.4	848.36	13.25	336.55	8.63	219.202	8	130	158	182	-

Y-Bellows Seal Globe Valves Overview

Overview

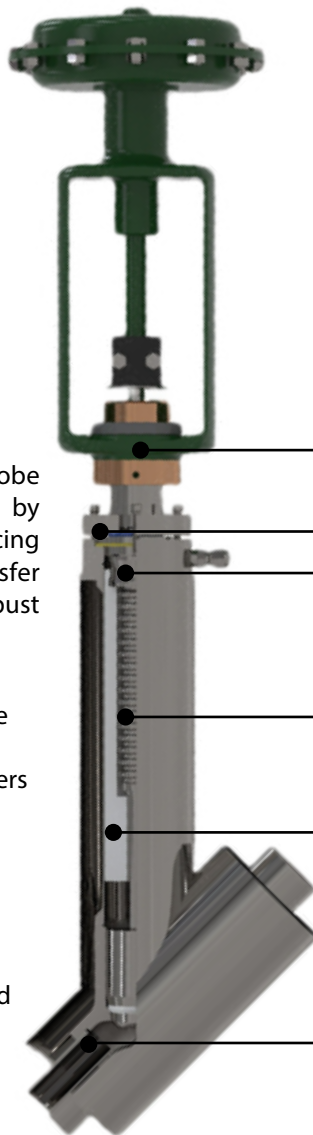
Y-Bellows Seal Globe Valve

- CRANE CRYOFLO® Y-Pattern Bellows Seal Globe Valve features lower pressure drop, tight shut-off, and enhanced durability, all contributing to overall improved efficiencies.

Crane CRYOFLO® Bellows Seal Y-Globe Valves minimizes Hydrogen loss by improving heat transfer rates, reducing pipeline latency in liquid transfer applications and leveraging a robust zero-leak design.

Key features of the Bellows Seal Globe valve include:

- Enhanced engineered design offers best-in-class heat transfer, greatly reducing Hydrogen loss.
- Innovative valve internals deliver improved CV in your application, improving liquid transfer times
- Unique cartridge replacement system allows for in-line repair, reducing down-time and increasing productivity



Easily convert from manual handwheel to actuation.

Improved bonnet seal design to ensure zero fugitive emission

Unique cartridge replacement system for efficient in-line maintenance.

Proven bellows design for high life cycle.

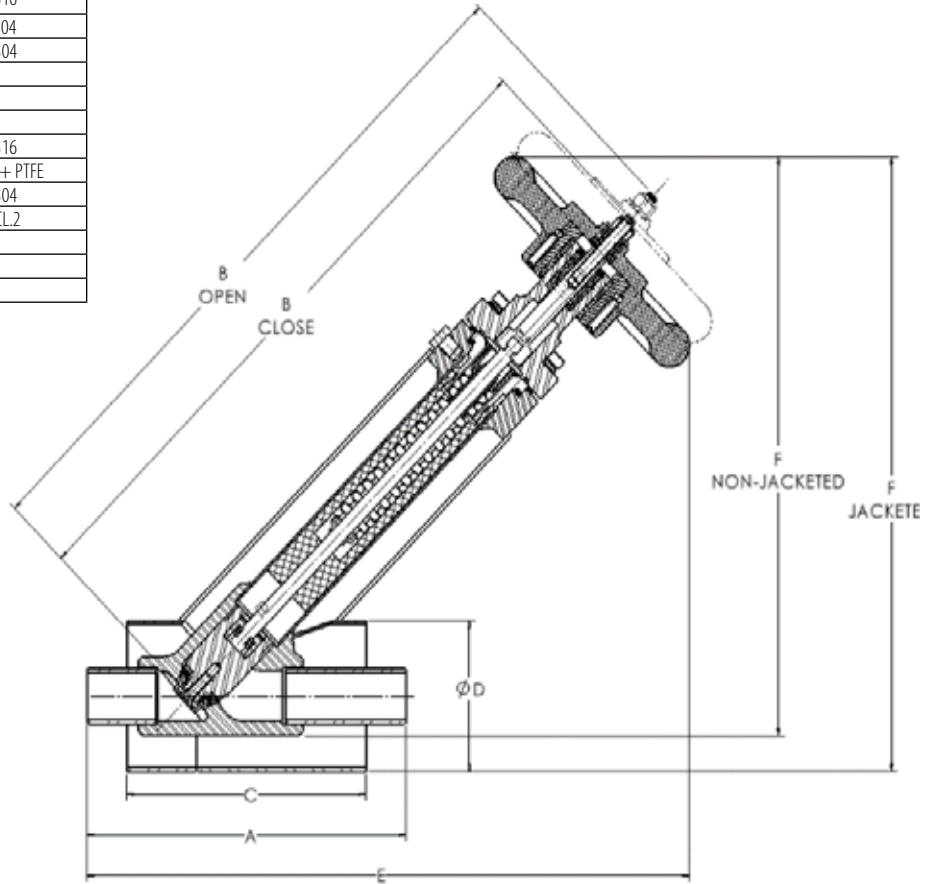
Vacuum barrier and Improved design minimizes heat leak and media boil-off.

Innovative valve internals deliver improved CV while maintaining highest industry bubble-tight shut-off standards.

Bellows Seal Y-Globe Valve

Materials of Construction

Description	Material
BODY	ASTM A351 CF8M
BODY STUB PIPE	ASTM A312 TP304
TOP PIPE FLANGE	ASTM A479 SS316
BODY NECK PIPE	ASTM A312 TP304
DISC	ASTM A479 SS304
SEAT	PCTFE
PTFE SLEEVE	PTFE
METAL BELLOW	1.4404
SLEEVE HOLDER	ASTM A479 SS316
SPIRAL WOUND GASKET	SS316 + GRAPHITE + PTFE
BONNET	ASTM A276 SS304
SOCKET HEAD CAP SCREW	ASTM A320 B8 CL.2
O RING	VITON
HANDWHEEL	LM-25
HANDWHEEL NUT	SS 18-8



Size		Pipe Ends		(Open)		(Closed)		Valve Body		Vacuum Jacketed		Valve Envelope				Weight (lbs)		Flow Coefficient	Heat Flux	
in	mm	A		B		B		C		ØD	Jacket Size	F		Jacketed	Non-Jacketed	Jacketed	Non-Jacketed	Cv	(BTU/HR)	
½"	10	7.875	200.025	16.7	424.18	15.9	403.86	5.875	149.225	3.5	88.9	3	14.5	368.3	13.5	342.9	14.4	11.3	9	6.12
¾"	20	7.875	200.025	16.7	424.18	15.9	403.86	5.875	149.225	3.5	88.9	3	14.5	368.3	13.5	342.9	15.2	12	13	6.12
1"	25	8	203.2	16.5	419.1	15.7	393.7	6	152.4	3.5	88.9	3	14.5	368.3	13.5	342.9	15.5	12	22	7.88
1 ½"	40	10.5	266.7	20.5	520.7	19.5	495.3	8.5	215.9	4.5	114.3	4	17.5	444.5	16.5	419.1	24.6	19.2	47	8.64
2"	50	10.5	266.7	23	584.2	21.5	546.6	8.5	215.9	5.563	141.3	5	20	508	18.5	469.9	33.5	26.7	96	12.96

Lift Check Globe Valves Overview

Overview

Lift Check Globe Valve

- Lift Check Valves are engineered for unidirectional fluid flow and backflow prevention, designed specifically for hydrogen applications with a precision cone seat to ensure zero leakage.
- Ideal for liquid hydrogen storage and transfer systems, pipelines, and cryogenic processing, ensuring reliable operation in extreme cryogenic temperatures.
- Features innovative valve internals for improved CV, bubble-tight shut-off at working pressure standards, and a design that eliminates potential leak paths, ensuring maximum safety and durability.

Improved bonnet seal design to ensure zero fugitive emission

Innovative valve internals deliver improved CV while maintaining highest industry bubble-tight shut-off at working pressure standards.

Crane CRYOFLO® Lift Check Valves ensures unidirectional fluid flow and preventing backflow, utilizing a precision cone seat design to eliminate hydrogen loss and enhance safety in hydrogen applications.

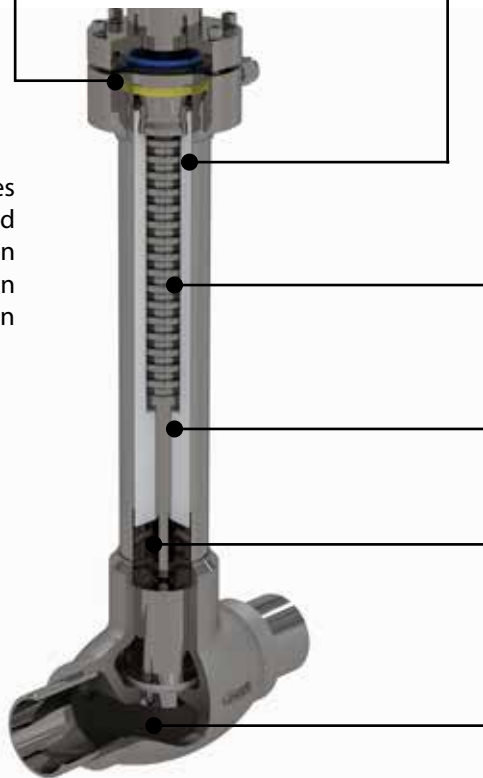
Unique cartridge replacement system allows for in-line repair, reducing downtime and increasing productivity

Key features of the Lift Check Globe valve include:

- Enhanced trim design to prevent backflow of the media while maintaining tight shut off.
- Engineered design offers best-in-class to reduce heat leak, greatly reducing Hydrogen loss.
- Innovative valve internals deliver improved CV in your application, improving liquid transfer times.

Engineered to eliminate all potential leak paths through the seat.

Vacuum barrier and Improved design minimizes heat leak and media boil-off.



Innovative valve internals deliver improved CV while maintaining highest industry bubble-tight shut-off at working pressure standards.

Innovative pin connection between disc and seat, designed for a longer operational lifecycle.

Lift Check Globe Valve Design Details

Styles

- Lift Check

Size Range

- ½" - 6"

Pressure Ratings

- 300 psi MAWP

Materials of Construction

- CF8M body, 304ss disc, 316/316L pipe
- CF8M body, 304ss disc, 304/304L pipe
- CF8M body, 316/316L disc & pipe
- CF3M body, 316Lss disc & pipe
- Other materials available upon request.

Design Standards & Compliance

- Designed to ASME B16.34, MSS-SP-134, ISO-28921
- Korean Gas Safety (KGS) Approval
- Canadian Registration (CRN)
- ISO 15848 Fugitive Emissions
- Oxygen clean option per CGA G-4.1

Temperature Range

- Designed for -269°C to 100°C (-452°F to 212°F)

End Connections

- Pipe ends with varied pipe schedules
- Socket Weld , Pipe
- Socket Weld , Tube
- Butt Weld ends with varied pipe fitting schedules

Assembly Configurations

- Vacuum Jacketed and Non-Jacketed
- Extended bonnet/stem per MSS-SP-134 and ISO 28921
- Customized stem length available

Sealing and Packaging

- Self-Centering PCTFE Seat
- ANSI Class VI Leak Rate

Standard Features

- Proprietary PTFE insert design to limit bonnet dead volume
- Metal-to-metal secondary seat seal
- Spiral wound bonnet flange gasket for improved sealing

Options

- Oxygen cleaning (Process clean standard for LH2 service) for Oxygen system compatibility
- Cold Box Cuff
- Extended Bonnet & Stem lengths

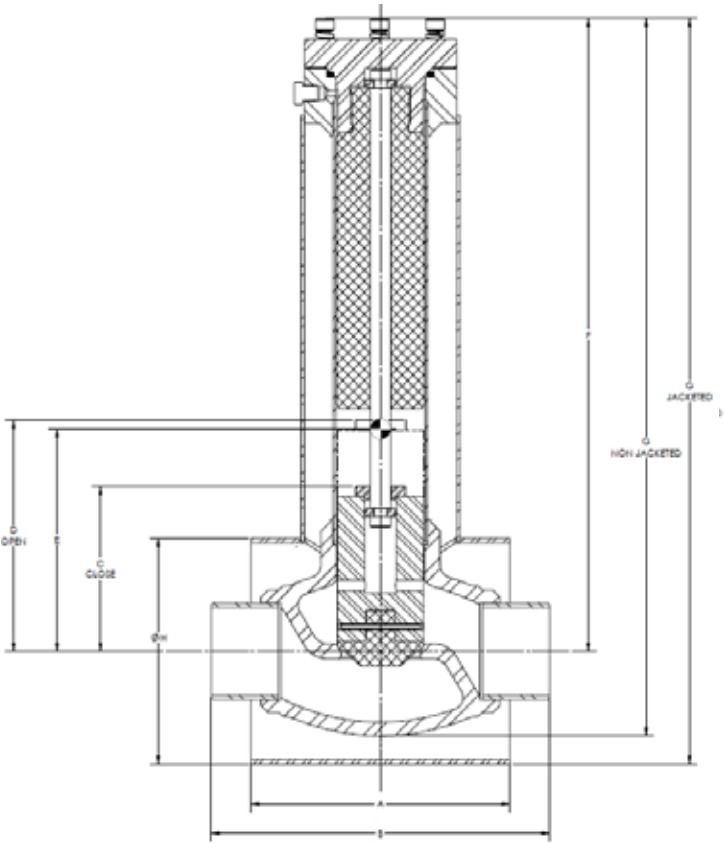
Applications

- Production, transportation, transfer, and storage of Liquid Hydrogen and other cryogenics
- Liquid Helium
- LIN, LAR, LOX, LNG, L-CO2

Lift Check Globe Valve

Materials of Construction

Description	Material
BODY	ASTM A351 CF8M
BODY STUB PIPE	ASTM A312 TP304
TOP PIPE FLANGE	ASTM A479 SS316
BODY NECK PIPE	ASTM A312 TP304
C-WASHER	ASTM A479 SS304
PTFE SLEEVE	PTFE
COVER	ASTM A479 SS316
DISC	ASTM A479 SS304
SEAT	PCTFE
STEM	1.4404/ASTM A479 SS316
DISC COVER PLATE	ASTM A479 SS304
SPIRAL WOUND GASKET	SS316 + GRAPHITE + PTFE
SLOTTED SPRING PIN	SS316
LOCK WASHER	SS316
SOCKET HEAD CAP SCREW	ASTM A320 B8 CL.2
NPT PLUG	SS316
INSULATION PIPE (HORIZONTAL)	ASTM A312 TP316
JACKETING PIPE (VERTICAL)	ASTM A312 TP316

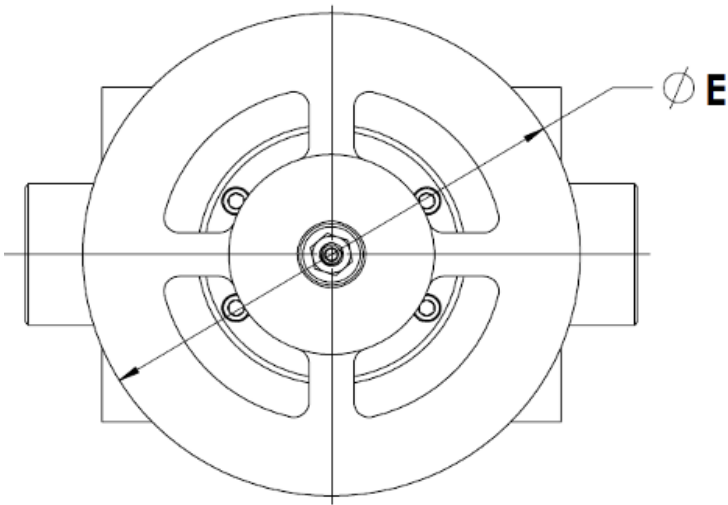


Size		CLASS	MAWP	A	B	C	D	E	F	G		ØH		Weight (lbs)		Flow Coefficient
in	mm									Jacketed	Non Jacketed	Jacketed	Non Jacketed	Jacketed	Non Jacketed	Jacketed
½"	10	300	300	3.75	4.75	2.96	3.96	5.52	12	13.4	13	2.875	2.5	9.6	7.2	9.7
¾"	20	300	300	4.38	5.38	2.96	3.96	4.94	12	13.7	13.3	3.5	3	10.7	8	14
1"	25	300	300	5.0	6.0	2.96	3.96	4.55	12	13.7	13.4	3.5	3	11.6	8.7	18
1 ½"	40	300	300	6.0	8.0	3.71	5.21	5.87	15.4	17.7	17.1	4.5	4	20.5	15.8	39
2"	50	300	300	6.5	8.5	4.07	5.47	5.7	15.6	18.4	17.17	5.57	5	30	23.3	58

Dimensions

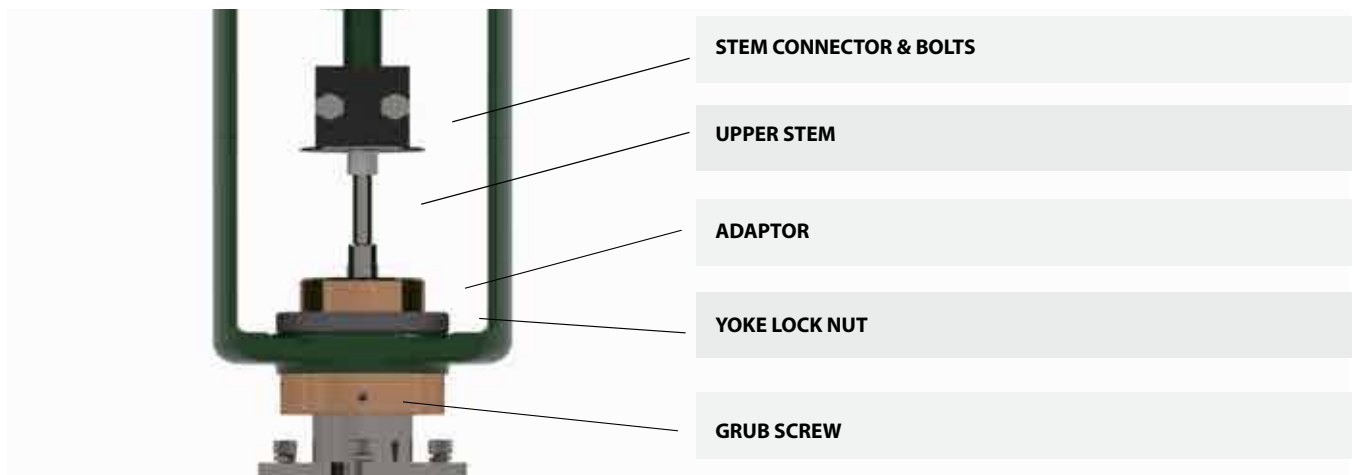
Ancillary Components

Handwheel (Lightweight).



Dimensions

Size (inches)	ØE (inches)	Jacketed Gross Weight (lbs)	Non-Jacketed Gross Weight (lbs)	Bare Stem Jacketed Weight (lbs)	Bare Stem Non-Jacketed Weight (lbs)
½"	10	14.0	11.5	15.0	12
¾"	20	15.1	12.4	15.6	12.8
1"	25	16.0	12.8	17.0	13.7
1 ½"	40	25.3	19.8	25.7	19.8
2"	50	36.0	28.7	36.5	29.5
3"	80	95.0	70.0	-	-
4"	100	152.7	132.0	-	-



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