

CRANE

CRYOFLO _{H₂}

Keeping Cryogenics Cool

TECHNICAL DATASHEET

BELLOWS SEAL GLOBE VALVES

Crane CRYOFLO®
High Performance
Bellows Seal Globe Valves

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Crane ChemPharma & Energy

 www.cranecpe.com

T-Bellows Seal Globe Valves Overview

Overview

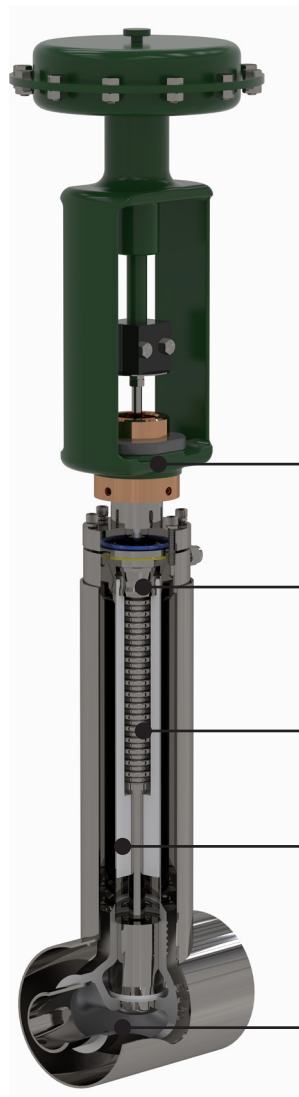
T-Bellows Seal Globe Valve

- 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.
- Can be installed bidirectionally.

Crane CRYOFLO® Bellows Seal T-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.

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.

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	
1	SIZE	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	Bellow Seal 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	
		S	Socket, pipe	
		R	Socket, tube	
		C	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	
		SZ	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	
MZ	Cold box, O2 Clean			

Bellows Seal Globe Valve Design Details

Size Range

- ½" - 6" NPS

Pressure Ratings

- 300 psi MAWP

Materials of Construction

- CF8M/SS316 body, bonnet & stem
- CF8/SS304 disc

Design Standards & Compliance

- ASME B16.34
- Tested to API-598
- Designed and Tested to MSS-SP-134
- Designed and Tested to ISO-28921
- ISO 15848
- Fire Safe Design (option)
- KGS Approval

Temperature Range

- Designed for -253°C to 100°C (-423°F to 212°F)

End Connections

- Pipe stub ends
- Butt-weld

Assembly Configurations

- Vacuum Jacketed and Non-Jacketed
- Extended bonnet/stem per MSS-SP-134
- Custom extended bonnets/stems available
- Cold-box Cuff option

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-Centerline PCTFE Seat
- ANSI Class 6 Leak Rate

Standard Features

- Proprietary PTFE Insert Design to limit bonnet dead volume
- Light weight design to limit cool down heat
- Metal-to-metal secondary seat seal
- Spiral wound bonnet flange gasket for improved

Actuation Options

- Handwheel
- Pneumatic actuation
- Electric actuation
- Actuator mounting kit for easy conversion between handwheel and actuator

Options

- Oxygen cleaning per CGA G-4.1
- Cold Box Cuff
- Extended Bonnet & Stem lengths

Applications

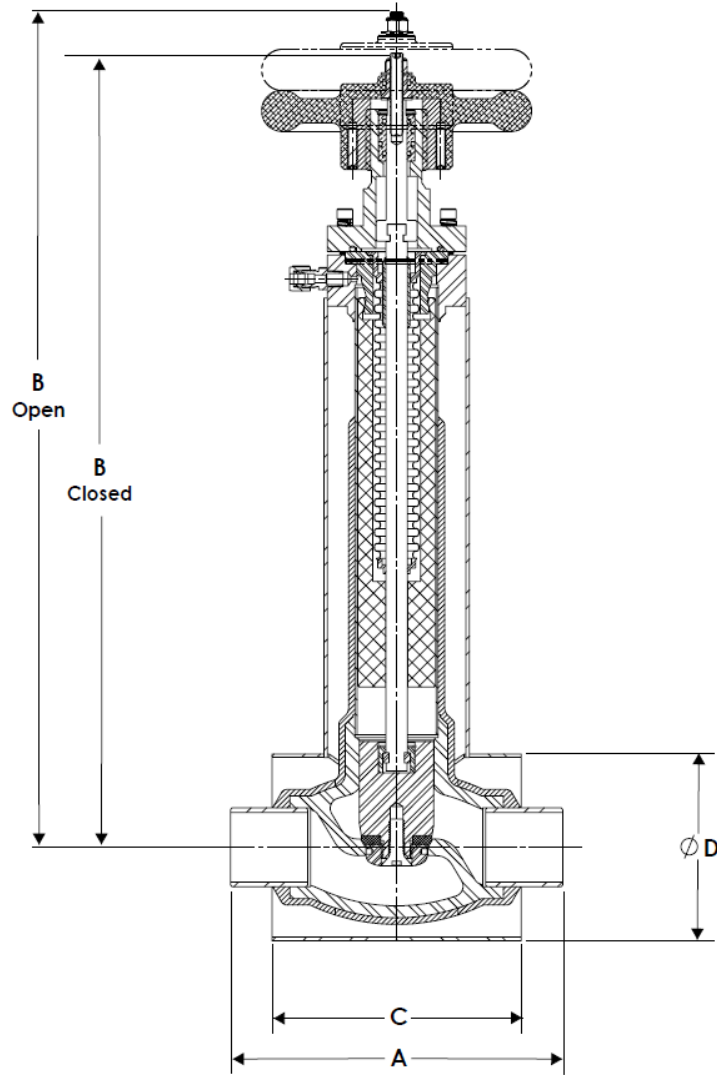
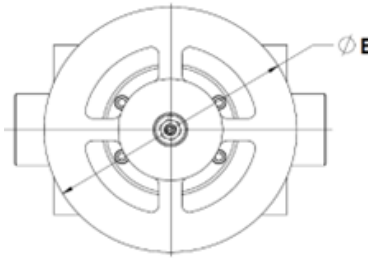
- Production, transportation, transfer, and storage of Liquid Hydrogen and other cryogenics
- Liquid Helium
- LIN, LAR, LOX, LNG, L-CO2

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	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



Dimensions

Size		Pipe Ends		(Open)		(Closed)					Weight	Flow Coefficient	Heat Flux			
in	mm	A	B	B	B	C	D	E	(lbs)	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	6.5	165.1	14.0	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	6.5	165.1	15.1	14	6.1
1"	25	6.0	152.4	16.3	414.02	15.5	393.7	5.0	127	3.5	88.9	6.5	165.1	16.0	17	7.9
1 ½"	40	8.0	203.2	20.0	508	19.1	485.14	6.0	152.4	4.5	114.3	6.5	165.1	25.3	35	8.6
2"	50	8.5	215.9	22.1	561.34	20.6	523.24	6.5	165.1	5.56	141.224	8.0	203.2	36.0	57	13.0
3"	80	14.0	355.6	28.0	711.2	26.0	660.4	12.0	304.8	6.63	168.402	9.0	228.6	95.0	136	-
4"	100	15.5	393.7	35.9	911.86	33.4	848.36	13.25	336.55	8.63	219.202	10.75	273.05	152.7	182	-

Y-Bellows Seal Globe Valves Overview

Overview

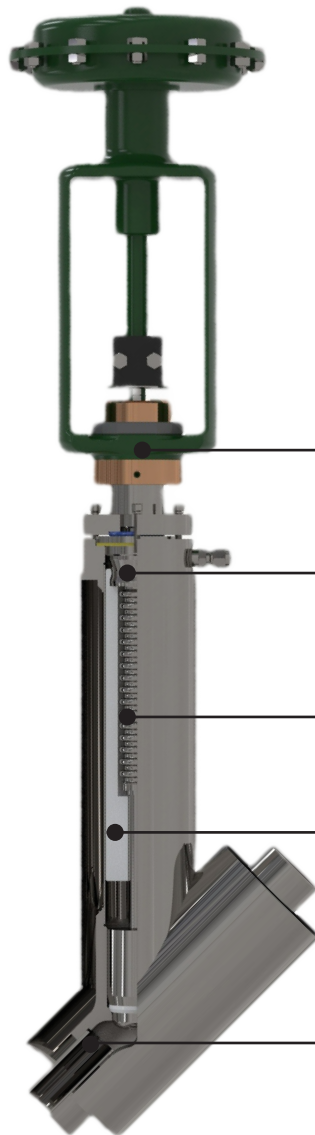
Y-Bellows Seal Globe Valve

- 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 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.

Unique cartridge replacement system for efficient in-line maintenance.

Proven bellows design for high life cycle.

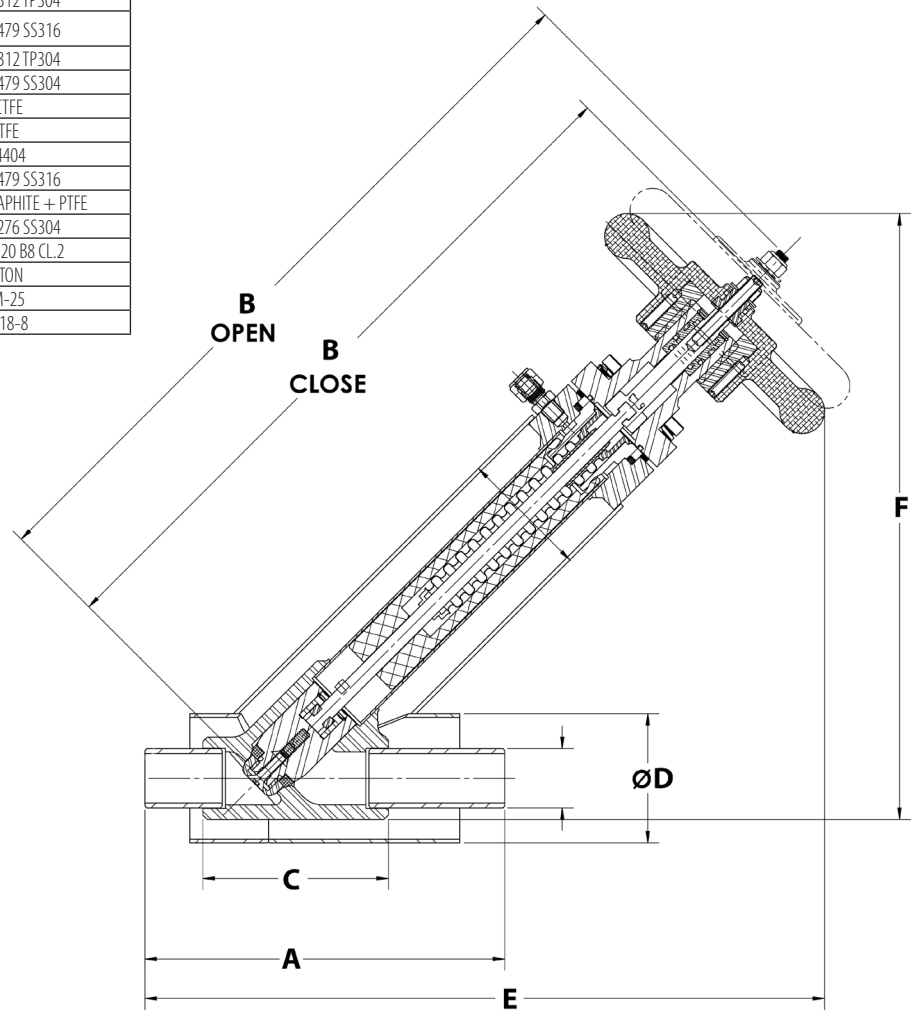
Vacuum barrier and Improved design minimizes heat leak and media boil-off.

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 BELLOWS	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



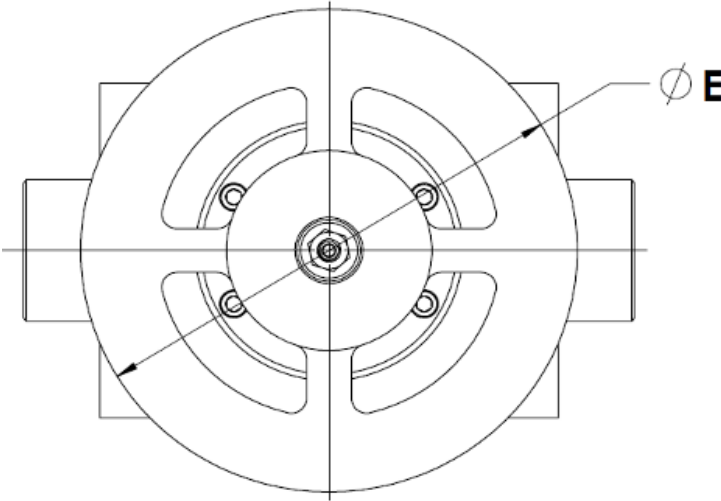
Dimensions

Size		Pipe Ends		(Open)		(Closed)		Valve Body		Vacuum Jacketed		Valve Envelope				Weight	Flow Coefficient	Heat Flux
in	mm	A		B		B		C		D		E		F		(lbs)	Cv	(BTU/HR)
1/2"	10	4.75	120.65	16.2	411.48	15.4	391.16	4.13	104.90	2.9	73.15	15	381.00	13.4	340.36	14.29	11	6.12
3/4"	20	5.375	136.525	16.3	414.02	15.5	393.7	4.13	104.90	2.9	73.15	15	381.00	13.5	342.90	14.95	14	6.12
1"	25	6.0	152.4	16.3	414.02	15.5	393.7	4.13	104.90	2.9	73.15	15.1	383.54	13.5	342.90	15	22.5	7.88
1 1/2"	40	8.0	203.2	20.0	508	19.1	485.14	5.1	129.54	4	101.60	19	482.60	16.5	419.10	25.19	47	8.64
2"	50	8.5	215.9	22.1	561.34	20.6	523.24	6	152.40	4.5	114.3	20.5	660.40	18.7	474.98	35.8	96.5	12.96
3"	80	14.0	355.6	28.0	711.2	26.0	660.4	10	254.00	5.6	141.22	26	834.90	22.5	571.50	95.0	166	-
4"	100	15.5	393.7	35.9	911.86	33.4	848.36	11.3	285.75	6.6	168.40	32.9	834.90	29.8	757.43	154.1	284	-

Dimensions

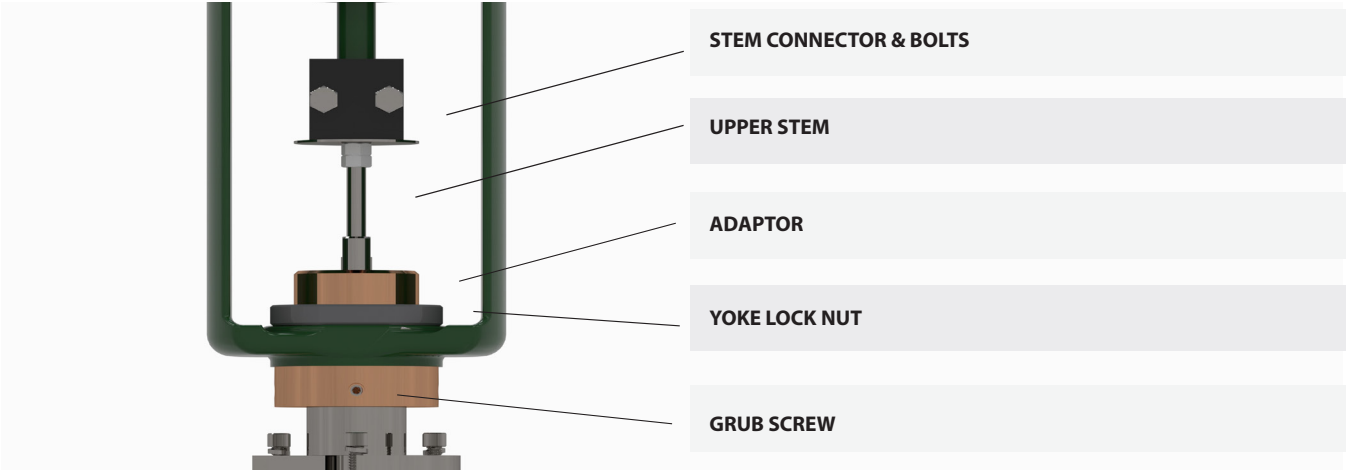
Ancillary Components

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	-	-



Technical Design Details

T Globe Valve

Valve Design						Valve Envelope		
Size		Design Pressure	Minimum Fluid design Temperature	Min - Max Ambient	Possible Heights of extension	Valve Seat Type	Face to Face Pipe Ends	Centerline to Top of Valve (Open)
in	mm	barg/psig	[°C]	[°C]	[mm/in]		in.	in.
1/2"	15	20.7 / 300	-254	100	414 / 16.3	Quick Opening	4.75	16.20
3/4"	20	20.7 / 300	-254	100	414 / 16.3	Quick Opening	5.38	16.30
1"	25	20.7 / 300	-254	100	414 / 16.3	Quick Opening	6.00	16.30
1 1/2"	40	20.7 / 300	-254	100	508 / 20	Quick Opening	8.00	20.10
2"	50	20.7 / 300	-254	100	561 / 22.1	Quick Opening	8.50	22.00

Y Globe Valve

Valve Design						Valve Envelope		
Size		Design Pressure	Minimum Fluid design Temperature	Min - Max Ambient	Possible Heights of extension	Valve Seat Type	Face to Face Pipe Ends	Centerline to Top of Valve (Open)
in	mm	barg/psig	[°C]	[°C]	[mm/in]		in.	in.
1/2"	15	20.7 / 300	-254	100	340 / 13.4	Quick Opening	7.87	16.70
3/4"	20	20.7 / 300	-254	100	340 / 13.4	Quick Opening	7.87	16.70
1"	25	20.7 / 300	-254	100	340 / 13.4	Quick Opening	8.00	16.70
1 1/2"	40	20.7 / 300	-254	100	445 / 17.5	Quick Opening	10.50	20.40
2"	50	20.7 / 300	-254	100	465 / 18.3	Quick Opening	10.50	22.90

Lift Check

Valve Design						Valve Envelope		
Size		Design Pressure	Minimum Fluid design Temperature	Min - Max Ambient	Possible Heights of extension	Valve Seat Type	Face to Face Pipe Ends	Centerline to Top of Valve (Open)
in	mm	barg/psig	[°C]	[°C]	[mm/in]		in.	in.
1/2"	15	20.7 / 300	-254	100	10.8	Lift Check	4.75	12.00
3/4"	20	20.7 / 300	-254	100	10.8	Lift Check	5.38	12.00
1"	25	20.7 / 300	-254	100	10.8	Lift Check	6.00	12.00
1 1/2"	40	20.7 / 300	-254	100	14.3	Lift Check	8.00	15.50
2"	50	20.7 / 300	-254	100	14.3	Lift Check	8.50	17.00

NOTES

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