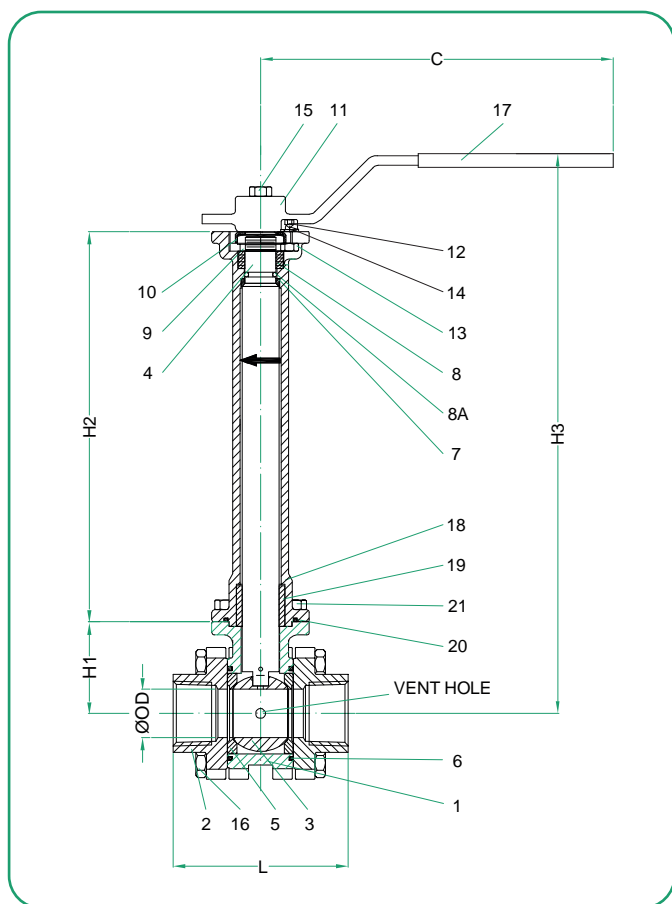

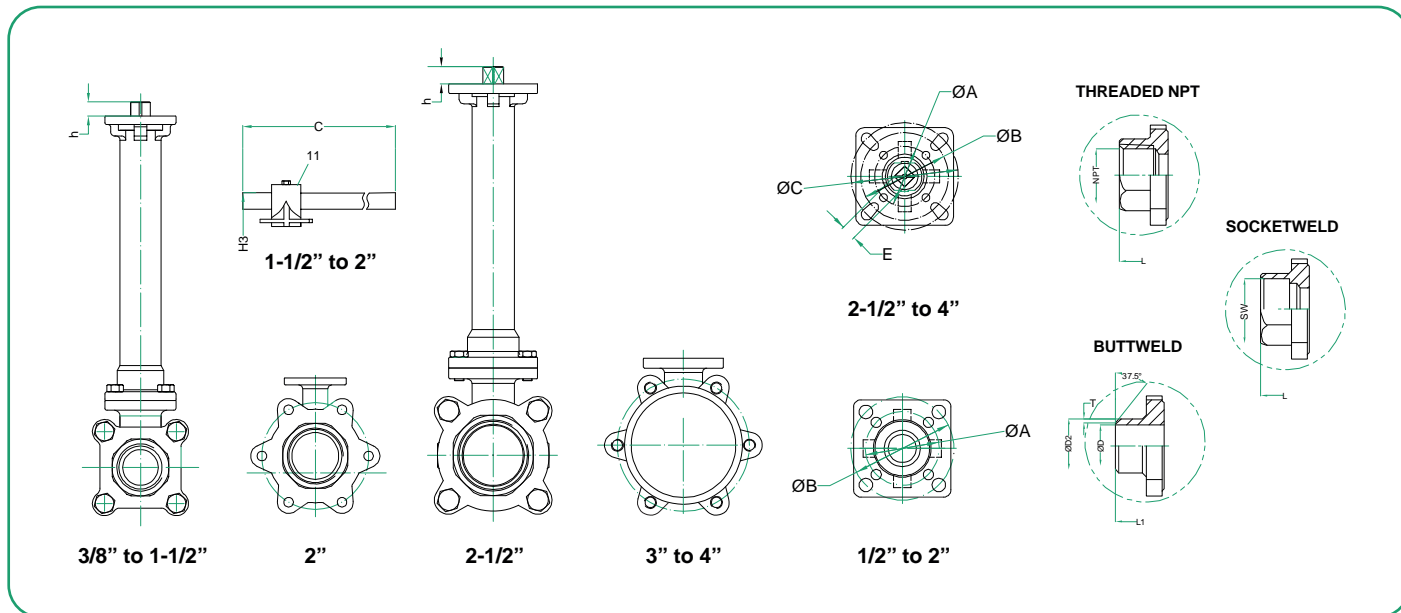


## Features / Design



- 1.- For cryogenic applications, TFV offers **Series 23CF Ball Valve** to suite different low temperature conditions. These kind of ball valves are widely used in the following applications: Liquefied Natural Gas (LNG) storage and transportation systems, liquified gas (nitrogen, oxygen, helium, argon, etc.), food processing, rubber production, medical, solar panels production, electronic manufacturing and air separation industries. Series 2CF cryogenic ball valves have been fully tested to BS 6364:1984 standard. Compare with other cryogenic valves, 2CF offers large flow rate, bubble tight sealing, long operating life, and easy maintenance.
- 2.- **Stem Extension.** The extended stem allows the liquified gas to evaporate inside the stem, and prevents damage to sealing rings and packing due to low temperature condition; thus, maintain the smooth operation of the ball valves and tight sealing. This design is different from conventional extended spindle: stem packings, stem washers, and o-rings are located on the top of the extension. This design avoids direct contact with the low temperature fluid, and ensures duly valve operation. Meantime, the design reduces the heat losses from the stem, and provides an insulation between the pipeline and the manual / automation operator.
- 3.- **Relief hole on the upstream side of the ball** prevents overpressure of the body cavity from thermal expansion. When temperature rises, fluid inside the bore expands multiple times the original volume due to the phase change from liquid to gas. It becomes very dangerous and may result in explosion. Relief hole acts as a pressure reducing mechanism to relieve pressure back to the upstream. The valve is thus uni-directional with an arrow showing flow direction.
- 4.- For ultra-low temp. condition, PCTFE material is preferred than conventional PTFE material. Compare with PTFE, PCTFE has higher mechanical strength and hardness, offers superior performance in -196°C condition.
- 5.- **CE Marking**  -0035
- 6.- **The whole series of ball valves are approved according to European Directive 2014/68/EU.**
- 7.- Pressure Rating: 2000 psi for ½" - 2" (DN15 - DN50)  
 1000 psi for 2½" (DN65) and above  
 150 psi with saturated steam
- 8.- Ends: Threaded End (ASME B1.20.1), Butt-welding (ASME B16.25), Socket-welding (ASME B16.11).
- 9.- Temperature Range: -320°F ~ 400°F (-196°C ~ 204°C) with PCTFE seats.
- 10.- Valve body and end cap connections are high quality investment casting. Body and end cap are designed based on ASME B16.34. All valves are factory tested to API 598 or EN12266-1 and MSS SP-72. Series 23CF ball valves have been tested and conform to BS 6364 Cryogenic Ball Valve standard.

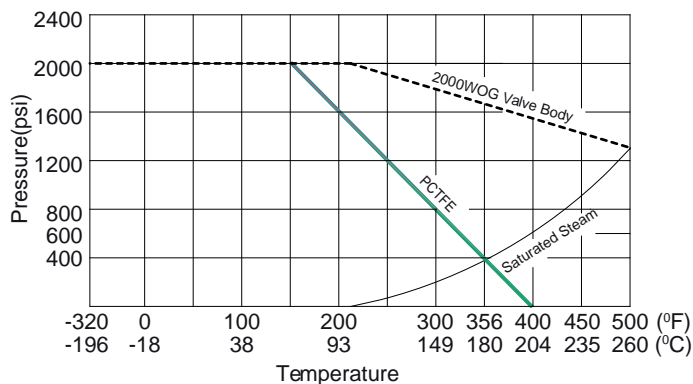
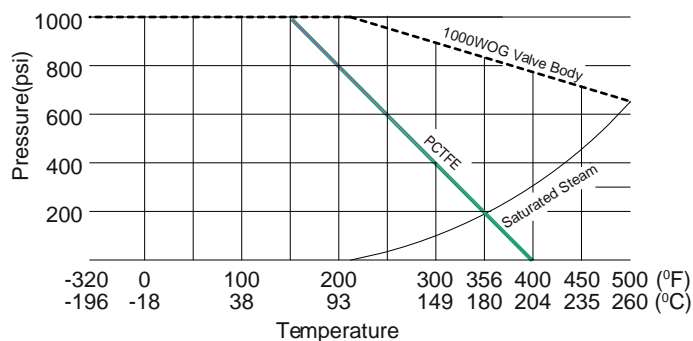




## Material List

NO.	PART NAME	MATERIAL
1	BODY	A216 WCB / A351 CF8M
2	END CAP	A216 WCB / A351 CF8M
3	BALL	A351 CF8M
4	ANTI STATIC STEM	17 - 4 PH SS
5	BALL SEAT	PCTFE
6	BODY SEAL	GRAFOIL
7	THRUST WASHER	PCTFE
8	STEM PACKING	PCTFE
8A	O.RING	VITON
9	STEM NUT	SS304
10	LOCK SADDLE	SS304
11	HANDLE	SS304
12	STOP PIN	SS304
13	STOP PIN NUT	SS304
14	STOP PIN WASHER	SS304
15	HANDLE BOLT	SS304
16	BODY BOLT	SS304
17	HANDLE SLEEVE	VINYL
18	EXTENSION	A216 WCB / A351 CF8M
19	THRUST BEARING	25% CARBON + 75% PTFE
20	EXTENSION GASKET	GRAFOIL
21	EXTENSION BOLT	SS304

## Pressure-Temperature Chart



----- Body Pressure      ————— PCTFE



## Dimensions (inches)

SIZE	ØOD (in)	L <sup>(1)</sup> (in)	L <sup>(2)</sup> (in)	NPT (in)	SW (in)	P MIN (in)	ØD (in)	ØD2 (in)	ØC (in)	E (in)	ISO5211	ØA (in)	ØB (in)	ØC (in)	H1 (in)	H2 (in)	H3 (in)	h (in)	CV (USgpm)	Torque (Lb*in)	Weight (Lb)
1/4"	0.378	2.638	2.638	1/4"	0.567 ± 0.008	0.374	0.409	*	6.142	0.354	F04 / F05	1.654	1.969	/	1.535	7.874	10.787	0.315	*	*	3.880
1/2"	0.591	2.953	2.953	1/2"	0.866 ± 0.008	0.374	0.622	0.839	6.142	0.354	F04 / F05	1.654	1.969	/	1.535	7.874	10.787	0.315	19.0	150.0	4.057
3/4"	0.787	3.150	3.543	3/4"	1.078 ± 0.008	0.492	0.823	1.051	6.142	0.354	F04 / F05	1.654	1.969	/	1.677	7.874	10.866	0.315	35.0	180.0	4.850
1"	0.984	3.543	3.937	1"	1.342 ± 0.008	0.492	1.047	1.315	7.126	0.433	F05 / F07	1.969	2.756	/	1.858	7.874	11.299	0.394	50.0	240.0	6.239
1 1/4"	1.220	4.331	4.331	1 1/4"	1.689 ± 0.008	0.492	1.378	1.661	7.126	0.433	F05 / F07	1.969	2.756	/	2.016	7.874	11.496	0.394	110.0	340.0	8.157
1 1/2"	1.496	4.724	4.921	1 1/2"	1.929 ± 0.010	0.492	1.606	1.902	15.551	0.551	F07 / F10	2.756	4.016	/	2.303	11.811	15.866	0.512	200.0	455.0	16.336
2"	1.969	5.512	5.906	2"	2.419 ± 0.010	0.630	2.067	2.374	15.551	0.551	F07 / F10	2.756	4.016	/	3.000	11.811	16.654	0.512	350.0	650.0	20.944
2 1/2"	2.500	7.283	7.480	2 1/2"	2.919 ± 0.010	0.630	2.594	2.874	19.488	0.669	F07 / F10	2.756	4.016	F12	3.638	11.850	17.244	0.748	*	*	30.644
3"	2.992	8.071	8.661	3"	3.545 ± 0.010	0.630	3.067	3.500	19.488	0.669	F07 / F10	2.756	4.016	F12	4.012	11.850	17.638	0.748	1100.0	1100.0	43.211
4"	3.819	9.449	10.630	4"	4.545 ± 0.010	0.630	4.028	4.500	25.591	0.866	F07 / F10	2.756	4.016	F12	4.862	11.850	18.465	0.827	2100.0	1600.0	66.139

**NOTES:**

\* Please consult with manufacturer.

(1) Face to face distance for socket weld and threaded connection.

(2) Face to face distance for butt weld connection.



## How to Order

DESIGN (SERIES)	SPECIAL FEATURES	MATERIAL			ENDS	SIZE		OPERATION
		BODY	TRIM	SEAT				
<b>23CF</b> Full Port 2 Pcs Ball Valve Cryogenic Service 2000 WOG <sup>(3)</sup>	<b>None</b> None	<b>2</b> WCB	<b>3</b> 316 SS	<b>P</b> PTFE	<b>T</b> Threaded	<b>0.25</b>	1/2"	<b>L</b> Manual Lever Operator
	<b>F</b> Fire Safe API 607	<b>3</b> CF8M	<b>4</b> 304 SS	<b>M</b> MF1241	<b>M</b> Two different ends to be specify on each order	<b>0.5</b>	3/4"	<b>C</b> Manual Lever with Locking Device
	<b>O</b> Oxygen Service	<b>4</b> CF8		<b>Y</b> PCTFE <sup>(5)</sup>		<b>0.75</b>	1"	
		<b>22</b> LCB <sup>(4)</sup>			<b>S</b> Socket Weld	<b>01</b>	1 1/2"	<b>B</b> Bare Shaft
					<b>B</b> Butt Weld	<b>01.25</b>	2"	<b>P</b> Pneumatic Actuator
						<b>01.5</b>	2 1/2"	
						<b>02</b>	3"	<b>E</b> Electric Actuator
						<b>02.5</b>	4"	
						<b>03</b>		
						<b>04</b>		

### Example:

Full Port Cryogenic Service Ball Valve, Body & Trim 316 SS, Seats: PCTFE, Ends: Threaded, 1/2" 2000# WOG, Manual Lever with Locking Device.

**23CF33YT02C**

NOTES:

- (3) 2000 psi for 1/2" - 2" (DN15 - DN50), 1000 psi for 2 1/2" (DN65) and above; 150 psi with saturated steam.
- (4) Low Temp Carbon Steel: ASTM A351 Gr. LCB.
- (5) For ultra-low temperature conditions, PCTFE material is preferred than conventional PTFE material.

