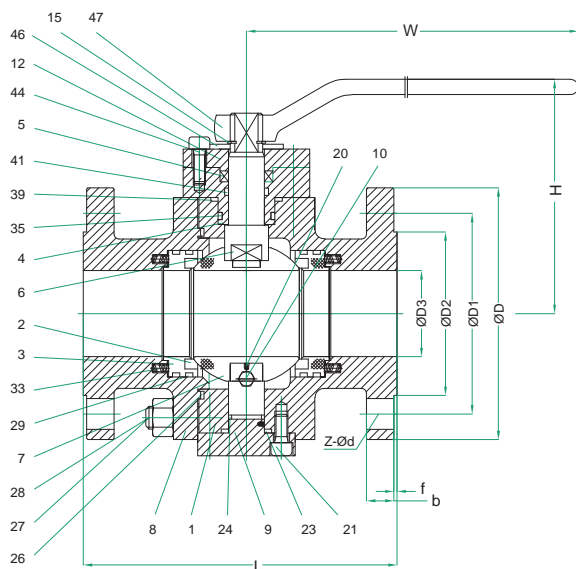




## Features / Design

- 1.- **TFV 3T Series** is a trunnion mounted ball valve. A trunnion ball valve has the ball held on a fixed axis and which allows the ball to turn - also called fixed ball valve. Due to its design the ball is fixed and it does not move when pressed so it is suitable for high pressure and large diameter valves.
- 2.- Design & Manufacture: API 6D.
- 3.- Body Structure: Split Body, Side Entry.
- 4.- Bore: Full Bore / Reduced Bore
- 5.- Connection: Flanged (ASME B16.5 & B16.47 A/B), BW (ASME B16.25), etc.
- 6.- Face to Face: ASME B16.10.
- 7.- Operation: Lever / Gear Operated, Pneumatic Operated, Motor Operated, Gas over Oil Actuator, etc.
- 8.- Pressure & Temperature: ASME B16.34.
- 9.- Test & Inspection: API 598.
- 10.- Fire Safe: API 607 / API 6FA.
- 11.- Visual Inspection: MSS-SP-55<sup>(1)</sup>.
- 12.- Marking: MSS-SP-25.
- 13.- Fugitive Emission: ISO 15848.
- 14.- Size: 4" ~ 48".
- 15.- Pressure Rating: ANSI 150# ~ 2500#.
- 16.- Temperature: -196°C ~ 600°C<sup>(2)</sup>.

### Design<sup>(3)</sup> for Class ASME 150# and ASME 300# for 2" to 4"



**NOTES:**

- (1) Only for casting version / materials.
- (2) Depending on seat material.
- (3) Due to size, for 150# and 300# for sizes 2in to 4in, only 2-pieces design available.

#### 17.- Other Features:

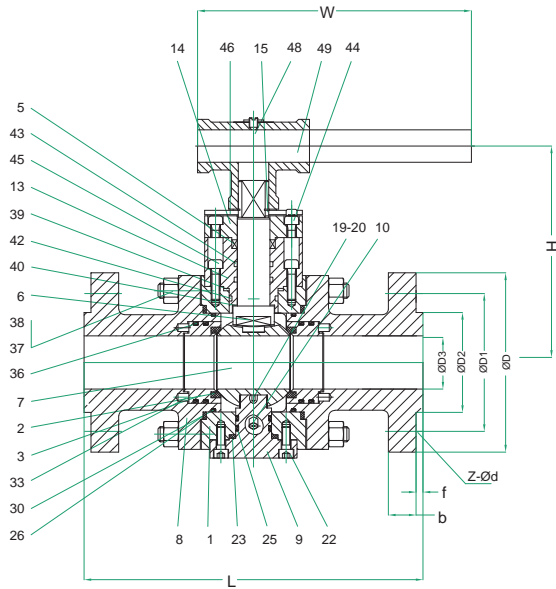
- Locking Device.
- Anti blowout design.
- Fire safe design.
- Antistatic design.
- Automatic cavity relief.
- Double Block & Bleed.
- Seat Sealant Injection.
- Stem Sealant Injection.

Applications: TFV Valve Trunnion Mounted Ball Valve is widely used in different applications, such like, Oil & Gas Field, Petrochemical Plant, Refineries, Power Generation Plant, Marine, Metallurgy, Paper & Pulp, Water & Waste Water Treatment, etc.

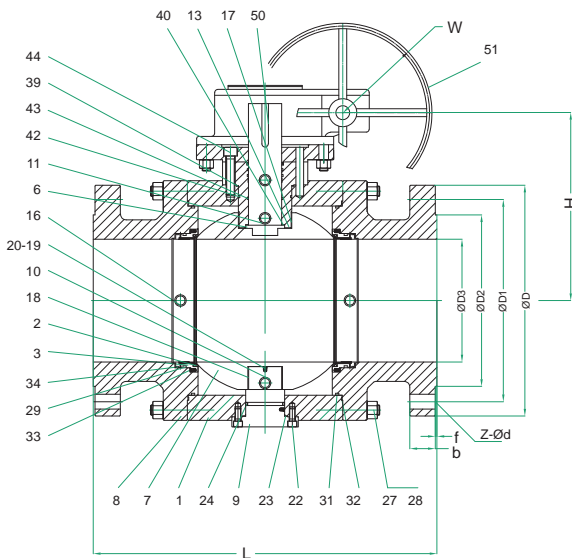


## Material List

**Design for Class ASME 600#  
for 2" to 4"**



**Design for Class ASME 150#, 300#,  
600# for 6" to 24"**



POS	NAME OF PART	MATERIAL
1	BODY	A105N / A182 F316
2	SEAT INSERT	R-PTFE
3	SEAT RING	A105 + ENP 75µm / A182 F316
4	PACKING SEAT	A105 / A182 F316
5	PACKING	GRAPHITE
6	STEM	AISI 4140 + ENP 75µm / A182 F316
7	BALL	A105 + ENP 75µm / A182 F316
8	COVER	A105N / A182 F316
9	TRUNNION	A105 + ENP 75µm / A182 F316
10	DRAIN VALVE	ASSEMBLY
11	VENT VALVE	ASSEMBLY
12	PACKING FLANGE	A105 / A182 F316
13	PACKING GLAND	A105 / A182 F316
14	GLAND COVER	A105 / A182 F316
15	ELASTIC BACK RING	65 Mn
16	INYECTION VALVE	ASSEMBLY
17	BEARING	SF-1
18	BEARING	SF-1
19	ANTI-STATIC BALL	SS316
20	ANTI-STATIC SPRING	SS316
21	SCREW BOLT	A193 B7M / A193 B8M
22	SCREW	A193 B7M / A193 B8M
23	SPIRAL WOUND GASKET	SS304 + GRAPHITE
24	O-RING	VITON
25	O-RING	VITON
26	SPIRAL WOUND GASKET	SS304 + GRAPHITE / SS316 + GRAPHITE
27	NUT	A194 2HM / A194 8M
28	BOLT	A193 B7M / A193 B8M
29	O-RING	VITON
30	O-RING	VITON
31	O-RING	VITON
32	GASKET	SS304 + GRAPHITE / SS316 + GRAPHITE
33	SPRING	X-750
34	O-RING	VITON
35	O-RING	VITON
36	O-RING	VITON
37	NUT	A194 2HM / A194 8M
38	BOLT	A193 B7M / A193 B8M
39	SPIRAL WOUND GASKET	SS304 + GRAPHITE / SS316 + GRAPHITE
40	THRUST WASHER	PTFE
41	O-RING	VITON
42	O-RING	VITON
43	O-RING	VITON
44	SCREW BOLT	A193 B7M / A193 B8M
45	SCREW BOLT	A193 B7M / A193 B8M
46	STOPPER	1025 + Zn
47	HAND LEVER	A216 WCB
48	SCREW BOLT	A193 B7M
49	T-TYPE	A216 WCB
50	PIN	420
51	GEAR OPERATOR	DI

NOTE: Material List as example, other materials, TRIMS and combinations available upon request, please contact us.



## Dimensions (inches)

### ANSI CLASS 150#

SIZE	L (in)	ØD (in)	ØD1 (in)	ØD2 (in)	ØD3 (in)	b (in)	f (in)	W (in)	Z (in)	Ød (in)	CV (USgpm)	Weight (lb)	Torque (lb*in)
2"	7.008	5.906	4.752	3.626	1.929	0.563	0.079	9.449	4	0.748	381.0	46.297	371.681
2 1/2"	7.520	7.087	5.500	4.126	2.520	0.626	0.079	12.598	4	0.748	560.0	59.525	769.912
3"	7.992	7.480	6.000	5.000	2.992	0.689	0.079	12.598	4	0.748	845.0	70.548	1238.938
4"	9.016	9.055	7.500	6.189	3.937	0.878	0.079	14.961	8	0.748	1523.0	110.231	1946.903
6"	15.512	11.024	9.500	8.500	5.906	0.941	0.079	11.811	8	0.886	338.0	361.558	3362.832
8"	17.992	13.583	11.752	10.626	7.913	1.063	0.079	11.811	8	0.886	6031.0	661.387	5663.717
10"	20.984	15.945	14.252	12.748	9.921	1.126	0.079	11.811	12	1.024	9442.0	970.035	106.469
12"	24.016	19.094	17.000	15.000	11.929	1.189	0.079	19.685	12	1.024	13614.0	1272.068	14646.018
14"	27.008	21.063	18.752	16.252	13.150	1.315	0.079	23.622	12	1.142	16621.0	1893.772	24734.513
16"	30.000	23.425	21.252	18.500	15.157	1.378	0.079	23.622	16	1.142	21920.0	2522.090	33230.088
18"	34.016	25.000	22.752	21.000	17.165	1.500	0.079	23.622	16	1.260	28076.0	3174.659	45044.248
20"	35.984	27.559	25.000	23.000	19.173	1.626	0.079	23.622	20	1.260	34995.0	4285.790	56681.416
24"	42.008	32.087	29.500	27.252	23.189	1.815	0.079	31.496	20	1.378	5117.0	6179.562	108761.062

NOTE: Weight, height from the center to lever / handwheel and lever length / handwheel diameter are reference.

### ANSI CLASS 300#

SIZE	L (in)	ØD (in)	ØD1 (in)	ØD2 (in)	ØD3 (in)	b (in)	f (in)	W (in)	Z (in)	Ød (in)	CV (USgpm)	Weight (lb)	Torque (lb*in)
2"	8.504	6.496	5.000	3.626	1.929	0.815	0.079	9.449	8	0.748	381.0	55.116	707.965
2 1/2"	9.488	7.480	5.874	4.126	2.520	0.941	0.079	12.598	8	0.886	560.0	74.957	1327.434
3"	11.142	8.268	6.626	5.000	2.992	1.063	0.079	12.598	8	0.886	845.0	101.413	1946.903
4"	12.008	10.039	7.874	6.189	3.937	1.189	0.079	14.961	8	0.866	1523.0	169.756	3185.841
6"	15.866	12.598	10.626	8.500	5.906	1.378	0.079	11.811	12	0.866	338.0	376.991	6017.699
8"	19.764	14.961	13.000	10.626	7.913	1.563	0.079	11.811	12	1.024	6031.0	709.889	10442.478
10"	22.362	17.520	15.252	12.748	9.921	1.815	0.079	15.748	16	1.142	9442.0	1190.497	18761.062
12"	25.512	20.472	17.717	15.000	11.929	1.941	0.079	19.685	16	1.260	13614.0	1682.128	22035.398
14"	30.000	23.031	20.252	16.252	13.150	2.063	0.079	23.622	20	1.260	16621.0	2149.509	37300.885
16"	32.992	25.591	22.500	18.500	15.157	2.189	0.079	23.622	20	1.378	21920.0	30886.474	49911.504
18"	35.984	27.953	24.748	21.000	17.165	2.315	0.079	23.622	24	1.378	28076.0	3860.297	72920.354
20"	39.016	30.512	27.000	23.000	19.173	2.441	0.079	23.622	24	1.378	34995.0	5465.264	97522.124
24"	45.000	36.024	32.000	27.252	23.189	2.689	0.079	31.496	24	1.614	5117.0	6371.365	171504.425

NOTE: Weight, height from the center to lever / handwheel and lever length / handwheel diameter are reference.



## Dimensions (inches)

### ANSI CLASS 600#

SIZE	L (in)	ØD (in)	ØD1 (in)	ØD2 (in)	ØD3 (in)	b (in)	f (in)	W (in)	Z (in)	Ød (in)	CV (USgpm)	Weight (Lb)	Torque (Lb*in)
2"	11.496	6.496	5.000	3.626	1.929	1.000	0.276	9.449	8	0.748	381.0	72.753	1017.699
2 1/2"	12.992	7.480	5.874	4.126	2.441	1.126	0.276	23.622	8	0.886	560.0	110.231	1592.920
3"	14.016	8.268	6.626	5.000	2.913	1.252	0.276	23.622	8	0.886	845.0	141.096	2955.752
4"	17.008	10.827	8.500	6.189	3.937	1.500	0.276	31.496	8	1.024	1523.0	257.941	4070.796
6"	22.008	13.976	11.500	8.500	5.906	1.878	0.276	11.811	12	1.142	2500.0	628.318	8849.558
8"	25.984	16.535	13.748	10.626	7.913	2.189	0.276	11.811	12	1.260	3381.0	996.490	17699.115
10"	30.984	20.079	17.000	12.748	9.921	2.500	0.276	15.748	16	1.378	6031.0	1622.604	31681.416
12"	32.992	22.047	19.252	15.000	11.929	2.626	0.276	19.685	20	1.378	9442.0	2204.624	52123.894
14"	35.000	23.819	20.748	16.252	13.150	2.752	0.276	23.622	20	1.535	13614.0	2939.946	57699.115
16"	39.016	26.969	23.748	18.500	15.157	3.000	0.276	23.622	20	1.614	16621.0	3814.000	776858.407
18"	42.992	29.331	25.748	21.000	17.165	3.252	0.276	23.622	20	1.772	21920.0	5037.567	118141.593
20"	47.008	32.087	28.500	23.000	19.173	3.500	0.276	23.622	24	1.772	28076.0	6203.813	163628.319
24"	55.000	37.008	33.000	27.252	23.189	4.000	0.276	31.496	24	2.008	349950	10846.752	273274.336

NOTE: Weight, height from the center to lever / handwheel and lever length / handwheel diameter are reference.

## Construction / Function / Features

### 1. Full Bore Design.

According to the customer's demand, full bore or reduced bore can be provided. The full bore valve has the diameter of channel completely equal to the inner diameter of pipe to facilitate to clean the pipe.

### 2. Fire-Proof Structure.

When the fire happens or the temperature rises to make PTFE soften to damage, the fire proof seta surface of thje seat supported circle can contact with ball to have seal function. This conforms to the requirements of API 607 or API 6FA.

### 3. Block and Bleed Function.

Fixed ball valve adopts spring to pre-tighten and seat seal is double pistons. It adopts piston principle to seal. Upstream and downstream seat make fluid stop. And the emptying valve installed on the middle cavity is used to empty and blow down valve installed at the bottom of valve to clear off dirt ti facilitate to clean the pipe.

### 4. Urgent help to seal.

Due to the dirt or fire make unusual failure of seat seal, sealant injection valve provide the quick connection with sealant injection gun. And it is convenient to inject seal grease into the seal part of the seat to reduce leakage.

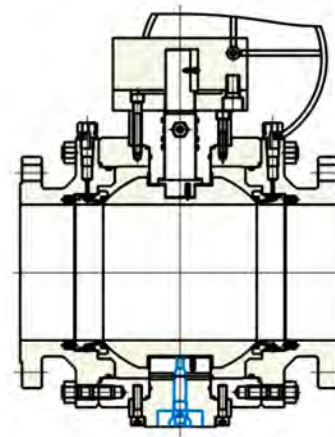


FIG 1. Full Bore Design.

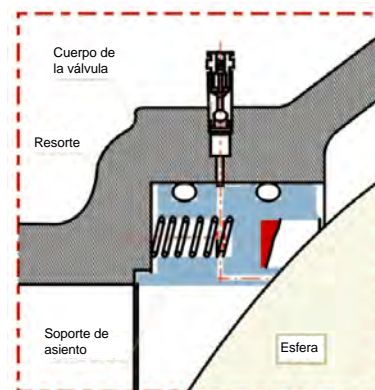


FIG 2. Fire-proof Structure.

## Construction / Function / Features

### 5. Automatic Relief.

When medium in the middle cavity unusually raises pressure for the rising of temperature, outlet of seat has automatic relief function. At the same time, according to the demands, the safety valve can be installed on the body to ensure the automatic relief function of body, so that the pipe can be safe.

### 6. Anti-static Design.

Chrome and nickel stainless steel spring and small ball are adopted to make electroconductive among ball. Stem and body to completely release static.

### 7. Operational Reliability.

For large ball valve, the TFE is adopted for seat and stem bearing, the relative movement at bearing portion requires less operational torque force because of less friction of the TFE, in addition, the long time lubrication of the sealants makes the operation more effective.

### 8. Seat Design.

There are two kinds of seta design, single seal and double seal. The former normally has relief function, the latter relieves the pressure through the safety valve on the body.

### 9. Extended Stem.

The extended stem is designed for underground and low temperature service. The length of stem depends on the service requirement. The operation methods include manual pneumatic-hydraulic, etc.

### 10. Sealing of Stem Gland.

The sealing gland is accomplished by arrangement of four o-rings and a sealant injection device.

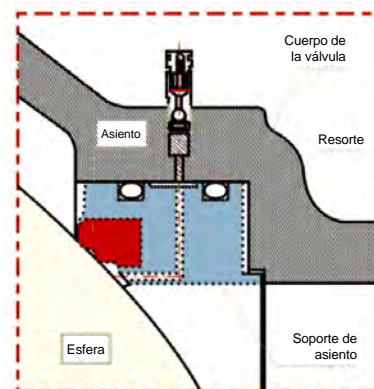


FIG 3. Urgent Help of Seal.

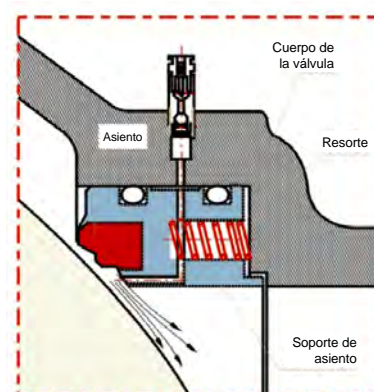


FIG 4. Automatic Relief.

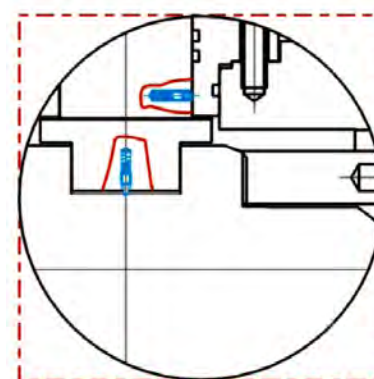
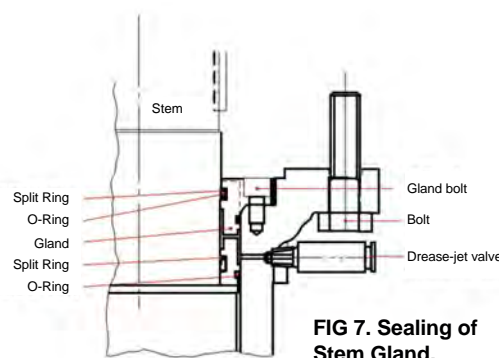
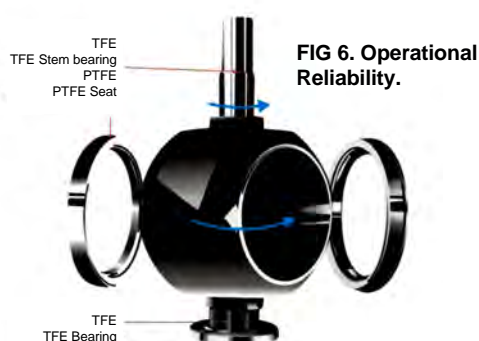


FIG 5. Anti-static Device.



## How to Order

VALVE BODY DESIGN (SERIES)	SPECIAL FEATURES	MATERIAL			ENDS	CLASS	SIZE	OPERATION
		BODY <sup>(4)</sup>	TRIM <sup>(5)</sup>	SEAT				
<b>3TF</b> Full Port 3 pcs Trunnion Ball Valve	<b>NONE</b> None	<b>20</b> A105/WCB/A516	<b>20</b> 4140+ENP / A105+ENP / A105+ENP	<b>P</b> PTFE	<b>F</b> Flanged RF	<b>0</b> ANSI 150#	<b>02</b> 2"	<b>L</b> Manual Lever Operator
	<b>F</b> Fire Safe API 607	<b>22</b> A350 LF2		<b>R</b> RPTFE		<b>3</b> ANSI 300#	<b>02.5</b> 2 1/2"	
<b>3TS</b> Std. Port 3 pcs Trunnion Ball Valve	<b>N</b> NACE	<b>23</b> A350 LF3	<b>21</b> 4140+ENP / 4140+ENP / 410+STL	<b>N</b> Nylon	<b>R</b> Flanged RTJ	<b>6</b> ANSI 600#	<b>03</b> 3"	<b>C</b> Manual Lever Operator with Locking Device
		<b>24</b> A182 F1		<b>K</b> PEEK		<b>9</b> ANSI 900#	<b>04</b> 4"	
<b>3TW</b> Full Port 3 pcs Full Welded Trunnion Ball Valve	<b>G</b> NACE/ Fire Safe API 607	<b>25</b> A182 F11 CL2	<b>22</b> 4140+ENP / LF2+ENP / LF2+ENP	<b>L</b> Devlon	<b>B</b> Butt Weld	<b>1</b> ANSI 1500#	<b>06</b> 6"	<b>B</b> Bare Shaft
		<b>26</b> A182 F22 CL3		<b>T</b> PCTFE		<b>2</b> ANSI 2500#	<b>08</b> 8"	
		<b>27</b> A182 F5	<b>23</b> 4140+HC / A105+HC / A105+HC	<b>V</b> Viton		<b>10</b> 10"		
		<b>28</b> A182 F9		<b>H</b> PTFE/ PEEK		<b>12</b> 12"		
		<b>30</b> A182 F316	<b>30</b> A182 F316 / A182 F316 / A182 F316	<b>M</b> Molon		<b>14</b> 14"		
		<b>31</b> A182 F316L				<b>16</b> 16"		
		<b>32</b> A182 F304	<b>31</b> A182 F316L / A182 F316 / A182 F316	<b>18</b> 18"				
		<b>33</b> A182 F304L		<b>20</b> 20"				
		<b>40</b> Monel		<b>24</b> 24"				
		<b>41</b> Alloy 20		<b>28</b> 28"				
		<b>42</b> Hastelloy		<b>30</b> 30"				
		<b>43</b> A182 321		<b>36</b> 36"				
		<b>44</b> A182 347						
		<b>45</b> Duplex						

### Example:

3 Pcs Trunnion Ball Valve, Acc. to API 6D, Fire Safe API 607 and NACE MR0175, Body A105, Stem 4140, Ball & Seat Ring A105+ENP, PTFE Insert, Flanged RF ANSI Class 600#, Size 4" with Manual Lever.

**3TF2020PF604L**

NOTES:

(4) Different materials available upon request.

(5) Main TRIM combinations as shown (Stem, Ball & Seat Ring), however there could be more options available upon customer request.

ENP = Electroless Nickel Plating.

HC = Hard Chrome Plating.

(6) Please contact us for more available sizes.

