

Flo-Tite, Inc.

Valves & Controls

3pc High Performance Fire Safe Ball Valve

Tri-Pro Series

Models

HPF50 - (316SS)

HPF40 - (WCB)

Full Port: 1/4" - 3"

Pressure Rating

2250 WOG / 250 WSP

Models

HPS50 - (316SS)

HPS40 - (WCB)

Standard Port: 1/4" - 4"

Pressure 3000 psi 1/4" - 1"

Pressure 2250 psi 1-1/2" - 4"



1" HPF52 (SW)



3" HPF51 (NPT)

Design Features / Options

- Fire Safe Certified to API 607 4th Edition
- I-SO 5211 Actuator Mounting
- Secondary Media Containment
- Anti-Static Grounding Device
- Weld in-Place, SW / BW
- Protected Seat Design
- Two Fully Contained Body Seals
- Cap Screw Body Assembly
- 17-4Ph Stem Standard
- V-Port Control (Available)
- Metal Seats (Available)

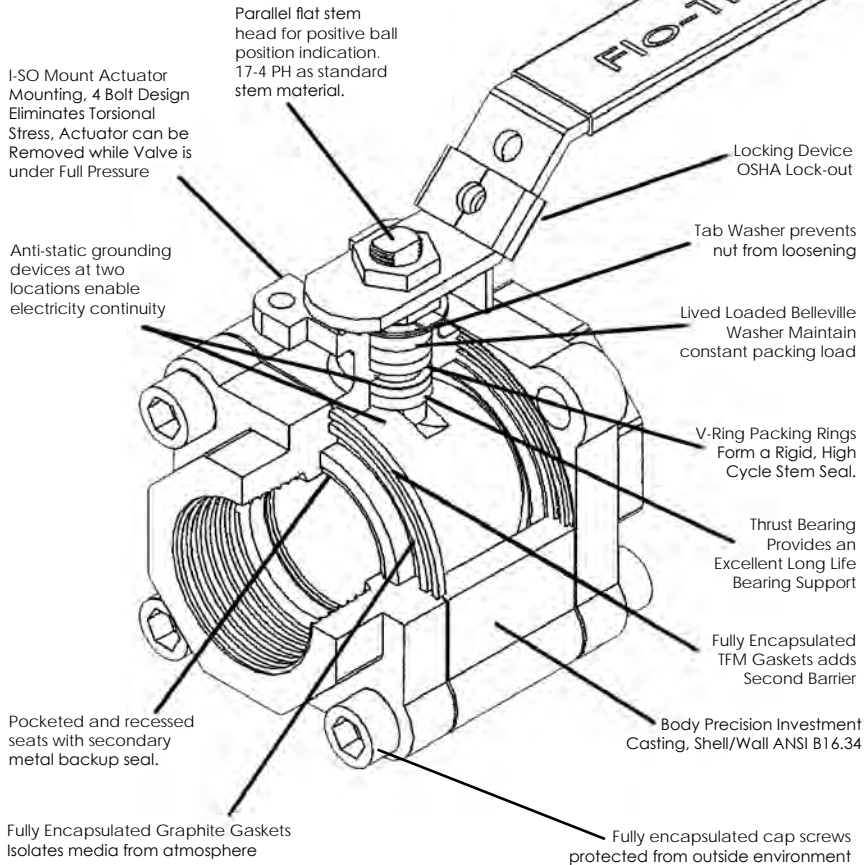
Tri-Pro's Advantage

- Ability to handle pressure and temperature shock
- Ability to withstand higher pressure drop
- Ability to handle slurries and resist abrasion and wear
- Bubble tight sealing to 550° F
- Bubble tight sealing to 2250 psi/3000psi
- Ability to handle thermal fluid and super heated steam (with Special Seats)

REFINED. BY DESIGN.
DIFFERENT. BY INTENT.

Design Specifications and Standard of Compliance

Technical Specifications



All Tri Pro valves are designed to meet ASME/ANSI B16.34 class 600&900 specifications and can be certified as such upon request at order submittal. The valve design is in compliance with BS 5351, BS 5159

Threaded End Connections meet ASME/ANSI B1.20.NPT, BSPTISO R/7.BS21

Socket Weld End Connections meet ASME/ANSI B16.11. Butt Weld End Connections meet MSS SP72. ANSI B16.25, B16.5 Figure 2 detail recommended sch. 40 up to 1000 PSI, sch. 80 up to 2200 PSI.

Flanged End Connections meet ASME/ANSI Class 600, ASME/ANSI B16.10 and B16.5

MSS SP25 compliance for standard marking system
All Tri-Pro Valves meet NACE MR0175 for sour gas service.

All valves are Fire Safe and certified to API 607 4th Edition. Fire Safe Designed Valves must have Graphite Stem packing.

Federal Spec WW-V-35C Type II valve body and end connections are high quality investment cast and solution annealed/ normalized.

All valves are hydrostatically shell tested to 1.5 x rating. All valves 100% air tested under water at 80-100 psi. Complies with API-598, BS6755Pt.2.

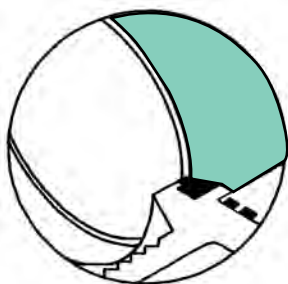
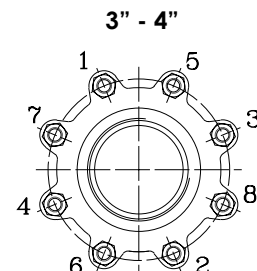
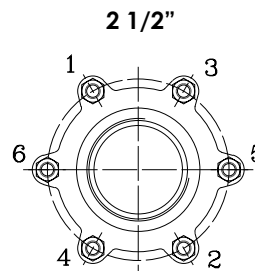
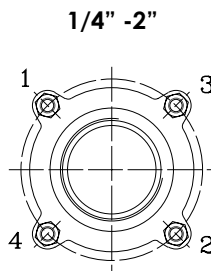
Vacuum Service Suitable to 20 Micron

Specially cleaned and lubricated valves can handle services of 10-3 mm. of Hg (1 micron).

Quality Assurance

All valves are manufactured to ISO 9001 quality standards

Valve Size	Bolt Size	Bolt Torque
		in. lb
1/4" - 3/4"	M8	250
1" - 1 1/4"	M10	450
1 1/2"	M12	850
2" - 2 1/2"	M14	1400
3" - 4"	5/8"	1800



Detail of Protected seat and encapsulated body seal design. Isolates and protects both seats and seals from flow path. Helps to prevent cold flow.



Seats & seals assembled into valve end caps

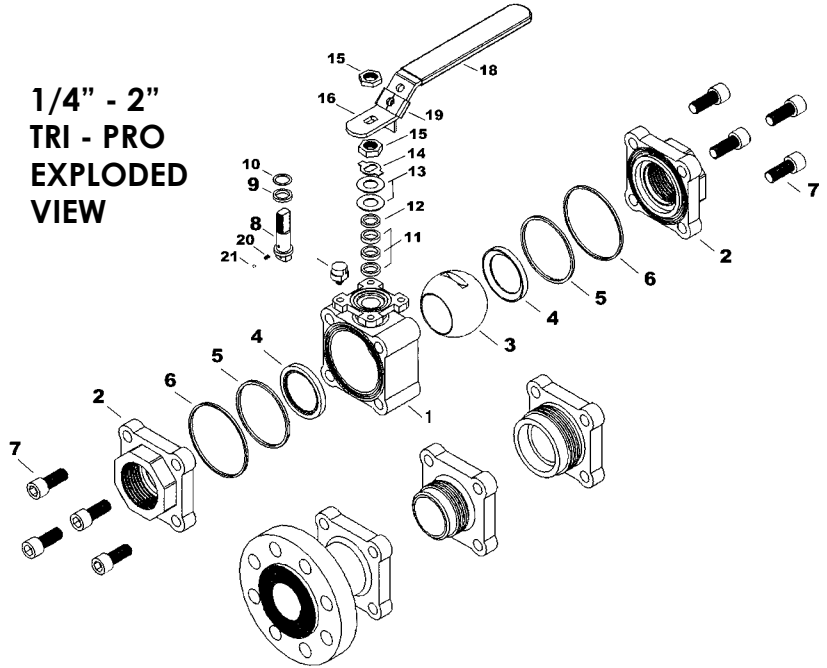
Seat Code	Seat Material
F	Super-Tek (TFM)
Y	Super-Tek III (carbon graphite filled TFM)
S	50% Stainless Steel filled PTFE
U	UHMWPE
P	PEEK
M	Metal
C	Cavity Filler

BILL OF MATERIAL

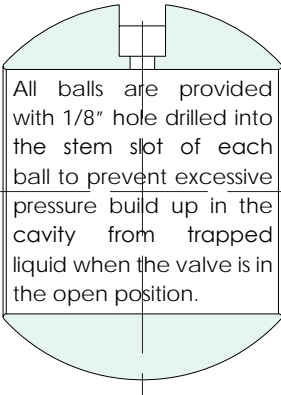
ITEM	NAME	STAINLESS STEEL	CARBON STEEL	QTY
1	BODY	A351-CF8M	A216 - WCB	1
2	CAP	A351-CF8M*	A216 - WCB	2
3	BALL	A351 CF8M	A351 CF8M	1
4	SEAT	SUPER-TEK#	SUPER-TEK#	2
5	GASKET	TFM#	TFM#	1
6	GASKET	GRAPHITE#	GRAPHITE#	1
7	BOLT	SS316	SS304	8
8	STEM	17-4PH	17-4PH	1
9	THRUST BEARING	50% SS316 Filled PTFE	50% SS316 Filled PTFE	1
10	THRUST WASHER	TFM#	TFM#	1
11	STEM PACKING	GRAPHITE#	GRAPHITE#	3
12	PACKING FOLLOWER	SS304	SS304	1
13	BELLEVILLE WASHER	SS301	SS301	2
14	LOCK WASHER	SS304	SS304	1
15	STEM NUT	SS304	SS304	2
16	HANDLE	SS304	SS304	1
17	STOPPER	SS304	SS304	1
18	PLASTIC COVER	PLASTIC	PLASTIC	1
19	LOCKING DEVICE	SS304	SS304	1
20	ANTI-STATIC SPRING	SS301	SS301	2
21	ANTI-STATIC BALL	SS316	SS316	2

Parts included in the repair kits
* Weld end, end caps are 316L

**1/4" - 2"
TRI - PRO
EXPLODED VIEW**

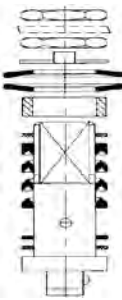


Ball Design Added Safety Feature



All balls are provided with 1/8" hole drilled into the stem slot of each ball to prevent excessive pressure build up in the cavity from trapped liquid when the valve is in the open position.

HI-TEK Stem Assembly



Flo-Tite's stem design is secured by a saddle type lock washer which prevents stem nut from unthreading in high cycle automation applications. All stems are blow-out proof design.

High performance 3 pc. "Vee" style stem packing standard.

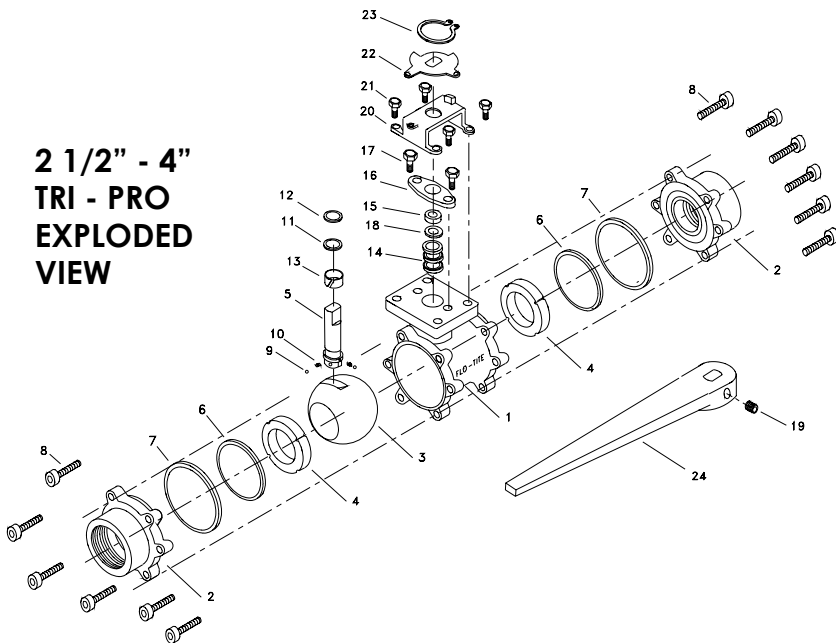
Self-adjusting Belleville washers automatically adjust for mechanical wear thermal, contraction and expansion.

BILL OF MATERIAL

ITEM	NAME	STAINLESS STEEL	CARBON STEEL	QTY
1	BODY	A351-CF8M-316	A216 - WCB	1
2	CAP	A351-CF8M-316	A216 - WCB	2
3	BALL	A351-CF8M-316	304SS	1
4	SEAT	TFM or 50/50	TFM or 50/50	2
5	STEM	17-4PH	17-4PH	1
6	GASKET	SUPER-TEK TFM	SUPER-TEK TFM	2
7	GASKET	GRAPHITE	GRAPHITE	2
8	BODY BOLT	SS316	SS316	16
9	ANTI-STATIC BALL	SS316	SS316	16
10	ANTI-STATIC SPRING	SS316	SS316	2
11	THRUST BEARING	50% SS316 Filled PTFE	50% SS316 Filled PTFE	1
12	THRUST WASHER	SUPER-TEK TFM	SUPER-TEK TFM	1
13	BEARING SLEEVE	SUPER-TEK TFM	SUPER-TEK TFM	1
14	STEM PACKING	GRAPHITE	GRAPHITE	3
15	PACKING FOLLOWER	SS304	SS304	1
16	GLAND PLATE	SS304	SS304	1
17	GLAND BOLT	SS304	SS304	2
18	PACKING PROTECTOR	50% SS316 Filled PTFE	50% SS316 Filled PTFE	1
19	SET SCREW	SS304	SS304	1
20	STOP HOUSING	A351 CF8	A216 WCB	1
21	HOUSING BOLT	SS304	SS304	4
22	TRAVEL STOPPER	SS304	Zinc Plated C.S.	1
23	SNAP RING	Nickel Plated C.S.	Nickel Plated C.S.	1
24	HANDLE	Ductile Iron	Ductile Iron	1

Parts included in the repair kits

**2 1/2" - 4"
TRI - PRO
EXPLODED VIEW**

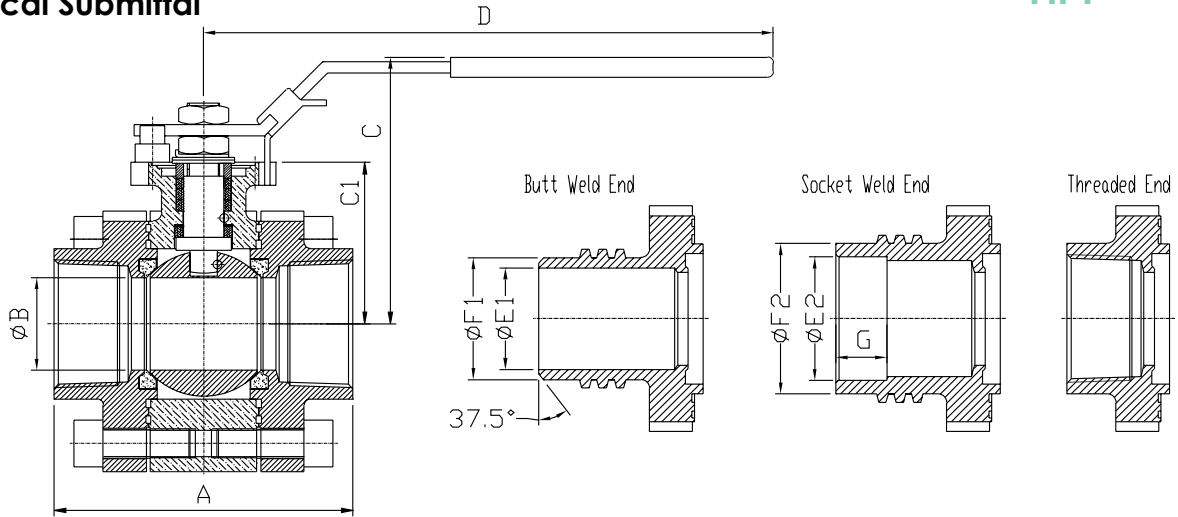


Both Full Port and Standard Port Valve Parts are Interchangeable

Dimensions - Full Bore

Technical Submittal

Tri-Pro Series HPF

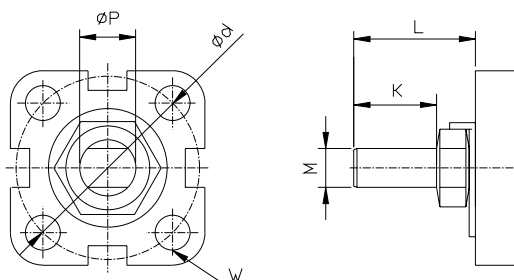


SIZE	A NPT	A BW & SW	B	C	C1	D	E1 sch 80	E2	F1	F2	G	Cv	Torque In - Lb	Weight Lbs SW
1/4"	2.72	4.81	0.456	2.69	1.54	6.3	0.302	0.555	0.713	1.024	0.393	18	75	2.5
3/8"	2.72	4.81	0.504	2.69	1.54	6.3	0.423	0.689	0.713	1.024	0.393	18	75	2.5
1/2"	2.91	4.89	0.591	2.69	1.54	6.3	0.546	0.854	0.854	1.240	0.393	18	85	3
3/4"	3.38	5.17	0.787	2.85	1.70	6.3	0.742	1.067	1.070	1.516	0.512	42	140	4
1"	3.7	5.24	0.984	3.44	2.06	6.89	0.957	1.331	1.338	1.693	0.512	72	190	5
1 1/4"	4.09	5.72	1.260	3.57	2.19	6.89	1.278	1.673	1.681	2.165	0.512	124	320	9
1 1/2"	4.61	6.19	1.575	4.24	2.65	8.66	1.500	1.913	1.913	2.441	0.512	210	430	12
2"	5.20	6.62	1.969	4.49	2.90	8.66	1.939	2.405	2.382	2.953	0.630	350	560	16
2 1/2"	7.28	8.78	2.50	6.22	3.39	15.4	2.323	2.906	2.875	3.620	0.984	650	950	32
3"	9.51	10.02	3.00	6.54	4.47	15.4	2.900	3.535	3.500	4.180	0.984	950	1200	45

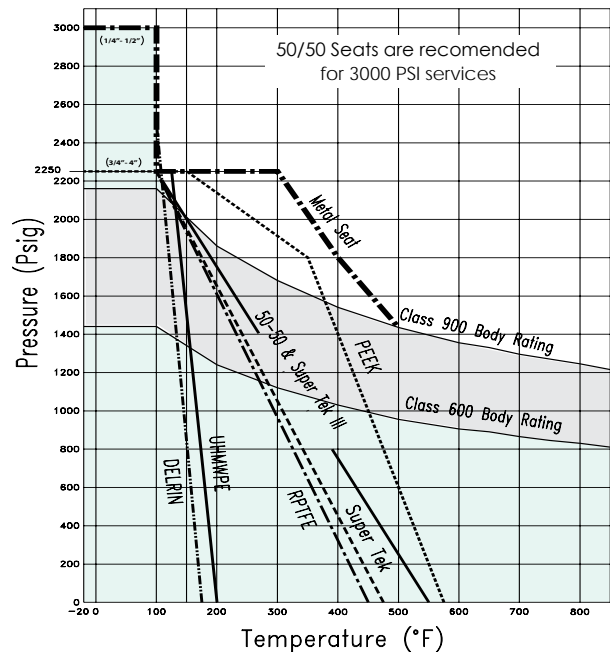
APPLICABLE STANDARDS	
Body Wall Thickness	ASME B16.34
NPT and SW Ends	ASME B16.11
Butt Weld End	ASME B16.25
Basic Dimensions	ASME B16.34
Testing Standard	ASME B16.34, AP1598
NACE	MR-01-75

MOUNTING DIMENSIONS

SIZE	d	K	L	M	P	W	Mt Pad
1/4"	1.654	0.28	0.53	.25	0.472	#10-24UNC	F04
3/8"	1.654	0.28	0.53	.25	0.472	#10-24UNC	F04
1/2"	1.654	0.28	0.53	.25	0.472	#10-24UNC	F04
3/4"	1.654	0.28	0.53	.25	0.472	#10-24UNC	F04
1"	1.969	0.44	0.74	0.315	0.551	1/4-20UNC	F05
1 1/4"	1.969	0.44	0.74	0.315	0.551	1/4-20UNC	F05
1 1/2"	2.756	0.53	0.88	0.374	0.630	5/16-18UNC	F07
2"	2.756	0.53	0.88	0.374	0.630	5/16-18UNC	F07
2 1/2"	4.016	1.75	3.07	0.669	1.102	1/2-13UNC	F10
3"	4.016	1.75	3.07	0.669	1.102	1/2-13UNC	F10



Pressure Temperature Rating

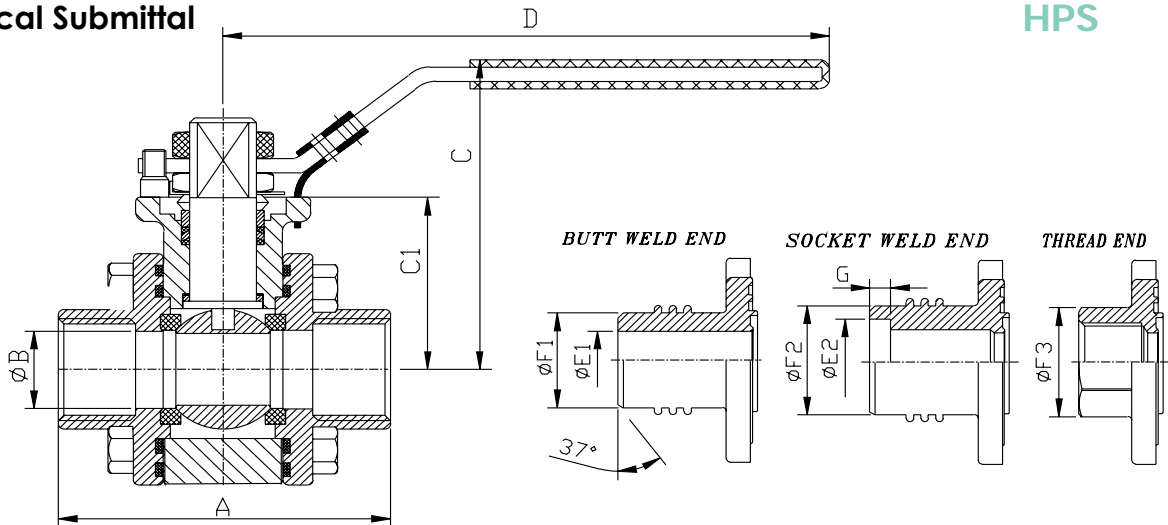


**** 50/50 Seat is recommended for 3000 WOG Service**

Dimensions - Reduced Bore

Tri-Pro Series HPS

Technical Submittal

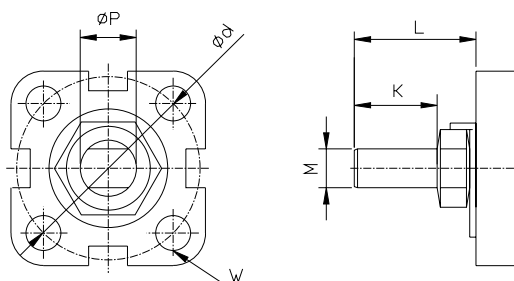


SIZE	A NPT	A BW & SW	B	C	C1	D	E1 sch 80	E2	F1	F2	G	Cv	Torque In - Lb	Weight Lbs SW
1/4"	2.72	4.81	0.456	2.69	1.54	6.3	0.302	0.555	0.713	1.024	0.393	18	75	2.5
3/8"	2.72	4.81	0.456	2.69	1.54	6.3	0.423	0.689	0.713	1.024	0.393	18	75	2.5
1/2"	2.91	4.89	0.504	2.69	1.54	6.3	0.546	0.854	0.854	1.240	0.393	18	75	3
3/4"	3.38	5.17	0.591	2.69	1.54	6.3	0.742	1.067	1.070	1.516	0.512	20	85	4
1"	3.7	5.24	0.787	2.85	1.70	6.3	0.957	1.331	1.338	1.693	0.512	40	140	5
1 1/4"	4.09	5.72	0.984	3.44	2.06	6.89	1.278	1.673	1.681	2.165	0.512	70	190	9
1 1/2"	4.61	6.19	1.260	3.57	2.19	6.89	1.500	1.913	1.913	2.441	0.512	120	320	12
2"	5.20	6.62	1.575	4.24	2.65	8.66	1.939	2.405	2.382	2.953	0.630	200	430	16
2 1/2"	7.28	8.78	1.969	4.49	2.90	8.66	2.323	2.906	2.875	3.460	0.984	300	560	32
3"	9.06	9.57	2.50	6.22	3.39	15.4	2.900	3.535	3.500	4.180	0.984	640	950	55
4"	13.0	12.78	3.00	6.54	3.66	15.4	3.826	4.543	4.500	5.380	1.181	900	1200	85

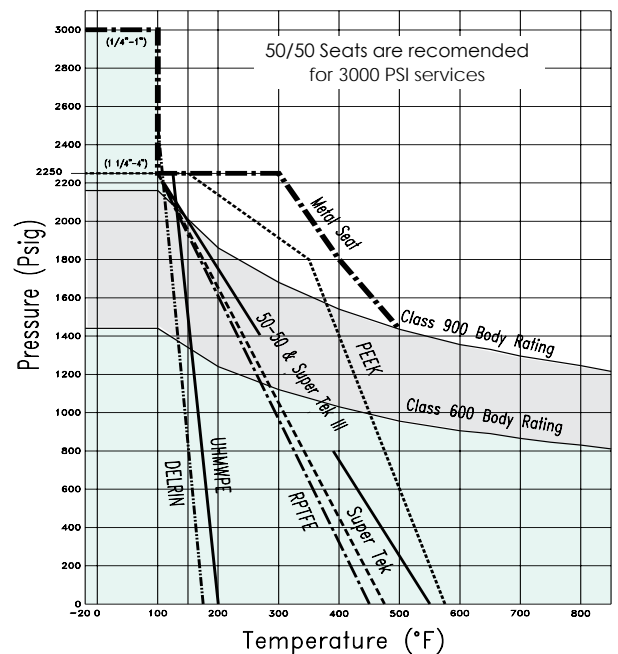
APPLICABLE STANDARDS	
Body Wall Thickness	ASME B16.34
NPT and SW Ends	ASME B16.11
Butt Weld End	ASME B16.25
Basic Dimensions	ASME B16.34-1
Testing Standard	ASME B16.34, AP1598
NACE	MR-01-75

MOUNTING DIMENSIONS

SIZE	d	K	L	M	P	W	Mt Pad
1/4", 3/8"	1.654	0.28	0.53	.25	0.472	#10-24UNC	F04
1/2"	1.654	0.28	0.53	.25	0.472	#10-24UNC	F04
3/4"	1.654	0.28	0.53	.25	0.472	#10-24UNC	F04
1"	1.654	0.28	0.53	.25	0.472	#10-24UNC	F04
1 1/4"	1.969	0.44	0.74	0.315	0.551	1/4-20UNC	F05
1 1/2"	1.969	0.44	0.74	0.315	0.551	1/4-20UNC	F05
2"	2.756	0.53	0.88	0.374	0.630	5/16-18UNC	F07
2 1/2"	2.756	0.53	0.88	0.374	0.630	5/16-18UNC	F07
3"	4.016	1.75	3.07	0.669	1.102	1/2-13UNC	F10
4"	4.016	1.75	3.07	0.669	1.102	1/2-13UNC	F10



Pressure Temperature Rating

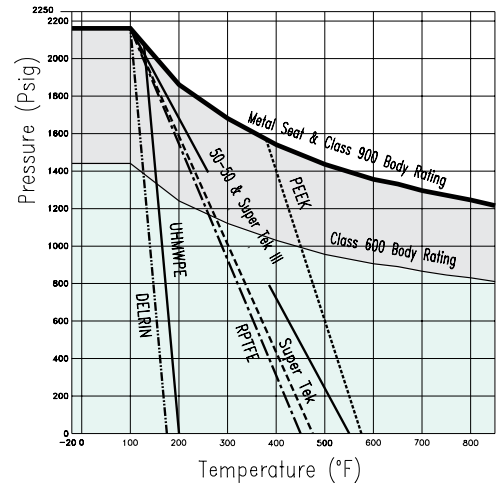
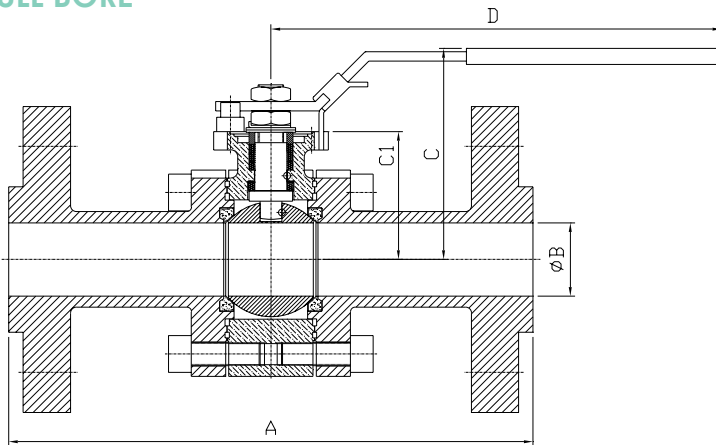


Body rating in this chart is for CF8M material. Max. WCB body rating is 2250 psi for class 900 and 1480 psi for class 600.

Dimensions - Flanged Class 600 and 900

Pressure Temperature Rating

Technical Submittal FULL BORE



Body rating in this chart is for CF8M material. Max. WCB body rating is 2220 psi for class 900 and 1480 psi for class 600.

SIZE	A Ansi 600	A Ansi 900	B	C	C1	D	E1 600# BOLT CIRCLE	E2 900# BOLT CIRCLE	F1 600# FLANGE OD	F2 900# FLANGE OD	Cv	Torque In-Lb
1/2"	6.50	8.50	0.59	2.69	1.54	6.3	2.62	3.25	3.75	4.75	18	85
3/4"	7.50	9.00	0.79	2.85	1.70	6.3	3.25	3.50	4.62	5.12	42	140
1"	8.50	10.0	0.98	3.44	2.06	6.89	3.50	4.00	4.88	5.88	72	190
1 1/4"	9.00	11.0	1.26	3.57	2.19	6.89	3.88	4.38	5.25	6.25	124	320
1 1/2"	9.50	12.0	1.58	4.24	2.65	8.66	4.50	4.88	6.12	7.00	210	430
2"	11.5	14.5	1.97	4.49	2.90	8.66	5.00	6.50	6.50	8.50	350	560
2-1/2"	13.0	16.5	2.50	6.22	3.39	15.4	5.88	7.50	7.50	9.62	650	900
3"	14.0	15.0	3.00	6.54	4.47	15.4	6.62	7.50	8.25	9.50	950	1050

APPLICABLE STANDARDS	
Wall Thickness	ASME B16.34
Face to Face	ASME B16.10
Flange Dimension	ASME B16.5
Fire Safe	AP1607
NACE	MR-0175
Basic Design	ASME B16.34

Valves will be supplied with full cast or weld on flanges

Tri-Pro - Product Identification Code for Full Valve Model Numbers

MODEL	BODY MATERIAL		SECOND END CONNECTION		SEAT		STEM SEAL		BODY SEAL		OPERATOR		SIZE	
SS - Full Port: NPT HPF51 SW HPF52 BW HPF53 FLG HPF56	316SS	SS	Threaded	1	TFM	F	TFM	F	TFM	F	LEVER LOCKING	L	1.4	8
	WCB	CS	Socket Weld	2	CTFM	Y	CTFM	Y	RTFM	X			3/8	10
	ALLOY 20	A2	Butt Weld	3					PTFE	T			1/2	15
CS - Full Port: NPT HPF41 SW HPF42 BW HPF43 FLG HPF46			Flanged 150	4	PTFE	T	PTFE	T	RPTFE	R	GEAR	G	1	25
			Flanged 300	5	RPTFE	R	RPTFE	R	50/50	S			1 1/4	32
			Flanged 600	6	50/50	S	50/50	S	UHMWPE	U	Deadman	S	1 1/4	32
SS - Red. Port: NPT HPS51 SW HPS52 BW HPS53			Flanged 900	7	UHMWPE	U	UHMWPE	U	PEEK	P	Actuator	A	1 1/2	40
			Flanged 1500	8	PEEK	P	GRAPHITE	G	GRAPHITE	G	Bare Stem	N	2	50
CS - Red. Port: NPT HPS41 SW HPS42 BW HPS43					Cavity Filled	C							2 1/2	65
					METAL	M							3	80
													4	100

Ball: All ball material is supplied standard as 316SS & 304SS. If different material is required please specify as special feature.
Stem: All stem material is supplied standard as 17-4PH.
Please specify as special feature if SS316 is needed. Special Features are noted at the end of the identification number, please see special feature codes. For extended number, see Tech Bulletin page 191.

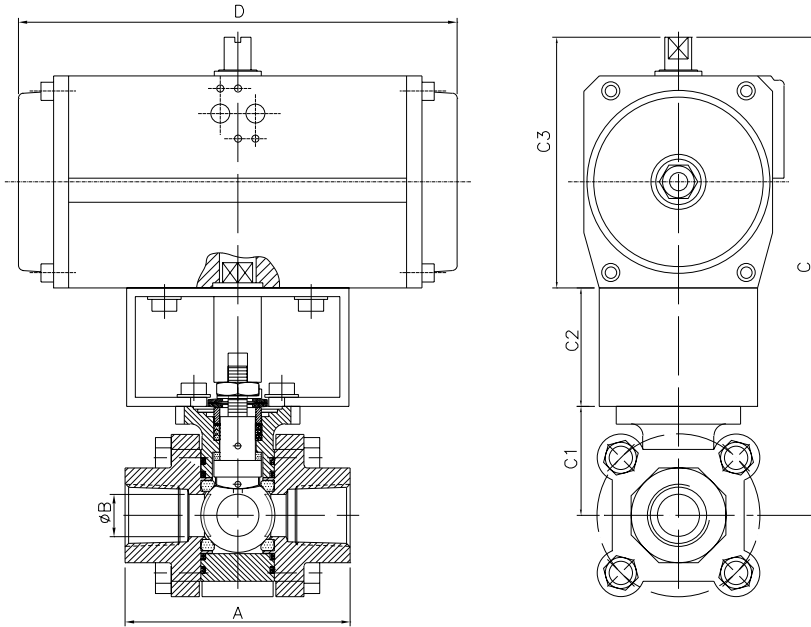
Ordering Examples by Part Numbers

MODEL	BODY MATERIAL	2nd END CONNECTION	SEAT	STEM SEAL	BODY SEAL	OPERATOR	SIZE	SPECIAL FEATURE
NPT end Red. Port C.S. Body	WCB	SW	TFM	GRAPHITE	TFM	LEVER	2"	Media Containment
HPS41	CS	2	F	G	F	L	50	H3

Ordering Information

When placing an order or requesting a quotation, please provide as many details on the application as possible such as media type, temperature, pressure, pipe size and etc.

Dimensions - Actuation / Flow Data



Pneumatic Actuator Dimensions shown in this drawing are for full port units based on 80 psi air to actuator, valves with standard seats, clean fluid only at ambient temperatures and pressures not to exceed 800 psi. Consult factory for additional actuator types and dimensional drawings.

Tri-Pro in Control Valve service

Flo-Tite also offers modulating V-port control valves. The V-ball is characterized to meet virtually all flow requirements. See tech bulletin page 120.

SIZE	A 600# Flange	A NPT	A BW & SW	B	C1	C2	Spring Return Actuator 80 psi				Double Acting Actuator 80 psi			
							C3	C	D	Actuator Model	C3	C	D	Actuator Model
1/4"	--	2.72	4.81	0.456	1.54	1.57	4.06	7.3	6.12	SR063-6	3.42	6.8	5.43	DA050
3/8"	--	2.72	4.81	0.504	1.54	1.57	4.06	7.3	6.12	SR063-6	4.06	7.3	6.12	DA063
1/2"	6.50	2.91	4.89	0.591	1.54	1.57	4.06	7.3	6.12	SR063-6	4.06	7.3	6.12	DA063
3/4"	7.50	3.38	5.17	0.787	1.70	1.57	4.73	8.3	8.27	SR075-6	4.73	8.3	8.27	DA075
1"	8.50	3.7	5.24	0.984	2.06	1.87	4.73	8.8	8.27	SR075-6	4.73	8.8	8.27	DA075
1 1/4"	9.00	4.09	5.72	1.260	2.19	1.87	5.12	9.3	8.97	SR085-6	5.12	9.3	8.97	DA085
1 1/2"	9.50	4.61	6.19	1.575	2.65	1.87	5.71	10.5	11.04	SR100-6	5.12	9.8	8.97	DA085
2"	11.50	5.20	6.62	1.969	2.90	1.87	6.78	11.8	12.2	SR115-6	5.71	10.8	11.04	DA100
2 1/2"	13.00	7.28	8.78	2.50	3.39	3.00	7.28	13.8	14.25	SR125-6	5.71	12.3	11.04	DA100
3"	14.00	9.51	10.02	3.0	4.47	3.00	8.16	15.8	15.35	SR145-6	6.78	14.5	12.2	DA115

All figures stated above are generally accepted for valves with standard seats average breakaway torque ratings for clean wet service

Torque Factors for Special Applications:

- 1 - increase the breakaway torque by 20% for dry gas service or demineralized water;
- 2 - add 10% for infrequent cycling;
- 3 - add 40% for slurry or light abrasive content;
- 4 - add 50% for metal seated valves, class V shut-off;
- 5 - deduct 10% for high lubricity service

Torque figures are for valves at 800 psi service. For higher pressure applications consult factory. Valve torque can vary due to pressure, media and temperatures.

The information provided above should be considered as a guide only and must be adjusted according to experience and judgement.

All TRI-Pro Valves have integrally cast mounting pad for ease of mounting actuation equipment.



V-ports 15, 30, 60, 90 deg. V & custom designs

Tri-Pro in Cryogenic service



The Tri-Pro series can be provided specifically for cryogenic applications. All cryogenic ball valves have extended bonnets, they offers exceptional performance under the most extreme cold working temperature conditions. See tech bulletin page 138.

FLO-TITE'S

True High Performance Ball Valve Technology

A superior quality, rugged, and universal purpose valve for all fluids ideal for saturated or superheated steam, slurries, semi-solids and corrosive services in endless industrial, chemical, power, gas, paper and original equipment applications.

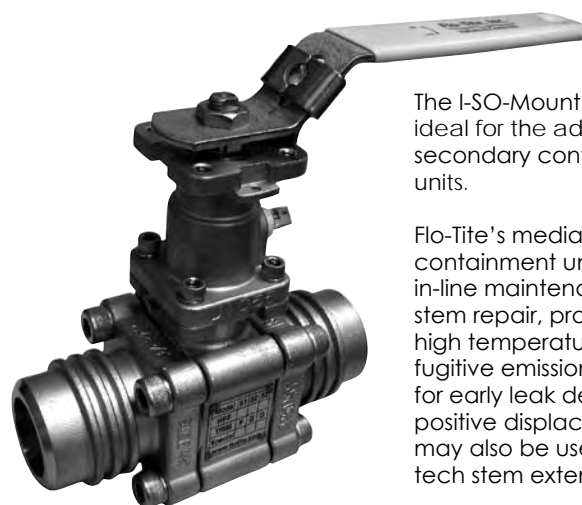
Three - Piece Design	Offers a wide selection of pipe end connections. Swing-out center body allows easy access to internal valve components.
Fully Protected Body Seals	Prevents seal ruptures in high pressure or steam applications
Live-Loaded-Blow-Out-Proof	Self adjust with pressure and temperature fluctuations. Blow-out proof Bottom Entry Stem, antistatic ground helps prevent accidents and injuries.
Secure Body Bolting	Cap screws - fully encapsulated secure end caps to tapped center body. Insuring ease of foolproof body assembly every time. Also protects bolts from outside environment.
Integral Actuator Mounting Pad	Ideal for actuation, ISO-5211 bolting, actuators may be retrofitted without disturbing the pipeline. Allows for secondary containment unit to be added when necessary.
Captured Seats	Pocketed and recessed seats with secondary metal backup seal, meeting API607-4, Super-TEK, TFM, 50/50, metal seats and more.
Weld-in-Place	Heat sink construction allows in-place welding, prevents damage to soft seat rings and eliminates the need to disassemble valve for welding. Assuring a safe & cost effective installation.
High Strength Stem	Parallel flat stem head for positive ball position indication. High strength 17-4 PH stainless steel is provided as standard.
Lockable Safety Handle	Prevents valves from being opened or closed accidentally. Lock-out meets OSHA standards with locking device.

MATERIAL IDENTIFICATION



Flo-Tite's marking system follows MSSP-25-1998 guidelines. In addition to the casted body information all valves have metal name plates that identify all valve soft parts. Valve users worldwide will be able to contact Flo-Tite quickly for any installation or service requirements as the company website address will be on all valves.

TRI-PRO WITH MEDIA CONTAINMENT UNITS



The I-SO-Mount platform is ideal for the addition of our secondary containment units.

Flo-Tite's media containment unit offers in-line maintenance for stem repair, protection for high temperature service, fugitive emission monitoring for early leak detection, positive displacement. It may also be used as a high tech stem extension.