



Flo-Tite 3 PC TITAN Series **FLANGED / SOCKET WELD END CONNECTION** **Installation, Operation, & Maintenance Manual**

Note: Before using a valve, read the entire IOM carefully and make sure you have a clear understanding of all information included.

This manual describes the procedures for the safe and efficient installation, operation, and maintenance of Flo-Tite Titan Series Ball Valves. **Failure to follow the procedures in this manual may result in Flo-Tite warranties being voided.** Problems with the operation and maintenance of these valves should be directed to the nearest Flo-Tite Representative.

Flo-Tite's TITAN Series valves are designed as a three piece construction to allow ease of access for maintenance of the valve ball and seat without special tools. This line of valves utilizes the "free floating" ball principle. The ball is not fixed, but is free to move with the line pressure. As a result, these valves are capable of tight shut-off with the flow in either direction or dead-ended, regardless of the position of the valve in the line. The downstream seat, which is opposite the pressurized side, of a closed valve must carry the load exerted by the line pressure on the ball, while the upstream seat is subject to little load or wear. For this reason, it is sometimes possible to increase useful seat life by turning the valve end-to-end in the pipeline.

INSTALLATION:

A. Receiving and Preparation Procedure:

- A1. Remove shipping protection.
- A2. Inspect the valve(s) for transportation damage*.
- A3. Inspect the valve bore and remove any debris.
- A4. Cycle the valve and inspect the valve for smooth operation, size permitting.
- A5. As shipped from the factory, valves may contain a silicone based lubricant. This is for break-in and may be removed if it is objectionable for a particular application by disassembling and solvent washing.

***If transportation damage is found, immediately take pictures for record purposes and contact the inbound carrier to submit a claim.**

B. Installation Procedure:

B1. General – The valve may be fitted in any position in the pipeline. Prior to installing the valve, the pipe on either side of the intended installation should be checked to be free of dirt, debris, weld slag, or etc. to prevent damage to the seats, seals, and surface of the ball. The piping must also be free of tension or compression.

WARNING – Never use the valve as a pipe support or structural member.

B2. Installation of the Flo-Tite TITAN Series valves is accomplished by inserting the valve between flanges / npt (end connections) attached to piping and supplied by others and attaching the valve to the mating flanges with fasteners of the size and type specified by industry standards. Fasteners should be tightened in a “star” pattern.

Caution – *Ensure that mating flanges are of the same size, type, and pressure rating as the valve and that fasteners are of the size and type approved for the flange.*

B3. *Valves with actuators should be checked for actuator-valve alignment. Angular or linear misalignment will result in high operational torque. Electric and/or pneumatic connections should be made in accordance with the correct actuator IOM instructions.*

C. OPERATION:

C1. Manual operation of the valve is accomplished by turning the handle ¼ turn (90 degrees).

*The valve is open when the handle is “in-line” with the valve or pipeline. The valve is closed when the handle is “across” or perpendicular to the valve or pipeline.

C2. Flo-Tite TITAN Series valves can be operated with either electric or pneumatic actuators. For instructions on installation and operation, refer to the IOM for the correct actuator.

C3. Flo-Tite TITAN Series valves may include one of several different styles of limit switches and positioners. Please refer to the appropriate IOM for each device.

MAINTENANCE:

CAUTION – *Ball valves can trap fluid in the ball cavity when closed. Be prepared to capture and manage any liquid retained in the valve body when disassembling the valve.*

WARNING – **If the valve has been in hazardous fluid, review applicable SDS sheet and decontaminate the valve before disassembly. All persons involved with the disassembly should wear personal protection equipment such as aprons, gloves, face shield, etc. to prevent personal injury.**

Access to the valve internals starts with relieving pressure in the pipeline. Turn the valve handle to the 45 degree, half open, position and flush the line, when applicable, to remove any hazardous material from the line. Repair kits can be ordered from the local Flo-Tite Representative. This should be done prior to any disassembly work.

CAUTION - *Valves with actuators, limit switches, or positioners should have these devices disassembled from the valve prior to disassembly of the valve.*

WARNING- **Use extreme caution disconnecting any electrical and/or pneumatic sources to the valve to protect against personal injury. Isolate the valve actuator prior to disconnecting.**

Stem Packing

Stem seal leakage may be corrected without disassembly. Tighten the packing gland nuts one flat at a time alternating between nuts until leakage stops. If leakage continues, or the valve’s operating torque becomes excessive, the seals are worn and replacement of the packing will be necessary.

WARNING- **Do not remove packing gland while the line is under pressure. Personal injury could occur.**

D. Valve Disassembly:

WARNING – **Use extreme caution when removing the TITAN Series valve from the pipeline to prevent personal injury that may be caused by “cold springing” of the piping.**

CAUTION – valves shall be adequately supported prior to unfastening the studs and nuts that hold the valve in line and secured with lifting straps or slings to hold the weight of the valve.

D1. Remove the flange bolts, spring washer, and nuts. Now lift valve from line for servicing. NOTE: care should be taken to avoid scratching or damaging serrated gasket. These valves can be heavy depending on what size you are repairing. They should be adequately supported before removal from the line has begun.

D2. For manual valve, loosen handle nut and remove handle. For actuated valve, remove actuator, and other hardware.

D3. Remove body end nuts, using proper wrench size. Lift off body end. One seat should come out with body end.

D4. Remove body seal.

D5. To take out the ball, rotate stem so ball is in fully closed position. Lift ball from body, using a strap and lift device, if necessary. NOTE: extreme caution should be taken to avoid damage to the ball.

CAUTION – *Use extreme care in handling the ball to avoid damage.*

D6. Remove the second seat and seal.

D7. Remove Stem –

- Remove packing nut, nut lock, Belleville washers, handle stopper, stop washer, gland, packing protector, thrust washer, stem packing and stem.

The stem must be removed from the inside of the body. Gently tap the top of the stem with a non-metallic mallet. The thrust washer should come out with the stem. Stem packing can now be removed. If a packing pick is used to remove packing, care must be taken not to scratch any surface.

Visual Inspection:

Clean and inspect all metal parts. It is not necessary to replace the ball and stem unless the seating surfaces have been damaged by abrasion or corrosion. Flo-Tite strongly recommends that all seats, seals, and packing be replaced whenever a valve is disassembled for reconditioning. This is the surest protection against subsequent leakage after reassembly. Replacement parts are sold as a kit. Refer to the metal tag attached to the side of the valve body to identify the specific sealing materials used. Kits can be obtained via the local

Flo-Tite Distributor. Replacement parts should be purchased prior to valve disassembly. Required information to purchase replacement parts include:

- Line size
- Model designation
- Seat/seal materials

Valve Reassembly:

Note- The valve may be reassembled and operated dry when no lubricants are allowed in the system. However, a light lubricant on the ball and stem will aid in assembly or reduce initial operating torque. Lubricant used must be compatible with the intended system fluid.

Install one new seat and seal in the body cavity with the spherical curvature facing the ball. Replace the stem in the reverse order from above based on valve size, including reattaching the handle. Use the wrench to bring the valve to the closed position. This will align the stem and the ball. Slide the ball into position. Turn the handle to the open position to help hold the ball in place. Install the second seal and seat into the body end. Place the body seal gasket into the shoulder counter-bore at the flange in the valve body. Using the match marks to realign the body and body end, carefully place the cap end back into the body. Install the cap end nuts and tighten in a star pattern to the torque values specified below.

VALVE SIZE	SIZE OF PACKING NUT	FASTENING TORQUES
1/2"	M10	87 In-lbs (10 N-m)
3/4"	M12	130 In-lbs (15 N-m)
1"	M14	217 In-lbs (25 N-m)
1 1/2"	3/4" - 10 UNC	347 In-lbs (39 N-m)
2"	3/4" - 10 UNC	347 In-lbs (39 N-m)

VALVE SIZE	SIZE OF BODY JOINT BOLTS	NUMBER OF BOLTS	FASTENING TORQUES
1/2"	5/16" - 18 UNC	12	217 In-lbs (25 N-m)
3/4"	3/8" - 16 UNC	12	217 In-lbs (25 N-m)
1"	3/8" - 16 UNC	16	217 In-lbs (25 N-m)
1 1/2"	1/2" - 13 UNC	20	712 In-lbs (80 N-m)
2"	1/2" - 13 UNC	20	712 In-lbs (80 N-m)

Note: Tolerances of +/- 10% of the above Fastening Torques are within the acceptable range.

WARNING- extreme care must be exercised during tightening of the body end nuts to make sure that complete engagement of studs with the body flange is maintained. There should be at least one stud thread exposed on each side.

Cycle the valve slowly, with a gentle back and forth motion to build gradually to a full quarter turn. By cycling slowly, the new seat lips will conform to the seal shape against the ball. An initial fast turning motion, at this point, may cut the seats before they have a chance to form the proper seal. When possible and practical, test the valve prior to reinstalling into the pipeline.

Reinstallation:

Carefully inspect the faces of both the valve flanges and the mating flanges to insure they are clean and undamaged. Place the valve in the preferred position and support it from moving. Install a sealing gasket between each pair of flanges and reinsert the bolting and hand tighten. Secure the bolting to the recommended torque values in a star pattern to ensure that the gasket is compressed evenly around the entire circumference.

Repair Kits:

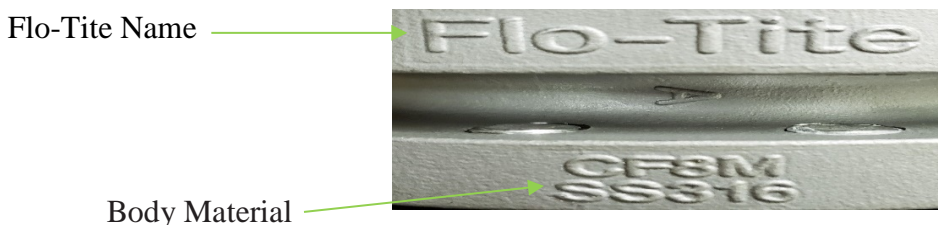
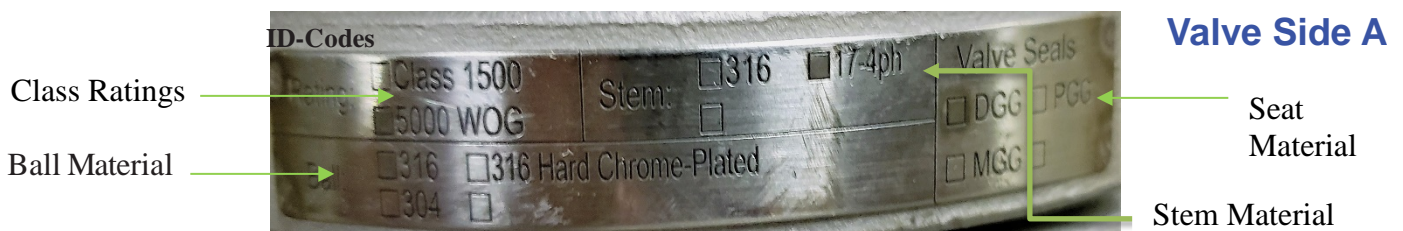
Repair kits typically consist of replaceable seats, body seals and packing seals. Contact your local Flo-Tite Distributor to order and receive the kits prior to any maintenance work.

VALVE - SOFT PARTS							
SEAT		STEM SEALS		BODY SEAL		O-RINGS	
TFM	F	TFM	F	TFM	F	VITON	V
CTFM	Y	CTFM	Y	CTFM	Y	EPDM	E
PTFE	T	RTFM	X	PTFE	T	PTFE	T
RPTFE	R	PTFE	T	RPTFE	R	BUNA	B

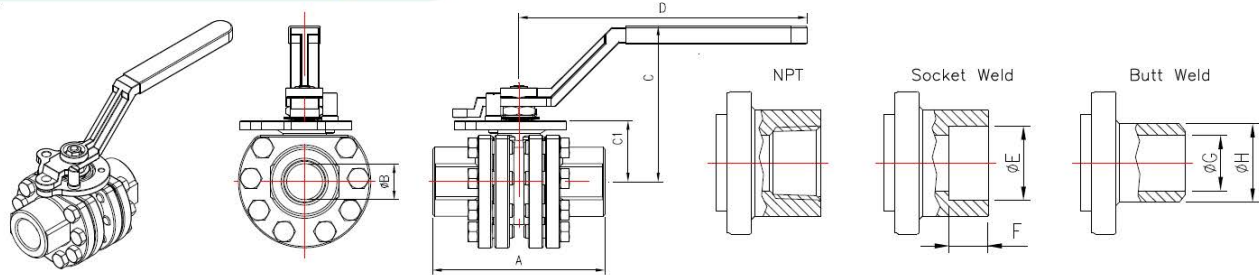
Flo-Tite's marking system follows MSS SP-25-1998

Valve Markings- Casted into the valve bodies include the following; Flo-Tite Name, Model Numbers, Body Material, Valve Size, & Pressure Rating.

Standard Trim Soft Parts



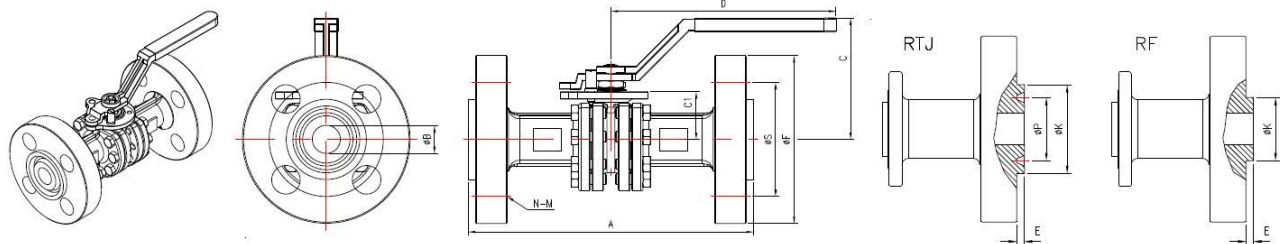
Dimensions and Weights



End Connections Threaded Socket Weld Butt Weld

SIZE	A			B	C	C1	D	E	F	G	H	Cv	Break Torque In-Lb *		Weight Lbs
	NPT	SW	BW										3600 psi	5000 psi	
1/2"	3.35	3.35	3.35	0.59	3.66	1.34	6.30	0.86	0.39	0.496	0.882	15	180	237	4.06
3/4"	4.13	4.13	4.13	0.79	3.96	1.56	6.30	1.07	0.51	0.638	1.094	35	300	403	5.73
1"	4.72	4.72	4.72	0.98	4.21	1.67	7.87	1.33	0.51	0.846	1.366	68	630	836	7.5
1 1/2"	5.91	5.91	5.91	1.50	5.63	2.76	10.43	1.92	0.51	1.272	1.941	155	1800	2280	22.4
2"	6.30	6.30	6.30	1.50	5.63	2.76	10.43	2.41	0.64	1.630	2.417	155	1900	2350	23.7

*Note: Torques are for clean liquid media only



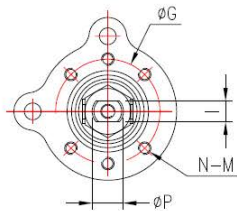
Flanged Ends ANSI Class 900/1500

SIZE	A		B	C	C1	D	E		F	K		M	N	P	S	Cv	Break Torque In-Lb *		Weight Lbs
	RF	RTJ					RF	RTJ		RF	RTJ						3600 psi	5000 psi	
1/2"	8.50	8.50	0.59	3.66	1.34	6.30	0.25	0.25	4.75	1.38	2.38	0.88	4	1.562	3.25	15	180	237	12.4
3/4"	9.00	9.00	0.79	3.96	1.56	6.30	0.25	0.25	5.12	1.69	2.62	0.88	4	1.750	3.50	35	300	403	16.4
1"	10.0	10.0	0.98	4.21	1.67	7.87	0.25	0.25	5.88	2.00	2.81	1.00	4	2.000	4.00	68	630	836	23.5
1 1/2"	12.0	12.0	1.50	5.63	2.76	10.43	0.25	0.25	7.00	2.88	3.62	1.12	4	2.688	4.88	155	1800	2280	48.2
2"	14.5	14.62	1.50	5.63	2.76	10.43	0.25	0.31	8.50	3.62	4.88	1.00	8	3.750	6.50	155	1900	2350	70.7

*Note: Torques are for clean liquid media only

Mounting Dimensions

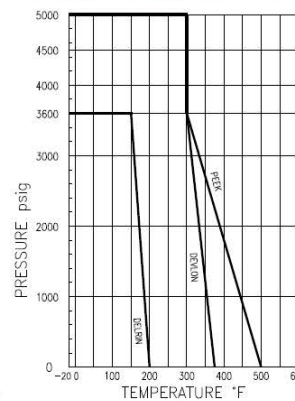
Size	G	I	K	L	M	N	P	ISO
1/2"	1.65	0.28	0.45	0.65	M5	6	M10	F04
3/4"	1.65	0.33	0.48	0.78	M5	6	M12	F04
1"	1.97	0.39	0.68	1.07	M6	6	M14	F05
1 1/2"	2.76	0.47	0.72	1.12	M8	8	3/4-10unc	F07
2"	2.76	0.47	0.72	1.12	M8	8	3/4-10unc	F07



Actuator Mounting Pad with 6 or 8 threaded holes. The bolting circle diameter complies with ISO 5211.

IMPORTANT:
Verify mounting dimensions before manufacturing mounting hardware.

Pressure/Temperature Chart



Titan Series Metal Seated Valves

High temperature metal seated ball valves are well suited for a variety of demanding services when high temperature and abrasive solids are present. Shut off classes V & VI are available.

Please carefully review all important procedures in this manual. If anything is unclear, please feel free to contact Flo-Tite directly.



Flo-Tite, Inc.
4815 West 5th St.
Lumberton, NC 28358

P. O. Box 1293
Lumberton, NC 28359
Website: www.flotite.com

Tel: (910) 738-8904
Fax: (910) 738-9112
E-mail: flotite@flotite.com