



**INSTALLATION – MAINTENANCE MANUAL
MULTIPORT THREADED AND WELD END BALL VALVES
MPC, MPT, MPS, MPB 130/230/240**

USE:

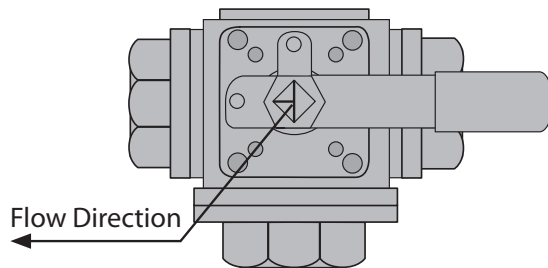
Life of valves can be extended when it is maintained under normal working conditions and in accordance with pressure/temperature and corrosion data chart.

VALVE OPERATIONS:

The three way ball valve can be configured into several options. Generally, flow pattern can be set with a quarter (90 degree) turn or half (180 degree) turn. Please consult our flow pattern chart for more information.

A. MANUAL OPERATION

Flow indicator shows the actual valve flow path. Illustration below shows the location of the flow indicator on the valve stem. Turn the handle 90 degrees or 180 degrees in accordance to your set flow pattern.



B. ACTUATOR OPERATION

Prior to actuator installation, please check the flow path of the valve by observing the port openings. Mark this opening on the ball valve prior to actuator installation in order to get the correct flow orientation. After actuator installation, valve should be checked for valve stem alignment. Angular or linear misalignment will result in high operational torque and unnecessary wear on the stem seal.

**GENERAL INFORMATION FOR ON-SITE
INSTALLATION:**

- The valve may be fitted in any position on the pipeline.
- Before installing the valves, the pipes must be

flushed clean of dirt, burrs and welding residues to prevent damage to the seats and ball surface.

- The pipeline must be free of tension.

INSTALLATION OF THREADED VALVES:

- Use conventional sealant, such as hemp core, Teflon, etc. on the threads.
- Apply wrench on the hexagon end of the valve only. Tightening by using the valve body or handle can seriously damage the valve.
- For applications where screwed end valves are back-welded on site, these valves must be dismantled according to instructions for weld end valves.

INSTALLATION OF WELD-END VALVES:

1. Prior to welding, end caps must be removed from the body to prevent damage to the internal soft seals.
2. Weld end type valves already have the body bolts loosen prior to shipment. Remove all the body bolts (#19) and place them in a safe place.
3. Remove each end caps (#2) from the body (#1) and carefully remove the soft parts (seats #4 and gaskets #5 from each of the end caps) and place them in a safe place.
4. Weld the pipe stub to each of the end caps. When stub and the end cap has cooled down, clean both end caps and stub body surface.
5. Replace the soft parts (seats #4 and gaskets #5) into its original position. Replace all the bolts (#19) and tighten slightly. This operation is very important to keep body and end caps perfectly parallel, thus, preventing distortion of the end caps.
6. Tighten body bolts evenly according to the body bolt torque chart on next page.
7. Check the valve for proper operation.



DISASSEMBLY AND CLEANING PROCEDURES:

Caution: Ball Valves can trap fluids in ball cavity

1. If the valve has been used to control hazardous media, it must be decontaminated before disassembly. It is recommended that the following steps be taken for safe removal and reassemble.
 - a. Relieve the line pressures.
 - b. Place the valve in all the available flow position and flush the line to remove any hazardous material from valve.
 - c. All persons involved in the removal and disassembly of the valve should wear proper protective clothing, such as face shield, glove, and apron, etc.
2. If valve is installed in the line, pipelines may have to be cut to disassemble the valve. Inline weld type valve can be disassembled without cutting the pipelines.

PROCEDURES TO REPLACE REPAIR KIT:

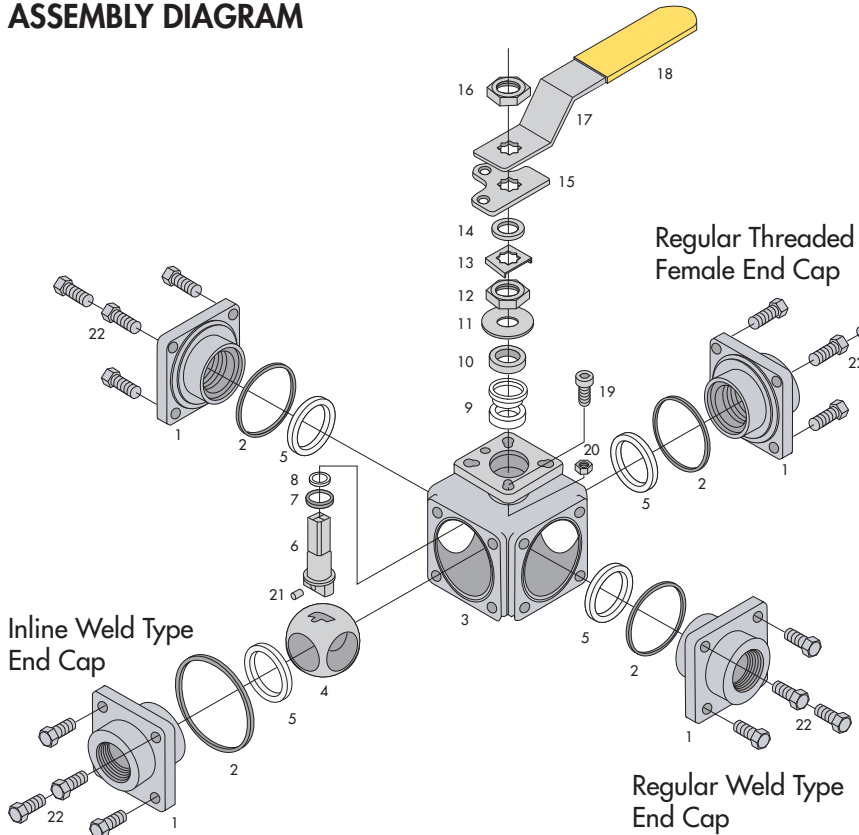
1. Follow the direction on disassembly and cleaning procedures.
2. Loosen each of body bolts (#19) and remove each of end caps (#2) including the blank end cap (#22) from the body (#1).
3. The seats (#4) are located inside end cap cavities. Replace the seats (#4) and gaskets (#5) with new ones. Place the end caps in a safe place.
4. To replace the stem components, the handle nut (#18) must be loosen. To assist in loosening of the handle nut, place a rod of diameter smaller than the ball orifice into the ball orifice. Loosen and remove the handle nut. Remove the handle (#16), stop plate (#15), space washer (#14), and lock saddle (#13). **Larger valves size 2½" - 4"** only have handle T-Bar (not shown in the assembly diagram).
5. Loosen and remove the stem nut (#12), belleville washer (#11), and gland. **Larger valves size 2½" - 4"** have gland, belleville washer, and gland washer (not shown in the assembly diagram).
6. Remove the rod and the ball should slight out from the center of ball valve body with a gentle push

(for ¼" - 2). **For larger size valve 2½" - 4"**, remove the bonnet cap and the trunion ball can be removed from the top of the valve body (not shown in the assembly diagram). Clean all the removed parts and place them in a safe place.

7. **For valves ¼" - 2" size**, push the stem (#6) downward. It should come out through the center body cavity. Remove the stem packing (#9), o-ring (#8), and thrust washer (#7). Clean the stem and replace with new stem packing, o-ring, and thrust washer. **For larger size ball valve 2½" - 2"**, replace with new o-ring, stem packing and bonnet gasket (not shown in the assembly diagram).
8. Replace the stem (#6), gland (#10), belleville washers (#11) and the stem nut. **For larger size valve 2½" - 4"**, replace the trunion ball and the bonnet cap
9. Tighten the stem nut according to the stem nut torque chart on next page. **For larger size valve 2½" - 4"**, tighten the circular gland until it bottoms out.
10. Replace the lock saddle (#13), space washer (#14), stop plate (#15), handle (#16), and handle nut (#18). **For larger size valve 2½" - 4"**, replace the handle t-bar and the lever (not shown in the assembly diagram).
11. Replace the end caps and tighten the body bolts evenly according to the body bolt torque chart on next page. **For large size valve 2½" - 4"**, also tighten the bonnet cap according to the body bolt torque chart.
12. Check the valve for proper operation.



ASSEMBLY DIAGRAM



No.	Part Name	Material
1	Body	ASTM A351 Gr. CF8M
2	End Cap	ASTM A351 Gr. CF8M
3	Ball	SS 316
4	Seat	TFM 1600
5	Gasket	TFM 1600
6	Stem	SS 316
7	Thrust Washer	TFM 1600
8	O-Ring	Viton
9	Stem Packing	TFM 1600
10	Gland	SS 304
11	Belleville Washer	SS 301
12	Stem Nut	SS 304
13	Lock Saddle	SS 304
14	Space Washer	SS 304
15	Stop Plate	SS 304
16	Handle	SS 304
17	Handle Sleeve	Vinyl
18	Handle Nut	SS 304
19	Body Bolt	SS 304
20	Pin Insert	SS 304
21	Stop Pin	SS 304
22	Blank End	ASTM A351 Gr. CF8M
23	Anti-Static Device	SS 316
24	End Cap (Inner)	ASTM A351 Gr. CF8M
25	ACP Gasket (Inner)	TFM 1600

TORQUE DATA

The body bolts of the valve should be tightened evenly. Tighten one-side snugly, then the one diagonally across. Repeat for the other bolts, bringing them all down tightly in sequence to the torque shown below.

Body Bolt Torque Chart

Size	Torque (In-Lb)	Bolt Size
1/4"	106	1/4" - 20UNC
3/8"	106	1/4" - 20UNC
1/2"	150	5/16" - 18UNC
3/4"	150	5/16" - 18UNC
1"	150	5/16" - 18UNC
1 1/4"	195	3/8" - 16UNC
1 1/2"	195	3/8" - 16UNC
2"	354	1/2" - 13UNC
2 1/2"	354	1/2" - 13UNC
3"	354	1/2" - 13UNC
4"	664	5/8" - 11UNC

Stem Nut Torque Chart

Size	Torque (In-Lb)	Nut Size
1/4"	71	M12x1.75
3/8"	71	M12x1.75
1/2"	71	M12x1.75
3/4"	106	M14x2.0
1"	106	M14x2.0
1 1/4"	133	M18x2.5
1 1/2"	133	M18x2.5
2"	168	M22x2.5
2 1/2"	N/A	N/A
3"	N/A	N/A
4"	N/A	N/A