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1 SCOPE

1.1 CAUTION

- 1.1.1 For your safety, read this manual before installation or servicing.
- 1.1.2 Before installing or servicing, please ensure the line pressure has been relieved and any hazardous fluids have been drained or purged from the system.
- 1.1.3 Ensure that all Lockout and Tagout procedures for the system have been properly implemented.

1.2 USE

- 1.2.1 A-T Controls 77-Series Ball Valve are available in Hygienic Ferrule Ends ($\frac{1}{2}$ " & $\frac{3}{4}$ " Type A, 1"-4" Type B) or Extended Tube Butt Weld Ends.
- 1.2.2 Maximum results and optimum valve life can be maintained under normal service conditions and in accordance with pressure/temperature ratings and corrosion data charts.

2 INSTALLATION

- 2.2 A-T Controls 77-Series Ball Valves are bi-directional and can be installed with the flow in either direction. The valve can be mounted in any position so that the handle, gear, or actuator has proper clearance, allows for optimal drainage, can be easily accessed, and the open/close indicator can be viewed. If the gear is equipped with a chain wheel, the valve shall be mounted in a way so that the chain does not come in contact with the valve or pipeline.
- 2.3 Before installation of the valves, the pipe must be flushed clean of dirt, burrs, and welding residues. Failure to do so can cause the seats, sealing surfaces, and internal polish to be damaged.
- 2.4 The pipe must be free from tension and in proper alignment.
- 2.5 Before installation of the valves, check to ensure that all connections are free from defects.
- 2.6 Be sure to consult with supplier of your clamps and gaskets to be used on the hygienic ends for the proper material, pressure rating, and clamp torque for your process. Over torqueing clamps may result in damage to the ferrule end.
- 2.7 Disassembly of the valve is not necessary for tube end valves. However, caution should be taken to ensure that the heat source does not come in contact with the sealing components of the valve in excess of the sealing component temperature limitation.

3 VALVE OPERATION

3.1 MANUAL

3.1.1 Handle

To open the valve, turn the handle counter-clockwise until the handle is parallel with the pipeline and the handle has contacted the handle stop.

To close the valve, turn the handle clockwise until the handle is perpendicular with the pipeline and the handle has contact the handle stop.

A handle lock is incorporated into the handle. To use slide the lock into the mounting pad, in the full open or full closed position. Insert an appropriate size lock or hasp into the hole in the handle. If it can be performed safely, try to turn to ensure that the valve has been locked properly.

3.1.2 Gear

To OPEN the valve; turn the hand wheel counter-clockwise. The indicator will be pointing to the open position and stop rotating when fully opened. The flow can be adjusted by stopping the indicator anywhere between open and close.

To CLOSE the valve; turn the hand wheel clockwise. The indicator will be pointing to the close position and the hand wheel will stop rotating when fully closed. The flow can be adjusted by stopping the indicator anywhere between open and close.

3.2 AUTOMATED

A-T Controls 77-Series Ball Valves can be mounted with quarter turn actuators. Valves with actuators shall be checked for proper valve stem alignment. Angular or linear misalignments may result in high operational torque and unnecessary wear on the valve stem. See the actuator IOM for information on operating the actuator.

4 DISASSEMBLY

!!!WARNING!!!

CAUTION, FLUIDS CAN BE TRAPPED IN THE BODY OF THE VALVE, POSSIBLY UNDER HIGH PRESSURE. FOR YOUR SAFETY, IT IS IMPORTANT THAT PRECAUTIONS ARE TAKEN BEFORE REMOVAL OF THE VALVE FROM THE LINE OR ANY DISASSEMBLY.

- 4.1 Remove actuator or gear if equipped.
- 4.2 Care should be taken to not damage the surface finish of the valve components.
- 4.3 Remove the ends (2) from the body by removing the body bolts (18) and body nuts (19).
- 4.4 Remove the seat (4) and body gasket (5) from both sides of the body (1). Once removed, with the valve in the fully closed position, the ball (3) should slide freely out of the body (1).
- 4.5 If equipped, remove the handle nut (13), handle (15), and handle stop assembly (22).
- 4.6 While holding the stem (7) stationary, remove the packing nut (13). Once removed, the locking saddle (12), Belleville washers (11) and packing bushing (10) should be free to remove.
- 4.7 While holding the bottom of the stem (7), push the stem (7) through the inside of the valve body (1).
- 4.8 Remove the packing set (8) and stem seal (6).
- 4.9 Inspect all components for damage and if necessary clean or replace.

5 ASSEMBLY

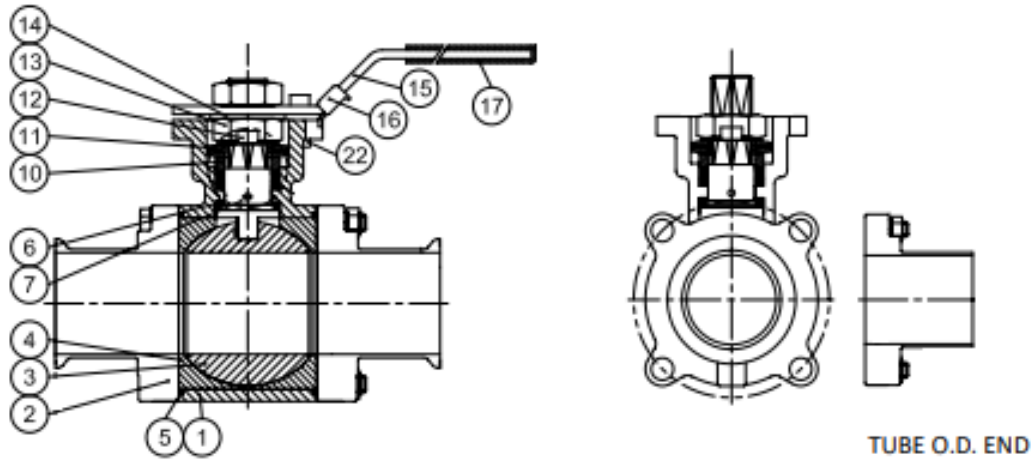
- 5.1 Care should be taken to not damage the surface finish of the valve components.
- 5.2 Place stem seal (6) on the stem (7) and install it by going through the body (1). Insert V-Style packing set (8) over stem (7) with the V pointing away from the valve (see Bill of Materials for correct orientation).
- 5.3 Install the packing gland (10), the Belleville washers (11), locking saddle (12), and packing nut (13). While holding the stem (7), tighten the packing nut (13) to the torque listed in the Fastener Torque Chart. Tighten further if needed in order to be able to bend the locking saddle (12) over a flat side of the packing nut (13).
- 5.4 Ensure that the stem (7) is in the closed position with the bottom tang parallel with the flow of the valve. Insert a seat (4) and body gasket (5) in one side of the body (1). Carefully slide the ball (3) into body (1) and insert the other seat (4) and body gasket (5).
- 5.5 Assemble ends (2) onto body (1). Insert all body bolts (18) and nuts (19) into valve and tighten to finger tight, making sure that the ends (2) are flat against the body (1). Tighten all bolts (18) (on both sides for valves 2-1/2"-4") from the nut (19) side (if equipped) in a star pattern to 50% of the final torque shown in the Fastener Torque Chart. Using the handle (15) or an adjustable wrench, cycle the valve 3 times. Tighten all of the body bolts (18) to the final torque in a star pattern. Cycle the valve 3 times again. Check each body bolt torque (18) and tighten if needed a final time. It is acceptable for the torque to relax slightly over time due to relaxation of the polymer components, but the valve will still seal properly. If leakage is detected, repeat the steps for tightening the body bolts.
- 5.6 If required, assemble the handle stop assembly (16), handle (15), and handle nut (13).

Valve Size	Torque of Body Bolts (In-lbs.)		Torque of Stem Nut (In-lbs.)
	50% of Final Torque	Final Torque	
1/2"	56	113	78
3/4"	61	122	78
1"	69	139	122
1-1/2"	156	312	165
2"	217	434	165
2-1/2"	347	694	191
3"	390	781	191
4"	390	781	217

6 REPAIR KITS

Repair kits are available to replace all soft goods. See Bill of Materials for components that are included in the repair kits.

7 BILL OF MATERIALS



NO.	PART NAME	QTY.	MATERIAL	REPAIR KIT
1	BODY	1	ASTM A351 GRADE CF3M	
2	END CAP	2	ASTM A351 GRADE CF3M	
3	BALL	1	ASTM A351 GRADE CF3M	
4	SEAT	2	PTFE	X
5	JOINT GASKET	2	PTFE	X
6	STEM SEAL	1	PTFE	X
7	STEM	1	ASTM A276 SS 316L	
8	GLAND PACKING	1	PTFE	X
9	GLAND WASHER	1	RTFE	X
10	GLAND BUSHING	1	AISI 304	
11	BELLEVILLE WASHER	2	AISI 301	
12	LOCK SADDLE	1	AISI 304	
13	STEM NUT	2	AISI 304	
14	STEM WASHER	1	AISI 304	
15	HANDLE	1	AISI 304	
16	HANDLE LOCK	1	AISI 304	
17	HANDLE SLEEVE	1	VINYL	
18	BODY BOLY	#	**	
19	BODY BOLT NUT	&	##	
20	WASHER	&	AISI 304	
21	STOP BOLT	1	AISI 304	
22	BOLT NUT	1	AISI 304	
23	ANTI-STATIC DEVICE	2	AISI 316	
# FOR 1/2"-4" - 4PCS ; FOR 4" 6 PCS				
& FOR 1/2"-2" 4 PCS ; FOR 2-1/2"-3" - 8PCS ; FOR 4" - 12 PCS				
** FOR 1/2" -2" ASTM A193 GRADE B8 ; FOR 2-1/2"-4" - ISO 3506-1 A2-70				
## FOR 1/2"-3" - ASTM A194 GRADE 8 ; FOR 2-1/2"-4" - ISO 3506-2 A2-70				

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For product specifications go to <https://a-tcontrols.com/Downloads/>

A-T Controls, Inc. • 9955 International Boulevard, Cincinnati, OH 45246 • Phone: (513) 530-5175 • Fax: (513) 247-5462 • www.atcontrols.com