

T, TH SERIES

Ball Valve Instruction Manual



◆ Installation

Installation Preparation

1. Remove protective cap and packing material
2. Before installing the valve, assure the specified pressure and temperature range is sufficient and piping line is installed properly.
3. The environment of installing valve should be suitable to the operation.

Connection of Taper Thread

1. Before assembly, make sure of removing dirt on male and female threads.
2. Teflon tape should be applied to male thread with 5 or 6 turns.
3. After wrapping the threads, make sure that the tape is properly fixed by pressing the tape with hands.
4. During the installation, dirt should not be contained.

Connection of Hy-Lok Tube Fitting

1. Insert prepared tubing into Hy-Lok fitting until tubing end is firmly seated on the body shoulder and make sure the nut is finger-tight.
2. Mark the nut at 9 o'clock position for identification of starting point.
3. Tighten the nut 1 1/4 turns with a wrench keeping the fitting body steady with a back-up wrench. After the nut is tightened 1 1/4 turn, the marking made at 9 o'clock position before, will now be at 12 o'clock position.

⚠ CAUTION

T, TH Series Ball Valve shall not be used for CNG System.

Hy-Lok

◆ Operation

⚠ CAUTION

1. To operate the valve, the enough space secured and free from the potential obstructions to interrupt the operating.
2. The Valve should be operated manually by an authorized person or trained personnel to ensure proper valve operation.
3. Operate the valve after complete installation in system.
4. Operate the valve in accordance with the specified user's procedure.
5. Operate the valve with handle. (Spanner, pipe wrench etc. are not permitted)

Open and Close the Valve

On-off Pattern(2-way)

Turn the Handle(17) 1/4 turns clockwise or counterclockwise to close or open.

Switching Pattern(3-way)

Turn the Handle(17) 1/2 turns clockwise or counterclockwise to switch the valve.

◆ Maintenance

⚠ CAUTION

1. The line shall be fully depressurized before attempting any maintenance and any fluids shall be drained. Check that Valve condition is within a safe temperature range and free from a power source.
2. The valve being removed should be operated at least once and left in the open position before removal.
3. Before disassembling the valve, ensure that the valve has been decontaminated correctly from any harmful gases or fluids and within a safe temperature range for handling.
4. The Valve should be operated manually by an authorized person or trained personnel to ensure proper valve operation.

Replacement of part components

Stem leakage is seat leakage is suspected, the valve will need to be removed from the line in order for new seats/seals to be fitted.

After removal of the valve, adopt the following procedure to remove, replace and reassemble the part components.

Leakage

1. Stem Leakage

In case of stem leakage, after removing the Handle(17), remove the End Connector(10), Trunnion Ball(11), Stem(12), Stem O-Ring(14), Stem Backup Ring(15), Stem Bearing(13), inspect the following parts if they may be damaged - Stem(12), Stem O-Ring(14), Stem Backup Ring(15), Stem Bearing(13). If damage, replace the damaged part component(s).

2. End Connection External leakage

In case of leakage between Body(1) and End Connector(10), please ensure you have tightened them first. If the nut is not firmly tightened, further tighten the End Connector(10). If the leakage remains after tightening, replace the End Packing(8).

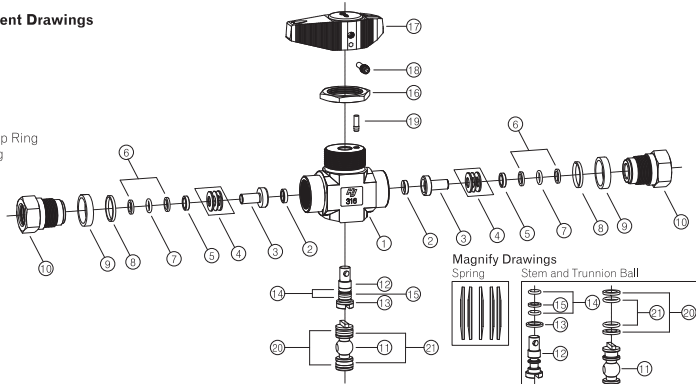
3. In-Line leakage

If leakage occurs inside the valve, please ensure if the valve is in fully closed condition. If the reason of leakage is Seat or Ball damage, replace the Seat(2) or Ball(11).

General Arrangement Drawings

► On-off Pattern

1. Body
2. Seat
3. Seat Carrier
4. Seat Spring
5. Seat Carrier Guide
6. Seat Carrier Backup Ring
7. Seat Carrier O-Ring
8. End Packing
9. Identification Ring
10. End Connector
11. Trunnion Ball
12. Stem
13. Stem Bearing
14. Stem O-Ring
15. Stem Backup Ring
16. Panel Nut
17. Handle
18. Handle Set Screw
19. Stop Pin
20. Ball Backup Ring
21. Ball O-Ring

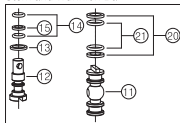


Magnify Drawings

Spring



Stem and Trunnion Ball



Reassembly

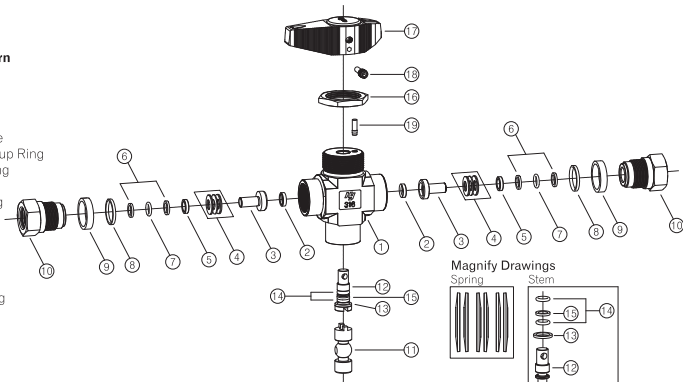
1. Before valve reassembly, check if any damage and corrosion in all part components of the valve. If the damage is considerable, replace the part component.
2. Insert the **Seat(2)** into the **Seat Carrier(3)**.
3. Insert the **Seat Spring(4)** (Check the position of Spring), **Seat Carrier Guide(5)**, **Seat Carrier Backup Ring(6)** and **Seat Carrier O-Ring(7)** into the **Seat Carrier(3)**.
4. Insert the **Seat Carrier(3)** into the **End Connector(10)**.
5. Insert the **End Packing(8)** and **Identification Ring(9)** into the **End Connector(10)**.
6. Tighten the **End Connector(10)** to **Body(1)** by hand.
7. Put the **Stem O-Ring(14)**, **Stem Backup Ring(15)**, **Stem O-Ring(14)** and **Stem Bearing(13)** on the **Stem(12)**. (**Stem O-Ring(14)** and **Stem Backup Ring(15)** shall be lubricated.)
8. Put the **Ball Backup Ring(20)** and **Ball O-Ring(21)** on the **Trunnion Ball(11)**.
9. Insert the **Stem(12)** into the **Body(1)**. Be careful not to scratch the inside walls of **Body(1)** bore, or to clip the **Stem O-Ring(14)** during installation.
10. Insert the **Trunnion Ball(11)** into the **Body(1)** by aligning the **Stem(12)** key and **Trunnion Ball(11)** slot.
11. Assemble the **Panel Nut(16)** to the **Body(1)**.
12. Tighten the **End Connector(10)** according to Torque Table.
13. Put the **Handle(17)** on the **Stem(12)**. (Insert the **Handle(17)** by aligning the arrow on the top of the **Stem(12)** with the arrow on the underside of the **Handle(17)**.) Align the **Handle Set Screw(18)** hole with the **Stem(12)** hole. Tighten the **Handle Set Screw(18)** into the **Stem(12)** hole.

Disassembly

1. Remove the **End Connector(10)** from the **Body(1)**.
2. Remove the **End Packing(8)** and **Identification Ring(9)** from the **End Connector(10)**.
3. Remove the **Seat Carrier(3)**, **Seat Spring(4)**, **Seat Carrier Guide(5)**, **Seat Carrier Backup Ring(6)** and **Seat Carrier O-Ring(7)** from the **End Connector(10)**.
4. Remove the **Seat(2)** from the **Seat Carrier(3)**.
5. After removing the **Handle Set Screw(18)**, remove the **Handle(17)**.
6. Press down on the top of the **Stem(12)** and remove through the bottom of **Body(1)**.
7. Remove the **Trunnion Ball(11)** from the **Stem(12)**.
8. Remove the **Stem Backup Ring(15)** and **Stem O-Ring(14)** from the **Stem(12)**.
9. Remove the **Ball Backup Ring(20)** and **Ball O-Ring(21)** from the **Trunnion Ball(11)**.
10. Loosen the **Panel Nut(16)** from the **Body(1)**.

► Switching Pattern

1. Body
2. Seat
3. Seat Carrier
4. Seat Spring
5. Seat Carrier Guide
6. Seat Carrier Backup Ring
7. Seat Carrier O-Ring
8. End Packing
9. Identification Ring
10. End Connector
11. Trunnion Ball
12. Stem
13. Stem Bearing
14. Stem O-Ring
15. Stem Backup Ring
16. Panel Nut
17. Handle
18. Handle Set Screw
19. Stop Pin



Disassembly

1. Remove the End Connector(10) from the Body(1).
2. Remove the End Packing(8) and Identification Ring(9) from the End Connector(10).
3. Remove the Seat Carrier(3), Seat Spring(4), Seat Carrier Guide(5), Seat Carrier Backup Ring(6) and Seat Carrier O-Ring(7) from the End Connector(10).
4. Remove the Seat(2) from the Seat Carrier(3).
5. After removing the Handle Set Screw(18), remove the Handle(17).
6. Press down on the top of the Stem(12) and remove through the bottom of Body(1).
7. Remove the Trunnion Ball(11) from the Stem(12).
8. Remove the Stem Backup Ring(15) and Stem O-Ring(14) from the Stem(12).
9. Loosen the Panel Nut(16) from the Body(1).

Reassembly

1. Before valve reassembly, check if any damage and corrosion in all part components of the valve. If the damage is considerable, replace the part component.
2. Insert the Seat(2) into the Seat Carrier(3).
3. Insert the Seat Spring(4) (Check the position of Spring), Seat Carrier Guide(5), Seat Carrier Backup Ring(6) and Seat Carrier O-Ring(7) into the Seat Carrier(3).
4. Insert the Seat Carrier(3) into the End Connector(10).
5. Insert the End Packing(8) and Identification Ring(9) into the End Connector(10).
6. Tighten the End Connector(10) to Body(1) by hand.
7. Put the Stem O-Ring(14), Stem Backup Ring(15), Stem O-Ring(14) and Stem Bearing(13) on the Stem(12). (Stem O-Ring(14) and Stem Backup Ring(15) shall be lubricated.)
8. Insert the Stem(12) into the Body(1). Take care not to score the inside walls of Body(1) bore, or to clip the Stem O-Ring(14) during installation.
9. Insert the Trunnion Ball(11) into the Body(1) by aligning the Stem(12) key and Ball(11) slot. Place hole of the Trunnion Ball(11) to opposite direction of arrow mark that is located top of Stem(12).
10. Assemble the Panel Nut(16) to the Body(1).
11. Tighten the End Connector(10) according to Torque Table.
12. Put the Handle(17) on the Stem(12). (Insert the Handle(17) by aligning the arrow on the top of the Stem(12) with the arrow on the underside of the Handle(17).) Align the Handle Set Screw(18) hole with the Stem(12) hole. Tighten the Handle Set Screw(18) into the Stem(12) hole.

Torque Table

Series	End Connector Size	Body Material	Torque (N · m)		
			End Connector		
			PTFE	PCTFE	PEEK
T TH	13/16" (20.6mm) 7/8" (22.2mm) 15/18" (23.8mm)	SS316	58.8	78.4	58.8

Pressure-Temperature Rating

Series	Seat Material	Temperature Rating	Pressure Rating @ 100°F(37°C)	
			Body Material	
			Stainless Steel	Alloyl 400
T	PCTFE	0°F ~ 250°F (-17°C ~ 121°C)	6000 psig (413 barg)	5000 psig (344 barg)
	PEEK	0°F ~ 450°F (-17°C ~ 232°C)		
	PTFE		1500 psig (103 barg)	

Series	Seat Material	Temperature Rating	Pressure Rating @ 100°F(37°C)	
			End Connection	Body Material
				Stainless Steel
TH	PEEK	0°F ~ 450°F (-17°C ~ 232°C)	Female 1/8", 1/4" Hy-Lok 1/4", 6mm	10000 psig (689 barg)
			Hy-Lok 8mm	7500 psig (516 barg)
			Hy-Lok 12mm	6600 psig (454 barg)
			Hy-Lok 3/8"	6500 psig (447 barg)
			Hy-Lok 1/2"	6700 psig (461 barg)
			Hy-Lok 10mm	6000 psig (413 barg)

◆ *Removal*

CAUTION

The valve shall be depressurized with the open position before removal.
And close the valve after fluids are fully drained.

1. Get permission to remove the valve.
2. For preventing the damage of the seat, awfully attention is needed when remove the valve.
3. After removal, clean the valve and cap the ends with plastic covers.