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I & M MK901 Series

*Installation & Maintenance Instructions for Steriflow
MK901 Series 3- Piece Cavity Filled Ball Valves*

Warning: Steriflow ball valves must only be used installed and repaired in accordance with these Installation & Maintenance Instructions. Observe all applicable public and company codes and regulations. In the event of leakage or other malfunction, call a qualified service person; continued operation may cause system failure or a general hazard.

Please read these instructions carefully!

Your Steriflow Valve product will provide you with long, trouble-free service if it is correctly installed and maintained. Spending a few minutes now reading these instructions can save hours of trouble and downtime later. When making repairs, use only genuine Steriflow Valve parts, available for immediate shipment from the factory.

Scope

This manual is intended as a guide to assist customers in the storage, installation, and maintenance of Steriflow MK901 Series ball valves. Subsequent additions or special instructions will be provided for special valves, critical service or customer requirements.

Applicability



1/2" - 3" Sizes



4" Size

This manual is applicable to the MK901 Steriflow three piece ball valves

Caution

To help prevent injury to personnel or damage to equipment, please read this section completely before performing any operations.

1. Valve pressure ratings are based on many variables, including valve series and size, as well as body, seat and bolt material. Verify that application does not exceed the pressure or temperature rating on the nameplate.
2. Always depressurize the line with the valve in the open position before disassembly. Cycle valve in depressurized line before removing valve.
3. Wear protective equipment and take appropriate precautions to safeguard against injury caused by the discharge of trapped fluids.

Use only Steriflow recommended spare parts for maintenance.

To ensure safety and maintain warranty, never modify valve in any way without prior approval from Steriflow.

Storage

No internal lubricant is used on these valves. An FDA H-1 food grade incidental contact lubricant may be used on the threads of the body-end cap bolts. All valves are adequately packed in a strong cardboard case in such a way as to avoid any possible damage during transport and storage.

Caution: If ball valves are not destined for immediate use, the following precautions should be taken:

1. If possible, leave the ball valves in their packing cases during the period of storage.
2. Ball valves must remain in open position during this time.

3. In order to prevent damage, protective plastic covers on valve ends should not be removed until immediately prior to installation.
4. It is advisable to store the valves in waterproof conditions. Ball valves should be protected to safeguard against humidity, moisture, dust, dirt sand, mud, salt spray and seawater.
5. All valves equipped with actuators shall be stored in dry conditions.
6. Valves to be stored for a long period of time should be checked by the quality control personnel every six months; every three months when valves are automated.

Maintenance During Storage Period

- Internal surface should be inspected to check for dust or other foreign objects.
- Rust or dust must be removed by cleaning with proper solvent.
- After cleaning, ball valves must be lubricated with an adequate lubricant.
- Ball valves should be operated for at least two complete cycles before installing or returning to storage.

Installation

The ball valves may be installed in any position using standard pipe fitting practices.

Caution: Before installation of the valve:

1. Pipe must be free of tension both during and after installation.
2. Pipe must be flushed to clean dirt, welding residues, etc. which would damage ball or seats.
3. The valve should be kept in OPEN POSITION during installation and protective plastic covers must be removed only at the moment of installation.
4. If the valve was specified to be tested per ASME 16.34, there may be some trapped water between the ball and the body cavity. This can be removed by partially opening the valve, thereby exposing the cavity to the through port of the ball.

■ Installation of Tri-clamp Ends

5. Be sure only specified gasket and clamp, suitable for the application rating, are used.
6. Be sure gasket is properly seated before tightening clamp.

■ Installation of Weld-End Ball Valves

7. It is recommended that tube weld end valves be welded in line using orbital welding. This can be done without disassembling the valve.
8. Other welding methods may not be feasible due to the thin wall of the tubing. If other methods are used, the valve and connecting pipe should be aligned, and then the center section of the valve dropped out during welding to prevent heat damage of seats and seals.

Manual Operation

1. Open and close the valve by turning the handle one-quarter turn (90°).
2. Valve is in open position when handle is in line with the pipe.
3. Valve is in closed position when the handle is perpendicular to the pipe.

Maintenance

Before starting maintenance, please read information contained in the **Caution Section** of the manual.

1. Open and close the ball valve at least once to release the pressure completely from valve body.
2. Ball valves, if correctly used, normally do not need any internal lubrication and maintenance. However, when necessary, ball or seats can be replaced by qualified personnel following the instructions of this manual.
3. For further information, please refer to the cross section view and parts list.

Valve Disassembly

A. To inspect and / or Replace Body Seals, Seats, Packing & Ball

Reference cross section view for parts identification

1. Valve must be in the open position.
2. Remove one body bolt (9) opposite hinge point and loosen all others. This will allow center section to swing out.
3. Close the ball and remove seats (4), ball (3), and body seals (5). Be careful not to damage the ball.
4. Remove the handle nut (14), handle (15), lock washer (20), stem nut (13), gland bushing (19), and stem packing (8).
5. Push the stem (6) into the body (1). Remove thrust washer (7) from stem.

B. Inspection and Replacement

With the valve completely disassembled, clean and examine all components.

1. Ball - The surface of the ball should be free from any defect. If any are found, the ball should be replaced. Using a defective ball will be extremely detrimental to valve performance.
2. Seats - Replacement of seats is recommended.
3. Stem and Body Seals – Stem and body seals should be discarded and replaced.
4. Remaining components of the valve - After cleaning, carefully examine for wear, corrosion and mechanical damage. Replace all defective parts.
5. Clean inside of body and stem housing. Light grease, compatible with line fluid, can be used on ball, seals and stem surface.

Note: A spare parts list is available for this valve. Please refer to explosion view below for identification. Please specify specific valve number to ensure proper parts are ordered. Steriflow Valve does not take responsibility for incorrectly ordered spare parts.

Reassembly

A. Stem

1. Replace thrust washer (7) on stem, and then insert the stem (6) from inside the body (1).
2. Install stem packing (8), gland bushing (19), stem nut (13), and tighten until snug, then one-half turn. Do not over-tighten! To avoid rotation of stem, insert the handle through the body and ball.
3. Install lock-washer (20), handle (15) and handle nut (14), and then tighten.

B. Ball, Seats and Seals

1. Place the stem in closed position and insert the ball, aligning groove in ball with bottom of stem.
2. Position the ball in the open position then insert the seats and body seals.
3. Insert the centerpiece between the end caps, reinstall removed bolts and tighten all bolts and nuts by hand.

4. Tighten nuts to recommended torque values using an alternating/opposing pattern with no more than 1/4 turn on each nut before alternating.

Testing

1. After completing the reassembly, check that valve operates smoothly by opening and closing valve several times
2. If entire valve was removed from line and if facilities are available, test the ball valve to appropriate specifications.

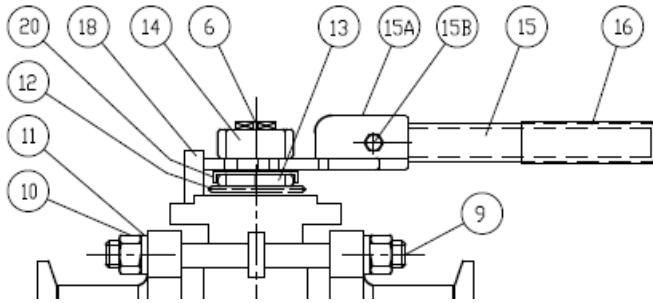
Troubleshooting

- A. Stem Leakage - You can eliminate leakage in the stem area by increasing the torque on the stem nut (13) in one-quarter turn increments. If leakage persists, replace stem packing (8).
- B. Body Seal Leakage - Check the torque of the body bolts (9) according to Torque Table. Replace body seals (5) if leakage persists.
- C. In Line or Seat Leakage - Check to be sure valve is in fully closed position. If leakage persists, the valve must be disassembled and damaged parts replaced.

Torque Table Body Bolt & Stem Nut

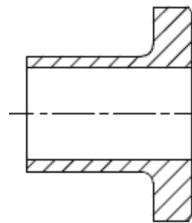
Valve Size	Bolt Size	Body Bolt Torque (in-lb)	Max Stem Nut Torque (in-lb)
1/2"	5/16-18 UNC-2B	70 - 110	90
3/4"	5/16-18 UNC-2B	80 - 120	90
1"	5/16-18 UNC-2B	85 - 130	110
1-1/2"	7/16-14 UNC-2B	120 - 180	170
2"	7/16-14 UNC-2B	200 - 300	180
2-1/2"	M12 x 1.75	435 - 660	260
3"	M14 x 2	480 - 725	380
4"	M16 x 2	560 - 840	450

Cross Section View



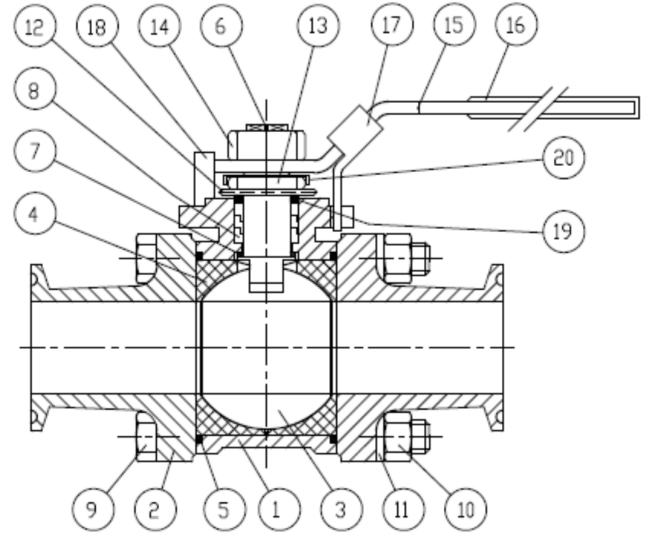
4" SIZE (Tri-Clamp Ends Shown)

ART1233



TUBE END

ART1232



TRI-CLAMP ENDS

1/2"-3" SIZES

Item No.	Part Name	Quantity	Item No.	Part Name	Quantity
1	Body	1	12	Belleville Washer	2
2	End Cap	2	13	Nut, Stem	1
3	Ball	1	14	Nut, Handle	1
4	Seat *	2	15	Handle	1
5	Gasket, Body *	2	15A	Adapter, Handle	1 (4" Only)
6	Stem	1	15B	Bolt, Handle	1 (4" Only)
7	Thrust Washer *	1	16	Cover, Handle	1
8	Packing, Stem *	1 Set	17	Locking Device	1
9	Bolt or Stud, Body	(1/2"-3") 4 (4") 6	18	Stop Pin, Handle	1
10	Nut, Body	(1/2"-3") 4 (4") 12	19	Gland Bushing	1
11	Washer, Body Bolt	(1/2"-3") 4 (4") 12	20	Lock Washer, Stem Nut	1

* Recommended Spare Parts