

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

3-WAY FULL PORT FLANGED BALL VALVE

3L66F150DM / 3T66F150DM

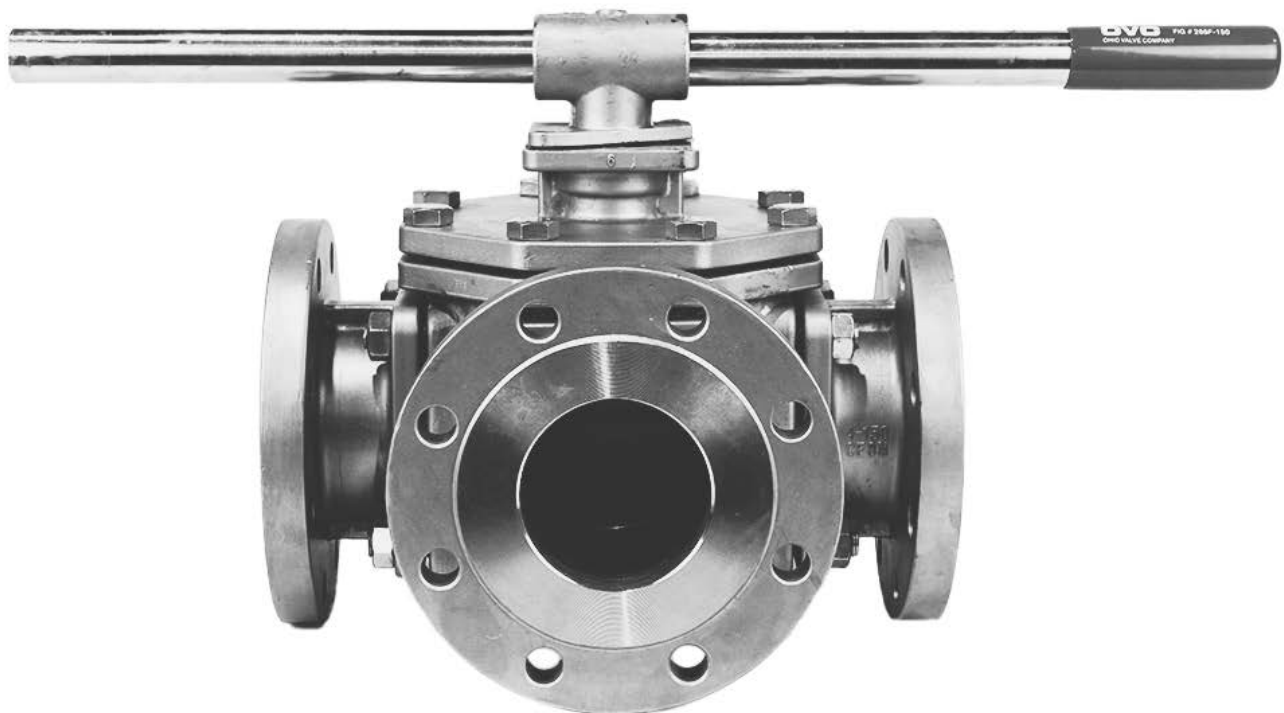


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1. SAFETY INFORMATION

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered herein.

- Always wear proper personal protective equipment (PPE).
- Do not attempt to disassemble a valve while there is pressure in the line. Make sure both upstream and downstream pressure is removed. Disassemble with caution in the event all pressure has not been relieved.
- Prior to replacing packing rings remove all pressure from the valve.
- To prevent valve distortion, inefficient operation, or early maintenance problems, support piping on each side of the valve.
- Do not touch surface of high temperature valves.
- Valves are not to be used with unstable fluids.
- If provided, the locking device on the handle is to avoid improper use of the valve by unauthorized people. This can be locked with a padlock.

2. GENERAL PRECAUTIONS

2.1 MATERIAL SELECTION

The possibility of material deterioration in service and the need for periodic inspections is dependent on the contained fluid. Carbide phase conversion to graphite, oxidation of ferrite materials, decrease in ductility of carbon steels at low temperature (even in applications above 29°F), and susceptibility to inter-granular corrosion of austenitic materials or grain boundary attack of nickel-base alloys are among those items. Information about corrosion data is provided in this IOM. The user is requested to take attention or consideration to determine if the used materials are suitable for the application.

2.2 FLUID THERMAL EXPANSION

With the ball in closed condition, it is possible that the sealed cavity inside the valve body can be filled with liquid. If this liquid is not released by partially opening the valve, and the valve is subject to a temperature increase, excessive pressure can occur inside the body. OVC 3-Way Flanged Full Port Ball Valves have self-relieving pressure seats that prevent pressure build-up. The user is recommended to prevent a pressure build-up inside the valve exceeding the design pressure by means of piping design, installation, or operation procedure.

2.3 DIRECT MOUNTING PAD

ISO 5211 direct mounting pad and stem orientation allows direct mounting of actuator to valves, making automation easier with improved performance. No brackets or couplers are required.

2.4 HYDROSTATIC TEST

Before delivery, all valve bodies are tested 1.5 times the working pressure in open position. After installation, the pipeline system may be subject to a system test not to exceed the above mention pressure.

(For example: PN 16 is hydrostatic tested $1.5 \times 16 = 24$ bar testing pressure)

2.5 LIQUIDS WITH HIGH FLUID VELOCITY

When ball valves must be operated frequently on liquids with very high velocity, a check shall be made with the valve distributor or manufacturer for appropriate advice to minimize the possibility of seat deformation, especially when working pressure and temperature is reaching maximum ranges.

2.6 THROTTLING SERVICE

Standard ball valves are generally not recommended for throttling service. The fluid flow can damage the leading edge of the ball and/or damage or deform the resilient ball seats causing leakage. High fluid velocity, and/or the presence of solid particles in the media, will reduce the lifetime of the seat and ball during throttling applications.

3. STORAGE

3.1 STORAGE

3.1.1 TEMPORARY STORAGE

If the valves are to be stored before installation, the following should be observed:

1. Keep the valves wrapped and protected as shipped from the manufacturer.
2. Do not remove the protective end covering until the valve is ready for installation. This will reduce the possibility of foreign material damaging internal valve components.
3. Valves stored outdoors should be positioned such that water does not accumulate in the valve body.

3.1.2 LONG TERM STORAGE

If the valves are to be stored for more than one year, they should be prepared in the following manner:

1. Remove the packing and apply a preservative to the packing chamber.
2. Apply a preservative to the external surface of the valve.
3. Do not remove the protective end covering until the valve is ready for installation.
4. Do not store the valves outdoors.

3.2 PREPARATION

1. Remove the plastic bag or valve end protection, if any.
2. Prior to shipment from the manufacturer, a preservative may have been applied to the inner body of the valve. This preservative may be removed with a solvent.
3. The inside of the valve should be inspected and blown out with compressed air. Adjacent piping must be clean and free from debris to prevent damage to the valve.
4. To prevent valve distortion, inefficient operation, or early maintenance problems, support piping on each side of the valve.
5. Make sure the valve is positioned such that there is sufficient space to reach the handle easily and safely.
6. OVC 3-Way Flanged Full Port Ball Valves can be installed in any position without regard for the direction of the flow, unless marked in the flow direction.
7. OVC 3-Way Flanged Full Port Ball Valves are not designed for throttling and should be kept in the fully open or closed position. Should the valve be used in a partially open or closed position, the ball and seats may become eroded in a very short time. This may also cause a chatter noise in the line.

4. INSTALLATION

4.1 HANDLING

Make sure the lifting equipment used is strong enough to ensure a safe installation.

4.2 CLEANING

Before the valves are installed, make sure they are clean(ed) inside and outside. Make sure the valves are free of dust and sand. You can clean the valves with drinking water, compressed air, or steam. Please be cautious with the cleaning of automated valves such that no water or steam will enter the actuator. Before installing the valve, make sure the flange faces are clean and undamaged. Make sure the flange packing used is completely centered and not obstructing the bore of the valve.

4.3 VALVE INSTALLATION

1. **Direction:** Most of the valves do not restrict the flow direction.
2. **Position Between Flanges:** The valve must be installed between flanges that are exactly welded on the pipeline. The length between the flanges must be exact according to the length of the valve, including the two gaskets used. It is very important to avoid stress tension on the valve body by pulling the flanges to the valve with the flange bolts. This process will cause great stress on the valve body resulting in a leaking valve. This stress can be so great that the valve can be deformed beyond repair. Outside temperature and exposure to the sun can have a great effect in the expansion of the pipeline. Designing and Engineering must take this into consideration. Heat expansion can put a lot of pressure on the valve body resulting in the deformation of the valve body and a leaking valve. Installation of an expansion joint can prevent these problems.

5. MAINTENANCE AND REPAIR

5.1 MAINTENANCE DURING THE OPERATION

Leakage may occur to the product after a certain period of operation. Maintenance shall be performed as follows:

5.1.1 LEAKING FROM THE STEM PACKING

- **Causes:** Prolonged or frequent use makes the stem packing gradually lose its elasticity, resulting in a weakened sealing effect in the stem, and finally leakage.
- **Remedial Measures:** Remove the handle and handle head. Tighten the fixing cap-c with a proper wrench, so that the gland presses tightly on the stem packing. This process stops new elastic deformation of the packing material and grabs tighter onto the stem, stopping the leak. This procedure may be performed regularly.

5.1.2 LEAKING VALVE BODY AND VALVE CAP

- **Causes:** After a period of operation, the tightening force between the valve body and valve cap becomes weaker, resulting in less pressure against the gasket and therefore the leak.
- **Remedial Measures:** Tighten the bolts connecting the cap to the body with a proper wrench, so as to enhance the sealing effect of the gasket between the cap and the body. This process increases the pressure, and therefore stops the leak. This procedure may be performed regularly.

5.1.3 LEAKING FROM THE VALVE SEAT

- **Causes:**
 1. After long-term valve operation and endurance of force, the resilience of the ball seat weakens, resulting in decreased pressure against the ball, thus leading to leakage. Remedial Measures: See (5.1.2)
 2. After long-term valve operation and endurance of force, the ball seat or the ball gets scratched and therefore leakage occurs. Remedial Measures: See (5.2.3)

5.2 REPAIR

After a certain period of operation, if the product continues to leak after the abovementioned maintenance, repair shall be performed as follows:

5.2.1 REPAIR THE LEAKING STEM PACKING

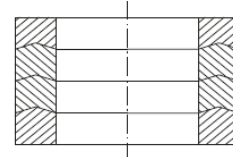
Method: Replace stem packing.

Dismantle:

- Remove the handle and handle head.
- Then remove the cap-c with the proper tool.
- Remove gland.
- Take out stem packing with a proper tool.

Assembly:

- Correctly arrange the four (upper, middle, lower) pieces of new gland packing.
- Place the packing onto the stem; mind the direction.
- Place the cap-c and tighten it.



5.2.2 REPAIRING THE LEAK AT THE BODY-CAP JOINT

Method: Replace the gasket.

Dismantle:

- Remove stud bolts joining the body and cap.
- Remove the gasket.

Assembly:

- Place the new gasket in position. Ensure that the gasket is smoothly placed.
- Place the cap onto the body and tighten the stud bolts

5.2.3 REPAIRING THE LEAK AT THE VALVE SEAT

Method: Replace the ball seat; polish or replace the ball body.

Dismantle:

- Remove the stud bolts joining the body and cap.
- Remove the ball.
- Remove the seat that leaks.

Assembly:

- Place the new seat in position. Ensure that the seat is smoothly placed.
- Place the cap onto the body and tighten the stud bolts.

Inspection and Treatment:

- Inspect the surface of the ball. Polish the ball if there are fine scratches or roughness. Replace with a new ball if the scratch is severe.

7. TECHNICAL PARAMETERS

7.1 TORQUE

NPS	DN	GLAND NUT		BOLT		HANDLE BOLT	
		N-M	IN-LB	N-M	IN-LB	N-M	IN-LB
1/2"	15	13	115.1	35	309.8	13	115.1
3/4"	20	13	115.1	35	309.8	13	115.1
1"	25	32.5	287.6	40	354	15	132.8
1-1/4"	32	71.5	632.8	60	531	17	150.5
1-1/2"	40	71.5	632.8	60	531	17	150.5
2"	50	104	920.5	60	531	17	150.5
2-1/2"	65	156	1380.7	75	663.8	17	150.5
3"	80	234	2071.1	75	663.8	17	150.5
4"	100	286	2531.3	85	752.3	17	150.5

Table 1 - Torque