INSTALLATION, OPERATION AND MAINTENANCE MANUAL

FULL PORT 2-PIECE BALL VALVE

266FTDM

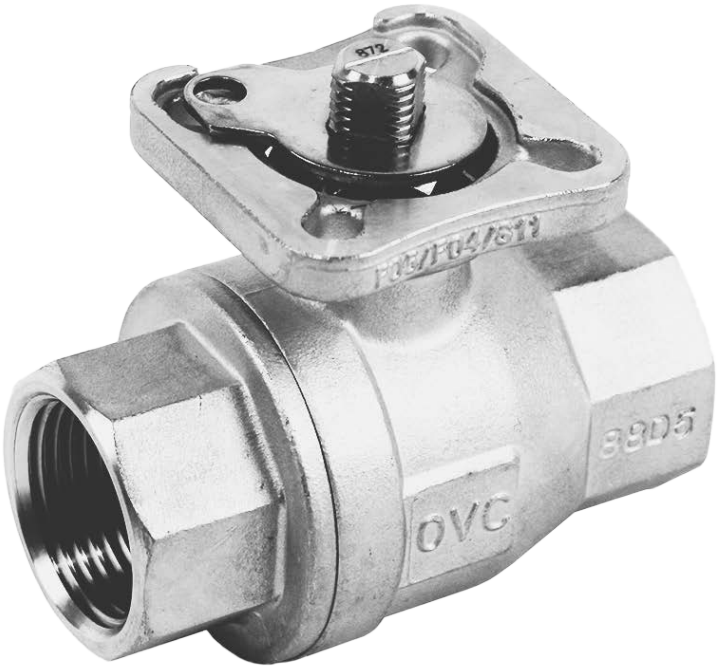


TABLE OF CONTENTS

1. SAFETY INFORMATION 3

2. GENERAL PRECAUTIONS 3

2.1 Material Selection. 3

2.2 Fluid Thermal Expansion. 3

2.3 Hydrostatic Test 3

2.4 Liquids with High Fluid Velocity 4

2.5 Throttling Service 4

3. STORAGE AND PREPARATION. 5

3.1 Storage. 5

3.2 Preparation. 5

4. INSTALLATION AND OPERATION 6

4.1 Installation. 6

4.2 Operation 6

4.3 Manual Operation 6

5. MAINTENANCE AND REPAIR. 6

5.1 Inspection and Maintenance 6

5.2 Troubleshooting 7

5.3 Stem-Packing Replacement 8

6. TECHNICAL PARAMETERS 9

6.1 Gland and Body & Cap Screw Torque 9

7. PRESSURE TEMPERATURE RATING 10

1. SAFETY INFORMATION

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this IOM. 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 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 depended 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

It is possible that with the ball in closed condition, the sealed cavity inside the valve body is 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 Full Port 2-Piece Ball Valves (Direct Mount) have self-relieving pressure seats to 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 HYDROSTATIC TEST

Before delivery, all valve body's 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 X 16 = 24 bar testing pressure)

2.4 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.

2.5 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 prescence of solid particles in the media will reduce the lifetime of seat and ball during throttling applications.

3. STORAGE AND PREPARATION

3.1 STORAGE

3.1.1 TEMPORARY STORAGE

If 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 dose 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. Do not remove the protective end covering.
3. Valves remaining in storage for an excessive period of time should have a preservative applied to the external surface.
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 maybe 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 with sufficient space to easily and safely reach the handle.
6. OVC Full Port 2-Piece Ball Valves (Direct Mount) can be installed in any position without regard for the direction of the flow, unless marked in the flow direction.
7. OVC Full Port 2-Piece Ball Valves (Direct Mount) 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 AND OPERATION

4.1 INSTALLATION

THREADED ENDS - Do not dismantle these valves before fitting; treat as a unit. Taper thread fittings should not be over-tightened. In some applications, screwed valves are back welded on-site. Such valves must be dismantled as per instruction for weld-end valves.

4.2 OPERATION

OVC Full Port 2-Piece Ball Valves (Direct Mount) provide tight shut-off when used under normal conditions and in accordance with pressure/temperature chart. If these valves are used in partially open (throttled) position seat, life may be reduced. Any media which might solidify, crystallize, or polymerize should not be allowed to stand in the ball valve cavities unless regular maintenance is provided.

4.3 MANUAL OPERATION

The basic type of handle fitted to all sizes of valve is sheet steel with integral stop. OVC Full Port 2-Piece Ball Valves (Direct Mount) have quarter-turn operation, closing in a counter-clockwise direction. It is possible to see when the valve is open or closed by the position of the handle. When the handle is across the pipeline, the valve is closed.

5. MAINTENANCE AND REPAIR

5.1 INSPECTION AND MAINTENANCE

A periodic inspection and maintenance schedule should be established for each valve. The time frames given for the implementation of these schedules are to be used as a guide only in establishing routine inspection and maintenance schedules. Exact time periods for performing these procedures cannot be provided due to the unknown nature of the service conditions each valve is in.

5.1.1 PERIODIC INSPECTION

A periodic inspection should be performed on each unit. The time frame should be adjusted depending on usage and service conditions. An infrequently used unit may have more time between inspections than a valve in constant service.

A periodic inspection should include the following:

- Open and close the valve. The actions should be smooth without any binding of the stem and ball through full travel.
- If valve is in service and under pressure:
    1. Examine the body to caps connection for leakage through the gasket. If leakage is found, tighten the bolt nuts evenly in a star pattern until the leakage slops. Do not exceed the maximum torque values in Table 3. If the leakage persists, see Section 5.2 - Troubleshooting.
    2. Check the stem packing for any leakage during the opening and closing action. If a leak is found tighten the gland nut alternately with no more than a quarter turn on it until the leak stop. If the leakage persists, see Section 5.2 - Troubleshooting.
    3. Inspect the exterior of the valves for cleanliness. Remove any dirt, grime, or oil from the valve body and caps.

5.1.2 POST INSPECTION

After completion of a periodic inspection, valves that are providing satisfactory service require no further disassembly or inspection. Should a valve be found which is not performing satisfactorily, see Section 5.2 - Troubleshooting.

5.1.3 MAINTENANCE

Other than periodic inspection, no routine maintenance is required. Routine replacement of parts, such as gasket and packing, is not usually performed until required. Once in service, it may become apparent that these and other parts require repair or replacement due to usage and service conditions. A maintenance schedule should be developed taking these conditions into consideration. Parts can be replaced during a routine overhaul.

5.2 TROUBLESHOOTING

The following chart will cover the various problems which are common to most valves. The information provided will aid in isolating and correcting these problems.

PROBLEM	PROBABLE CAUSE	SOLUTION
LEAKAGE THROUGH THE STEM AND PACKING	• Gland nut is loose. • Packing aged or failure. • Inadequate amount of packing rings. • Packing is hard and dry. • Thrust washer is damaged. • Stem is damaged.	• Tighten gland nut. • Replace packing. • Install additional packing rings (see Section 5.3). • Replace with new packing (see Section 5.3). • Replace with new thrust washer. • Repair or replace as required.
PROBLEMS IN OPERATING VALVE	• Gland nut over-wear. • Packing is exerting excessive force on the stem. • Stem is damaged. • Internal components may be damaged.	• Replace gland nut. • Check torque on gland nuts. Properly loosen gland nut. • Repair or replace as required. • Disassemble the valve. Inspect ball, seat, and stem, and repair as needed.
LEAKAGE BETWEEN BODY AND CAP	• Cap is loose. • Gasket is damaged. • Body or cap faces are damaged.	• Tighten the cap. • Disassemble and install a new gasket. • Repair and install a new gasket.
SEAT LEAKAGE	• Valve is not properly seated. • Internal components (ball, seat, stem) are damaged or worn. • Leakage by foreign material.	• Check to see if valve is fully closed. • Inspect internal components (ball, seat, and stem) and repair or replace as required. • Disassemble and clean the ball and seats, and repair or replace as required.

TABLE 1 - VALVE TROUBLESHOOTING

5.3 STEM-PACKING REPLACEMENT

WARNING - To prevent injury, ensure that all pressure is removed from the valve both upstream and downstream before disassembly.

1. Check original tightness of valve operation. Remove stem nut, washer, handle, and gland bolt. Clear the packing chamber.
2. Remove the existing or defective packing rings with a sharp tool or packing remover.
3. Examine the machined surfaces of the stem and packing chamber. Remove any scoriae or burrs with emory cloth or hand filing. Clean the stem with a solvent-soaked rag.
4. Install new packing. Install rings individually using a split ring spacer, compressing each ring by hand-tightening the gland nut.
5. When packing chamber becomes filled with packing, reassemble gland nut. Tighten the gland nut until the gland nut begins to get tight. If gland travels more than the height of one packing ring into the packing chamber, insert one more ring and repeat step 4 until chamber is filled.
6. Compare valve operation to original tightness. If valve operation is considerably tighter than original operating tightness, back off one quarter-turn on the gland nut and re-check tightness.
7. Several hours after a repacked valve has been returned to service, inspect the packing area to ensure full compression, tight bolting, and no leakage. Should leakage occur, tighten the gland nut at quarter-turn increments until leakage stops.

6. TECHNICAL PARAMETERS

6.1 GLAND AND BODY & CAP SCREW TORQUE

NPS	DN	GLAND		BODY & CAP SCREW TORQUE
		N-M	IN-LB	KGF/CM²
1/4”	8	20	177	10
3/8”	10	20	177	10
1/2”	15	20	177	10
3/4”	20	25	221	15
1”	25	30	266	20
1-1/4”	32	30	266	20
1-1/2”	40	35	310	35
2”	50	35	310	40

TABLE 2 - GLAND AND BODY & CAP SCREW TORQUE

OHIO VALVE COMPANY

PRESSURE TEMPERATURE RATING

366FWDM / 356FWDM / 366FTDM / 356FTDM / 266FTDM

