Installation and Operation Manual

Ball Valve Flanged

Mechanical Services & HVAC Products
F43D16

Stainless Steel Industrial Valves
F43D16-50/51 | F43T16-50/51 | F43Df10-50/51

This manual is also available online.

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SAFETY PRECAUTIONS

Caution

Read and understand carefully this document prior attempting to install Fivalco® products. Failure to follow these instructions could cause severe injury, product and/or property damage.

Installation, maintenance and replacement of Fivalco® products must be implemented by an experienced, well trained installer. Wear safety glasses, helmet, hand and foot protection during installation.

The owner is responsible for maintaining the system in proper operation condition.

Fivalco shall not be held responsible for any incidents arising from improper installation, operation and maintenance work. The responsibility for this must rest with the installer and user.

Disclaimer

This manual serves as a general guideline and reference to the installers and users. Every effort has been made to ensure the information contained in this manual is accurate at the time of publication. Fivalco Limited assumes no responsibility or liability for any errors and/or misinterpretation of the information. Contact your local vendor, distributor or Fivalco Limited for detail technical data and specification of each model, and if any additional information is required. We reserve the right to alter this manual without notice.

"The quality goes in before our name goes on"

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BALL VALVE

1 GENERAL

Ball valves form a significant component of the piping systems, are widely used in various systems for isolation of the medium. Failure of a ball valve in such systems, either due to faulty installation or improper maintenance, could result in extensive damage and costly repairs. Problems with or malfunctions of the valves due to faulty installation or improper maintenance may result in extensive and costly operation to effectively correct or eliminate the problem.

Ball valves may not be installed and used as anchor points, and should at all times be kept free from stress arising from the system pipeline. Valves should not be installed in applications or for service other than the recommended for that purpose or approved in advance by the manufacture. Valves should not be installed in lines where service pressure will exceed the rated working pressure of the valve.

Ball valves should not be used in applications that are exposed to freezing temperature unless sufficient flow is maintained through the valve or other protection is provided to prevent freezing.

Ball valves are operated through a handle to drive the valve stem and 90° ball rotation, in order to achieve the sealing between the opening and closing. The sealing surface is generally made of polytetrafluoroethylene (PTFE), which is abrasion-resistant, corrosion-resistant, good resistance to scouring, reliable sealing and long service life.

2 UNLOADING & TRANSPORTATION

A vital consideration in handling valves should be avoid damaging or scratching the coating protection.

All valves should be unloaded carefully. Each valve should be carefully lowered from the truck to the ground; it should not be dropped. In the case of larger valves, forklifts or slings around the body of the valve or under the skids should be used for unloading. Only hoists and slings with adequate load capacity to handle the weight of the valve or valves should be used. Hoists should not be hooked into or chains fastened around yokes, stem, or handwheels. Failure to carefully follow these recommendations is likely to result in damage to the valve.

3 STORAGE

The valves should be stored in a dry and cooled room to prevent moisture, rain, direct sunlight and rust. When stored in the warehouse, valves should be in the fully open position with both sides covered to prevent dirt from entering and damaging the surface. In colder climates where valves may be subject to freezing temperatures, it is absolutely essential to remove the water from the valve interior. Failure to do so many results in a cracked valve casting and or deterioration of the resilient seat material. Avoid keeping the ball valve in a half-open position for an extended period, as this can cause indentations on the sealing surface, leading to leakage.

4 INSPECTION PRIOR TO INSTALLATION

Valves should be inspected at the time of receipt for damage in shipment. The initial inspection should be to verify compliance with specifications, direction of opening, and type of end connections. A visual inspection of the seating surfaces should be performed to detect any damage in shipment or scoring of the seating surfaces. Inspection personnel should look for bent levers, broken handwheels, cracked parts, loose bolt, missing parts and accessories, and any other evidence of mishandling during shipment.

Each valve should be operated through one complete opening-and-closing cycle in the position in which it is to be installed. Contact your vendor or local representative immediately if any disorder is found.

5 INSTALLATION

Before installation, carefully check the nameplate to ensure it meets the specified requirements. The product should have been commissioned according to standard specifications and usage requirements before leaving the factory. Therefore, during on-site installation, proceed if the product parts are undamaged from transportation and storage, and adjustment parts remain secure, without requiring additional commissioning.

Valves can be installed at horizontal or vertical pipeline depending on its application. When installed, the medium flow direction should be the same as the flowing direction on the valves, if any. Ball valves should be installed, if possible, a minimum of 6 pipe diameters from other line elements, i.e., elbows, pumps, valves, etc. Sometimes this is not feasible, but it is important to achieve as much distance as possible. Nevertheless, the installer shall provide sufficient space for valves for easy installation, operation, maintenance, inspection and replacement.

During valve installation, ensure it is fully open to prevent foreign objects or welding debris from dislodging the sphere. Tighten the nut evenly and diagonally with appropriate torque to ensure reliable sealing between the valve and pipe flange.

To close the valve, turn the handle clockwise until perpendicular to the pipeline, reaching the fully closed position when the positioning block is engaged.

To open the valve, turn the handle counterclockwise until parallel to the pipeline, achieving the fully open position when the valve is fully extended.

Ensure the working temperature and pressure do not exceed the maximum permissible limits to maintain valve performance.

Do not strike the valve during installation.

During system operation, the valve must be fully open or fully closed and should not be used as a regulating valve.

Bolts must be tightening in a crosswise pattern (see figure 1). Installer should ensure that the valve flanges are well aligned and an even pressure on the gasket surface is applied.

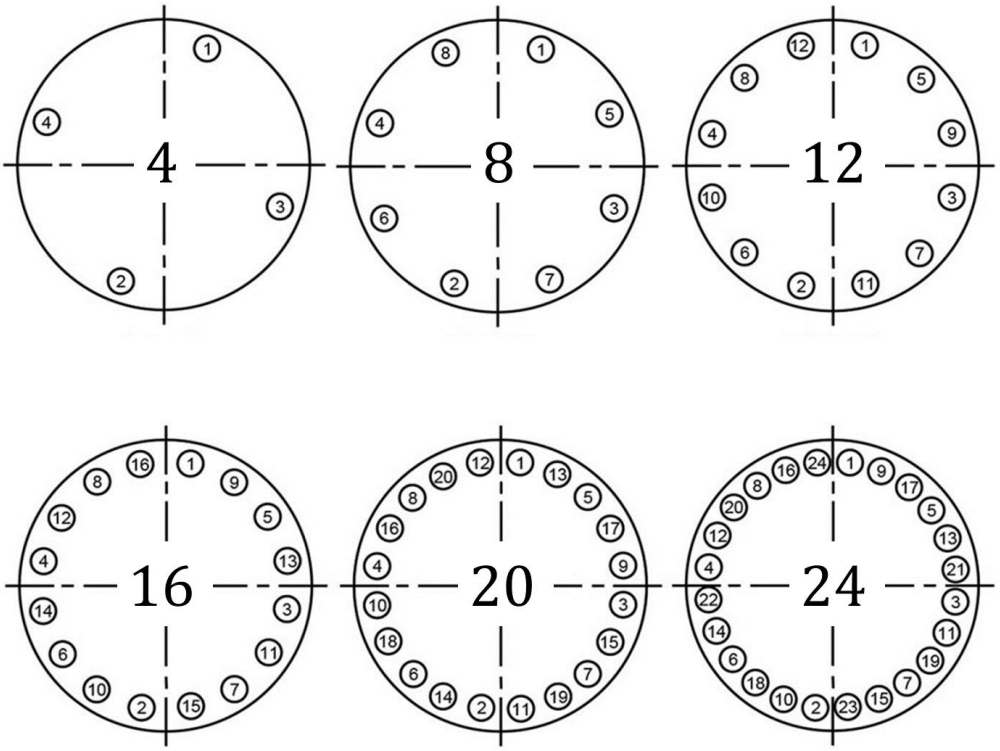

Figure 1: Crosswise pattern for tightening or loosening bolts.

6 TROUBLE-SHOOT

Potential Malfunction	Leakage at packing.
Possible causes	1. Packing is aged beyond its useful life. 2. Stem lacks high precision; it may be bent, corroded, or worn. 3. Improper operation with excessive force. 4. Gland is skewed, causing stem wear and packing damage.
Solutions	1. Replace packing promptly. 2. Straighten or repair a bent or worn stem; replace if seriously damaged. 3. Strictly follow operating procedures and apply uniform, normal force. 4. Apply uniform pressure on bolts to eliminate unilateral friction.

Potential Malfunction	Leakage at packing.
Possible causes	5. Packing is aged beyond its useful life. 6. Stem lacks high precision; it may be bent, corroded, or worn. 7. Improper operation with excessive force. 8. Gland is skewed, causing stem wear and packing damage.
Solutions	5. Replace packing promptly. 6. Straighten or repair a bent or worn stem; replace if seriously damaged. 7. Strictly follow operating procedures and apply uniform, normal force. 8. Apply uniform pressure on bolts to eliminate unilateral friction.

Potential Malfunction	Leakage at gasket.
Possible causes	1. Operation is not smooth, causing pressure and temperature fluctuations. 2. Insufficient compression force on the gasket. 3. Uneven compression force on the gasket.
Solutions	1. Carefully adjust for smooth operation. 2. Ensure pre-tensioning force meets requirements and perform "hot tightening" after warming up. 3. Tighten the bolts uniformly and symmetrically.

Potential Malfunction	Sealing surface leakage (internal leakage).
Possible causes	1. The sealing surface does not close tightly. 2. Excessive closing force causes the sealing surface to be crushed or deformed by extrusion.
Solutions	1. Mark the opening and closing positions of the valve and promptly repair poor closures. 2. Follow operating procedures when opening and closing the valve.

Potential Malfunction	Inflexible stem operation.
Possible causes	1. Packing pressure is excessively tight, gripping the valve stem. 2. Improper operation causes deformation and damage to the valve stem and related parts.
Solutions	1. Loosen the gland appropriately to prevent the packing from gripping the valve stem. 2. Operate with correct force and technique.

7 MAINTENANCE

If the valve is installed according to our standard procedures, it is maintenance free.
However, for every 4-5 years, we recommend that you carry out a routine check of the valve for leaks around the stem and the flange gaskets. All seals will in the course of time be influenced by air and sunshine, frequent and careful checks can reveal leaks. Moreover, we recommend you to adjust the bolts in the flange connections, as the compression of the flange gaskets may be reduced in the course of time and thus leaks may arise.

When the valves being used for some time, the leaking may be happened in the filling area because of the friction caused by the stem moving, you can tighten the connection nut of the filling flange and adjust; it is dangerous to change filling with the pipes full of pressure, so we do not suggest you change the filling when the valves are working. If it is dangerous because of the temperature, high pressure and chemical elements, the filling must not be changed under the pressure situation.

8 WARNINGS

1. The user is responsible for selecting appropriate materials for the valve, considering potential deterioration in service and conducting necessary periodic inspections.
2. The valve is designed for general conditions only. Special requirements must be specified in the contract.
3. The valve is designed to withstand minor corrosion. It may not be suitable for severe corrosion or specific corrosive environments.
4. The operating temperature of the valve must not exceed its design limits. Any consequences resulting from temperatures exceeding these limits are solely the responsibility of the user.
5. During operation, the valve body surface temperature may cause burns. Users must install warning signs in corresponding areas.
6. The valve should not undergo welding repairs or surface painting during operation.
7. The valve should not be disassembled while under pressure.
8. During repairs, use materials as specified in the sixth table for proper matching.
9. The valve design does not include life calculation, trials, or fatigue calibration. Users must ensure regular maintenance and replacement.
10. The valve design does not account for seismic loads. The manufacturer bears no responsibility for any consequences arising from seismic activity.

WARRANTY STATEMENT

Fivalco's products are designed, engineered and manufactured within its specification of intended use, under the highest quality control possible. Commitment on quality and performance is always at the top of our agenda.

Fivalco warrants that for a period of thirty-six (36) months following delivery, the Fivalco products will perform in accordance with published specifications, and will be free from defects in material or workmanship provided that the products are stored and installed in accordance with recommendations in our catalogues.

Fivalco's obligation shall be to replace any product found to be defective in design, material or workmanship during the warranty period. Fivalco shall not be obligated to refund the purchase price and other liabilities on monetary compensation, nor shall it be obligated to pay for any labor or costs associated with the removal of the defective products or the reinstallation of those products. No warranty coverage will be provided for products that have been altered and / or used for a purpose other than that for which they were designed or installed contrary to Fivalco's guidelines.