

Maintenance and Installation instruction for 3-Way Transfer valves DUKE ... und DUKE-F... DN 50 to DN 200

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Introduction

Please read the installation instructions before installing the DUKE to avoid errors. The balls in the ball valves are provided with an L-through hole. The DUKE was fully assembled in our production for functional testing. For transporting the boom is disassembled. The ball valves are self-assembled. When installing the linkage site, make sure that both balls have the same position (note "Hand lever and ball position"). For cost reasons, the DUKE to DN 150 has a WAFER-fitting.

Maintenance instruction for 3-Way-valve of the 3-Way Transfer valve DUKE DN 50...100

MVA 3-Way transfer valves are maintenance free. If it may become necessary, to change the gaskets made of PTFE, follow these steps:

- 1) Please follow the accident prevention regulations.
- 2) Remove the valve from the system. If necessary, remove toxic or flammable residues.
- 3) Clamp the ball valve in a vise.
- 4) Mark the screw ring position relative to the housing.
- 5) Unscrew the threaded locking ring (Pos. 2) from the body (Pos. 1).
- 6) Remove the body sealing ring (Pos.6).
- 7) Remove the ball (Pos. 3) and check the surface. If the surface is damaged, the ball must be replaced.
- 8) Clean the seats (Pos. 5) and replace them if they are damaged.
- 9) Remove the two nuts (Pos. 14 +17) of the stem (Pos. 4) and remove the stem from the housing. Replace any worn or defective parts.
- 10) Clean all parts and assemble them in reverse order using new gaskets (3 pieces).
- 11) Tighten the threaded locking ring (Pos. 2). Align the marks.
- 12) Check the free movement of the ball.

Pos.	Component
1	Body
2	Threaded Locking Ring
3	Ball
4	Stem
5	Seat
6	Sealing Ring
7	O'Ring
8	Upper Ring
9	Stem O'Ring
10	Upper Sealing Couple
11	Packing Gland
12	Operating Stop
13	Belleville Washers
14	Stem Retaining Nut
15	Fixing Nut Plate
17	Locking Nut
19	Operation Stop Screw

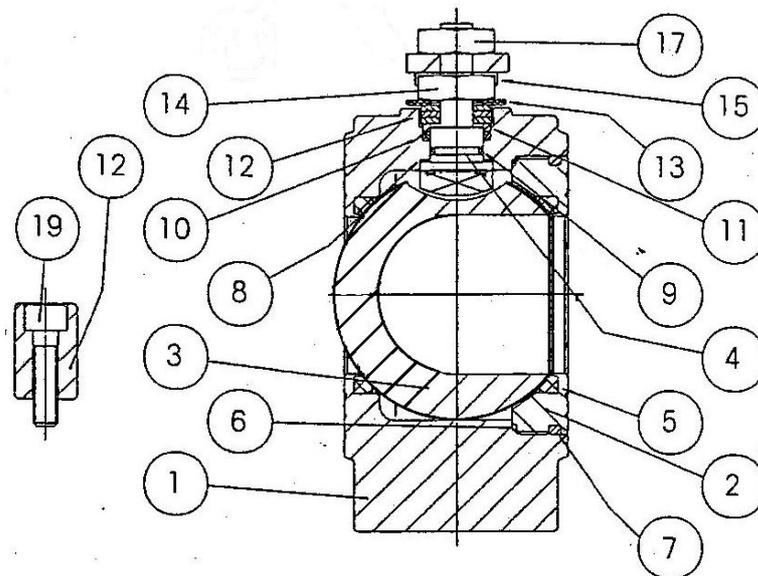


Figure 1: Component list ball valve DN 50...100

Maintenance instruction for 3-Way-valve of the 3-Way Transfer valve DUKE 125...150

MVA ball valves 3-Way transfer valves are maintenance free. If it may become necessary to change the gaskets made of PTFE, follow these steps:

- 1) Please follow the accident prevention regulations.
- 2) Remove the valve from the system. If necessary, remove toxic or flammable residues.
- 3) Clamp the ball valve in a vise.
- 4) Mark the closure position relative to the housing.
- 5) Unscrew the closure (Pos. 3) from the body (Pos. 1).
- 6) Remove the body gasket (Pos.7).
- 7) Remove the ball (Pos. 5) and check the surface. If the surface is damaged, the ball must be replaced.
- 8) Clean the seats (Pos. 6) and replace them if they are damaged.
- 9) Remove the two nuts (Pos. 11) of the stem (Pos. 4) and remove the stem from the housing. Replace any worn or defective parts.
- 10) Clean all parts and assemble them in reverse order using new gaskets (3 pieces).
- 11) Tighten the closure (Pos. 3). Align the marking.
- 12) Check the free movement of the ball.

Pos.	Component
1	Body
2	Screw
3	Closure
4	Stem
5	Ball
6	Seats
7	Body Gasket
8	Washer
9	Gland
10	Lever
11	Nut / Lock Nut
12	Spring Washer
13	Stop Device
14	Antistatic Device
15	Stem O'Ring
16	Body O'Ring

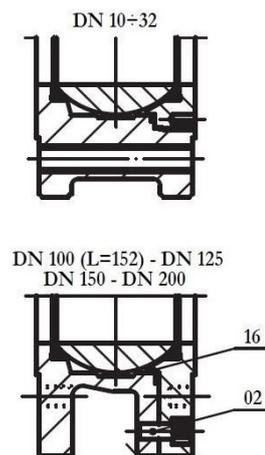
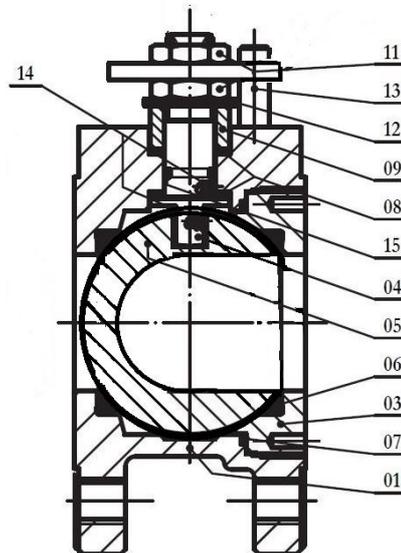


Figure 2: Component list ball valve DN 125...150

Maintenance instruction for 3-Way-valve of the 3-Way-Transfer valve DUKE – F DN 50...200

MVA ball valves 3-Way transfer valves are maintenance free. If it may become necessary to change the gaskets made of PTFE, follow these steps:

- 1) Please follow the accident prevention regulations.
- 2) Remove the valve from the system. If necessary, remove toxic or flammable residues.
- 3) Loosen the screws and nuts (Pos. 12). Remove the housing cover (Pos. 4) by pulling it upwards.
- 4) Remove the cover joint gasket (Pos. 13) and remove all three flanges (Pos. 2)
- 5) Loosen all the nuts (Pos. 17). Clean the cap joint gaskets (Pos. 6) and replace them if they are damaged.
- 6) Remove the ball with stem (Pos. 3) and check the surface. If the surface is damaged, the ball must be replaced.
- 7) Clean the ball seats (Pos. 8) and replace them if they are damaged.
- 8) After you have cleaned all the parts, assemble the parts in reverse order using new gaskets (3 pieces).
- 9) Check the free movement of the ball.

Pos.	Component
1	Body
2	Flange Cap
3	Ball & Stem
4	Top Cover
5	C Retainer Ring
6	Cap Joint Gasket
8	Ball Seat
9	Gland
10	Stem Packing
11	Bushing
12	Cover Bolt
13	Cover Joint Gasket
14	Gland Bolt
15	Stopper
16	Spring
17	Nut
18	Stud

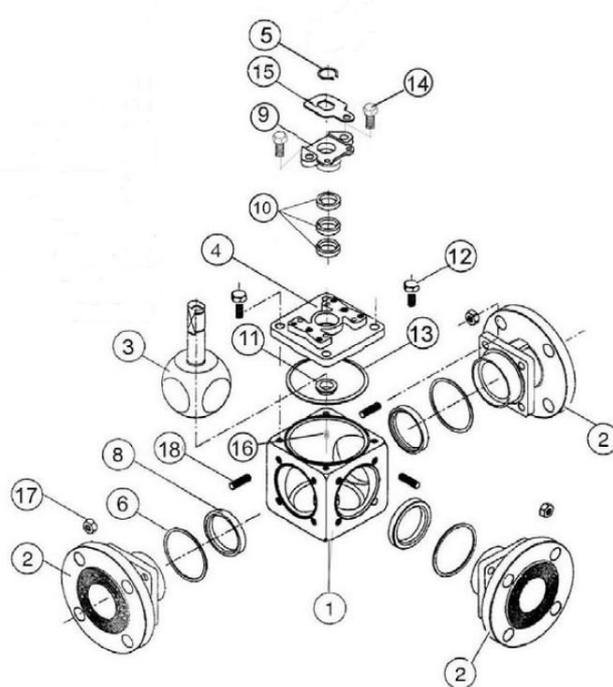


Figure 3: Component list ball valve DN50...200 DUKE-F

Installation and operating instructions for the linkage of the 3-Way Transfer valve Typ DUKE

Installation

The rod must be mounted between the ball valves. Pay particular attention to the same ball position. Please note the left hand and right hand lever position (see Figure 4 and 5). The rod connectors on the upper ball valve operating shaft (flat head) are secured with a clamp ring. Twist the rod with the lever by 90 ° by loosening the four fixing screws on the bottom of the linkage ball valve coupling. After the desired lever position has been set, the 4 fixing screws must be tightened again. Also a rotation of the rod by 90 ° is possible by replugging the square on the hand gear (DN 150).

Operating instructions

Make sure that the valves are always completely open or closed, an intermediate position is not permitted.

Hand lever and ball position

To enable proper operation, ensure that the upper and lower ball have the same position at the installation. The hand lever is always in the position of the currently open side. The lever will point to the heat exchanger currently in operation. The rod with the hand lever from position 1 (the left heat exchanger) to position 2 (the right heat exchanger) can be adjusted by 90 °. The arrows in figure 3 and 4 show the flow of the medium in the appropriate position.

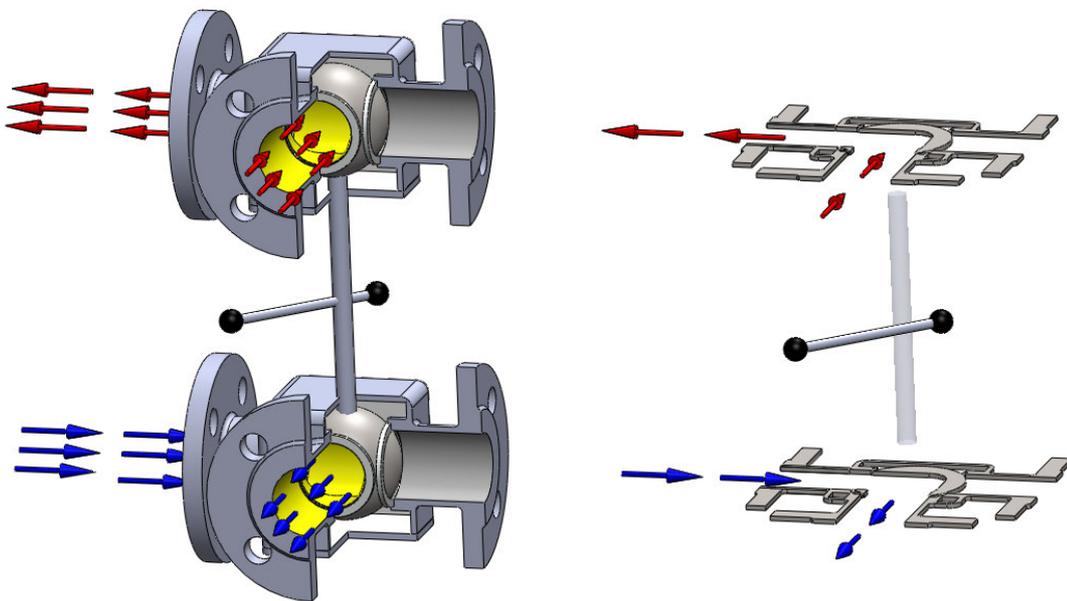


Figure 4: Position 1 left heat exchanger

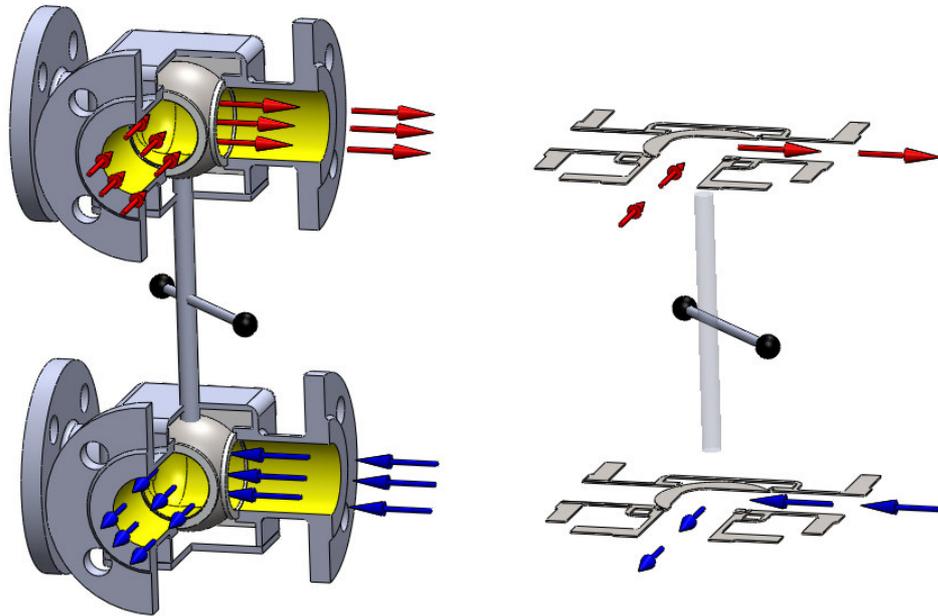


Figure 5: Position 2 right heat exchanger

Position indicator

3-Way Transfer valves without a hand lever are provided with a position indicator on the shaft. After the shaft has been installed correctly, the segments of the position indicator must be secured with a welding spot against accidental twist. The mark arranged at 90° angle, indicate the holes in the ball. A clear determination of the ball position is possible

A. Storage

- 1) During storage, the flanges must be sealed to protect them from dirt and the ball from damage.
- 2) The shift lever is located at the end position, so the seals are protected against deformation.

B. Installation of the Transfer valve

After installing the fittings, it must be ensured that the selector shaft axis of the upper and lower ball valve is not subjected to extreme tensions from the heat exchangers or other fittings. Ensure that the valves are mounted in an axis flange to flange - stem to stem. The ball valve connections (flanges) shall not be exposed to torsion. If the differential pressure from inlet to outlet ball valve is > 6 bar, take care that the pressure is equalized.

C. Operating

To operate the changeover switches, the media must be free of gas and the pressure on all sides of the valves must be the same. Compensation takes place through opening a Bypass around the valve. Pressure peaks and gas absorption can therefore be avoided. Please follow the steps:

- 1) Open the vent valve of the not in operation side.
- 2) Open the connection line (only if a bypass is installed)
- 3) The vent valve must be closed as soon as all air has left the system
- 4) When the pressure is equal on both sides, the position can be changed by a simple movement of the hand lever (or handgear) with a 90 ° rotation. Extreme forces should not be used.
- 5) When the switching is done, the connection line must be closed to compensation.

D. Maintenance / Repair instructions

It is necessary to ensure that the selection lever (or handgear) is in the end position, so that the seals are save from deformation.

E. Repair

In case of repair, the ball valves must be removed from the system. If the valves are opened, all the internal seals (O-rings), seats, seal rings and washers must be replaced. Before these parts are installed, the valve must to be cleaned and the gasket surfaces and the surface of the ball must be checked for damage. Before the valves are installed, a leaking test with max. 0.5 bar air has to be performed. After this test, the valves must be installed in the system again. The position of the balls and the fittings must correspond to the first installation (see point B).