

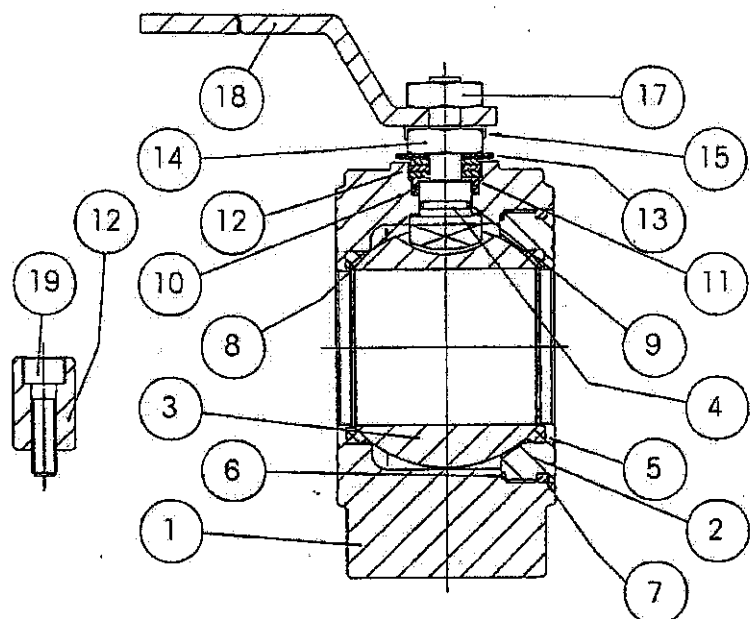
Mounting- and Service instructions for 3-way ball valve array model DUKE

MVA ball valves do not require any maintenance and will be supplied completely assembled and ready to use.

After a long running period it might be necessary to change the PTFE components. In such case please proceed as follows while paying attention to the relevant rules for accident prevention.

- 1) Remove the valve from the pipe-system. Clean the residual piping product from valve, especially if toxic or harmful.
- 2) Block the valve in a parallel-jaw vice.
- 3) Rotate the ball in "closed position" by shifting the lever.
- 4) Countersign the position of body-ring nut, marking a reference line with a marking tool.
- 5) Unscrew and remove the ring-nut (item 2) from body (item 1) with a pin scanner.
- 6) Raise and remove the body seal (item 6) with an extractor tool.
- 7) Remove the ball (item 3) and inspect its spherical surface. In case of furrows or damages the ball has to be replaced.
- 8) Raise and remove the two seats (item 5) with an extractor tool. Clean the seats carefully and in case of furrows or damages replace them.
- 9) Unscrew and remove the two nuts (items 14+17) from the stem (item 6). Remove the stem from inside. Inspect the worn out conditions of stem, bushes, etc. and replace the damaged ones.
- 10) After cleaning all the parts reassemble them proceeding contrary to disassemble.
- 11) Screw the ring nut (item 2) onto body with a pin spanner up to marked reference line. Check the ball rotation resistance. The power resistance has to be homogeneous during the "opening for closing" manoeuvre of the valve.

Item	Part
1	Body
2	Ring Nut
3	Ball
4	Stem
5	Seat
6	Body Seal
7	O-Ring
8	Lower Stem Rings
9	Stem O-Ring
10	Upper Sealing Couple
11	Packing Gland
12	Operation Stop
13	Belleville Washers
14	Nut
15	Fixing Nut Plate
17	Nut
18	Lever Handle
19	Bolt



Installation- and Operating Instructions for the fixed rod of the 3-way ball valve array model DUKE

Installation Instructions

The connection-rods are fixed between the two 3-way-ball-valve of the double-three-way-change-over-valve.

You can change the connection-rods if the position of the handle does not correspond to the mounting place.

In this case, please proceed as follows while paying attention to the relevant rules for accident prevention and instruct your staff only to use suitable tools.

By loosening the 8 screws of the connection-rod, you can turn the lever in four 90° steps.

Tighten the screws if you have reached the requested position of the hand-lever.

Operation Instructions

Make sure that the ball valves are completely opened or closed when turning the change-over-valve; any other position is not admissible.

A. Storage

1. During storage the ball valve should be sealed against the entry of contaminant, which may cause damage to the ball and seals.
2. Ensure that the change-over lever is placed against its stop on the detention plate to protect its seals from deformation.

B. Mounting of Transfer Ball Valves with Flexible Coupling Shaft

Ensure the balls are aligned in parallel with the coupling shaft when the change-over lever is against the stop on the detention plate.

When fitting the valves, care should be taken to ensure they are not subjected to any extreme loads applied via heat exchangers or associated vessels. The valve connections should never be exposed to torsional stresses of any kind and should be aligned. If operational pressures exceed 6 bar the valves should be pressure equalized prior to change-over (separate equalizing lines between vessels should be used) - Ensure flanges are aligned when mounted.

B1. Mounting of Transfer Ball Valves, Single or Rigidly Coupled

Ensure the balls are aligned in parallel when the change-over lever is against the stop on the detention plate. The rest see "E".

C. Operation

To operate change-over ball valves, pressure must be equalized on both sides of Installation and all free air expelled from systems. This prevents excessive loads being applied to change-over levers and air absorption of System fluid.

Change-over is carried out as follows:

1. Open vent valve an unit not in service;
2. Open equalizing line;
3. Close vent valves when all free air has been expelled from system;
4. When pressure has equalized valve can be changed over in one single movement of change-over lever (90 degree turn) - Extreme force should not be used.
5. On completion of change - over equalizing line must be closed.

D. Maintenance / repair instructions

Ensure that the change-over lever is placed against its stop on the detention plate to protect its seals from deformation.

E. Repair

In case of a repair, the valve has to be disassembled from the System. If the valve has been opened all internal seals ("O"rings), ball seats, bushings and bearings are to be replaced. Before replacing the parts the ball valve has to be cleaned and the gasket surfaces and ball surface have to be inspected if no defect may harm the new gaskets.

Before mounting in the system a leak test with air max 0,5 bar has to be performed to check whether the repair has been successful.

After this check, the valves can be mounted in the system again. The position of the ball have to be checked before mounting (see B).