

DUAL PLATE CHECK VALVE

INSTALLATION, OPERATION AND MAINTENANCE

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1 - SAFETY INFORMATION

The following general safety information should be taken into account in addition to the specific warnings and cautions specified in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered in this I.O.M.



To avoid injury, never attempt disassembly while there are pressures either upstream or downstream. Even when replacing gaskets, caution is necessary to avoid possible injury. Disassemble with caution in the event all pressures are not relieved.



To prevent valve bending, damage, inefficient operation, or early maintenance problems, support piping on each side of the valve.



- A valve is a pressurized mechanism containing fluids under pressure and consequently should be handled with appropriate care.
- Valve surface temperature may be dangerously too hot or too cold for skin contact.
- Upon disassembly, attention should be paid to the possibility of releasing dangerous and or ignitable accumulated fluids.
- Ensure adequate ventilation is available for service.

This manual provides instructions for storing, general servicing, installation and removal of valves. Trust Valves refuses any liability for damage to people, property or plant as well as loss of production and loss of income under any circumstances but especially if caused by incorrect installation or utilization of the valve or if the valve installed is not fit for intended purpose. It is the sole responsibility of the user to ensure the valve type and materials are correctly specified.

DURING OPERATION, TAKE INTO ACCOUNT THE FOLLOWING WARNINGS:

- Valve's internal parts (disc/stem/hinge pin/seats/gaskets/seals, etc.) shall be handled with care avoiding scratches or surface damage.
- All tools and equipment for handling the internal parts shall be soft coated, or else take care.
- Valves can be fitted with gaskets or seals in PTFE, Buna, Viton, etc., hence high temperatures and some cleaning fluids may damage sealing components.

For all operations, refer to position number on part list of the applicable drawing.

2.0 - INSTALLATION



Piping should be properly aligned and supported to reduce mechanical loading on the end connections.

Install valve in system using proper size and type of mating flanges and appropriate gaskets (for FF or RF) or ring joint gaskets (for RTJ). Observe the following precautions:

- Do not install wafer check valves directly against another valve whereby the check valve discharges downstream directly into another valve.
- Do not install the valve whereby it directly discharges downstream into a tee or elbow fitting. Refer to Diagram 1.
- Dual plate check valves are not suitable for vertical down flow installations.

2.1 - INSTALLATION POSITIONS

Check valves are unidirectional and have the direction of flow indicated on the valve's body.

Dual plate check valves are recommended for use only in horizontal lines and vertical lines for upwards flow only.

2.2 - PREPARATION FOR INSTALLATION

- Remove protective end caps and inspect valve ends for damage to flange faces.
- Thoroughly clean adjacent piping system to remove any foreign material that could cause damage to seating surfaces during valve operation.
- Verify that the space available for installation is adequate to allow the valve to be installed.

2.3 END CONNECTIONS

Flanged Ends

Check to see that mating flanges are dimensionally compatible with the flanges on the valve body and ensure sealing surfaces are free of debris.

Install correct studs and nuts for the application and place the gasket between flange facings.



Stud nuts should be tightened in an opposite crisscross pattern in equal increments to ensure even gasket compression. See Diagram 5.

2.4 - CLEANING

Before installation, wash off any rust proofing solution coating with kerosene, or any hydrocarbon solvent product. Valve plates (flaps) should be checked to ensure they are free.

2.5 - DIRECTION OF FLOW & INSTALLATION POSITION

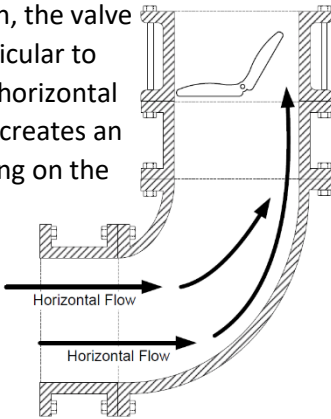
The direction of flow in the line should coincide with the flow direction indicated by the cast 'arrow' on the body of the valve.



Dual plate check valves are designed for steady flow conditions and are not recommended for use near reciprocating pumps, but especially compressors, any pulsating devices or other types of physical/thermal shock-load applications. In this type of application, the check valve will not perform efficiently and will ultimately fail.

For vertical installation, it is necessary to orientate the valve rib such that there is equal loading on both flaps. Refer Diagram 1. Additional pressure drop should be expected due to the weight of the discs.

In this position, the valve rib is perpendicular to the incoming horizontal piping, which creates an unequal loading on the plates.



In this position, the valve rib is parallel to the incoming horizontal piping and creates an equal loading on the plates.

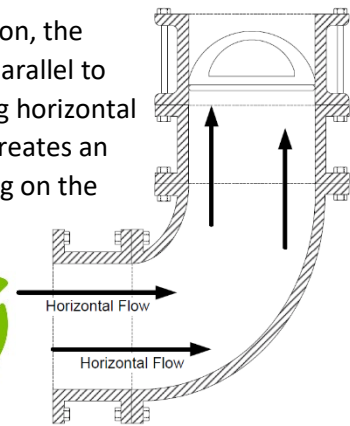


Diagram 1



Dual plate check valves can be installed either horizontally or vertically. For vertical installations, dual plate check valves can only be installed with flow direction upward. In the vertical position, the outlet will be above the inlet.

Indicates flow direction

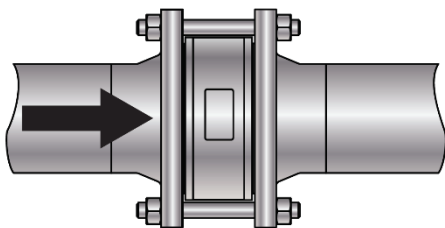
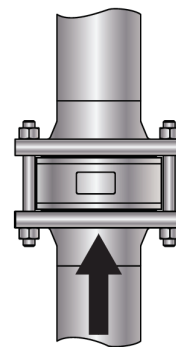


Diagram 2



Vertical pipe with flow UP.

2.6 – HORIZONTAL PIPING

Insert valve into pipeline so that the Pin Retainers (plugs) are placed in an up and down position. In other words the central rib in the middle of the valve must be perpendicular to the flow. For valves with lifting lug, use it as a guide but install the same way. Consult Diagram 1 and 2 for orientation positions.

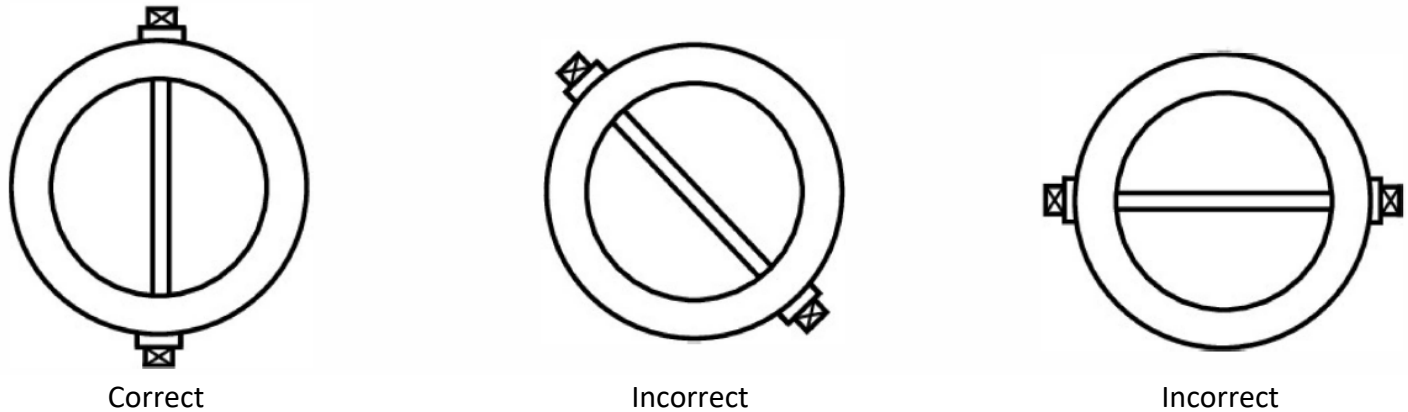


Diagram 3

2.7 – DISTANCE BETWEEN DUAL PLATE CHECK VALVE AND A BUTTERFLY VALVE

If you attach another valve to the outlet side of the dual plate check valve, ensure that there is enough distance between two valves so that the plates of the check valve do not touch the disc of the other valve in the open position. For separating other valves such as butterfly valves, a spacer spool may be required to stop the disc interfering with the check valve plates.

2.8 – ORIENTATION OF DUAL PLATE CHECK VALVE TO PUMP DISCHARGE

When mounting the dual plate check valve near a pump, as indicated on Diagram 4, position so that the flow of the pump meets evenly with the two plates of the valve. The hinge pin of the dual plate check valve should be at right angles to the pump shaft. Ideally, for maximum service life keep distance 'A' more than 6 times the diameter of the pipe. For higher pressures, the distances should be further. Consult Diagram 1 and 2 for orientation positions.

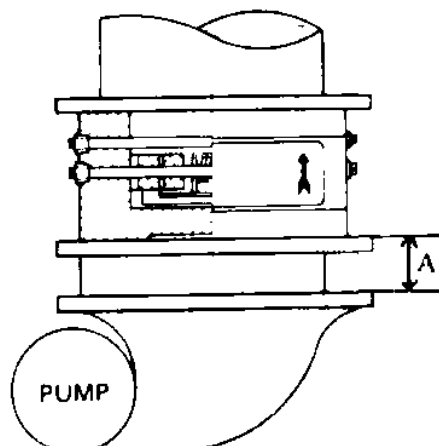


Diagram 4

2.9 – GASKETS

The opening end of the outlet side of Dual plate check valve is manufactured larger than the internal diameter of the pipe. Use a gasket that is either the same internal diameter of the dual plate check outlet, or slightly larger. Most common spiral wound or CNAF pipe gaskets will fit, providing they are the same corresponding flange class rating as the valve it is specified to. CNAF gaskets are only suitable up to 1400 kPa (200 psi). Ring joint gaskets are frequently specified in class 900 to 2500. The recommended tightening sequence is shown below in Diagram 5. Tighten in numerical order, gradually increasing torque with each sequence.

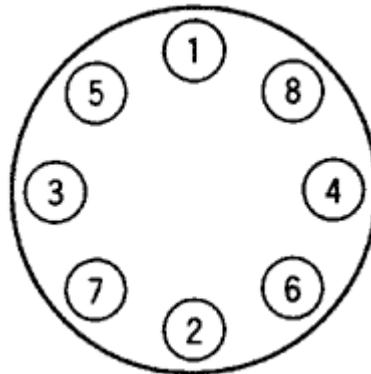


Diagram 5

2.10 – POST-INSTALLATION PROCEDURES

After installation, the line should be cleaned by flushing to remove any foreign material. When caustics are used to flush the line, additional flushing with clean water is required. The valve should be opened and closed after installation to ensure proper operating function.

With the line pressurized, check the valve end connections and any body plugs for leaks.

3 – OPERATIONS

The check valve operation is automatic and requires no assistance. When the flow exerts sufficient pressure against the plates to overcome the plates' weight, they allow the flow to continue through the piping system. As pressure decreases, the plates lower until its own weight forces it to seat. This prevents the possibility of a reversal in the flow.

Metal seated check valves are not zero leak devices and may "seep" in service. This type of valve should always be backed up with an isolation valve. Even soft seated valves require a small amount of back pressure to effect a seat. Similarly, to open the valve, the cracking pressure depends on the spring tension. Low cracking pressure springs are available.

4 – MAINTENANCE

No periodic maintenance is necessary.

5.0 - REPAIRS

Proper safety equipment and apparel should be worn when preparing to service a valve. Observe the general safety warnings throughout this catalogue and consult your safety and plant managers.

5.1 - REPAIR INSTRUCTION

Due to the relatively low replacement cost of small diameter standard iron or carbon steel valves especially under DN200 (8"), it is usually less expensive to replace the complete valve than to have maintenance personnel effect repairs. Refer to indicative bill of materials in Appendix A, Diagram 6. Design varies according to size, class, seat type, etc.; hence refer to as-built drawing.

Gasket sealing surfaces should be scraped clean (avoid radial marks).

5.2 - REMOVING VALVE FROM PIPELINE

1. To remove the Check Valve from the pipeline, first isolate the Check Valve by shutting off the upstream pump and closing the downstream isolation valve. Drain the system as much as possible.
2. Relieve pressure from both sides of the Check Valve by venting the line.
3. Loosen the outlet side first; never loosen the inlet side first. Once pressure has been relieved, loosen inlet side.
4. Remove Check Valve from the pipeline and inspect the internal components for wear or damage. If replacement parts are required, please contact Trust Valves for repair recommendations.

For any technical request or assistance, feel free to contact Trust Valves Quality Department at:
quality@trust-valves.com – +39 02 9675 4324

6 – APPENDIX A

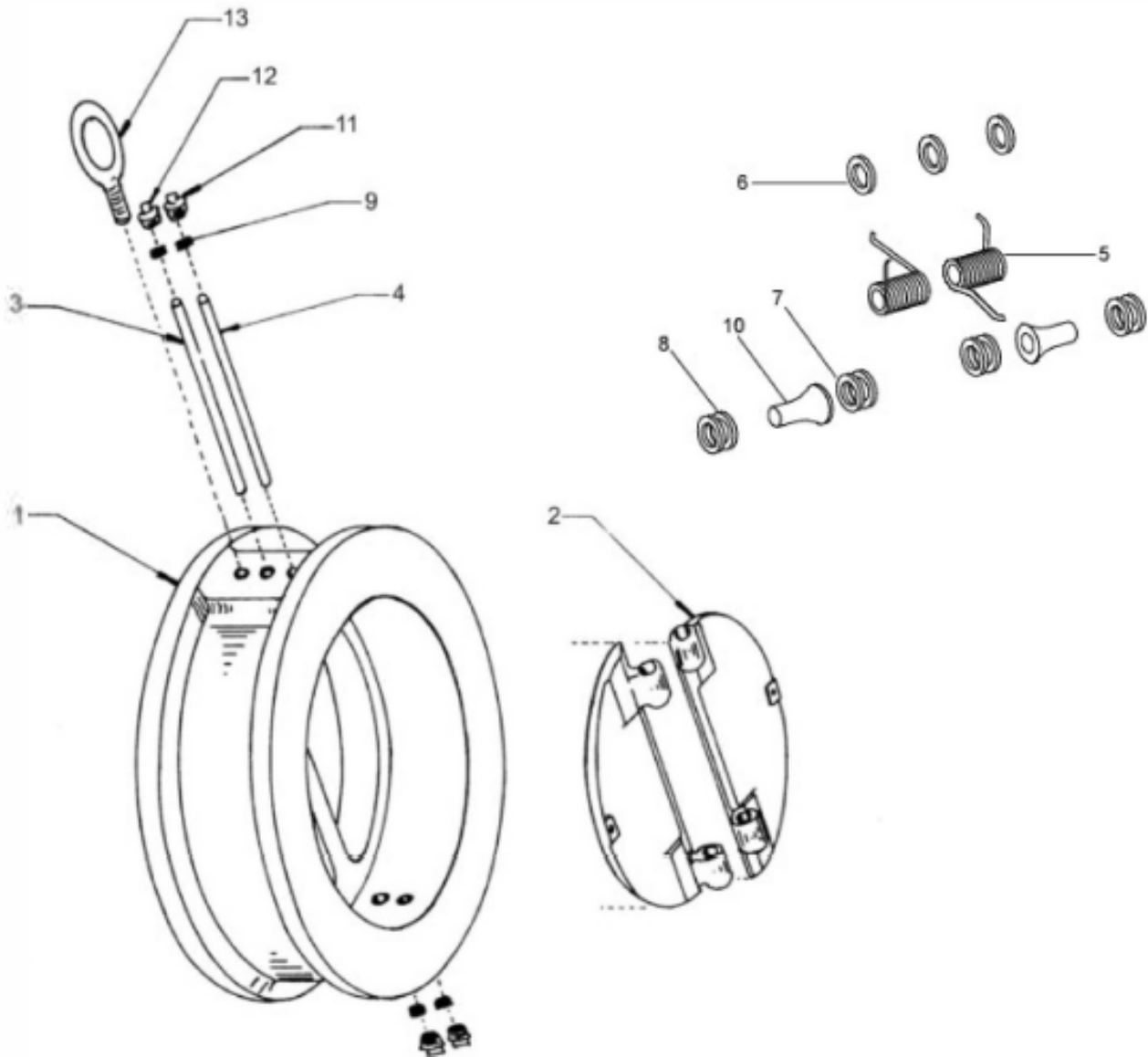


Diagram 6

PART N°	DESCRIPTION	PART N°	DESCRIPTION
1	Body	8	Body Lug Bearing
2	Plates	9	Pin Stabilizers
3	Hinge Pin	10	Support Sleeves
4	Stop Pin	11	Hinge Pin Retainer Plugs
5	Spring	12	Stop Pin Retainer
6	Spring Bearing	13	Lifting Eye Bolt
7	Plate Lug Bearing		

Indicative drawing only, refer to as-built drawing. Drawing will vary according to size, class, materials, etc.