

# Installation and Maintenance Manual

## Forbes Marshall Disc Check Valve

FMDCV (DIN) & FMDCV (ANSI)

### 1. Product Working Principle:

Forbes Marshall Disc Check Valve ensures unidirectional fluid flow in pipes by restricting the back flow of fluids. Valve are opened by the pressure of the flow of the fluid and closed by spring as soon as the flow ceases and before the reverse flow occurs as shown in fig.1

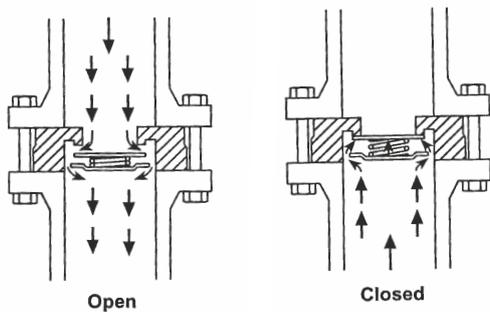


Fig. 1: Operation of Forbes Marshall Disc Check Valve

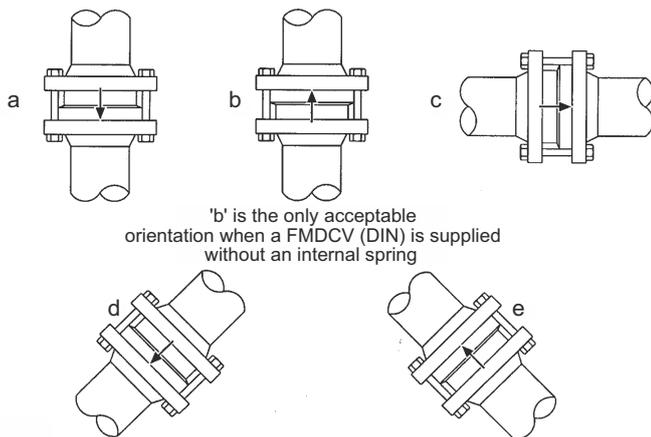


Fig. 2: FMDCV (DIN) & FMDCV (ANSI) any orientation installation

### 3. Start-up and Commissioning:

#### 3.1 Flushing of lines:

As part of pre-installation all fluid handling equipment particularly piping should be thoroughly cleaned of scale and the internal debris which accumulates during construction. This is accomplished by blowing or flushing with air, steam, water and other suitable medium.

Follow these steps to carry out the flushing.

**Note:** For a detailed procedure on flushing of lines please visit Forbes Marshall website.

#### 3.2 Commissioning:

After installation or maintenance ensure that the system is fully functioning by confirming fluid is passing through it.

1. After flushing of lines is complete, ensure that upstream isolation valve is opened.
2. Check for leaks and attend if any.

### 4. Maintenance Guidelines:

Before undertaking any maintenance on the product it must be isolated from both supply line and return line as it is under pressure during operation. When re-assembling ensure that product if are clean. Once completed open isolation valves slowly and check for leaks.

- ☑ Unscrew the nuts from the flange remove the gasket, to remove the dirt deposits rinse the equipment with fresh water and wipe the disc with a clean, lint free cloth.
- ☑ Any minor or major damage / scratch on the disc surface of the metal disc or body seat will cause failure in the Forbes Marshall Disc Check Valve with standard metal disc to resist back flow of condensate. The spring retainer should be unlocked using bend tool if not use mallet to apply light strokes on locked side of spring retainer to remove disc form the body to repair the scratch / damage part of the disc. Since the disc is less hardened than the body seat, fine particle passing through the

### 2. Installation Guidelines:



Before implementing any installations observe the 'Important Safety Notes' in Section

2. Referring to the Limiting conditions check the product is suitable for the intended installation.

- ☑ Check materials, pressure and temperature and their maximum values.
- ☑ Determine the correct installation situation and the direction of fluid flow.
- ☑ Remove packing covers from the product.
- ☑ Forbes Marshall Disc Check Valve must only be installed where 'weld neck' flanges are used. Other flanges types may restrict operation.
- ☑ Spring loaded check valves simply fit between two pipe flanges as shown in fig. 2. Standard gaskets are used either side of the valve together with longer bolts or studs.

**Note:** Flanges, bolts (or studs), nuts and joint gaskets to be provided by the installer. Normal sensible flange bolting practice should be followed e.g. torque tightening the bolts in opposite sequence.

☑ The FMDCV (DIN) can be installed in any plane with the exception of valve is supplied without an integral spring. These must be fitted in a vertical flow line with the flow from bottom-to-top i.e. upward flow (see fig. 2b). FMDCV (DIN) must be fitted in accordance with the direction of the flow arrow on the body, indicating correct fluid flow direction.

**Note:** Forbes Marshall Disc Check Valve are not suitable for use where heavily pulsating flow exists, such as close to a compressor.

spring loaded check valve (along with the condensate) could damage the disc. This damage will be in the form of scratches on the disc surface area. If the scratch depth is not much this can be cured by lapping the disc and the steam trap can be made functional. If the body seat is slightly worn out it can be refaced by lapping individual on a glass surface plate. The amount of material to be removed by lapping should not exceed 0.25mm (0.010”).

**Note:** Viton / EPDM soft faced disc cannot be lapped. If scratches or damage on Viton /EPDM soft faced disc the product should be replaced.

**Lapping Procedure:**

Requirement: Emery paper, glass surface plate, lapping paste (Aluminum Oxide slurry) and oil.

- First, lap the disc on a piece of emery paper (grade 220) to eliminate scratches on the disc and to prepare the surface for further fine lapping.
- Apply the lapping paste and oil on to the glass surface and rotate the disc in the shape of the numeric “8” (Eight).
- Lapping should be done till all scratches on the disc disappear.

**Note:** If the scratches on the disc are not curable then the product should be replaced.

When re-assembling the spring retainer, place the lapped side of the metal disc in contact with the body seating face. New gasket should be used either side of the spring loaded check valve together with longer bolts or studs when fit between two pipe flanges. Ensure the spring retainer is locked using bend tool if not use screw driver to lock the spring retainer.

**5. Troubleshooting:**

If the expected performance is unachievable after installation of the Forbes Marshall Disc Check Valve, check the following points for appropriate corrective measures.

Failure Mode	Possible Cause	Remedy
No Fluid discharge	Forbes Marshall Disc Check Valve installed in reverse direction of the fluid discharge	Forbes Marshall Disc Check Valve should be installed with arrow on the body pointing in direction of fluid discharge.
	Foreign material deposits between the disc and body seat have accumulated.	Rinse the Forbes Marshall Disc Check Valve with fresh water and wipe the disc with a clean, lint free cloth.
Fluid leak through spring loaded check valve.	The spring is damage or worn out.	Replace damage spring with standard spring as per the product requirement
	The disc / seat of body are damaged.	Replace the spring loaded check valve with the new one.
	Spring retainer is unlocked	Spring retainer should be locked using bend tool or screw driver.
	The gasket is worn or damaged.	Replace with new gasket during maintenance to avoid further leakage.

**Note:** Never attempt to modify the product. When replacing part with new part, use the spare parts listed in Section 9 of detail UM.



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