MULTI DOOR NON RETURN VALVE

INSTRUCTION MANUAL ON INSTALLATION OPERATION AND MAINTENANCE

DURGA VALVES PVT. LTD.

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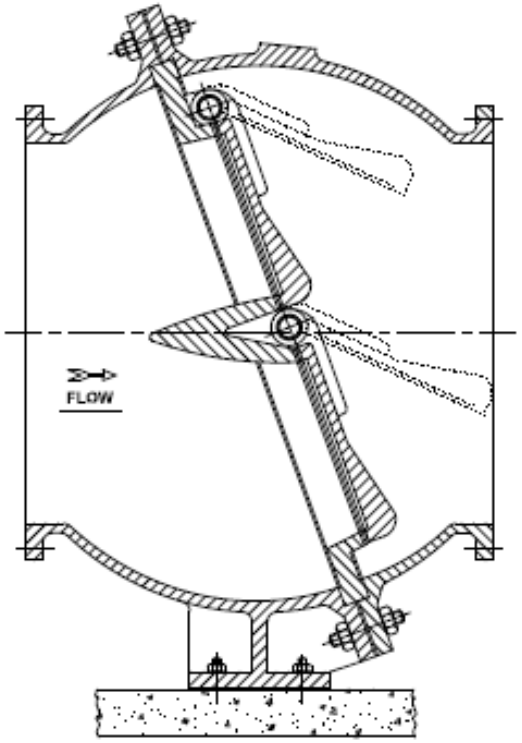

Fig - 1

Multi Door Non-Return Valve typical view (Fig-1)

DVPL Multi Door Non Return Valves generally conform to IS 5312, Part-2 standard for dimensions, materials of construction and constructional features, as per the need of the application. This Multi Door

Non Return Valves are Metal Seated type with a choice of by-pass arrangements as an optional accessory and have proven performance.

The doors of the Multi Door Non Return Valve are hinged on diaphragm. Door Rings and Diaphragm Rings are precisely machined, scraped and lapped to get mirror finish for achieving leak-tightness.

In DVPL Multi Door Non Return Valves, No. of Doors has two for sizes 600 to 800 mm, three for sizes 900 & 1000 mm and four for sizes 1100 & 1200 mm.

By pass arrangement is provided at specific requirement from customers and the size of by-pass arrangement is referred from standard IS: 5312, Part-2.

OPERATION:

The Multi Door Non-Return Valve name about the working principle of it. Its construction are same unlike non single door valve but only difference between these two are numbers of door in the valve through which the water flows from one end to another end. This is highly dependable with virtually no maintenance required in this type valve there is only one moving part that is the hinge pin on that axis the doors get open and closed this type valve does not need any other device to open or close its totally works on water pressure at the same time it prevents the back flow of water there won't be any back flow to the pump or reverse side.

The opposite sides of the valve are connected with a diagonal tilted disc at an angle of 45 degrees, which provides a short 35 degree stroke, quick closing time, low head loss. The design of Multi Door non return valve is designed such a way that the minimum pressure must be lost.

Before the heavy column of retarding water does the damage, Durga Valve's tilted disc multi door non-return valve acts on its own. Durable & slam proof. Durga valve offers multi door design that embodies the outstanding non-slam closure characteristics, a design that is proven in over a hundred installations all over the country. These are ideally suited where frequent surges are expected. For this valve has only door shafts are moving object for that it does not require any Maintenance a lubricating ball bearing to give proper movement of the doors.

PARTS:

Outer shell and inner shell are common parts of the valve the few parts are available like Diaphragm, a tilted disc on which the doors are given. Diaphragm ring it's provide where the Diaphragm is rested on it. Doors, the part through which water flows it's located over diaphragm. Door ring, on the diaphragm a ring is given to as per door size to rest door at no flow condition. Hinge pin, the pin or axis over which the doors open and closed. Guide, the doors should open which its range of where it can get back to its own position & should not touches body so guide is located at the valve inner shell.

2.2 STORAGE & PRESERVATION:

If the valve has to be stored at site before installation,

a. Store it on horizontal level surface in dry and clean atmosphere.

b. Store the products in well-covered sheds, protected from sun, rain and dust.

c. It is advisable to give a coat of grease on seat rings during the storage period. Keep the seat rings away dusty atmosphere.

3. INSTRUCTIONS FOR INSTALLATION:

CHECKS ON THE VALVE ASSEMBLY BEFORE INSTALLATION

a. Before taking the Multi Door Non Return Valve for pipe installation, make sure that it is cleaned from inside and outside and there are no foreign or metallic objects sticking on to its sealing elements. Also clean the valve interior passage to remove any foreign matter & rust preventive on machined surfaces.

b. Ensure that the entire rust preventive on the machined surface in the flow area is removed, before the valve is put in pipe-line.

c. Note the name plate details on valve body and check valve pressure rating adequacy with respect to operating pressure. Also check direction of flow in the pipe-line and place the Multi Door Non Return Valve accordingly.

d. Multi Door Non Return Valves are designed to generally operate horizontal pipe lines, unless otherwise prior specified by the customer at the time of placement of order.

e. Operate the Doors of Multi Door Non Return Valve manually from Full Close to Full Open and Full Open to Full Close. Ensure that there is no undue resistance/friction in the operation.

f. Before connecting valve & pipeline flanges, ensure that they do not have parallel, angular and radial gaps. While fitting the valve in pipeline, ensure that diagonally opposite bolts are simultaneously & uniformly tightened.

g. Orientation of Hinge Pins of the valve, while fitting in the pipe-line must be horizontal. This can be ensured by checking level of the support for the valve foot, using spirit level.

3.2 CHECKS FOR THE PIPE-LINE BEFORE INSTALLATION:

a. Clean the pipeline thoroughly so that it does not contain any solid matters which may damage the valve internals.

b. Avoid parallel, radial and angular mismatch between connecting flanges of valve and the pipeline.

c. Upstream and downstream piping should be adequately supported and anchored (if required) in such a way that the piping system does not impose any forces & moments on the valve body and the hydraulic thrust arising due to valve closure is Carried & sustained by valve supports. Valve flanges are not designed to carry any External loads and moments arising due to pipe expansions / contractions. It is advisable to use Flange Adapter Assembly, after the valve to facilitate valve dismantling and to prevent any undue loads being transmitted to valve flange.

d. Provide suitable concrete block with foundation bolts for supporting the valves. It is advisable to install a support for the valve at bottom to prevent any sagging to be caused by weight of the valve.

e. Ensure that pipeline flanges are parallel and are mating the valve flange without leaving any parallel or angular gap between the flanges. Do not over-tighten the flange bolts / nuts to make the

flanges parallel forcefully. That may develop undue stresses in the valve flanges & body leading their deformation & malfunctioning.

f. If the Multi Door Non-Return Valves are supplied with By-pass arrangement (against specific order requirement), ensure the by-pass arrangement on the valve is intact.

g. Maximum flow velocity in the pipe-line should not exceed 4 m/s.

4. <u>COMMISSIONING:</u>

4.1 PRE-COMMISSIONING CHECKS

a. Ensure manually that the valve doors open and close smoothly.

b. Flow direction of the valve matches with that in the pipeline.

c. The entire pipe flange bolting is properly tightened.

d. Surge protection devices (if any) are operative.

4.2 COMMISSIONING:

a. Open the By-pass Valve across the valve (if provided).

b. Charge the pipe-line with water.

c. Ensure that there is no leakage through flange gaskets.

Now the valve is commissioned for its Operation.

5. <u>OPERATION</u>:

a. By-pass valve (if provided) – keep it open while every Start/ Stop operation cycle of the pump.

b. Once the Multi Door Non Return Valve is closed, the By-pass valve may be kept closed till next operation of the valve.

MAINTENANCE:

It is usually safe to say that the more moving parts in a valve, the greater the need for maintenance. A simple lift check valve can provide service for decades without maintenance because the disc stems slides through permanently lubricated bearings. Lift check valve springs are typically proof of design tested to at least 50,000 cycles and can last far longer. The only maintenance on lift check valves would be to regularly listen to the valve when the pump is not running and try to hear for seat leakage. Leakage sounds like a hissing noise and can be easily detected with a doctor's stethoscope. Once leakage becomes steady, it will just be a matter of months before the metal seat trim begins to erode and allow excessive leakage. The leakage erodes the seat in localized areas and is often described as wire draw because it looks like a thin abrasive wire was pulled across the seating surface. Chattering should also be observed, which consists of clanking against the open stop which may be a result of swirling flow or insufficient velocity to peg the valve open. It is tempting for engineers to sometimes install a check valve that is three or more sizes larger than the pump discharge nozzle to reduce the head loss. That is admirable, but check valves require a minimum velocity for proper operation.

6. MAINTENANCE INSTRUCTIONS:

Maintenance Check Points:

Sr.	Parameter to check	Method of Checking	Weekly	During Overhaul
01	Leakage through valve seat	Visual	*	
02	Noise / Vibrations while opening or closing the valve	Feel	*	
03	Condition of Door Ring / Diaphragm Ring Faces – Scratches, dent marks, intactness & continuity of contact	Visual & feeler Gauge		*
04	Condition of Hinged Pins	Visual		*

DVPL Multi Door Non Return Valves require very little maintenance if maintenance check point are attended to during periodic inspection & during overhaul. However valves could malfunction in unusual conditions of usage, water contamination and may required maintenance as below:

7. TROUBLE SHOOTING OF DVPL KINEMATIC AIR VALVES:

Sr. No.	Problem	Probable Reason	Action Required
01	Leakage through the valve seat	a. By-pass connection open (if by-pass arrangement is provided) b. External object caught between door ring & diaphragm ring. c. Worn out / deformed or damaged seat rings.	a. Close By-pass valve. b. Try to flush away the external object by creating flow to flush it away. If it does and remove it manually. c. Replacement the Door Rings / Diaphragm Rings
02	Leakage through side flanges	a. Inadequate tightening of flanged joint. b. Damaged gasket c. Parallel / angular gap between valve and pipe flanges	a. Re-tighten the flanged joint. b. Replace gasket c. Remove parallel / angular gap between valve and pipe flanges
03	Noise/vibration during operation & during closure	Inadequately supported / inadequately fixed piping / valve	Support / fix upstream / downstream piping & valve (with foundation bolts where applicable)

8. INTIMATING PRODUCT/PERFORMANCE COMPLAINT:

While communicating product complaint please information to be sent our H.O or Branch Offices mentioned in this manual to help us to resolve the problem promptly.

Our Contact office & e-mail id:

H.O & WORKS – PH-033-26778088, E-MAIL- kolkatta@durgavalves.com
SECUNDERABAD OFFICE - PH-040-2753 5719, E-MAIL – hyderabad@durgavalves.com
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