SLANTED SEAT TILTING DISK CHECK VALVE

INSTRUCTION MANUAL ON INSTALLATION OPERATION AND MAINTENANCE

DURGA VALVES PVT. LTD.

ICHAPUR ROAD, CANAL SIDE, SANTRAGACHI, HOWRAH-711104

INTRODUCTION -

Safety: These operating and maintenance instructions must always be observed and the DVPL installation and operating instructions for the valve should be used.

The user must not alter or modify this product or the mounting parts / fittings supplied with it. DVPL assumes no warranty or liability for damages arising from non-compliance with these instructions.

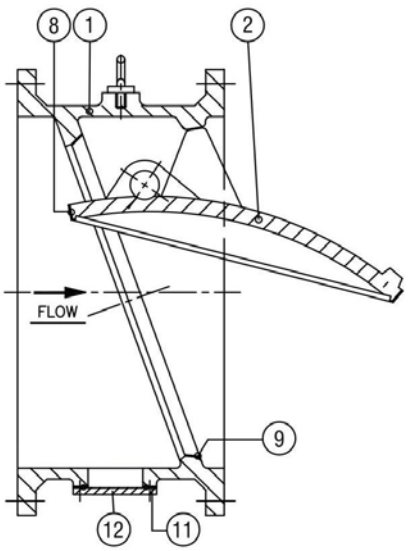
For this valve to be used, it must be installed by qualified, specially trained personnel only.

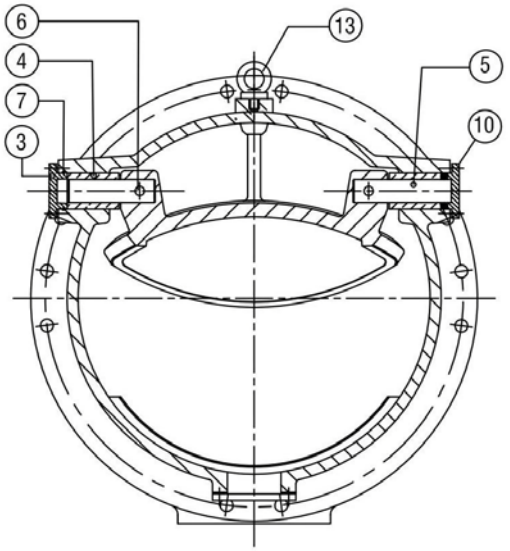
Proper use: The DVPL Slanted Seat Tilting Disk Check Valve is a valve designed for installation in pipelines.

The standard model can be used to allow moderate flow in one direction and automatically prevent reverse flow in pressurized pipelines.

The user must obtain the prior written approval of the manufacturer for any deviating operating conditions and applications.

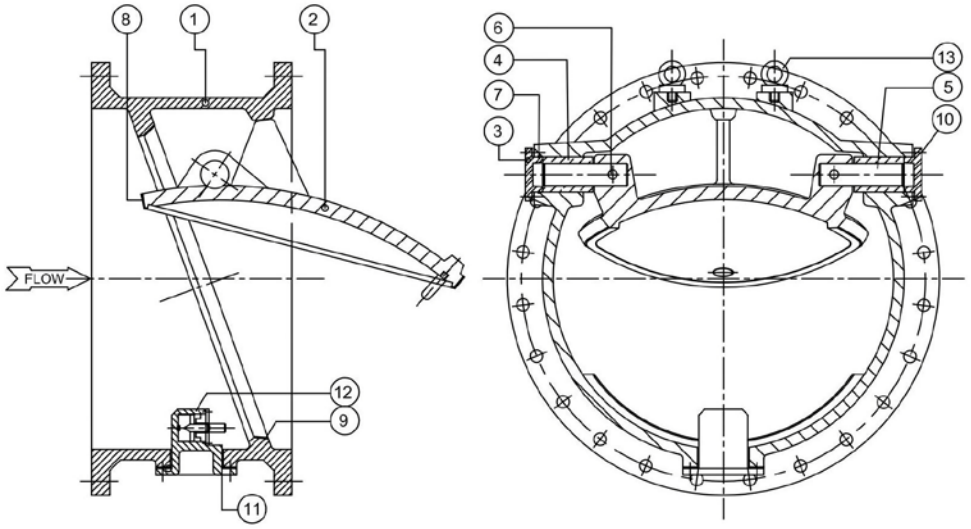
TYPE OF TILTING DISC CHECK VALVE -





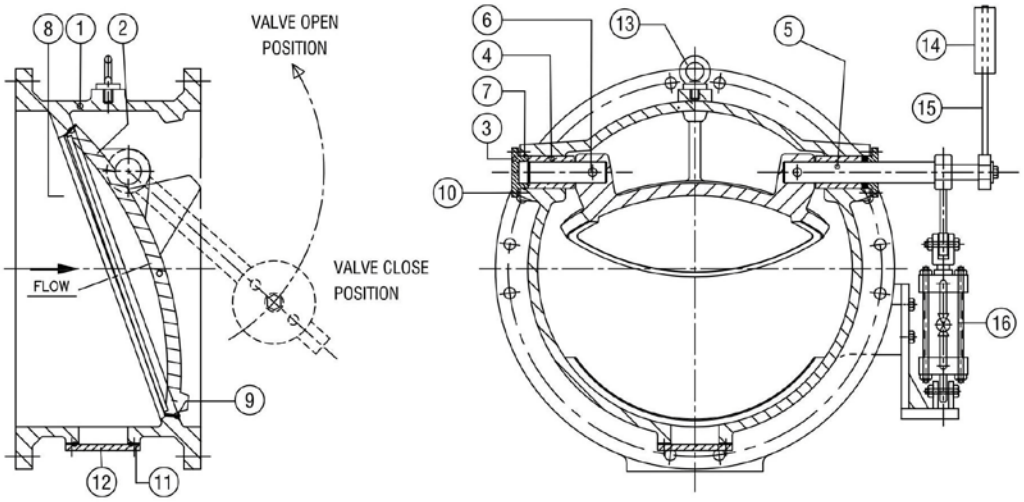
SLANTED SEATED SWING TYPE CHECK VALVE

SL. No.	DESCRIPTION
1	BODY
2	DISC
3	RETAINER
4	BEARING BUSH
5	SHAFT
6	DOWEL PIN
7	RUBBER 'O' RING
8	BODY SEAT FACING
9	DISC SEAT FACING
10	EXTERNAL FASTENERS
11	GASKET
12	DRAIN COVER
13	LIFTING EYE BOLT



ITEM	DESCRIPTION
1	BODY
2	DISC
3	RETAINER
4	BEARING BUSH
5	SHAFT
6	DOWEL PIN
7	RUBBER 'O' RING
8	BODY SEAT FACING
9	DISC SEAT FACING
10	EXTERNAL FASTENERS
11	GASKET
12	DAMPER UNIT
13	LIFTING EYE BOLT

SWING TYPE SLANTED SEATED NON RETURN VALVE
WITH INTERNAL DAMPING ARRANGEMENT



SL. No.	DESCRIPTION
1	BODY
2	DISC
3	RETAINER
4	BEARING BUSH
5	SHAFT
6	DOWEL PIN
7	RUBBER 'O' RING
8	BODY SEAT FACING
9	DISC SEAT FACING
10	EXTERNAL FASTENERS
11	GASKET
12	DRAIN COVER
13	LIFTING EYE BOLT
14	COUNTER WEIGHT
15	LEVER ARM
16	DASH POT

SLANTED SEATED SWING TYPE CHECK VALVE WITH EXTERNAL
DASH-POT & COUNTER WEIGHT ARRANGEMENT

HANDING, STORAGE & PRESERVATION -

Transportation: To transport the valve to the installation site, it must be properly packed. Packing must ensure that the valve is protected against weather effects and damage. When the valve is transported over long distances and especially exposed to climate, it should be protected by sealing in plastic wrap.

The check valve needs to be closed and transported with the disc. To ensure this, the valve disc must be well clamped to avoid any damage.

Storage: DVPL Slanted Seated Tilting Disc Check Valve should be stored with the disc check valve closed. The valve must be stored in an upright position with the bearing bush on its inlet side flange pointing horizontally or upwards. Valves should be stored in a dry, well-ventilated area. Assemblies and components relevant to the proper functioning of the valve, such as discs and damper units, must be protected from dust and other types of dirt by suitable covers.

PRODUCT WITH FUNCTION DETAILS -

Features: The DVPL Slanted Seated Tilting Disc Check valve is a non return valve with a full flange design and can therefore be used both between two pipeline flanges and as an end of line valve under full operating pressure. Due to the pressure of the medium, the disc opens automatically.

Proper sealing on the other hand is controlled by the medium transported (metal seated) pressure. To comply with the required leak rate, back pressure is required. As a standard, the valve is supplied without damper unit.

Alternatively, internal damper units or counterweights with damper units are used to reduce water hammer effects.

Features of the internal damping unit: The function of the internal damping unit is to reduce the effect of water hammer and valves. More or less important effects may occur depending on hydraulic conditions. If the effect of the valve is unacceptable which is permanent, not only high pressure peaks in the pipeline, but damp installation will become inevitable.

Internal damping reliably fulfills the corresponding requirements in a complex way.

Function of the internal damping unit: The damper is topped up at the factory with fluid without bubbles. The diaphragm must curve concavely inwards. In this state the damper is fully active. The installation can be used alongside a vertical or horizontal pipe line. The function of the diaphragm is to balance the damping chamber reduction caused by the insertion of the front piston.

High pressure occurs only behind the cylindrically damped piston. Hence, the diaphragms are not subjected to any damping overload. Due to inertia as well as displacement of the medium inside the damper, the kinetic energy of the disc is reduced.

The high speed effect of the inlet contours allows a smooth transition from disc to final position. Damping at this connection results from the pressure built up inside the damper and the width of the circular gap around the piston, through which the medium must escape. As the disc opens, the piston is pushed back to its initial position by means of a thrust spring placed behind the piston, thus simultaneously draining the damping chamber and reopening the damper.

Maintenance of the internal damping unit: The design of the damping device allows installation and dismantling with open and close valves.

a) **Dismantling:** Drain the pipeline completely. Remove the screws from the damper housing and pull the damper unit (see. 12) from the valve body with the tools.

b) **Installation:** Before installing the damper unit with closed disc the piston must be manually moved and locked in its final position. This is done by a corresponding tool, such as an Allen key or a screw driver, is held from the outside before the piston, thus, locking the piston. Now the damper can be reinserted. After tightening the damper housing cylinder screws the auxiliary tool will be removed, the piston is now seated close to the limit bolt.

   This method of installation is only necessary once it is impossible to dismantle the valve. Generally, the damper is maintenance free. However, an inspection and an operational test are recommended during shutdown or other reconditioning activities.

Application media: DVPL Slanted Seated Tilting Disc Check valve seals are made of metallic material, the valve can be used with the following media:

Use with Water, raw water, slurry, cooling water, weak acid and alkaline solutions.

If the valve should not be used in strong acid, sea water, it will damage the seat rings and the valve will not work properly, the user should consult the manufacturer before use.

Mode of operation: The maximum operating temperature and pressure specified in the technical documentation must not be exceeded. A closed non-return valve shall only be exposed to pressure within its nominal pressure range.

For installation space, installation position and minimum flow velocity, instructions must be observed.

INSTALLATION IN THE PIPELINE -

Site requirements: When valves are installed between pipeline flanges, the flanges must have flat and parallel faces and be in true alignment. Flanges of pipelines must be placed in proper alignment prior to valve installation. Otherwise the valve body may break with high load and strain during operation.

The installation of the valve in the pipeline should be as pressure free as possible.

When installing the valve it is necessary to ensure that the remaining space between the flanges is large enough to prevent damage to the coating on the face of the flanges.

When work is carried out in the area of the valve which may cause dirt (such as painting, building brick walls or concrete work), the valve must be protected by a suitable cover.

Installation location: The installation location for the valve must be selected in such a way that there is sufficient space for function checks and maintenance work (eg valve disassembly and cleaning, damper unit disassembly).

For open air installations, the valve must be properly covered to protect against extreme weather. To ensure proper function and long service life of the check valve, several factors need to be considered for the optimal installation location.

Steady Flow: A smooth and even flow ensures stable positioning of the disc in place. To achieve steady and even flow, a straight damping zone should be provided upstream of the check valve. If it is not possible to keep a damped zone, the turbulence of the flow can shock the disc which can shorten the service life. To prevent this, the flow velocity should be increased.

Assembly instructions, accessories: Before installing the valve, it must be checked for transport or storage damage. When stored at the construction site prior to installation, the valve shall be protected from dirt by a suitable cover. When the valve is installed it must be free of dust and dirt. DVPL accepts no liability for consequential damages caused by dirt, grit etc.

Correct movement and function of parts should be checked before installation. After painting the valve, it must be ensured that the function part is not painted over.

When the final position damper unit is assembled, its operation and maintenance instructions must be observed.

It is necessary to ensure that suitable lifting devices are available for assembly of DVPL check valves. Suspending the valve on its disc or final damper unit can destroy them.

When the valve is connected to the flange of the pipeline, the screws and bolts used in the bore hole should be screwed from flange to flange using washers.

Screws should be fastened transversely to prevent unnecessary tension and cracking or breakage. Cannot be pulled towards pipeline fittings. If the gap between the fitting and the flange is too large, it must be compensated by using thicker seals.

VALVE OPERATION -

Visual Inspection: Before operating valves and equipment, all functional parts must be subjected to visual inspection. Check that all connections are tight.

Function test and pressure test: Before installing the valve, its function parts (disc, internal damping unit, counter weight) should be fully opened and closed at least once and checked for proper operation.

Be careful!! When closed, the check valve should only be exposed to pressure that will not exceed its nominal pressure. When pressure testing is performed on a pipeline during which the test pressure exceeds the allowable nominal pressure on the closing side of the check valve, the pressure must be balanced by bypass. Pressure testing is not a problem if the pipeline is full on the flow (open) side.

MAINTENANCE AND SERVICE -

General Safety Instructions: Before performing any inspection and maintenance work on valves or mounted parts and attachments, the pressurized pipeline must be shut off, the pressure relieved and the system secured against unintentional switching. Depending on the type and criticality of the medium or liquid transported, all necessary safety rules must be observed.

After completion of maintenance work and before resuming work, all connections must be checked for proper tightness and leak-freeness.

Inspection and Actuation Interval: Valves should be inspected at least once a year for leakage, smooth operation and corrosion protection. The same applies to the operation of indoor damping units. Under extreme operating conditions, inspections are required at short intervals.

Disc and Seat Area Inspection: At the intervals recommended above, the valve should be taken apart and cleaned. Body discs and metal seats need to be cleaned especially carefully.

Leaking body seal: After a long period of operation, the material body seal may leak. The seals are located on the bearing cover as well as the end position damper unit cover. They can be reinstalled after disassembling the respective parts.

Damaged Bearings: Violent slamming of discs due to improper or adverse installation conditions can damage bearing bushes or shafts over time. To replace the bearing, the valve must be

disconnected from the pipeline, the bearing cover and the disc must be removed. Bearing bushes can be replaced after pulling the shafts and disassembling the disc. The valve is reassembled in reverse order.

Cleaning, Lubrication: To ensure proper function, the valve body should be cleaned at recommended intervals and the bearings should be lightly greased after each cleaning.

TROUBLE SHOOTING -

For all maintenance and repair work please observe the general safety instructions.

Problem	Cause	Corrective action
The disc does not seal properly	Foreign particle(s) jammed in seat area	Clean valve, dismantle if necessary and remove foreign particle(s).
	Deposits from the medium are settled on seats or discs	Disassemble the valve and clean the seat area and disc
	Back pressure is very low	To achieve the specified leak rate, the back pressure must be in the specified column of water
	Obstruction of adverse flow and closing movement in the valve disc	Change the installation location
	The final position damper unit is blocked	Disassemble the damper unit and unblock it according to the operating instructions
	Obstruction of closed movement due to worn bearings	Bearing replacement
Disc slams	Unfavorable installation position and thus unfavorable flow on the disc.	Change the installation location
	The flow velocity of the medium is very low	Install valves with a smaller nominal diameter or increase the flow velocity in the system within the valve's allowable range
The body is leaky	Corroded seal	Seal replacement

Our Contact office & e-mail id:
H.O & WORKS ==== PH: 033-2677 8088, E-MAIL: ho@dvpl.co.in
HYDERABAD OFFICE ==== PH: 040-6631 0642, E-MAIL: hyderabad@dvpl.co.in
CHENNAI OFFICE ==== PH: 044-2498 0842, E-MAIL: chennai@dvpl.co.in
MUMBAI OFFICE ==== PH: 022-4024 2529, E-MAIL: mumbai@dvpl.co.in
GURAJAT OFFICE ==== PH: 079-2658 6080, E-MAIL: gujarat@dvpl.co.in