

HYDROVEX[®] LCV CHECK VALVE

CSO, SSO, Stormwater Management

WATER TECHNOLOGIES

HYDROVEX® LCV Check Valve

Application

Overflow weirs, designed to relieve a sewer system during storm events, can sometimes be subject to backwater from the receiving body of water. This massive intake of water into the sewer system or retention basin can adversely affect the operation of the sewer and wastewater treatment plant.

The HYDROVEX® LCV Check Valve has been specifically developed to completely seal the overflow weir and prevent backwater from entering the main sewer network. The installation of a HYDROVEX® LCV is very simple, and it can be installed in new or existing structures. Furthermore, the check valve can be used as an odour control device.



Figure 1: HYDROVEX® LCV check valve, typical installation

Operation

The HYDROVEX® LCV Check Valve is composed of a stainless steel mounting frame having an angled tubular opening. A flexible rubber lid, attached to the top edge of the mounting plate, rests on the angled section of the tube. The mounting frame is anchored to the concrete structure.

During an overflow event, an upstream head corresponding to the actual weight of the lid is required to move the lid from its resting position. This load is approximately equal to 20% of the effective opening height of the check valve. As the

upstream head increases, the flexible lid will deflect further, thus increasing the flow section (Figure 2).

In backflow conditions, the rubber lid is pressed strongly and uniformly on the seat, creating a watertight seal. The rubber lid is made longer than the actual opening to avoid a complete collapse. For backwater levels up to 50% of the effective opening height, no actual headloss is observed due to the reduction of the apparent weight of the lid and its diffuser effect.

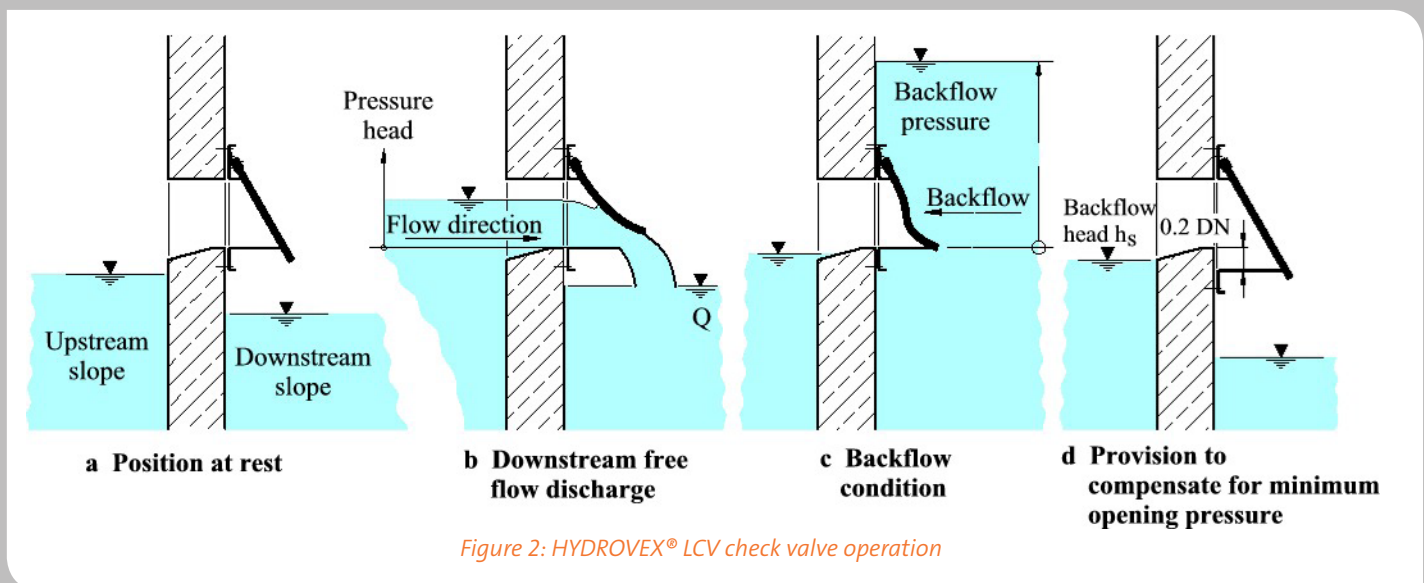


Figure 2: HYDROVEX® LCV check valve operation

Advantages

The HYDROVEX® LCV Check Valve is a simple and effective device with many advantages compared to other check valves. The most notable advantages include:

- low headloss
- no mechanical components (bearings, bushings, etc.)
- installation in existing overflow structures
- fast closing and seals properly with small downstream backflow
- clog-free valve arrangement
- corrosion resistant construction

Figure 3 compares the HYDROVEX® LCV Check Valve and a circular check valve with an equal effective open area. With an equivalent upstream water level ($h=1$ DN), the two valves evacuate the same flow. As a result, the overflow elevation in the sewer collector can be increased which in turn decreases overflow frequency.

Additionally, if backwater reaches the lower edge of the HYDROVEX® LCV Check Valve, the hydraulic capacity of the circular check valve is greatly affected. In this example, the circular check valve will have only half of its hydraulic capacity remaining while the HYDROVEX® LCV Check Valve is still at full capacity.

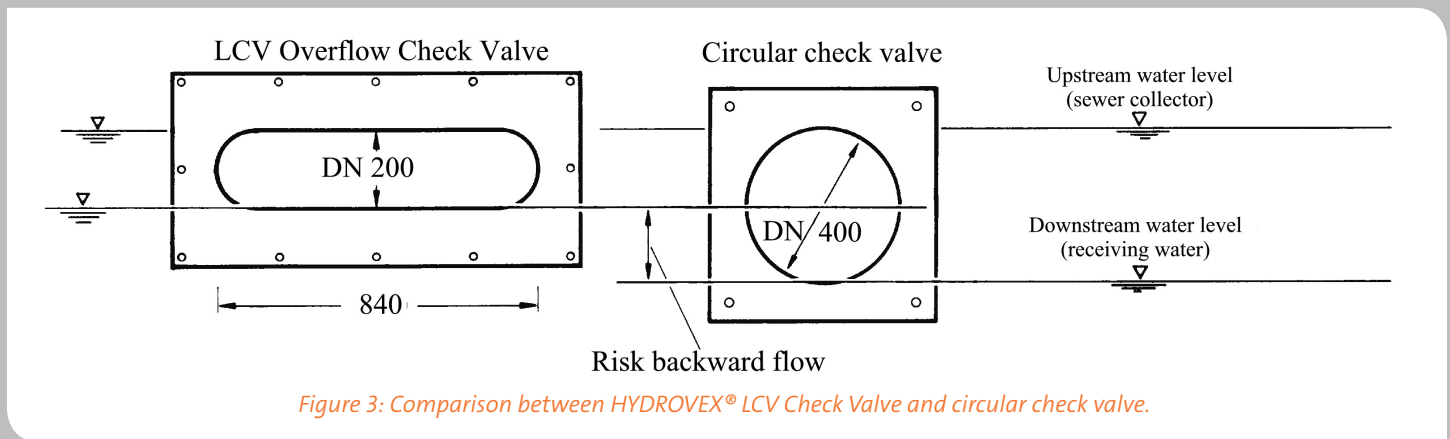


Figure 3: Comparison between HYDROVEX® LCV Check Valve and circular check valve.

Selection

The HYDROVEX® LCV Check Valve is available with opening heights from 4” (100mm) up to 24” (600mm) and effective lengths up to 6ft (2 m). For weir lengths longer than 6ft, multiple units can be installed side by side. The maximum backwater retention height for each model is given in the following table.

DN mm [in]	Maximum Retention Height m [ft]
100 [4]	9.0 [29.5]
150 [6]	7.0 [23.0]
200 [8]	6.5 [21.3]
250 [10]	6.0 [19.7]
300 [12]	6.0 [19.7]
350 [14]	6.0 [19.7]
400 [16]	5.5 [18.0]
500 [20]	4.0 [13.1]
600 [24]	2.0 [6.6]

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