

Hydro-Brake® Flow Control System

For further information on Hydro-Brake® Flow Control Systems

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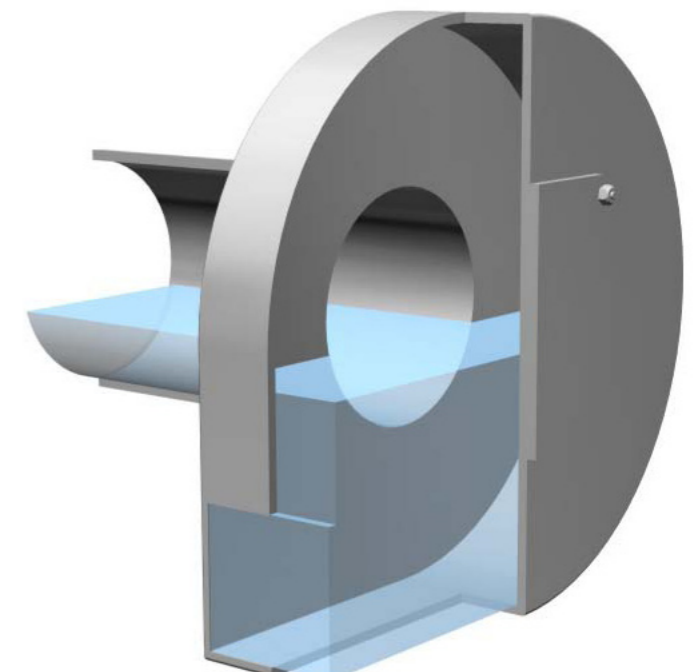
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Water Quality

Hydro-Brake® Flow Control System

What is it?

The Hydro-Brake® Flow Control is a device for controlling liquid flow. It is self-activating, utilising the upstream hydraulic energy to generate an air filled vortex within the centre of the casing.

How it Works

The Hydro-Brake® Flow Control is a self-activating vortex flow control device that provides superior hydraulic performance compared to conventional flow regulators with patented features that reduce maintenance requirements.

Because Hydro-Brake® Flow Control harnesses the energy inherent in the flow field they have no moving parts and no energy requirements. With clear openings up to 600% larger than conventional flow control devices, the risk of blocking is reduced to an absolute minimum.

In addition, the unique head/discharge characteristics provide a high early discharge effect which can reduce storage volume requirements, lowering project costs.

The design consists of an intake, a volute and an outlet. The configuration is critical to ensure precise discharge control. Flow is directed tangentially into a volute to form a vortex. Peripheral velocities induce an air filled core with a resulting back pressure that reduces the discharge.

The Hydro-Brake® Flow Control out-performs conventional flow control devices. Its unique S-shaped head/discharge curve which has been devised from extensive systematic modeling and field testing, comprises two distinct phases (see figure 2). As the head increases a transition takes place from free flow (lower portion of the curve) to vortex controlled flow (upper portion of the curve).

The Hydro-Brake® Flow Control thereby achieves maximum design discharge rates at lower heads than conventional controls. As a result, storage requirements can be reduced by up to 30% (as shown in figure 2), significantly reducing project costs. Custom head discharge curves can be produced to meet site specific precision flow control requirements.

Flow Control for WSUD

The two phase operation allows separate duty points to be assigned for high and low flows using only a single device. Figure 3 shows how this may be achieved by matching pipe levels with key points on the HBFC characteristic curve.

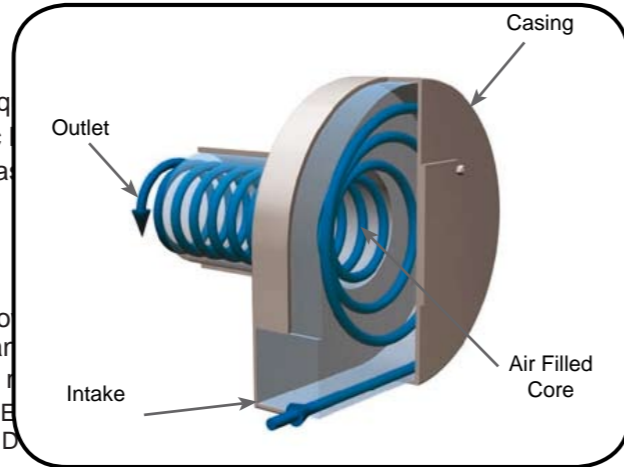


Figure 1 - Flow pattern within 'S' Type unit head/flow control

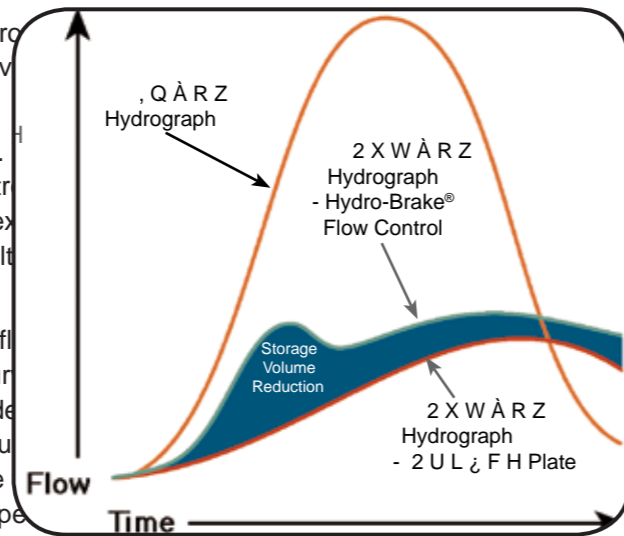


Figure 2 - Storage routing

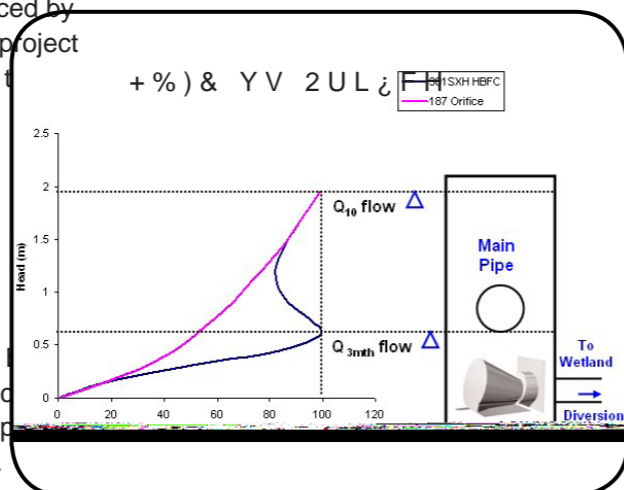


Figure 3 - HBFC and Orifice Plate Comparison Head / Discharge Curves

Hydro-Brake® Flow Control System

Advantages

- t No moving parts or power requirements
- t Large open area (reduced risk of blockage)
- t Multiple duty points
- t Self-activating and self-cleaning
- t Highest precision passive flow control
- t Integral bypass allowing access for rodding / jetting

Flow Range:

Typically 2-700 l/s (2-150 l/s if used in conjunction within a precast Hydro-Brake® Chamber).

Although not always possible to package within a precast chamber, the following is a list of alternative Hydro-Brake Flow Controls available through Rocla Water Quality.

Type C

Provides suitable control for stormwater, foul and combined sewer flows. The Type C has a pronounced S-shaped head/discharge curve, allowing low flows to pass without restriction ensuring optimum environmental flow. Generally used to control high flow applications. Applications include control of watercourses.

Pivoting Bypass Door

The Hydro-Brake® Flow Control is fitted with an integral pivoting bypass door built onto the front face of the unit. If a blockage occurs it is likely to occur on the inlet of a flow control. The bypass door is fitted with a stainless steel wire that is run to cover level. If a blockage does occur the wire is pulled upwards from cover level, the door opens exposing a large aperture on the front plate of the unit allowing the system to be drained of water. Once the water level within the chamber subsides the unit can be cleared.

Flow Range:

Storm Water
Typically 90 l/s upwards.

Sewer
Typically 240 l/s upwards.

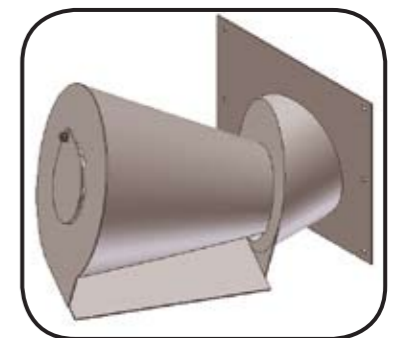


Figure 5 - Type C Hydro-Brake Flow Control

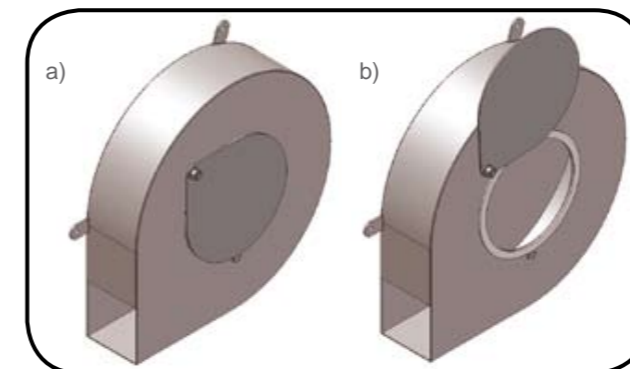


Figure 4 - Hydro-Brake® Flow Control with bypass door
a) closed b) fully open - emergency drain down

Type CH and CX

Similar to the Type C, the box intake of the Type CH provides a larger opening for reducing the risk of blockage during low flows. Applications include CSO's storage tanks and wetland protection.

Flow Range:

Surface Water
Typically 4 l/s upwards.

Foul Water
Typically 16 l/s upwards.

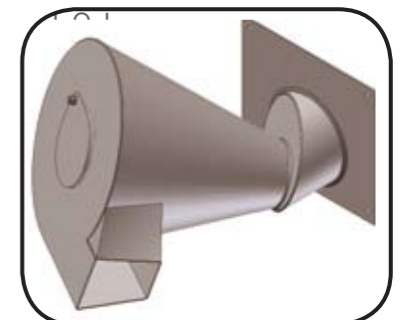


Figure 6 - Type CX Hydro-Brake Flow Control

Popular Device Types

Type SH, SXH and SMXH
(see Figure 4 above)

These three models are most suited to the precast Hydro-Brake® Chamber. They are specifically designed to control stormwater flow and require a sump / catch pit below the unit.

Please note, other types of Hydro-Brake® Controls are available. Please contact our P.A.D engineering team for advice on unit selection to provide a solution to your particular requirements.