VORETEX REGULATOR
Type WAB (UCY / CY-F / CE/V)
UCY series, CY series, CE/V series, OP series

Conical vortex regulator
Type WAB-UCY (wet installation)

Vertical vortex regulator Type WAB-CE/V (wet installation)

Semi-dry vortex regulation Type WAB-CY-F (semi-dry installation)
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Flow regulator overview

Flow regulators have the task of restricting the pass forward flow during storm conditions and are used to regulate the flow from storm water retention tanks, sewers, retention tanks or overflow chambers to a preset value independent of the head, whilst allowing a constant flow.

Some retention bassins do have little requirements on the throttle accuracy but require a complete open cross-section without moving parts for little blockage risk. Cyclon vortex throttles do have a big market acceptance because of these advantages and it's simple construction.

The applications for robust vortex throttles are manifold and there exist a very long experience with these throttles.

Vortex throttle with integrated bypass system.
**Product Specifications**

A stainless steel Vortex Flow Control consists of a cyclone-like body suited with a specific inlet and outlet. It can be installed wet and semi-dry. Detailed specifications and constructional details of the mentioned Flow Controls can also be demanded by info@biogest.com

Optionally the Flow Control can be fitted with an integrated bypass system. This system will assure a full bypass of the wastewater in the case of blockage in the Flow Control. This bypass system can be operated by means of a manual pulling cord which is to be fitted just below the manhole.

**Wet Installation**  
**Typ WAB-UCY**

The Vortex flow regulator Type UCY is a wet installed unit. Therefore, in contrast to semi-dry installations, there is no need of a separate throttle manhole needed.

However, in order to be able to empty the manhole in the event of an accident, a separate emergency drain should be foreseen. The Vortex flow regulator consists of an inlet, a conical vortex chamber and an outlet, which can be fixed on a concrete wall or put into concrete in an opening.

**Operational description**

A predefined regulation flow rate, will be throttled by means of a vortex principle. The wet installed unit is mounted in front of an outlet opening of a storage system.

The Vortex flow regulator consists of a robust stainless steel construction with no moving parts. The water flows tangentially into the throttle. At low flows the flow control presents practically no resistance to the water flow.

As the water flow increases, tangential velocity within the flow control increases and eventually lead to the formation of an air-filled vortex core. This vortex has a breaking effect without physically obstructing the flow opening and therefore guarantees a predefined maximum capacity. The vortex flow regulator is also available with an adjustable u-shaped inlet area. This allows reducing the flow subsequently.
**Design flow**
The nominal sizes of the flow limiter are selected according to the required design flow value and the water head. Due to the free flow with the vortex principle, the maximum throttle rate will be achieved at the upper end of the water head.

![Flow curve](image)

**Installation**
The Vortex flow regulator Type WAB-UCY will be fixed doweled with a mounting plate on an outlet wall. Optional the unit can be concreted into the wall. The profiled concrete has to be placed after installation.
Type WAB-CE/V

The Vertical vortex regulator Type CE/V is a wet installed unit. Therefore, in contrast to semi-dry installations, there is no need of a separate throttle manhole needed.

However, in order to be able to empty the manhole in the event of an accident, a separate emergency drain (integrated or separately) should be foreseen. The Vortex flow regulator consists of a vertical conical vortex body and is particularly suitable for the limitation of rainwater. This vortex body is placed on a plug-in board, which will be doweled on a wall. With a pull rod, the device can be pulled up to remove any blockages.

Operational description

A predefined regulation flow rate, will be throttled by means of a vortex principle. The wet installed unit is mounted in front of an outlet opening of a storage system.

The inlet of the vertical vortex regulator is tangential in flow direction. The outlet is in flow direction at the back of the unit. Because the outlet is located higher than the inlet, the inlet is normally submerged. This leads to a permanent damming at the inlet.

In a storm event and rising water level, the air escapes from a small hole at the apex of the vertical vortex body. As soon as the water level reached the peak the vortex flow starts. This vortex has a breaking effect without physically obstructing the flow opening and therefore guarantees a predefined maximum capacity.

Installation

The Vortex flow regulator TYP CE-V consist on two pieces. The plug-in board will be doweled on the outlet opening. Then the vortex unit must be inserted into the plug-in board. Below the unit, a bottom step of at least 1x the size of the outlet opening must be present.
Emergency draining for retention systems

In accordance with ATV Standard A 166, a higher emergency bypass pipe with a minimum diameter of DN 200 is to be provided parallel to each flow regulation device, through which the wastewater can be drained by gravity in the event of a blockage.

Although the Vortex flow regulator type WAB has an inspection opening to remove blockages, in extreme cases a large blockage of the regulator can occur, which make it unpossible to enter the manhole. In cases such as these, the upstream sewer network including the storage chambers may have to be pumped out, unless an inlet penstock or a bypass arrangement is installed. For this reason, we always recommend the installation of an emergency draining facility.

BIOGEST® supplies several emergency drainage options for use with our regulating devices:

a) For the simplest arrangement, we recommend the BIOGEST gate valve, which can be bolted by the side of the Vortex flow regulator to provide an emergency bypass.

b) If it is not possible to use a gate valve for space reasons, e.g. structure too narrow or a bypass pipe cannot be laid (e.g. in case of retrofitting), it is possible to use an integrated emergency draining facility, TYPE SZ or the adapter with an integrated emergency draining facility, TYPE ADAPT-NE. Further details of these two options are detailed in the following chapter, optional components

NOTE: The slide valves of flow restrictor devices and bypass pipes in “wet” and “semi-dry” structures are to be equipped with slide rods or spindle extensions in accordance with ATV Standard A 166 for safety reasons, so that they can be operated without entering the structures or tanks.

Installation in circular chambers

The Wirbelabflussbegrenzer Typ WAB-UCY and WAB-CE/V in wet installation can be installed in suitably dimensioned circular chambers. A flat and vertical installation surface (concrete surface) is required for the ALPHEUS unit to be fixed correctly.

If a flat and vertical installation surface is not available, BIOGEST® can supply an adapter, which balances out the radius of the shaft (see bellow optional components).
TYPE SZ integrated bypass facility (spindle lifting system)

With the "SZ" device, the complete Vortex flow regulator can be lifted up with the help of the spindle. Any coarse materials causing a blockage in front of the discharge opening are then punched through the larger cross-sectional area of the outlet, so that the chamber can be drained. Any remaining coarse material can then be removed from the tank so that the Vortex regulator can be replaced in its working position. Use of the spindle lifting system type "SZ" is dependent on the geometry of the storm water tank. Where new storage systems are to be built, the facility can be easily accommodated within the design and realised at a low cost and minimal effort. Where a retro fit is required due consideration must be given to the ease and practicality of installing the lifting device.
Adapter with integrated emergency bypass facility TYPE ADAPT-NE

Many chambers often only have one discharge outlet. To realize the emergency bypass facility required to meet standards such as ATV Standard A166 a separate bypass system must be installed at great expense due to the additional pipe work required to return the flow from the bypass back into the continuation flow. The integrated adapter provides an emergency bypass facility in an easier and more cost effective method.
Adapter with integrated bypass facility and emergency overflow TYPE ADAPT-NE-NU
This adapter provides three additional functions, it is a very compact system, and is available for installation in a rectangular or circular chambers.

Function 1: Squares the radius
Time-consuming construction of a concrete installation surface is eliminated.

Function 2: Emergency bypass facility
This allows an emergency bypass facility that does not require any additional holes to be cut into the chamber.

Function 3: Emergency overflow
Removes the need to construct an overflow form the bypass back to the continuation flow sewer.
Integrated gate valve TYPE INT-FS

According to the ATV Standard A 166, all storm water tanks should have a flow restricting gate valve regardless of the type of flow restrictor used. The gate valve is required for the trial run, for tests according to the EKVO (control regulation of operators), for maintenance and repair work to the sewer network and for using the retention tank as an emergency storage tank.
Semi-Dry Installation
Type WAB-CY-F

The Vortex flow regulator Type CY-F will be installed semi-dry. Therefore a separate dry chamber is needed. The Vortex flow regulator Type CY-F consist of an inlet with flange connection, a conical vortex chamber and a free outlet opening.

Operational description

The operation of the Vortex flow regulator Type WAB-CY-F in semi-dry installation is halbtrockener Aufstellung ist analog to the operation of the Vortex flow regulator Type WAB-UCY in wet installation.

The Vortex flow regulator consists of a robust stainless steel construction with no moving parts. The water flows tangentially into the throttle. At low flows the flow control presents practically no resistance to the water flow.

As the water flow increases, tangential velocity within the flow control increases and eventually lead to the formation of an air-filled vortex core. This vortex has a breaking effect without physically obstructing the flow opening and therefore guarantees a predefined maximum capacity.
Discharge opening / wall opening / outgoing pipes
The diameter of the outlet opening / outlet pipe must be big enough, that the throttle flow can be handled. Otherwise, a backflow of water can dirten the manhole.

Installation
The installation of the semi-dry Vortex flow regulator Type WAB-CY-F will be with a flange connection. The connection to the wall with be with a wall connection piece, which exists in three arrangements. The profiled concrete has to be placed after installation.
Vortex flow regulator Type WAB- CY-F for semi-dry installation incl. accessories.

Emergency by-pass for semi-dry installation incl. accessories.
Advantages of the Vortex regulator

- Regulation without moving parts
- No wear parts
- Operates without any external power
- Robust and simple stainless steel construction
- Simple and easy installation
- Minimum maintenance needed.

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