Wastewater Management

ELIQUO | HYDROK

ALPHEUS®

AT, AS & AA Flow Regulators

The universal flow regulators for constant flows

ALPHEUS® Flow Regulators

Wet, dry or semi-dry installations

Automatic blockage release

WITH INCREASING DEMANDS UPON THE CONTROL OF FLOWS WITHIN WATER SYSTEMS THE MODERN MECHANICAL FLOW REGULATORS ARE NOW REQUIRED TO PROVIDE INCREASINGLY ACCURATE AND RELIABLE OPERATION.

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 discharge.

ALPHEUS-AT

The ALPHEUS AT is a robust unit and is normally installed in a separate dry chamber outside the main body of the tank or sewer. The installation can be semi-dry or dry.

OPERATING PRICIPLE

The **ALPHEUS-AT** is the correct solution for controlling the pass forward flow rate where no power is available or desirable. It precisely regulates the predetermined flow rate irrespective of head conditions. The unit is factory calibrated by setting the outlet control plate to a predetermined height that will allow the desired pass forward rate to flow unhindered through the unit during normal dry weather flow. During storm conditions the outlet control plate causes the flow to back up within the unit, as it does the float rises. The float is linked to the inlet control plate that closes as the float rises. The inlet control plate controls the flow into the Alpheus unit and maintains the head within the unit at a constant, which in turn limits the flow out of the unit to the desired flow rate.

As the incoming flow subsides the float falls and opens the inlet plate to allow greater flows into the unit. In the event of a blockage of the inlet control plate the float falls and the plate opens to force the blockage through. Should the outlet control plate become blocked the float will rise above its normal pre-set level at which point it raises the outlet control plate to allow the debris to clear. The system is designed to operate frequently at low flow rates.

STORM WATER FLOW

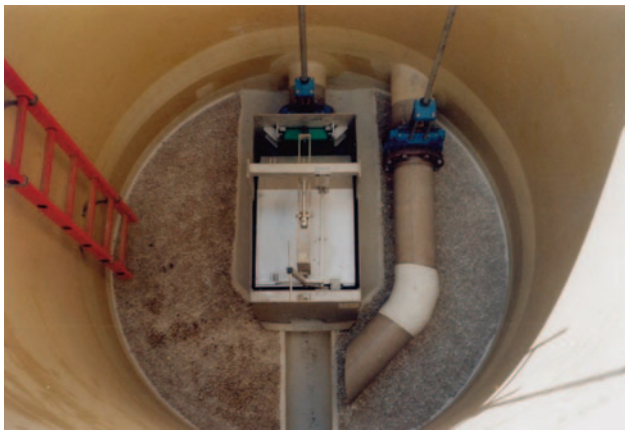
During storm water conditions the water level rises inside the unit in front of the outlet control plate. The internal float rises up and gradually pulls down the inlet control plate to regulate. Regulation is now activated. Units fitted with a "dry-weather-automatic" option will start the regulation when the float starts to move and the outlet control plate moves in regulating position.

The water level within the regulator unit rises to a certain steady water level. With a rising water level the float rises and closes the inlet plate to reduce the inlet of water until the level is set again. Whilst a falling water level will cause the float to lower and the inlet control plate to open.

The regulation of the inlet plate, controlled by the float, causes a steady water level in the unit and due to the fixed position of the outlet control plate, the flow rate is held constant.

AUTOMATIC DE-BLOCKING

It is possible that blockages at the inlet control plate occur and will hinder storm water from entering the unit. In this case the water stored already in the unit discharges through the outlet, the float falls due to its own weight and in turn the inlet plate opens. As the inlet plate opens or, after it has completely opened, the solids can pass unrestricted into the unit, the water level rises quickly and returns the inlet plate to its regulating position.



ALPHEUS-AS

As many sewerage network storage systems do not have a power supply, the ALPHEUS-AS has been developed, which runs without external power but with the same reliability as electrically actuated regulators. The ALPHEUS-AS offers the high accuracy flow control required to precisely restrict the discharge rate from a combined sewerage network , irrespective of the head of water and to allow a pre-designed flow of wastewater to be constantly discharged.

OPERATING PRICIPLE

Installed in front of the discharge orifice of a sewerage system in a wet chamber installation, the designed discharge rate is accurately controlled – irrespective of the water level in the tank.

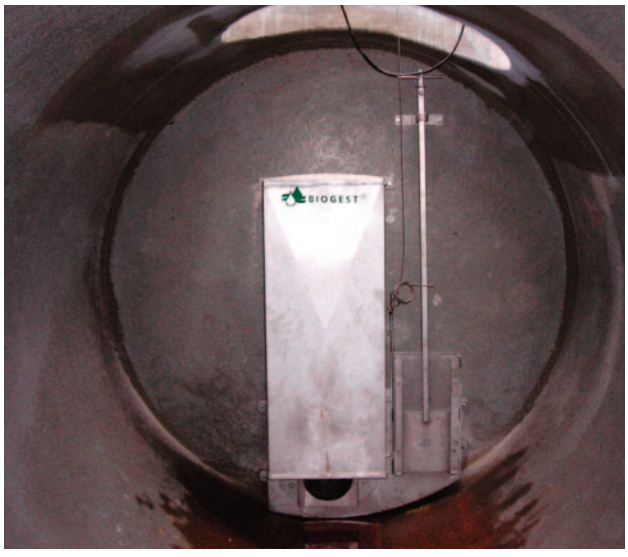
Accurate control, irrespective of head, is achieved with the help of a float, which is located inside the ALPHEUS' housing. The key design feature is that the housing is designed as a submersible bell: I.e. it is open at the bottom but is otherwise hermetically sealed. Consequently air is trapped within the housing and the water level inside the bell rises less than the level in the storm water tank because of the air pocket.

The benefit of the differential pressure is that the unit is smaller as we need less travel to achieve full regulation. This reduced travel action enables a very compact unit design, which allows the ALPHEUS-AS to be installed even in very confined conditions. A further important advantage of the submersible bell housing over other designs is that the control mechanism lies inside the air zone, i.e. outside the wastewater, remaining 'dry' and without the risk of ragging, is therefore prevented.

STORM WATER FLOW

When wastewater flows into the storage system under storm conditions, flow passes through the Alpheus but due to the higher volume the level in the chamber rises. As it does so the level will rise within the ALPHEUS-AS unit itself, if the level reaches the float in the ALPHEUS-AS housing the control mechanism commences.

As the float rises it causes the orifice plate to lower over the outlet thereby reducing the cross sectional area.



ALPHEUS-AA

Due to the presence of sewage related debris it is possible for the standard ALPHEUS-AS to suffer from blockages. These can be overcome by operating personnel using a manual pulling device. However, several hours or even days can pass between the blockage occurring and its detection/removal, as tank checks are mostly carried out at set intervals. For this reason the **ALPHEUS-AA** has been developed where the flow regulation automatically detects and removes a blockage. The **ALPHEUS-AA** is highly effective particularly in combined water systems and for low pass forward flow rates (<10 l/s).

OPERATING PRICIPLE

When no power supply is available, the **ALPHEUS-AA** is the most appropriate regulator for the job. Installed in front of the discharge orifice of a sewerage system, in a wet chamber installation, the designed discharge rate is accurately controlled – irrespective of the water level in the tank.

Accurate control, irrespective of head, is achieved with the help of a float, which is located inside the **ALPHEUS-AA** housing. The key design feature is that the housing is designed as a submersible bell: i.e. it is open at the bottom but is otherwise hermetically sealed. Consequently air is trapped within the housing and the water level inside the bell rises less than the level in the storm water tank because of the air pocket.

The benefit of the differential pressure is that the unit is smaller as we need less travel to achieve full regulation. This reduced travel action enables a very compact unit design, which allows the **ALPHEUS-AA** to be installed even in very confined conditions. A further important advantage of the submersible bell housing over other designs is that the control mechanism lies inside the air zone, i.e. outside the wastewater and the risk of ragging is therefore prevented.

AUTOMATIC WATER FLOW

Provided that the components of the blockage are smaller than the outlet cross-section, the **ALPHEUS-AA** automatically identifies a blockage and opens the outlet orifice, the blockage is then cleared by being flushed through the discharge outlet by the increased head of water.

On the orifice plate there is a sensor, which is designed as an open pipe socket. During regulation the water flow passes the sensor with a high velocity and generates a partial vacuum. A valve in the trigger device is actuated by the partial vacuum. The tank water passes through the valve via the filler pipe into the auxiliary float. The air in the auxiliary float escapes via the ventilation pipe into the open air. The auxiliary float is weighted down by the inlet flow and remains in the lower end position.

If a blockage occurs in the discharge outlet during regulation, the partial vacuum disappears and the valve switches back into the home position. The water flows out of the auxiliary float through the valve and through the **ALPHEUS-AA** into the sewer. Air passes through the ventilation pipe into the emptying auxiliary float. The auxiliary float becomes buoyant and pulls the control float located beneath the housing by means of a pulley system, against the buoyancy of the water. This opens the orifice plate to increase the outlet opening.

The float activated mechanism, designed to maintain a constant discharge without the use of external energy sources.

ELIQUO HYDROK LTD
Indian Queens Ind Estate, St. Columb | Cornwall, England | TR9 6TL
T +44 1726 861 900
sales@eliquohydrok.co.uk | www.eliquohydrok.co.uk

MEMBER OF **ELIQUO WATER GROUP**