Wastewater Management Systems

ELIQUO | HYDROK

Vacuum Flushing

Rectangular, circular tank and sewer cleansing system

Tank & Sewer Flushing

Rectangular and circular retention tanks

Sewer systems

WITH INCREASING DEMANDS UPON SEWERAGE NETWORKS TO ATTENUATE AND PROVIDE STORAGE CAPACITY FOR STORM WATER FLOWS, WATER COMPANIES ARE REQUIRED TO INVEST INTO NEW AND EXISTING STORAGE SYSTEMS. ALL SUCH SYSTEMS ENCOURAGE THE SETTLEMENT OF SOLIDS AND SEDIMENTS WHICH CAN LEAD TO OPERATIONAL PROBLEMS AND HIGH MAINTENANCE COSTS. IN ORDER TO EFFECTIVELY CLEAN THE RETENTION TANKS, THE VACUUM FLUSHING SYSTEM (VFS) WAS DEVELOPED WHICH CAN BE USED WITH OR WITHOUT ELECTRICAL ENERGY.

Vacuum Flushing rectangular tanks can be configured to allow individual lanes to be flushed separately

Vacuum Flushing for circular retention tank flushing, centre or sidewall positioned

The need for flushing wastewater storage tanks is a recognised and understood need due to the build up of solids and the potential for odour release. The Vacuum Flushing System (VFS) has been developed to automatically clean storage tanks that do not have self cleaning gradients. The principal advantage of this system is that there is no need for any hazardous man entry procedures because all of the components are accessible without the need for anyone to enter the tank for any reason.

HOW IT WORKS

In a storm event the storage tank starts to fill as the network reaches full capacity. During storage, solids settle in the base of the tank and in order to retain storage capacity and to eliminate the potential for odours the tank will need to be flushed.

When the level in the storage system rises the vacuum pump starts extracting the air in the flush chamber and draws water from the storage tank into the chamber. This allows the chamber to fill independent of the water level. Once the storage system empties, the diaphragm valve opens and the rapid influx of air fills the vacuum, this in turn forces the contents of the flush chamber into the storage system. The result is a large surging volume of water that efficiently cleans the floor of sludge and other sewage related debris.

If two or more flush chambers are installed in a storage tank they can be operated by just one vacuum pump but will flush separately. During further rainfalls the cycle starts again.

It is possible to flush in dry weather conditions if an alternative water source can be provided to fill the siphon. This can be carried out using a permanent piped water supply or alternately, if a permanent supply is not feasible, the use of a mobile water tanker.

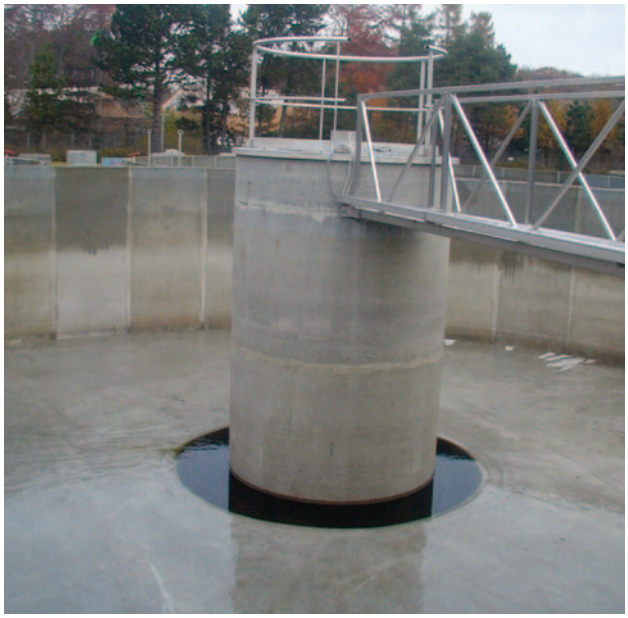
AVAILAIBLE CONFIGURATIONS

RECTANGULAR RETENTION TANKS

CIRCULAR RETENTION TANKS

SEWER NETWORKS

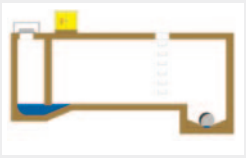
VFS for rectangular or circular retention tank flushing.



VFS for sewer network flushing.

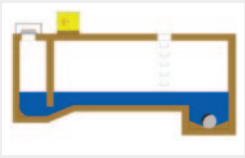
Operating Principle

1



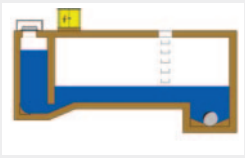
Both the tank and flushing chamber are empty

2



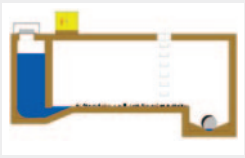
The storm begins. Combined sewage and rainwater spill into the storage chamber and rises above the syphon level of the inlet to the flushing system.

3



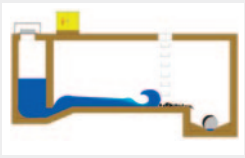
The vacuum pump starts automatically drawing water from the storage chamber into the flushing chamber. Once the maximum level in the flush chamber is reached the vacuum pump stops automatically.

4



The storm subsides and the storage chamber empties leaving sludge and other sewage related debris on the chamber floor. The level in the flushing chamber is still held under vacuum.

5



Once the tank is empty the flushing sequence starts automatically. The vacuum seal is broken and a large volume of water surges from the flushing chamber driving all of the solids from the chamber floor.

ADVANTAGES AND BENEFITS

- No submerged moving parts, all parts serviceable without entering the tank
- Full flushing action even after partial fillings
- High cleaning performance with a water head of up to 7m
- No separate water supply required, system flushed with storage water (rain and sewage water)
- Low energy consumption (about 1.5 kWh per flushing)
- Minimal maintenance (oil change)
- No maintenance within the tank for greater health and safety
- Potential for a separate "dry" flush with additional external water supply (dry climates)
- Completely automatic operation, prepared for a remote control system
- Excellent quality – low whole of life cost.

BEFORE FLUSHING

AFTER FLUSHING

A flexible vacuum flushing solution suitable for rectangular and round retention tanks plus sewer networks

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