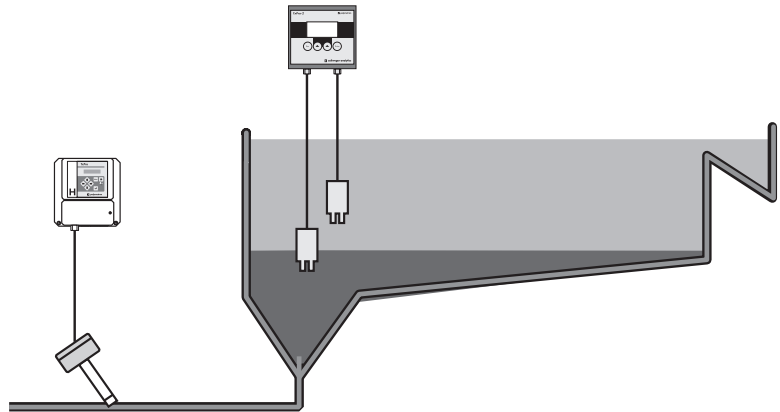


Desludging of wastewater clarifiers and settling tanks

application note



A TxPro™-2 transmitter with two RD-240 sensors (right) monitors the blanket level and a HC-300 High Concentration sensor with a TxPro-H transmitter monitors the underflow in a primary clarifier.

Description

Desludging refers to the periodic removal of sludge that accumulates at the bottom of primary wastewater clarifiers (also known as settling tanks or sedimentation basins). Sludge is made up of solids in the wastewater that have settled at the bottom. The accumulation is referred to as a sludge blanket.

Sludge must be removed to make room for more settling. Desludging must be timed so that the solids concentration of the underflow is within the design parameters of downstream equipment such as thickeners and digesters.

Critical factors

The critical factors include the influent rate, the wastewater source and composition, the settling rate, the blanket height / solids concentration correlation and downstream solids concentration requirements.

Influent

Influent to a primary clarifier is raw wastewater often mixed with recycled effluents from within the plant. The suspended solids are typically large and easily settled. Extreme influent flows can cause disruptions in the sludge blanket accumulation.

Detention time

The amount of time wastewater and sludge remain in the tank depends on the depth of the tank, the influent rate, surface overflow rate and the required solids concentration of the sludge.

Effluent

For a primary clarifier, the underflow solids concentration can be less if the sludge is intended for thickening (0.5% to 1.5% solids) than if it is intended for digesting (2.0% to 5.0% solids). The effluent should be relatively free of suspended solids, grease and scum. The effluent is typically directed to an aeration basin for activated sludge treatment.

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A HC-300 sensor has sufficient range (0% to 10%) to monitor underflow pump-out for most applications. The instrument can be mounted to the sludge pipe through a ball valve and connected to a TxPro-H transmitter. The data should be used to determine when the shut off solids level has been reached.

For automated desludging, the data from the underflow sensor can be used to turn off the sludge pumps once the solids concentration has fallen below a selected level. A timer or data from an SLM-3000 Sludge Level Monitor and Profiler (in secondary clarifiers) or a TxPro-2 transmitter with an RD-240 sensor configured as a limit alarm (in primary clarifiers) can be used to turn on the pump. The SLM-3000 is typically bolted to the catwalk above the tank. The sensor is suspended from a cable drum into the process.

This publication is not intended to form the basis of a contract. The company reserves the right to change design and specification of its products without notice.

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