

Automatic Floating Sludge Removal Device for Settling Tanks

(circular and longitudinal settling tanks)

No need anymore for manual adjustment

Depth of drain is now specified only by the pump capacity

Absolute and relative water-level changes are compensated
for automatically

Wear-resistant to a large extent, because:

- minor rotating motion -
- no packings required -

closed channel through, consequently:

- no leakages -
- no hold fast by ice or packing washers or flaps -
- Scum removal also possible behind the channel -

Enormous drain capacity in continuous running operation,
therefore suitable for high amounts of floating sludge.

**Completion with scum brakes for forced removal is
possible any time.**

Together with forced removal, pre-thickening of floating
sludge (scum) is variable adjustable

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Funktions of the automatic floating scum discharge channel

In keeping with the latest technological development, floatables are normally discharged with so-called skim channels. Usually these channels are adjusted manually by an operator who stands on the bridge and tries to make out the depth of immersion of the front edge of the skim channel, and this over a distance of 2-3 m. With an immersion depth of f.i. 1-2 cm, this is extremely difficult.

Additionally this immersion depth adjusted with great difficulties, is only stable for a short time. Just after the operator has completed this manual adjustment, the relative water level to the edge of the skim channel has changed again so that either no scum is skimmed off or the skim channel edge has submerged so far that water is drained only from below the cover of floating scum.

Following sources of defects can be responsible:

- Tolerances in the tank head (the sludge remover with the floating scum collecting system changes its relative height to the water level).
- Water-level variations due to changing water volume and therefore different overflow rates at the serrated slats.
(With clear-water drain systems which operate according to the effluent law, the water-level variations are even much higher.)
- Wind influence (the water level changes to sloped position).

Here we expect too much of any skim channel usually adjustable by hand with the help of a spindle. What is missing is the automatic adaption to relatively alternating water levels. This problem can be solved with complicated and sensitive measuring and controlling equipment. Our aim however, was to meet this problem with a simple and robust mechanical compensation control.

We solved this task by means of a simple float pipe, which is integrated inside the tilting-type channel. Based on the water level inside the channel, we receive a clockwise or an anti-clockwise torque.

The formula for the overflow volume "Q" of a straight weir (acc. to Tolkmitt) is:

$$Q = 2/3 * \mu * \sqrt{2g} * h^{3/2}$$

simplified formula: $Q = 1,772 * h^{3/2}$

When changing this formula: $h = \frac{Q^{2/3}}{1,772}$

we get a direct dependence of the overflow height "h" from overflow "Q".

This means in practice that the immersion edge of the skim channel does not require difficult adjustment and setting by spindle anymore, because the depth of immersion regulates automatically by determination of the suction capacity.

Also with absolute or relative water-level variations the adjusted value is maintained automatically.

The scum skimming system adjusts automatically to the water level.

Unevenness of the runway, water-level variations due to different water volumes or to wind influence do not have any effect anymore.



Fully automatic Floating Sludge (Scum) Removal device in a Rectangular Clarifier



"Suction effect" of a fully automatic, self adjusted skim channel



Automatic Floating Sludge removal device installed in an rectangular sedimentation tank



The scum will be pushed
by an traveling scraper
or by a chain and flight
collector to the end of the
tank



The skimming device
(installed at the end of
the settling tank)
is "sipping off" the
floating scum
automatically
(it even works at water
level fluktuation of
several centimeters).



Automatic Scum Removal in the canal from the aeration tanks to the final clarifiers

