



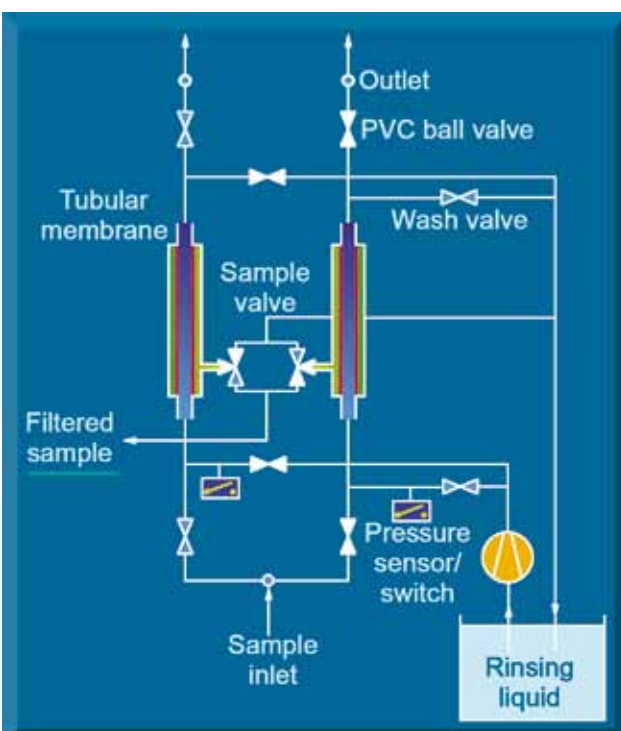
On-line Filtration Systems



Cross flow ultra-filtration is a low-pressure membrane filtration with the capacity to filter sample streams with a high number of suspended solids and floating particles. A semi-permeable membrane incorporated in the membrane modules performs the filtration. Low molecular weight pieces e.g. salts, sugars and most surfactants, pass through the membrane and are removed as permeate. Suspended solids are rejected by the membrane. Ultra-filtration membranes retain material as low as 5 μm .

The unfiltered sample flows across the membrane surface at high velocity. This cross-flow characteristic differs from the end-point flow of ordinary filtration, where "cake" builds up on the filter surface, requiring frequent filter replacement or cleaning. Cross-flow prevents filter-cake build up, resulting in high filtration rates that can be maintained continuously, eliminating the cost for frequent filter replacements.

This filter system needs a centrifugal pump or, when the sample contains large floating particles (sewage water inlet), a centrifugal cutting pump. For guaranteed continued filtration, two filter units should be installed. With PVC ball-valves the user is able to select the filter to be used. When the filter is not selected for filtration, it can be cleaned with a separate cleaning circuit. This cleaning circuit consists of a circulating pump and a container with detergent solution.



Principle of Cross-flow filtration

With the use of a programmable logic Controller it is possible to program an automatic rinsing cycle. After a pre-settable time, the PLC unit switches (by means of electrically driven ball valves) the sample to the other filter unit. The filter unit can be cleaned after the circulating pump starts. Also this pump is controlled by the PLC. With pressure sensors the PLC will check the sample stream for high pressure caused by the obstructions into the sample loop. In case of blockage, the PLC immediately detects the high pressure and selects the other filter unit. At the same time an alarm will be activated.

At a pressure of 2.5 bar:

- No pre-filtration is required
- Minimum operator attention is required
- Long membrane lifetime
- Easy to clean, cleaning can be done fast, either chemically or mechanically
- Low incremental membrane replacement cost

Other Skalar filters and Accessories

DISC FILTER



The Disc filter is a miniaturized cross-flow filtration. The key is the combination of this filter unit with the low sample volume of the monitor unit. The filtration unit has a completely closed sample loop and is mainly used for samples with average suspended solids. The filter cell for the raw liquid guarantees a cleaning effect due to turbulent flow in combination with filter material, POM/Teflon, and therefore provides the On-line Process Analyzer with sufficient, 3 ml/min filtrate over a long period (min. 1 week). The cleaning is dependent on the sample composition, mechanical or mechanical in combination with chemical, by periodical back-flush with a cleaning agent. The filtration system is such that it is easy to change a filter without breaking the process.

PAPER BAND FILTER



Paper band filtration is ideally suited for samples that contain small quantities of relatively large particles. The filtration removes particles larger than fifteen microns in size and will also remove any oil in the sample. The paper band filtration unit is available in a single or dual stream configuration. Paper band filtration is being successfully applied to surface water, drinking water, effluent streams and small pilot plants. The 25 mm paper filter moves over the teflon table. The unfiltered sample is pumped with the sample pump and sprayed over the filter paper. The filtered sample line is directly connected to the monitor sample selection valve. The transport of the filter paper is controlled by a slow speed motor which moves the paper continuously with a speed of approximately 15 cm per hour.

OVERFLOW UNIT



For handling pressurized samples an overflow unit has been developed by Skalar. The pressured sample is run into a catch reservoir, from where the sample is taken at atmospheric pressure through a valved PVC line to the analyzer and the overflow runs to waste.

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