

EQUFLOW SENSORS: SINGLE USE AND DISPOSABLE FLOW SENSORS FOR MEDICAL EQUIPMENT

In medical technology- and production processes, reliability, accuracy, and safety are of the essence. False measurements are unacceptable when using a dialysis system, for instance. Equflow develops and produces modular flow sensors based on a unique and extremely reliable principle. The sensors are so-called turbine flowmeters furnished with an infrared sensor enabling flow measurement of an extensive number of low-viscous liquids.

The use of these disposable flow sensors reduces down-times during your production process and saves energy. An intensive validation process preceded the commercial introduction. The result is an accurate reliable flow measurement that complies with industry standards such as USP Class VI. An automated calibration system can be installed to maintain maximum accuracies, every time wettable parts are exchanged.

Turbine Flowmeter

Equflows' flowmeters can be used in applications where flow control is required and can also be used in dosing operations (volume control). The turbine flowmeters offer two important advantages: High accuracy and -repeatability when measuring flows of low-viscous liquids. This applies to both flow control and volume measurement (dosing operations). Equflow has developed a mechanical construction enabling an almost frictionless turbine movement that barely causes any wear and tear.

Video:

(If video is not possible, insert [IMG 1] Working principle of a turbine flowmeter, instead)

The infrared sensor positioned close to the turbine part in the flowmeter, measures the number of pulses that the reflectors of the six turbine blades generate. The more pulses the IR sensor detects, the faster the medium flows. The on-off signal produced by the blades passing the IR sensor, is onwards converted into a square wave pulse signal. The controller (i.e. PLC or similar) calculates the flow or volume that was measured.

Single Use in Medical Technologies

In medical technologies, strict requirements prevail for flow measurements. The measurements must be reliable, accurate and need to be performed in sterile conditions. In order to meet these requirements, Equflow's single-use flowmeters are produced in a clean room and can be sterilized by gamma radiation if required. A dialysis system, for example, must be able to be cleaned quickly and easily after each run. This applies to all sorts of medical devices and equipment that process (body) liquids. Avoiding contamination and/or infection is of the essence. Moreover, the fast and easy exchange of the flow tubes minimalizes down-time.

How Does it Work?

Basically, the modular sensor system consists of four components; the flow tube with turbine and the bar code scanner are the most advanced parts. These components ensure a reliable and accurate flow measurement for years.

The components:

- turbine tube (incl. rotor and other internals) for single use;
- bar code scanner system for automatic calibration;
- choice of housing including IR sensor for the disposable tube;
- electronics for flow measurement.

[IMG 2] The Tubeholder System connected to the Barcode Scanner

Turbine Tube for Single Use

A turbine tube for single use is positioned between two hoses that transport the liquid from or to a component of the machine or device. The flow tube holds the mini-turbine, which turbine blades are detected by the IR sensor beaming through the transparent tube wall. The turbine is very light (negligible mass), so that it will react instantly to minor flow variations and hence provides an accurate signal at all times. Equflow uses PFA or PVDF as transparent disposable materials of construction. Turbine tubes are available in different sizes that cover flow ranges from 20 mL/min up to 200 L/min.

Bar Code Scanner System for Automatic Calibration

Each turbine tube is supplied with a unique bar code, comprising of the K factor (amount of pulses/Liter) of the tube, amongst other data such as lot number, serial number, etc. The respective K factors are determined for each tube by using a calibrated testing procedure.

The fluid properties and other specifications are set in the process system of the production or control process. When the turbine tube is replaced, the operator only needs to scan the new bar code with the bar code scanner. The new K-factor will automatically be uploaded in the computer and consequently a reliable measurement will be guaranteed again.

Choice of Housing for the Disposable Tube

The working principle of Equflow's flow sensors is based on the count of the reflections of the six turbine blades. Different housings are available to hold the disposable tubes. The most suitable model for your process depends on your flow measurement system and on how often the flow tube has to be exchanged.

[IMG 3] All disposable flow sensor models

Electronics for Flow Measurement

converting the digital turbine pulses produced by the infrared sensor into volume or flow can be done by a controller. Equflow offers single and dual flow controllers as well as batch controllers. Contact Equflow to learn more about these products.

Contact us

Equflow BV
www.equflow.com
info@equflow.com
+31 (0)24 379 2666