Accurate open channel flow measurement

Prosonic FMU40 measures flow rate in influent stream at wastewater plant

Benefits at a glance

- Increased operational efficiency
- Reduced energy costs
- Increased process quality
- Reduced cost of installation and improper setup

A Midwest wastewater treatment plant was in need of a technology that could measure the flow rate in an influent stream. Accurate open channel flow measurement would allow the customer to complete reporting, operate more efficiently, reduce energy costs and increase process quality.

The Challenge The customer was having issues with a legacy ultrasonic level device with remote sensor that was separate from the electronics. The plant was looking for a technology that would accurately measure the flow rate of wastewater into the influent stream in order to be reported to environmental authorities.

Our solution Ultrasonic measurement Time-of-Flight Prosonic FMU90 The existing legacy device was replaced by the compact Prosonic FMU40 ultrasonic level device reducing the cost of mounting separate electronics. The compact FMU40 was top-mounted above a flume transmitting ultrasonic pulses in the direction of the product surface and reflected back and received by the sensor – measuring the time between the pulse transmission and reception. The 32 point linearization of the instrument allows a conversion of the level measurement into an output signal that is proportional to the flow rate. The FMU40 was a good fit because the application required a 4-20 mA flow signal and not pulsed flow output.

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Solution details The linearization function of the FMU40 allows conversion of the measured value into any unit of length or volume. In open channels or measuring weirs, a flow linearization is possible (calculation of the flow from the measured level).

The supplied ToF (Time-of-Flight) operating program can automatically calculate the table for any tank, weir or flume and upload it into the device. Flow curves for open channels can be calculated and entered into the instrument via the ToF tool as well.

Results As wastewater flowing into the treatment plant must be accounted for, the accurate flow measurement allows the customer to adjust for varying flow rates, all while operating more efficiently, reducing energy costs and increasing the quality of the process. The signal of this compact device can be used directly in the control system without conversion, thus reducing the cost of installation and risk of improper setup.

Ultrasonic measurement Time-of-Flight Prosonic FMU40

USA

Endress+Hauser, Inc.
2350 Endress Place
Greenwood, IN 46143
Tel: 317-535-7138
Sales: 888-ENDRESS
Service: 800-642-8737
Fax: 317-535-8498
info@us.endress.com
www.us.endress.com

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