APPLICATION REPORT

Water & Wastewater

Distance measurement in a wastewater pumping station

- Reliable pump control for quick emptying of wastewater containers
- Effective pump dry run prevention
- Cost-effective measurement with non-contact radar (FMCW)

1. Background

The ZVO (Ostharz Association for Water Supply and Wastewater Disposal) operates a wastewater system with 11 wastewater treatment plants in Germany. The company operates an additional 150 pumping stations to transfer municipal wastewater loads to the wastewater treatment plants. One of these pumping stations is located in the town of Falkenstein in the Harz district, where pumps raise the wastewater loads by 7 m / 23 ft. The loads are then taken via a pressure line along the Selke river to the local wastewater treatment plant.

ZVO pumping station

2. Measurement requirements

At the pumping station, the wastewater is first collected in hoppers. Once the level has reached a defined level, or is below that level, the pumps must be activated or switched off by way of a PLC.

Up until now the ZVO has been using an ultrasonic sensor to detect the respective switching point using a distance measurement. Due to the increasing moisture in the shaft, however, condensation frequently built up on the antenna of the device, which in turn had a negative impact on the acoustic measuring signal. In addition, the measuring device proved to be extremely susceptible to larger temperature fluctuations. Despite temperature compensation, spontaneously occurring, intensive sunlight led to considerable measurement deviations. This meant, among other things, that frequently the only way to prevent the pump from running dry was to activate the emergency off float switch.

Originally, the ZVO had planned to replace the sensor with a hydrostatic pressure sensor. However, this would have made it necessary to install a protective tube. That is why the customer started looking for a reasonably priced alternative that could be installed easily during operation.

KROHNE

3. KROHNE solution

The ZVO is now using the OPTIWAVE 5200 C for distance measurement. The company was able to set up the non-contact radar (FMCW) level transmitter very quickly. No special knowledge was necessary thanks to the simple navigation. All that was required was a one-time adjustment of the tracking speed to the very quick emptying of the container.

The measuring device was originally supplied with a horizontal converter. However, the switch was made to a vertical housing position to make the values easier to read from above. Thanks to the quick coupling system, it was possible to remove the modular converter of the OPTIWAVE 5200 C under process conditions and simply rotate it by 360°.

Fast retrofit of the converter thanks to quick coupling system

4. Customer benefits

The OPTIWAVE 5200 offers the ZVO the desired cost-effective yet reliable distance measurement for the pump control. The radar device is perfectly designed for measuring foaming wastewater with temperature fluctuations outside.

Unlike the ultrasonic sensor or comparable radar level measuring device, the OPTIWAVE 5200 features a flat, non-peak signal feed. Condensation has thus hardly any effect on the measurement. Thanks to the OPTIWAVE 5200's slim antenna design, drops of condensation can also flow off quickly.device, the OPTIWAVE 5200 features a flat, non-peak signal feed. Condensation has thus hardly any effect on the measurement.

OPTIWAVE 5200 C above the wastewater container

5. Product used

OPTIWAVE 5200 C

- 2-wire FMCW radar level transmitter for the water and wastewater industry
- Cost-effective distance measurement in wastewater shafts and containers
- Innovative horn antenna design for wastewater applications with condensate formation
- Suitable for use outdoors
- Modular design of housing and antenna ensures suitability for a variety of mounting positions
- Quick coupling system for the removal of the converter under process conditions
- Measuring range up to 30 m / 98.4 ft

Contact
Would you like further information about these or other applications?
Do you require technical advice for your application?
application@krohne.com

Please visit our website for a current list of all KROHNE contacts and addresses.

www.krohne.com