



NON-CONTACT FLOW MEASUREMENTS IN THE SERVICE OF MARINE RESEARCH

MEASUREMENT TASK

The RV METEOR is a globally operating, multidisciplinary research vessel owned by the Federal Republic of Germany, operated and coordinated by the LEITSTELLE DEUTSCHE FORSCHUNGSSCHIFFE/University of Hamburg. In its daily work as a laboratory at sea, METEOR fulfils two specific functions: Firstly, it determines typical oceanographic parameters such as conductivity, salinity, temperature and density of the surface water (down to a depth of approx. 6 m) using a so-called thermosalinograph system and makes the results available to scientific databases.

Its second task is to continuously measure the sound velocity. It changes between 1400 m/s and 1800 m/s at the surface of the oceans due to the fluctuating oceanographic parameters. Consequently acoustic echosounding systems can be calibrated with corrected sound velocity in each case, to be able to precisely measure and map the seabed in succession.

SOLUTION

The operator made several demands on a flow measurement system to be installed. The most important characteristic for the research was a non-contact flow measurement of the seawater in order to avoid chemical influences and to distort analysis results. It was also necessary to find equipment that offered a wide range and flexibility of interfaces. Two non-intrusive clamp-on ultrasonic flowmeters type KATflow 100 were installed on PVDF pipelines with DN 25 ... 40 mm.

The results of the continuous flow measurements at the METEOR today allow concrete conclusions about system statuses, such as organic growth and sedimentation in the pipeline systems and at sensors and, of course, whether pump and valve controls are set correctly.

"Overall, the flowmeter plays a central role. Without flow recording, everything we measure in these systems is actually meaningless", says Mr Wolf, one of the responsible technical inspectors at the shipping company. As the shipping company itself explains: "While the high-precision and exotic scientific sensors often act as divas during operation, the process-related sensors should be exactly the opposite. Stability, reliability and robustness are required here". "Since 2014, thanks to flow measurement, scientists have been able to carry out reliable validation and classification of the data obtained without any failures", Mr Wolf concludes.

ADVANTAGES

- No chemical influence on the medium thanks to non-invasive measurements
- Variety of interfaces for data exchange and processing
- Conclusions on fouling, sedimentation, pump and valve controls
- Installation without process interruption also possible on oil and fuel lines
- Continuous flow rate determination as a reliable basic parameter
- Measurement of a wide range of process liquids, pipe types and diameters

SPECIFICATIONS

Installation type	Fixed installation
Medium	Seawater
Pipe material	PVDF pipe
Pipe diameter	25 to 40 mm
Temperature	+8 ... +18° C
Flow rate	Constant flow required

APPLICATION



The German research vessel METEOR on the high seas.

INSTRUMENT SOLUTION



KATflow 100 installation as part of a thermosalinograph system on the research vessel METEOR.