



APPLICATION NOTE Chemical

Clamp-on flow measurement for pump performance monitoring

- Reliable readings for monitoring cooling water pump performance at difficult process conditions
- Ultrasonic clamp-on flow measurement on a large glass reinforced plastic (GRP) pipeline
- Flexible, battery-powered solution for pump verification at different flow rates

1. Background

A chemical company in Turkey operates a cooling system for the temperature control of their processes. The cooling water is pumped to heat exchangers that separate the process from the cooling water. The performance of the cooling water pumps (CWP) is pivotal for the flawless operation of the processes.

2. Measurement requirements

To test CWP performance at different flow rates and to optimise the cooling circuits, the company was searching for a flexible and cost-effective flow instrumentation at different flow rates (2500...7500 m³/h). There had so far been no flow measurement. The customer demanded that the large pipe (DN1900 / 76") remain untouched. The flow measurement was to be temporary and non-intrusive. Cutting the pipe to install an inline flowmeter was not an option. The pipe is made of GRP (glass reinforced plastic) with a wall thickness of 27 mm / 1.06 in, which called for a sophisticated clamp-on technology to cope with such conditions.

3. KROHNE solution

The customer turned to KROHNE for non-intrusive flow measurement on the challenging GRP pipe. After the application-specific setup and installation of the clamp-on transducers, the OPTISONIC 6300 P ultrasonic clamp-on flowmeter proved itself, providing reliable readings to temporarily check the flow rates under different load conditions.

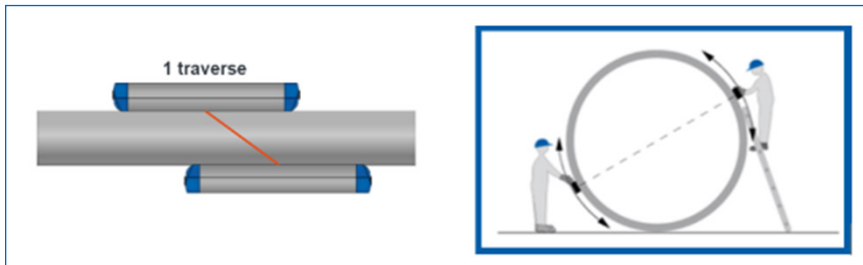
The OPTISONIC 6300 P comes battery-powered with a portable signal converter (P) and a patented mounting rail with click-and-turn mechanism which enables a fast, accurate and reliable installation that can be installed at virtually any location without interrupting the process or cutting pipes. All measurement data can be monitored and analysed via a smart handheld or mobile device using the dedicated OPTISONIC 6300 P mobile app.

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Data transfer between handheld and converter can be done via a USB cable or secure wireless Bluetooth® connection. The portable clamp-on solution allows not only real-time measurement, but also data-logging for evaluation of readings over a certain period and at different flow rates.

In general, GRP pipes are more difficult to measure with an ultrasonic clamp-on flowmeter than e.g. metallic pipes, plastic pipes made of PE or other materials from a single component. The latest version of the OPTISONIC 6300 P features enhanced measurement performance to successfully handle applications with challenging pipe material. Given the material and the large diameter of the pipe, the KROHNE service engineers recommended using Z-mode measurement with one traverse and two single rails for the best possible signal strength.



Z-mode measurement with one traverse using 2 rails



Battery-powered ultrasonic clamp-on flowmeter with portable signal converter



OPTISONIC 6300 P mounted with two rails on GRP pipe

4. Customer benefits

The OPTISONIC 6300 P ensures reliable flow measurement of cooling water even under challenging process conditions with difficult-to-handle GRP pipe material. It enables comprehensive performance testing of the cooling water pumps over a wide range of flow rates. By leveraging its data logger capability, the operator can also assess pump performance over time and at different flow ranges to improve process efficiency.

The OPTISONIC 6300 P offers a flexible and cost-effective solution, particularly for large pipes up to DN4000 / 160". It is an excellent alternative to inline flowmeters when the high absolute accuracy of inline meters is not required. KROHNE also offers an equipment rental option for the portable flowmeter in many countries, which allows customers to perform temporary flow measurements at reduced costs.

The OPTISONIC 6300 P represents decades of expertise in ultrasonic flow measurement and clamp-on technology. In addition to portable battery-powered clamp-on versions, KROHNE also offers mains-powered stationary clamp-on flowmeters for permanent installation. All of these add to KROHNE's extensive portfolio of inline ultrasonic flowmeters for utility, process and custody transfer applications.

5. Product used

OPTISONIC 6300 P

- Ultrasonic clamp-on flowmeter for temporary flow measurement of liquids
- Battery-powered meter used to collect additional flow data or for cost-effective on-site verification of inline flowmeters
- For pipes DN15...4000 / ½...160"; up to +120°C / +248°F
- Portable signal converter with integrated data logger
- Commissioning, monitoring and data analysis via a mobile smart device using the OPTISONIC 6300 P mobile app in combination with a USB cable or wireless Bluetooth connection®



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