

# Non-Invasive Flow Measurement for the Water and Wastewater Industries

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## Wastewater Process

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**This is the simplest way that the water industry can be broken down. Whether we are considering an individuals' role within an organisation, or the type of equipment we are using, the position within a water company will be defined by whether a function relates to the provision of drinking water (clean), or the treatment and disposal of waste (dirty).**

The advantage of a clamp-on ultrasonic flowmeter is that is equally useful on both sides of the hygiene divide, providing valuable information on both clean and dirty applications. Whether the technology is used to meter the supply of drinking water to a town, or the passage of Return Activated Sludge (RAS) through the treatment process, the requirement is the same: to achieve the most accurate and reliable measurement, with the least cost or interference to the process.



With clamp-on technology, the ultrasonic sensors are conveniently clamped onto the external surface of the pipe and flow measurements carried out without the need to cut the pipe or interrupt the flow. This not only has the advantage that the sterility and integrity of the system are guaranteed at all times and personnel are not exposed to any substances that are hazardous to health, but also ensures that the measuring equipment is installed quickly and easily.

### **Benefits of Clamp-On Flowmeters for the Water Cycle**

Katronic ultrasonic flowmeters are available as both portable and fixed installation instruments, suitable for different uses in the water and wastewater industry, from sanitary applications to sewage flow measurement. They can measure on pipes of all standard materials over a diameter range of 10 mm to 6500 mm. KATflow meters are simple to install and are ideal for dealing with extensive pipe networks where large diameter mains as well as smaller supply lines need to be monitored and flow surveys carried out.

Clamp-on flowmeters provide the tools needed to meet the diverse requirements of such a demanding industry. The technology can be used for permanent installation on large pipes where installation of an invasive flowmeter is not economically viable, and on all of the different process fluids encountered within the network. For large diameter pipes, the purchase cost of a Katronic flowmeter will be lower than that of an alternative in-line solution.

The only outlay a customer has with a clamp-on flowmeter is the capital expenditure while invasive meters incur further expense for engineering work, down-time, trained staff and specialist equipment leading to much higher overall costs. Another economic benefit of Katronic clamp-on flowmeters is that some instruments can be used to measure two pipes at the same time, making them doubly cost-effective.

## **KATflow 200 – Hand-Held and Lightweight Clamp-On Ultrasonic Flowmeter**

The KATflow 200 is a fully portable instrument with a power which is belied by its small size. This lightweight flowmeter is incredibly easy to use and can be operated one-handed which makes it an ideal tool for use in confined spaces or when working at height. The hand-held KATflow 200 is packed with features that make this versatile instrument unique for a meter of its size and price bracket. The flowmeter is available with a choice of robust stainless steel transducers to cover a temperature range of -30 °C to +250 °C.

### **Real-World Application: Sludge Pipe Flow Measurement, UK**



Katronic were recently called into action for a water company in the west of England. The customer had been attempting and failing to achieve reliable measurements on a 75 mm sludge carbon steel pipe using their existing clamp-on meter and contacted Katronic for support. A Katronic engineer was able to install the KATflow 200 and achieve stable, accurate flow readings in less than ten minutes.

## **KATflow 210 – Watertight and Robust Clamp-On Ultrasonic Flowmeter**



The KATflow 210 is a portable flowmeter designed for situations that require a reliable flow measurement regardless of the conditions in which it needs to be operated. With its advanced battery technology and durable waterproof housing the instrument is intended for long-term installation in remote areas where access to power is limited and exposure to the worst of elements is likely. This device has been further enhanced by the inclusion of a specially manufactured IP 68 version of the K1N stainless steel transducers which increases shock protection and ensures this ruggedised package provides the perfect balance of reliability, robustness and autonomy.

### **Real-World Application: Reduction in Water Loss, Switzerland**

Katronic's partner in Switzerland provided a Swiss customer with a measurement system designed to reduce water losses on the network as part of a planned upgrade programme. It was decided to use a portable ultrasonic flowmeter KATflow 210 to fulfil the measuring task with its rugged IP 67 enclosure, the instrument was suitable for outdoor installation, regardless of weather conditions. Once the recorded values were analysed it was possible to confirm that the maximum peaks of consumption had not exceeded velocity limits, even with pipes of smaller nominal diameters than the usual 400 mm pipe. In addition, the proportion of successful flushing processes in the pipe system would be significantly increased by 86 % (previously 26 %), which in turn would lead to lower water consumption. It is expected that through this work it will be possible to make six-figure cost savings through the use of drawing smaller bore pipes.

### **KATflow 230 – Flexible and Functional Clamp-On Ultrasonic Flowmeter**

The KATflow 230 is easily portable but incorporates an advanced specification for situations which require comprehensive measurement features coupled with easy operation. The flowmeter has two measurement channels, which allow it to monitor two pipes simultaneously or to improve accuracy in non-ideal conditions. The KATflow 230 can also be supplied with a variety of options to meet the most diverse application requirements. The choice of 4-20 mA, relay and open-collector outputs available on the KATflow 230 allow it to be used as a temporary replacement for existing in-line flow- meters when calibration is due.

### **Real-World Application: Drinking Water Supply, UK**

When the flowmeter on a large main supplying drinking water to Taunton, the biggest town in Somerset, failed Katronic were brought in to supply a replacement. The large size of the pipe and restrictions on access would have made the installation of an in-line meter hard enough, but the fact the shutting

off the flow would deprive a number of homes of drinking water made it impossible. As part of the specification process two engineers from Katronic attended site and took measurements with a KATflow 230 flowmeter. This was chosen as the dual-sensor technology allowed for better accuracy, and also because it replicated the specification of the recommended flowmeter for the ultimate installation (KATflow 150). The trial with the KATflow 230 was a success in spite of the complicated installation conditions and gave the client confidence in the technology.

### **KATflow 100 – Compact and Convenient Clamp-On Ultrasonic Flow Transmitter**

The KATflow 100 is a compact clamp-on ultrasonic flow transmitter with a robust and practical design for permanent installation and flow measurement on single pipes. The instrument offers a cost-effective option owing to its simplified specification and availability of a range of transducer types. The varied functionality and simple operation of the KATflow 100 make it the perfect product for large projects and customer specific solutions.

### **Real-World Application: Raw Water Measurements, USA**

A number of KATflow 100 flowmeters were recently installed by Katronic in the USA. The customer needed a reliable measurement for their 30" (762 mm) raw water pipes. The KATflow 100 provided an economical solution and gave stable and accurate results in spite of the uneven and unusual pipe surface.

### **KATflow 150 – Advanced and Adaptable Clamp-On Ultrasonic Flowmeter**



The KATflow 150 is the premier product for flexibility and performance, providing the user with a comprehensive specification and a list of configuration options. The practical modular design and the wide variety of different transducer types available ensure this instrument is suitable for everything from simple water flow measurements to energy flow monitoring and automated process control. The dual-channel design allows the user to either save cost and time by performing two independent measurements simultaneously or to install two pairs of transducers on a single pipe for locations where there are non-ideal flow conditions.

### **Real-World Application: London Sludge Flows, UK**

As part of the upgrade of a number of treatment works the UK's largest water company turned to Katronic to provide the flowmeters. Since Katronic and Thames Water began their relationship in partnership with ABB Katronic has supplied a large number of dual-channel KATflow 150 meters for the measurement of RAS at a number of sites in the greater London area. The instruments have been supported by our local engineer and the team from Z-Tech. Each measurement point uses one KAT-flow 150 and two pairs of the robust K1L sensors in order to provide the optimum accuracy and reliability.