

Ultrasonic flow measurement with FLUXUS®

# Non-invasive water and wastewater flow measurement

Versatile. Economic. Leakage-free.

Drinking water supply

Network monitoring and balancing

Leakage detection

Wastewater disposal



**FLEXIM**  
Sets Standards

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# The flow of water brings revenue

Sustainability and responsibility are two ways that remind us that every drop of water pumped out of the ground, or collected in a reservoir comes at a price, and brings potential for revenue.

Local governments are being called to effectively manage our water resources. An audit process with accurate flow measurement is a leading method for ensuring sustainability in our drinking water systems.

Additionally, municipalities are rushed to find new revenue sources. Accurate flow measurement is extremely important when it comes to ensuring that every drop is accounted for and improving revenue streams.

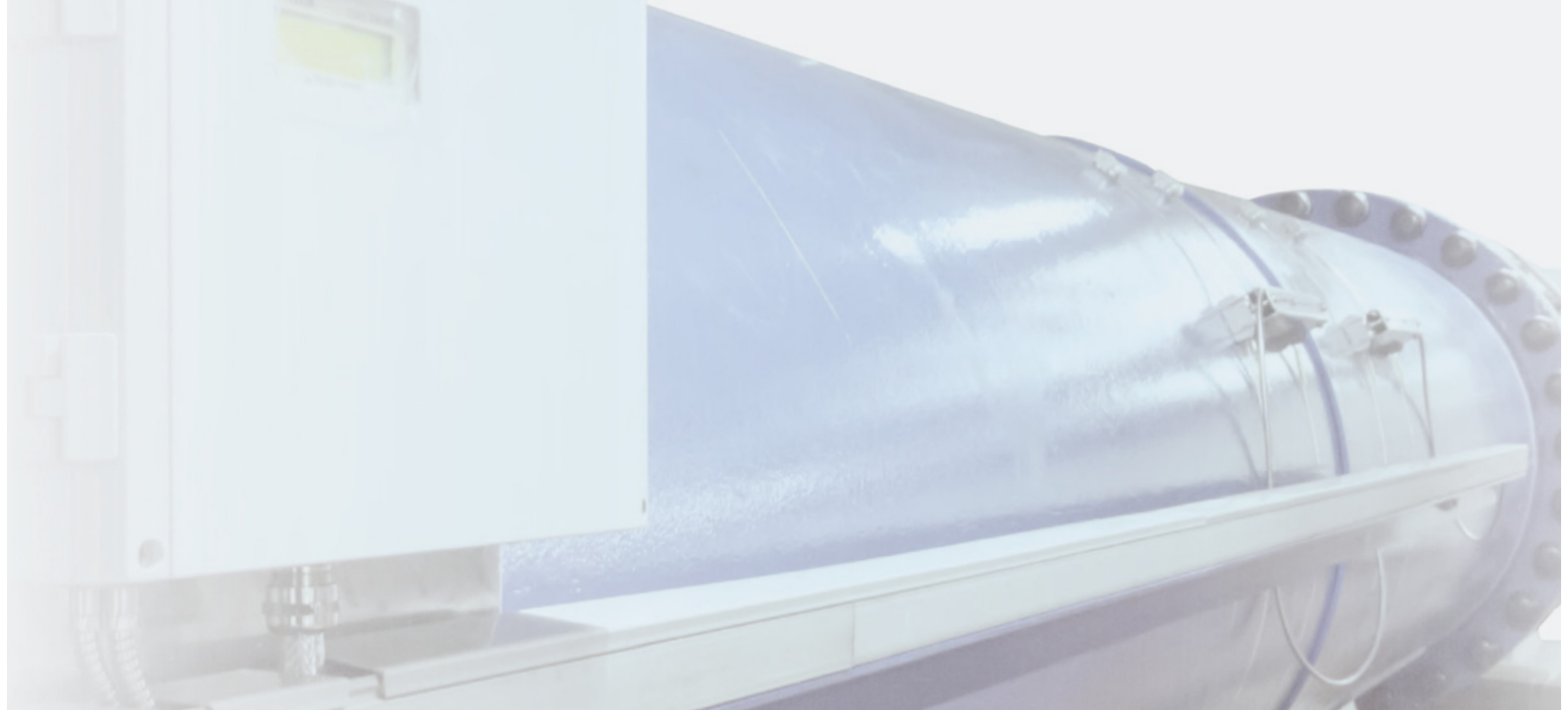
## **FLEXIM offers the most reliable measurement system for water production, treatment and distribution**

Withdrawal of drinking water usually begins at wells, reservoirs and large water tanks. Pipes with large nominal diameters carry the extracted water quantities and pass them on to the local distribution system.

Large nominal diameters also mean high costs for wetted measuring systems. This isn't the case with a FLUXUS® ultrasonic non-invasive flow meter, which is much less expensive than a magnetic inductive flow meter at most common pipe sizes, but can be retrofitted during ongoing operation and without the additional cost of engineering work and pipe work.

Moreover, magnetic flow meters often show inaccurate readings as conductive material from the ground water deposit in the electrodes of the meter, causing it to drift to lower measurement readings than actually present.

## **Common applications in the water and wastewater sector**

- New plant construction
  - Retrofits on existing pipes
  - Replacement of Venturis with limited turn down
  - Replacement of mechanical meters with bearings
  - Replacement of magnetic inductive meters with mineral build-up
  - Distribution system monitoring and water balancing
  - Pump performance verification
  - Leak detection and water loss prevention
  - Flow control for chemical feed and demand
  - Sewage collection, treatment and reuse
  - Measuring system for emergency circuit control of valves
  - Flow direction indicator
- 



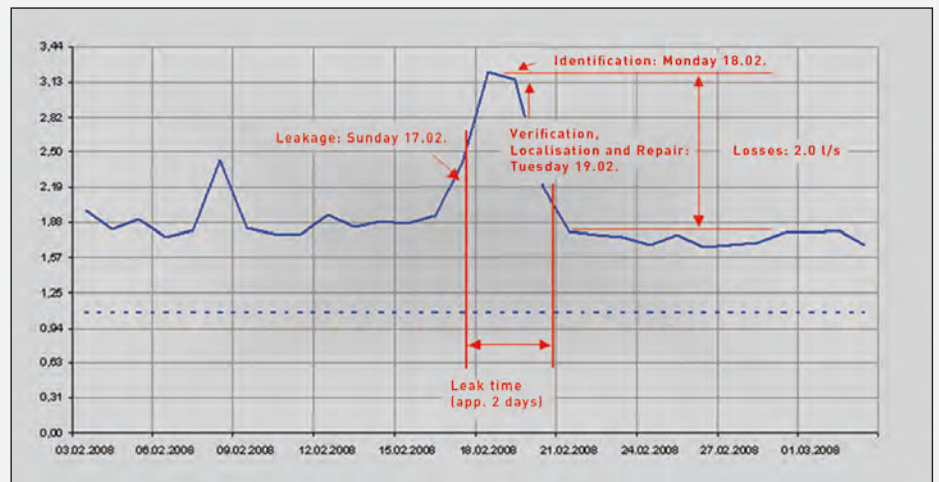
## Advantages of FLUXUS®:

- Unparalleled accuracy and repeatability
- Extremely easy to install - no downtime necessary
- Permanent and maintenance-free external flow measurement
- Highly versatile - installation on pipes with diameters ranging from 10 mm to 12 m with no limitation on wall thickness and material
- Simple and cost-effective retrofitting on existing pipelines - huge cost advantage over other meter technologies
- High measuring dynamics - captures low and high flow rates
- High zero point stability - drift free measurement - no measurement dropouts
- Calibration is done at the factory - no need to obtain zero flow at site
- Highly hygienic: no direct contact between the measuring system and the medium
- Resistant to pipe wall scaling - strong signals even on old or glass fiber pipes
- Able to measure pulsating flows for accurate chemical dosing
- Safe and durable underground operation by means of IP68 / NEMA 6P transducers and the VARIOFIX mounting fixture

## Detecting substantial pipe breaks and small leaks

In order to identify real water losses promptly, the inflows of a supply system must be monitored constantly.

Pipe ruptures, which require rapid isolation of the particular pipe section, can easily be identified by abnormal changes in flow behavior using appropriate measurement techniques.



By using matched transducer pairs and a unique measurement algorithm for signal evaluation, the FLUXUS® can detect very large and very small amounts of flow with very high precision. With many miles of pipeline in a municipal water or wastewater system, small leaks that are otherwise undetectable can be pinpointed quickly with the FLEXIM family of meters.





### Case study: Underground flow measurement points on drinking water lines

A considerable amount of work and effort is often involved when it comes to retrofitting existing pipelines of a drinking water supply system with flow measurement devices:

In order to install a conventional magnetic flowmeter, civil engineering work must first be carried out to expose the pipeline. Further, the pipe must be shut off for the installation which means an interruption of supply.

In addition to its non-invasive advantages, ultrasonic flow measurement is already an established standard measurement technology in the water sector. The compact and extremely sturdy IP68 clamp-on ultrasonic transducers are simply attached to the outside of the pipe.

The site only has to be exposed for a short time in order to access the supply pipeline and is then back filled immediately after installation. Permanent acoustic coupling and therefore maintenance-free measurement is ensured by the extremely solid VARIO-FIX mounting fixture. Advanced monitoring systems use the FLUXUS® ultrasonic flow meter as a measurement source, where the data is transferred to the process control system via a mobile radio link.

### Advantages:

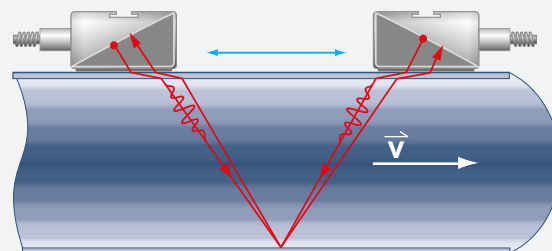
- Reliable and accurate non-invasive flow measurement - even on armored concrete pipes
- Durable measuring device with IP68 transducers and robust mounting fixtures
- Underground installation without any expensive shaft construction

### The ideal solution for wastewater collection, treatment and reuse

With the constant expansion of sewage treatment plants and more stringent requirements for advanced wastewater treatment, operators are in search of reliable ways to retrofit their piping systems. Non-invasive flow measurement with FLUXUS® ultrasonic flow meters has proven to be a very good and cost effective alternative to all other technologies used for wastewater flow applications.

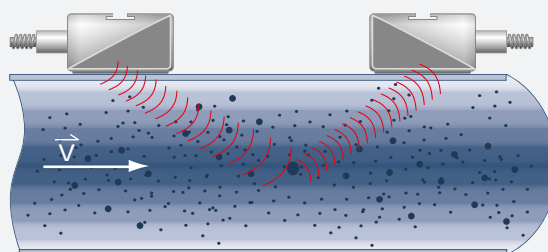
Normally, the volume flow rate is determined based on the transit-time difference method. Very high accuracies are possible with this technique.

Transit-time difference method in the event of low solids content



In media with higher solids content (>10%) such as sludges, or bubbly flows, where signals may be attenuated, the meter switches to HybridTrek® mode. In HybridTrek® mode the transit time difference between consecutive signals reflected by particles or bubbles in the flow is measured. The measured time difference is proportional to particle velocity and thus proportional to actual flow rate.

HybridTrek® mode in the event of high solids content



# Offering unparalleled performance and versatility



FLUXUS® F401

FLEXIM meters offer a precise bidirectional flow measurement over a wide turndown ratio. This is especially important at low flow velocities during off peak times. The unique ability to measure extremely low flow and achieving the best zero stability on the market is due to carefully matched and paired transducers and sophisticated algorithms for digital signal processing.

In conjunction with the IP68 / NEMA 6P transducers, permanent pipe wall coupling materials and highly rugged mounting fixtures, FLEXIM offers virtually maintenance free, cost effective, and long term stable flow measurements.

For temporary meter checks and audits, FLEXIM offers the FLUXUS® F401 and F601 portable meters. The FLUXUS® F401 is expressly designed for serving common applications in the water and wastewater sector plants. It is capable of measuring at line sizes from 25 to 3000 mm with IP68 / NEMA 6P transducers and an IP67 / NEMA 6 protected transmitter suitcase. It offers over 24 hrs. of remote measurements that can be extended up to 7 days with an additional battery suitcase.

The FLUXUS® F601 is the portable meter for industrial environments allowing the flow measurement of virtually any liquid media. These meters are ideal for existing meter accuracy verification and water loss studies.

For permanent installations, FLEXIM engineered the FLUXUS® ADM 5X07 and F704 series. The FLUXUS® ADM 5X07 is the ideal solution for any water and wastewater applications from line sizes between 10 mm and 2,5 m with particle loads up to 6% content by volume. For even bigger line sizes, higher solid contents (up to 10% content by volume) and any liquid medium within industrial environments, the FLUXUS® F70X series will best suit your needs. The F70X series also offers full Modbus, BacNET or HART functionality where needed. All permanent meters can be equipped with a GSM module for mobile data transfer.

The FLUXUS® F704 is also available as a special Low Flow meter engineered for accurate and reliable measurements of chemical dosing applications with line sizes ranging from 1/4" to 1" inner diameter and flow rates down to 3 l/h.



FLUXUS® ADM 5107



FLUXUS® F601



FLUXUS® F704

# FLEXIM

In partnership



Water and wastewater treatment is an important factor in safeguarding water resources. The challenge that operators are faced with, is meeting the ever increasing stringent legislative requirements, while at the same time, reducing operational costs. FLEXIM helps to meet these requirements by producing accurate and reliable measurements in demanding water and wastewater applications.

## **FLEXIM is the leader in ultrasonic flow measurement technology**

The flexibility to clamp-on to the outside of the pipe and accurately measure what is going through, helps our business partners optimise their water and wastewater treatment plants.

### **FLEXIM meters help to optimise:**

- your water usage by providing an easy and comprehensive method to discover water loss.
- your wastewater streams and sewage collection systems by equalising pump and lift station performances.

**FLEXIM meters are perfectly suited for maintenance applications.** Our range of portable and permanent meters are easily installed under flowing conditions and easily identify leaky valves and underperforming pumps. They are also the systems of choice for the replacement of failed inline meters without having to cut them out of the pipe.

**FLEXIM turns data into information you can use.** Our FluxDiag software makes data retrieval a snap. View and export flow measurements into useful information quickly and easily.

**FLEXIM has experience on applications where others cannot operate,** by applying advanced technology that enables the meter to start-up and operate where other ultrasonic meters have not been successful.

**FLEXIM is an experienced partner for the water and wastewater industry.**

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