

Get The Key To Water Savings

Ultrasonic Flow Meters Offer Accurate Water Flow Measurement

APPLICATION CHALLENGES

There are more than 37,000 Rural Water Utilities in the United States. These utilities generally serve small and rural communities of less than 10,000 people. While these utilities may be much smaller than those that serve the big cities, they still have the same tasks: providing water in compliance with the Safe Drinking Water Act, protecting their drinking water sources, allocation and distribution, and operating, managing and financing water and wastewater utilities.

Unlike some of their big city counterparts, rural utilities sometimes have a difficult time increasing capacity and may be hamstrung by dated infrastructure, limited personnel and smaller budgets. Since water is a valuable commodity, one key challenge is to measure it accurately. This data can then be analyzed to detect leaks, allocate and distribute water, optimize treatment options and make the utility more efficient.

MEASURING WATER FLOWS CAN BE EXPENSIVE

Water flows have traditionally been measured by turbine or paddlewheel meters. These meters rotate with a speed proportional to the velocity of the flowing water. While this is a simple concept, rotating meters have moving parts and are prone to having their blades fouled or damaged and thus need regular maintenance. Also, they are not particularly accurate.

Another common method is to use a differential pressure device. In this type of meter, a plate with a small hole in the middle (called an orifice plate) causes a pressure drop as the water is forced through the hole. By measuring the pressure on both sides of the plate, the flow rate of the water can be calculated. These are generally more accurate than turbine meters, but the hole and the pressure ports can get plugged up. In addition, the expense is more since the orifice plate and two pressure transducers must be tied into a flow computer to calculate the flow.

An ideal solution would be a device with no moving parts that is external to the pipe. Fortunately, such devices do exist!

ULTRASONIC FLOW METERS EASE THE BURDEN

In a transit-time ultrasonic flow meter, an ultrasonic signal is transmitted through the pipe wall in the direction of the flowing fluid (downstream), and then another signal is

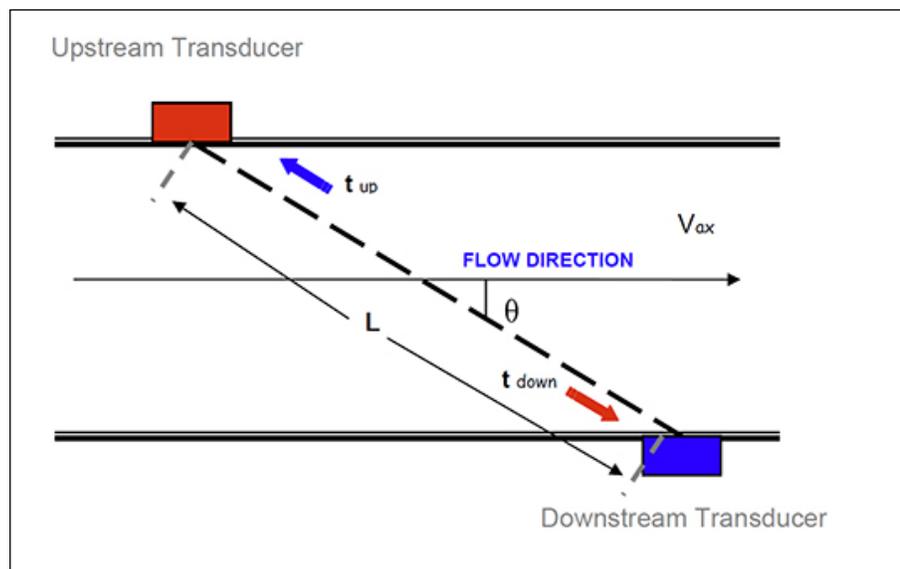
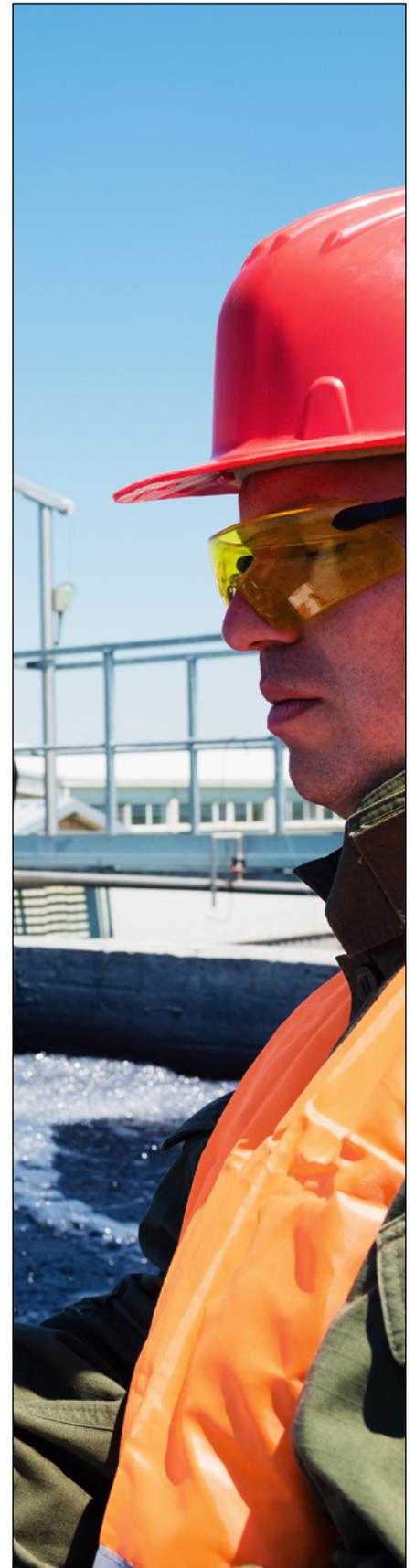


Figure 1: Transit-Time Ultrasonic Principle Of Operations



transmitted against the flowing fluid (upstream). This is illustrated in Figure 1. In its most basic form, the time for the sonic pulse to travel downstream is compared to the time for the pulse to travel upstream. This differential time is then used to calculate the velocity of the flowing fluid.

Since ultrasonic meters are clamped to outside of the pipe, it is easy for utilities to retrofit them. They are also relatively inexpensive, quite accurate (up to 0.5% of reading) and have no moving parts, thus answering some of the challenges presented by legacy technology

BIG SAVINGS ON THE CARMEL RIVIERA

Carmel Riviera Mutual Water Company is a small rural water company serving 600 homes along California's beautiful and rugged Big Sur coast. Historically, their estimated annual water loss through leaks, waste, evaporation and other losses was around 30% of the total produced. The company budgeted almost \$60,000 per year in initiatives to reduce these leaks, including labor and materials for surveys and expensive repairs.

SIERRA'S SOLUTION

In their efforts to expand operational efficiency, Carmel Rivera investigated using Sierra's InnovaSonic® 207i Clamp-on Ultrasonic Flow Meter. It promised to help determine water-loss percentage, improve production efficiency, improve water quality (reducing back flush) and more accurately identify over-users. The versatility of the clamp-on ultrasonic meter made it a perfect tool for the small, often cash-strapped, water company. Simply clamp the sensors onto the outside of the water pipe and extremely accurate measurement was now possible—no need for costly system shut downs, pipe cutting and plumbing.

After six months of using the InnovaSonic 207i, Carmel Riviera found their actual loss rate to be only 12% of their production – uncovering an 18% discrepancy in original water loss estimates. The improved production and usage figures derived from the InnovaSonic enabled the company to significantly reduce their \$60,000 annual maintenance and operations budget to target more funding on improving conservation and efficiency.

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sierrainstruments.com/ultrasonictransform

HERE'S WHAT MAKES SIERRA'S INNOVASONIC 207I AN IDEAL CHOICE:

- Highly accurate (+/- 0.5% of reading)
- Reduces maintenance costs by providing accurate usage rates
- One meter for pipes 2" to 200"
- Clamp-on sensors are very easy to install with no pipe intrusions
- Includes complete data logging and analysis tools

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InnovaSonic® 207i with Clamp-on Transducers

Benefits of InnovaSonic® 207i:

- Tolerant of liquids with small amounts of air bubbles or suspended solids
- Thermal Energy/BTU capability
- Clamp-on standard, insertion transducers available
- Install meter during plant operations—no process shut downs, no leakage risks
- No moving parts to clog or fatigue like turbine meters
- Ideal for large line sizes
- High zero stability, nearly drift free
- Operational safety and robustness
- Large display with push buttons, user-friendly menu
- Mounting kit included to lock transducer into place
- Daily, monthly and yearly totalized flow rate
- Easy Installation with Smart Interface Portal Software (SIP)
- Rental Program Available
- Buy Online for fast delivery