

# CONTROL

## TOP TIPS

### Improving Process Efficiency and Cost Savings with Clamp-on Flow Meters



Green initiatives, sustainability, and energy efficiency have become the cornerstones of process improvements in today's industries. Manufacturing facilities, process industries, and public utilities are ripe for implementing some of the rapidly evolving advances in process measurement, which can benefit the company through cost savings, less waste of materials, increased uptime, and energy savings. Measurement of fluid materials is a key metric for numerous sectors of many different industries, and advances in flow measurement are helping these parts of the industry in various ways.

Specifically, clamp-on flow meters offer key benefits in numerous industries, including general manufacturing, semiconductor, wastewater treatment, refrigeration, and heating and cooling systems. Actually, any industry where fluids are used is fair game for clamp-on flow meter use. Here's a breakdown of some of the advantages of the latest offerings of this technology:

1

#### **Understand that technology has evolved.**

Compared to even just a few years ago, today's clamp-on flow meters offer new levels of highly precise measurement of fluid flow. Doppler flow meters have been used for decades in various industries — and still are — but for many industry segments, they are not practical. This is mainly due to the need for bubbles, particles, or other impurities in the fluid that can reflect the Doppler ultrasonic signals. For very clean liquids, Doppler will not work. However, today's latest technology utilizes "transit time principles," which propagate ultrasonic pulses diagonally between upstream and downstream sensors mounted on the exterior of the pipe and measure the time difference caused by the flow of the fluid itself. This results in higher accuracy measurements and is not limited to fluids with impurities or bubbles in the flow.

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## 2

### **Consider the ease of installation and maintenance.**

Clamp-on flow meters do not require pipe cutting, welding, or even draining of the pipe that is to be measured. Simply clamping the transducers to the pipe or tubing and performing a setup of the sensor head is all that is required, the process doesn't have to be disturbed. Even grease is not required on the latest flow meters to allow conduction of the ultrasonic pulses.

Additionally, hand-held meters can be used as a "go/no-go" for verifying flow or checking for clogs. Since they share the same highly accurate technology, they can be used any time to check calibration of other meters, or to temporarily replace a faulty meter in the system, once again increasing operational uptime.

## 3

### **Multiple transducers can connect to one converter to do differential analysis.**

Having two sensors connect to a single converter (the intelligence of the unit) can allow for some clever differential analysis when used on two points in the process. This can be for leakage detection in the system, or for heating/cooling systems, combined with an RTD or other temperature detector to monitor the thermal and caloric efficiency of the line.

## 4

### **Understand the low cost of ownership.**

Because the latest clamp-on flow meter models can support a wide variety of piping sizes, from small tubing through piping several meters in diameter, one model can likely handle most flow detection needs throughout a facility. This reduces the need to stock spares for numerous models, each for a different pipe diameter, simplifies the procurement process, and makes flow meter choice for any new processes simpler, thereby "future-proofing" any new flow meter needs.

Additionally, because fewer models are needed in a facility, less personnel training is needed for engineering and maintenance departments, and less documentation is required to accommodate multiple models of flow meters. This results in much lower ongoing costs and built-in familiarity with installed flow meters across the factory, as well as any newly installed ones.

## 5

### **Evaluate how the meter is set up.**

Using a flow meter technology that can be pre-programmed offline, away from the chaos and noise of the factory floor, can result in fewer setup errors and a quicker return to service of the affected process. Add to this the ability to set up the meter by using buttons and menus directly on the meter face makes for a quick turnaround to a well-running process.

## 6

### **Explore improving process efficiency.**

Chemicals are very expensive and dosing the correct amounts is paramount to an efficient process. Traditional flow meters can be prone to meter drift, resulting in wasted raw materials and bad batches. Newer flow measurement technology can assist with eliminating meter drift and improving efficiency.

Heat exchangers and certain types of piping are subject to corrosion and/or buildup of scaling on the inner walls of the pipe. For heat exchangers, this can result in loss of efficiency of the heat transfer characteristics and wasted energy. For piping, any material coating or corrosion on the interior walls results in head loss and the resultant reduction in flow, which again results in wasted energy and loss of efficiency in the process. Continuous monitoring and historical trending can detect these issues so the process stays at peak efficiency.

## 7

### **Seek out expert advice.**

Specifying and identifying new measurement technology can be confusing. Working with a partner who can identify your process's flow measurement needs and sell the benefits to the stakeholders can be very helpful for ensuring that any changes are focused on gains in efficiency, lowering costs, and improving the process's end product.

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