Delivering on the Promise of Vortex.

Rosemount™ 8800 Vortex Flow Meters

Delivering confidence in measurement accuracy through advanced signal processing and diagnostics in real-time.

EMERSON™

The unexpected challenges of traditional vortex.

When vortex technology was introduced, it promised to improve reliability, reduce installation and maintenance costs, and provide cost effective flow measurement.

Traditional vortex designs have limitations such as inherent low flow cutoff, ports and crevices that can clog, and susceptibility to inaccurate measurement from vibration. Traditional vortex meters are also difficult to troubleshoot and require separate equipment for calibration verification.

Enterprise in process industries face pressure to improve product quality while increasing productivity to be more competitive, and to reduce staff in the plant and in the field.

"Exposure to harmful environments accounts for 8.8% of fatalities in the oil & gas industry."
- Centers for Disease Control and Prevention

8.8%

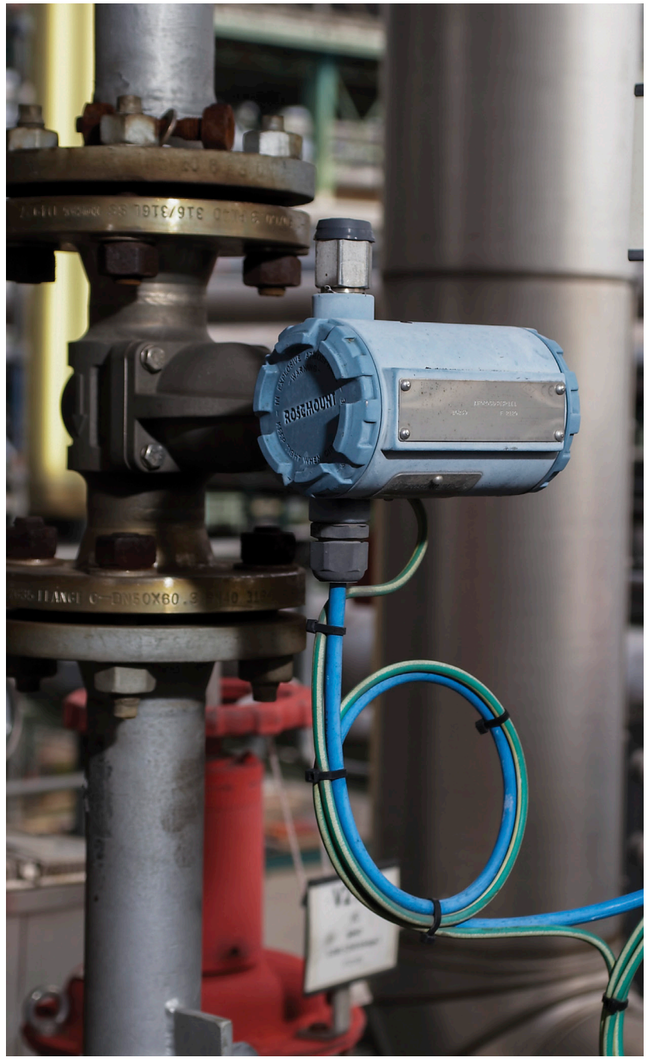
"Competitive benchmarking data indicates that most U.S petroleum refineries can economically improve energy efficiency by 10%–20%."
- ENERGY STAR

"Over 92% of all faults in SIS applications occur in the field instruments and control elements."
- Offshore Reliability Database

Staying competitive means getting the highest efficiency out of your plant, as safely as possible, with the fewest number of shutdowns. The Rosemount 8800 Vortex Flow Meter delivers these benefits through a unique design that overcomes the limitation of traditional vortex flow meters.

Vortex Flow Meters

Application flexibility with power to withstand a wide range of operating conditions.



Installation flexibility with reduced maintenance

- Quick installation utilizing the drop-in solution of simply bolting the meter and connecting communications and power
- Comprehensive connection points meet the needs of most applications and include flanged, reducer, weld-end, and threaded end
- Meet a diverse range of process challenges with the widest selection of materials, including SST, Nickel, Carbon Steel and Duplex
- Leverage remote mounting capabilities with standard and armored cables
- Minimal maintenance required due to no moving parts or need to install hard to maintain impulse lines

Sensor verification improves uptime

- Increase process availability and eliminate the need for shutdowns with process isolated sensor
- Reduce costly bypass piping for critical process installations and enhance overall user safety with the Critical Process Valve

Rest assured with proven reliability

- Unique non-clog, leak-free design eliminates bypass lines for fugitive emissions
- Extra level of safety with a CriticalProcess valve for verification of secondary containment integrity

Simple user interface means no “guess and check”

- Easy access of internal signal generator via Field communicator or AMS Suite
- Enhance vibration immunity by setting filters with real-time visualization using ProLink
- Optimize flow range through dynamic tracking with Adaptive Digital Signal Processing (ADSP)

Rosemount 8800 Core Flow Meter Offering

Flanged Vortex Flow Meter

- Wide range of flange ratings available
- Ideal for all applications from general purpose to the most demanding applications
- Up to ANSI Class 1500 / PN205 pressure ratings for high pressure applications
- Ideal for steam, gas and liquid applications

Reducer Vortex Flow Meter

- Flanged vortex flow meter with reducing flanges integrated into design
- Reduces cost by eliminating the need for field assembly of reduced piping
- Both Reducer and standard vortex have a common face-to-face dimension which allows the user to change the meter without impacting the piping layout or drawing

Remote Mount Vortex Transmitter

- Reduced installation complexity with remotely mounted transmitter
- Armored cable is also available when maximum reliability and resistance to environment are a concern

Weld-end Vortex Flow Meter

- Flange gaskets are eliminated by welding the flow meter directly into the processing piping
- The only vortex flow meter available with zero leak points

Wafer Vortex Flow Meter

- Lightweight, cost-effective solution
- Easy installation with standard alignment
- Ideal for utility applications

Threaded End Vortex Flow Meter

- Easy installation by matching existing threaded pipe union
- Reduce cost by eliminating flanged connections

The Rosemount 8800 eliminates problems that plague process reliability

Traditional Flow Meter Installation

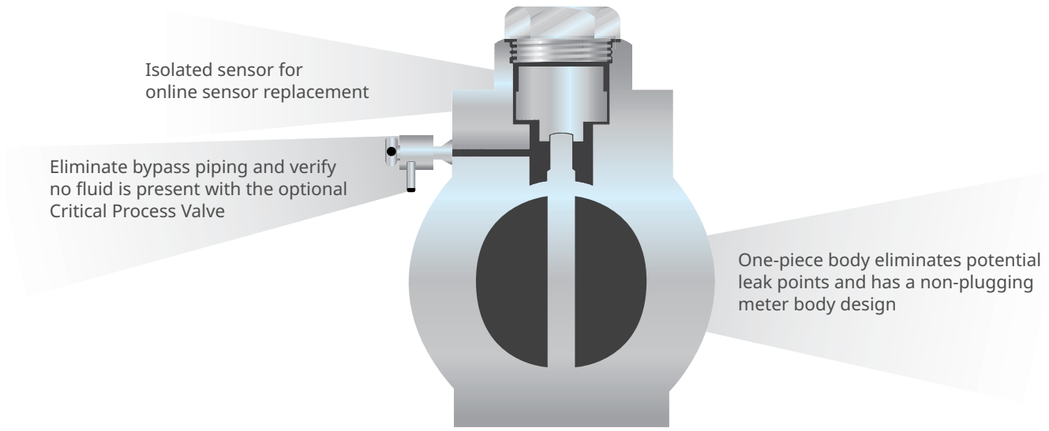
- Potential for over 30 leak points due to impulse piping
- High installation costs
- Potential plugging

Rosemount 8800 Integrated Flow Meter Solution

- Gasket-free design eliminates possible leak points
- Reduced installation costs with drop-in solution
- All-welded design with no ports or crevices decreases potential for plugging

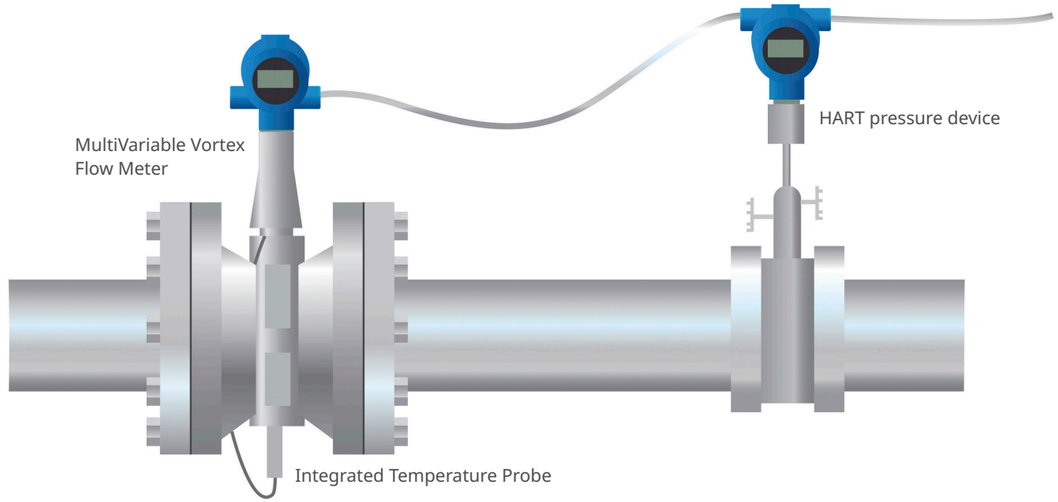
Emerson Engineering Advantage

The non-wetted sensor built into the shedder bar eliminates need for bypass piping and sensor replacement can take place without process shutdown. The isolated sensor design fully eliminates the need to break process seals for sensor replacement.

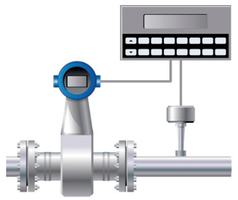


Steam Measurement Solution

With rising energy costs, capturing steam usage as part of an energy management program is critical. Saturated steam applications often require flow meters with wide rangeability, good accuracy, and high reliability. Emerson's Rosemount MultiVariable Vortex meets all these requirements, helping improve your bottom line.



Simplify Measurement with Internal Compensation



- Vortex meters are well suited for steam applications due to high reliability and wide rangeability
- In most steam applications, compensated mass is often preferred
- Many users rely on external compensation to achieve optimal performance and reliability
- External compensation can be costly and often complex

Reducer Vortex Technology

- Many steam applications have low flows due to seasonal or process demands
- Measuring range on traditional vortex is susceptible to missed measurement at low flows due to low flow cutoff
- Reducer vortex eliminates this problem by using smaller meter body – allowing steam usage capture even at low flows

Advantages of MultiVariable Vortex

- MultiVariable Vortex delivers mass flow readings with temperature and pressure compensation
- Integral temperature sensor uses shedder bar as a thermowell, keeping vortex and temperature sensors isolated for easy maintenance
- Capability to capture an input from a HART® pressure device for pressure compensated mass flow
- Pressure OR temperature mass flow compensation for saturated steam
- Pressure AND temperature mass flow compensation for superheated steam
- Superheat Diagnostics allows for an alert and/or alarm to activate when degrees of superheat are close to saturated conditions.

OUR COMMITMENT
TO YOUR SAFETY

Since Safety Instrumented Systems (SIS) are a critical mitigation layer to prevent a catastrophic event in an industrial environment, it's important to ensure the most reliable equipment is installed and meets the proper safety standards.

Emerson's commitment to safety means developing technologies that address the inefficiencies of traditional flow instrumentation and, ultimately, improve the safety and reliability of your plant while maximizing process uptime.

The Rosemount 8800 portfolio provides the most comprehensive vortex offering for SIS applications.

Rosemount 8800 Safety Certified Vortex Flow Meter Offering

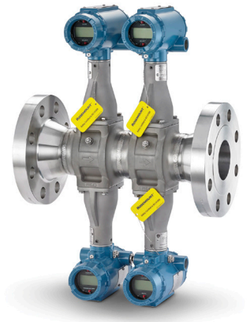
8800 Vortex Flow Meter

- Capable of up to SIL 2 certification
- *Eliminate leak points*
- *All-welded/casted meter body construction*

8800 Dual Vortex Flow Meter

- Capable of up to SIL 3 certification
- *Eliminate leak points*
- *All-welded/casted meter body construction*
- Reduce installation and maintenance costs with redundant dual transmitters and sensing elements for 1oo2 voting needs

8800 Quad Vortex Flow Meter



- Capable of up to SIL 3 certification along with basic process control
- *Eliminate leak points*
- *All-welded/casted meter body construction*
- Ultimate solution to guard against spurious trips with redundant four transmitters and sensing elements for 2oo3 voting needs
- Reduce piping needs by eliminating additional flanges and pipe runs required for an installation of multiple flow meters in a traditional redundant flow measurement solution

Refinery Improves Reliability of Crude Charge Heater Pass Measurements and SIS with Quad Vortex Meters

A North American refinery needed accurate and reliable flow measurements for its multi-pass heaters to guard against heater damage and avoid false heater trips. These measurements are typically part of a safety instrumented system (SIS) loop. If a flow meter indicates there is adequate flow when in reality the flow has stopped or is significantly reduced, there is a potential risk that the heater tube could rupture if no fluid flows through to take away the heat. Another possible scenario is that the flow meter falsely indicates there is no flow when there really is, which will trip the heater when it shouldn't, causing operational safety concerns.

The customer's crude unit charge heater utilized a single orifice plate with four transmitters on each of the four feed passes into the heater. Challenges with steam tracing meant the customer faced plugging and freezing of impulse lines which caused significant maintenance issues on their DP orifice meters.

To solve this issue, the customer opted to replace their DP Orifice meters with four 4-inch reducer Rosemount™ Quad Vortex Flow Meters. The flow meters were installed with remote transmitters on each heater feed pass line to the crude charge heater. Since the flow meters were installed in hard-to-reach locations, the remote-capable electronics allowed for easier data collection and process control.

Unlike the original installation, which had a single primary element and multiple transmitters, the Rosemount Quad Vortex has four independent sensors in a single meter, enabling both redundancy of the hardware and the electronics of the meter. With four independent transmitters and sensors, a dual shedder bar integrated in a single meter body, the Quad Vortex flow meter is calibrated to provide an accurate single flow meter with four independent measurements.

The results

- **Improved reliability** of Safety Instrumented System (SIS) and preventing spurious trips by adding redundancy for both the electronics and sensors
- **Eliminated** frequent maintenance caused from plugging and freezing of impulse lines on DP orifice meters
- **Single device solution** in a solid, welded meter body with no leak points

> *"Rosemount Quad Vortex Flow Meters provide measurement redundancy and reliability for critical safety applications while reducing maintenance time and costs."*
>
> Plant Engineer,
> Utility in California

With the customer's SIS requirements, it was now possible to enable 2oo3 voting.

The vortex flow meters have been operating at the customer's site for over a year and have had no measurement issues. Because the vortex flow meters are designed to be extremely reliable with a non-clog meter body and no impulse lines, the customer no longer has any issues with freezing or plugged impulse lines. The Rosemount Quad Vortex Flow Meter is a complete solution that meets and exceeds the customer's expectations.

The Rosemount 8800 delivers reliability, safety and maximum process availability, optimizing your plant environment.

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