

# Rosemount Orifice Series

Differential Pressure Flow



Innovative Offering for Better Measurement

**ROSEMOUNT**

  
**EMERSON**  
Process Management

# Revolutionizing the Industry Workhorse – Orifice Plate Technology

It's no coincidence that orifice plates are still the most popular flow technology. They provide reliable and accurate flow measurement for gas, liquid and steam applications. Orifice flowmeter installations are straightforward and affordable.



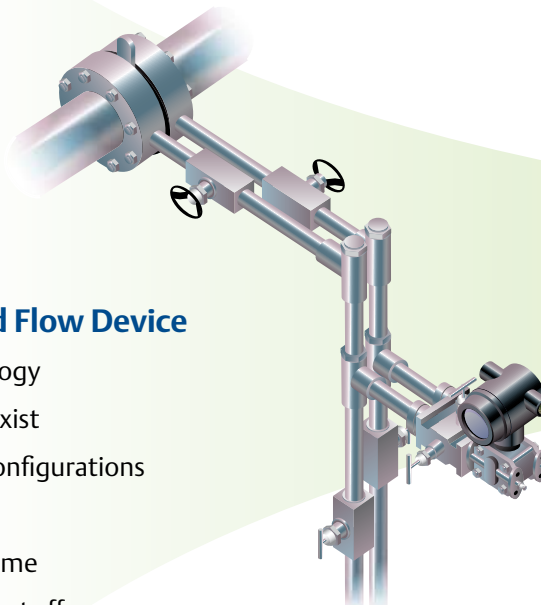
## Best Primary Element Offering

Rosemount orifice primary elements offer best-in-class capabilities.

- Best practices for better measurement
- Wide variety of innovative solutions

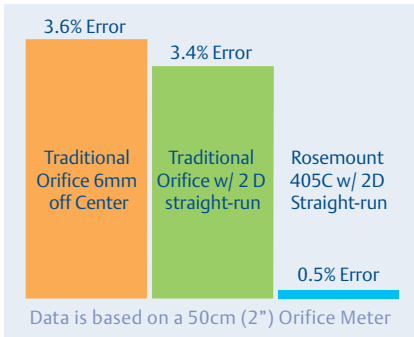
## Proven Technology

Orifice technology is time-tested with established standards for manufacture and use. Performance under varied installation and process conditions is well documented.



## The Most Specified Flow Device

- Well-known technology
- Industry standards exist
- Flexible mounting configurations
- Highly repeatable
- Excellent response time
- No inherent low-flow cut off
- Field calibrated
- Two-wire



### Minimized Installation Errors

Rosemount orifice flowmeters facilitate proper installation to maximize performance.

- Alignment mechanisms ensure centering
- Reduced straight run requirements



### Engineered To Your Specifications

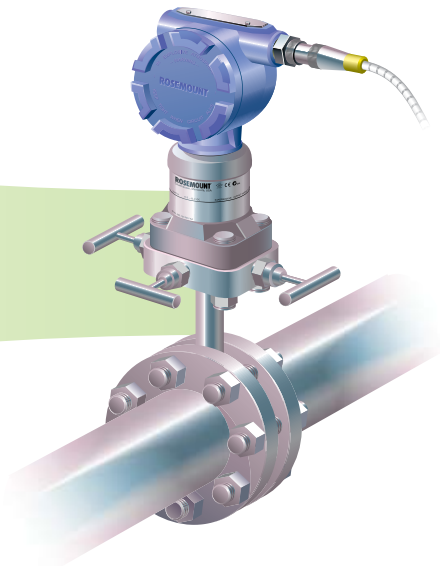
Rosemount orifice flowmeters are designed and built to meet your requirements.

- Arrives tested, calibrated and ready-to-install
- Custom designs through Engineered Assemblies

### Reduced Total Cost of Ownership

Rosemount orifice flowmeters reduce capital and operating expenditures and are more reliable.

- Integrated components lower installed costs
- Direct mounting eliminates maintenance-intensive impulse lines



Reliable and proven technology

Reduced cost and maximized performance

A complete line of ready-to-install

flowmeters

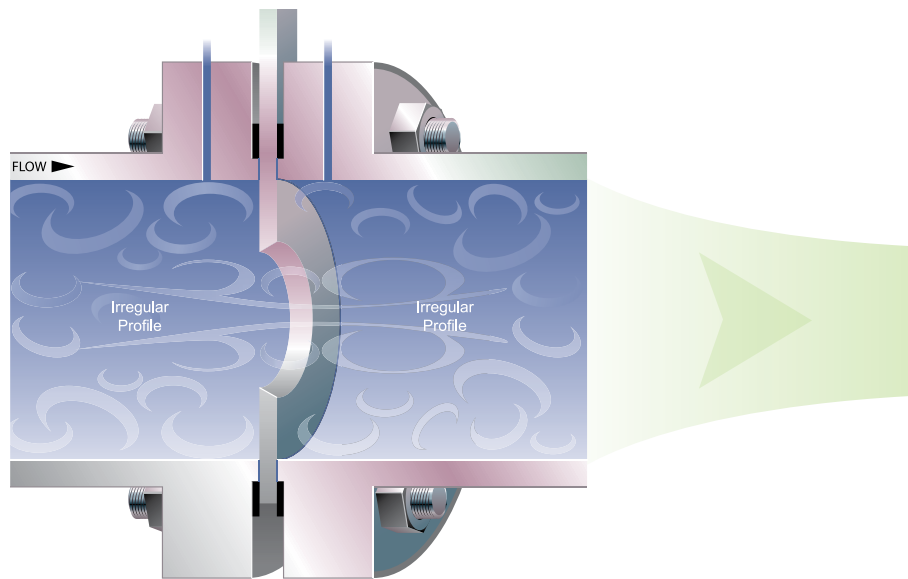


## Unconditionally Better Measurement – Conditioning Orifice Plate Technology

While orifice plate technology has been the overwhelming choice for flow measurement, it has traditionally required significant straight-run for accurate results. Rosemount conditioning orifice plate technology provides unprecedented performance with minimal straight-run. Orifice metering is now more flexible and better than ever before.

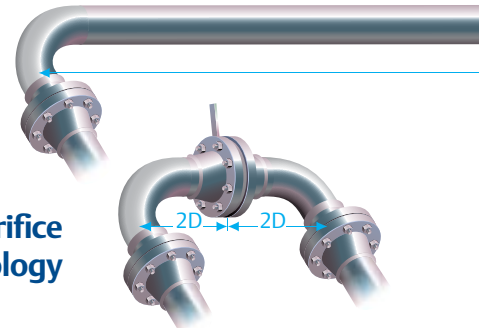
### The Impact of Swirl

Upstream disturbances cause swirl in a pipe and create an irregular flow profile. These effects are amplified across a concentric orifice plate, allowing the disturbance to impact measurement.



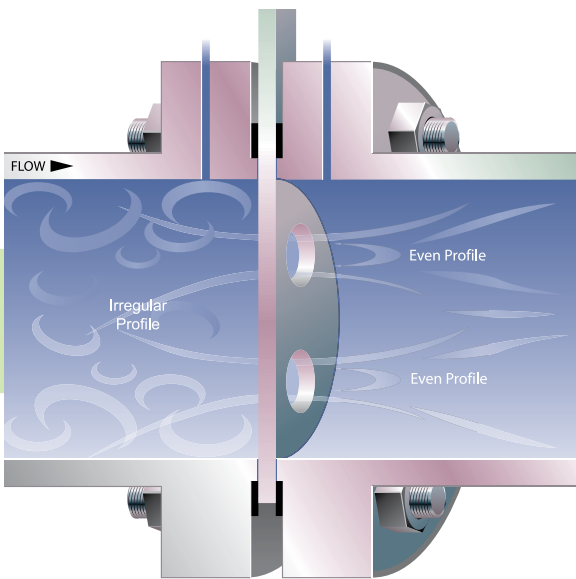
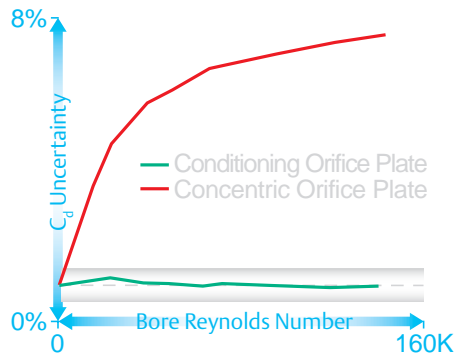
### Traditional Orifice Plate Technology

### Conditioning Orifice Plate Technology



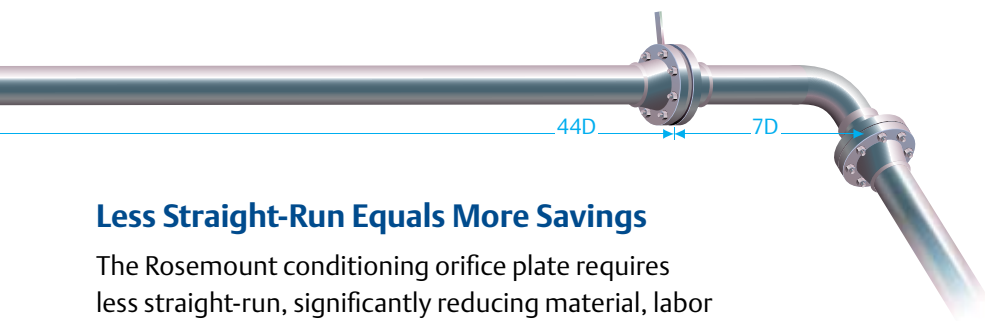
## Improved Performance

Rosemount conditioning orifice plate technology eliminates errors caused by upstream disturbances. This unique design achieves 0.5% accuracy, making it the best performing primary element available.



## Controlling Swirl with an Innovative Design

The four equally spaced holes of the Rosemount conditioning orifice plate eliminate swirl and irregular flow profiles. This results in a more stable and accurate measurement.



## Less Straight-Run Equals More Savings

The Rosemount conditioning orifice plate requires less straight-run, significantly reducing material, labor and procurement costs. Engineering time is reduced since the flowmeter can be installed virtually anywhere.

Reduce pipe

straight-run and

increase savings

Improve flow

accuracy with the

innovative design

Two pipe diameters

from an upstream

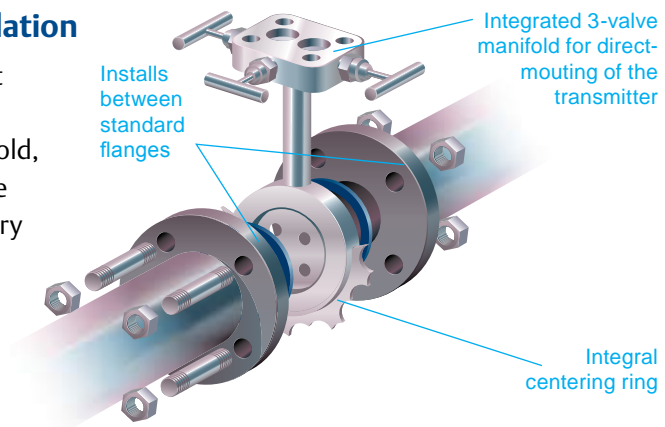
flow disturbance

## Best Practices for Better Measurement – Improved Orifice Installation

Rosemount orifice products are designed for ease of installation and maximum performance by eliminating the need for impulse lines, special flanges or piping modifications. Self-centering mechanisms ensure optimal accuracy while improving the overall installation process. Fully leak tested, calibrated and ready-to-install assemblies are provided to ensure a better measurement experience.

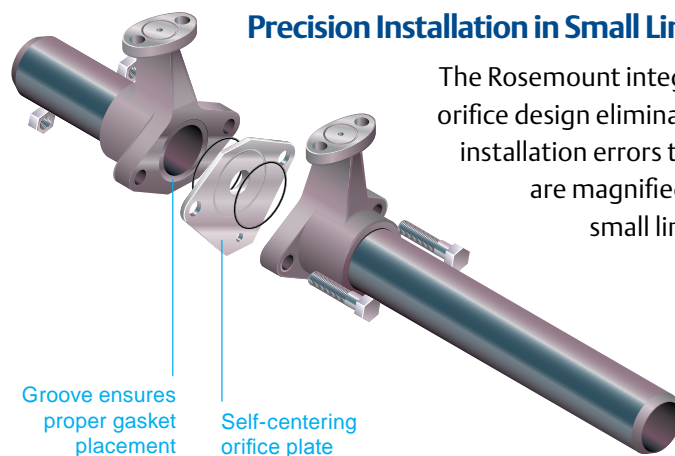
### Simplified Installation

Rosemount compact orifice technology combines the manifold, connection hardware and the orifice primary element in a single, reliable package.



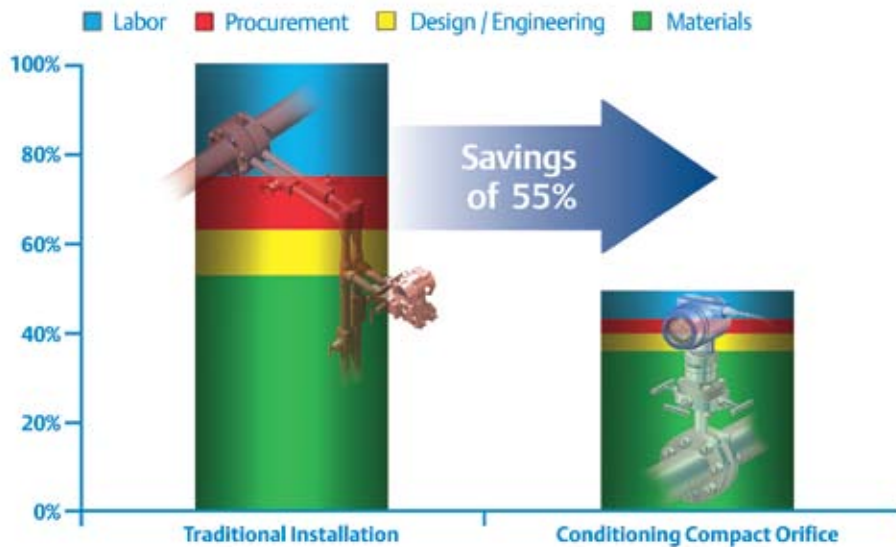
### Precision Installation in Small Lines

The Rosemount integral orifice design eliminates installation errors that are magnified in small lines.



## Low Installed Cost

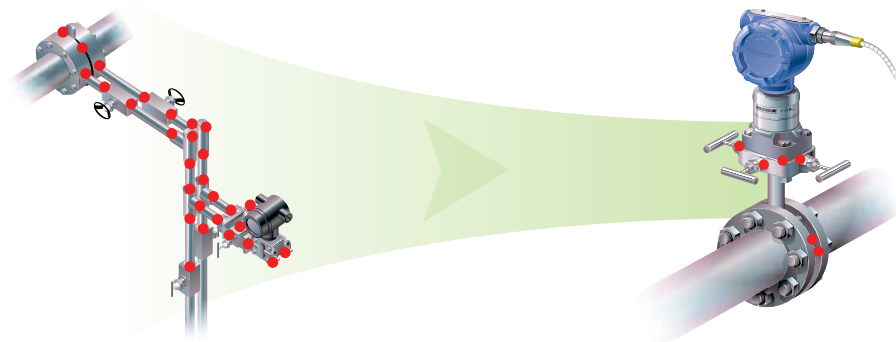
Unique Rosemount orifice flowmeters offer significant installation savings. Specification, ordering, and installation occur as one seamless process. This reduces risk and ensures faster delivery for an efficient start-up.



\*Based on 2" (50mm) line size; does not include transmitter cost

## Reduced Fugitive Emissions

The direct-mount capabilities of the Rosemount offering results in a reliable, worry-free installation. Impulse lines and extra connection hardware are eliminated, reducing potential leak points by up to 70%.



Economical  
and simple installation

•  
Direct-mount

flowmeters reduce  
total installed costs

•  
Enhanced

environmental

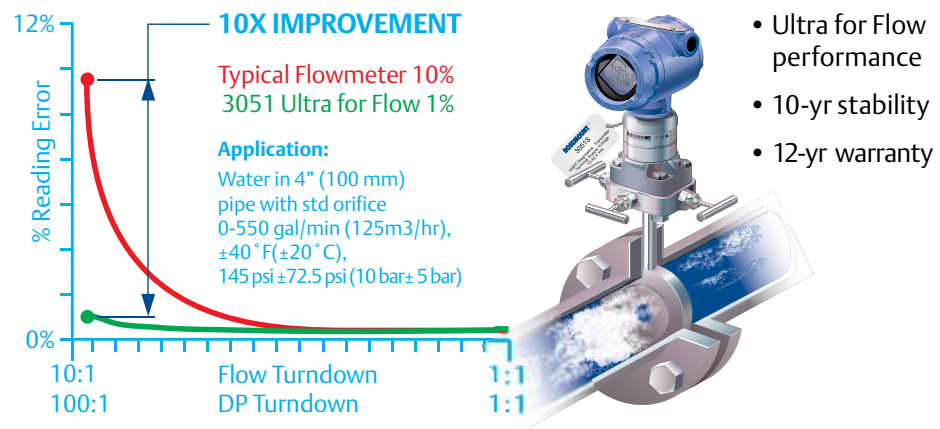
compliance



# The Complete Solution for Better Measurement – Rosemount DP Flowmeters

Rosemount 3051S flowmeters combine the industry leading 3051S transmitter with innovative orifice technologies. These customized flowmeter assemblies offer all of the scalable benefits of the 3051S in a direct-mount DP flow platform. The unprecedented performance and reliability of Rosemount 3051S Flowmeters is complimented by simplified ordering and installation.

## Enhanced Flow Measurement Over a Wide Turndown



## Smart Wireless DP Flow Solutions

Rosemount 3051S DP Flowmeters are part of Emerson's Smart Wireless solutions. Smart Wireless extends the benefits of the PlantWeb® architecture to assets that were previously physically inaccessible or too costly to reach.





## Advanced DP Flow Capabilities

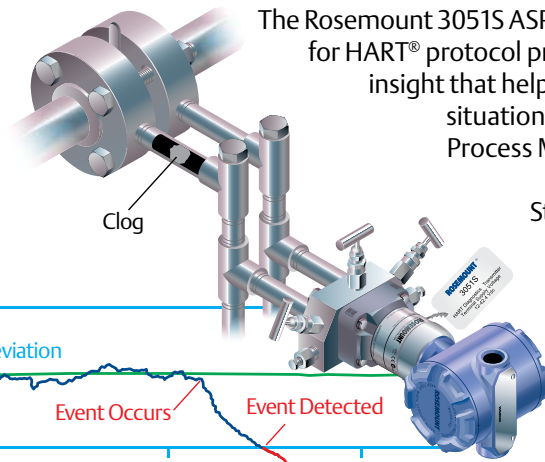
The ability to optimize your DP flow application requirements

- Remote display & interface
- User-configurable flow units
- Process alerts
- Low flow cut-off



Display and interface can be mounted remotely at-grade level for safe and easy access

## Advanced Diagnostic Functionality



The Rosemount 3051S ASP™ Diagnostics Suite for HART® protocol provides new process insight that helps prevent abnormal situations through Statistical Process Monitoring, Variable Logging with Time Stamp, and Advanced Process Alerts.

Increase reliability  
and performance  
with unprecedented  
flow measurement  
capabilities

•  
Improve your  
bottom line by  
replacing individual  
components with a  
single flowmeter

•  
Increase process  
efficiency with  
PlantWeb digital  
architecture

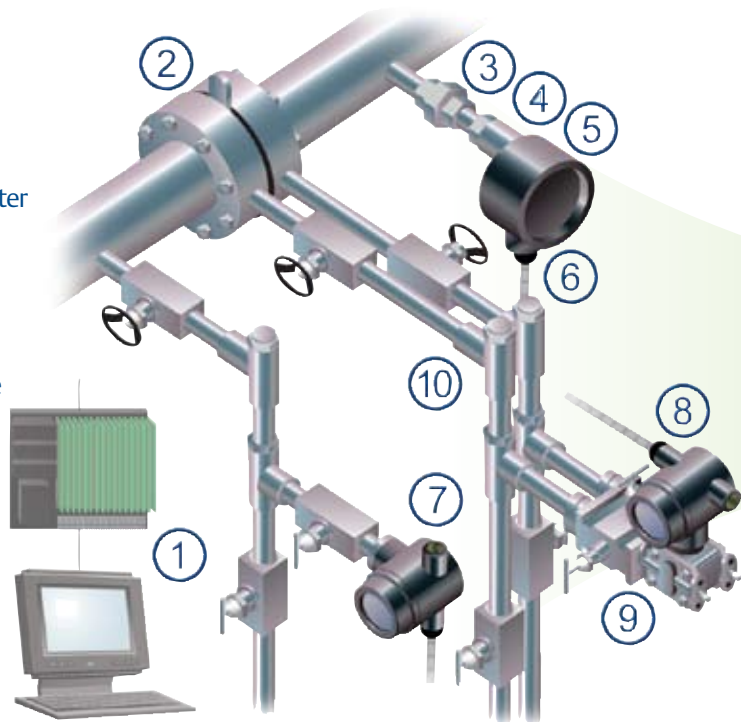
## Rosemount MultiVariable Flowmeter Capabilities

Rosemount MultiVariable Flowmeters are the most advanced DP Flowmeters available. Rosemount Mass Flowmeters deliver real-time mass flow in a single integrated package, making mass flow measurement accurate and easy while reducing process variability. Our integrated flowmeters provide the functionality of ten devices in the convenience of one advanced mass flowmeter package.

### Ten Devices. One Flowmeter.

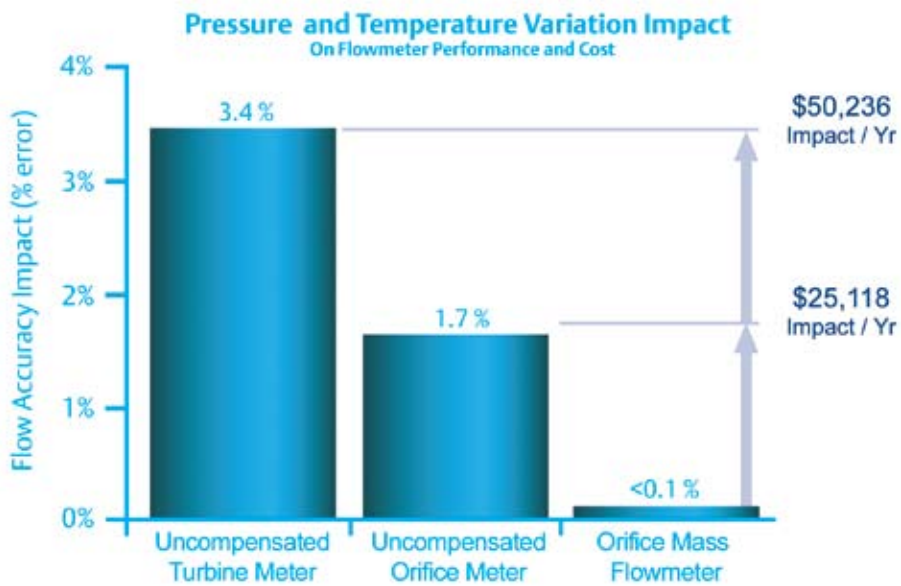
Advanced electronics integrated with orifice technology create a mass flowmeter with unprecedented capabilities. Rosemount mass flowmeters integrate the ten individual components required for traditional mass flow measurement. No longer is a separate flow computer or DCS calculation required for measuring mass flow.

1. Flow Computer
2. Primary Element
3. Thermowell
4. Temperature Sensor
5. Temperature Transmitter
6. Sensor Wiring
7. Pressure Transmitter
8. DP Transmitter
9. Manifold
10. Connection Hardware

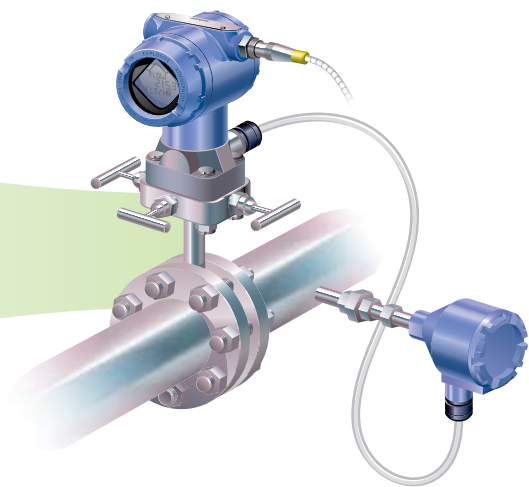


## Proven Mass Flow Measurement

All gas and steam flows have pressure and temperature variations that significantly reduce flow accuracy. Rosemount Multivariable Orifice Flowmeters with real-time compensation virtually eliminate this impact.



\* Pressure variations due to flow through 100ft (30m) of 4" (100mm) pipe with 4 elbows  
\*\* \$ 21000 SCF ( 70'1000 SCM) N<sub>2</sub> at 50psi (3 bar), 68°F (20°C), 1500 SCFM (43 Sm<sup>3</sup>/min) max flow



- Real-time fully compensated mass flow in a single, integrated flowmeter package
- Improves accuracy and performance by up to 90% compared to an uncompensated flowmeter
- Arrives fully assembled, leak-tested, and ready-to-install

Multiple variables in one device reduce process penetrations, inventory, and installation costs

• Reduce process variability and increase profitability in a single flowmeter

• Accurate measurement with unmatched operating performance including dynamically compensated mass flow



## Innovative Elements in a Comprehensive Offering

The Rosemount orifice offering includes everything you need to engineer and install your flow point. This comprehensive offering has been developed for easy specification and ordering. Each product is manufactured in strict accordance with industry standards, ensuring the highest level of quality and performance.

### Orifice Plates

Rosemount orifice plates are manufactured to meet AGA, ASME, ISO and DIN standards. A revolutionary conditioning orifice plate eliminates the need for long straight-runs while providing unprecedented performance.



### Flange Unions & Meter Sections

Rosemount flange unions and meter runs meet the most stringent requirements with careful attention given to tap location, pipe wall smoothness and flange facings. Each assembly comes complete with all required installation hardware.





### Compact Orifice Plates

The Rosemount 405 compact orifice primary element is a fully integrated solution that eliminates the need for fittings, tubing, valves, adapters, manifolds and mounting brackets. The unique wafer body allows installation in any flange location. A conditioning orifice plate option delivers unprecedented performance in limited straight-run applications.



### Integral Orifice Assemblies

The Rosemount 1195 integral orifice provides high accuracy in small line size applications. A self-centering plate, precision honed pipe section and tight machining tolerances ensure higher installed performance. Numerous process connections are available for flexible installation.



### Engineered Assemblies

Rosemount Engineered Assemblies deliver complete measurement solutions. Each assembly is factory configured, leak-tested and ready-to-install. Engineered Assemblies are easily customized to meet the needs of virtually any application.

Easy procurement

with a wide range

of styles and ratings



Faster start – ups

through easy

installations

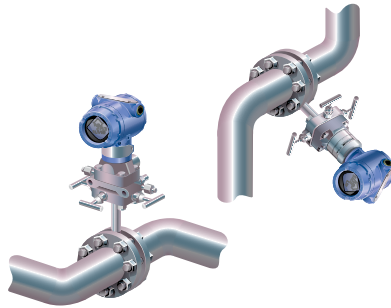


Increase process

efficiency with best-

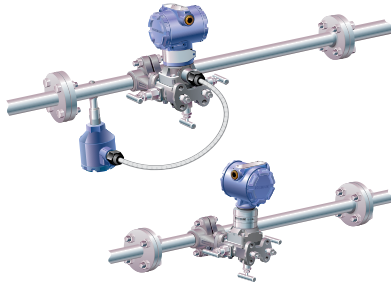
in-class products

To see just how Emerson can provide multiple savings in flow measurement applications with best-in-class Rosemount orifice solutions, visit us online at [www.rosemount.com/DP\\_Flow](http://www.rosemount.com/DP_Flow)



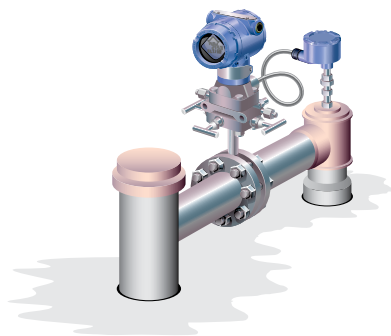
### Install in Short Straight Pipe Run

- The conditioning orifice requires less straight pipe run, significantly reducing engineering, procurement and installation costs
- Delivers superior performance with only two pipe diameters from an upstream flow disturbance



### Improve Utility Measurements in Small Lines

- The 1195 self-centering plate design and precision honed pipe sections maximize installed performance
- Numerous process connections available for installation flexibility



### Improve Oil and Gas Wellhead Measurement

- The conditioning orifice provides superior flow measurement directly after the wellhead
- Reduced short straight pipe results in substantial installation savings
- Proven accurate and reliable in wet gas applications



## Complete Capabilities. Better Measurement.



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