Efficient and Accurate Flow Measurement with Annubar Flow Meters

Rosemount™ Annubar™ Flow Meters

Accurate and dependable flow instruments to lower installed cost and increase efficiency.

EMERSON™

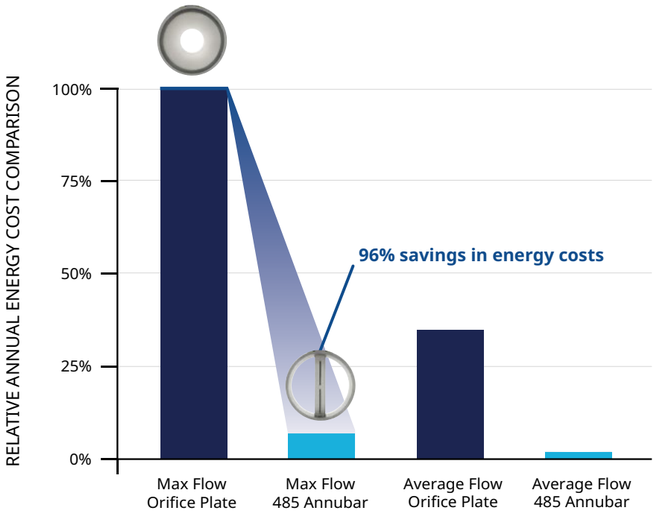
Optimize Your Operations with Annubar Technology

Emerson is the inventor of the averaging pitot tube (APT) and introduced the technology to the HVAC industry more than 50 years ago. Emerson's commitment to continuous innovation in the development of the Annubar has set the standard for reliable and accurate flow measurement in a wide range of industrial applications.

The averaging pitot tube design was created to provide a low pressure loss and accurate method for measuring the flow velocity across the entire cross section of a pipe. By averaging the pressure readings at multiple points along the pipe diameter, this technology minimizes errors caused by flow disturbances, ensuring accurate and repeatable measurements.

Simplify Your Process with Insertion Technology

Rosemount Annubar technology reduces the total cost of ownership of the flow measurement by lowering installation and energy costs. The savings become even greater as the line size increases.



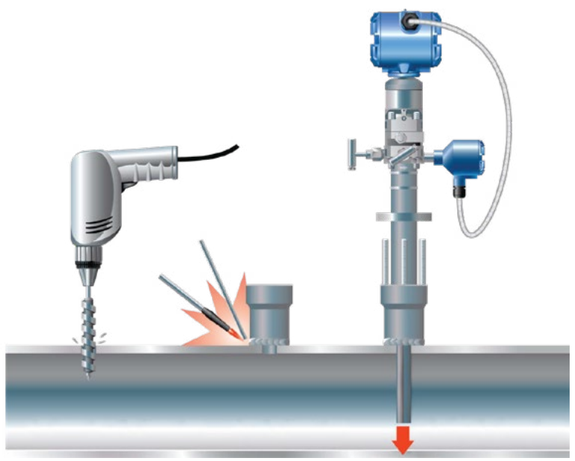
Assumption: 8 in. (200 mm)

Lower Operating Costs. Maximize Energy Savings.

Rosemount Annubar flow meters lower operating costs through a minimal restriction design that produces less permanent pressure loss than other DP flow technologies. This efficiency translates to reduced energy consumption cutting pumping, compression, and fuel costs and can deliver a full return on investment within six months.

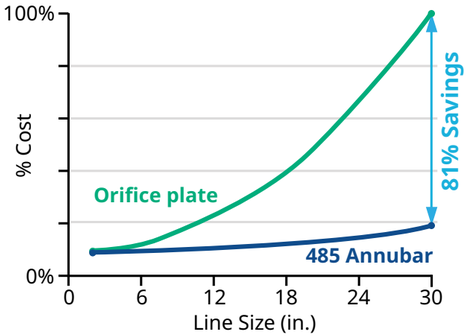
Lower Material Costs for Large Line Sizes

Rosemount Annubar flow meters require less material. Contrast to orifice plates, which reduce the cost and weight of the flow meter installation. This makes the Annubar flow meter an economical choice for large line size installations.



1. Drill hole in pipe 2. Weld mounting hardware 3. Insert Annubar sensor

Cost Comparison for Orifice Plate and Annubar



Reduce Installation Time and Cost

The Annubar installs quickly and easily, without the need for complex pipe modifications, saving both time and installation costs. With the patented Pak-Lok mounting option, a complete flow meter installation can be done in just three simple steps, shown to the left. This allows systems to be up and running faster with minimal disruption.

Confidence in Every Critical Flow Measurement

Save Installation Time & Cost

Integral temperature measurement enables accurate temperature output without additional pipe penetrations or installation time and expense.

Reduce Process Variability

T-shaped design of the Rosemount Annubar delivers the highest signal-to-noise ratio.

Decrease Measurement Error

Annubar achieves ±0.75% of flow accuracy. The frontal slot design of the sensor measures 70% more of the velocity flow profile, increasing the accuracy of the measurement.

Enhance Measurement at Low Flow Rates

The flat upstream surface of the T-shape Rosemount Annubar sensor creates a fixed separation point that generates a linear performance over a wider flow range.

Rosemount 485 Annubar

We compared various technologies such as ultrasonic versus pitot tubes as well as suppliers against each other. In our estimation, Rosemount Annubar offered the best overall package for the application. We are very pleased with the performance of the Annubar Flow Meter.
-Senior Instrument Reliability Engineer

Reliability in Challenging Applications

The solid machined sensor design of the Rosemount 585 Annubar eliminates structural welds in the flow path, enabling maximum strength. The sensor is available in 316 SST, C-276, Alloy 800, and others upon request for the greatest flexibility.

Bi-directional Measurement

Rosemount 585 Annubar flow meters can be used to measure bi-directional flow eliminating the need for two flow meter assemblies. Options for dual direct mounted transmitters make installation simple and cost effective.

Rosemount 585 Annubar

Flow Measurement Made Simple

Rosemount Annubar flow meters arrive fully assembled, configured, and leak tested. It is a complete solution delivering compensated mass flow in a single pipe penetration reducing engineering, hardware, and installation expenses.

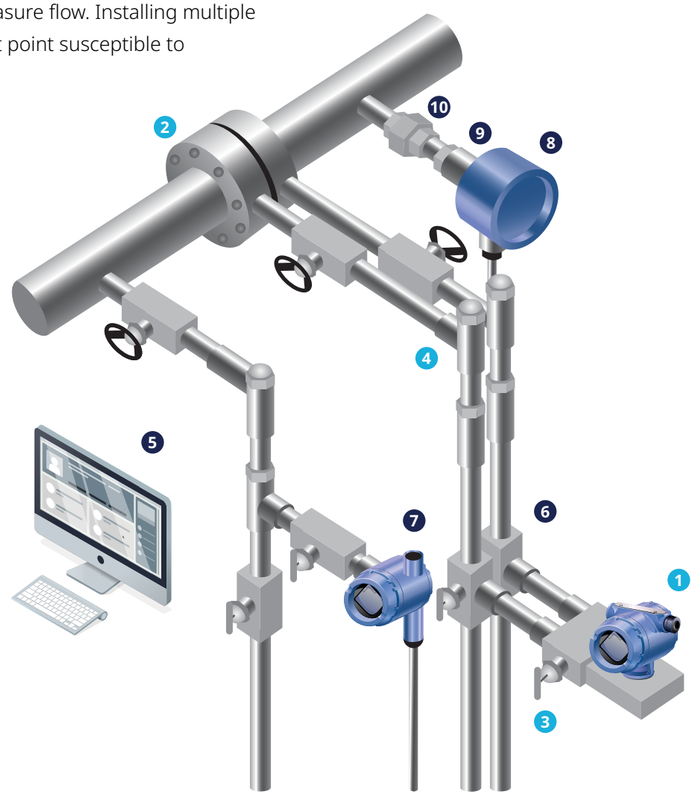
Traditional DP flow installations can require up to 10 individual components and multiple pipe penetrations to measure flow. Installing multiple components makes the measurement point susceptible to leaking, plugging, freezing, and measurement inaccuracies.

TRADITIONAL

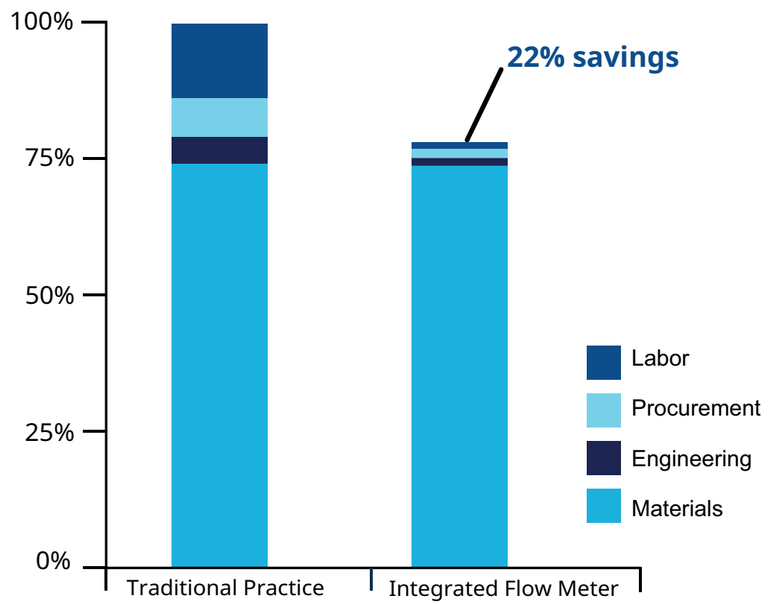
1. DP Transmitter
2. Primary Element
3. Manifold
4. Connection Hardware

TRADITIONAL: FULLY COMPENSATED

5. Flow Computer
6. Sensor Wiring
7. Pressure Transmitter
8. Temperature Transmitter
9. Thermowell
10. Temperature Sensor



Reduce Installation Costs with Rosemount Annubar Flow Meters



Reduce Labor Time and Simplify Procurement

Rosemount Annubar flow meters arrive fully configured, leak-tested, and ready to install, with all configuration and calibration completed at the factory for a fast, trouble-free startup. The ability to order a complete flow meter with a single model number simplifies the procurement process, eliminating the time and coordination required to source and assemble components from multiple vendors for each flow measurement point.

Superior Flow Measurement

Rosemount Annubar flow meters combine the industry's best differential pressure and multivariable transmitters with the leading averaging pitot tube technology to create the most accurate and reliable solution available.

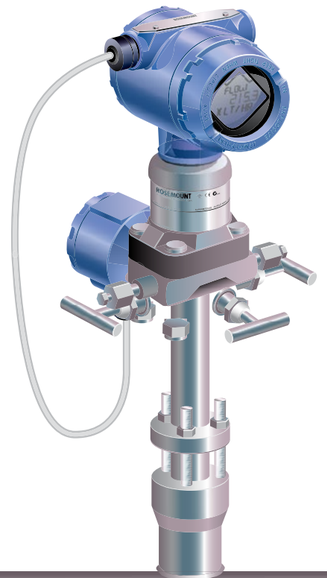
Experience Cost Savings

Impulse lines are a major source of flow measurement errors and process leaks. By eliminating impulse lines, Rosemount flow meters have 70% fewer leak points which reduces the susceptibility of freezing and plugging, saving time and money.

Simplify and Improve Mass Flow Measurement

Rosemount Annubar flow meters are engineered with advanced capabilities to maximize your success through faster start-ups, reduced operating costs, and higher productivity.

Rosemount 3051S **MultiVariable™** transmitters deliver unprecedented performance and capabilities by integrating multivariable technology into the industry-leading, scalable Rosemount 3051S platform. The result is effortless flow measurement for tighter control and improved productivity.

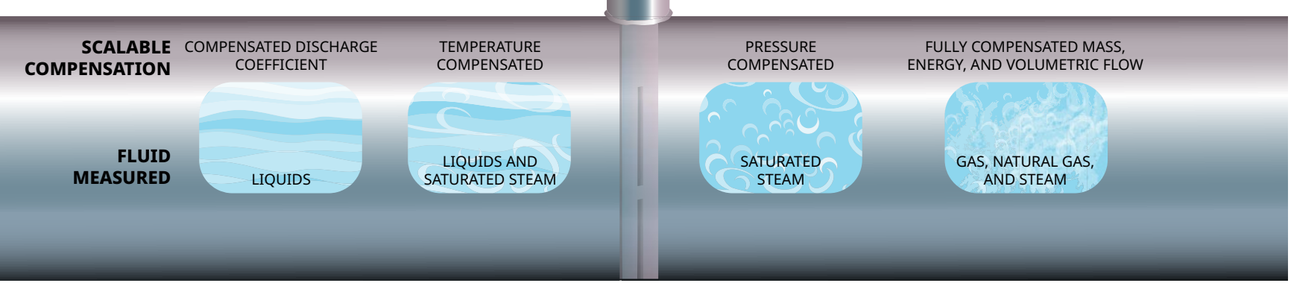


INPUTS

- Process fluid
- Primary element
- Line size

OUTPUTS

- Mass flow
- Volumetric flow
- Totalized flow
- Energy flow
- Process temperature
- Differential pressure
- Static pressure
- Module temperature



Advanced Flow Meter Technology

Extend Process Insight and Improve Operations

Emerson **Smart Wireless** flow meters offer unparalleled ease of use. Installing and commissioning a fully integrated and configured wireless Rosemount Annubar flow meter is fast and easy.

Predict and Prevent Abnormal Flow Conditions

Enhance quality and improve productivity with **Advanced Diagnostics**. Measure and log statistical process characteristics to proactively monitor, detect, and alert you to abnormal flow conditions.

Industry Leading 28:1 Flow Turndown

The most versatile measurement on the market. Reduce cost and complexity with a single flow meter that can perform over the widest range of flow. Therefore, eliminating the need for multiple transmitters to support changing production rates, seasonal shifts, or fluctuating demand.

Flexible Mounting Styles

Rosemount Flo-Tap Retractable Mounting

- The Flo-Tap Rosemount Annubar assembly can be hot-tapped without interrupting process flow. There is no need to shut down your process to install a flow meter

Rosemount 585 Annubar Primary Element for Severe Service

- Reliable solution for severe service applications including high velocity, high temperature, high pressure, and extreme flowing conditions. Offered in a variety of materials for optimal compatibility with the process

Rosemount 585 Annubar Main Steam Line

- Designed exclusively for critical steam service in power plants or cogeneration systems, offering maximum resistance to the harmful effects of high temperature steam. Easy-to-maintain design allows for simple removal for steam blowdown and other maintenance procedures

Pak-Lok

- Utilizes the latest patented compression design to firmly secure the Rosemount Annubar sensor to the opposite wall of the pipe

Flanged

- The rugged structural requirements of high pressure applications are met with the flanged assembly

Flange-Lok

- Combines a Pak-Lok compression sealing mechanism with a mounting flange for convenient installation with a single pipe penetration

Paper Mill Reaches Record High Production Output with Rosemout Annubar Flow Meter

The results

- High production output with increased return on investment
- Lowered permanent pressure loss
- Improved installation with pressure and temperature compensated flow solution

"Just by replacing an old flow meter, the customer achieved higher production rates and efficiencies."

Challenge

The customer was looking to upgrade the efficiency of the plant and increase paper production with minimal investment costs. According to the customer's calculations an increase in the steam pressure at the inlet of the dryer section to the paper machine would result in a significant increase of production output. The steam is coming from the power house to the dryers. By measuring steam flow, condensate return, and the amount of energy supplied, the customer can calculate the efficiency of the paper machine and of the heat recovery system. They can also determine if there are any steam losses in the system. Additionally, by measuring the steam flow, the customer can determine the proper amount of specific energy applied for paper production. The plant was previously using old orifice plates for measuring the steam flow to three of their paper machines.

Solution

In order to increase the line pressure and upgrade the flow measurement, Emerson provided the customer with the Rosemount™ Annubar™ Flow Meter solution. The choice of flow meter was based upon the following main criteria:

- Calculations showing low permanent pressure loss versus the existing flow meter
- Minimal modification to the existing piping
- A fully pressure and temperature compensated measurement in one complete package

After installing the Rosemount Annubar Flow Meter, the customer had record high paper production and one of the main reasons for this was due to the increased pressure in the paper machine steam heads. Just by replacing an old flow meter, the customer achieved higher production rates and efficiencies.

The increase in line pressure was achieved with a cost effective solution as compared to other alternatives. Emerson is committed to helping customers keep the competitive edge in their industry by allowing them to save costs with innovative solutions.

Rosemount Annubar Flow Meters enhance process efficiency with a reliable, low-maintenance flow measurement solution.

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