

Emerson Flow and Density Measurement

Best-in-class technology for outstanding results



Emerson Flow and Density Measurement Technology Committed to Your Success

Emerson's best-in-class Micro Motion® and Rosemount® flow and density measurement technologies, wide breadth of products, and unmatched value ensure you will realize outstanding results in your process and operation.

Technology Leadership

Decades of application experience ensure Emerson truly understands customer measurement challenges and is able to deliver the most advanced flow and density measurement technologies to customers around the globe.

World-class research and development capabilities support ongoing product development to find solutions for difficult application and process challenges. A range of globally-accredited calibration options, in accordance with ISO 17025 and other international standards, deliver superior quality products and support wide-ranging customer needs.

- First loop-powered 2-wire Coriolis, with mA output signal and multi-variable capability over HART® for accurate, repeatable measurement performance with low installation and maintenance costs
- Smart Meter Verification checks the complete meter integrity and performance (sensor through electronics) in minutes while maintaining process measurement and without having to shut the process down
- Most accurate, reliable magnetic flowmeter with advanced diagnostics, improves process control while delivering ongoing maintenance savings
- The only all cast/all-weld designed Vortex meter eliminates clogging and leaking to deliver unmatched reliability
- Smart Wireless THUM Adapter can unlock multivariable measurement, advanced diagnostics, meter verification, and totalized flow in your existing flow devices
- Best available measurement performance for applications where two-phase flow or entrained gas is present
- Outstanding range of dedicated density devices offer excellent repeatability and accuracy in pipeline and tank operating conditions



ROSEMOUNT®



Product Breadth

Emerson offers an unmatched array of flow and density measurement technologies to meet virtually any measurement challenge. From the smallest flow rate to the largest, the lowest temperature to the highest, onshore or offshore, gas or liquid, you will find the ideal measurement device that fits your exact needs.

Micro Motion Coriolis flow and density meters and Rosemount Magnetic and Vortex meters easily enable process optimization, increased production and improved profitability. Whether your application requires precise, compact and drainable process control or large flow rate fiscal transfer, look no further than Emerson for the widest range of flow and density measurement solutions.



Unparalleled Value

Substantial application knowledge and expertise, comprehensive training programs, and a global network of service and support make Emerson the best flow and density measurement partner.

- Unmatched, real-world application experience ensures your process is operational and delivering results in the shortest time possible
- Sizing, material compatibility and selection makes sure you receive the right product for the job
- Factory-trained and certified technicians diagnose and solve problems quickly and courteously
- Worldwide technical assistance means support is never far away
- Online forum, tools, support and translated documentation ensure you have what you need, when you need it

Industries

- *Alternative Fuels*
- *Automotive*
- *Chemical & Petrochemical*
- *Fine & Specialty Chemicals*
- *Food & Beverage*
- *Hydrocarbon Transportation & Distribution*
- *Industrial Gases*
- *Life Sciences & Pharmaceutical*
- *Marine*
- *Mining & Minerals*
- *Municipal*
- *Natural Gas Processing*
- *OEM*
- *Oilfield Services*
- *Oil & Gas Production*
- *Personal Care Products*
- *Power*
- *Pulp & Paper*
- *Refining*
- *Water & Wastewater*

Coriolis

Coriolis Flow & Density Meters

A single Micro Motion Coriolis meter can tighten control, improve process insight, monitor emissions and minimize waste. Customers continue to find new ways in which to apply Micro Motion Coriolis flow and density measurement technology in order to further benefit from all the advantages available.



ELITE Coriolis Flow & Density Meters

Micro Motion ELITE® Coriolis meters are the leading precision flow and density measurement solution offering the most accurate and repeatable mass measurement for liquids, gases, or slurries.

F-Series Flow and Density Meter

Highly accurate mass flow, volume flow, and density measurement in applications that require a compact, drainable design.



H-Series Coriolis Flow and Density Meter

All-hygienic meters for sanitary conditions requiring accurate mass flow, volume flow, and density measurement in a drainable and cleanable design.



T-Series Coriolis Flow & Density Meters

Straight-tube, full-bore meter design for easy cleaning.

LF-Series Coriolis Flow & Density Meter

The smallest Coriolis meter for tight spaces and ultra-low, high precision flow measurement.

R-Series Coriolis Flow Meters

Basic, reliable measurement while benefiting from the fundamental advantages of Coriolis.

Density & Viscosity

7835 Precision Liquid and Concentration Density Meter

The industry standard for on-line density measurement and designed for the fiscal metering of crude oil, refined hydrocarbons and non-aggressive process liquids.



7845/7847 Liquid and Concentration Density Meters

High performance, general purpose density meters designed for general process and hygienic applications.

7826/7828 Direct Insertion Density Meters

Designed to operate in pipelines and tanks, delivering measurement such as Specific Gravity, %solids, %volume concentration and °Brix.

3098 Gas Specific Gravity Meter

The industry standard for direct measurement of gas molecular weight offering continuous online measurements and the highest accuracy and resolution.

7812 Gas Density Meter

For fiscal metering of natural gas and offer the highest accuracy with excellent repeatability under pipeline operating conditions. Available in NiSpan-C.



7827 Insertion Viscosity Meter

Used for quality and analytical measurements where kinematic viscosity at line and reference temperature are required to be measured.

7829 Visconic Viscosity Meter

Measurement and control of online process viscosity applications and simultaneously measures real-time viscosity, density and temperature.

7829 Viscomaster Viscosity Meter

For real-time measurement and control heavy fuel oil (HFO) that supply engines, turbines and burners in Marine and Power applications.

Magnetic Flow

Rosemount E-Series Magnetic Flowmeter

Designed for maximum reliability even in the harshest environments, the Rosemount E-Series Magnetic Flowmeter offers industry best performance and diagnostic capabilities. With Emerson Smart Meter Verification, troubleshooting and auditing of magnetic flowmeter installations is quick and easy. The Advanced Diagnostics available in every E-Series transmitter offers increased visibility to process conditions, enabling better decision making.

E-Series Transmitters

- Advanced diagnostics unlock the potential of the device
- Multiple communications protocols are available
- A local operator interface makes setup easy
- Integral or remote transmitter options enhance installation flexibility

E-Series Sensors

- Solve more application needs with a variety of liner and electrode materials, and high pressure sensors
- Reduce capital expense with the wafer meter design



Rosemount 8705 Flanged Sensor

An all welded design that ensures reliability in the harshest environments, available in a wide range of sizes, lining and electrode materials are available to meet most process conditions.

Rosemount 8711 Water Sensor

Economical, compact, and lightweight alternative to flanged magnetic flowmeters with alignment rings provided making installation easier.

Rosemount 8721 Hygienic Sensor

All 316L SST construction meters deliver a straight-through design for maximum cleanability. 3-A and EHEDG approved.

Rosemount High-Signal Magnetic Flowmeter System

The Rosemount High-Signal flowmeter system provides stable flow measurement in the most difficult high-noise applications while maintaining the benefits of DC technology.

Vortex

Rosemount 8800D Series Vortex Flowmeter

Achieve better measurement practices across your applications by eliminating potential leak points, incorporating gasket-free meter body designs that are immune to vibration.

Rosemount 8800 CriticalProcess™ Vortex Flowmeter

Designed to increase plant availability and enhance overall safety. This feature allows users to verify the performance of the Vortex sensor while providing an added level of safety on critical applications.

Rosemount 8800 Reducer Vortex Flowmeter

The Reducer Vortex can measure lower flows better than any other Vortex meter. The benefit is simplified installations which reduce project risk and minimize installation costs.

Rosemount 8800 MultiVariable Vortex Flowmeter

Combines your temperature and flow devices into a single, highly accurate instrument, eliminating the costly installation of two separate devices.



Emerson Process Management has set new standards in flow and density measurement technology to deliver quality measurement and unsurpassed performance for a wide range of applications.

Micro Motion Coriolis Flow & Density Meters

A wide range of measurement solutions delivers what's required - and much more.



Sensors	ELITE®	F-Series	H-Series	T-Series	R-Series	LF-Series	7835 7845 7847	7826 7827 7828 7829	7812 3098
Application type									
Continuous control	●	●	●	●	●	●	●	●	●
Batching / loading / blending	●	●	●	●	●	●	●	●	●
Custody transfer	●	●	●				●	●	●
Measurement accuracy									
Liquid & slurry - Flow	±0.05%	±0.10%	±0.10%	±0.15%	±0.50%	±0.50%			
Liquid & slurry - Density	±0.0002 g/cm³ (±0.2 kg/m³)	±0.001 g/cm³ (±1.0 kg/m³)	±0.001 g/cm³ (±1.0 kg/m³)	±0.002 g/cm³ (±2.0 kg/m³)		±0.005 g/cm³ (±5.0 kg/m³)	±0.0001 g/cm³ (±0.1 kg/m³)	±0.001 g/cm³ (±1.0 kg/m³)	
Liquid - Viscosity								±1% FS	
Gas - Flow	±0.35%	±0.50%	±0.50%	±0.50%	±0.75%	±0.50%			
Gas - Density									±0.10%
Capabilities									
Self-draining	●	●	●	●	●		●	●	
Sanitary / hygienic	●		●	●			●		
Two-phase flow / entrained gas	●	●	●				●		
Meter verification	●	●	●						
Secondary containment	●	●	●	●			●		
High temperature *	●	●							
High pressure **	●	●						●	
Cryogenic *	●						●		
Wetted materials									
300-series stainless steel	●	●	●		●	●	●	●	●
Nickel alloy	●	●						●	
Ni-Span-C®							●		●
Titanium				●				●	
Monel®								●	
Zirconium								●	
Fits nominal line sizes									
Inches	1/10-12	1/4-4	1/4-4	1/4-2	1/4-3	1/32-1/4	1	1 or larger	1 or larger
Millimeters	3-300	6-100	6-100	6-50	6-75	0.8-6	23	25 or larger	25 or larger

* Standard temperature is -148 to +400 °F (-100 to +204 °C) High temperature is above +400 °F (+204 °C) Cryogenic is below -148 °F (-100 °C)
 ** Above 1494 psi (103 bar)

● Supported on all models ● Supported on some models

Micro Motion
Coriolis flow
and density
measurement



ELITE



F-Series



H-Series



T-Series



R-Series



LF-Series

Micro Motion
density and
concentration
measurement



ELITE



H-Series



T-Series



7835 /45 /47 Model



7826 /27/28/29 Model



7812 Model



3098 Model

Transmitters	1500	1700	2200S	2400S	2500	2700	3300	3350	3500	3700	7950 7951
Output variables											
Mass / volume flow	•	•	•	•	•	•	•	•	•	•	
Net product content / flow [†]				•	•	•			•	•	
Temperature			•	•	•	•			•	•	•
Density			•	•	•	•			•	•	•
Concentration				•	•	•			•	•	•
Viscosity / referred viscosity											•
Local display											
2-line		•	•	•		•					
Multi-line							•	•	•	•	•
Power											
AC		•		•		•	•	•	•	•	•
DC	•	•		•	•	•	•	•	•	•	•
Loop powered			•								
Outputs											
4-20 mA	•	•	•	•	•	•	•	•	•	•	•
10 kHz pulse	•	•		•	•	•	•	•	•	•	
Discrete	•	•		•	•	•	•	•	•	•	•
HART® / Wireless HART®	•	•	•	•	•	•	•	•	•	•	
Modbus®	•	•			•	•	•	•	•	•	•
FOUNDATION™ fieldbus						•					
PROFIBUS-PA						•					
PROFIBUS-DP				•							
DeviceNet™				•							
Inputs											
10 kHz pulse							•	•			
Discrete				•	•	•	•	•	•	•	
4-20 mA											•
HART®									•	•	
2-wire density sensor											•
3-wire density sensor											•
4-wire Coriolis sensor	•	•			•	•			•	•	
9-wire Coriolis sensor	•	•			•	•			•	•	
Mounting											
Integral - Field		•	•	•		•					
Remote - Field		•				•		•		•	•
Remote - Control room	•				•		•		•		•
Remote - Rack / Panel Mount							•		•		
Special application types											
Batch controller							•	•	•	•	
Custody transfer						•	•	•	•	•	
Two-phase flow/entrained gas	•	•		•	•	•			•	•	
Filling & dosing	•										
Meter verification	•	•		•	•	•			•	•	
SIS Certified		•				•					
Hazardous approvals											
C1D1		•	•			•					
C1D2		•	•	•		•		•		•	
Zone 1		•	•			•		•		•	
Zone 2		•	•	•		•		•		•	

Coriolis flow and density transmitters



Model 1500 / 2500



Model 1700 / 2700



Model 2200S



Model 2400S



Series 3000

For detailed product information, refer to the specific Product Data Sheet at www.MicroMotion.com

[†]Flow rate of product based on concentration. For example, in a dissolved sugar solution, the measurement is the flow rate of the sugar alone and in a net oil application the measurement is water alone or oil alone.

Rosemount Vortex and Magnetic Meters

Broad instrumentation selection for increased efficiency and safety -
at a lower installed cost.

ROSEMOUNT®

Vortex Flowmeters

	Flanged & Reducer	Wafer	CriticalProcess™	Dual	Weld-End	MultiVariable™ Flanged and Reducer
Targeted Application						
Critical Process Applications			•	•		
Utility Water and Gas	•	•				
Cryogenic					•	
Saturated Steam						•
Safety Instrumented Systems				•		
High Pressure (ANSI Class 1500)	•			•	•	
Capabilities						
Clog-free, Gasket-free meterbody	•	•	•	•	•	•
Isolated sensor	•	•	•	•	•	•
Mass balanced sensor and ADSP for Vibration Immunity	•	•	•	•	•	•
Flow Simulation and Signal/Trigger for Meter Verification	•	•	•	•	•	•
Single Sensor can be used for all line sizes and meter types	•	•	•	•	•	•
Wetted Materials						
Stainless Steel	•	•	•	•	•	•
Nickel Alloy	•	•	•	•		
Alternate material as required	•		•	•	•	•
Measured Variables						
Flow	•	•	•	•	•	•
Temperature						•
Output Variables						
Flow	•	•	•	•	•	•
Temperature						•
Density (saturated steam)						•
T-Compensated Mass Flow (saturated steam)						•
Outputs						
4-20mA / HART	•	•	•	•	•	•
10 kHz Pulse	•	•	•	•	•	•
FOUNDATION fieldbus™	•	•	•	•	•	•
Mounting						
Integral	•	•	•	•	•	•
Remote	•	•	•	•	•	•
Hazardous Area Approvals						
FM - Ex-Proof, IS, Dust, FISCO (FF)	•	•	•	•	•	•
CSA - Ex-Proof, IS, Dust, FISCO (FF)	•	•	•	•	•	•
ATEX - Flameproof, IS, Dust, Type-N, FISCO (FF)	•	•	•	•	•	•
IECEx - Flameproof, IS, Dust, Type-N, FISCO (FF)	•	•	•	•	•	•
NEPSI - Flameproof, IS, Type-N, FISCO (FF)	•	•	•	•	•	•
TIIS - Flameproof	•	•	•	•	•	•
Accuracy						
Liquids	0.65% of rate	0.65% of rate	0.65% of rate	0.65% of rate	0.65% of rate	0.65% of rate
Gases	1.00% of rate	1.00% of rate	1.00% of rate	1.00% of rate	1.00% of rate	1.00% of rate
Mass Flow of Saturated Steam						2.00% of rate
Nominal Line Sizes						
Inches	1/2-12	1/2-8	1-12	1/2-12	1/2-4	1.5-12
Millimeters	15-300	15-200	25-300	15-300	15-100	40-300



Vortex Meters

Flanged



Wafers



Reducer



Dual



Weld-End



MultiVariable™



CriticalProcess™

Magnetic Sensors

	Flanged (8705)	High Signal™ (8707)	Wafer (8711)	Hygienic (8721)
Application type				
Process Applications	●	●	●	
Utility Water-based Flows	●		●	
High Consistency Slurry	●	●		
Hygienic (Sanitary)				●
High Pressure (Up to ANSI Class 2500) ⁽¹⁾	●	●		
Line Sizes				
Nominal line size - inches	1/2 to 36	3 to 36	0.15 to 8	1/2 to 4
Nominal line size - millimeters	15 - 900	80 - 900	4 - 200	15 - 100
Liner Selection ⁽²⁾	Temp Limits	Line Size (8705/8707)	Line Size (8711)	
PFA - Best (Fluoropolymer)	-20 to 350° F -29 to 177° C	1/2 to 14 inch (15 to 350 mm)	0.15 to 0.3 inch (4 to 8 mm)	
PTFE - Most common for flanged, more cost effective (Fluoropolymer)	-20 to 350° F -29 to 177° C	1/2 to 36 inch (15 to 900 mm)	1/2 to 8 inch (15 to 200 mm)	
ETFE - Most common for wafers lower max temp (Fluoropolymer)	-20 to 300° F -29 to 149° C	1/2 to 16 inch (15 to 400 mm)	1/2 to 8 inch (15 to 200 mm)	
Polyurethane - Water with no chemicals	-0 to 140° F -18 to 60° C	1 to 36 inch (25 to 900 mm)	NA	
Neoprene - Water and Seawater	-0 to 176° F -18 to 80° C	1 to 36 inch (25 to 900 mm)	NA	
Linatex - Mining slurries, large debris	-0 to 158° F -18 to 70° C	1 to 36 inch (25 to 900 mm)	NA	
Electrode Selection	Notes			
Type				
Flush	Standard design. Suitable for most applications including slurries			
Bullet-nose	Used where coating is a concern and no solids are present			
Material ⁽³⁾				
316L Stainless Steel	Standard Material. Compatible with most water-based applications			
Nickel Alloy 276	Typically used in medium to high acid concentrations and sea water			
Platinum	Typically used in most aggressive liquor applications			
Tantalum	Typically used in high concentration acids (hydrochloric, hydrofluoric)			
Titanium	Typically used in high concentration caustic (sodium, potassium hydroxide)			



Magnetic Transmitters

	8732	8712	8712H High Signal™	
Selection Considerations				
Mounting	Integral or Remote ⁽⁴⁾	Wall Mount Remote	Wall Mount Remote	
LOI	4-button	Dedicated 15 button	Dedicated 15 button	
Output & Communication Protocols	4-20 mA, 10 kHz Pulse FOUNDATION fieldbus Profibus PA	4-20 mA, 10 kHz Pulse	4-20mA, HART, 1 kHz Pulse	
Power Supply	90-250AC, 12-42DC	90-250AC, 12-42DC	115V AC only	
Diagnostics & Enhanced Features				Notes
Standard	●	●	●	Transmitter & Sensor Faults, Empty Pipe
DA1 - HART Diagnostics 1	●	●		Ground & Wiring, High Process Noise
DA2 - HART Diagnostics 2	●	●		8714i Meter Verification
D01 - FOUNDATION fieldbus/Profibus PA/ Diagnostics 1	●			Ground & Wiring, High Process Noise
D02 - FOUNDATION fieldbus/Profibus PA Diagnostics 2	●			8714i Meter Verification
D1 - High Accuracy Calibration	●	●	●	0.15% +/- 1mm/s ⁽⁵⁾
AX - DI/DO	●	●		Discrete In and Out



(1) Polyurethane liner only (2) 8721 available in PFA only (3) Alternate materials available (4) Pipe-mount remote (5) E-Series high performance. 0.25% for High Signal™

Superior Measurement for Virtually Any Application

Emerson flow measurement meters deliver the world's best measurement stability, reliability, and overall performance for a wide range of applications and process environments.

Applications

- Allocation
- Batching
- Bioreactor feeds
- Bleaching agents (liquids and gas)
- Blending
- Bunker loading
- Carbonation and bottling
- Catalyst feed
- CNG
- Concentration (°Brix, °Plato, % caustic, others)
- Chemical recovery
- Coatings
- Cooling water
- Combustion control
- Continuous ratio and product blending
- Continuous reaction
- Custody transfer (liquids and gas)
- Deionized makeup water
- District energy steam and water
- Drilling mud quality and returns
- Effluent streams
- Endpoint detection in batch reactions
- Energy balance
- Ethylene transfer
- Evaporator control
- Feed and product characterization
- Fermentation
- Fiscal transfer
- Fuel gas combustion
- Greenhouse Gas (GHG) compliance
- Hygienic applications
- Interface detection in multi-product pipelines
- Leak detection systems
- Loss control
- Material and mass balance
- Natural gas check metering
- Net oil / water cut measurement
- Oil well cementing and hydrofracturing
- Pill coating
- Product mixing
- Rail car, ship and truck loading and unloading
- Raw material dilution
- Retail vehicle fueling
- Safety Instrumented Systems (SIS)
- Shipping and receiving
- Steam measurement
- Solvents and solvent separation
- Sterile gas feeds
- Utility water
- Utility steam
- Utility gas
- Vial filling



Emerson Process Management's Micro Motion and Rosemount products include some of the world's most advanced measurement instruments, all of which are connected through our PlantWeb™ digital plant architecture. We are continually working with customers to ensure that they are fully prepared to meet technology and industry requirements.

Emerson Flow Global Presence

Micro Motion and Rosemount flow and density measurement products are manufactured, calibrated and supported all over the globe. With highly accredited facilities and support services, Emerson global flow service and technology centers provide the highest quality engineering, production, service, training and calibration available.

Locations to serve you:

- Micro Motion Headquarters: Boulder, Colorado
- Rosemount Flow Headquarters: Eden Prairie, Minnesota
- Sorocaba, Brazil
- Nanjing, China
- Pudong, China
- Pune & Mumbai, India
- Chiba, Japan
- Chihuahua, Mexico
- Ede, The Netherlands
- Manila, Philippines
- Chelyabinsk, Russia
- Dubai, UAE
- Slough, UK



TECHNOLOGY LEADERSHIP

Robust, innovative technologies provides reliable, accurate and repeatable measurement and diagnostics

WIDEST BREADTH OF PRODUCT

Broad range of flow measurement products deliver the flexibility and performance required

UNPARALLELED VALUE

Exceptional expertise and support ensure the best flow technology selection for the application



Micro Motion and Rosemount, divisions of Emerson Process Management, are known globally in over 85 countries for quality and reliability. As part of the Emerson PlantWeb® digital plant architecture, we enable increased plant availability, decreased costs and enhanced safety. Emerson delivers application expertise, service and technical support not available elsewhere.



Emerson Process Management offers a wide range of flow measurement technologies including:

- Daniel Differential Pressure, Ultrasonic and Turbine
- Micro Motion Coriolis Flow and Density
- Rosemount Differential Pressure
- Rosemount Magnetic and Vortex
- Roxar Multiphase

Learn more about Emerson's complete breadth of measurement technologies at www.EmersonProcess.com



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