

One solution for all mass flow applications

Schneider Electric Coriolis Series
Formerly Foxboro Coriolis Flowmeters



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Schneider
Electric



Innovative construction and superior performance

The new Schneider Electric Coriolis Series offers a complete portfolio of state-of-the-art straight and bent tube design Coriolis flowmeters for a wide range of applications, including low to high pressures and cryogenic to high-temperature applications.

This novel Coriolis series offers a broad range of sizes and multiple wetted materials to fulfill virtually every application and process condition. The innovative construction and superior performance provide mass, volume flow, density and concentration measurements of liquids and gases. Challenging applications such as entrained gas (2-phase flow), highly viscous media, non-homogeneous mixtures and slurries are addressed with this offer.

A flowmeter for every application

When it comes to selecting a flowmeter for your application, we have you covered. Schneider Electric's family of Coriolis flowmeters range from small to large, for high pressure, cryogenic and high temperatures. The meter's diagnostics software monitors a series of process and auxiliary values to ultimately confirm the condition of the process medium. Our Coriolis mass flowmeters can even generate intelligent warning messages when a certain proportion of gas bubbles or solids is exceeded, providing valuable information about the process itself.

When process parameters such as medium, temperature, or pressure undergo sudden changes, a reliable and accurate mass flowmeter is needed. Schneider Electric offers superior mass flowmeters with a unique straight tube design for minimal pressure drop, highly viscous, corrosive and slurry applications. Whatever your process requires, you can count on Schneider Electric Coriolis mass flowmeters for design and quality.

The solution for extended temperature applications

Reliable and accurate mass flow measurement of liquid and gas products is challenging at the best of times and this becomes a more significant concern when operating at extreme process conditions.

A high level of performance, together with a wide operating temperature range up to 400°C / 752°F, makes the CFS600A the ideal choice for mass flow measurement in a wide variety of applications.

Designed to meet the requirements of general purpose liquid and gas applications, the extended low temperature range of -200°C / -328°F also makes the CFS600A suitable for Liquid Natural Gas (LNG) and cryogenic applications.

Typical applications

- Measurement of liquids, gases and liquids with entrained gas
- Bulk loading
- Oil & gas
- Food & beverage
- Chemical
- Pharmaceutical
- Petrochemical
- Marine
- Power plants
- Pulp & paper



CFS300A



CFS400A



CFS700A



CFS600A



Innovative design for better
results

Experience the benefits of the Schneider Electric Coriolis Series

The Coriolis from Schneider Electric is available in sizes from 1/2" to 16" (DN15 to DN400) and in 6 different materials; 316L, duplex and super-duplex stainless steels, Hastelloy®, titanium, and tantalum, and conforms to the standard installation lengths according to NAMUR NE 132 "Coriolis Mass Meter (CMM)".

Superior performance – even with quick temperature and media changes

The Schneider Electric Coriolis series sets the standard in accuracy and reliability.

Schneider Electric offers superior mass flowmeters with straight and bent tube designs, so you can choose the best meter for your application. We offer a unique straight tube design for minimal pressure drop, highly viscous, corrosive and slurry applications. The superior bent tube design of the CFS600A is suitable for cryogenic, high temperature and extremely high-pressure applications.

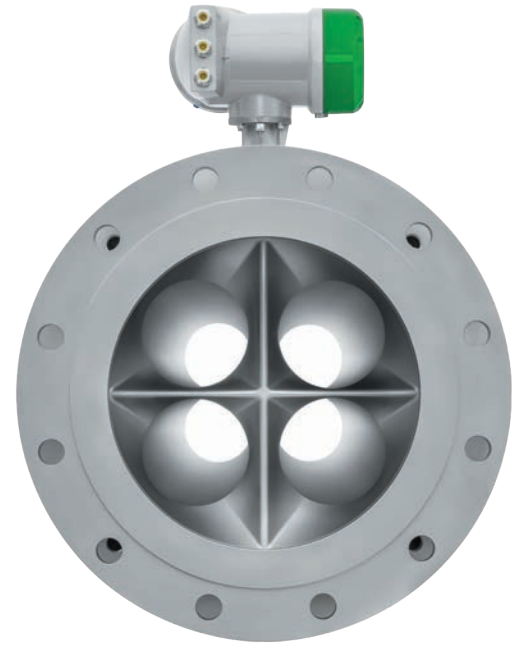
Design engineers are constantly striving to reduce overall system pressure drop and the correct flowmeter can play a vital part in achieving this. The Coriolis CFS400A has a unique four straight tube design with an optimized flow splitter giving it the lowest pressure drop of any high-capacity Coriolis mass flowmeter on the market. It also has the highest flow rate at up to 169,021 lb/min in the sixteen (16") inch tube.

State-of-the-art straight and bent tube design

The straight tube flowmeter design fits the pipe profile and makes almost no additional contribution to the overall system pressure drop. The bent tube flowmeter design generates a higher pressure drop than straight tube designs for the same size or capacity. The laws of physics dictate that the higher the number of bends and the tighter the bend angles, the greater the pressure drop created. Flow splitters contribute to the pressure drop and therefore the Coriolis flow splitter design has been optimized to reduce this contribution further.

In addition, where bent tube designs require elevated pipework, there will be an increase in pipeline length and the number of angled fittings required to achieve the installation. This in turn provides an additional contribution to the overall pressure drop calculation required for bent tube meters.

Integral pressure compensation reduces the pressure effect. Unlike bent tube meters, the Coriolis Plus CFS400A straight tube design is not susceptible to the Bourdon effect. Circumferentially mounted strain gauges on the measuring tubes of the CFS400A compensate for hoop stress, making the meter less sensitive to changes in the process pressure. In addition, where bent tube designs require elevated pipework there will be an increase in pipeline.



Features

- HART®, Modbus, Foundation Fieldbus, Profibus PA/DP
- Entrained Gas Control, Gas Volume Fraction (GVF) from 0 to 100%
- Exotic Wetted Materials: Hastelloy, Titanium, Tantalum and Duplex Stainless Steel
- Standard Secondary Pressure Containment
- Low-pressure Drop
- Custody Transfer Approvals: NTEP, MC, OIML, MID
- Diagnostics in accordance with NAMUR NE 107 requirements
- Calibrated at 3 temperatures to optimize compensation for temperature



Superior electronics performance

Coriolis Mass Flowmeter, CF34A Transmitter

The CFT34A Coriolis mass flow transmitter is perfect for all precision measurements, offering high performance when entrained gas is present and providing continuous measurement with gas entrainment from 0-100%. It also offers excellent zero-level stability and state-of-the-art density measurement.

Compatible with the complete range of Schneider Electric Coriolis mass flowmeters, the CFT34A features push button and optical keys in its standard configuration.

The CFT34A is available in integral or remote mount design with unparalleled measurement stability which provides unrivalled density measurement. The premium diagnostics provide continuous condition-based monitoring.

The CFT34A transmitter is available with various hazardous area approvals and custody transfer approvals.





Features

- Transmitter for CFS300A, CFS400A, CFS600A CFS700A
- Accuracy up to $\pm 0.05\%$
- Remote version up to 20 m (66 ft)
- Multiple output options
- Communication Protocols: HART 7, Foundation Fieldbus, Modbus, (Profibus PA/DP)
- High level diagnostics according to NAMUR NE107
- Measurement of mass flow, total mass, temperature, density, volume flow, total volume, velocity, flow direction, Brix, Baume, NaOH, Plato, API, mass concentration and volume concentration
- Available languages: English, German, French, Danish, Spanish, Italian, Dutch, Polish, Portuguese, Swedish, Turkish and Norwegian
- Advanced measurement capability and stability
- Entrained gas control meter maintains operation over a wide range of gas fractions and complex flow conditions
- No start-up issues with air entrainment
- Multiple flow tubes in the same line possible without crosstalk issues
- Die-cast aluminum or stainless steel IP66/67 housing with 100...230 VAC or 24 VDC
- Hazardous area, custody transfer and SIL 2/3 approvals (Q1, 2022)

Sensor and sensor electronics diagnostics:

- Sensor signal integrity
- Sensor and drive coils diagnostics
- Measurement channels check comparison of internal signals with references
- Drive circuit integrity
- Process temperature
- CPU diagnostics
- Process temperature circuit monitoring
- Internal data integrity check
- Redundant calibration

Diagnostics for transmitter and I/Os:

- Data bus monitoring
- Current output connections
- Current readback with redundant calibration
- Factory calibration integrity
- Electronics temperature
- CPU diagnostics
- Voltage monitoring



Stable and continuous operation

Repeatable 2-phase flow measurement

If measurement of your mass flowmeter is interrupted because of gas entrainment in the medium, consider using Schneider Electric Coriolis mass flowmeters instead. Should your process have unwanted entrained gas, or if you need air inside your product, our Coriolis mass flowmeters provide stable and continued operation across a wide range of gas fractions and complex flow conditions.

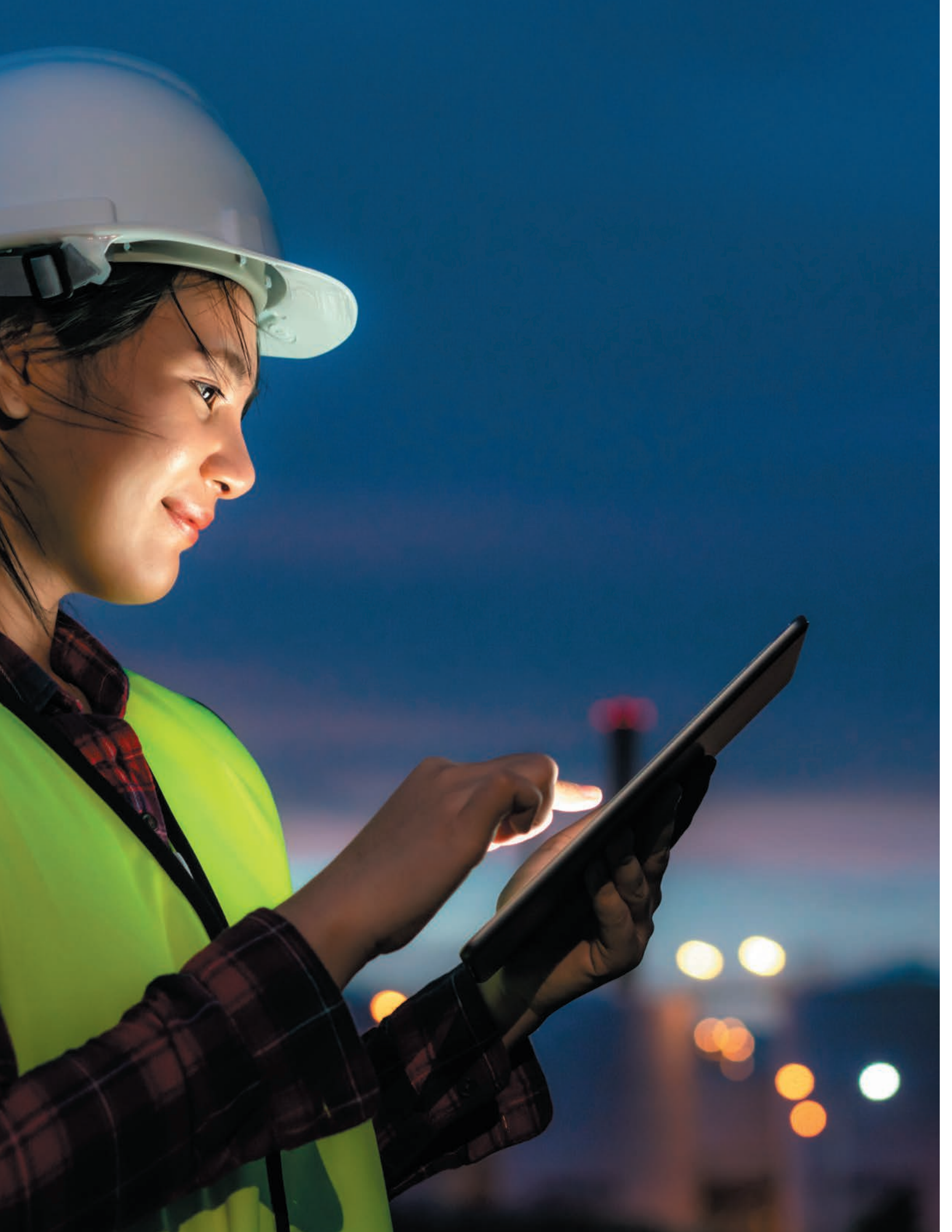
Schneider Electric's 2-phase flow functionality offer a solution for flow conditions at a gas volume fraction (GVF) from 0 to 100%:

How it works

Regular oscillation of the tubes in the Coriolis mass flowmeter is desired. Air entrained in the liquid dampens this regular oscillation of the flow measuring tubes. As the air content rises, the oscillation can come to a complete stop. Powerful control algorithms overcome this challenge allowing the meter to maintain oscillation and continue to measure even during a complete transition from a 100% liquid phase to a 100% gas phase — Schneider Electric's Coriolis mass flowmeter will continuously measure.

The Coriolis flowmeter can measure both the mass flow and density of any fluid, whether it has entrained air or not. Mass flow measurement of single-phase fluids (i.e. no entrained air is present) is common practice but for traditional mass flowmeters it becomes challenging with entrained gas. In many applications where entrained gas is present, Schneider Electric's Coriolis mass flowmeters show excellent accuracy and repeatability for process control, batching, loading, offloading, and transfer measurement.









- Applications with entrained gas can simply be resolved
- Enhanced diagnostics with 2-phase signal
- Diagnostics in accordance with NAMUR NE
- 107 requirements
- Uninterrupted measurement with 0 to 100% gas entrainment



Increased performance, efficiency and reliability

Schneider Electric's Coriolis Series offers increased performance with the highest operational efficiency and reliability in the industry. The CFT34A is the Coriolis transmitter for use with these flow tubes and is available in an integral/compact configuration or remote/field version.

Industries and applications

				
Model	CFS300A	CFS400A	CFS700A	CFS600A
Description	Dual-straight tube with optimized flow splitter, for general purpose applications and process control.	Quad or dual-straight tube with internal pressure compensation, for large capacity and custody transfer.	Single straight tube without flow splitter for lowest pressure drop, for advanced applications and harsh environments.	Twin bent tube with optimized flow splitter, for high-performance and Extreme temperatures.
Industries	<ul style="list-style-type: none"> General Industry Energy Petrochemical Food & Beverage Paper 	<ul style="list-style-type: none"> Oil and Gas Petrochemical Power Chemical Food & Beverage 	<ul style="list-style-type: none"> Petrochemical Chemical Pharmaceutical Pulp & Paper Mining, Minerals & Metals 	<ul style="list-style-type: none"> Petrochemical Chemical Oil & Gas Food & Beverage Pharmaceutical Energy Water & Wastewater
Applications	<ul style="list-style-type: none"> Mixing, batching, dosing Fuel consumption Concentration measurement in soft drinks Truck/tanker offloading Gas measurement Alcohol measurement Process control Sanitary, CIP/SIP 	<ul style="list-style-type: none"> Custody transfer of hydrocarbons Replacement for PD or turbine meters Measurement skids Alternative to ultrasonic Railroad car unloading 	<ul style="list-style-type: none"> Batching Corrosive fluids Slurries with abrasive solids Custody transfer Concentration measurements requiring hygienic approvals 	<ul style="list-style-type: none"> Gas measurement Fuel oil consumption LNG transfer Custody transfer Concentration measurement
Mass flow Accuracy	Liquid: $\pm 0.15\%$ Gas: 0.5% Density: $\pm 2 \text{ kg/m}^3$ (On site $\pm 0.5 \text{ kg/m}^3$)	Liquid: $\pm 0.10\%$ (opt. $\pm 0.05\%$) Gas: $\pm 0.35\%$ Density: $\pm 1 \text{ kg/m}^3$ ($\pm 0.2 \text{ kg/m}^3$)	Liquid: $\pm 0.1\%$ Gas: $\pm 0.35\%$ Density: $\pm 1 \text{ Kg/m}^3$ (On site $\pm 0.2 \text{ kg/m}^3$)	Liquid: $\pm 0.1\%$ Flat (opt. $\pm 0.05\%$) Gas: $\pm 0.35\%$ Density: $\pm 1 \text{ Kg/m}^3$ (On site $\pm 0.2 \text{ kg/m}^3$)
End Connections Line Sizes	1/2"(DN15) to 4"(DN100)	4"(DN100) to 16"(DN400)	1/2"(DN10) to 4"(DN100)	1/2"(DN15) to 8"(DN200)
Specifications	Refer to PSS 1-2B8B	Refer to PSS 1-2B8C	Refer to PSS 1-2B8D	Refer to PSS 1-2B8E
Coriolis Flow Transmitter				
Model	CFT34A	CFT34A	CFT34A	CFT34A



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