

# SITRANS F X

Vortex flowmeter

The optimum measurement device  
for steam, gases and liquids



## SITRANS F

Answers for industry.

**SIEMENS**

# Totally integrated solutions from a single supplier



## Industry segments:

- Chemical
- HVAC/Power
- Food & Beverage
- Pharma
- Oil & Gas

In a highly competitive marketplace where customers, shareholders and legislators increasingly focus on cost efficiency, financial strength and environmental awareness, being in control of your processes and resources is more important than ever.

Siemens has reached a world-leading position as a totally integrated and scalable solutions provider. This is based on strategic business insight, market knowledge and technological excellence across a wide range of industries. We integrate this knowledge into our products, enabling you to trust us to deliver solutions tailor-made to fit your business.

We aim to create reliable, precise and flexible solutions where integration is essential and in focus. We have no ambition to obstruct your existing processes.








The SITRANS F X vortex flowmeter is a superior metering solution that offers new levels of precision in measuring the flow of

steam, gases and liquids by combining a pressure and temperature sensor in one unit. Technologically superior to traditional flowmeters, a compelling combination of features places SITRANS F X vortex flowmeters in a league of their own. The meters' versatility means that they can be used with positive effect in a broad range of industries.

## Why choose the SITRANS F X vortex flowmeter?

Knowing how much steam, gas or liquid passes through your system or industrial plant is one of several complex factors that can have a major impact on your business. Unnecessary costs, material waste and lack of precision translate directly to your bottom line. Precise metering using durable, reliable and cost-efficient flowmeters helps ensure that you remain competitive.

# Technical specifications

							
	Flange version Single conv.	Flange version Single conv.	Flange version Single conv.	Flange version Dual conv.	Sandwich vers. Single conv.	Sandwich vers. Single conv.	Sandwich vers. Single conv.
MEASURING METHOD							
Volumetric	●	●	●	●	●	●	●
Mass flow	●	●	●	●	●	●	●
SPECIFICATIONS							
Display	2 lines, 10 characters per line						
Keypad	●	●	●	●	●	●	●
Connection	DN15 - 300 (½" - 12") EN 1092-1; ASME				DN15 - 100 (½" - 4") EN 1092-1; ASME		
Pressure rating	PN 10 - PN 100		Class 150 - 600		PN 16 - PN 100 Class 150 - 600		
Material sensor	Stainless Steel 1.4404 (316L) / 1.4435 (316L) / FPM or FFKM: Hastelloy C22 (on request)						
Material transmitter	Aluminium						
Flow rate liquid	0.45 - 1600 m³/h				0.45 - 186 m³/h		
Flow rate air	6.8 - 18370 m³/h				6.8 - 2125 m³/h		
Flow rate steam	5.25 - 126775 kg/h				5.25 - 16665 kg/h		
Accuracy	Steam and gases: +/- 1% Liquids: +/- 0.75%						
Medium temp.	-40 °C - 240 °C ( -40 °F - 464 °F)						
Enclosure rating	IP 66 / 67						
Temperature sensor	●	●	●	●	●	●	●
Pressure sensor		●	●			●	●
Isolation valve			●				●
Temperature compensations	For saturated steam is integrated as standard						
Temperature and pressure compensation		For steam, gases, wet gases and gas mixtures				For steam, gases, wet gases and gas mixtures	
Current output	4...20 mA						
Pulse output	Pulse frequency max. 0.5 Hz						
Digital output	HART®						
Approvals	ATEX II 2G EEx d ia [ia] IIC T6 and FM Class I, II, III Div. 1 & 2						
Power supply non Ex-Version	14...36 V DC						
Power supply Ex-Version	14...28 V DC						

## Features and advantages:

- 2-wire device with integrated pressure and temperature sensors
- Easy to mount – 'plug and play'
- Accurate and reliable metering: measures operating, normal volumetric and mass flow of steam, gases, conductive and non-conductive liquids, even in fluctuating temperatures and pressures
- Fully-welded sensor design without internal gaskets, makes SITRANS F X the safest vortex flowmeter available
- Easy communication (HART®)
- Excellent long-term stability due to rugged design
- The SITRANS F X bluff body obstructs flow considerably less than an orifice plate meter, resulting in significantly lower pressure drop and energy consumption
- Optimum process reliability, thanks to Intelligent Signal Processing (ISP), enables stable readings, free from external perturbations
- Maintenance-free sensor design
- Online sizing programme appropriate for a large range of media
- Available in multiple software languages: English, German, French

# Stay ahead with superior metering



## How does vortex technology work?

A vortex flowmeter measures process flow by detecting the frequency at which alternating vortices are shed from a bluff body, which is hit by the medium.

The vortices create a differential force across a sensor wing, flexing it at a frequency proportional to a flow rate that is measured by the meter.

The movement of the oscillating wing is transmitted to the SITRANS F X electronics by a dual piezoelectric crystal sensor mounted in the wing.

## All-in-one solution

Designed for applications that require reliable flow measurements independent of conductivity, viscosity, temperature, density and pressure, SITRANS F X vortex flowmeters offer new levels of flexibility and user-friendliness in an efficient and cost-effective package.

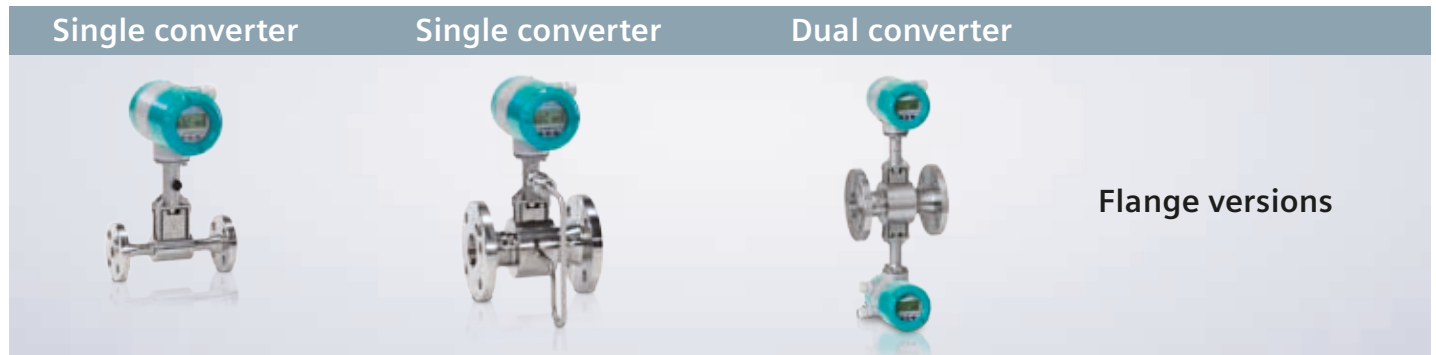
Easy to mount and integrate, this metering solution is the ideal choice for a wide range of applications:

- Steam and saturated steam measurement
- Burner consumption measurement
- Boiler monitoring
- Control of compressor output
- Consumption measurement in compressed air systems
- Measurement of industrial gases
- SIP and CIP processes in the food & beverage and pharmaceutical industries



# Product overview

## SITRANS FX300 - Volumetric and Mass flow



A compact flowmeter in a flange version, suitable for universal use in measuring steam, gases and liquids. The temperature compensation for saturated steam is integrated as standard, enabling direct density compensations.

This flowmeter has a pressure sensor integrated and an isolation valve as an additional option. The advantages of this unique design include no additional cost-intensive installation of sensors, no additional cabling work, no faulty measurement results and a direct measurement of mass and/or energy.

This is a genuine redundant system with two independent sensors and two converters, which provides twofold functional measurement: reliability and availability. This variant is optimally suited for measurements in multi-product pipelines.



This sandwich flowmeter is suitable for universal use in the measurement of steam, gases and liquids. It is provided with additional optimised centring rings and can be centrally aligned by turning the centring rings, eliminating any offset between the vortex flowmeter and the pipeline.

As an option, the vortex flowmeter can be supplied with a shut-off valve (both for flange and sandwich versions) allowing the pressure sensor to be exchanged without interrupting the process and allowing pressure and leak testing of the pipeline. Moreover, calibration can take place at a later stage.



# Durable and precise solutions for the Chemical industry



## SITRANS F X vortex flowmeters offer features ideal for the chemical industry:

- 2-wire device with integrated pressure and temperature sensors
- Redundant measurement system with independent sensors and transmitters which is ideal when adding steam into the process and a double measurement is needed
- Self-diagnostics providing the user with information about the installation when starting up
- Easy to maintain: flow- / temperature sensor, pressure sensor and electronics can be changed without demounting the device from the process line
- Meets NAMUR NE 43 requirements
- ATEX and FM approvals, securing safe installations in hazardous zones
- Material: Stainless steel or Hastelloy C22

No two chemicals are the same, and efficient production depends on metering solutions that combine precision, flexibility and safety.

As technologies evolve, production and process efficiency increases. For this reason, selecting the best metering solution for your valuable raw materials and expensive equipment can have a big impact on profits. As a proven world leader within process automation and optimisation, Siemens has the industry insight and strategic perspective to help you make the most of your investment.

SITRANS F X vortex flowmeters feature a measuring accuracy of 1 % for steam and gas applications and 0.75 % for liquids and can be easily integrated so you can immediately feel the difference.

# Efficient metering for HVAC and Power plants



The SITRANS F X vortex family of flowmeters can provide both energy and cost savings while improving overall system efficiency. Because it is equally good at measuring the flow of several different media, the vortex principle is an ideal and flexible solution in HVAC systems.

Reliable metering and an easy-to-use interface, which uses HART® to communicate perfectly with existing monitoring systems, are two central features in the combined flowmeter and sensor solution. Vortex technology is one of the few methods currently available that can measure the flow of steam and easily cope with several applications.

As energy prices soar, the heating, ventilation and air-conditioning markets are under increasing pressure to reduce energy costs and increase energy efficiency.

This is why you need a flowmeter that can help you monitor flow. An efficient flowmeter helps optimise your system and reduce its energy consumption without having a negative effect on the desired temperature or ambient conditions.

## Simplicity of design for lower maintenance and enhanced lifespan

- Calculation of energy enhances cost efficiency
- 2-wire device with integrated pressure and temperature sensors enables the elimination of cables; in addition, the billing of steam is enhanced
- Maintenance-free sensor design due to high resistance without moving parts
- Inline check and calibration of pressure sensor due to isolation valve

## Industry applications:

- Air flow
- Heating
- Cooling
- Chilling

# Catering for the tastes of Food & Beverage and Pharma

## Industry applications:

- Pharmaceutica
- Sugar refineries
- Dairies
- Breweries
- Soft drink production



## SITRANS F X vortex flowmeter's rugged design gives you a competitive edge that makes a difference to your bottom line

- Easy to install and integrate
- Fully-welded sensor design providing excellent resistance against hammer effects
- Easy sensor alignment with centring rings for the sandwich versions, ensuring centring of the product, provides a full flow to run through the pipes
- No moving parts, designed in a way that reduces the risk of food contamination

As consumer tastes change, so do the demands consumers place on what they eat and drink. In a constantly changing market, food & beverage and pharmaceutical companies must be able to adapt their production setup quickly and safely to cater for new market trends.

Cost-efficiency is a key competitive parameter for the many companies that are constantly battling in the marketplace. The tough competition forces them to find new ways of making their production more efficient and getting their products onto the shelves without unnecessary delay. This means that all aspects of production

are closely scrutinised to find ways to save energy, reduce waste and maintain a consistently high level of quality while maximising profits.

As a result, plant automation is an all-important factor in keeping costs and waste as low as possible without sacrificing production flexibility.

By integrating a SITRANS F X vortex flowmeter into your production setup, you are investing in a solution that offers the potential of significant bottom line advantages without sacrificing food safety or quality.



# Oil & Gas solutions for harsh applications



Extracting oil and gas from deep below the surface of the earth is a costly process that consumes large amounts of time and energy. In order to compete in the global heating market, the ability to accurately monitor the flow of valuable natural resources is crucial.

In such conditions, a versatile and reliable flowmeter like the SITRANS F X vortex meter is a valuable addition to your processes. Featuring a stainless steel, wear-resistant design that reduces the risk of damage to the bluff body, the meter offers reliable and maintenance free operation in environments characterised by high pressure, temperature and corrosion.

Intelligent Signal Processing (ISP) enables the system to first analyse the measurement signal and then filter out all frequencies other than the vortex signal. This guarantees precise and reliable metering, even in the harshest conditions.

SITRANS F X vortex flowmeters have been designed to be rugged, reliable and durable: ideal features for an industry that works under adverse conditions, varying temperatures and pressures.

## Designed to meet the needs of the toughest work environments

- Resistant sensor - designed to be rugged, reliable and durable, making it resistant to possible hammer effects
- Low pressure loss makes it more cost efficient
- Reliability due to ISP makes the vortex flowmeter resistant to external vibrations
- HART® communication
- Redundant measurement system, with two independent sensors and transmitters, which is ideal if the process cannot be interrupted
- ATEX and FM approvals, securing safe installations in hazardous zones

## Industry applications:

- Replacing orifice for gas flow
- Oil flow or crude

## Get more information

[www.siemens.com/processautomation](http://www.siemens.com/processautomation)  
[www.siemens.com/processinstrumentation](http://www.siemens.com/processinstrumentation)

Siemens Flow Instruments A/S  
DK-6430 NORDBORG  
DENMARK

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