SIFLOW FC070

Coriolis mass flow transmitter
As easy to install as playing a CD

siflow FC070

SIEMENS

Whatever your flow metering application, there is only one transmitter you will ever need

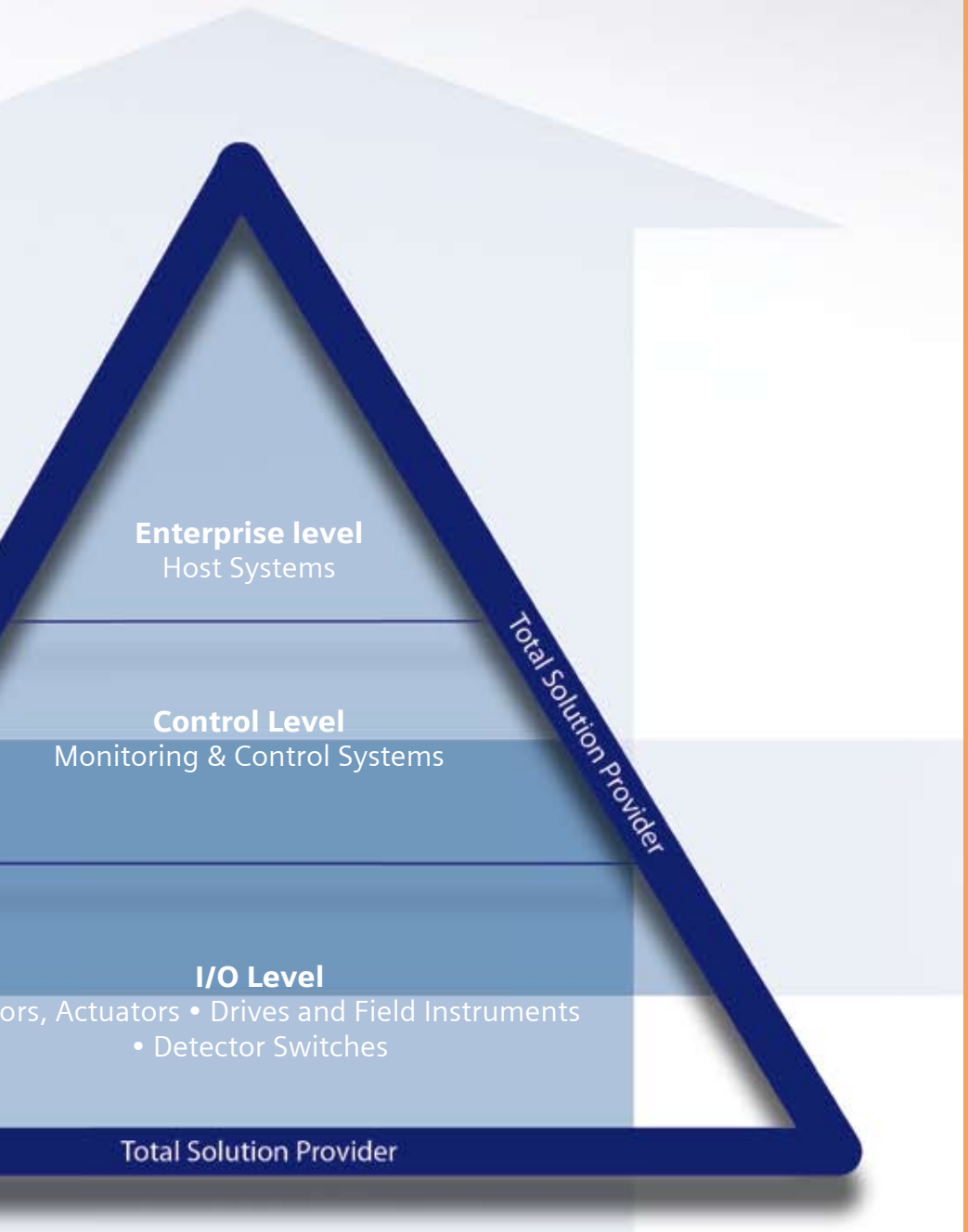
SIFLOW FC070 coriolis mass flow transmitter takes the advantages of the coriolis measuring principle into the SIMATIC world, enabling seamless integration and state-of-the-art performance. SIFLOW FC070 covers the full repertoire within all industries and applications.

- Direct integration into SIMATIC S7 automation system
- Standardised user interface – SIMATIC Manager, PCS7 and SIMATIC PDM
- Compatible with the complete range of SITRANS F C coriolis sensors

SIFLOW FC070 is the most compact, space-saving and versatile flow transmitter we have ever designed. Based on the coriolis measuring principle, it measures mass flow, volume flow, density, temperature and fraction, and offers technological functions such as totalisers and advanced batch. The unit can accurately measure all kinds of liquid and gas, conductive or non-conductive, and can be applied to all applications in the process industry, ensuring cost-effective, seamless flow integration.

Total Solution Provider

Sens



Integration

Choosing Siemens means

Your Total Solution Provider
Siemens is the market leader in total solutions for process automation and instrumentation. More than merely a supplier, Siemens is integrated into the value chain, providing services from engineering to commissioning or service, locally or worldwide.

TIA – Totally Integrated Automation
Thanks to a common program environment, database and open communication systems, our products, systems and solutions can be totally integrated into any industry sector. Siemens TIA solutions are scalable, engineered for upgrade from stand-alone to automated system on demand.

The power of a single partner
Standardized concepts across technology and business areas make it easy to exploit Siemens synergies to the full, for any size or complexity of task.

Future-proof product range
Continual innovation and technological leadership ensure future-proof automation and instrumentation systems.

Flexibility
Our breadth of technologies means we are always able to offer the best combination or adaptation of sensor and transmitter, for any application in virtually any industry.

Accuracy
We test and calibrate all flowmeters in our own EN 45001-approved laboratories. Our meters meet or exceed international OIML standards, ensuring long-term accuracy – and traceability back to international norms.

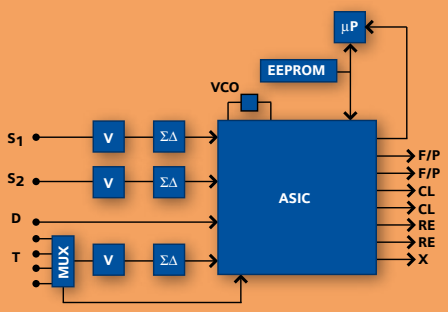
Covering the full repertoire within all industries and applications

Ultra compact
Cost-effective and space-saving design captured in a 40 mm S7-300 enclosure

SIFLOW FC070 at a glance ...

Innovative design

The SIFLOW FC070 transmitter is based on the latest developments within digital processing technology: engineered for high performance, fast flow step response, immunity against process generated noise, easy to install, commission and maintain. Although a totally new design, our well proven SENSORPROM and MASS - ASIC technology is adapted into SIFLOW FC070, ensuring compatibility with the complete range of coriolis sensors.



System integration

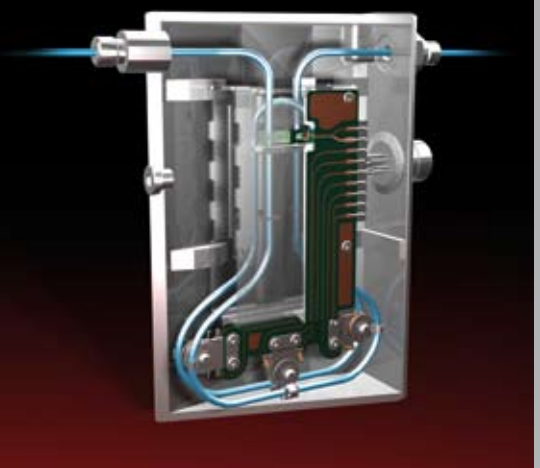
Insert the transmitter in the rack, turn on the power, and flow rate is immediately displayed. Standardized SIMATIC front connector enables installation or replacement within seconds. The SENSORPROM facilitates true plug and play ensuring simple and user-friendly integration, commissioning and maintenance.

- Direct integration into S7-300
- Decentralized in ET 200M for use with S7-300 and S7-400 or third party PLC systems with PROFIBUS DP masters
- MODBUS RTU RS232/485 interface for stand alone operation via MODBUS RTU master or connection to SIMATIC PDM
- Easy programming via standard package offering drivers and faceplates for PCS7, predefined function blocks for Step 7 or standard SIMATIC PDM

Design and approvals

SIFLOW FC070 is available in two versions: the S7-300 enclosure in standard version and the Ex-version, meeting industry's toughest challenges:

- Standard: CE, cULus, ATEX II 3 G EEx nA II T4
- Ex: CE, cULus, ATEX II (1) G [EEx ia] IIC
- Namur NE21 and VDE2650



State-of-the-art technology

Coriolis flowmeters measure mass flow directly, unaffected by changes in fluid density, pressure, viscosity and temperature. This makes them extremely accurate. The pipe is vibrated at its resonant frequency by an electro mechanical driver. The motion at any point on the tube represents a sine wave, and when flow moves through the pipe, the pipe will twist proportionally to the mass flow rate. This is referred to as the "Coriolis Effect".

Ultra compact
Cost-effective and space-saving design captured in a 40 mm S7-300 enclosure.
- Requires 50% less installation space than ordinary transmitters
- Easy installation into control panels
- All wiring accessible from the front

Performance
- High accuracy; ±0.1% of rate and superior repeatability: ±0.05% on mass flow rate
- High performance measurement: 30 Hz update rate on all I/O and Buses

Input/Output
- SIMATIC P-BUS and integrated RS232/485 MODBUS RTU serial communication
- 2 digital outputs: pulse, frequency, quadrature, 2-stage batch
- 1 digital input: start/hold/continue batch, zero-point adjustment, and reset totalisers
- Power supply: 24 V dc

Stand-alone functionality or third-party PLC integration
Although SIFLOW FC070 is a SIMATIC modular designed coriolis transmitter, it also has stand-alone capabilities, enabling it to operate outside a SIMATIC environment, via either:
- built-in digital input and outputs
- communication through the built-in MODBUS RS232/485 interface
- MODBUS interface for PDM and data acquisition
- DP Norm profibus for all third party systems through ET 200M profibus

The innovative line of SIMATIC programmable controllers


S7-300 central


S7-300 remote


S7-400


Stand-alone

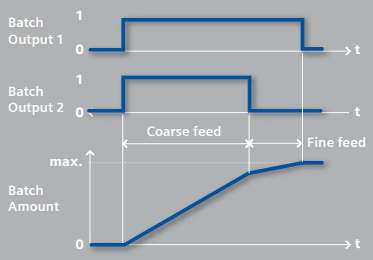
SENSORPROM technology
Ensuring the markets most user-friendly mass flowmeter. Just turn on the power and the actual flow is displayed immediately. The unique SENSORPROM memory unit provides:
- *Factory pre-programming with calibration data, pipe size, sensor type and output settings*
- *Any values or settings changed by the users are stored automatically*
- *Automatically re-programs any new transmitter with full information*
- *Transmitter replacement in less than 5 minutes*

...SIFLOW FC070 at a glance

Built-in technological functions

Built-in technological functions, such as totalisers and advanced batch, reduces the load of central CPUs to maintain full performance. Highly autonomous, SIFLOW FC070 keeps control of the process in the event of a fault in other systems, giving a more cost-effective solution.

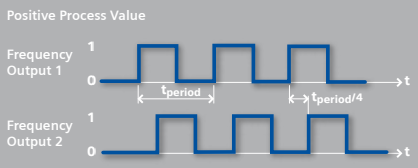
Two stage batch



Two stage batch

Fully autonomous 2-stage batch controller with adaptive compensation ensures high-speed dosing and accuracy in highly dynamic batch applications

Quadrature frequency output



Quadrature frequency output

In applications where redundancy is required, like food & beverage, chemicals, oil and gas, the industry demands accurate billing, reliable data exchange and custody transfer. Digital outputs 1 and 2 can be selected for quadrature frequency output, where the digital outputs are shifted in phase for:

- *Flow direction*
- *Redundancy*
- *Resolution*

Functionality

SIFLOW FC070 coriolis transmitter measures multiple process parameters, and also offers technological functions such as totalisers.

Multi parameters

SIFLOW FC070 is a true multi-parameter transmitter enabling all the features that coriolis mass flow measurement can offer, such as:

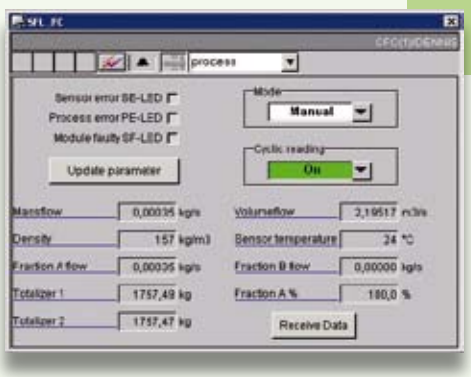
- Mass flow
- Volume flow
- Density
- Temperature
- Fraction
- Totaliser
- Advanced batch handling

Comprehensive diagnostic and message functions

SIFLOW FC070 has a comprehensive set of diagnostics, message and service functions, complying with NAMUR NE43, which can be divided into:

- Sensor errors (SE)
- Process errors (PE)
- Handling errors (HE)
- Status information

SIFLOW FC070 utilizes the comprehensive set of diagnostic and process alarm methods of SIMATIC S7 and PCS7, thereby offering a standardised interface for diagnostics and messages. Third-party Profibus or MODBUS and stand-alone system diagnostics and messages are equally available. Sensor errors (SE) and process errors (PE) are indicated with LEDs on the front of the SIFLOW FC070.



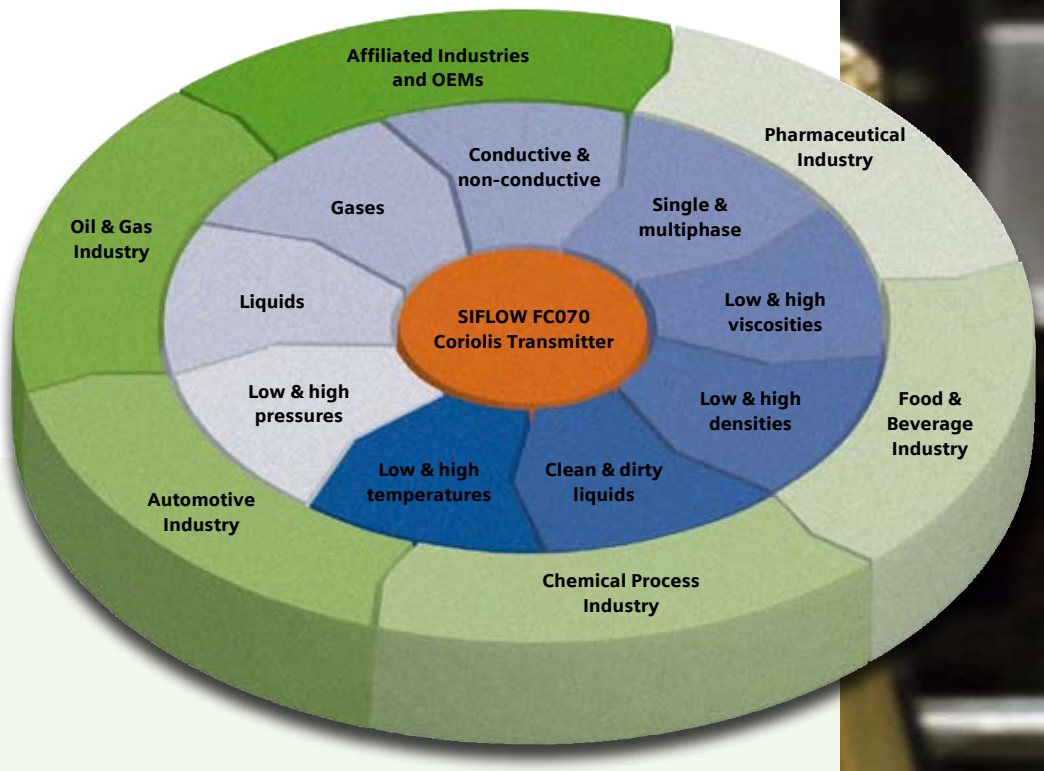
PCS7 display showing SIFLOW FC070 process values

Suitable for any industry and application

SIFLOW FC070 generates a unique synergy across application and industry segments, adding a new dimension to the Totally Integrated Automation concept with its seamless integration into the automation system.

SITRANS F C Coriolis meters are application independent – meaning they can measure all liquid and gaseous media. The ability of this single technology to solve multiple flow application tasks considerably reduces the time and cost of flowmeter planning, selection, sizing and installation.
Its remarkable versatility makes SIFLOW FC070 relevant and attractive to most industries, regardless of their business sector.

One flow meter is all you will ever need.



Optimum protection - Chemical Process Industry

SIFLOW FC070 is designed to meet the chemical industry's toughest challenges, offering an exceptional sensor and transmitter safety concept facilitation ATEX and cUL. It copes with the most demanding process conditions, from mini-plants to full scale production plants, delivering accurate and reliable performance within:

- Multi-parameter process information and monitoring
- Bulk loading of chemicals
- Blending and dosing additives and catalysts
- Measurement of highly-aggressive, non-conductive chemicals

Your benefits

- Markets best intrinsically safe sensor and transmitter interface, category ia IIC
- Sophisticated self diagnosis
- Plug-and-play sensor and transmitter concept
- Choice of corrosion resistant sensor materials

Reliable Solutions – Oil & Gas Industry

SIFLOW FC070 provides reliable, precision measurements for on/off-shore oil and gas production optimisation and product storage, including:

- Off-shore pipeline inhibitor dosing
- Multi-product interface detection (oil/gas separation)
- Terminal loading and off-loading
- Measurement of natural gas and fluids
- Conditioning and safety monitoring of density and empty-pipe conditions

Your benefits

- No moving parts means maintenance-free operation
- Low pressure loss due to sensor design
- Multi-parameter measurement
- Straightforward calibration and traceability on liquids as well as gases
- Sensor range covers most applications (DI 1.5 to DN 150)

Precision measurement – Pharma and Food & Beverage Industries

SIFLOW FC070 efficiently manages flow processes in the Pharma and Food & Beverage Industries. In addition to mass and volume flow rate, it measures fraction flow, °Balling, °Baume, °Brix, density and temperature with unparalleled accuracy and reliability, improving process management applied to typical SIMATIC applications, such as:

- Fast filling, batch control and continuous in-line blending
- Carbonating and bottling (liquids as well as CO_2 gases)
- Quality monitoring and control of medical gases
- Coating of foodstuffs and pills

Your benefits

- Seamless integration in typical OEM applications running on SIMATIC
- Sensors have high level of chemical corrosion resistance, suitable for CIP and SIP cleaning
- Impervious to temperature shocks (steam cleaning)
- 1-pipe design providing high safety/hygiene
- High speed (<1 sec.) advanced batch controller

Superior performance in affiliated industries and OEM solutions

SIFLOW FC070 provides the versatility and performance needed to meet the high demands of a wide variety of applications and affiliated industries. The continuous development of new, low-flow coriolis mass flow meters is achieved in close cooperation with our customers, expanding application abilities within areas such as:

- Fuel injection nozzle testing within the automotive industry
- Refrigerant charging for compressors and air conditioning
- High accuracy gas measurement: N_2, O_2, Ar, H_2 and ethylene
- Engine consumption and conditioning measurement (flow, temperature and density)

Your benefits

- Seamless mechanical and electrical integration thanks to SIFLOW's plug-and-play functionality
- Compact, space-saving transmitter and sensor design
- Unsurpassed performance in accuracy, turn down range and step response
- Full SIMATIC integration, as well as stand-alone installation simplify the scope of OEM standardisation

Small-sized sensors

Medium-sized sensors

Large-sized sensors

SIFLOW FC070 is compatible with the complete SITRANS F C sensor range

Small-sized sensors
SITRANS F C MASS 2100 and SITRANS FC300

Small-sized sensors are the preferred meters for research and development and mini-plant applications for liquid or gas measurement, where measuring small quantities is important.

- Sensor construction is intrinsically safe to Ex ia IIC
- Plug-and-play installation and commissioning in under 10 minutes

Medium-sized sensors
SITRANS F C MASS 2100

Medium-sized coriolis flow meters are used in applications ranging from straightforward to demanding tasks in harsh environments.

- Extremely robust sensor design, intrinsically safe to Ex ia IIC, including the largest pipe wall thickness on the market, facilitating excellent resistance to corrosive and abrasive liquids
- Minimum pressure loss due to a large internal diameter throughout the entire meter ensures a perfect match between flow capacity and accuracy

Large-sized sensors
SITRANS F C MC1

In the large-size category, the MC1 offers an ideal balance between size, maximum flow capacity and ease of installation. Parallel pipe construction facilitates:

- Space saving, sturdy design
- Impervious to pipeline stresses and vibrations
- Self-draining in both horizontal and vertical positions
- Optimally-orientated inductive sensors generate large signal amplitudes

SITRANS F C MASS 2100 and SITRANS FC300		MASS 2100 DI 1.5 (1/16")	SITRANS FC300 (1/6")
Measuring range	kg/h (lb/h)	65 (143)	350 (772)
Pressure 316L	Bar (psi)	230 (3336)	130 (1885)
Pressure C-22	Bar (psi)	365 (5294)	410 (5945)
Pipe material		1.4435 (316L) Stainless steel or Hastelloy C-22	
Pipe design		1-pipe system	

SITRANS F C MASS 2100		DI 3 /(1/8")	DI 6 (1/4")	DI 15 (1/2")	DI 25 (1")	DI 40 (1 1/2")
Measuring range	kg/h	250	1,000	5,600	25,000	52,000
Measuring range	lb/h	550	2,200	12,345	55,100	114,600
Pressure 316L	Bar (psi)	230 (3336)	265 (3844)	130 (1885)	110 (1595)	105 (1523)
Pressure C-22	Bar (psi)	350 (5076)	410 (5946)	200 (2900)	185 (2683)	Not available
Pipe material		1.4435 (316L) Stainless steel or Hastelloy C-22				
Pipe design		1-pipe system				
SITRANS F C MC1		**DN 50 (2")**	**DN 65 (2.5")**	**DN 80 (3")**	**DN 100 (4")**	**DN 150 (6")**
Measuring range	kg/h	42,600	87,000	113,400	192,000	510,000
Measuring range	lb/h	93,900	191,800	250,000	423,300	1,125 k
Pressure 316Ti or C-4	Bar (psi)	100 (1450)	100 (1450)	100 (1450)	40 (580)	40 (580)
Pipe material		1.4571 (316 Ti) Stainless steel or Hastelloy C-4				
Pipe design		2-pipe system				

Five-step integration: as easy as it gets

Insert the transmitter into the rack, turn on the power, and flow rate is immediately displayed. The standardised SIMATIC front connector enables installation or replacement within seconds. The SENSORPROM facilitates true plug-and-play functionality.

1. The components of a complete coriolis mass flow meter system
2. Insert the SENSORPROM
3. Snap-in SIFLOW FC070 to the SIMATIC rail
4. Connect the sensor to the transmitter
5. Turn on power and the system is ready to operate


1


2


3


4


5

As easy to install as playing a CD

Your Siemens partner worldwide

Find a Siemens contact in your area at:
www.siemens.com/processinstrumentation

For additional information, visit:
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