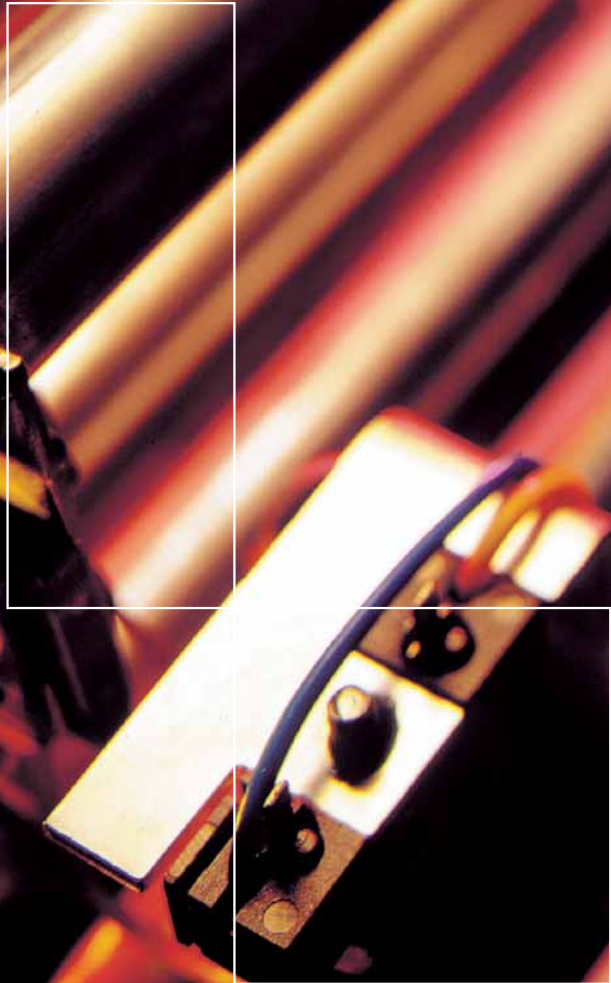


SITRANS F C MASSFLO
Flow metering based on
coriolis technology



sitrans f MASSFLO



SIEMENS



Advanced technology for increased accuracy and profitability in the Value Chain

What's right for you?

Choosing the right flowmeter for the right application can dramatically improve your operations... and improve your bottom line.

We provide industry specific solutions for:

- **Chemical**
- **Food & Beverage**
- **Pharmaceutical**
- **Oil & Gas**
- **General Process Industries**
- **Low Flow Applications**

Siemens offers a complete line of highly accurate, coriolis mass flowmeters

SITRANS F C MASSFLO meters will help you do an easier job of managing flow. Whether it is in installation, managing operations, or verifying continuous accuracy, customers rely on Siemens flowmeters to improve the entire value chain of activities.

Thanks to their accuracy, they deliver precise information about liquids or gases passing through a pipe for dosing, product blending, determining billing or cost and other vital functions.

Stressing safety, reliability and quality we have utilized advanced technology to achieve unsurpassed operational performance.

SITRANS F C MASSFLO flowmeters are among the best selling flowmeters today:

- High accuracy – 0.10% of mass flow rate ensures maximum quality and reduced waste
- Multi-parameter measurement for mass flow rate, volumetric flow rate, density, fraction flow and temperature

- Measurements are unaffected by variations in pressure, temperature, density, electrical conductivity and viscosity
- Using SENSORPROM technology each flowmeter is factory calibrated before shipment
- Maintenance free: no moving parts
- Flexible and unsurpassed integration with USM II communication platform





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 contains calibration data and user settings, and automatically programmes the SITRANS F C MASSFLO meter during power up. It provides:

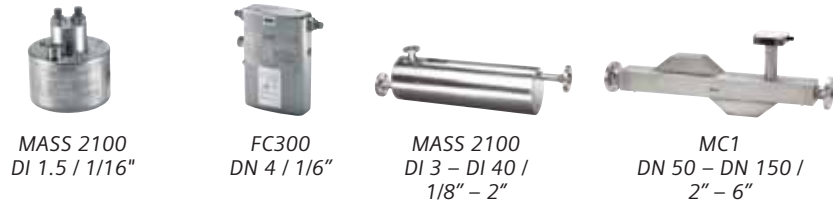
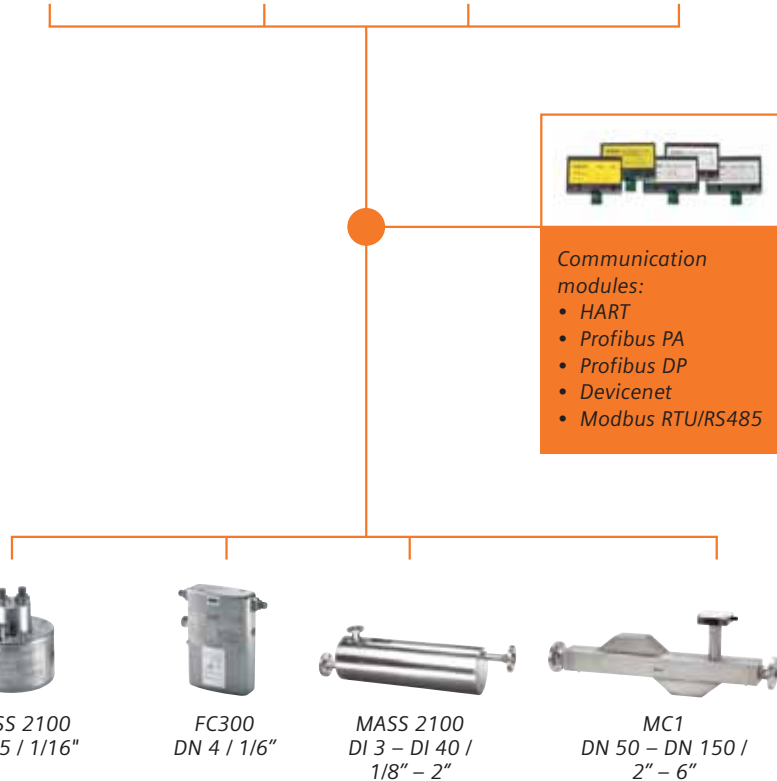
- Factory pre-programming with calibration data, pipe size, sensor type and output settings.
- Any values or settings changed by the users are stored automatically
- Automatically re-programmes any new transmitter with full information
- Transmitter replacement in less than 5 minutes



Communication Modules
 "Plug & Play" Communication Modules provide modularity on a new level. The USM II (Universal Signal Module) makes flowmeter networking installation and configuration easy. Its modularity makes it future proof and compatible with virtually every communication standard.

One Platform. Infinite Solutions

Thanks to Siemens philosophy of modular design, we are making it easy to buy the coriolis mass flowmeter solutions and services you need.



Siemens modularity creates competitiveness

A standardised interface allows modularity between our sensors and transmitters.

Among its benefits are a streamlined product range, simplified ordering procedure, flexible logistic handling and quick reaction to changing customer demands.





Control room

Totally Integrated Automation

Gain full performance in the Value Chain

Totally Integrated Automation Solutions – only from Siemens

With its Totally Integrated Automation (TIA) strategy, Siemens is in a class of its own as the sole provider of a common solutions platform for all industries. Designed for the individual customer demands, TIA enables the realization of industry specific automation solutions that significantly increase production while also offering sound investment security. These solutions are designed to ideally support companies in optimizing their plant, system and process flows.

Best of all, Siemens TIA solutions are completely scalable.

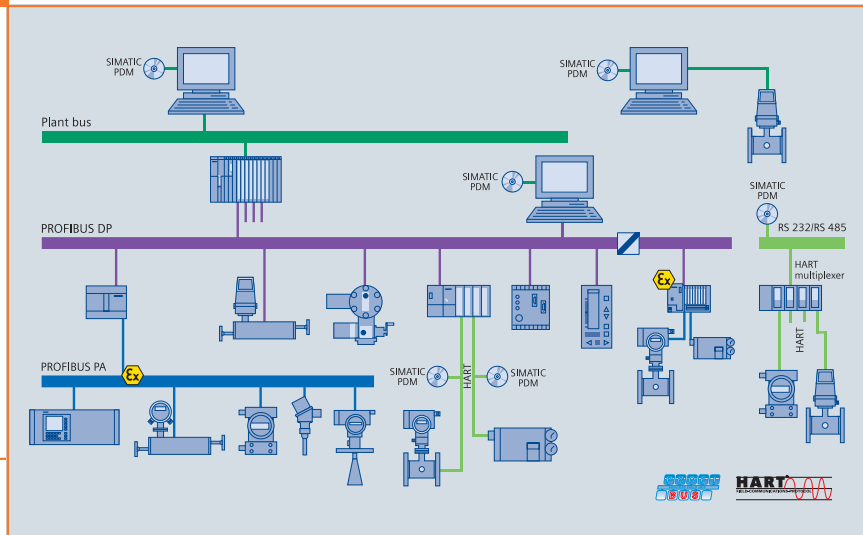
You can start with a stand-alone installation today, secure in the knowledge that you can always integrate your system tomorrow.

- Confirm flowmeters are operating optimally and are properly utilized
- Reduce downtime through predictive maintenance programs
- Access real-time flow data
- Generate the highest yield by driving down waste and costs
- SIMATIC PDM software tool for the operation, configuration, parameterization, maintenance and diagnosis of intelligent field instruments based on the world-wide leading EDDL standard



Combine and integrate with Totally Integrated Automation

Control level/Field level



SIMATIC PDM allows a wide variety of process devices to be configured using one software system and one uniform graphical user interface.

Transmitters with greater flexibility and high performance

With MASS 6000 - enhanced signal processing transmitter, Siemens has pushed development of the coriolis technology a giant leap forward. The SITRANS F C transmitters are designed for high performance, easy operation and reduced maintenance.

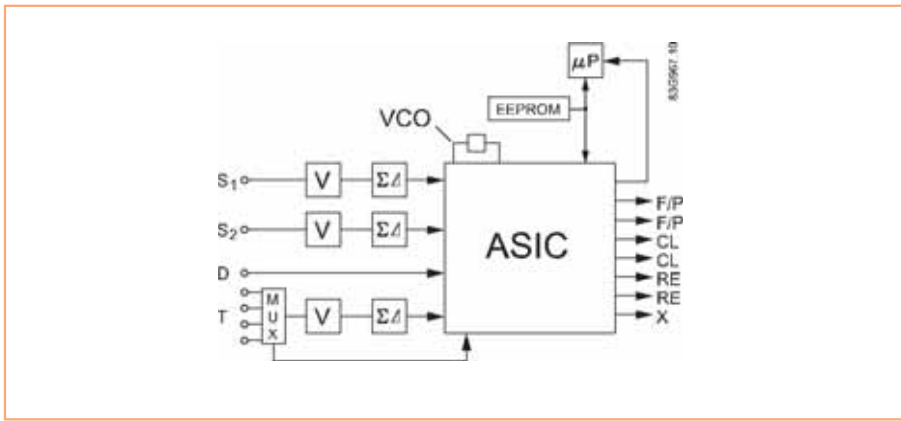
The flexible concept offers a transmitter solution for almost any

application. Multiple I/O is available as standard, and a wide selection of add-on communication modules can be selected, installed and delivered directly from the factory or installed years later.

The SENSORPROM memory unit which contains all calibration and user data ensures easy commissioning and maintenance.



- 1 Fully stainless steel enclosure, ensuring optimum cost of ownership
- 2 Intrinsically safe keypad and display offers optimum functionality and programming in hazardous areas
- 3 Add-On Modules
- 4 SENSORPROM technology facilitates: Factory preprogramming of calibration data, all values and settings made by the user are automatically stored
- 5 All Siemens sensor constructions are intrinsically safe to Ex ia IIC, meeting industry's toughest challenges



Innovative features with MASS 6000

- Dedicated mass flow chip with the latest ASIC technology improves step-response and enables high-speed batching
- Superior noise immunity due to a patented DFT (Discrete Fourier Transformation) algorithm
- Improved dynamic measurement range. Application flexibility is greatly enhanced, since the meter can be located at any point in the installation
- Advanced diagnosis and service menu enhances trouble shooting and meter verification



Transmitters	MASS 6000 19"	MASS 6000 IP 67	MASS 6000 Exd
Grade of enclosure	IP 20 or IP 66 / NEMA 2 or 4	IP 67 / NEMA 4X	IP 67 / NEMA 4X
Output facilities	1 current, 1 pulse/frequency, 1 relay or 3 current, 2 pulse/frequency, 2 relay – only valid for MASS 6000 19"		
Input	1 optocoupler: zeropoint adjustment or batch (start/stop/hold)		
Measurements	Mass flow, total mass, volume flow, total volume, density, temperature, % fraction		
Serial interface	HART, Profibus PA, Profibus DP, Devicenet, Modbus RTU		HART, Profibus PA
Display	3 line alpha numeric LCD with back light		
Ex-Approvals	ATEX, UL	UL	ATEX
Power supply	115/230 V AC or 24V AC/DC		24 V AC/DC



The sensor program Sensible, flexible and reliable

One of the most demanding tasks is accurate and reliable flow measurement and dosing. Optimum meter performance is achieved through an intelligent sensor design with a strong focus on safety, reliability and quality; enabling high accuracy 0.1% of rate with a large turndown range.

- 1 The MASS 2100 DI 1.5 shown here proves our philosophy. The meter is installed with a single quick release clamp fitting and a single multi-plug connector that's fast and cost-effective
- 2 Maximum immunity to noise. The centre block concept, together with balanced pipe loops, ensure dependable long-term stability eliminating influences from process conditions
- 3 Plug & Play. Install and commission a meter in less than 10 minutes
- 4 Single-pipe design optimizes hygiene and safety. All our sensors consist of one single pipe without any welds ensuring that steam or CIP-cleaning can be carried out with confidence

MASS 2100 DI 1.5 / 1/16"

In many industries such as food & beverage or pharmaceuticals, accurate recipe control means everything.

The MASS 2100 DI 1.5 / 1/16" has demonstrated superior performance in numerous applications and field trials relating to accuracy and turn down ratio.

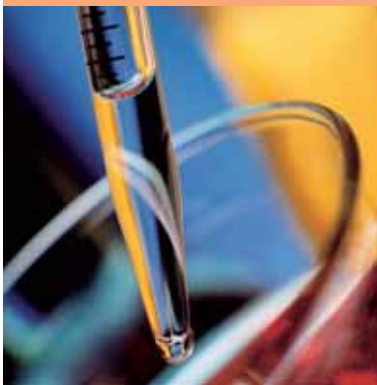
It is the preferred meter for research and development and mini-plant applications for liquid or gas measurement, when measuring small quantities is important.

FC300 DN 4 / 1/6"

Siemens has created an even more compact and versatile sensor delivering better than 0.1% accuracy. The new design, measuring only 135 x 205 x 58 mm has a robust and rigid stainless steel encapsulation with a surprisingly low weight of only 3.5 kg.

The size and weight make it easy to install and integrate into a wide range of applications like engine and valve test beds in the automotive industry and it has Ex approvals making it ideal for harsh environments.

FC300 DN 4 – 10 minutes is all you need



<i>Mount the clamp</i>	<i>Fit the meter in the clamp and tighten</i>	<i>Connect the pre-wired multi-plug connector</i>	<i>Fit backplate to converter and measurement can commence</i>



MASS 2100
DI 1.5 / 1/16"



FC300 DN 4 / 1/6"



MASS 2100 DI 3 – DI 40
1/8" – 2"



MC1 DN 50 – DN 150
2" – 6"

Meeting industry's toughest challenges



MASS 2100 DI 3 – DI 40 / 1/8" – 2"

The medium ranged coriolis flow-meters from Siemens are used in applications, covering mini-plants in the pharmaceutical industry to demanding tasks in harsh environments within the chemical process and on/offshore industry applications.

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

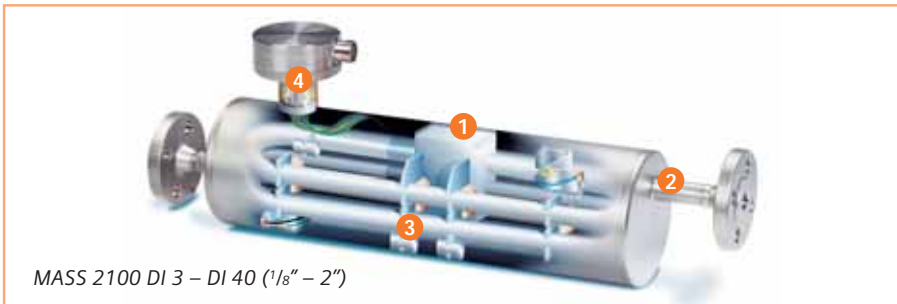
MC1 DN 50 – DN 150 / 2" – 6"

In the large size category, the MC1 offers the ideal fit between size, maximum flow capacity and ease of installation.

The parallel pipes are welded into a split flow at each end to eliminate a direct coupling to the process connections and significantly reduce effects from external vibrations. With no weld seams at high stress locations on the measuring pipe, a long lifetime of problem-free operation is achieved.

- Space saving sturdy design
- Insensitive to pipeline stresses and vibrations
- Self draining in both horizontal and vertical positions
- Parallel S-tube design enhances accuracy and turn-down range

- 1 High immunity against changing process conditions and vibrations is achieved with unique center-block concept
- 2 Only one pipe, with no welds. Ideal for CIP applications
- 3 Safe pipe design. We use the market's thickest pipe and offer a choice of high grade stainless steel or Hastelloy for corrosive applications
- 4 All Siemens sensor constructions are intrinsically safe to EEx ia IIC (Zone 0) and approved according to ATEX and UL, meeting industry's toughest challenges



FC300		DN 4 / 1/6"					
Measuring range	kg/h (lb/h)	350 (770)					
Pressure 316L	bar (psi)	130 (1885)					
Pressure C-22	bar (psi)	410 (5945)					
Pipe material		1.4435 (316L) Stainless steel or Hastelloy C-22					
Pipe design		1-pipe system					
MASS 2100 Sizes		DI 1.5 / 1/16"	DI 3 / 1/8"	DI 6 / 1/4"	DI 15 / 1/2"	DI 25 / 1"	DI 40 / 2"
Measuring range	kg/h	65	250	1,000	5,600	25,000	52,000
Measuring range	lb/h	140	550	2200	12,345	55,100	114,600
Pressure 316L	bar (psi)	230 (3336)	230 (3336)	265 (3844)	130 (1885)	110 (1595)	105 (1523)
Pressure C-22	bar (psi)	365 (5294)	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					
MC1 Sizes		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	1,124 k	
Pressure 316Ti / C-4	bar (psi)	100 (1450)	100 (1450)	100 (1450)	40 (580)	40 (580)	
Pipe material		1.4571 (316Ti) Stainless steel or Hastelloy C-4					
Pipe design		2-pipe system					

The dedicated SITRANS F C MASSFLO program Reliable solutions for your industry



Choosing the right flowmeter can dramatically improve your bottom line. Whether you work in chemical, oil and gas, life science, low-flow, or general process industries; Siemens has an accurate and reliable solution for you.

The Power of Protection – Chemical Process Industry

Siemens coriolis mass flowmeters are designed to meet the chemical industry's toughest challenges offering an Exceptional Safety Concept, -meeting the NAMUR extended safety requirements as well as ATEX and cUL.

The result is a product program that can cope 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

- Dosing of additives and catalysts
- Blending of ingredients
- Regeneration monitoring of process exhaust gases
- Measurement of highly aggressive non conducting chemicals

Your benefits

- Intrinsically safe rated input and outputs, category ia
- Compliance with NAMUR NE 21
- Multi-informational, multi-lingual display
- Sophisticated self diagnosis
- Error log and error-pending indication
- Choice of corrosion resistant sensor materials



Reliable Solutions – Oil & Gas Industries

Siemens mass flow technology provides reliable precision measurements for on/offshore oil & gas production optimization, and product storage.

We provide solutions around the world with a substantial number of Siemens coriolis mass flowmeters installed in oil & gas applications.

- Off-shore pipeline inhibitor dosing
- Multi-product interface detection(oil/gas separation)
- Terminal loading and off-loading
- Measurement of natural gas fluids
- Measuring liquids, slurries and gases
- Rail car and truck loading

Your benefits

- No moving parts means maintenance free operation
- Low pressure loss due to sensor design
- Multi-parameter measurement: mass flow, volume flow, density temperature, fraction
- Straight forward calibration and traceability on liquids as well as gases
- Sensor range covers most applications (DI 1.5 to DN 150)



Accuracy you can count on

Precision Measurement – Pharma and Food & Beverage Industry

Siemens provides flow solutions for the pharma, food and beverage industries to efficiently manage flow processes, giving them a competitive edge.

Whether Fraction flow, °Balling, °Baumé, °Brix, or °Plato Siemens is measuring it with unparalleled accuracy and repeatability. Siemens mass flowmeters can improve your process and make you more competitive in:

- Measuring flow, fraction flow and density
- Measuring utility flows such as natural gas to ovens
- Batching and continuous inline blending
- Carbonating and bottling (liquids as well as gases)
- Hydrogenating edible oils
- Coating of foodstuff and pills
- Monitoring and dosing of medical gases

Your benefits

- Suitable for CIP and SIP cleaning
- High pressure, hose down cleaning flexibility
- High levels of chemical resistance due to transmitter and sensor design in stainless steel
- Insensitive to temperature shocks (steam cleaning)
- Wide choice of process connectors
- Multi-parameter measurement: mass flow, volume flow, density, temperature, fraction
- 1-pipe design providing high safety/hygiene
- Advanced build-in batch control
- High speed batching (<1 sec)



Superior Performance in Low Flow Applications

The excellent performance available from Siemens low flow products have ensured their use in a wide variety of applications. The continuous development of new low flow coriolis mass flowmeters has been done in cooperation with our customers. The new meters provide the versatility and performance needed to meet the high demands in applications such as:

- Fuel injection nozzle testing
- Refrigerant charging for hermetic compressors
- Dosing of flavorings and additives
- Measurement of essence and fragrances in the cosmetics industry
- High accuracy gas measurement – N₂, O₂, Ar, H₂, ethylene
- Gasoline and diesel test rigs

Your benefits

- Compact sensor design
- Unsurpassed performance and accuracy – 0.1% of mass flow rate
- Large dynamically turn down range 1:100
- High accuracy on density measurement
- Corrosion and installation optimized enclosure in stainless steel
- Plug and play in less than 10 minutes
- Multiple communication interfaces: Profibus PA/DP, Modbus, HART, DeviceNet



Your Siemens partners worldwide

Find a contact in your area at:

www.siemens.com/processinstrumentation

www.siemens.com/flow



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