FCT030 is based on the latest developments within digital signal processing technology – engineered for high measuring performance, fast response to step changes in flow, fast dosing applications, high immunity against process noise, easy to install commission and maintain.

The FCT030 transmitter delivers true multi-parameter measurements i.e. massflow, volumeflow, standard volumeflow, density, temperature and fraction.

The FCT030 IP67 transmitter can be remote connected or compact mounted with all sensors of type FCS300, sizes DN 15 to DN 150, MASS 2100 DI 1.5, DI 3, DI 6, DI 15 and FC300 DN 4.

**Fraction**

The transmitter FCT030 can be set up at works to measure and report various fraction concentrations of two-part mixtures or solutions. Where a discrete relationship exists between concentration and density at particular temperatures a calculation is performed and the percentage concentration by volume or mass of Part A or Part B (100 % minus Part A) is measured. For solutions and some mixtures the total mass, or dry weight, is also available.

In some industries, a selection of standard density scales has been adopted to represent the density or relative density of the process fluid.

If "Standard fractions" option is chosen at ordering, the following fraction or standard density scales can be selected in the setup menu:

- API number
- Balling
- °Brix
- °Oeschlé
- Plato
- Specific Gravity
- Twaddell
- %HFCS42
- %HFCS55
- %HFCS90
- Ethanol-Water (ABM)\(^1\)
  - 0 % to 20 %
- Ethanol-Water (ABM)\(^1\)
  - 15 % to 35 %
- Ethanol-Water (ABM)\(^1\)
  - 30 % to 55 %
- Ethanol-Water (ABM)\(^1\)
  - 50 % to 100 %

1) ABM: Alcohol by Mass.

Coriolis flowmeters can be applied in all industries, such as:

- Chemical & Pharma: detergents, bulk chemicals, acids, alkalis, paint mixing systems, solvents and resins, pharmaceuticals, blood products, vaccines, insulin production
- Food & Beverage: dairy products, beer, wine, soft drinks, "Brix/"Plato, fruit juices and pulps, bottling, CO2 dosing, CIP/SIP-liquids, mixture recipe control
- Automotive: fuel injection nozzle & pump testing, filling of AC units, engine consumption
- Oil & Gas: filling of gas bottles, furnace control, test separators
- Hydrocarbon processing: oil refining, derivatives manufacturing, polymerisation
- Water & Waste Water: dosing of chemicals for water treatment

The multiple outputs and bus communication mean that all of the process information can be read either instantaneously (10 ms update) or periodically as plant operation requires.

**Operation and display**

- User-configurable operation display
  - Full graphical display 240 x 160 pixels with up to 6 programmable views
  - Self-explaining alarm handling/log in clear text
  - Help text for all parameters appears automatically in the configuration menu
  - Keypad can be used for controlling dosing as start/stop/hold/reset
- SensorFlash technology stores production specific system documentation and provides removable memory of all flowmeter setups and functions
- Calibration certificates
- Pressure and material test certificates (as ordered)
- Non-volatile memory backup of operational data
- Transfer of user configuration to other flowmeters
- Alarm history log
- Parameter change log
- Logging of min and max process values
- Data logging of process values and parameter

**Alarms and safety**

- Advanced diagnosis and service menu enhances trouble-shooting and meter validation
- Configurable upper and lower alarm and warning limits for all process values
- Alarm handling can be selected between Siemens and NAMUR standard configurations
- FCT030 is in preparation to be certified for integrated safety in accordance with IEC 61508 and IEC 61511 as a compact FC330.
  - SIL 3 (single-channel operation) in preparation
  - SIL 3 (dual-channel operation) in preparation
Outputs and control
- Built-in dosing controller with compensation and monitoring comprising 3 built-in totalizers
- Multi-parameter outputs, individually configurable for massflow, volumeflow, standard volumeflow, density, temperature or fraction flow such as °Brix or °Plato
Up to four I/O channels are configured as follows:

**Channel 1**
Channel 1 is 4 to 20 mA analog output with HART 7.5, PROFIBUS PA, PROFIBUS DP and Modbus RS-485 RTU. The current signal can be configured for massflow, volumeflow or density, standard volume flow, medium temperature, Fraction A and B and Fraction A% and B%.

**Channel 2**
Channel 2 is a signal output which can be freely configured for any process variable.
- Analog current (0/4 to 20 mA)
- 3 stage analog valve dosing control
- Frequency or pulse
- Digital one or two-valve dosing control in combination with channel 3 or 4
- Operational and alarm status

**Channels 3 and 4**
Channels 3 and 4 can be ordered with signal (freely configured for any process variable) or relay outputs, or signal input.

**Signal**
Signal output can be user configured to:
- Analog current (0/4 to 20 mA)
- 3 stage analog valve dosing control
- Frequency or pulse
- Redundant frequency or pulse (linked to Channel 2)
- Digital one or two-valve dosing control
- Operational and alarm status

**Relay**
Relay output(s) can be user configured to:
- Digital one or two-valve dosing control
- Operation status including flow direction
- Alarm status

**Signal input**
Signal input can be user-configured for
- Dosing control
- Totalizer reset functions
- Force or freeze output(s)
- Initiate automatic zero point adjustment
Signal outputs and inputs for non hazardous areas can be changed for active or passive operations by dip switch.

For hazardous areas Signal outputs and inputs can’t be changed by dip switch, and has to selected individually by ordering.

During service and maintenance all outputs can be forced to a preset value for simulation, verification or calibration purposes.

**Approvals and certificates**
The FCT030 Coriolis flowmeter program was designed from the ground up to comply with or exceed the requirements of international standards and regulations.

**Design**
The transmitter SITRANS FCT030 is designed in an IP67/NEMA 4X aluminum enclosure with corrosion resistant coating. It can be remote connected or compact mounted with an sensor
- FCS300 DN 15, DN 25, DN 50, DN 80, DN 100 and DN 150,
- MASS 2100 DI1.5, DI 3, DI 6, DI 15 and
- FC300 DN 4.

FCT030 is available with current output HART 7.5, Modbus RS-485 RTU, PROFIBUS DP or PROFIBUS PA as standard on Channel 1.

The transmitter has a modular design with discrete, replaceable electronic modules and connection boards to maintain separation between functions and facilitate field service. All modules are fully traceable and their provenance is included in the transmitter setup.

**SensorFlash**
SensorFlash is a standard, 4 GByte micro SD card with the ability to be updated by PC. It is supplied with each sensor with the complete set of certification documents including calibration report. Material, pressure test, factory conformance certificates are optional at ordering.

The Siemens SensorFlash memory unit offers the following features and benefits:
- Automatically program any similar transmitter in seconds to the operation standard
- Transmitter replacement in less than 5 minutes
- True “plug & play” provided by integrated cross-checking data consistency and HW/SW version verification
- Permanent memory of operational and functional information from the moment that the flowmeter is switched on
- New firmware updates can be downloaded from the SIEMENS internet portal for Product Support and placed onto Sensor Flash (unmounted from the transmitter and inserted into a PC’s SD card slot). The firmware is then inserted into the existing flowmeter and the complete system upgraded.
- Storing of alarm history log
- Storing of parameter change log
- Storing of process peak values log

**Datalogging on SensorFlash**
The following functions are available:
- Logging of process values
- Logging of parameter settings
- Selectable logging interval
Flow Measurement
SITRANS FC

Transmitter SITRANS FCT030

Function

The following functions are available:

- Mass flowrate, volume flowrate, density, process temperature, frame temperature, fraction flow
- Up to four output/input channels selected at ordering
- Outputs can be individually configured with mass, volume, density etc.
- Three built-in totalizers which can count forward, backward or forward and backward
- Low flow cut-off, adjustable
- Density cut-off or empty pipe cut-off, adjustable
- Flow direction adjustable
- Alarm system consisting of alarm-log, alarm pending menu
- Internal data logger is updated each 10 minutes with operational data such as system health, totalizer values, all configurations and data needed for custody transfer requirements to OIML R 117 and NTEP
- Display of operating time with real-time clock. Daylight saving time is not implemented
- Uni/bidirectional flow measurement
- Flowrate outputs are freely configurable between maximum negative and maximum positive flows according to the sensor capacity
- Limit switches programmable for flow, density, temperature or fraction process values. Limit points can be graded as warning and alarm for values both above and below nominal process conditions
- Process noise filter for optimization of measurement performance under non-ideal application conditions. 5-stage pumping filter compensates for flow fluctuations caused by e.g. single acting piston pumps
- Full dosing controller with 5 user-configurable recipes
- Automatic zero adjustment menu, with zero point evaluation display
- Full service menu for effective and straightforward application and meter troubleshooting
- Precise temperature measurement ensures optimum accuracy on massflow, density and fraction flow
- Fraction flow computation is based on a 5th-order algorithm matching known applications.
- Audit trail information, stores parameters changes with time stamp information
- Simulation of process values, status information and alarms
- Aerated flow filtering system, for advanced filtering of fluids with gas or air bubbles
- Datalogging of process values and parameter changes on SensorFlash
### Technical specifications

**Process media**
- Fluid Group 1 (suitable for dangerous fluids)
- Aggregate state: Paste/light slurry, liquid and gas

**Number of process variables**
- 7

**Measurement of**
- Mass flow
- Volume flow
- Density
- Process media temperature
- Standard volume flow
- Reference density
- Fraction A flow
- Fraction B flow
- Fraction A %
- Fraction B %

**Current output**
- Current: 0 ... 20 mA or 4 ... 20 mA (Channel 1 only 4 ... 20 mA)
- Load: < 500 Ω per channel
- Time constant: 0 ... 100 s adjustable

**Digital output**
1. **Pulse**
   - 41.6 μs ... 5 s pulse duration
2. **Frequency**
   - 0 ... 12.5 kHz, 50 % duty cycle, 120 % overscale provision
3. **Time constant**
   - 0 ... 100 s adjustable
4. **Active**
   - 0 ... 24 V DC, 110 mA, short-circuit-protected
5. **Passive**
   - 3 ... 30 V DC, max. 110 mA

**Relay**
- Type: Change-over voltage-free relay contact
- Load: 30 V AC/100 mA
- Functions: Alarm level, alarm number, limit, flow direction

**Digital input**
1. **Only for channel 3 and 4**
2. **Voltage**
   - 15 ... 30 V DC (2 ... 15 mA)
3. **Functionality**
   - Start/stop/hold/continue dosing, reset totalizer 1 and 2, force output, freeze output

**Galvanic isolation**
- All inputs and outputs are galvanically isolated, isolation voltage 500 V.

**Cut-off**
- Low-flow: 0 ... 9.9 % of maximum flow

**Limit function**
- Mass flow, volume flow, fraction, density, sensor temperature

**Totalizer**
- Three eight-digit counters for forward, net or reverse flow

**Display**
- Background illumination with alphanumerical text, 3 x 20 characters to indicate flow rate, totalized values, settings and faults.
- Time constant as current output
- Reverse flow indicated by negative sign

**Zero point adjustment**
- Via keypad or remote via digital input

### Ambient temperature
- **Operation**
  - Transmitter: -40 ... +60 °C (-40 ... +140 °F), (humidity max. 95 %)
  - Display: -20 ... +60 °C (-4 ... +140 °F)
- **Storage**
  - Transmitter: -40 ... +70 °C (-40 ... +158 °F)
  - Display: -20 ... +70 °C (-4 ... +158 °F)

### Communication Ch1
- HART 7.5
- PROFIBUS PA
- PROFIBUS DP
- Modbus RS-485 RTU

### Enclosure
- **Material**: Aluminum
- **Rating**: IP67/NEMA 4X to IEC 529 and DIN 40050 (1 mH for 30 min.)
- **Mechanical load**: 18 ... 400 Hz random, 3.17 g RMS, in all directions

### Supply voltage
- **Supply**: 20 ... 27 V DC ± 10%; 100 ... 240 V AC ± 10 %, 47 ... 63 Hz
- **Fluctuation**: No limit
- **Power consumption**: 7.5 W/15 VA

### EMC performance
- **Emission**: EN 55011/CISPR-11 (Class A)
- **Immunity**: EN/IEC 61236-1 (Industry)
- **NAMUR**: Within the value limits according to “General requirements” with error criteria A in accordance with NE 21

### Environment
- **Environmental conditions acc. to IEC/EN/UL 61010-1**
  - Altitude up to 2000 m
  - Pollution degree 2

### Maintenance
- The flowmeter has a built-in error log/pending menu which should be inspected on a regular basis.

### Cable glands
- Cable glands are available in Nylon, Nickel plated brass or stainless steel (316L/W1.4404) in the following dimensions:
  - 1 x M25, 2 x M20
  - 3 x ½ " NPT

### Digital cable connection
- Standard industrial signal cable up to 75 m long with 2 x screened pairs or 4-wire overall screen can be laid between the sensor and transmitter. Siemens offers cables in a selection of pre-cut lengths and prepared for either gland or plug connection.

### Analog cable connection (MASS 2100/FC300)
- Standard industrial cable up to 15 m distance between sensor and transmitter.
- PVC insulated 5 x 2 x Ø 0.34 mm, twisted and screened in pairs, temperature range -20 ... +105 °C
- Siemens offers cables in a selection of precut lengths and with two M20 connectors mounted.

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1) With 300 Ω internal impedance. For coil switching use the passive output option.
Flow Measurement
SITRANS F C

Transmitter SITRANS FCT030

Approvals

Hazardous area
- ATEX, IECEX, cCSAus (Class 1 Div 1), EAC Ex, cCSAus Zone 1, NEPSI, INMETRO (depending on version and configuration)
  - Zone 1: Ex db eb ia [ia 5a] IIC T6 Gb
  - Zone 21: Ex tb [ia Da] IIIIC T85°C Db

Custody transfer (in preparation)
- OIML R 117 type approval to a wide variety of liquids other than water (in preparation)
- NTEP for US and Canada (in preparation)

Pressure equipment
- PED
- CRN (in preparation)

Hygienic applications
(in preparation)
- EHEDG (in preparation) for hygienic variant sensors (DN 25 ... DN 80)
- External cleanability satisfies EHEDG

Certificates

Safety Integration Level
(in preparation)
- SIL 3 for software (in preparation)
- SIL 2 for hardware (in preparation)
- SIL 3 for redundant hardware systems (in preparation)
- Pressure equipment
- Low voltage directive
- WEEE
- RoHS

CE mark

Regional certifications
- C-TICK (Australia and New Zealand EMC)
- EAC (Belarus, Armenia, Kazakhstan, Russia)
- KCC (South Korea)
(in preparation)

Dimensional drawings

SITRANS FCT030, compact version, dimensions in mm (inch)
SITRANS FCT030, field mount version for low flow MASS2100/FC300 sensors with analog cable and M20 plug connection, dimensions in mm (inch)

SITRANS FCT030, field mount version for sensors with digital cable and M12 plug connection, dimensions in mm (inch)

SITRANS FCT030, wall mount version, dimensions in mm (inch)