

## Flow Measurement

### SITRANS FC (Coriolis)

#### Sensors and Flowmeter systems

#### SITRANS FC310 flowmeter system

##### Overview



The compact flowmeter SITRANS FC310 can be ordered for industrial, hygienic or NAMUR service.

Intended for integration into OEM skids, machines or pre-assembled plant systems, the flowmeter is based on the latest developments within digital signal processing technology - engineered for high measuring performance:

- Fast response to rapid changes in flow
- Fast dosing applications with control in host system
- High immunity against process noise
- High turndown ratio of flowrates
- Suitable for liquid and gas service
- Easy to install, commission and maintain

With all global marine approvals the FC310 is ideal for integration in ship fuel efficiency and environmental measurement systems as well as bunkering solutions.

The FCT010 transmitter delivers true multi-parameter measurements i.e. massflow, density, temperature.

FC310 is available with Modbus RTU (RS 485) multi-drop serial communication.

The flowmeter is supplied with SensorFlash, a micro SD card containing all relevant certificates. The SITRANS FC310 flowmeter system consists of a SITRANS FCS300 sensor and a SITRANS FCT010 transmitter always compact mounted.

##### Benefits

- It is compact and light, fitting neatly into dense piping arrangements
- Effective separation of measurement from plant vibration
- Reliable measurements due to high signal to noise ratio
- Short overall length; easy drop-in replacement into most existing installations
- Direct connection to host with high-speed Modbus simplifies machine or skid construction and set-up
- Modbus RS 485 RTU allows simple and easy integration with all Modbus masters with fast update rate of process values.

##### Technical specifications

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sizes</b>                                       | DN 15 (½")<br>DN 25 (1")<br>DN 50 (2")<br>DN 80 (3")<br>DN 100 (4")<br>DN 150 (6")                                                                                                                                                                                                                                                                                                              |
| <b>Accuracy</b>                                    | ± 0.10 % or ± 0.20 %<br>Additional ± 0.40 % for gases                                                                                                                                                                                                                                                                                                                                           |
| <b>Repeatability</b>                               | ± 0.05 %                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Flow range</b><br>(water @ 1 bar pressure loss) | <ul style="list-style-type: none"> <li>• DN 15 4 500 kg/h (163.3 lb/min)</li> <li>• DN 25 20 500 kg/h (753.2 lb/min)</li> <li>• DN 50 49 000 kg/h (1 800 lb/min)</li> <li>• DN 80 122 000 kg/h (4 483 lb/min)</li> <li>• DN 100 273 000 kg/h (10 031 lb/min)</li> <li>• DN 150 459 200 kg/h (16 873 lb/min)</li> </ul>                                                                          |
| <b>Power supply</b>                                | 12-27 V DC; 1.1 W                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Weight</b>                                      | 4.6 ... 207 kg                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Material</b>                                    | <ul style="list-style-type: none"> <li>• Sensor <ul style="list-style-type: none"> <li>- Measuring tubes 316L stainless steel or nickel alloy C4</li> <li>- Enclosure 304 stainless steel</li> </ul> </li> <li>• Transmitter Aluminum with corrosion-resistant coating class C4</li> </ul>                                                                                                      |
| <b>Enclosure rating</b>                            | IP67                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Pressure ratings</b>                            | <ul style="list-style-type: none"> <li>• Measuring tubes <ul style="list-style-type: none"> <li>- 316L 100 bar (1 450 psi)</li> <li>- Nickel alloy C4 100 bar (1 450 psi)</li> </ul> </li> <li>• Sensor enclosure No pressure containment</li> </ul>                                                                                                                                            |
| <b>Temperature ratings</b>                         | <ul style="list-style-type: none"> <li>• Process medium -50 ... +205 °C (-58 ... +400 °F)</li> <li>• Ambient -40 ... +60 °C (-40 ... +140 °F)</li> </ul>                                                                                                                                                                                                                                        |
| <b>Process connections</b>                         | <ul style="list-style-type: none"> <li>• Flanges EN 1092-1 B1, EN 1092-1 B2, EN 1092-1 D, ANSI/ASME B16.5, JIS B 2220</li> <li>• Pipe threads ASME B1.20 (NPT) female pipe thread, ISO 228-1 G female pipe thread (BSPF)</li> <li>• Hygienic threads DIN 11851, SMS 1145</li> <li>• Hygienic clamps DIN 32676 Hygienic Clamp Row A</li> </ul>                                                   |
| <b>Approvals</b>                                   | <ul style="list-style-type: none"> <li>• Hazardous area (zone 1) ATEX, IECEx, EAC Ex, cCSAus, NEPSI, EAC</li> <li>• Pressure equipment No dust approval<br/>PED, CRN (in preparation)</li> <li>• Hygienic EHEDG (DN 25 ... 80) (in preparation)</li> <li>• Marine Germanischer Lloyd/det Norske Veritas, Bureau Veritas, Lloyds of London, American Bureau of Shipping, RINA (Italy)</li> </ul> |
| <b>NAMUR</b>                                       | NAMUR-compliant (e.g. NE 21, NE 41 and NE 132)                                                                                                                                                                                                                                                                                                                                                  |
| <b>Communication</b>                               | Modbus RS 485 RTU                                                                                                                                                                                                                                                                                                                                                                               |
| <b>EMC performance</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                 |
| Emission                                           | EN 55011/CISPR-11 (Class B)                                                                                                                                                                                                                                                                                                                                                                     |
| Immunity                                           | EN/IEC 61326-1 (Industry)                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Mechanical load</b>                             | 18 ... 400 Hz random<br>The flow meter will mechanically tolerate 3.17 g RMS in all directions. Flow accuracy cannot be guaranteed under all conditions.                                                                                                                                                                                                                                        |

## SITRANS FC310 flowmeter system

## Selection and ordering data

## Article No.

## Article No.

**SITRANS FC310 digital coriolis flowmeter with SITRANS FCS300 standard flow sensor with hygienic and flange/pipe thread connections and compact mounting with FCT010 transmitter**

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

**Sensor size, connector size**

DN 15, DN 10 (½", 3/8")

DN 15, DN 15 (½", ½")

DN 15, DN 20 (½", ¾")

DN 25, DN 20 (1", ¾")

DN 25, DN 25 (1", 1")

DN 25, DN 40 (1", 1½")

DN 50, DN 40 (2", 1½")

DN 50, DN 50 (2", 2")

DN 50, DN 65 (2", 2½")

DN 80, DN 65 (3", 2½")

DN 80, DN 80 (3", 3")

DN 80, DN 100 (3", 4")

DN 100, DN 80 (4", 3")

DN 100, DN 100 (4", 4")

DN 100, DN 150 (4", 6")

DN 150, DN 100 (6", 4")

DN 150, DN 150 (6", 6")

DN 150, DN 200 (6", 8")

**Process connection**

EN 1092-1 B1, PN 16

EN 1092-1 B1, PN 40

EN 1092-1 B2, PN 63

EN 1092-1 B2, PN 100

EN 1092-1 D, PN 40

ASME B16.5 RF, class 150

ASME B16.5 RF, class 300

ASME B16.5 RF, class 600

ASME B16.5 RF, class 900 (p- and t-rating as class 600)

ANSI B16.5-2009, class 1500 (p- and t-rating as class 600)

ISO 228-1G female pipe thread

ASME B1.20.1 NPT female pipe thread

DIN 11851 hygienic screwed

DIN 32676 hygienic clamp Row A

SMS 1145 hygienic screwed

JIS B2220/10K

JIS B2220/20K

EN 1092-1, PN 16, NAMUR length

EN 1092-1, PN 40, NAMUR length

**Wetted parts material**

AISI 316L/1.4435/1.4404

AISI 316L/1.4435/1.4404 (polished)

Nickel alloy C4

**SITRANS FC310 digital coriolis flowmeter with SITRANS FCS300 standard flow sensor with hygienic and flange/pipe thread connections and compact mounting with FCT010 transmitter**

**Calibration/Accuracy class**

0.2 % flow, 10 kg/m³ density

0.1 % flow, 2 kg/m³ density

**Mounting style, transmitter housing and material**

Compact, IP67, aluminum

**Ex approval**

Non-Ex

ATEX II 2G zone 1

IECEx Gb (zone 1)

US (cCSAus), Div 1

Canada (cCSAus), class I, zone 1

NEPSI

INMETRO (in preparation)

KCC (in preparation)

EAC

**Local User Interface**

Blind

## Selection and ordering data

## Order code

**Further designs**

Please add "-Z" to Article No. and specify Order code(s).

**Cable glands**

None (replacement sensor)

Metric, no glands

Metric, plastic

Metric, brass/Ni plated

Metric, stainless steel

NPT, no glands

NPT, plastic

NPT, brass/Ni plated

NPT, stainless steel

Metric thread with M12 socket fitted

**Software functions and CT approvals**

Standard

**I/O configuration Ch1**

Modbus RTU RS 485

**I/O configuration Ch2, Ch3 and Ch4**

None

**Add-on options and accessories**

Please add "-Z" to Article No. and specify Order code(s).

**Certificates**

Certificate EN 10204-2.2 confirmation of pressure containing material

Certificate EN 10204-3.1 material (wetted parts)

Certificate NACE MR0175-2009 + MR0103-2012

Certificate EN 10204-2.1 Declaration of compliance with the order

Insp. Certificate EN 10204-3.1 for visual, dimensional and functional test

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##### Add-on options and accessories

Please add "-Z" to Article No. and specify Order code(s).

Certificate EN 10204-3.1 PMI Positive material ident. of pressure-cont./wetted parts (confirmation only)

**C07**

Certificate EN 10204-3.1 P-test Pressure-test acc. AD2000

**C08**

Test pack (pressure test, non-destructive welding test, welder & welding procedure certificate)

**C09**

Certificate EN 10204-3.1 welding X-ray / Dye-penetration test of weldings (pressure cont.)

**C10**

Certificate EN 10204-2.1 Declaration of accuracy

**C11**

Certificate EN 10204-3.1 PMI Positive material ident. of pressure-cont./wetted parts (including heat analysis)

**C12**

##### Customer selected calibration

DN 15 ... 50, multi-point, 5 flows × 1 pass Flow 10 ... 100 % of  $Q_{norm}$

**D60**

DN 15 ... 50, multi-point, 10 flows × 1 pass Flow 10 ... 100 % of  $Q_{norm}$

**D61**

DN 80, multi-point, 5 flows × 1 pass Flow 10 ... 100 % of  $Q_{norm}$

**D62**

DN 80, multi-point, 10 flows × 1 pass Flow 10 ... 100 % of  $Q_{norm}$

**D63**

DN 100, multi-point, 5 flows × 1 pass Flow 10 ... 100 % of  $Q_{norm}$

**D64**

DN 100, multi-point, 10 flows × 1 pass Flow 10 ... 100 % of  $Q_{norm}$

**D65**

DN 150, multi-point, 5 flows × 1 pass Flow 10 ... 100 % of  $Q_{norm}$

**D66**

DN 150, multi-point, 8 flows × 1 pass Flow 10 ... 100 % of  $Q_{norm}$

**D67**

##### Cable

None

**L50**

5 m (16.4 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted

**L51**

5 m (16.4 ft), sensor cable, 4 wire, without plugs for terminal connection

**L52**

5 m (16.4 ft), sensor cable, 4 wire, with 1 pc M12 plug mounted

**L53**

10 m (32.8 ft) sensor cable, 4 wire, with 2 pcs M12 plugs mounted

**L55**

10 m (32.8 ft), sensor cable, 4 wire, without plugs for terminal connection

**L56**

10 m (32.8 ft), sensor cable, 4 wire, with 1 pc M12 plug mounted

**L57**

25 m (82 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted

**L59**

25 m (82 ft), sensor cable, 4 wire, without plugs for terminal connection

**L60**

##### Add-on options and accessories

Please add "-Z" to Article No. and specify Order code(s).

25 m (82 ft), sensor cable, 4 wire, with 1 pc M12 plug mounted

**L61**

50 m (164 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted

**L63**

50 m (164 ft), sensor cable, 4 wire, without plugs for terminal connection

**L64**

50 m (164 ft), sensor cable, 4 wire, with 1 pc M12 plug mounted

**L65**

75 m (246 ft), sensor cable, 4 wire, with 2 pcs M12 plugs mounted

**L67**

75 m (246 ft), sensor cable, 4 wire, without plugs for terminal connection

**L68**

75 m (246 ft), sensor cable, 4 wire, with 1 pc M12 plug mounted

**L69**

##### Sensor options

FCS300 marine approval

**S22**

##### Additional data

Please add "-Z" to Article No. and specify Order code(s) and plain text.

##### Tag name

Tag name plate, stainless steel

**Y17**

#### Operating instructions for SITRANS FC310

| Description                      | Article No.        |
|----------------------------------|--------------------|
| English                          | <b>A5E44036384</b> |
| • for firmware V 4.0 and onwards |                    |
| German                           | <b>TBD</b>         |
| • for firmware V 4.0 and onwards |                    |

All literature is available to download for free, in a range of languages, at

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

#### Accessories

| Description                                                       | Article No.        |
|-------------------------------------------------------------------|--------------------|
| <b>SITRANS I300</b><br><b>Isolating power supply – Ex barrier</b> | <b>A5E39832532</b> |

