

# Flow Measurement

## SITRANS F C

### Flow sensor SITRANS FCS200

#### Overview



SITRANS FCS200 (DN10, DN 15 and DN 25) is a Coriolis sensor specialized for accurate mass flow measurement of gases.

The sensor offers superior performance in terms of flow accuracy and turn down ratio. The ultra compact sensor design makes installation, replacement and commissioning very straight forward and easy.

#### Benefits

- High accuracy gas measurement
- Approved for use in hazardous area
- DN 10 and DN 15 is custody transfer approved, according to OIML R 139 (Compressed gaseous fuel measuring systems for vehicles). For custody transfer applications SIFLOW FC070 Ex CT must be used.
- Self-draining in vertical orientation
- Pt1000 temperature measurement for optimum accuracy
- SENSORPROM enabling true "plug & play"
- Rigid enclosure design reducing influence from pipeline vibration and thermal stress
- High-pressure measurement up to 350 bar (5076 psi)
- Ultra compact sensor design with space-saving split flow

#### Application

SITRANS FCS200 is designed for measurement of gases and is suitable for use in the oil and gas industry:

- Filling of gas bottles
- CNG dispensers
- Metering of general gas applications

#### Design

SITRANS FCS200 is available in DN 10, DN 15 and DN 25.

The sensor consists of 2 parallel measuring pipes, welded directly onto a flow splitter at each end of the sensor to eliminate a direct coupling to the process connectors and significantly reduce effects from external vibrations. The flow-splitters are welded directly onto a rigid sensor housing which acts as a mechanical low pass filter.

The SITRANS FCS200 DN 10 and DN 15 wetted parts material is Hastelloy C22, and the DN 25 wetted parts material is AISI 316Ti/1.4571. The enclosure is made of stainless steel AISI 304/1.4301 with a grade of encapsulation of IP67.

The two black rupture discs are designed to protect the enclosure from overpressure.

#### Function

The flow measuring principle is based on the Coriolis effect. See "System information SITRANS F C".

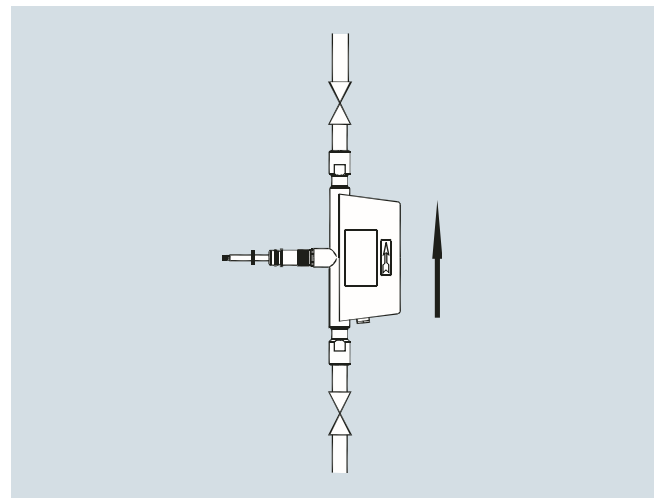
#### Integration

The complete flowmeter consists of the sensor (SITRANS FCS200) and a transmitter SITRANS F C MASS 6000 or SIFLOW FC070. All communication options are available for MASS 6000.

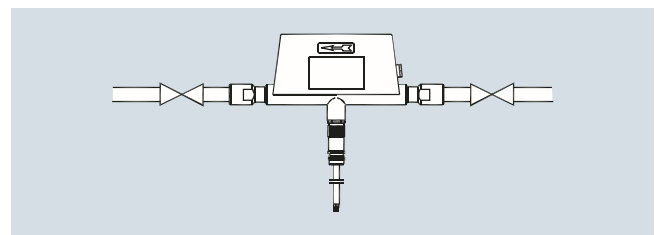
The sensor is shipped with a SENSORPROM memory unit containing all information about calibration data, device identity and factory pre-programming of transmitter settings.

#### Installation guidelines

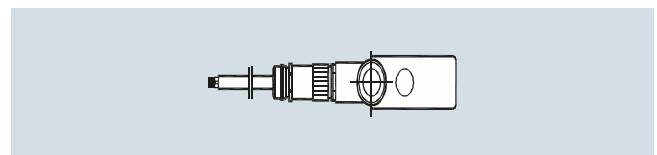
Siemens Flow Instruments recommends installing the sensor in one of the following ways:



Vertical orientation with an upwards flow



Horizontal installation, tubes up



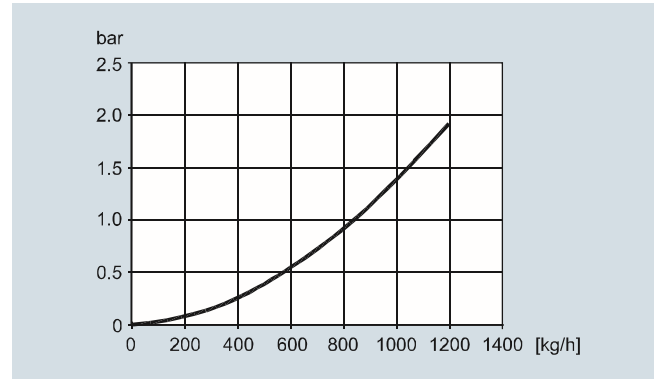
Horizontal installation, tubes sideways

## Technical specifications

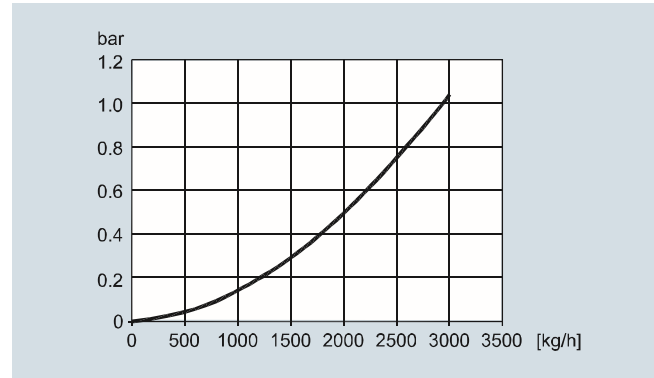
Sensor size	DN 10	DN 15	DN 25
<b>Mass Flow</b>			
Accuracy [% of rate]		± 0.5	
Repeatability [% of rate]		± 0.25	
Max. zero point error [kg/h (lb/h)]	0.25 (0.55)	1.2 (2.65)	3.0 (6.6)
Measuring range [kg/min (lb/min)]	0 ... 42 (0 ... 92.6)	0 ... 200 (0 ... 440.9)	0 ... 500 (0 ... 1102.3)
Process temperature	-40 ... +125 °C (-40 ... +257 °F)		
Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)		
Temperature error	0.5 °C (0.9 °F)		
Pressure [bar (psi)]	350 (5076)	350 (5076)	214 (3104)
Enclosure grade	IP66/IP67 (EN 60529)		
<b>Material</b>			
Measuring pipe	Hastelloy C22/2.4602	Hastelloy C22/2.4602	Stainless steel AISI 316L/1.4571
Splitter	Hastelloy C22/2.4602	Stainless steel AISI 316L/1.4571	Stainless steel AISI 316L/1.4571
Enclosure and connection (flanges)	Stainless steel		
Connection thread	¼" NPT ½" NPT ½" VCO	½" NPT ¾" NPT 1" NPT ¾" VCO	1" NPT 1½" NPT 1" VCO
Ex approval	<ul style="list-style-type: none"> <li>• ATEX II 1/2 G Ex ia IIC T5/T4 Ga/Gb</li> <li>• IECEx Ex ia IIC T5/T4 Ga/Gb</li> <li>• FM Class I, Div 1, Groups A, B, C and D</li> </ul>		
Weight approx.	2.8 kg (6.2 lb)	6.0 kg (13.2 lb)	11 kg (24.2 lb)
<b>Approvals Custody transfer</b>			
DN 10/DN 15	PTB Germany approval nr: 5.4.11/11.22 OIML R 139 - Compressed gaseous fuel measuring systems for vehicles		

## Characteristic curves

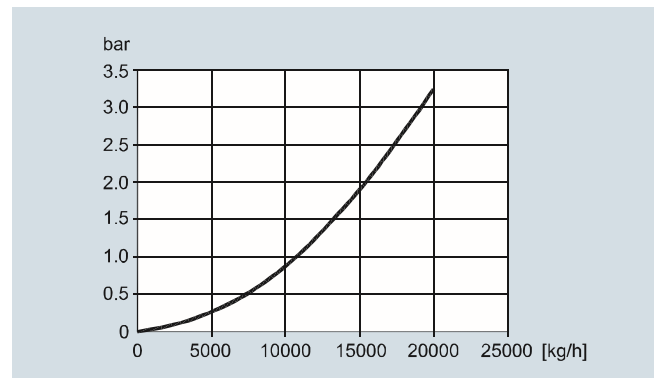
## DN 10



## DN 15



## DN 25



The pressure drop as a function of capacity for CNG with a pressure of 200 bar (2900 psi) and an ambient temperature of 20 °C (68 °F).

# Flow Measurement

## SITRANS F C

### Flow sensor SITRANS FCS200

Selection and Ordering data	Article No.
<b>SITRANS F C Flow sensors</b>	
<b>SITRANS FCS200 sensor, without heating jacket</b>	<b>7 ME 4 5 0 0 -</b>
<b>Sensor size and material</b>	
DN 10, Hastelloy C22/2.4602	2 D
DN 15, Hastelloy C22/2.4602	2 E
DN 25, Stainless steel AISI 316Ti/1.4571	1 F
<b>Pressure</b>	
PN 214 (DN 25)	K
PN 350 (DN 10 and DN 15)	N
<b>Process connection/flange</b>	
½"/VCO	7 1
¾"/VCO	7 2
1"/VCO	7 3
¼"/NPT pipe thread	8 1
½"/NPT pipe thread	8 2
¾"/NPT pipe thread	8 3
1"/NPT pipe thread	8 4
1½"/NPT pipe thread	8 5
<b>Configuration</b>	
Standard	1
<b>Transmitter</b>	
None	A
<b>Cable</b>	
No cable	A
<b>Calibration</b>	
Standard calibration	1

### Operating instructions for SITRANS FCS200

Description	Article No.
• English	<b>A5E02508199</b>
• German	<b>A5E03082574</b>
• Spanish	<b>A5E03082587</b>
• French	<b>A5E03082581</b>
• Italian	<b>A5E03504933</b>

### Spare parts

Description	Article No.
<b>Multiple plug for cable mounting</b>	<b>FDK:083H5056</b>
<b>2 kB SENSORPROM unit</b> (Sensor Serial No. and Article No. must be specified by ordering)	<b>FDK:083H4410</b>

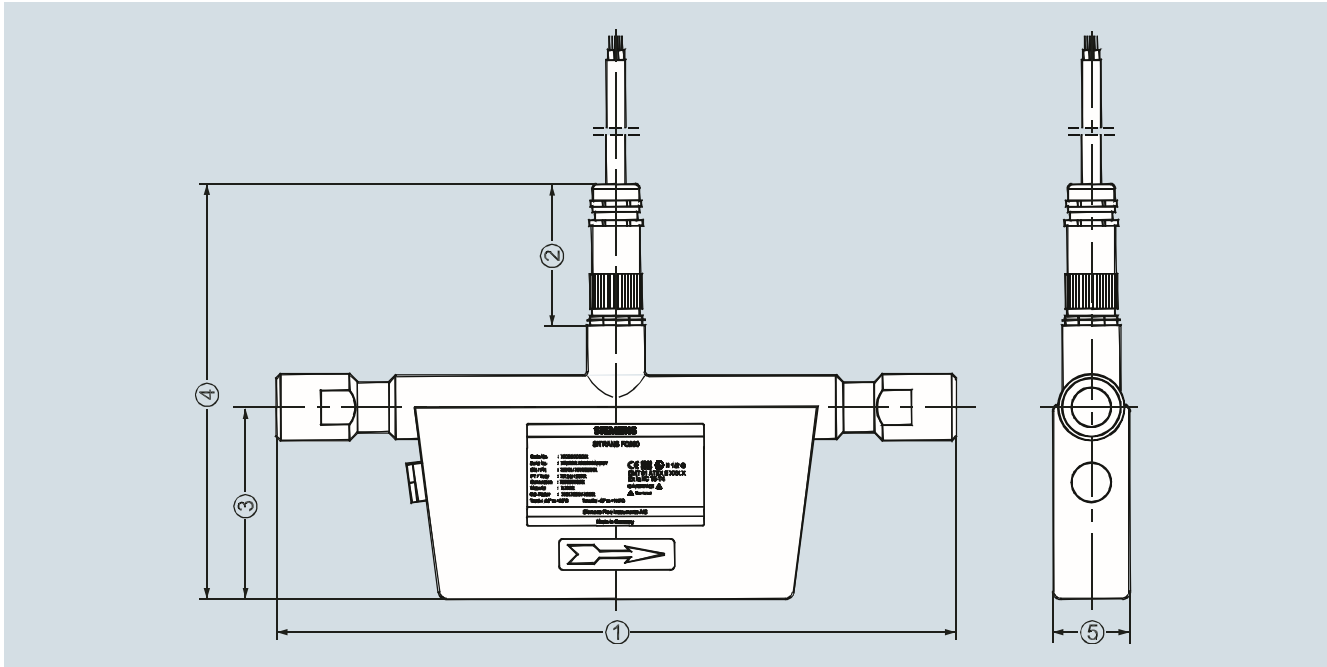
Selection and Ordering data	Order code
<b>Additional information</b>	
Please add "-Z" to Article No. and specify Order code(s) and plain text.	
Pressure testing certificate PED: 97/23/EC	<b>C11</b>
Material certificate EN 10204-3.1	<b>C12</b>
NDT-Penetrant inspection report ISO 3452	<b>C13</b>
Factory certificate according to EN 10204 2.2	<b>C14</b>
Factory certificate according to EN 10204 2.1	<b>C15</b>
Tag name plate, stainless steel	<b>Y17</b>

### Accessories

Description	Article No.
<b>Cable with multiple plug</b>	
5 m (16.4 ft)	<b>FDK:083H3015</b>
Standard blue cable between SIFLOW FC070/MASS 6000 and FCS200,	10 m (32.8 ft) <b>FDK:083H3016</b>
25 m (82 ft) <b>FDK:083H3017</b>	
5 x 2 x 0.34 mm <sup>2</sup> twisted and screened in pairs.	50 m (164 ft) <b>FDK:083H3018</b>
Temperature range -20 °C ... +110 °C (-4 °F ... +230 °F)	75 m (246 ft) <b>FDK:083H3054</b>
	150 m (492 ft) <b>FDK:083H3055</b>

## Dimensional drawings

## SITRANS FCS200, DN 10 ... DN 15



SITRANS FCS200, DN 10 ... DN 15, dimensions in mm (inch)

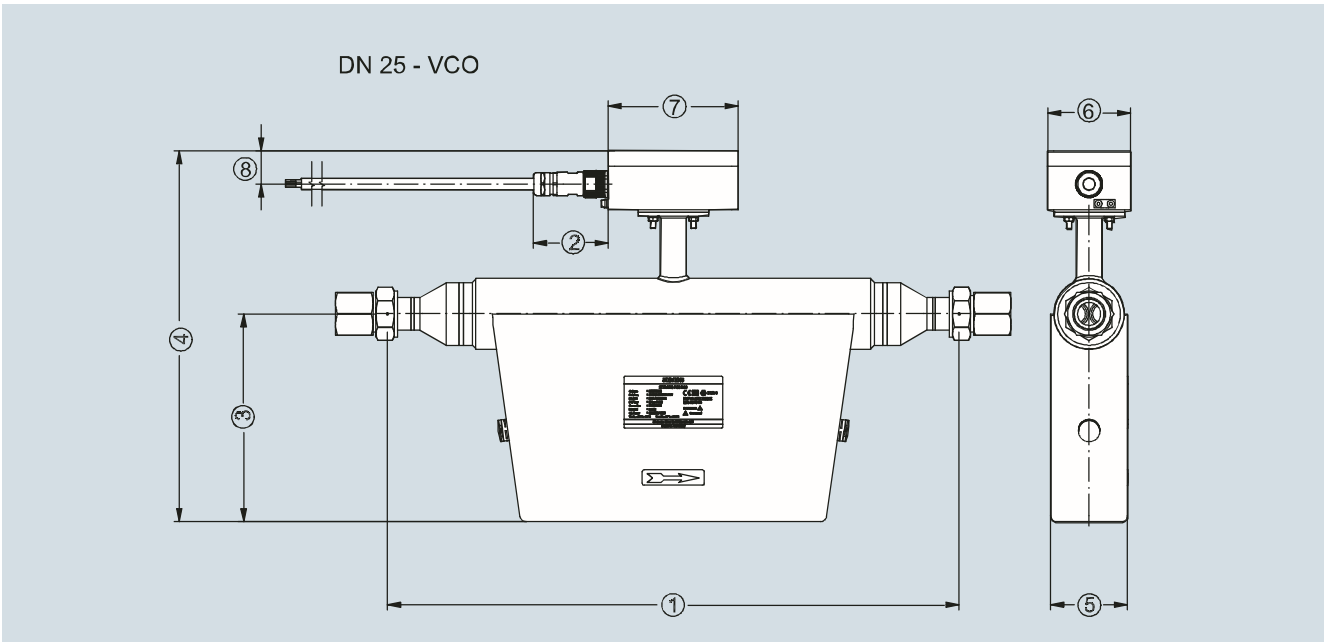
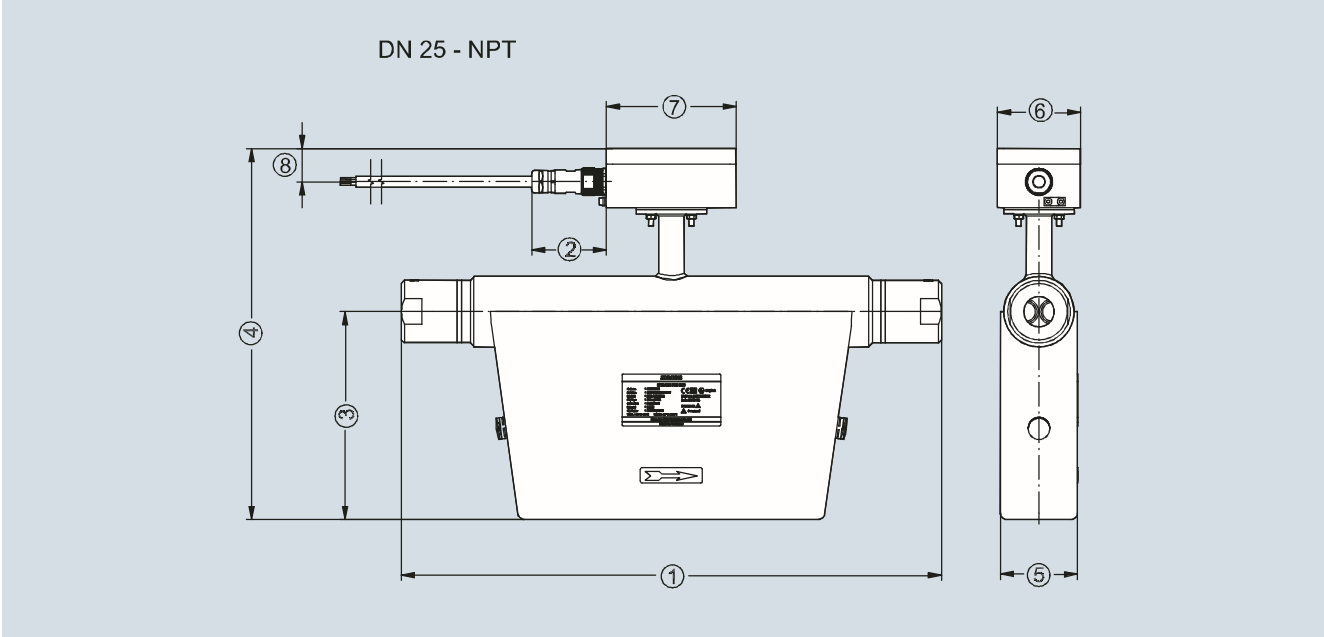
Position	DN 10 with NPT connectors mm (inch)	DN 10 with VCO connectors mm (inch)	DN 15 mm (inch)
(1)	350 (13.78)	330 (12.99)	450 (17.72)
(2)	72 (2.84)	72 (2.84)	72 (2.84)
(3)	100 (3.94)	100 (3.94)	148 (5.83)
(4)	204 (8.03)	204 (8.03)	253 (9.96)
(5)	40 (1.57)	40 (1.57)	48 (1.89)

# Flow Measurement SITRANS F C

## Flow sensor SITRANS FCS200

### SITRANS FCS200, DN 25

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SITRANS FCS200, DN 25, dimensions in mm (inch)

Position	DN 25 with NPT connection mm (inch)	DN 25 with VCO connection mm (inch)
(1)	520 (20.47)	550 (21.65)
(2)	72 (2.84)	72 (2.84)
(3)	200 (7.87)	200 (7.87)
(4)	357 (14.77)	357 (14.77)
(5)	74 (2.91)	74 (2.91)
(6)	80 (3.15)	80 (3.15)
(7)	125 (4.92)	125 (4.92)
(8)	32 (1.26)	32 (1.26)