

## Flow Measurement

### SITRANS F US Inline

#### Flowmeter SITRANS FUE380 with CT approval

#### Overview



The 2-path flowmeter SITRANS FUE380 comes as battery or mains-powered and is designed to measure water flow in district heating plants, local networks, boiler stations, substations, chiller plants (including glycol mixes without type approval) and other general water applications.

The flowmeter FUE380 is approved according to energy meter standards EN 1434 class 2, OIML R 75 class 2 and MID class 2. Metrological parameters are protected against manipulation. The type-approved flowmeter version is named SITRANS FUE380. For a standard flowmeter type FUS380 without a type approval, see separate FUS380 chapter.

Technically, the meter types SITRANS FUS380 and SITRANS FUE380 are completely identical, only difference is the calibration limit and the type approval for custody transfer.

#### Benefits

- Battery-powered up to 6 years
- 115/230 V mains-powered with back-up battery option in case of mains power failure
- Fast measuring frequency 15 Hz/0.5 Hz (230 V AC/Battery)
- Easy one-button straight forward display
- 2-path measuring principle for optimum accuracy
- Compact or remote mounting
- Measures on most district water qualities and water conductivities
- No pressure drop
- Long-term stability
- 2 galvanically isolated digital outputs for easy connection to a calculator (potential-free)
- Bidirectional measurement, with 2 totalizers and outputs
- Dynamic range  $Q_i; Q_p$  up to 1:50/100 or max. range  $Q_i; Q_s$  up to 1:400

#### Application

The main application for SITRANS FUE380 is measurement of water flow or water flow in energy meter systems for custody transfer in district heating networks or chilled water (including glycol mixes without type approval).

Combined with an energy calculator and a pair of temperature sensors, SITRANS FUE380 can be used as part of an energy meter system. For this purpose Siemens offers energy calculator SITRANS FUE950.

#### Design

The 2-path design of SITRANS FUE380 ensures maximum accuracy under short inlet conditions. The approved flowmeter consists of a flow sensor pipe, 4 transducers/transducer cables and a transmitter SITRANS FUE080.

The unit is available in a compact or a remote version with up to 30 meter distance from flowmeter to transmitter. When ordering a compact version the transducer cables are pre-mounted and ready for installation.

Compact mounting is only possible up to 120 °C (248 °F). The sensor must be isolated to protect transmitter from heat. The transmitter is available in an IP67/NEMA 4X/6 enclosure.

#### FUE380 MI-004 approval

The SITRANS FUE380 program is type-approved according to international energy meter standard EN 1434. On 1 November 2006 the MI-004 energy meter directive became effective providing that all energy meters with a MI-004 verification label can be sold across the EU borders.

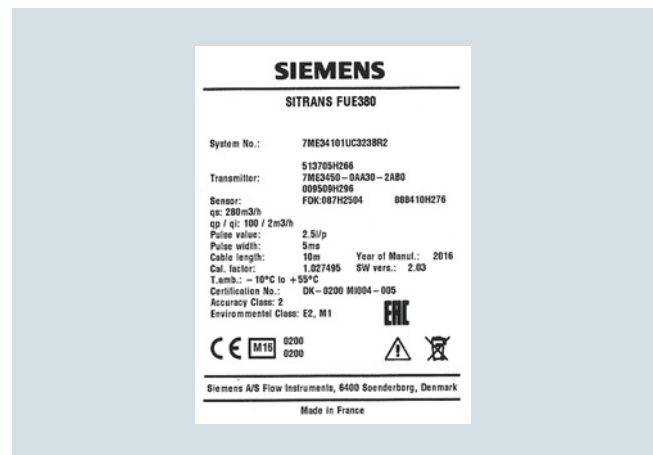
The FUE380 are MI-004 verified and labeled products according to Directive 2014/32/EU of the European Parliament and Council of 26 February, 2014 on measuring instruments, Annex VI Thermal Energy Meters (MI-004), in sizes from DN 50 to DN 1200.

The MID certification is obtained as module B + module D approvals according to the above-mentioned directive.

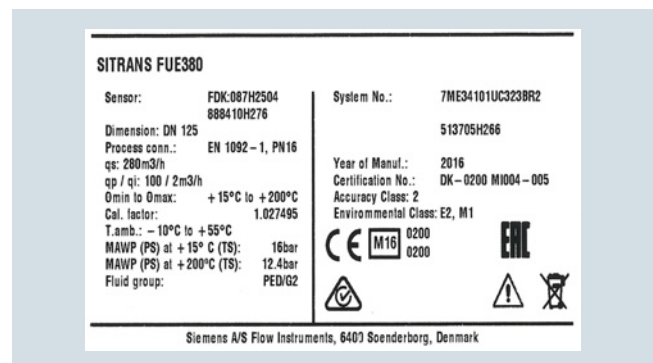
Module B: MI-004 Type MID approval according to EN 1434: 2007 (approved for media water)

Module D: Quality insurance MID approval of production

The MID system label with the approval information is placed on the side of the transmitter and on the sensor. An example of the product label is shown below:



FUE380 transmitter label (with MID first verification)



FUE380 sensor label (with MID first verification)

### Integration

The flowmeter digital output is often used as input for an energy meter or as input for digital systems for remote reading. SITRANS FUE380 has two digital output functions that can be individually selected.

Pulse output rate is defined when ordering. To get optimal benefit the pulse value must be selected as low as possible.

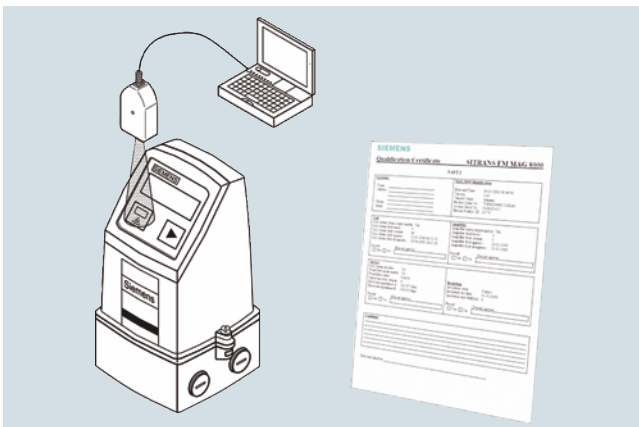
If the flowmeter forms part of an energy meter system for custody transfer, no further approvals are needed, except possible local approvals on the flowmeter.

### Function

Together with the SIMATIC PDM tool the FUE380 offers the possibility of testing and verifying the flowmeter on site and creating a printed "Qualification Certificate" with specific data that defines the quality status of the measurement.

The Qualification Certificate shows information about the actual status of the flowmeter:

- general settings, flowmeter and battery information, totalizer values, and pulse output settings
- detailed information about the transmitter and the sensor functionality, and a main parameter list for evaluating the functionality of the flowmeter



## Flow Measurement

### SITRANS F US Inline

#### Flowmeter SITRANS FUE380 with CT approval

#### Configuration SITRANS FUE380 type-approved

#### Selection guide SITRANS FUE380, type-approved flowmeter

DN	Q <sub>s</sub> (m <sup>3</sup> /h)	Q <sub>max</sub> (m <sup>3</sup> /h) (105 % of Q <sub>s</sub> )	Q <sub>p</sub> (m <sup>3</sup> /h)	Q <sub>i</sub> (m <sup>3</sup> /h) (1:50 of Q <sub>p</sub> ) <sup>4)</sup>	Q <sub>i</sub> (m <sup>3</sup> /h) (1:100 of Q <sub>p</sub> ) <sup>4)</sup>	Cut-off (m <sup>3</sup> /h)	Cut-off (% of Q <sub>max</sub> )	Typical pulse value <sup>5)</sup> (l/pulse)
50	30	31.5	15 <sup>2)</sup>	0.3	-	0.075	0.24	1
50	45	47.25	15 <sup>2)</sup>	0.3	-	0.075	0.16	1
50	45	47.25	30 <sup>3)</sup>	-	0.30	0.150	0.32	1
65	50	52.5	25 <sup>2)</sup>	0.5	-	0.125	0.24	1
65	72	75.6	25 <sup>2)</sup>	0.5	-	0.125	0.17	1
65	72	75.6	50 <sup>3)</sup>	-	0.50	0.250	0.33	1
80	80	84	40 <sup>2)</sup>	0.8	-	0.200	0.24	2.5
80	120	126	40 <sup>2)</sup>	0.8	-	0.200	0.16	2.5
80	120	126	80 <sup>3)</sup>	-	0.80	0.400	0.32	2.5
100	120	126	60 <sup>2)</sup>	1.2	-	0.300	0.24	2.5
100	180	189	60 <sup>2)</sup>	1.2	-	0.300	0.16	2.5
100	180	189	120 <sup>3)</sup>	-	1.20	0.600	0.32	2.5
125	200	210	100 <sup>2)</sup>	2.0	-	0.500	0.24	2.5
125	280	294	100 <sup>2)</sup>	2.0	-	0.500	0.17	2.5
125	280	294	200 <sup>3)</sup>	-	2.00	1.000	0.34	2.5
150	300	315	150 <sup>2)</sup>	3.0	-	0.750	0.24	10
150	420	441	150 <sup>2)</sup>	3.0	-	0.750	0.17	10
150	420	441	300 <sup>3)</sup>	-	3.00	1.500	0.34	10
200	500	525	250 <sup>2)</sup>	5.0	-	1.250	0.24	10
200	700	735	250 <sup>2)</sup>	5.0	-	1.250	0.17	10
200	700	735	500 <sup>3)</sup>	-	5.00	2.500	0.34	10
250	800	840	400 <sup>2)</sup>	8.0	-	2.000	0.24	10
250	1 120	1 176	400 <sup>2)</sup>	8.0	-	2.000	0.17	10
250	1 120	1 176	800 <sup>3)</sup>	-	8.00	4.000	0.34	10
300	1 120	1 176	560 <sup>2)</sup>	11.2	-	2.800	0.24	50
300	1 560	1 638	560 <sup>2)</sup>	11.2	-	2.800	0.17	50
300	1 560	1 638	1120 <sup>3)</sup>	-	11.20	5.600	0.34	50
350	1 500	1 575	750 <sup>2)</sup>	15.0	-	3.750	0.24	50
350	2 100	2 205	750 <sup>2)</sup>	15.0	-	3.750	0.17	50
350	2 100	2 205	1 500 <sup>3)</sup>	-	15.00	7.500	0.34	50
400	1 900	1 995	950 <sup>2)</sup>	19.0	-	4.750	0.24	50
400	2 660	2 793	950 <sup>2)</sup>	19.0	-	4.750	0.17	50
400	2 660	2 793	1 900 <sup>3)</sup>	-	19.00	9.500	0.34	50
500	2 950	3 097.5	1 475 <sup>2)</sup>	29.5	-	7.375	0.24	100
500	4 130	4 336.5	1 475 <sup>2)</sup>	29.5	-	7.375	0.17	100
500	4 130	4 336.5	2 950 <sup>3)</sup>	-	29.50	14.750	0.34	100
600	4 300	4 515	2 150 <sup>2)</sup>	43.0	-	10.750	0.24	100
600	6 020	6 321	2 150 <sup>2)</sup>	43.0	-	10.750	0.17	100
600	6 020	6 321	4 300 <sup>3)</sup>	-	43.00	21.500	0.34	100
700	5 800	6 090	2 900 <sup>2)</sup>	58.0	-	14.500	0.24	100
700	8 120	8 526	2 900 <sup>2)</sup>	58.0	-	14.500	0.17	100
700	8 120	8 526	5 800 <sup>3)</sup>	-	58.00	29.000	0.34	100
800	7 600	7 980	3 800 <sup>2)</sup>	76.0	-	19.000	0.24	100
800	10 640	11 172	3 800 <sup>2)</sup>	76.0	-	19.000	0.17	100
800	10 640	11 172	7 600 <sup>3)</sup>	-	76.00	38.000	0.34	100
900	10 000	10 500	5 000 <sup>2)</sup>	100.0	-	25.000	0.24	100
900	14 000	14 700	5 000 <sup>2)</sup>	100.0	-	25.000	0.17	100
900	14 000	14 700	10 000 <sup>3)</sup>	-	100.00	50.000	0.34	100

### Flowmeter SITRANS FUE380 with CT approval

DN	$Q_s$ (m <sup>3</sup> /h)	$Q_{max}$ (m <sup>3</sup> /h) (105 % of $Q_s$ )	$Q_p$ (m <sup>3</sup> /h)	$Q_i$ (m <sup>3</sup> /h) (1:50 of $Q_p$ ) <sup>4)</sup>	$Q_l$ (m <sup>3</sup> /h) (1:100 of $Q_p$ ) <sup>4)</sup>	Cut-off (m <sup>3</sup> /h)	Cut-off (% of $Q_{max}$ )	Typical pulse value <sup>5)</sup> (l/pulse)
1 000	12 000	12 600	6 000 <sup>2)</sup>	120.0	-	30.000	0.24	100
1 000	16 800	17 640	6 000 <sup>2)</sup>	120.0	-	30.000	0.17	100
1 000	16 800	17 640	12 000 <sup>3)</sup>	-	120.00	60.000	0.34	100
1 200	18 000	18 900	9 000 <sup>2)</sup>	180.0	-	45.000	0.24	100
1 200	25 200	26 460	9 000 <sup>2)</sup>	180.0	-	45.000	0.17	100
1 200	25 200	26 460	18 000 <sup>3)</sup>	-	180.00	90.000	0.34	100

Dynamic range  $Q_i:Q_p$ : better than 1:100 or 1:50 according to OIML R 75 class 2 and MID EN 1434 class 2.

$Q_i$  ( $Q_{min}$ ) means the minimal and  $Q_p$  ( $Q_{nom}$ ) the nominal flow rate according to the approval requirements.

$Q_s$  is the highest operatable flow rate. The maximum flow rate ( $Q_{max}$ ) is 105 % of  $Q_s$ . The low flow cut-off is 50 % of  $Q_i$ .

$Q_i$ ,  $Q_p$  and  $Q_s$  are shown on the system nameplate of the FUE380.

In order to obtain best pulse output resolution in the range  $Q_{min}$  to  $Q_s$  of approx. 100 Hz at  $Q_s$ , two or three flow values for every dimension can be selected at ordering. Therefore the ordering data table also shows  $Q_p$  ( $Q_n$ ). This flow rate is between  $Q_i$  ( $Q_{min}$ ) and  $Q_s$  and indicates the normal or typical flow according to the approval requirements.

<sup>1)</sup> Typical pulse values with a pulse length of 5 ms in connection with SITRANS FUE950. Other values are possible, please see the selections at the 7ME341 Order code.

<sup>2)</sup> EN 1434 and MID flow values

<sup>3)</sup> OIML R 75 and MID flow values

<sup>4)</sup> The minimum flow ( $Q_i$ ) should be checked in the PIA-portal or product master data base (PMD)

<sup>5)</sup> To get optimal benefit of the pulses the pulse value and pulse length shall be selected as low as possible. The following calculation formula can be used for determining the shortest pulse value at a pulse length of 5 ms:  $L/pulse > Q_s$  (m<sup>3</sup>/h) / 360.

For example  $Q_s = 300$  m<sup>3</sup>/h;  $L/pulse > 300/360$ ;  $L/pulse > 0.83$ ; therefore the pulse value must be 1 l/pulse

## Flow Measurement

### SITRANS F US Inline

#### Flowmeter SITRANS FUE380 with CT approval

#### Technical specifications

<b>Pipe design</b>	2-path sensor with flanges and inline transducers wet-calibrated from factory
Nominal size welded version (DN 50 ... DN 80 in bronze)	DN 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 500, 600, 700, 800, 900, 1000, 1200
Pressure rate	PN 16, PN 25, PN 40 EN 1092-1 flanges: • type 01 (B): DN 100 to DN 125 • type 11 (B): DN 150 to DN 1200 • type 11 (B) 'design': DN 50 to DN 80
Pipe material	• DN 100 ... DN 1200: Carbon Steel EN 1.0345/P235 GH, painted in light-gray. • DN 50 ... DN 80: Die-cast bronze G-CuSn10/W2.1050.01 (EN 1982)
Transducer design	• DN 100 ... DN 1200: Inline version and welded onto the pipe • DN 50 ... DN 80: Screwed into the pipe
Transducer material	Stainless steel (AISI 316/1.4404)/brass (CuZn <sub>36</sub> Pb <sub>2</sub> As)
<b>Sensor operating conditions</b>	
Ambient temperature	
• Operation	-10 ... +60 °C (14 ... 140 °F) (MID version: -10 ... +55 °C (14 ... 131 °F))
• Storage	-40 ... +85 °C (-40 ... +185 °F)
Measured media	Heating water, according to VDI-2035 (pH 8.2 - 10.5), industrial VdTÜV information sheet 1466 and AGFW information sheet FW 510.
Media/surface temperature	
• DN 100 ... DN 1200	Remote: 2 ... 200 °C (35.6 ... 392 °F) MID: min. +15 °C/+59 °F
• DN 50 ... DN 80	Remote: 2 ... 150 °C (35.6 ... 302 °F) MID: min. +15 °C/+59 °F
• DN 50 ... DN 1200	Compact: 2 ... 120 °C (35.6 ... 248 °F) MID: min. +15 °C/+59 °F
Degree of protection	Sensor connection IP67/NEMA 4X/6
Electromagnetic compatibility	
• Emitted interference	To EN 55011/CISPR-11
• Noise immunity	To EN/IEC 61326-1 (Industry)
• MID	Environment class E2 and M1
Max. flow velocity at Q <sub>s</sub>	DN 50 ... DN 1200: 9 m/s (29.5 ft/s)

#### Transmitter

The transmitter related to this system is the SITRANS FUE080. Technical specifications to the FUE080 see page 3/252 ff.

#### Sensor cable

Cable length	Max. 30 m (98.4 ft) between transmitter and sensor
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#### Certificates and approvals

Conformity certificate	The devices are supplied as standard with a Siemens Certificate of Conformity on DVD
Material certificate	Material certificate according EN 10204-3.1 is optionally available

#### Calibration report

A standard calibration report is shipped with every flowmeter.

Extended accredited ISO/IEC 17025 calibration certificates optionally available

#### Approvals

- Approval standards: EN 1434 and OIML R 75 Class 2
- Type approval: MID, MI-004, class 2 approval and certification (according to EN 1434)
- CPA/CMC (China)

The sensors are approved according to EU directive 2014/68/EU dated 27 June 2014 regarding fluid group 1, classified in category III. Design according to EN 13480 (PED Directive).

#### Type-dependent settings

Flow value	Predefined according to EN 1434/OIML R 75/MID
Approval	Country specific
Flow rate v <sub>f</sub>	0.02 ... 9 m/s (0.065 ... 29.5 ft/s)
Output A	Preset: Forward pulses
Output B	Preset: Alarm
Pulse value A & B (depending on DN value)	Preset: See scheme - previous page Preset for SITRANS FUE950 or free selectable depending on flow rate (Q <sub>s</sub> )
Pulse width	Preset: 5 ms
Flow unit setup	Preset: m <sup>3</sup> /h
Volume unit setup	Preset: m <sup>3</sup>

#### Flowmeter Calibration and traceability

To ensure continuous accurate measurement, flowmeters must be calibrated. The calibration is conducted at Siemens flow facilities with traceable instruments referring directly to the physical unit of measurement according to the International System of Units (SI).

Therefore, the calibration certificate ensures recognition of the test results worldwide, including the US (NIST traceability). Siemens offers accredited calibrations assured to ISO 17025 in the flow range from 0.0001 m<sup>3</sup>/h to 10 000 m<sup>3</sup>/h. Siemens Flow Instruments accredited laboratories are recognized by ILAC MRA (International Laboratory Accreditation Corporation - Mutual Recognition Arrangement) ensuring international traceability and recognition of the test results worldwide.

A standard calibration certificate with Q<sub>n</sub> as selected flow is shipped with each SITRANS FUE380. This production calibration protocol consists of 2 x 3 points at Q<sub>i</sub>, 10 % Q<sub>p</sub> and Q<sub>p</sub> (max. 4 200 m<sup>3</sup>/h).

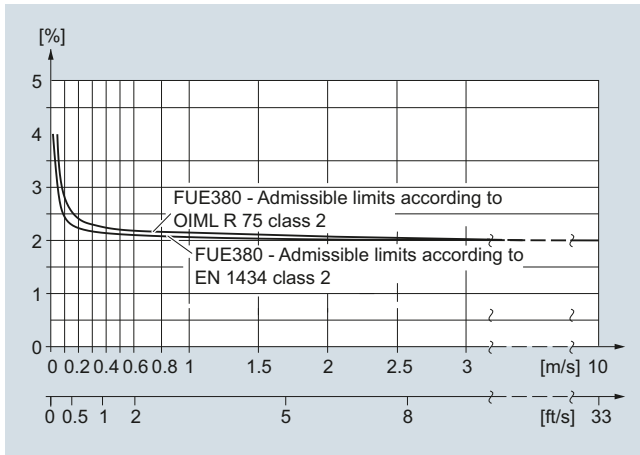
### Typical accuracy SITRANS FUE380:

$$\pm(0.5 + 0.02 Q_p/Q) [\%]$$

$Q_p$  according to EN 1434/OIML requirements.

Example: DN 100,  $Q_p = 60 \text{ m}^3/\text{h}$  at  $Q = 1.2 \text{ m}^3/\text{h}$ :

Accuracy at  $1.2 \text{ m}^3/\text{h} = \text{typical } 1.5 \%$



SITRANS FUE380 fulfils the requirements

$E_f = \pm (2 + 0.02 Q_p/Q_i)$  max.  $\pm 5 \%$ , according to EN 1434 and OIML R 75, class 2 or MID class 2 requirements.

# Flow Measurement

## SITRANS F US Inline

### Flowmeter SITRANS FUE380 with CT approval

#### Selection and Ordering data

Article No. Order code

#### Flowmeter SITRANS FUE380 (type-approved)

7 ME 3 4 1 0 -

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

#### Diameter Flow setting [m<sup>3</sup>/h] Qp[m<sup>3</sup>/h]<sup>1)</sup> Qs [m<sup>3</sup>/h]

DN 50 (2") <sup>2)</sup>	15 <sup>3)</sup>	30	1 B
DN 50 (2") <sup>2)</sup>	15 <sup>3)</sup>	45	1 C
DN 50 (2") <sup>2)</sup>	30 <sup>4)</sup>	45	1 D
DN 65 (2½") <sup>2)</sup>	25 <sup>3)</sup>	50	1 F
DN 65 (2½") <sup>2)</sup>	25 <sup>3)</sup>	72	1 G
DN 65 (2½") <sup>2)</sup>	50 <sup>4)</sup>	72	1 H
DN 80 (3") <sup>2)</sup>	40 <sup>3)</sup>	80	1 K
DN 80 (3") <sup>2)</sup>	40 <sup>3)</sup>	120	1 L
DN 80 (3") <sup>2)</sup>	80 <sup>4)</sup>	120	1 M
DN 100 (4")	60 <sup>3)</sup>	120	1 P
DN 100 (4")	60 <sup>3)</sup>	180	1 Q
DN 100 (4")	120 <sup>4)</sup>	180	1 R
DN 125 (5")	100 <sup>3)</sup>	200	1 T
DN 125 (5")	100 <sup>3)</sup>	280	1 U
DN 125 (5")	200 <sup>4)</sup>	280	1 V
DN 150 (6")	150 <sup>3)</sup>	300	2 B
DN 150 (6")	150 <sup>3)</sup>	420	2 C
DN 150 (6")	300 <sup>4)</sup>	420	2 D
DN 200 (8")	250 <sup>3)</sup>	500	2 F
DN 200 (8")	250 <sup>3)</sup>	700	2 G
DN 200 (8")	500 <sup>4)</sup>	700	2 H
DN 250 (10")	400 <sup>3)</sup>	800	2 K
DN 250 (10")	400 <sup>3)</sup>	1 120	2 L
DN 250 (10")	800 <sup>4)</sup>	1 120	2 M
DN 300 (12")	560 <sup>3)</sup>	1 120	2 P
DN 300 (12")	560 <sup>3)</sup>	1 560	2 Q
DN 300 (12")	1 120 <sup>4)</sup>	1 560	2 R
DN 350 (14")	750 <sup>3)</sup>	1 500	2 T
DN 350 (14")	750 <sup>3)</sup>	2 100	2 U
DN 350 (14")	1 500 <sup>4)</sup>	2 100	2 V
DN 400 (16")	950 <sup>3)</sup>	1 900	3 B
DN 400 (16")	950 <sup>3)</sup>	2 660	3 C
DN 400 (16")	1 900 <sup>4)</sup>	2 660	3 D
DN 500 (20")	1 475 <sup>3)</sup>	2 950	3 K
DN 500 (20")	1 475 <sup>3)</sup>	4 130	3 L
DN 500 (20")	2 950 <sup>4)</sup>	4 130	3 M
DN 600 (24")	2 150 <sup>3)</sup>	4 300	3 T
DN 600 (24")	2 150 <sup>3)</sup>	6 020	3 U
DN 600 (24")	4 300 <sup>4)</sup>	6 020	3 V
DN 700 (28")	2 900 <sup>3)</sup>	5 800	4 F
DN 700 (28")	2 900 <sup>3)</sup>	8 120	4 G
DN 700 (28")	5 800 <sup>4)</sup>	8 120	4 H
DN 800 (32")	3 800 <sup>3)</sup>	7 600	4 P
DN 800 (32")	3 800 <sup>3)</sup>	10 640	4 Q
DN 800 (32")	7 600 <sup>4)</sup>	10 640	4 R
DN 900 (36")	5 000 <sup>3)</sup>	10 000	5 B
DN 900 (36")	5 000 <sup>3)</sup>	14 000	5 C
DN 900 (36")	10 000 <sup>4)</sup>	14 000	5 D
DN 1000 (40")	6 000 <sup>3)</sup>	12 000	5 K
DN 1000 (40")	6 000 <sup>3)</sup>	16 800	5 L
DN 1000 (40")	12 000 <sup>4)</sup>	16 800	5 M
DN 1200 (48")	9 000 <sup>3)</sup>	18 000	5 T
DN 1200 (48")	9 000 <sup>3)</sup>	25 200	5 U
DN 1200 (48")	18 000 <sup>4)</sup>	25 200	5 V

#### Selection and Ordering data

Article No. Order code

#### Flowmeter SITRANS FUE380 (type-approved)

7 ME 3 4 1 0 -

#### Flange norm and pressure rating

System without sensor - only a transmitter

#### EN 1092-1

PN 16 (DN 100 ... DN 1 200)

PN 25 (DN 200 ... DN 1 000)

PN 40 (DN 50 ... DN 250)<sup>5)</sup>

#### Compact/remote connection

Compact version, max. 120 °C (248 °F)

Remote version, max. 150/200 °C (302/392 °F)

5 m (16.4 ft)

10 m (32.8 ft)

20 m (65.6 ft)

30 m (98.4 ft)

#### Approvals/pulse output

Without approval (neutral)

Selectable pulse output

With approval marks

Selectable pulse output

With approval marks and seal

Selectable pulse output

#### Pulse output value setup<sup>8)</sup>

0.1 l/p

1 l/p

2.5 l/p

10 l/p

50 l/p

100 l/p

250 l/pulse

1 m<sup>3</sup>/pulse

0.25 l/pulse

0.5 l/pulse

5 l/pulse

25 l/pulse

500 l/pulse

2.5 m<sup>3</sup>/pulse5 m<sup>3</sup>/pulse10 m<sup>3</sup>/pulse25 m<sup>3</sup>/pulse50 m<sup>3</sup>/pulse100 m<sup>3</sup>/pulse250 m<sup>3</sup>/pulse500 m<sup>3</sup>/pulse1 000 m<sup>3</sup>/pulse

For notes 1) to 8) see next page

C  
D  
E

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NOA

NOB

NOC

NOD

NOE

NOF

NOG

NOH

NOJ

NOK

NOL

NOM

NON

NOP

Selection and Ordering data	Article No.	Order code
<b>Flowmeter SITRANS FUE380 (type-approved)</b>	<b>7ME3410-</b>	
<b>Transmitter SITRANS FUE080</b>		
IP67/NEMA 4X/6 115 ... 230 V AC	B	
IP67/NEMA 4X/6 3.6 V battery version, incl. dual battery pack <sup>6)</sup>	D	
IP67/NEMA 4X/6 115 ... 230 V AC, including 3.6 V single battery backup <sup>6)</sup>	E	
IP67/NEMA 4X/6 3.6 V battery version (no battery pack included)	G	
<b>Country/approval type<sup>7)</sup></b>		
Neutral, no approval mark	A	
China	C	
Russia, EN 1434/OIML R 75	M	
MID-Approval, (EN 1434/OIML R 75), English	R	
MID-Approval, (EN 1434/OIML R 75), German	S	
MID-Approval, (EN 1434/OIML R 75), Polish	T	
MID-Approval, (EN 1434/OIML R 75), French	U	
<b>Pulse width setup</b>		
5 ms (standard)	2	
10 ms	3	
20 ms	4	
50 ms	5	
100 ms	6	
200 ms	7	
500 ms	8	

- 1)  $Q_p$  ( $Q_n$ ) is the normal flow according to the approval requirements.  $Q_p$  and  $Q_s$  is shown on the system label.
- 2) Pipe material bronze brass
- 3) EN 1434 flow values. The minimum flow ( $Q_i$ ) should be checked in the PIA-portal or product master data base (PMD).
- 4) OIML R 75/EN1434 flow values without PTB approval
- 5) PN 40 standard for DN 50 ... DN 80 die-cast bronze pipes
- 6) Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.
- 7) Other countries in progress
- 8) To get optimal benefit of the pulses the pulse value and pulse length shall be selected as low as possible. The following calculation formula can be used for determining the shortest pulse value at a pulse length of 5 ms:  
 $L/pulse > Q_s (m^3/h) / 360$   
 For example  $Q_s = 300 m^3/h$ ;  $L/pulse > 300/360$ ;  $L/pulse > 0.83$ ; therefore the pulse value must be 1 l/pulse

Selection and Ordering data	Order code
<b>Additional information</b>	
Please add „-Z“ to Article No. and following add-on code(s) with plain text.	
<b>Calibration/certificate FUE380</b>	
Approval, verification and approval sealing as defined with the article number. See Order code.	
Production calibration for DN 50 ... DN 1200 with $Q_n$ as selected in diameter Incl. Calibration protocol: 2 x 3 points, $Q_i$ , 10 % $Q_p$ and $Q_p$ (max. 8000 m <sup>3</sup> /h).	<b>Included</b>
Accredited Siemens ISO/IEC 17025 calibration for DN 50 ... DN 200 with $Q_n$ as selected in diameter. Certificate: 2 x 5 points, $Q_i$ , 5 %, 10 %, 50 % and 100 % of $Q_p$ (max. 630 m <sup>3</sup> /h).	<b>D20</b>
Accredited Siemens ISO/IEC 17025 calibration for DN 250 ... DN 600 with $Q_n$ as selected in diameter. Certificate: 2 x 5 points, $Q_i$ , 5 %, 10 %, 50 % and 100 % of $Q_p$ (max. 2800 m <sup>3</sup> /h).	<b>D21</b>
Accredited Siemens ISO/IEC 17025 calibration, DN 500 ... DN 1200 with $Q_n$ as selected in diameter. Certificate: 2 x 5 points, $Q_i$ , 5 %, 10 %, 50 % and 100 % of $Q_p$ (max. 8000 m <sup>3</sup> /h).	<b>D22</b>
Output B as reverse flow pulses. No calibration/verification of this function.	<b>E21</b>
<b>Material certificate</b>	
EN 10204-3.1 (pipe material)	<b>F10</b>
<b>Regional specific approval</b>	
KCC marking for Korea	<b>W28</b>
<b>Tag name plate</b>	
Stainless steel TAG plate (1 x 24 x 80 mm), wire fixed. Font size depends on text length: 8 mm for 1 ... 10 characters, 4 mm for 11 ... 20 characters (specify in plain text).	<b>Y17</b>

### Flowmeter SITRANS FUE380 operating instructions, accessories and spare parts

#### Operating instructions

Description	Article No.
• English	<b>A5E00730100</b>
• German	<b>A5E00740611</b>

This device is shipped with Safety Notes and a DVD containing further SITRANS F US literature.

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)

**For accessories and spare parts on page 3/255 see chapter of transmitter FUS080/FUE080.**



Please use online Product selector to get latest updates.

Product selector link:

[www.pia-portal.automation.siemens.com](http://www.pia-portal.automation.siemens.com)

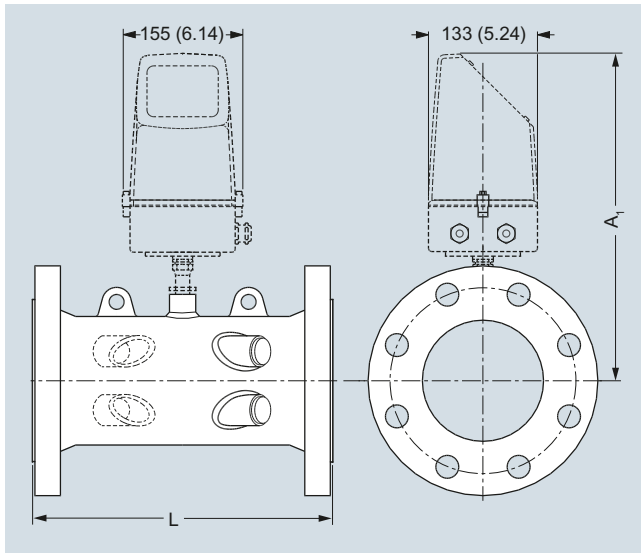


## Flow Measurement

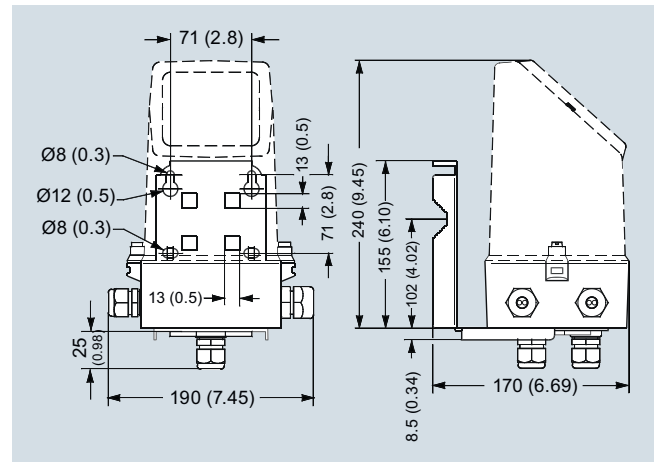
### SITRANS F US Inline

#### Flowmeter SITRANS FUS380 and FUE380

#### Dimensional drawings



#### Transmitter IP67/NEMA 4X/6, wall mounting



Dimensions in mm (inch)

#### Sensor dimensions for FUS380 and FUE380

Size DN	PN 16		PN 25		PN 40		A <sub>1</sub> mm	Lift hug
	L mm	Weight kg	L mm	Weight kg	L mm	Weight kg		
50	-	-	-	-	300 +0/-2	10	350	No
65	-	-	-	-	300 +0/-2	15	363	No
80	-	-	-	-	350 +0/-2	18	370	No
100	350 +0/-2	15	-	-	350 +0/-2	18	372	No
125	350 +0/-2	18	-	-	350 +0/-2	24	385	No
150	500 +0/-3	28	-	-	500 +0/-3	34	399	No
200	500 +0/-3	38	500 +0/-3	47	500 +0/-3	55	425	Yes
250	600 +0/-3	60	600 +0/-3	76	600 +0/-3	91	452	Yes
300	500 +0/-3	66	500 +0/-3	81	-	-	478	Yes
350	550 +0/-3	94	550 +0/-3	121	-	-	495	Yes
400	600 +0/-3	124	600 +0/-3	153	-	-	520	Yes
500	625 +0/-3	194	625 +0/-3	231	-	-	570	Yes
600	750 +0/-3	303	750 +0/-3	365	-	-	622	Yes
700	875 +0/-3	361	875 +0/-3	553	-	-	673	Yes
800	1000 +0/-3	494	1000 +0/-3	770	-	-	724	Yes
900	1230 +0/-6	535	1300 +0/-6	835	-	-	775	Yes
1000	1300 +0/-6	594	1370 +0/-6	1000	-	-	826	Yes
1200	1360 +0/-6	732	-	-	-	-	928	Yes

#### Notes:

- Weight for transmitter/electronics 1.5 kg (compact version) or approximately 5 kg (remote version including 10 m cable set)
- - Means not available
- All weights are **approximate**
- For flange values - see norm EN 1092-1

Size inch	PN 16		PN 25		PN 40		A <sub>1</sub> inch	Lift hug
	L inch	Weight lb	L inch	Weight lb	L inch	Weight lb		
2	-	-	-	-	11.81 +0/-0.08	22	13.78	No
2½	-	-	-	-	11.81 +0/-0.08	33	14.30	No
3	-	-	-	-	13.78 +0/-0.08	40	14.57	No
4	13.78 +0/-0.08	33	-	-	13.78 +0/-0.08	40	14.65	No
5	13.78 +0/-0.08	40	-	-	13.78 +0/-0.08	53	15.16	No
6	19.68 +0/-0.12	62	-	-	19.68 +0/-0.12	75	15.71	No
8	19.68 +0/-0.12	84	19.68 +0/-0.12	104	19.68 +0/-0.12	121	16.74	Yes
10	23.62 +0/-0.12	132	23.62 +0/-0.12	168	23.62 +0/-0.12	201	17.80	Yes
12	19.68 +0/-0.12	146	19.68 +0/-0.12	179	-	-	18.82	Yes
14	21.65 +0/-0.12	207	21.65 +0/-0.12	267	-	-	19.49	Yes
16	23.62 +0/-0.12	273	23.62 +0/-0.12	337	-	-	20.48	Yes
20	24.61 +0/-0.12	428	24.61 +0/-0.12	509	-	-	22.45	Yes
24	29.53 +0/-0.12	668	29.53 +0/-0.12	805	-	-	24.49	Yes
28	34.45 +0/-0.12	796	34.45 +0/-0.12	1246	-	-	26.50	Yes
32	39.37 +0/-0.12	1089	39.37 +0/-0.12	1698	-	-	28.51	Yes
36	48.43 +0/-0.24	1179	51.18 +0/-0.24	1841	-	-	30.52	Yes
40	51.18 +0/-0.24	1310	53.94 +0/-0.24	2205	-	-	32.52	Yes
48	53.54 +0/-0.24	1614	-	-	-	-	36.54	Yes

**Notes:**

- Weight for transmitter/electronics 3.3 lb (compact version) or approximately 11 lb (remote version including 32.8 ft cable set)
- - Means not available
- All weights are **approximate**
- For flange values - see norm EN 1092-1

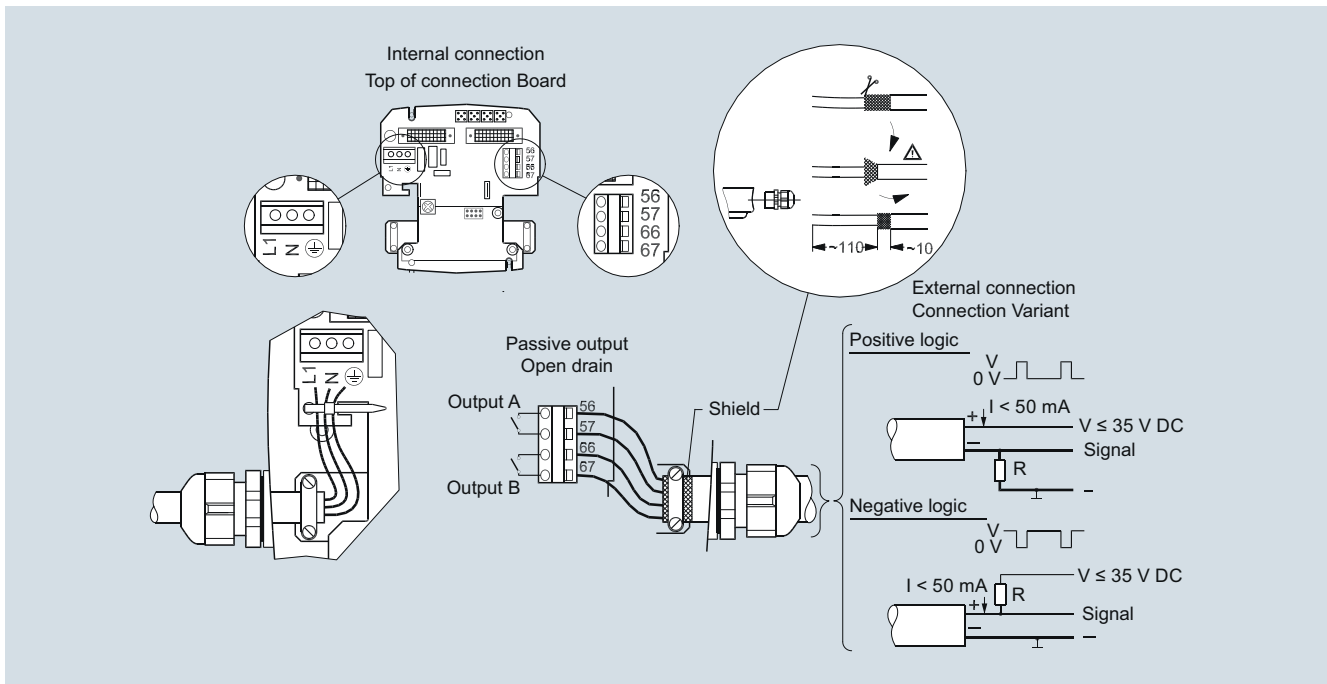
# Flow Measurement

## SITRANS F US Inline

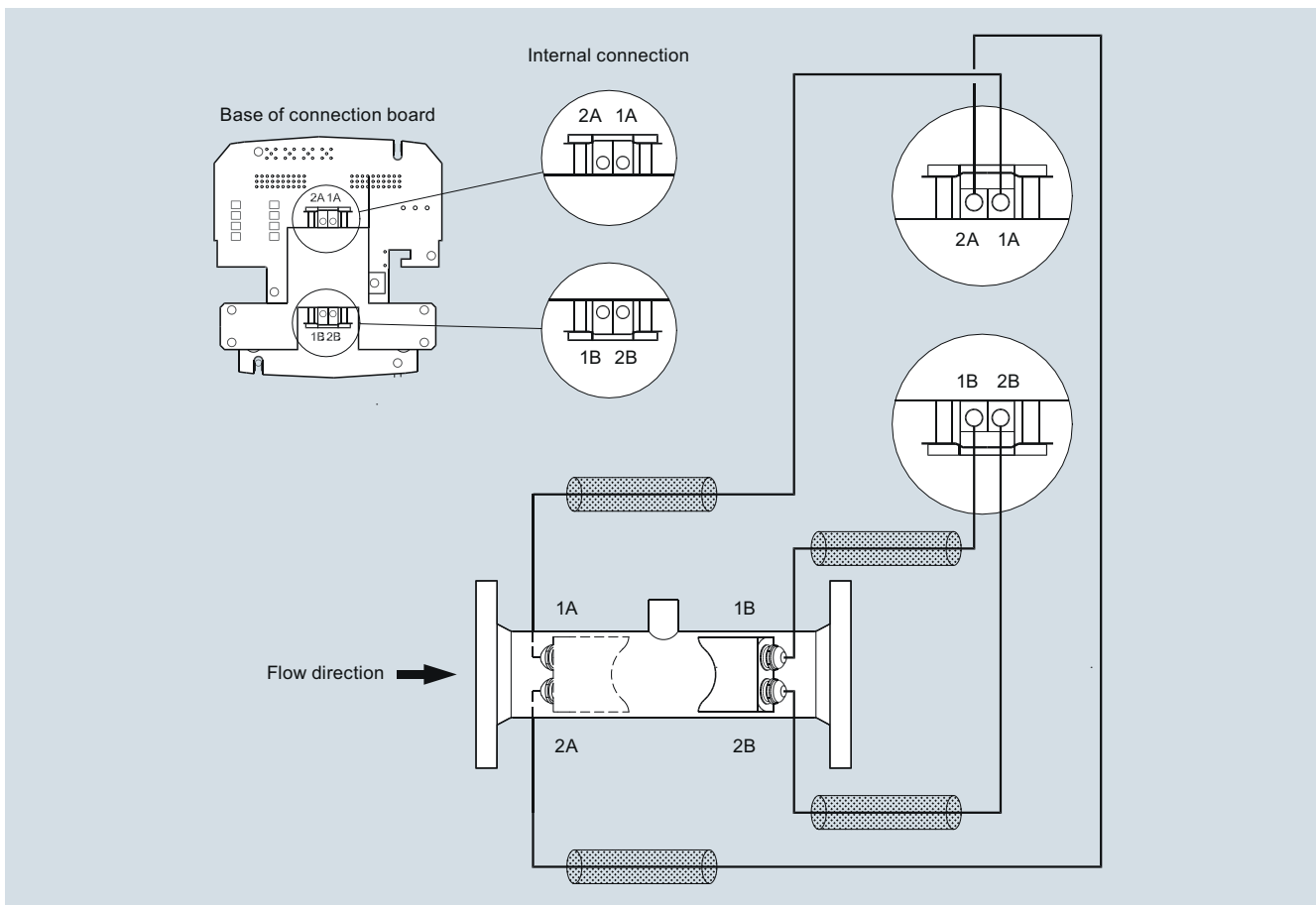
### Flowmeter SITRANS FUS380 and FUE380

#### Schematics

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Electrical connection of transmitter SITRANS FUS/FUE380



Electrical connection of sensor SITRANS FUS/FUE380