DANAK
PROD Reg. No. 7026

FORCE Certification

EU-Type Examination Certificate

Measuring Instrument Directive

Certificate number: DK-0200-MI004-005

Issued by FORCE Certification A/S Denmark
EU-notified body number 0200

In accordance with the Danish Safety Technology Authority's statutory order no. 544 of May 28, 2018 which implements the Directive 2014/32/EU of the European Parliament and Council of February 26, 2014 on measuring instruments (MID).

Issued to: **Siemens AG**
DE-76181
Karlsruhe
Germany

Reference No.:	117-29536.10.01
Type of instrument:	Ultrasonic Flowmeter
Type designation:	SITRANS FUE380
Valid until:	November 30, 2018
Number of pages:	7, including appendix
Date of issue:	September 1, 2018
Version:	9 This new version of DK-0200-MI004-005 is an administrative extension of the validity period and it replaces all previous versions.

Approved by

Michael Møller Nielsen
Certification Manager

Processed by

Lars Poder
Examiner

The conformity markings may only be affixed to the above type approved equipment. The manufacturer's Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the Directive is fully complied with and controlled by a written inspection agreement with a notified body. This EU-type examination certificate may not be reproduced except in full, without written permission by FORCE Certification A/S.

FORCE Certification references:
TASK No.: 117-29536.10.01 and ID. No.: 0200-MID-04783

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FORCE Certification

DK-0200-MI004-005

Appendix to

EU-Type Examination Certificate

Measuring Instrument Directive

Number: DK-0200-MI004-005
Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

Administrative extension of the validity period.
Version No. 9.

Applied standards and documents:
EN1434:2007

The instruments/measuring systems shall correspond with the following specifications:

Type designation:
SITRANS FUE380

Description:
The Volume meter SITRANS FUE380 is an ultrasonic flow meter working after the transmission time difference principle.
The meters consists of a flow sensor and a transmitter.
The flow sensor has 2 sound tracks.

Technical documentation:
Reference No. 117-29536.10.01, 117-29536.09.01, 117-29536.07.01 and 117-29536.06.01.

FORCE Certification A/S file No. 80.970.6-0048/06, 80.976-116/09, 80.976-172/10, 80.976-190/10, 80.976-213/11 and 80.976-226/11.

Technical data

Instrument tested according to	: EN1434:2007
Software version	: 1.02, 1.04, 1.05, 2.01 or 2.03
Verification tolerance	: $\pm(2+0{,}02\ q_p/q)\%$, max. ±5%
Temperature	: θ_{min} - θ_{max} 15°C...200°C
Pressure	: PN10, PN16, PN25 & PN40 (bar)
Power supply	: 115 - 230VAC or 3.6VDC battery
Environment class	: E2, M1
Accuracy class	: 2
Climatic class	: -10 - +55°C, condensing, closed
Durability specification	: 10 years

SITRANS FUE380 FLOW meter Variants

Diameter	q_p [m3/h]	q_s [m3/h]
DN50	15	30
DN50	15	45
DN50	30	45
DN65	25	50
DN65	25	72
DN65	50	72
DN80	40	80
DN80	40	120
DN80	80	120
DN100	60	120
DN100	60	180
DN100	120	180
DN125	100	200
DN125	100	280
DN125	200	280
DN150	150	300
DN150	150	420
DN150	300	420
DN200	250	500
DN200	250	700
DN200	500	700
DN250	400	800
DN250	400	1120
DN250	800	1120
DN300	560	1120
DN300	560	1560
DN300	1120	1560
DN350	750	1500
DN350	750	2100
DN350	1500	2100
DN400	950	1900
DN400	950	2660
DN400	1900	2660
DN500	1475	2950
DN500	1475	4130
DN500	2950	4130
DN600	2150	4300
DN600	2150	6020
DN600	4300	6020
DN700	2900	5800
DN700	2900	8120
DN700	5800	8120
DN800	3800	7600
DN800	3800	10640
DN800	7600	10640
DN900	5000	10000
DN900	5000	14000
DN900	10000	14000
DN1000	6000	12000
DN1000	6000	16800
DN1000	12000	16800
DN1200	9000	18000
DN1200	9000	25200
DN1200	18000	25200

Max. $q_p/q_i = 100$

Verification

Errors:	Maximum permissible errors according to Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID), Annex MI-004.
Procedure:	Verification requirements according to EN1434:2007
Test Points:	$q_i \leq q \leq 1.1\ q_i$ $0.1\ q_p \leq q \leq 0.11\ q_p$ $0.9\ q_p \leq q \leq 1.0\ q_p$

The meter shall be verified before becoming operational (initial verification).
The verification is done with water.

Temperature according to DS/EN 1434-5 Initial verification tests:

Initial verification at temperatures between 15°C and 50°C is approved provided a verification tolerance of max ±1,5% regardless of flow rate is applied.

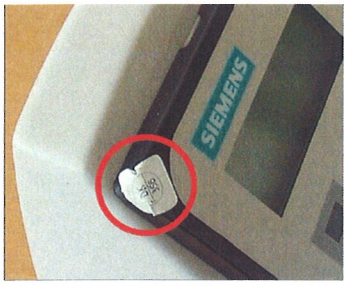
Verification tolerance, according to DS/EN 1434-5:

When the verification is done the meter is sealed as described under sealing.

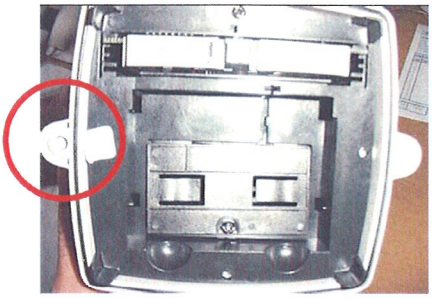
Sealing See the following 7 pictures.

Sealing

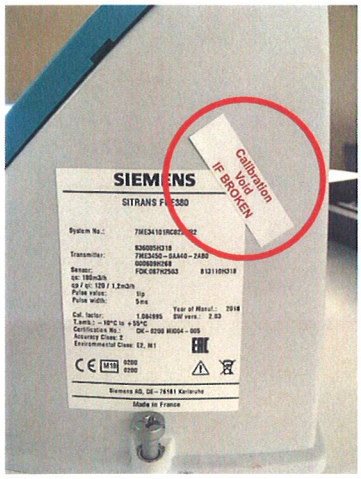
b) Sealing of electronics



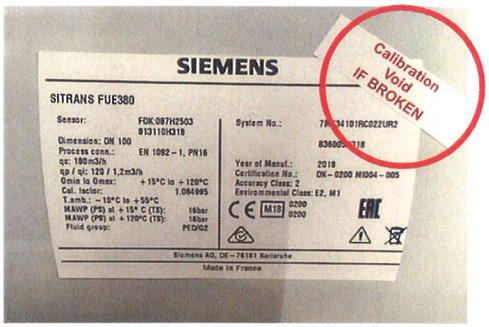
b) Sealing of electronics



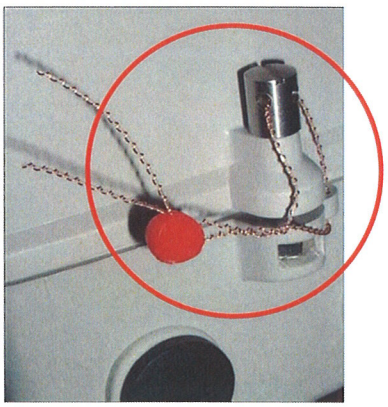
c) Sealing of electronics

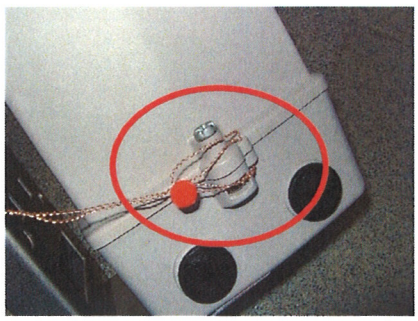


d) Sealing of sensors



e) Installation sealing





Installation

The flow sensor can be mounted horizontal or vertical.
Flow direction marked on the sensor.

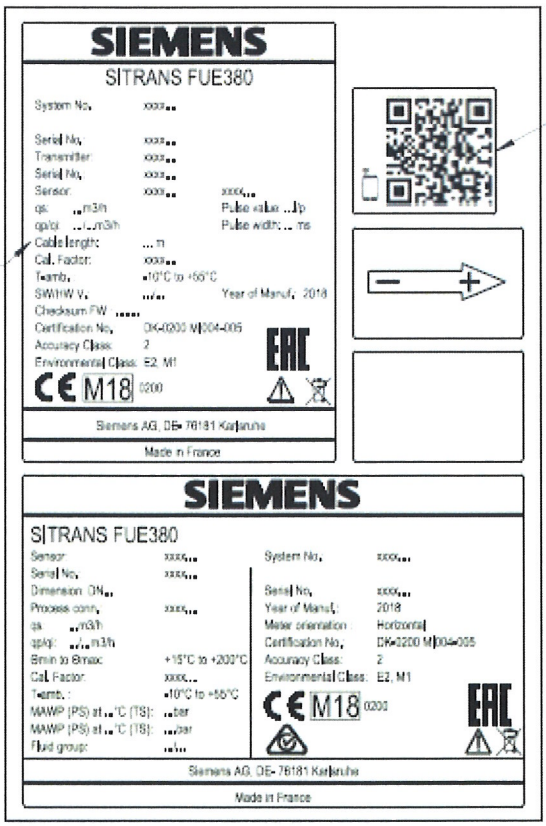
The signal transmitter can be fitted compact on the sensor or remotely.

SITRANS FUE380 ≥ DN80 1.5 meter straight length of pipe before.

Labeling and inscriptions

Manufacturer, type, year
Serial no.
EC-Type examination certificate number
Tmax and Pmax
Application temperature range
Power supply
Accuracy class
Software version
Direction of flow
Mechanical and electromagnetic environment classes.

Example



Flowmeter SITRANS FUS380 standard

Overview

The 2-path flowmeter SITRANS FUS380 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), and other general water applications.
The type-approved flowmeter version is named SITRANS FUE380 - see page 3/294.
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)
- Analog output 4 to 20 mA
- Bidirectional measurement, with 2 totalizers and outputs
- Dynamic range Q_i (min) : Q_s (max) up to 1:400

Application

The main application for SITRANS FUS380 is measurement of water flow or water flow in energy meter systems in district heating networks or chilled water (including glycol mixes).

Design

The 2-path design of SITRANS FUS380 ensures maximum accuracy under short inlet conditions. The flowmeter consists of a flow sensor pipe, 4 transducers/transducer cables and a transmitter SITRANS FUS080.

The unit is available in a compact or a remote version. Both versions are pre-mounted with short coax-cables. Remote transmitter up to a distance of 30 m by one Sensor link cable (SSL).

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.

Integration

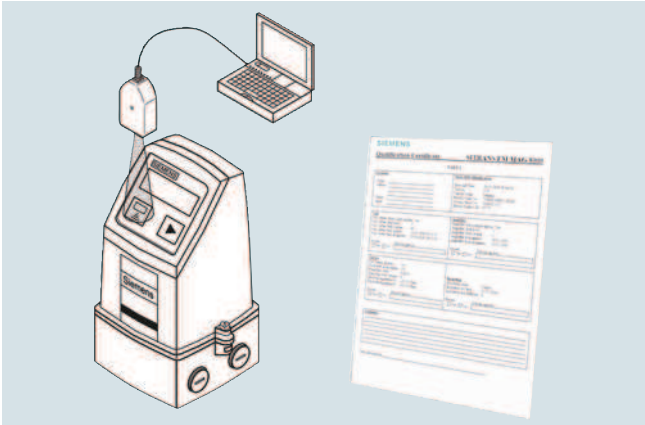
The flowmeter digital output is often used as input for an energy meter or as input for digital systems for remote reading.
SITRANS FUS380 has two digital output functions that can be individually selected.
Pulse output rate is defined when ordering. To get optimal benefit the pulse value must be selected 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 FUS380 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



Configuration SITRANS FUS380

Selection guide SITRANS FUS380, standard version

DN	Q_s (m^3/h)	Q_{max} (m^3/h) (105 % of Q_s)	Q_p (m^3/h)	Q_i (m^3/h) (1:100 of Q_p)	Cut-off (m^3/h)	Cut-off (% of Q_{max})	Typical pulse value[1] (l/pulse)
50	15	15.75	15	0.15	0.075	0.48	1
50	45	47.25	15	0.15	0.075	0.16	1
50	45	47.25	30	0.3	0.150	0.32	1
65	25	26.25	25	0.25	0.125	0.48	1
65	72	75.6	25	0.25	0.125	0.17	1
65	72	75.6	50	0.5	0.250	0.33	1
80	40	42	40	0.4	0.200	0.48	2.5
80	120	126	40	0.4	0.200	0.16	2.5
80	120	126	80	0.8	0.400	0.32	2.5
100	60	63	60	0.6	0.300	0.48	2.5
100	180	189	60	0.6	0.300	0.16	2.5
100	240	252	120	1.2	0.600	0.24	2.5
125	10	10.5	100	1	0.500	4.76	2.5
125	280	294	100	1	0.500	0.17	2.5
125	400	420	200	2	1.000	0.24	2.5
150	150	157.5	150	1.5	0.750	0.48	10
150	420	441	150	1.5	0.750	0.17	10
150	560	588	300	3	1.500	0.26	10
200	250	262.5	250	2.5	1.250	0.48	10
200	700	735	250	2.5	1.250	0.17	10
200	900	945	500	5	2.500	0.26	10
250	400	420	400	4	2.000	0.48	10
250	1 120	1 176	400	4	2.000	0.17	10
250	1 400	1 470	800	8	4.000	0.27	10
300	560	588	560	5.6	2.800	0.48	50
300	1 560	1 638	560	5.6	2.800	0.17	50
300	2 100	2 205	1 120	11.2	5.600	0.25	50
350	750	787.5	750	7.5	3.750	0.48	50
350	2 100	2 205	750	7.5	3.750	0.17	50
350	2 800	2940	1 500	15	7.500	0.26	50
400	950	9 97.5	950	9.5	4.750	0.48	50
400	2 660	2 793	950	9.5	4.750	0.17	50
400	3 600	3 780	1 900	19	9.500	0.25	50
500	1 475	1 548.75	1 475	14.75	7.375	0.48	100
500	4 130	4 336.5	1 475	14.75	7.375	0.17	100
500	5 500	5 775	2 950	29.5	14.750	0.26	100
600	2 150	2 257.5	2 150	21.5	10.750	0.48	100
600	6 020	6 321	2 150	21.5	10.750	0.17	100
600	8 000	8 400	4 300	43	21.500	0.26	100
700	2 900	3 045	2 900	29	14.500	0.48	100
700	8 120	8 526	2 900	29	14.500	0.17	100
700	10 800	11 340	5 800	58	29.000	0.26	100
800	3 800	3 990	3 800	38	19.000	0.48	100
800	10 640	11 172	3 800	38	19.000	0.17	100
800	14 200	14 910	7 600	76	38.000	0.25	100
900	5 000	5 250	3 800	38	19.000	0.36	100
900	14 000	14 700	5 000	50	25.000	0.17	100
900	20 000	21 000	5 000	50	25.000	0.12	100
1 000	6 000	6 300	3 800	38	19.000	0.30	100
1 000	16 800	17 640	6 000	60	30.000	0.17	100
1 000	24 000	25 200	12 000	120	60.000	0.24	100
1 200	9 000	9 450	3 800	38	19.000	0.20	100
1 200	25 200	26 460	9 000	90	45.000	0.17	100
1 200	36 000	37 800	18 000	180	90.000	0.24	100

The values Q_i, Q_p and Q_s are shown on the system label of the FUS380. Q_i (Q_{min}) means the minimal and Q_p (Q_{nom}) the nominal flow rate. Q_s is the highest operatable flow rate. The maxium flow rate (Q_{max}) is 105 % of Q_s. The low flow cut-off is 50 % of Q_i.

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.

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

[1] Typical pulse values for SITRANS FUS380 with pulse length 5 ms. Other values are possible - please see the selections at the 7ME340 Order codes.

Flowmeter SITRANS FUS380 standard

Technical specifications

Sensor design	2-path sensor with flanges and inline transducers wet-calibrated from factory
Nominal size (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 ... 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 ($CuZn_{36}Pb_2As$)
Sensor operating conditions	
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)
• DN 50 ... DN 80	Remote: 2 … 150 °C (35.6 … 302 °F)
• DN 50 ... DN 1200	Compact: 2 … 120 °C (35.6 … 248 °F)
Degree of protection	Sensor connection IP67/NEMA 4X/6
Max. flow velocity	DN 50 … DN 1200: 9 m/s (29.5 ft/s)
Electromagnetic compatibility	
• Emitted interference	To EN 55011/CSPRI-11
• Noise immunity	To EN/IEC 61236-1 (Industry)
Transmitter	
The transmitter related to this system is the SITRANS FUS080. Technical specifications to the FUS080 see page 3/253 ff.	
Sensor cable	
Transducer cable length	Pre-mounted with short coax-cables
Sensor link cable length (SSL)	5, 10, 20, 30 m (16.4, 32.8, 65.6, 98.4 ft)
Certificates and approvals	
Conformity certificate (CE)	The devices are supplied as standard with a Siemens Certificate of Conformity on DVD
Material certificate	Material certificate according EN 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	No custody transfer approvals

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).

SITRANS FUS380 uncertainty

	FUS380
Flow value setting	Predefined settings according to dimension
Approval	No approval
Flow rate v_f	0.02 … 9 m/s (0.065 … 29.5 ft/s)
Output A	Pulse: forward, reverse, forward net, reverse net (Preset: forward)
Output B	Pulse (forward, reverse, forward net, reverse net, alarm, call-up (Preset: alarm)
Pulse value A & B (depending on DN value)	0.1 l/p, 0.25 l/p, 0.5 l/p, 1 l/p, 2.5 l/p, 10 l/p, 25 l/p, 50 l/p, 100 l/p, 250 l/p, 500 l/p, 1 m^3/p, 2.5 m^3/p, 5 m^3/p, 10 m^3/p, 25 m^3/p, 50 m^3/p, 100 m^3/p, 250 m^3/p, 500 m^3/p, 1000 m^3/p
Pulse width	5/10/20/50/100/200/500 ms
Flow unit setup	Preset: m^3/h
Volume unit setup	Preset: m^3

Flowmeter Calibration and traceability

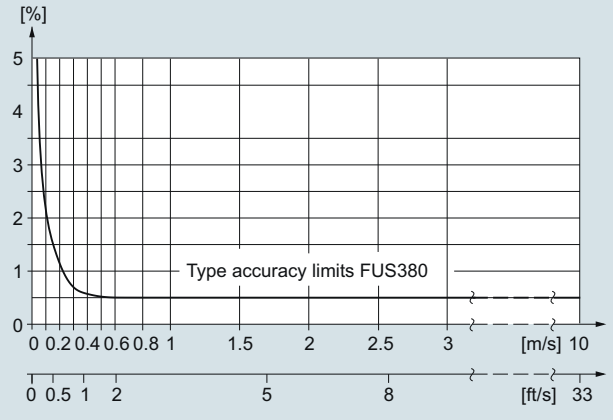
To ensure continuous accurate measurement, flowmeters must be calibrated. The calibration is conducted at Siemens flow facilities with traceable instruments referring directly to the physical unit of measurement according to the International System of Units (SI).

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^3/h to 10 000 m^3/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_n as selected flow is shipped with each SITRANS FUS380. This production calibration protocol consists of 2 x 3 points at Q_i, 10 % Q_p and Q_p (max. 4 200 m^3/h).

Accuracy SITRANS FUS380:

± 0.5 % for 0.5 m/s < v < 10 m/s and ± 0.25/$V_{act.}$ [%] below 0.5 m/s



Selection and Ordering data

Flowmeter SITRANS FUS380 (standard) ↗

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

Diameter	Approval	Pressure rating	Flow setting [m^3/h] Q_p (Q_n) is the normal flow according to the approval requirements. Q_p and Q_s is shown on the system label. Qp (Qn)	Qs	Article-No. 7ME3400 - ■■■■ 0 - ■■ A ■ ■■■ Order code
Pipe material: Die-cast bronze					
DN 50 (2")	EN 1434	PN 40	15	15	1 A
DN 50 (2")	EN 1434	PN 40	15	45	1 C
DN 50 (2")	OIML R75	PN 40	30	45	1 D
DN 65 (2½")	EN 1434	PN 40	25	25	1 E
DN 65 (2½")	EN 1434	PN 40	25	72	1 G
DN 65 (2½")	OIML R75	PN 40	50	72	1 H
DN 80 (3")	EN 1434	PN 40	40	40	1 J
DN 80 (3")	EN 1434	PN 40	40	120	1 L
DN 80 (3")	OIML R75	PN 40	80	120	1 M
Pipe material: Carbon steel					
DN 100 (4")	EN 1434	PN16, PN 40	60	60	1 N
DN 100 (4")	EN 1434	PN16, PN 40	60	180	1 Q
DN 100 (4")	OIML R75	PN16, PN 40	120	240	1 R
DN 125 (5")	EN 1434	PN16, PN 40	100	100	1 S
DN 125 (5")	EN 1434	PN16, PN 40	100	280	1 U
DN 125 (5")	OIML R75	PN16, PN 40	200	400	1 V
DN 150 (6")	EN 1434	PN16, PN 40	150	150	2 A
DN 150 (6")	EN 1434	PN16, PN 40	150	420	2 C
DN 150 (6")	OIML R75	PN16, PN 40	300	560	2 D
DN 200 (8")	EN 1434	PN16, PN 25, PN 40	250	250	2 E
DN 200 (8")	EN 1434	PN16, PN 25, PN 40	250	700	2 G
DN 200 (8")	OIML R75	PN16, PN 25, PN 40	500	900	2 H
DN 250 (10")	EN 1434	PN16, PN 25, PN 40	400	400	2 J
DN 250 (10")	EN 1434	PN16, PN 25, PN 40	400	1 120	2 L
DN 250 (10")	OIML R75	PN16, PN 25, PN 40	800	1 400	2 M
DN 300 (12")	EN 1434	PN16, PN 25	560	560	2 N
DN 300 (12")	EN 1434	PN16, PN 25	560	1 560	2 Q
DN 300 (12")	OIML R75	PN16, PN 25	1 120	2 100	2 R
DN 350 (14")	EN 1434	PN16, PN 25	750	750	2 S
DN 350 (14")	EN 1434	PN16, PN 25	750	2 100	2 U
DN 350 (14")	OIML R75	PN16, PN 25	1 500	2 800	2 V
DN 400 (16")	EN 1434	PN16, PN 25	950	950	3 A
DN 400 (16")	EN 1434	PN16, PN 25	950	2 660	3 C
DN 400 (16")	OIML R75	PN16, PN 25	1 900	3 600	3 D
DN 500 (20")	EN 1434	PN16, PN 25	1 475	1 475	3 J
DN 500 (20")	EN 1434	PN16, PN 25	1 475	4 130	3 L
DN 500 (20")	OIML R75	PN16, PN 25	2 950	5 500	3 M
DN 600 (24")	EN 1434	PN16, PN 25	2 150	2 150	3 S
DN 600 (24")	EN 1434	PN16, PN 25	2 150	6 020	3 U
DN 600 (24")	OIML R75	PN16, PN 25	4 300	8 000	3 V
DN 700 (28")	EN 1434	PN16, PN 25	2 900	2 900	4 E
DN 700 (28")	EN 1434	PN16, PN 25	2 900	8 120	4 G
DN 700 (28")	OIML R75	PN16, PN 25	5 800	10 800	4 H
DN 800 (32")	EN 1434	PN16, PN 25	3 800	3 800	4 N
DN 800 (32")	EN 1434	PN16, PN 25	3 800	10 640	4 Q
DN 800 (32")	OIML R75	PN16, PN 25	7 600	14 200	4 R

Flowmeter SITRANS FUS380 standard

Selection and Ordering data

Article-No. 7ME3400 - ■■■■ 0 - ■■ A ■ ■■■ Order code

Flowmeter SITRANS FUS380 (standard)

Diameter	Approval	Pressure rating	Flow setting [m^3/h] Qp (Qn)	Qs	
Remote only					
DN 900 (36")	EN 1434	PN16, PN 25	5 000	5 000	5 A
DN 900 (36")	EN 1434	PN16, PN 25	5 000	14 000	5 C
DN 900 (36")	OIML R75	PN16, PN 25	10 000	20 000	5 D
DN 1 000 (40")	EN 1434	PN16, PN 25	6 000	6 000	5 J
DN 1 000 (40")	EN 1434	PN16, PN 25	6 000	16 800	5 L
DN 1 000 (40")	OIML R75	PN16, PN 25	12 000	24 000	5 M
DN 1 200 (48")	EN 1434	PN16	9 000	9 000	5 S
DN 1 200 (48")	EN 1434	PN16	9 000	25 200	5 U
DN 1 200 (48")	OIML R75	PN16	18 000	36 000	5 V

Flange norm and pressure rating

System without sensor - only a transmitter FUS080 as spare part - settings as defined with this Article No.	A
EN 1092-1 Flanges	
PN 16 (DN 100 ... DN 1 200)	C
PN 25 (DN 200 ... DN 1 000)	D
PN 40 (DN 50 ... DN 250)	E

Compact/remote connection

Note: Sensor cable always firmly connected to connection box.

Compact version, Liquid max. 120 °C (248 °F)	0
Remote version, Liquid max. 150/200 °C (302/392 °F)	
Sensor link cable (SSL)	
• 5 m (16.4 ft)	2
• 10 m (32.8 ft)	3
• 20 m (65.6 ft)	4
• 30 m (98.4 ft)	5

Pulse output value setup

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

Pulse value		
• 0.1 l/pulse	1	
• 1 l/pulse	2	
• 2.5 l/pulse	3	
• 10 l/pulse	4	
• 50 l/pulse	5	
• 100 l/pulse	6	
• 250 l/pulse	7	
• 1 m^3/pulse	8	
• 0.25 l/pulse	9	N 0 A
• 0.5 l/pulse	9	N 0 B
• 5 l/pulse	9	N 0 C
• 25 l/pulse	9	N 0 D
• 500 l/pulse	9	N 0 E
• 2.5 m^3/pulse	9	N 0 F
• 5 m^3/pulse	9	N 0 G
• 10 m^3/pulse	9	N 0 H
• 25 m^3/pulse	9	N 0 J
• 50 m^3/pulse	9	N 0 K
• 100 m^3/pulse	9	N 0 L
• 250 m^3/pulse	9	N 0 M
• 500 m^3/pulse	9	N 0 N
• 1000 m^3/pulse	9	N 0 P

Selection and Ordering data	Article-No. / Order code
Flowmeter SITRANS FUS380 (standard)	**7ME3400 -** ■■■■ **0 -** ■■ **A** ■ ■■■
Transmitter variant FUS080 power/analaog output	
115 ... 230 V AC	**B**
3.6 V Lithium battery, dual pack is included	**D**
115 ... 230 V AC, backup 3.6 V DC Lithium battery, single pack is included	**E**
3.6 V battery version (no battery pack included)	**G**
Option with 4 ... 20 mA analog output module	
• 115 ... 230 V AC	**R**
• 115 ... 230 V AC, backup 3.6 V DC, Lithium battery, single pack is included	**U**
Note: 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.	
Pulse width setup	
Pulse width	
• 5 ms (standard)	**2**
• 10 ms	**3**
• 20 ms	**4**
• 50 ms	**5**
• 100 ms	**6**
• 200 ms	**7**
• 500 ms	**8**

Selection and Ordering data	Order code
Additional information	
Please add „**-Z**" to Article No. and following add-on code(s) with plain text.	
Calibration/certificate FUS380	
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^3/h).	**Included**
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^3/h).	**D20**
Accredited Siemens ISO/IEC 17025 calibration for DN 250 ... DN 600 with Q_n as selected in diameter. Certificate: 2 x 5 points, 5 %, 10 %, 50 % and 100 % of Q_p (max. 2800 m^3/h).	**D21**
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^3/h).	**D22**
Output B as reverse flow pulses. No calibration/verification of this function.	**E21**
Material certificate	
EN 10204-3.1 (pipe material)	**C12**
Regional specific approval	
KCC marking for Korea	**W28**
Tag name plate	
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).	**Y17**

Please use online Product selector to get latest updates. Product selector link:
www.pia-portal.automation.siemens.com

Flowmeter SITRANS FUS380 operating instructions, accessories and spare parts

Operating instructions

Description	Article No.
• English	**A5E00730100**
• German	**A5E00740611**

All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

For accessories and spare parts see chapter of transmitter SITRANS FUS080/FUE080 on page 3/257.

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)
- Analog output 4 to 20 mA
- Bidirectional measurement, with 2 totalizers and outputs
- Dynamic range Q_i:Q_p up to 1:50/100 or max. range Qi:Qs 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. Both versions are pre-mounted with short coax-cables. Remote transmitter up to a distance of 30 m by one Sensor link cable (SSL).

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.

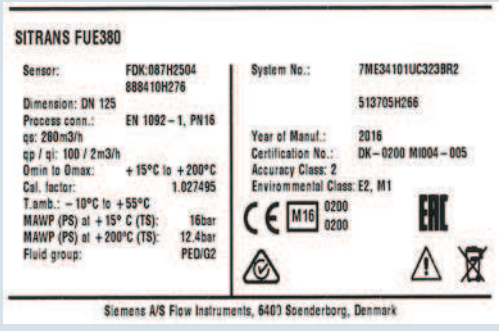
The MID certification is obtained as module B + module D approvals according to the above-mentioned directive.

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.

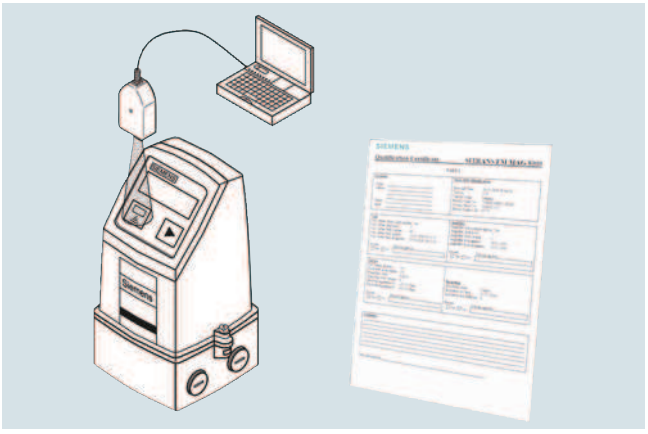
If the flowmeter forms part of an energy meter system for custody transfer, no further approvals are needed, except possible local approvals on the flowmeter.

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



Configuration SITRANS FUE380 type-approved

Selection guide SITRANS FUE380, type-approved flowmeter

DN	Q_s (m^3/h)	Q_{max} (m^3/h) (105 % of Q_s)	Q_p (m^3/h)	Q_i (m^3/h) (1:50 of Q_p) EN 1434/MID	Q_i (m^3/h) (1:100 of Q_p) OIML R 75/MID	Cut-off (m^3/h)	Cut-off (% of Q_{max})	Typical pulse value (l/pulse)
50	30	31.5	15	0.3	-	0.075	0.24	1
50	45	47.25	15	0.3	-	0.075	0.16	1
50	45	47.25	30	-	0.30	0.150	0.32	1
65	50	52.5	25	0.5	-	0.125	0.24	1
65	72	75.6	25	0.5	-	0.125	0.17	1
65	72	75.6	50	-	0.50	0.250	0.33	1
80	80	84	40	0.8	-	0.200	0.24	2.5
80	120	126	40	0.8	-	0.200	0.16	2.5
80	120	126	80	-	0.80	0.400	0.32	2.5
100	120	126	60	1.2	-	0.300	0.24	2.5
100	180	189	60	1.2	-	0.300	0.16	2.5
100	180	189	120	-	1.20	0.600	0.32	2.5
125	200	210	100	2.0	-	0.500	0.24	2.5
125	280	294	100	2.0	-	0.500	0.17	2.5
125	280	294	200	-	2.00	1.000	0.34	2.5
150	300	315	150	3.0	-	0.750	0.24	10
150	420	441	150	3.0	-	0.750	0.17	10
150	420	441	300	-	3.00	1.500	0.34	10
200	500	525	250	5.0	-	1.250	0.24	10
200	700	735	250	5.0	-	1.250	0.17	10
200	700	735	500	-	5.00	2.500	0.34	10
250	800	840	400	8.0	-	2.000	0.24	10
250	1 120	1 176	400	8.0	-	2.000	0.17	10
250	1 120	1 176	800	-	8.00	4.000	0.34	10
300	1 120	1 176	560	11.2	-	2.800	0.24	50
300	1 560	1 638	560	11.2	-	2.800	0.17	50
300	1 560	1 638	1120	-	11.20	5.600	0.34	50
350	1 500	1 575	750	15.0	-	3.750	0.24	50
350	2 100	2 205	750	15.0	-	3.750	0.17	50
350	2 100	2 205	1 500	-	15.00	7.500	0.34	50
400	1 900	1 995	950	19.0	-	4.750	0.24	50
400	2 660	2 793	950	19.0	-	4.750	0.17	50
400	2 660	2 793	1 900	-	19.00	9.500	0.34	50
500	2 950	3 097.5	1 475	29.5	-	7.375	0.24	100
500	4 130	4 336.5	1 475	29.5	-	7.375	0.17	100
500	4 130	4 336.5	2 950	-	29.50	14.75	0.34	100
600	4 300	4 515	2 150	43.0	-	10.75	0.24	100
600	6 020	6 321	2 150	43.0	-	10.75	0.17	100
600	6 020	6 321	4 300	-	43.00	21.50	0.34	100
700	5 800	6 090	2 900	58.0	-	14.50	0.24	100
700	8 120	8 526	2 900	58.0	-	14.50	0.17	100
700	8 120	8 526	5 800	-	58.00	29.00	0.34	100
800	7 600	7 980	3 800	76.0	-	19.00	0.24	100
800	10 640	11 172	3 800	76.0	-	19.00	0.17	100
800	10 640	11 172	7 600	-	76.00	38.00	0.34	100
900	10 000	10 500	5 000	100.0	-	25.00	0.24	100
900	14 000	14 700	5 000	100.0	-	25.00	0.17	100
900	14 000	14 700	10 000	-	100.00	50.00	0.34	100

DN	Q_s (m^3/h)	Q_{max} (m^3/h) (105 % of Q_s)	Q_p (m^3/h)	Q_i (m^3/h) (1:50 of Q_p) EN 1434/MID	Q_i (m^3/h) (1:100 of Q_p) OIML R 75/MID	Cut-off (m^3/h)	Cut-off (% of Q_{max})	Typical pulse value (l/pulse)
1 000	12 000	12 600	6 000	120.0	-	30.00	0.24	100
1 000	16 800	17 640	6 000	120.0	-	30.00	0.17	100
1 000	16 800	17 640	12 000	-	120.00	60.00	0.34	100
1 200	18 000	18 900	9 000	180.0	-	45.00	0.24	100
1 200	25 200	26 460	9 000	180.0	-	45.00	0.17	100
1 200	25 200	26 460	18 000	-	180.00	90.00	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.

Qi (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

Note:

The minimum flow (Q_i) should be checked in the PIA-portal or product master data base (PMD)

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

Flowmeter SITRANS FUE380 with CT approval

Technical specifications

Pipe design	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 ($CuZn_{36}Pb_2As$)
Sensor operating conditions	
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_s	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 3/253 ff.

Sensor cable	
Transducer cable length	Pre-mounted with short coax-cables
Sensor link cable length (SSL)	5, 10, 20, 30 m (16.4, 32.8, 65.6, 98.4 ft)

Certificates and approvals	
Conformity certificate (CE)	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_f	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_s)
Pulse width	Preset: 5 ms
Flow unit setup	Preset: m^3/h
Volume unit setup	Preset: m^3

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).

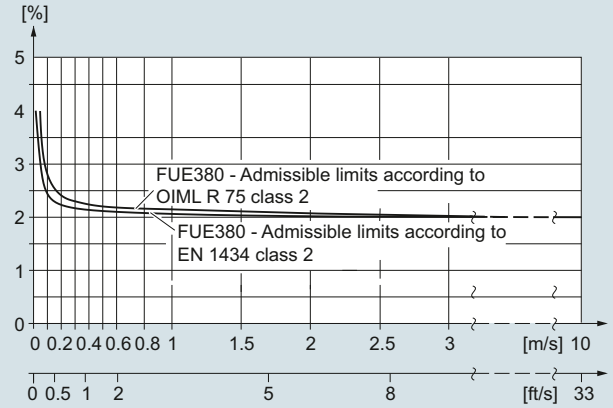
Therefore, the calibration certificate ensures recognition of the test results worldwide, including the US (NIST traceability). Siemens offers accredited calibrations assured to ISO 17025 in the flow range from 0.0001 m^3/h to 10 000 m^3/h. Siemens Flow Instruments accredited laboratories are recognized 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_n as selected flow is shipped with each SITRANS FUE380. This production calibration protocol consists of 2 x 3 points at Q_i, 10 % Q_p and Q_p (max. 4 200 m^3/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 m^3/h at Q = 1.2 m^3/h:
Accuracy at 1.2 m^3/h = typical 1.5 %



SITRANS FUE380 fulfils the requirements
$E_f = \pm (2 + 0.02\ Q_p/Q_i)$ max. ± 5 %, according to EN 1434 and OIML R 75, class 2 or MID class 2 requirements.

Flowmeter SITRANS FUE380 with CT approval

Selection and Ordering data

Flowmeter SITRANS FUE380 (type-approved) ↗ **7ME3410 -** ■■■■■ - ■■■■ ■■■

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

Diameter	Approval	Pressure rating	Flow setting [m^3/h] Q_p (Q_n) is the normal flow according to the approval requirements. Q_p and Q_s is shown on the system label.		Article No. Order code
			Qp[m^3/h]	**Qs [m^3/h]**	
Pipe material: Die-cast bronze					
DN 50 (2")	EN 1434	PN 40	15	30	1 B
DN 50 (2")	EN 1434	PN 40	15	45	1 C
DN 50 (2")	OIML R75	PN 40	30	45	1 D
DN 65 (2½")	EN 1434	PN 40	25	50	1 F
DN 65 (2½")	EN 1434	PN 40	25	72	1 G
DN 65 (2½")	OIML R75	PN 40	50	72	1 H
DN 80 (3")	EN 1434	PN 40	40	80	1 K
DN 80 (3")	EN 1434	PN 40	40	120	1 L
DN 80 (3")	OIML R75	PN 40	80	120	1 M
Pipe material: Carbon steel					
DN 100 (4")	EN 1434	PN16, PN 40	60	120	1 P
DN 100 (4")	EN 1434	PN16, PN 40	60	180	1 Q
DN 100 (4")	OIML R75	PN16, PN 40	120	180	1 R
DN 125 (5")	EN 1434	PN16, PN 40	100	200	1 T
DN 125 (5")	EN 1434	PN16, PN 40	100	280	1 U
DN 125 (5")	OIML R75	PN16, PN 40	200	280	1 V
DN 150 (6")	EN 1434	PN16, PN 40	150	300	2 B
DN 150 (6")	EN 1434	PN16, PN 40	150	420	2 C
DN 150 (6")	OIML R75	PN16, PN 40	300	420	2 D
DN 200 (8")	EN 1434	PN16, PN 25, PN 40	250	500	2 F
DN 200 (8")	EN 1434	PN16, PN 25, PN 40	250	700	2 G
DN 200 (8")	OIML R75	PN16, PN 25, PN 40	500	700	2 H
DN 250 (10")	EN 1434	PN16, PN 25, PN 40	400	800	2 K
DN 250 (10")	EN 1434	PN16, PN 25, PN 40	400	1 120	2 L
DN 250 (10")	OIML R75	PN16, PN 25, PN 40	800	1 120	2 M
DN 300 (12")	EN 1434	PN16, PN 25	560	1 120	2 P
DN 300 (12")	EN 1434	PN16, PN 25	560	1 560	2 Q
DN 300 (12")	OIML R75	PN16, PN 25	1 120	1 560	2 R
DN 350 (14")	EN 1434	PN16, PN 25	750	1 500	2 T
DN 350 (14")	EN 1434	PN16, PN 25	750	2 100	2 U
DN 350 (14")	OIML R75	PN16, PN 25	1 500	2 100	2 V
DN 400 (16")	EN 1434	PN16, PN 25	950	1 900	3 B
DN 400 (16")	EN 1434	PN16, PN 25	950	2 660	3 C
DN 400 (16")	OIML R75	PN16, PN 25	1 900	2 660	3 D
DN 500 (20")	EN 1434	PN16, PN 25	1 475	2 950	3 K
DN 500 (20")	EN 1434	PN16, PN 25	1 475	4 130	3 L
DN 500 (20")	OIML R75	PN16, PN 25	2 950	41 30	3 M
DN 600 (24")	EN 1434	PN16, PN 25	2 150	4 300	3 T
DN 600 (24")	EN 1434	PN16, PN 25	2 150	6 020	3 U
DN 600 (24")	OIML R75	PN16, PN 25	4 300	6 020	3 V
DN 700 (28")	EN 1434	PN16, PN 25	2 900	5 800	4 F
DN 700 (28")	EN 1434	PN16, PN 25	2 900	8 120	4 G
DN 700 (28")	OIML R75	PN16, PN 25	5 800	8120	4 H
DN 800 (32")	EN 1434	PN16, PN 25	3 800	7 600	4 P
DN 800 (32")	EN 1434	PN16, PN 25	3 800	10 640	4 Q
DN 800 (32")	OIML R75	PN16, PN 25	7 600	10 640	4 R

3

Selection and Ordering data

Article No. Order code

Flowmeter SITRANS FUE380 (type-approved) — **7ME3410 -** ■■■■■ - ■■■■ ■■■

Diameter	Approval	Pressure rating	Flow setting [m^3/h] Qp[m^3/h]	Qs [m^3/h]	
Remote only					
DN 900 (36")	EN 1434	PN16, PN 25	5 000	10 000	5 B
DN 900 (36")	EN 1434	PN16, PN 25	5 000	14 000	5 C
DN 900 (36")	OIML R75	PN16, PN 25	10 000	14 000	5 D
DN 1000 (40")	EN 1434	PN16, PN 25	6 000	12 000	5 K
DN 1000 (40")	EN 1434	PN16, PN 25	6 000	16 800	5 L
DN 1000 (40")	OIML R75	PN16, PN 25	12 000	16 800	5 M
DN 1200 (48")	EN 1434	PN16	9 000	18 000	5 T
DN 1200 (48")	EN 1434	PN16	9 000	25 200	5 U
DN 1200 (48")	OIML R75	PN16	18 000	25 200	5 V

Flange norm and pressure rating

System without sensor - only a transmitter

EN 1092-1

PN 16 (DN 100 ... DN 1 200)	C
PN 25 (DN 200 ... DN 1 000)	D
PN 40 (DN 50 ... DN 250)	E

Compact/remote connection

Note: Sensor cable always firmly connected to connection box.

Compact version, Liquid max. 120 °C (248 °F)	0
Remote version, Liquid max. 150/200 °C (302/392 °F)	
Sensor link cable (SSL)	
• 5 m (16.4 ft)	2
• 10 m (32.8 ft)	3
• 20 m (65.6 ft)	4
• 30 m (98.4 ft)	5

Approvals/pulse output

Without approval (neutral)	0
With CT approval	1
With CT approval MID004, authority seal	2

Pulse output value setup

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

Pulse value	1	
• 0.1 l/pulse	1	
• 1 l/pulse	2	
• 2.5 l/pulse	3	
• 10 l/pulse	4	
• 50 l/pulse	5	
• 100 l/pulse	6	
• 250 l/pulse	7	
• 1 m^3/pulse	8	
• 0.25 l/pulse	9	N 0 A
• 0.5 l/pulse	9	N 0 B
• 5 l/pulse	9	N 0 C
• 25 l/pulse	9	N 0 D
• 500 l/pulse	9	N 0 E
• 2.5 m^3/pulse	9	N 0 F
• 5 m^3/pulse	9	N 0 G
• 10 m^3/pulse	9	N 0 H
• 25 m^3/pulse	9	N 0 J
• 50 m^3/pulse	9	N 0 K
• 100 m^3/pulse	9	N 0 L
• 250 m^3/pulse	9	N 0 M
• 500 m^3/pulse	9	N 0 N
• 1 000 m^3/pulse	9	N 0 P

Flowmeter SITRANS FUE380 with CT approval

3

Selection and Ordering data	Article No. / Order code
Flowmeter SITRANS FUE380 (type-approved)	**7ME3410 -** ■■■■■ - ■■■■ ■■■
Transmitter variant FUE080 power/analog output	
115 ... 230 V AC	**B**
3.6 V Lithium battery, dual pack is included	**D**
115 ... 230 V AC, backup 3.6 V DC Lithium battery, single pack is included	**E**
3.6 V battery version (no battery pack included)	**G**
Option with 4 ... 20 mA analog output module	
• 115 ... 230 V AC	**R**
• 115 ... 230 V AC, backup 3.6 V DC, Lithium battery, single pack is included	**U**
Note: 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.	
Country specific design	
Neutral, no approval mark	**A**
China, PA 2008-T222	**C**
Russia, EN 1434/OIML R75	**M**
MID-Approval (MI004), Language on name plate English	**R**
MID-Approval (MI004), Language on name plate German	**S**
MID-Approval (MI004), Language on name plate Polish	**T**
MID-Approval (MI004), Language on name plate French	**U**
Pulse width setup	
Pulse width	**2**
• 5 ms (standard)	**2**
• 10 ms	**3**
• 20 ms	**4**
• 50 ms	**5**
• 100 ms	**6**
• 200 ms	**7**
• 500 ms	**8**

Selection and Ordering data	Order code
Additional information	
Please add „**-Z**" to Article No. and following add-on code(s) with plain text.	
Calibration/certificate FUE380	
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^3/h).	**Included**
3.1 Inspection certificate (EN 10204-3.1) - pipe material	**C12**
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 Qp (max. 630 m^3/h).	**D20**
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^3/h).	**D21**
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 Qp (max. 8000 m^3/h).	**D22**
Output B as reverse flow pulses. No calibration/verification of this function.	**E21**
Tag name plate	
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).	**Y17**

Flowmeter SITRANS FUE380 operating instructions, accessories and spare parts

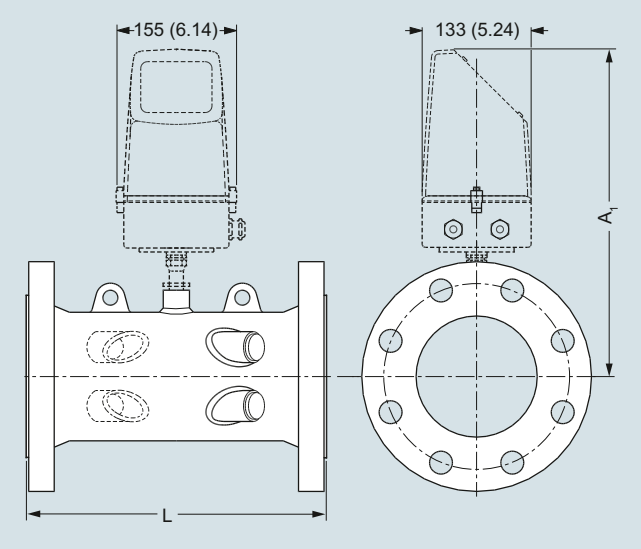
Operating instructions

Description	Article No.
• English	**A5E00730100**
• German	**A5E00740611**

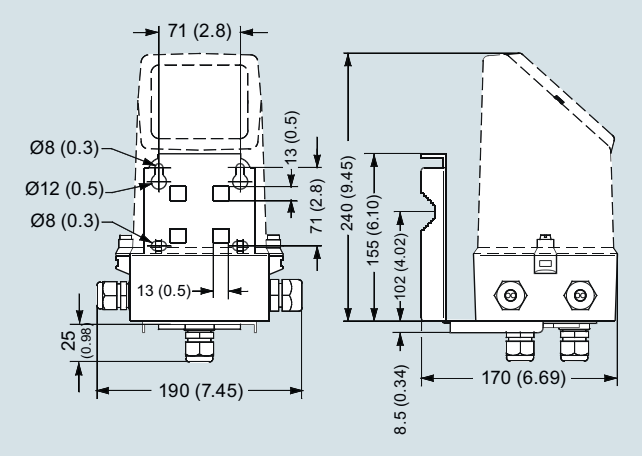
All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

For accessories and spare parts on page 3/257 see chapter of transmitter FUS080/FUE080.

Dimensional drawings



Transmitter IP67/NEMA 4X/6, wall mounting



Dimensions in mm (inch)

Sensor dimensions for FUS380 and FUE380

Size	PN 16		PN 25		PN 40			
	L	Weight	L	Weight	L	Weight	A_1	Lift hug
DN	mm	kg	mm	kg	mm	kg	mm	
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

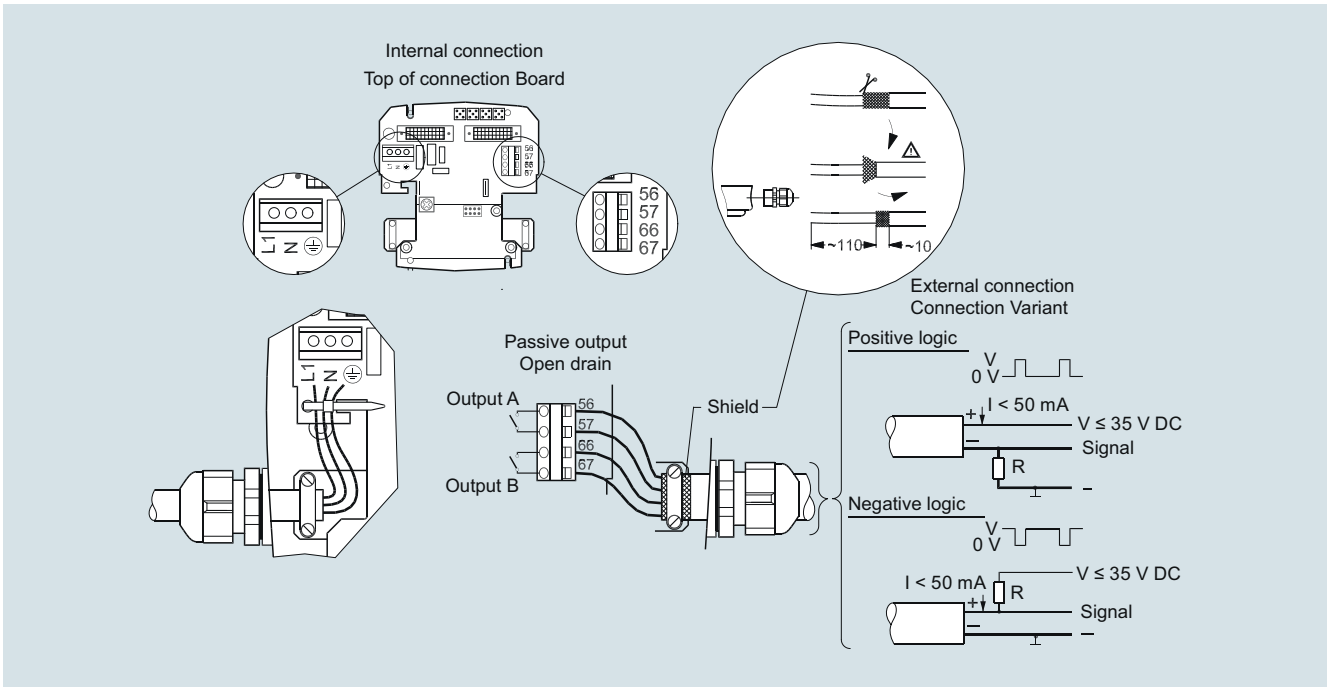
Notes:
- Weight for transmitter/electronics 1.5 kg (compact version) or approximately 3 kg (remote version including 10 m cable set)
- - Means not available
- All weights are **approximate**
- For flange values - see norm EN 1092-1

Flowmeter SITRANS FUS380 and FUE380

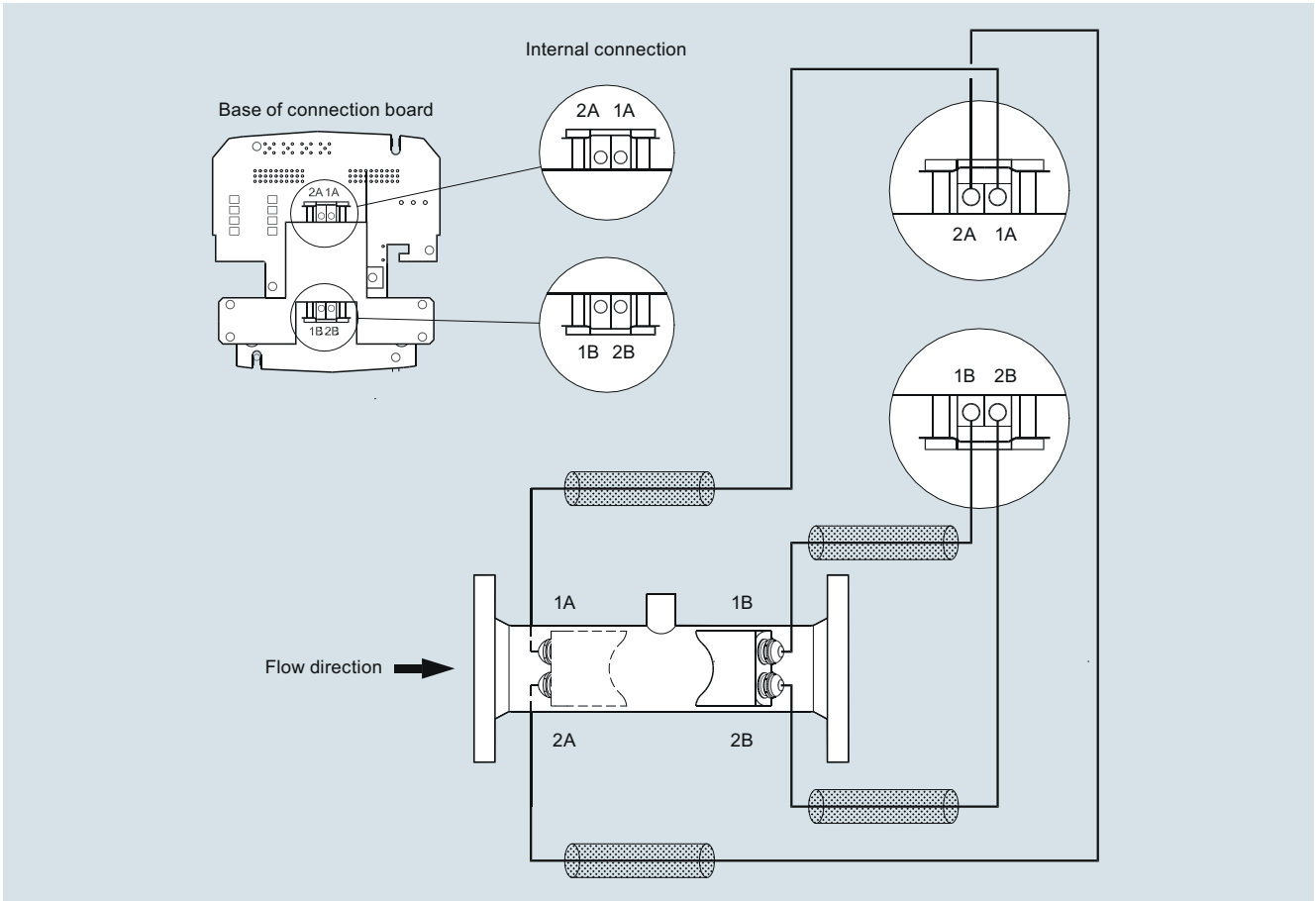
Size	PN 16		PN 25		PN 40			
	L	Weight	L	Weight	L	Weight	A_1	Lift hug
inch	inch	lb	inch	lb	inch	lb	inch	
2	-	-	-	-	11.81 +0/-0.08	22	13.78	No
2½	-	-	-	-	11.81 +0/-0.08	33	14.30	No
3	-	-	-	-	13.78 +0/-0.08	40	14.57	No
4	13.78 +0/-0.08	33	-	-	13.78 +0/-0.08	40	14.65	No
5	13.78 +0/-0.08	40	-	-	13.78 +0/-0.08	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 6.6 lb (remote version including 32.8 ft cable set)
- - Means not available
- All weights are **approximate**
- For flange values - see norm EN 1092-1

Schematics



Electrical connection of transmitter SITRANS FUS/FUE380



Electrical connection of sensor SITRANS FUS/FUE380

SIEMENS

EU Declaration of Conformity
EU-Konformitätserklärung
EU-Déclaration de Conformité

CE

No. A5E31824796A/008

Manufacturer: *Hersteller:* *Fabricant:*	Siemens AG
Address: *Anschrift:* *Adresse:*	DE-76181 Karlsruhe
Product description: *Produktbezeichnung:* *Identificateur:*	**Flowmeter / Durchflussmessgerät / Débitmètre** **SITRANS F US FUS080, FUE080, FUS380, FUE380** 7ME3400-xxxxx-xabx 7ME3410-xxxxx-xabx a,b= see table in annex A / siehe Tabelle im Anhang A

The product described above in the form as delivered is in conformity with the provisions of the following European Directives:
Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:
Le produit mentionné ci-dessus, tel qu'il est livré, est conforme aux dispositions des Directives Européennes suivantes :

2014/30/EU EMC	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility *Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit* *Directive du parlement Européen et du conseil relative à l'harmonisation des législations des États membres concernant la compatibilité électromagnétique*
2014/35/EU LVD	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits *Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt* *Directive du parlement Européen et du conseil relative à l'harmonisation des législations des États membres concernant la mise à disposition sur le marché du matériel électrique destiné à être employé dans certaines limites de tension*
2014/68/EU PED	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment *Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Druckgeräten auf dem Markt* *Directive du parlement Européen et du conseil relative à l'harmonisation des législations des États membres concernant la mise à disposition sur le marché des équipements sous pression*
2014/32/EU MID	Directive of the European Parliament and the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments *Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Messgeräten auf dem Markt* *Directive du parlement Européen et du conseil relative à l'harmonisation des législations des États membres concernant la mise à disposition sur le marché d'instruments de mesure*

Annex A is integral part of this declaration..
Anhang A ist integraler Bestandteil dieser Erklärung.
L'annexe A fait partie intégrante de la présente déclaration

This declaration certifies the conformity to the specified directives but contains no assurance of properties.
The safety documentation accompanying the product shall be considered in detail.
Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie nach §443 BGB.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
La présente déclaration atteste la conformité aux Directives citées. Elle n'est pas assimilable à un descriptif justifiant certaines propriétés.
La documentation relative à la sécurité accompagnant le produit doit être examinée en détail.

SIEMENS

EU Declaration of Conformity
EU-Konformitätserklärung
EU-Declaration de Conformite

No. A5E31824796A/008

2011/65/EU
RoHS

Directive of the European Parliament and the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
Richtlinie des Europäischen Parlaments und des Rates zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräte.
Directive du parlement Européen et du conseil relative à la limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques

Karlsruhe, 29.05.2018
Siemens Aktiengesellschaft

Volker Rissland,
Research & Development / *Entwicklung / Développement*
(Name, function / *Name, Funktion, / Nom, fonction*)

Signature / *Unterschrift / Signature*

Jürgen Pflaum,
Quality / *Qualität / Qualité*
(Name, function / *Name, Funktion, / Nom, fonction*)

Signature / *Unterschrift / Signature*

Annex A is integral part of this declaration..
Anhang A ist integraler Bestandteil dieser Erklärung.
L'annexe A fait partie intégrante de la présente déclaration

This declaration certifies the conformity to the specified directives but contains no assurance of properties.
The safety documentation accompanying the product shall be considered in detail.
Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie nach §443 BGB.
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La documentation relative à la sécurité accompagnant le produit doit être examinée en détail.

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Annex A to the EU Declaration of Conformity
Anhang A zur EU-Konformitätserklärung
Annexe A de la Déclaration de conformité

No. A5E31824796A/008

Product description: **Flowmeter / Durchflussmessgerät / Débitmètre**
Produktbezeichnung: **SITRANS F US FUS080, FUE080, FUS380, FUE380**
Identificateur: 7ME3400-xxxxx-xabx
7ME3410-xxxxx-xabx
a,b= see table in annex A / siehe Tabelle im Anhang A

Conformity to the Directives indicated on page 1 is assured through the application of the following standards (depending on versions):
Die Konformität mit den auf Blatt 1 angeführten Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen (variantenabhängig):
La conformité aux Directives indiquées sur la page 1 est garantie par l'application des normes suivantes (selon les versions) :

Directive *Richtlinie* *Directive*	Standard / Reference number *Norm / Referenznummer* *Norme / référence*	Edition *Ausgabedatum* *Edition*	a=B,E	a=D,G	a=B,E b=R,S,T,U	a=D,G b=R,S,T,U
2014/30/EU	EN 61326-1 *	2013	●	●	●	●
2014/35/EU	EN 61010-1	2010	●		●	
2014/68/EU	PED ESR annex 1	2014	● **	● **	● **	● **
2014/32/EU	EN 1434	2007			● ***	● ***

* all environments included / *beinhaltet alle Umgebungen/dans tout type d'environnement*
** only when marked with Notified Body identification number 0200 after the CE-mark
*** only when marked with [M+year] and Notified Body identification number 0200 after the CE-mark

EC-type examination certificate *EG-Baumusterprüfbescheinigung* *Certificat évaluation de type*	a=B,E	a=D,G	a=B,E b=R,S,T,U	a=D,G b=R,S,T,U
FORCE Certification A/S, DK-0200-MI004-005 (Module B)			●	●
FORCE Certification A/S, DK-0200-MID-D-002 (Module D)			● ***	● ***
FORCE Certification A/S, DK-0200-PED-H-002 (Module H)	● **	● **	● **	● **

** only when marked with Notified Body identification number 0200 after the CE-mark
*** only when marked with [M+year] and Notified Body identification number 0200 after the CE-mark

Inspection / Surveillance:
Kontrolle / Überwachung:
Contrôle / Supervision:

Directive *Richtlinie* *Directive*		Notified Body Product Quality Assurance *Benannte Stelle Qualitätssicherung Produktion* *Organisme notifie*	No. *Nr.* *N°.*
2014/32/EU	MID	FORCE Certification A/S, Park Allé 345, 2605 Brøndby, Denmark	0200
2014/68/EU	PED	FORCE Certification A/S, Park Allé 345, 2605 Brøndby, Denmark	0200

Misuratori di portata ad ultrasuoni

SITRANS FUS / FUE380

Istruzioni operative - 07/2010

SITRANS F

SIEMENS

Introduzione 1

1.1 Prefazione

Queste istruzioni contengono tutte le informazioni necessarie per l'avviamento e l'uso del misuratore di portata ad ultrasuoni SITRANS F tipo FUS380 e tipo FUE380 approvato per sistemi per la misura del calore.
Queste istruzioni sono rivolte a personale tecnico dedicato all'installazione meccanica, alle connessioni elettriche ed alla messa in servizio dello strumento, così come a personale tecnico di assistenza.

Istruzioni generali di sicurezza 2

2.1 Note di sicurezza

Per questioni di sicurezza è importante che i seguenti punti, specialmente quelli marcati col segnale di pericolo, siano letti e compresi prima dell'installazione del misuratore:

- Installazione, collegamento, messa in servizio e manutenzione devono essere eseguiti da personale qualificato ed autorizzato.
- E' molto importante, per chiunque lavori sullo strumento, leggere e comprendere le istruzioni e le indicazioni fornite dal presente manuale e seguire tali istruzioni ed indicazioni prima dell'utilizzo dello strumento stesso.
- Solamente personale autorizzato e preparato dal proprietario dello strumento può operare sullo strumento stesso.
- Il personale addetto all'installazione deve assicurarsi che il sistema di misura sia correttamente collegato in accordo con quanto indicato dal diagramma di connessione.
- Per applicazioni con alte pressioni di lavoro o liquidi che possono risultare pericolosi per le persone, ambienti, apparecchiature o altro nel caso di rottura della tubazione, Siemens raccomanda di adottare tutte le precauzioni come posizionamenti particolari, schermature o installazione di dispositivi e valvole di sicurezza prima dell'installazione del sensore.
- Riparazioni e manutenzione specializzata devono essere eseguite solamente da personale autorizzato Siemens.

2.3 Disposizioni di progetto e sicurezza del costruttore

- La responsabilità per la scelta del materiale del tubo del sensore di portata per quanto riguarda la resistenza all'abrasione e alla corrosione è dell'acquirente. L'effetto di qualsiasi cambiamento nel liquido di processo durante il funzionamento dello strumento deve essere preso in considerazione. Una non corretta selezione del materiale del tubo del sensore di portata può portare a malfunzionamento dello strumento.
- Sollecitazioni e carichi causati da terremoti, traffico, forti venti e danni da incendio non sono stati presi in considerazione nella progettazione del misuratore di portata.

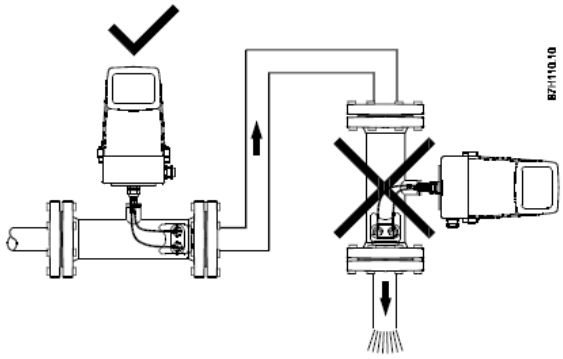
- Non installare il misuratore di portata in modo tale che agisca da centro delle sollecitazioni meccaniche alla linea. Carichi esterni non sono stati presi in considerazione nella progettazione del misuratore di portata.
- Prestare attenzione ai rischi a cui si va incontro installando il sensore in un sistema con vibrazioni notevoli. Parti possono staccarsi e muoversi liberamente: in questo caso è necessario monitorare in continuo il sistema.
- Flange e connessioni così come le relative classificazioni in pressione/temperatura sono state descritte nella normativa EN 1092-1. Vedere il gruppo acciaio ferrite 1E1: tabella 15.
- Durante il funzionamento non superare i campi di pressione e temperatura indicati sulle etichette poste su sensori e convertitori o in queste istruzioni operative.
- E' raccomandato per tutte le installazioni includere una adeguata valvola di sicurezza e adeguati dispositivi per il drenaggio.
- Secondo la Pressure Equipment Directive (PED), questo strumento è considerato un accessorio e non approvato per l'uso come accessorio di sicurezza, come definito nella direttiva PED.

PERICOLO

Non rimuovere i trasduttori durante il funzionamento (tassativo per i DN50 . . . DN80).

Funzionamento a batteria:

- Per tutte le versioni a batteria il trasmettitore del misuratore di portata deve essere montato verticalmente! Diversamente, la durata della batteria verrà sensibilmente ridotta, Quindi la versione compatta a batteria non deve essere installata su tubazioni verticali, come da figura:



- Quando sono alimentati a batteria, i SITRANS FUS380 e FUE380 non sono coperti dalla Low Voltage Directive (LVD). Quindi un'installazione può essere considerata conforme con la LVD solo quando il SITRANS FUS380/FUE380 è collegato a dispositivi conformi alla LVD.
- Le batterie al litio sono sorgenti primarie di alimentazione con alto contenuto di energia. Esse sono progettate per incontrare gli standard di sicurezza più elevati. Esse possono, tuttavia, presentare un rischio potenziale se non sono correttamente trattate elettricamente o meccanicamente. Ciò è nella maggior parte delle circostanze associato con la generazione di eccessivo calore, dove l'aumento della pressione interna può causare la rottura della cella.
  Quindi devono essere osservate le seguenti precauzioni di base quando si maneggiano e si utilizzano batterie al litio:
  - Non cortocircuitare, ricaricare, sovraccaricare o connettere con polarità inversa
  - Non esporre a temperature al di fuori del campo di temperatura indicato, né incenerire la batteria
  - Non rompere, forare o aprire le celle o disassemblare il pacco batterie
  - Non eseguire saldature sui terminali o il corpo delle batterie
  - Non esporre il contenuto delle celle con l'acqua

- Il trattamento delle batterie al Litio è regolato dall' United Nations Model Regulations sul Trasporto di prodotti Pericolosi, UN documento ST/SGAC.10-1, 12th revise edition, 2001. La norma UN no.3091 class 9 copre le batterie al litio imballate con o all'interno dei dispositivi. La norma UN no.3090 class 9 copre il trasporto delle batterie in se stesse.
  Quindi devono essere considerate le seguenti precauzioni di base quando si trasportano le batterie al litio:
  - Trasportare solamente in imballi speciali con etichette e documenti di trasporto speciali
  - Prestare attenzione nel maneggiare, trasportare ed imballare al fine di prevenire corto-circuiti nelle batterie
  - Le massa globale dell'imballo è limitata e dipende dal tipo di trasporto. In generale, un peso sotto i 5kg. è accettato per tutte le tipologie di trasporto.

- Rimuovere le batterie dal trasmettitore prima di spedire il misuratore di portata alla Siemens nel caso di riparazione o garanzia.

Descrizione 3

3.1 Descrizione del prodotto

Il misuratore di portata ad ultrasuoni a 2 tracce SITRANS FUS380 ed il modello approvato SITRANS FUE380, sono alimentati a batteria o con alimentazione115/230 VAC e sono progettati per misurare portate d'acqua in impianti di riscaldamento, centrali, sottostazioni, impianti chiller e altre applicazioni generiche su acqua incluse trattamento acque e irrigazione.

Il misuratore di portata SITRANS F US è disponibile nelle seguenti varianti:

- FUS380: Misuratore di portata universale con impostazioni selezionabili
- FUE380: Misuratore di portata approvato e dedicato a misure di portata in sistemi per la contabilizzazione dell'energia. Il SITRANS FUE380 è approvato secondo gli standard dettati dalle normative EN 1434 classe 2, OIML R 75 classe 2 e MID MI-004.
  Il FUE380 può essere marchiato, neutro, o etichettato con un' approvazione specifica nazionale, a seconda di come viene selezionato in fase di ordinazione.

Entrambi i tipi di misuratori di portata SITRANS FUS380 e FUE380 sono disponibili nelle versioni compatta o separata ed i collegamenti elettrici e le funzioni sono le stesse per entrambi i tipi. La massima distanza possibile tra sensore e trasmettitore e di 30 metri.

Il misuratore di portata consiste nella parte trasmettitore FUS080 e nella parte sensore FUS300. Queste due parti possono essere ordinate solamente in coppia come sistema per la misura di portata tipo FUS380 o FUE380. Per il FUS380 può essere ordinato separatamente un trasmettitore come ricambio (vedere catalogo SIEMENS FI 01). Per il FUE380 ciò non è possibile in quanto misuratore approvato (fiscale). Per entrambi i sistemi la parte sensore non può essere ordinata senza il trasmettitore.

Nel FUS380 i parametri di programmazione e le uscite impulsive sono pre-impostati da fabbrica e protetti da un blocco software. Un accessorio software è richiesto per modificare i parametri.
Nel FUE380 i parametri metrologici e le uscite impulsive sono pre-impostati da fabbrica e protetti da un blocco hardware e dai sigilli per evitarne la manomissione.
Nessuna impostazione è richiesta all'atto della installazione, essendo tutti i parametri pre-impostati da fabbrica (plug & play).

Temperatura dell'acqua (versione compatta) per sensori da DN50 a DN1200 : da 2 a 120°C (versione approvata MID, minimo 15°C)
Temperatura dell'acqua (versione separata) sensori in acciaio da DN100 a DN1200: da 2 a 200°C (versione approvata MID, minimo 15°C) - sensori in bronzo da DN50 a DN80: da 2 a 150°C (versione approvata MID, minimo 15°C).

Accessori per il corretto assemblaggio sulla linea e guarnizioni per flange non sono di responsabilità SIEMENS.

3.2 Manutenzione

Al fine di localizzare e diagnosticare malfunzionamenti, è disponibile un tool software per la diagnosi e la riprogrammazione delle uscite. Informazioni sugli errori esistenti sono disponibili a display. Gli errori avvenuti vengono memorizzati ed è possibile verificarli attraverso la porta di comunicazione ad infrarossi.
Il software per la diagnostica e la programmazione dei parametri è il SIEMENS SIMATIC PDM Single Point (vedere sul catalogo SIEMENS FI 01 – Accessori FUS/FUE380).

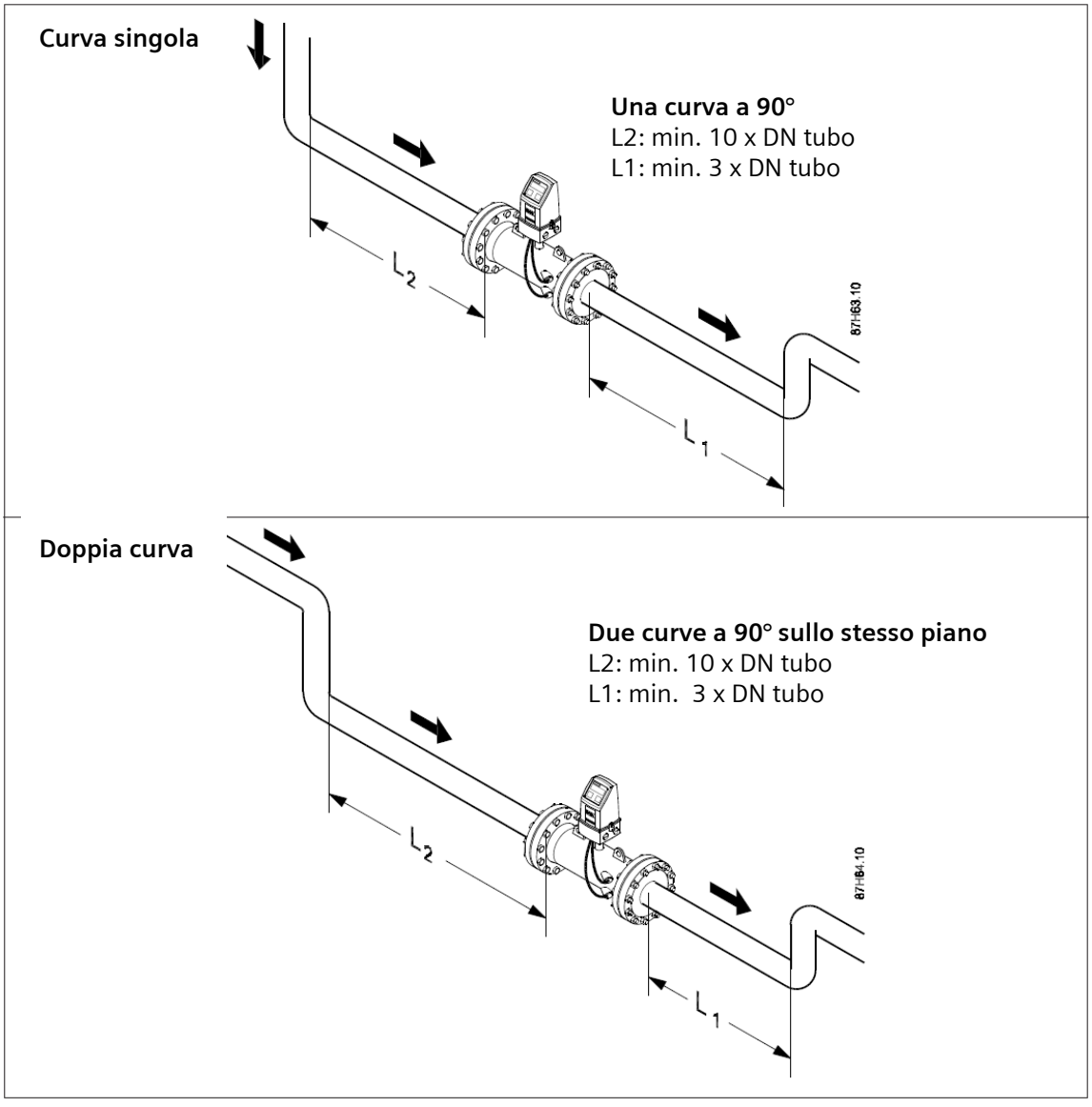
Installazione 4

4.1 Installazione del sensore versioni compatta e separata

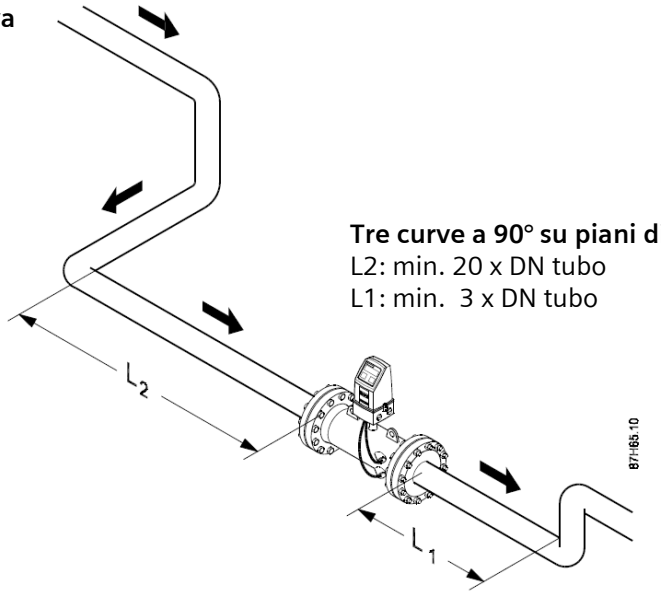
Requisiti per tratti rettilinei a monte e a valle del sensore
Al fine di ottimizzare le prestazioni dello strumento è necessario avere tratti rettilinei di tubazione di uguale DN a quello del sensore a monte e a valle del misuratore di portata.
Inoltre deve essere rispettata una minima distanza tra misuratore e pompe o valvole. E' altresì importante centrare il sensore di portata relativamente a controflange e guarnizioni.
Assicurarsi che il sensore di portata sia posizionato in un punto basso del circuito per evitare che aria resti intrappolata entro il sensore in corrispondenza dei trasduttori.

Trovare una posizione sulla tubazione con tratti rettilinei aventi lunghezza come sotto specificato.

Nota - per sistemi FUE380 approvati MID è raccomandata la seguente condizione in ingresso (a monte): L2 per dimensioni ≥ DN 80 : 1,5 m.



Tripla curva

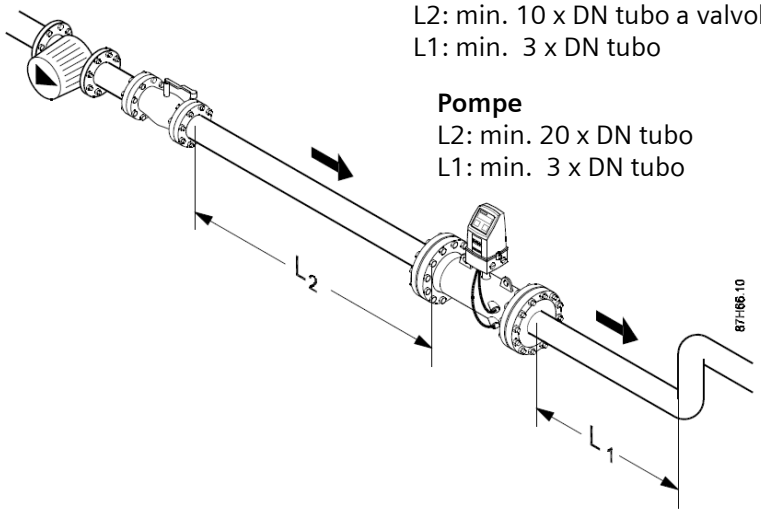


Tre curve a 90° su piani diversi
L2: min. 20 x DN tubo
L1: min. 3 x DN tubo

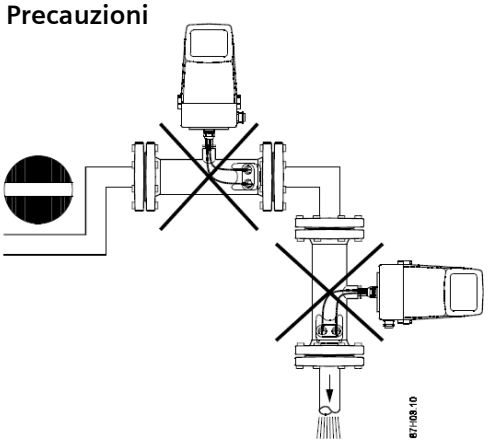
Pompe e valvole

Valvole
L2: min. 10 x DN tubo a valvola tutta aperta
L1: min. 3 x DN tubo

Pompe
L2: min. 20 x DN tubo
L1: min. 3 x DN tubo



Precauzioni



Evitare l'installazione nei punti più alti del circuito per evitare che aria resti intrappolata nel sensore.
Evitare l'installazione del sensore a scarico libero.
Il sensore può essere installato su tubazioni orizzontali o verticali.

Nota
Per ottenere la massima durata della batteria al Litio, Siemens raccomanda l'installazione del convertitore di portata in posizione verticale verso l'alto.

4.2 Installazione del trasmettitore versioni compatta e separata

4.2.1 Informazioni generali

Il trasmettitore viene fornito separatamente, pronto per essere collegato alla corrispondente base (verificare la corrispondenza trasmettitore – sensore aventi lo stesso System Number).
I SITRANS FUS380 e FUE380 possono essere alimentati a batteria o con alimentazione 115/230 VAC. Verificare il tipo di alimentazione da utilizzare leggendo l'etichetta posta sul trasmettitore.

Importante:
Un trasmettitore ordinato con la sola alimentazione a batteria, non può essere modificato per accettare l'alimentazione in VAC, perché manca della corrispondente componentistica elettronica.
Sulle versioni compatte, tutti i cavi trasduttori sono pre-assemblati da fabbrica.
Il montaggio e collegamento dei cavi per le uscite impulsive sono identici per le versioni compatta e separata.

4.2.2 Isolamento termico

Entrambe le versioni posso essere isolate termicamente.
Siemens raccomanda sempre l'isolamento termico del sensore nelle **versioni compatte** per prevenire eccessivo trasferimento di calore al trasmettitore. La raccomandazione vale sia per la versione alimentata a batteria sia per la versione alimentata in VAC.

4.2.3 Versione alimentata con tensione alternata

La versione alimentata con tensione alternata VAC può sempre essere equipaggiata con una batteria. Nel caso venga a mancare la tensione alternata, la batteria entra in funzione fornendo alimentazione al trasmettitore (batteria di back-up).
La batteria **non è** del tipo ricaricabile. La batteria **deve** essere sostituita almeno ogni 6 anni.

La fornitura può comprendere un trasmettitore con batteria pre-installata. In alternativa, la batteria deve essere installata prima dell'uso. (vedi paragrafo "Versione alimentata a batteria").

Nota
Il trasmettitore viene fornito con il connettore maschio della batteria **non connesso** al connettore femmina posto sulla parte inferiore del trasmettitore. Questa connessione va fatta per abilitare la funzione di batteria di back-up. Per ulteriori dettagli vedere il paragrafo "Installazione della batteria".

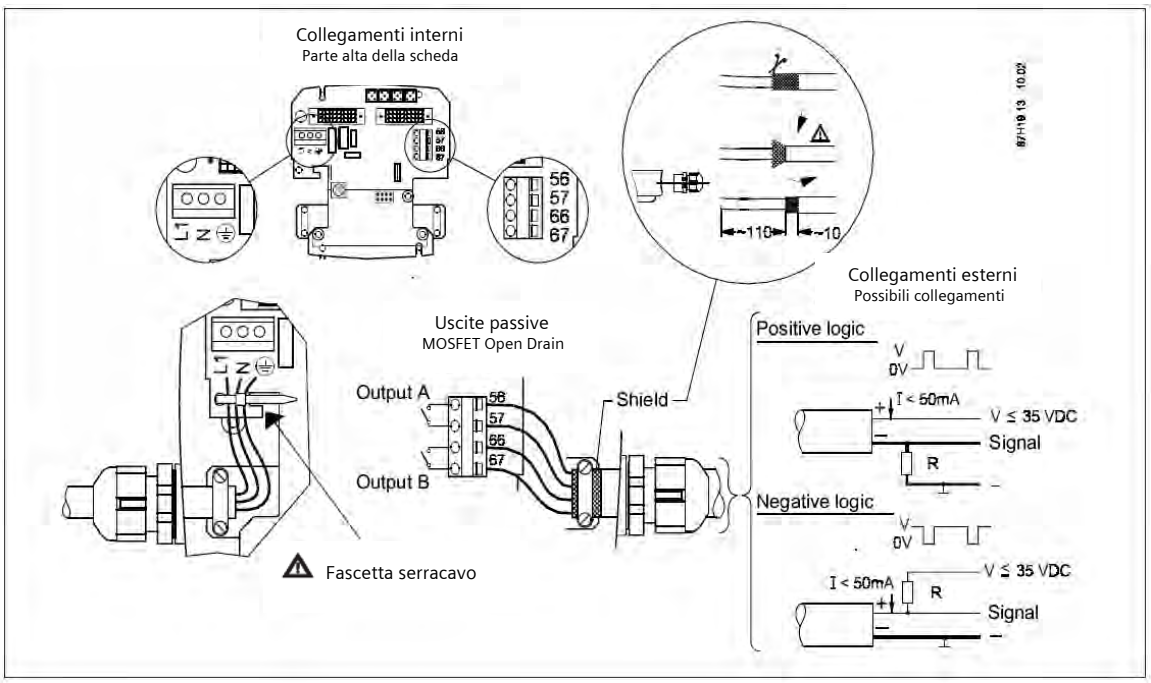
4.2.4 Schema dei collegamenti per alimentazione e uscite impulsive

 Scollegare sempre l'alimentazione in VAC prima di disconnettere il trasmettitore dalla base (solo per le versioni alimentate in tensione alternata).

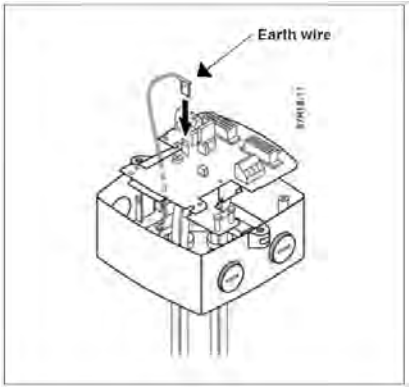
 **Importante**
Le fascetta serra-cavo **deve** essere stretta sulla scheda di connessione come indicato nella figura seguente.

Lato superiore scheda di connessione

Trasmettitori alimentati in VAC : morsetti L1, N e ⏚
Tensioni ammesse : 87 VAC . . . . 250 VAC



Messa a terra pericoli potenziali



Nelle unità alimentate con tensione alternata VAC, il cavo di terra deve essere collegato al morsetto PE ⏚ sulla scheda di connessione, come indicato.

E' pericoloso toccare il retro della scheda di connessione!

4.2.5 Trasmettitori alimentati in VAC con batteria di back-up

Quando i SITRANS FUS380/FUE380 sono alimentati in VAC, è possibile inserire una batteria di back-up per assicurare il funzionamento continuo nel caso venga a mancare l'alimentazione. A seconda della durata e della frequenza delle cadute dell'alimentazione, la batteria ha una durata di circa 6 anni (calcolando in media una caduta di tensione al giorno della durata di un'ora).

Verificare che sul display appaia il simbolo dell'alimentazione VAC ad installazione completa. Questo simbolo indica che l'installazione è corretta. Se il collegamento all'alimentazione non è stabilito correttamente, il misuratore funzionerà solamente a batteria. La durata della batteria sarà significativamente ridotta se le batterie vengono utilizzate in modo continuo e non con sola funzione di back-up.

4.3 Installazione del trasmettitore versioni compatta e separata

I SITRANS FUS380 e FUE380 sono predisposti per alloggiare fino a 2 batterie da 3,6 V.
Quando è installato il pacco da 2 batterie, la durata sarà almeno di 6 anni con funzionamento in condizioni normali di temperatura (vedere catalogo SIEMENS FI 01).

Svitare la vite e rimuovere il coperchio vano batterie per inserire il pacco batterie.
Collegare il piccolo connettore delle batterie al connettore posto in mezzo ai due connettori principali. Assicurarsi che il cavetto sia inserito nel piccolo canale dedicato tra il connettore e la batteria.

Nota
SIEMENS raccomanda la sostituzione delle batteria ogni 5 – 6 anni.
Ogni volta che una batteria viene collegata, il trasmettitore fa partire una routine di start-up, vedi paragrafo "Messa in servizio".

La sostituzione della batteria non altera i dati registrati. I dati registrati possono essere azzerati solamente utilizzando un'applicazione software su PC. Secondo quanto dettato dalla normativa per i FUE380 questa operazione è possibile solo rimuovendo i sigilli sui trasmettitori e con chiavetta hardware.

Fig. 1

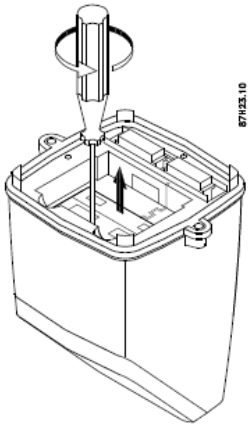


Fig. 2

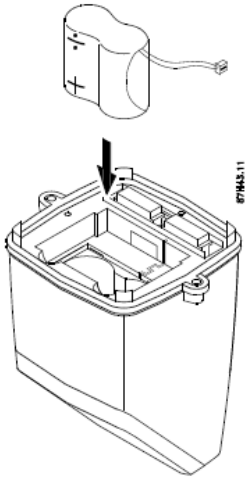


Fig. 3

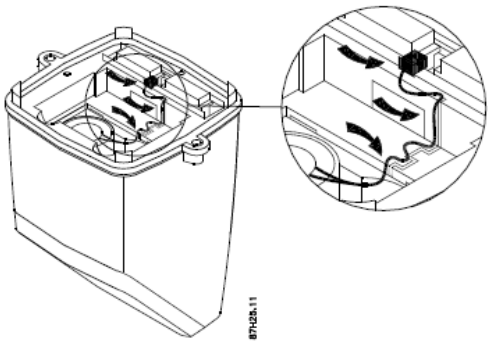
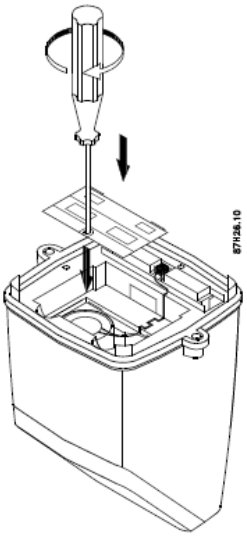


Fig. 4



4.4 Installazione del trasmettitore versione separata

4.4.1 Installazione della staffa per montaggio a parete o palina

1. Svitare le due viti ai lati del trasmettitore e rimuoverlo.
2. Montare la staffa a parete in modo appropriato considerando la lunghezza dei cavi coassiali di collegamento, e lasciando spazio sufficiente per l'ingresso dei cavi nella parte inferiore e lateralmente.

Fig. 1

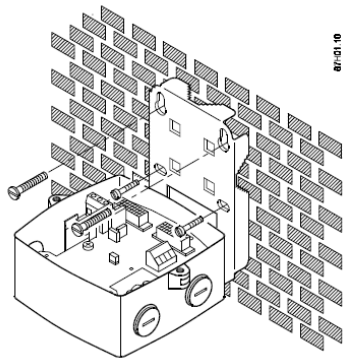


Fig. 2

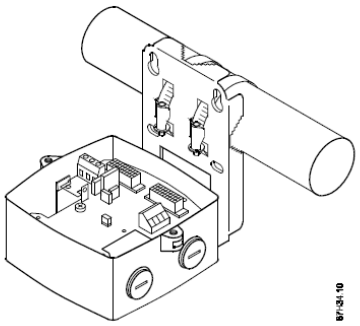
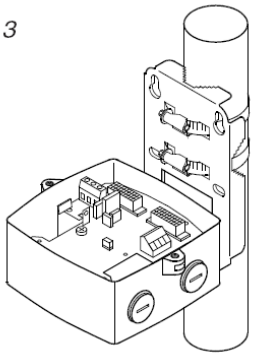
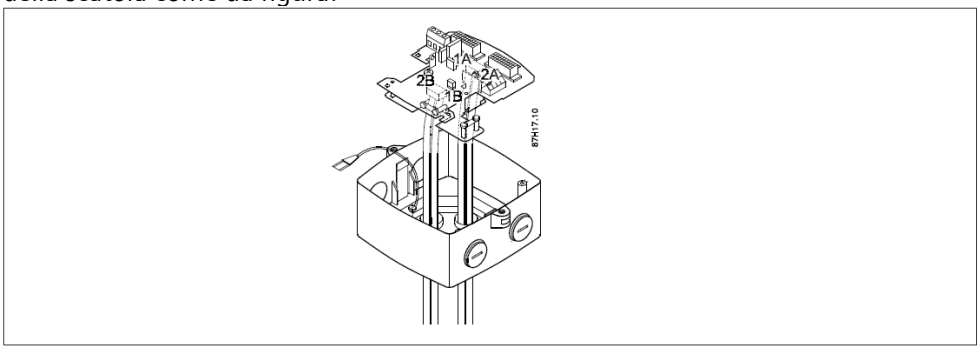


Fig. 3



4.4.2 Collegamento dei cavi trasduttori

I SITRANS FUS380 e FUE380 nelle versioni separate vengono forniti con 4 cavi separati per il collegamento dei trasduttori. Ciascun cavo può essere collegato a un qualsiasi trasduttore (i cavi non sono accoppiati con i trasduttori) tuttavia sono etichettati 1A, 1B, 2A e 2B per facilitarne il cablaggio. Sganciare la scheda di connessione e allentare il cavo di terra. I cavi sono da fabbrica terminati e crimpati da ambo i lati. Spingere delicatamente i cavi uno ad uno dal fondo della scatola attraverso i pressacavi e regolare i 4 cavi in modo che sporgano circa 100mm. dal profilo superiore della scatola come da figura:

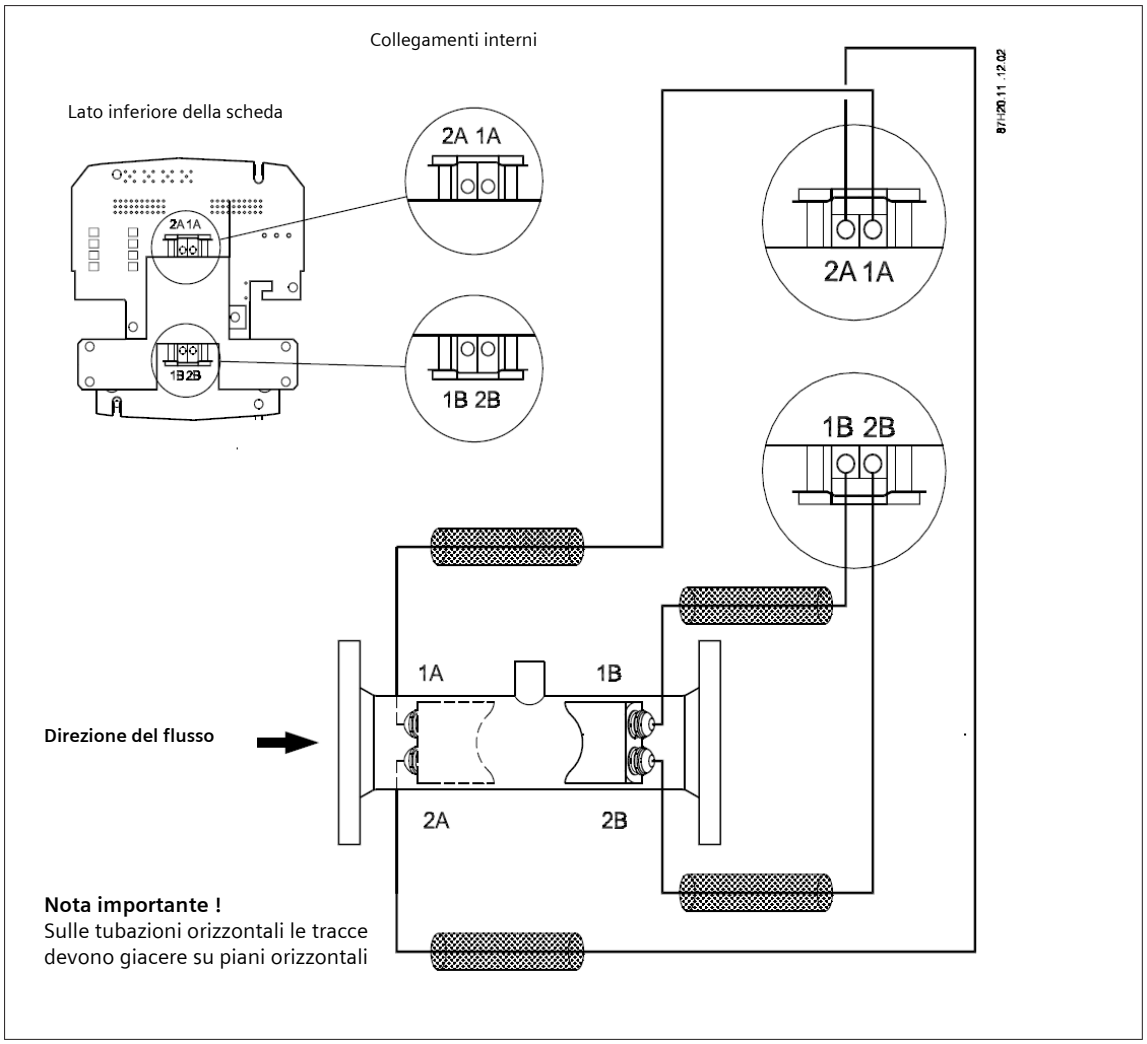


4.4.3 Schema di collegamento dei trasduttori

Cavi 1A ed 1B alla prima traccia (superiore), 1A a monte e 1B a valle rispetto alla direzione del flusso.
Cavi 2A e 2B alla seconda traccia (inferiore), 2A a monte e 2B a valle rispetto alla direzione del flusso.

Nota: NON tagliare i cavi poiché ciò influenza la precisione dello strumento.

4.4.4 Schema di collegamento lato inferiore della scheda



Collegamenti elettrici 5

5.1 Impostazione delle uscite impulsive A e B

Inserire il cavo relativo alle uscite impulsive attraverso il pressa cavo prima di riagganciare la scheda di connessione nella sua posizione finale all'interno della scatola.
Nelle versioni compatte installare i cavi di alimentazione ed uscite attraverso i pressa cavi senza rimuovere la scheda.

Per i FUS380 e i FUE380, l'impostazione delle uscite impulsive A e B viene determinata in base al numero d'ordine: i settaggi di fabbrica si possono trovare nelle tabelle di cui sotto. Le impostazioni per il FUS380 possono essere lette e modificate utilizzando un PC, il software SIMATIC PDM (Process Device Manager) e l'interfaccia ottica ad infrarossi IrDA (vedere accessori per i FUS380 sul catalogo SIEMENS FI 01). Le impostazioni per i FUE380 approvati non possono essere modificate, secondo quanto detta la normativa, ma possono essere lette mediante il software PDM.

	FUS380	**FUE380**
Uscita A	Impulsi in senso positivo o negativo Impostazione di fabbrica: positivo	Impulsi in senso positivo o neg. Impost. di fabbrica: positivo
Uscita B	Impulsi in senso positivo o negativo allarme, o chiamata Impostazione di fabbrica: allarme	Impulsi in senso positivo o neg., allarme, o chiamata Impost. di fabbrica: allarme
Peso degli impulsi A e B (dipende dal valore del DN)	0.1 l/p; 0.25 l/p; 0.5 l/p; 1 l/p; 2.5 l/p; 10 l/p; 25 l/p; 50 l/p; 100 l/p; 250 l/p; 500 l/p; 1 m³/p; 2.5 m³/p; 5 m³/p; 10 m³/p; 25 m³/p; 50 m³/p; 100 m³/p; 250 m³/p; 500 m³/p; 1000 m³/p	Preset: vedere schema per FUE380 o le seguenti impostazioni per i contatori di energia SITRANS FUE950
Durata dell'impulso	5; 10; 20; 50; 100; 200; 500 ms	Impost. di fabbrica: 5 ms

5.1.1 Impostazione di fabbrica per l'uscita impulsiva A dei FUE380 dedicata per contatore di energia tipo SITRANS FUE950

Uscita A, morsetti 56/57 :
Il peso dell'impulso può essere letto sull'etichetta posta sul lato destro del trasmettitore e **deve corrispondere** al peso dell'impulso programmato sul contatore di energia.
Le impostazioni per i SITRANS FUS380 dipendono dal codice di ordinazione (vedi tabella di sopra).
La seguente tabella mostra le impostazioni di fabbrica raccomandate per i FUS380/FUE380 (durata dell'impulso 5 ms), adatte per i contatori di energia tipo SITRANS FUE950.

DN	Peso dell'impulso (litri/impulso)
50	1
65	1
80	2.5
100	2.5
125	2.5
150	10
200	10
250	10
300	50
350	50
400	50
500	100
600	100
700	100
800	100
900	100
1000	100
1200	100

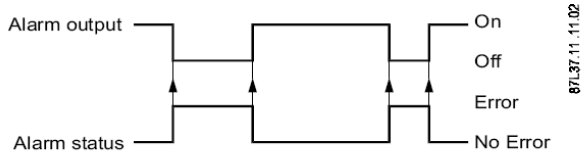
5.1.2 Impostazione di fabbrica per l'uscita impulsiva B per i FUS380 e FUE380

Uscita B, morsetti 66/67 :
SITRANS FUS380 e FUE380

Pre-impostata da fabbrica per indicazione di allarme – vedi Fig. 1

Esempio: se la traccia 1 non misura un'icona triangolare di allarme appare sul display: ⚠
Il codice di allarme F1 viene visualizzato sul display menu 4 e l'uscita si porta allo stato "Off".

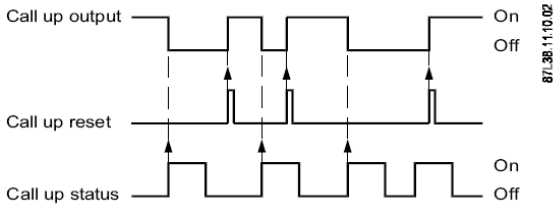
Fig. 1



Indicazione di chiamata - vedi Fig. 2
L'uscita di chiamata è attiva finchè manualmente resettata utilizzando il software PDM. La funzione di chiamata viene anche attivata quando è attiva la funzione di allarme.

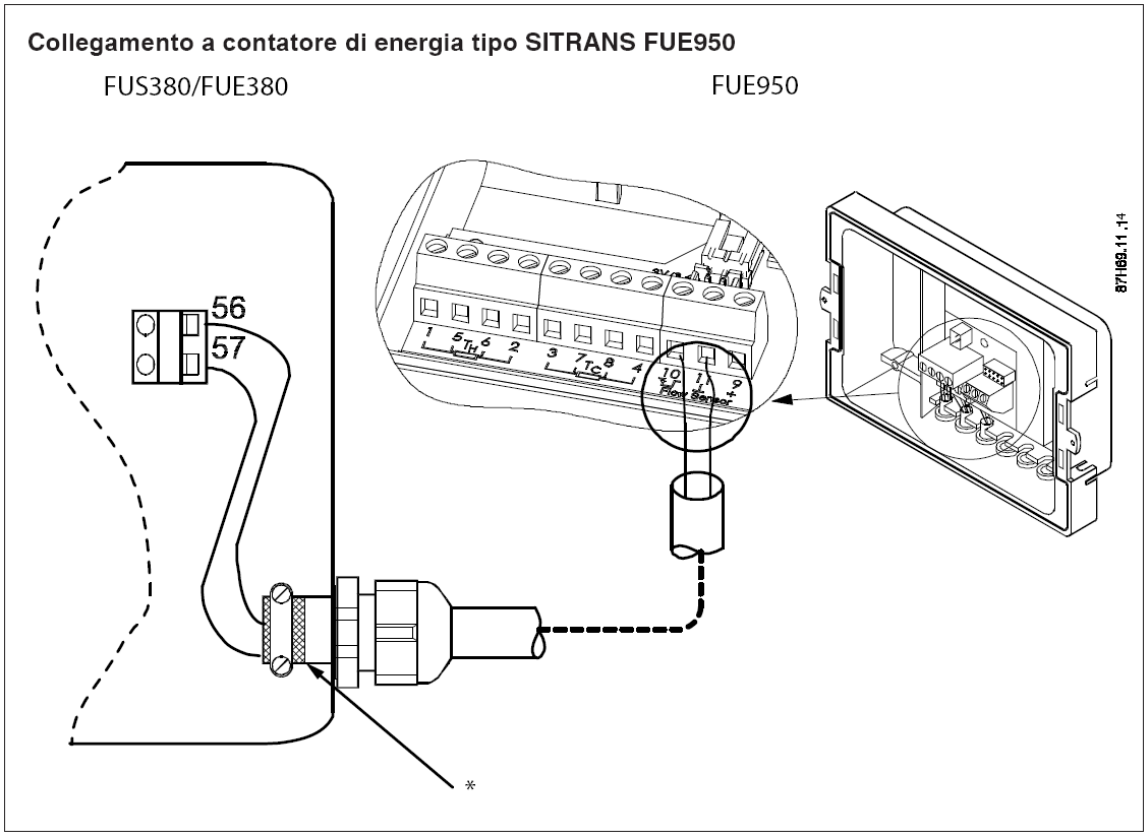
SIMATIC PDM (Process Device Manager): vedi accessori FUS380 su catalogo SIEMENS FI 01

Fig. 2



La terza possibilità per l'impostazione dell'uscita impulsiva B è quella come uscita impulsiva per flusso positivo (uguale all'uscita impulsiva A) o per flusso inverso (negativo). Tipicamente con le stesse possibilità di impostazioni viste per l'uscita impulsiva A (tabelle a pag. 15).

5.1.3 Schema per il collegamento a contatore di energia tipo SITRANS FUE950



*: è vivamente raccomandato l'utilizzo di un cavo schermato.
Massima lunghezza del cavo di collegamento tra SITRANS FUE380 e SITRANS FUE950: **10 metri**.

NOTA MOLTO IMPORTANTE !

Il peso degli impulsi in uscita dal misuratore di portata SITRANS FUE380 deve corrispondere al peso per gli impulsi in ingresso programmato sul contatore di energia SITRANS FUE950 (vedi paragrafo 5.1.1)

Messa in servizio 6

6.1 Messa in servizio del misuratore attraverso tasto e display

Il pannello di controllo del trasmettitore è realizzato con un unico tasto e un display a 8-digit : vedi Fig. 3.

Dopo aver collegato le batterie, resettare il contatore interno per il calcolo dell'energia residua, per avere un' indicazione corretta della capacità delle batterie.

Quando vengono installate delle nuove batterie, parte la routine di avviamento del misuratore di portata. Per prima cosa il display mostra la versione di software attiva. Dopo 10 secondi apparirà il messaggio "reset.bat". Premere il tasto entro 6 secondi per resettare il contatore interno per il calcolo dell'energia residua. Apparirà poi il messaggio "accept". Premendo ancora il tasto entro 6 secondi, il contatore interno per la carica della batteria verrà resettato e l'indicatore della carica della batteria mostrerà la piena carica – vedi Fig. 1.

Tasto 

Premere il tasto per passare all'indice successivo ed alle relative informazioni – vedi Fig. 2.

Fig. 1

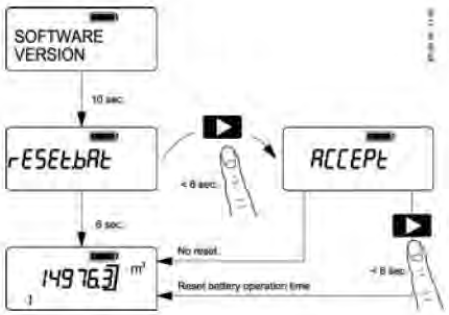


Fig. 2

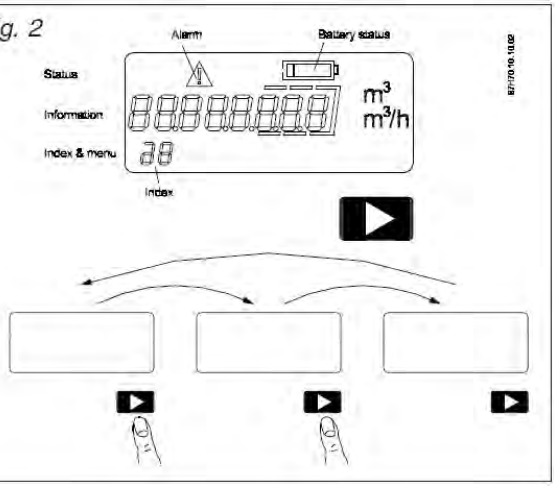
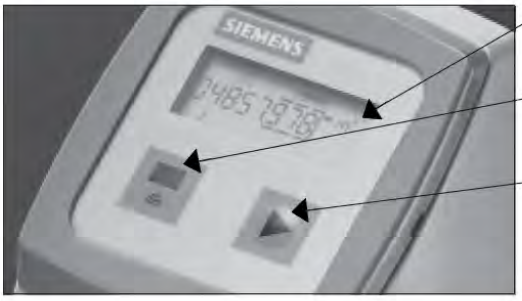


Fig. 3



Display ad 8-digit

Porta per la comunicazione ad infrarossi IrDA

Singolo tasto

6.2 Menu Operatore

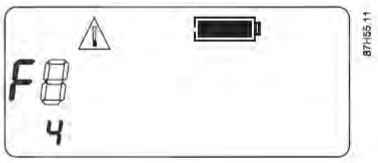
Menu 1
Volume Flusso Totalizzatore 1.
L'icona della batteria mostra la piena carica.

Menu 2 (solo FUS380)
Volume Flusso Totalizzatore 2 (da fabbrica configurato per flusso inverso).
Valori negativi indicano portate negative.

Menu 3
Portata istantanea.
Valori negativi indicano portata negativa.

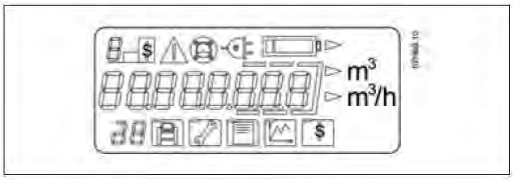
Menu 4
Informazioni sugli errori in corso.
Ciascun codice indica un errore specifico.

F	Nessun errore
F1	La Traccia 1 non misura
F2	La Traccia 2 non misura
F3	Errore interno
F4	Errore interno
F5	Batteria scarica o assenza aliment.
F6	Portata eccessiva
F7	Frequenza impulsi eccessiva out A
F8	Frequenza impulsi eccessiva out B
F9	Allarme su Datalogger



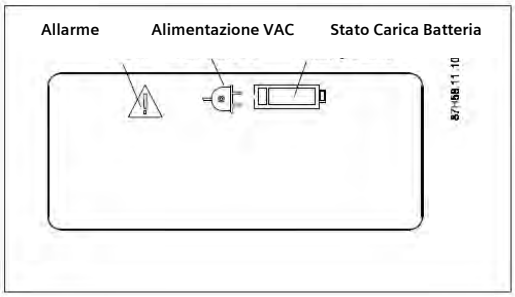
Combinazione codici di errore:
F12 vuol dire errori F1 e F2 :
la traccia 1 e la traccia 2 non misurano.

Display test
Verifica di tutti i segmenti led.
Il display accende e spegne tutti i segmenti.

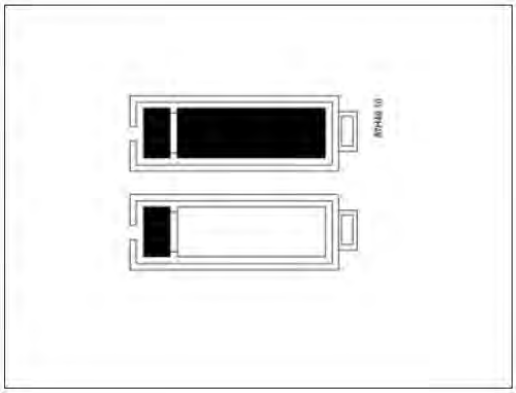


6.3 Icone informative

Le icone informative mostrano lo stato attuale di importanti elementi del misuratore. Il simbolo di allarme appare quando i sensori ad ultrasuoni non misurano o quando si verifica un allarme mostrato nel menu 4. Il simbolo di allarme scompare quando il problema viene risolto. Il simbolo dell'alimentazione appare quando la tensione in VAC viene data al trasmettitore.



Ci sono due simboli per lo stato di carica della. batteria. Il simbolo di Piena Carica indica che la carica è oltre il livello di allarme (contatore orario su 6 anni). Il simbolo di Carica Bassa indica che la carica è sotto il livello di allarme e la batteria deve essere sostituita (la carica è al di sotto di un valore pre-impostato, ma non ancora a zero). Il misuratore di portata continua a funzionare regolarmente quando appare il simbolo di Carica, Bassa fino a quando la batteria si scarica completamente.



Ricerca guasti 7

7.1 Codici allarmi

Codici Allarmi	Malfunzionamento	Rimedio
Display Spento	Connettore batteria non collegato, batteria scarica, alimentazione assente	Verificare versione trasmettitore (alimentazione) verificare cavo e presenza alimentazione Tipo di batteria non corretto (sostituire batteria)
F1	La Traccia 1 (superiore) non misura	Traccia non bagnata (tubo vuoto) e/o problema sui cavi ai trasduttori 1A o 1B
F2	La Traccia 2 (inferiore) non misura	Traccia non bagnata (tubo vuoto) e/o problema sui cavi ai trasduttori 2A o 2B
F3	Errore software interno	Contattare il fornitore
F4	Errore software interno	Contattare il fornitore
F5	Carica Batteria al di sotto del limite	Sostituire la Batteria e resettare il simbolo
	Assenza alimentazione in VAC	Verificare presenza e valore tensione VAC
F6	La portata eccede il valore impostato di Qmax. (velocità max.10 m/s)	Velocità dell'acqua entro il tubo troppo alta
F7	Overflow uscita impulsiva A	La frequenza degli impulsi in uscita è > 100 Hz
F8	Overflow uscita impulsiva B	La frequenza degli impulsi in uscita è > 100 Hz
F9	Allarme Datalogger	L'allarme Datalogger si verifica se l'attuale consumo sul totalizzatore 1 è alla fine del tempo di log o sopra o sotto i limiti impostati. Questo è solo un allarme e non influisce sulla misura di portata. Verificare i limiti di consumo impostati sul data logger (via PDM, "valore no. 602")

Esempio: errore sul display (menu 4) F12. Significa presenza contemporanea degli errori F1 e F2.
Diagnosi: tubazione vuota o problema sui cavi trasduttori o trasduttori mal funzionanti.

Sigillatura 8

8.1 Sigilli per versione approvata SITRANS FUE380

Trasmettitore (nuovo sigillo)		Sensore DN 100...1200	
Trasmettitore (vecchio sigillo)		Sensore DN 50...80	

8.2 Verifica dei sigilli per versione approvata SITRANS FUE380

Trasmettitore
Verifica del sigillo sotto la cornice

Verifica del sigillo sotto il trasmettitore

Dati Tecnici 9

9.1 Dati tecnici SITRANS FUS380 e FUE380

Descrizione	Specifica		
Trasmettitore FUS080			
Contenitore	IP67 secondo norme EN 60529 e DIN 40050 (NEMA 4X/6)		
Temperatura ambiente	0°C …60 °C (32 °F…. 140 °F) [2]		
Temperatura di stoccaggio	- 35 °C…85 °C (40 °F…185 °F)		
Installazione	Cavi trasduttori da 5, 10, 20, 30 m (16.4, 33, 65, 90 ft) dal sensore		
Carico meccanico	2 g, 1…800 Hz sinusoidale in tutte le direzioni secondo IEC 68-2-6		
Materiale contenitore	Poliammide rinforzato con fibre di vetro colore grigio chiaro		
Alimentazione	- Batteria: 3.6 V LiSOCl (Lithium Thionyl Chloride) sostituibile pacco batterie da 32 Ah		
	- Alimentazione: 87 … 265 V AC (50 … 60 Hz)		
Durata batterie	Almeno 6 anni con funzionamento a 60 °C (140 °F)		
Display	LCD, 8 digits, ulteriori 2 digits ed icone per informazioni sullo stato		
Singolo tasto	Unico tasto per visualizzare sul display tutte le impostazioni e i valori		
Frequenza in misura	0.5 Hz funzionamento a batteria o 20 Hz funzionamento con alim. in VAC		
Comunicazione	a infrarossi IrDA attaverso finestra su pannello (protocollo MODBUS RTU); attraverso moduli seriali aggiuntivi RS232 o RS485 (sempre con protocollo MODBUS RTU)		
Uscite digitali	Due uscite passive galvanicamente isolate open drain-mos, A e B		
	Max. ±35 V, 50 mA		
Uscita impulsiva A	Programmata da fabbrica come uscita impulsiva per flusso positivo		
Uscita impulsiva B	Programmata da fabbrica come allarme per malfunzionamento in corso		
Durata impulsi	5, 10, 20, 50, 100, 200, 500 ms		
Massima frequenza impulsi	100 Hz		
Unità di Volume	FUE380: m^3		
	FUS380: Programmata come da ordine (default: m^3)		
Unità di Portata	FUE380: m^3/h (default)		
	FUS380: Programmata come da ordine (default: m^3/h)		
Codici Allarmi	Assenza misure su Tracce 1, 2 , errore interno, stato batteria, portata eccessiva, frequenza impulsi eccessiva		
Lunghezza cavi	Max. 30 metri tra trasmettitore e sensore (disponibili: 5, 10, 20, 30 m)		
EMC	Emissione EN 61000-6-4		
	Immunità EN 61000-6-2		
Peso	Trasmettitore: 1.5 kg (3 lb)		
Sensori per FUS380 / FUE380			
Design tubo	sensore a 2 tracce con flange e trasduttori integrati calibrato con acqua in fabbrica (ente di accreditamento riconosciuto EA)		
Dimensioni nominali	DN 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 500, 600, 700, 800, 900, 1000, 1200		
Pressioni nominali	PN 16, PN 25, PN 40, EN 1092-1		
Materiali tubo di misura	DN 50 ... 80: Bronzo		
	DN 100 ... 1200: Acciaio al Carbonio EN 1.0345 / p235 GH, verniciato		
Design trasduttori	DN 50 ... 80: Montati sul sensore.		
	DN 100 ... 1200: Versioni integrate saldati al tubo di misura.		
Materiali trasduttori	Acciaio Inox (AISI 316 / 1.4404) / ottone (CuZn36Pb2As)		
Temperatura del liquido	Compatto:	DN 50 ... 1200:	2 ... 120 °C (35.6 ... 248 °F) [1]
	Separato:	DN 50 ... 80:	2 ... 150 °C (35.6 ... 302 °F) [1]
		DN 100 ... 1200:	2 ... 200 °C (35.6 ... 392 °F) [1]

[1] MID: minima temperatura 15°C (59°F)

[2] MID: classe ambientale -10°C...+55°C (14°F....131°F)

*: Le batterie industriali scariche vengono accettate dal produttore o dall'importatore, che ha originalmente venduto le batterie, o dal produttore o importatore, dove la nuova batteria industriale viene acquistata.

9.1.1 Valori di portata per FUS380 e FUE380

I 3 valori di portata Q_i, Q_p e Q_s sono indicati sulle etichette dei FUE380 e FUS380.

Q_i (Q_{min}) è la minima e Q_p (Q_{nom}) è la portata nominale secondo richieste versioni approvate.
Q_s è la massima portata applicabile. La massima portata assoluta (Q_{max}) è il 105% della Q_s.
Il taglio alla bassa portata è il 50 % della Q_i.

Il range dinamico dei FUS380 Q_i:Q_s è fino a 1:400 e per Q_i:Q_p migliore di 1:100.
Il range dinamico dei FUE380 Q_i:Q_p è migliore di 1:100 o 1:50 secondo EN 1434, OIML R75 class 2 e MID.

Al fine di ottenere la miglior risoluzione sull'uscita ad impulsi nel range da Q_{min} a Q_s di circa 100 Hz alla Qs, 2 o 3 valori di portata per ogni DN possono essere selezionati in fase d'ordine.
Quindi la tabella di ordinazione mostra anche la Q_p (Q_n).
Questo valore di portata è tra il valore di Q_i (Q_{min}) e quello di Q_s ed indica la portata tipica o normale secondo le specifiche richieste dall'approvazione.

I valori di portata per i FUS380 ed i FUE380 si possono trovare nelle tabelle seguenti.

[3]: valori di portata secondo EN 1434 e MID
[4]: valori di portata secindo OIML R 75 e MID

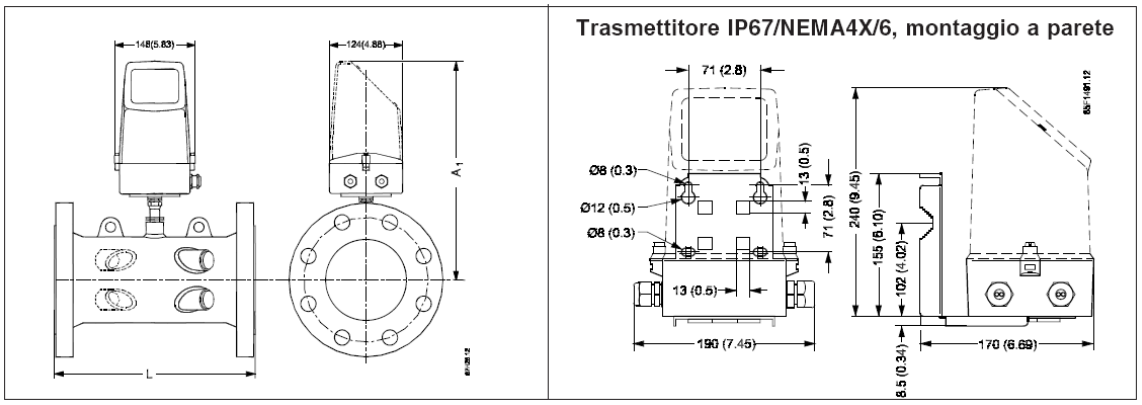
Valori di Portata per i FUS380

DN	Q_s (m^3/h)	Q_{max} (m^3/h) (105% of Q_s)	Q_p (m^3/h)	Q_i (m^3/h) (1:100 of Q_p)	Cut-off (m^3/h) (50% of Q_i)	Cut-off (% of Q_{max})	Peso impulso tipico[2] (l/pulse)
50	15	15.75	15	0.15	0.075	0.48	1
50	45	47.25	15	0.15	0.075	0.16	1
50	45	47.25	30	0.3	0.150	0.32	1
65	25	26.25	25	0.25	0.125	0.48	1
65	72	75.6	25	0.25	0.125	0.17	1
65	72	75.6	50	0.5	0.250	0.33	1
80	40	42	40	0.4	0.200	0.48	2.5
80	120	126	40	0.4	0.200	0.16	2.5
80	120	126	80	0.8	0.400	0.32	2.5
100	60	63	60	0.6	0.300	0.48	2.5
100	180	189	60	0.6	0.300	0.16	2.5
100	240	252	120	1.2	0.600	0.24	2.5
125	10	10.5	100	1	0.500	4.76	2.5
125	280	294	100	1	0.500	0.17	2.5
125	400	420	200	2	1.000	0.24	2.5
150	150	157.5	150	1.5	0.750	0.48	10
150	420	441	150	1.5	0.750	0.17	10
150	560	588	300	3	1.500	0.26	10
200	250	262.5	250	2.5	1.250	0.48	10
200	700	735	250	2.5	1.250	0.17	10
200	900	945	500	5	2.500	0.26	10
250	400	420	400	4	2.000	0.48	10
250	1120	1176	400	4	2.000	0.17	10
250	1400	1470	800	8	4.000	0.27	10
300	560	588	560	5.6	2.800	0.48	50
300	1560	1638	560	5.6	2.800	0.17	50
300	2100	2205	1120	11.2	5.600	0.25	50
350	750	787.5	750	7.5	3.750	0.48	50
350	2100	2205	750	7.5	3.750	0.17	50
350	2800	2940	1500	15	7.500	0.26	50
400	950	997.5	950	9.5	4.750	0.48	50
400	2660	2793	950	9.5	4.750	0.17	50
400	3600	3780	1900	19	9.500	0.25	50
500	1475	1548.75	1475	14.75	7.375	0.48	100
500	4130	4336.5	1475	14.75	7.375	0.17	100
500	5500	5775	2950	29.5	14.750	0.26	100
600	2150	2257.5	2150	21.5	10.750	0.48	100
600	6020	6321	2150	21.5	10.750	0.17	100
600	8000	8400	4300	43	21.500	0.26	100
700	2900	3045	2900	29	14.500	0.48	100
700	8120	8526	2900	29	14.500	0.17	100
700	10800	11340	5800	58	29.000	0.26	100
800	3800	3990	3800	38	19.000	0.48	100
800	10640	11172	3800	38	19.000	0.17	100
800	14200	14910	7600	76	38.000	0.25	100
900	5000	5250	3800	50	25.000	0.48	100
900	14000	14700	5000	50	25.000	0.17	100
900	20000	21000	5000	100	50.000	0.24	100
1000	6000	6300	3800	60	30.000	0.48	100
1000	16800	17640	6000	60	30.000	0.17	100
1000	24000	25200	12000	120	60.000	0.24	100
1200	9000	9450	3800	90	45.000	0.48	100
1200	25200	26460	9000	90	45.000	0.17	100
1200	36000	37800	18000	180	90.000	0.24	100

Valori di Portata per i FUE380

DN	Q_s (m^3/h)	Q_{max} (m^3/h) (105% of Q_s)	Q_p (m^3/h)	Q_i (m^3/h) (1:50 of Q_p)	Q_i (m^3/h) (1:100 of Q_p)	Cut-off (m^3/h) (50% of Q_i)	Cut-off (% of Q_{max})	Peso impulso tipico[2] (l/pulse)
50	30	31.5	15[3]	0.3	0.15	0.075	0.24	1
50	45	47.25	15[3]	0.3	0.15	0.075	0.16	1
50	45	47.25	30[4]	-	0.30	0.150	0.32	1
65	50	52.5	25[3]	0.5	0.25	0.125	0.24	1
65	72	75.6	25[3]	0.5	0.25	0.125	0.17	1
65	72	75.6	50[4]	-	0.50	0.250	0.33	1
80	80	84	40[3]	0.8	0.40	0.200	0.24	2.5
80	120	126	40[3]	0.8	0.40	0.200	0.16	2.5
80	120	126	80[4]	-	0.80	0.400	0.32	2.5
100	120	126	60[3]	1.2	0.60	0.300	0.24	2.5
100	180	189	60[3]	1.2	0.60	0.300	0.16	2.5
100	180	189	120[4]	-	1.20	0.600	0.32	2.5
125	200	210	100[3]	2.0	1.00	0.500	0.24	2.5
125	280	294	100[3]	2.0	1.00	0.500	0.17	2.5
125	280	294	200[4]	-	2.00	1.000	0.34	2.5
150	300	315	150[3]	3.0	1.50	0.750	0.24	10
150	420	441	150[3]	3.0	1.50	0.750	0.17	10
150	420	441	300[4]	-	3.00	1.500	0.34	10
200	500	525	250[3]	5.0	2.50	1.250	0.24	10
200	700	735	250[3]	5.0	2.50	1.250	0.17	10
200	700	735	500[4]	-	5.00	2.500	0.34	10
250	800	840	400[3]	8.0	4.00	2.000	0.24	10
250	1120	1176	400[3]	8.0	4.00	2.000	0.17	10
250	1120	176	800[4]	-	8.00	4.000	0.34	10
300	1120	1176	560[3]	11.2	5.60	2.800	0.24	50
300	1560	1638	560[3]	11.2	5.60	2.800	0.17	50
300	1560	1638	1120[4]	-	11.20	5.600	0.34	50
350	1500	1575	750[3]	15.0	7.50	3.750	0.24	50
350	2100	2205	750[3]	15.0	7.50	3.750	0.17	50
350	2100	2205	1500[4]	-	15.00	7.500	0.34	50
400	1900	1995	950[3]	19.0	9.50	4.750	0.24	50
400	2660	2793	950[3]	19.0	9.50	4.750	0.17	50
400	2660	2793	1900[4]	-	19.00	9.500	0.34	50
500	2950	3097.5	1475[3]	29.5	14.75	7.375	0.24	100
500	4130	4336.5	1475[3]	29.5	14.75	7.375	0.17	100
500	4130	4336.5	2950[4]	-	29.50	14.750	0.34	100
600	4300	4515	2150[3]	43.0	21.50	10.750	0.24	100
600	6020	6321	2150[3]	43.0	21.50	10.750	0.17	100
600	6020	6321	4300[4]	-	43.00	21.500	0.34	100
700	5800	6090	2900[3]	58.0	29.00	14.500	0.24	100
700	8120	8526	2900[3]	58.0	29.00	14.500	0.17	100
700	8120	8526	5800[4]	-	58.00	29.000	0.34	100
800	7600	7980	3800[3]	76.0	38.00	19.000	0.24	100
800	10640	11172	3800[3]	76.0	38.00	19.000	0.17	100
800	10640	11172	7600[4]	-	76.00	38.000	0.34	100
900	10000	10500	5000[3]	100.0	50.00	25.000	0.24	100
900	14000	14700	5000[3]	100.0	50.00	25.000	0.17	100
900	14000	14700	10000[4]	-	100.00	50.000	0.34	100
1000	12000	12600	6000[3]	120.0	60.00	30.000	0.24	100
1000	16800	17640	6000[3]	120.0	60.00	30.000	0.17	100
1000	16800	17640	12000[4]	-	120.00	60.000	0.34	100
1200	18000	18900	9000[3]	180.0	90.00	45.000	0.24	100
1200	25200	26460	9000[3]	180.0	90.00	45.000	0.17	100
1200	25200	26460	18000[4]	-	180.00	90.000	0.34	100

9.2 Disegni dimensionali per i FUS380 e per i FUE380



9.2.1 Dimensioni dei sensori per i FUS380 e per i FUE380

Size	PN 16		PN 25		PN 40				
	L	Weight	L	Weight	L	Weight	Material	A1	Lift
DN	mm	kg	mm	kg	mm	kg		mm	hug
50	-			-	300 +0-2	10	Bronze	350	No
65	-			-	300 +0-2	15	Bronze	360	No
80	-			-	350 +0-2	18	Bronze	370	No
100	350+0-2	15	-	-	350+0-3	18	Steel	375	No
125	350+0-2	18	-	-	350+0-3	24	Steel	380	No
150	500+0-3	28	-	-	500+0-3	34	Steel	390	Yes
200	500+0-3	38	500+0-3	47	500+0-3	55	Steel	414	Yes
250	600+0-3	60	600+0-3	76	600+0-3	91	Steel	440	Yes
300	500+0-3	66	500+0-3	81	-	-	Steel	466	Yes
350	550+0-3	94	550+0-3	121	-	-	Steel	495	Yes
400	600+0-3	124	600+0-3	153	-	-	Steel	507	Yes
500	625+0-3	190	625+0-3	244	-	-	Steel	558	Yes
600	750+0-3	303	750+0-3	365	-	-	Steel	609	Yes
700	875+0-3	361	875+0-3	552	-	-	Steel	660	Yes
800	1000+0-3	494	1000+0-3	770	-	-	Steel	710	Yes
900	1230 +/-6	475	1300 +/-6	835	-		Steel	810	Yes
1000	1300 +/-6	594	1370 +/-6	1078		-	Steel	910	Yes
1200	1360 +/-6	732	-		-		Steel	1110	Yes

Note:
Peso del solo trasmettitore 1,5 kg. (3,3 lb)
Per le dimensioni delle flange vedere la normativa EN 1092-1
" – " significa non disponibile

Size	PN 16		PN 25		PN 40				
	L	Weight	L	Weight	L	Weight	Material	A1	Lift
inch	inch	lb	inch	lb	inch	lb		inch	hug
2	-		-		12 +0-0.08	22	Bronze	14	No
2 1/2	-		-		12 +0-0.08	33	Bronze	14.4	No
3"	-		-		14 +0-0.08	40	Bronze	14.8	No
4	13.77+0-0.08	33	-	-	13.77+0-0.12	40	Steel	15	No
5	13.77+0-0.08	40	-	-	13.77+0-0.12	53	Steel	15.2	No
6	19.68+0-0.12	62	-	-	19.68+0-0.12	75	Steel	15.6	Yes
8	19.68+0-0.12	84	19.68+0-0.12	104	19.68+0-0.12	121	Steel	16.30	Yes
10	23.62+0-0.12	132	23.62+0-0.12	168	23.62+0-0.12	201	Steel	17.32	Yes
12	19.68+0-0.12	146	19.68+0-0.12	179	-	-	Steel	18.35	Yes
14	21.65+0-0.12	207	21.65+0-0.12	267	-	-	Steel	19.8	Yes
16	23.62+0-0.12	273	23.62+0-0.12	337	-	-	Steel	19.96	Yes
20	24.61+0-3	419	24.61+0-3	538	-	-	Steel	21.97	Yes
24	29.53+0-0.12	668	29.53+0-0.12	805	-	-	Steel	23.98	Yes
28	34.45+0-0.12	796	34.45+0-0.12	1217	-	-	Steel	25.98	Yes
32	39.37+0-0.12	1089	39.37+0-0.12	1698	-	-	Steel	27.95	Yes
36	49.2 +/-0.24	1047	52 +/-0.24	1841	-		Steel	32.4	Yes
40	52 +/-0.24	1309	54.8 +/-0.34	2376	-		Steel	36.4	Yes
48	54.4 +/-0.24	1614	-		-		Steel	44.4	Yes

Note:
Peso del solo trasmettitore 1,5 kg. (3,3 lb)
Per le dimensioni delle flange vedere la normativa EN 1092-1
" – " significa non disponibile

Codici di ordinazione 10

10.1 Selezione opzioni e dati di ordinazione FUS380

Flowmeter SITRANS FUS380 standard

Selection and Ordering data			Order No.	Order code
Flowmeter SITRANS FUS380 (standard)			7ME3400 -	
			■■■■0 - ■■A■	■■■
Diameter	**Flow setting [m³/h]**			
	Qp (Qn)[1]	**Qs**		
DN 50 (2")[2]	15	15	1A	
DN 50 (2")[2]	15	45	1C	
DN 50 (2")[2]	30	45	1D	
DN 65 (2½")[2]	25	25	1E	
DN 65 (2½")[2]	25	72	1G	
DN 65 (2½")[2]	50	72	1H	
DN 80 (3")[2]	40	40	1J	
DN 80 (3")[2]	40	120	1L	
DN 80 (3")[2]	80	120	1M	
DN 100 (4")	60	60	1N	
DN 100 (4")	60	180	1Q	
DN 100 (4")	120	240	1R	
DN 125 (5")	100	100	1S	
DN 125 (5")	100	280	1U	
DN 125 (5")	200	400	1V	
DN 150 (6")	150	150	2A	
DN 150 (6")	150	420	2C	
DN 150 (6")	300	560	2D	
DN 200 (8")	250	250	2E	
DN 200 (8")	250	700	2G	
DN 200 (8")	500	900	2H	
DN 250 (10")	400	400	2J	
DN 250 (10")	400	1120	2L	
DN 250 (10")	800	1400	2M	
DN 300 (12")	560	560	2N	
DN 300 (12")	560	1560	2Q	
DN 300 (12")	1120	2100	2R	
DN 350 (14")	750	750	2S	
DN 350 (14")	750	2100	2U	
DN 350 (14")	1500	2800	2V	
DN 400 (16")	950	950	3A	
DN 400 (16")	950	2660	3C	
DN 400 (16")	1900	3600	3D	
DN 500 (20")	1475	1475	3J	
DN 500 (20")	1475	4130	3L	
DN 500 (20")	2950	5500	3M	
DN 600 (24")	2150	2150	3S	
DN 600 (24")	2150	6020	3U	
DN 600 (24")	4300	8000	3V	
DN 700 (28")	2900	2900	4E	
DN 700 (28")	2900	8120	4G	
DN 700 (28")	5800	10 800	4H	
DN 800 (32")	3800	3800	4N	
DN 800 (32")	3800	10 640	4Q	
DN 800 (32")	7600	14 200	4R	
DN 900 (36")	5000	5000	5A	
DN 900 (36")	5000	14 000	5C	
DN 900 (36")	10000	20 000	5D	
DN 1000 (40")	6000	6000	5J	
DN 1000 (40")	6000	16 800	5L	
DN 1000 (40")	12 000	24 000	5M	
DN 1200 (48")	9000	9000	5S	
DN 1200 (48")	9000	25 200	5U	
DN 1200 (48")	18 000	36 000	5V	

This device is shipped with a Quick Start guide and the SITRANS F manual CD containing the complete manual library. Printed Operating Instructions are available for purchase via PMD.

Selection and Ordering data	Order No.	Order code
Flowmeter SITRANS FUS380 (standard)	7ME3400 -	
	■■■■0 - ■■A■	■■■
Flange norm and pressure rating		
System without sensor - only a transmitter FUS080 as spare part - settings as defined with this order no.	A	
EN 1092-1 Flanges		
PN 16 (DN 100 ... DN 1200)	C	
PN 25 (DN 200 ... DN 1000)	D	
PN 40 (DN 50 ... DN 250)[3]	E	
Compact / remote connection		
Compact version, max. 120 °C (248 °F) up to DN 800	0	
Remote version, max. 150/200 °C (302/392 °F)		
5 m (16.4 ft)	2	
10 m (32.8 ft)	3	
20 m (65.6 ft)	4	
30 m (98.4 ft)	5	
Pulse output value setup		
0.1 l/p (option for DN 50 ... DN 65) with 5 ms	1	
1 l/p (typical for DN 50 ... DN 65) with 5 ms	2	
2.5 l/p (typical for DN 80 ... DN 125) with 5 ms	3	
10 l/p (typical for DN 150 ... DN 250) with 5 ms	4	
50 l/p (typical for DN 300 ... DN 400) with 5 ms	5	
100 l/p (typical for DN 500 ... DN 1200) with 5 ms	6	
250 l/pulse	7	
1 m³/pulse	8	
0.25 l/pulse	9	N0A
0.5 l/pulse	9	N0B
5 l/pulse	9	N0C
25 l/pulse	9	N0D
500 l/pulse	9	N0E
2.5 m³/pulse	9	N0F
5 m³/pulse	9	N0G
10 m³/pulse	9	N0H
25 m³/pulse	9	N0J
50 m³/pulse	9	N0K
100 m³/pulse	9	N0L
250 m³/pulse	9	N0M
500 m³/pulse	9	N0N
1000 m³/pulse	9	N0P
Transmitter SITRANS FUS080		
IP67/NEMA 4X/6 115 ... 230 V AC	B	
IP67/NEMA 4X/6 3.6 V battery version, incl. dual battery pack	D	
IP67/NEMA 4X/6 115 ... 230 V AC, including 3.6 V single battery backup	E	
IP67/NEMA 4X/6 3.6 V battery version (no battery pack included)[4]	G	
Pulse width setup		
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 or typical flow. Q_p and Q_s is shown on the system label.
[2] Pipe material bronze brass.
[3] PN 40 standard for DN 50 ... DN 80 die-cast bronze pipes.
[4] 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.

Selection and Ordering data	Order code
Additional information	
Please add „**-Z**" to Order No. and following add-on code(s) with plain text.	
Calibration / certificate FUS380	
Production calibration for DN 50 ... DN 1200 with Q_n as selected in diameter. Calibration protocol: 2 x 3 points, Q_i, 10% Q_p and Q_p (max. 4200 m^3/h).	**Included**
Accredited Siemens ISO/IEC 17025 calibration for DN 50 ... DN 200 with Q_n as selected in diameter. Certificate: 2 x 3 points, Q_i, 10% Q_p and Q_p (max. 250 m^3/h).	**D20**
Accredited Siemens ISO/IEC 17025 calibration for DN 100 ... DN 500 with Q_n as selected in diameter. Certificate: 2 x 3 points, Q_i, 10% Q_p and Q_p (max. 1300 m^3/h).	**D21**
Accredited Siemens ISO/IEC 17025 calibration, DN 300 ... DN 1200 with Q_n as selected in diameter. Certificate: 2 x 3 points, Q_i, 10% Q_p and Q_p (max. 4200 m^3/h).	**D22**
Output B as reverse flow pulses. No calibration/verification.	**E21**
Material certificate	
EN 10204-3.1	**F10**
Tag name plate	
Stainless steel tag name plate, text length depends on font size: 8 mm up to 10 characters, 4 mm up to 20 characters, or 3 mm up to 30 characters (add plain text)	**Y17**
Operating instructions for SITRANS FUS380 flowmeter	Order No.
English	**A5E00730100**
German	**A5E00740611**
Spanish	**A5E00754188**
French	**A5E00754173**

This device is shipped with a Quick Start Guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/sitrans/documentation

For accessories and spare parts see end of following chapter on FUE380.

MLFB Ordering example

Customer requires a flowmeter:

- DN 250, PN 25, compact version (media temperature max. 120 °C (248 °F)), mains power version.
- Material certificate and metal tag name plate.
- Pulse output for for 10 l/pulse and min. 5 ms pulse width.

Ordering:

FUS380: **7ME3400-2LD00-4BA2-Z, F10, Y17**

Please use online Product selector to get latest updates. Product selector link:
www.mlfb-selector.automation.siemens.com

10.2 Selezione opzioni e dati di ordinazione versione approvata FUE380

Flowmeter FUE380 with approval

Selection and Ordering data			Order No. 7ME3410-	Order code
Flowmeter SITRANS FUE380 (type-approved)				
Diameter	**Flow setting [m^3/h] Qp[m^3/h][1]**	**Qs [m^3/h]**		
DN 50 (2")[2]	15[3]	30	1 B	
DN 50 (2")[2]	15[3]	45	1 C	
DN 50 (2")[2]	30[4]	45	1 D	
DN 65 (2½")[2]	25[3]	50	1 F	
DN 65 (2½")[2]	25[3]	72	1 G	
DN 65 (2½")[2]	50[4]	72	1 H	
DN 80 (3")[2]	40[3]	80	1 K	
DN 80 (3")[2]	40[3]	120	1 L	
DN 80 (3")[2]	80[4]	120	1 M	
DN 100 (4")	60[3]	120	1 P	
DN 100 (4")	60[3]	180	1 Q	
DN 100 (4")	120[4]	180	1 R	
DN 125 (5")	100[3]	200	1 T	
DN 125 (5")	100[3]	280	1 U	
DN 125 (5")	200[4]	280	1 V	
DN 150 (6")	150[3]	300	2 B	
DN 150 (6")	150[3]	420	2 C	
DN 150 (6")	300[4]	420	2 D	
DN 200 (8")	250[3]	500	2 F	
DN 200 (8")	250[3]	700	2 G	
DN 200 (8")	500[4]	700	2 H	
DN 250 (10")	400[3]	800	2 K	
DN 250 (10")	400[3]	1120	2 L	
DN 250 (10")	800[4]	1120	2 M	
DN 300 (12")	560[3]	1120	2 P	
DN 300 (12")	560[3]	1560	2 Q	
DN 300 (12")	1120[4]	1560	2 R	
DN 350 (14")	750[3]	1500	2 T	
DN 350 (14")	750[3]	2100	2 U	
DN 350 (14")	1500[4]	2100	2 V	
DN 400 (16")	950[3]	1900	3 B	
DN 400 (16")	950[3]	2660	3 C	
DN 400 (16")	1900[4]	2660	3 D	
DN 500 (20")	1475[3]	2950	3 K	
DN 500 (20")	1475[3]	4130	3 L	
DN 500 (20")	2950[4]	4130	3 M	
DN 600 (24")	2150[3]	4300	3 T	
DN 600 (24")	2150[3]	6020	3 U	
DN 600 (24")	4300[4]	6020	3 V	
DN 700 (28")	2900[3]	5800	4 F	
DN 700 (28")	2900[3]	8120	4 G	
DN 700 (28")	5800[4]	8120	4 H	
DN 800 (32")	3800[3]	7600	4 P	
DN 800 (32")	3800[3]	10 640	4 Q	
DN 800 (32")	7600[4]	10 640	4 R	
DN 900 (36")	5000[3]	10 000	5 B	
DN 900 (36")	5000[3]	14 000	5 C	
DN 900 (36")	10 000[4]	14 000	5 D	
DN 1000 (40")	6000[3]	12 000	5 K	
DN 1000 (40")	6000[3]	16 800	5 L	
DN 1000 (40")	12 000[4]	16 800	5 M	
DN 1200 (48")	9000[3]	18 000	5 T	
DN 1200 (48")	9000[3]	25 200	5 U	
DN 1200 (48")	18 000[4]	25 200	5 V	

This device is shipped with a Quick Start guide and the SITRANS F manual CD containing the complete manual library. Printed Operating Instructions are available for purchase via PMD.

For notes 1) to 8) see next page

Selection and Ordering data	Order No. 7ME3410-	Order code
Flowmeter SITRANS FUE380 (type-approved)		
Flange norm and pressure rating		
System without sensor - only a transmitter		
EN 1092-1		
PN 16 (DN 100 ... DN 1200)	C	
PN 25 (DN 200 ... DN 1000)	D	
PN 40 (DN 50 ... DN 250)[5]	E	
Compact / remote connection		
Compact version, max. 120 °C (248 °F)	0	
Remote version, max. 200 °C (392 °F)		
5 m (16.4 ft)	2	
10 m (32.8 ft)	3	
20 m (65.6 ft)	4	
30 m (98.4 ft)	5	
Approvals / pulse output		
Without approval (neutral) Selectable pulse output (following code can be 1 ... 9)	0	
With approval marks Selectable pulse output (following code can be 1 ... 9)	1	
With approval marks and seal Selectable pulse output (following code can be 1 ... 9)	2	
Without approval (neutral) Preset pulse output for FUE950 energy meter (following code must be 2 ... 6)	3	
With approval marks Preset pulse output for FUE950 energy meter (following code must be 2 ... 6, dimension depending)	4	
With approval marks and seal Preset pulse output for FUE950 energy meter (following code must be 2 ... 6)	5	
Pulse output value setup		
0.1 l/p (option for DN 50 ... DN 65) with 5 ms	1	
1 l/p (typical for DN 50 ... DN 65) with 5 ms	2	
2.5 l/p (typical for DN 80 ... DN 125) with 5 ms	3	
10 l/p (typical for DN 150 ... DN 250) with 5 ms	4	
50 l/p (typical for DN 300 ... DN 400) with 5 ms	5	
100 l/p (typical for DN 500 ... DN 1200) with 5 ms	6	
Optional pulse values		
250 l/pulse	7	
1 m^3/pulse	8	
0.25 l/pulse	9	N0A
0.5 l/pulse	9	N0B
5 l/pulse	9	N0C
25 l/pulse	9	N0D
500 l/pulse	9	N0E
2.5 m^3/pulse	9	N0F
5 m^3/pulse	9	N0G
10 m^3/pulse	9	N0H
25 m^3/pulse	9	N0J
50 m^3/pulse	9	N0K
100 m^3/pulse	9	N0L
250 m^3/pulse	9	N0M
500 m^3/pulse	9	N0N
1000 m^3/pulse	9	N0P

Selection and Ordering data	Order No.	Order code
Flowmeter SITRANS FUE380 (type-approved)	7ME3410-	
Transmitter SITRANS FUE080		
IP67/NEMA 4X/6 115 ... 230 V AC		B
IP67/NEMA 4X/6 3.6 V battery version, incl. dual battery pack		D
IP67/NEMA 4X/6 115 ... 230 V AC, including 3.6 V single battery backup		E
IP67/NEMA 4X/6 3.6 V battery version (no battery pack included)[6]		G
Country / approval type [7]		
Neutral, no approval mark		A
China		C
Denmark[8], EN 1434/OIML R 75		E
Finland[8], EN 1434/OIML R 75		F
Germany[8], EN 1434 (PTB approval, DN 80 ... DN 1200)		G
Russia, EN 1434/OIML R 75		M
Ukraine, EN1434/OIML R 75		P
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
Pulse width setup		
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-selector or product master data base (PMD).

4) OIML R 75 flow values

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) In Europe the MID approval is the standard, please use following selections.

Please also see www.siemens.com/SITRANSFordering for practical examples of ordering.

Selection and Ordering data	Order code
Additional information	
Please add „**-Z**" to Order No. and following add-on code(s) with plain text.	
Calibration / certificate FUE380	
Approval, verification and sealing as defined with the order number. See order code.	
Production calibration for DN 50 ... DN 1200 with Q_n as selected in diameter. Calibration protocol: 2 x 3 points, Q_i, 10% Q_p and Q_p (max. 4200 m^3/h).	**Included**
Accredited Siemens ISO/IEC 17025 calibration for DN 50 ... DN 200 with Q_n as selected in diameter. Certificate: 2 x 3 points, Q_i, 10% Q_p and Q_p (max. 250 m^3/h).	**D20**
Accredited Siemens ISO/IEC 17025 calibration for DN 100 ... DN 500 with Q_n as selected in diameter. Certificate: 2 x 3 points, Q_i, 10% Q_p and Q_p (max. 1300 m^3/h).	**D21**
Accredited Siemens ISO/IEC 17025 calibration, DN 300 ... DN 1200 with Q_n as selected in diameter. Certificate: 2 x 3 points, Q_i, 10% Q_p and Q_p (max. 4200 m^3/h).	**D22**
Output B as reverse flow pulses. No calibration/verification.	**E21**
Material certificate	
EN 10204-3.1	**F10**
Tag name plate	
Stainless steel tag name plate, text length depends on font size: 8 mm up to 10 characters, 4 mm up to 20 characters, or 3 mm up to 30 characters (add plain text)	**Y17**
Operating instructions for SITRANS FUE380 flowmeter	Order No.
English	**A5E00730100**
German	**A5E00740611**
Spanish	**A5E00754188**
French	**A5E00754173**

This device is shipped with a Quick Start Guide and a CD containing further SITRANS F literature.

All literature is also available for free at: http://www.siemens.com/flowdocumentation

MLFB Ordering example

Customer requires a flowmeter for custody transfer:

- DN 250, PN 25, compact version (media temperature max. 120 °C), battery version.
- Type-approved according to MID (EN 1434), verified and sealed, type label in German.
- Material certificate and metal tag name plate.
- Pulse output for energymeter SITRANS FUE950.

Ordering:

FUE380: **7ME3410-2LD05-4DS2-Z, F10, Y17**

Example of appropriate energy meter (see the following chapter):

Energy meter type: **7ME3470-3AA36-0DD2-Z, E02**

Please use online Product selector to get latest updates.
Product selector link:
www.siemens.com/flowdocumentation

10.3 Accessori e ricambi per FUS380 e FUE380

Flowmeter FUS380 and FUE380

Accessories and spare parts for flowmeter FUS380 and FUE380

SITRANS FUS380/FUE380 - Spare parts

Description	Order No.	
Dual battery pack (6 year lifetime) 33 Ah [1]	A5E02679676	
Single battery back-up to main supply 13.5 Ah. Attention on note 1)	A5E02679923	
Battery cover for transmitter FUS080	A5E00694468	
PG 13.5 set (2 pcs.) for main cable/pulse cable	FDK:083G0228	
PG 13.5 set (2 pcs.) for dual coaxial cable (6 mm)	A5E00694500	
SITRANS FUS/FUE380 wall mounting kit for remote transmitter mounting, including connection plate (DN 50 ... DN 1200/2" ... 48")	A5E00694509	
SITRANS FUS/FUE380 terminal box for compact transmitter mounting, including connection plate, (bronze sensors only, DN 50 ... DN 80/2" ... 3")	A5E01208138	
SITRANS FUS/FUE380 terminal box for compact transmitter mounting, including connection plate, (steel sensors only, DN 100 ... DN 1200/4" ... 48")	A5E00694660	
Sun lid for FUS080 (Frame and lid)	A5E02328485	
Brace (holder) for optical IrDA eye	A5E00695277	
IrDA infrared interface adapter with USB for data acquisition with 1.2 m (3.9 ft) cable	FDK:087L4163	
RS 232 add-on module, point to point communication interface with Modbus RTU protocol	FDK:087L4212	
RS 485 add-on module, multidrop communication interface with Modbus RTU protocol	FDK:087L4213	

Description	Order No.	
5 m (16.4 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") remote mounting	A5E01208092	
10 m (32.8 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") remote mounting	A5E01208114	
20 m (65.6 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") remote mounting	A5E01208117	
30 m (98.4 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") remote mounting	A5E01208121	
1 m (3.28 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") for compact version	A5E01208126	
5 m (16.4 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") remote mounting	A5E00695476	
10 m (32.8 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") remote mounting	A5E00695479	
20 m (65.6 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") remote mounting	A5E00695480	
30 m (98.4 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") remote mounting	A5E00695483	
1 m (3.28 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") for compact version	A5E00695486	
Process Device Manager		
SIMATIC PDM Single Point V6.0 For operation and parameterization of one field device, communication using PROFIBUS DP/PA or HART modem, incl. 1 TAG **Cannot** be expanded by further functions or TAG option/power-pack 5 languages (German, English, French, Spanish, Italian) executes with Windows 2000 Professional or Windows XP Professional	6ES7658-3HX06-0YA5	

[1] 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.

Downloads for DEVICE description FUE380
http://support.automation.siemens.com/WW/view/en/17320235

Appendice 11

11.1 Dichiarazione di conformità CE

SIEMENS

EC Declaration of Conformity
EG-Konformitätserklärung

CE

No. A5E00733799A - DS03

Manufacturer: *Hersteller:*	Siemens Flow Instruments A/S
Address: *Anschrift:*	Nordborgvej 81, 6430 Nordborg, DK-Denmark
Product description: *Produktbezeichnung*	Flow transmitter / Durchfluss meßumformer SITRANS FUS080, FUE080, FUE380, FUS380 Type / Typ 7ME340 (standard) and 7ME341 (type approved)

The product described above in the form as delivered is in conformity with the provisions of the following European Directives:
Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:

2004/108/EC EMC	Directive of the European Parliament and of the Council on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC. *Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit und zur Aufhebung der Richtlinie 89/336/EWG.*
2006/95/EC LVD	Directive of the European Parliament and of the Council on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits. *Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.*
97/23/EC PED	Directive of the European Parliament and of the Council on the approximation of the laws of the Member States concerning pressure equipment. *Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Druckgeräte*
2004/22/EC MID	Directive of the European Parliament and the Council on the approximation of the laws of the Member States concerning equipment intended for Legal Metrological Measuring systems. *Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten für Geräte zur bestimmungsgemäßen Verwendung in Legale Metrologische Messsysteme*

Annex A is integral part of this declaration.
Anhang A ist integraler Bestandteil dieser Erklärung.
This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail.
Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie nach §443 BGB.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

Nordborg, 28.08.2007

Siemens Flow Instruments A/S

28/8-07		28-8-2007	
J. Parkum, R&D Manager		O.Kirk-Andersen, Quality Manager	
Name, function *Name, Funktion*	signatur *Unterschrift*	Name, function *Name, Funktion*	signatur *Unterschrift*

Annex A to the EC Declaration of Conformity
Anhang A zur EG-Konformitätserklärung

No. A5E00733799A - DS03

Product description:
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SITRANS FUS080, FUE080, FUE380, FUS380
Type / Typ 7ME340 (standard) and 7ME341 (type approved)

Conformity to the Directives indicated on page 1 is assured through the application of the following standards (depending on versions).
Die Konformität mit den auf Blatt 1 angeführten Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen (variantenabhängig):

Directives
Richtlinien

Directive *Richtlinie*	Standard / Reference number *Norm / Referenznummer*	Edition *Ausgabe datum*	7ME340 7ME341 g-hjklm-npqr	7ME340 7ME341 g-hjklm-npqr	7ME345 g-hjklm-npqr	7ME345 g-hjklm-npqr
2004/108/EC	EN 61326-1 *	2006	p = B;E	p = D;G	l = 3;4	l = 1;2
2004/108/EC	EN 61326-2-5	2006	p = B;E	p = D;G	l = 3;4	l = 1;2
2006/95/EC	EN 61010-1	2001	p = B;E		l = 3;4	
97/23EEC	Annex III, Module H	1999	p = B;E	p = D;G		
2004/22/EC	EN1434	2006	q =R;S;T;U	q =R;S;T;U		

* all environments included

Certificates
Zertifikate

Certificates *Zertifikate*	7ME341 g-hjklm-npqr	7ME341 g-hjklm-npqr		
FORCE-Dantest: DK-0200-MI004-005	q =R;S;T;U	q =R;S;T;U		

Inspection / Surveillance:
Kontrolle / Überwachung:

Directive *Richtlinie*		Notified Body Product Quality Assurance *Benannte Stelle Qualitätssicherung Produktion*	No.:
2004/22/EC	MID	FORCE-Dantest CERT	0200
97/23/EC	PED	FORCE-Dantest CERT	0200

Per maggiori informazioni

www.siemens.com/flow

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Ultrasonic flowmeters

SITRANS FUS/FUE380

Operating Instructions • 07/2010

SITRANS F

SIEMENS

Introduction 1

1.1 Preface

These instructions contain all the information required to commission and use the SITRANS F US ultrasonic flowmeter types FUS380 and the type-approved flowmeter FUE380 for heat metering systems.

These instructions are intended to assist personnel performing mechanical installation, electrical connection and commissioning of the device, as well as service and maintenance engineers.

General safety instructions 2

2.1 Safety notes

For safety reasons it is important that the following points, especially those marked with a warning sign, are read and understood before the system is installed:

- Installation, connection, commissioning and service must be carried out by personnel who are qualified and authorized to do so.
- It is very important for any person working with the equipment to read and understand the instructions and directions provided in this manual and follow instructions and directions before using the equipment.
- Only personnel authorized and trained by the owner of the equipment may operate the equipment.
- Installation personnel must ensure that the measuring system is correctly connected in accordance with the connection diagram.
- For applications involving high working pressures or media that can be dangerous to people, surroundings, equipment or other in the event of pipe fracture, Siemens recommends taking precautions such as special placement, shielding or installation of a safety guard or safety valve prior to installation of the sensor.
- Repair and service may be performed by approved Siemens Flow Instruments personnel only.

2.2 Manufacturer's design and safety statement

- Responsibility for the choice of flowmeter pipe material as regards abrasion and corrosion resistance lies with the purchaser. The effect of any change in process medium during operation of the meter should be taken into account. Incorrect selection of flowmeter pipe material could lead to failure of the flowmeter.
- Stresses and loading caused by earthquakes, traffic, high winds and fire damage are **not** taken into account during flowmeter design.

- Do **not** install the flowmeter such that it acts as a focus for pipeline stresses. External loading is **not** taken into account during flowmeter design.

- Please be aware of the risk of installing the sensor in a highly vibrating environment. Parts may shake loose and the complete system must be monitored in that case.

- Flanges and joints as well as related pressure/temperature (p/t) classification has been described in EN 1092-1. See ferrite steel group 1E1: table 15.

- During operation do **not** exceed the pressure and/or temperature ratings indicated on the data label or in these operating instructions.

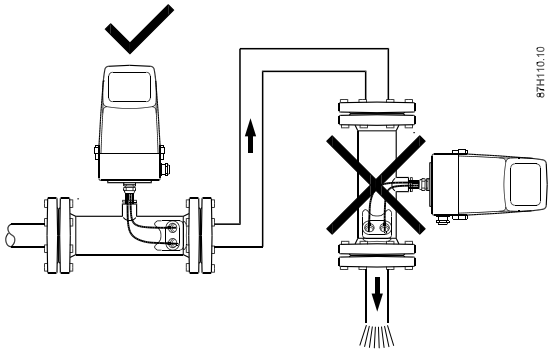
- It is recommended that all installations include an appropriate safety valve and adequate means for draining.

- Under the „Pressure Equipment Directive“ (PED), this product is a presssure accessory and not approved for use as a safety accessory, as defined by the PED.

- **DANGER**
  Do not unscrew the transducers during pipe operation (especially for DN 50 ... DN 80).

Battery operation:

- For all battery versions the transmitter of the flowmeter should be mounted vertically! Otherwise the lifetime of the battery will be reduced. Therefore, the battery compact versions should not be installed in vertical pipelines - see figure.



- When battery-operated, SITRANS FUS380 and FUE380 are not covered by the „Low Voltage Directive“ (LVD). Hence, an installation can be considered in conformance with LVD, only when the SITRANS FUS380 / FUE380 is connected to equipment conforming to LVD.

- Lithium batteries are primary power sources with high energy content. They are designed to meet the highest possible safety standard. They may, however, present a potential hazard if they are abused electrically or mechanically. This is in most circumstances associated with the generation of excessive heat, where increased internal pressure may cause the cell to rupture.

  Thus the following basic precautions should be observed when handling and using lithium batteries:
  - Do not short-circuit, recharge, overcharge or connect with false polarity.
  - Do not expose to temperature beyond the specified temperature range or incinerate the battery.
  - Do not crush, puncture or open cells or disassemble battery packs.
  - Do not weld or solder to the body of the battery.
  - Do not expose contents to water.

- Lithium batteries are regulated under United Nations Model Regulations on Transport of Dangerous goods, UN document ST/SGAC.10-1,12th revised edition, 2001. UN no. 3091 class 9 covers lithium batteries packed with or inside the equipment. UN no. 3090 class 9 covers transportation of batteries on their own.
  Thus the following basic precautions should be taken when transporting lithium batteries:
  - Transport only in special packaging with special labels and transportation documents.
  - Exercise caution in handling, transportation and packing in order to prevent short circuiting of the batteries.
  - The gross mass of the package is limited according to the type of transportation. In general, a gross mass below 5 kg is acceptable for all forms of transportation.

- Remove battery from transmitter before returning the flowmeter to Siemens for service or warranty claim.

Description 3

3.1 Product description

The 2-track ultrasonic flowmeter SITRANS FUS380 and type-approved SITRANS FUE380 come as battery or mains-powered and are designed to measure water flow in district heating plants, local stations, substations, chiller plants and other general water applications including treated water and irrigation applications.

The SITRANS F US flowmeter is available in the following variants:

- FUS380: A universal flowmeter with selectable settings.
- FUE380: A type-approved flowmeter dedicated to measure flow in a heating system. SITRANS FUE380 is approved according to heat meter standards EN 1434 class 2, OIML R 75 class 2 and MID. FUE380 may be marked „neutral“ or have a country-specific approval label, depending on selection of flowmeter setup when ordering.

Both flowmeter types SITRANS FUS380 and FUE380 are available in either compact or remote versions and electrical wiring and operation are identical for both types. The maximum permissible distance between sensor and transmitter is 30 meters.

The flowmeter comes as a transmitter part FUS080 and a sensor part FUS300. These two parts can be only ordered together as a flowmeter system type FUS380 or FUE380. For FUS380 a spare part transmitter can be ordered separately (see FI01 catalogue). For FUE380 this is not allowed according to the approvals. For both systems the sensor part cannot be ordered without a transmitter.

In FUS380, parameters and pulse output are preset from factory and protected via software lock. A software tool is required to change parameters.

In FUE380 - metrological parameters and pulse output are preset from factory and protected via hardware lock and sealings to avoid manipulation.

No settings on installation are required as all parameters are set from factory (plug and play).

Maximum temperature (compact version) for DN 50 ... 1200 sensors 2 ... 120 °C (35,6 ... 248 °F) - MID versions min. 15°C (59°F).

Maximum temperature (remote version) DN 100 ... 1200 steel sensors 2 ... 200 °C (35,6 ... 392 °F) - MID versions min. 15°C (59°F)
and for DN 50 ... 80 bronze sensors 2 ... 150 °C (35,6 ... 302 °F)
- MID versions min. 15°C (59°F).

Accessories for correct pipeline assembly and use of flange gaskets are not the responsibility of Siemens Flow Instruments A/S.

3.2 Service

In order to locate and diagnose failures, a software tool for diagnosis and re-programming of outputs is available. Failure information is available on the display. Failures are stored in memory, and can be accessed via infra-red communication port.

(Software for diagnosis and setting of parameters is available from Siemens Automation and Drives, Process Instrumentation and Analytics - see FUS380 accessories in product catalog FI01).

Installation 4

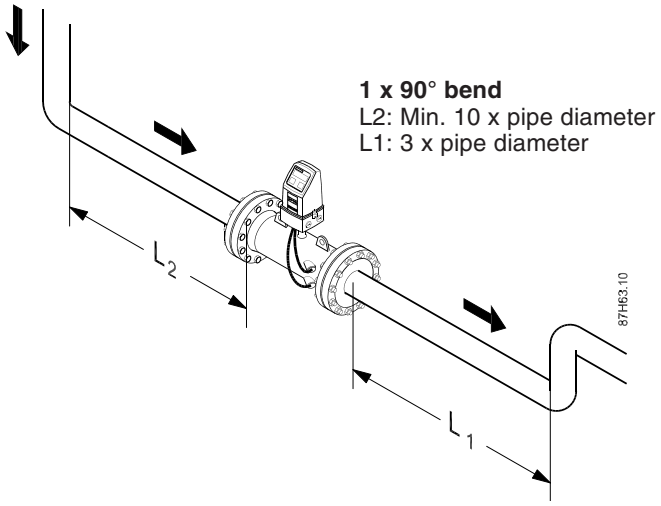
4.1 Installation of sensor compact/remote versions

Requirement for straight inlet before flowmeter
In order to maximise performance it is necessary to have straight inlet and outlet flow conditions before and after flowmeter.
Furthermore, a minimum distance between flowmeter and pumps and valves must be respected.
It is also important to centre flowmeter in relation to flanges and gaskets.
Make sure that flowmeter is positioned as low as possible to prevent air from being trapped in flowmeter at transducers.

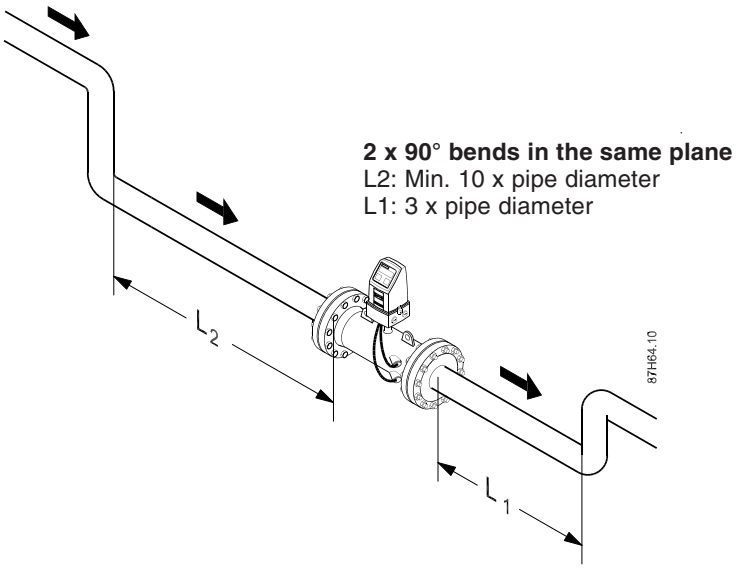
Find a position on the pipeline where inlet pipe to flowmeter has a straight length as specified below.

Note
For MID-approved FUE380 systems the following inlet pipe is recommend:
L2 for sizes ≥ DN 80: 1.5 m

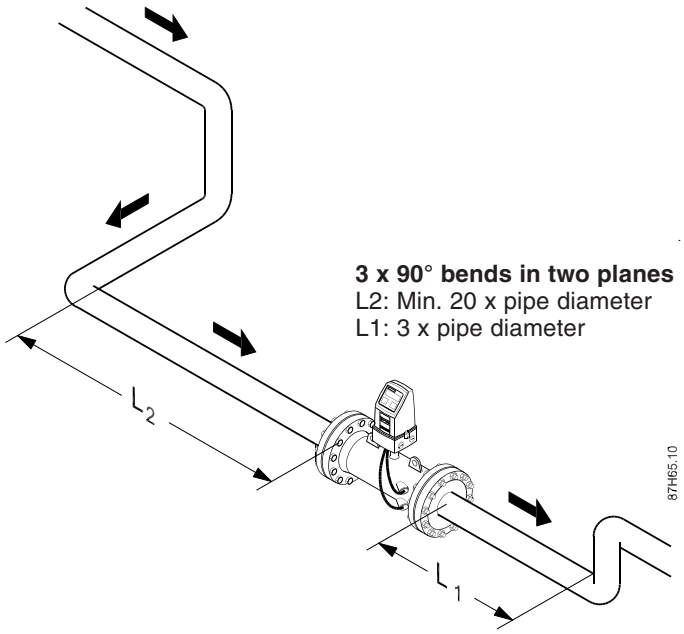
Single bend



Dual bend

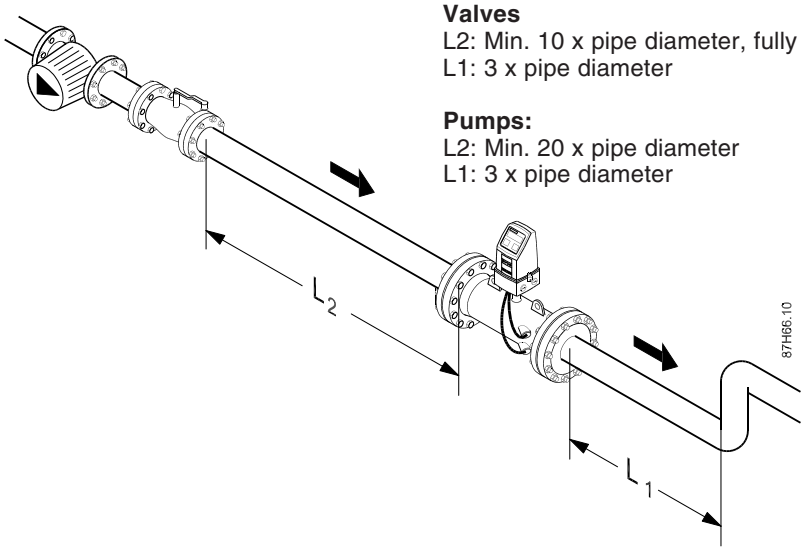


Triple bend



3 x 90° bends in two planes
L2: Min. 20 x pipe diameter
L1: 3 x pipe diameter

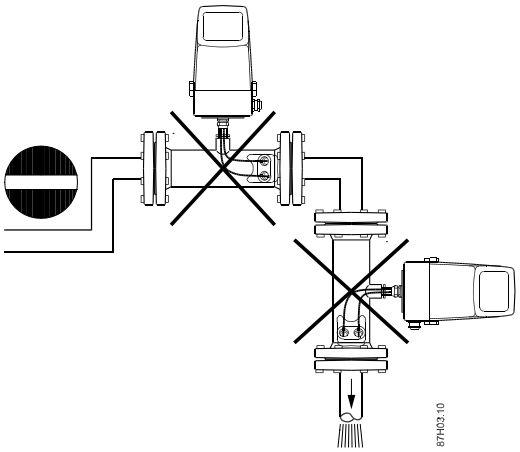
Valves and pumps



Valves
L2: Min. 10 x pipe diameter, fully open valve
L1: 3 x pipe diameter

Pumps:
L2: Min. 20 x pipe diameter
L1: 3 x pipe diameter

Precautions



Avoid installation at the highest point in the system because air bubbles will be trapped in flowmeter.

Avoid installation at a point where there is a free outlet after flowmeter.

Flowmeter pipe section may be installed in either a horizontal or vertical position.

Note
To obtain **maximum** battery lifetime with the Lithium Thionyl Chloride battery pack, Siemens recommends installing flowmeter transmitter in an upright position.

4.2 Installation of transmitter compact/remote versions

4.2.1 General information

The transmitter is packed separately - ready for plug-in into base part.

SITRANS FUS380 and FUE380 may be mains-powered or battery-powered. Determine flowmeter power source type by reading label or via product code.

Important:
A transmitter ordered as only battery-powered **cannot** be updated with additional mains power, because no mains power supply circuits are installed in this transmitter type.

On compact versions, all transducer cables are pre-mounted from factory.

Mounting of output pulse cables is identical for compact and remote versions.

4.2.2 Insulation

Both versions can be insulated.
Siemens always recommends insulation of sensor in the **compact version** to prevent heat transfer to transmitter. This recommendation applies to both battery-powered and mains-powered versions.

4.2.3 Mains-powered version

The mains-powered version can always be retrofitted with a battery pack.
In the event of power failure battery will take over power supply of unit.
Battery is **not** of a rechargeable type. Battery must be replaced every 6 years.

At delivery, transmitter may be pre-mounted with a battery pack. Alternatively, battery pack must be installed before use. (See section „Battery-powered version“).

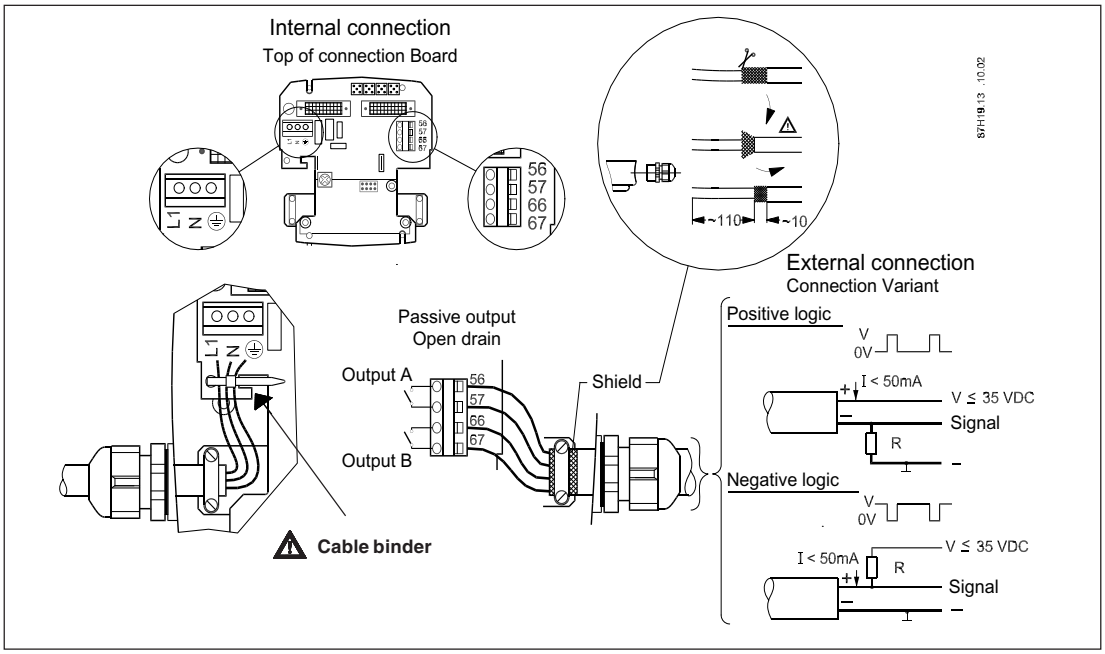
Note
Male battery plug is **not** connected to plug female socket connection upon delivery. This connection must be made to enable back-up battery power supply. Please refer to section „Battery-powered version“ for further details.

4.2.4 Wiring diagram for mains power supply, pulse output

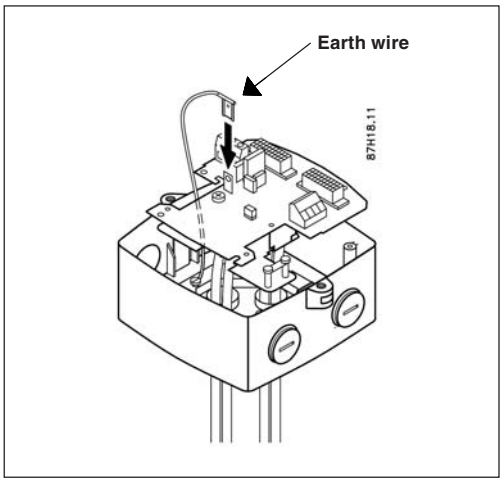
Always disconnect mains supply before removing transmitter top part (mains-powered units only).

Important
Cable binder **must** be fastened to printed circuit board according to drawing.

Top of connection board
Mains-powered units: Terminal L1, N, terminal ⏚
Voltage: 87 V AC…250 V AC



⚠ **Potential hazards grounding**



In mains-powered units protective earth wire must be connected to PE ⏚ on printed circuit board using connector.

Do **not** touch rear of printed circuit board.

4.2.5 Mains-powered units with back-up battery

If SITRANS FUS380 and FUE380 are mains-powered, a battery can be inserted as back-up power supply to ensure continuous operation in the event of power failure. Depending on duration and numbers of mains power failures, battery has a lifetime of minimum 6 years (one battery). (Average: one mains power failure per day (duration 1 hour) for min. 6 years).

Check that mains power supply symbol appears in display when installation is complete. This symbol indicates that installation is correct. If mains power supply connection is not established correctly, flowmeter will operate on battery power only. Battery life will be significantly shorter if batteries are used continuously as opposed to only occasionally in a back-up function.

4.3 Battery-powered version

SITRANS FUS380 and FUE380 are prepared for up to 2 batteries of 3.6 V.
When two batteries are installed in battery pack it will have an operation life of minimum 6 years under normal temperature conditions (please refer to FI01 catalog).

Unscrew battery cover to insert the battery pack.

Connect small plug-in between the two main connectors. Ensure that wire is inserted into small channel leading from plug to battery.

Note
Siemens recommends replacing battery every 5 - 6 years.
Every time a battery is fitted and connected, the unit runs a start up routine, see section: „Operation“.

Changing battery does not influence accumulated value. Accumulated values can **only** be reset using PC software. According to the approval requirements for FUE380 versions this is only possible with unsealed transmitter and hardware lock.

Fig. 1

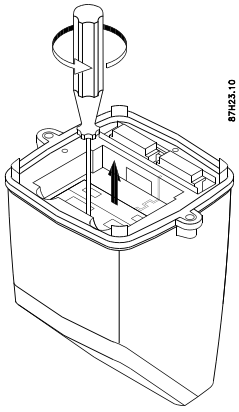


Fig. 2

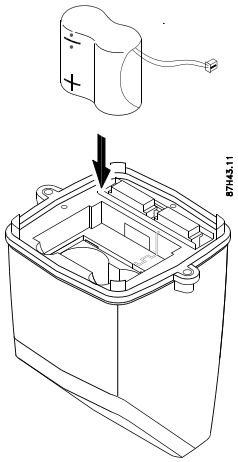


Fig. 3

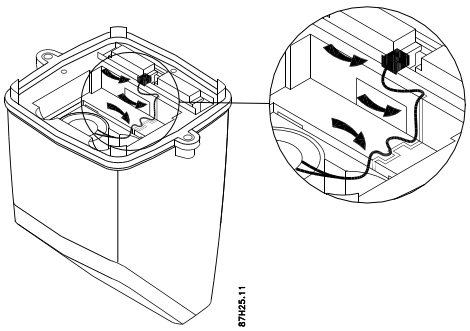
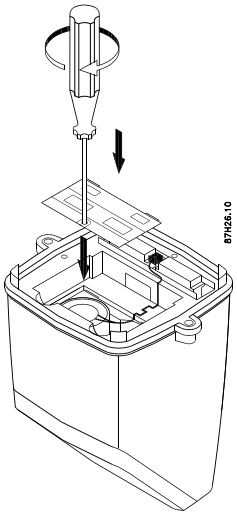


Fig. 4



4.4 Installation of transmitter, remote version

4.4.1 Installation of wall/pipe bracket

1. Loosen the 2 screws on each side of unit and remove transmitter.

2. Mount wall bracket in an appropriate place taking coaxial cable length into con-sideration, and allowing adequate space for cable inlets underneath and on both sides.

Fig. 1

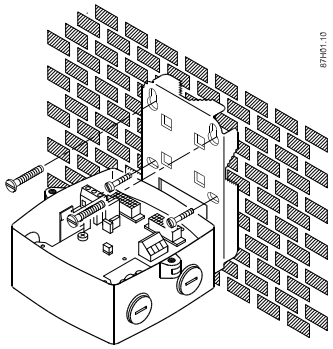


Fig. 2

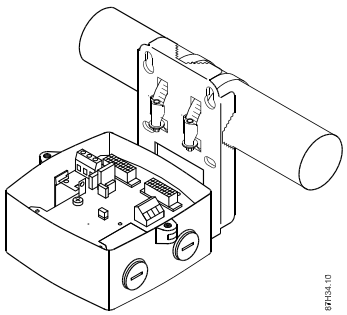
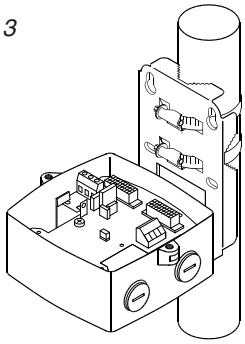


Fig. 3

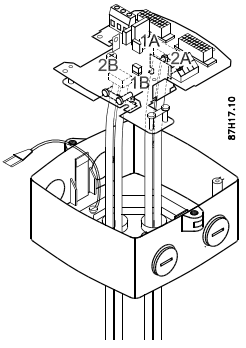


4.4.2 Connection of transducer cables

SITRANS FUS380 and FUE380 is supplied with 4 separate cables.
Cables can be used on all transducers (cables are not paired with a specific transducer).

Snap out connection plate and loosen grounding wire.

Cables are manufactured with crimp on cable ends.
Smoothly push cables one by one from underneath the base through glands and adjust all four cable ends approximately 100 mm from upper frame of base (see figure).

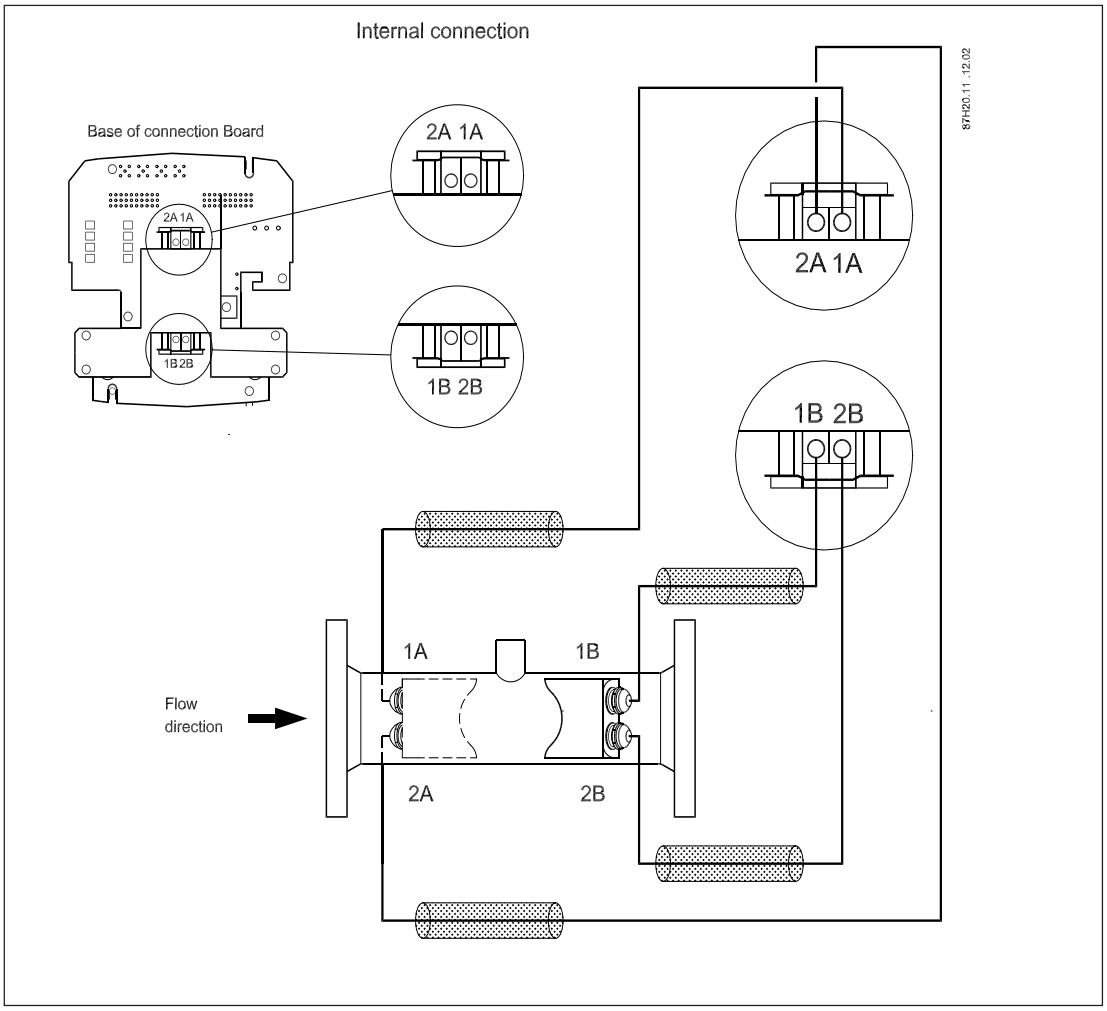


4.4.3 Transducer connection scheme

Cables 1A and 1B first track, 1A upstream, 1B downstream.
Cables 2A and 2B second track, 2A upstream, 2B downstream.

Note
Do **not** change length of the four cables, as this will influence accuracy of unit.

4.4.4 Wiring diagram, base of connection board



Electrical connection 5

5.1 Pulse output A and B setting

Install pulse cable through glands, **before pushing** printed circuit board back into place in base part.
For compact version, install pulse cables and power supply cable through gland without removing printed circuit board.

For FUS380 and FUE380, pulse output A and B settings depend on the ordering: Normal factory settings, see the following table. Settings for FUS380 can be read out and changed using a PC, SIMATIC PDM (Process device manager) software and IrDA optical interface (see accessories for FUS380 in FI01 catalogue). The approved FUE380 settings cannot be changed according approval requirements, but it can be read out per PDM.

	FUS380	**FUE380**
Output A	Forward or reverse pulses Preset: Forward	Forward or reverse pulses Preset: Forward
Output B	Forward or reverse pulses, alarm, call-up Preset: Alarm	Forward or reverse pulses, alarm, call-up Preset: Alarm
Pulse value A & B (depending on DN value)	0.1 l/p; 0.25 l/p; 0.5 l/p; 1 l/p; 2.5 l/p; 10 l/p; 25 l/p; 50 l/p; 100 l/p; 250 l/p; 500 l/p; 1 m^3/p; 2.5 m^3/p; 5 m^3/p; 10 m^3/p; 25 m^3/p; 50 m^3/p; 100 m^3/p; 250 m^3/p; 500 m^3/p; 1000 m^3/p	Preset: See scheme for FUE380 or the following settings for SITRANS FUE950 energy calculator.
Pulse width	5; 10; 20; 50; 100; 200; 500 ms	Preset: 5 ms

5.1.1 FUE380 preset pulse output A settings dedicated to energy calculator type SITRANS FUE950

Output A, terminals 56/57:
Pulse rate can be seen on transmitter side label and **must correspond** to pulse setting of energy calculator type.
SITRANS FUS380 settings depend on the ordering (see table above). The following table shows the recommended FUS380/FUE380 factory settings (pulse width 5 ms), adapted to heat calculator FUE950.

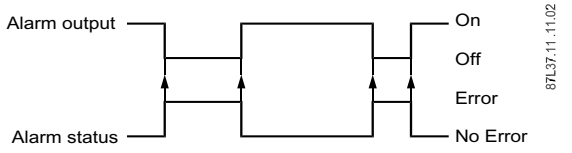
DN	**Pulse setting (liter/pulse)**
50	1
65	1
80	2.5
100	2.5
125	2.5
150	10
200	10
250	10
300	50
350	50
400	50
500	100
600	100
700	100
800	100
900	100
1000	100
1200	100

5.1.2 FUS380 and FUE380 preset output B settings

Output B, terminals 66/67:
SITRANS FUS380 and FUE380

Preset to alarm indication - see Fig. 1:
Example: If track 1 is not measuring, a „triangle“ alert appears on display. Failure code „F1“ appears in display menu 4, and relay output terminals switch to „off“.

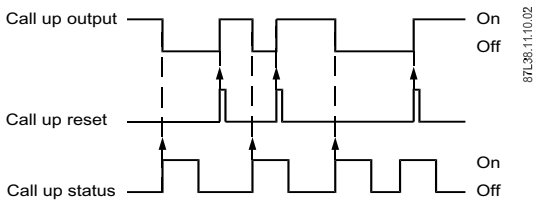
Fig. 1



Call up indication - see Fig. 2:
The call up output is active until manually reset by use of PDM* program. Call-up function is also activated when alarm output function is activated.

* SIMATIC PDM - Process Device Manager, see accessories / spare parts in catalogue FI01.

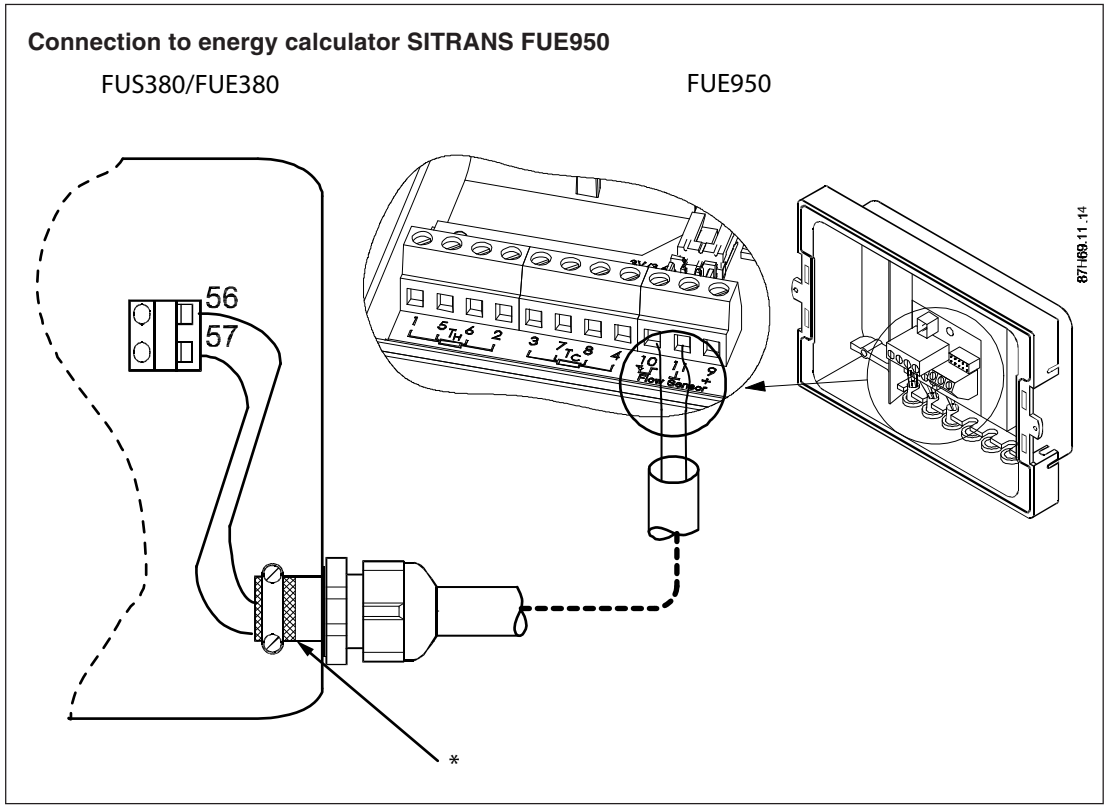
Fig. 2



A third possibility is to adjust output B as volume pulse output, e.g. reward pulses. Typically with the same settings as the forward pulses (see table above).

5.1.3 Wiring diagram for connection to energy calculator type SITRANS FUE950

Connection to energy calculator SITRANS FUE950



*: It is recommended to use shielded cable.
Max. cable length between energy calculator SITRANS FUE950 and SITRANS FUE380 = 10 meter.

Important
Pulse output from flowmeter **must** correspond to pulse input setting on energy calculator (see section 5.1.1).

Operation 6

6.1 Flowmeter operation via push button and display

The transmitter control panel is designed with a single push button and a 8-digit display for optimal dialog - see Fig 3.

After fitting new batteries, reset internal power calculation counter to correctly indicate power capacity.

When new batteries are installed, the flowmeter start-up routine begins. First, display shows active software version. After ten seconds the message „reset.bat“ will appear. Press push button within six seconds to reset internal power calculation counter. The message „accept“ will appear. When push button is pressed again within six seconds, internal battery counter will be reset, and battery indicator will show „full“ - see Fig. 1

Push button
Activate push button to toggle to next index and related information - see Fig.2.

Fig. 1

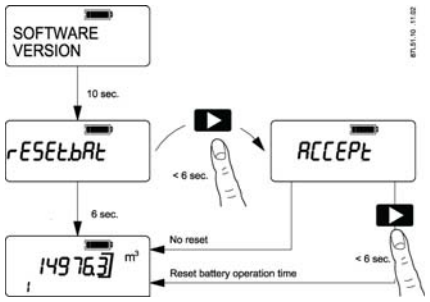


Fig. 2

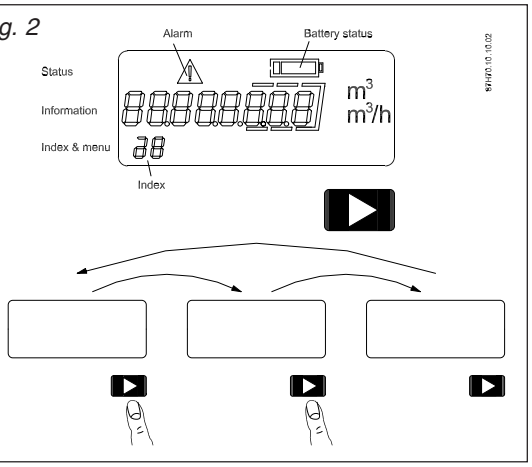
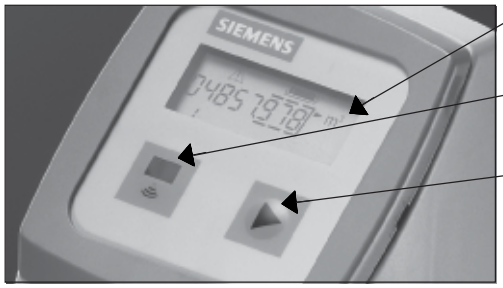


Fig. 3



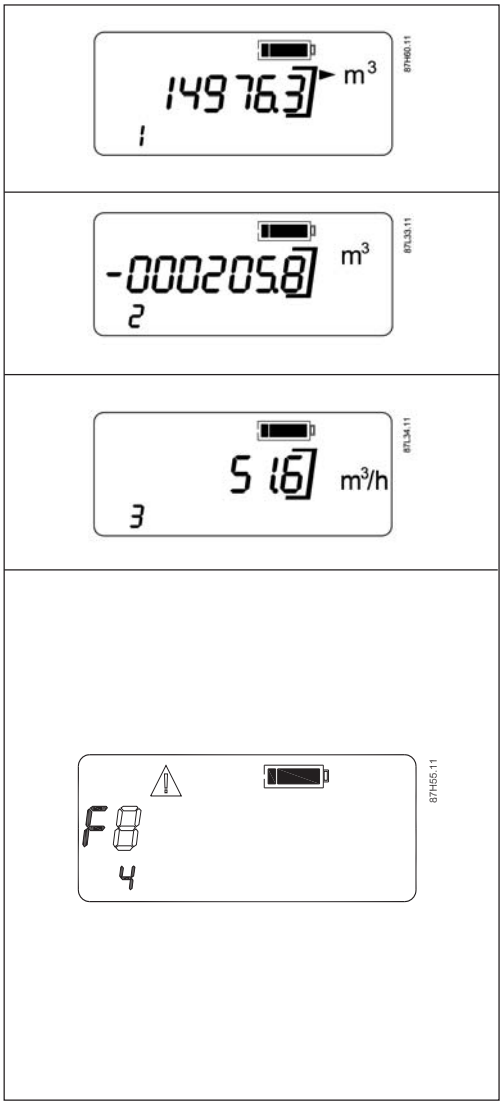
8-digit display

Infra-red communication port

Single push button

6.2 Operator menu

Menu 1
Flow volume totalizer 1.
Battery icon shows full.



Menu 2 (FUS380 only)
Flow volume totalizer 2 (factory configured for reverse flow).
Negative values indicate reverse flow calculation.

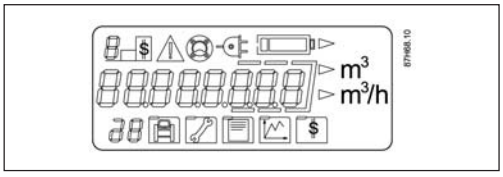
Menu 3
Actual flow rate.
Negative values indicate reverse flow.

Menu 4
Failure information.
Each code indicates a specific failure.

F	No failure (normal indication)
F1	Track 1 not measuring
F2	Track 2 not measuring
F3	Internal failure
F4	Internal failure
F5	Battery low or power supply failure
F6	Flow overload
F7	Pulse freq. overload output A
F8	Pulse freq. overload output B
F9	Datalogger warning/alarm

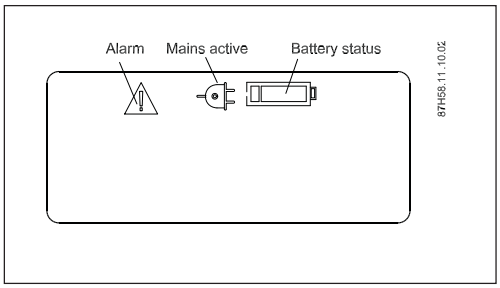
Failure code combinations:
F12 is the equivalent of F1 and F2 simultaneously: track 1 and track 2 are not measuring.

Display test
Check of all segments.
Display toggles between all segments on/off.

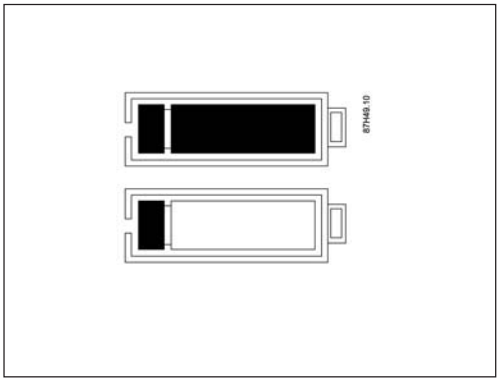


6.3 Information symbols

Status information symbols show actual status of important flowmeter elements.
The warning/alarm symbol appears when ultrasonic sensors do not measure or when a failure occurs according to menu 4. The warning/alarm symbol disappears when problem is rectified.
Mains power supply symbol appears when mains power is connected to transmitter.



There are two symbols for battery charge status. „Battery full“ symbol indicates battery charge is above the warning level (6-year hour counter).
„Battery low“ symbol indicates that battery charge is below warning level and battery should be replaced. „Battery low“ symbol indicates only that battery charge is below a pre-set level, not that charge is zero. Flow measurement continues uninterrupted when battery low symbol appears, until battery is completely drained.



Troubleshooting 7

7.1 Alarm code

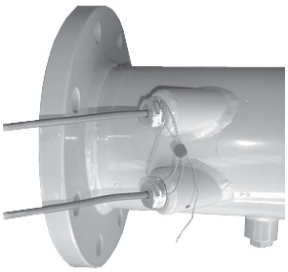
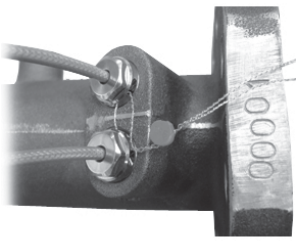
Alarm code	Failure	Remedy
Blank display	Battery plug not connected, or battery empty, mains power interrupted	Check flowmeter version. Battery version not able to run on mains power Wrong battery version: Replace battery pack
F1	Track 1 (upper track) not measuring	No water in upper part of pipe and/or cables or transducer 1A or 1B defect
F2	Track 2 (lower track) not measuring	No water in lower part of pipe and/or cables or tranducers for 2A or 2B defect
F3	Internal software failure	Contact supplier
F4	Internal software failure	Contact supplier
F5	Battery charge below preset limitation	Replace battery pack and reset status symbol
	Power supply failure	Check mains power supply
F6	Flow exceeds preset flow rate in unit (max. speed 10 m/s)	Water flow in pipe too fast
F7	Pulse output A overflow	Pulse output exceeds 100 Hz
F8	Pulse output B overflow	Pulse output exceeds 100 Hz
F9	Datalogger warning/alarm	Datalogger warning monitors whether actual consumption on totalizer 1 is on end of log interval or above or below the limit settings. This is only a warning and has no influence on the flowmetering. Check data logger values and consumption limit (via PDM, "value no. 602")

Example:
Failure information in display F12. This indicates a combination of failure codes F1 and F2.

Diagnosis:
No water in pipe, or track 1 and 2 cables defect, or transducers defect.

Sealing 8

8.1 User sealing of SITRANS FUE380

Transmittter (new sealing)		Sensor DN 100...1200	
Transmittter (older sealing)		Sensor DN 50...80	

8.2 Verification sealing of SITRANS FUE380

	
Transmitter Verfication sealing under frame	Verfication sealing in bottom of transmitter

Technical data 9

9.1 Technical data SITRANS FUS380 and FUE380

Description	Specification		
Transmitter FUS080			
Enclosure	IP67 according to EN 60529 and DIN 40050 (NEMA 4X/6)		
Ambient temperature	0 °C …60 °C (32 °F…. 140 °F) [2]		
Storage temperature	–35 °C…85 °C (–40 °F…185 °F)		
Installation	Cable max. 5, 10, 20, 30 m (16.4, 33, 65, 90 ft) from sensor		
Mechanical vibration	2 g, 1…800 Hz sinusoidal in all directions to IEC 68-2-6		
Design	Fibre glass reinforced polyamide in light-gray color		
Power supply	• Battery: replaceable 3.6 V LiSOCl (Lithium Thionyl Chloride) battery pack 32 Ah		
	• Mains: 87 … 265 V AC (50 … 60 Hz)		
Battery change interval	6 years at 60 °C (140 °F) operation		
Display	LCD, 8 digits, additional 2 digits and symbols for status information		
Push button	One push button for toggling between display information		
Measuring function	0.5 Hz battery mode or 20 Hz mains-powered		
Communication	IrDA on display panel (MODBUS RTU protocol); separate add-on serial interface moduls RS232 or RS485 (also MODBUS RTU protocol)		
Digital output	Two passive, galvanically isolated open drain-mos outputs A and B		
	Max. ±35 V, 50 mA		
Pulse output A	Preset to pulse output for forward flow		
Pulse output B	Preset to alarm for present failure		
Pulse width	5, 10, 20, 50, 100, 200, 500 ms		
Max. pulse frequency	100 Hz		
Volume units	FUE380: m^3		
	FUS380: Preset at ordering (default: m^3)		
Flow units	FUE380: m^3/h (default)		
	FUS380: Preset at ordering (default: m^3/h)		
Alarm codes	Track 1, 2 measuring, internal failure, battery low, flow overload, pulse output frequency overload		
Cable length	Max. 30 meter between transmitter and pipe (factory sets: 5, 10, 20, 30 m)		
EMC	Emission EN 61000-6-4		
	Immunity EN 61000-6-2		
Weight	Transmitter: 1.5 kg (3 lb)		
Sensor for FUS380 / FUE380			
Pipe design	2-track sensor with flanges and integrated transducers wet-calibrated from factory		
Nominal size	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		
Pipe material	DN 50 ... 80:	Bronze	
	DN 100 ... 1200:	Carbon Steel EN 1.0345 / p235 GH, painted in light-gray	
Transducer design	DN 50 ... 80:	Mounted in sensor.	
	DN 100 ... 1200:	Integrated version welded onto pipe.	
Transducer material	Stainless steel (AISI 316 / 1.4404) / brass (CuZn36Pb2As)		
Media temperature	Compact:	DN 50 ... 1200:	2 ... 120 °C (35.6 ... 248 °F) [1]
	Remote:	DN 50 ... 80:	2 ... 150 °C (35.6 ... 302 °F) [1]
		DN 100 ... 1200:	2 ... 200 °C (35.6 ... 392 °F) [1]

[1] MID: minimum temperature 15°C (59°F)

[2] MID: environment class -10°C...+55°C (14°F....131°F)

*: Waste industrial batteries are accepted back by the producer or importer, who has originally marketed the battery, or by the producer or importer, where the new industrial battery is purchased.

9.1.1 Pipe dimensions for FUS380 and FUE380

The 3 flow values Q_i, Q_p and Q_s are shown on system label of FUE380 and FUS380.

Q_i (Q_{min}) means minimum and Q_p (Q_{nom}) nominal flow rate according to approval requirements. Q_s is the highest operatable flow rate. Maximum flow rate (Q_{max}) is 105% of Q_s. Low-flow cut-off is 50 % of Q_i.

FUS380 dynamic range Q_i:Q_s is up to 1:400 and for Q_i:Q_p better than 1:100.
FUE380 dynamic range Q_i:Q_p is better than 1:100 or 1:50 according to EN 1434, OIML R75 class 2 and MID.

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 normal or typical flow according to approval requirements.

Flow values for FUS380 and FUE380 can be found in tables on the following pages.

[3]: EN 1434 and MID flow values
[4]: OIML R 75 and MID flow values

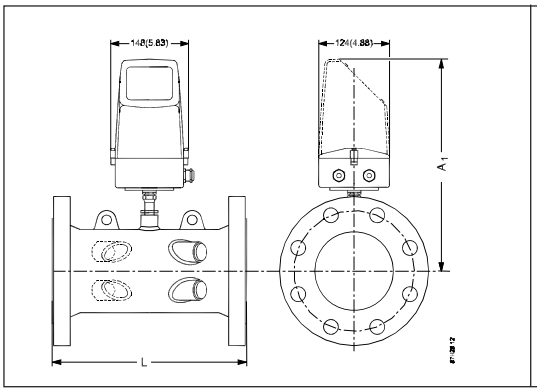
Flow values FUS380

DN	Q_s (m^3/h)	Q_{max} (m^3/h) (105% of Q_s)	Q_p (m^3/h)	Q_i (m^3/h) (1:100 of Q_p)	Cut-off (m^3/h) (50% of Q_i)	Cut-off (% of Q_{max})	Typical pulse value[2] (l/pulse)
50	15	15.75	15	0.15	0.075	0.48	1
50	45	47.25	15	0.15	0.075	0.16	1
50	45	47.25	30	0.3	0.150	0.32	1
65	25	26.25	25	0.25	0.125	0.48	1
65	72	75.6	25	0.25	0.125	0.17	1
65	72	75.6	50	0.5	0.250	0.33	1
80	40	42	40	0.4	0.200	0.48	2.5
80	120	126	40	0.4	0.200	0.16	2.5
80	120	126	80	0.8	0.400	0.32	2.5
100	60	63	60	0.6	0.300	0.48	2.5
100	180	189	60	0.6	0.300	0.16	2.5
100	240	252	120	1.2	0.600	0.24	2.5
125	10	10.5	100	1	0.500	4.76	2.5
125	280	294	100	1	0.500	0.17	2.5
125	400	420	200	2	1.000	0.24	2.5
150	150	157.5	150	1.5	0.750	0.48	10
150	420	441	150	1.5	0.750	0.17	10
150	560	588	300	3	1.500	0.26	10
200	250	262.5	250	2.5	1.250	0.48	10
200	700	735	250	2.5	1.250	0.17	10
200	900	945	500	5	2.500	0.26	10
250	400	420	400	4	2.000	0.48	10
250	1120	1176	400	4	2.000	0.17	10
250	1400	1470	800	8	4.000	0.27	10
300	560	588	560	5.6	2.800	0.48	50
300	1560	1638	560	5.6	2.800	0.17	50
300	2100	2205	1120	11.2	5.600	0.25	50
350	750	787.5	750	7.5	3.750	0.48	50
350	2100	2205	750	7.5	3.750	0.17	50
350	2800	2940	1500	15	7.500	0.26	50
400	950	997.5	950	9.5	4.750	0.48	50
400	2660	2793	950	9.5	4.750	0.17	50
400	3600	3780	1900	19	9.500	0.25	50
500	1475	1548.75	1475	14.75	7.375	0.48	100
500	4130	4336.5	1475	14.75	7.375	0.17	100
500	5500	5775	2950	29.5	14.750	0.26	100
600	2150	2257.5	2150	21.5	10.750	0.48	100
600	6020	6321	2150	21.5	10.750	0.17	100
600	8000	8400	4300	43	21.500	0.26	100
700	2900	3045	2900	29	14.500	0.48	100
700	8120	8526	2900	29	14.500	0.17	100
700	10800	11340	5800	58	29.000	0.26	100
800	3800	3990	3800	38	19.000	0.48	100
800	10640	11172	3800	38	19.000	0.17	100
800	14200	14910	7600	76	38.000	0.25	100
900	5000	5250	3800	50	25.000	0.48	100
900	14000	14700	5000	50	25.000	0.17	100
900	20000	21000	5000	100	50.000	0.24	100
1000	6000	6300	3800	60	30.000	0.48	100
1000	16800	17640	6000	60	30.000	0.17	100
1000	24000	25200	12000	120	60.000	0.24	100
1200	9000	9450	3800	90	45.000	0.48	100
1200	25200	26460	9000	90	45.000	0.17	100
1200	36000	37800	18000	180	90.000	0.24	100

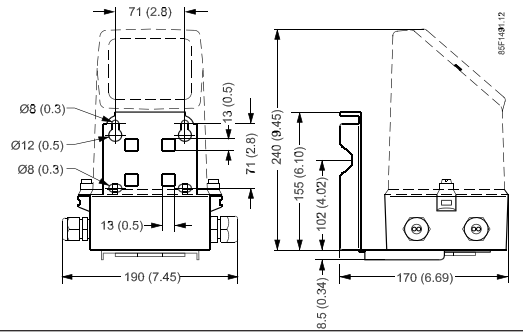
Flow values FUE380

DN	Q_s (m^3/h)	Q_{max} (m^3/h) (105% of Q_s)	Q_p (m^3/h)	Q_i (m^3/h) (1:50 of Q_p)	Q_i (m^3/h) (1:100 of Q_p)	Cut-off (m^3/h) (50% of Q_i)	Cut-off (% of Q_{max})	Typical pulse value[2] (l/pulse)
50	30	31.5	15[3]	0.3	0.15	0.075	0.24	1
50	45	47.25	15[3]	0.3	0.15	0.075	0.16	1
50	45	47.25	30[4]	-	0.30	0.150	0.32	1
65	50	52.5	25[3]	0.5	0.25	0.125	0.24	1
65	72	75.6	25[3]	0.5	0.25	0.125	0.17	1
65	72	75.6	50[4]	-	0.50	0.250	0.33	1
80	80	84	40[3]	0.8	0.40	0.200	0.24	2.5
80	120	126	40[3]	0.8	0.40	0.200	0.16	2.5
80	120	126	80[4]	-	0.80	0.400	0.32	2.5
100	120	126	60[3]	1.2	0.60	0.300	0.24	2.5
100	180	189	60[3]	1.2	0.60	0.300	0.16	2.5
100	180	189	120[4]	-	1.20	0.600	0.32	2.5
125	200	210	100[3]	2.0	1.00	0.500	0.24	2.5
125	280	294	100[3]	2.0	1.00	0.500	0.17	2.5
125	280	294	200[4]	-	2.00	1.000	0.34	2.5
150	300	315	150[3]	3.0	1.50	0.750	0.24	10
150	420	441	150[3]	3.0	1.50	0.750	0.17	10
150	420	441	300[4]	-	3.00	1.500	0.34	10
200	500	525	250[3]	5.0	2.50	1.250	0.24	10
200	700	735	250[3]	5.0	2.50	1.250	0.17	10
200	700	735	500[4]	-	5.00	2.500	0.34	10
250	800	840	400[3]	8.0	4.00	2.000	0.24	10
250	1120	1176	400[3]	8.0	4.00	2.000	0.17	10
250	1120	176	800[4]	-	8.00	4.000	0.34	10
300	1120	1176	560[3]	11.2	5.60	2.800	0.24	50
300	1560	1638	560[3]	11.2	5.60	2.800	0.17	50
300	1560	1638	1120[4]	-	11.20	5.600	0.34	50
350	1500	1575	750[3]	15.0	7.50	3.750	0.24	50
350	2100	2205	750[3]	15.0	7.50	3.750	0.17	50
350	2100	2205	1500[4]	-	15.00	7.500	0.34	50
400	1900	1995	950[3]	19.0	9.50	4.750	0.24	50
400	2660	2793	950[3]	19.0	9.50	4.750	0.17	50
400	2660	2793	1900[4]	-	19.00	9.500	0.34	50
500	2950	3097.5	1475[3]	29.5	14.75	7.375	0.24	100
500	4130	4336.5	1475[3]	29.5	14.75	7.375	0.17	100
500	4130	4336.5	2950[4]	-	29.50	14.750	0.34	100
600	4300	4515	2150[3]	43.0	21.50	10.750	0.24	100
600	6020	6321	2150[3]	43.0	21.50	10.750	0.17	100
600	6020	6321	4300[4]	-	43.00	21.500	0.34	100
700	5800	6090	2900[3]	58.0	29.00	14.500	0.24	100
700	8120	8526	2900[3]	58.0	29.00	14.500	0.17	100
700	8120	8526	5800[4]	-	58.00	29.000	0.34	100
800	7600	7980	3800[3]	76.0	38.00	19.000	0.24	100
800	10640	11172	3800[3]	76.0	38.00	19.000	0.17	100
800	10640	11172	7600[4]	-	76.00	38.000	0.34	100
900	10000	10500	5000[3]	100.0	50.00	25.000	0.24	100
900	14000	14700	5000[3]	100.0	50.00	25.000	0.17	100
900	14000	14700	10000[4]	-	100.00	50.000	0.34	100
1000	12000	12600	6000[3]	120.0	60.00	30.000	0.24	100
1000	16800	17640	6000[3]	120.0	60.00	30.000	0.17	100
1000	16800	17640	12000[4]	-	120.00	60.000	0.34	100
1200	18000	18900	9000[3]	180.0	90.00	45.000	0.24	100
1200	25200	26460	9000[3]	180.0	90.00	45.000	0.17	100
1200	25200	26460	18000[4]	-	180.00	90.000	0.34	100

9.2 Dimensional drawings for FUS380 and FUE380



Transmitter IP67/NEMA 4X/6, wall mounting



9.2.1 Pipe dimensions for FUS380 and FUE380

Size	PN 16		PN 25		PN 40				
	L	Weight	L	Weight	L	Weight	Material	A1	Lift
DN	mm	kg	mm	kg	mm	kg		mm	hug
50	-			-	300 +0-2	10	Bronze	350	No
65	-			-	300 +0-2	15	Bronze	360	No
80	-			-	350 +0-2	18	Bronze	370	No
100	350+0-2	15	-	-	350+0-3	18	Steel	375	No
125	350+0-2	18	-	-	350+0-3	24	Steel	380	No
150	500+0-3	28	-	-	500+0-3	34	Steel	390	Yes
200	500+0-3	38	500+0-3	47	500+0-3	55	Steel	414	Yes
250	600+0-3	60	600+0-3	76	600+0-3	91	Steel	440	Yes
300	500+0-3	66	500+0-3	81	-	-	Steel	466	Yes
350	550+0-3	94	550+0-3	121	-	-	Steel	495	Yes
400	600+0-3	124	600+0-3	153	-	-	Steel	507	Yes
500	625+0-3	190	625+0-3	244	-	-	Steel	558	Yes
600	750+0-3	303	750+0-3	365	-	-	Steel	609	Yes
700	875+0-3	361	875+0-3	552	-	-	Steel	660	Yes
800	1000+0-3	494	1000+0-3	770	-	-	Steel	710	Yes
900	1230 +/-6	475	1300 +/-6	835	-		Steel	810	Yes
1000	1300 +/-6	594	1370 +/-6	1078		-	Steel	910	Yes
1200	1360 +/-6	732	-		-		Steel	1110	Yes

Notes:

- Weight for transmitter/electronics 1.5 kg (3.3 lb).
- For flange values - see norm EN 1092-1.
- - means not available.

Size	PN 16		PN 25		PN 40				
	L	Weight	L	Weight	L	Weight	Material	A1	Lift
inch	inch	lb	inch	lb	inch	lb		inch	hug
2	-		-		12 +0-0.08	22	Bronze	14	No
2 1/2	-		-		12 +0-0.08	33	Bronze	14.4	No
3"	-		-		14 +0-0.08	40	Bronze	14.8	No
4	13.77+0-0.08	33	-	-	13.77+0-0.12	40	Steel	15	No
5	13.77+0-0.08	40	-	-	13.77+0-0.12	53	Steel	15.2	No
6	19.68+0-0.12	62	-	-	19.68+0-0.12	75	Steel	15.6	Yes
8	19.68+0-0.12	84	19.68+0-0.12	104	19.68+0-0.12	121	Steel	16.30	Yes
10	23.62+0-0.12	132	23.62+0-0.12	168	23.62+0-0.12	201	Steel	17.32	Yes
12	19.68+0-0.12	146	19.68+0-0.12	179	-	-	Steel	18.35	Yes
14	21.65+0-0.12	207	21.65+0-0.12	267	-	-	Steel	19.8	Yes
16	23.62+0-0.12	273	23.62+0-0.12	337	-	-	Steel	19.96	Yes
20	24.61+0-3	419	24.61+0-3	538	-	-	Steel	21.97	Yes
24	29.53+0-0.12	668	29.53+0-0.12	805	-	-	Steel	23.98	Yes
28	34.45+0-0.12	796	34.45+0-0.12	1217	-	-	Steel	25.98	Yes
32	39.37+0-0.12	1089	39.37+0-0.12	1698	-	-	Steel	27.95	Yes
36	49.2 +/-0.24	1047	52 +/-0.24	1841	-		Steel	32.4	Yes
40	52 +/-0.24	1309	54.8 +/-0.34	2376	-		Steel	36.4	Yes
48	54.4 +/-0.24	1614	-		-		Steel	44.4	Yes

Notes:

- Weight for transmitter/electronics 1.5 kg (3.3 lb).
- For flange values - see norm EN 1092-1.
- - means not available.

Ordering 10

10.1 FUS380 selection and ordering data

Flowmeter SITRANS FUS380 (standard)			Order-No. 7ME 3 4 0 0 -	Order code
			□□□□0-□□A	□□□
Diameter	**Flow setting Qp[4] [m³/h]**	**Qs [m³/h]**		
DN 50 / 2"[1]	15	15	**1 A**	
DN 50 / 2"[1]	15	45	**1 C**	
DN 50 / 2"[1]	30	45	**1 D**	
DN 65 / 2½"[1]	25	25	**1 E**	
DN 65 / 2½"[1]	25	75	**1 G**	
DN 65 / 2½"[1]	50	72	**1 H**	
DN 80 / 3"[1]	40	40	**1 J**	
DN 80 / 3"[1]	40	120	**1 L**	
DN 80 / 3"[1]	40	120	**1 M**	
DN 100 / 4"	60	60	**1 N**	
DN 100 / 4"	60	180	**1 Q**	
DN 100 / 4"	120	240	**1 R**	
DN 125 / 5"	100	100	**1 S**	
DN 125 / 5"	100	280	**1 U**	
DN 125 / 5"	200	400	**1 V**	
DN 150 / 6"	150	150	**2 A**	
DN 150 / 6"	150	420	**2 C**	
DN 150 / 6"	300	560	**2 D**	
DN 200 / 8"	250	250	**2 E**	
DN 200 / 8"	250	700	**2 G**	
DN 200 / 8"	500	900	**2 H**	
DN 250 / 10"	400	400	**2 J**	
DN 250 / 10"	400	1120	**2 L**	
DN 250 / 10"	800	1400	**2 M**	
DN 300 / 12"	560	560	**2 N**	
DN 300 / 12"	560	1560	**2 Q**	
DN 300 / 12"	1120	2100	**2 R**	
DN 350 / 14"	750	750	**2 S**	
DN 350 / 14"	750	2100	**2 U**	
DN 350 / 14"	1500	2800	**2 V**	
DN 400 / 16"	950	950	**3 A**	
DN 400 / 16"	950	2660	**3 C**	
DN 400 / 16"	1900	3600	**3 D**	
DN 500 / 20"	1475	1475	**3 J**	
DN 500 / 20"	1475	4130	**3 L**	
DN 500 / 20"	2950	5500	**3 M**	
DN 600 / 24"	2150	2150	**3 S**	
DN 600 / 24"	2150	6020	**3 U**	
DN 600 / 24"	4300	8000	**3 V**	
DN 700 / 28"	2900	2900	**4 E**	
DN 700 / 28"	2900	8120	**4 G**	
DN 700 / 28"	5800	10800	**4 H**	
DN 800 / 32"	3800	3800	**4 N**	
DN 800 / 32"	3800	10640	**4 Q**	
DN 800 / 32"	7600	14200	**4 R**	
DN 900 / 36"	5000	5000	**5 A**	
DN 900 / 36"	5000	14000	**5 C**	
DN 900 / 36"	10000	20000	**5 D**	
DN 1000 / 40"	6000	6000	**5 J**	
DN 1000 / 40"	6000	16800	**5 L**	
DN 1000 / 40"	12000	24000	**5 M**	
DN 1200 / 48"	9000	9000	**5 S**	
DN 1200 / 48"	9000	25200	**5 U**	
DN 1200 / 48"	18000	36000	**5 V**	

Flowmeter SITRANS FUS380 (standard)	Order-No. 7ME 3 4 0 0 -	Order code
	□□□□0-□□A	□□□
Flange norm and pressure rating		
System without sensor - only a transmitter FUS080 as spare part - settings as defined by order number.	**A**	
EN 1092-1 Flanges		
PN 16 (DN 100 ... 1200)	**C**	
PN 25 (DN 200 ... 1000)	**D**	
PN 40 (DN 50 ... 250)[2]	**E**	
Compact / remote connection		
Compact version, max. 120 °C (248 °F) up to DN 800	**0**	
Remote version, max. 150/200 °C (302/392 °F)		
5 m (16.4 ft)	**2**	
10 m (32.8 ft)	**3**	
20 m (65.6 ft)	**4**	
30 m (98.4 ft)	**5**	
Pulse output value setup		
0.1 l/pulse (option for DN 50...DN 65)	**1**	
1 l/pulse (typical for DN 50...DN 65)	**2**	
2.5 l/pulse (typical for DN 80...DN 125)	**3**	
10 l/pulse (typical for DN 150...DN 250)	**4**	
50 l/pulse (typical for DN 300...DN 400)	**5**	
100 l/pulse (typical for DN 500...DN 1200)	**6**	
250 l/pulse	**7**	
1 m³/pulse	**8**	
0.25 l/pulse	**9**	**N0A**
0.5 l/pulse	**9**	**N0B**
5 l/pulse	**9**	**N0C**
25 l/pulse	**9**	**N0D**
500 l/pulse	**9**	**N0E**
2.5 m³/pulse	**9**	**N0F**
5 m³/pulse	**9**	**N0G**
10 m³/pulse	**9**	**N0H**
25 m³/pulse	**9**	**N0J**
50 m³/pulse	**9**	**N0K**
100 m³/pulse	**9**	**N0L**
250 m³/pulse	**9**	**N0M**
500 m³/pulse	**9**	**N0N**
1000 m³/pulse	**9**	**N0P**
Transmitter SITRANS FUS080		
IP67/NEMA 4X/6 115...230 V AC	**B**	
IP67/NEMA 4X/6 3.6 V battery version incl. dual battery pack	**D**	
IP67/NEMA 4X/6 115...230 V AC, including 3.6 V single battery back up	**E**	
IP67/NEMA 4X/6 3.6 V battery version (no battery pack included)[3]	**G**	
Pulse width setup		
5 ms (standard)	**2**	
10 ms	**3**	
20 ms	**4**	
50 ms	**5**	
100 ms	**6**	
200 ms	**7**	
500 ms	**8**	

Additional information	Order code
Please add „-Z“ to order No. and following add-on code(s) with plain text	
Accredited Siemens calibration FUS380	
Production calibration for DN 50 ... DN 1200 with Qn as selected in diameter Calibration protocol: 2 x 3 points, Qi, 10% Qp and Qp (max. 4200 m^3/h).	**Included**
Accredited Siemens ISO/IEC 17025 calibration for DN50 ... 200 with Qn as selected in diameter. Certificate: 2 x 3 points, Qi, 10% Qp and Qp (max. 250 m^3/h)..	**D20**
Accredited Siemens ISO/IEC 17025 calibration for DN100 ... 500 with Qn as selected in diameter. Certificate: 2 x 3 points, Qi, 10% Qp and Qp (max. 1300 m^3/h).	**D21**
Accredited Siemens ISO/IEC 17025 calibration for DN300 ... 1200 with Qn as selected in diameter. Certificate: 2 x 3 points, Qi, 10% Qp and Qp (max. 4200 m^3/h).	**D22**
Output B as reverse flow pulses. No calibration/verification	**E21**
Material certificate EN 10204-3.1	**F10**
Tag name plate Stainless steel tag with 12 mm characters, max. 15 characters (add plain text)	**Y17**

For accessories and spare parts see end of following chapter to FUE380.

MLFB Ordering example

Customer requires a flowmeter:
DN 250, PN 25, compact version (media temperature max. 120 °C), mains power version.
Material certificate and metal tag name plate
Pulse output for 10 l/pulse and min. 5 ms puls width.

Ordering:

FUS380: 7ME3400-2LD00-4BA2-Z, F10,Y17

1) Pipe material is bronze
2) PN 40 standard for DN 50...80 bronze pipes
3) 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.
4) Qp (Qn) is normal or typical flow. Qp and Qs are shown on system label.

10.2 FUE380 (type approved) selection and ordering data

Flowmeter SITRANS FUE380 (type approved)			Order-No. 7ME 3 4 1 0 -	Order code
Diameter	**Flow setting Qp[6] [m³/h]**	**Qs [m³/h]**		
DN 50 / 2"[1]	15[2]	30	**1 B**	
DN 50 / 2"[1]	15[2]	45	**1 C**	
DN 50 / 2"[1]	30[3]	45	**1 D**	
DN 65 / 2½"[1]	25[2]	50	**1 F**	
DN 65 / 2½"[1]	25[2]	72	**1 G**	
DN 65 / 2½"[1]	50[3]	72	**1 H**	
DN 80 / 3"[1]	40[2]	80	**1 K**	
DN 80 / 3"[1]	40[2]	120	**1 L**	
DN 80 / 3"[1]	80[3]	120	**1 M**	
DN 100 / 4"	60[2]	120	**1 P**	
DN 100 / 4"	60[2]	180	**1 Q**	
DN 100 / 4"	120[3]	180	**1 R**	
DN 125 / 5"	100[2]	200	**1 T**	
DN 125 / 5"	100[2]	280	**1 U**	
DN 125 / 5"	200[3]	280	**1 V**	
DN 150 / 6"	150[2]	300	**2 B**	
DN 150 / 6"	150[2]	420	**2 C**	
DN 150 / 6"	300[3]	420	**2 D**	
DN 200 / 8"	250[2]	500	**2 F**	
DN 200 / 8"	250[2]	700	**2 G**	
DN 200 / 8"	500[3]	700	**2 H**	
DN 250 / 10"	400[2]	800	**2 K**	
DN 250 / 10"	400[2]	1120	**2 L**	
DN 250 / 10"	800[3]	1120	**2 M**	
DN 300 / 12"	560[2]	1120	**2 P**	
DN 300 / 12"	560[2]	1560	**2 Q**	
DN 300 / 12"	1120[3]	1560	**2 R**	
DN 350 / 14"	750[2]	1500	**2 T**	
DN 350 / 14"	750[2]	2100	**2 U**	
DN 350 / 14"	1500[3]	2100	**2 V**	
DN 400 / 16"	950[2]	1900	**3 B**	
DN 400 / 16"	950[2]	2660	**3 C**	
DN 400 / 16"	1900[3]	2660	**3 D**	
DN 500 / 20"	1475[2]	2950	**3 K**	
DN 500 / 20"	1475[2]	4130	**3 L**	
DN 500 / 20"	2950[3]	4130	**3 M**	
DN 600 / 24"	2150[2]	4300	**3 T**	
DN 600 / 24"	2150[2]	6020	**3 U**	
DN 600 / 24"	4300[3]	6020	**3 V**	
DN 700 / 28"	2900[2]	5800	**4 F**	
DN 700 / 28"	2900[2]	8120	**4 G**	
DN 700 / 28"	5800[3]	8120	**4 H**	
DN 800 / 32"	3800[2]	7600	**4 P**	
DN 800 / 32"	3800[2]	10640	**4 Q**	
DN 800 / 32"	7600[3]	10640	**4 R**	
DN 900 / 36"	5000[2]	10000	**5 B**	
DN 900 / 36"	5000[2]	14000	**5 C**	
DN 900 / 36"	10000[3]	14000	**5 D**	
DN 1000 / 40"	6000[2]	12000	**5 K**	
DN 1000 / 40"	6000[2]	16800	**5 L**	
DN 1000 / 40"	12000[3]	16800	**5 M**	
DN 1200 / 48"	9000[2]	18000	**5 T**	
DN 1200 / 48"	9000[2]	25200	**5 U**	
DN 1200 / 48"	18000[3]	25200	**5 V**	

Flowmeter SITRANS FUE380 (type approved)	Order-No. 7ME 3 4 1 0 -	Order code
Flange norm and pressure rating		
EN 1092-1		
PN 16 (DN 100 ... 1200)	**C**	
PN 25 (DN 200 ... 1000)	**D**	
PN 40 (DN 50 ... 250)[4]	**E**	
Compact / remote connection		
Compact version, max. 120 °C (248 °F) (up to DN 800)	**0**	
Remote version, max. 200 °C (392 °F)		
5 m (16.4 ft)	**2**	
10 m (32.8 ft)	**3**	
20 m (65.6 ft)	**4**	
30 m (98.4 ft)	**5**	
Approvals / pulse output		
Without approval (neutral) Selectable pulse output (following code can be 1...9)	**0**	
With approval marks Selectable pulse output (following code can be 1...9)	**1**	
With approval marks and seal Selectable pulse output (following code can be 1...9)	**2**	
Without approval (neutral) Preset pulse output for FUE950 energy meter (following code must be 2...6)	**3**	
With approval marks Preset pulse output for FUE950 energy meter (following code must be 2...6)	**4**	
With approval marks and seal Preset pulse output for FUE950 energy meter (following code must be 2...6)	**5**	
Pulse output value setup		
0.1 l/pulse (option for DN 50...DN 65)	**1**	
1 l/pulse (typical for DN 50...DN 65)	**2**	
2.5 l/pulse (typical for DN 80...DN 125)	**3**	
10 l/pulse (typical for DN 150...DN 250)	**4**	
50 l/pulse (typical for DN 300...DN 400)	**5**	
100 l/pulse (typical for DN 500...DN 1200)	**6**	
Optional pulse values		
250 l/pulse	**7**	
1 m³/pulse	**8**	
0.25 l/pulse	**9**	**N0A**
0.5 l/pulse	**9**	**N0B**
5 l/pulse	**9**	**N0C**
25 l/pulse	**9**	**N0D**
500 l/pulse	**9**	**N0E**
2.5 m³/pulse	**9**	**N0F**
5 m³/pulse	**9**	**N0G**
10 m³/pulse	**9**	**N0H**
25 m³/pulse	**9**	**N0J**
50 m³/pulse	**9**	**N0K**
100 m³/pulse	**9**	**N0L**
250 m³/pulse	**9**	**N0M**
500 m³/pulse	**9**	**N0N**
1000 m³/pulse	**9**	**N0P**
Transmitter SITRANS FUE080		
IP67/NEMA 4X/6 115...230 V AC	**B**	
IP67/NEMA 4X/6 3.6 V battery version incl. dual battery pack	**D**	
IP67/NEMA 4X/6 115...230 V AC, including 3.6 V single battery back up	**E**	
IP67/NEMA 4X/6 3.6 V battery version (no battery pack included)[5]	**G**	

	Order-No.	Order code
Flowmeter SITRANS FUE380 (type approved)	**7ME 3 4 1 0 -** □□□□□-□□□□	□□□
Country / approved type [7]		
Neutral, no approval mark	**A**	
Denmark, EN 1434/OIML R75	**E**	
Germany, EN 1434 (PTB approved, ≥ DN80)	G	
China	**Z**	**Q0C**
MID-Approval (EN 1434/OIML R75), English	**R**	
MID-Approval (EN 1434/OIML R75), German	**S**	
MID-Approval (EN 1434/OIML R75), Polish	**T**	
MID-Approval (EN 1434/OIML R75), French	**U**	
Pulse width setup		
5 ms (standard)		**2**
10 ms		**3**
20 ms		**4**
50 ms		**5**
100 ms		**6**
200 ms		**7**
500 ms		**8**

1) Pipe material is bronze
2) EN 1434 flow values
3) OIML R75 flow values
4) PN 40 standard for DN 50...80 bronze pipes
5) 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.
6) Qp (Qn) is normal flow according to the approval requirements. Qp and Qs is shown on system label.
7) Other countries in progress.

Additional information	Order code
Please add „-Z“ to order No. and following add-on code(s) with plain text	
Calibration / certificate FUE380	
Approval, Verification and sealing as defined by order number.	**See order code**
Production calibration for DN 50 ... DN 1200 with Qn as selected in diameter Calibration protocol: 2 x 3 points, Qi, 10% Qp and Qp (max. 4200 m³/h).	**Included**
Accredited Siemens ISO/IEC 17025 calibration for DN50 ... 200 with Qn as selected in diameter. Certificate: 2 x 3 points, Qi, 10% Qp and Qp (max. 250 m³/h)..	**D20**
Accredited Siemens ISO/IEC 17025 calibration for DN100 ... 500 with Qn as selected in diameter. Certificate: 2 x 3 points, Qi, 10% Qp and Qp (max. 1300 m³/h).	**D21**
Accredited Siemens ISO/IEC 17025 calibration for DN300 ... 1200 with Qn as selected in diameter. Certificate: 2 x 3 points, Qi, 10% Qp and Qp (max. 4200 m³/h).	**D22**
Output B as reverse flow pulses. No calibration/verification	**E21**
Material certificate EN 10204-3.1	**F10**
Tag name plate Stainless steel tag with 12 mm characters, max. 15 characters (add plain text)	**Y17**

PIA Selector®

Please use online PIA Selector to get latest updates.

Product selector link: www.pia-selector.automation.siemens.com

10.3 Spare parts for FUS380 and FUE380

Type/Description	Order No.	Symbol
Dual battery pack (6 year lifetime) 33 Ah	A5E02679676	
Single battery back-up to main supply 13.5 Ah	A5E02679923	
Battery cover for transmitter FUS080	A5E00694468	
Pg 13.5 set (2 pcs.) for main cable/pulse cable	FDK:083G0228	
Pg 13.5 set for dual coax cable (6 mm)	A5E00694500	
Wall mounting kit for remote mounting including printed circuit board (DN 50 ... 1200 (2"... 48") only)	A5E00694509	
Terminal box for compact mounting for DN50...DN80 compact versions including printed circuit board	A5E01208138	
Terminal box for DN100...DN1200 compact versions including printed circuit board	A5E00694660	
Brace (holder) for optical IrDA eye	A5E00695277	
IrDA infrared interface adapter with USB for data acquisition with 1.2 m (3.9 ft) cable	FDK:087L4163	
RS 232 add-on module, point to point communication interface with MODBUS RTU protocol	FDK:087L4212	
RS 485 add-on module, mulitidrop communication interface with MODBUS RTU protocol	FDK:087L4213	
5 m (16.4 ft) cable set (4 pcs.) for DN 50...80 remote mounting	A5E01208092	
10 m (32.8 ft) cable set (4 pcs.) for DN 50...80 remote mounting	A5E01208114	
20 m (65.6 ft) cable set (4 pcs.) for DN 50...80 remote mounting	A5E01208117	
30 m (98.4 ft) cable set (4 pcs.) for DN 50...80 remote mounting	A5E01208121	
1 m (3.28 ft) cable set (4 pcs.) for DN 50...80 compact version	A5E01208126	
5 m (16.4 ft) cable set (4 pcs.) for DN 100...1200 remote mounting	A5E00695476	
10 m (32.8 ft) cable set (4 pcs.) for DN 100...1200 remote mounting	A5E00695479	
20 m (65.6 ft) cable set (4 pcs.) for DN 100...1200 remote mounting	A5E00695480	
30 m (98.4 ft) cable set (4 pcs.) for DN 100...1200 remote mounting	A5E00695483	
1 m (3.28 ft) cable set (4 pcs.) for DN 100...1200 compact version	A5E00695486	
Process Device Manager SIMATIC PDM: ***SIMATIC PDM Single Point V6.0*** For operation and parameterization of one field device, communication using PROFIBUS DP/PA or HART modem, incl. 1 TAG **Cannot** be expanded by further functions or TAG option/power-pack; 5 languages (German, English, French, Spanish, Italian) executes with Windows 2000 Professional or Windows XP Professional	6ES7 658- 3HX06-0YA5	

Downloads for DEVICE description FUE380: http:/support.automation.siemens.com/WW/view/en/17320235

Appendix 11

11.1 EC Declaration of Conformity

SIEMENS

EC Declaration of Conformity
EG-Konformitätserklärung

CE

No. A5E00733799A - DS03

Manufacturer: *Hersteller:*	Siemens Flow Instruments A/S
Address: *Anschrift:*	Nordborgvej 81, 6430 Nordborg, DK-Denmark
Product description: *Produktbezeichnung*	Flow transmitter / Durchfluss meßumformer SITRANS FUS080, FUE080, FUE380, FUS380 Type / Typ 7ME340 (standard) and 7ME341 (type approved)

The product described above in the form as delivered is in conformity with the provisions of the following European Directives:
Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:

2004/108/EC EMC	Directive of the European Parliament and of the Council on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC. *Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit und zur Aufhebung der Richtlinie 89/336/EWG.*
2006/95/EC LVD	Directive of the European Parliament and of the Council on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits. *Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.*
97/23/EC PED	Directive of the European Parliament and of the Council on the approximation of the laws of the Member States concerning pressure equipment. *Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Druckgeräte*
2004/22/EC MID	Directive of the European Parliament and the Council on the approximation of the laws of the Member States concerning equipment intended for Legal Metrological Measuring systems. *Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten für Geräte zur bestimmungsgemäßen Verwendung in Legale Metrologische Messsysteme.*

Annex A is integral part of this declaration.
Anhang A ist integraler Bestandteil dieser Erklärung.
This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail.
Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie nach §443 BGB.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

Nordborg, 28.08.2007

Siemens Flow Instruments A/S

28/8-07

J. Parkum, R&D Manager

Name, function
Name, Funktion

signatur
Unterschrift

28-8-2007

O.Kirk-Andersen, Quality Manager

Name, function
Name, Funktion

signatur
Unterschrift

Annex A to the EC Declaration of Conformity
Anhang A zur EG-Konformitätserklärung

No. A5E00733799A - DS03

Product description:
Produktbezeichnung

Flow transmitter / Durchfluss meßumformer
SITRANS FUS080, FUE080, FUE380, FUS380
Type / Typ 7ME340 (standard) and 7ME341 (type approved)

Conformity to the Directives indicated on page 1 is assured through the application of the following standards (depending on versions):
Die Konformität mit den auf Blatt 1 angeführten Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen (variantenabhängig):

Directives
Richtlinien

Directive *Richtlinie*	Standard / Reference number *Norm / Referenznummer*	Edition *Ausgabe datum*	7ME340 7ME341 g-hjklm-npqr	7ME340 7ME341 g-hjklm-npqr	7ME345 g-hjklm-npqr	7ME345 g-hjklm-npqr
2004/108/EC	EN 61326-1 *	2006	p = B;E	p = D;G	l = 3;4	l = 1;2
2004/108/EC	EN 61326-2-5	2006	p = B;E	p = D;G	l = 3;4	l = 1;2
2006/95/EC	EN 61010-1	2001	p = B;E		l = 3;4	
97/23EEC	Annex III, Module H	1999	p = B;E	p = D;G		
2004/22/EC	EN1434	2006	q =R;S;T;U	q =R;S;T;U		

* all environments included

Certificates
Zertifikate

Certificates *Zertifikate*	7ME341 g-hjklm-npqr	7ME341 g-hjklm-npqr		
FORCE-Dantest: DK-0200-MI004-005	q =R;S;T;U	q =R;S;T;U		

Inspection / Surveillance:
Kontrolle / Überwachung:

Directive *Richtlinie*		Notified Body Product Quality Assurance *Benannte Stelle Qualitätssicherung Produktion*	No.:
2004/22/EC	MID	FORCE-Dantest CERT	0200
97/23/EC	PED	FORCE-Dantest CERT	0200

For more information

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