

# Ultrasonic flowmeters

SITRANS FUS/FUE380

Operating Instructions • 07/2010



SITRANS F

**SIEMENS**



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# Introduction

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## 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.

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# General safety instructions

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## 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.
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## 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.

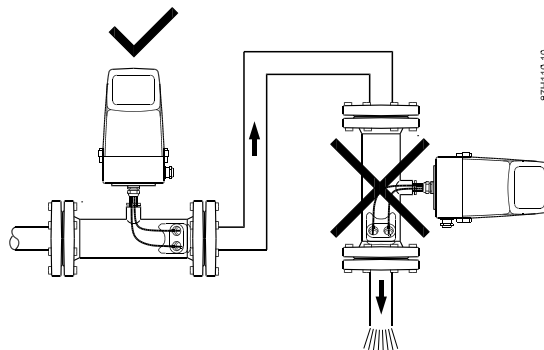
- Do **not** install the flowmeter such that it acts as a focus for pipeline stresses. External loading is **not** taken into account during flowmeter design.
- Please be aware of the risk of installing the sensor in a highly vibrating environment. Parts may shake loose and the complete system must be 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 pressure 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.

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- Lithium batteries are regulated under United Nations Model Regulations on Transport of Dangerous goods, UN document ST/SGAC.10-1, 12<sup>th</sup> 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.

## 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.

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## 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).

## 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.

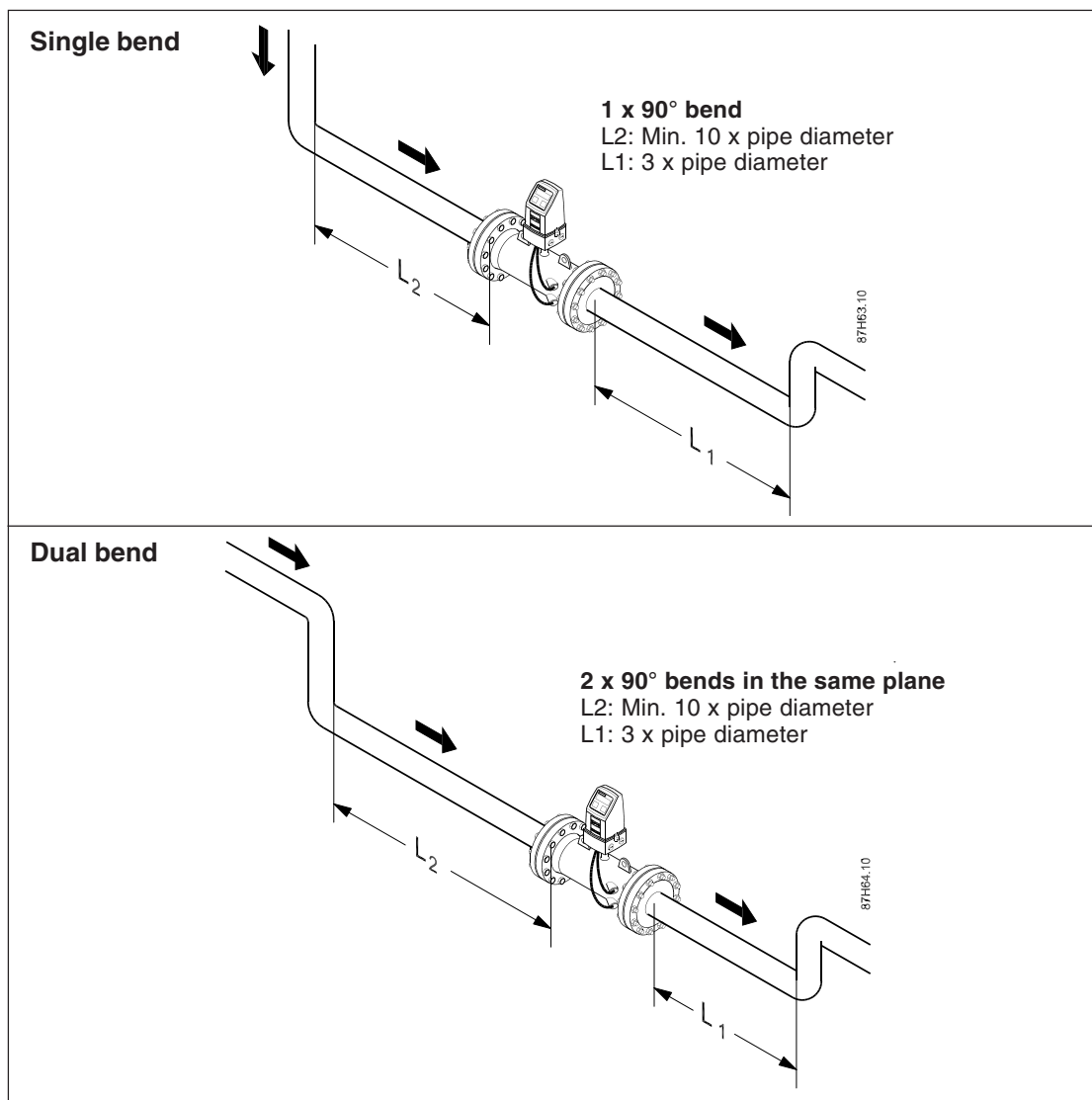
Make sure that flowmeter is positioned as low as possible to prevent air from being trapped in flowmeter at transducers.

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

### Note

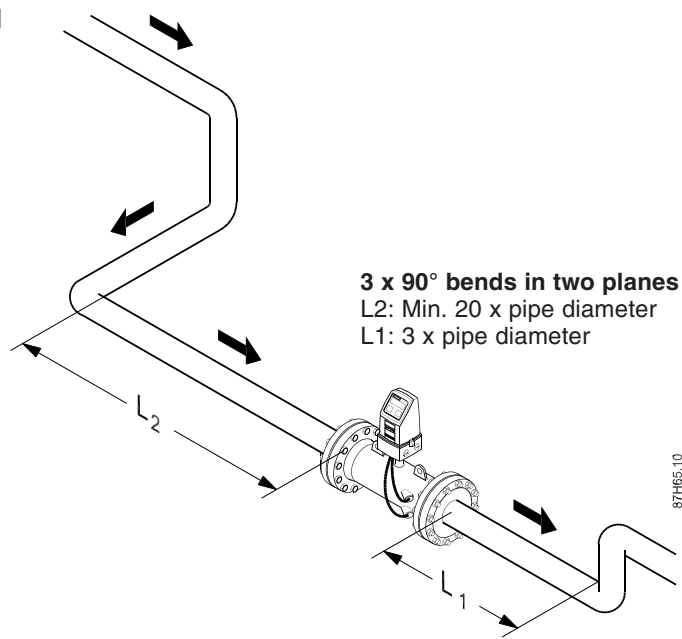
For MID-approved FUE380 systems the following inlet pipe is recommend:

L2 for sizes  $\geq$  DN 80: 1.5 m

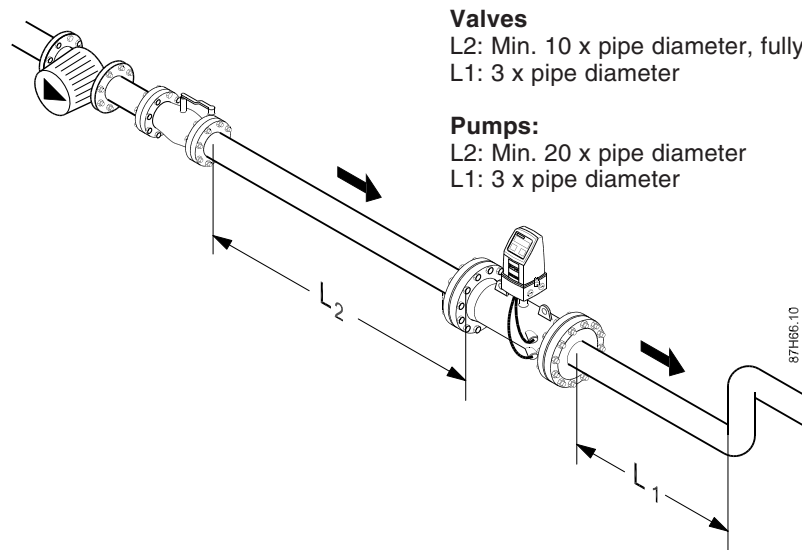




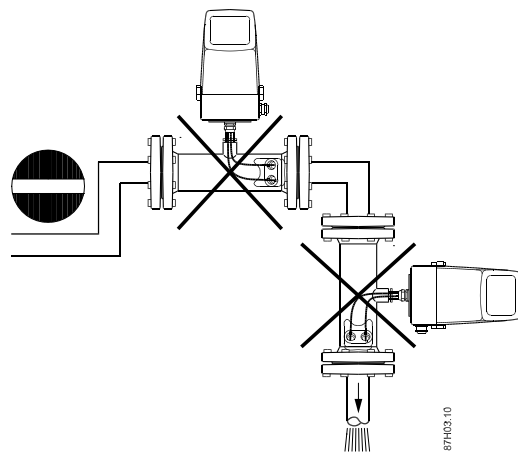
### Triple bend



### Valves and pumps



### 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.

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## 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).

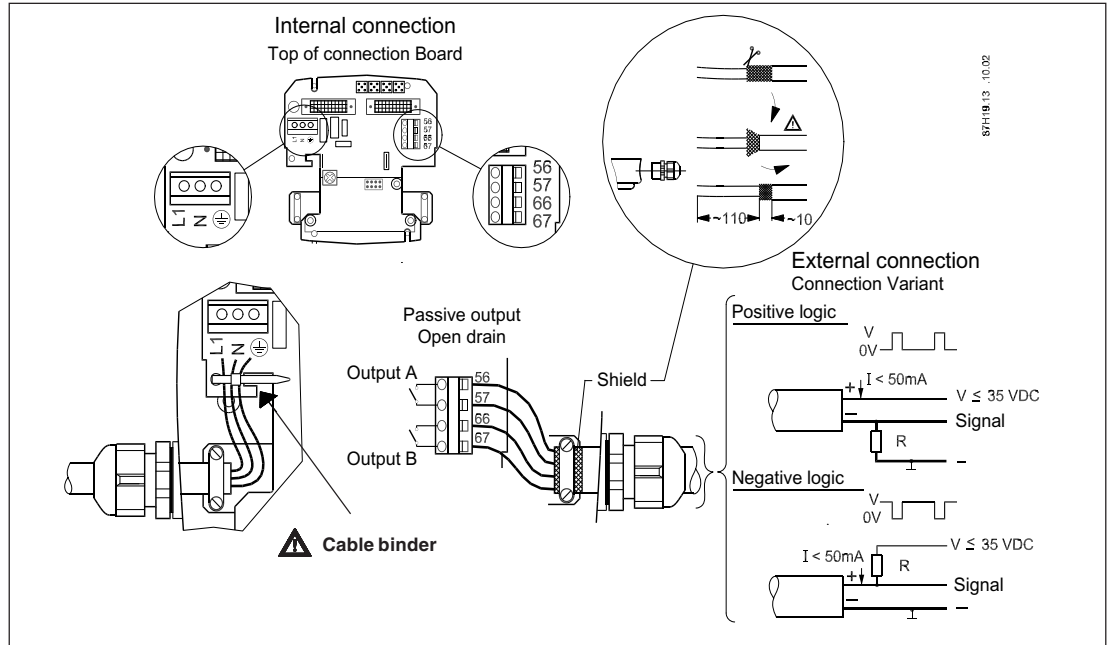


**Important**

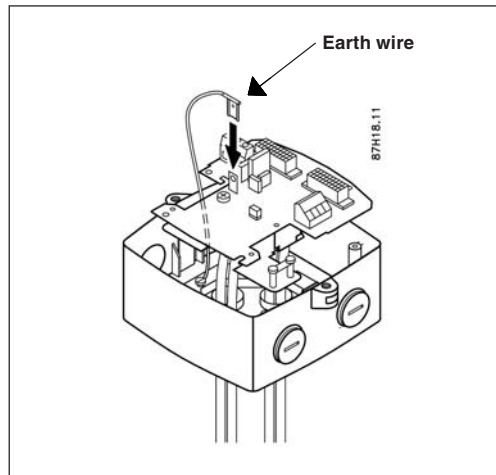
Cable binder **must** be fastened to printed circuit board according to drawing.


### 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.

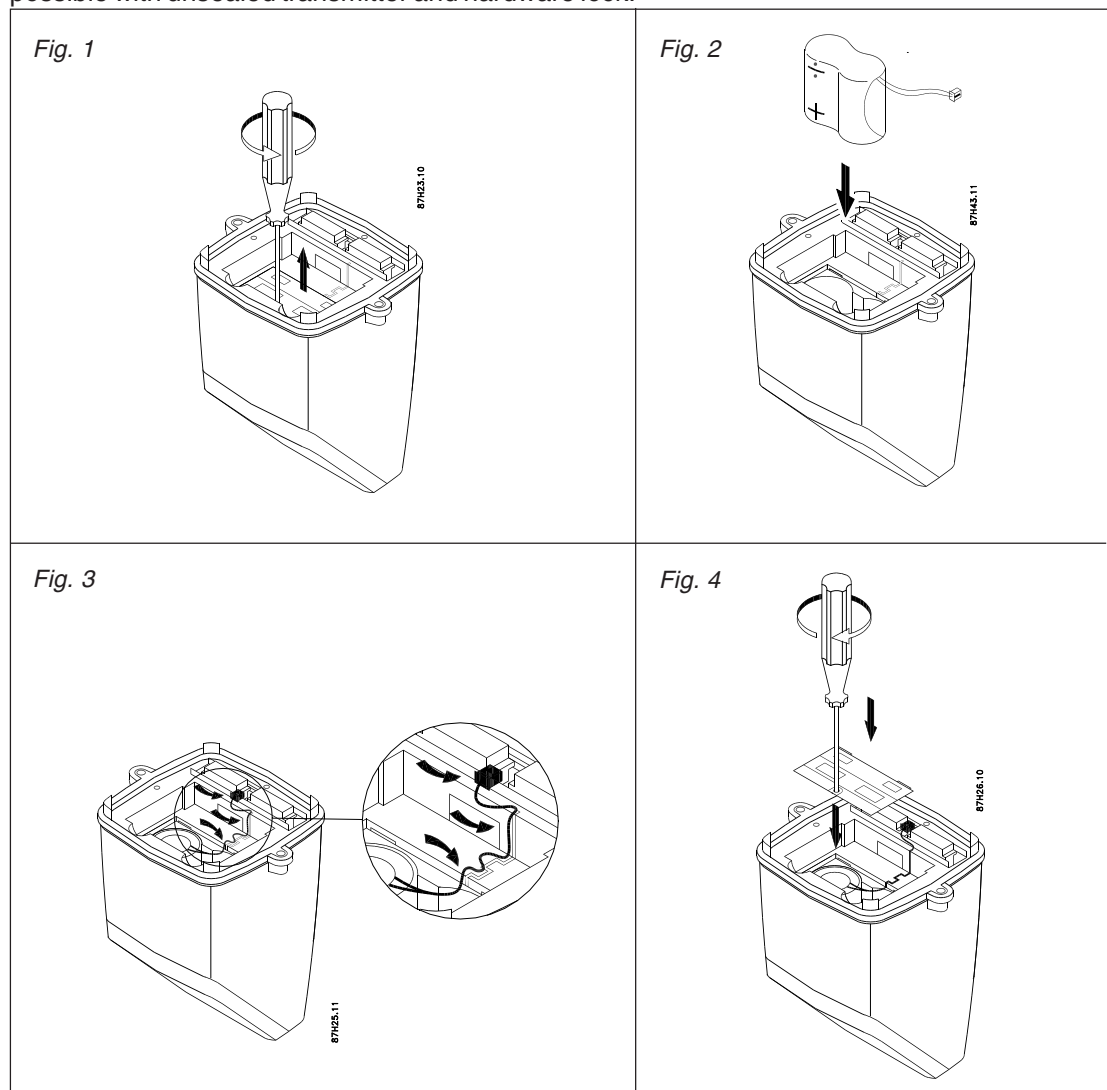
Connect small plug-in between the two main connectors. Ensure that wire is inserted into small channel leading from plug to battery.

### 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“.

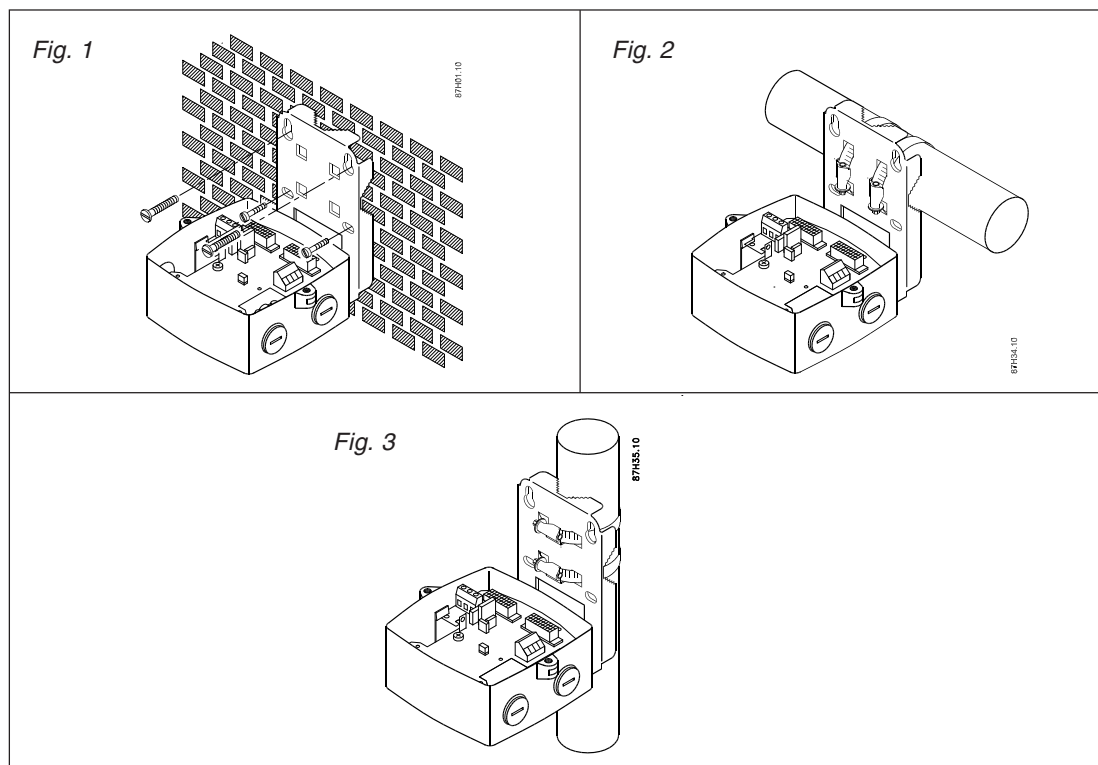
Changing battery does not influence accumulated value. Accumulated values can **only** be reset using PC software. According to the approval requirements for FUE380 versions this is only possible with unsealed transmitter and hardware lock.



## 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 consideration, and allowing adequate space for cable inlets underneath and on both sides.

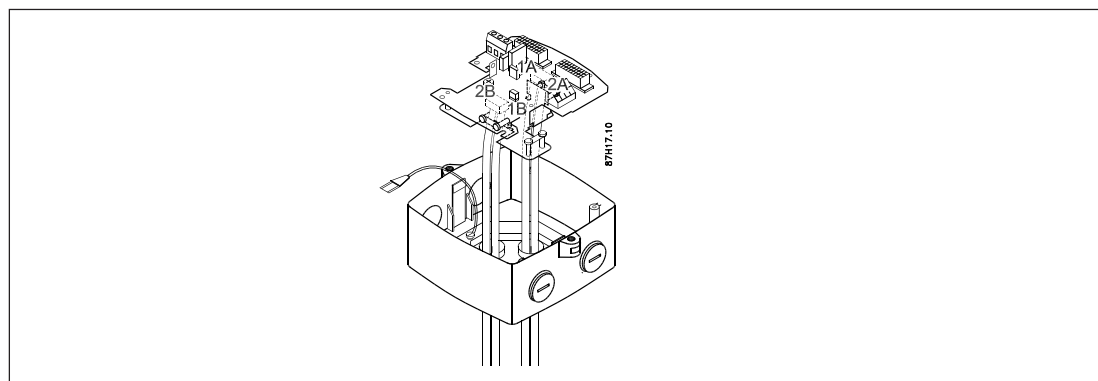


### 4.4.2 Connection of transducer cables

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).



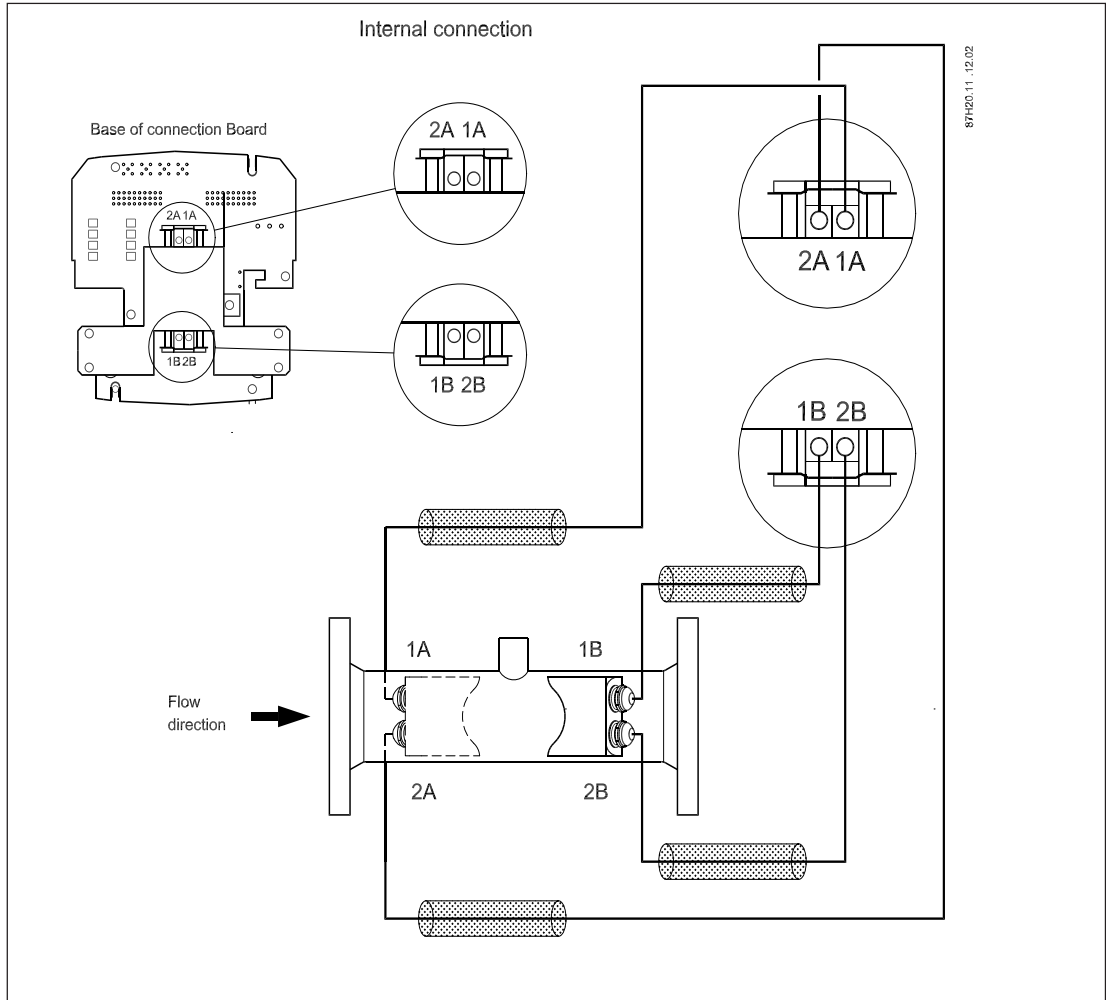
### 4.4.3 Transducer connection scheme

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



## 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 <sup>3</sup> /p; 2.5 m <sup>3</sup> /p; 5 m <sup>3</sup> /p; 10 m <sup>3</sup> /p; 25 m <sup>3</sup> /p; 50 m <sup>3</sup> /p; 100 m <sup>3</sup> /p; 250 m <sup>3</sup> /p; 500 m <sup>3</sup> /p; 1000 m <sup>3</sup> /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.

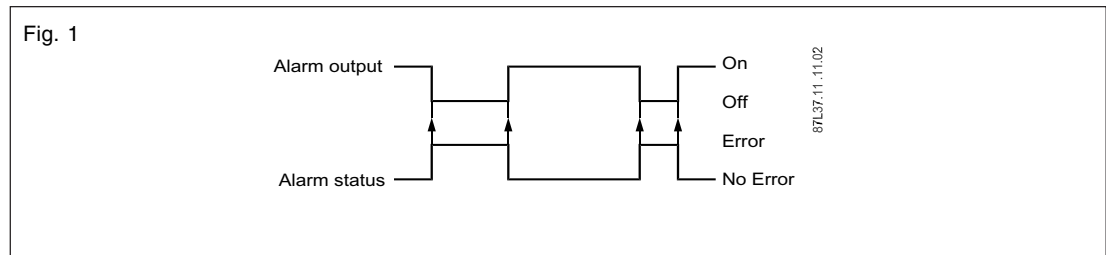
DN	Pulse setting (liter/pulse )
50	1
65	1
80	2.5
100	2.5
125	2.5
150	10
200	10
250	10
300	50
350	50
400	50
500	100
600	100
700	100
800	100
900	100
1000	100
1200	100

## 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:

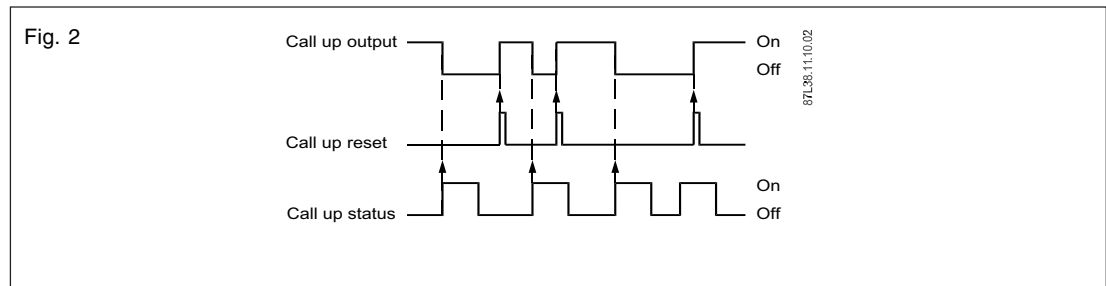
Example: If track 1 is not measuring, a „triangle“ alert appears on display. Failure code „F1“ appears in display menu 4, and relay output terminals switch to „off“.



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.

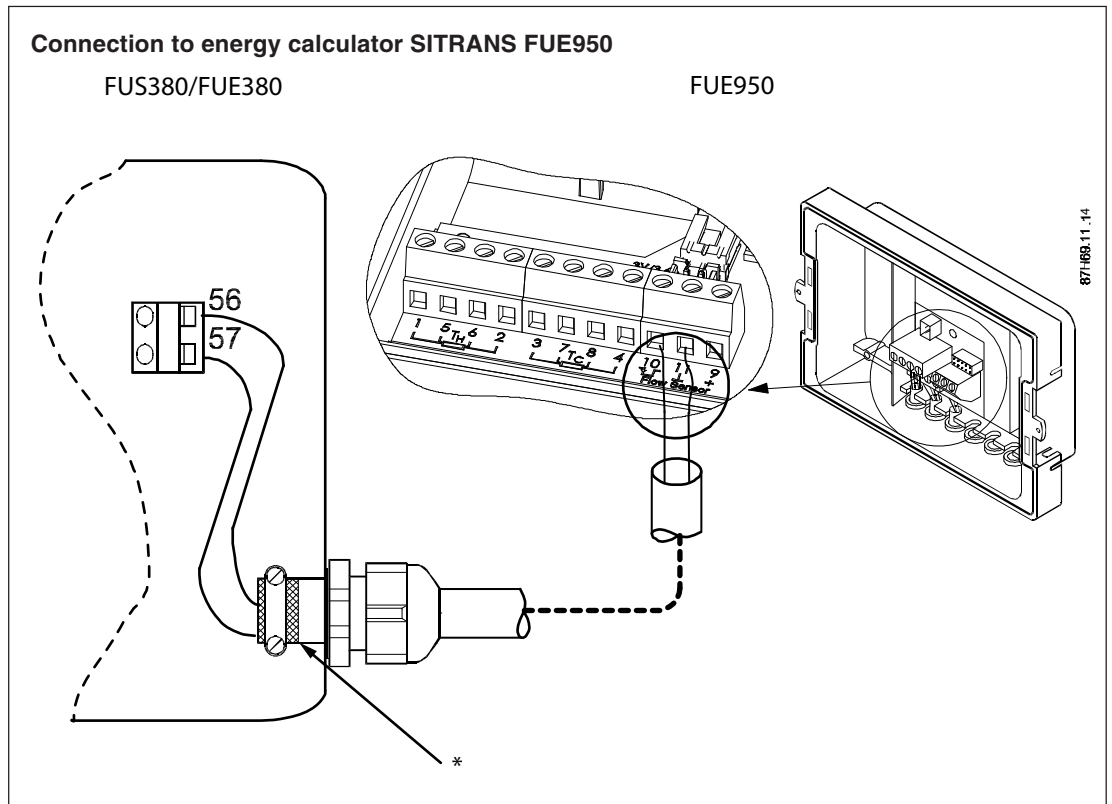
\* SIMATIC PDM - Process Device Manager, see accessories / spare parts in catalogue FI01.



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



\*: 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).

## 6.1 Flowmeter operation via push button and display

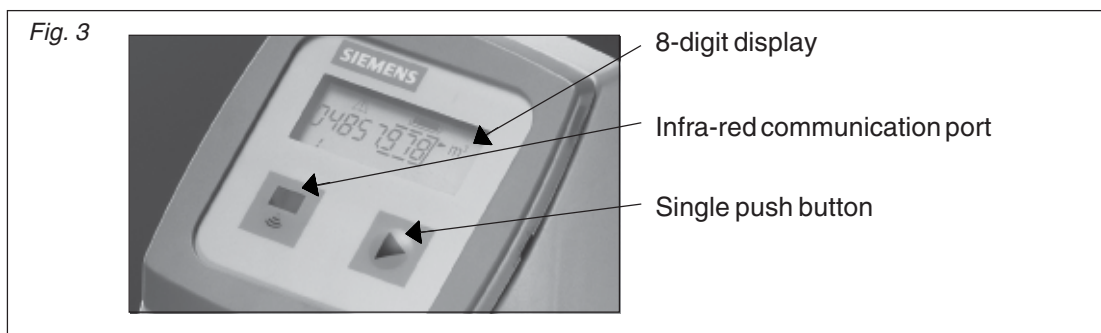
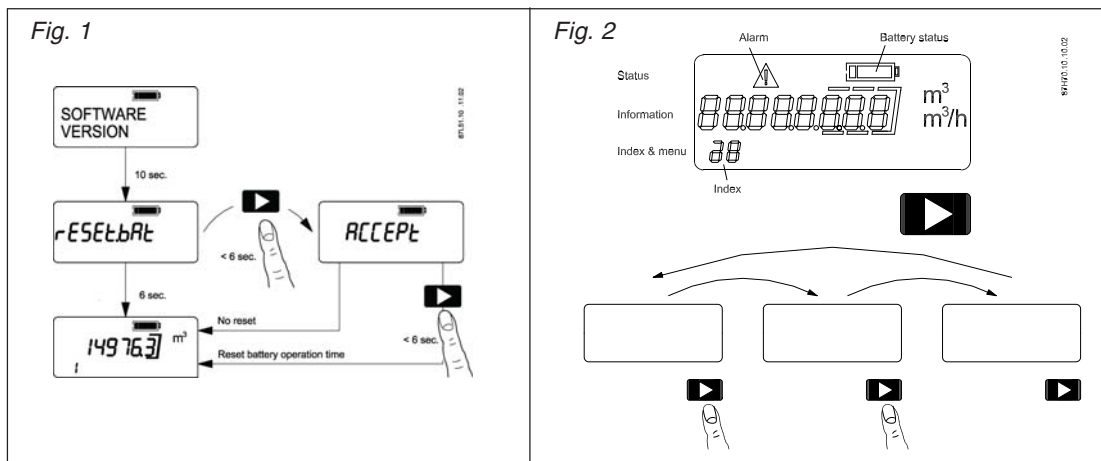
The transmitter control panel is designed with a single push button and a 8-digit display for optimal dialog - see Fig 3.

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

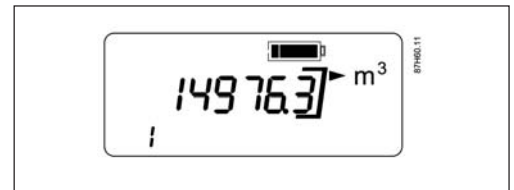
Activate push button to toggle to next index and related information - see Fig.2.



## 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.



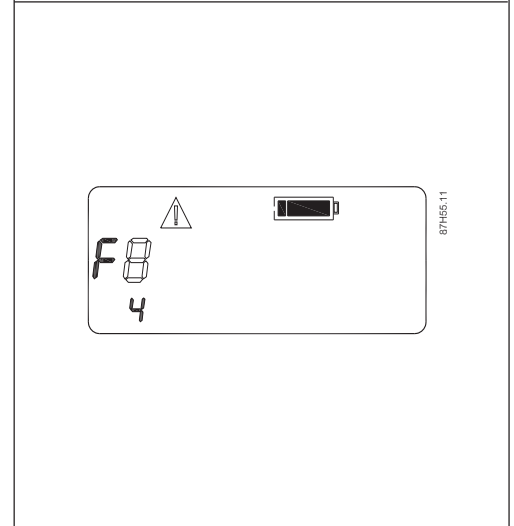
### Menu 4

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

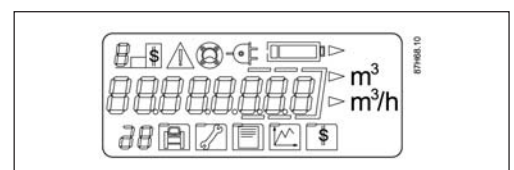
Failure code combinations:

**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.

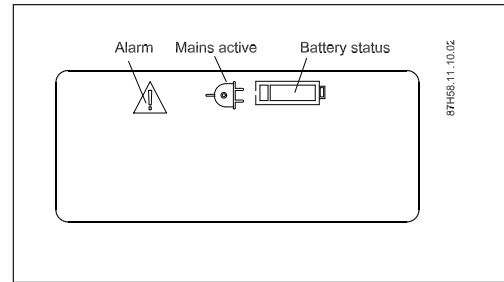


## 6.3 Information symbols

Status information symbols show actual status of important flowmeter elements.

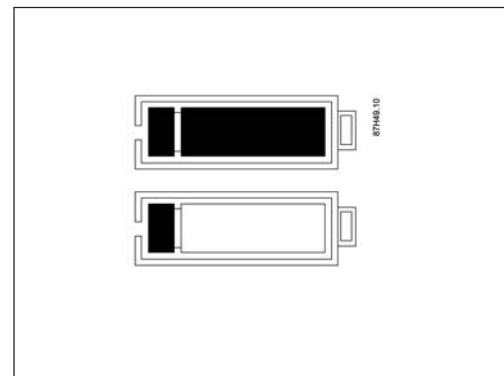
The warning/alarm symbol appears when ultrasonic sensors do not measure or when a failure occurs according to menu 4. The warning/alarm symbol disappears when problem is rectified.

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

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## 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 transducers 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:*

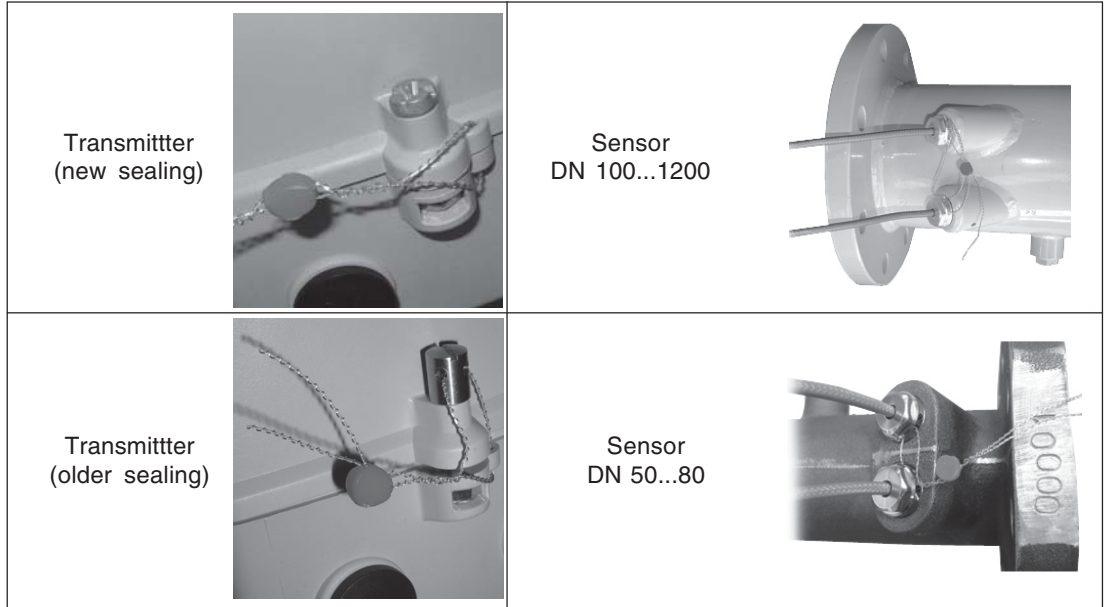
Failure information in display F12. This indicates a combination of failure codes F1 and F2.

*Diagnosis:*

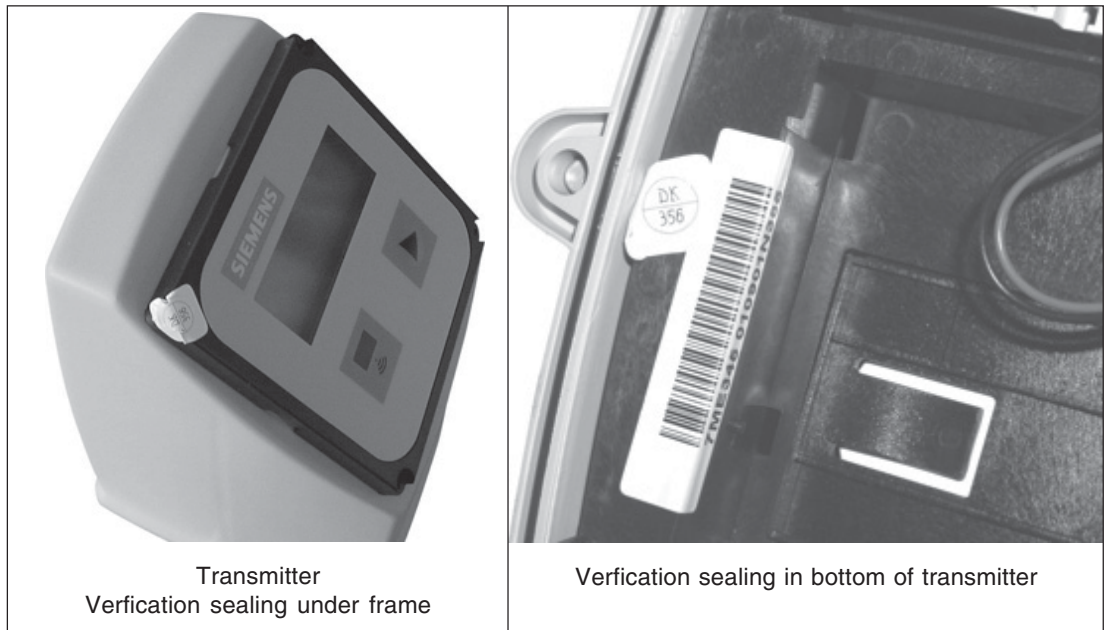
No water in pipe, or track 1 and 2 cables defect, or transducers defect.

# Sealing

## 8.1 User sealing of SITRANS FUE380



## 8.2 Verification sealing of SITRANS FUE380



## 9.1 Technical data SITRANS FUS380 and FUE380

Description	Specification
<b>Transmitter FUS080</b>	
Enclosure	IP67 according to EN 60529 and DIN 40050 (NEMA 4X/6)
Ambient temperature	0 °C ...60 °C (32 °F.... 140 °F) <sup>2)</sup>
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	<ul style="list-style-type: none"> <li>• Battery: replaceable 3.6 V LiSOCl (Lithium Thionyl Chloride) battery pack 32 Ah</li> <li>• Mains: 87 ... 265 V AC (50 ... 60 Hz)</li> </ul>
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 <sup>3</sup> FUS380: Preset at ordering (default: m <sup>3</sup> )
Flow units	FUE380: m <sup>3</sup> /h (default) FUS380: Preset at ordering (default: m <sup>3</sup> /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)
<b>Sensor for FUS380 / FUE380</b>	
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) <sup>1)</sup> Remote: DN 50 ... 80: 2 ... 150 °C (35.6 ... 302 °F) <sup>1)</sup> DN 100 ... 1200: 2 ... 200 °C (35.6 ... 392 °F) <sup>1)</sup>

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.

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### 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  $Q_p$  ( $Q_{\text{nom}}$ ) 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

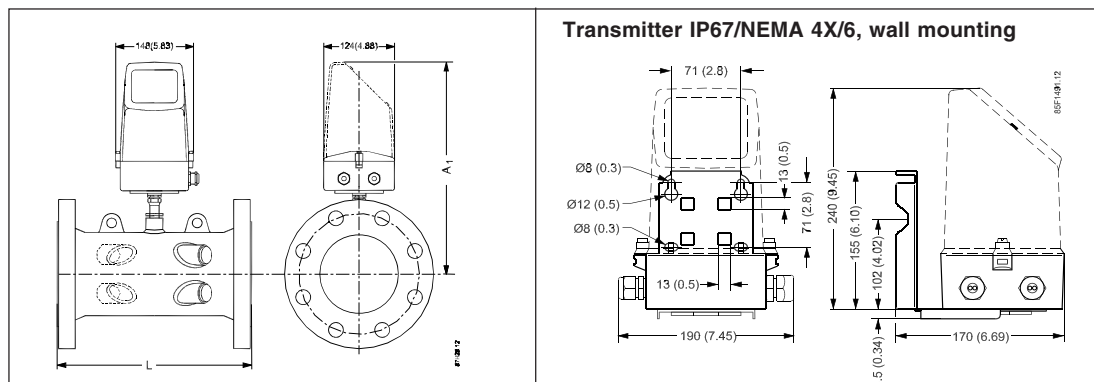
DN	Q <sub>s</sub> (m <sup>3</sup> /h)	Q <sub>max</sub> (m <sup>3</sup> /h) (105% of Q <sub>s</sub> )	Q <sub>p</sub> (m <sup>3</sup> /h)	Q <sub>i</sub> (m <sup>3</sup> /h) (1:100 of Q <sub>p</sub> )	Cut-off (m <sup>3</sup> /h) (50% of Q <sub>i</sub> )	Cut-off (% of Q <sub>max</sub> )	Typical pulse value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

## 9.2 Dimensional drawings for FUS380 and FUE380



### 9.2.1 Pipe dimensions for FUS380 and FUE380

Size	PN 16		PN 25		PN 40		Material	A1	Lift hug
	L	Weight	L	Weight	L	Weight			
DN	mm	kg	mm	kg	mm	kg		mm	
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		Material	A1	Lift hug
	L	Weight	L	Weight	L	Weight			
inch	inch	lb	inch	lb	inch	lb		inch	
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.	Order code
			7ME 3 4 0 0 -	
			□ □ □ 0 - □ A □ □ □ □	
Diameter	Flow setting Qp <sup>4)</sup> [m <sup>3</sup> /h] Qs [m <sup>3</sup> /h]			
DN 50 / 2" <sup>1)</sup>	15	15	1 A	
DN 50 / 2" <sup>1)</sup>	15	45	1 C	
DN 50 / 2" <sup>1)</sup>	30	45	1 D	
DN 65 / 2½" <sup>1)</sup>	25	25	1 E	
DN 65 / 2½" <sup>1)</sup>	25	75	1 G	
DN 65 / 2½" <sup>1)</sup>	50	72	1 H	
DN 80 / 3" <sup>1)</sup>	40	40	1 J	
DN 80 / 3" <sup>1)</sup>	40	120	1 L	
DN 80 / 3" <sup>1)</sup>	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.	Order code
			7ME 3 4 0 0 -	
			□ □ □ 0 - □ A □ □ □ □	
<b>Flange norm and pressure rating</b> System without sensor - only a transmitter FUS080 as spare part - settings as defined by order number.				
<u>EN 1092-1 Flanges</u> PN 16 (DN 100 ... 1200) PN 25 (DN 200 ... 1000) PN 40 (DN 50 ... 250) <sup>2)</sup>				A C D E
<b>Compact / remote connection</b> Compact version, max. 120 °C (248 °F) up to DN 800				0
<u>Remote version, max. 150/200 °C (302/392 °F)</u> 5 m (16.4 ft) 10 m (32.8 ft) 20 m (65.6 ft) 30 m (98.4 ft)				2 3 4 5
<b>Pulse output value setup</b> 0.1 l/pulse (option for DN 50...DN 65) 1 l/pulse (typical for DN 50...DN 65) 2.5 l/pulse (typical for DN 80...DN 125)  10 l/pulse (typical for DN 150...DN 250) 50 l/pulse (typical for DN 300...DN 400) 100 l/pulse (typical for DN 500...DN 1200)  250 l/pulse 1 m <sup>3</sup> /pulse 0.25 l/pulse 0.5 l/pulse 5 l/pulse 25 l/pulse  500 l/pulse 2.5 m <sup>3</sup> /pulse 5 m <sup>3</sup> /pulse  10 m <sup>3</sup> /pulse 25 m <sup>3</sup> /pulse 50 m <sup>3</sup> /pulse  100 m <sup>3</sup> /pulse 250 m <sup>3</sup> /pulse 500 m <sup>3</sup> /pulse  1000 m <sup>3</sup> /pulse				1 2 3  4 5 6  7 8 9 9 9 9  9 9 9  9 9 9  9  9
<b>Transmitter SITRANS FUS080</b> IP67/NEMA 4X/6 115...230 V AC IP67/NEMA 4X/6 3.6 V battery version incl. dual battery pack IP67/NEMA 4X/6 115...230 V AC, including 3.6 V single battery back up IP67/NEMA 4X/6 3.6 V battery version (no battery pack included) <sup>3)</sup>				B D  E  G
<b>Pulse width setup</b> 5 ms (standard) 10 ms 20 ms  50 ms 100 ms 200 ms 500 ms				2 3 4  5 6 7 8
				NOA NOB NOC NOD  NOE NOF NOG  NOH NOJ NOK  NOL NOM NON  NOP

Additional information	Order code
Please add „-Z“ to order No. and following add-on code(s) with plain text	
<b>Accredited Siemens calibration FUS380</b>	
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 <sup>3</sup> /h).	<b>Included</b>
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 <sup>3</sup> /h)..	<b>D20</b>
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 <sup>3</sup> /h).	<b>D21</b>
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 <sup>3</sup> /h).	<b>D22</b>
Output B as reverse flow pulses. No calibration/verification	<b>E21</b>
<b>Material certificate</b> EN 10204-3.1	<b>F10</b>
<b>Tag name plate</b> Stainless steel tag with 12 mm characters, max. 15 characters (add plain text)	<b>Y17</b>

**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.	Order code	Flowmeter SITRANS FUE380 (type approved)			Order-No.	Order code
			7ME 3 4 1 0 -					7ME 3 4 1 0 -	
Diameter	Flow setting Qp <sup>6)</sup> [m <sup>3</sup> /h] Qs [m <sup>3</sup> /h]								
DN 50 / 2 <sup>n</sup> 1)	15 <sup>2)</sup> 30		1 B						
DN 50 / 2 <sup>n</sup> 1)	15 <sup>2)</sup> 45		1 C						
DN 50 / 2 <sup>n</sup> 1)	30 <sup>3)</sup> 45		1 D						
DN 65 / 2½ <sup>n</sup> 1)	25 <sup>2)</sup> 50		1 F						
DN 65 / 2½ <sup>n</sup> 1)	25 <sup>2)</sup> 72		1 G						
DN 65 / 2½ <sup>n</sup> 1)	50 <sup>3)</sup> 72		1 H						
DN 80 / 3 <sup>n</sup> 1)	40 <sup>2)</sup> 80		1 K						
DN 80 / 3 <sup>n</sup> 1)	40 <sup>2)</sup> 120		1 L						
DN 80 / 3 <sup>n</sup> 1)	80 <sup>3)</sup> 120		1 M						
DN 100 / 4"	60 <sup>2)</sup> 120		1 P						
DN 100 / 4"	60 <sup>2)</sup> 180		1 Q						
DN 100 / 4"	120 <sup>3)</sup> 180		1 R						
DN 125 / 5"	100 <sup>2)</sup> 200		1 T						
DN 125 / 5"	100 <sup>2)</sup> 280		1 U						
DN 125 / 5"	200 <sup>3)</sup> 280		1 V						
DN 150 / 6"	150 <sup>2)</sup> 300		2 B						
DN 150 / 6"	150 <sup>2)</sup> 420		2 C						
DN 150 / 6"	300 <sup>3)</sup> 420		2 D						
DN 200 / 8"	250 <sup>2)</sup> 500		2 F						
DN 200 / 8"	250 <sup>2)</sup> 700		2 G						
DN 200 / 8"	500 <sup>3)</sup> 700		2 H						
DN 250 / 10"	400 <sup>2)</sup> 800		2 K						
DN 250 / 10"	400 <sup>2)</sup> 1120		2 L						
DN 250 / 10"	800 <sup>3)</sup> 1120		2 M						
DN 300 / 12"	560 <sup>2)</sup> 1120		2 P						
DN 300 / 12"	560 <sup>2)</sup> 1560		2 Q						
DN 300 / 12"	1120 <sup>3)</sup> 1560		2 R						
DN 350 / 14"	750 <sup>2)</sup> 1500		2 T						
DN 350 / 14"	750 <sup>2)</sup> 2100		2 U						
DN 350 / 14"	1500 <sup>3)</sup> 2100		2 V						
DN 400 / 16"	950 <sup>2)</sup> 1900		3 B						
DN 400 / 16"	950 <sup>2)</sup> 2660		3 C						
DN 400 / 16"	1900 <sup>3)</sup> 2660		3 D						
DN 500 / 20"	1475 <sup>2)</sup> 2950		3 K						
DN 500 / 20"	1475 <sup>2)</sup> 4130		3 L						
DN 500 / 20"	2950 <sup>3)</sup> 4130		3 M						
DN 600 / 24"	2150 <sup>2)</sup> 4300		3 T						
DN 600 / 24"	2150 <sup>2)</sup> 6020		3 U						
DN 600 / 24"	4300 <sup>3)</sup> 6020		3 V						
DN 700 / 28"	2900 <sup>2)</sup> 5800		4 F						
DN 700 / 28"	2900 <sup>2)</sup> 8120		4 G						
DN 700 / 28"	5800 <sup>3)</sup> 8120		4 H						
DN 800 / 32"	3800 <sup>2)</sup> 7600		4 P						
DN 800 / 32"	3800 <sup>2)</sup> 10640		4 Q						
DN 800 / 32"	7600 <sup>3)</sup> 10640		4 R						
DN 900 / 36"	5000 <sup>2)</sup> 10000		5 B						
DN 900 / 36"	5000 <sup>2)</sup> 14000		5 C						
DN 900 / 36"	10000 <sup>3)</sup> 14000		5 D						
DN 1000 / 40"	6000 <sup>2)</sup> 12000		5 K						
DN 1000 / 40"	6000 <sup>2)</sup> 16800		5 L						
DN 1000 / 40"	12000 <sup>3)</sup> 16800		5 M						
DN 1200 / 48"	9000 <sup>2)</sup> 18000		5 T						
DN 1200 / 48"	9000 <sup>2)</sup> 25200		5 U						
DN 1200 / 48"	18000 <sup>3)</sup> 25200		5 V						
					<b>Flange norm and pressure rating</b> EN 1092-1				
					PN 16 (DN 100 ... 1200)			C	
					PN 25 (DN 200 ... 1000)			D	
					PN 40 (DN 50 ... 250) <sup>4)</sup>			E	
					<b>Compact / remote connection</b> 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	
					<b>Approvals / pulse output</b> Without approval (neutral)			0	
					Selectable pulse output (following code can be 1...9)				
					With approval marks			1	
					Selectable pulse output (following code can be 1...9)				
					With approval marks and seal			2	
					Selectable pulse output (following code can be 1...9)				
					Without approval (neutral)			3	
					Preset pulse output for FUE950 energy meter (following code must be 2...6)				
					With approval marks			4	
					Preset pulse output for FUE950 energy meter (following code must be 2...6)				
					With approval marks and seal			5	
					Preset pulse output for FUE950 energy meter (following code must be 2...6)				
					<b>Pulse output value setup</b> 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	
					<b>Optional pulse values</b> 250 l/pulse			7	
					1 m <sup>3</sup> /pulse			8	
					0.25 l/pulse			9	
					0.5 l/pulse			9	
					5 l/pulse			9	
					25 l/pulse			9	
					500 l/pulse			9	
					2.5 m <sup>3</sup> /pulse			9	
					5 m <sup>3</sup> /pulse			9	
					10 m <sup>3</sup> /pulse			9	
					25 m <sup>3</sup> /pulse			9	
					50 m <sup>3</sup> /pulse			9	
					100 m <sup>3</sup> /pulse			9	
					250 m <sup>3</sup> /pulse			9	
					500 m <sup>3</sup> /pulse			9	
					1000 m <sup>3</sup> /pulse			9	
					<b>Transmitter SITRANS FUE080</b> IP67/NEMA 4X/6 115...230 V AC			B	
					IP67/NEMA 4X/6 3.6 V battery version incl. dual battery pack			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) <sup>5)</sup>			G	

	Order-No.	Order code	Additional information	Order code
<b>Flowmeter SITRANS FUE380 (type approved)</b>	<b>7ME 3 4 1 0 -</b>		Please add „-Z“ to order No. and following add-on code(s) with plain text	
<b>Country / approved type <sup>7)</sup></b> Neutral, no approval mark		<b>A</b>	<b>Calibration / certificate FUE380</b> Approval, Verification and sealing as defined by order number.	<b>See order code</b>
Denmark, EN 1434/OIML R75		<b>E</b>	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 <sup>3</sup> /h).	<b>Included</b>
Germany, EN 1434 (PTB approved, $\geq$ DN80)		<b>G</b>	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 <sup>3</sup> /h)..	<b>D20</b>
China		<b>Z</b>	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 <sup>3</sup> /h).	<b>D21</b>
MID-Approval (EN 1434/OIML R75), English		<b>R</b>	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 <sup>3</sup> /h).	<b>D22</b>
MID-Approval (EN 1434/OIML R75), German		<b>S</b>	Output B as reverse flow pulses. No calibration/verification	<b>E21</b>
MID-Approval (EN 1434/OIML R75), Polish		<b>T</b>	<b>Material certificate</b> EN 10204-3.1	<b>F10</b>
MID-Approval (EN 1434/OIML R75), French		<b>U</b>	<b>Tag name plate</b> Stainless steel tag with 12 mm characters, max. 15 characters (add plain text)	<b>Y17</b>
<b>Pulse width setup</b> 5 ms (standard)		<b>2</b>		
10 ms		<b>3</b>		
20 ms		<b>4</b>		
50 ms		<b>5</b>		
100 ms		<b>6</b>		
200 ms		<b>7</b>		
500 ms		<b>8</b>		












- 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.



Please use online PIA Selector to get latest updates.

Product selector link: [www.pia-selector.automation.siemens.com](http://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, multidrop 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	
<b>Process Device Manager SIMATIC PDM:</b> <b>SIMATIC PDM Single Point V6.0</b> For operation and parameterization of one field device, communi- cation using PROFIBUS DP/PA or HART modem, incl. 1 TAG <b>Cannot</b> 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>



## 11.1 EC Declaration of Conformity

SIEMENS

EC Declaration of Conformity  
EG-Konformitätserklärung

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<br>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.<br><i>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.</i>   |
| 2006/95/EC<br>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.<br><i>Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.</i> |
| 97/23/EC<br>PED    | Directive of the European Parliament and of the Council on the approximation of the laws of the Member States concerning pressure equipment.<br><i>Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Druckgeräte</i>  |
| 2004/22/EC<br>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.<br><i>Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten für Geräte zur bestimmungsgemäßen Verwendung in Legale Metrologische Messsysteme.</i>                   |

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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

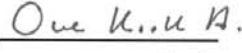
2818-07

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:

*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 <i>Richtlinie</i>	Standard / Reference number <i>Norm / Referenznummer</i>	Edition <i>Ausgabe datum</i>	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	
97/23/EEC	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 <i>Zertifikate</i>	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 <i>Richtlinie</i>	Notified Body Product Quality Assurance <i>Benannte Stelle Qualitätssicherung Produktion</i>		No.:
2004/22/EC	MID	FORCE-Dantest CERT	0200
97/23/EC	PED	FORCE-Dantest CERT	0200

## For more information

[www.siemens.com/flow](http://www.siemens.com/flow)

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