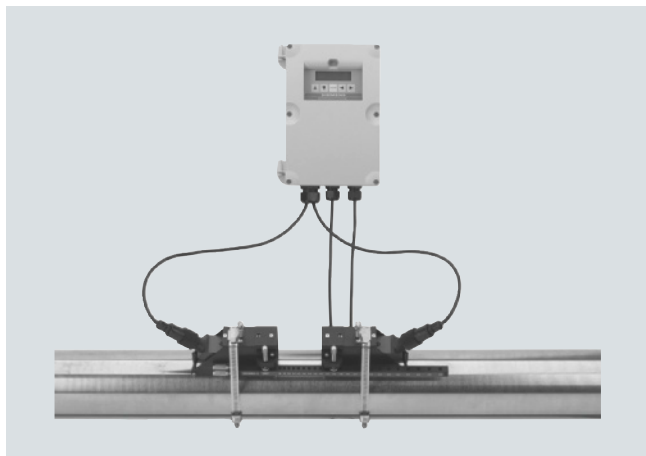


# Flow Measurement

## SITRANS F US Clamp-on

### SITRANS FST020 (Basic)

#### Overview



SITRANS FST020 offers reliable flow measurement at a much lower cost than other clamp-on ultrasonic flowmeters, with flow rate accuracy of  $\pm 0.5\%$  to  $1.0\%$  for most applications.

#### Benefits

- Easy installation; no need to cut pipe or stop flow
- Minimal maintenance; external sensors do not require periodic cleaning
- No moving parts to wear or foul
- No pressure drop or energy loss
- Compact, integral design reduces installation cost
- Wide turn-down ratio
- Optional WideBeam technology ensures high performance.
- ZeroMatic Path automatically sets zero without stopping flow and eliminates zero drift.

#### Application

SITRANS FST020 is suitable for most clean liquid applications, including the following:

- Water & wastewater industry
  - Potable water
  - Wastewater, influent & effluent
  - Processed sewage, sludge
- Chemical feed industry
  - Sodium hypochlorite
  - Sodium hydroxide
- HVAC & power industries
  - Coolant flow
  - Fuel flow
- Process control
  - Chemicals
  - Pharmaceuticals

The SITRANS FST020 flowmeter is not available with hazardous areas approval.

#### Design

- IP65 (NEMA 4X) wall mount constructed of polycarbonate
- Single channel versions only

#### Function

- 2x16 integral alphanumeric display and 5 key keypad for installation menu and data display
- Pulse rate output
- RS232 digital communication port with a DB9 connector
- Totalizer start/stop and rest control lines.
- Remote PC installation menu
- ZeroMatic Path automatically sets zero
- Bidirectional flow operation
- 1 MByte data logger with both site & data logger storage
- Menu language in English, Spanish, German, Italian and French

#### Technical specifications

##### Input

Flow range	$\pm 12$ m/s ( $\pm 40$ ft/s), bi-directional
Flow sensitivity	0.0003 m/s (0.001 ft/s) flow rate independent

##### Digital Inputs

Totalizer Hold	Optically isolated diode Input voltage: 2 ... 10 V DC
Totalizer Reset	Optically isolated diode Input voltage: 2 ... 10 V DC

##### Output

Current	<ul style="list-style-type: none"> <li>• 4 ... 20 mA (Isolated)</li> <li>• externally powered 10 ... 30 V DC</li> </ul>
Relay	<ul style="list-style-type: none"> <li>• Programmable Form C 250 mA</li> <li>• 30 V DC</li> <li>• 3 V A max</li> </ul>
Pulse rate <sup>1)</sup>	<ul style="list-style-type: none"> <li>• Optically isolated transistor 10 mA</li> <li>• 30 V DC max</li> </ul>

##### Accuracy

<ul style="list-style-type: none"> <li>• 4 ... 20 mA</li> <li>• Pulse, relay output</li> </ul>	for velocities $\geq 0.3$ m/s (1 ft/s)
Batch repeatability	$\pm 1.0\%$ ... $2.0\%$ of flow
Zero Drift	$\pm 0.5\%$ ... $1.0\%$ of flow
	$\pm 0.15\%$
Data refresh rate	0.1 % of rate; 0.0003 m/s (0.001 ft/s)
	5 Hz

##### Transmitter conditions

Operating temperature	-10 ... +50 °C (14 ... +122 °F)
Storage temperature	-20 ... +60 °C (-4 ... +140 °F)
Degree of protection	IP65 NEMA 4X

##### Design

Weight	1,4 kg (3.0 lbs)
Dimensions (W x H x D)	175 x 235 x 92 mm (6.89 x 9.25 x 3.62 inches)
Enclosure material	Polycarbonate

##### Power supply

	100 ... 240 V AC @ 15 VA or 11.5 ... 28.5 V DC @ 10 W
--	--

##### Certificates and approvals

Unclassified locations	UL, UL <sub>c</sub>
Classified locations	
CE	EMC Directive 2004/108/EC ATEX Directive 94/9/EC
C-TICK	

<sup>1)</sup> When used to represent flow rate (PGEN) the frequency can reach as high as 5000 Hz. When used to represent flow total it can reach 50 Hz.

**Standard MLFB for quick delivery on SITRANS FST020 (Basic)**
**Selection and Ordering data**

Order No.

**SITRANS FST020 (Basic)**

L) 7ME357 - 30 - 0

**Design**

IP65 (NEMA 4X ) wall mount

**Number of channels/ultrasonic paths**

Single channel

**Flowmeter functions and I/O configurations**

- With display and 1 additional analog output and SPST relay

**Meter power options**

100 ... 240 V AC

11.5 ... 28.5 V DC, 10 W max

**Sensor**

(includes pipe mounting kit for indicated max. OD listed)  
See "Sensor selection charts" for specifications.

no sensor

A2 universal	Trackmount and straps provided up to 75 mm (3")	A
B3 universal	Trackmount and straps provided up to 125 mm (5")	B
C3 universal	Mounting frame and straps provided up to 300 mm (13")	C
D3 universal	Mounting frame and straps provided up to 600 mm (24")	D
E2 universal	Mounting frame and straps provided up to 1200 mm (48") <sup>1)</sup>	E
For the following A1H to D4H sensors, temperature range is -40 ... 65 °C (-41 ... 150 °F), nominal 21 °C (70 °F)		F
C1H (high precision)	Mounting frame and straps provided up to 1200 mm (48")	M
C2H (high precision)	Mounting frame and straps provided up to 1200 mm (48")	N
D1H (high precision)	Mounting frame and straps provided up to 1200 mm (48") <sup>1)</sup>	P
D4H (high precision)	Mounting frame and straps provided up to 1200 mm (48") <sup>1)</sup>	R

**Sensor cables**

No sensor cable

6 m (20 ft) PVC Jacket (1 pr)

15 m (50 ft) PVC Jacket (1 pr)

30 m (100 ft) PVC Jacket

46 m (150 ft) PVC Jacket

91 m (300 ft) PVC Jacket

**Approvals**
UL, UL<sub>C</sub>, CE, C-TICK

Standard MLFB offering represents 2 to 3 weeks delivery time for quantities under 5.

<sup>1)</sup> Supplied spacer bar supports pipes up to 750 mm (30 inches). For pipes larger than 750 mm (30 inches) purchase also, spare part 7ME3960-OMS40 (1012BN-4).

L) Subject to export regulations AL: N, ECCN: 3A991X.

# Flow Measurement

## SITRANS F US Clamp-on

### SITRANS FST020 (Basic)

#### Selection and Ordering data

SITRANS FST020 (Basic) IP65 (NEMA 4x) L) 7ME3570-

3 0 - 0

#### Number of channels/ultrasonic paths

Single channel

1

#### Flowmeter functions and I/O configurations

- With display keypad 1x 4 ... 20 mA, 1x relay, 1x pulse/frequency, 2x digital input

H

#### Meter power options

100 ... 240 V AC

11.5 ... 28.5 V DC

A  
B

#### Sensor for channel 1<sup>1)</sup>

Including pipe mounting tracks for Sizes A & B universal sensors indented for pipe with a OD less than 125 mm (5") and mounting frame/spacer bars for sizes C, D & E universal sensors. Straps provided are for the indicated maximum OD listed below. Strap kits are available to accommodate larger pipes (refer to spare part list). Refer to "Sensor Selection Charts" for the sensor suitability of pipe size and wall thickness

no sensor

A2 universal Trackmount and straps provided up to 75 mm (3")

A

B3 universal Trackmount and straps provided up to 125 mm (5")

B

C3 universal Mounting frame and straps provided up to 330 mm (13")

C

D3 universal Mounting frame and straps provided up to 600 mm (24")

D

E2 universal Mounting frame and straps provided up to 1200 mm (48")

E

For the following A1H to D4H transducers, temperature range is -40 ... 65 °C (-41 ... 150 °F), nominal 21 °C (70 °F)

A2H (high precision) Trackmount and straps provided up to 75 mm (3")

F

A3H (high precision) Trackmount and straps provided up to 75 mm (5")

H

B1H (high precision) Trackmount and straps provided up to 125 mm (5")

J

B2H (high precision) Trackmount and straps provided up to 125 mm (5")

K

C1H (high precision) up to 600 min (24") with mounting hardware

L

C2H (high precision) up to 600 min (24") with mounting hardware

M

D1H (high precision) Mounting frame and straps provided up to 1200 mm (48")<sup>1)</sup>

N

D2H (high precision) Mounting frame and straps provided up to 1200 mm (48")<sup>1)</sup>

P

D4H (high precision) Mounting frame and straps provided up to 1200 mm (48")<sup>1)</sup>

Q

R

#### Selection and Ordering data

SITRANS FST020 (Basic) IP65 (NEMA 4x) L) 7ME3570-

3 0 - 0

High temperature sensor size 2 for up to 230 °C (446 °F) (30 to 200 mm diam. (1 to 8 inch diam.))

Z P 1 A

High temperature sensor size 3 for up to 230 °C (446 °F) (150 to 610 mm diam. 6 to 24 inch diam.))

Z P 1 B

High temperature sensor size 4 for up to 230 °C (446 °F) (400 to 1200 mm diam. (16 to 48 inch diam.))

Z P 1 C

#### Sensor cables (pair)

No sensor cable

A

6 m (20 ft) PVC Jacket

B

15 m (50 ft) PVC Jacket

C

30 m (100 ft) PVC Jacket

D

46 m (150 ft) PVC Jacket

E

61 m (200 ft) PVC Jacket

F

91 m (300 ft) PVC Jacket

G

6 m (20 ft) Plenum rated (Teflon jacket)

H

15 m (50 ft) Plenum rated (Teflon jacket)

J

30 m (100 ft) Plenum rated (Teflon jacket)

K

46 m (150 ft) Plenum rated (Teflon jacket)

L

61 m (200 ft) Plenum rated (Teflon jacket)

M

91 m (300 ft) Plenum rated (Teflon jacket)

N

91 m (300 ft) Plenum rated (Teflon jacket)

N

#### Approvals

UL, UL<sub>C</sub>, CE, C-TICK

0

<sup>1)</sup> Supplied spacer bar supports pipes up to 1050 mm (42"). For pipes larger than 1050 mm (42") purchase also, spare part 7ME3960-0MS40 (1012BN-4)

L) Subject to export regulations AL: N, ECCN: 3A991X.

# Flow Measurement

## SITRANS F US Clamp-on

### SITRANS FST020 (Basic)

Selection and Ordering data	Order code
<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s).	
Cable termination kit (for one cable pair) • Sensor cable termination for standard and plenum cable	<b>T01</b>
Wet flow transfer calibration (priced on request) 6 point calibration 2/water (Price per channel)	
• 2SS40 pipe	<b>D01</b>
• 3CS40 pipe	<b>D02</b>
• 4CS40 pipe	<b>D03</b>
• 4SS40 pipe	<b>D04</b>
• 6CS40 pipe	<b>D05</b>
• 6SS40 pipe	<b>D06</b>
• 6CS120 pipe	<b>D07</b>
• 8CS40 pipe	<b>D08</b>
• 8SS40 pipe	<b>D09</b>
• 8CS120 pipe	<b>D10</b>
• 10CS Standard pipe	<b>D11</b>
• 10CS40 pipe	<b>D12</b>
• 10SS40 pipe	<b>D13</b>
• 12CS Standard pipe	<b>D14</b>
• 12CS40 pipe	<b>D15</b>
• 14CS30 pipe	<b>D16</b>
• 14CS40 pipe	<b>D17</b>
• 16CS Standard pipe	<b>D18</b>
• 16CS40 pipe	<b>D19</b>
• 18CS Standard pipe	<b>D20</b>
• 20CS20 pipe	<b>D21</b>
• 20CS30 pipe	<b>D22</b>
• 24CS Standard pipe	<b>D23</b>
• 24CS20 pipe	<b>D24</b>
• 24CS30 pipe	<b>D25</b>
• 30CS Standard pipe	<b>D26</b>
• 36CS Standard pipe	<b>D27</b>
• Other pipe, other liquid, additional points, witness	<b>Y28</b>
Tag name plate • Stainless steel tags with 3.2 mm (0.13 inch) character size (68 characters max.)	<b>Y19</b>

#### MLFB example

##### Application example

A basic clamp-on meter is required for a DN 150 (6" schedule 40) carbon steel waste water line, with a pipe wall thickness of 7.1 mm (0.28"). Meter electronics are to be located in an instrumentation shed with available AC power. 36 m (120 ft) of sensor cable is needed to reach pipe location.

MLFB Order No.: **7ME3570-1HA300-ONE0**

Selection and Ordering data	Order No.	Ord. code
<b>SITRANS FST020 meter family</b> D)	<b>7ME3570-1HA300-ONE0</b>	
IP65 (NEMA 4X) enclosure	0	
Single channel	1	
Standard I/O option	H	
100 ... 240 V AC power option	A	
Sensor code for channel 1	N	
46 m (150 ft) sensor cable	E	

D) Subject to export regulations AL: N, ECCN: EAR99H.

Selection and Ordering data	Order code
<b>Operating Instructions for SITRANS FST020</b>	
English NEMA 4X	D) <b>A5E03086487</b>
German NEMA 4X	<b>A5E03086488</b>
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: <a href="http://www.siemens.com/flowdocumentation">http://www.siemens.com/flowdocumentation</a>	

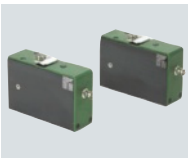










#### Universal sensor selection chart

Based on pipe size (pipes other than steel)					
Pipe size	Order Code	Outer diameter range (mm)		Outer diameter range (inches)	
		min.	max.	min.	max.
A2	<b>B</b>	12,7	50,8	0.5	2
B3	<b>C</b>	19	127	0.75	5
C3	<b>D</b>	51	305	2	12
D3	<b>E</b>	203	610	8	24
E2	<b>F</b>	254	6096	10	249

#### High precision sensor selection chart

Based on pipe wall thickness (steel pipes only)					
Pipe Wall	Order Code	Pipe Wall [mm]		Pipe Wall [inches]	
		min.	max.	min.	max.
A1H	<b>G</b>	0,64	1,02	0.025	0.04
A2H	<b>H</b>	1,02	1,52	0.04	0.06
A3H	<b>J</b>	1,52	2,03	0.06	0.08
B1H	<b>K</b>	2,03	3,05	0.08	0.12
B2H	<b>L</b>	3,05	4,06	0.12	0.16
C1H	<b>M</b>	4,06	5,84	0.16	0.23
C2H	<b>N</b>	5,84	8,13	0.23	0.32
D1H	<b>P</b>	8,13	11,18	0.32	0.44
D2H	<b>Q</b>	11,18	15,75	0.44	0.62
D4H	<b>R</b>	15,75	31,75	0.62	1.25





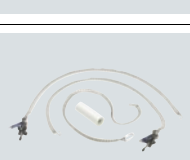


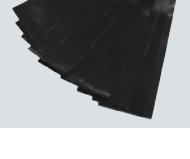
## Accessories/Spare parts for clamp-on ultrasonic flowmeters

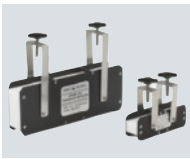

Description	Order No.		Description	Order No.	
<b>Universal Portable Sensors</b> Selected generally for portable systems where a wide variety of pipes are to be measured. Since they are selected based on diameter only, a wide range of pipe sizes and materials can be covered with a minimum number of sensors. These can also be selected as a cost savings on applications where standard accuracy is sufficient.	D) 7ME3951-...		<b>Mounting Frames</b> These items are useful in simplifying sensor installation. They are strapped to the pipe first then the sensors are installed, making the installation less cumbersome and more precise. They also enable easy repeated mounting of the sensors assuring conformation to the original sensor positioning. They may be left in place at each measurement location where periodic flow surveys are conducted to simplify subsequent installations and ensure repeatable results.	D) 7ME3960-...	
<b>High Precision Sensors</b> Selected generally for dedicated meters since the need to cover a range of pipes is not a requirement. They provide the highest accuracy achievable by the meters and therefore should be selected whenever higher accuracy/repeatability is required. They are only applicable to steel pipes but no other metals, and are selected solely by wall thickness.	D) 7ME3950-...		<b>Spacer Bars</b> Sensors are required to be mounted at a set distance from each other as determined by pipe size and medium being measured. The spacer bar simplifies this requirement by eliminating the need to undertake a precise dimensional measurement. The flowmeter will specify a specific spacing index which is easily accommodated with the marked indices on the bar.	D) 7ME3960-...	
<b>High Temperature Sensors</b> Are selected whenever pipe temperature will exceed 250 °F (120 °C) up to a maximum of 450 °F (232 °C). They are universal type and can therefore be used on any pipe material and are selected by pipe diameter.	D) 7ME3950-...		<b>Clamp-On RTD's</b> 1000 Ω platinum RTD's for use where temperature is required. Used with Energy Meters to record supply/return temperature. For this purpose precision matched pairs (to 0.02 °C) are supplied. Single RTD's are also used with SITRANS FUH and SITRANS FUG meters to enable live calculations of "Liquid" and Standard Volume Correction.	D) 7ME3950-...	
<b>Weld Seal Mount</b> These provide the most secure and strongest mounting of the flow sensors. They are generally selected for "High End" meter types where maximum performance criteria applies. They accommodate high precision sensors designed to mount inside these enclosures. May be welded to the pipe if so desired by the customer. They come in 2-piece or 1-piece configurations depending upon the application pipe size and type (Liquid/Gas).	D) 7ME3960-...		<b>Insert RTD's</b> Are identical to clamp-on RTD's as described above except that they are inserted into the pipe (In a Thermowell). They provide more precise and quicker responding temperature measurement. They are selected when precise temperature measurement of the actual liquid or gas is required as opposed to pipe "skin temperature". Since they project into the pipe they cannot be used in pipeline that undergo periodic "pigging".	D) 7ME3950-...	
<b>Mounting tracks</b> Typically used on smaller pipes for easier and more stable mounting for dedicated universal style sensor size A or B, also available for dedicated high precision sensor size A or B.	D) 7ME3960-...		<b>Standard Cable (Flow Sensor or RTD)</b> Selected for general purpose installations where no special application requirements exist.	D) 7ME3960-...	
			<b>Submersible Cable (Flow Sensor)</b> Polyethylene jacketed, for locations that experience periodic or continual submersion of the flow sensors.	D) 7ME3960-...	

# Flow Measurement

## SITRANS F US Clamp-on

### Accessories/Spare parts

Description	Order No.	
<b>Plenum Cable (Flow Sensor or RTD)</b> For temperatures above 180 °F. Teflon jacketed to withstand high temperatures, is used when high temp sensors are specified.	D) 7ME3960-...	
<b>Armored Cable (Flow Sensor)</b> Double shielded cable, selected when cable will not be installed in conduit between meter and sensors.	D) 7ME3960-...	
<b>Temperature sensor cable</b> Cable to connect field installed RTD to flow meter, available in Teflon wrapped, plenum or submersible grade. Typically used for SITRANS FUE, FUH and FUG series meters where a temperature sensor is employed.	D) 7ME3960-...	
<b>Straps</b> Used to fasten sensors or mounting frames to pipe for dedicated meter installations. Stainless steel construction for corrosion resistance.	D) 7ME3960-...	
<b>Chains (EZ clamps)</b> Used to fasten portable sensors or mounting frames to pipe. Thumbscrews eliminate need for hand tools when mounting sensors, and allow for easy on/off operations.	D) 7ME3960-...	
<b>Ultrasonic Couplant</b> Fills any voids between sensor emitting surface and pipe wall to allow maximum energy transfer between sensor and pipe. Several different types of couplants are employed as determined by the application conditions and type of installation (Temporary or permanent).	D) 7ME3960-...	
<b>Dry Couplant</b> The dry coupling pad is intended for use in any liquid, clamp-on transit time or Doppler applications that require a more durable coupling material. Installation is easy by simply placing one strip of material between sensor and pipe. Not intended for clamp-on gas where damping material is used. The temperature range is -34 to +200 °C (-30 to +392 °F).	D) 7ME3960-...	
<b>Damping Material</b> Used with gas meters, and required as part of their sensor installation. This material absorbs excess ultrasonic energy from the pipe wall to enable the meter to detect and operate with low amplitude sensor signals normally associated with Clamp-on Gas applications.	D) 7ME3960-...	

Description	Order No.	
<b>Test Block</b> Used for checking operation of a meter and sensors prior to a field installation, or as a troubleshooting tool. Selected by sensor size, each block accommodates 2 sensor sizes. Available only for universal sensors.	D) 7ME3960-...	
<b>Termination Kit (Flow Sensor or RTD)</b> Provides the connectors, labels and shrink tubing or other associated hardware to complete the termination of a specific cable type. These can be provided in cases where users will be purchasing bulk cable directly and cutting to length at their site, or when existing cable length is to be altered. Selected by cable type.	D) 7ME3960-...	

Selection and Ordering data	Order No.
<i>Spare parts (System)</i>	
<b>SITRANS F US clamp-on</b>	<b>7ME 3 9 4 0 -</b>
<b>Power supplies, batteries and chargers</b>	
Power supply 90 ... 240 V AC	
• for IP65 (NEMA 4X) wall mount or IP66 (NEMA 7) wall mount explosionproof	D) <b>0 PA 0 0</b>
• for IP65 (NEMA 7) compact explosionproof	D) <b>2 PA 0 0</b>
Power supply 9 ... 36 V DC	
• for IP65 (NEMA 4X) wall mount or IP66 (NEMA7) wall mount explosionproof	K) <b>0 PB 0 0</b>
• negative ground for NEMA 7 compact explosionproof	D) <b>2 PJ 0 0</b>
• positive ground for NEMA 7 compact explosionproof	D) <b>2 PK 0 0</b>
Portable meter batteries and accessories	
• Internal battery (Portable meters only)	D) <b>3 PP 0 0</b>
IP67 Portable meter charger	
• Type A for Europe (CEE7/7)	D) <b>3 PC 0 0</b>
• Type C for Australia (AS3112)	D) <b>3 PD 0 0</b>
• Type D for UK (BS1363)	D) <b>3 PE 0 0</b>
• Type J for Japan (JIS8303)	D) <b>3 PF 0 0</b>
• Type K for US (NEMA 5-15P)	D) <b>3 PG 0 0</b>
• Type L for Switzerland (SEV1011)	D) <b>3 PH 0 0</b>
IP40 Portable meter charger	
• Type A for Europe (CEE7/7)	D) <b>4 PC 0 0</b>
• Type C for Australia (AS3112)	D) <b>4 PD 0 0</b>
• Type D for UK (BS1363)	D) <b>4 PE 0 0</b>
• Type J for Japan (JIS8303)	D) <b>4 PF 0 0</b>
• Type K for US (NEMA 5-15P)	D) <b>4 PG 0 0</b>
• Type L for Switzerland (SEV1011)	D) <b>4 PH 0 0</b>
<b>MODBUS system computer modules</b>	
MODBUS converter module	D) <b>CQO-1015N-5M</b>
Mounting kit (type 1) for MODBUS converter module	D) <b>CQO-1015N-5M-MK1</b>
Mounting kit (type 2) for MODBUS converter module	D) <b>CQO-1015N-5M-MK2</b>
Mounting kit (type 3) for MODBUS converter module	D) <b>CQO-1015N-5M-MK3</b>
Field configuration kit with manual, for MODBUS converter module	D) <b>CQO-1015N-5M-FK1</b>
<b>Pipe mounting brackets</b>	
2 inch pipe mounting bracket for IP65 (NEMA 7) compact explosionproof	D) <b>CQO-1012XMB-1</b>
2 inch pipe mounting bracket for IP65 (NEMA 4X) wall mount	D) <b>CQO-1012NMB-1</b>

D) Subject to export regulations AL: N, ECCN: EAR99H.

K) Subject to export regulations AL: N, ECCN: 5A991X.

# Flow Measurement

## SITRANS F US Clamp-on

### Accessories/Spare parts

Selection and Ordering data	Order No.
<i>Spare parts (Sensors)</i>	
<b>SITRANS F US clamp-on</b>	
<b>Meter type</b>	
Dedicated (SITRANS FUS1010, FUG1010, FUH1010, FUE1010)	D) <b>7ME3950</b> - ■■■■
Portable (SITRANS FUP1010 or FUE1010)	D) <b>7ME3951-0</b> ■■■■
<b>Approvals</b>	
UL, ULc, CE (Portable only)	<b>0</b>
FM/CSA hazardous (classified) locations	<b>1</b>
ATEX Ex II 1G Ex ia IIC T5 (not for RTDs)	<b>2</b>
INMETRO (not for RTDs)	<b>3</b>
<b>Spare sensor code</b>	
<u>For liquid flow sensors pipe ranges please refer to sensor selection chart in the SITRANS FUS1010 section</u>	
<u>Liquid flow sensors for use with mounting frames or tracks (including portable)</u>	
A2 universal	<b>LB00</b>
B3 universal	<b>LC00</b>
C3 universal	<b>LD00</b>
D3 universal	<b>LE00</b>
E2 universal	<b>LF00</b>
A1H (high precision)	<b>LG00</b>
A2H (high precision)	<b>LH00</b>
A3H (high precision)	<b>LJ00</b>
B1H (high precision)	<b>LK00</b>
B2H (high precision)	<b>LL00</b>
B3H (high precision)	<b>LT00</b>
C1H (high precision)	<b>LM00</b>
C2H (high precision)	<b>LN00</b>
D1H (high precision)	<b>LP00</b>
D2H (high precision)	<b>LQ00</b>
D3H (high precision)	<b>LU00</b>
D4H (high precision)	<b>LR00</b>
Doppler	<b>LS00</b>
<u>High precision liquid sensor for weld seal enclosures</u>	
C1H (high precision, weld seal)	<b>SM00</b>
C2H (high precision, weld seal)	<b>SN00</b>
D1H (high precision, weld seal)	<b>SP00</b>
D2H (high precision, weld seal)	<b>SQ00</b>
D3H (high precision, weld seal)	<b>SU00</b>
D4H (high precision, weld seal)	<b>SR00</b>

Selection and Ordering data	Order No.
<i>Spare parts (Sensors)</i>	
<b>SITRANS F US clamp-on</b>	
<b>Meter type</b>	
Dedicated (SITRANS FUS1010, FUG1010, FUH1010, FUE1010)	D) <b>7ME3950</b> - ■■■■
Portable (SITRANS FUP1010 or FUE1010)	D) <b>7ME3951-0</b> ■■■■
<u>High temperature universal liquid sensors</u>	
Note: not available with INMETRO approval	
High temp. sensor size 1 for up to 230 °C (12.7 to 100 mm diam.)	<b>LA10</b>
High temp. sensor size 2 for up to 230 °C (30 to 200 mm diam.)	<b>LA20</b>
High temp. sensor size 3 for up to 230 °C (150 to 600 diam.)	<b>LA30</b>
High temp. sensor size 4 for up to 230 °C (400 to 1200 diam.)	<b>LA40</b>
<u>For gas flow sensors pipe ranges please refer to sensor selection chart in the SITRANS FUG1010 section</u>	
<u>High precision gas flow sensors for use with mounting frames or tracks</u>	
B1H (high precision)	<b>GK00</b>
B2H (high precision)	<b>GL00</b>
B3H (high precision)	<b>GT00</b>
C1H (high precision)	<b>GM00</b>
C2H (high precision)	<b>GN00</b>
D1H (high precision)	<b>GP00</b>
D2H (high precision)	<b>GQ00</b>
D3H (high precision)	<b>GU00</b>
D4H (high precision)	<b>GR00</b>
<u>High precision gas sensor for weld seal enclosures</u>	
C1H (high precision, weld seal)	<b>HM00</b>
C2H (high precision, weld seal)	<b>HN00</b>
D1H (high precision, weld seal)	<b>HP00</b>
D2H (high precision, weld seal)	<b>HQ00</b>
D3H (high precision, weld seal)	<b>HU00</b>
D4H (high precision, weld seal)	<b>HR00</b>
D) Subject to export regulations AL: N, ECCN: EAR99H	

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Selection and Ordering data	Order No.	Selection and Ordering data	Order No.
<b>Spare parts (Sensors)</b>		<b>Spare parts (Miscellaneous)</b>	
<b>SITRANS F US clamp-on</b>		<b>SITRANS F US clamp-on</b>	D) <b>7ME3960 -</b>
<b>Meter type</b>		<b>Meter design</b>	
Dedicated (SITRANS FUS1010, FUG1010, FUH1010, FUE1010)	D) <b>7ME3950 -</b>	IP65 (NEMA 4X) wall mount or IP66 (NEMA 7) wall mount explosionproof	<b>0</b>
Portable (SITRANS FUP1010 or FUE1010)	D) <b>7ME3951 - 0</b>	IP65 (NEMA 7) compact	<b>2</b>
<u>Standard RTD sensors (not for energy systems)</u>		IP67 weatherproof portable	<b>3</b>
Standard clamp-on RTD	<b>1TA00</b>	IP40 (NEMA 1) Portable	<b>4</b>
Submersible clamp-on RTD (not for Portable)	<b>1TB00</b>	<b>Dedicated sensor mounting hardware</b>	
Insertion style RTD pair (size 1), 140 mm (5.5 inch)	<b>1TJ00</b>	Sensor mounting tracks (aluminium with mounting straps) for pipes < 125 mm (5 inch)	
Insertion style RTD pair (size 2), 216 mm (8.5 inch)	<b>1TJ01</b>	• Universal sensor size A or B	<b>0MA00</b>
Insertion style RTD pair (size 3), 292 mm (11.5 inch)	<b>1TJ02</b>	• High precision sensor size A or B	<b>0MB00</b>
Insertion style RTD pair (size 4), 368 mm (14.5 inch)	<b>1TJ03</b>	Sensor mounting frames for	
<u>Standard for energy system (matched pair)</u>		• Universal sensor size B (for pipes > 125 mm (5 inch))	D) <b>CQO-1012FN-PB</b>
Standard clamp-on RTD	<b>1TA10</b>	• Universal sensor size C	<b>0MC00</b>
Insertion style RTD pair (size 1) for SITRANS FUE1010, 140 mm (5.5 inch)	<b>1TJ10</b>	• Universal sensor size D	<b>0MC01</b>
Insertion style RTD pair (size 2) for SITRANS FUE1010, 216 mm (8.5 inch)	<b>1TJ11</b>	• Universal sensor size E	<b>0MC02</b>
Insertion style RTD pair (size 3) for SITRANS FUE1010, 292 mm (11.5 inch)	<b>1TJ12</b>	• High precision sensor size B (for pipes > 125 mm (5 inch))	D) <b>CQO-1012FNH-PB</b>
Insertion style RTD pair (size 4) for SITRANS FUE1010, 368 mm (14.5 inch)	<b>1TJ13</b>	• High precision sensor size C	<b>0MD00</b>
1) Supplied spacer bar supports pipes up to 750 mm (30 inches). For pipes larger than 750 mm (30 inches) purchase also, spare part 7ME3960-0MS40 (1012-BN-4)		• High precision sensor size D	<b>0MD01</b>
D) Subject to export regulations AL: N, ECCN: EAR99H.		Mounting straps for mounting frames (slotted stainless steel)	
		• For pipes from DN 50 to DN 150	<b>0SM00</b>
		• For pipes from DN 50 to DN 300	<b>0SM10</b>
		• For pipes from DN 300 to DN 600	<b>0SM20</b>
		• For pipes from DN 600 to DN 1200	<b>0SM30</b>
		• For pipes from DN 1200 to DN 1500	<b>0SM40</b>
		• For pipes from DN 1500 to DN 2100	<b>0SM50</b>
		• For pipes from DN 2100 to DN 3000	<b>0SM60</b>
		Spacer bars (for indexing sensors on pipe)	
		• Spacer bars for pipes to 200 mm/8 inch (liquid), 600 mm / 24 inch (gas)	<b>0MS10</b>
		• Spacer bars for pipes to 500 mm/20 inch (liquid), DN 1200 / 48 inch (gas)	<b>0MS20</b>
		• Spacer bars for pipes to 800 mm/32 inch (liquid)	<b>0MS30</b>
		• Spacer bars for pipes to 1200 mm/48 inch (liquid) Only use in conjunction with 7ME3960-0MS30	<b>0MS40</b>
		Weld seal mounting enclosures for liquid and gas sensors	
		• Single enclosure for size C high precision	<b>0WS20</b>
		• Single enclosure for size D high precision	<b>0WS30</b>
		• Single enclosure for size E universal	<b>0WS40</b>
		• Dual enclosure for size C high precision	<b>0WD20</b>
		• Dual enclosure for size D high precision	<b>0WD30</b>
		• Dual enclosure for size E universal	<b>0WD40</b>

# Flow Measurement

## SITRANS F US Clamp-on

### Accessories/Spare parts

Selection and Ordering data	Order No.
<i>Spare parts (Miscellaneous)</i>	
<b>SITRANS F US clamp-on</b>	D) <b>7ME3960 -</b>
Stainless steel straps for weld seal enclosure mounting	
• Mounting strap for pipe diameter to 300 mm (13 inch)	<b>0SM01</b>
• Mounting strap for pipe diameter to 600 mm (24 inch)	<b>0SM11</b>
• Mounting strap for pipe diameter to 1200 mm (48 inch)	<b>0SM21</b>
• Mounting strap for pipe diameter to 1500 mm (60 inch)	<b>0SM31</b>
• Mounting strap for pipe diameter to 2130 mm (84 inch)	<b>0SM41</b>
• Mounting strap for pipe diameter to 3050 mm (120 inch)	<b>0SM51</b>
Stainless mounting tracks for high temp 991 sensors	
• Size 1 high temp sensor pair	D) <b>CQO-992MTNHMSH-1</b>
• Size 2 high temp sensor pair	D) <b>CQO-992MTNHMSH-2</b>
• Size 3 high temp sensor pair	D) <b>CQO-992MTNHMSH-3</b>
• Size 4 high temp sensor pair	D) <b>CQO-992MTNHMSH-4</b>
Clamp-on RTD mounting hardware for dedicated systems	
• RTD mounting hardware for dedicated system: 152 to 610 mm (6 to 24 inch)	<b>0MR00</b>
• RTD mounting hardware for dedicated system: 12.7 to 50.8 mm (0.5 to 2 inch)	<b>0MR01</b>
• RTD mounting hardware for dedicated system: 31.8 to 203.2 mm (1.25 to 8 inch)	<b>0MR02</b>
• RTD mounting hardware for dedicated system: 508 to 1219 mm (20 to 48 inch)	<b>0MR04</b>
• Junction box for clamp on RTD's	D) <b>CQO-992ECJ</b>
<b>Portable sensor mounting hardware</b>	
Sensor mounting tracks for portable sensors (aluminum with mounting chains) for pipes < 125 mm (5 inch) for	
• Universal sensor size A or B	<b>3MA00</b>
• High precision sensor size A or B	<b>3MB00</b>
Sensor mounting frames	
• Universal sensor size B (for pipes >125 mm (5 inch))	D) <b>CQO-1012FP-PB</b>
• Universal sensor size C	<b>3MC00</b>
• Universal sensor size D	<b>3MC01</b>
• Universal sensor size E	<b>3MC02</b>
• High precision sensor size B (for pipes > 125 mm (5 inch))	D) <b>CQO-1012FPH-PB</b>
• High precision sensor size C	<b>3MD00</b>
• High precision sensor size D	<b>3MD01</b>
Spacer bar (for indexing portable sensors)	<b>3MS00</b>
Mounting chain and EZ clamp hardware	
• EZ clamp hardware set for DN 25 to DN 600 (1 to 24 inch); handles all transducers except "D" size HP and "E" size univ.	D) <b>CQO-1012Z-1</b>
• EZ clamp hardware set for DN 25 to DN 600 (1 to 24 inch) for "D" size HP and "E" size universal	D) <b>CQO-1012Z-2</b>
• Mounting chain for portable sensors: 4 x 760 mm lengths	<b>3CM10</b>
• Mounting chain for portable sensors: 2 x 760 mm and 2 x 1500 mm lengths	<b>3CM20</b>

Selection and Ordering data	Order No.
<i>Spare parts (Miscellaneous)</i>	
<b>SITRANS F US clamp-on</b>	D) <b>7ME3960 -</b>
RTD mounting hardware for portable system	<b>3MR00</b>
Sensor connector adaptors	
• "F" connector to BNC adapter (order 2 per sensor set)	D) <b>CQO-1012NFPA</b>
SITRANS FST020 Sensor trackmounts	
• Single enclosure mounting track for "A" size Xdcr pair, Reflect	D) <b>CQO-1022A1R</b>
• Single enclosure mounting track for "B" size Xdcr pair, Reflect	D) <b>CQO-1022B1R</b>
• Dual enclosure mounting track for "B" size Xdcr pair, Reflect/Direct	D) <b>CQO-1022B2R</b>
• Single enclosure mounting track for "C" size Xdcr pair, Reflect	D) <b>CQO-1022C1R</b>
• Dual enclosure mounting track for "C" size Xdcr pair, Reflect/Direct	D) <b>CQO-1022C2R</b>
• Dual enclosure mounting track for "D" size Xdcr pair, Reflect/Direct	D) <b>CQO-1022D2R</b>
D) Subject to export regulations AL: N, ECCN: EAR99H.	

# Flow Measurement

## SITRANS F US Clamp-on

### Accessories/Spare parts

Selection and Ordering data	Order No.	Selection and Ordering data	Order No.
<i>Spare parts (Miscellaneous)</i>		<i>Spare parts (Miscellaneous)</i>	
<b>SITRANS F US clamp-on</b>	D) <b>7ME3960 -</b>	<b>SITRANS F US clamp-on</b>	D) <b>7ME3960 -</b>
<b>Insert RTD Thermowells</b>		<b>Ultrasonic couplants</b>	
• Thermowell std. duty uninsulated pipe 140 mm (5.5 inch)	D) <b>CQO-1012TW-1</b>	• Temporary water based for portable systems: 350 ml (12 oz): -34 ... +38 °C (-30 ... +100 °F)	<b>0UC10</b>
• Thermowell std. duty uninsulated pipe 216 mm (8.5 inch)	D) <b>CQO-1012TW-2</b>	• Permanent synthetic polymer based: 90 ml (3 oz) -40 ... +190 °C (-40 ... +375 °F)	<b>0UC20</b>
• Thermowell std. duty uninsulated pipe 292 mm (11.5 inch)	D) <b>CQO-1012TW-3</b>	• Permanent high temp fluoroether: 12 ml (0.4 oz): -40 ... +230 °C (-40 ... +450 °F)	<b>0UC30</b>
• Thermowell std. duty with lagging 140 mm (5.5 inch)	D) <b>CQO-1012TW-1L</b>	• Permanent high temp fluoroether: 163 ml (5.5 oz): -40 ... +230 °C (-40 ... +450 °F)	<b>0UC50</b>
• Thermowell std. duty with lagging 216 mm (8.5 inch)	D) <b>CQO-1012TW-2L</b>	• Permanent vulcanizing silicone rubber couplant: 90 ml (3 oz): -40 ... +120 °C (-40 ... +250 °F)	D) <b>CQO-CC112</b>
• Thermowell std. duty with lagging 292 mm (11.5 inch)	D) <b>CQO-1012TW-3L</b>	• Permanent high temp silicone grease: 12 ml (0.4 oz): -40 ... +230 °C (-40 ... +450 °F)	D) <b>CQO-CC117</b>
<b>Sensor cables for</b> (Use "Sensor cable selection chart" to complete Order No. with ##)		• Permanent high temp silicone grease: 150 ml (5 oz): -40 ... +230 °C (-40 ... +450 °F)	D) <b>CQO-CC117A</b>
• IP65 (NEMA 4X) wall mount or IP 66 (NEMA 7) wall mount explosionproof	<b>0CK##</b>	• Couplant for submersible sensor applications	D) <b>CQO-CC120</b>
• IP65 (NEMA 7) compact explosionproof	<b>2CK##</b>	• Dry coupling pads (qty of 10): -34 to +200 °C (-30 to +392 °F)	<b>0UC40</b>
• IP67 Weatherproof portable	<b>3CK##</b>	<b>Pipe damping films for SITRANS FUG gas systems</b>	
• IP40 (NEMA 1) Portable	<b>4CK##</b>	• B1, B2, B3, C1 and C2 sensors	<b>0DM10</b>
<b>RTD cables for</b> (Use "Sensor cable selection chart" to complete Order No. with ##)		• D1 and D3 sensors	<b>0DM20</b>
• All dedicated systems	<b>0CR##</b>	• D2 sensor	<b>0DM30</b>
• IP67 Weatherproof portable	<b>3CR##</b>	• D4 sensor	<b>0DM40</b>
• IP40 (NEMA 1) Portable	<b>4CR##</b>	<b>Serial RS232 Cables and I/O Adapters</b>	
<b>Dedicated cable termination kits</b>		• RS232 Cable for all dedicated meters	<b>0CS00</b>
• Standard, plenum and armored sensor cable (NEMA 4X wall mount and NEMA 7 wall mount explosionproof)	<b>0CT01</b>	• RS232 Cable for IP66 weatherproof portable meter	<b>3CS00</b>
• Submersible sensor cable (NEMA 4X wall mount and NEMA 7 wall mount explosionproof)	<b>0CT11</b>	• RS232 Cable for IP40 Portable meter	<b>4CS00</b>
• Standard and plenum sensor cable (SITRANS FST020)	<b>1CT01</b>	• I/O adapter for IP66 Weatherproof portable meter	<b>3AD00</b>
• Standard, plenum and armored sensor cable (NEMA 7 compact explosionproof)	<b>2CT01</b>	<b>Universal Sensor Test Blocks</b>	
• Submersible sensor cable (NEMA 7 compact explosionproof)	<b>2CT11</b>	• Test block for size A and B universal sensors	<b>0TB10</b>
• Clamp-on RTD cable termination kit for standard RTD	<b>0CT21</b>	• Test block for size C and D universal sensors	<b>0TB20</b>
• Clamp-on RTD cable termination kit for submersible RTD	<b>0CT31</b>	<b>Field Manuals</b>	
• Insert RTD cable termination kit	<b>0CT41</b>	• CD with documentation for SITRANS F US Clamp-on ultrasonic flowmeters (English)	D) <b>A5E02830664-03</b>

D) Subject to export regulations AL: N, ECCN: EAR99H.

# Flow Measurement

## SITRANS F US Clamp-on

### Accessories/Spare parts

#### Sensor cable selection chart (Dedicated, pair)

Sensor cable codes for length and type options				
Cable length m (ft)	Standard -40...+80 °C (-40...+176 °F)	Submersible -40...+80 °C (-40...+176 °F)	Plenum -40...+200 °C (-40...+392 °F)	Armored -40...+80 °C (-40...+176 °F)
Order code				
6 (20)	<b>K01</b>	<b>K11</b>	<b>K21</b>	<b>K31</b>
15 (50)	<b>K02</b>	<b>K12</b>	<b>K22</b>	<b>K32</b>
30 (100)	<b>K03</b>	<b>K13</b>	<b>K23</b>	<b>K33</b>
46 (150)	<b>K04</b>	<b>K14</b>	<b>K24</b>	<b>K34</b>
61 (200)	<b>K05</b>	<b>K15</b>	<b>K25</b>	<b>K35</b>
91 (300)	<b>K06</b>	<b>K16</b>	<b>K26</b>	<b>K36</b>

#### Sensor cable selection chart (SITRANS FUP1010, FUE1010 Portable, pair)

Sensor cable codes for length and type options		
Cable length m (ft)	Standard -40 ... + 80 °C (-40 ... +176 °F)	Plenum -40 ... + 200 °C (-40 ... +392 °F)
Order Code		
6 (20)	<b>K01</b>	<b>K21</b>
15 (50)	<b>K02</b>	<b>K22</b>
30 (100)	<b>K03</b>	<b>K23</b>

#### RTD cable selection chart (Dedicated, each)

RTD cable codes for length and type				
Cable length m (ft)	Standard -40 ... +200 °C (-40 ... +392 °F)	Submersible -40 ... +200 °C (-40 ... +392 °F)	for insert RTD -40 ... +200 °C (-40 ... 392 °F)	for submersible insert RTD -40 ... +200 °C (-40 ... 392 °F)
Order code				
6 (20)	<b>R01</b>	<b>R11</b>	<b>R21</b>	<b>R31</b>
15 (50)	<b>R02</b>	<b>R12</b>	<b>R22</b>	<b>R32</b>
30 (100)	<b>R03</b>	<b>R13</b>	<b>R23</b>	<b>R33</b>
46 (150)	<b>R04</b>	<b>R14</b>	<b>R24</b>	<b>R34</b>
61 (200)	<b>R05</b>	<b>R15</b>	<b>R25</b>	<b>R35</b>
91 (300)	<b>R06</b>	<b>R16</b>	<b>R26</b>	<b>R36</b>

#### RTD cable selection chart (SITRANS FUP1010, FUE1010 Portable, each)

RTD cable codes for length and type options	
Cable length m (ft)	IP67 -40 ... + 200 °C (-40 ... +392 °F)
Order Code	
6 (20)	<b>R11</b>
15 (50)	<b>R12</b>
30 (100)	<b>R13</b>

#### Accessories - Standard MLFB offering

Description	Order No.
Insert RTD size 1	D) <b>7ME3950-1TJ10</b>
Thermowell size 1 w/lagging	D) <b>CQO:1012TW-1L</b>
EZ Clamp 1 ... 24 inch	D) <b>CQO:1012Z-1</b>
Junction Box for Clamp RTD	D) <b>CQO:992ECJ</b>
Term kit standard, Plenum, Armored sensor cable	D) <b>7ME3960-0CT01</b>
Term kit Submersible sensor cable	D) <b>7ME3960-0CT11</b>
C1 Weld seal	D) <b>7ME3960-0WS20</b>
D1 Weld Seal	D) <b>7ME3960-0WS30</b>
C2 Weld Seal	D) <b>7ME3960-0WD20</b>
D2 Weld Seal	D) <b>7ME3960-0WD30</b>
Straps size 2	D) <b>7ME3960-0SM11</b>
Straps size 3	D) <b>7ME3960-0SM21</b>
Straps size 4	D) <b>7ME3960-0SM31</b>
Weld seal sensors C2 FM	D) <b>7ME3950-1SN00</b>
Weld seal sensors D1 FM	D) <b>7ME3950-1SP00</b>
Weld seal sensors D2 FM	D) <b>7ME3950-1SQ00</b>
Weld seal sensors D4 FM	D) <b>7ME3950-1SR00</b>
Weld seal sensors C2 ATEX	D) <b>7ME3950-2SN00</b>
Weld seal sensors D1 ATEX	D) <b>7ME3950-2SP00</b>
Weld seal sensors D2 ATEX	D) <b>7ME3950-2SQ00</b>
Weld seal sensors D4 ATEX	D) <b>7ME3950-2SR00</b>
Weld seal sensors Gas C2 FM	D) <b>7ME3950-1HN00</b>
Weld seal sensors Gas D1 FM	D) <b>7ME3950-1HP00</b>
Weld seal sensors Gas D2 FM	D) <b>7ME3950-1HQ00</b>
Weld seal sensors Gas D4 FM	D) <b>7ME3950-1HR00</b>
Weld seal sensors Gas C2 ATEX	D) <b>7ME3950-2HN00</b>
Weld seal sensors Gas D1 ATEX	D) <b>7ME3950-2HP00</b>
Weld seal sensors Gas D2 ATEX	D) <b>7ME3950-2HQ00</b>
Weld seal sensors Gas D4 ATEX	D) <b>7ME3950-2HR00</b>

Standard MLFB product offering represents 4 to 6 weeks delivery time.

D) Subject to export regulations AL: N, ECCN: EAR99H.