

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 $\pm 1.0\%$ to 2.0% 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

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 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	± 12 m/s (± 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"> • 4 ... 20 mA (Isolated) • externally powered 10 ... 30 V DC
Relay	<ul style="list-style-type: none"> • Programmable Form C 250 mA • 30 V DC • 3 V A max
Pulse rate	<ul style="list-style-type: none"> • Optically isolated transistor 10 mA • 30 V DC max
Accuracy	
Accuracy	$\pm 1.0\%$... 2.0% of flow, for velocities greater than 0.3 m/s (1 ft/s)
Batch repeatability	$\pm 0.15\%$
Zero Drift	0.1 % of rate; 0.0003 m/s (0.001 ft/s)
Data refresh rate	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 _C
Classified locations	
CE	EMC Directive 2004/108/EC LVD Directive 2006/95/EG C-TICK

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Standard MLFB for quick delivery on SITRANS FST020 (Dedicated basic standard)

Selection and Ordering data	Order No.	Order code
SITRANS FST020 Basic Clamp-on	L) 7ME357 - 30 - 0	K02 + K02 +
Design		
IP65 (NEMA 4x)	0	
Number of channels/ultrasonic paths		
Single channel	1	
Flowmeter functions and I/O configurations		
• With display and 1 additional analog output and SPST relay	H	
Meter power options		
100... 240 V AC	A	
11.5 ... 28.5 V DC, 10 W max	B	
Sensor (includes pipe mounting kit for indicated max. OD listed) See „Sensor selection charts“ for specifications.		
no sensor		A
A2 universal	Trackmount and straps provided up to 75 mm (3")	B
B3 universal	Trackmount and straps provided up to 125 mm (5")	C
C3 universal	Mounting frame and straps provided up to 300 mm (13")	D
D3 universal	Mounting frame and straps provided up to 600 mm (24")	E
E2 universal	Mounting frame and straps provided up to 1200 mm (48") ¹⁾	F
For the following A1H to D4H sensors, temperature range is -40 ... 65 °C (-41 ... 150 °F), nominal 21 °C (70 °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") ¹⁾	P
D4H (high precision)	Mounting frame and straps provided up to 1200 mm (48") ¹⁾	R
Sensor cables		
No sensor cable		A
6 m (20 ft) PVC Jacket (1 pr)		B
15 m (50 ft) PVC Jacket (1 pr)		C
30 m (100 ft) PVC Jacket		D
46 m (150 ft) PVC Jacket		E
91 m (300 ft) PVC Jacket		G
Approvals		
UL, UL _C , CE, C-TICK		0

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

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 (1012BN-4).

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

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SITRANS FST020 (Basic)

Selection and Ordering data	Order No.	Ord. code
SITRANS FST020 Basic clamp-on, IP65 (NEMA 4x)	L) 7ME3570-	
	3 0 - 0	
Number of channels/ultrasonic paths		
Single channel	1	
Flowmeter functions and I/O configurations		
• With display and 1 x additional analog output and SPST relay	H	
Meter power options		
100 ... 240 V AC	A	
11.5 ... 28.5 V DC	B	
Sensor for channel 1¹⁾		
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		A
A2 universal	Trackmount and straps provided up to 75 mm (3")	B
B3 universal	Trackmount and straps provided up to 125 mm (5")	C
C3 universal	Mounting frame and straps provided up to 330 mm (13")	D
D3 universal	Mounting frame and straps provided up to 600 mm (24")	E
E2 universal	Mounting frame and straps provided up to 1200 mm (48")	F
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")	H
A3H (high precision)	Trackmount and straps provided up to 75 mm (5")	J
B1H (high precision)	Trackmount and straps provided up to 125 mm (5")	K
B2H (high precision)	Trackmount and straps provided up to 125 mm (5")	L
C1H (high precision)	up to 600 min (24") with mounting hardware	M
C2H (high precision)	up to 600 min (24") with mounting hardware	N
D1H (high precision)	Mounting frame and straps provided up to 1200 mm (48") ¹⁾	P
D2H (high precision)	Mounting frame and straps provided up to 1200 mm (48") ¹⁾	Q
D4H (high precision)	Mounting frame and straps provided up to 1200 mm (48") ¹⁾	R

Selection and Ordering data	Order No.	Ord. code
SITRANS FST020 Basic clamp-on, 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
Approvals		
UL, UL _C , CE, C-TICK		0

¹⁾ 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)

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Selection and Ordering data Order code

Further designs

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

T01

Wet flow transfer calibration (priced on request)

- 6 point up to DN 25 ... DN 100 (1 ... 4 inch) **D10**
- 6 point up to DN 125 ... DN 200 (5 ... 8 inch) **D11**
- 6 point up to DN 250 ... DN 300 (10 ... 12 inch) **D12**
- 6 point up to DN 350 ... DN 400 (14 ... 16 inch) **D13**
- 6 point up to DN 450 ... DN 500 (18 ... 20 inch) **D14**
- 6 point up to DN 550 ... DN 600 (22 ... 24 inch) **D15**
- 6 point up to DN 650 ... DN 750 (26 ... 30 inch) **D16**
- 6 point up to DN 800 ... DN 900 (32 ... 36 inch) **D17**

Tag name plate

- Stainless steel tags with 3.2 mm (0.13 inch) character size (68 characters max.)

Y19

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.: **7ME3570-1HA300-0NE0**

Selection and Ordering data Order No. Ord. code

FST020 meter family

D) **7ME357 - 30 - 00**

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

Operating Instructions for FST020

English NEMA 4X

D) **A5E03086487**

German NEMA 4X

A5E03086488

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

All literature is also available for free at:

<http://www.siemens.com/flowdocumentation>

Sensor selection charts

Universal sensors for any pipe material

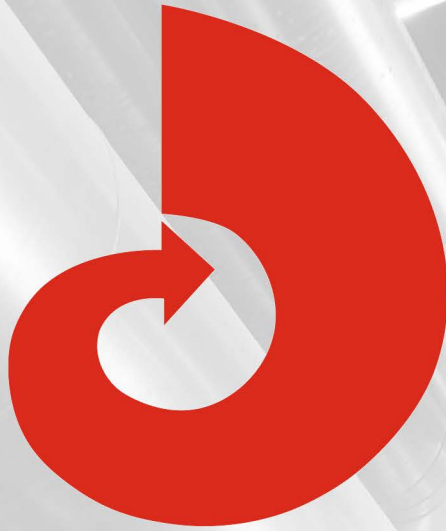
Sensor type (universal)	Order Code	Outer diameter range (mm)		Outer diameter range (inches)	
		min.	max.	min.	max.
A2	B	12,7	50,8	0.5	2
B3	C	19	127	0.75	5
C3	D	51	305	2	12
D3	E	203	610	8	24
E2	F	254	6096	10	249

High precision sensors for steel pipe with outer diameter/wall thickness ratio < 10

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

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

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