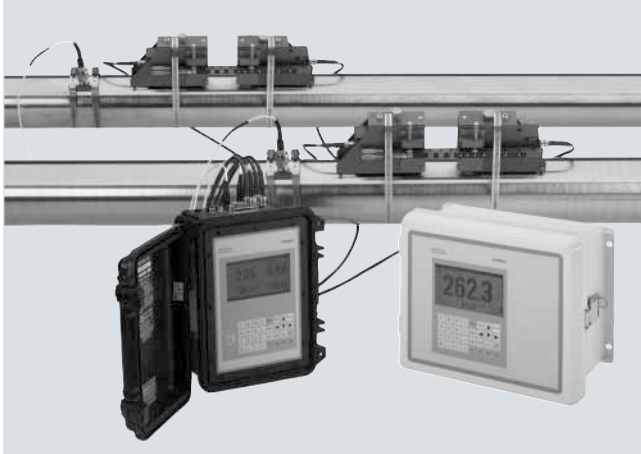# Flow Measurement
SITRANS F US Clamp-on

Overview

SITRANS FUE1010 is a highly accurate clamp-on non-intrusive ultrasonic flow transmitter for revenue grade thermal energy sub-metering and energy efficiency distribution monitoring, with a real time coefficient of performance (COP) for HVAC systems.

SITRANS FUE1010 is available in single and dual channel or dual path configurations, with your choice of IP65 (NEMA 4X) dedicated wall mount or IP40 (NEMA 1) portable enclosures.

Benefits

- Measures energy rate and total consumption with highest accuracy available
- Accurately measures at both low flow rates and low differential temperatures
- Easy installation; no need to cut pipe or stop flow
- Minimal maintenance; external sensors do not require periodic cleaning
- No moving parts to foul or wear
- No pressure drop or energy loss
- Wide turn-down ratio
- Choice of single or dual channel / dual path or dual mode operation:
  - Dual channel operation reduces the cost for the system on a per channel measurement basis and permits measuring hot and chilled water lines at the same time
  - Dual path capability insures high flow measurement accuracy on installations with less than desirable piping runs
- Ability to operate in either Wide-Beam Transit-time or reflexor (Doppler) mode for applications with high aeration
- ZeroMatic Path automatically sets zero without stopping flow and reduces zero drift, even at low flow

Application

FUE1010 is ideally suited to thermal energy / power industry applications, including:

- Chilled water sub-metering
- Hot water sub-metering
- Condenser water
- Glycol
- Thermal storage
- Lake source cooling

Design

FUE1010 is available in three configurations:

- IP65 (NEMA 4X) Enclosure constructed of fiberglass reinforced polyester with stainless steel hardware and polyester keypad
  - Single channel
  - Dual channel / dual path
- IP40 (NEMA 1) Portable Impact Resistant Enclosure constructed of mineral reinforced copolymer polypropylene
  - Dual channel / dual path

Function

- Flow transmitter has an integral 33 button keypad and large (128 x 240 pixel) graphic display visible up to 12 m (40 ft) away
- 4-wire 1000 Ω platinum RTD's for supply and return temperature measurements are precision matched to within 0.01 °C (0.02 °F)
- Temperature is factory calibrated with built-in field calibrator.
- Built-in energy/BTU mode
- Detection of aeration and cavitation caused by worn or damaged impellers, misaligned shafts, etc.
- Reverse flow and empty pipe detection
- Chiller efficiency analysis: accepts an independent analog input representing kW usage for calculation of the following functions which can be selected for data logging or output purposes:
  - Cooling load (kW/ton)
  - Coefficient of performance (COP)
  - Energy efficiency ratio (EER)
- Optional current inputs
- Digital communication options:
  - MODBUS / Metasys N2 (IP65 (NEMA 4X) only)
  - RS232 Serial digital port (standard)
- ZeroMatic Path automatically sets zero
- Bi-directional flow operation
- 1 MByte data logger with both site and data logger storage
- English, spanish, german, italian and french language options

Flow Measurement
SITRANS F US Clamp-on

SITRANS FUE1010 (Energy)

■ **Technical specifications**

Input	
Flow range	0 … 12 m/s (0 … 40 ft/s), bi-directional
Flow sensitivity	0.0003 m/s (0.001 ft/s)
Pipe size	6.4 mm … 9.14 m (0.25" … 360")
Inputs per channel	• Current: 2 x 4 … 20 mA
	• Voltage: 2 x 0 … 10 V DC
	• Temperature: 2 x 4 wire 1 kΩ RTD
	• Totalizer commands (clear/hold)

Output	
Standard outputs	• Current: 2 x 4 … 20 mA DC (1 kΩ at 30 V DC)
	• Voltage: 2 x 0 … 10 V DC (5 kΩ minimum)
	• Status Alarm: 4 x SPDT Relays
	• Mercury wetted relays
	• Frequency: 2 x 0 … 5000 Hz
	• RS232
Optional outputs	• Expanded I/Os (4 additional 4 ... 20 mA outputs) with form c relays
	• Expanded I/Os with Mercury wetted relays

Accuracy	
Accuracy	± 0.5% ... 1.0% of flow, for velocities greater than 0.3 m/s (1 ft/s) ± 0.0015 ... 0.003 m/s (± 0.005 ... 0.01 ft/s), for velocities less than 0.3 m/s (1 ft/s)
Batch repeatability	± 0.15% of flow, for velocities greater than 0.3 m/s (1 ft/s) ± 0.0005 m/s (± 0.0015 ft/s), for velocities less than 0.3 m/s (1 ft/s)

Rated operation conditions	
Degree of protection	Dedicated wall mount enclosure: IP65 (NEMA 4X) Portable enclosures: IP40 (NEMA 1)
Liquid temperature	
• Standard	-40 … +120 °C (-40 … +250 °F)
• Optional	-40 … +230 °C (-40 … +450 °F)
Sensor temperature	
• Standard	-40 … +120 °C (-40 … +250 °F)
• Optional	-62 … +232 °C (-80 … +450 °F)
Ambient temperature	-18 ... +60 °C (0 ... 140 °F)

Design	
Dimensions	see SITRANS F US Clamp-on "System info and selection guide"
Weight	see diagrams

Power supply	
Dedicated	90 … 240 V AC, 50 ... 60 Hz, 30 VA or 14.0 … 18.5 V DC
Portable enclosure	Rechargeable battery

Indication and operation	
Data logger memory	1 Mbyte of storage
Display	128 x 240 pixel LCD with back-light
Keypad	33 keypad buttons with tactile feedback
Language options	English, spanish, german, italian, french

Certificates and approvals	
Dedicated enclosures	
FM and CSA ratings	I.S. Class I, II, Div 1 NI Class I, Div 2 S Class II, Div 2
CE	EMC Directive 2004/108/EC LVD Directive 2006/95/EG C-TICK
ATEX ratings	• Transmitter: Ex II (1) G [Ex ia] IIC Ex II 3 (1) G Ex nC [ia] IIC T5
	• Sensors: Ex II 1 G Ex ia IIC T5
INMETRO ratings	• Transmitter: [BR-Ex ia] IIC BR-Ex nc [ia] IIC T5
	• Sensors: BR-Ex ia IIC T5
Portable enclosures	UL ULc
CE	EMC Directive 2004/108/EC LVD Directive 2006/95/EG

Standard MLFB for quick delivery on SITRANS FUE1010 (Energy system)

Selection and Ordering data	Order No.	Order code
SITRANS FUE1010 Energy Clamp-on	L) 7ME350■ - ■■■■0 - ■■■■	■■■ ■■■ + ■■■ + ■■■

Design

Dedicated

IP65 (NEMA 4X)	**0**	K02 + K02 + R02

Portables

IP40 (NEMA 1) Battery powered	**2**	K01 + K01 + R01

Number of channels/ultrasonic paths

Dedicated meters

Single channel	**1**

Portable meters

Dual channel/Dual path	**4**

Flowmeter functions and I/O configurations

- Portable Standard I/O
  - Energy efficiency COP/EER output
  - 2x 4-20mA analog input .... **C**
- Dedicated Standard I/O
  - Reflexor Capability
  - Energy efficiency COP/EER output
  - 2x 4-20mA analog input .... **F**

Meter power options

90 ... 240 V AC (Dedicated only)	**A**
Charger Type A for Europe (CEE7/7)	**C**
Charger Type K for U.S. (NEMA 5-15P)	**G**
No charger	**J**

Communication options

RS 232 (standard)	**0**

RTD temperature sensor pair

No RTDs (Note: Temperature input is required for Energy systems)	**0**
1x Pair Std clamp-on RTD (NEMA 4X only)[3]	**1**
2x Pair Std clamp-on RTD (For Dual Channel NEMA 4X only)[3]	**2**
1x Pair Std clamp-on RTD (For NEMA 12 portable)[3]	**3**
2x Pair Std clamp-on RTD (For Dual Channel NEMA 1 portable)[3]	**4**
1x Insertion RTD with Thermowell and Lagging	**M1A**
2x Insertion RTD with Thermowell and Lagging	**M1B**

Sensor for channel 1
(includes pipe mounting kit and spacer bar 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][4]	**F**
C1H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[4]	**M**
C2H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[4]	**N**
D1H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[4]	**P**
D2H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[4]	**Q**
Doppler	to 12" with strap kit (not for IP65 (NEMA7))	**S**
D1H	High temperature range 104 °C / 220 °F HP[2]	**Z** P1P

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

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Flow Measurement
SITRANS F US Clamp-on

SITRANS FUE1010 (Energy)

Selection and Ordering data		Order No.	Order code
SITRANS FUE1010 Energy Clamp-on		L) **7 M E 3 5 0 ▨ - ▨▨▨▨ 0 - ▨▨▨▨**	**▨▨▨ ▨▨▨ + ▨▨▨ + ▨▨▨**

Sensor for channel 2
(includes pipe mounting kit and spacer bar 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][4]	**F**
C1H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[4]	**M**
C2H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[4]	**N**
D1H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[4]	**P**
D4H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[4]	**R**
Doppler	to 12" with strap kit (not for IP65 (NEMA7))	**S**
D1H	High temperature range 104 °C / 220 °F HP[2]	**Z Q 1 P**

Approvals	UL/Portable	**0**
	FM, CSA, CE, C-TICK/Dedicated	**1**

[1] Supplied spacer bar supports pipes up to 1050 mm (42 inches). For pipes larger than 1050 mm (42 inches) purchase also, spare part 7ME3960-0MS40 (1012BN-4)

[2] 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)

[3] Requires two R** cables per one RTD pair

[4] 600 mm (24") for portable systems only

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

Standard MLFB product offering represents 4 to 6 weeks delivery time

For sensor and RTD cables for quick delivery see tables at end of section

4

Selection and Ordering data	Order No.	Ord. code
SITRANS FUE1010 Energy clamp-on		
• Dedicated IP65 (NEMA 4X) L)	**7ME3500-**	
• Portables IP40 (NEMA 1) battery powered L)	**7ME3502-**	
	▪▪▪▪▪ - 0▪▪▪ ▪▪▪	

Number of channels/ultrasonic paths
Dedicated meter

<u>Dedicated meter</u>		
Single channel	**1**	
Dual channel / Dual path	**2**	
<u>Portables</u>		
Dual channel / Dual path	**4**	

Flowmeter functions and I/O configura-tions

• Portable Standard I/O - Reflexor capability - Graphic display - 2 x 0 ... 10 V - 2 x 4 ... 20 mA - 2 x pulse output - 4 x status logic - Energy efficiency COP/EER output - 2 x 4 ... 20 mA analog input	**C**	
• Dedicated Standard I/O - Reflexor capability - Graphic display - 2 x 0 ... 10 V - 2 x 4 ... 20 mA - 2 x pulse output - 4 x relay C type - Energy efficiency COP/EER output - 2 x 4 ... 20 mA analog input	**F**	
• Standard I/O with Mercury wetted relays	**Z**	**J 1 A**
• Extended output adder plus standard inputs (4 additional 4 ... 20 mA outputs) and form C relay	**Z**	**J 1 B**
• Extended output adder plus standard inputs (4 additional 4 ... 20 mA outputs) and Mercury wetted relays	**Z**	**J 1 C**

Meter power options

90 ... 240 V AC (Dedicated only)	**A**	
9 ... 36 V DC (Dedicated only)	**B**	
Charger Type A for Europe (CEE7/7)	**C**	
Charger Type C for Australia (AS3112)	**D**	
Charger Type D for U.K. (BS1363)	**E**	
Charger Type J for Japan (JIS8303)	**F**	
Charger Type K for U.S. (NEMA 5-15P)	**G**	
Charger Type L for Switzerland (SEV1011)	**H**	
No Charger	**J**	
External 4 hours battery with US plug for Portable	**Z**	**K 1 A**
External 4 hours battery with European plug for Portable	**Z**	**K 1 B**

Communication options

RS232 (standard)	**0**	
MODBUS (dedicated only)	**1**	

Selection and Ordering data	Order No.	Ord. code
SITRANS FUE1010 Energy clamp-on		
• Dedicated IP65 (NEMA 4X) L)	**7ME3500-**	
• Portables IP40 (NEMA 1) battery powered L)	**7ME3502-**	
	▪▪▪▪▪ - 0▪▪▪ ▪▪▪	

RTD temperature sensor
(includes mounting hardware for pipes above 1.5" outer diameter)

No RTDs (Note: temperature input is required for energy system)	**0**	
1 x pair standard clamp-on RTD (NEMA 4X only)[3]	**1**	
2 x pair standard clamp-on RTD (for dual channel NEMA 4X only)[3]	**2**	
1 x pair standard clamp-on RTD (NEMA 1 portable)[3]	**3**	
2 x pair standard clamp-on RTD (for dual channel NEMA 1 portable)[3]	**4**	
1 x Insertion style RTD with thermowell and lagging[3]	**9**	**M 1 A**
2 x Insertion style RTD with thermowell and lagging[3]	**9**	**M 1 B**

Sensor for channel 1
Including pipe mounting tracks for sizes A & B sensors indented for pipe with a OD less than 125 mm (5") and mounting frame/spacer bars for sizes C, D & E 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.

		Ord. code
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)4)]	**F**

For the following A1H to D4H sensors, temperature range is -40 °C to 65 °C (-41 °F to 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 (3")	**J**
B1H (high precision)	Trackmount and straps provided up to 125 mm (5")	**K**

[1] Supplied spacer bar supports pipes up to 1050 mm (42 inches). For pipes larger than 1050 mm (42 inches) purchase also, spare part 7ME3960-0MS40 (1012BN-4).

[2] 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).

[3] Requires two R** cables per one RTD pair

[4] 600 mm (24") for portable systems only

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

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Flow Measurement
SITRANS F US Clamp-on

SITRANS FUE1010 (Energy)

4

Selection and Ordering data	Order No.	Ord. code
SITRANS FUE1010 Energy clamp-on		
• Dedicated IP65 (NEMA 4X) L)	**7ME3500-**	
• Portables IP40 (NEMA 1) battery powered L)	**7ME3502-**	
	▨▨▨▨▨ - 0 ▨▨▨ ▨▨▨	

Sensor for channel 1 (continued)

B2H (high precision)	Trackmount and straps provided up to 125 mm (5")	L
C1H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[3]	M
C2H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[3]	N
D1H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[2)3]	P
D2H (high precision)	Trackmount and straps provided up to 1200 mm (48")[2)3]	Q
D4H (high precision)	Trackmount and straps provided up to 1200 mm (48")[2)3]	R
Doppler	to 12" with strap kit	S

High temperature sensor size 2 for up to 230 °C (446 °F) (30 to 200 mm diam. (1.18 to 7.67 inch diam.))	Z	P 1 A
High temperature sensor size 3 for up to 230 °C (446 °F) (150 to 610 mm diam. (5.90 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. (15.75 to 47.25 inch diam.))	Z	P 1 C

For the following B1H to D4H sensors, temperature range is -1 °C up to 104 °C (30 °F up to 220 °F), nominal 65 °C (150 °F):

B1H (high temperature range HP)	Z	P 1 K
B2H (high temperature range HP)	Z	P 1 L
C1H (high temperature range HP)	Z	P 1 M
C2H (high temperature range HP)	Z	P 1 N
D1H (high temperature range HP)[2]	Z	P 1 P
D2H (high temperature range HP)[2]	Z	P 1 Q
D4H (high temperature range HP)[2]	Z	P 1 R

Sensor for channel 2
(includes pipe mounting kit for indicated max. outer diameter 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)3]	F

Selection and Ordering data	Order No.	Ord. code
SITRANS FUE1010 Energy clamp-on		
• Dedicated IP65 (NEMA 4X) L)	**7ME3500-**	
• Portables IP40 (NEMA 1) battery powered L)	**7ME3502-**	
	▨▨▨▨▨ - 0 ▨▨▨ ▨▨▨	

Sensor for channel 2 (continued)

For the following A1H to D4H sensors, temperature range is -40 °C to 65 °C (-41 °F to 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 (3")	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)	Mounting frame and straps provided up to 1200 mm (48")[3]	M
C2H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[3]	N
D1H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[2)3]	P
D2H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[2)3]	Q
D4H (high precision)	Mounting frame and straps provided up to 1200 mm (48")[2)3]	R
Doppler	to 12" with strap kit	S

High temperature sensor size 2 for up to 230 °C (446 °F) (30 to 200 mm diam. (1.18 to 7.67 inch diam.))	Z	Q 1 A
High temperature sensor size 3 for up to 230 °C (446 °F) (150 to 610 mm diam. (5.90 to 24 inch diam.))	Z	Q 1 B
High temperature sensor size 4 for up to 230 °C (446 °F) (400 to 1200 mm diam. (15.75 to 47.25 inch diam.))	Z	Q 1 C

For the following B1H to D4H sensors, temperature range is -1 °C up to 104 °C (30 °F up to 220 °F), nominal 65 °C (150 °F):

B1H (high temperature range HP)	Z	Q 1 K
B2H (high temperature range HP)	Z	Q 1 L
C1H (high temperature range HP)	Z	Q 1 M
C2H (high temperature range HP)	Z	Q 1 N
D1H (high temperature range HP)[2]	Z	Q 1 P
D2H (high temperature range HP)[2]	Z	Q 1 Q
D4H (high temperature range HP)[2]	Z	Q 1 R

Approvals

FM/CSA/CE/C-TICK Dedicated	1
UL/ULc/CE Portable	0

[1] Supplied spacer bar supports pipes up to 1050 mm (42 inches). For pipes larger than 1050 mm (42 inches) purchase also, spare part 7ME3960-0MS40 (1012BN-4)

[2] 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)

[3] 600 mm (24") for portable systems only

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

Selection and Ordering data	Order code
Further designs	
Please add „**-Z**" to Order No. and specify Order code(s).	
Cable assembly for sensors (add for # of channels) See „Sensor cable selection chart"	**K..**
Cable assembly for RTDs (add for # of RTDs) See „RTD cable selection chart"	**R..**
Cable termination kit (for one cable pair) dedicated only	
• Termination for standard, plenum and armored sensor cable	**T01**
• Termination for submersible sensor cable	**T11**
• RTD cable termination kit for standard RTD	**T21**
• RTD cable termination kit for submersible RTD	**T31**
• Insert RTD cable termination kit	**T41**
Wet flow transfer calibration (priced on request)	
• 6 point up to 4 inch (DN 100)	**D10**
• 6 point up to 5 to 8 inch (DN 125 to DN 200)	**D11**
• 6 point up to 10 to 12 inch (DN 250 to DN 300)	**D12**
• 6 point up to 14 to 16 inch (DN 350 to DN 400)	**D13**
• 6 point up to 18 to 20 inch (DN 450 to DN 500)	**D14**
• 6 point up to 22 to 24 inch (DN 550 to DN 600)	**D15**
• 6 point up to 26 to 30 inch (DN 650 to DN 750)	**D16**
• 6 point up to 32 to 36 inch (DN 800 to DN 900)	**D17**
Tag name plate	
• Stainless steel tag with 3.2 mm (0.13 inch) character size (68 characters max.)	**Y19**

MLFB example

Application example

A dedicated clamp-on energy meter is required for two separate return lines. Both will use clamp-on RTDs for the supply and return lines. AC power is available and data access will be via MODBUS communication.

Pipe 1 is a DN150 (6") schedule 40 carbon steel line
Pipe 2 is a DN 300 (12") ductile iron line

MLFB Order No.: **7ME3500-2DA10-2NE0-Z**
K03 + K05 + R03 + R05 + R02 + R03

4

Selection and Ordering data	Order No.						Ord. code		
FUE1010 meter family	7 M E 3 5 0	-	▨ ▨ ▨ ▨	0 -	▨ ▨ ▨ ▨	▨ ▨ ▨			
IP65 (NEMA 4X) enclosure	0								
Dual channel	2								
Dedicated Type 1 I/O option			D						
90 ... 230 V AC power option			A						
MODBUS option				1					
2 pairs of clamp-on RTDs						2			
Sensor code for 6" pipe						N			
Sensor code for 12" pipe						E			
No approval required						0			
30 m (100 ft) sensor cable for channel 1							K 0 3		
61 m (200 ft) sensor cable for channel 1							K 0 5		
30 m (100 ft) cable for RTD 1							R 0 3		
61 m (200 ft) cable for RTD 2							R 0 5		
15 m (50 ft) cable for RTD 3							R 0 2		
30 m (100 ft) cable for RTD 4							R 0 3		

Selection and Ordering data	Order code
Operating Instructions for FUE1010	
English NEMA 4x	**A5E03086491**[D]
German NEMA 4x	**A5E03086492**[D]
English IP40 NEMA 1	**A5E02951524A**
German IP40 NEMA 1	**A5E02951536A**

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

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

Flow Measurement
SITRANS F US Clamp-on

SITRANS FUE1010 (Energy)

Sensor selection charts

Universal sensors for any pipe material

Sensor Size code	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	240

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

Sensor Size code	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

Sensor cable selection chart

Sensor cable codes for length and type options

Cable length m (ft)	Standard (PVC jacket) -40…+80 °C (-40…+176 °F)	Submersible[1] (polyethylene jacket) -40…+80 °C (-40…+176 °F)	Plenum Rated (teflon jacket) -40…+200 °C (-40…+392 °F)	Armored[1] -40…+80 °C (-40…+176 °F)
	Order code			
6 (20)	**K01**[2]	**K11**	**K21**	**K31**
15 (50)	**K02**	**K12**[2]	**K22**	**K32**[2]
30 (100)	**K03**[2]	**K13**[2]	**K23**	**K33**
46 (150)	**K04**[2]	**K14**	**K24**	**K34**
61 (200)	**K05**	**K15**	**K25**	**K35**
91 (300)	**K06**[2]	**K16**	**K26**	**K36**

[1] Submersible and armored sensor cable is not available for portable versions.
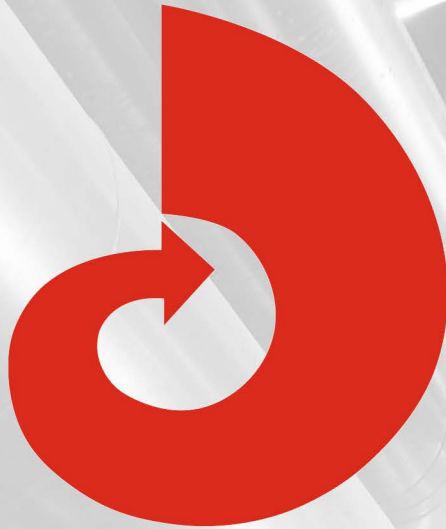[2] Standard MLFB for quick delivery

RTD cable selection chart

RTD cable codes for length and type

Cable length m (ft)	Standard (teflon wrapped) -40 ... +200 °C (-40 ... +392 °F)	Insert[1] -40 ... +200 °C (-40 ... +392 °F)
	Order code	
6 (20)	**R01**[2]	**R21**
15 (50)	**R02**[2]	**R22**
30 (100)	**R03**[2]	**R23**
46 (150)	**R04**	**R24**
61 (200)	**R05**	**R25**
91 (300)	**R06**	**R26**

[1] Submersible RTD cable is not available for portable versions.
[2] Standard MLFB for quick delivery

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