

Overview



SITRANS FUS1010 is the most versatile clamp-on ultrasonic flowmeter available today. It can operate in either WideBeam Transit-Time or Reflexor (Doppler) mode, making it suitable for virtually any liquid, even those with high aeration or suspended solids.

SITRANS FUS1010 is available in single, dual channel/dual path and optional four channel/four path configurations. You have a choice of IP65 (NEMA 4X), IP65 (NEMA 7) and IP66 (NEMA 7) explosion proof enclosures.

Benefits

- Versatility; there is no need to change meters when operating conditions change
- Easy installation; no need to cut pipe or stop flow
- Minimal maintenance; external transducers 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 channel or dual channel/dual path, with doppler capability. Four channel/four beam optional.
 - Optional four channels allow measurement of four independent pipes at the same time, reducing overall ownership costs
 - Dual mode allows for transit time and reflexor operation at the same time on the same pipe
 - Dual path allows for two sets of transducers to be set up on one pipe and averaged for higher accuracy
- Zeromatic Path automatically sets zero without stopping flow and reduces zero drift, even at low flow

Application

FUS1010 is suitable for a wide variety of liquid applications, including the following:

- Water industry
 - Raw water
 - Potable water
 - Sludges
 - Chemicals
- Wastewater industry
 - Raw sewage
 - Effluent
 - Sludges
 - Mixed liquor
 - Chemicals
- HVAC industry
 - Chillers
 - Condensers
 - Hot and cold water systems
- Power industry
 - Nuclear
 - Fossil
 - Hydroelectric
- Processing industry
 - Process control
 - Batching
 - Rate indication
 - Volumetric and mass measurement

Design

FUS1010 is available in three configurations:

- IP65 (NEMA 4X) enclosure
 - Single channel
 - Dual channel / dual path
 - Four channel (optional)
- IP65 (NEMA 7) Compact explosion proof enclosure
 - Single channel
 - Dual channel / dual path
- IP66 (NEMA 7) Wall mount explosion proof enclosure
 - Single channel
 - Dual channel / dual path
 - Four channel (optional)

Function

- IP65 (NEMA 4X) and IP66 (NEMA 7) flow display computers have integral 33 button keypads and large (128 x 240 pixel) graphic displays visible up to 12 m (40 ft) away
- IP65 (NEMA 7) compact flow display computer has a 2 x 16 Alphanumeric LCD display
- Current, voltage, status alarm, frequency and RS232 outputs (see specification section for details)
- Optional current, voltage and temperature inputs (see specification section for details)
- Zeromatic Path automatically sets zero
- Bidirectional flow operation
- 1 MByte data logger with both site and data logger storage
- English, Spanish, German, Italian and French language options

SITRANS F flowmeters

SITRANS F US

SITRANS FUS1010 Standard clamp-on

Technical specifications

SITRANS FUS1010, IP65 (NEMA 4X) Flow display computer



Enclosure IP65 (NEMA 4X)

Input

Flow range	± 12 m/s (± 40 ft/s), bidirectional
Pipe size	6.4 mm ... 9.14 m (0.25" ... 360")
Optional inputs	- Current: 2x 4 ... 20 mA DC - Voltage: 2x 0 ... 10 V DC - Temperature: 2x 4 wire 1 kΩ RTD
Single channel	

Output

Outputs	- Current: 2x 4 ... 20 mA DC (1 kΩ at 30 V DC) - Voltage: 2x 0 ... 10 V DC (5 kΩ min.) - Status Alarm: 4x SPDT relays - Frequency: 2x 0 ... 5 kHz - RS232
Single channel	

Accuracy

Accuracy	$\pm 0.5\%$... 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	$\pm 0.15\%$ 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)

Data refresh rate	5 Hz
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Rated operation conditions

Degree of protection	IP65 (NEMA 4X)
Liquid temperature	
• Standard	-40 ... +120 °C (-40 ... +250 °F)
• Optional	-40 ... +230 °C (-40 ... +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	90 ... 240 V AC, 50 ... 60 Hz, 30 VA or 9 ... 36 V DC, 12 W
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Indication and operation

Data logger memory	1 MByte
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

FM and CSA ratings	I.S. Class 1, 2, Div 1 N-I Class 1, Div 2 S Class 2, Div 2 (FM only)
ATEX ratings	
• Flow display computer	Ex II (1) G [EEx ia] IIC Ex II 3 (1) G EEx nC [ia] IIC T5
• Transducers	Ex II 1 G EEx ia IIC T5 Ex II 2 G EEx m II T5 (for use with flowmeter in safe area)
CCOE rating	EEx (ia)
CEPEL ratings	
• Flow display computer	[BR-Ex ia] IIC T6 (pending on 4 channel) BR-Ex nC [ia] IIC T6 (pending)
• Transducers	BR-Ex ia IIC T6 IP65
GoST ratings	
• Flow display computer	[Exia]IIC
• Transducers	0ExiaIIC T5

SITRANS FUS1010, IP65 (NEMA 7) Compact explosion proof



Enclosure IP65 (NEMA 7)

Input

Flow range	± 12 m/s (± 40 ft/s), bidirectional
Pipe size	6.4 mm ... 9.14 m (0.25" ... 360")
Optional inputs single channel	• Current: 1x 4 ... 20 mA DC • Temperature: 2x 4 wire 1 kΩ RTD

Output

Outputs single channel	• Current (externally powered): 1x 4 ... 20 mA DC (1 kΩ at 30 V DC) • Status Alarm: 1x Isolated open collector • Frequency: 2x 0 ... 5 kHz • RS232
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Accuracy

Calibratable accuracy	0.1% (API proving method)
Intrinsic accuracy	$\pm 0.5\%$... 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	$\pm 0.15\%$ 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)

Data refresh rate	5 Hz
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Rated operation conditions

Degree of protection	IP65 (NEMA 7)
Liquid temperature	
• Standard	-40 ... +120 °C (-40 ... +250 °F)
• Optional	-40 ... +230 °C (-40 ... +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	90 ... 240 V AC, 50 ... 60 Hz, 15 VA or 9 ... 36 V DC, 10 W

Indication and operation

Data logger memory	1 MByte
Display	2 x 16 alphanumeric LCD display
Keypad	5 Magnetic hall effect switches
Language options	English, Spanish, German, Italian, French

Certificates and approvals

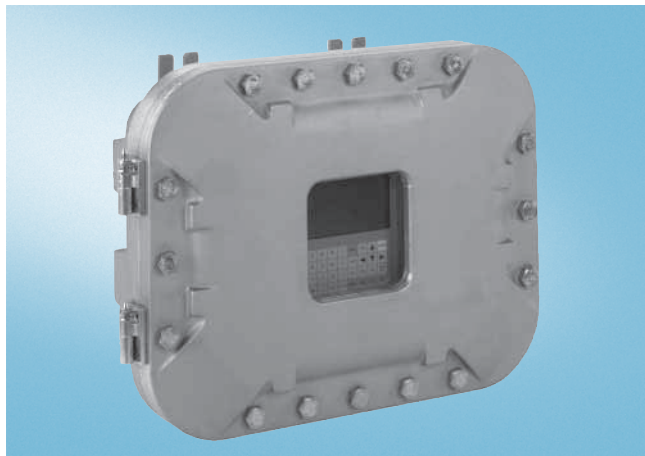
FM and CSA ratings	Ex Class 1, Div 1 D-I Class 2, Div 1 I.S. Class 1, Div 1 N-I Class 1, Div 2 S Class 2, Div 2 (FM only)
ATEX ratings	
• Flow display computer	Ex II 2 (1) G EEx d [ia] IIC T5
• Transducers	Ex II 1 G EEx ia IIC T5
CCOE rating	EEx d
CEPEL ratings	
• Flow display computer	BR-Ex d [ia] IIC T6
• Transducers	BR-Ex ia IIC T6 IP65

SITRANS F flowmeters

SITRANS F US

SITRANS FUS1010 Standard clamp-on

SITRANS FUS1010, IP66 (NEMA 7) Wall mount explosion proof enclosure



Enclosure IP66 (NEMA 7)

Input

Flow range	± 12 m/s (± 40 ft/s), bidirectional
Pipe size	6.4 mm ... 9.14 m (0.25" ... 360")
Optional Inputs single channel	• Current: 2x 4 ... 20 mA DC • Voltage: 2x 0 ... 10 V DC • Temperature: 2x 4 wire 1 kΩ RTD

Output

Outputs single channel	• Current: 2x 4 ... 20 mA DC (1 kΩ at 30 V DC) • Voltage: 2x 0 ... 10 V DC (5 kΩ min.) • Status Alarm: 4x SPDT Relays • Frequency: 2x 0 ... 5 kHz • RS232
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Accuracy

Accuracy	$\pm 0.5\%$... 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	$\pm 0.15\%$ 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)

Data refresh rate	5 Hz
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Rated operation conditions

Degree of protection	IP66 (NEMA 7)
Liquid temperature	
• Standard	-40 ... +120 °C (-40 ... +250 °F)
• Optional	-40 ... +230 °C (-40 ... +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	90 ... 240 V AC, 50 ... 60 Hz, 30 VA or 9 ... 36 V DC, 12 W
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Indication and operation

Data logger memory	1 MByte
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

FM and CSA ratings	Ex Class 1, Div 1 D-I Class 2, Div 1 I.S. Class 1, Div 1 N-I Class 1, Div 2 S Class 2, Div 2 (FM only)
ATEX ratings	
• Flow display computer	Ex II (1) G [EEx ia] IIC Ex II 3 (1) G EEx nC [ia] IIC T5 Ex II 2 (1) G EEx d [ia IIC] IIB T5 Ex II 2 (1) G EEx d [ia IIC] IIB + H2 T5
• Transducers	Ex II 1 G EEx ia IIC T5
CEPEL ratings	
• Flow display computer	[BR-Ex ia] IIC T6 (pending) BR-Ex nC [ia] IIC T6 (pending) BR-Ex d [ia] IIC T6 (pending)
• Transducers	BR-Ex ia IIC T6 IP65

Selection and Ordering data	Order-No.	Ord. code
SITRANS FUS1010 Standard clamp-on		
• IP65 (NEMA 4X)	7ME3530-	
• IP65 (NEMA 7) compact	7ME3531-	
• IP66 (NEMA 7) wall mounted	7ME3532-	
	0 -	
Number of channels/ultrasonic beams		
Single channel	1	
Dual channel / Dual beam	2	
Special: Four channel / Four Beam (NEMA 4X and NEMA 7 wall mount only)	9	H 1 Y
Flowmeter functions and I/O configurations		
includes graphic or digital display and Reflexor capability for all except IP65 (NEMA 7) compact units		
<u>IP65 (NEMA 4X) and IP66 (NEMA 7 wall mounted) units</u>		
• Type 1 Standard	A	
- 2x 0 ... 10 V		
- 2x 4 ... 20 mA		
- 2x pulse output		
- 4x relay C type		
• Type 3 option adder	C	
- UniMass capability with 2x RTD input and		
- 4x 4 ... 20 mA analog input		
<u>IP65 (NEMA 7) compact units</u>		
• Type 1 Standard	D	
- 1x 4 ... 20 mA (Loop) and 1x status (open collector) per channel		
- 1x pulse output for single channel units only		
• Type 3 option adder	F	
- UniMass capability with 1 RTD input and		
- 1x analog input per channel		
• Other version (Expanded I/O and/or Mercury wetted relays)	Z	J 1 Y
Add order code and plain text.		
Meter power options		
90 ... 240 V AC	A	
9 ... 36 V DC (except compact NEMA 7)	B	
9 ... 36 V DC negative GND (compact only)	J	
9 ... 36 V DC positive GND (compact only)	K	
Communication options		
RS232 (standard)	0	
MODBUS (dedicated only, excludes NEMA 7 compact)	1	
Ethernet (dedicated only, excludes NEMA 7 compact)	2	
Special: Dial up Modem (dedicated only, excludes compact NEMA 7)	9	L 1 Y
RTD temperature sensor		
(includes mounting hardware for pipes between 1.5" and 24" outer diameter)		
No RTDs	0	
1x standard clamp-on RTD	1	
2x standard clamp-on RTD	2	
1x submersible clamp-on RTD	3	
2x submersible clamp-on RTD	4	
Special (for insert style RTDs)	9	N 1 Y

Selection and Ordering data	Order-No.	Ord. code
SITRANS FUS1010 Standard clamp-on		
• IP65 (NEMA 4X)	7ME3530-	
• IP65 (NEMA 7) compact	7ME3531-	
• IP66 (NEMA 7) wall mounted	7ME3532-	
	0 -	
Transducer for channel 1		
(includes pipe mounting kit and spacer bar for indicated max. OD listed)		
See „Transducer selection charts“ for specifications.		
no transducer		A
A2 universal to 3"/track mount		B
B3 universal to 5"/track mount		C
C3 universal to 13"/mounting frame		D
D3 universal to 24"/mounting frame		E
E2 universal to 48"/mounting frame		F
A1H (high precision) to 3"/track mount		G
A2H (high precision) to 3"/track mount		H
A3H (high precision) to 3"/track mount		J
B1H (high precision) to 5"/track mount		K
B2H (high precision) to 5"/track mount		L
C1H (high precision) to 24"/mounting frame		M
C2H (high precision) to 24"/mounting frame		N
D1H (high precision) to 48"/mounting frame		P
D2H (high precision) to 48"/mounting frame		Q
D4H (high precision) to 48"/mounting frame		R
Doppler to 12" with strap kit (not for IP65 (NEMA 7))		S
Other versions (different size, type, mount, temperature range, or corrosion resistant), add Order code and plain text.	Z	P 1 Y
Transducer for channel 2		
(includes pipe mounting kit for indicated max. OD listed)		
See „Transducer selection charts“ for specifications.		
no transducer		A
A2 universal to 3"/track mount		B
B3 universal to 5"/track mount		C
C3 universal to 13"/mounting frame		D
D3 universal to 24"/mounting frame		E
E2 universal to 48"/mounting frame		F
A1H (high precision) to 3"/track mount		G
A2H (high precision) to 3"/track mount		H
A3H (high precision) to 3"/track mount		J
B1H (high precision) to 5"/track mount		K
B2H (high precision) to 5"/track mount		L
C1H (high precision) to 24"/mounting frame		M
C2H (high precision) to 24"/mounting frame		N
D1H (high precision) to 48"/mounting frame		P
D2H (high precision) to 48"/mounting frame		Q
D4H (high precision) to 48"/mounting frame		R
Doppler to 12" with chain or strap kit (not for IP65 (NEMA 7))		S
Other versions (different size, type, mount, temperature range, or corrosion resistant), add Order code and plain text.	Z	Q 1 Y
Approvals		
no approval		0
FM/CSA		1
ATEX EEx ia		2
CEPEL		3
Special ATEX EEx m		9
add Order code and plain text:		R 1 Y
Length of integral cable:		

