

Overview



The SITRANS FM100 is an electromagnetic flow sensor in a compact design for basic applications in the process and OEM industry.

Benefits

- Connection ½", ¾", 1", 2"
- Flow- and temperature measurement
- IO-Link communication
- Dosing function with external control output
- Colored, multi-parameter configurable TFT display, rotatable 90°
- Bidirectional measuring
- Intuitive setup menu via 4 optical touch keys
- 2 freely configurable outputs
- All-metal design: stainless steel
- Included in Quick Ship Program (delivery time see PIA LCP)

Application

The main applications of the SITRANS FM electromagnetic flow sensors can be found in the following fields:

- OEM industry
- Process industry
- Small water cycles: e.g. cooling water, water leakage
- Dosing e.g. in chemical industry

Design

The SITRANS FM100 is designed to measure small- and medium sized flow of conductive liquids. The small build allows to fit the device in almost any space. The robust stainless-steel housing protects the device in changing surroundings.

The measurement is displayed on the local screen as well as accessible via 2 freely configurable outputs (pulse-/frequency-/alarm- and analogue).

Mode of operation

The flow measuring principle is based on Faraday's law of electromagnetic induction according to which the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

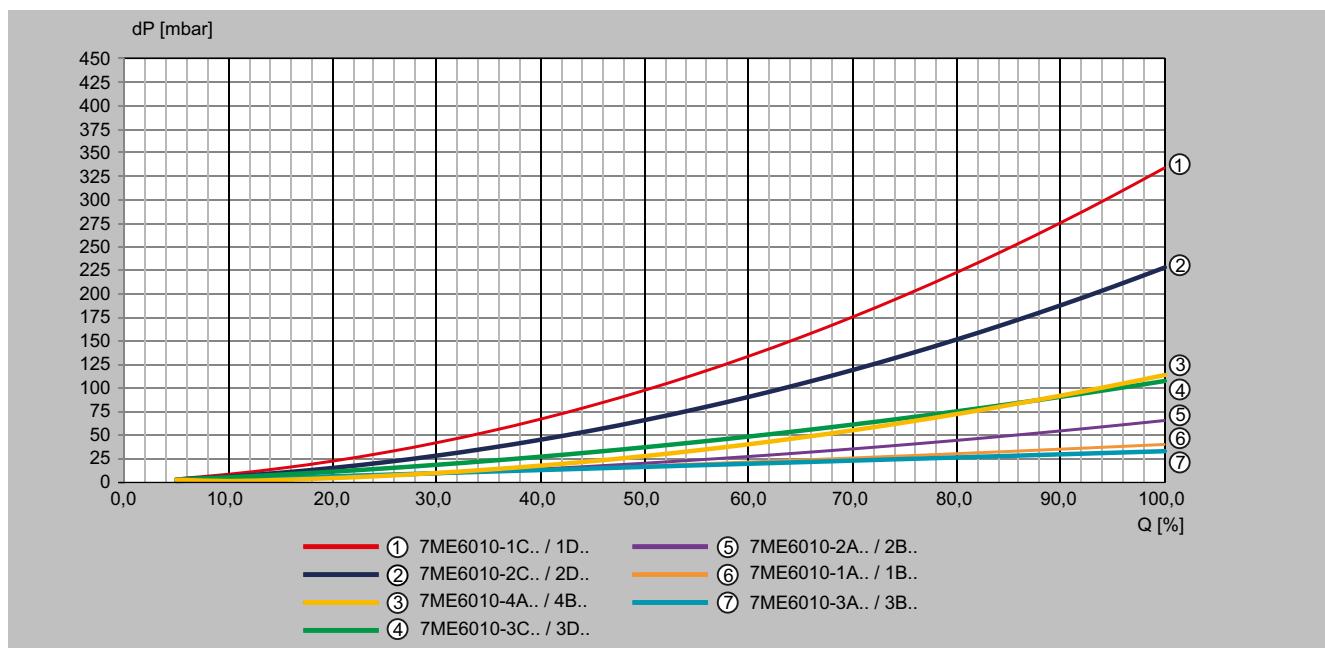
Flow Measurement

SITRANS FM (electromagnetic)

Flowmeters with pulsed DC field technology / SITRANS FM100

Integration

Pressure loss



Selection and ordering data

SITRANS FM100 flowmeter	Article No. 7ME6010-	●	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.						
Process connection, measuring range						
Male thread G1/2", 0,03 ... 3 l/min	1	A				
Male thread G1/2", 0,25 ... 48 gal/h	1	B				
Male thread G1/2", 0,04 ... 10 l/min	1	C				
Male thread G1/2", 0,011 ... 2,6 gal/min	1	D				
Male thread G3/4", 0,1 ... 25 l/min	2	A				
Male thread G3/4", 0,025 ... 6,6 gal/min	2	B				
Male thread G3/4", 0,2 ... 50 l/min	2	C				
Male thread G3/4", 0,053 ... 13 gal/min	2	D				
Male thread G1", 0,2 ... 50 l/min	3	A				
Male thread G1", 0,053 ... 13 gal/min	3	B				
Male thread G1", 0,4 ... 100 l/min	3	C				
Male thread G1", 0,1 ... 26 gal/min	3	D				
Male thread G2", 1,5 ... 350 l/min	4	A				
Female thread 2" NPT, 0,4 ... 92 gal/min	4	B				
Transmitter design						
Compact design without cable						A
Gasket material						
FKM/FPM						0
EPDM						1
Quality inspection certificate						
Without						0
3-point factory calibration						3
5-point factory calibration						5

Technical specifications

FM100		FM100	
Measuring principle	Electromagnetic induction	Electrical data	
Media	Conductive liquid with $\geq 20 \mu\text{S}/\text{cm}$	Power supply	19 ... 30 V DC
Accuracy	$\leq (0.8\% \text{ of reading} + 0.5\% \text{ of full scale})^1$	Power consumption	Max. 200 mA
Repeatability	$\pm 0.2\% \text{ of full scale}$	Outputs	
Response time flow t_{90}		• Frequency	Push-Pull, freely scalable, 2kHz @ overflow
• Alarm/pulse/frequency output	< 100 ms		$f_{\min} @ FS = 50 \text{ Hz}$
• Current output	< 1 s		$f_{\max} @ FS = 1 \text{ 000 Hz}$
Temperature measurement		• Pulse	Push-Pull, freely scalable, configurable for partial and accumulated totalizer
Sensor	PT1000	• Alarm	NPN, PNP, Push-Pull, configurable max. 30 V DC, max. 200 mA short-circuit proof
Accuracy	$\leq \pm 2^\circ\text{C}$ (flow $> 0.2 \text{ m/s}$)	• Current	0(4) ... 20 mA (active) or 0(2) ... 10 V DC
Measuring range	Temperature range of media	Input	Max. load 500 Ω
Response time temperature t_{90} (signal output)	< 20 s	• Control	Active signal U_{high} max. 30 V DC
Process connection			$0 < Low < 10 \text{ V DC}$
Nominal size	G $\frac{1}{2}$ " ... G 2"		15 V DC < High < Vs
Process connection	Compatible NPT adapter available ($\frac{1}{4}$ " ... 2")		Dosing output OUT2:
Rated operation conditions	Threaded fitting		Push-Pull, High active
Mounting position	In all directions, bidirectional measuring	Communication	Control input OUT1:
In-/outlet	3 x diameter / 2 x diameter	• Manufacturer ID	START/STOP $0.5 \text{ s} < t_{high} < 4 \text{ s}$
Ambient temperature	-20 ... +70 °C (-4 ... +158 °F)	• Manufacturer name	RESET $t_{high} > 5 \text{ s}$
Enclosure rating	IP67	• Version	
Operating pressure	Max. 16 bar	• Bitrate	
Pressure drop	See pressure loss diagram	• Minimal cycle time	V1.1
Mechanical load		• SIO-Mode	COM3
• Shock resistance	DIN EN 60068-2-27:2010: 20 g (11 ms)	• Block parameterization	1.1 ms
• Vibration resistance	DIN EN 60068-2-6:2008: 5 g (10 ... 2 000 Hz)	• Operational readiness	Yes (OUT1 in configuration IO-Link)
• Environmental testing	DIN EN 60068-2-30:2006: severity level b	• Max. cable length	Yes
EMC	2014/30/EU		10 s
Design			20 m
Weight	See dimensional drawings		
Housing material	Stainless steel 1.4404		
Electrode material	Stainless steel 1.4404		
Connection fitting	Stainless steel 1.4404		
Insulation parts	PEEK		
Seals	FKM (Option: EPDM)		
Display	PMMA		
	Operation via 4 optical touch sensors (operation with hand gloves)		
Cable entries	TFT display, 128 x 128 pixels, 1.4" display, orientation in 90° steps adjustable, repetition rate adjustable 0.5 ... 10 s		
Dimensions	M12x1 4-pin connection		
	See dimensional drawings		

Factory calibration points

Type	Measuring range	Quality inspection certificate	Measuring point [l/min]				
			1	2	3	4	5
7ME6010	1A, 1B	0	1.5	-	-	-	-
		3	0.5	1.5	2.5	-	-
		5	0.5	1	1.5	2	2.5
	1C, 1D	0	5	-	-	-	-
		3	1	5	8	-	-
		5	0.5	2	5	6	8

¹⁾ Under reference conditions:

- Media temperature: 15 ... 30 °C
- Ambient temperature: 15 ... 30 °C
- 1 cST
- 500 $\mu\text{S}/\text{cm}$
- 1 bar

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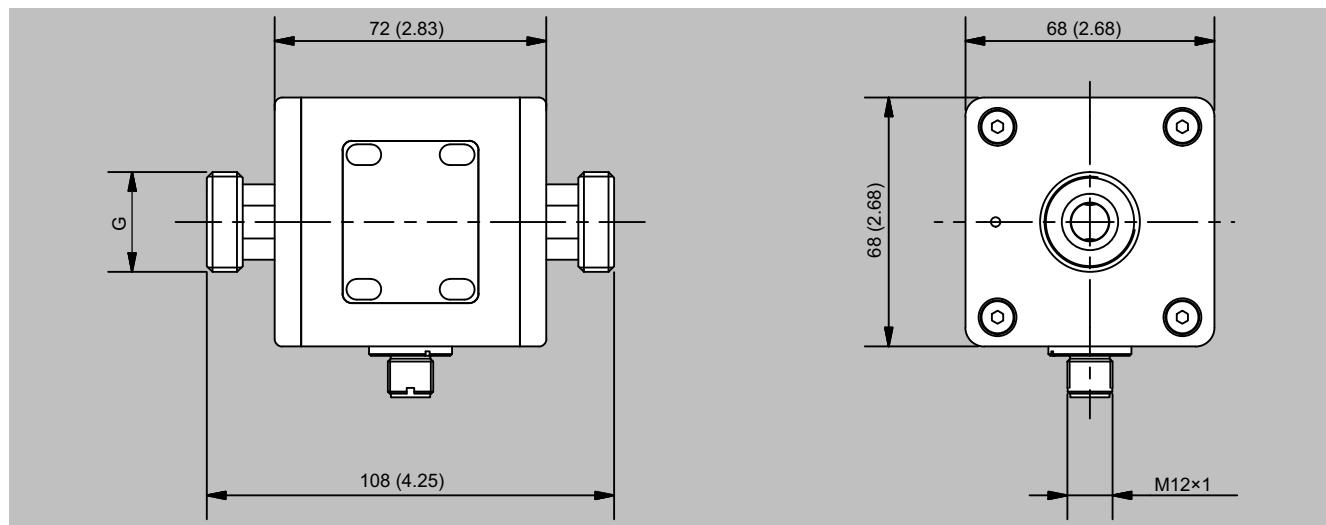
Technical specifications (continued)

Type	Measuring range	Quality inspection certificate	Measuring point [l/min]				
			1	2	3	4	5
7ME6010	2A, 2B	0	12	-	-	-	-
		3	2	12	20	-	-
		5	0.5	2	12	15	20
	2C, 2D	0	25	-	-	-	-
		3	4	25	50	-	-
		5	4	15	25	30	40
	3C, 3D	0	50	-	-	-	-
		3	20	50	80	-	-
		5	8	20	50	60	80
	4A, 4B	0	170	-	-	-	-
		3	20	170	280	-	-
		5	20	100	170	200	280

Dimensional drawings

SITRANS FM100 flowmeter with compact transmitter

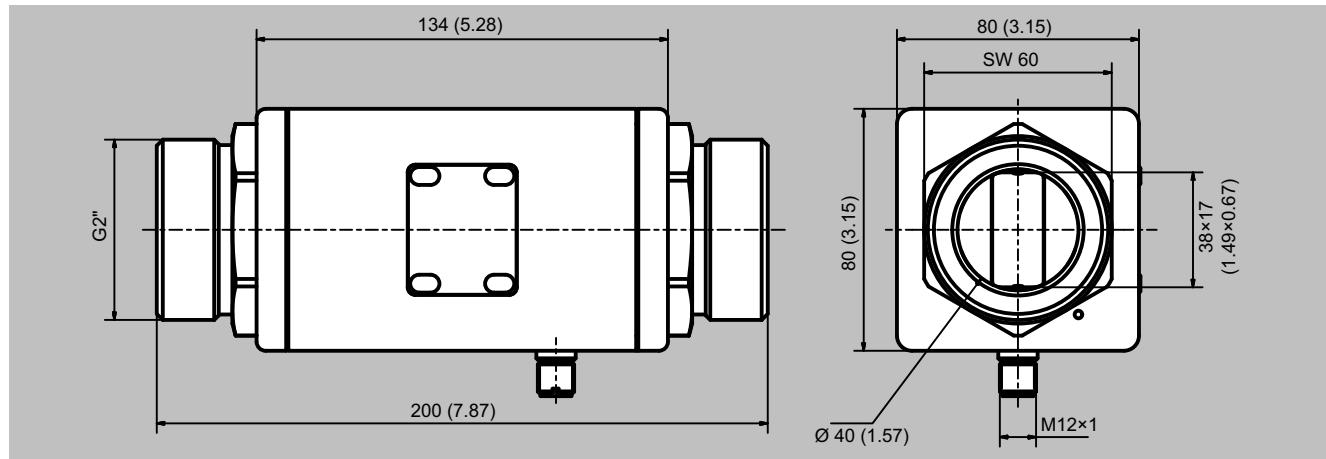
Process connection G1/2", G3/4" and G1



SITRANS FM100 with compact transmitter, process connection G1/2", G3/4" and G1"; dimensions in mm (inch)

Process connection	Nominal size	Weight (g)
Male thread	G1/2"	998
Male thread	G3/4"	988
Male thread	G1"	1010

Process connection G2"



SITRANS FM100 with compact transmitter, process connection G2"; dimensions in mm (inch)

Process connection	Nominal size	Weight (g)
Male thread	G2"	2420

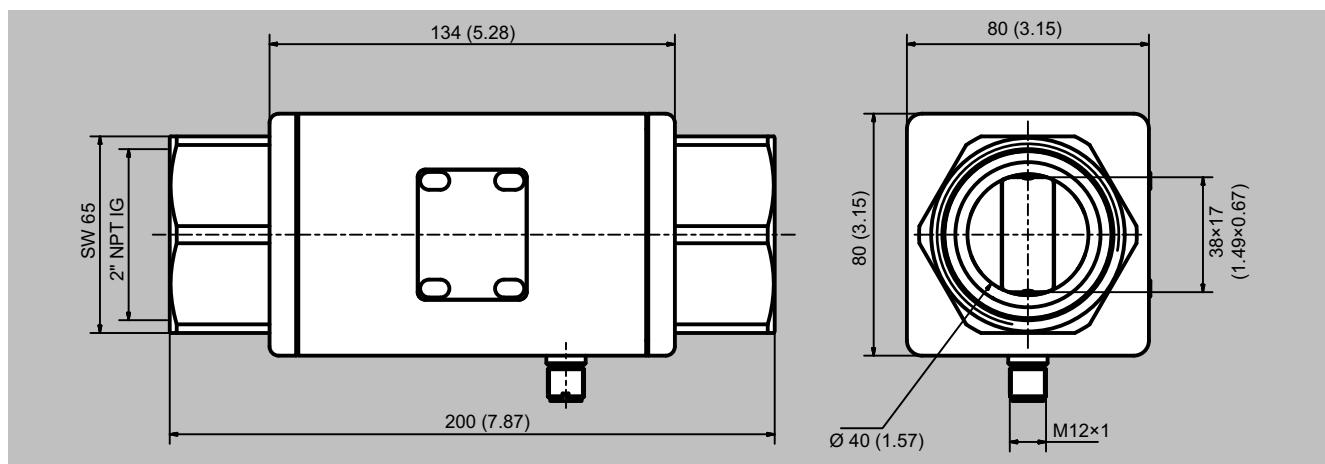
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Dimensional drawings (continued)

Process connection 2" NPT IG



SITRANS FM100 with compact transmitter, process connection 2" NPT (female); dimensions in mm (inch)

Process connection	Nominal size	Weight (g)
Female thread	2" NPT IG	2140

SITRANS FM100 inner diameters

Connection, nominal size	Inside diameters (DN)	Range
G1/2"	5 mm	0.03 ... 3 l/min / 0.04 ... 10 l/min
G3/4"	10 mm	0.1 ... 25 l/min / 0.2 ... 50 l/min
G1"	15 mm	0.2 ... 50 l/min / 0.4 ... 100 l/min
2" NPT IG	see dimensional drawings	1.5 ... 350 l/min