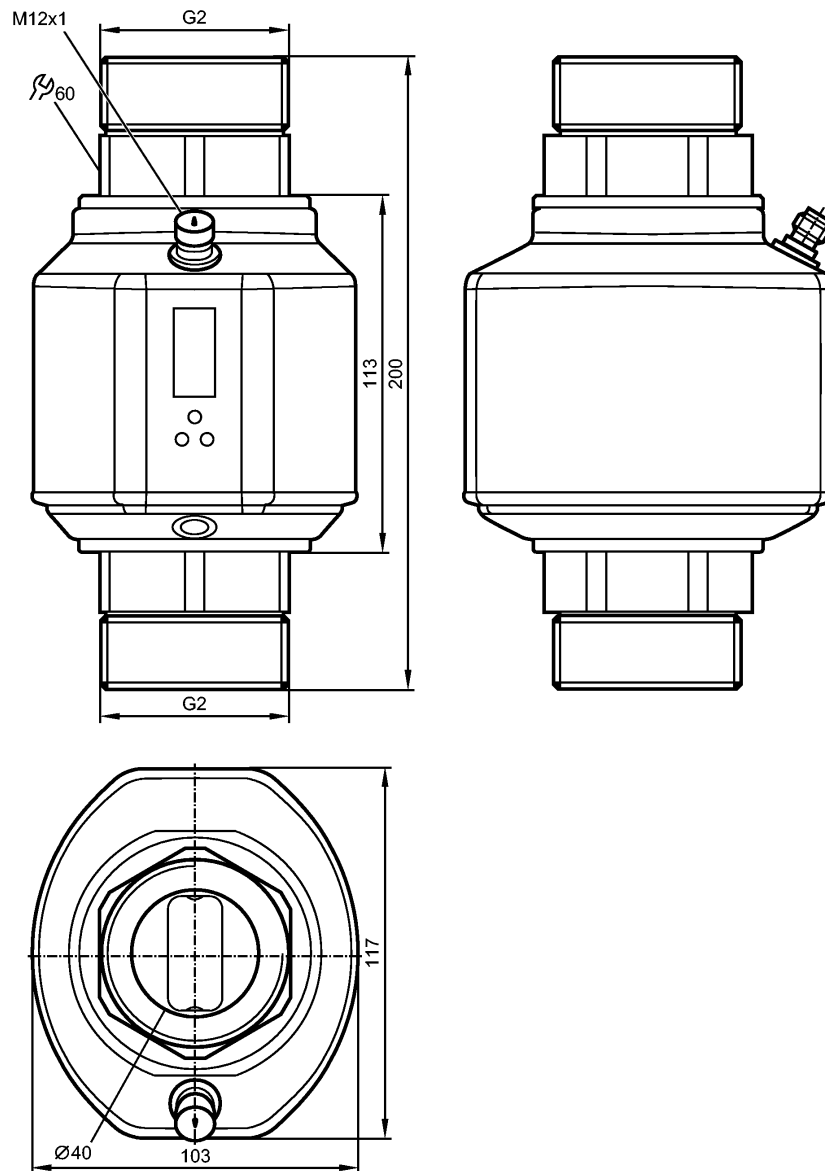


SM2001

SMR21XGXFRKG/US

Flow sensors



Product characteristics

Magnetic-inductive flow meter

Quick disconnect

Process connection: G2 flat seal

connection to pipe by means of an adapter

Function programmable

Totalizer function

Empty pipe detection

2 outputs

OUT1 = flow monitoring (binary), flow rate meter (pulse), preset meter (binary)

OUT2 = flow monitoring or temperature monitoring (analog or binary)

Input for counter reset

4-digit alphanumeric display

Measuring range

1.3...160 gpm

Application

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Flow sensors

Application	conductive liquids of the fluid group 2 according to the Pressure Equipment Directive (PED) (conductivity: $\geq 20 \mu\text{S/cm}$ / viscosity: $< 70 \text{ mm}^2/\text{s}$ at 40°C)	
Pressure rating	[psi]	232
Medium temperature	[°F]	14...158
Electrical data		
Electrical design		DC PNP/NPN
Operating voltage	[V]	18...32 DC ¹⁾
Current consumption	[mA]	< 150
Protection class		III
Reverse polarity protection		yes
Outputs		
Output function	OUT1: normally open / normally closed programmable or pulse or frequency or empty pipe detection or IO-Link OUT2: normally open / normally closed programmable or analogue (4...20 mA; 0...10 V, scalable) or empty pipe detection	
Current rating	[mA]	2 x 250
Voltage drop	[V]	< 2
Short-circuit protection		yes (non-latching)
Overload protection		yes
Analog output		4...20 mA; 0...10 V
Max. load	[Ω]	500 (4...20 mA)
Min. load	[Ω]	2000 (0...10 V)
Pulse output		flow rate meter
Frequency range [Hz]		0.1...10000
Measuring / setting range		
Empty pipe detection	normally closed / open	
Flow monitoring		
Measuring range	80...9600 gph	1.3...160 gpm
Display range	-11520...11520 gph	-190...190 gpm
Resolution	5 gph	0.1 gpm
Set point, SP	130...9600 gph	2.1...160 gpm
Reset point, rP	80...9550 gph	1.3...159.2 gpm
Analog start point, ASP	0...7680 gph	0...128 gpm
Analog end point, AEP	1920...9600 gph	32...160 gpm
Flow end point, FEP	320...9600 gph; 5.2...160 gpm	
Low flow cut-off, LFC	80...240 gph	1.3...4 gpm
in steps of	5 gph	0.1 gpm
Frequency end point, FrEP	0.01...10 kHz	
in steps of	10 Hz	
Measuring dynamics	1:120	
Volumetric flow quantity monitoring		
Measuring range	[gal]	0.0...9 999 E06
Display range	[gal]	0.0...9 999 E06
Set point, SP	[gal]	0.02...9 999 E06
Pulse value		0.02...160 E06 gal
in steps of		0.02 gal

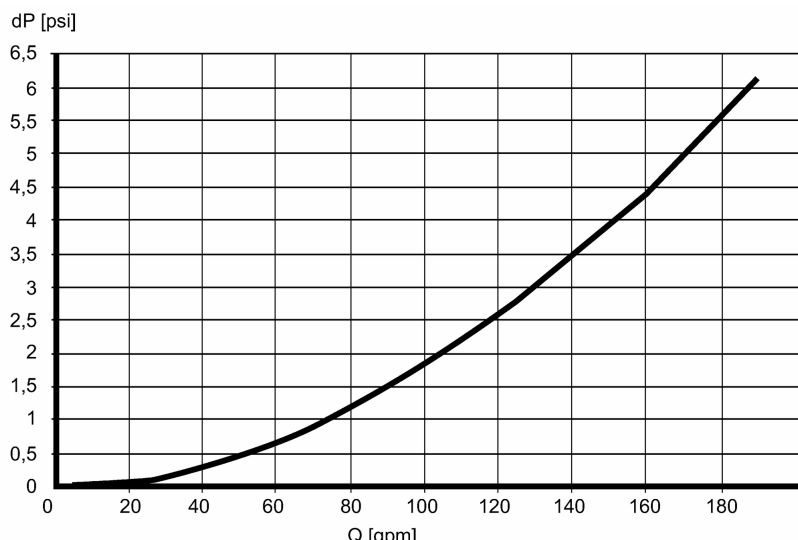
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Flow sensors

Pulse length	[s]	0.008...2
Temperature monitoring		
Measuring range	[°F]	-4...176
Display range	[°F]	-40...212
Resolution	[°F]	0.5
Set point, SP	[°F]	-2...176
Reset point, rP	[°F]	-3...175
Analog start point, ASP	[°F]	-4...140
Analog end point, AEP	[°F]	32...176
in steps of	[°F]	0.5

Accuracy / deviations

Flow monitoring		
Accuracy		$\pm (0.8\% \text{ MW} + 0.5\% \text{ MEW})^2$
Repeatability		$\pm 0.2\% \text{ MEW}$
Pressure loss (dP) / flow rate (Q)		

Temperature monitoring		
Accuracy	[K]	± 1 (77 °F; Q > 4 gpm)
Temperature drift		± 0.0185 °F / K

Reaction times

Power-on delay time	[s]	5
Flow monitoring		
Start-up delay	[s]	0...50
Response time	[s]	< 0.35 (dAP = 0)
Damping, dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	T09 = 3 (Q > 4 gpm)

Software / programming

Programming options	Hysteresis / window; NO / NC; output logic; current / voltage / frequency / pulse output; start-up delay; display can be deactivated; display unit; empty pipe detection	
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Interfaces

IO-Link Device		
Transfer type		COM2 (38.4 kBaud)
IO-Link revision		1.1

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Flow sensors

SDCI standard	IEC 61131-9 CDV
IO-Link Device ID	390d / 00 01 86h
Profiles	Smart Sensor: Process Data Variable; Device Identification
SIO mode	yes
Required master port class	A
Process data analogue	3
Process data binary	2
Min. process cycle time [ms]	5

Environment

Ambient temperature [°F]	14...140
Storage temperature [°F]	-13...176
Protection	IP 65 / IP 67

Tests / approvals

Pressure equipment directive	article 3, section 3 - sound engineering practice
EMC	DIN EN 60947-5-9
Shock resistance	DIN EN 60068-2-27 20 g (11 ms)
Vibration resistance	DIN EN 60068-2-6 5 g (10...2000 Hz)
MTTF [Years]	78

Mechanical data

Process connection	G2 flat seal
Materials (wetted parts)	stainless steel 316L / 1.4404; stainless steel 316Ti / 1.4571; PEEK (polyether ether ketone); Hastelloy C-4 (2.4610); Centellen; FKM
Housing materials	stainless steel 316L / 1.4404; stainless steel 316Ti / 1.4571; PEI; FKM; PBT-GF 20; elastolan
Weight [kg]	3.061

Displays / operating elements

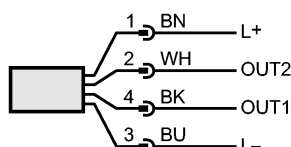
Display	Display unit 6 x LED green (gpm, gph, gal, °F, 10 ³ , 1000 x 10 ³) Switching status 2 x LED yellow Measured values 4-digit alphanumeric display Programming 4-digit alphanumeric display
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Electrical connection

Connection	M12 connector; gold-plated contacts
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Wiring

Core colors
 BK black
 BN brown
 BU blue
 WH white



Colours to DIN EN 60947-5-2

OUT1: 6 options:
 switching output empty pipe detection
 switching output flow rate monitoring
 frequency output flow rate monitoring
 pulse output quantity meter
 signal output preset counter
 IO-Link

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Flow sensors

OUT2: 6 options:

switching output empty pipe detection

switching output flow rate monitoring

switching output temperature monitoring

analogue output flow rate

analogue output temperature

Input for counter reset

Accessories

Accessories (included)

2 x packing washer (Centellen); Label

Remarks

Remarks

1) to DIN EN 50178, SELV, PELV

 2) at 4 gpm, medium and ambient temperature $+72\text{ }^{\circ}\text{F} \pm 7\text{ }^{\circ}\text{F}$

MW = measured value

MEW = final value of the measuring range

Pack quantity

[piece]

1