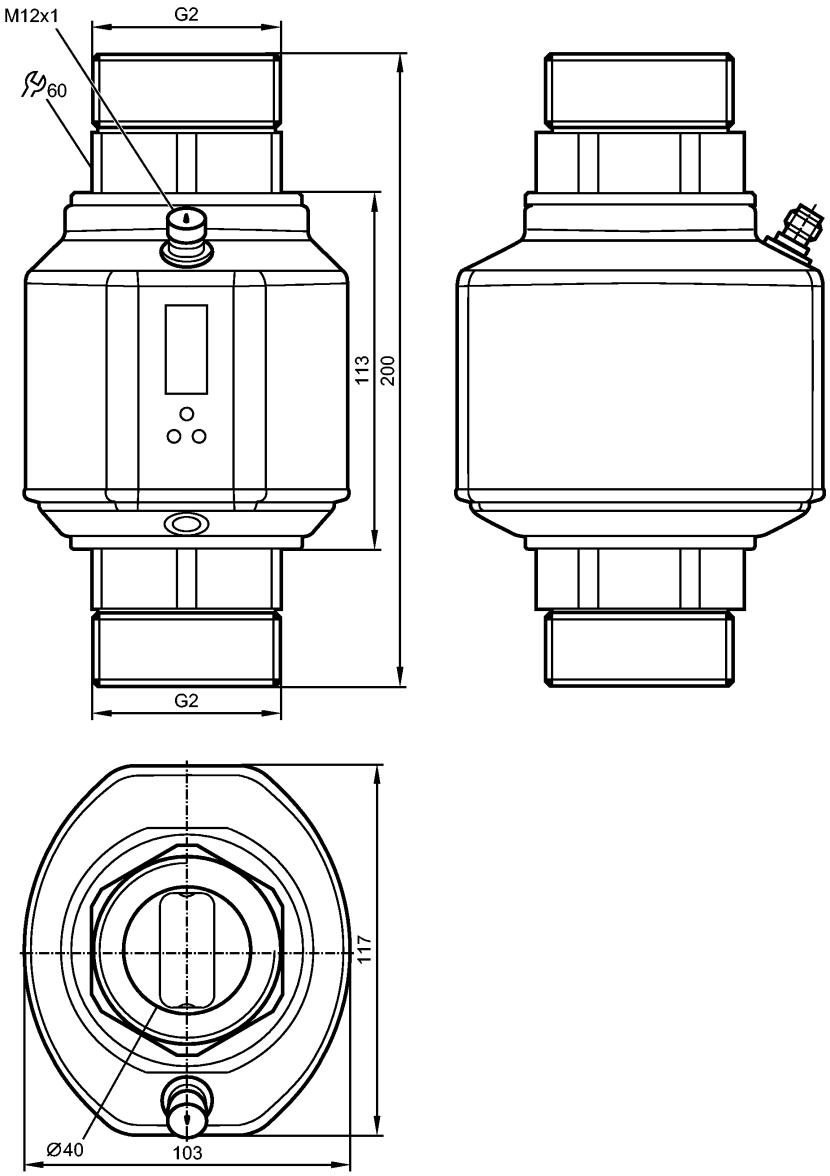
SM0510

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

5...900 l/min

Application

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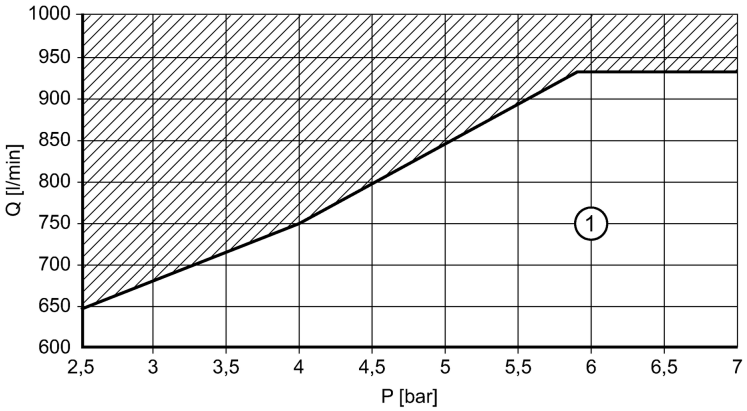
Application		Conductive liquids (conductivity:>= 20 µS/cm / viscosity: < 70 cSt at 104 °F)	
Cavitation		 1: cavitation-free operating area (see operating instructions)	
Pressure rating	[bar]	16	
Medium temperature	[°C]	-10...70	
Electrical data			
Electrical design		DC PNP/NPN	
Operating voltage	[V]	18...32 DC [1])	
Current consumption	[mA]	< 150	
Insulation resistance	[MΩ]	> 100 (500 V DC)	
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		5...900 l/min	0.3...54 m³/h
Display range		-920...920 l/min	-55.2...55.2 m³/h
Resolution		1 l/min	0.05 m³/h
Set point, SP		10...900 l/min	0.55...54 m³/h
Reset point, rP		5...896 l/min	0.3...53.75 m³/h
Analog start point, ASP		0...720 l/min	0...43.2 m³/h
Analog end point, AEP		180...900 l/min	10.8...54 m³/h

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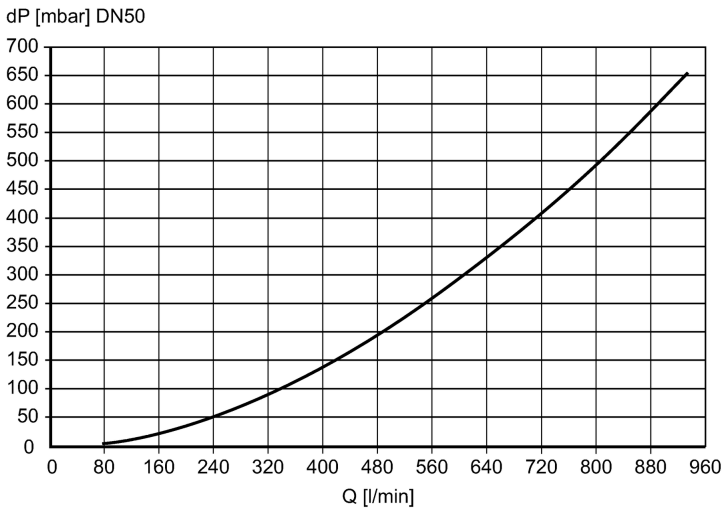
Flow end point, FEP		20...900 l/min; 1.2...54 m³/h	
Low flow cut-off, LFC		5...15 l/min	0.3…0.9 m³/h
in steps of		1 l/min	0.05 m³/h
Frequency end point, FrEP		0.01...10 kHz	
in steps of		10 Hz	
Measuring dynamics		1:180	
Volumetric flow quantity monitoring			
Measuring range	[l...m³]	0.0…9999 x 10³	
Display range	[l...m³]	0.0…9999 x 10³	
Set point, SP	[l...m³]	0.1 l...600 x 10³ m³	
Pulse value		0.1 l...600 x 10³ m³	
in steps of		0.1 l	
Pulse length	[s]	0.003...2	
Temperature monitoring			
Measuring range	[°C]	-20...80	
Display range	[°C]	-40...100	
Resolution	[°C]	0.2	
Set point, SP	[°C]	-19.2...80.0	
Reset point, rP	[°C]	-19.6...79.6	
Analog start point, ASP	[°C]	-20...60	
Analog end point, AEP	[°C]	0...80	
in steps of	[°C]	0.2	

Accuracy / deviations

Flow monitoring		
Accuracy	[% of the final value]	± (0.8% MW + 0.5% MEW) ²)
Repeatability		± 0.2% MEW
Pressure loss (dP) / flow rate (Q)		
Temperature monitoring		
Accuracy	[K]	± 1 (bei 25 °C, Q > 15 l/min)

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 > 15 l/min)
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
Interfaces		
IO-Link Device		
Transfer type		COM2 (38.4 kBaud)
IO-Link revision		1.1
SDCI standard		IEC 61131-9 CDV
IO-Link Device ID		509 d / 00 01 FD h
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	[°C]	-10...60
Storage temperature	[°C]	-25...80
Protection		IP 65 / IP 67
Tests / approvals		
Pressure equipment directive		article 3, section 3 - sound engineering practice
EMC		DIN EN 61000-4-2 ESD: 4 kV CD / 8 kV AD DIN EN 61000-4-3 HF radiated: 10 V/m DIN EN 61000-4-4 Burst: 2 kV DIN EN 61000-4-5 Surge: 1 kV DIN EN 61000-4-6 HF conducted: 10 V
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]	77.9
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; PC (polycarbonate); FKM; PBT-GF 20; elastolan
Weight	[kg]	3.177
Displays / operating elements		
Display		Display unit 6 x LED green (l/min, m³/h, l, m³, 10³, °C) Switching status 2 x LED yellow Measured values 4-digit alphanumeric display Programming 4-digit alphanumeric display
Electrical connection		
Connection		M12 connector; gold-plated contacts
Wiring		

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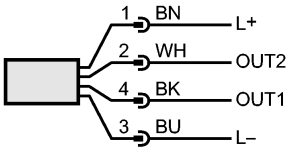
Core colors

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
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]) Q > 15l/min, medium and ambient temperature +22 °C ± 4 K MW = measured value MEW = final value of the measuring range
Pack quantity [piece]	1

Other data

Temperature drift	± 0.0333 °C / K