

SM0510



Magnetic-inductive flow meter

SMR21XGXFRKG/US



Product characteristics		
Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1	
Measuring range	5...900 l/min	0.3...54 m³/h
Process connection	threaded connection G 2 external thread DN50 flat seal	
Application		
Special feature	Gold-plated contacts	
Application	totaliser function; empty pipe detection; for industrial applications	
Installation	connection to pipe by means of an adapter	
Media	conductive liquids; water; hydrous media	



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Note on media		conductivity: $\geq 20 \mu\text{S/cm}$
		viscosity: $< 70 \text{ mm}^2/\text{s}$ (40 °C)
Medium temperature	[°C]	-10...90
Pressure rating	[bar]	16
Pressure rating	[MPa]	1.6

Electrical data		
Operating voltage	[V]	18...32 DC; (to SELV/PELV)
Current consumption	[mA]	< 150
Protection class		III
Reverse polarity protection		yes
Power-on delay time	[s]	5
Measuring principle		magnetic-inductive

Inputs / outputs	
Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1

Inputs	
Inputs	counter reset

Outputs		
Total number of outputs		2
Output signal		switching signal; analogue signal; pulse signal; frequency signal; IO-Link; (configurable)
Electrical design		PNP/NPN
Number of digital outputs		2
Output function		normally open / normally closed; (parameterisable)
Max. voltage drop switching output DC	[V]	2
Permanent current rating of switching output DC	[mA]	250; (per output)
Number of analogue outputs		1
Analogue current output	[mA]	4...20; (scalable)
Max. load	[Ω]	500
Analogue voltage output	[V]	0...10; (scalable)
Min. load resistance	[Ω]	2000
Pulse output		flow rate meter
Short-circuit protection		yes
Type of short-circuit protection		pulsed
Overload protection		yes
Frequency of the output	[Hz]	0.1...10000

Measuring/setting range		
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
Analogue start point ASP	0...720 l/min	0...43.2 m³/h
Analogue end point AEP	180...900 l/min	10.8...54 m³/h



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Low flow cut-off LFC	< 15 l/min	< 0.9 m³/h
In steps of	1 l/min	0.05 m³/h
Measuring dynamics	1:180	
Volumetric flow quantity monitoring		
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	
Reset point rP [°C]	-19.6...79.6	
Analogue start point [°C]	-20...60	
Analogue end point [°C]	0...80	
In steps of [°C]	0.2	
Accuracy / deviations		
Flow monitoring		
Accuracy (in the measuring range)	± (0,8 % MW + 0,5 % MEW)	
Repeatability	± 0,2% MEW	
Temperature monitoring		
Temperature drift	± 0,0333 °C / K	
Accuracy [K]	± 1 (bei 25 °C, Q > 15 l/min)	
Response times		
Flow monitoring		
Response time [s]	0.35; (dAP = 0)	
Delay time programmable dS, dr [s]	0...50	
Damping process value dAP [s]	0...5	
Temperature monitoring		
Dynamic response T05 / T09 [s]	T09 = 3 (Q > 15 l/min)	
Software / programming		
Parameter setting options	Flow monitoring; quantity meter; Preset counter; Temperature monitoring; hysteresis / window; normally open / normally closed; switching logic; current/voltage/frequency/pulse output; start-up delay; display can be deactivated; Display unit; empty pipe detection	
Interfaces		
Communication interface	IO-Link	
Transmission type	COM2 (38,4 kBaud)	
IO-Link revision	1.1	
SDCI standard	IEC 61131-9 CDV	
Profiles	Smart Sensor: Process Data Variable; Device Identification	
SIO mode	yes	
Required master port type	A	

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Process data analogue		3
Process data binary		2
Min. process cycle time	[ms]	5
Supported DeviceIDs	Type of operation	DeviceID
	default	509

Operating conditions		
Ambient temperature	[°C]	-10...60
Storage temperature	[°C]	-25...80
Protection		IP 65; IP 67

Tests / approvals		
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
CPA approval	model number	004MI
	accuracy class	-
	maximum allowable error	± 1,5 % FS
	Q (min)	0,3 m³/h
	Q (t)	-
	Q (max)	54 m³/h
	Medium temperature	-10...70 °C
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]	85
UL approval	UL Approval no.	I008
	File number UL	E174189
Pressure Equipment Directive	Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight	[g]	3212
Housing		rectangular
Dimensions	[mm]	200 x 103 x 117
Materials		stainless steel (316L/1.4404); stainless steel (316Ti/1.4571); PC; FKM; PBT-GF20; TPE-U
Materials (wetted parts)		stainless steel (316L/1.4404); stainless steel (316Ti/1.4571); PEEK; Centellen; FKM
Process connection		threaded connection G 2 external thread DN50 flat seal

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	alphanumeric display, 4-digit
	programming	alphanumeric display, 4-digit

Accessories	
Items supplied	sealings: 2, Centellen
	Label

Remarks	
Remarks	MW = measured value
	MEW = Final value of the measuring range

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Pack quantity

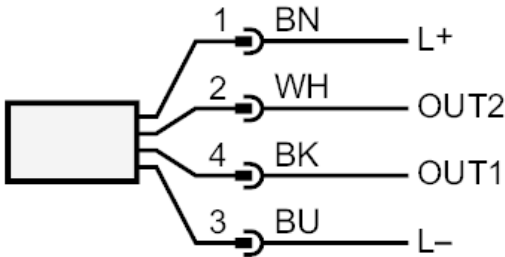
1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



OUT1:

colours to DIN EN 60947-5-2
switching output empty pipe detection
switching output volumetric flow quantity monitoring
frequency output volumetric flow quantity monitoring
Pulse output quantity meter
signal output Preset counter
IO-Link

OUT2:

switching output empty pipe detection
switching output volumetric flow quantity monitoring
switching output Temperature monitoring
analogue output volumetric flow quantity monitoring
analogue output Temperature monitoring
input counter reset

Core colours :

BK = black
BN = brown
BU = blue
WH = white



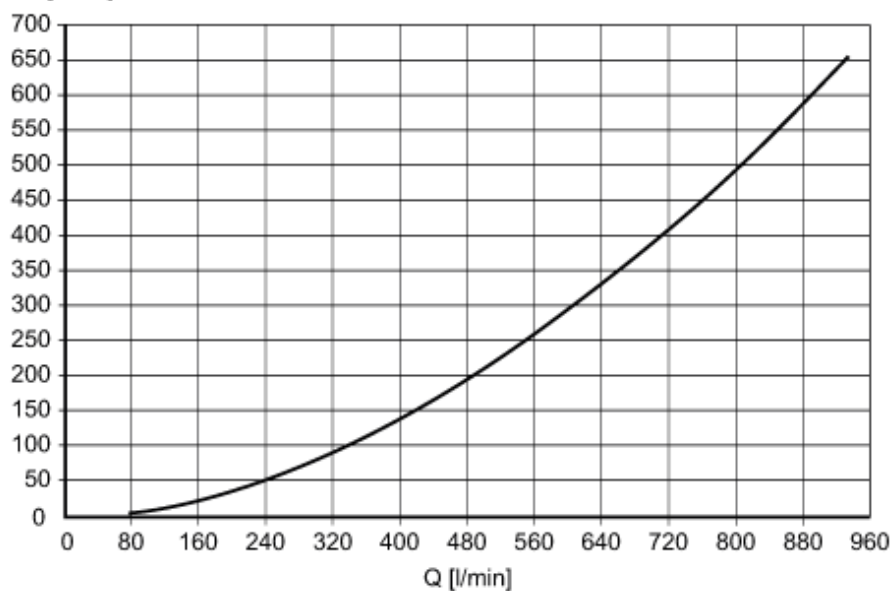
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Diagrams and graphs

Pressure loss

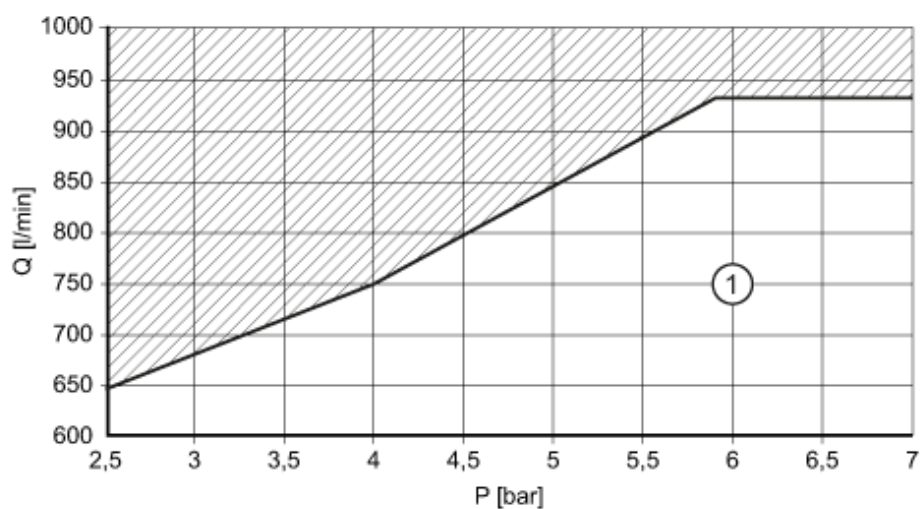
dP [mbar] DN50



dP Pressure loss

Q volumetric flow quantity

Cavitation



1 cavitation-free working area see operating instructions