

SM0510



Magnetic-inductive flow meter

SMR21XGXFRKG/US



Product characteristics		
Number of inputs and outputs	Number of digital outputs: 2; Number of analog 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		
System	gold-plated contacts	
Application	Totalizer function; empty pipe detection; for industrial applications	
Installation	connection to pipe by means of an adapter	
Media	Conductive liquids; water; water-based 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	16 bar	1.6 MPa

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 analog outputs: 1
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Inputs

Inputs	counter reset
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Outputs

Total number of outputs	2	
Output signal	switching signal; analog signal; pulse signal; frequency signal; IO-Link; (configurable)	
Electrical design	PNP/NPN	
Number of digital outputs	2	
Output function	normally open / closed; (configurable)	
Max. voltage drop switching output DC [V]	2	
Permanent current rating of switching output DC [mA]	250; (per output)	
Number of analog outputs	1	
Analog current output [mA]	4...20; (scalable)	
Max. load [Ω]	500	
Analog 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	yes (non-latching)	
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
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
Low flow cut-off LFC	$< 15 \text{ l/min}$	$< 0.9 \text{ m}^3/\text{h}$
In steps of	1 l/min	0.05 m³/h



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Measuring dynamics	1:180
Volumetric flow quantity monitoring	
Pulse value	0.1 l...600 x 10 ³ m ³
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
Analog start point [°C]	-20...60
Analog 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)
Reaction 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 / 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 class	A
Process data analog	3
Process data binary	2

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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 number	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
Material	stainless steel (1.4404 / 316L); stainless steel (1.4571/316Ti); PC; FKM; PBT-GF20; TPE-U	
Materials (wetted parts)	stainless steel (1.4404 / 316L); stainless steel (1.4571/316Ti); 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	
Pack quantity	1 pcs.	

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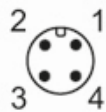


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Electrical connection

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



Connection



OUT1:	Colors 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 analog output Volumetric flow quantity monitoring analog output Temperature monitoring Input counter reset Core colors :
BK =	black
BN =	brown
BU =	blue
WH =	white

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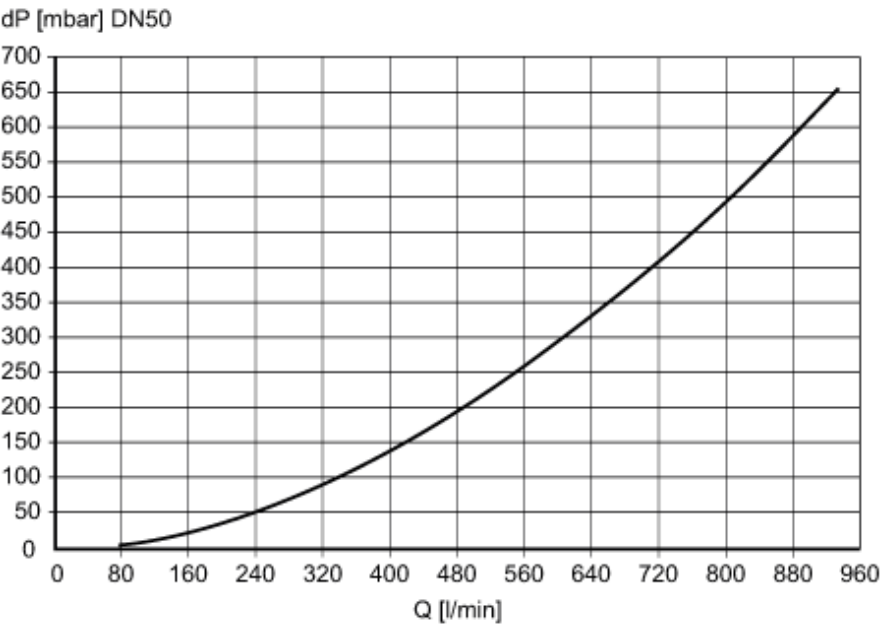


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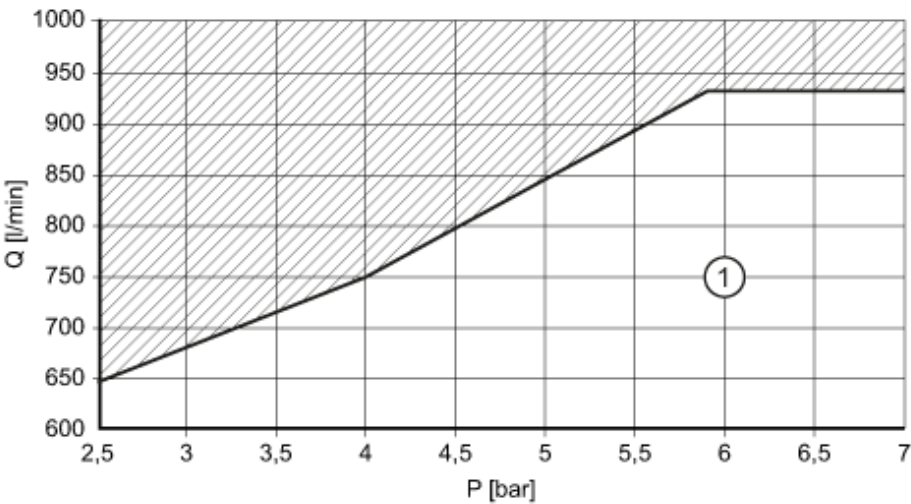
Diagrams and graphs

Pressure loss



dP Pressure loss
Q volumetric flow quantity

Cavitation



1 cavitation-free working area see operating instructions