

SM9001



Magnetic-inductive flow meter

SMR21XGXFRKG/US



Application	
Application	totaliser function; empty pipe detection; for industrial applications
Installation	connection to pipe by means of an adapter
Media	conductive liquids; water; hydrous media
Medien	conductivity: $\geq 20 \mu\text{S/cm}$ viscosity: $< 70 \text{ mm}^2/\text{s}$ (40 °C)
Medium temperature	[°F] 14...158
Pressure rating	[bar] 16



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Electrical data		
Operating voltage	[V]	18...32 DC; (according to EN 50178 SELV/PELV)
Current consumption	[mA]	< 150
Protection class		III
Reverse polarity protection		yes
Power-on delay time	[s]	5
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	80...4800 gph	1.3...80 gpm
Display range	-5760...5760 gph	-96...96 gpm
Resolution	5 gph	0.1 gpm
Set point SP	105...4800 gph	1.7...80 gpm
Reset point rP	80...4775 gph	1.3...79.6 gpm
Analogue start point ASP	0...3840 gph	0...64 gpm
Analogue end point AEP	960...4800 gph	16...80 gpm
Low flow cut-off LFC	< 240 gph	< 4 gpm
Measuring dynamics	1:60	
In steps of	5 gph	0.1 gpm
volumetric flow quantity monitoring		
Pulse value	0.02...80 E06 gal	
In steps of	0.02 gal	
Pulse length	[s]	0,016...2



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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
Analogue start point	[°F]	-4...140
Analogue end point	[°F]	32...176
In steps of	[°F]	0.5
Accuracy / deviations		
Flow monitoring		
Accuracy (in the measuring range)		$\pm (0,8 \% \text{ MW} + 0,5 \% \text{ MEW})$; (4 gpm; medium and operating temperature: 72 °F $\pm$ 7 °F)
Repeatability		$\pm 0,2\% \text{ MEW}$
Temperature monitoring		
Temperature drift		$\pm 0,0185 \text{ °F / K}$
Accuracy	[K]	± 1 (77 °F; Q > 4 gpm)
Response times		
Flow monitoring		
Response time	[s]	0.35; (dAP = 0)
Delay time programmable dS, dr	[s]	0...50
Damping for the switching output dAP	[s]	0...5
Temperature monitoring		
Dynamic response T05 / T09	[s]	T09 = 3 (Q > 4 gpm)
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
IO-Link device ID		392d / 00 01 88h
Profiles		Smart Sensor: Process Data Variable; Device Identification
SIO mode		yes
Required master port type		A
Process data analogue		3
Process data binary		2
Min. process cycle time	[ms]	5

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Operating conditions		
Ambient temperature	[°F]	14...140
Storage temperature	[°F]	-13...176
Protection		IP 65; IP 67
Tests / approvals		
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
Pressure Equipment Directive	Sound Engineering Practice; can be used for group 2 fluids; group 1 fluids on request	
Mechanical data		
Weight	[g]	3059.4
Materials	stainless steel (1.4404 / 316L); stainless steel (1.4571/316Ti); PEI; 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 flat seal	
Displays / operating elements		
Display	Display unit	6 x LED, green (gpm, gph, gal, °F, 10³, 1000 x 10³)
	switching status	2 x LED, yellow
	measured values	alphanumeric display, 4-digit
	programming	alphanumeric display, 4-digit
Accessories		
Accessories (supplied)	sealings: 2, Centellen	
	Label	
Remarks		
Remarks	MW = measured value	
	MEW = Final value of the measuring range	
Pack quantity	1 pcs.	
Electrical connection		
Connector: 1 x M12; Contacts: gold-plated		
		



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Connection



	colours to DIN EN 60947-5-2
OUT1:	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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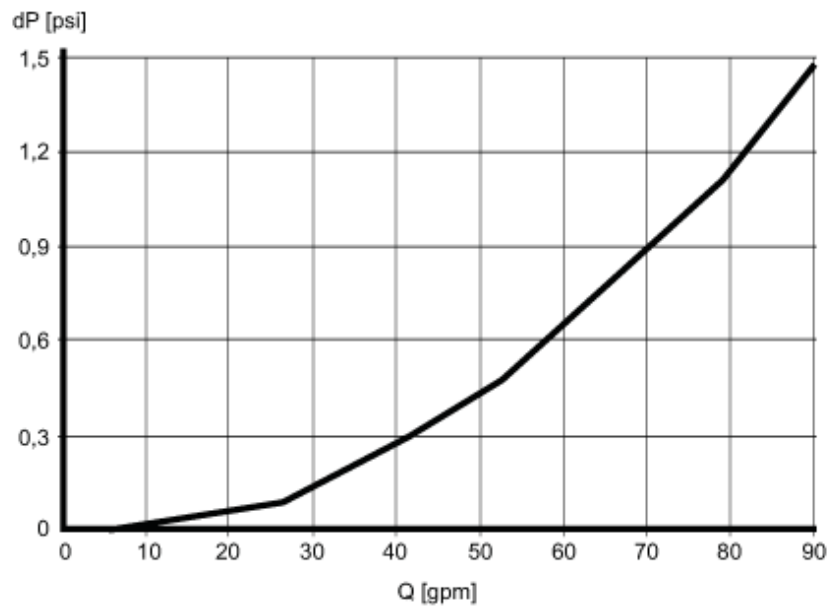
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Diagrams and graphs

Pressure loss



dP Pressure loss

Q volumetric flow quantity