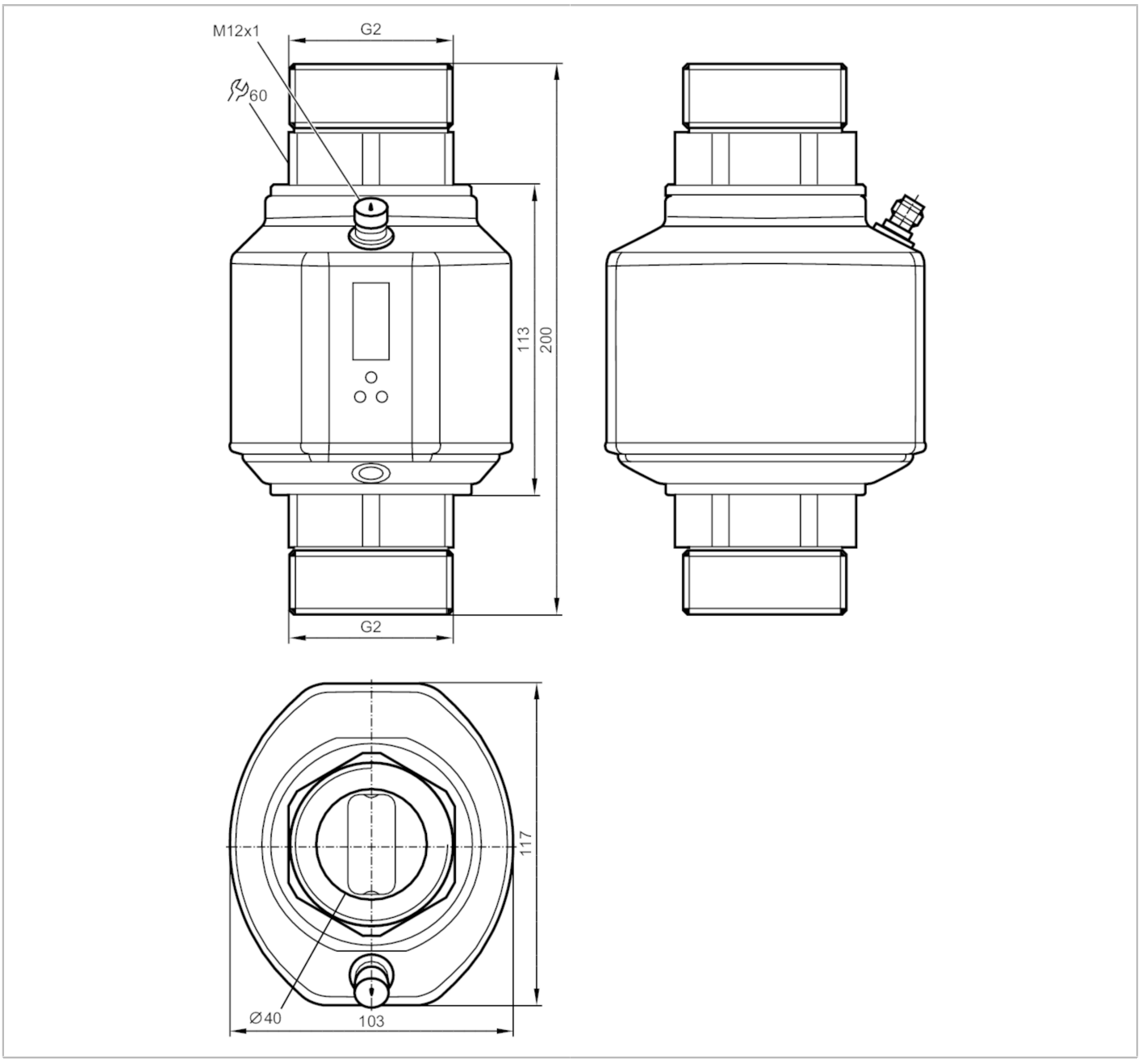
SM2001

Magnetic-inductive flow meter

SMR21XGXFRKG/US



CE CRN cULus LISTED EC 1935/2004 IO-Link UKCA

Product characteristics		
Number of inputs and outputs	Number of digital outputs: 2; Number of analog outputs: 1	
Measuring range	80...9600 gph	1.3...160 gpm
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: ≥ 20 µS/cm		
		viscosity: < 70 mm²/s (40 °C)		
Medium temperature	[°F]	14...176		
Pressure rating		16 bar	232 psi	1.6 MPa
MAWP (for applications according to CRN)	[bar]	16		
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		
Inputs / outputs				
Number of inputs and outputs		Number of digital outputs: 2; Number of analog outputs: 1		
Inputs				
Inputs		counter reset		
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		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	
Low flow cut-off LFC		< 240 gph	< 4 gpm	

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In steps of		5 gph	0.1 gpm
Measuring dynamics		1:120	
Volumetric flow quantity monitoring			
Pulse value		0.02...160 E06 gal	
In steps of		0.02 gal	
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	[°F]	-4...140	
Analog end point	[°F]	32...176	
In steps of	[°F]	0.5	
Accuracy / deviations			
Flow monitoring			
Accuracy (in the measuring range)		± (0,8 % MW + 0,5 % MEW)	
Repeatability		± 0,2% MEW	
Temperature monitoring			
Temperature drift		± 0,0185 °F / K	
Accuracy	[K]	± 1 (77 °F; Q > 4 gpm)	
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 > 4 gpm)	
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	

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Process data binary		2	
Min. process cycle time	[ms]	5	
Supported DeviceIDs		**Type of operation**	**DeviceID**
		default	390
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]	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]	3069.2	
Housing		rectangular	
Dimensions	[mm]	200 x 103 x 117	
Material		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; NBR fiber-reinforced; FKM	
Process connection		threaded connection G 2 external thread DN50 flat seal	
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	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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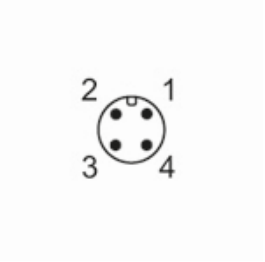
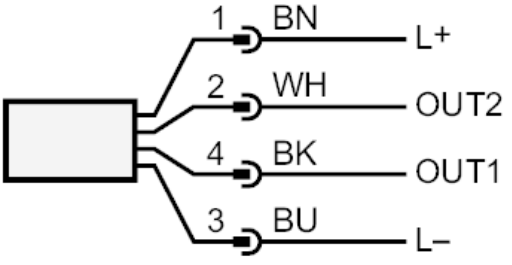
Electrical connection

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



Connection



	Colors 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
	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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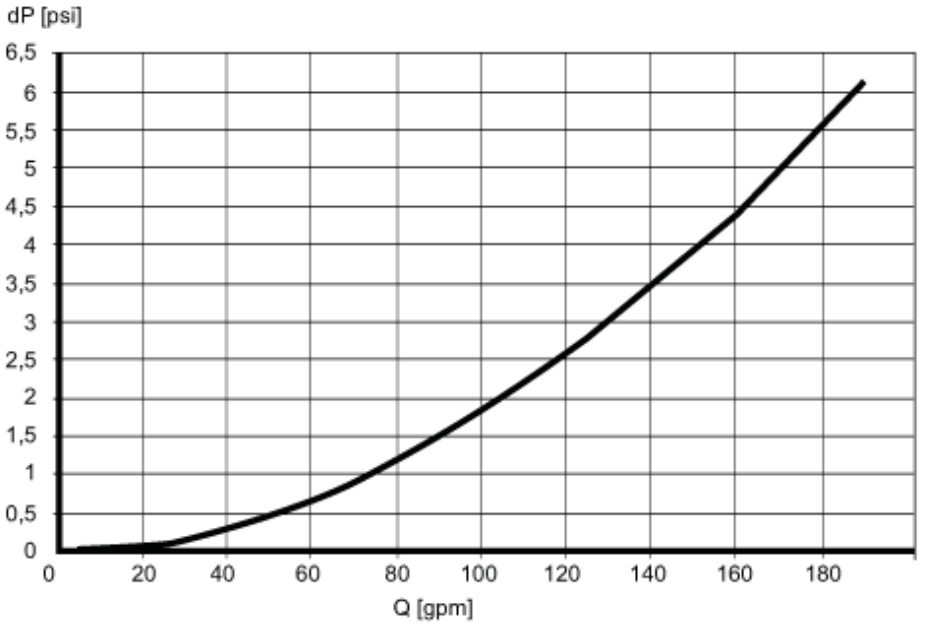
Diagrams and graphs

Pressure loss



dP Pressure loss

Q volumetric flow quantity