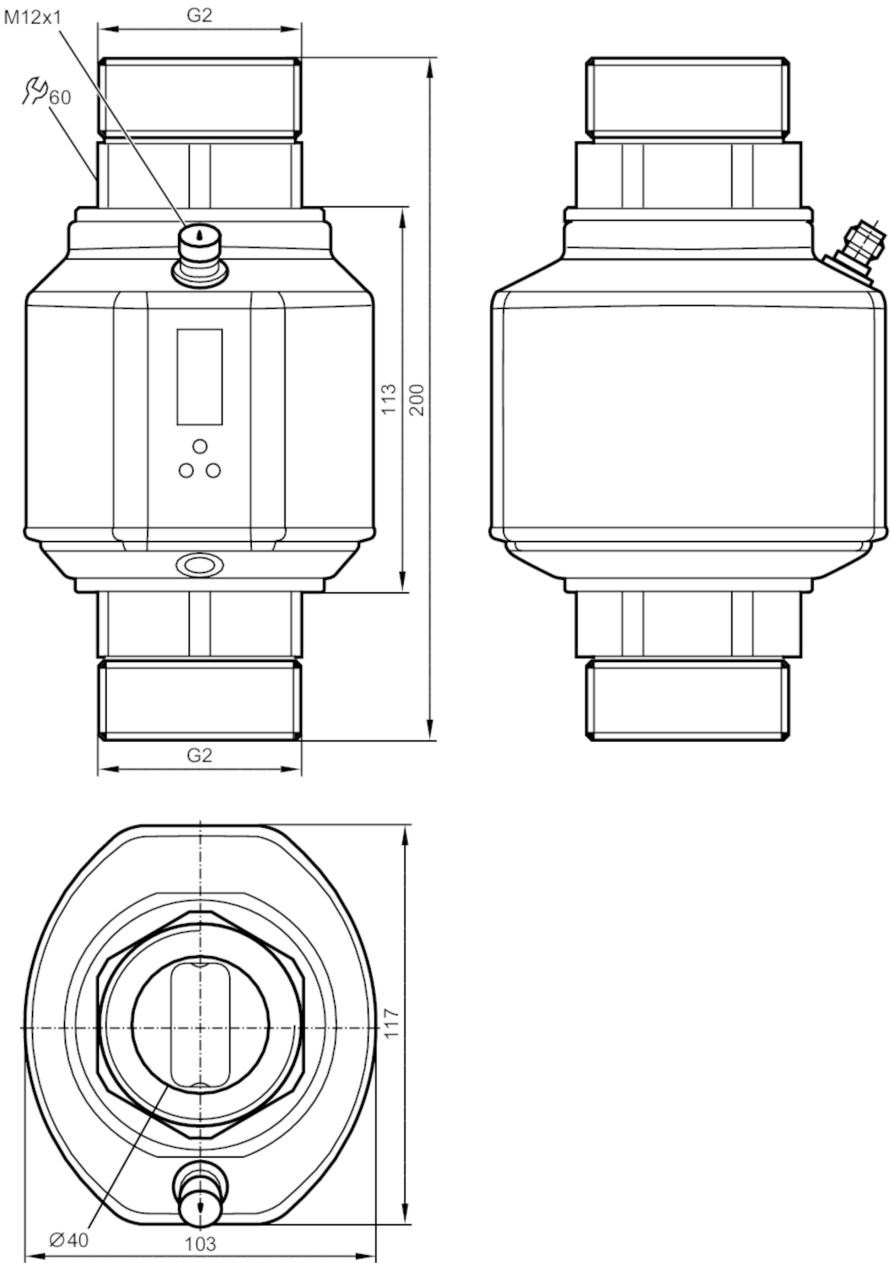


SM2000



Magnetic-inductive flow meter

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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	[°C] -10...70
Pressure rating	[bar] 16



Magnetic-inductive flow meter

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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	5...600 l/min	0.3...36 m³/h
Display range	-720...720 l/min	-43.2...43.2 m³/h
Resolution	0.5 l/min	0.02 m³/h
Set point SP	8...600 l/min	0.5...36 m³/h
Reset point rP	5...597 l/min	0.3...35.8 m³/h
Analogue start point ASP	0...480 l/min	0...28.8 m³/h
Analogue end point AEP	120...600 l/min	7.2...36 m³/h
Low flow cut-off LFC	< 15 l/min	< 0.9 m³/h
Measuring dynamics		1:120
In steps of	0.5 l/min	0.02 m³/h
volumetric flow quantity monitoring		
Pulse value		0.0001...600x10³ m³
In steps of		0.0001 m³
Pulse length	[s]	0,008...2



Magnetic-inductive flow meter

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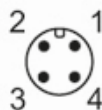
Temperature monitoring		
Measuring range	[°C]	-20...80
Display range	[°C]	-40...100
Resolution	[°C]	0.2
Set point SP	[°C]	-19.2...80
Reset point rP	[°C]	-19.6...79.6
Analogue start point	[°C]	-20...60
Analogue end point	[°C]	0...80
In steps of	[°C]	0.2
Accuracy / deviations		
Flow monitoring		
Accuracy (in the measuring range)		± (0,8 % MW + 0,5 % MEW); (Q > 15 l/min; medium and operating temperature: 22 °C ± 4 K)
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 for the switching output 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	
IO-Link device ID	389d / 00 01 85h	
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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Magnetic-inductive flow meter

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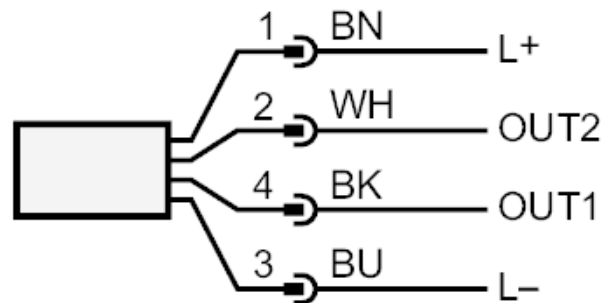
Operating conditions		
Ambient temperature	[°C]	-10...60
Storage temperature	[°C]	-25...80
Protection		IP 65; IP 67
Tests / approvals		
EMC	DIN EN 60947-5-9	
Shock resistance	DIN EN 60068-2-27	20 g (11 ms)
Vibration resistance	DIN EN 60068-2-6	5 g (10...2000 Hz)
MTTF	[years]	78
Pressure Equipment Directive	Sound Engineering Practice; can be used for group 2 fluids; group 1 fluids on request	
Mechanical data		
Weight	[g]	3071.4
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 (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		
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		
		



Magnetic-inductive flow meter

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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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Magnetic-inductive flow meter

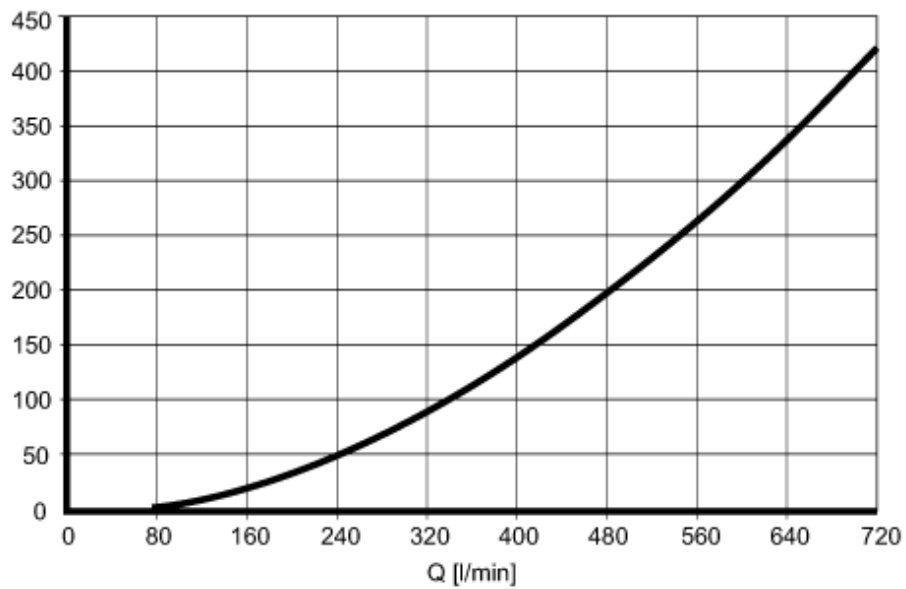
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Diagrams and graphs

Pressure loss

dP [mbar] DN50



dP Pressure loss

Q volumetric flow quantity