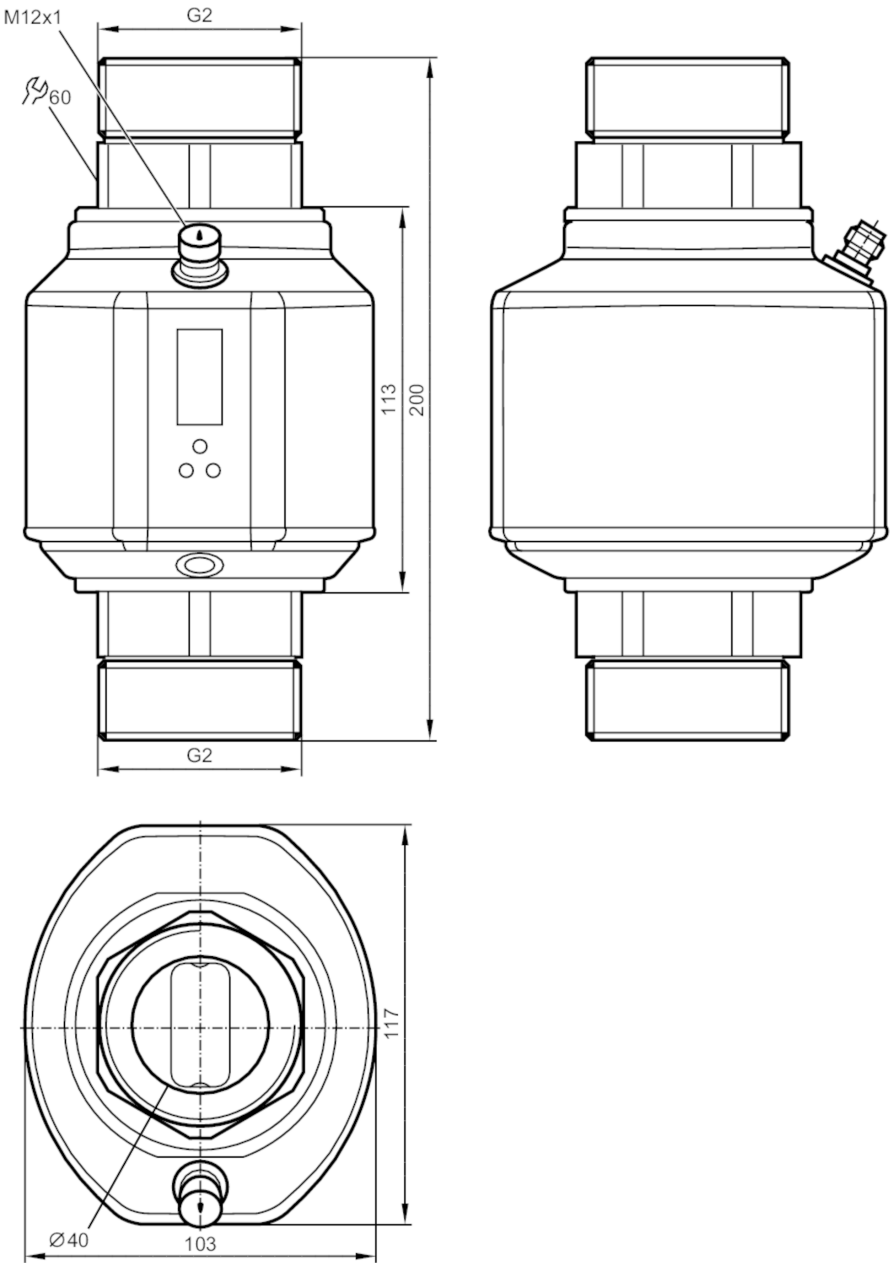


SM2000



Magnetic-inductive flow meter

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Product characteristics		
Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1	
Measuring range	5...600 l/min	0.3...36 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	16 bar	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	
Measuring principle	magnetic-inductive	

Inputs / outputs

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

Inputs	counter reset	
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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



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Low flow cut-off LFC	< 15 l/min		< 0.9 m³/h
In steps of	0.5 l/min		0.02 m³/h
Measuring dynamics	1:120		
Volumetric flow quantity monitoring			
Pulse value	0.0001...600 x 10³ m³		
In steps of	0.0001 m³		
Pulse length [s]	0,008...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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Magnetic-inductive flow meter

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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	389

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	
CPA approval	model number	004MI
	accuracy class	-
	maximum allowable error	± 1,5 % FS
	Q (min)	0,3 m³/h
	Q (t)	-
	Q (max)	36 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]		3208
Housing		rectangular
Dimensions [mm]		200 x 103 x 117
Materials	stainless steel (316L/1.4404); stainless steel (316Ti/1.4571); PEI; 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	
Pack quantity	1 pcs.	

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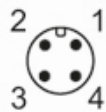


Magnetic-inductive flow meter

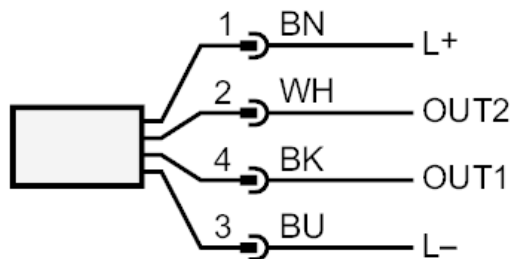
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Electrical connection

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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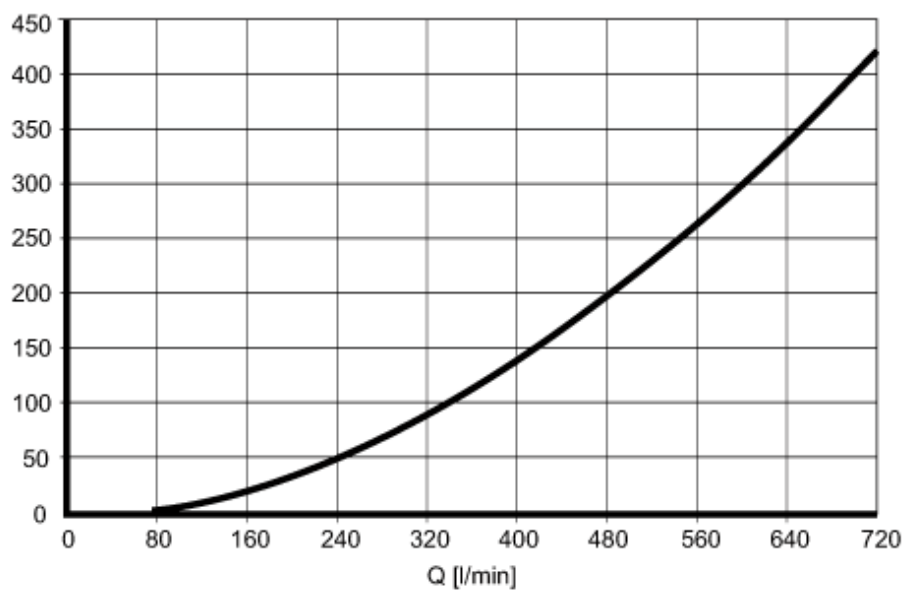
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Diagrams and graphs

Pressure loss

dP [mbar] DN50



dP Pressure loss

Q volumetric flow quantity