

# SM6020

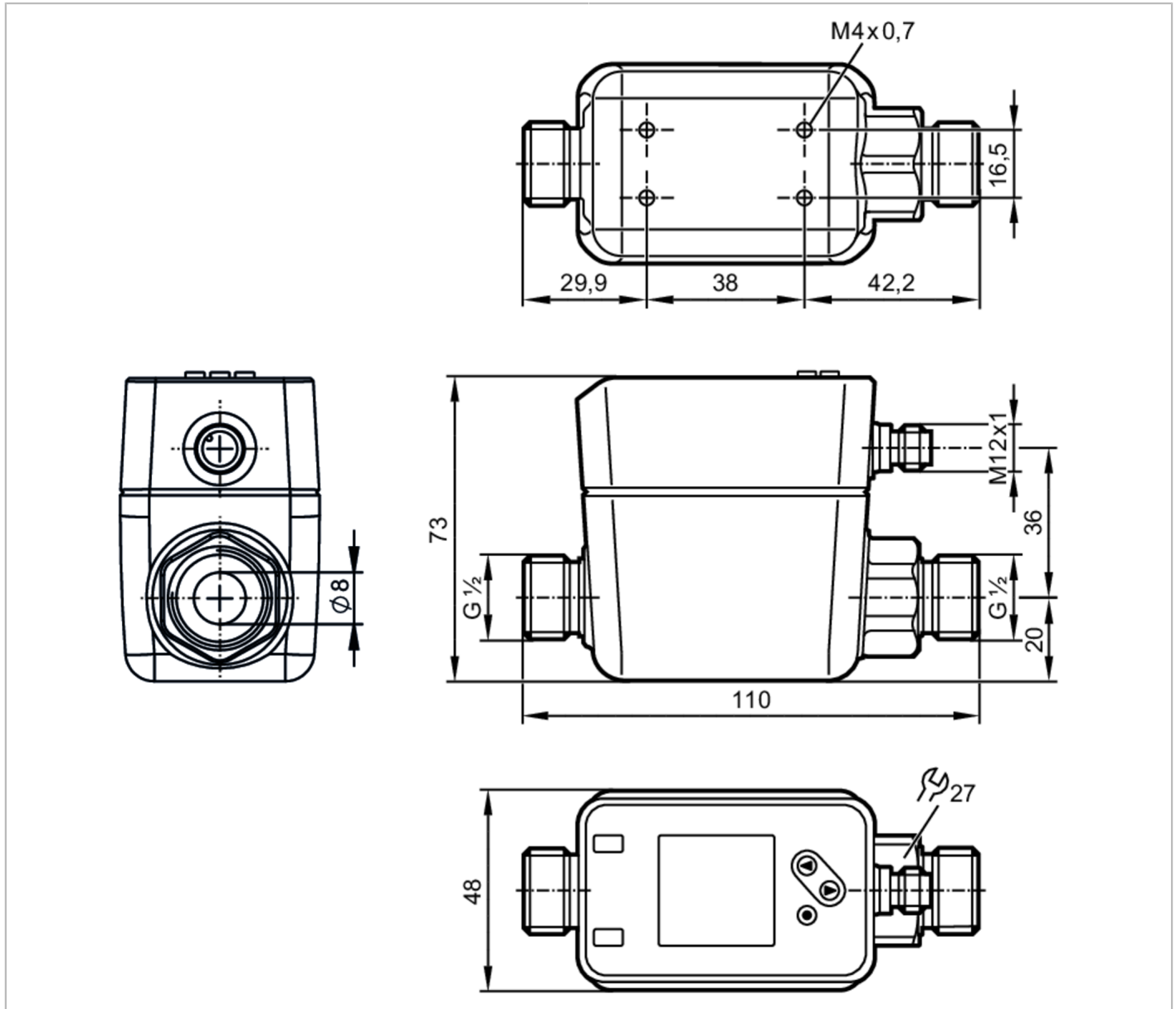


## Magnetic-inductive flow meter

SMR12XGXFRKG/US-100

Alternative articles: SM6000

When selecting an alternative article and accessories please note that technical data may differ!



### Product characteristics

Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1			
Measuring range	0.05...35 l/min	0.003...2.1 m³/h	0.6...555 gph	0.01...9.25 gpm
Process connection	threaded connection G 1/2 external thread DN15 flat seal			

### Application

Special feature	Gold-plated contacts
Media	conductive liquids; water; hydrous media
Note on media	conductivity: $\geq 20 \mu\text{S/cm}$ viscosity: $< 70 \text{ mm}^2/\text{s}$ (40 °C)
Medium temperature [°C]	-20...90

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Pressure rating	16 bar	1.6 MPa		
<b>Electrical data</b>				
Operating voltage [V]	18...30 DC; (to SELV/PELV)			
Current consumption [mA]	< 80			
Protection class	III			
Reverse polarity protection	yes			
Power-on delay time [s]	5			
Measuring principle	magnetic-inductive			
<b>Inputs / outputs</b>				
Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1			
<b>Inputs</b>				
Inputs	counter reset			
<b>Outputs</b>				
Total number of outputs	2			
Output signal	switching signal; analogue signal; pulse signal; IO-Link; frequency signal; (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]	100			
Number of analogue outputs	1			
Analogue current output [mA]	4...20; (scalable)			
Max. load [ $\Omega$ ]	500			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	pulsed			
Overload protection	yes			
<b>Measuring/setting range</b>				
Measuring range	0.05...35 l/min	0.003...2.1 m <sup>3</sup> /h	0.6...555 gph	0.01...9.25 gpm
Display range	-42...42 l/min	-2.5...2.5 m <sup>3</sup> /h	-666...666 gph	-11.1...11.1 gpm
Resolution	0.02 l/min	0.002 m <sup>3</sup> /h	0.6 gph	0.01 gpm
Set point SP	0.25...35 l/min	0.015...2.1 m <sup>3</sup> /h	4.2...555 gph	0.07...9.25 gpm
Reset point rP	0...34.8 l/min	0...2.08 m <sup>3</sup> /h	1.2...552 gph	0.02...9.2 gpm
Analogue start point ASP	0...28 l/min	0...1.7 m <sup>3</sup> /h	0...666 gph	0...7.4 gpm
Analogue end point AEP	7...35 l/min	0.42...2.1 m <sup>3</sup> /h	111...555 gph	1.85...9.25 gpm
Low flow cut-off LFC	0.05...1.75 l/min	0.003...0.1 m <sup>3</sup> /h	0.6...27.6 gph	0.01...0.46 gpm
Frequency end point, FEP	7...35 l/min	0.42...2.1 m <sup>3</sup> /h	111.6...555 gph	1.86...9.25 gpm
Frequency at the end point FRP [Hz]	1...10000			
<b>Volumetric flow quantity monitoring</b>				
Pulse length [s]	0.001...2			
Pulse value	0.001...99990000 l			

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Temperature monitoring		
Measuring range	[°C]	-20...90
Display range	[°C]	-42...112
Resolution	[°C]	0.1
Set point SP	[°C]	-19.6...90
Reset point rP	[°C]	-20...89.6
Analogue start point	[°C]	-20...68
Analogue end point	[°C]	2...90
In steps of	[°C]	0.1

Accuracy / deviations		
Flow monitoring		
Accuracy (in the measuring range)		± (0,8 % MW + 0,2 % MEW)
Repeatability		± 0,2 % MEW
Temperature monitoring		
Accuracy	[K]	± 2,5 (Q > 5 % MEW)

Response times		
Flow monitoring		
Start-up delay	[s]	0...50
Response time	[s]	< 0.25; (dAP = 0, T09)
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	15; (Q > 10 % MEW, T09)

Software / programming		
Parameter setting options	hysteresis / window; normally open / normally closed; switching logic; frequency output; current/pulse output; start-up delay; display can be deactivated; Display unit	

Interfaces		
Communication interface	IO-Link	
Transmission type	COM2 (38,4 kBaud)	
IO-Link revision	1.1	
SDCI standard	IEC 61131-9	
Profiles	Common - I&D	Identification and Diagnosis
	Function	Measurement data, standard resolution
SIO mode	yes	
Required master port type	A	
Process data analogue	3	
Process data binary	2	
Min. process cycle time	[ms]	8
Supported DeviceIDs	<b>Type of operation</b>	<b>DeviceID</b>
	default	949

Operating conditions		
Ambient temperature	[°C]	-20...60
Storage temperature	[°C]	-25...80
Protection		IP 65; IP 67

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Tests / approvals		
EMC	DIN EN 60947-5-9	
CPA approval	model number	005MI
	accuracy class	-
	maximum allowable error	$\pm 1,0$ % FS
	Q (min)	0,003 m <sup>3</sup> /h
	Q (t)	-
	Q (max)	2,1 m <sup>3</sup> /h
Shock resistance	DIN IEC 68-2-27	20 g (11 ms)
Vibration resistance	DIN IEC 68-2-6:	5 g (10...2000 Hz)
MTTF [years]		114
UL approval	UL approval no.	I014
	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]		717.2
Housing		rectangular
Dimensions [mm]		110 x 48 x 73
Materials	stainless steel (316/1.4408); stainless steel (316L/1.4404); PC; PBT+PC-GF30	
Materials (wetted parts)	Pipe section: stainless steel (316L/1.4404); Process connection sealing: NBR reinforced fibre Flat seal; FKM; PEEK; carbon fibre PEEK	
Process connection	threaded connection G 1/2 external thread DN15 flat seal	

Displays / operating elements		
Display		colour display 1,44", 128 x 128 pixels
		2 x LED, yellow

Remarks		
Remarks		MW = measured value
		MEW = Final value of the measuring range
Pack quantity		1 pcs.

### Electrical connection

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



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### Connection



OUT1: switching output volumetric flow quantity monitoring  
switching output Temperature monitoring  
Pulse output quantity meter  
frequency output volumetric flow monitoring  
frequency output Temperature monitoring  
signal output Preset counter  
IO-Link

OUT2: switching output volumetric flow quantity monitoring  
switching output Temperature monitoring  
analogue output flow  
analogue output temperature  
input counter reset  
colours to DIN EN 60947-5-2

Core colours :

BK = black  
BN = brown  
BU = blue  
WH = white

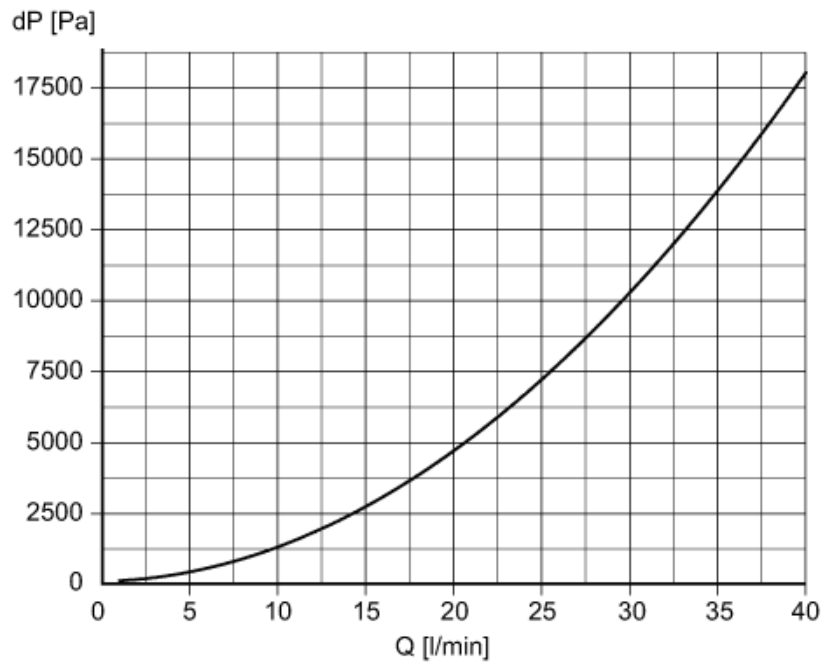
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### Diagrams and graphs



Pressure loss / volumetric flow quantity