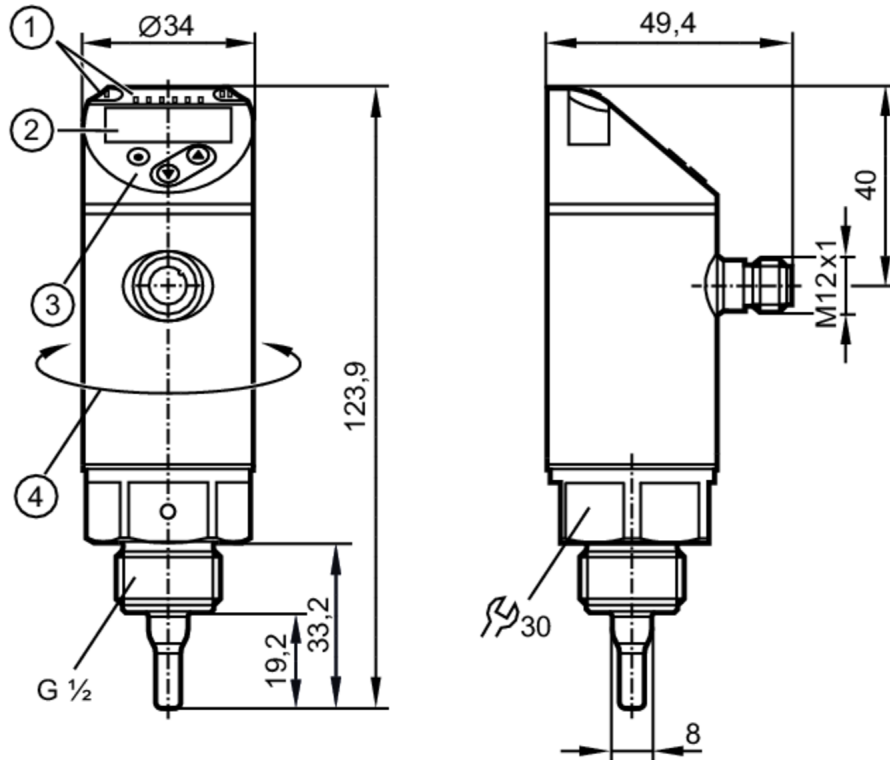


# SA2000



## Flow sensor

SAR12XDBFRKG/US-100



- 1 LEDs Display unit / switching status
- 2 alphanumeric display 4-digit red/green
- 3 programming buttons
- 4 upper part of the housing can be rotated 345°



### Product characteristics

Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1
Process connection	threaded connection G 1/2

### Application

Special feature	Gold-plated contacts
Media	water; glycol solutions; air; oils
Note on media	low-viscosity oils with viscosity: ≤ 40 mm <sup>2</sup> /s (40 °C) high-viscosity oils with viscosity: > 40 mm <sup>2</sup> /s (40 °C)
Medium temperature [°C]	-20...90
Pressure rating [bar]	100
Pressure rating [Mpa]	10
MAWP (for applications according to CRN) [bar]	85

### Electrical data

Operating voltage [V]	18...30 DC
Current consumption [mA]	< 100
Protection class	III

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Reverse polarity protection	yes
Power-on delay time [s]	10

### Inputs / outputs

Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1
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### Outputs

Total number of outputs	2
Output signal	switching signal; analogue 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]	2.5
Permanent current rating of switching output DC [mA]	250
Number of analogue outputs	1
Analogue current output [mA]	4...20; (scalable)
Max. load [Ω]	350
Short-circuit protection	yes
Type of short-circuit protection	pulsed
Overload protection	yes
Frequency of the output [Hz]	0...1000

### Measuring/setting range

Probe length L [mm]	19.2
Operating mode	relative; absolutely liquid; absolutely gaseous; (absolute: reference measurement recommended)
Note on factory setting	Operating mode: relative

### Temperature monitoring

Measuring range [°C]	-20...90
Resolution [°C]	0.2

### Liquid media - absolute operating mode

Setting range [m/s]	0.04...3
Greatest sensitivity [m/s]	0.04...3

### Liquid media - relative operating mode

Setting range [m/s]	0.04...6
Greatest sensitivity [m/s]	0.04...3

### Gases - operating mode "absolute"

Setting range [m/s]	0...100
Greatest sensitivity [m/s]	30...100

### Gases - operating mode "relative"

Setting range [m/s]	0...200
Greatest sensitivity [m/s]	30...100

### Accuracy / deviations

Temperature drift [cm/s x 1/K]	0,003 m/s x 1/K (< 20 °C; > 70 °C)
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Temperature gradient	[K/min]	100
<b>Absolute operating mode</b>		
Repeatability		0,05 m/s; (water; flow velocity: 0,05...3 m/s)
<b>Relative operating mode</b>		
Accuracy		± (7 % MW + 2 % MEW); (for relative mode in the range of maximum sensitivity under the following conditions:; water: 20...70 °C; inlet length: 1.5 m; DN25 (DIN 2448); mounting position according to instructions; Accuracy can differ for other media and mounting positions.)
Repeatability		0,05 m/s; (water; flow velocity: 0,05...3 m/s)
<b>Temperature monitoring</b>		
Temperature drift		± 0,005 K/°C
Accuracy	[K]	± 0,3 / ± 1; (water; flow velocity: 0,3...3 m/s / air; flow velocity: > 10 m/s)
<b>Response times</b>		
Response time	[s]	0.5; (T09; water; glycol: 0,8 s; air: 7 s; oil: 1,8 s; each T09)
<b>Temperature monitoring</b>		
Dynamic response T05 / T09	[s]	1,5 (T09); (water; flow velocity: 0,3...3 m/s)
<b>Software / programming</b>		
Parameter setting options		hysteresis / window; normally open / normally closed; switching logic; current/frequency output; medium selection; Damping; Teach function; display can be rotated and switched off; standard unit of measurement; process value colour
<b>Interfaces</b>		
Communication interface		IO-Link
Transmission type		COM2 (38,4 kBaud)
IO-Link revision		1.1
SDCI standard		IEC 61131-9
Profiles		Smart Sensor: Process Data Variable; Device Identification, Device Diagnosis
SIO mode		yes
Required master port type		A
Process data analogue		2
Process data binary		2
Min. process cycle time	[ms]	3
Supported DeviceIDs	Type of operation	DeviceID
	Factory setting / ModE = (REL)	535
	ModE = (LIQU)	540
	ModE = (GAS)	547
<b>Operating conditions</b>		
Ambient temperature	[°C]	-40...80
Storage temperature	[°C]	-40...100
Protection		IP 65; IP 67
<b>Tests / approvals</b>		
EMC	DIN EN 60947-5-9	
Shock resistance	DIN EN 60068-2-27	50 g (11 ms)
Vibration resistance	DIN EN 60068-2-6	20 g (10...2000 Hz)
MTTF	[years]	143

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UL approval	UL Approval no.	I003
	File number UL	E174189

### Mechanical data

Weight [g]	324
Materials	stainless steel (1.4404 / 316L); stainless steel (1.4310 / 301); PBT-GF20; PBT-GF30
Materials (wetted parts)	stainless steel (1.4404 / 316L); Gasket: FKM
Process connection	threaded connection G 1/2

### Displays / operating elements

Display	Display unit	6 x LED, green (% , m/s, l/min, m <sup>3</sup> /h, °C, 10 <sup>3</sup> )
	switching status	2 x LED, yellow
	measured values	alphanumeric display, red/green 4-digit

### 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



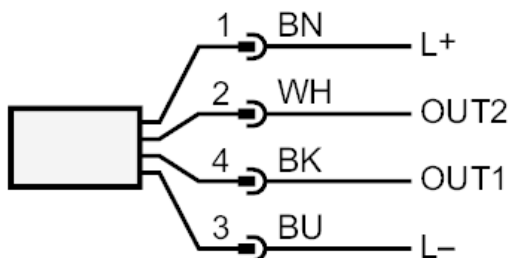
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## Flow sensor

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### Connection



colours to DIN EN 60947-5-2

#### OUT1:

- switching output volumetric flow quantity monitoring
- frequency output volumetric flow quantity monitoring
- IO-Link

#### OUT2:

- switching output volumetric flow quantity monitoring
- switching output Temperature monitoring
- analogue output volumetric flow quantity monitoring
- analogue output Temperature monitoring
- frequency output volumetric flow quantity monitoring
- frequency output Temperature monitoring
- input External Teach

Core colours :

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