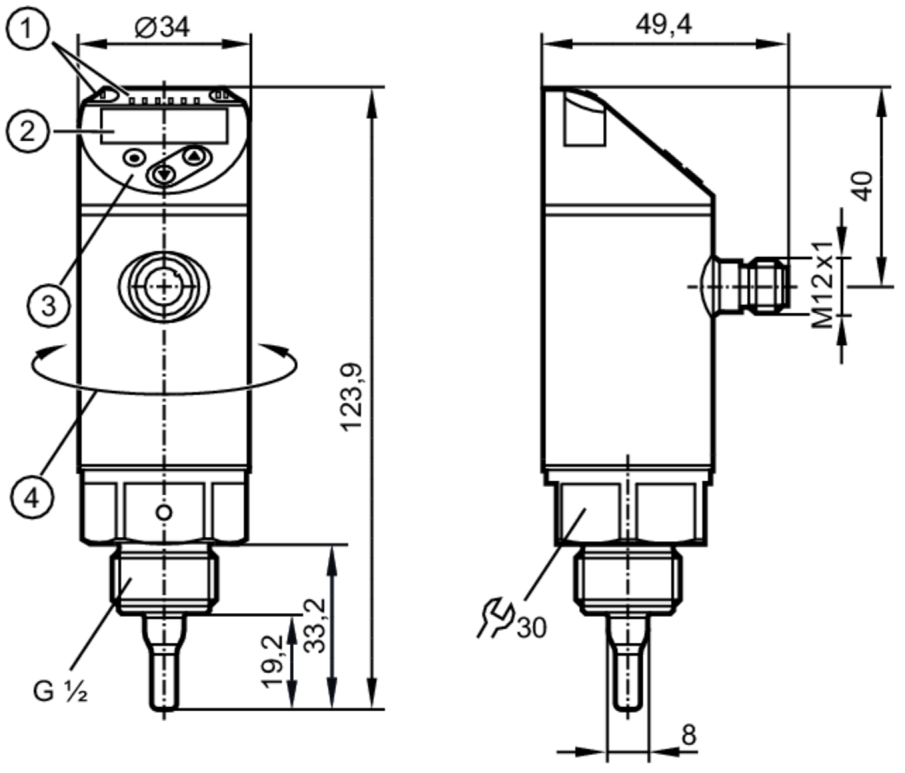
SA2000

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 external thread
Application		
Special feature		Gold-plated contacts
Media		water; glycol solutions; air; oils
Note on media		low-viscosity oils with viscosity: ≤ 40 mm²/s (40 °C)
		high-viscosity oils with viscosity: > 40 mm²/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
Measuring principle		calorimetric
Inputs / outputs		
Number of inputs and outputs		Number of digital outputs: 2; Number of analogue outputs: 1
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; Factory setting: 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
Absolute operating mode		
Repeatability		0,05 m/s; (water; flow velocity: 0,05...3 m/s)
Relative operating mode		
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)
Temperature monitoring		
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)

Response times		
Response time	[s]	0.5; (T09; water; glycol: 0,8 s; air: 7 s; oil: 1,8 s; each T09)
Temperature monitoring		
Dynamic response T05 / T09	[s]	1,5 (T09); (water; flow velocity: 0,3...3 m/s)

Software / programming		
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

Interfaces			
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 = (GAS)	547
		ModE = (LIQU)	540

Operating conditions		
Ambient temperature	[°C]	-40...80
Storage temperature	[°C]	-40...100
Protection		IP 65; IP 67

Tests / approvals			
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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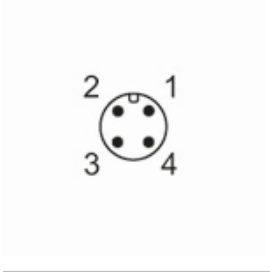
UL approval		UL Approval no.	I003
		File number UL	E174189
Mechanical data			
Weight	[g]	270	
Housing		cylindrical	
Dimensions	[mm]	Ø 34 / L = 123.9	
Materials		stainless steel (316L/1.4404); stainless steel (301/1.4310); PBT-GF20; PBT-GF30	
Materials (wetted parts)		stainless steel (316L/1.4404); Gasket: FKM	
Process connection		threaded connection G 1/2 external thread	
Probe diameter	[mm]	5	
Installation length EL	[mm]	19.2	
Displays / operating elements			
Display		Display unit	6 x LED, green (%, m/s, l/min, m³/h, °C, 10³)
		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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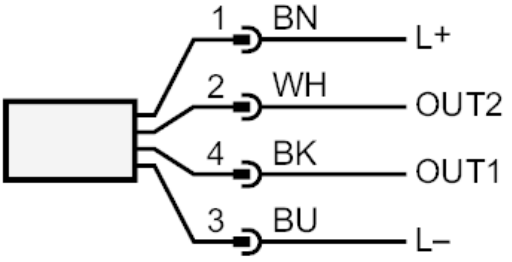
Connection



	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