SA2000
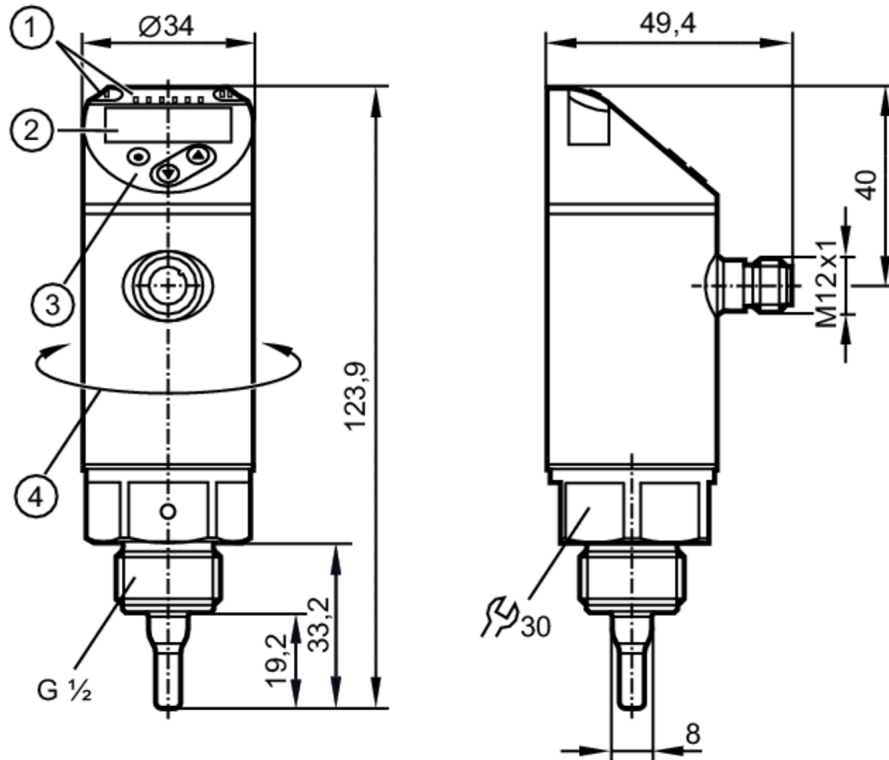
Flow sensor

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°

CE CRN c(UL)us LISTED IO-Link UKCA

Product characteristics

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

Application

System		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

Inputs / outputs

Number of inputs and outputs	Number of digital outputs: 2; Number of analog outputs: 1

Outputs

Total number of outputs		2
Output signal		switching signal; analog signal; frequency signal; IO-Link; (configurable)
Electrical design		PNP/NPN
Number of digital outputs		2
Output function		normally open / closed; (configurable)
Max. voltage drop switching output DC	[V]	2.5
Permanent current rating of switching output DC	[mA]	250
Number of analog outputs		1
Analog current output	[mA]	4...20; (scalable)
Max. load	[Ω]	350
Short-circuit protection		yes
Type of short-circuit protection		yes (non-latching)
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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Max. temperature gradient of[K/min] medium		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)

Reaction 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 / closed; switching logic; current/ frequency output; medium selection; Damping; Teach function; display can be rotated and switched off; standard unit of measurement; process value color

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 class		A
Process data analog		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 number	I003
	File number UL	E174189

Mechanical data

Weight	[g]	270
Material		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, 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

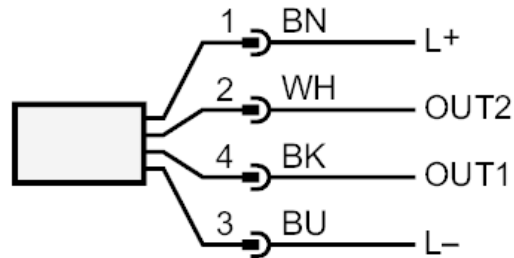Connector: 1 x M12; coding: A; Contacts: gold-plated

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Connection

	Colors 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
-	analog output Volumetric flow quantity monitoring
-	analog output Temperature monitoring
-	Frequency output Volumetric flow quantity monitoring
-	Frequency output Temperature monitoring
-	Input External Teach
	Core colors :
BK =	black
BN =	brown
BU =	blue
WH =	white