

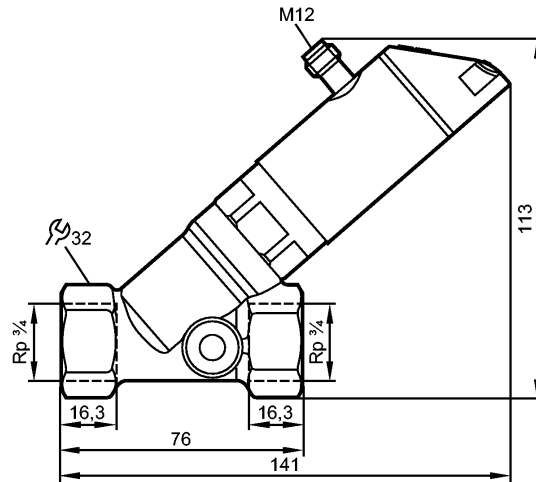


# SBY233

SBY34IF0FRKG



Flow sensors



## Product characteristics

Mechatronic flow meter

with non-return valve

Process connection: Rp 3/4

With display (360° rotatable); IO-Link; temperature measurement

## Application

Application	Liquids (water, glycol solutions, coolants, oil (oil 1 with viscosity 10 mm <sup>2</sup> /s at 40 °C; oil 2 with viscosity 46 mm <sup>2</sup> /s at 40 °C))
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Pressure rating	[bar]	40
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Medium temperature	[°C]	-10...100
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## Electrical data

Electrical design	DC
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Operating voltage	[V]	18...30 DC; to DIN EN 50178, SELV, PELV
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Current consumption	[mA]	< 50
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Protection class	III
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Reverse polarity protection	yes
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## Outputs

Output function	OUT1: NO / NC programmable or frequency or IO-Link OUT2: NO / NC programmable or analogue
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Current rating	[mA]	2 x 150; 2 x 200 (...60 °C); 2 x 250 (...40 °C)
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Voltage drop	[V]	< 2
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Short-circuit protection	yes
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Overload protection	yes
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Analog output	4...20 mA
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Max. load	[Ω]	500
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Frequency range [Hz]	0...10000
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## Measuring / setting range

Flow monitoring		
Measuring range	0.5...25 [l/min]	0.03...1.5 [m <sup>3</sup> /h]

Display range	0...30 [l/min]	0...1.8 [m <sup>3</sup> /h]
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Resolution	0.1 [l/min]	0.01 [m <sup>3</sup> /h]
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Set point, SP	0.2...25 [l/min]	0.01...1.5 [m <sup>3</sup> /h]
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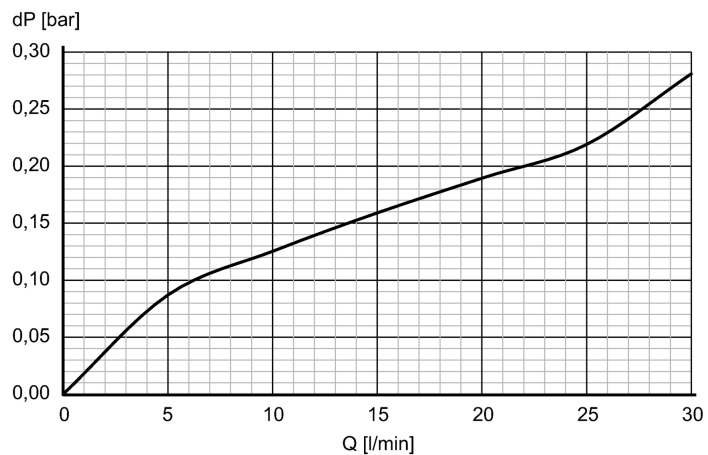
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Reset point, rP	0...24.8 [l/min]	0...1.49 [m³/h]
Frequency end point, FEP	1.7...25 [l/min]	0.1...1.5 [m³/h]
in steps of	0.1 [l/min]	0.01 [m³/h]
Frequency at the end point, FrP [Hz]	10...10000	
in steps of	10 Hz	
Measuring dynamics	1:50	
Temperature monitoring		
Measuring range [°C]	-10...100	
Display range [°C]	-32...122	
Resolution [°C]	1	
Set point, SP [°C]	-9...100	
Reset point, rP [°C]	-10...99	
Frequency start point, FSP [°C]	-10...78	
Frequency end point, FEP [°C]	12...100	
in steps of [°C]	1	
Frequency at the end point, FrP [Hz]	10...10000	

## Accuracy / deviations

Flow monitoring	
Accuracy [% of the final value]	$\pm (4 \% \text{ MW} + 1 \% \text{ MEW});$ $Q > 0.5 \text{ l/min, medium and ambient temperature } +22 \text{ }^\circ\text{C} \pm 4 \text{ K}$
Repeatability	$\pm 1 \% \text{ MEW}$

Pressure loss (dP) / flow rate (Q)



Temperature monitoring	
Accuracy [K]	3 K (25°C; Q > 1 l/min)
Temperature drift	0.029 °C / K

## Reaction times

Power-on delay time [s]	< 3
Flow monitoring	
Response time [s]	0.01
Damping for the switching output (dAP) [s]	0...5
Damping for the analog output (dAA) [s]	0...5
in steps of	0.1 s
Temperature monitoring	
Response time [s]	T09 = 120 (Q > 1 l/min)



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## Software / programming

Programming options	Hysteresis/window; NO/NC; switching logic; current / frequency output; fluid selection, damping switching/analogue output, display can be rotated/switched off; standard unit of measurement/colour process value
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## Interfaces

IO-Link Device	
Transfer type	COM2 (38.4 kBaud)
IO-Link revision	1.1
SDCI standard	IEC 61131-9 CDV
IO-Link Device ID	561 d / 0231 h
Profiles	Smart Sensor: Process Data Variable; Device Identification
SIO mode	yes
Required master port class	A
Process data analogue	2
Process data binary	2
Min. process cycle time [ms]	5

## Environment

Ambient temperature [°C]	0...60, at max. 80 °C medium temperature (0...40 °C at max. 100 °C medium temperature)
Storage temperature [°C]	-15...80
Protection	IP 65 / IP 67

## Tests / approvals

Pressure equipment directive	sound engineering practice
EMC	DIN EN 61000-6-2 DIN EN 61000-6-3
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]	145
UL approval number	I005

## Mechanical data

Process connection	Rp 3/4
Materials (wetted parts)	stainless steel 316 / 1.4401; stainless steel 316L / 1.4404; brass (2.0371); brass chemically nickel-plated; PPS; O-ring: FKM
Housing materials	stainless steel 316L / 1.4404; PBT+PC-GF 30; PBT-GF 20; PC; brass chemically nickel-plated
Weight [kg]	0.669
Switching cycles min.	10 million

## Displays / operating elements

Display	Display unit      3 x LED green Switching status    2 x LED yellow 4-digit alphanumeric display / alternating indication Measured values of red and green Programming      4-digit alphanumeric display
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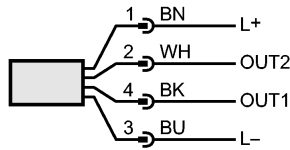
## Electrical connection

Connection	M12 connector; gold-plated contacts
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## Wiring



Core colors  
 BK black  
 BN brown  
 BU blue  
 WH white



**OUT1:**

- switching output flow rate monitoring
- switching output temperature monitoring
- frequency output flow rate monitoring
- frequency output temperature monitoring
- IO-Link

**OUT2:**

- switching output flow rate monitoring
- switching output temperature monitoring
- analogue output flow rate
- analogue output temperature

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 Colours to DIN EN 60947-5-2

**Remarks**

Remarks	Use of 200 micron filtration is recommended. All data refer to water (20 °C). MW = measured value MEW = final value of the measuring range
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Pack quantity	[piece]	1
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