SBY233

Flow meter with fast response and display

SBY34IF0FRKG

Please note the changed housing design!

CE CRN c(UL)us LISTED IO-Link
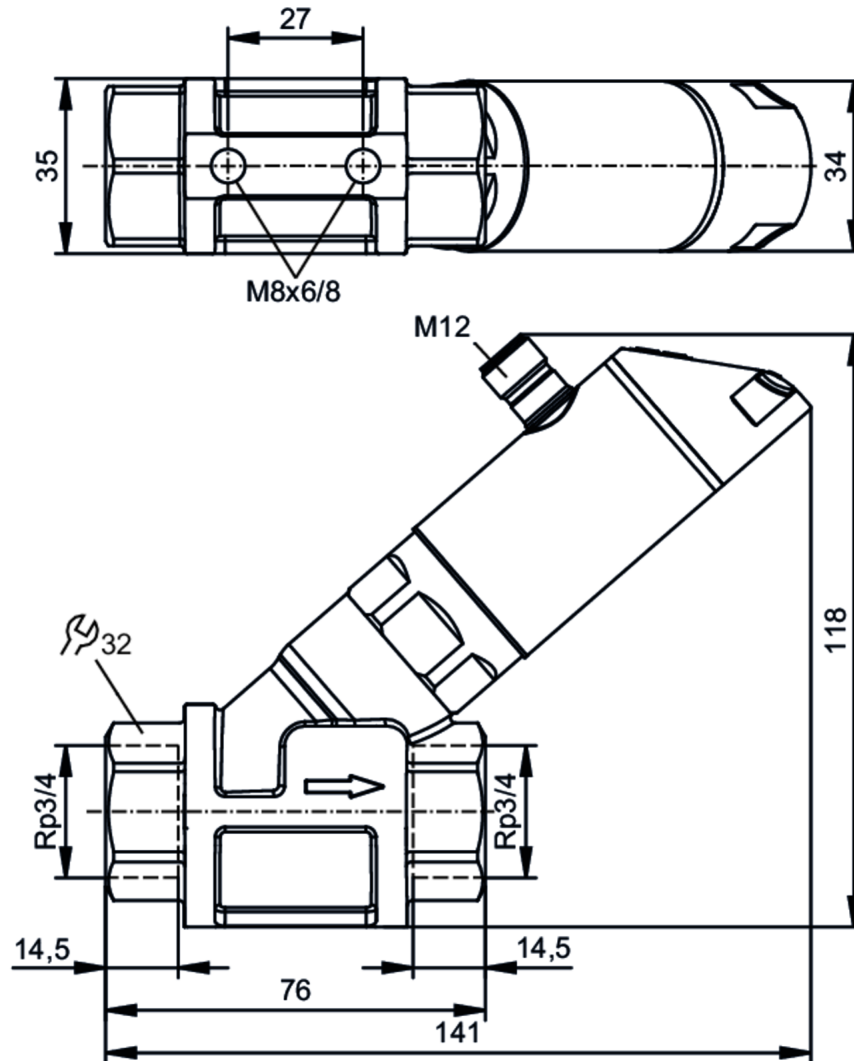
Product characteristics

Number of inputs and outputs	Number of digital outputs: 2; Number of analog outputs: 1	
Measuring range	0.5...25 l/min	0.03...1.5 m³/h
Process connection	threaded connection Rp 3/4 Internal thread	

Application

System	gold-plated contacts
Application	for industrial applications
Media	Liquids; water; glycol solutions; Coolants
Note on media	oil 1 with viscosity: 10 mm²/s (40 °C)
	oil 2 with viscosity: 46 mm²/s (40 °C)
Medium temperature [°C]	-10...100
Pressure rating [bar]	40
Pressure rating [MPa]	4

SBY233

Flow meter with fast response and display

SBY34IF0FRKG

MAWP (for applications according to CRN)	[bar]	40	

Electrical data

Operating voltage	[V]	18...30 DC; (to SELV/PELV)	
Current consumption	[mA]	< 50	
Protection class		III	
Reverse polarity protection		yes	
Power-on delay time	[s]	< 3	

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)	
Number of digital outputs		2	
Output function		normally open / closed; (configurable)	
Max. voltage drop switching output DC	[V]	2	
Permanent current rating of switching output DC	[mA]	150; (per output 2 x 200 (...60 °C); 2 x 250 (...40 °C))	
Switching cycles (mechanical)		10 million	
Number of analog outputs		1	
Analog current output	[mA]	4...20	
Max. load	[Ω]	500	
Short-circuit protection		yes	
Overload protection		yes	
Frequency of the output	[Hz]	0...10000	

Measuring/setting range

Measuring range		0.5...25 l/min	0.03...1.5 m³/h
Display range		0...30 l/min	0...1.8 m³/h
Resolution		0.1 l/min	0.01 m³/h
Set point SP		0.2...25 l/min	0.01...1.5 m³/h
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	
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	
In steps of	[°C]	1	
Frequency start point, FSP	[°C]	-10...78	

SBY233

Flow meter with fast response and display

SBY34IF0FRKG

Frequency end point, FEP	[°C]	12...100
Frequency at the end point FRP	[Hz]	10...10000

Accuracy / deviations

Flow monitoring

Accuracy (in the measuring range)	± (4 % MW + 1 % MEW); (Q > 0,5 l/min; medium and operating temperature: +22 °C ± 4K)
Repeatability	± 1 % MEW

Temperature monitoring

Temperature drift		0,029 °C / K
Accuracy	[K]	3 K (25°C; Q > 1 l/min)

Reaction times

Flow monitoring

Response time	[s]	0.01
Damping process value dAP	[s]	0...5
Damping for the analog output dAA	[s]	0...5

Temperature monitoring

Dynamic response T05 / T09	[s]	T09 = 120 (Q > 1 l/min)

Software / programming

Parameter setting options	hysteresis / window; normally open / closed; switching logic; current/frequency output; medium selection; damping for the switching output / analog output; 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 CDV
Profiles	Smart Sensor: Process Data Variable; Device Identification
SIO mode	yes
Required master port class	A
Process data analog	2
Process data binary	2
Min. process cycle time [ms]	5

Supported DeviceIDs	Type of operation	DeviceID
	default	561

Operating conditions

Ambient temperature	[°C]	0...60
Note on ambient temperature		medium temperature < 80 °C
		medium temperature < 100 °C: 0...40 °C
Storage temperature	[°C]	-15...80
Protection		IP 65; IP 67

Tests / approvals

EMC	DIN EN 61000-6-2	
	DIN EN 61000-6-3	

SBY233

Flow meter with fast response and display

SBY34IF0FRKG

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	UL approval number	I005
Pressure equipment directive		sound engineering practice; can be used for group 2 fluids; group 1 fluids on request

Mechanical data		
Weight [g]		734.1
Material		stainless steel (1.4404 / 316L); PBT+PC-GF30; PBT-GF20; PC; brass chemically nickel-plated
Materials (wetted parts)		stainless steel (1.4401 / 316); stainless steel (1.4404 / 316L); brass (2.0371); brass chemically nickel-plated; PPS; O-ring: FKM
Process connection		threaded connection Rp 3/4 Internal thread

Displays / operating elements		
Display	Display unit	3 x LED, green
	Switching status	2 x LED, yellow
	Measured values	alphanumeric display, red/green 4-digit
	Programming	alphanumeric display, 4-digit

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
Notes		Please note the changed housing design!
Pack quantity		1 pcs.

Electrical connection

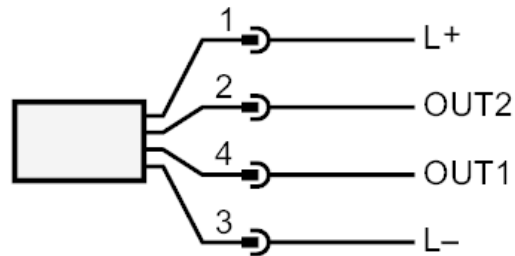Connector: 1 x M12; coding: A; Contacts: gold-plated

SBY233

Flow meter with fast response and display

| Connection |
| --- |

OUT1:
-       Switching output Volumetric flow quantity monitoring
-       Switching output Temperature monitoring
-       Frequency output Volumetric flow quantity monitoring
-       Frequency output Temperature monitoring
-       IO-Link

OUT2:
-       Switching output Volumetric flow quantity monitoring
-       Switching output Temperature monitoring
-       analog output Volumetric flow quantity monitoring
-       analog output Temperature monitoring

Diagrams and graphs

Pressure loss
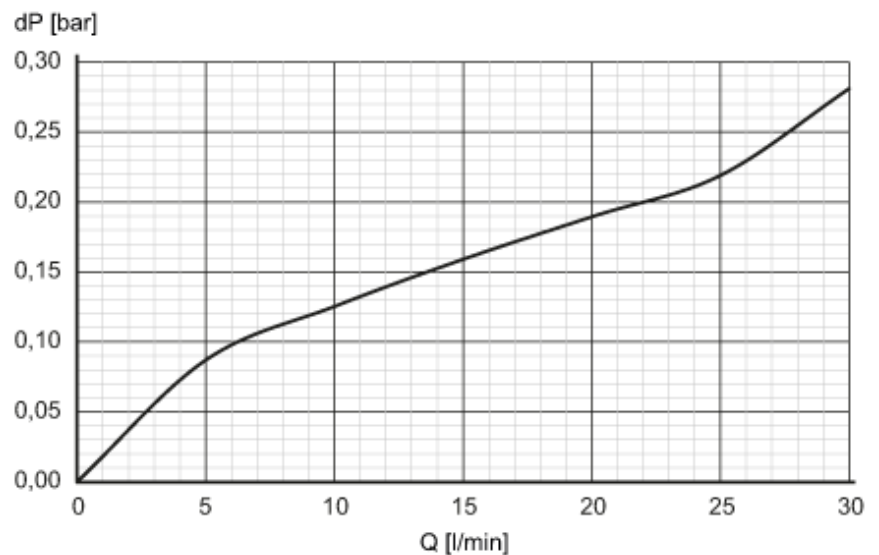
dP   Pressure loss

Q   volumetric flow quantity