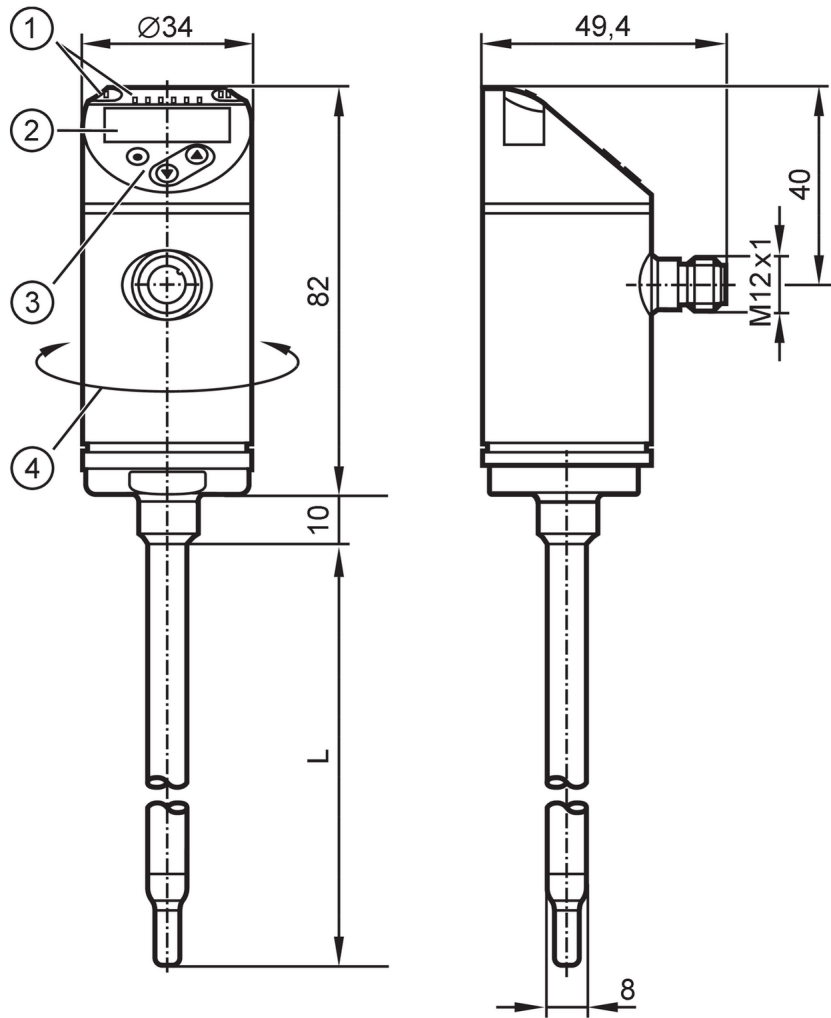


# SA4310



## Flow sensor

SAEXXXBFRKG/US-100



- L 200 mm  
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 analog outputs: 1 |
| Process connection           | Clamp fitting $\varnothing 8$ mm                          |

### Application

|                                                |                                                                                                                                                          |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Special feature                                | gold-plated contacts                                                                                                                                     |
| Media                                          | water; glycol solutions; air; oils                                                                                                                       |
| Note on media                                  | low-viscosity oils with viscosity: $\leq 40 \text{ mm}^2/\text{s}$ (104 °F)<br>high-viscosity oils with viscosity: $> 40 \text{ mm}^2/\text{s}$ (104 °F) |
| Medium temperature [°F]                        | -4...212                                                                                                                                                 |
| Pressure rating                                | 50 bar 725 psi 5 MPa                                                                                                                                     |
| MAWP (for applications according to CRN) [bar] | 50                                                                                                                                                       |

### Electrical data

|                       |            |
|-----------------------|------------|
| Operating voltage [V] | 18...30 DC |
|-----------------------|------------|



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|                             |      |              |
|-----------------------------|------|--------------|
| Current consumption         | [mA] | < 100        |
| Protection class            |      | III          |
| 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 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] | 200                                                                                                                       |
| Operating mode |      | relative; absolutely liquid; absolutely gaseous; (absolute: reference measurement recommended; Factory setting: relative) |

## Temperature monitoring

|                 |      |          |
|-----------------|------|----------|
| Measuring range | [°F] | -4...212 |
| Resolution      | [°F] | 0.5      |

## Liquid media - absolute operating mode

|                      |        |             |
|----------------------|--------|-------------|
| Setting range        | [ft/s] | 0.15...9.85 |
| Greatest sensitivity | [ft/s] | 0.15...9.85 |

## Liquid media - relative operating mode

|                      |        |             |
|----------------------|--------|-------------|
| Setting range        | [ft/s] | 0.15...19.5 |
| Greatest sensitivity | [ft/s] | 0.15...9.85 |

## Gases - operating mode "absolute"

|                      |        |         |
|----------------------|--------|---------|
| Setting range        | [ft/s] | 6...328 |
| Greatest sensitivity | [ft/s] | 6...328 |

## Gases - operating mode "relative"

|                      |        |         |
|----------------------|--------|---------|
| Setting range        | [ft/s] | 6...656 |
| Greatest sensitivity | [ft/s] | 6...328 |

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## Flow sensor

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| Accuracy / deviations               |                                |                                                                                                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature drift                   | [cm/s x 1/K]                   | 0,01 fps x 1/K (< 68 °F; > 158 °F)                                                                                                                                                                                                                                               |
| Max. temperature gradient of medium | [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: 68...158 °F; inlet length: 5 ft; 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                   |                                | ± 0,003 K/°F                                                                                                                                                                                                                                                                     |
| Accuracy                            | [K]                            | ± 0,3 / ± 1; (water; Flow velocity: 1...9,85 fps / air; Flow velocity: > 32,8 fps)                                                                                                                                                                                               |
| 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: 1...9,85 fps)                                                                                                                                                                                                                                  |
| 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 - SSP 0           | Generic Profiled Sensor                                                                                                                                                                                                                                                          |
|                                     | Function                       | Device identification                                                                                                                                                                                                                                                            |
|                                     | Function                       | Process data variable                                                                                                                                                                                                                                                            |
|                                     | Function                       | 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                 | <b>Type of operation</b>       | <b>DeviceID</b>                                                                                                                                                                                                                                                                  |
|                                     | Factory setting / ModE = (REL) | 537                                                                                                                                                                                                                                                                              |
|                                     | ModE = (GAS)                   | 551                                                                                                                                                                                                                                                                              |
|                                     | ModE = (LIQU)                  | 544                                                                                                                                                                                                                                                                              |
| Operating conditions                |                                |                                                                                                                                                                                                                                                                                  |
| Ambient temperature                 | [°F]                           | -40...176                                                                                                                                                                                                                                                                        |
| Storage temperature                 | [°F]                           | -40...212                                                                                                                                                                                                                                                                        |
| Protection                          |                                | IP 65; IP 67                                                                                                                                                                                                                                                                     |

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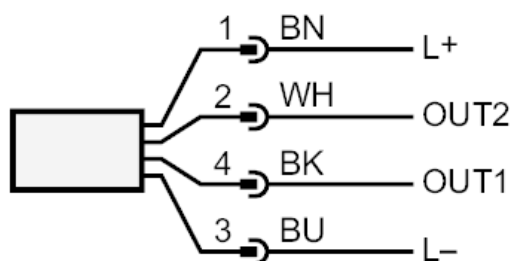
| Tests / approvals                                       |                    |                                                          |
|---------------------------------------------------------|--------------------|----------------------------------------------------------|
| EMC                                                     | DIN EN 60947-5-9   |                                                          |
| Shock resistance                                        | DIN EN 60068-2-27  | 50 g (11 ms)                                             |
| Vibration resistance                                    | DIN EN 60068-2-6   | 2 g (10...2000 Hz)                                       |
| MTTF [years]                                            |                    | 143                                                      |
| UL approval                                             | UL approval number | I017                                                     |
|                                                         | File number UL     | E174189                                                  |
| Mechanical data                                         |                    |                                                          |
| Weight [g]                                              |                    | 344.5                                                    |
| Housing                                                 |                    | tubular                                                  |
| Dimensions [mm]                                         |                    | Ø 8 / L = 292                                            |
| Material                                                |                    | stainless steel (1.4404 / 316L); PBT-GF20; PBT-GF30      |
| Materials (wetted parts)                                |                    | stainless steel (1.4404 / 316L)                          |
| Process connection                                      |                    | Clamp fitting Ø 8 mm                                     |
| Displays / operating elements                           |                    |                                                          |
| Display                                                 | Display unit       | 6 x LED, green (% , fps, gpm, cfm, °F, 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: 4, gold-plated |                    |                                                          |
|                                                         |                    |                                                          |



## Flow sensor

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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