

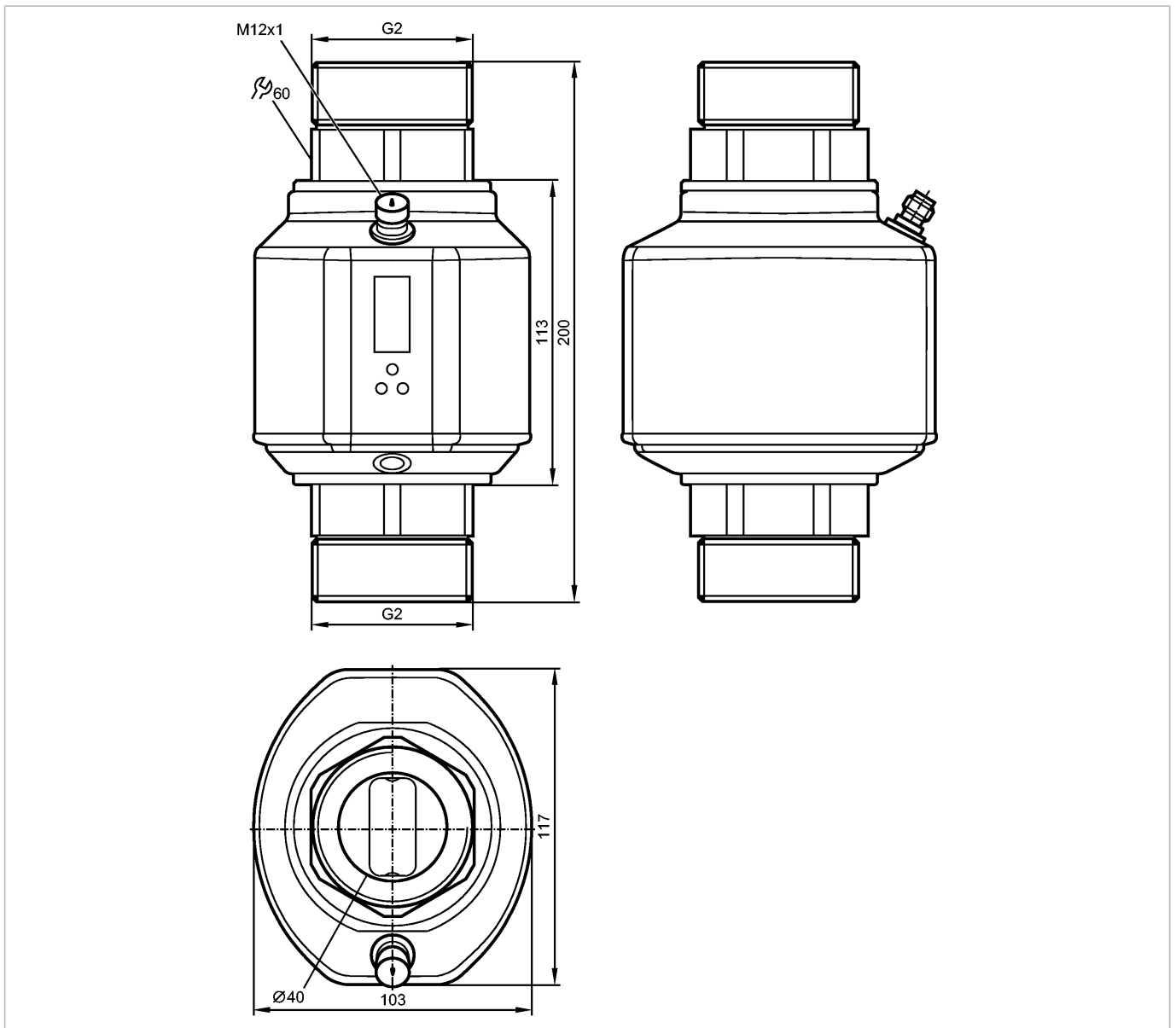


SM9000

SMR21XGXFRKG/US



Flow sensors



Product characteristics

Magnetic-inductive flow meter

Quick disconnect

Process connection: G2 flat seal

connection to pipe by means of an adapter

Function programmable

Totalizer function

Empty pipe detection

2 outputs

OUT1 = flow monitoring (binary), flow rate meter (pulse), preset meter (binary)

OUT2 = flow monitoring or temperature monitoring (analog or binary)

Input for counter reset

4-digit alphanumeric display

Measuring range

5...300 l/min

Application



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Flow sensors

| | | |
|-------------------------------------|---|--------------------------------|
| Application | conductive liquids of the fluid group 2 according to the Pressure Equipment Directive (PED) (conductivity: $\geq 20 \mu\text{S/cm}$ / viscosity: $< 70 \text{ mm}^2/\text{s}$ at 40°C) | |
| Pressure rating [bar] | 16 | |
| Medium temperature [°C] | -10...70 | |
| Electrical data | | |
| Electrical design | DC PNP/NPN | |
| Operating voltage [V] | 18...32 DC ¹⁾ | |
| Current consumption [mA] | < 150 | |
| Insulation resistance [MΩ] | > 100 (500 V DC) | |
| Protection class | III | |
| Reverse polarity protection | yes | |
| Outputs | | |
| Output function | OUT1: normally open / normally closed programmable or pulse or frequency or empty pipe detection or IO-Link OUT2: normally open / normally closed programmable or analogue (4...20 mA; 0...10 V, scalable) or empty pipe detection | |
| Current rating [mA] | 2 x 250 | |
| Voltage drop [V] | < 2 | |
| Short-circuit protection | yes (non-latching) | |
| Overload protection | yes | |
| Analog output | 4...20 mA; 0...10 V | |
| Max. load [Ω] | 500 (4...20 mA) | |
| Min. load [Ω] | 2000 (0...10 V) | |
| Pulse output | flow rate meter | |
| Frequency range [Hz] | 0.1...10000 | |
| Measuring / setting range | | |
| Empty pipe detection | normally closed / open | |
| Flow monitoring | | |
| Measuring range | 5...300 l/min | 0.3...18 m ³ /h |
| Display range | -360...360 l/min | -21.6...21.6 m ³ /h |
| Resolution | 0.5 l/min | 0.02 m ³ /h |
| Set point, SP | 6.5...300 l/min | 0.4...18 m ³ /h |
| Reset point, rP | 5...298.5 l/min | 0.3...17.9 m ³ /h |
| Analog start point, ASP | 0...240 l/min | 0...14.4 m ³ /h |
| Analog end point, AEP | 60...300 l/min | 3.6...18 m ³ /h |
| Flow end point, FEP | 20...300 l/min; 1.5...18 m ³ /h | |
| Low flow cut-off, LFC | 5...15 l/min | 0.3...0.9 m ³ /h |
| in steps of | 0.5 l/min | 0.02 m ³ /h |
| Frequency end point, FrEP | 0.01...10 kHz | |
| in steps of | 10 Hz | |
| Measuring dynamics | 1:60 | |
| Volumetric flow quantity monitoring | | |
| Pulse value | 0.0001...300x10 ³ m ³ | |
| in steps of | 0.0001 m ³ | |
| Pulse length [s] | 0.016...2 | |
| Temperature monitoring | | |



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Flow sensors

| | | |
|-------------------------|------|--------------|
| Measuring range | [°C] | -20...80 |
| Display range | [°C] | -40...100 |
| Resolution | [°C] | 0.2 |
| Set point, SP | [°C] | -19.2...80.0 |
| Reset point, rP | [°C] | -19.6...79.6 |
| Analog start point, ASP | [°C] | -20...60 |
| Analog end point, AEP | [°C] | 0...80 |
| in steps of | [°C] | 0.2 |

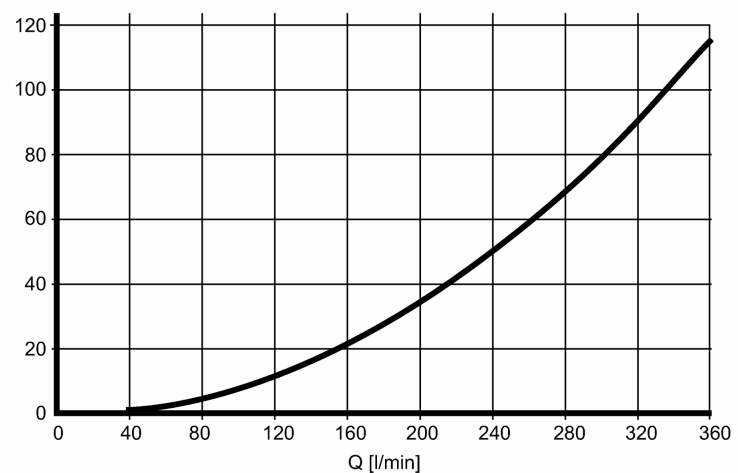
Accuracy / deviations

Flow monitoring

| | | |
|---------------|--|--|
| Accuracy | | $\pm (0.8\% \text{ MW} + 0.5\% \text{ MEW})^2$ |
| Repeatability | | $\pm 0.2\% \text{ MEW}$ |

Pressure loss (dP) / flow rate (Q)

dP [mbar] DN50



Temperature monitoring

| | | |
|-------------------|-----|---|
| Accuracy | [K] | $\pm 1 (25\text{ °C}; Q > 15\text{ l/min})$ |
| Temperature drift | | $\pm 0.0333\text{ °C / K}$ |

Reaction times

| | | |
|------------------------|-----|---------------------------------|
| Power-on delay time | [s] | 5 |
| Flow monitoring | | |
| Start-up delay | [s] | 0...50 |
| Response time | [s] | $< 0.35 (dAP = 0)$ |
| Damping, dAP | [s] | 0...5 |
| Temperature monitoring | | |
| Response time | [s] | $T09 = 3 (Q > 15\text{ l/min})$ |

Software / programming

| | |
|---------------------|--|
| Programming options | Hysteresis / window; NO / NC; output logic; current / voltage / frequency / pulse output; start-up delay; display can be deactivated; display unit; empty pipe detection |
|---------------------|--|

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 | 391d / 00 01 87h |



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Flow sensors

| | |
|------------------------------|--|
| Profiles | Smart Sensor: Process Data Variable; Device Identification |
| SIO mode | yes |
| Required master port class | A |
| Process data analogue | 3 |
| Process data binary | 2 |
| Min. process cycle time [ms] | 5 |

| Environment | |
|--------------------------|---------------|
| Ambient temperature [°C] | -10...60 |
| Storage temperature [°C] | -25...80 |
| Protection | IP 65 / IP 67 |

| Tests / approvals | |
|------------------------------|---|
| Pressure equipment directive | article 3, section 3 - sound engineering practice |
| EMC | DIN EN 60947-5-9 |
| 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] | 86 |

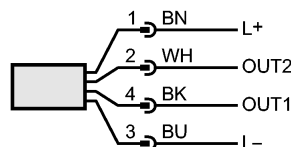
| Mechanical data | |
|--------------------------|--|
| Process connection | G2 flat seal |
| Materials (wetted parts) | stainless steel 316L / 1.4404; stainless steel 316Ti / 1.4571; PEEK (polyether ether ketone); Hastelloy C-4 (2.4610); Centellen; FKM |
| Housing materials | stainless steel 316L / 1.4404; stainless steel 316Ti / 1.4571; PEI; FKM; PBT-GF 20; elastolan |
| Weight [kg] | 3.121 |

| Displays / operating elements | |
|-------------------------------|--|
| Display | Display unit 6 x LED green (l/min, m ³ /h, l, m ³ , 10 ³ , °C) Switching status 2 x LED yellow Measured values 4-digit alphanumeric display Programming 4-digit alphanumeric display |

| Electrical connection | |
|-----------------------|-------------------------------------|
| Connection | M12 connector; gold-plated contacts |

Wiring

Core colors
 BK black
 BN brown
 BU blue
 WH white



Colours to DIN EN 60947-5-2

 OUT1: 6 options:
 switching output empty pipe detection
 switching output flow rate monitoring
 frequency output flow rate monitoring
 pulse output quantity meter
 signal output preset counter
 IO-Link

OUT2: 6 options:
 switching output empty pipe detection



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Flow sensors

switching output flow rate monitoring
 switching output temperature monitoring
 analogue output flow rate
 analogue output temperature
 Input for counter reset

Accessories

| | |
|------------------------|---------------------------------------|
| Accessories (included) | 2 x packing washer (Centellen); Label |
|------------------------|---------------------------------------|

Remarks

| | |
|---------|---|
| Remarks | 1) to DIN EN 50178, SELV, PELV 2) $Q > 15\text{ l/min}$, medium and ambient temperature $+22\text{ °C} \pm 4\text{ K}$ MW = measured value MEW = final value of the measuring range |
|---------|---|

| | | |
|---------------|---------|---|
| Pack quantity | [piece] | 1 |
|---------------|---------|---|