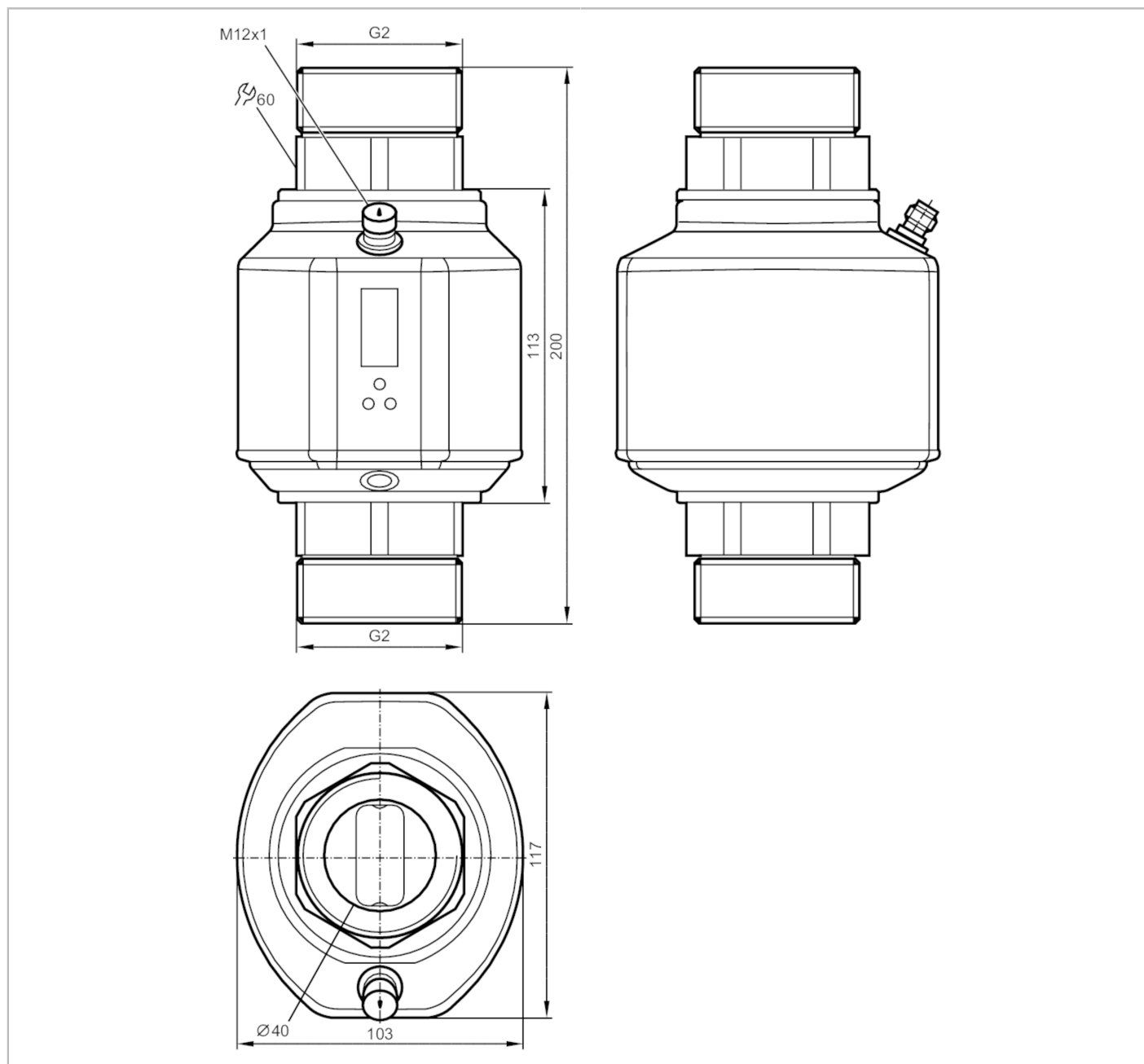


# SM2130



## Magnetic-inductive flow meter

SMR21XGXFRKG/US



ACS CE CRN c UL LISTED US IO-Link KTW/W270 Reg31 UK CA

| Product characteristics      |   |
|------------------------------|---|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analog outputs: 1             |
| Measuring range              | 5...900 l/min 0.3...54 m³/h   |
| Process connection           | threaded connection G 2 DN50 flat seal                                |
| Application                  |   |
| System                       | gold-plated contacts  |
| Application                  | Totalizer function; empty pipe detection; for industrial applications |
| Installation                 | connection to pipe by means of an adapter                             |
| Media                        | Conductive liquids; water; water-based media                          |

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|  |       |   |
|--|-------|---|
| Note on media                            |       | conductivity: $\geq 20 \mu\text{S/cm}$          |
|  |       | viscosity: $< 70 \text{ mm}^2/\text{s}$ (40 °C) |
| Medium temperature                       | [°C]  | -10...90  |
| Pressure rating                          | [bar] | 16  |
| MAWP (for applications according to CRN) | [bar] | 16.5  |

### Electrical data

|                             |      |                            |
|-----------------------------|------|----------------------------|
| Operating voltage           | [V]  | 18...32 DC; (to SELV/PELV) |
| Current consumption         | [mA] | $< 150$                    |
| Protection class            |      | III                        |
| Reverse polarity protection |      | yes                        |
| Power-on delay time         | [s]  | 5                          |

### Inputs / outputs

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

### Inputs

|        |               |
|--------|---------------|
| Inputs | counter reset |
|--------|---------------|

### Outputs

|   |              |  |
|---|--------------|--|
| Total number of outputs                         |              | 2  |
| Output signal                                   |              | switching signal; analog signal; pulse 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  |
| Permanent current rating of switching output DC | [mA]         | 250; (per output)  |
| Number of analog outputs                        |              | 1  |
| Analog current output                           | [mA]         | 4...20; (scalable)   |
| Max. load                                       | [ $\Omega$ ] | 500  |
| Analog voltage output                           | [V]          | 0...10; (scalable)   |
| Min. load resistance                            | [ $\Omega$ ] | 2000   |
| Pulse output                                    |              | flow rate meter  |
| Short-circuit protection                        |              | yes  |
| Type of short-circuit protection                |              | yes (non-latching)   |
| Overload protection                             |              | yes  |
| Frequency of the output                         | [Hz]         | 0.1...10000  |

### Measuring/setting range

|                        |                      |                                |
|------------------------|----------------------|--------------------------------|
| Measuring range        | 5...900 l/min        | 0.3...54 m <sup>3</sup> /h     |
| Display range          | -920...920 l/min     | -55.2...55.2 m <sup>3</sup> /h |
| Resolution             | 1 l/min              | 0.05 m <sup>3</sup> /h         |
| Set point SP           | 10...900 l/min       | 0.55...54 m <sup>3</sup> /h    |
| Reset point rP         | 5...896 l/min        | 0.3...53.75 m <sup>3</sup> /h  |
| Analog start point ASP | 0...720 l/min        | 0...43.2 m <sup>3</sup> /h     |
| Analog end point AEP   | 180...900 l/min      | 10.8...54 m <sup>3</sup> /h    |
| Low flow cut-off LFC   | $< 15 \text{ l/min}$ | $< 0.9 \text{ m}^3/\text{h}$   |

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|                                     |         |  |
|-------------------------------------|---------|--|
| In steps of                         | 1 l/min | 0.05 m <sup>3</sup> /h                       |
| Measuring dynamics                  |         | 1:180  |
| Volumetric flow quantity monitoring |         |  |
| Pulse value                         |         | 0.1 l...600 x 10 <sup>3</sup> m <sup>3</sup> |
| In steps of                         |         | 0.1 l  |
| Pulse length [s]                    |         | 0,003...2                                    |
| Temperature monitoring              |         |  |
| Measuring range [°C]                |         | -20...80                                     |
| Display range [°C]                  |         | -40...100                                    |
| Resolution [°C]                     |         | 0.2  |
| Set point SP [°C]                   |         | -19.2...80                                   |
| Reset point rP [°C]                 |         | -19.6...79.6                                 |
| Analog start point [°C]             |         | -20...60                                     |
| Analog end point [°C]               |         | 0...80                                       |
| In steps of [°C]                    |         | 0.2  |

### Accuracy / deviations

|                                   |  |  |
|-----------------------------------|--|--|
| Flow monitoring                   |  |  |
| Accuracy (in the measuring range) |  | $\pm (0,8 \% MW + 0,5 \% MEW)$ ; (Q > 15 l/min; medium and operating temperature: 22 °C $\pm$ 4 K) |
| Repeatability                     |  | $\pm 0,2\% MEW$  |
| Temperature monitoring            |  |  |
| Temperature drift                 |  | $\pm 0,0333 \text{ } ^\circ\text{C} / \text{K}$  |
| Accuracy [K]                      |  | $\pm 1$ (bei 25 °C, Q > 15 l/min)  |

### Reaction times

|                                    |  |                        |
|------------------------------------|--|------------------------|
| Flow monitoring                    |  |                        |
| Response time [s]                  |  | 0.35; (dAP = 0)        |
| Delay time programmable dS, dr [s] |  | 0...50                 |
| Damping process value dAP [s]      |  | 0...5                  |
| Temperature monitoring             |  |                        |
| Dynamic response T05 / T09 [s]     |  | T09 = 3 (Q > 15 l/min) |

### Software / programming

|                           |   |
|---------------------------|---|
| Parameter setting options | Flow monitoring; quantity meter; Preset counter; Temperature monitoring; hysteresis / window; normally open / closed; switching logic; current/voltage/frequency/pulse output; Start-up delay; display can be deactivated; Display unit; empty pipe detection |
|---------------------------|---|

### 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        | 3  |

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|                         |                          |                 |
|-------------------------|--------------------------|-----------------|
| Process data binary     |                          | 2               |
| Min. process cycle time | [ms]                     | 5               |
| Supported DeviceIDs     | <b>Type of operation</b> | <b>DeviceID</b> |
|                         | default                  | 1322            |

|                             |      |              |
|-----------------------------|------|--------------|
| <b>Operating conditions</b> |      |              |
| Ambient temperature         | [°C] | -10...60     |
| Storage temperature         | [°C] | -25...80     |
| Protection                  |      | IP 65; IP 67 |

|                              |   |                    |
|------------------------------|---|--------------------|
| <b>Tests / approvals</b>     |   |                    |
| EMC                          | DIN EN 61000-4-2 ESD  | 4 kV CD / 8 kV AD  |
|                              | DIN EN 61000-4-3 HF radiated  | 10 V/m             |
|                              | DIN EN 61000-4-4 Burst  | 2 kV               |
|                              | DIN EN 61000-4-5 Surge  | 1 kV               |
|                              | DIN EN 61000-4-6 HF conducted   | 10 V               |
|                              | Shock resistance  | DIN EN 60068-2-27  |
| Vibration resistance         | DIN EN 60068-2-6  | 5 g (10...2000 Hz) |
| MTTF                         | [years]   | 85                 |
| UL approval                  | UL approval number  | I008               |
|                              | File number UL  | E174189            |
| Pressure equipment directive | sound engineering practice; can be used for group 2 fluids; group 1 fluids on request |                    |

|                          |  |        |
|--------------------------|--|--------|
| <b>Mechanical data</b>   |  |        |
| Weight                   | [g]  | 3109.9 |
| Material                 | stainless steel (1.4404 / 316L); stainless steel (1.4571/316Ti ); PC; FKM; PBT-GF20; TPE-U |        |
| Materials (wetted parts) | stainless steel (1.4404 / 316L); stainless steel (1.4571/316Ti ); PEEK; Centellen; EPDM    |        |
| Process connection       | threaded connection G 2 DN50 flat seal   |        |

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

|                    |                        |  |
|--------------------|------------------------|--|
| <b>Accessories</b> |                        |  |
| Items supplied     | sealings: 2, Centellen |  |
|                    | Label                  |  |

|                |  |  |
|----------------|--|--|
| <b>Remarks</b> |  |  |
| Remarks        | MW = Measured value                      |  |
|                | MEW = Final value of the measuring range |  |
| Pack quantity  | 1 pcs.                                   |  |

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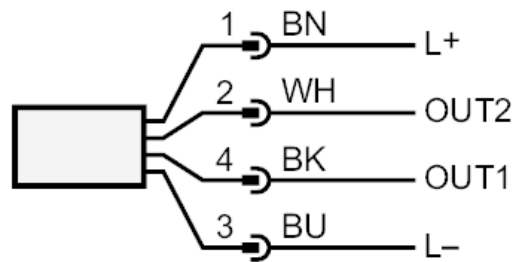
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### Electrical connection

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



### Connection



|       |   |
|-------|---|
| OUT1: | Colors to DIN EN 60947-5-2<br>Switching output empty pipe detection<br>Switching output Volumetric flow quantity monitoring<br>Frequency output Volumetric flow quantity monitoring<br>Pulse output quantity meter<br>signal output Preset counter<br>IO-Link                 |
| OUT2: | Switching output empty pipe detection<br>Switching output Volumetric flow quantity monitoring<br>Switching output Temperature monitoring<br>analog output Volumetric flow quantity monitoring<br>analog output Temperature monitoring<br>Input counter reset<br>Core colors : |
| BK =  | black   |
| BN =  | brown   |
| BU =  | blue  |
| WH =  | white   |

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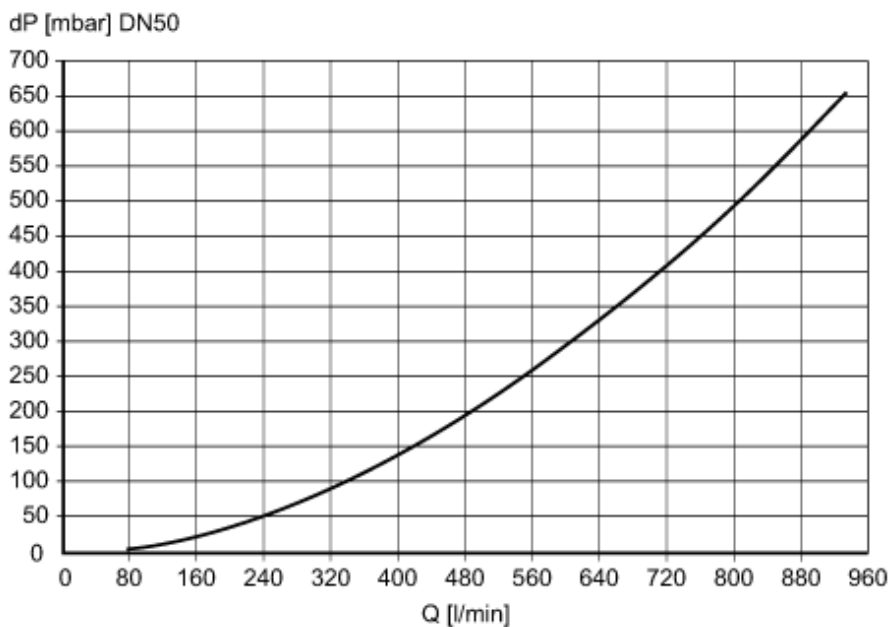


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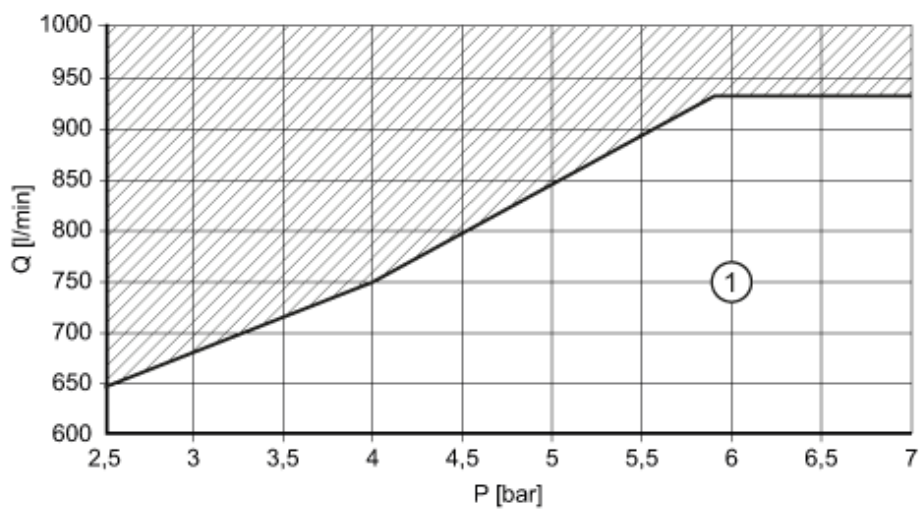
### Diagrams and graphs

#### Pressure loss



dP Pressure loss  
Q volumetric flow quantity

#### Cavitation



1 cavitation-free working area see operating instructions