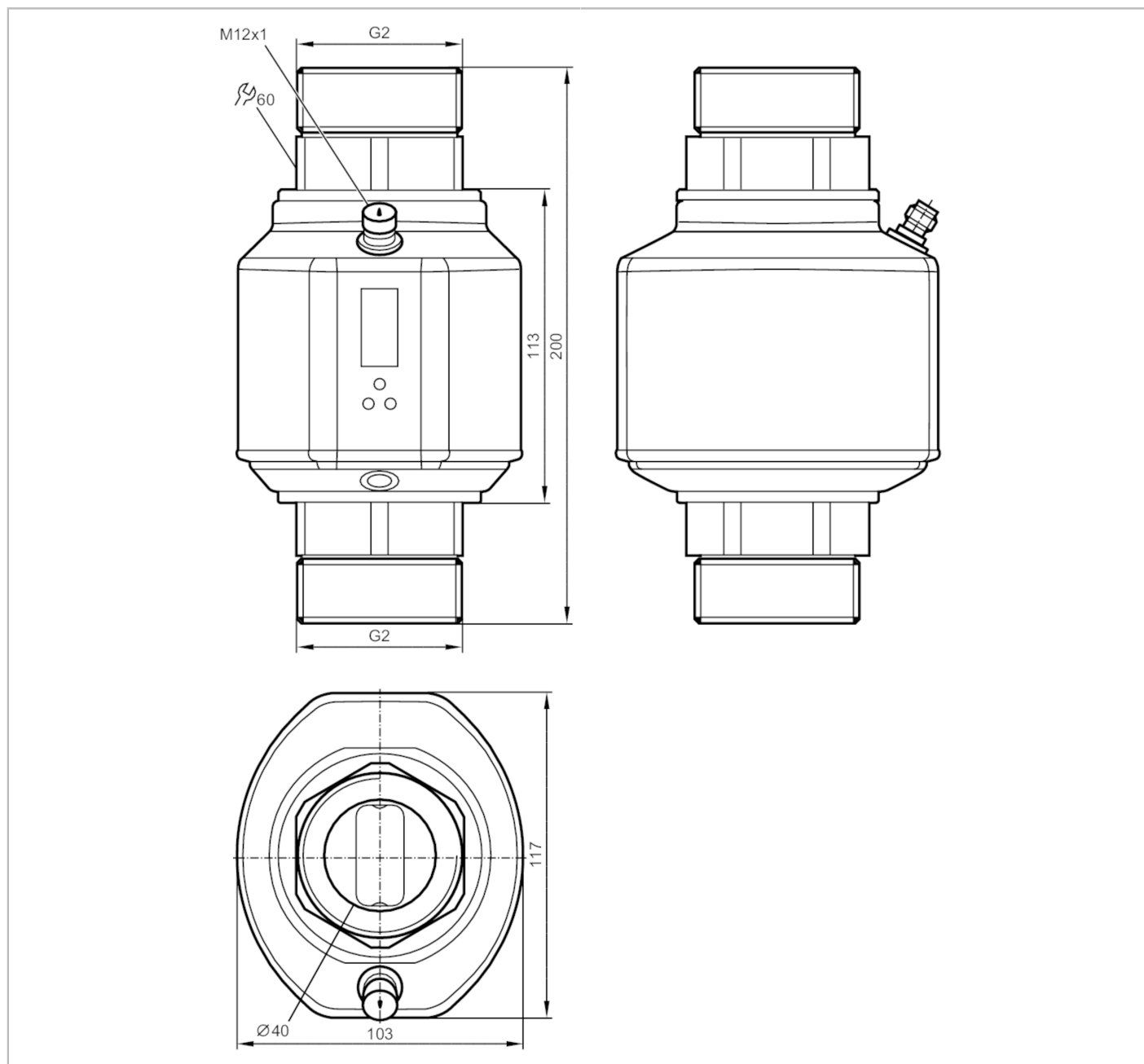


# SM2100



## Magnetic-inductive flow meter

SMR21XGXFRKG/US



ACS CE PA CRN cUL<sup>US</sup> LISTED ENEC IO-Link KTW/W270 Reg31 UK CA

### Product characteristics

|                              |   |                            |
|------------------------------|---|----------------------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analogue outputs: 1 |                            |
| Measuring range              | 5...600 l/min   | 0.3...36 m <sup>3</sup> /h |
| Process connection           | threaded connection G 2 DN50 flat seal                      |                            |

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| Application  |  |
|--|--|
| Special feature                                      | Gold-plated contacts   |
| Application  | totaliser function; empty pipe detection; for industrial applications                      |
| Installation   | connection to pipe by means of an adapter  |
| Media  | conductive liquids; water; hydrous media   |
| Note on media  | conductivity: $\geq 20 \mu\text{S/cm}$<br>viscosity: $< 70 \text{ mm}^2/\text{s}$ (40 °C)  |
| Medium temperature [°C]                              | -10...70   |
| Pressure rating [bar]                                | 16   |
| Pressure rating [Mpa]                                | 1.6  |
| MAWP (for applications according to CRN) [bar]       | 16   |
| Electrical data                                      |  |
| Operating voltage [V]                                | 18...32 DC; (according to EN 50178 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 analogue outputs: 1                                |
| Inputs   |  |
| Inputs   | counter reset  |
| Outputs  |  |
| Total number of outputs                              | 2  |
| Output signal  | switching signal; analogue signal; pulse signal; frequency signal; IO-Link; (configurable) |
| Electrical design                                    | PNP/NPN  |
| Number of digital outputs                            | 2  |
| Output function                                      | normally open / normally closed; (parameterisable)   |
| Max. voltage drop switching output DC [V]            | 2  |
| Permanent current rating of switching output DC [mA] | 250; (per output)  |
| Number of analogue outputs                           | 1  |
| Analogue current output [mA]                         | 4...20; (scalable)   |
| Max. load [Ω]  | 500  |
| Analogue voltage output [V]                          | 0...10; (scalable)   |
| Min. load resistance [Ω]                             | 2000   |
| Pulse output   | flow rate meter  |
| Short-circuit protection                             | yes  |
| Type of short-circuit protection                     | pulsed   |
| Overload protection                                  | yes  |
| Frequency of the output [Hz]                         | 0.1...10000  |

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| Measuring/setting range                  |  |                   |
|--|--|-------------------|
| Measuring range                          | 5...600 l/min  | 0.3...36 m³/h     |
| Display range                            | -720...720 l/min   | -43.2...43.2 m³/h |
| Resolution                               | 0.5 l/min  | 0.02 m³/h         |
| Set point SP                             | 8...600 l/min  | 0.5...36 m³/h     |
| Reset point rP                           | 5...597 l/min  | 0.3...35.8 m³/h   |
| Analogue start point ASP                 | 0...480 l/min  | 0...28.8 m³/h     |
| Analogue end point AEP                   | 120...600 l/min  | 7.2...36 m³/h     |
| Low flow cut-off LFC                     | < 15 l/min   | < 0.9 m³/h        |
| In steps of                              | 0.5 l/min  | 0.02 m³/h         |
| Measuring dynamics                       | 1:120  |                   |
| Volumetric flow quantity monitoring      |  |                   |
| Pulse value                              | 0.0001...600 x 10³ m³  |                   |
| In steps of                              | 0.0001 m³  |                   |
| Pulse length [s]                         | 0,008...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   |                   |
| Analogue start point [°C]                | -20...60   |                   |
| Analogue end point [°C]                  | 0...80   |                   |
| In steps of [°C]                         | 0.2  |                   |
| Accuracy / deviations                    |  |                   |
| Flow monitoring                          |  |                   |
| Accuracy (in the measuring range)        | ± (0,8 % MW + 0,5 % MEW)   |                   |
| Repeatability                            | ± 0,2% MEW   |                   |
| Temperature monitoring                   |  |                   |
| Temperature drift                        | ± 0,0333 °C / K  |                   |
| Accuracy [K]                             | ± 1 (bei 25 °C, Q > 15 l/min)  |                   |
| Response times                           |  |                   |
| Flow monitoring                          |  |                   |
| Response time [s]                        | 0.35; (dAP = 0)  |                   |
| Delay time programmable dS, dr [s]       | 0...50   |                   |
| Damping for the switching output 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 / normally closed; switching logic; current/voltage/frequency/pulse output; start-up delay; display can be deactivated; Display unit; empty pipe detection |                   |

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## Magnetic-inductive flow meter

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| 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 type     | A   |  |
| Process data analogue         | 3   |  |
| Process data binary           | 2   |  |
| Min. process cycle time [ms]  | 5   |  |
| Supported DeviceIDs           | Type of operation   | DeviceID                                     |
|                               | Default   | 357  |
| Operating conditions          |   |  |
| Ambient temperature [°C]      | -10...60  |  |
| Storage temperature [°C]      | -25...80  |  |
| Protection                    | IP 65; IP 67  |  |
| Tests / approvals             |   |  |
| EMC                           | DIN EN 60947-5-9  |  |
|                               | model number  | 004MI  |
| CPA approval                  | accuracy class  | -  |
|                               | maximum allowable error   | ± 1,5 % FS                                   |
|                               | Q (min)   | 0,3 m³/h                                     |
|                               | Q (t)   | -  |
|                               | Q (max)   | 36 m³/h                                      |
| 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]                  | 78  |  |
| UL approval                   | UL Approval no.   | I008   |
|                               | File number UL  | E174189                                      |
| Pressure Equipment Directive  | Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request       |  |
| Mechanical data               |   |  |
| Weight [g]                    | 3163  |  |
| Materials                     | stainless steel (1.4404 / 316L); stainless steel (1.4571/316Ti ); PEI; 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  |  |
| Displays / operating elements |   |  |
| Display                       | Display unit  | 6 x LED, green (l/min, m³/h, l, m³, 10³, °C) |
|                               | switching status  | 2 x LED, yellow                              |
|                               | measured values   | alphanumeric display, 4-digit                |
|                               | programming   | alphanumeric display, 4-digit                |
| Accessories                   |   |  |
| Items supplied                | sealings: 2, Centellen  |  |
|                               | Label   |  |

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| Remarks       |  |
|---------------|--|
| Remarks       | MW = measured value                      |
|               | MEW = Final value of the measuring range |
| Pack quantity | 1 pcs.                                   |

### Electrical connection

Connector: 1 x M12; Contacts: gold-plated



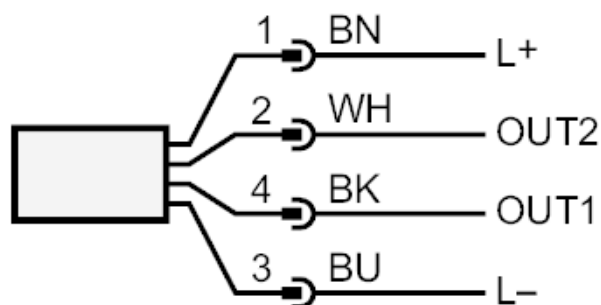
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### Connection



|       |  |
|-------|--|
|       | colours to DIN EN 60947-5-2  |
| OUT1: | 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>analogue output volumetric flow quantity monitoring<br>analogue output Temperature monitoring<br>input counter reset |
|       | Core colours :   |
| BK =  | black  |
| BN =  | brown  |
| BU =  | blue   |
| WH =  | white  |

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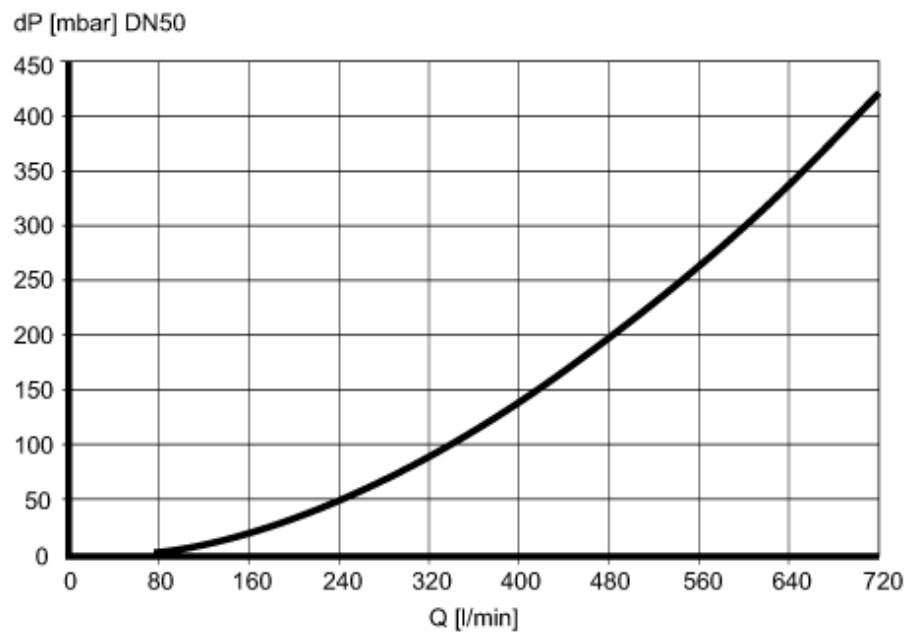


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### Diagrams and graphs

Pressure loss



dP Pressure loss

Q volumetric flow quantity