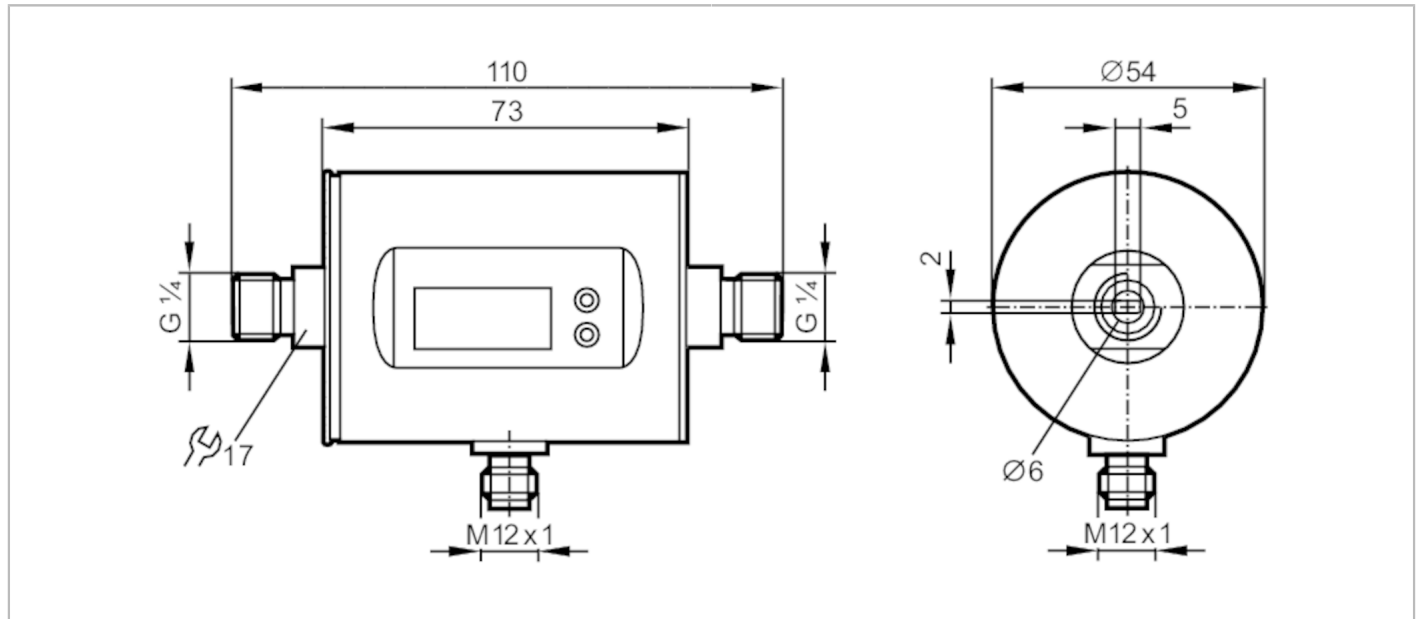


# SM4000



## Magnetic-inductive flow meter

SMR14DXXFRKG/US-100



### Product characteristics

|                              |                                                             |                 |
|------------------------------|-------------------------------------------------------------|-----------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analogue outputs: 1 |                 |
| Measuring range              | 5...3000 ml/min                                             | 0.005...3 l/min |
| Process connection           | threaded connection G 1/4 DN6 flat seal                     |                 |

### Application

|                                                |                                                                                           |  |
|------------------------------------------------|-------------------------------------------------------------------------------------------|--|
| Special feature                                | Gold-plated contacts                                                                      |  |
| Application                                    | totaliser function; 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]                        | 0...60                                                                                    |  |
| Pressure rating [bar]                          | 10                                                                                        |  |
| Pressure rating [MPa]                          | 1                                                                                         |  |
| MAWP (for applications according to CRN) [bar] | 7.3                                                                                       |  |

### Electrical data

|                             |                            |  |
|-----------------------------|----------------------------|--|
| Operating voltage [V]       | 18...30 DC; (to SELV/PELV) |  |
| Current consumption [mA]    | < 80                       |  |
| 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 |  |
|--------|---------------|--|



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| Outputs                                              |                                                                          |                 |
|------------------------------------------------------|--------------------------------------------------------------------------|-----------------|
| Total number of outputs                              | 2                                                                        |                 |
| Output signal                                        | switching signal; analogue signal; pulse 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] | 200                                                                      |                 |
| 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                                                                      |                 |
| Measuring/setting range                              |                                                                          |                 |
| Measuring range                                      | 5...3000 ml/min                                                          | 0.005...3 l/min |
| Display range [ml/min]                               | -1999...3600                                                             |                 |
| Resolution [ml/min]                                  | 1                                                                        |                 |
| Set point SP [ml/min]                                | 20...3000                                                                |                 |
| Reset point rP [ml/min]                              | 5...2984                                                                 |                 |
| Analogue start point ASP [ml/min]                    | 0...2400                                                                 |                 |
| Analogue end point AEP [ml/min]                      | 600...3000                                                               |                 |
| Low flow cut-off LFC [ml/min]                        | < 60                                                                     |                 |
| Volumetric flow quantity monitoring                  |                                                                          |                 |
| Pulse value                                          | 1...3000 ml                                                              |                 |
| Pulse length [s]                                     | 0,008...2                                                                |                 |
| Temperature monitoring                               |                                                                          |                 |
| Measuring range [°C]                                 | -20...80                                                                 |                 |
| 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)                    | ± (2 % MW + 0,5 % MEW)                                                   |                 |
| Repeatability                                        | ± 0,2% MEW                                                               |                 |



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|                                |                                                                                                                                                                                                                                         |                        |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Temperature monitoring         |                                                                                                                                                                                                                                         |                        |
| Accuracy                       | [K]                                                                                                                                                                                                                                     | ± 2,5 (Q > 0,5 l/min)  |
| Response times                 |                                                                                                                                                                                                                                         |                        |
| Flow monitoring                |                                                                                                                                                                                                                                         |                        |
| Response time                  | [s]                                                                                                                                                                                                                                     | 0.15; (dAP = 0, T19)   |
| Delay time programmable dS, dr | [s]                                                                                                                                                                                                                                     | 0...50                 |
| Damping process value dAP      | [s]                                                                                                                                                                                                                                     | 0...5                  |
| Temperature monitoring         |                                                                                                                                                                                                                                         |                        |
| Dynamic response T05 / T09     | [s]                                                                                                                                                                                                                                     | T09 = 40 (Q > 1 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/pulse output; start-up delay; display can be deactivated; Display unit |                        |
| Interfaces                     |                                                                                                                                                                                                                                         |                        |
| Communication interface        | IO-Link                                                                                                                                                                                                                                 |                        |
| Transmission type              | COM2 (38,4 kBaud)                                                                                                                                                                                                                       |                        |
| IO-Link revision               | 1.1                                                                                                                                                                                                                                     |                        |
| SDCI standard                  | IEC 61131-9                                                                                                                                                                                                                             |                        |
| Profiles                       | Smart Sensor: Process Data Variable; Device Identification, Device Diagnosis                                                                                                                                                            |                        |
| SIO mode                       | yes                                                                                                                                                                                                                                     |                        |
| Required master port type      | A                                                                                                                                                                                                                                       |                        |
| Process data analogue          | 3                                                                                                                                                                                                                                       |                        |
| Process data binary            | 2                                                                                                                                                                                                                                       |                        |
| Min. process cycle time        | [ms]                                                                                                                                                                                                                                    | 4                      |
| Supported DeviceIDs            | Type of operation                                                                                                                                                                                                                       | DeviceID               |
|                                | default                                                                                                                                                                                                                                 | 671                    |
| Operating conditions           |                                                                                                                                                                                                                                         |                        |
| Ambient temperature            | [°C]                                                                                                                                                                                                                                    | -10...60               |
| Storage temperature            | [°C]                                                                                                                                                                                                                                    | -25...80               |
| Protection                     | IP 67                                                                                                                                                                                                                                   |                        |
| Tests / approvals              |                                                                                                                                                                                                                                         |                        |
| EMC                            | DIN EN 60947-5-9                                                                                                                                                                                                                        |                        |
| CPA approval                   | model number                                                                                                                                                                                                                            | 007MI                  |
|                                | accuracy class                                                                                                                                                                                                                          | -                      |
|                                | maximum allowable error                                                                                                                                                                                                                 | ± 2,5 % FS             |
|                                | Q (min)                                                                                                                                                                                                                                 | 0,0003 m³/h            |
|                                | Q (t)                                                                                                                                                                                                                                   | -                      |
|                                | Q (max)                                                                                                                                                                                                                                 | 0,18 m³/h              |
| Shock resistance               | DIN IEC 68-2-27                                                                                                                                                                                                                         | 20 g (11 ms)           |
| Vibration resistance           | DIN IEC 68-2-6                                                                                                                                                                                                                          | 5 g (10...2000 Hz)     |
| MTTF                           | [ANN]                                                                                                                                                                                                                                   | 144                    |
| Pressure Equipment Directive   | Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request                                                                                                                                                   |                        |
| Mechanical data                |                                                                                                                                                                                                                                         |                        |
| Weight                         | [g]                                                                                                                                                                                                                                     | 536.5                  |

# SM4000



## Magnetic-inductive flow meter

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|                          |                                                         |
|--------------------------|---------------------------------------------------------|
| Materials                | stainless steel (1.4404 / 316L); PBT-GF20; PC; FKM; TPE |
| Materials (wetted parts) | stainless steel (1.4404 / 316L); PEEK; FKM              |
| Process connection       | threaded connection G 1/4 DN6 flat seal                 |

### Displays / operating elements

|         |                  |                                              |
|---------|------------------|----------------------------------------------|
| Display | Display unit     | 6 x LED, green (ml/min, l/h, l, m³, °C, 10³) |
|         | switching status | 2 x LED, yellow                              |
|         | measured values  | alphanumeric display, 4-digit                |
|         | programming      | alphanumeric display, 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: gold-plated

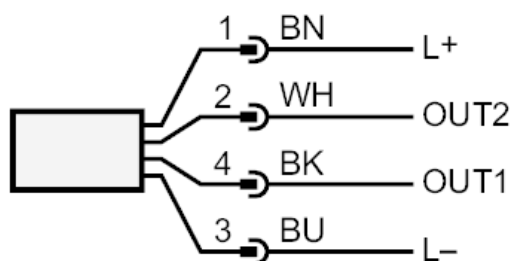




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SMR14DXXFRKG/US-100

### Connection



colours to DIN EN 60947-5-2

#### OUT1:

- switching output volumetric flow quantity monitoring
- Pulse output quantity meter
- signal output Preset counter
- IO-Link

#### OUT2:

- switching output volumetric flow quantity monitoring
- switching output Temperature monitoring
- analogue output volumetric flow quantity monitoring
- analogue output Temperature monitoring
- input counter reset

Core colours :

- BK = black
- BN = brown
- BU = blue
- WH = white

# SM4000

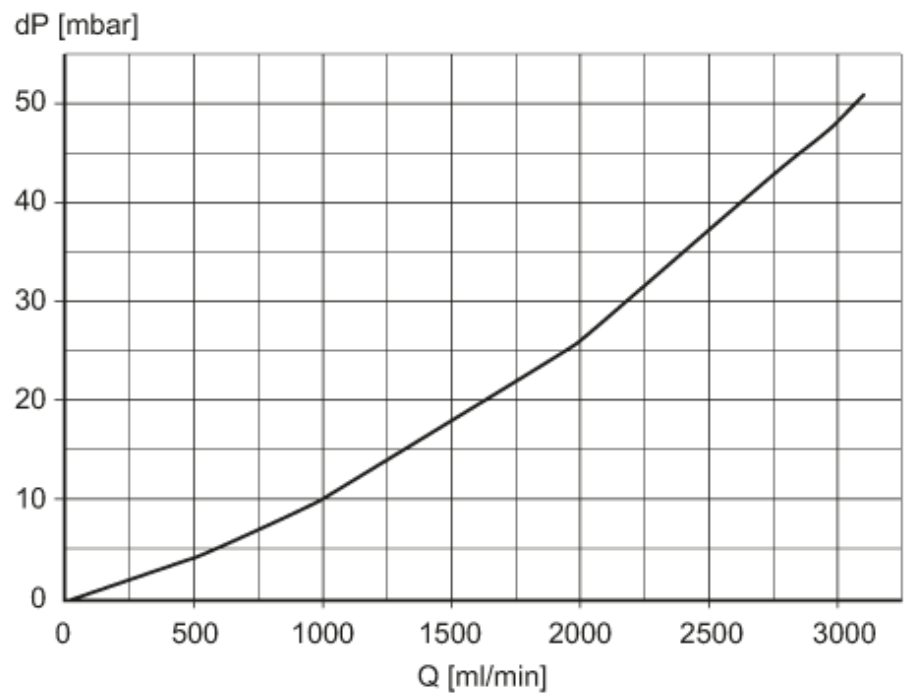
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### Diagrams and graphs

Pressure loss



dP Pressure loss

Q volumetric flow quantity