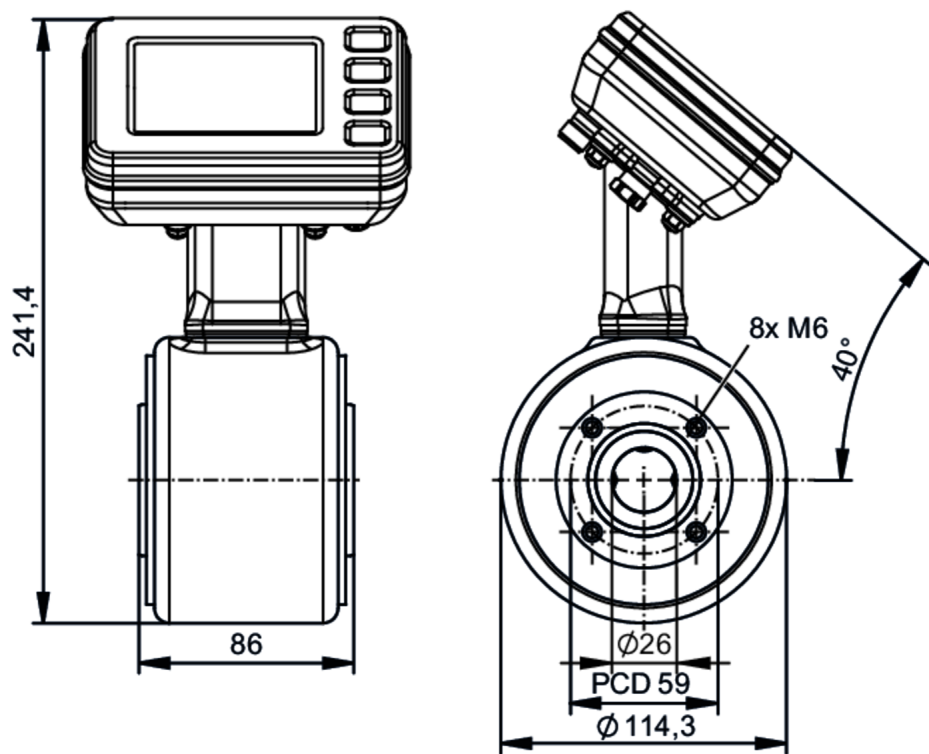


SMF220



Magnetic-inductive flow meter

SMG25KGFFRKG/USD



| Product characteristics |                                                                                                          |                 |                  |                |
|-------------------------|----------------------------------------------------------------------------------------------------------|-----------------|------------------|----------------|
| Measuring range         | 2.5...300 l/min                                                                                          | 150...18000 l/h | 0.08...10.18 m/s | 0.15...18 m³/h |
| Nominal diameter        | DN25 (1")                                                                                                |                 |                  |                |
| Process connection      | ifm-specific device flange                                                                               |                 |                  |                |
| Application             |                                                                                                          |                 |                  |                |
| System                  | gold-plated contacts                                                                                     |                 |                  |                |
| Application             | food and beverage industry                                                                               |                 |                  |                |
| Media                   | Conductive liquids; water; water-based media                                                             |                 |                  |                |
| Note on media           | food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream |                 |                  |                |
|                         | conductivity: ≥ 5 µS/cm                                                                                  |                 |                  |                |
| Medium temperature      | [°C]                                                                                                     | -20...150       |                  |                |
| Min. burst pressure     | 60 bar                                                                                                   | 6 MPa           |                  |                |
| Pressure rating         | 40 bar                                                                                                   | 4 MPa           |                  |                |
| Electrical data         |                                                                                                          |                 |                  |                |
| Operating voltage       | [V]                                                                                                      | 18...32 DC      |                  |                |

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|                             |                    |
|-----------------------------|--------------------|
| Current consumption [mA]    | 250; (24 V)        |
| Protection class            | III                |
| Reverse polarity protection | yes                |
| Power-on delay time [s]     | < 5                |
| Measuring principle         | magnetic-inductive |

### Inputs / outputs

|                                    |   |
|------------------------------------|---|
| Total number of inputs and outputs | 2 |
|------------------------------------|---|

### Inputs

|        |      |                          |
|--------|------|--------------------------|
| Inputs | OUT2 | external totalizer reset |
|--------|------|--------------------------|

### Outputs

|                                  |                    |                                                                            |
|----------------------------------|--------------------|----------------------------------------------------------------------------|
| Total number of outputs          | 2                  |                                                                            |
| Output signal                    | OUT1               | pulse signal; totalizer switching signal; diagnostic signal; IO-Link       |
|                                  | OUT2               | analog signal; pulse signal; totalizer switching signal; diagnostic signal |
| Electrical design                | PNP/NPN            |                                                                            |
| Pulse output                     | flow rate meter    |                                                                            |
| Short-circuit protection         | yes                |                                                                            |
| Type of short-circuit protection | yes (non-latching) |                                                                            |
| Overload protection              | yes                |                                                                            |

### Analog

|                             |                      |
|-----------------------------|----------------------|
| Number of analog outputs    | 1                    |
| Analog current output [mA]  | 4...20; (skalierbar) |
| Max. load [Ω]               | 500                  |
| Resolution of analog output | 0.38 μA              |

### Digital

|                                                      |           |
|------------------------------------------------------|-----------|
| Number of digital outputs                            | 2         |
| Max. voltage drop switching output DC [V]            | 2         |
| Permanent current rating of switching output DC [mA] | 100       |
| Switching frequency DC [Hz]                          | 0...10000 |

### Measuring/setting range

|                         |                    |                    |                    |                   |
|-------------------------|--------------------|--------------------|--------------------|-------------------|
| Measuring range         | 2.5...300 l/min    | 150...18000 l/h    | 0.08...10.18 m/s   | 0.15...18 m³/h    |
| Display range           | -360...360 l/min   | -21600...21600 l/h | -12.22...12.22 m/s | -21.6...21.6 m³/h |
| Resolution              | 0.01 l/min         | 10 l/h             | 0.01 m/s           | 0.01 m³/h         |
| Note on factory setting | 0...4,0 m³/h       |                    |                    |                   |
| Analog start point ASP  | -300...240 l/min   | -18000...14400 l/h | -10.18...8.15 m/s  | -18...14.4 m³/h   |
| Analog end point AEP    | -240...300 l/min   | -14400...18000 l/h | -8.15...10.18 m/s  | -14.4...18 m³/h   |
| Low flow cut-off LFC    | 0...240 l/min      | 0...14400 l/h      | 0...8.15 m/s       | 0...14.4 m³/h     |
| Pulse length [s]        | 0.00005...2        |                    |                    |                   |
| Pulse value             | 0.001...99990000 l |                    |                    |                   |

### Temperature monitoring

|                      |           |
|----------------------|-----------|
| Measuring range [°C] | -20...150 |
|----------------------|-----------|

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## Magnetic-inductive flow meter

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|                                   |                                                                   |                                               |
|-----------------------------------|-------------------------------------------------------------------|-----------------------------------------------|
| Display range                     | [°C]                                                              | -20...150                                     |
| Resolution                        | [°C]                                                              | 0.01                                          |
| Analog start point                | [°C]                                                              | -20...116                                     |
| Analog end point                  | [°C]                                                              | 14...150                                      |
| Conductivity monitoring           |                                                                   |                                               |
| Measuring range                   | [μS/cm]                                                           | 100...100000                                  |
| Display range                     | [μS/cm]                                                           | 0...10000000                                  |
| Resolution                        | [μS/cm]                                                           | 1                                             |
| Analog start point                | [μS/cm]                                                           | 0...80000                                     |
| Analog end point                  | [μS/cm]                                                           | 20000...100000                                |
| Accuracy / deviations             |                                                                   |                                               |
| Volumetric flow monitoring        |                                                                   |                                               |
| Accuracy (in the measuring range) | with optional factory calibration (availability is being planned) | ± (0,2 % MW + 2 mm/s)                         |
|                                   | standard                                                          | ± (0,5 % MW + 1,5 mm/s)                       |
| Repeatability                     |                                                                   | 0,1% MW                                       |
| Temperature monitoring            |                                                                   |                                               |
| Accuracy                          | [K]                                                               | ± 1                                           |
| Repeatability                     | [K]                                                               | ± 0,5                                         |
| Conductivity monitoring           |                                                                   |                                               |
| Accuracy (in the measuring range) | in the range of 100...20000 μS/cm                                 | ±10% MW                                       |
|                                   | in the range of 20000...100000 μS/cm                              | ±20% MW                                       |
| Repeatability                     |                                                                   | ± 5% MW                                       |
| Reaction times                    |                                                                   |                                               |
| Volumetric flow monitoring        |                                                                   |                                               |
| Response time                     | [s]                                                               | < 0.3                                         |
| Damping process value dAP         | [s]                                                               | 0...5                                         |
| Temperature monitoring            |                                                                   |                                               |
| Response time                     | [s]                                                               | < 3; (Flow velocity: ≥ 0,5m/s)                |
| Conductivity monitoring           |                                                                   |                                               |
| Response time                     | [s]                                                               | < 2                                           |
| Software / programming            |                                                                   |                                               |
| Diagnostic functions              |                                                                   | direction of flow detection; liquid detection |
| Interfaces                        |                                                                   |                                               |
| Communication interface           |                                                                   | IO-Link                                       |
| Transmission type                 |                                                                   | COM3 (230,4 kBaud)                            |
| IO-Link revision                  |                                                                   | 1.1.3                                         |
| SDCI standard                     |                                                                   | IEC 61131-9                                   |

# SMF220



## Magnetic-inductive flow meter

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|                                 |                                                                                                                                                                                                                                               |                   |                                                              |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------------------------------------|
| Profiles                        | Smart Sensor - SSP 4.3.4                                                                                                                                                                                                                      |                   | Measuring and Switching Sensor, floating point, 4 channel    |
|                                 | BLOB                                                                                                                                                                                                                                          |                   | Binary Large Object transfer                                 |
|                                 | Common - I&D                                                                                                                                                                                                                                  |                   | Identification and Diagnosis                                 |
|                                 | Extension                                                                                                                                                                                                                                     |                   | Sensor Control Wide                                          |
|                                 | Extension                                                                                                                                                                                                                                     |                   | Quantity detection, switches when value exceeds the setpoint |
|                                 | Function                                                                                                                                                                                                                                      |                   | Locator                                                      |
|                                 | Function                                                                                                                                                                                                                                      |                   | ProductURI                                                   |
| SIO mode                        | yes                                                                                                                                                                                                                                           |                   |                                                              |
| Required master port class      | A                                                                                                                                                                                                                                             |                   |                                                              |
| Process data analog             | 6                                                                                                                                                                                                                                             |                   |                                                              |
| Process data binary             | 8                                                                                                                                                                                                                                             |                   |                                                              |
| Min. process cycle time [ms]    | 1.9                                                                                                                                                                                                                                           |                   |                                                              |
| IO-Link process data (cyclical) | Function                                                                                                                                                                                                                                      | bit length        |                                                              |
|                                 | totalizer                                                                                                                                                                                                                                     | 32                |                                                              |
|                                 | flow                                                                                                                                                                                                                                          | 32                |                                                              |
|                                 | temperature                                                                                                                                                                                                                                   | 32                |                                                              |
|                                 | conductivity                                                                                                                                                                                                                                  | 32                |                                                              |
|                                 | status                                                                                                                                                                                                                                        | 4                 |                                                              |
|                                 | binary switching information                                                                                                                                                                                                                  | 8                 |                                                              |
| IO-Link functions (acyclical)   | direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function                                                                                                                            |                   |                                                              |
| Supported DeviceIDs             | Type of operation                                                                                                                                                                                                                             | DeviceID          |                                                              |
|                                 | default                                                                                                                                                                                                                                       | 1786              |                                                              |
| Operating conditions            |                                                                                                                                                                                                                                               |                   |                                                              |
| Ambient temperature [°C]        | -20...65                                                                                                                                                                                                                                      |                   |                                                              |
| Storage temperature [°C]        | -20...80                                                                                                                                                                                                                                      |                   |                                                              |
| Protection                      | IP 67; IP 69; (to DIN EN 60529)                                                                                                                                                                                                               |                   |                                                              |
| Tests / approvals               |                                                                                                                                                                                                                                               |                   |                                                              |
| EMC                             | DIN 61326-1                                                                                                                                                                                                                                   |                   |                                                              |
| Shock resistance                | DIN IEC 68-2-27                                                                                                                                                                                                                               | 20 g (18ms)       |                                                              |
| Vibration resistance            | DIN IEC 68-2-6                                                                                                                                                                                                                                | 5 g (10...2000Hz) |                                                              |
| MTTF [years]                    | 81                                                                                                                                                                                                                                            |                   |                                                              |
| UL approval                     | UL approval number                                                                                                                                                                                                                            | I031              |                                                              |
|                                 | 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]                      | 3687.95                                                                                                                                                                                                                                       |                   |                                                              |
| Housing                         | tubular                                                                                                                                                                                                                                       |                   |                                                              |
| Inlet pipe length               | 5 x DN                                                                                                                                                                                                                                        |                   |                                                              |
| Outlet pipe length              | 2 x DN                                                                                                                                                                                                                                        |                   |                                                              |
| Dimensions [mm]                 | Ø 114.3 / L = 86                                                                                                                                                                                                                              |                   |                                                              |
| Material                        | housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); Display: polysulfone; Display-sealing: FKM; LED ring: PP |                   |                                                              |
| Materials (wetted parts)        | Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)                                                                                                                                                                                |                   |                                                              |

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|                                                   |                            |
|---------------------------------------------------|----------------------------|
| Nominal diameter                                  | DN25 (1")                  |
| Process connection                                | ifm-specific device flange |
| Surface characteristics Ra/Rz of the wetted parts | Ra < 0.4 µm                |

Displays / operating elements

|                    |                                                                                  |                                                             |
|--------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------|
| Display            | process value                                                                    | full graphics TFT display, multi-color 3,5" 128 x 128 Pixel |
|                    |                                                                                  | display layouts: 4                                          |
|                    |                                                                                  | display rotation: 4 x 90°                                   |
|                    | operating status                                                                 | LED ring, three-color                                       |
| Display unit       | l/min; l/h; hl/min; hl/h; m³/min; m³/h; m/s; °C; µS/cm; S/m; ms/cm               |                                                             |
| Factory setting    | m³/h; °C; µS/cm                                                                  |                                                             |
| Language           | German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese |                                                             |
| Operating elements | 4                                                                                | capacitive pushbuttons                                      |

Remarks

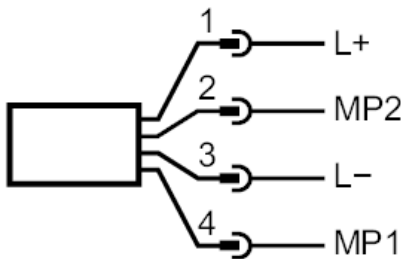
|               |                                                                                                                                                                         |  |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Remarks       | MW = Measured value                                                                                                                                                     |  |
|               | MEW = Final value of the measuring range                                                                                                                                |  |
|               | pulse and totalizer signal are only available for one of the two outputs                                                                                                |  |
|               | reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection               |  |
|               | reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up |  |
|               | accuracy specifications according to factory certificate on delivery                                                                                                    |  |
| Pack quantity | 1 pcs.                                                                                                                                                                  |  |

Electrical connection

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



Connection



# SMF220



## Magnetic-inductive flow meter

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### Electrical connection - plug

|   |     |                |
|---|-----|----------------|
| 1 | L+  |                |
| 2 | MP2 | DO2, AO, Reset |
| 3 | L-  |                |
| 4 | MP1 | DO1, IO-Link   |

AO: analog output; DO: digital output; MP: multi-function connection