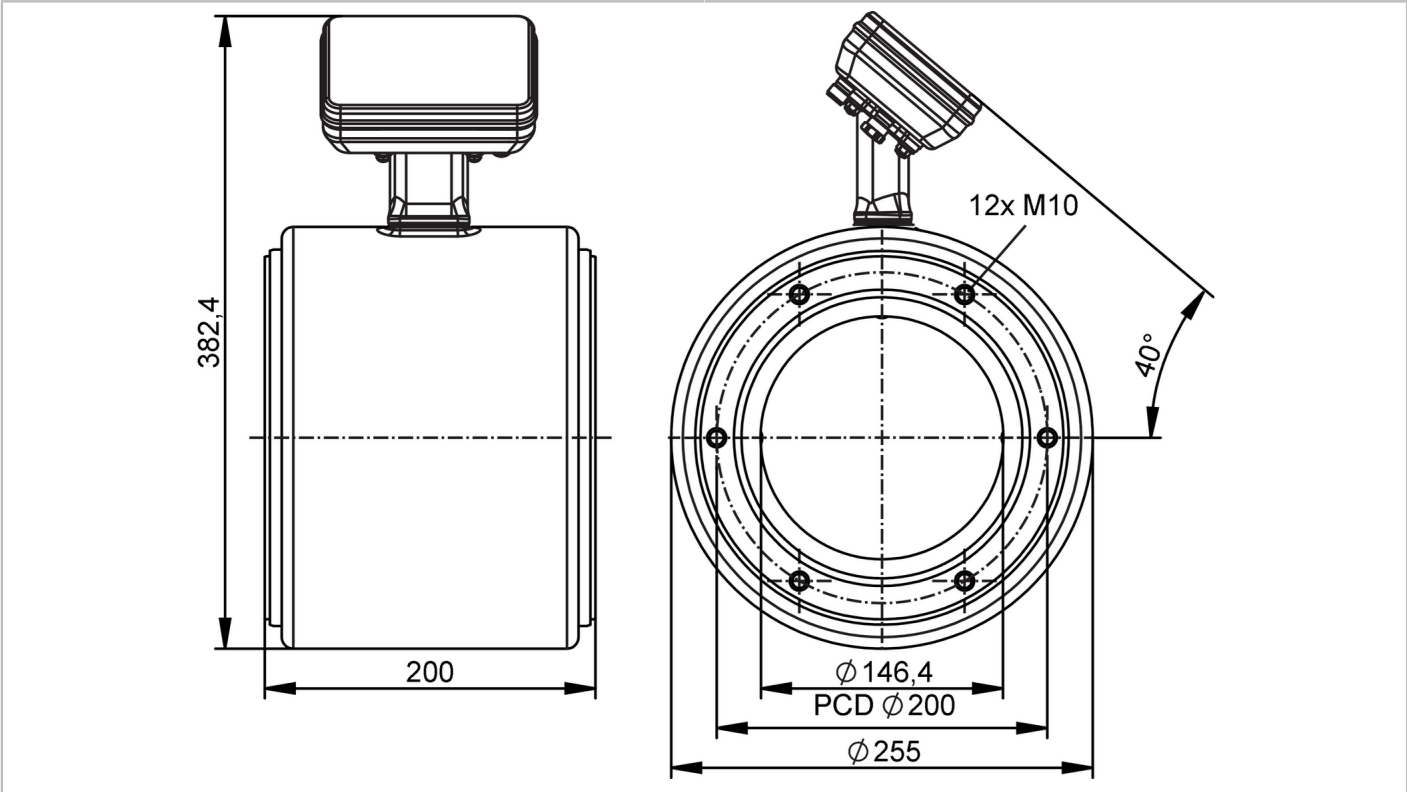


# SMF950



## Magnetic-inductive flow meter

SMGX2KGFFRKG/UST



EC 1935/2004

FCM



### Product characteristics

|                    |                            |              |               |                   |
|--------------------|----------------------------|--------------|---------------|-------------------|
| Measuring range    | 100...10000 l/min          | 6...600 m³/h | 26...2642 gpm | 0.31...30.94 ft/s |
| Nominal diameter   | DN150 (6")                 |              |               |                   |
| Process connection | ifm-specific device flange |              |               |                   |

### Application

|                         |                                                                                                          |         |         |
|-------------------------|----------------------------------------------------------------------------------------------------------|---------|---------|
| Special feature         | 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: $\geq 5 \mu\text{S/cm}$                                                                    |         |         |
| Medium temperature [°C] | -20...150                                                                                                |         |         |
| Min. burst pressure     | 24 bar                                                                                                   | 348 psi | 2.4 MPa |
| Pressure rating         | 16 bar                                                                                                   | 232 psi | 1.6 MPa |

### Electrical data

|                             |                    |
|-----------------------------|--------------------|
| Operating voltage [V]       | 18...32 DC         |
| Current consumption [mA]    | 250; (24 V)        |
| Protection class            | III                |
| Reverse polarity protection | yes                |
| Power-on delay time [s]     | < 5                |
| Measuring principle         | magnetic-inductive |

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| 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                                      | 100...10000 l/min    | 6...600 m³/h                                                               | 26...2642 gpm            | 0.31...30.94 ft/s   |
| Note on factory setting                              | 0...160,0 m³/h       |                                                                            |                          |                     |
| Analog start point ASP                               | -10000...8000 l/min  | -600...480 m³/h                                                            | -2642...2113 gpm         | -30.94...24.75 ft/s |
| Analog end point AEP                                 | -8000...10000 l/min  | -480...600 m³/h                                                            | -2113...2642 gpm         | -24.75...30.94 ft/s |
| Low flow cut-off LFC                                 | 0...8000 l/min       | 0...480 m³/h                                                               | 0...2113 gpm             | 0...24.75 ft/s      |
| Pulse length [s]                                     | 0.00005...2          |                                                                            |                          |                     |
| Pulse value                                          | 0.017...99999000 l   |                                                                            |                          |                     |
| Temperature monitoring                               |                      |                                                                            |                          |                     |
| Measuring range                                      | -20...150 °C         |                                                                            | -4...302 °F              |                     |
| Analog start point                                   | -20...116 °C         |                                                                            | -4...240.8 °F            |                     |
| Analog end point                                     | 14...150 °C          |                                                                            | 57.2...302 °F            |                     |
| Conductivity monitoring                              |                      |                                                                            |                          |                     |
| Measuring range [µS/cm]                              | 100...100000         |                                                                            |                          |                     |
| Analog start point [µS/cm]                           | 0...80000            |                                                                            |                          |                     |
| Analog end point [µS/cm]                             | 20000...100000       |                                                                            |                          |                     |



## Magnetic-inductive flow meter

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| 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 (v > 0,5 m/s)                                            |
| Repeatability                     | [K]                                                               | ± 0,5 (v > 0,5 m/s)                                          |
| 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; (v > 0,5 m/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                                                       |                                                              |
| 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                                                          |

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|                                    |                                                                                                                    |                   |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------|
| IO-Link process data<br>(cyclical) | <b>Function</b>                                                                                                    | <b>bit length</b> |
|                                    | 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                | <b>Type of operation</b>                                                                                           | <b>DeviceID</b>   |
|                                    | default                                                                                                            | 1809              |

| Operating conditions |                                 |             |
|----------------------|---------------------------------|-------------|
| Ambient temperature  | -20...65 °C                     | -4...149 °F |
| Storage temperature  | -20...80 °C                     | -4...176 °F |
| 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]                 |                                                                                       | 83                |
| UL approval                  | UL approval number                                                                    | I032              |
|                              | 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]                                        |                                                                                                                                                                                                   | 20800                      |
| Housing                                           |                                                                                                                                                                                                   | tubular                    |
| Inlet pipe length                                 |                                                                                                                                                                                                   | 5 x DN                     |
| Outlet pipe length                                |                                                                                                                                                                                                   | 2 x DN                     |
| Dimensions [mm]                                   |                                                                                                                                                                                                   | Ø 255 / L = 200            |
| 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); LED ring: PP |                            |
| Materials (wetted parts)                          | Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)                                                                                                                                    |                            |
| Nominal diameter                                  |                                                                                                                                                                                                   | DN150 (6")                 |
| Process connection                                |                                                                                                                                                                                                   | ifm-specific device flange |
| Surface characteristics Ra/Rz of the wetted parts |                                                                                                                                                                                                   | Ra < 0.4 µm                |

| Displays / operating elements |                  |                       |
|-------------------------------|------------------|-----------------------|
| Display                       | operating status | LED ring, three-color |
| Factory setting               | m³/h; °C; µS/cm  |                       |

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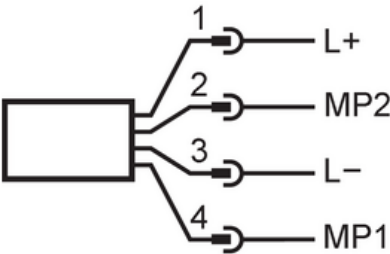
| Remarks       |                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 - plug

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



Connection



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

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