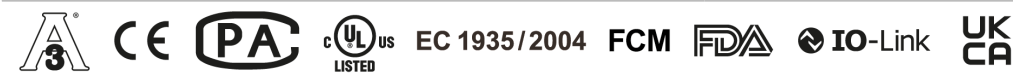
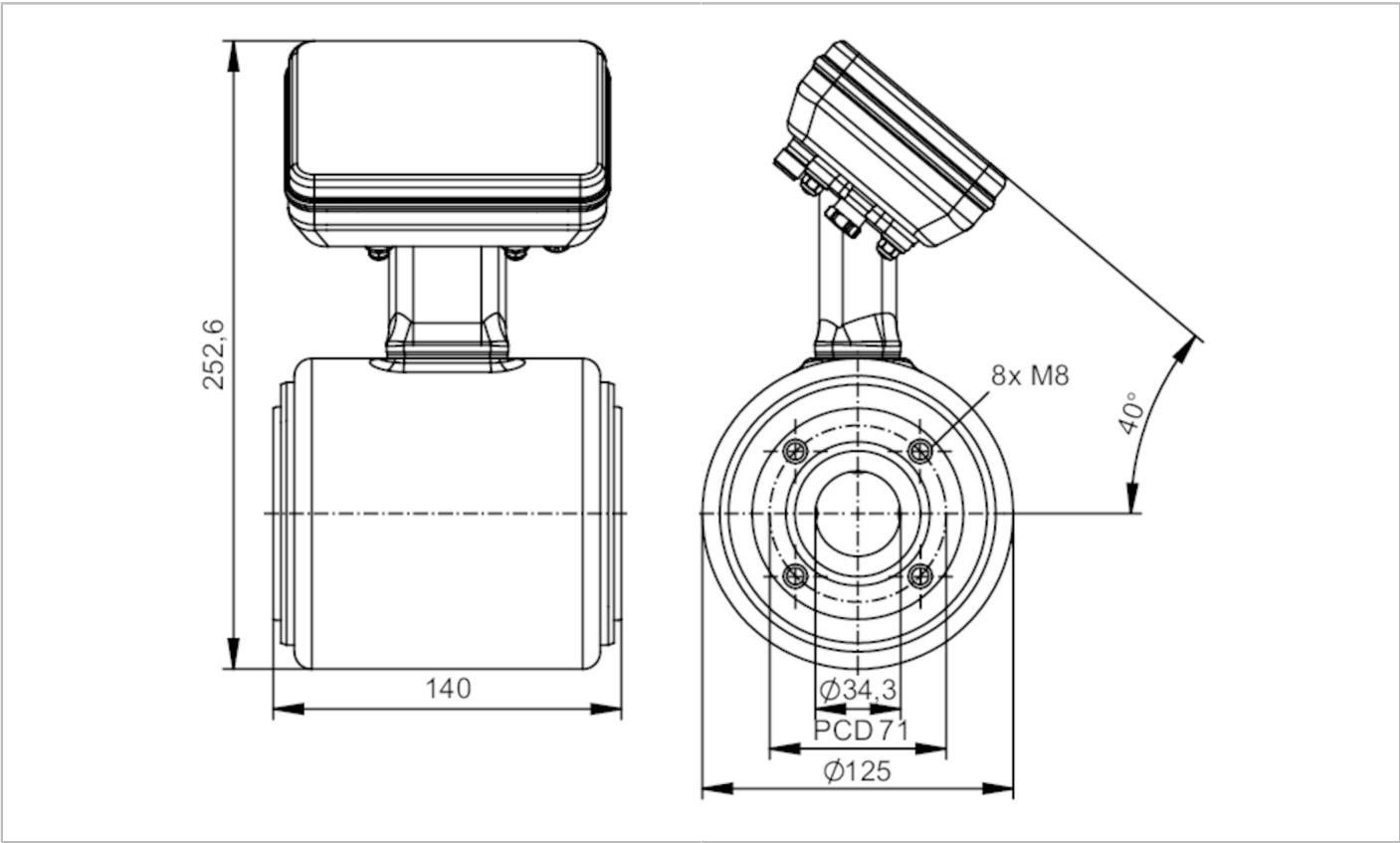


# SMF350



## Magnetic-inductive flow meter

SMG40KGFFRKG/UST



| Product characteristics     |                                                                                                            |                    |                   |                  |
|-----------------------------|------------------------------------------------------------------------------------------------------------|--------------------|-------------------|------------------|
| Measuring range             | 5...750 l/min                                                                                              | 0.3...45 m³/h      | 1.32...198.15 gpm | 0.23...32.8 ft/s |
| Nominal diameter            | DN40 (1 1/2")                                                                                              |                    |                   |                  |
| Process connection          | ifm-specific device flange                                                                                 |                    |                   |                  |
| Application                 |                                                                                                            |                    |                   |                  |
| Special feature             | Gold-plated contacts                                                                                       |                    |                   |                  |
| Application                 | food and beverage industry                                                                                 |                    |                   |                  |
| Media                       | conductive liquids; water; hydrous media                                                                   |                    |                   |                  |
| Note on media               | food products such as beer, milk, fruit juices, soft drinks, ketchup, yoghurt, yoghurt toppings, ice cream |                    |                   |                  |
|                             | conductivity: ≥ 5 µS/cm                                                                                    |                    |                   |                  |
| Medium temperature          | [°C]                                                                                                       | -20...150          |                   |                  |
| Min. bursting pressure      | 60 bar                                                                                                     | 870 psi            | 6 MPa             |                  |
| Pressure rating             | 40 bar                                                                                                     | 580.1 psi          | 4 MPa             |                  |
| Electrical data             |                                                                                                            |                    |                   |                  |
| Operating voltage           | [V]                                                                                                        | 18...32 DC         |                   |                  |
| Current consumption         | [mA]                                                                                                       | 250; (24V)         |                   |                  |
| 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 totaliser reset                                                     |                      |                    |
| Outputs                                              |  |                      |                                                                              |                      |                    |
| Total number of outputs                              |  | 2                    |                                                                              |                      |                    |
| Output signal                                        |  | OUT1                 | pulse signal; totaliser switching signal; diagnostic signal; IO-Link         |                      |                    |
|                                                      |  | OUT2                 | analogue signal; pulse signal; totaliser switching signal; diagnostic signal |                      |                    |
| Electrical design                                    |  | PNP/NPN              |                                                                              |                      |                    |
| Pulse output                                         |  | flow rate meter      |                                                                              |                      |                    |
| Short-circuit protection                             |  | yes                  |                                                                              |                      |                    |
| Type of short-circuit protection                     |  | pulsed               |                                                                              |                      |                    |
| Overload protection                                  |  | yes                  |                                                                              |                      |                    |
| Analogue                                             |  |                      |                                                                              |                      |                    |
| Number of analogue outputs                           |  | 1                    |                                                                              |                      |                    |
| Analogue current output [mA]                         |  | 4...20; (skalierbar) |                                                                              |                      |                    |
| Max. load [Ω]                                        |  | 500                  |                                                                              |                      |                    |
| Resolution of analogue 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                                      |  | 5...750 l/min        | 0.3...45 m³/h                                                                | 1.32...198.15 gpm    | 0.23...32.8 ft/s   |
| Note on factory setting                              |  | 0...11,0 m³/h        |                                                                              |                      |                    |
| Analogue start point ASP                             |  | -750...600 l/min     | -45...36 m³/h                                                                | -198.15...158.52 gpm | -32.8...26.24 ft/s |
| Analogue end point AEP                               |  | -600...750 l/min     | -36...45 m³/h                                                                | -158.52...198.15 gpm | -26.24...32.8 ft/s |
| Low flow cut-off LFC                                 |  | 0...600 l/min        | 0...36 m³/h                                                                  | 0...158.52 gpm       | 0...26.24 ft/s     |
| Pulse length [s]                                     |  | 0.00005...2          |                                                                              |                      |                    |
| Pulse value                                          |  | 0.002...99999000 l   |                                                                              |                      |                    |
| Temperature monitoring                               |  |                      |                                                                              |                      |                    |
| Measuring range                                      |  | -20...150 °C         |                                                                              | -4...302 °F          |                    |
| Analogue start point                                 |  | -20...116 °C         |                                                                              | -4...240.8 °F        |                    |
| Analogue end point                                   |  | 14...150 °C          |                                                                              | 57.2...302 °F        |                    |
| Conductivity monitoring                              |  |                      |                                                                              |                      |                    |
| Measuring range [µS/cm]                              |  | 100...100000         |                                                                              |                      |                    |
| Analogue start point [µS/cm]                         |  | 0...80000            |                                                                              |                      |                    |
| Analogue end point [µS/cm]                           |  | 20000...100000       |                                                                              |                      |                    |



## Magnetic-inductive flow meter

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| Accuracy / deviations                 |                                                                   |                                                              |
|---------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|
| Volumetric flow monitoring            |                                                                   |                                                              |
| Accuracy (under reference conditions) | 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                                                           |                                                              |
| Response 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                                                       |                                                              |
| 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 type             | A                                                                 |                                                              |
| Process data analogue                 | 6                                                                 |                                                              |
| Process data binary                   | 8                                                                 |                                                              |
| Min. process cycle time               | [ms]                                                              | 1.9                                                          |

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## Magnetic-inductive flow meter

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|                                    |                                                                                                                    |                   |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------|
| IO-Link process data<br>(cyclical) | <b>function</b>                                                                                                    | <b>bit length</b> |
|                                    | totaliser                                                                                                          | 32                |
|                                    | flow                                                                                                               | 32                |
|                                    | temperature                                                                                                        | 32                |
|                                    | conductivity                                                                                                       | 32                |
|                                    | status                                                                                                             | 4                 |
|                                    | binary switching information                                                                                       | 8                 |
| IO-Link functions (acyclical)      | direction of flow detection; totaliser; memory; operating hours counter; internal temperature; simulation function |                   |
| Supported DeviceIDs                | <b>Type of operation</b>                                                                                           | <b>DeviceID</b>   |
|                                    | default                                                                                                            | 1791              |

| 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                                                                           |                   |
| CPA approval                 | model number                                                                          | SMF               |
|                              | accuracy class                                                                        | 0,5               |
| Shock resistance             | DIN IEC 68-2-27                                                                       | 20 g (18ms)       |
| Vibration resistance         | DIN IEC 68-2-6                                                                        | 5 g (10...2000Hz) |
| MTTF [years]                 |                                                                                       | 82                |
| UL approval                  | UL approval no.                                                                       | I032              |
| Pressure Equipment Directive | Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request |                   |

| Mechanical data                                   |                                                                                                                                                                                           |                            |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Weight [g]                                        |                                                                                                                                                                                           | 5300                       |
| Housing                                           |                                                                                                                                                                                           | cylindrical                |
| Inlet pipe length                                 |                                                                                                                                                                                           | 5 x DN                     |
| Outlet pipe length                                |                                                                                                                                                                                           | 2 x DN                     |
| Dimensions [mm]                                   |                                                                                                                                                                                           | Ø 125 / L = 140            |
| Materials                                         | housing: stainless steel (316L/1.4404); flange: stainless steel (304/1.4301); electronics fixture: stainless steel (304/1.4301); electronics: stainless steel (316L/1.4404); LED ring: PP |                            |
| Materials (wetted parts)                          | Pipe section: PFA; electrodes: stainless steel (316L/1.4435)                                                                                                                              |                            |
| Nominal diameter                                  |                                                                                                                                                                                           | DN40 (1 1/2")              |
| 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-colour |
| Factory setting               |                  | m³/h; °C; µS/cm        |

# SMF350



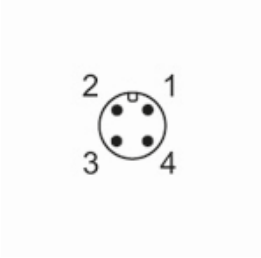
## Magnetic-inductive flow meter

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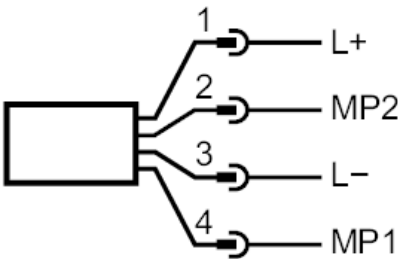
| Remarks       |                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remarks       | MW = measured value                                                                                                                                                     |
|               | MEW = Final value of the measuring range                                                                                                                                |
|               | pulse and totaliser 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



### Electrical connection - plug

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

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