

# SM6120

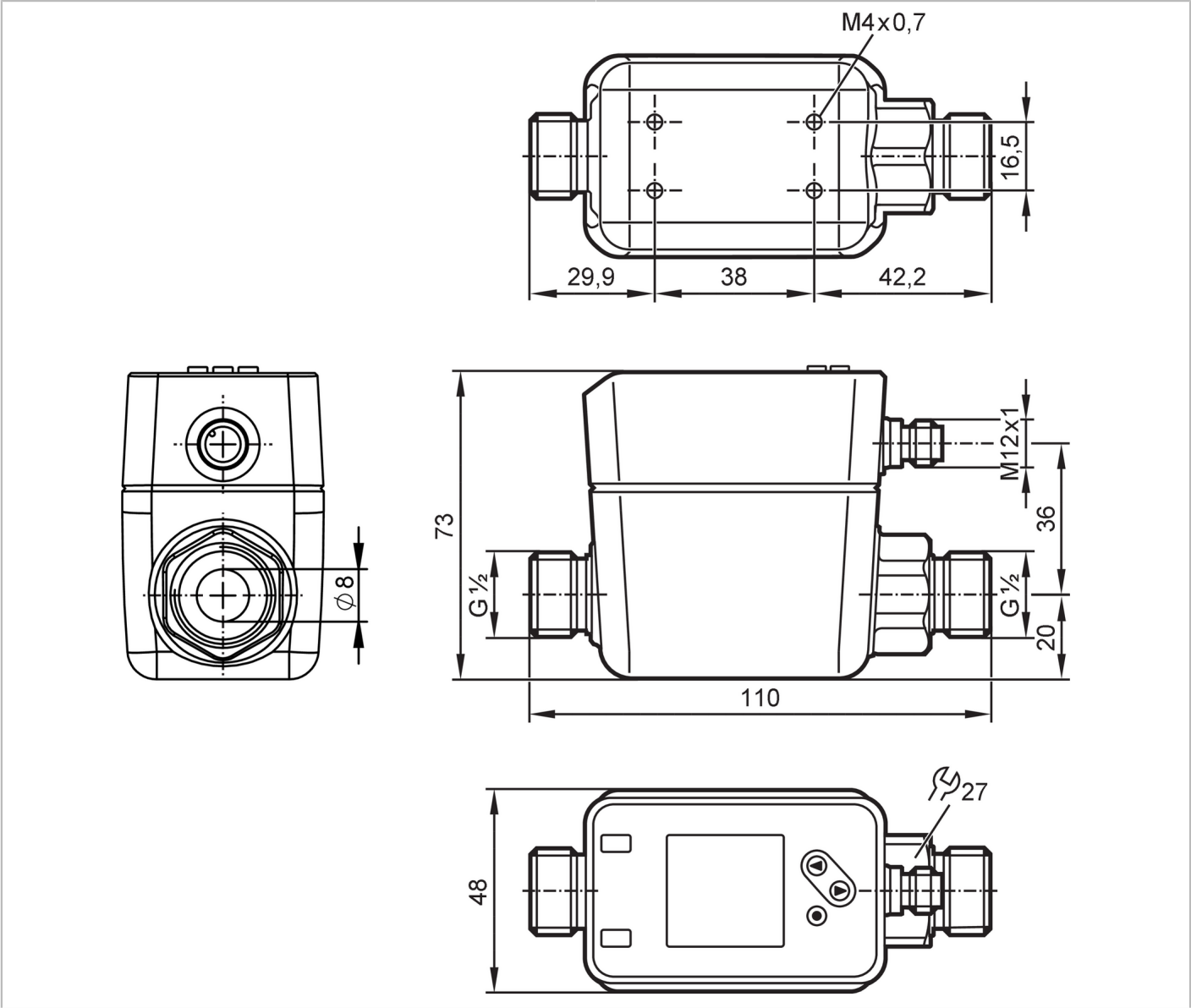


## Magnetic-inductive flow meter

SMR12XGXFRKG/US-100

Alternative articles: SM6100

When selecting an alternative article and accessories please note that technical data may differ!



| Product characteristics      |                                                           |                  |               |                 |
|------------------------------|-----------------------------------------------------------|------------------|---------------|-----------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analog outputs: 1 |                  |               |                 |
| Measuring range              | 0.05...35 l/min                                           | 0.003...2.1 m³/h | 0.6...555 gph | 0.01...9.25 gpm |
| Process connection           | threaded connection G 1/2 external thread DN15 flat seal  |                  |               |                 |
| Application                  |                                                           |                  |               |                 |
| Special feature              | gold-plated contacts                                      |                  |               |                 |
| Media                        | Conductive liquids; water; water-based media              |                  |               |                 |
| Note on media                | conductivity: ≥ 20 µS/cm                                  |                  |               |                 |
|                              | viscosity: < 70 mm²/s (40 °C)                             |                  |               |                 |
| Medium temperature           | [°C]                                                      | -20...90         |               |                 |
| Pressure rating              | 16 bar                                                    |                  | 1.6 MPa       |                 |

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| 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                                                                                        |                  |                 |
| Measuring principle                             |      | magnetic-inductive                                                                       |                  |                 |
| Inputs / outputs                                |      |                                                                                          |                  |                 |
| Number of inputs and outputs                    |      | Number of digital outputs: 2; Number of analog outputs: 1                                |                  |                 |
| Inputs                                          |      |                                                                                          |                  |                 |
| Inputs                                          |      | counter reset                                                                            |                  |                 |
| Outputs                                         |      |                                                                                          |                  |                 |
| Total number of outputs                         |      | 2                                                                                        |                  |                 |
| Output signal                                   |      | switching signal; analog signal; pulse signal; IO-Link; frequency signal; (configurable) |                  |                 |
| Electrical design                               |      | PNP/NPN                                                                                  |                  |                 |
| Number of digital outputs                       |      | 2                                                                                        |                  |                 |
| Output function                                 |      | normally open / closed; (configurable)                                                   |                  |                 |
| Max. voltage drop switching output DC           | [V]  | 2                                                                                        |                  |                 |
| Permanent current rating of switching output DC | [mA] | 100                                                                                      |                  |                 |
| Number of analog outputs                        |      | 1                                                                                        |                  |                 |
| Analog current output                           | [mA] | 4...20; (scalable)                                                                       |                  |                 |
| Max. load                                       | [Ω]  | 500                                                                                      |                  |                 |
| Pulse output                                    |      | flow rate meter                                                                          |                  |                 |
| Short-circuit protection                        |      | yes                                                                                      |                  |                 |
| Type of short-circuit protection                |      | yes (non-latching)                                                                       |                  |                 |
| Overload protection                             |      | yes                                                                                      |                  |                 |
| Measuring/setting range                         |      |                                                                                          |                  |                 |
| Measuring range                                 |      | 0.05...35 l/min                                                                          | 0.003...2.1 m³/h | 0.6...555 gph   |
| Display range                                   |      | -42...42 l/min                                                                           | -2.5...2.5 m³/h  | -666...666 gph  |
| Resolution                                      |      | 0.02 l/min                                                                               | 0.002 m³/h       | 0.6 gph         |
| Set point SP                                    |      | 0.25...35 l/min                                                                          | 0.015...2.1 m³/h | 4.2...555 gph   |
| Reset point rP                                  |      | 0...34.8 l/min                                                                           | 0...2.08 m³/h    | 1.2...552 gph   |
| Analog start point ASP                          |      | 0...28 l/min                                                                             | 0...1.7 m³/h     | 0...666 gph     |
| Analog end point AEP                            |      | 7...35 l/min                                                                             | 0.42...2.1 m³/h  | 111...555 gph   |
| Low flow cut-off LFC                            |      | 0.05...1.75 l/min                                                                        | 0.003...0.1 m³/h | 0.6...27.6 gph  |
| Frequency end point, FEP                        |      | 7...35 l/min                                                                             | 0.42...2.1 m³/h  | 111.6...555 gph |
| Frequency at the end point FRP                  | [Hz] | 1...10000                                                                                |                  |                 |
| Volumetric flow quantity monitoring             |      |                                                                                          |                  |                 |
| Pulse length                                    | [s]  | 0.001...2                                                                                |                  |                 |
| Pulse value                                     |      | 0.001...99990000 l                                                                       |                  |                 |



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|                                   |                                                                                                                                                                |                                       |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Temperature monitoring            |                                                                                                                                                                |                                       |
| Measuring range                   | [°C]                                                                                                                                                           | -20...90                              |
| Display range                     | [°C]                                                                                                                                                           | -42...112                             |
| Resolution                        | [°C]                                                                                                                                                           | 0.1                                   |
| Set point SP                      | [°C]                                                                                                                                                           | -19.6...90                            |
| Reset point rP                    | [°C]                                                                                                                                                           | -20...89.6                            |
| Analog start point                | [°C]                                                                                                                                                           | -20...68                              |
| Analog end point                  | [°C]                                                                                                                                                           | 2...90                                |
| In steps of                       | [°C]                                                                                                                                                           | 0.1                                   |
| Accuracy / deviations             |                                                                                                                                                                |                                       |
| Flow monitoring                   |                                                                                                                                                                |                                       |
| Accuracy (in the measuring range) |                                                                                                                                                                | ± (0,8 % MW + 0,2 % MEW)              |
| Repeatability                     |                                                                                                                                                                | ± 0,2 % MEW                           |
| Temperature monitoring            |                                                                                                                                                                |                                       |
| Accuracy                          | [K]                                                                                                                                                            | ± 2,5 (Q > 5 % MEW)                   |
| Reaction times                    |                                                                                                                                                                |                                       |
| Flow monitoring                   |                                                                                                                                                                |                                       |
| Start-up delay                    | [s]                                                                                                                                                            | 0...50                                |
| Response time                     | [s]                                                                                                                                                            | < 0.25; (dAP = 0, T09)                |
| Damping process value dAP         | [s]                                                                                                                                                            | 0...5                                 |
| Temperature monitoring            |                                                                                                                                                                |                                       |
| Response time                     | [s]                                                                                                                                                            | 15; (Q > 10 % MEW, T09)               |
| Software / programming            |                                                                                                                                                                |                                       |
| Parameter setting options         | hysteresis / window; normally open / closed; switching logic; Frequency output; current/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                          | Common - I&D                                                                                                                                                   | Identification and Diagnosis          |
|                                   | Function                                                                                                                                                       | Measurement data, standard resolution |
| SIO mode                          | yes                                                                                                                                                            |                                       |
| Required master port class        | A                                                                                                                                                              |                                       |
| Process data analog               | 3                                                                                                                                                              |                                       |
| Process data binary               | 2                                                                                                                                                              |                                       |
| Min. process cycle time           | [ms]                                                                                                                                                           | 8                                     |
| Supported DeviceIDs               | Type of operation                                                                                                                                              | DeviceID                              |
|                                   | default                                                                                                                                                        | 949                                   |
| Operating conditions              |                                                                                                                                                                |                                       |
| Ambient temperature               | [°C]                                                                                                                                                           | -20...60                              |
| Storage temperature               | [°C]                                                                                                                                                           | -25...80                              |
| Protection                        | IP 65; IP 67                                                                                                                                                   |                                       |

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| Tests / approvals                                                                   |                                                                                                                                       |                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| EMC                                                                                 | DIN EN 60947-5-9                                                                                                                      |                                       |
| CPA approval                                                                        | model number                                                                                                                          | 005MI                                 |
|                                                                                     | accuracy class                                                                                                                        | -                                     |
|                                                                                     | maximum allowable error                                                                                                               | ± 1,0 % FS                            |
|                                                                                     | Q (min)                                                                                                                               | 0,003 m³/h                            |
|                                                                                     | Q (t)                                                                                                                                 | -                                     |
|                                                                                     | Q (max)                                                                                                                               | 2,1 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                                                                                | [years]                                                                                                                               | 114                                   |
| UL approval                                                                         | UL approval number                                                                                                                    | I014                                  |
|                                                                                     | 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]                                                                                                                                   | 709.55                                |
| Housing                                                                             |                                                                                                                                       | rectangular                           |
| Dimensions                                                                          | [mm]                                                                                                                                  | 110 x 48 x 73                         |
| Material                                                                            | stainless steel (1.4408/316); stainless steel (1.4404 / 316L); PC; PBT+PC-GF30                                                        |                                       |
| Materials (wetted parts)                                                            | Pipe section: stainless steel (1.4404 / 316L); Process connection sealing: NBR fiber-reinforced Gasket; PEEK; EPDM; carbon fiber PEEK |                                       |
| Process connection                                                                  | threaded connection G 1/2 external thread DN15 flat seal                                                                              |                                       |
| Displays / operating elements                                                       |                                                                                                                                       |                                       |
| Display                                                                             |                                                                                                                                       | Color display 1,44", 128 x 128 pixels |
|                                                                                     |                                                                                                                                       | 2 x LED, yellow                       |
| 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: 4, gold-plated                             |                                                                                                                                       |                                       |
|  |                                                                                                                                       |                                       |

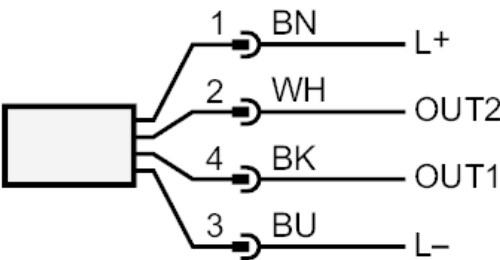
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### Connection



|       |                                                      |
|-------|------------------------------------------------------|
| OUT1: | Colors to DIN EN 60947-5-2                           |
|       | Switching output Volumetric flow quantity monitoring |
|       | Switching output Temperature monitoring              |
|       | Pulse output quantity meter                          |
|       | Frequency output volumetric flow monitoring          |
|       | Frequency output Temperature monitoring              |
|       | signal output Preset counter                         |
| OUT2: | IO-Link                                              |
|       | Switching output Volumetric flow quantity monitoring |
|       | Switching output Temperature monitoring              |
|       | analog output flow                                   |
|       | analog output temperature                            |
|       | Input counter reset                                  |
|       | Core colors :                                        |
| BK =  | black                                                |
| BN =  | brown                                                |
| BU =  | blue                                                 |
| WH =  | white                                                |

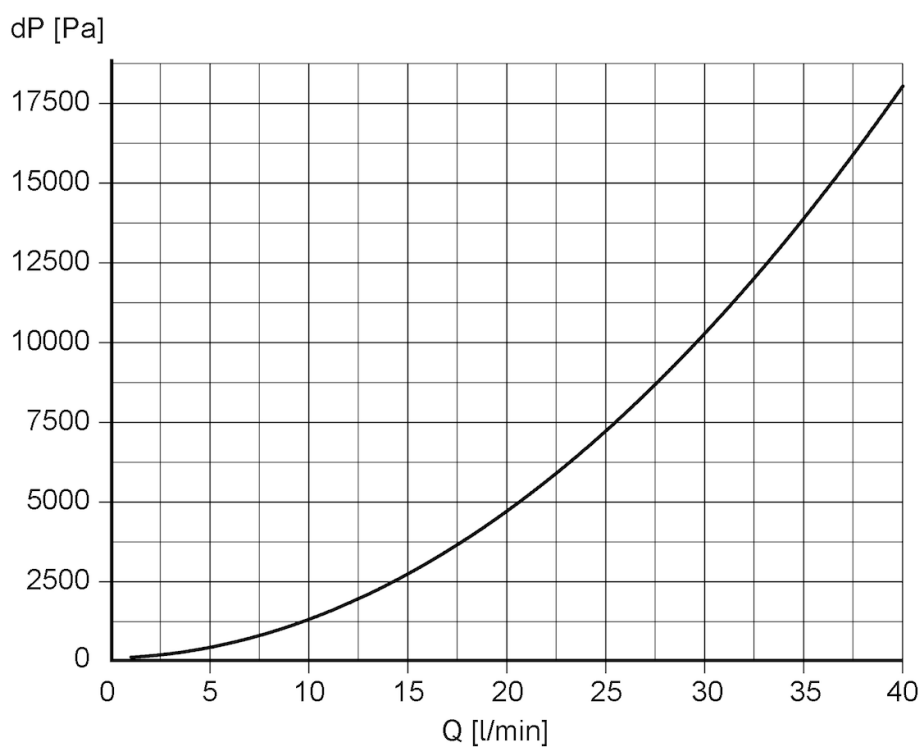
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### Diagrams and graphs



Pressure loss / volumetric flow quantity