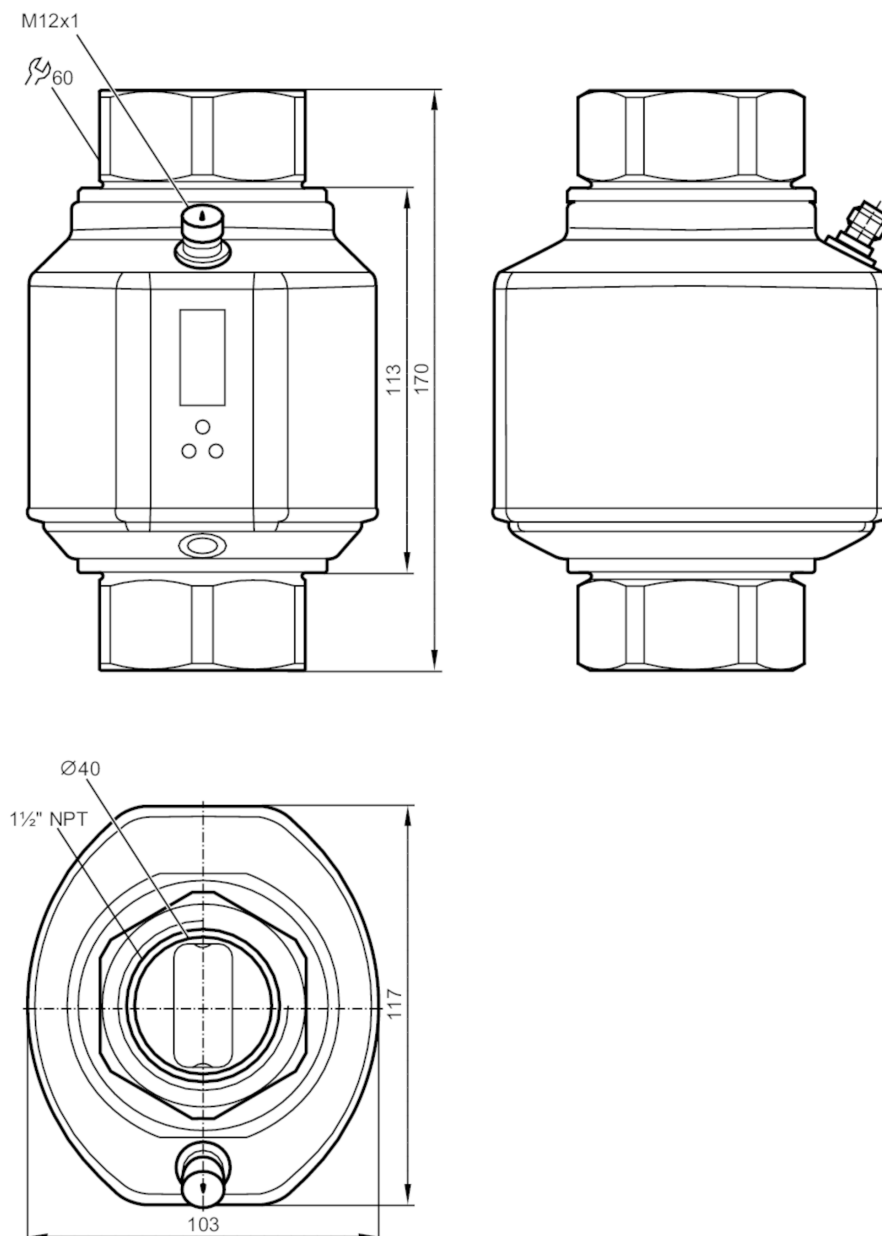


# SM9601



## Magnetic-inductive flow meter

SMN32XGXFRKG/US-100



### Product characteristics

|                              |                                                             |              |
|------------------------------|-------------------------------------------------------------|--------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analogue outputs: 1 |              |
| Measuring range              | 80...4800 gph                                               | 1.3...80 gpm |
| Process connection           | threaded connection 1 1/2 NPT DN40                          |              |



## Magnetic-inductive flow meter

SMN32XGXFRKG/US-100

| Application                                          |                                                                                            |
|------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Special feature                                      | Gold-plated contacts                                                                       |
| Application                                          | totaliser function; empty pipe detection; for industrial applications                      |
| Media                                                | conductive liquids; water; hydrous media                                                   |
| Note on media                                        | conductivity: $\geq 20 \mu\text{S/cm}$<br>viscosity: $< 70 \text{ mm}^2/\text{s}$ (40 °C)  |
| Medium temperature [°F]                              | 14...158                                                                                   |
| Pressure rating [bar]                                | 16                                                                                         |
| MAWP (for applications according to CRN) [bar]       | 16.5                                                                                       |
| Electrical data                                      |                                                                                            |
| Operating voltage [V]                                | 18...32 DC; (according to EN 50178 SELV/PELV)                                              |
| Current consumption [mA]                             | $< 150$                                                                                    |
| Protection class                                     | III                                                                                        |
| Reverse polarity protection                          | yes                                                                                        |
| Power-on delay time [s]                              | 5                                                                                          |
| Inputs / outputs                                     |                                                                                            |
| Number of inputs and outputs                         | Number of digital outputs: 2; Number of analogue outputs: 1                                |
| Inputs                                               |                                                                                            |
| Inputs                                               | counter reset                                                                              |
| Outputs                                              |                                                                                            |
| Total number of outputs                              | 2                                                                                          |
| Output signal                                        | switching signal; analogue signal; pulse signal; frequency signal; IO-Link; (configurable) |
| Electrical design                                    | PNP/NPN                                                                                    |
| Number of digital outputs                            | 2                                                                                          |
| Output function                                      | normally open / normally closed; (parameterisable)                                         |
| Max. voltage drop switching output DC [V]            | 2                                                                                          |
| Permanent current rating of switching output DC [mA] | 250; (per output)                                                                          |
| Number of analogue outputs                           | 1                                                                                          |
| Analogue current output [mA]                         | 4...20; (scalable)                                                                         |
| Max. load [Ω]                                        | 500                                                                                        |
| Analogue voltage output [V]                          | 0...10; (scalable)                                                                         |
| Min. load resistance [Ω]                             | 2000                                                                                       |
| Pulse output                                         | flow rate meter                                                                            |
| Short-circuit protection                             | yes                                                                                        |
| Type of short-circuit protection                     | pulsed                                                                                     |
| Overload protection                                  | yes                                                                                        |
| Frequency of the output [Hz]                         | 0.1...10000                                                                                |



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| Measuring/setting range                  |                                                                                                                                                                                                                                                                        |                |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Measuring range                          | 80...4800 gph                                                                                                                                                                                                                                                          | 1.3...80 gpm   |
| Display range                            | -5760...5760 gph                                                                                                                                                                                                                                                       | -96...96 gpm   |
| Resolution                               | 5 gph                                                                                                                                                                                                                                                                  | 0.1 gpm        |
| Set point SP                             | 105...4800 gph                                                                                                                                                                                                                                                         | 1.7...80 gpm   |
| Reset point rP                           | 80...4775 gph                                                                                                                                                                                                                                                          | 1.3...79.6 gpm |
| Analogue start point ASP                 | 0...3840 gph                                                                                                                                                                                                                                                           | 0...64 gpm     |
| Analogue end point AEP                   | 960...4800 gph                                                                                                                                                                                                                                                         | 16...80 gpm    |
| Low flow cut-off LFC                     | < 240 gph                                                                                                                                                                                                                                                              | < 4 gpm        |
| In steps of                              | 5 gph                                                                                                                                                                                                                                                                  | 0.1 gpm        |
| Measuring dynamics                       | 1:60                                                                                                                                                                                                                                                                   |                |
| Volumetric flow quantity monitoring      |                                                                                                                                                                                                                                                                        |                |
| Pulse value                              | 0.02...80 E06 gal                                                                                                                                                                                                                                                      |                |
| In steps of                              | 0.02 gal                                                                                                                                                                                                                                                               |                |
| Pulse length [s]                         | 0,016...2                                                                                                                                                                                                                                                              |                |
| Temperature monitoring                   |                                                                                                                                                                                                                                                                        |                |
| Measuring range [°F]                     | -4...176                                                                                                                                                                                                                                                               |                |
| Display range [°F]                       | -40...212                                                                                                                                                                                                                                                              |                |
| Resolution [°F]                          | 0.5                                                                                                                                                                                                                                                                    |                |
| Set point SP [°F]                        | -2...176                                                                                                                                                                                                                                                               |                |
| Reset point rP [°F]                      | -3...175                                                                                                                                                                                                                                                               |                |
| Analogue start point [°F]                | -4...140                                                                                                                                                                                                                                                               |                |
| Analogue end point [°F]                  | 32...176                                                                                                                                                                                                                                                               |                |
| In steps of [°F]                         | 0.5                                                                                                                                                                                                                                                                    |                |
| Accuracy / deviations                    |                                                                                                                                                                                                                                                                        |                |
| Flow monitoring                          |                                                                                                                                                                                                                                                                        |                |
| Accuracy (in the measuring range)        | ± (0,8 % MW + 0,5 % MEW)                                                                                                                                                                                                                                               |                |
| Repeatability                            | ± 0,2% MEW                                                                                                                                                                                                                                                             |                |
| Temperature monitoring                   |                                                                                                                                                                                                                                                                        |                |
| Temperature drift                        | ± 0,0185 °F / K                                                                                                                                                                                                                                                        |                |
| Accuracy [K]                             | ± 1 (77 °F; Q > 4 gpm)                                                                                                                                                                                                                                                 |                |
| Response times                           |                                                                                                                                                                                                                                                                        |                |
| Flow monitoring                          |                                                                                                                                                                                                                                                                        |                |
| Response time [s]                        | 0.35; (dAP = 0)                                                                                                                                                                                                                                                        |                |
| Delay time programmable dS, dr [s]       | 0...50                                                                                                                                                                                                                                                                 |                |
| Damping for the switching output dAP [s] | 0...5                                                                                                                                                                                                                                                                  |                |
| Temperature monitoring                   |                                                                                                                                                                                                                                                                        |                |
| Dynamic response T05 / T09 [s]           | T09 = 3 (Q > 4 gpm)                                                                                                                                                                                                                                                    |                |
| Software / programming                   |                                                                                                                                                                                                                                                                        |                |
| Parameter setting options                | Flow monitoring; quantity meter; Preset counter; Temperature monitoring; hysteresis / window; normally open / normally closed; switching logic; current/voltage/frequency/pulse output; start-up delay; display can be deactivated; Display unit; empty pipe detection |                |



## Magnetic-inductive flow meter

SMN32XGXFRKG/US-100

| Interfaces                                |                                                                                             |                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Communication interface                   | IO-Link                                                                                     |                                                     |
| Transmission type                         | COM2 (38,4 kBaud)                                                                           |                                                     |
| IO-Link revision                          | 1.1                                                                                         |                                                     |
| SDCI standard                             | IEC 61131-9 CDV                                                                             |                                                     |
| IO-Link device ID                         | 392 d / 00 01 88 h                                                                          |                                                     |
| Profiles                                  | Smart Sensor: Process Data Variable; Device Identification                                  |                                                     |
| SIO mode                                  | yes                                                                                         |                                                     |
| Required master port type                 | A                                                                                           |                                                     |
| Process data analogue                     | 3                                                                                           |                                                     |
| Process data binary                       | 2                                                                                           |                                                     |
| Min. process cycle time [ms]              | 5                                                                                           |                                                     |
| Operating conditions                      |                                                                                             |                                                     |
| Ambient temperature [°F]                  | 14...140                                                                                    |                                                     |
| Storage temperature [°F]                  | -13...176                                                                                   |                                                     |
| Protection                                | IP 65; IP 67                                                                                |                                                     |
| Tests / approvals                         |                                                                                             |                                                     |
| EMC                                       | DIN EN 60947-5-9                                                                            |                                                     |
| Shock resistance                          | DIN EN 60068-2-27                                                                           | 20 g (11 ms)                                        |
| Vibration resistance                      | DIN EN 60068-2-6                                                                            | 5 g (10...2000 Hz)                                  |
| MTTF [years]                              | 78                                                                                          |                                                     |
| Pressure Equipment Directive              | Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request       |                                                     |
| Mechanical data                           |                                                                                             |                                                     |
| Weight [g]                                | 2755.95                                                                                     |                                                     |
| Materials                                 | stainless steel (1.4404 / 316L); stainless steel (1.4571/316Ti ); PEI; FKM; PBT-GF20; TPE-U |                                                     |
| Materials (wetted parts)                  | stainless steel (1.4404 / 316L); stainless steel (1.4571/316Ti ); PEEK; FKM                 |                                                     |
| Process connection                        | threaded connection 1 1/2 NPT DN40                                                          |                                                     |
| Displays / operating elements             |                                                                                             |                                                     |
| Display                                   | Display unit                                                                                | 6 x LED, green (gpm, gph, gal, °F, 10³, 1000 x 10³) |
|                                           | switching status                                                                            | 2 x LED, yellow                                     |
|                                           | measured values                                                                             | alphanumeric display, 4-digit                       |
|                                           | programming                                                                                 | alphanumeric display, 4-digit                       |
| Accessories                               |                                                                                             |                                                     |
| Accessories (supplied)                    | Label                                                                                       |                                                     |
| Remarks                                   |                                                                                             |                                                     |
| Remarks                                   | MW = measured value                                                                         |                                                     |
|                                           | MEW = Final value of the measuring range                                                    |                                                     |
| Pack quantity                             | 1 pcs.                                                                                      |                                                     |
| Electrical connection                     |                                                                                             |                                                     |
| Connector: 1 x M12; Contacts: gold-plated |                                                                                             |                                                     |

# SM9601

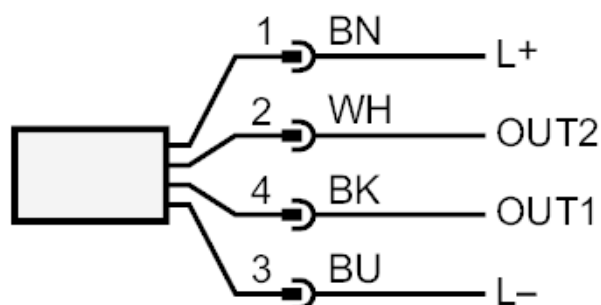


## Magnetic-inductive flow meter

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### Connection



OUT1:

colours to DIN EN 60947-5-2

switching output empty pipe detection

switching output volumetric flow quantity monitoring

frequency output volumetric flow quantity monitoring

Pulse output quantity meter

signal output Preset counter

IO-Link

OUT2:

switching output empty pipe detection

switching output volumetric flow quantity monitoring

switching output Temperature monitoring

analogue output volumetric flow quantity monitoring

analogue output Temperature monitoring

input counter reset

Core colours :

BK = black

BN = brown

BU = blue

WH = white

# SM9601

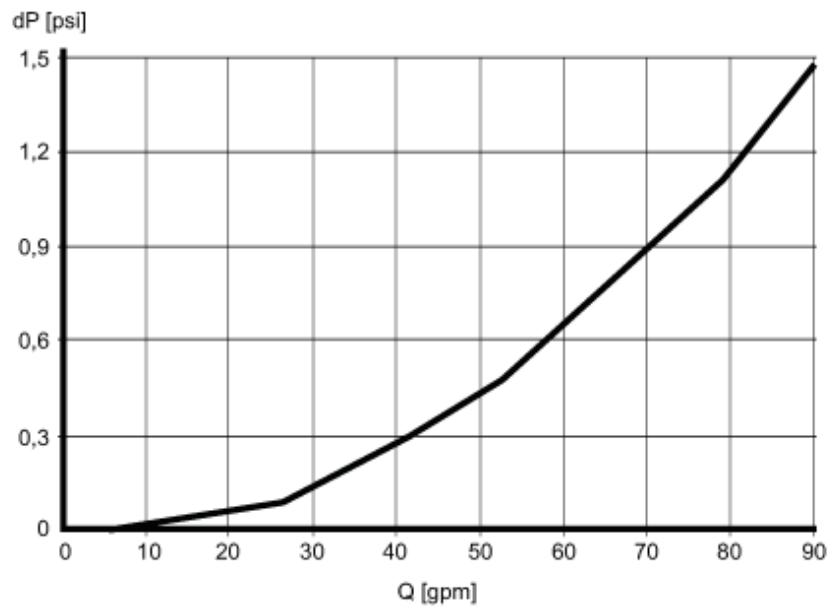
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### Diagrams and graphs

Pressure loss



dP Pressure loss

Q volumetric flow quantity