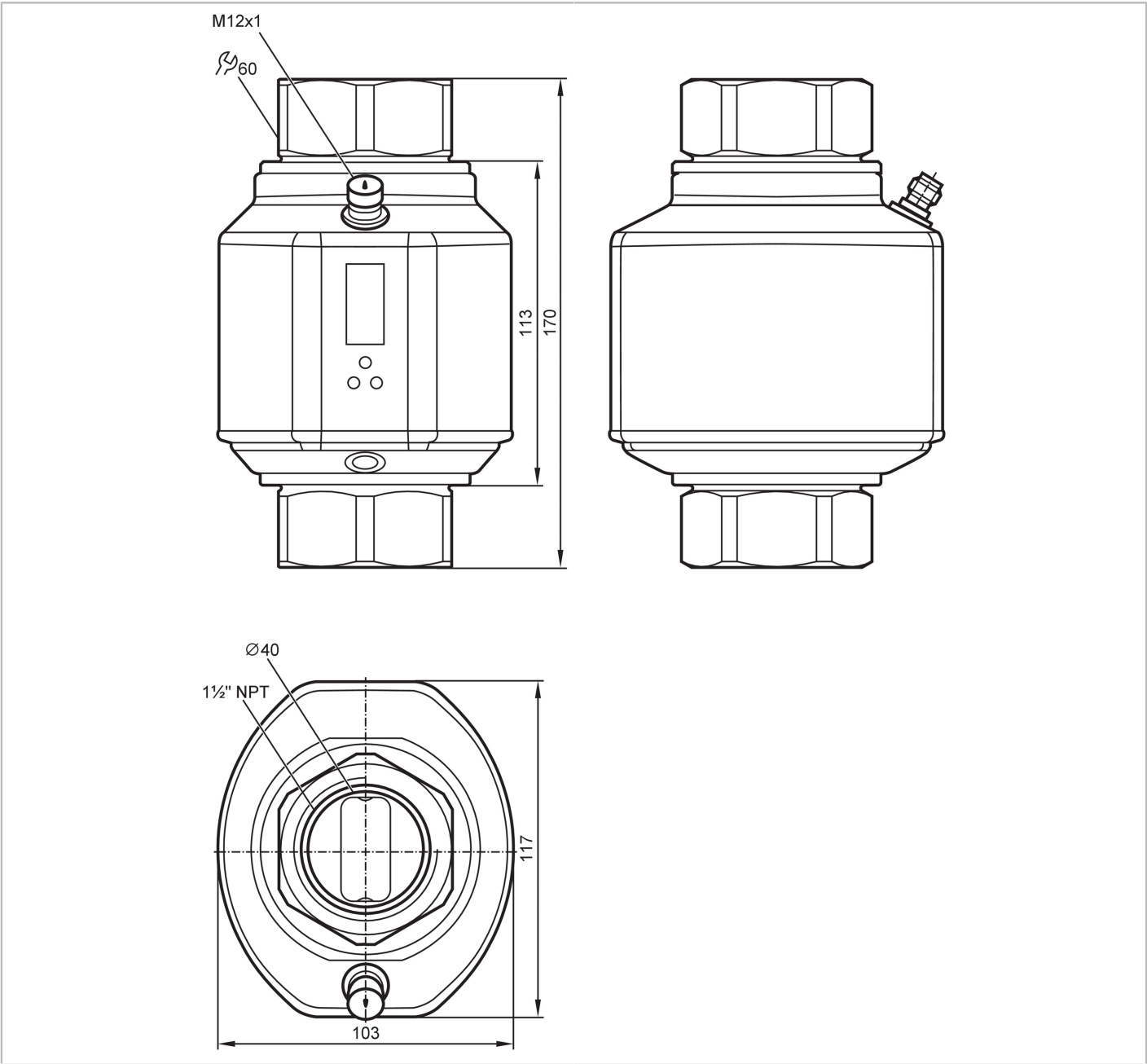


SM9601



Magnetic-inductive flow meter

SMN32XGXFRKG/US-100



CE CRN cUL US LISTED EC 1935/2004 FCM JP IO-Link UK CA

Product characteristics

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

Application

|                 |                                                                       |
|-----------------|-----------------------------------------------------------------------|
| Special feature | gold-plated contacts                                                  |
| Application     | Totalizer function; empty pipe detection; for industrial applications |
| Media           | Conductive liquids; water; water-based media                          |
| Note on media   | conductivity: $\geq 20 \mu\text{S/cm}$                                |
|                 | viscosity: $< 70 \text{ mm}^2/\text{s}$ (40 °C)                       |

# SM9601



## Magnetic-inductive flow meter

SMN32XGXFRKG/US-100

|                                          |         |          |
|------------------------------------------|---------|----------|
| Medium temperature                       | [°F]    | 14...194 |
| Pressure rating                          | 16 bar  | 1.6 MPa  |
| MAWP (for applications according to CRN) | 8.9 bar | 0.89 MPa |

| Electrical data             |      |                            |
|-----------------------------|------|----------------------------|
| Operating voltage           | [V]  | 18...32 DC; (to SELV/PELV) |
| Current consumption         | [mA] | < 150                      |
| 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; frequency signal; IO-Link; (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] | 250; (per output)                                                                        |
| Number of analog outputs                        |      | 1                                                                                        |
| Analog current output                           | [mA] | 4...20; (scalable)                                                                       |
| Max. load                                       | [Ω]  | 500                                                                                      |
| Analog 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                |      | yes (non-latching)                                                                       |
| Overload protection                             |      | yes                                                                                      |
| Frequency of the output                         | [Hz] | 0.1...10000                                                                              |

| 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 |
| Analog start point ASP  | 0...3840 gph     | 0...64 gpm     |
| Analog 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        |



## Magnetic-inductive flow meter

SMN32XGXFRKG/US-100

|                                     |                                                                                                                                                                                                                                                               |                         |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 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                                                                                                                                                                                                                                                      |                         |
| Analog start point [°F]             | -4...140                                                                                                                                                                                                                                                      |                         |
| Analog 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)                                                                                                                                                                                                                                        |                         |
| Reaction times                      |                                                                                                                                                                                                                                                               |                         |
| Flow monitoring                     |                                                                                                                                                                                                                                                               |                         |
| Response time [s]                   | 0.35; (dAP = 0)                                                                                                                                                                                                                                               |                         |
| Delay time programmable dS, dr [s]  | 0...50                                                                                                                                                                                                                                                        |                         |
| Damping process value 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 / closed; switching logic; current/voltage/frequency/pulse output; Start-up delay; display can be deactivated; Display unit; empty pipe detection |                         |
| Interfaces                          |                                                                                                                                                                                                                                                               |                         |
| Communication interface             | IO-Link                                                                                                                                                                                                                                                       |                         |
| Transmission type                   | COM2 (38,4 kBaud)                                                                                                                                                                                                                                             |                         |
| IO-Link revision                    | 1.1                                                                                                                                                                                                                                                           |                         |
| SDCI standard                       | IEC 61131-9 CDV                                                                                                                                                                                                                                               |                         |
| Profiles                            | Smart Sensor - SSP 0                                                                                                                                                                                                                                          | Generic Profiled Sensor |
|                                     | Function                                                                                                                                                                                                                                                      | Device identification   |
|                                     | Function                                                                                                                                                                                                                                                      | Process data variable   |
| SIO mode                            | yes                                                                                                                                                                                                                                                           |                         |
| Required master port class          | A                                                                                                                                                                                                                                                             |                         |

# SM9601



## Magnetic-inductive flow meter

SMN32XGXFRKG/US-100

|                              |                          |                 |
|------------------------------|--------------------------|-----------------|
| Process data analog          | 3                        |                 |
| Process data binary          | 2                        |                 |
| Min. process cycle time [ms] | 5                        |                 |
| Supported DeviceIDs          | <b>Type of operation</b> | <b>DeviceID</b> |
|                              | default                  | 392             |

| 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]                 | 85                                                                                    |                    |
| UL approval                  | UL approval number                                                                    | I008               |
|                              | 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]               | 2776.5                                                                                      |  |
| Housing                  | rectangular                                                                                 |  |
| Inlet pipe length        | 3 x DN                                                                                      |  |
| Outlet pipe length       | 1 x DN                                                                                      |  |
| Dimensions [mm]          | 170 x 103 x 117                                                                             |  |
| Material                 | 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 Internal thread DN40                                         |  |

| Displays / operating elements |                  |                                                                               |
|-------------------------------|------------------|-------------------------------------------------------------------------------|
| Display                       | Display unit     | 6 x LED, green (gpm, gph, gal, °F, 10 <sup>3</sup> , 1000 x 10 <sup>3</sup> ) |
|                               | Switching status | 2 x LED, yellow                                                               |
|                               | Measured values  | alphanumeric display, 4-digit                                                 |
|                               | Programming      | alphanumeric display, 4-digit                                                 |

| Accessories    |       |  |
|----------------|-------|--|
| Items supplied | Label |  |

| 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



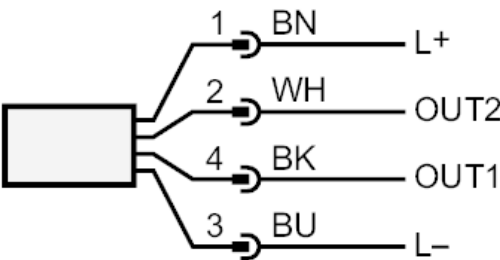
# SM9601



## Magnetic-inductive flow meter

SMN32XGXFRKG/US-100

### Connection



- OUT1:
- Colors 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
  - analog output Volumetric flow quantity monitoring
  - analog output Temperature monitoring
  - Input counter reset
- Core colors :
- BK = black
- BN = brown
- BU = blue
- WH = white

# SM9601

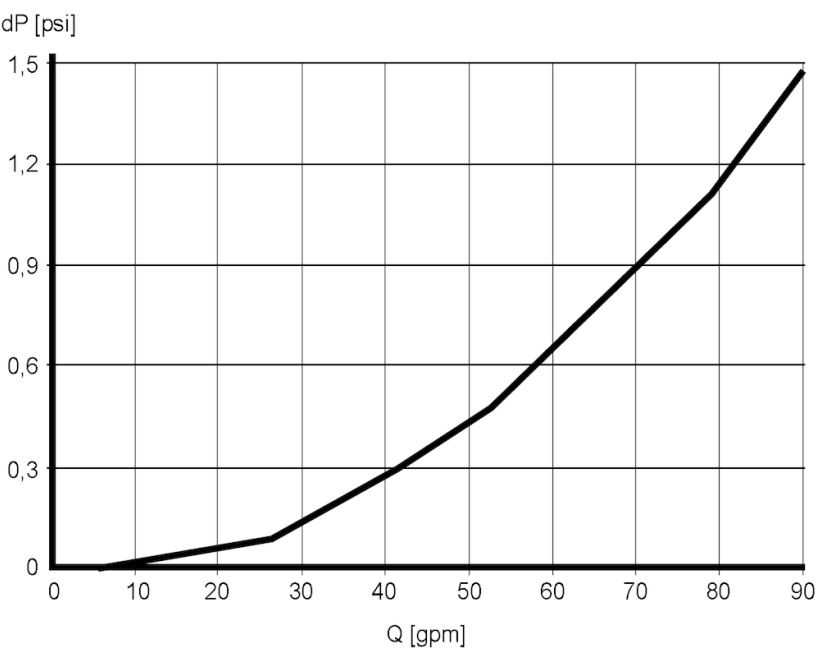


## Magnetic-inductive flow meter

SMN32XGXFRKG/US-100

### Diagrams and graphs

Pressure loss



dP Pressure loss  
Q volumetric flow quantity