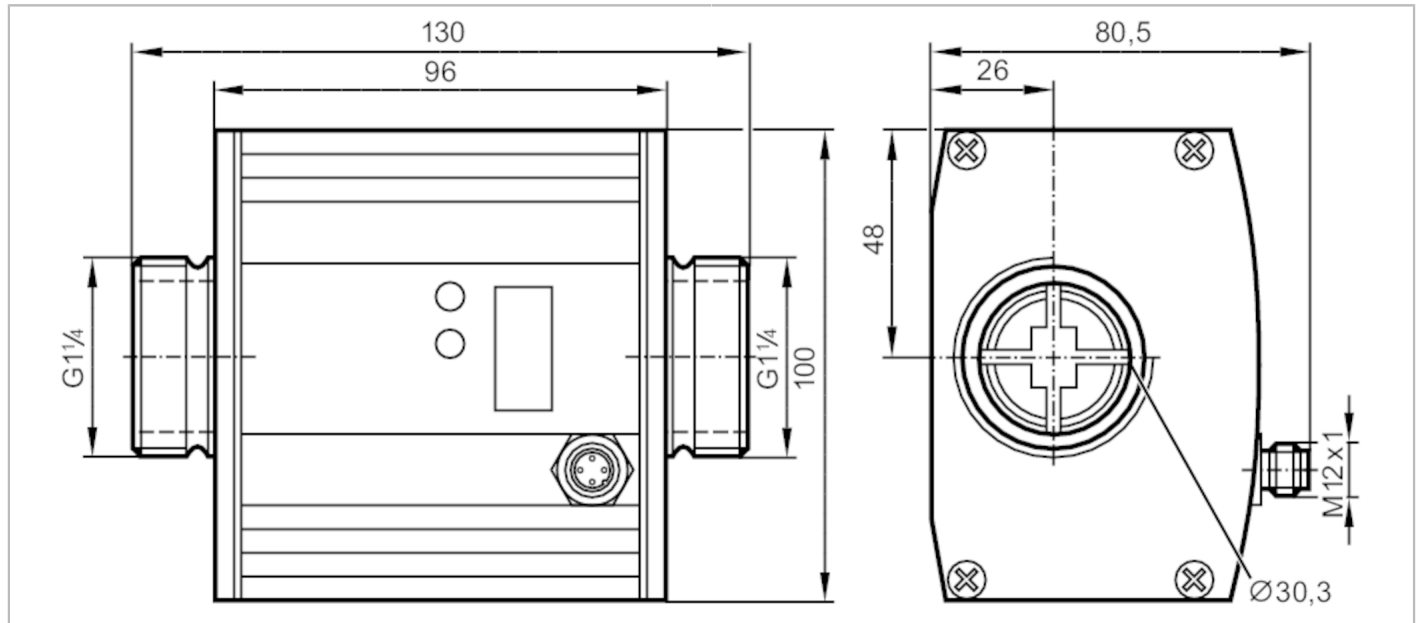


# SU9001

## Ultrasonic flow meter

SUR54HGBFRKG/W/US-100-IPF



### Product characteristics

|                              |                                                           |               |
|------------------------------|-----------------------------------------------------------|---------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analog outputs: 1 |               |
| Measuring range              | 0...3170 gph                                              | 0...52.84 gpm |
| Process connection           | threaded connection G 1 1/4 external thread flat seal     |               |

### Application

|                         |                                                                                                                                                |         |         |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|
| System                  | gold-plated contacts                                                                                                                           |         |         |
| Application             | Totalizer function; for industrial applications                                                                                                |         |         |
| Installation            | connection to pipe by means of an adapter                                                                                                      |         |         |
| Media                   | water; glycol solutions; Coolants; oils                                                                                                        |         |         |
| Note on media           | low-viscosity oils with viscosity: 7...40 mm <sup>2</sup> /s (40 °C)<br>high-viscosity oils with viscosity: 30...68 mm <sup>2</sup> /s (40 °C) |         |         |
| Medium temperature [°F] | 14...176                                                                                                                                       |         |         |
| Pressure rating         | 16 bar                                                                                                                                         | 232 psi | 1.6 MPa |

### Electrical data

|                                 |                            |  |  |
|---------------------------------|----------------------------|--|--|
| Operating voltage [V]           | 19...30 DC; (to SELV/PELV) |  |  |
| Current consumption [mA]        | 100                        |  |  |
| Min. insulation resistance [MΩ] | 100; (500 V DC)            |  |  |
| Protection class                | III                        |  |  |
| Reverse polarity protection     | yes                        |  |  |
| Power-on delay time [s]         | 10                         |  |  |
| Measuring principle             | ultrasonic                 |  |  |

### Inputs / outputs

|                              |                                                           |
|------------------------------|-----------------------------------------------------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analog outputs: 1 |
|------------------------------|-----------------------------------------------------------|

### Inputs

|        |               |
|--------|---------------|
| Inputs | counter reset |
|--------|---------------|



## Ultrasonic flow meter

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| Outputs                                              |                                                               |                   |
|------------------------------------------------------|---------------------------------------------------------------|-------------------|
| Total number of outputs                              | 2                                                             |                   |
| Output signal                                        | switching signal; analog signal; pulse 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] | 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                                                           |                   |
| Measuring/setting range                              |                                                               |                   |
| Measuring range                                      | 0...3170 gph                                                  | 0...52.84 gpm     |
| Display range                                        | 0...3804 gph                                                  | 0...63.4 gpm      |
| Resolution                                           | 1 gph                                                         | 0.02 gpm          |
| Set point SP                                         | 7...3170 gph                                                  | 0.12...52.84 gpm  |
| Reset point rP                                       | 0...3163 gph                                                  | 0...52.72 gpm     |
| Analog start point ASP                               | 0...2547 gph                                                  | 0...42.46 gpm     |
| Analog end point AEP                                 | 621...3170 gph                                                | 10.36...52.84 gpm |
| Max. flow rate                                       | 3804 gph                                                      | 63.4 gpm          |
| In steps of                                          | 1 gph                                                         | 0.02 gpm          |
| Volumetric flow quantity monitoring                  |                                                               |                   |
| Pulse value                                          | 0.02...9000 * 10 <sup>3</sup> gal                             |                   |
| In steps of                                          | 0.02 gal                                                      |                   |
| Pulse length [s]                                     | 0,095...2                                                     |                   |
| Temperature monitoring                               |                                                               |                   |
| Measuring range [°F]                                 | 14...176                                                      |                   |
| Resolution [°F]                                      | 0.5                                                           |                   |
| Set point SP [°F]                                    | 14.5...176                                                    |                   |
| Reset point rP [°F]                                  | 14...175.5                                                    |                   |
| Analog start point [°F]                              | 14...144                                                      |                   |
| Analog end point [°F]                                | 46...176                                                      |                   |
| In steps of [°F]                                     | 0.5                                                           |                   |

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| Accuracy / deviations             |                                                                                       |                                                                                                             |
|-----------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Flow monitoring                   |                                                                                       |                                                                                                             |
| Accuracy (in the measuring range) |                                                                                       | water: < ± (3 % MW + 0,2 % MEW); glycol (35 %), oil (viscosity 68 mm²/s at 40 °C): < ± (8 % MW + 0,5 % MEW) |
| Repeatability                     |                                                                                       | 0,05 gpm; 3 gph                                                                                             |
| Temperature monitoring            |                                                                                       |                                                                                                             |
| Accuracy                          | [K]                                                                                   | ± 5,4 (Q > 0,26 gpm)                                                                                        |
| Reaction times                    |                                                                                       |                                                                                                             |
| Flow monitoring                   |                                                                                       |                                                                                                             |
| Response time                     | [s]                                                                                   | 0.25; (dAP = 0)                                                                                             |
| Delay time programmable dS, dr    | [s]                                                                                   | 0...50                                                                                                      |
| Damping process value dAP         | [s]                                                                                   | 0...1                                                                                                       |
| Temperature monitoring            |                                                                                       |                                                                                                             |
| Dynamic response T05 / T09        | [s]                                                                                   | T09 = 30 (Q > 5 gpm); (water)                                                                               |
| Software / programming            |                                                                                       |                                                                                                             |
| Parameter setting options         | Flow monitoring; quantity meter; Preset counter; Temperature monitoring               |                                                                                                             |
| Operating conditions              |                                                                                       |                                                                                                             |
| Ambient temperature               | [°F]                                                                                  | 14...140                                                                                                    |
| Storage temperature               | [°F]                                                                                  | -13...176                                                                                                   |
| Protection                        |                                                                                       | IP 67                                                                                                       |
| Tests / approvals                 |                                                                                       |                                                                                                             |
| EMC                               | EN 61000-4-2 ESD                                                                      | 4 kV CD / 8 kV AD                                                                                           |
|                                   | EN 61000-4-3 HF radiated                                                              | 10 V/m                                                                                                      |
|                                   | EN 61000-4-4 Burst                                                                    | 2 kV                                                                                                        |
|                                   | EN 61000-4-5 Surge                                                                    | 0,5 kV                                                                                                      |
|                                   | EN 61000-4-6 HF conducted                                                             | 10 V                                                                                                        |
| 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]                                                                               | 185                                                                                                         |
| Pressure equipment directive      | sound engineering practice; can be used for group 2 fluids; group 1 fluids on request |                                                                                                             |
| Mechanical data                   |                                                                                       |                                                                                                             |
| Weight                            | [g]                                                                                   | 1859                                                                                                        |
| Housing                           | rectangular                                                                           |                                                                                                             |
| Dimensions                        | [mm]                                                                                  | 130 x 100 x 80.5                                                                                            |
| Material                          | housing: AlMgSi0.5 anodized; sealing: FKM; PA 6.6; cover film: PA                     |                                                                                                             |
| Materials (wetted parts)          | stainless steel (1.4404 / 316L); FKM; PPS; Centellen 200                              |                                                                                                             |
| Process connection                | threaded connection G 1 1/4 external thread flat seal                                 |                                                                                                             |
| Displays / operating elements     |                                                                                       |                                                                                                             |
| Display                           | Display unit                                                                          | 5 x LED, green (gpm, gph, gal, °F, 10³)                                                                     |
|                                   | Switching status                                                                      | 2 x LED, yellow                                                                                             |
|                                   | Measured values                                                                       | alphanumeric display, 4-digit                                                                               |
|                                   | Programming                                                                           | alphanumeric display, 4-digit                                                                               |

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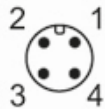
## Ultrasonic flow meter

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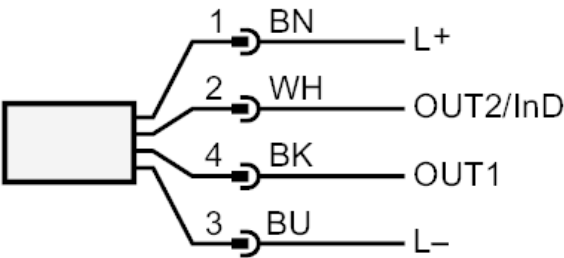
| Accessories            |                                                       |
|------------------------|-------------------------------------------------------|
| Items supplied         | sealings: 2, Centellen                                |
| Accessories (optional) | adapter for pipe: 1 x 1" NPT, stainless steel, E40206 |
| Remarks                |                                                       |
| Remarks                | sealing: only with supplied Centellen seals           |
|                        | MW = Measured value                                   |
|                        | MEW = Final value of the measuring range              |
| Pack quantity          | 1 pcs.                                                |

### Electrical connection

Connector: 1 x M12; coding: A; Moulded body: brass, Optalloy-plated; Contacts: gold-plated



### Connection



|           |                                                                                                                                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OUT1:     | Switching output Volumetric flow quantity monitoring<br>Pulse output quantity meter<br>signal output Preset counter                                                                |
| OUT2/InD: | Switching output Volumetric flow quantity monitoring / Temperature monitoring<br>analog output Volumetric flow quantity monitoring / Temperature monitoring<br>Input counter reset |

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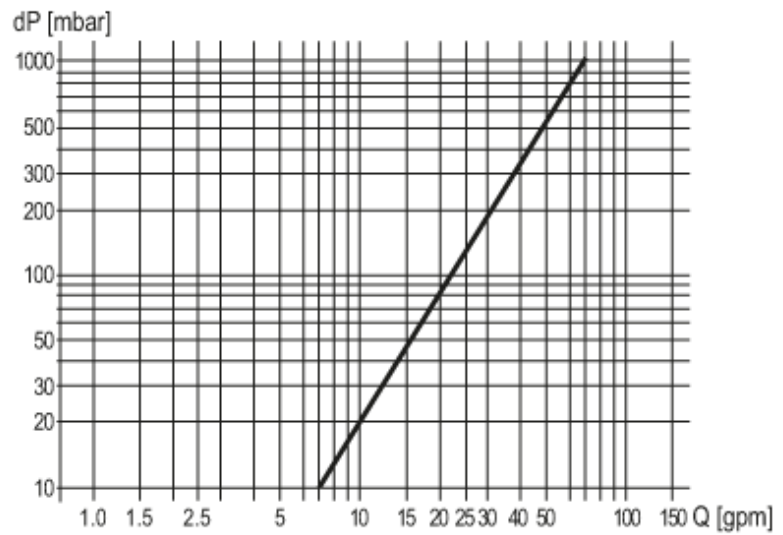
## Ultrasonic flow meter

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### Diagrams and graphs

Pressure loss



dP Pressure loss

Q volumetric flow quantity