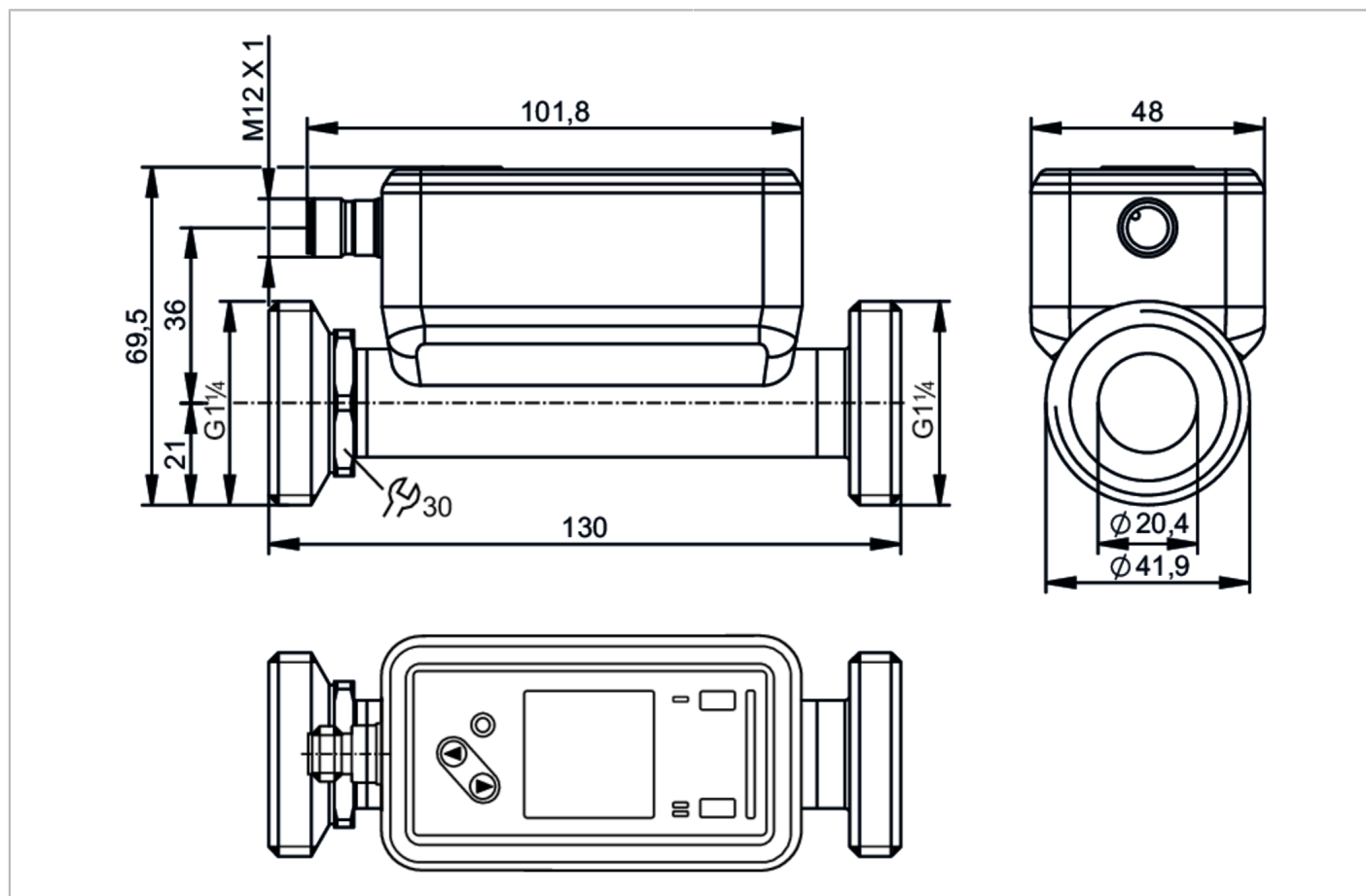


# SU9021

## Ultrasonic flow meter

SUR54XXBFRKG/US



ACS CE PA cUL US LISTED IO-Link KTW/W270 NSF Reg31

| Product characteristics     |                                                                                                  |                            |               |                  |
|-----------------------------|--------------------------------------------------------------------------------------------------|----------------------------|---------------|------------------|
| Measuring range             | 1...275 l/min                                                                                    | 0.06...16.5 m³/h           | 16...4359 gph | 0.26...72.64 gpm |
| Process connection          | threaded connection G 1 1/4 external thread DN32                                                 |                            |               |                  |
| Application                 |                                                                                                  |                            |               |                  |
| System                      | gold-plated contacts                                                                             |                            |               |                  |
| Media                       | ultra-pure water; water; water-based media                                                       |                            |               |                  |
| Note on media               | water-based media: for media with >10 % additives, the repeatability is the only available value |                            |               |                  |
| Medium temperature          | -20...100 °C                                                                                     |                            | -4...212 °F   |                  |
| Min. bursting pressure      | 150 bar                                                                                          |                            | 15 MPa        |                  |
| Pressure rating             | 100 bar                                                                                          |                            | 10 MPa        |                  |
| Vacuum resistance           | [mbar]                                                                                           | -1000                      |               |                  |
| Electrical data             |                                                                                                  |                            |               |                  |
| Operating voltage           | [V]                                                                                              | 18...32 DC; (to SELV/PELV) |               |                  |
| Current consumption         | [mA]                                                                                             | < 75                       |               |                  |
| Protection class            |                                                                                                  | III                        |               |                  |
| Reverse polarity protection |                                                                                                  | yes                        |               |                  |
| Power-on delay time         | [s]                                                                                              | 5                          |               |                  |
| Measuring principle         |                                                                                                  | ultrasonic                 |               |                  |



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| Inputs                                          |      |                                                                                                                            |                     |                  |                    |
|-------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------|---------------------|------------------|--------------------|
| Inputs                                          |      | counter reset                                                                                                              |                     |                  |                    |
| Outputs                                         |      |                                                                                                                            |                     |                  |                    |
| Total number of outputs                         |      | 2                                                                                                                          |                     |                  |                    |
| Output signal                                   |      | switching signal; pulse signal; analog signal; IO-Link;<br>frequency signal; diagnostic signal; totalizer switching signal |                     |                  |                    |
| Electrical design                               |      | PNP/NPN                                                                                                                    |                     |                  |                    |
| Output function                                 |      | normally open / closed; (configurable)                                                                                     |                     |                  |                    |
| Max. voltage drop switching output DC           | [V]  | 2                                                                                                                          |                     |                  |                    |
| Permanent current rating of switching output DC | [mA] | 100                                                                                                                        |                     |                  |                    |
| Switching frequency DC                          | [Hz] | 0...10000                                                                                                                  |                     |                  |                    |
| Analog current output                           | [mA] | 4...20                                                                                                                     |                     |                  |                    |
| 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                                 |      | 1...275 l/min                                                                                                              | 0.06...16.5 m³/h    | 16...4359 gph    | 0.26...72.64 gpm   |
| Display range                                   |      | -330...330 l/min                                                                                                           | -19.8...19.8 m³/h   | -5231...5231 gph | -87.18...87.18 gpm |
| Resolution                                      |      | 0.1 l/min                                                                                                                  | 0.001 m³/h          | 1 gph            | 0.01 gpm           |
| Set point SP                                    |      | 2.5...275 l/min                                                                                                            | 0.151...16.5 m³/h   | 40...4359 gph    | 0.66...72.65 gpm   |
| Reset point rP                                  |      | 1.1...273.6 l/min                                                                                                          | 0.065...16.414 m³/h | 17...4336 gph    | 0.29...72.27 gpm   |
| Analog start point ASP                          |      | -275...220 l/min                                                                                                           | -16.5...13.2 m³/h   | -4359...3487 gph | -72.65...58.12 gpm |
| Analog end point AEP                            |      | -220...275 l/min                                                                                                           | -13.2...16.5 m³/h   | -3487...4359 gph | -58.12...72.65 gpm |
| Low flow cut-off LFC                            |      | 1...13.8 l/min                                                                                                             | 0.06...0.825 m³/h   | 16...218 gph     | 0.26...3.63 gpm    |
| Frequency end point, FEP                        |      | 55.2...275 l/min                                                                                                           | 3.31...16.5 m³/h    | 874...4359 gph   | 14.75...72.65 gpm  |
| Frequency at the end point FRP                  | [Hz] | 1...10000                                                                                                                  |                     |                  |                    |
| Volumetric flow quantity monitoring             |      |                                                                                                                            |                     |                  |                    |
| Pulse length                                    | [s]  | 0.002...2                                                                                                                  |                     |                  |                    |
| Pulse value                                     |      | 0.02...99990000 l; 0.026...26414563.515 gal                                                                                |                     |                  |                    |
| Temperature monitoring                          |      |                                                                                                                            |                     |                  |                    |
| Measuring range                                 |      | -20...100 °C                                                                                                               |                     | -4...212 °F      |                    |
| Display range                                   |      | -44...124 °C                                                                                                               |                     | -47.2...255.2 °F |                    |
| Resolution                                      |      | 0.1 °C                                                                                                                     |                     | 0.1 °F           |                    |
| Set point SP                                    |      | -19.6...100 °C                                                                                                             |                     | -3.2...212 °F    |                    |
| Reset point rP                                  |      | -20...99.6 °C                                                                                                              |                     | -4...211.2 °F    |                    |
| Analog start point                              |      | -20...76 °C                                                                                                                |                     | -4...168.8 °F    |                    |
| Analog end point                                |      | 4...100 °C                                                                                                                 |                     | 39.2...212 °F    |                    |
| Frequency start point, FSP                      |      | -20...76 °C                                                                                                                |                     | 4...168.8 °F     |                    |
| Frequency end point, FEP                        |      | 4...100 °C                                                                                                                 |                     | 39.2...212 °F    |                    |
| Frequency at the end point FRP                  | [Hz] | 1...10000                                                                                                                  |                     |                  |                    |



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| Accuracy / deviations                          |                          |                                                |
|------------------------------------------------|--------------------------|------------------------------------------------|
| Flow monitoring                                |                          |                                                |
| Accuracy (in the measuring range)              |                          | $\pm (1,0 \% \text{ MW} + 0,5 \% \text{ MEW})$ |
| Repeatability                                  |                          | $\pm 0,2 \% \text{ MEW}$                       |
| Temperature monitoring                         |                          |                                                |
| Accuracy [K]                                   |                          | $\pm 2,5 (Q > 5 \% \text{ MEW})$               |
| Temperature coefficient [% of the span / 10 K] |                          | 0,2                                            |
| Reaction times                                 |                          |                                                |
| Flow monitoring                                |                          |                                                |
| Response time [s]                              |                          | $< 0.25; (dAP = 0, T09)$                       |
| Damping process value dAP [s]                  |                          | 0...5                                          |
| Temperature monitoring                         |                          |                                                |
| Dynamic response T05 / T09 [s]                 |                          | 5,7 / 86                                       |
| Software / programming                         |                          |                                                |
| Diagnostic functions                           |                          | direction of flow detection; signal quality    |
| Interfaces                                     |                          |                                                |
| Communication interface                        |                          | IO-Link                                        |
| Transmission type                              |                          | COM2 (38,4 kBaud)                              |
| IO-Link revision                               |                          | 1.1.3                                          |
| SDCI standard                                  |                          | IEC 61131-9: 2013-07                           |
| Profiles                                       | <b>Function class</b>    | <b>Description</b>                             |
|                                                | 0x4000                   | Identification and Diagnosis                   |
| Required master port class                     |                          | A                                              |
| Process data analog                            |                          | 3                                              |
| Process data binary                            |                          | 2                                              |
| Min. process cycle time [ms]                   |                          | 9.6                                            |
| IO-Link process data (cyclical)                | <b>Function</b>          | <b>bit length</b>                              |
|                                                | totalizer                | 32                                             |
|                                                | Flow monitoring          | 32                                             |
|                                                | Temperature monitoring   | 32                                             |
|                                                | status                   | 4                                              |
|                                                | Output 1                 | 1                                              |
|                                                | Output 2                 | 1                                              |
| Supported DeviceIDs                            | <b>Type of operation</b> | <b>DeviceID</b>                                |
|                                                | default                  | 1638                                           |
| Operating conditions                           |                          |                                                |
| Ambient temperature [°C]                       |                          | -20...60                                       |
| Storage temperature [°C]                       |                          | -25...80                                       |
| Protection                                     |                          | IP 67                                          |
| Tests / approvals                              |                          |                                                |
| EMC                                            | DIN 61326-1:2021         |                                                |
| CPA approval                                   | model number             | 003US                                          |
|                                                | accuracy class           | 1,5                                            |

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|                              |                                                           |                   |
|------------------------------|-----------------------------------------------------------|-------------------|
| Shock resistance             | DIN IEC 68-2-27                                           | 20 g (11ms)       |
| Vibration resistance         | DIN IEC 68-2-6                                            | 5 g (10...2000Hz) |
| MTTF [years]                 |                                                           | 160               |
| UL approval                  | UL approval number                                        | I034              |
| Pressure equipment directive | can be used for group 2 fluids; group 1 fluids on request |                   |

### Mechanical data

|                                                   |                                                                                              |
|---------------------------------------------------|----------------------------------------------------------------------------------------------|
| Weight [g]                                        | 620.4                                                                                        |
| Housing                                           | rectangular                                                                                  |
| Type of mounting                                  | inlet pipe length 5xDN; outlet pipe length 1xDN                                              |
| Dimensions [mm]                                   | 130 x 48 x 69.5                                                                              |
| Material                                          | housing: stainless steel (1.4404 / 316L); Display: PFA; sealing Display: FKM; connector: PBT |
| Materials (wetted parts)                          | Pipe section: stainless steel (1.4404 / 316L); Process connection sealing: Centellen Gasket  |
| Process connection                                | threaded connection G 1 1/4 external thread DN32                                             |
| Surface characteristics Ra/Rz of the wetted parts | 1.25 µm                                                                                      |

### Displays / operating elements

|         |                    |                                       |
|---------|--------------------|---------------------------------------|
| Display |                    | Color display 1,44", 128 x 128 pixels |
|         | Switching function | 2 x LED, yellow                       |
|         | diagnosis          | 1 x LED, three-color                  |

### Accessories

|                |                     |
|----------------|---------------------|
| Items supplied | Gasket 2, Centellen |
|                | package insert      |

### Remarks

|               |                                                                          |
|---------------|--------------------------------------------------------------------------|
| Remarks       | MW = Measured value                                                      |
|               | MEW = Final value of the measuring range                                 |
|               | pulse and totalizer signal are only available for one of the two outputs |
|               | the accuracy indications are adhered to over the entire application area |
| Pack quantity | 1 pcs.                                                                   |

### Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated





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Connection



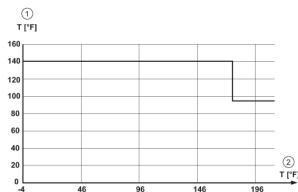
- OUT1/IO-Link:
- Switching output Volumetric flow quantity monitoring  
Switching output Temperature monitoring  
Pulse output quantity meter  
Frequency output Volumetric flow quantity monitoring  
Frequency output Temperature monitoring  
Diagnostic output direction of flow detection  
Diagnostic output signal quality  
signal output Preset counter
- OUT2/InD:
- Switching output Volumetric flow quantity monitoring  
Switching output Temperature monitoring  
Pulse output quantity meter  
analog output flow  
analog output temperature  
Diagnostic output direction of flow detection  
Diagnostic output signal quality  
signal output Preset counter  
Input counter reset

Colors to DIN EN 60947-5-2

|             |           |
|-------------|-----------|
| Core colors | BK= black |
|             | BN= brown |
|             | BU= blue  |
|             | WH= white |

Diagrams and graphs

derating ambient temperature



- 1 Ambient temperature
- 2 Medium temperature

Druckverlustkurve

