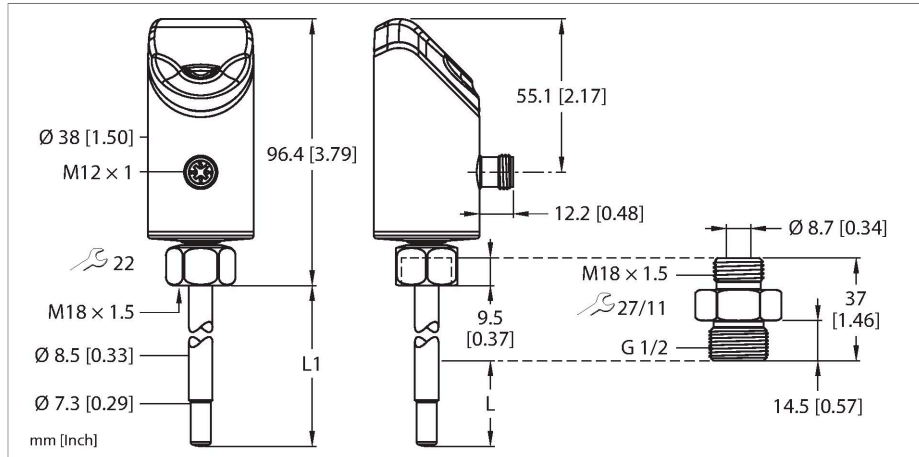


FS100-300L-60-2UPN8-H1141

Flow Sensor



Technical data

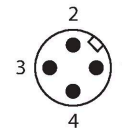
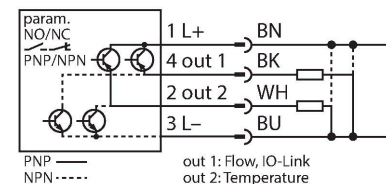
| | |
|-----------------------------|---|
| Type | FS100-300L-60-2UPN8-H1141 |
| ID | 100028425 |
| Medium temperature | -25...+85 °C |
| Application area | |
| Mounting | Immersion sensor |
| Application area | liquids |
| Bar length (L1) | 70 mm |
| Immersion depth (L) | 41.9 mm, When using the supplied adapter |
| Process Pressure | 300 bar |
| Flow Monitoring | |
| Standard flow range | 3...300 cm/s |
| | Any axial alignment of the sensor rod in the medium |
| Extended flow range | 1...300 cm/s |
| Extended flow range comment | Directed inflow to punch mark ±20 ° |
| Switching point accuracy | 1...30 cm/s; for water 3...300 cm/s |
| Reproducibility | 0.2...5 cm/s ; for water 3...100 cm/s; 10...80 °C |
| Response time T09 | 6 s |
| Response time T05 | 3 s |
| Temperature drift | 0.5 cm/s × 1/K |
| Temperature gradient | ≤ 300 K/min |
| Hysteresis | 3 ... 25 % of the switching point |

Features

- Screw-in adapter with process connection G1/2 inch male thread included in delivery
- Electronics housing material/contact with medium 1.4404 (316L)/1.4571 (316Ti)
- Immersion depth 41.9 mm
- Process value display with bar graph
- Flow monitoring for liquid media
- Protection classes IP66, IP67 and IP69K
- Adjustment of flow speed via teach function
- 10...33 VDC
- NO/NC contact, PNP/NPN output, IO-Link
- Connector, M12 × 1



Wiring diagram



Functional principle

The flow sensor functions according to the calorimetric principle. The distinctive feature of this principle is that the flow rate correlates directly to the thermal loss of energy in the probe. The increased loss of energy is

Technical data

therefore a direct measure of an increased flow rate.

| Temperature monitoring | |
|---|---|
| Measuring range | -25...85 °C |
| Switching point accuracy | ± 2 K; for water >3 cm/s |
| Reproducibility | ≤ 0.5 K |
| Resolution | 0.5 K |
| Response time T09 | 12 s |
| Response time T05 | 3 s |
| Electrical data | |
| Operating voltage U _b | 10...33 VDC |
| Short-circuit/reverse polarity protection | yes, cyclic / yes (voltage supply) |
| Power consumption | ≤ 1.6 W, Typ. 1.3 W |
| Voltage drop | ≤ 1.8 VDC |
| Continuous current carrying capacity of the DC switching output | 250 mA |
| Overload protection | Yes |
| Insulation class | III |
| Standby delay time | 18...30 s |
| Outputs | |
| Output 1 | Flow: Switching output or IO-Link |
| Output 2 | Temperature: Switching output |
| Communication protocol | IO-Link |
| Output function | NO/NC programmable, PNP/NPN |
| IO-Link | |
| IO-Link specification | V 1.1 |
| IO-Link port type | Class A |
| Transmission physics | COM 2 (38.4 kBaud) |
| Frame type | 2.2 |
| Included in the SIDI GSDML | Yes |
| Programming | |
| Programming options | Automatic switching logic recognition, easy switching point adjustment via touchpads |
| Mechanical data | |
| Housing material | Stainless-steel/Plastic, 1.4404 (AISI 316L)/Grilamid TR90 UV/Elastollan C 65 A 15 HPM 000/Ultramid A3X2G5 |
| Adapter material | Stainless steel 1.4571 (316Ti) |
| Materials (contact with media) | Stainless steel 1.4571 (AISI 316Ti), FKM O-ring, AFM flat seal |
| Process connection | G 1/2" male thread |

Technical data

| | |
|-------------------------------------|---|
| Process connection sensor | M18 x 1.5 female thread |
| Process connection adapter | M18 x 1.5 male thread; G 1/2" male thread |
| Electrical connection | Connector, M12 x 1 |
| Protection class | IP66 IP67 IP69K |
| Electromagnetic compatibility (EMC) | DIN EN 60947-5-9: 2007 |
| Environmental conditions | |
| Ambient temperature | -40...+80 °C (UL: -25...+80 °C) |
| Storage temperature | -40...+80 °C |
| Shock resistance | 50 g (11 ms) EN 60068-2-27 |
| Vibration resistance | 20 g (55...2000 Hz) DIN EN 60068-2-6 |
| Tests/approvals | |
| Approvals | CE cULus |
| UL registration number | E516036 |
| Display | LED display functions for status of supply voltage, switching states and teach processes. Process indicators via bar graph. |
| MTTF | 120 years acc. to SN 29500 (Ed. 99) 40 °C |

Mounting instructions

Product features



Inclined display

The user interface is tilted by 45°, offering a high level of comfort when operating and reading values.

FLOW and TEMP LEDs

Two LED displays which are visible from almost all directions indicate the status of the outputs and the active teach mode.

Status LEDs

Additional LED displays provide information about the status of the power supply, faults and the locking function and—if available—IO-Link communication.

Process value display

The generous 11-segment bicolor LED bar displays either the flow or temperature values in an easy-to-read manner.

Label

The translucent front cap and the metal housing are scratch-resistant and are inscribed in a contrasting color using a laser.

MODE, ENTER and SET

Touch pads allow menus to be navigated reliably — without wear and tear and with no need for additional sealing.

Alignment

The sensor head can be freely rotated within a range of 340°, simplifying the alignment of the electrical connection and user interface following installation.

Translucent front cap

The front cap is made from scratch-resistant, temperature-resistant, translucent plastic.

Modular Concept

The portfolio exhibits a variable and modular mechanical concept. The neutral M18 coupling nut on the sensor and the various screw-in adapters allow a variable process connection based on the usage requirements. Fast and flexible thanks to using neutral stock and spare parts as required.

Temperature measurement

Based on the calorimetric principle, the sensor also offers the option, in addition to monitoring the flow rate, of measuring the medium temperature. If in addition to the flow rate the medium temperature is also important, both process variables can be determined and evaluated independently of each other.

DeltaFlow

The implemented DeltaFlow monitoring supports error-free teaching by only enabling all teach processes once the flow rate to be monitored has settled at a constant level.

Auto Detection PNP/NPN

The automatic setting of the sensor output signal supports error-free configuration of the sensor on connection to the remote IO environment. The sensor automatically activates the output type that corresponds to the signal type of the input card connected. This function is activated by default and can also be configured specifically as required.

Programmable NO/NC

The switching outputs can optionally be used as normally open or normally closed. If the sensors have more than one switching output, these can be configured differently. Each switching output is configured as normally open by default.

Back to pre- and factory settings

Both Back to functions offer the option of resetting the current settings. Back to Pre-Settings replaces the current settings with the previous settings. Back to Factory Settings resets the sensor to the factory settings.

Lock function (Loc/unLoc)

The touch buttons can be locked/unlocked. When the key lock is activated, a teach-in process cannot be initiated. This prevents parameters from being modified accidentally, for example.

Teach functions (Quick and MAX/MIN)

Quick Teach allows quick teaching in of the switchpoint without teaching in a separate MAX/MIN range. With MAX/MIN Teach on the other hand, the flow range to be monitored is scaled to two limit values to be taught and the switchpoint is set within these two limits. Sensors with a switching output have both modes, whereas sensors without a switching output only have MAX/MIN Teach.

LED display

| LED | Color | Status | Description |
|------|--------|----------|---|
| PWR | Green | On | Operating voltage applied Device is operational |
| | | Flashing | Operating voltage applied IO-Link communication active (inverted flash with T on 900 ms and T off 100 ms) |
| FLT | Red | On | Error displayed (for error pattern in combination with LEDs see manual) |
| | | Off | No errors displayed |
| LOC | Yellow | On | Device locked |
| | | Off | Device unlocked |
| | | Flashing | Locking/unlocking process active |
| FLOW | Yellow | On | NO: Flow switchpoint exceeded (output "high") NC: Flow below minimum switchpoint (output "high") |
| | | Off | NO: Flow below minimum switchpoint (output "low") NC: Flow switchpoint exceeded (output "low") |
| | | Flashing | Teach mode/display of diagnostic data (see manual for specification) |
| TEMP | Yellow | On | NO: Temperature switchpoint exceeded (output "high") NC: Temperature below minimum switchpoint (output "high") |
| | | Off | NO: Temperature below minimum switchpoint (output "low") NC: Temperature switchpoint exceeded (output "low") |
| | | Flashing | Teach mode/display of diagnostic data (see manual for specification) |

For detailed description of the display patterns and flashing codes, see manual D100002084

IO-Link process data image

| | | | | | | | | | | | | | | | | |
|----------|-----------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------|--------------------|
| Bit | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Byte n | 14 Bit Process Value (TEMP) | | | | | | | | | | | | | | State Out 2 (TEMP) | State Out 1 (FLOW) |
| Bit | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 |
| Byte n+1 | 16 Bit Process Value (FLOW) | | | | | | | | | | | | | | | |