TURCK

Your Global Automation Partner

FS+
Compact Flow Sensors

FS+ Compact Flow Sensors with IO-Link

Reliable flow monitoring

The compact flow sensors of the FS+ series enable reliable and repeatable monitoring of liquid media. The sensors can be used in almost all industrial applications thanks to the modular mechanical concept. For the desired process connection a wide range of different process adapters are available.

Standard applications

Flow sensors are typically used for monitoring purposes in the following application areas:

- Cooling circuits in welding applications
- Dry-run protection of pumps
- Cleaning process sequences

Reducing downtime

Flow sensors are used primarily to increase plant availability and to reduce downtime. In addition, the sensors make the engineering process smoother with many different connection options for integrating them into both new and existing systems, as well as simple and intuitive commissioning.

Product features

The FS+ compact flow sensors offer maximum protection even in harsh industrial environments. The extremely robust design includes a stainless steel housing and a one-piece cover. Since there are no mechanical moving parts, the sensors are much less susceptible to wear. The enclosure is made from materials that are resistant to both UV radiation and salt spray. Combined with the reduced number of sealing surfaces, this design ensures that the inside of the device is kept completely free from moisture and dust, even when used outdoors. The new sealing concepts meet the standards of the protection classes IP66, IP67 and IP69K.

By using the Quick Teach function directly on the sensor, the flow switching point can be set quickly and safely in just a few steps. The 4-digit alphanumeric display shows either the process value of flow or the media temperature. Each switching point can be displayed in a different color.

The sensor automatically becomes locked if it has not been used for five minutes. The sensor can also be locked manually at any time to prevent any operator errors.

Flow and temperature

Since the sensors monitor the media temperature as well as the flow velocity, they can be used in a much larger range of applications. For example, it is possible to use the temperature values in addition to the flow values as part of preventive maintenance to anticipate potential issues.

Advanced functions

By using the advanced features, users can reset the sensor to its previous settings (undo function) and to its factory settings. The switching behavior of the outputs can be set to either "normally open" (NO) or "normally closed" (NC). Using additional hysteresis and filter functions the sensor can be configured with the optimal set-up even for complex applications.

Modular concept
The modular mechanical concept allows for a wide range of flow sensors. The neutral M18 × 1 coupling nut allows different process connections to be connected to the respective application. Well-planned warehouse management ensures the shortest possible delivery times.

Automatic detection
The output of the sensor is automatically set depending on the connected I/O, simplifying the configuration process and eliminating potential errors. This saves users both time and money.

Simplified mounting and start-up

The FS+ product series offers a variety of helpful features that make installation, connection and start-up as efficient and simple as possible.

The innovative Delta Flow monitoring ensures systematic safety when programming the sensor

The user can adjust the switch point conveniently and quickly using the Quick Teach function

Since the sensor housing can be freely rotated by 340°, the display and the electrical connection can be easily adjusted after the sensor has been installed

Output signals are automatically detected making it easy to connect the device to the controller environment

The modular mechanical concept with a large range of adapters allows flexible adaptation to almost any process

The sensor operates within the specified parameters, regardless of how the probe tip is orientated in the medium

Since the sensor also measures the media temperature, fewer components are required for a single application

DESIGN AWARD 2019

Delta Flow monitoring
All teach functions are only enabled once there is a constant flow. This way, accidental or systematic errors are substantially reduced.

Sensor adjustment
The sensor operates within the standard flow range, regardless of how the probe is oriented, thus reliably preventing sensor signals from being misinterpreted.

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

Process value display
The large bi-color alphanumeric display clearly shows either flow or temperature values

Label
The translucent front cap and the metal housing are scratch-resistant and high-contrast laser inscribed

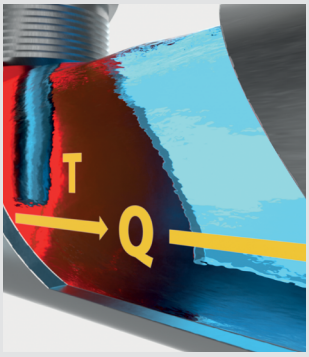
Inclined display
The user interface is inclined by 45°, offering a high level of visibility when setting and reading values

Status LED
Additional LEDs provide information about the status of the power supply, faults and the locking function and – if available – IO-Link communication

Translucent front cap
The cap is made of scratch-resistant, temperature-resistant and translucent plastic. It is an essential component of the high protection class

MODE, ENTER and SET
The three touch pads allow users to navigate the menu wear-free and safe

IO-Link



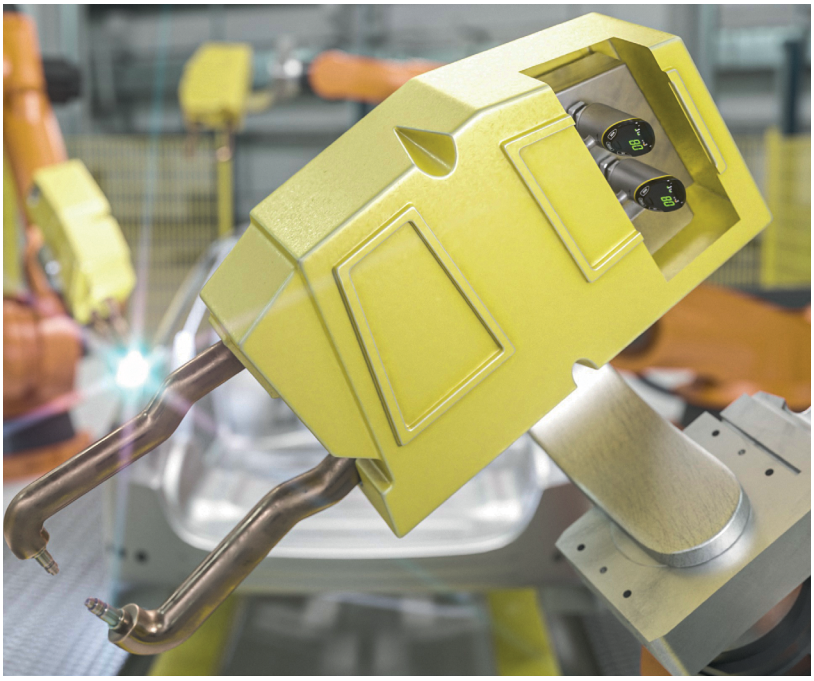
Temperature measurement
The calorimetric principle allows the permanent measurement of the media temperature in addition to the flow. The user thus receives valuable additional information. A separate device is no longer required to measure the temperature.

Quick Teach
The Quick Teach function offers a fast, easy and convenient way of setting the desired teach point. The actual flow is monitored for potential deviations from a freely definable reference flow.

Typical Applications

Monitoring the supply of cleaning agents to drum washers

An FS+ is used in every circuit to ensure that washing drums are continuously supplied with water and cleaning agents. The latest generation of flow sensors reliably monitors the flow of media and raises an alarm as soon as the flow exceeds or undershoots the pre-set monitoring range. The FS+ is highly impermeable and resistant to chemicals, making it well-suited for withstanding the harsh environmental conditions of this application.



Monitoring the cooling circuit on welding clamps

For precise and safe welding of high quality, a functioning cooling circuit is crucial. The FS+ flow sensor not only monitors the permanent flow of the coolant, but can also detect any impending overheating of the cooling circuit at an early stage thanks to the adjustable temperature switching point alerting the user.

Types and Features

Product highlights

- Modular mechanical concept
- Automatic signal detection
- Delta Flow monitoring
- Variable sensor orientation
- Measurement of media temperature
- Quick Teach option
- Innovative operating concept
- High protection classes IP66, IP67 and IP69K
- IO-Link 1.1

Award-winning industrial design

The design of the FS+ flow sensors has been awarded the iF DESIGN AWARD for the "Industry/Tools" category. The prize has been awarded annually since 1954 for outstanding achievements in product design. The jury was particularly convinced by the cross-platform, innovative operating concept.

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IO-Link

FS121 processing unit

ID	Type designation*	Operating voltage	Output function	Communication	Electrical connection
100047864	FS121-2UPN8-H1141	24 VDC	PNP/NPN (NO/NC)	IO-Link	M12 × 1, 4-pin

*Compatible with the flow sensors of the FCS, FP100 (immersion sensors) and FCI (inline sensors) series

FS101 compact flow sensors

ID	Type designation*	Process connection	Immersion length [mm]	Operating voltage	Output function	Communication	Electrical connection
100030866	FS101-300L-04-2UPN8-H1141	G1/4	16.9	24 VDC	PNP/NPN (NO/NC)	IO-Link	M12 × 1, 4-pin
100030867	FS101-300L-30-2UPN8-H1141	G1/2	16.9	24 VDC	PNP/NPN (NO/NC)	IO-Link	M12 × 1, 4-pin
100030869	FS101-300L-16-2UPN8-H1141	N1/2	16.9	24 VDC	PNP/NPN (NO/NC)	IO-Link	M12 × 1, 4-pin
100030871	FS101-300L-63-2UPN8-H1141	N1/2	41.9	24 VDC	PNP/NPN (NO/NC)	IO-Link	M12 × 1, 4-pin
100030870	FS101-300L-62-2UPN8-H1141	G1/2	64.9	24 VDC	PNP/NPN (NO/NC)	IO-Link	M12 × 1, 4-pin
100030872	FS101-300L-30-2LI-H1141	G1/2	16.9	24 VDC	4…20 mA	–	M12 × 1, 4-pin

*Medium: Liquid | Operating range: 1…300 cm/s | Material (contact with media): V4A 1.4571 (316 Ti)

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