



Your Global Automation Partner

FS101...AR32

Compact Flow Sensor

Instructions for Use

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1 About these instructions

These instructions describe the setup, functions and use of the product and help you to operate the product according to its intended purpose. Read these instructions carefully before using the product. This will prevent the risk of personal injury and damage to property. Keep these instructions safe during the service life of the product. If the product is passed on, pass on these instructions as well.

1.1 Target groups

These instructions are aimed at qualified personnel and must be carefully read by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

1.2 Explanation of symbols

The following symbols are used in these instructions:



DANGER

DANGER indicates a hazardous situation with a high level of risk, which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a hazardous situation with a medium level of risk, which, if not avoided, will result in death or serious injury.



CAUTION

CAUTION indicates a hazardous situation with a medium level of risk, which, if not avoided, will result in moderate or minor injury.



NOTICE

CAUTION indicates a situation which, if not avoided, may cause damage to property.



NOTE

NOTE indicates tips, recommendations and important information about special action steps and issues. The notes simplify your work and help you to avoid additional work.



MANDATORY ACTION

This symbol denotes actions that the user must carry out.



RESULT OF ACTION

This symbol denotes the relevant results of an action.

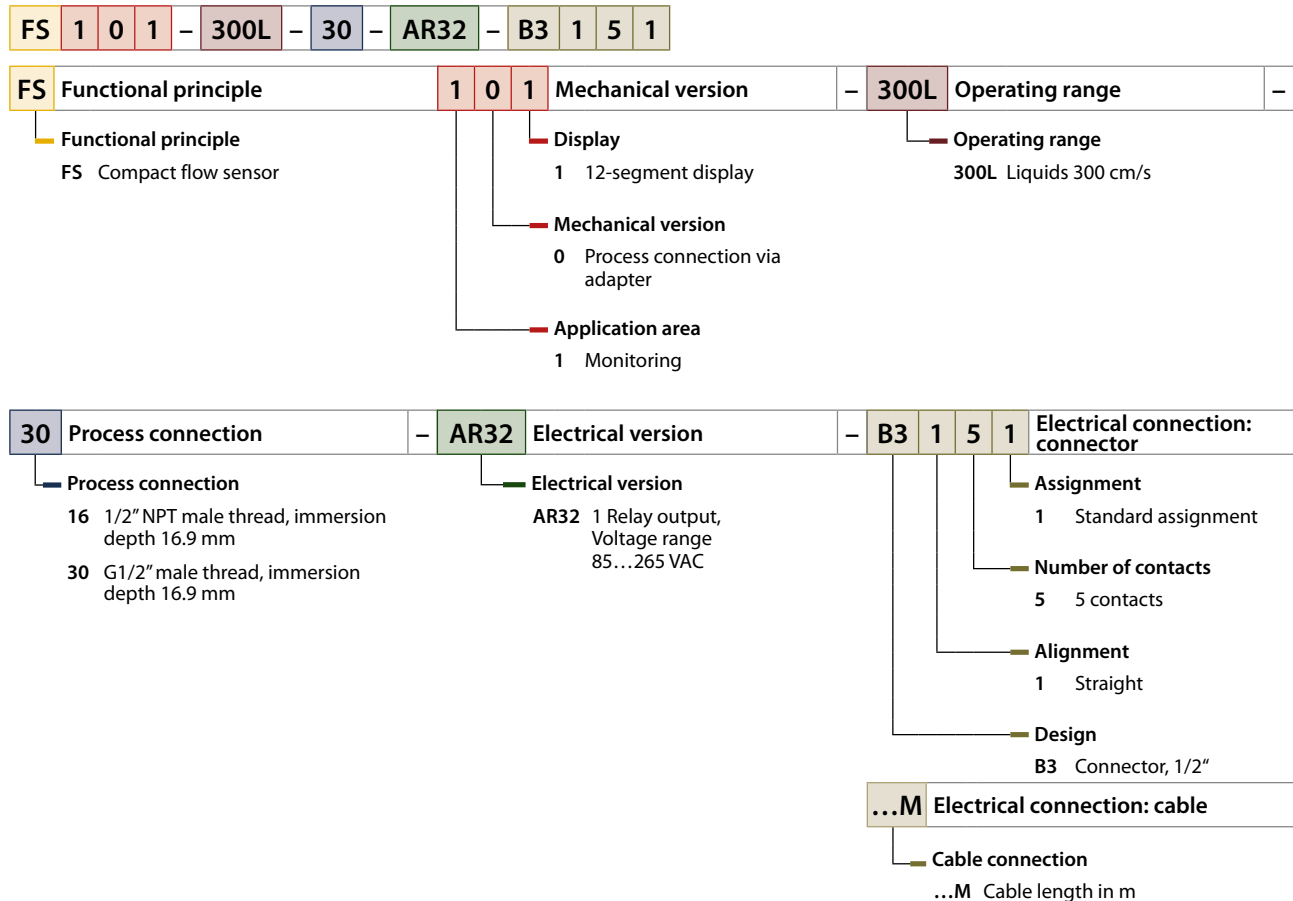
1.3 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to techdoc@turck.com.

2 Notes on the product

2.1 Product identification

These instructions apply to the following flow sensors:



2.2 Scope of delivery

The delivery consists of the following:

- Compact flow sensor
- Thread adapter for process connection
- Two seals (not on devices with NPT threads)
- Quick Start Guide

2.3 Turck service

Turck supports you in your projects – from the initial analysis right through to the commissioning of your application. The Turck product database at www.turck.com offers you several software tools for programming, configuring or commissioning, as well as data sheets and CAD files in many export formats.

The contact data for Turck branches is provided at [► 34].

3 For your safety

The product is designed according to state of the art technology. Residual hazards, however, still exist. Observe the following safety instructions and warnings in order to prevent danger to persons and property. Turck accepts no liability for damage caused by failure to observe these safety instructions.

3.1 Intended use

The compact flow sensors are used to monitor the flow speed of liquid media. Typical applications include monitoring cooling circuits (e.g. in welding applications) and protecting pumps from running dry.

The device must only be used as described in these instructions. Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

3.2 Obvious misuse

- The devices are not safety components and must not be used for personal or property protection.

3.3 General safety instructions

- The device must only be fitted, installed, operated, parameterized and maintained by trained and qualified personnel.
- Only use the device in compliance with the applicable national and international regulations, standards and laws.
- The device meets the EMC requirements for the industrial areas. When used in residential areas, take measures to prevent radio frequency interference.

4 Product description

The compact flow sensors of the FS+ product series are housed in a metal housing with protection class IP67 and IP69K. The devices have a bar length of 45 mm without process connection or an immersion depth of 16.9 mm with an NPT or G process connection. The sensor head can also be rotated by 340° after installation. The display can be rotated 180°. The devices have a metal M18 × 1.5 connector (connector) or a cable connection.

■ FS...AR32...: One relay output

4.1 Device overview

The overview shows example dimension drawings of the compact flow sensors.

Connector devices

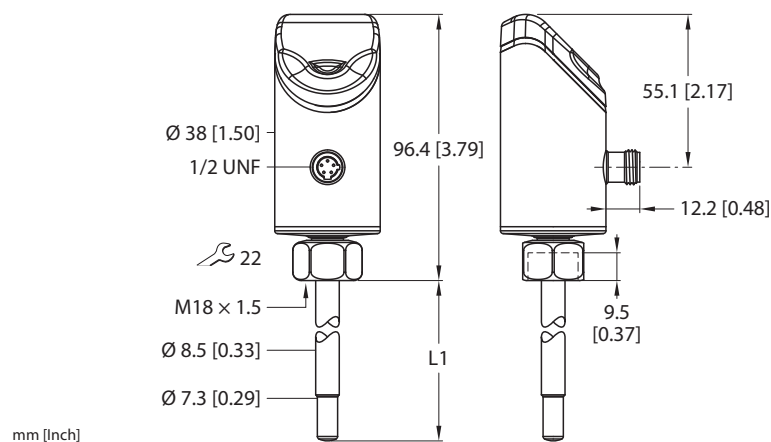


Fig. 1: Dimensions — sensor with 1/2" UNF connector without screw-in adapter

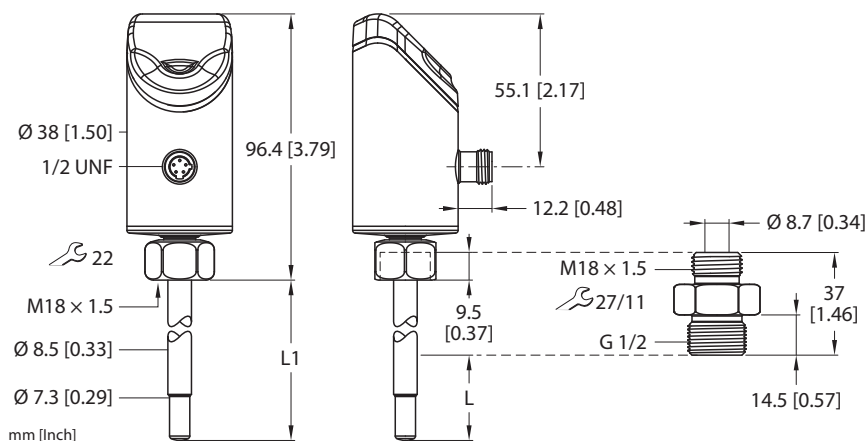


Fig. 2: Dimensions — sensor with 1/2" UNF connector and G 1/2" screw-in adapter

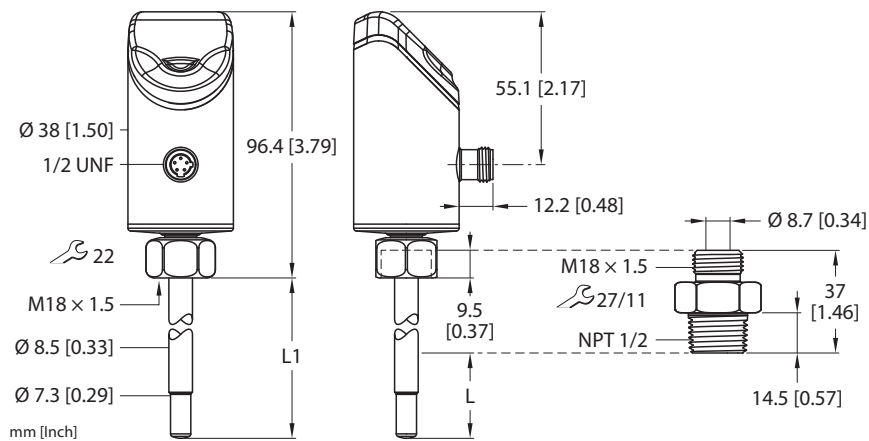


Fig. 3: Dimensions — sensor with 1/2" UNF connector and 1/2" NPT screw-in adapter

Cable devices

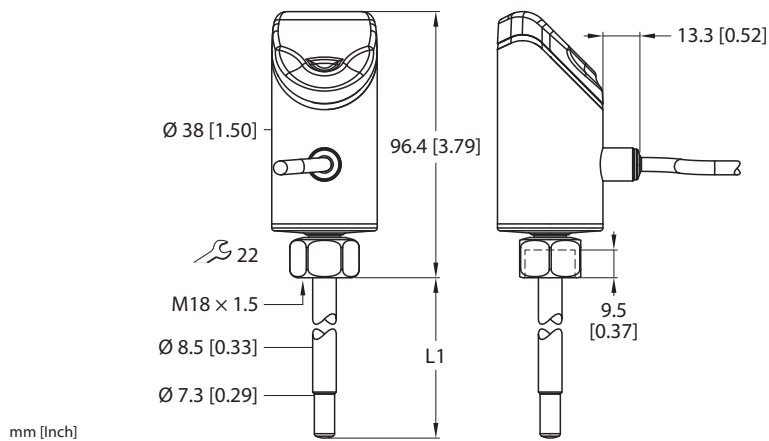


Fig. 4: Dimensions — sensor with cable connection without screw-in adapter

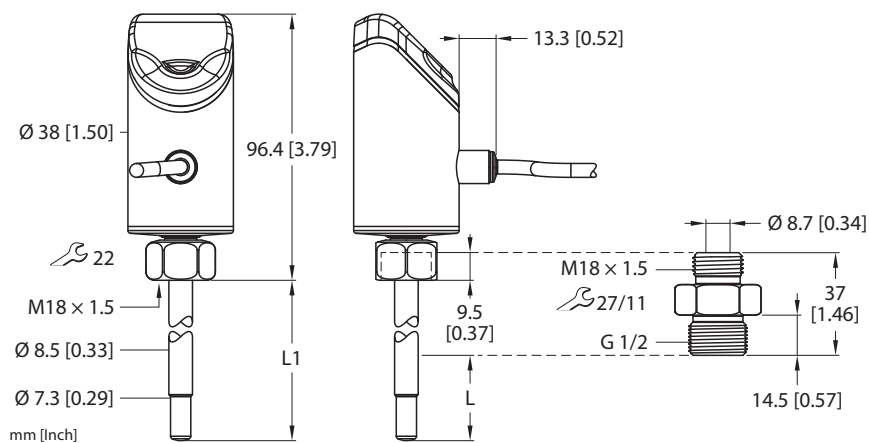


Fig. 5: Dimensions — sensor with cable connection and G 1/2" screw-in adapter

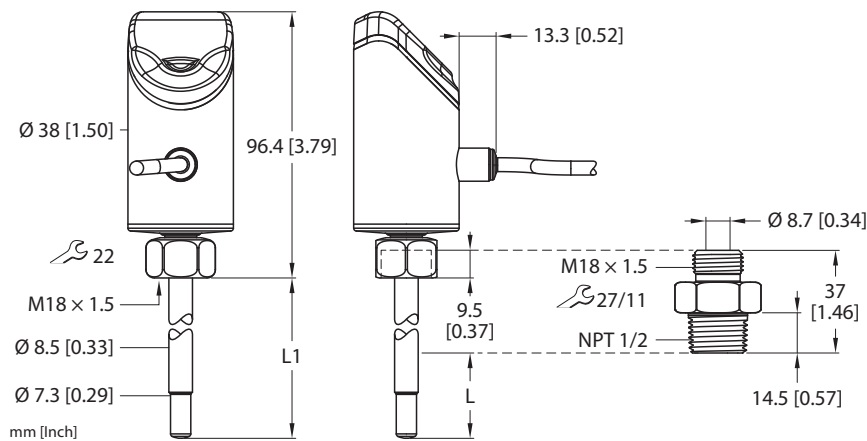


Fig. 6: Dimensions — sensor with cable connection and 1/2" NPT screw-in adapter

4.2 Operating and display functions

The front of the device is provided with three touchpads [ENTER], [MODE] and [SET], a 4-digit 12-segment multicolor display and status LEDs. This enables the user to set all essential functions and properties directly on the device and read the actual process values and set switching points.

4.3 Operating principle

The flow sensors operate calorimetrically. The function is based on the thermo-dynamic principle. When the medium is flowing, thermal energy is dissipated at the sensor. The resulting temperature on the sensor is measured and compared to the medium temperature. The flow status can be derived directly from the determined temperature difference: The greater the energy dissipation, the higher the flow speed or flow rate.

4.4 Functions and operating modes

The devices show the recorded flow and temperature values on the front via status LEDs and a four-digit display. In Quick-Teach mode, the display shows the flow value as a deviation ($\pm$) from a teachable switching point. In MAX/MIN mode, the display shows the flow value—relative to a teachable flow range—as a percentage.

The relay output can optionally be used as a normally open or normally closed contact.

A single point mode (SPM), two point mode (TPM) or window mode (WIn) can be set for the relay output. In single point mode, a limit value is set at which the relay output changes its state. In two point mode, a lower and an upper limit are set at which the relay output changes its state as the process value rises or falls. In window mode, a lower and an upper window limit are set. Outside the window, the relay output changes its state.

4.4.1 Flow monitoring

The flow speed is detected by a calorimetric sensor in the flow channel and evaluated by the integrated processing unit. The current flow value is shown on the display.

The switching output Out 1 (Flow) changes its switching state when the set switching point is reached for the flow rate. The switching state depends on the switching logic as well as on single point mode, two point mode and window mode.

4.4.2 Temperature display

The calorimetric measurement method used by the sensors not only monitors the flow speed, but also measures the approximate temperature of the media. Both process variables are recorded and evaluated independently of each other. The current temperature is indicated on the display. After the display is unlocked, press the [SET] touchpad once or use the [MODE] touchpad to navigate through the main menu to display the current temperature.

4.4.3 DeltaFlow monitoring

The DeltaFlow monitor compares the flow speed within a predefined time period. The user has no influence on this function.

In teach-in mode, the memory function for teach-in values is only enabled when the system is in a stable condition, i.e. the changes in flow rate are sufficiently small. Delta Flow Monitoring prevents values from being stored when the physical system (comprising the sensor and medium) is still in the temperature compensation phase in which incorrect results can arise. In operating mode, the DeltaFlow function monitors the sensor's warm-up procedure after the operating voltage is switched on.

The following schematic diagram illustrates the functional sequence:

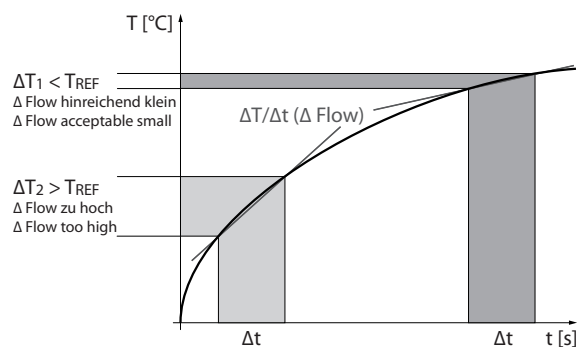


Fig. 7: Delta flow monitoring — schematic diagram

4.4.4 Output functions — relay output

Single point mode

In **single point mode**, a limit value is specified at which the switching output changes its switching state.

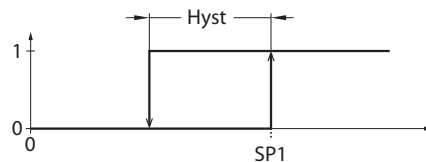


Fig. 8: Single point mode

Window mode

In **window mode**, an upper and a lower window limit are set for the switching output. The switch window must be within the detection range.

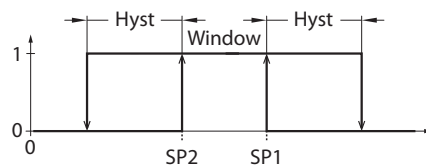


Fig. 9: Window mode

Two point mode

In **two point mode**, a switch-on point and a switch-off point are set for the switching output.

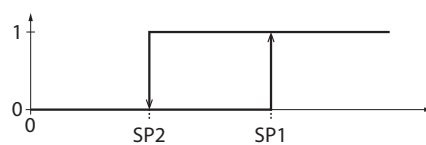
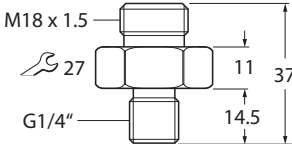
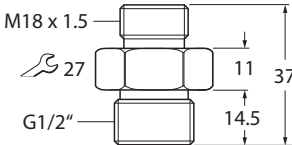
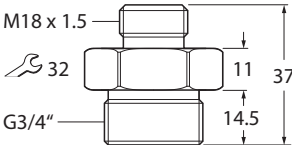
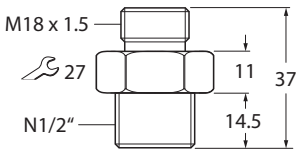
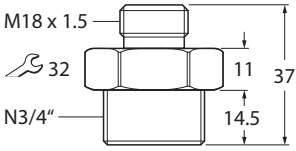


Fig. 10: Two point mode

4.5 Technical accessories

The screw-in adapters are available for different threads. This allows the device to be flexibly adapted to different process connections. Additional adapters can be ordered separately as accessories.

Dimension drawing	Type	ID	Description
	FAA-04-1.4571	100001989	Screw-in adapter for immersion sensors from the FS..., FP... product series; material: stainless steel 1.4571 (316Ti); process connection: G1/4"
	FAA-80-1.4571	100001988	Screw-in adapter for immersion sensors from the FS..., FP... product series; material: stainless steel 1.4571 (316Ti); process connection: G1/2"
	FAA-81-1.4571	100001991	Screw-in adapter for immersion sensors from the FS..., FP... product series; material: stainless steel 1.4571 (316Ti); process connection: G3/4"

Dimension drawing	Type	ID	Description
	FAA-A1-1.4571	100001987	Screw-in adapter for immersion sensors from the FS..., FP... product series; material: stainless steel 1.4571 (316Ti); process connection: N1/2"
	FAA-34-1.4571	100001990	Screw-in adapter for immersion sensors from the FS..., FP... product series; material: stainless steel 1.4571 (316Ti); process connection: N3/4"

5 Installing

5.1 General installation instructions

- ▶ For optimal monitoring, mount the sensor such that the probe rod is fully immersed in the medium.
- ▶ If the medium flows in a horizontal direction and may contain deposits or trapped gas (e.g. air bubbles): Mount the sensor e.g. laterally.

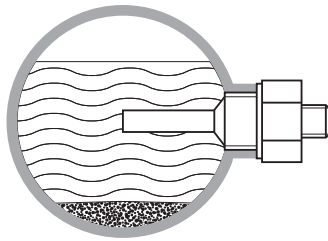


Fig. 11: Lateral mounting

- ▶ If the medium flows in a horizontal direction and the flow channel is not completely filled with the medium: Mount the sensor e.g. below the flow.

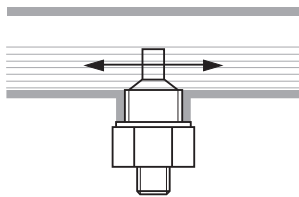


Fig. 12: Mounting below the flow

- ▶ If the medium flows in a vertical direction: Mount the sensor only in risers.
- ▶ A minimum distance from potential interference variables (pumps, valves, flow rectifiers, pipe bends, changes in the cross section) must be maintained.

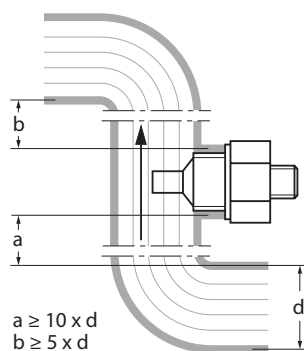


Fig. 13: Minimum distances to interference variables

- ▶ Prevent the tip of the probe rod coming into contact with the opposite side of the flow channel inner wall.

5.2 Special installation instructions

- ▶ Only mount Turck sensors from the FS product series using screw-in adapters from the FAA-... product series.
- ▶ For devices with a G..." process connection: Position one of the two seals (included in the delivery) between the screw-in adapter and the process connection (e.g. union).
- ▶ Screw the screw-in adapter onto the process connection (maximum torque of 100 Nm).
- ▶ Guide the probe rod through the screw-in adapter and hand-tighten the sensor (M18 × 1.5 coupling nut) with the screw-in adapter.
- ▶ For a standard flow range (3...300 cm/s): The probe rod can be installed in the medium independent of the flow direction (range of 360°).
- ▶ For an extended flow range (1...300 cm/s): Mount the probe rod directed so that the medium flows toward the prick punch mark, tolerance range of $\pm 45^\circ$.

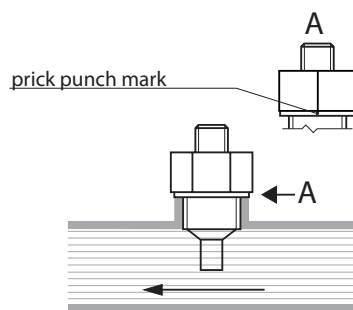


Fig. 14: Mount the probe rod directed correctly

- ▶ Screw an M18 × 1.5 coupling nut onto the screw-in adapter (maximum torque of 40 Nm).
- ▶ Optional: For optimum operation and readability, adjust the sensor head within a range of 340°.
- ▶ For devices with a G..." process connection: After removing and reinstalling the screw-in adapter, use a new seal (replacement seal included in the delivery).
- ▶ Teach in the teach-in values again if the sensor has been removed and re-installed or the process connection has been disconnected.

6 Connecting



DANGER

High voltage

Danger of electric shock

► Do not connect the cable devices under voltage.

6.1 Connecting corded devices

- Connect the connection cable for the sensor to the power source as shown in the wiring diagram.

6.1.1 Wiring diagram

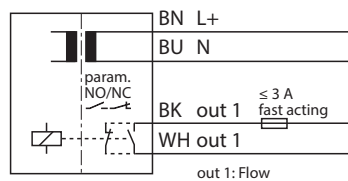


Fig. 15: FS101-...-AR32-2M wiring diagram

6.2 Connecting plug-in devices

- Connect the connection cable coupling to the sensor connector.
- Connect the connection cable to the power source as shown in the wiring diagram.

6.2.1 Wiring diagram

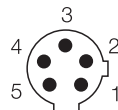


Fig. 16: Pin assignment

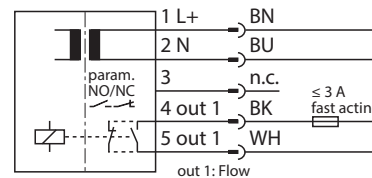


Fig. 17: FS101-...-AR32-B3151 wiring diagram

7 Commissioning

The device is operational automatically once the power supply is switched on. During heating up, ---- is shown in the display. The number of dashes decreases from left to right until the device is ready. The process value is then displayed.

The sensor operates in MAX/MIN mode by default.

- ▶ Perform MAX/MIN teach or Quick-Teach to adapt the sensor to application-specific conditions.

8 Operation



WARNING

The housing can heat up to over 75 °C (167 °F) in the area of the probe
Risk of burning due to hot housing surfaces!

- ▶ Protect the housing from contact with flammable material.
- ▶ Protect the housing from accidental contact.

8.1 LED status indicators — operation

The LEDs indicate readiness for operation, the status of the outputs and pending diagnostic messages. An additional LED indicates that the device has been locked.

LED	Indication	Meaning
PWR	Green	Device is operational
FLT	Red	Error
LOC	Yellow	Device locked
	Yellow flashing	"Lock/unlock" process active
	Off	Device unlocked
I (FLOW)	Yellow	■ NO: Switching point exceeded/within window (active output)
		■ NC: Switching point undershot/outside window (active output)
	Off	■ NO: Switching point undershot/outside window (inactive output) ■ NC: Switching point exceeded/within window (inactive output)
%	Green	Flow in %
°C	Green	Temperature in °C
°F	Green	Temperature in °F

8.2 Display indications

Display	Meaning
- - - -	Sensor failure
HW	Internal hardware error
PArF	Faulty factory parameters
VOLT	Operating voltage outside the permissible range
Oor+	Flow value above the detection range
Oor-	Flow value below the detection range
Oor	No measurement data available
PArA	Incorrect user parameterization
TEMP	Device temperature outside the permissible range
Err	Unspecified error
Orun	Value > 100 % of the set flow range in MAX/MIN-Teach, value > 50 % of the set switching point in Quick-Teach
Urun	Value < 0 % of the set flow range in MAX/MIN-Teach, value < 50 % of the set switching point in Quick-Teach

9 Setting and Parameterization

The device can be assigned parameters as follows:

- Setting via touchpad
- Setting via FDT/DTM

9.1 Settable functions and properties

The three front touchpads (ENTER, MODE, SET) enable the user to set all the essential functions and properties directly on the device via the menu guidance.

Setting options — via touchpads

- Locking/unlocking touchpads
- Flow switching points
- MAX/MIN teach, Quick-Teach
- NO/NC changeover
- Display units: metric, imperial
- Advanced settings: Password setting
- Advanced settings: Switching behavior of the output, display settings
- Advanced settings: Reset to the previous settings (pre-settings) or factory settings

Factory settings

- MAX/MIN values for teach functions: Re-teach the application after commissioning
- Switching point 1: Flow 70 %
- Switching point 2: Flow 69 %
- Output function OUT1: NO contact

9.2 Setting via touchpads

Use the [MODE] or [SET] touchpads to navigate through the main menu, as well as the OUT1 output submenu, the DISP display menu, the EF extended functions menu. Press [ENTER] to select the respective submenu. Touching [MODE] and [SET] at the same time will cancel the parameter assignment. The device returns to the standard display.

Standard menu guidance — main menu

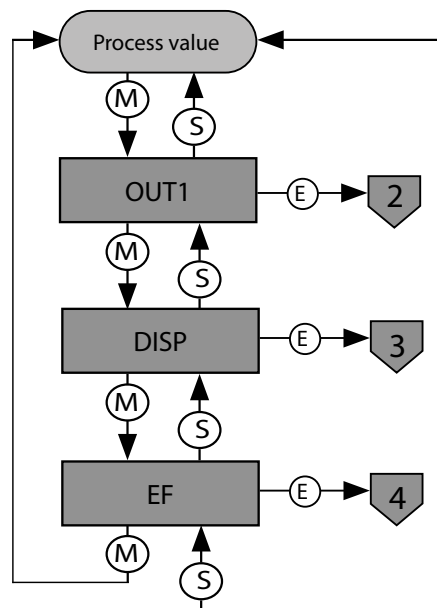


Fig. 18: Main menu

OUT1 submenu

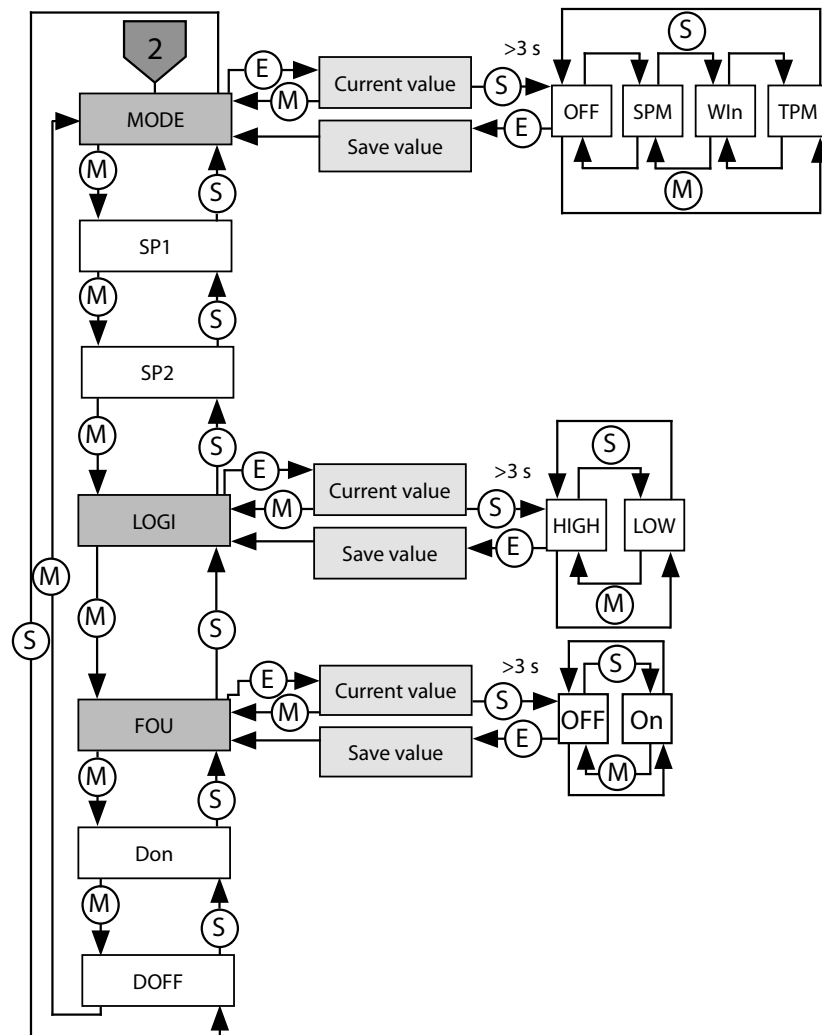


Fig. 19: OUT1 submenu

Display submenu (DISP)

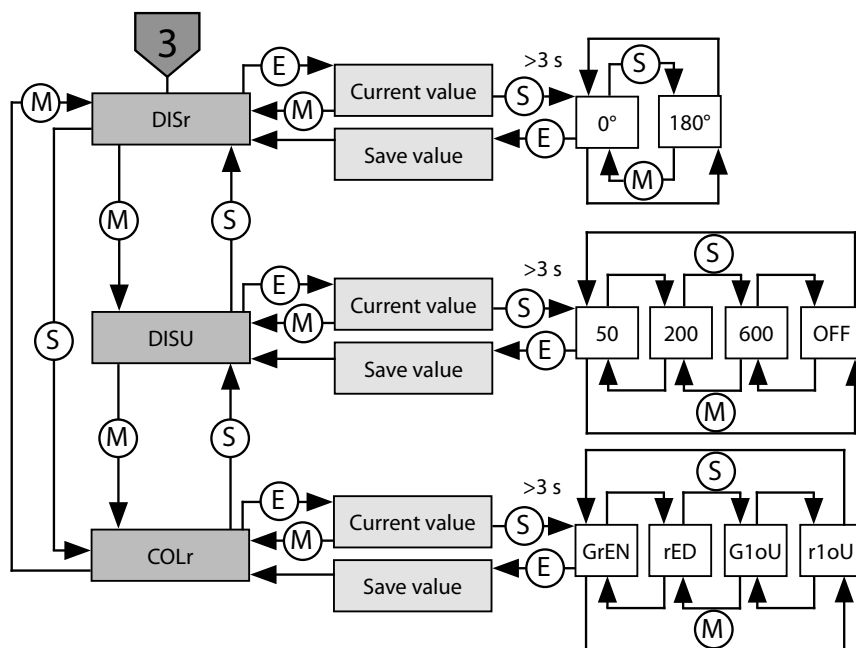


Fig. 20: Display submenu

Extended functions submenu (EF)

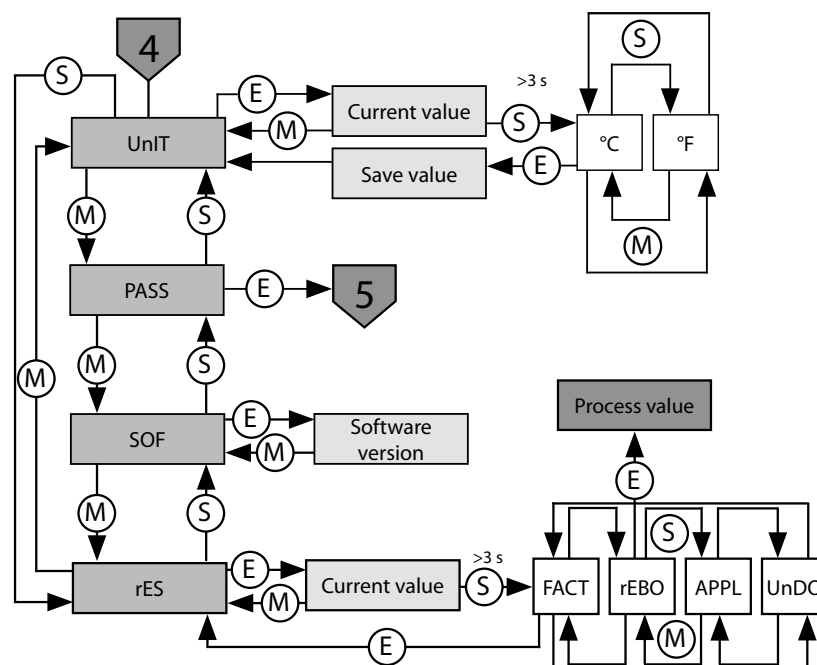
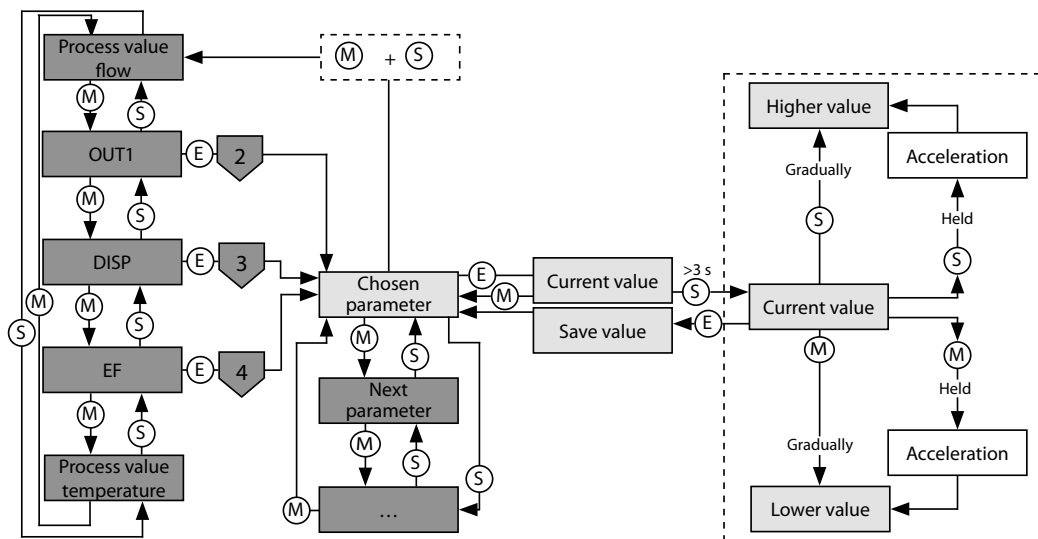


Fig. 21: Extended functions submenu (EF)

9.2.1 Setting parameter values via touchpads

- ▶ Unlock the device when [MODE] or [SET] is touched, a red running light appears and the LOC LED is lit.
- ▶ Touch [MODE] or [SET] until the required parameter is displayed.
- ▶ Touch [ENTER] to select a parameter.
- ▶ Changing the displayed value: Touch [SET] for 3 s until the display is no longer flashing. Or: Touch [MODE] to return to the parameter selection.
- ▶ Increase or decrease the value gradually via [MODE] or [SET]. Certain values can be continuously changed by holding down [MODE] or [SET].
- ▶ Touch [ENTER] to save the modified value. The saved value flashes twice.



9.2.2 Unlocking the device

- ▶ Touch [ENTER] for 3 s until all green bars are flashing on the display.
 - ▶ Swipe [MODE], [ENTER], [SET] in succession: Two red flashing bars appear when each touchpad is touched. Once the two red bars have turned green, move onto the next touchpad without removing your finger from the touchscreen.
 - ▶ Release the touchpads when six green bars are flashing on the display.
- ⇒ LOC LED goes off.
- ⇒ uLoc appears in the display and then disappears.

9.2.3 Locking the device

- ▶ Touch [MODE] and [SET] simultaneously for 3 s.
- ⇒ When the LOC LED flashes, Loc will appear on the display and then go out.
- ⇒ LOC LED is yellow.

The sensor is automatically locked if the touchpads of the device are not actuated for 1 min.

9.2.4 Protecting the sensor with a password

- ▶ Select PASS in the EF menu.
- ▶ Change values via [SET].
- ▶ Use [MODE] to navigate between the four digits of the password.
- ▶ Use [ENTER] to store the new password.

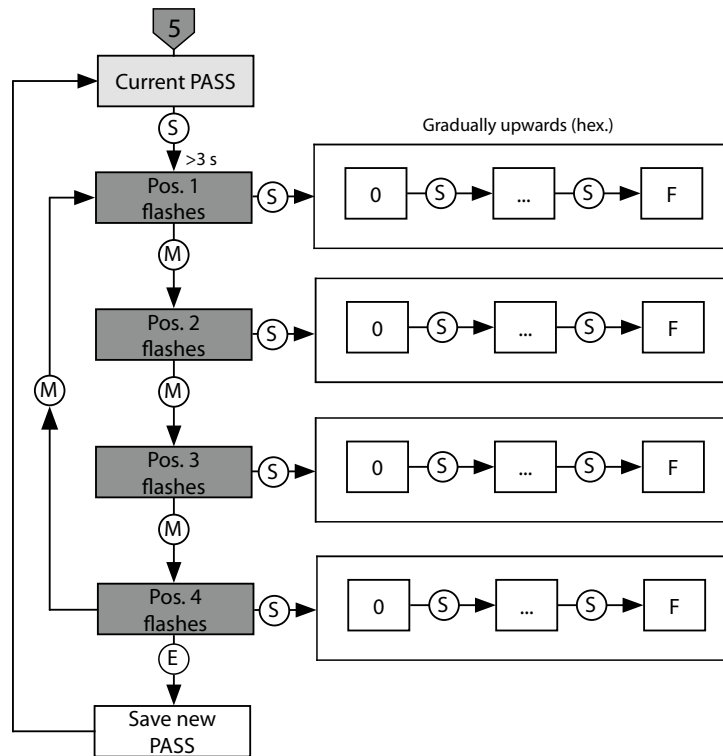


Fig. 22: Password setting

9.2.5 Parameters in the main menu

Default values are shown in **bold**.

	Explanation	Function
OUT1	Output 1 submenu	Setting options for relay output for flow speed
DISP	Display submenu	Refer to the "Parameters in the DISP submenu" table for additional setting options
EF	Extended Functions submenu	For additional setting options see the "Parameters in the EF submenu" table

9.2.6 Parameters in the OUT1 submenu

	Explanation	Options	Function
MODE		OFF	
		SPM	Single point mode
		WIn	Window mode (window function)
		TPM	Two point mode
SP1	Switching point 1		SPM: Limit value at which the relay output changes its switching state TPM: Upper limit value at which the relay output changes its switching state as the flow speed rises WIn: Upper window limit at which the relay output changes its switching state Default: 70 %
SP2	Switching point 2		SPM: Not available TPM: Lower limit value at which the relay output changes its switching state as the flow speed falls WIn: Lower window limit at which the relay output changes its switching state Default: 69 %
LOGI	Invert switching logic	HIGH	0 → 1
		LOW	1 → 0
FOU	Behavior in the event of a fault (e.g. wire break or short circuit)	On	The output is activated in the event of an error.
		OFF	The output is deactivated in the event of a fault.
Don	Switch-on delay		0...60 s in increments of 0.1 s (0 = delay time not activated) Default: 0.0 s
DOFF	Switch-off delay		0...60 s in increments of 0.1 s (0 = delay time not activated) Default: 0.0 s

9.2.7 Parameters in the DISP submenu (Display)

	Explanation	Options	Function
DISr	Display orientation	0°	Display rotated by 0°
		180°	Display rotated by 180°
DISU	Display update	50	50-ms update time
		200	200-ms update time
		600	600-ms update time
		OFF	Display update deactivated
COLr	Display color	GrEN	Green
		rED	Red
		G1oU	Green if OUT1 is switched, otherwise red
		r1oU	Red if OUT1 is switched, otherwise green

9.2.8 Parameters in the EF submenu (Extended Functions)

	Explanation	Options	Function
UnIT	Display unit	°C	°C
		°F	°F
PASS	Password		Define password and activate password protection
		0000	No password
SOF	Software version		Display of the firmware version
rES	Reset	FACT	Reset the parameters to the factory settings
		rEBO	Restart the device (warm start)
		APPL	Reset application-specific data
		UnDO	Reset the parameters to the previous settings (last device start)

9.2.9 Quick-Teach

With the Quick-Teach function, the current flow speed can be directly taught in as the switching point FLOW for devices with a switching output; setting a separate MAX/MIN indicated range is not required.

- ▶ Bring the flow speed in the application to the target flow rate to be monitored.
- ▶ Press [ENTER] once.
- ⇒ DeltaFlow active: If the display (+ 0) flashes red, the system is not yet in a stable condition. If the display (+ 0) flashes green, the system is in a stable condition.
- ▶ Press [ENTER] for 3 s until the display (+ 0) lights up green.
- ▶ Optional: Modify the switching point in ± 1 % increments (max. 9 %).
- ▶ Press [SET] to incrementally increase the switching point by 1 % of the reference flow rate.
- ▶ Press [MODE] to incrementally decrease the switching point by 1 % of the reference flow rate.
- ▶ Store the switching point: Press [ENTER].
- ⇒ The display flashes green briefly and changes to + 0.
- ⇒ The display shows the percentage deviation of the flow rate in relation to the set switching point.
- ⇒ The display shows if the value deviates by -50 % (Urun) or +50 % (Orun) of the set switching point.

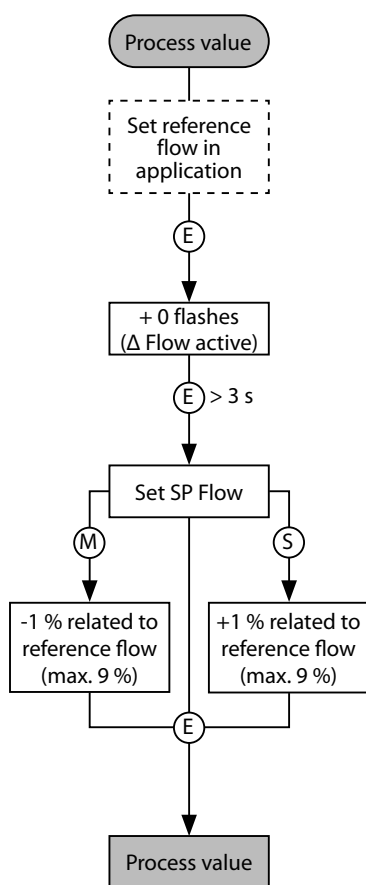


Fig. 23: FS101 Quick-Teach

9.2.10 MAX/MIN teach-in

Set the upper limit of the indicated range:

- ▶ Operate the flow speed in the application at the upper limit value.
- ▶ Press and hold [ENTER].
- ⇒ DeltaFlow active: If the display (IEP) flashes red, the system is not yet in a stable condition. If the display (IEP) flashes green, the system is in a stable condition.
- ▶ Press [SET] for 3 s until IEP briefly lights up green and the value 9 flashes green.
- ⇒ The upper limit value for the flow speed is set.

Set the lower limit of the indicated range:

- ▶ Operate the flow speed in the application at the lower limit value.
- ▶ Keep reducing the flow speed while a numerical value (9...1) flashes green in the display.
- ▶ As soon as ISP appears in the display, the lower limit can be freely selected.
- ⇒ DeltaFlow active: If the display (ISP) flashes red, the system is not yet in a stable condition. If the display (ISP) flashes green, the system is in a stable condition.
- ▶ Press [SET] for 3 s until ISP lights up green in the display.
- ⇒ The display changes to 0. The lower limit value for the flow speed is set.
- ⇒ The display shows if the value drops below 0 % (Urun) or rises above 100 % (Orun) of the set flow range.

The switching points for single point mode, window mode and two point mode can be set for the MAX/MIN-Teach. By default, the switching point in single point mode is at a flow speed of 70 %.

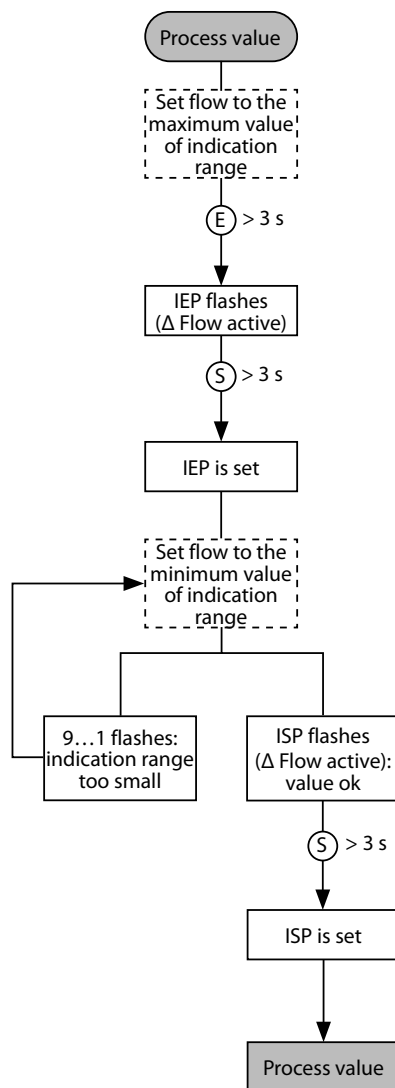


Fig. 24: MAX/MIN teach-in

10 Troubleshooting

If the device does not function as expected, first check whether ambient interference is present.

If there is no ambient interference present, check the connections of the device for faults.

If there are no faults, there is a device malfunction. In this case, decommission the device and replace it with a new device of the same type.

11 Maintenance

The device is maintenance-free. Clean with a damp cloth if required.

12 Repair

The device is not intended for repair by the user. The device must be decommissioned if it is faulty. Observe our return acceptance conditions when returning the device to Turck.

12.1 Returning devices

If a device has to be returned, bear in mind that only devices with a decontamination declaration will be accepted. This is available for download at <https://www.turck.de/en/return-service-6079.php> and must be completely filled in, and affixed securely and weather-proof to the outside of the packaging.

13 Disposal



The devices must be disposed of properly and do not belong in the domestic waste.

14 Technical data

Technical data	FS101...AR32...B3151	FS101...AR32...2M
Application area		
Mounting conditions	Immersion sensor	
Application area	FS101: liquid media	
Ambient temperature	-40...+80 °C	
Temperature of medium	-25...+85 °C	
Storage temperature	-40...+80 °C	
Pressure resistance	300 bar	
Flow monitoring		
Response time T09	6 s	
Response time T05	3 s	
Standard flow range	3...300 cm/s	
	Any axial alignment of the sensor rod in the medium	
Extended flow range	1...300 cm/s	
	Directed inflow to punch mark ±20°	
Switching point accuracy	1...30 cm/s; for water 3...300 cm/s	
Reproducibility	1...5 cm/s; for water 3...100 cm/s; 10...80 °C	
Temperature gradient	≤ 300 K/min	
Hysteresis	3...25 % of the switching point	
Temperature display		
Measuring range	-25...+85 °C	
Resolution	0.1 K	
Response time T09	12 s	
Response time T06	3 s	
Electrical data		
Operating voltage	85...265 VAC (47...62 Hz)	
Operating voltage (UL)	100...240 VAC (50/60 Hz)	
Load type on the relay	Resistive	
Contact rating	3 A at 250 VAC	
Surge category	II	
Short circuit protection	No	
Reverse polarity protection	Yes	
Power consumption	≤ 1.7 W (1.4 W)	
Overload protection	No	
Protection class	II	
Outputs		
Output function output 1	Relay output: Flow; NO/NC programmable	
Programming		
Programming options	Automatic switching logic recognition easy switchpoint adjustment via touchpads	

Technical data	FS101...AR32...B3151	FS101...AR32...2M
Mechanical data		
Housing material	Stainless steel, 1.4404 (316L)	
Adapter material	Stainless steel, 1.4571 (316Ti)	
Material (in direct contact with media)	Stainless steel, 1.4571 (AISI 316Ti), FKM O-ring, AFM flat seal (only for devices with a G process connection)	
Process connection	1/2" NPT or G 1/2" external thread	
Process connection sensor	M18 × 1.5 internal thread	
Process connection adapter	M18 × 1.5 external thread	
Electrical connection	1/2" UNF-20 4-pin + PE 18 × 1.5 connector	Cable, 2 m
Degree of protection	IP67, IP69K	
Electromagnetic compatibility	DIN EN 60947-5-9: 2007	
Ambient conditions		
Ambient temperature	-40...+80 °C	
Storage temperature	-40...+80 °C	
Relative humidity	10...95 %	
Shock resistance	50 G (11 ms), DIN EN 60068-2-27	
Vibration resistance	20 G (55...2000 Hz), DIN EN 60068-2-6	
Tests/approvals		
Approvals	CE cULus UKCA	
Registration number	E516036	
Indication	LED display function for status of supply voltage, switching states, units and teach processes. Process display via 12-segment display	
MTTF	120 years acc. to SN 29500 (Ed. 99) 40 °C	

15 Turck branches — contact data

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