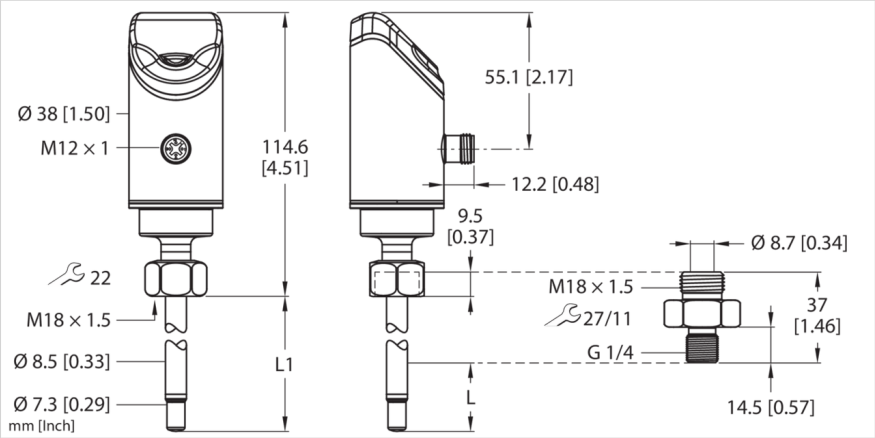
FS501-L-04-LI2UPN8-H1141

Flow meter for liquids

With integrated evaluation electronics and display
Calorimetric measuring principle — immersion design



Typ	FS501-L-04-LI2UPN8-H1141
Ident-No.	100053069

Technical data

Application area	
Application area	liquids
Immersion depth (L)	16,9 mm, When using the supplied adapter
Bar length (L1)	45 mm
Medium temperature	0…+80 °C
Medium	liquids
Pressure resistance	60 bar
Flow	
Standard flow range	0.06...3,00 m/s
Reproducibility	< 2%
Flow measurement accuracy	<= (± 8 % of measured value + 2 % of full scale)* Tested with water at 20 °C ±5 °C in a DN25 pipe with upstream section 40 × D and downstream section 10 × D of the internal diameter
Response time	0.5 s for water 0.8 s for water glycol
Temperature	
Measuring range	0...80 °C
Switching point accuracy	<= ± 2 K

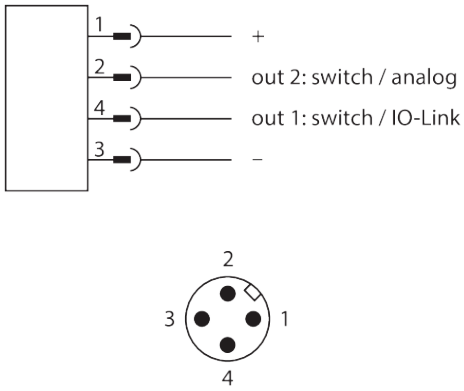
Features

- Screw-in adapter with process connection G1/4″ male thread included in delivery
- M18 × 1.5 female to G1/4″ male thread
- Electronics housing material/media-contacting 1.4404 (316L)/1.4571 (316Ti)
- Immersion depth 16.9 mm
- 4-digit 12-segment display, rotatable by 180°
- Flow measurement of liquid media
- Flow speed and flow volume
- Pipe internal diameter adjustable from 15… 250 mm
- Setting via touchpads and IO-Link
- Totalizer and teach functions via IO-Link
- Protection classes IP66, IP67 and IP69K
- 17…33 VDC
- NO/NC, PNP/NPN output
- Analog output (current/voltage)
- IO-Link SSP 4.3.2
- M12 × 1 connector

Technical data

Resolution	0,1 K
Response time T09	1,5 s
Power supply	
Operating voltage U_B	17...33 VDC
Power consumption	max. 17 W (2 W intern, 15 W extern)
Overload protection	Yes
Protective measure	SELV/PELV (UL requirement): limited energy according to UL61010-1 or LPS according to UL60950-1 or Class 2
Electrical data	
Output function	NO/NC programmable, PNP/NPN IO-Link
Standby delay time	30 s
Short-circuit protection	yes, cyclic
Wire break/reverse polarity protection	yes
Continuous current carrying capacity of the DC switching output	250 mA
Insulation class	III
Voltage drop	≤ 2 VDC
Interfaces	
Communication protocol	IO-Link
Outputs	
Electrical output	2 × switching output, IO-Link, Current output (3-wire), Voltage output (3-wire)
Output 1	IO-Link/switching output
Output 2	Analog or switching output
IO-Link	
IO-Link specification	V1.1, Smart Sensor Profile
IO-Link port type	Class A
Transmission physics	entspricht der 3-Leiter Physik (PHY2)
Transmission rate	COM 2 (38,4 kBaud)
Process data width	80 bit (2 × Float32T + IntegerT(10) + 2 × 1 BOOL + 2 × 2 switch)
Measured value information	64 bit (2xFloat32T)
Switching point information	4 bit (2 × 2 switching points)
Frame type	2.2
Minimum cycle time	6 ms
Function Pin 2	DI
Function pin 4	IO-Link

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 therefore a direct measure of an increased flow rate.

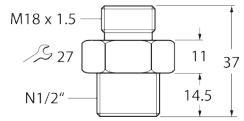
Technical data

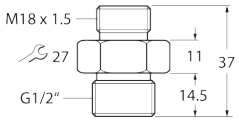
Maximum cable length	20 m
Profile support	Smart Sensor Profile
Included in the SIDI GSDML	In preparation
Programming	
Programming options	Automatische Schaltlogikerkennung, einfache Schaltpunkteinstellung via Touchpads
Mechanical data	
Design	With display (integrated probe)
Construction type designation	FS501
Dimensions	141,4 mm x 38 mm x 49 mm
Housing material	Stainless-steel/Plastic, 1.4404 (AISI 316L)/Grilamid TR90 UV/Elastollan C 65 A 15 HPM 000/Ultramid A3X2G5
Adapter material	Edelstahl 1.4571 (316Ti)
Materials (contact with media)	Stainless steel 1.4571 (AISI 316Ti), FKM O-ring, AFM flat seal
Electrical connection	Connector, M12 × 1
Process connection	G 1/4" male thread
Process connection adapter	M18 × 1.5 male thread; G 1/4″ male thread
Process connection sensor	M18 x 1.5 female thread
Mounting conditions	Immersion sensor
Environmental conditions	
Ambient temperature	-40...+80 °C
	(UL: -25...+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
Protection class	IP66 IP67 IP69K, (IP rating not evaluated by UL)
Tests/approvals	
Approvals	CE, cULus
Approvals	CE, cULus
Displays/controls	
Display	4-digit 12-segment display, rotatable by 180°, red or green
Comments	

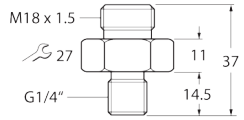
Technical data

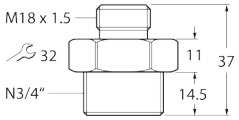
Remark to product	Installation exclusively using Turck process adapters: FAA-xx-xxxx-series screw-in adapters; FAF-xx-xxxx-series welding adapters. Adapters must be ordered separately as accessories

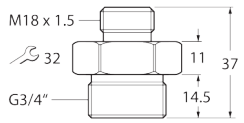
Mounting accessories

FAA-A1-1.4571	100001987
	Screw-in adapter for immersion sensors from the series FS.. , FP..; material: stainless steel 1.4571 (316Ti); process connection: N1/2″

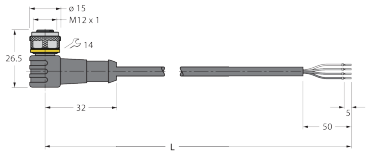
FAA-80-1.4571	100001988
	Screw-in adapter for immersion sensors from the series FS.. , FP..; material: stainless steel 1.4571 (316Ti); process connection: G1/2″

FAA-04-1.4571	100001989
	Screw-in adapter for immersion sensors from the series FS.. , FP..; material: stainless steel 1.4571 (316Ti); process connection: G1/4″

FAA-34-1.4571	100001990
	Screw-in adapter for immersion sensors from the series FS.. , FP..; material: stainless steel 1.4571 (316Ti); process connection: N3/4″

FAA-81-1.4571	100001991
	Screw-in adapter for immersion sensors from the series FS.. , FP..; material: stainless steel 1.4571 (316Ti); process connection: G3/4″

Connectivity accessories

WKC4.4T-2/TEL	6625025
	Connection cable, M12 female connector, angled, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval

RKC4.4T-2/TEL	6625013
	Connection cable, M12 female connector, straight, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval