



### Flow transmitter / flow switch for general industrial applications

Technical information TI11.18

#### In brief



Modbus



IO-Link



#### Application

- Machinery and plant engineering
- Air-conditioning and refrigeration plant engineering
- Hydraulic and pneumatic systems
- Process industry
- Environmental technology
- Facility and building automation

#### Main features

- Flow velocities from 3cm/s to 300cm/s
- Wide variety of process connections and sensor lengths
- Wear-free calorimetric sensor
- Process temperature range  $-20^{\circ}\text{C}$  to  $+110^{\circ}\text{C}$
- High process pressure tightness up to 40bar
- Fully welded robust steel enclosure
- High protection class IP69K/IP67
- Evaluation electronic RS485 Modbus®-RTU / IO-Link®

#### Description

The device is an electronic flow resp. temperature switch for monitoring, control and continuous measurement of flow and temperatures in liquids. A high variety of versions of process connections and electronic types allows the use for a wide range of applications, also for demanding measuring requirements.

Due to its high accuracy and the digital adjustability by RS485 Modbus®-RTU or IO-Link® the device can be suited to a wide variety of applications.

The robust design and the high-quality workmanship turns the device into a very high quality product, which even the most adverse environmental conditions cannot affect, whether the lowest temperatures when used outdoors, extreme shock and vibration stress or aggressive media.

A captive laser marking of the type

label ensures the identifiability throughout the entire lifetime of the device.

Obviously is the optional marking of a measurement point designation resp. TAG, a customer label or of a neutral type label, of course also per laser marking.

A LABS- resp. silicone-free version, a factory calibration with calibration certificate and a customer specific configuration resp. preset is also optionally available like a material test certificate EN10204 3.1 or a factory certifications for drink water suitability. Customer specific special versions can be realized short-term on request, e.g. special designs for the process connection or other process materials.



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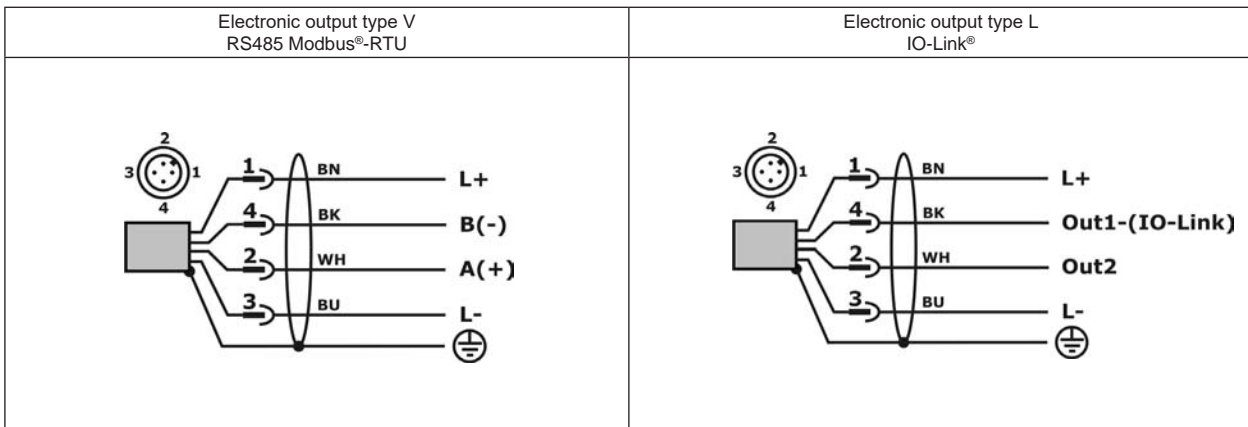
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<b>Measuring range</b>	
Measuring principle	Calorimetric flow measurement
Nominal measuring range	3...300 cm/s
<b>Output type V – RS485 Modbus®-RTU</b>	
Interface	RS485, bidirectional / Modbus®-RTU / 9600 Baud (4800...38400 Baud)
Time behavior	Flow: T90 ≤ 6s / ton ≤ 10s Temperature: T90 ≤ 4s / ton ≤ 2s
<b>Output type L – IO-Link®</b>	
Interface	IO-Link® V1.1 / Com2 (38400 Baud)
Analogue output	0...20mA: 0...20,5mA / ≤ 0,05mA / ≤ 22mA / dI ≤ 1µA 4...20mA: 3,8...20,5mA / ≥ 3,6mA / ≤ 22mA / dI ≤ 1µA
Switch output	2x PP (Push-Pull), switch to +L/-L
Output	Uout ≤ 0,2V, ≥ Us – 2V / Iout 0...200mA (current limited ≤ 450mA, short circuit protected)
Time behavior	Flow: T90 ≤ 6s / ton ≤ 10s Temperature: T90 ≤ 4s / ton ≤ 2s
<b>Auxiliary power</b>	
Supply voltage Us polarity protected	Type V – RS485 Modbus®-RTU: 6...35VDC Type L – IO-Link®: 9...35VDC, without IO-Link® / 18...30VDC, with IO-Link®
<b>Measuring accuracy</b>	
Accuracy	Flow: ≤ ±5% Measuring end value (5...100cm/s) / (-20°C...+85°C) ≤ ±10% Measuring end value (100...175cm/s) / (-20°C...+85°C) Temperature: ≤ ±1,5K (≥ 20cm/s)
Long term drift	Flow: ≤ ±10% of measuring value / year (-20°C...+85°C)
Temperature deviation	Flow: ≤ ±0,4cm/s / K (-20°C...+85°C)
<b>Process conditions</b>	
Process temperature	-20°C...+110°C
Process pressure	≤ 40 bar
<b>Environmental conditions</b>	
Environmental temperature	-20°C...+100°C
Protection level	IP69K/IP67 (EN/IEC 60529)
MTTF	463 years

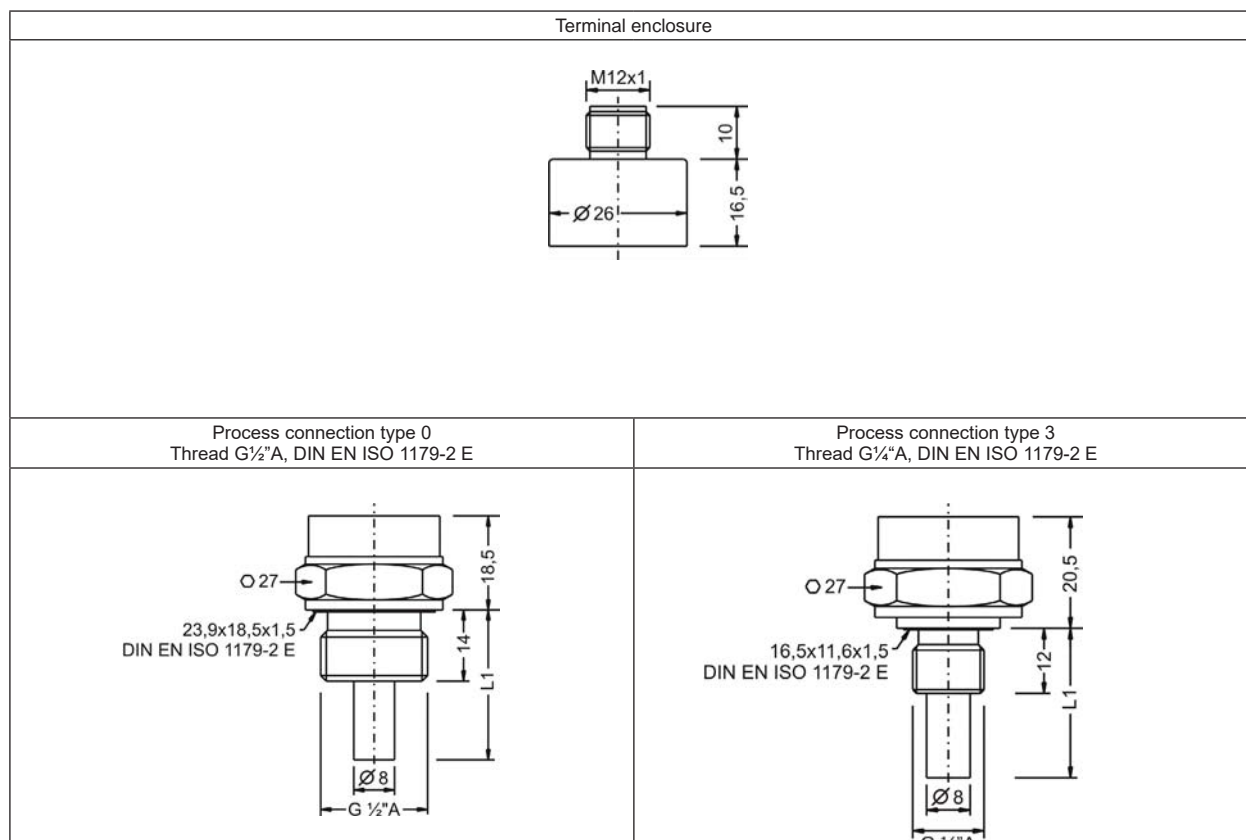
## Electrical connection



# Order code

FU4S	<b>Type</b>	Standard
K	<b>Measuring system</b>	Calorimetric sensor
S	<b>Approval</b>	Standard
0	<b>Process connection</b>	Thread ISO 228-1 – G½"A, DIN EN ISO 1179-2 E
3		Thread ISO 228-1 – G¼"A, DIN EN ISO 1179-2 E
Y		others
1	<b>Material process gaskets (process wetted)</b>	FPM – fluorelastomere (e.g. Viton®)
3		EPDM – ethylene-propylene-dienmonomere
Y		others
V	<b>Material process connection (process wetted)</b>	CrNi-steel
C	<b>Material terminal enclosure</b>	CrNi-steel
0	<b>Sensor length L1</b>	
1		
2		
3		
V	<b>Electronic – output</b>	RS485 Modbus®-RTU, 4-wire
L		IO-Link®, 1x current 0/4...20mA / 2x switch, 4-wire
S	<b>Electronic – function</b>	Standard
0	<b>Process temperature</b>	Standard –20°C...+110°C
0		
0		
S	<b>Electrical connection</b>	Plug M12x1
	<b>Additional options</b>	
		-SF LABS-free, silicone-free / paint compatible version
		-ML Measurement point designation / TAG – Laser marking
		-KL Customer label on device – Laser marking
		-TN Type label neutral
		-MZ Material test certificate – EN10204 3.1
		-WT Factory certification – drink water suitability
		-KF Configuration / Preset
		-WK Factory calibration – calibration certificate

**Flowcont® FU4S** K S V C S 0 0 0 S



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