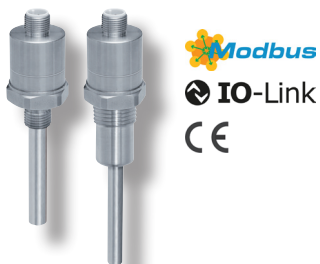


# Fluxicont FU4

Flow transmitter / Flow switch  
Operating manual BA11.18

Technical modifications reserved.



## 1 Safety instructions

The operating manual is part of the device and must be kept always accessible nearest its installation location.

Installation, electrical connection, commissioning, operation, dismantling and disposal of the device must be made by a qualified and authorized expert according to the information's in this Operating Manual and the relevant standards and rules.

This expert must have read and understood this Operating Manual and especially the safety notes. Complementary the Technical Information TI has to be adhered to, that can be ordered by the manufacturer or downloaded from the homepage.

### 1.1 Operational safety

The device is safely built and tested according to state-of-the-art technology.

The device meets the legal requirements of all relevant EU directives. This is confirmed by attaching the CE mark. The associated EU-Declaration of Conformity can be ordered or downloaded from the homepage.

This measuring device meets article 4 (3) of the EU directive 2014/68/EU (pressure equipment device directive) and is designed and produced in good engineer practice.

### 1.2 Intended use

The device is an electronic flow transmitter / flow switch for monitoring, control and continuous measurement of flow and temperatures in liquids.

The device may only be used within the permitted operation limits. Every use besides these limits as agreed can lead to serious dangers.

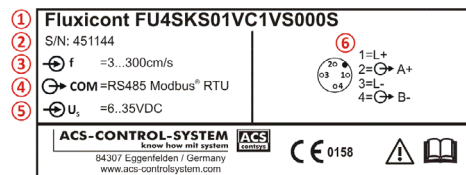
The materials of the device must be checked for compatibility with the respective application requirements (contacting materials, process temperature) before use. An unsuitable material can lead to damage, abnormal behavior or destruction of the device and to the resulting dangers. The sensors may not be used as sole device for prevention of dangerous conditions in machines and plants.

The operational reliability of the device is ensured only at the intended use.

An inappropriately use, disregarding the Operating Manual and the technical rules, using under-qualified personnel, making unauthorized alterations as well as damage of the device releases the manufacturer from liability for any resulting damage. This renders the manufacturer's warranty null and void.

## 2 Installation

### 2.1 Product label



- ① Type code
- ② Serial number
- ③ Input signal / Measuring range
- ④ Output signal
- ⑤ Power supply
- ⑥ Pin assignment

ACS-CONTROL-SYSTEM GmbH  
Lauterbachstr. 57  
D- 84307 Eggenfelden

Tel.: +49 (0) 8721/ 9668-0  
Fax: +49 (0) 8721/ 9668-30

### 2.2 Installation place

The correct function of the device within the specific technical data can only be guaranteed, if the permitted process and environmental conditions at the installation place (see Technical Information TI) will not be exceeded.

The sensor tip should be completely surrounded by medium. The sensor tip must be positioned in the area of maximum fluid velocity (pipe center).

**Recommended orientation: Tube horizontal, lateral installation**

**Recommended orientation: Tube vertical, lateral installation**

**Note** - Hygienic applications  $\geq 3^\circ$  inclination for self-draining.  
**Note** - The installation into a downpipe is not recommended.

**Conditionally recommended orientation: Tube horizontal, top installation**

**Note** - The pipe must be completely filled with medium.  
**Note** - The sensor tip should never touch the pipe wall.

**Conditionally recommended orientation: Tube horizontal, bottom installation**

**Note** - The pipe must be free of deposits.

A fully developed flow profile is necessary for correct monitoring. Steadying sections must be provided after a pump, pipe bend, etc.

$\varnothing \gg$  Pipe diameter  
 $S \gg$  Disturbance influence

The installation of the device should be made if possible at temperature calmed places.

### 2.3 Installation notes

Do not remove packaging until just before mounting and check the device for any damage.

**DANGER** - Install the device only when the system is pressureless. There is a risk of fast escaping media resp. pressure blow.

**DANGER** - Let the system cool down sufficiently before installing the device. There is a risk of dangerous and hot media escaping.

Sealing faces and threads on the device and at the mounting point must be clean and without damage.

The welding socket for the process connection metallic elastomer-free sealing must be installed without tension and contorsion:

- Drill a hole with outside diameter of the welding socket, tolerance  $+0,2\text{mm}$ .
- Insert the socket with the installation mark into the opposite direction of the flow direction.
- Attach the socket at 4 positions crosswise.
- Weld the sections between the attachment positions, possibly use a core rod.
- Let the welding socket cool down between welding the sections.

Parallel threads must be sealed by a suitable O-ring, flat or profile gasket. An additional sealing material such as yam, hemp or PTFE tape should not be used.

The tightening of the thread process connection may only be done at the hexagon by a suitable spanner at most with the maximum permitted torque strength ( $\leq 50\text{Nm}$  / Process connection metallic elastomer-free sealing:  $15\text{Nm}$  ( $5 \dots 20\text{Nm}$ )).

To achieve the best accuracy, the probe must be installed with the installation mark pointing into the opposite direction of the flow direction of the medium.

## 3 Electrical connection

**Danger** - Install the device only when power supply is off. There is a risk of electric shock.

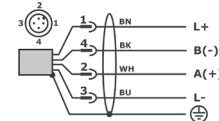
**Note** - For inauguration deactivate all connected control devices, to avoid unwanted control reactions.

The device must be grounded, e.g. by the metallic process connection.

Install cable separated from power leading cables, if existing connect shield to earth.

Cable: M12 - A-coded, 1-BN = brown / 2-WH = white / 3-BU = blue / 4-BK = black

### 3.1 Electronic type V - RS485 Modbus®-RTU



Connect the device at bus topology (line). A stub line must be avoided.

Observe line termination resistors  $120\Omega$  (A+ to B-) and bias network resistors  $720\Omega$  (A+ to L+ / B- to L-).

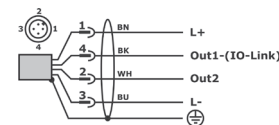
Use a cable 4-core acc. to the EIA485 recommendations:

Impedance	135...165Ω @ 3...20Mhz
Cable capacity	< 30pF/m
Cable diameter	> 0,64mm
Cable cross section	0,34 mm² / AWG 22
Loop resistance	< 110Ω/km
Shielding	Braided shield /shield foil
Cable length	38400 Baud $\leq$ 1200m

Observe maximum permitted supply voltage:

- $U_s = 6 \dots 35\text{VDC}$

### 3.2 Electronic type L - IO-Link®



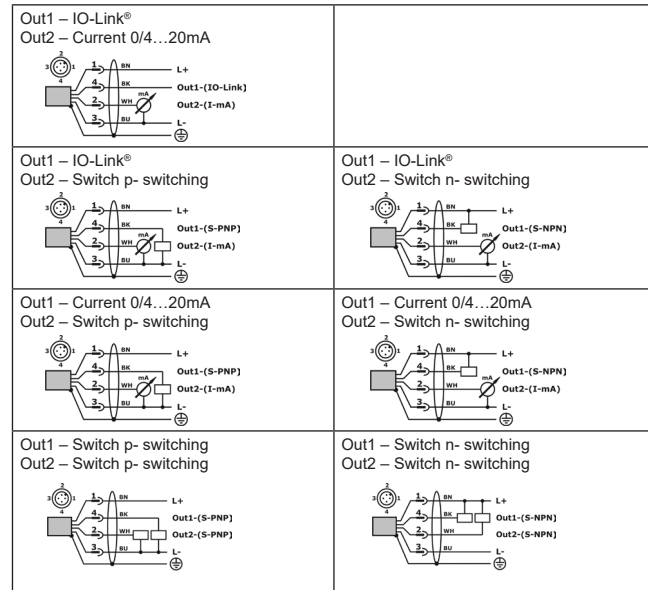
The IO-Link® communication requires an IO-Link®-Master.  
 Use a cable max. 20m, 3- resp. 4-core, unshielded.  
 Analogue output: A shielded cable must be used.  
 Observe maximum permitted supply voltage:

- $U_s = 9 \dots 35VDC$
- $U_s = 18 \dots 30VDC$ , IO-Link®

Observe maximum permitted load resistor of the analogue output:

- $RL \leq ((U_s - 8V) / 22mA)$

**Note** – Inductive loads at the switch outputs, e.g. contactors or magnetic vents may only be used with a free-wheeling diode or a RC protection circuit.



## 4 Operation

### 4.1 Modbus®-RTU

Knowledge concerning Modbus®-RTU is provided.

Function code	Function
03	Read Holding Register
04	Read Input Register
06	Write Single Register
16	Write Multiple Register

Holding Register – Device settings			2 Byte – Uint16 - R/W
Address	Description	Default	Comment
2000	Modbus ID	1	Modbus ID / 1 ... 247
2001	Baud-Rate	3	0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200 5 = 38400 6 = 57600 7 = 115200
2002	Parity	2	0 = None 1 = Odd 2 = Even
2003	Number Stopbits	0	0 = 1 Stop Bit 1 = 2 Stop Bit
2004	Word Order	0	0 = ABCD 1 = CDAB

Input Register – Values		2 Byte – Read only
Address	Data Type	Description
1000	UInt16	Device Type
1001	UInt32	Serial Number
1003	UInt16	Calibration Date
1004	UInt16	Hardware Version

Input Register – Values		4 Byte – Float – Read only
Address	Data Type	Description
1010	Upper Range	PV = Flow
1012	Lower Range	PV = Flow
1014	Maximum	PV = Flow
1016	Minimum	PV = Flow
1018	Upper Range	SV = Temperature
1020	Lower Range	SV = Temperature
1022	Maximum	SV = Temperature
1024	Minimum	SV = Temperature

Input Register – Values			Read only
Address	Byte Type	Description	Comment
1100	2 UInt16	Status	Bit 0: Invalid Measure Value PV Bit 1: Invalid Measure Value SV
1101	2 UInt16	Unit	PV = Flow
1102	4 Float	Measure Value	PV = Flow
1104	2 UInt16	Unit	SV = Temperature
1105	4 Float	Measure Value	SV = Temperature

Holding Register – Values			2 Byte – Uint16 – R/W
Address	Description	Default	Comment
2020	Damping Tau	1000	ms / PV = Flow
2021	Damping Tau	1000	ms / SV = Temperature

### 4.2 IO-Link®

Configuration via IO-Link®-Master, software and device driver IODD.

The IODD file as well as the IODD description can be ordered by the manufacturer or downloaded from the homepage.

## 5 Maintenance

The device is free of maintenance.

Solid coatings on the sensor can lead to faulty measurement results. The sensor must be regularly cleaned. Don't use sharp resp. hard tools, pressured air or aggressive chemicals. For dismantling the device see safety information's of the chapter "Dismounting".

## 6 Dismounting

Use suitable protective clothing, e.g. goggles, gloves.

**Danger** - Dismount the device only when power supply is off. There is a risk of electric shock.

**Danger** - Let the device and the system cool down sufficiently fore dismantling it. There is a risk of hot surfaces as well as dangerous and hot media escaping.

**Danger** - Dismount the device only when the system is pressureless. There is a risk of fast escaping media resp. pressure blow.

After dismantling the electrical connection plug must be fitted with protective caps.

## 7 Troubleshooting / Repair

In case of malfunction check:

- Enclosure >> Damage
- Sensor >> Damage / Pollution
- Process gaskets >> Damage
- Supply voltage >> Polarity / Voltage / Load / Contact
- Cable >> Damage / Short circuit / Wire break

For dismantling the device see safety information's of the chapter "Dismounting".

A repair may only be carried out by the manufacturer.

## 8 Return

Enclose necessary information's for return:

- An exact description of the application.
- The chemical and physical characteristics of the product.
- A short description of the occurred error.

Before returning the device, the following measures must be performed:

- Adhesive product residues e.g. caustic, toxic, radioactive etc. must be removed.
- A returning must be refrained, if it is not possible by 100% to remove the unhealthy product completely.

## 9 Disposal

This instrument is not subject to the WEEE directive and the respective national laws. Hence, pass the instrument directly on to a specialized recycling company and do not use the municipal collecting points.