

Operating Manual

Operating and Maintenance Manual

Conductive Limit Level Sensor
Type CFP compact

**CAUTION**

This operating manual contains important information and safety precautions.



Please read this manual thoroughly prior to installation, electrical connection and commissioning of the device.

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Original operating manual

Please keep for future reference!








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1. Target groups

Target group	Task
User/owner	Ensure that this manual is accessible at the place of use of the system for future reference.
	Ensure that all staff read and observe this manual and the included documentation, in particular, the safety and warning signs/instructions.
	Inform all staff about the potential dangers emanating from the medium and/or plant/system components.
	Train and instruct all specialist personnel and fitters with regard to the contents of this manual.
	Ensure that the contents of the operating manual are fully understood and adhered to by the specialist personnel and fitters.
Specialist personnel, fitters	Read and observe this manual and the included documentation, in particular, the safety and warning signs/instructions.

2. Warning signs and symbols

Warning sign	Hazard rating	Consequences of non-observance
	Imminent danger	Death or serious injuries due to explosion
	Imminent danger	Death or serious injuries due to live components
	Imminent danger	Death or serious injuries as a result of ignoring the warning
	Possibly dangerous situation	Minor injuries or damage to assets
	indicates important information	Nonobservance could impair the function of the valve!

Symbols	Meaning
•	Bullets

3. General information

Prerequisites for the perfect function of this product:

- Observance of the warning signs and symbols.
- Chemical and mechanical resistance of all components coming into contact with the medium.
- Observance of the installation and mounting direction.
- Proper transport and storage.
- Installation and commissioning by instructed specialist personnel.
- Operation in accordance with this operating manual.
- Correct servicing.

NOTE

The description and instructions refer to the standard version.

3.1 General safety information

The safety information in this operating manual only refers to the device described herein.

In combination with other plant/system components, hazard potentials may result that must be evaluated by means of a hazard analysis.

The user/owner of the system is responsible for this hazard analysis, the adherence to resulting protection measures and to regional safety regulations.

The following is not taken into account by the safety information:

Unexpected situations and events that could be encountered during installation, operation and maintenance.

The location specific safety instructions, for the adherence of which the user/owner is responsible - together with the installation personnel involved.

3.2 Intended use

- These probes are used for limit level detection of electrically conductive liquids.

Utilisation

- as level probes with 2 probe rods as maximum or minimum filling level display.
- as level probe with 3 probe rods as 2-state control unit.

DANGER



not suitable for use in potentially explosive areas!

3.3 Warning against misuse

In the event of improper/incorrect use or non-intended use, hazards may emanate from this

device such as container overflow or damage to system/plant components due to incorrect assembly or setting.

3.4 General safety information

This product is designed according to state-of-the-art technology taking the standard regulations and directives into consideration. As the user/owner, adhere to the safety information contained in this operating manual, the country-specific installation standards (e.g. in Germany the VDE regulations), as well as the applicable safety regulations for containers and pipes, and the accident prevention regulations.

3.5 CE sign

This product complies with the following directives: EN 55011/B; EN61326-1.

3.6 Personnel qualification and training

Ensure that the personnel employed for the operation, maintenance, inspection and installation of the device are suitably qualified for this type of work.

3.7 Hazards resulting from non-observance of the safety information

Non-observance of the safety information can lead to hazards to persons, to the environment and to the device/system/plant.

Non-observance of the safety information will lead to the loss of any right to claim for damages.

In particular, non-observance could lead to the following hazardous situations, for example:

- Danger to persons due to electrical, mechanical or chemical effects.
- Environmental hazards as a result of the leakage of hazardous substances.
- Malfunction of important functions of the device/system/plant.
- Disruption of prescribed maintenance and repair methods.

3.8 Safety-conscious work practices

Observe the safety information contained in this operating manual, the pertinent national accident prevention regulations, as well as all in-house work, operating and safety instructions of the owner/user.

3.9 Safety information for the user

- Inform personnel, instructed with the installation, inspection and/or maintenance work, of any potential dangers emanating from the medium/plant and ensure that they work in accordance with safety procedures and in a suitable way for thermoplastic materials.
- Exclude the risk of electric shock (apply the country-specific and/or the local public utility company regulations).

3.10 Safety information for maintenance, inspection and assembly work

- Ensure that the device/system/plant is disconnected from the power supply and secured against unauthorised reactivation.
- Always decontaminate device components exposed to media that are hazardous to health.
- Refit and/or reactivate and check all safety and protective devices/guards immediately after completion of the work.

3.11 Unauthorised conversion/spare part procurement

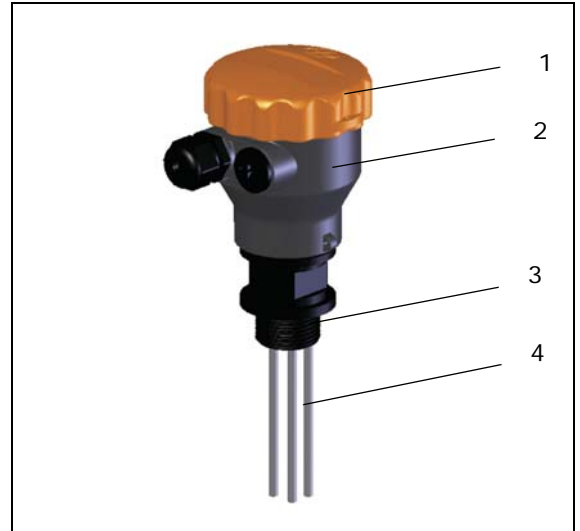
The device may not be converted or changed without the prior approval of the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure the safety of the device. The use of other components shall invalidate the guarantee with respect to any resulting damage!

3.12 Inadmissible operation

The operational safety of the supplied device is only guaranteed if it is used according to its intended use and in compliance with the following sections of the operating manual. Ensure that the device parameters specified by the manufacturer are not exceeded.

4. Product description

4.1 Components



1. Housing cover
2. Connection head
3. Device connection
4. Sensor rods

4.2 Application

The ASV type CFP is a sensor for (contact) limit level detection of liquids.

The sensitivity can be individually adjusted using a potentiometer. This product may be exposed to the temperatures and pressures specified in the "Technical data".

4.3 Function description

The sensor operates according to the conductive principle. When the conductive liquid reaches the ends of the electrode rods, a conductive connection is created, which is evaluated by the integrated electronics.

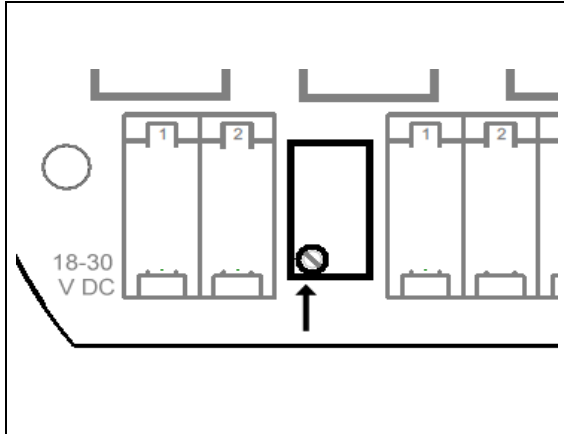
Electrolytic decomposition is avoided due to the alternating current.

Limits of use

- conductive probes, in general, are not suitable for fluids that contain oil or grease or are susceptible to forming electrically insulating sediments.
- not suitable for electrically non-conductive liquids.
- not suitable for liquids to which stainless steel (1.4571) is not permanently resistant.

4.4 Operation

The potentiometer on the PCB in the connection head is used for adjusting the sensitivity to the conductivity of the respective medium. The sensitivity is increased by turning the potentiometer clockwise. The LEDs indicate when the respective limit level is reached.



CAUTION

Do not use the top part of the housing to screw in the sensor as this could cause mechanical damage leading to leaks.

5.4 Voltage supply

DANGER

Please adhere to the safety information!

Only connect in an isolated state!

Connect the supply voltage in accordance with the following connection diagrams.

5.5 Connection cable

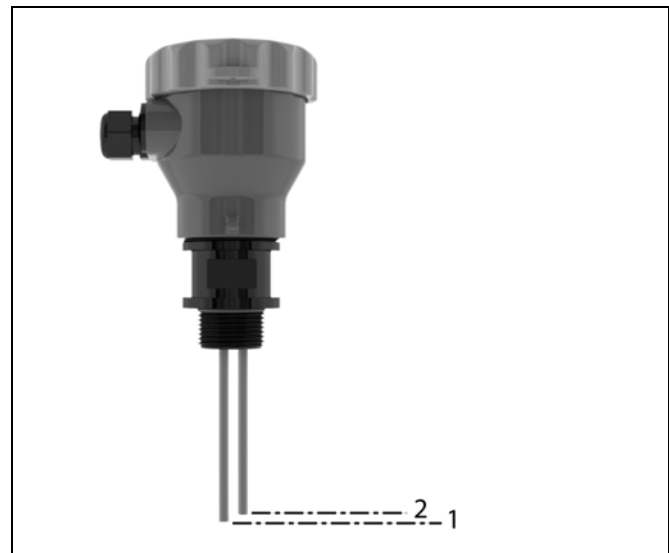
The device is connected with a commercially available cable. We recommend using a shielded cable if electro-magnetic interference above the EN 61326 test values for industrial areas is to be expected or if the cable length exceeds 30 m.

The max. cable cross section must not exceed 1.5 mm². A cable outer diameter of 7 ... 13 mm guarantees the sealing effect of the cable screw connection.

If you use cables with other diameters, change the seal or use a suitable cable screw connection.

5.6 Electrical connection

5.6.1 Example: 2-rod probe



1 = Reference (white wire - plug Pin1)

2 = Maximum / Minimum
(blue wire - plug Pin2)

4.5 Storage and transport

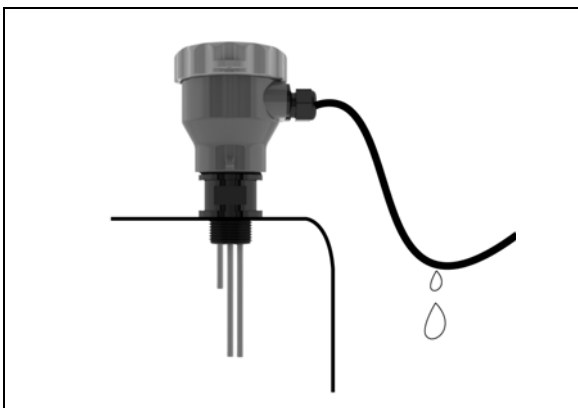
During delivery to the place of use your device is protected by packaging from the normal wear and tear of transport. For standard devices the packaging is made of cardboard, which is recyclable and environmentally compatible. Dispose of the packaging material via a specialised recycling company.

5. Installation

5.1 General information

Ensure that the device components coming into contact with the medium are suitable for the respective process conditions such as pressure, temperature etc., as well as for the chemical properties of the media.

Take the appropriate measures to prevent the ingress of moisture:



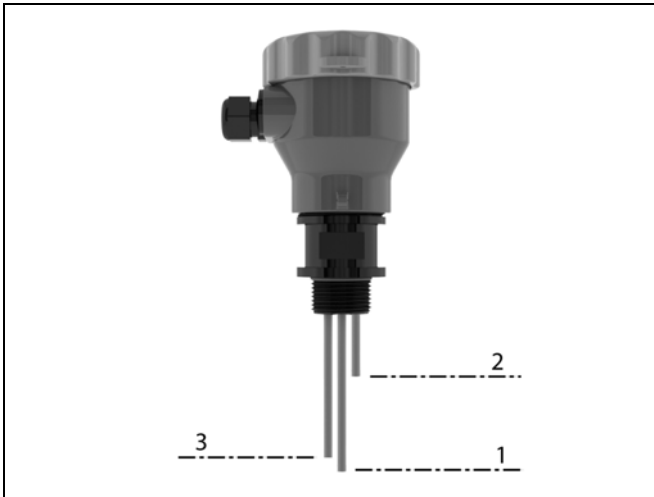
5.2 Measuring range

The maximum probe length is 1500 mm. Ensure that the non-insulated ends do not touch each other!

5.3 Mechanical installation

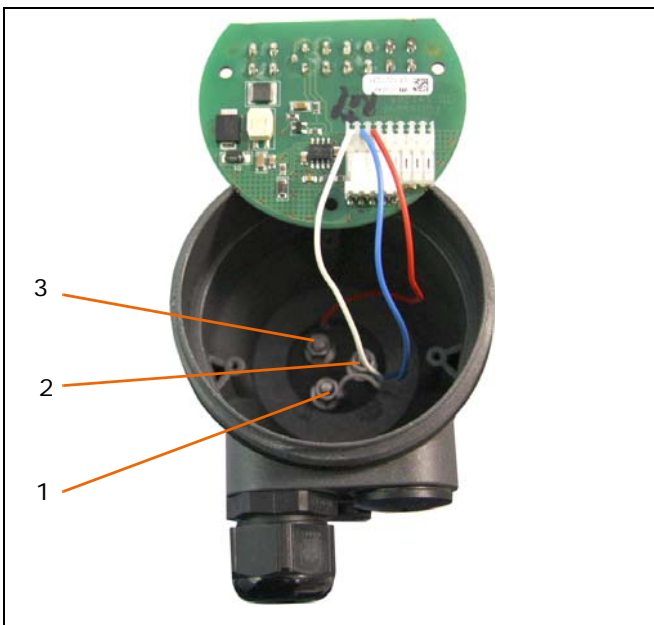
Use a suitably sized open jaw spanner to screw the filling level sensor vertically into the top of the container. Ensure that it is vertically aligned in relation to the surface of the medium to be measured. Only fit vertically from above!

5.6.2 Example: 3-rod probe



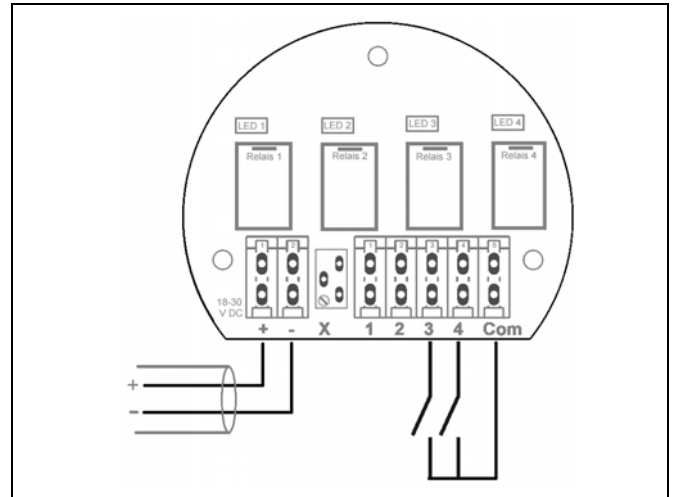
- 1 = Reference (white wire - plug Pin1)
- 2 = Maximum (blue wire - plug Pin2)
- 3 = Minimum (red wire - plug Pin3)

5.6.3 Probe connection



- 1 = Reference (white wire - plug Pin1)
- 2 = Maximum (blue wire - plug Pin2)
- 3 = Minimum (red wire - plug Pin3)

5.6.4 Wiring diagram



- + Voltage supply (18..30 V DC)
- Voltage supply (0 V)
- 1 -
- 2 -
- 3 Relay 3 (NO)
- 4 Relay 4 (NO)
- COM Relay 1-4 (COM)
- X Potentiometer for adjusting the sensitivity

5.6.5 CFP electrically connect



There is a danger of electric Power!

Only trained and authorized electricians may carry out work on the electrical installation.

Turn off the electrical power to the associated switch and secure the switch against unintentional re-start with a padlock.

5.6.6 Proceed as follows:

1. Unscrew the housing cover.
2. Undo the union nut of the cable screw connection.
3. Strip approx. 10 cm of the connection cable, remove approx. 1 cm of the insulation from the lead ends and fit ferrules.
4. Insert the cable through the cable screw connection into the connection head.
5. Insert the ends of the leads into the terminals according to the wiring diagram.
6. Push down the clamp levers.
7. Check that the leads are correctly seated in the terminals.
8. Firmly tighten the union nut of the cable screw connection. Ensure that the sealing ring completely encloses the cable.



9. Screw on the housing cover.
The electrical connection is completed.

6. Commissioning/start-up

Once the limit level sensor has been connected to the voltage supply, it is necessary to set the relays to the respective states and test them. It is necessary to adjust the sensitivity if the conductivity of the medium is very low or very high. For this, test the function of the sensor with the medium. Turning the potentiometer clockwise increases the sensitivity; turning counterclockwise reduces it. The LEDs indicate when the respective limit level is reached.

Service/maintenance

7. Maintenance

This product is maintenance-free when used in accordance with its intended use.

In some applications residue may adhere to the sensor and impair the measuring result. Depending on the sensor and application, it is therefore necessary to take measures to remove any excessive residue and prevent such residue from hardening. Clean the rods if necessary. Ensure that the cleaning agents are suitable for the respective materials.

Prior to commissioning, check that all devices are correctly connected and functioning. Check the electricity supply - including that of the downstream devices.

Observe the general operating instructions for the devices used.

Check the function of the devices at suitable intervals.

It is the responsibility of the user/owner to define the type of inspection and the time intervals within the specified time frame.

We recommend that devices used outside are checked/tested at least every six months.

7.1 Troubleshooting

Despite the high functional reliability of this product, malfunctions can still occur during operation. This can have the following causes:

- Deposits on the sensor rods
- Process changes
- Supply voltage
- Sensitivity too low / too high
- Signal evaluation

As a first measure, always check the output/ input signals.

8. Removal

CAUTION



Prior to removal, take necessary precautions with regard to hazardous process conditions such as pressure in the container, high temperatures, aggressive or toxic filling media etc.

8.1 Disposal

The device consists of materials that can be recycled by specialised recycling companies.

We have designed the electronics to allow easy separation and have used recyclable materials.

This device is not subject to the WEEE Directive 2002/96/EC and the respective national laws (in Germany e.g. ElektroG). Give the device directly to a specialised recycling company. The device may not be disposed of via a municipal collection point that is only intended for products used by private

households in accordance with the WEEE Directive.

Professional disposal avoids a negative impact on persons and the environment and allows the recycling of valuable raw materials.

9. Appendix

9.1 General technical data

Measuring value

- Limit level

Measuring principle

- Conductive

Type of protection

- Connection head: IP67

Voltage supply

- $U_{in} = 18 \dots 30V$ DC

Connection cable

- Cable outer diameter of 7 ... 13 mm
- Nominal cross-section 1.5 mm²

9.2 Materials / weights

9.2.1 Materials coming into contact with the medium

- Rods: stainless steel (1.4571)
- Insulation: polyolefin
- Device connection: PE-EPDM

9.2.2 Materials not coming into contact with the medium

- Housing: PP-GF
- Housing cover: PP-GF / PA transparent
- Cover seal: NBR

9.2.3 Weight

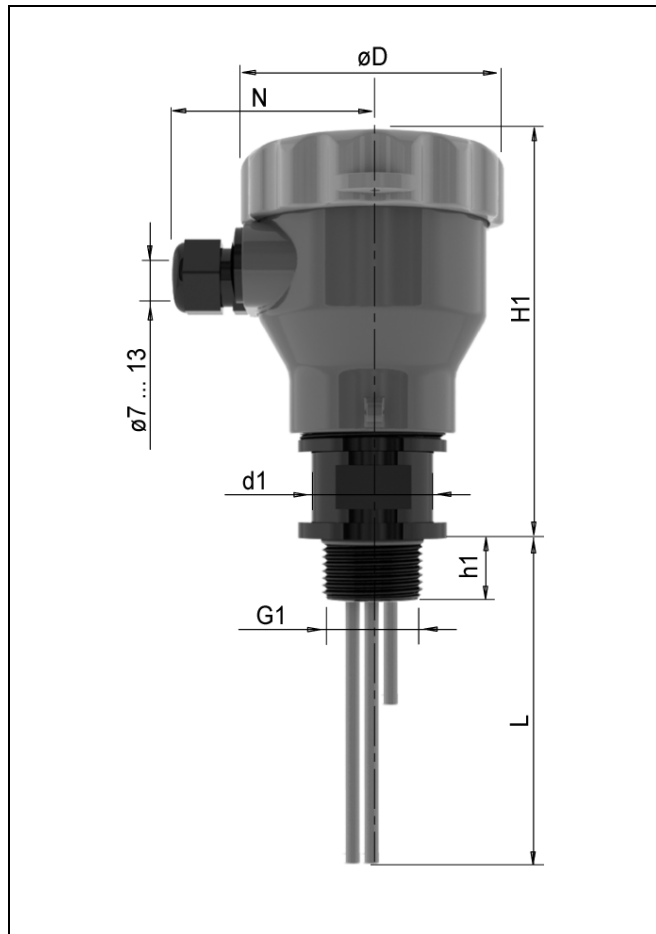
- Basic weight without rods: 0.25 kg
- Rod per 1m: 0.12 kg

9.3 Output signal Relay version

- Normally open relay (NO)
- 2A/ 30 V DC and 0.5 A / 125 V AC
- Common COM connection

9.4 Ambient/process conditions

- Ambient/storage and transport temperature -20 ... 70°C
- Process temperature -20 ... 60°C
- Ambient/container pressure 0.8 ... 1.1 bar
- Relative humidity 20..85%

10. Dimensions

11. Ident No.

ID No.	designation
141935	ASV CFP 2 R-100 Relay version Limit level sensor, conductive Immersion depth: 100 mm Device connection: 1" PE
141936	ASV CFP 2 R-500 Relay version Limit level sensor, conductive Immersion depth: 500 mm Device connection: 1" PE
141937	ASV CFP 2 R-1000 Relay version Limit level sensor, conductive Immersion depth: 1000 mm Device connection: 1" PE
141938	ASV CFP 3 R-500 Relay version Limit level sensor, conductive Immersion depth: 500 mm Device connection: 1" PE
141939	ASV CFP 3 R-1000 Relay version Limit level sensor, conductive Immersion depth: 1000 mm Device connection: 1" PE

L	100	500	1000
D	86	86	86
d1	40	40	40
G1	1"	1"	1"
H1	130	130	130
h1	20	20	20
L	100	500	1000
N	66	66	66



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