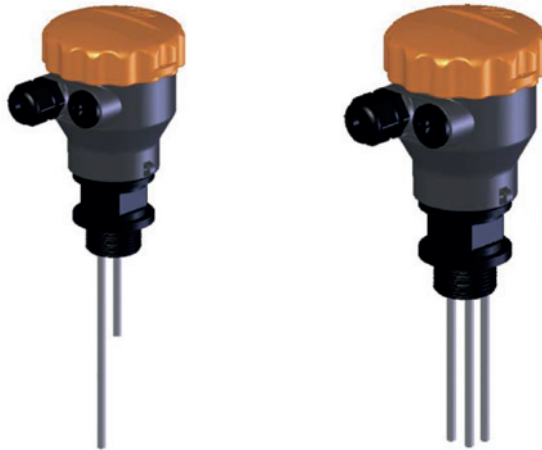


Conductive limit level sensor

Original operating manual

CFP series



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Subject to technical modifications.
Read carefully before use.
Save for future use.



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1 About this document

This manual:

- is part of the equipment
- applies to all series referred to
- describes safe and proper operation during all operating phases

1.1 Target groups

Operating company

- Responsibilities:
 - Always keep this manual accessible where the device is used on the system.
 - Ensure that employees read and observe this document, particularly the safety instructions and warnings, and the documents which also apply.
 - Observe any additional country-specific rules and regulations that relate to the system.

Qualified personnel, fitter








- Mechanics qualification:
 - Qualified employees with additional training for fitting the respective pipework
- Electrical qualification:
 - Qualified electrician
- Transport qualification:
 - Qualified transport specialist
- Responsibility:
 - Read, observe and follow this manual and the other applicable documents, especially all safety instructions and warnings.

1.2 Other applicable documents

| | |
|--|---|
| <p>To download:</p> <p>Resistance lists Resistance of materials used to chemicals</p> <p>www.stuebbe.com/pdf/300051.pdf</p> |  |
| <p>To download:</p> <p>CFP data sheet Technical data and conditions of operation</p> <p>www.stuebbe.com/pdf/302489.pdf</p> |  |
| <p>To download:</p> <p>CE declaration of conformity Conformity with standards</p> <p>www.stuebbe.com/pdf/300771.pdf</p> |  |


Tab. 1 Other application documents, purpose and where found

1.3 Warnings and symbols

| Symbol | Meaning |
|--|--|
|  | <ul style="list-style-type: none"> • Immediate acute risk • Death, serious bodily harm |
|  | <ul style="list-style-type: none"> • Potentially acute risk • Death, serious bodily harm |
|  | <ul style="list-style-type: none"> • Potentially hazardous situation • Minor injury |
|  | <ul style="list-style-type: none"> • Potentially hazardous situation • Material damage |
|  | <p>Safety warning sign</p> <ul style="list-style-type: none"> ▶ Take note of all information highlighted by the safety warning sign and follow the instructions to avoid injury or death. |
|  | Instruction |
| 1., 2., ... | Multiple-step instructions |
| ✓ | Precondition |
| → | Cross reference |
|  | Information, notes |

Tab. 2 Warnings and symbols

2 General safety instructions

 The manufacturer accepts no liability for damages caused by disregarding any of the documentation.

2.1 Intended use


The device is intended to be used for sensing the limit level of electrically conductive liquid media, by contact.

- Only use the device with suitable media (→ resistance lists).
- Adhere to the operating limits (→ Data sheet).

Avoidance of obvious misuse (examples)

- Do not use the device on media with the following characteristics:
 - Containing oil or grease
 - Tendency to form non-conductive deposits
 - Conductivity of the medium less than 16µS/cm
 - Media to which stainless steel (1.4571) is not resistant
- Do not use the device in potentially explosive atmospheres.

2.2 General safety instructions

 Observe the following regulations before carrying out any work.

2.2.1 Obligations of the operating company

Safety-conscious operation

- Only operate the device if it is in perfect technical condition and only use it as intended, staying aware of safety and risks, and in adherence to the instructions in this manual.
- Ensure that the following safety aspects are observed and monitored:
 - Intended use
 - Statutory or other safety and accident-prevention regulations
 - Safety regulations governing the handling of hazardous substances
 - Applicable standards and guidelines in the country where the pump is operated
- Make personal protective equipment available.

Qualified personnel

- Make sure all personnel tasked with work on the device have read and understood this manual and all other applicable documents, especially the safety, maintenance and repair information, before they start any work.
- Organize responsibilities, areas of competence and the supervision of personnel.
- The following work should be carried out by specialist technicians only:
 - Installation, repair and maintenance work
 - Work on the electrical system

- Make sure that trainee personnel only work on the device under supervision of specialist technicians.

2.2.2 Obligations of personnel

Only complete work on the device if the following requirements are met:

- System is empty
- System has been flushed
- System is depressurized
- System has cooled down
- System is secured against being switched back on again
- Do not make any modifications to the device.

2.3 Hazardous media

- When handling hazardous media, observe the safety regulations for the handling of hazardous substances.
- Use personal protective equipment when carrying out any work on the device.
- Collect leaking pumped liquid and residues in a safe manner and dispose of in accordance with environmental regulations.

3 Layout and Function

3.1 Marking

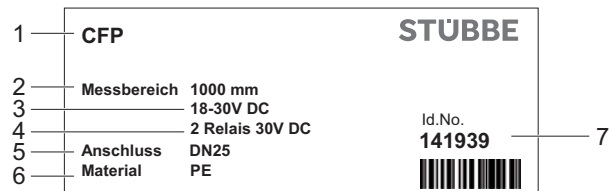


Fig. 1 Name plate (example)

- 1 Device type
- 2 Measurement range
- 3 Supply voltage range
- 4 Outlet
- 5 Connection (nominal width)
- 6 Media connection and gasket material
- 7 ID number

3.2 Description

The device is a probe to be used for sensing the limit level of electrically conductive liquid media, by contact.

- When the medium makes contact with the sensor rods, this creates a conductive connection which is evaluated by the electronics in the connector head.
- Sensitivity adjustment via the potentiometer
- Device installed in the vessel so that it is perpendicular to the surface of the medium
- 2-rod probe for indicating the minimum or maximum filling level
- 3-rod probe in the following variants depending on the circuit board installed:
 - 2-state control unit
 - Indicates the minimum and maximum filling level

3.3 Layout

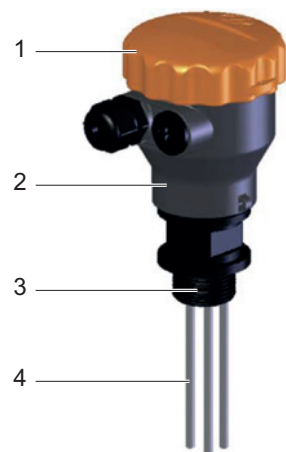


Fig. 2 Layout (example)

- 1 Housing cover
- 2 Connector head
- 3 Process connection
- 4 Sensor rods

4 Transport, Storage and Disposal

4.1 Unpacking and inspection on delivery

1. Unpack the device when received and inspect it for transport damage and completeness.
2. Check that the information on the type plate agrees with the order/design data.
3. Report any transport damage to the manufacturer immediately.
4. If fitted immediately: Dispose of packaging material according to local regulations.
 - If fitted at a later point: leave device in its original packaging.

4.2 Transportation

- Device should preferably be transported in the original packaging.

4.3 Storage

NOTE

Material damage due to inappropriate storage!

- Store the device properly.

1. Make sure the storage room meets the following conditions:
 - Dry
 - Frost-free
 - Vibration-free
 - Not in direct sunlight
 - Storage temperature +10 °C to +60 °C
2. Device should preferably be stored in the original packaging.

4.4 Disposal

⚠ WARNING

Substances hazardous to health!

The device contains substances that are hazardous to health and the environment if disposed of improperly.

- Do not discard the old device in household waste.

1. When disposed of via the manufacturer's return system:
 - If applicable, delete any personal data.
 - Keep the old device separate from household waste and return it to the manufacturer.
2. In the case of self-disposal:
 - Remove battery.
 - Disassemble electronic parts and plastic parts.
 - Dispose of parts according to local regulations.

5 Installation and connection

5.1 Preparations for installation


5.1.1 Check operating conditions

1. Ensure the required operating conditions are met:
 - Resistance of body and seal material to the medium (→ resistance lists).
 - Media temperature (→ Data sheet)
 - Operating pressure (→ Data sheet)
2. Consult with the manufacturer regarding any other use of the device.

5.1.2 Preparation of the device

1. Ensure the device is protected against ingress of moisture.
2. Cut the probe rods to length if necessary. Check the application examples for the relevant type (→ 9.2.1 Description of the contact points, Page 8).
3. Check that the uninsulated ends of the rods are not touching each other.

5.1.3 Preparation of the vessel

 The device can be installed in closed and open containers. When installed in an open vessel, the device should be mounted on a suitable bracket (such as the PE installation kit).

1. When installed in an enclosed vessel, ensure the approved installation thread diameter G 1" is provided.
2. Check that the vessel provides sufficient immersion depth.
3. Align the vessel correctly, ensuring the following points are satisfied:
 - The device must be mounted perpendicular to the surface of the medium
 - Sufficient space for installation, electrical connection and maintenance

5.2 Install device

- ✓ The device installation is complete.

WARNING

Risk of injury and poisoning due to medium spraying out!


- Use personal protective equipment when carrying out any work on the fitting.

NOTE

Incorrect installation can lead to material damage!

- Do not grip the top part of the housing to screw in the device.
- Insert a screwdriver into the process connection in order to screw in the device perpendicular to the surface of the medium.


5.3 Electrical connection

 Cable without shielding can be used to connect the device. If electromagnetic interference is anticipated, or if the cable lengths are greater than 30 m, shielded cable should be used.

- ✓ The unit must be installed properly.
 - ✓ Power supply switched off and secured against being switched back on again.
1. Unscrew the housing cover.
 2. Guide the connection cable through the cable glands and connect:
 - Connection cable (→ Data sheet)
 - Description of the contact points and circuit diagrams (→ 9.2 Connection diagrams, Page 8).
 3. Tighten the cable glands securely.
 4. Screw on the housing cover.

6 Operation

6.1 Configure device

 If the medium exhibits either low conductivity or high conductivity, it will be necessary to adjust the sensitivity using the potentiometer.

The potentiometer is described in the connection diagrams (→ 9.2.2 Connection diagrams, Page 8).

- ✓ The device is installed and connected.
1. Fill the vessel until the medium makes contact with the probe rods.
 2. Unscrew the housing cover.
 3. Switch on power supply.
 4. To increase the sensitivity, turn the potentiometer clockwise.
 5. To decrease the sensitivity, turn the potentiometer anti-clockwise.

The LEDs indicate that the respective limit level has been reached.

6. Switch off power supply.
7. Screw on the housing cover.

6.2 Commissioning

- ✓ The device is installed and connected.
- ✓ The device has been adjusted.
- Switch on power supply.

When the medium makes contact with the sensor rods, the device will indicate the minimum or maximum filling level. If the device is fitted with a 2-state control unit, the corresponding circuit will be activated.

7 Maintenance

WARNING

Risk of injury and poisoning due to hazardous media and improper operating procedure!

- ▶ Use personal protective equipment when carrying out any work on the device.
- ▶ Disconnect the power supply and secure it against being switched back on again.
- ▶ Block the infeed of media to the vessel / the device.
- ▶ Depressurize the vessel / the device and allow it to cool down.
- ▶ Safely collect the media and dispose of it in accordance with environmental regulations.

7.1 Servicing

| Interval | Action |
|-------------------|--|
| As necessary | ▶ Clean device with a damp cloth. |
| If deposits occur | ▶ Clean the probe rods. Ensure that the materials are resistant to the cleaning agents (→ resistance list). |
| Six-monthly | ▶ Perform a visual and functional check: <ul style="list-style-type: none"> • Normal operating conditions unchanged • No leaks |

Tab. 3 Servicing activities

- ▶ Perform maintenance tasks according to the table.

7.2 Maintenance

7.2.1 Removing the device

- ✓ System is empty.
 - ✓ System has been flushed.
 - ✓ System is depressurized.
 - ✓ System has cooled down.
 - ✓ System must be secured against being switched back on again.
1. Disconnect the supply cable.
 2. Take the device out of the vessel.
 3. Decontaminate device if required.

7.2.2 Replacement parts and return

1. Have the following information ready to hand when ordering spare parts (→ Type plate).
 - Device type
 - ID number
 - Nominal pressure and diameter
 - Body and seal material
2. Please complete and enclose the document of compliance for returns (→ www.stuebbe.com/en/service/download).



3. Use only spare parts from STÜBBE.

8 Faults

WARNING

Risk of injury and poisoning due to hazardous media liquids!

- ▶ Use personal protective equipment when carrying out any work on the device.

| Fault | Possible cause | Corrective action |
|----------------------|--------------------------------|--|
| Device does not trip | Deposits on the probe rods | ▶ Clean the probe rods. Ensure that the materials are resistant to the cleaning agents (→ resistance list). |
| | No supply voltage | ▶ Check the supply voltage and if necessary switch it on. ▶ Check the electrical connection and if necessary make the correct connection (→ 5.3 Electrical connection, Page 6). |
| | Sensitivity too high / too low | ▶ Adjust the device correctly (→ 6.1 Configure device, Page 6). |


Tab. 4 Troubleshooting

After the fault has been rectified, test the device.

- ▶ Dip the probe rods into the medium and check the output signals and input signals. If the device trips, the fault has been rectified.

9 Appendix

9.1 Technical data, operating limits, dimensions and weights

 The particulars are described on the data sheet (→ Data sheet).

9.2 Connection diagrams

9.2.1 Description of the contact points

2-rod probe



Fig. 3 Contact points for 2-rod probe (example)

- 1 Reference (black probe)
- 2 Minimum/maximum (relay 4 / blue probe)

3-rod probe



Fig. 4 Contact points for 3-rod probe (example)

- 1 Reference (black probe)
- 2 Maximum (relay 4 / blue probe)
- 3 Minimum (relay 3 / red probe)

9.2.2 Connection diagrams

Filling level indicator

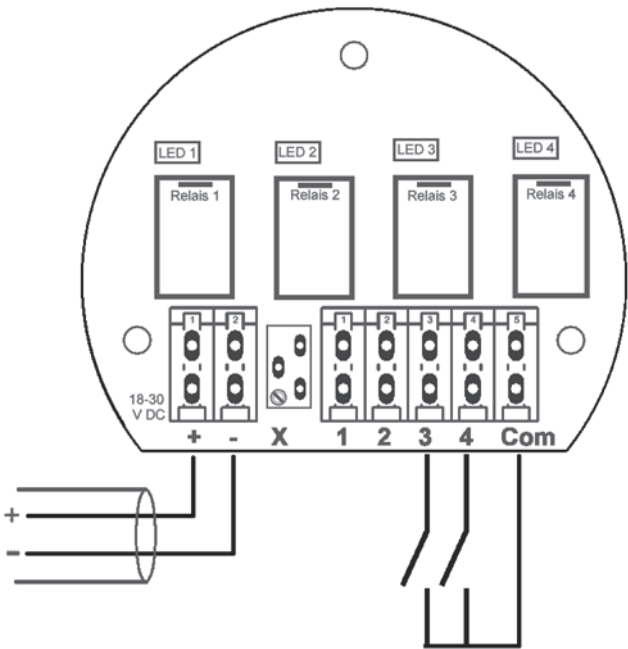


Fig. 5 Connection diagram, filling level indicator

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

Tab. 5 Connection diagram, filling level indicator

2-state control unit

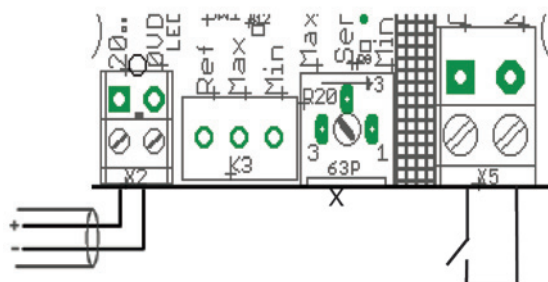


Fig. 6 Connection diagram, 2-state control unit

| Terminal | Connection |
|----------|---|
| + | Voltage supply (20...30 V DC) |
| - | Voltage supply (0 V) |
| X | Potentiometer for adjusting the sensitivity |
| X5 | Relay (NO) |
| | Relay (COM) |

Tab. 6 Connection diagram, 2-state control unit

9.3 Output signals

9.3.1 Filling level indicator

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

9.3.2 2-state control unit

- Normally-open relay (NO)
- 8A/250 V AC