

# Filling level transmitter MOT

Original operating manual

Series  
MOT C2



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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

|  |   |
|--|---|
| To download:<br><b>Resistance lists</b><br>Resistance of materials used to chemicals<br><a href="http://www.stuebbe.com/pdf_resistance/300051.pdf">www.stuebbe.com/pdf_resistance/300051.pdf</a> |  |
| To download:<br><b>Data sheet</b><br>Technical data and conditions of operation<br><a href="http://www.stuebbe.com/pdf_datasheets/302346.pdf">www.stuebbe.com/pdf_datasheets/302346.pdf</a>      |    |
| To download:<br><b>CE declaration of conformity</b><br>Conformity with standards<br><a href="http://www.stuebbe.com/pdf_DOC/302358.pdf">www.stuebbe.com/pdf_DOC/302358.pdf</a>                   |  |


Tab. 1 Other application documents, purpose and where found

## 1.3 Warnings and symbols

| Symbol   | Meaning  |
|--|--|
|  | <ul style="list-style-type: none"> <li>• Immediate acute risk</li> <li>• Death, serious bodily harm</li> </ul>                                     |
|  | <ul style="list-style-type: none"> <li>• Potentially acute risk</li> <li>• Death, serious bodily harm</li> </ul>                                   |
|  | <ul style="list-style-type: none"> <li>• Potentially hazardous situation</li> <li>• Minor injury</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>• Potentially hazardous situation</li> <li>• Material damage</li> </ul>                                     |
|   | Safety warning sign<br>► 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 measures the filling level of a liquid medium.

- Device must only be used for measuring the filling level in liquid media.
- Only use the device with suitable media (→ resistance lists).
- Adhere to the operating limits (→ Data sheet).

### 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 Specific hazards

#### 2.3.1 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 Name plate

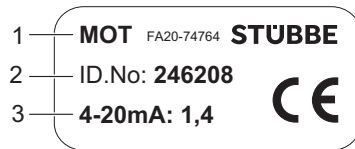


Fig. 1 Name plate (example)

- 1 Device type
- 2 ID number
- 3 Output on pin 1 and 4

Device type

- MOT C2 – current output

### 3.2 Description

The device measures the filling level of a liquid medium with the help of a magnetic float. The device transmits the measured value via a standardized 4-20 mA current output.

### 3.3 Assembly

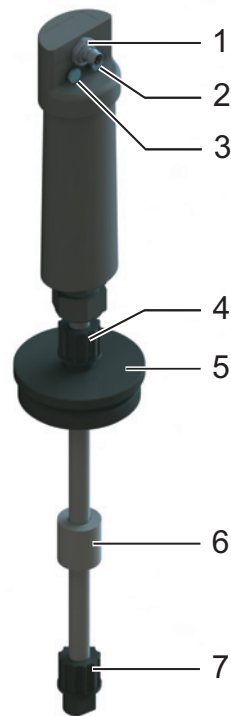


Fig. 2 Assembly

- 1 M8 connector
- 2 20 mA key (concealed) / plug
- 3 4 mA key (concealed) / plug
- 4 Tank gland union nut
- 5 Tank gland ( $\frac{3}{4}$ " or 2")
- 6 Float
- 7 End piece

## 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

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##### 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

 Plastic parts can be contaminated by poisonous or radioactive media to such an extent that cleaning will not be sufficient.

#### WARNING

##### Risk of poisoning and environmental damage from medium!

- ▶ Use personal protective equipment when carrying out any work on the device.
  - ▶ Prior to the disposal of the device: Neutralize residues of medium in the device.
- 
1. Remove electronic parts and dispose of in accordance with local regulations.
  2. Dispose of plastic parts in accordance with local regulations.


## 5 Installation and connection

### 5.1 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.

### 5.2 Prepare tank


- ✓ The operating conditions must have been checked.

 The device can be installed in closed and open containers. When the device is installed in open containers, it is mounted on a suitable mounting device (e.g. mounting bracket).

1. Make sure that the tank connection is suitable for the installation of the device. Observe permissible connection widths:
  - 3/4"
  - 2"
2. Align the tank correctly and observe the following:
  - Vertical mounting position of the device
  - Sufficient space for installation, electrical connection and maintenance
3. Avoid interferences:
  - Secure the tank against unintentional changes of position.
  - Do not select an installation location near filling pipes.
  - When installing in open tanks or basins, do not install the unit over turbulence or the vortex caused by agitators.

### 5.3 Install device

- ✓ Tank has been properly prepared.

 Avoidance of medium buildup.  
Select installation location so that no build-up or crystallization is possible.

### WARNING

#### Risk of injury and poisoning due to medium spraying out!


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

1. Undo the union nut of the tank gland.
2. Check the union nut on the end piece for a tight fit and tighten if necessary.

3. Guide the device into the tank connection on the top of the tank and lower it to the base of the tank.
4. Fasten the device to the tank connection with the tank gland.
5. Tighten the union nut of the tank gland.

### 5.4 Electrical connection of device

- ✓ Device is installed in the tank.
- ✓ Power supply switched off and secured against being switched back on again.


 Cable without shielding can be used to connect the device. If electromagnetic interference is anticipated, then shielded cable must be used.

1. Cut sensor cable to length.
2. Fit plug (→ 9.2 Plug assignment, Page 10).
3. Connect the device with the sensor cable.

## 6 Operation

### 6.1 Configure device

- ✓ Device is installed in the tank.
- ✓ Device is connected properly with the power supply and ready for operation.

 If necessary, the float position can be adjusted manually with the keys.

On delivery, the device is set as follows:

- Top float position = 20 mA
- Bottom float position = 4 mA

1. Remove both plugs to operate the keys.
2. To set the bottom float position, proceed as follows:
  - Empty the tank until the desired float position is reached.
  - Press the 4 mA key or the 20 mA key with a suitable tool as required.
  - Check the setting 4 mA or 20 mA in the control display.

The bottom float position is stored for the selected current output.


3. To set the top float position, proceed as follows:
  - Fill the tank to the maximum level until the desired float position is reached.
  - Press the 4 mA key or the 20 mA key with a suitable tool as required.
  - Check the setting 4 mA or 20 mA in the control display.

The top float position is stored for the selected current output.

4. Mount both plugs on the keys.

### 6.2 Restore the pump to service

- ✓ Device is installed in the tank.
- ✓ Device is connected properly with the power supply and ready for operation.
- ✓ Device is set manually as required.

 For this purpose, the current output for filling level must be displayed in the higher-level controller as a measured value.

- ▶ After starting the superordinate control, the device transmits a current signal (4-20 mA) linear to the filling level.

## 7 Maintenance

### WARNING

**Risk of injury and poisoning due to hazardous or hot media!**

- ▶ Use personal protective equipment when carrying out any work on the device.
- ▶ Make sure that the tank is depressurized.
- ▶ Block the media supply to the tank.
- ▶ Switch off the power supply to the system.
- ▶ Secure the power supply against being switched back on again.
- ▶ Provide warning of maintenance and repair work and set up warning signs.

### 7.1 Servicing

| Interval     | Action   |
|--------------|--|
| As necessary | <ul style="list-style-type: none"> <li>• Clean device with a damp cloth.</li> </ul>  |
| Six-monthly  | Visual and function check: <ul style="list-style-type: none"> <li>• Normal operating conditions unchanged</li> <li>• No leaks</li> </ul> |

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. Unplug connection cable.
  2. Take the device out of the tank.
  3. Decontaminate device if required.



## 7.2.2 Replacement parts and return

1. Have the following information ready to hand when ordering spare parts (→ 3.1 Name plate, Page 5).
  - Device type
  - ID number
  - Connection and gasket material
2. Please complete and enclose the document of compliance for returns (→ [www.stuebbe.com/en/service/download](http://www.stuebbe.com/en/service/download)).



3. Use only spare parts from STÜBBE.

## 8 Troubleshooting

### WARNING

**Risk of injury and poisoning due to hazardous or hot media!**


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

| Error   | Possible cause                   | Corrective action                                    |
|---|----------------------------------|--|
| No change to the output signal  | Float is stuck                   | ▶ Clean sensor.                                      |
|   | Sensor defective                 | ▶ Inform STÜBBE customer service.                    |
| Current value remains at the bottom float position, even with higher filling levels | Float leaking                    | ▶ Inform STÜBBE customer service.                    |
| Current values reach the end positions of 4 mA and 20 mA prematurely                | End positions stored incorrectly | ▶ Reset the device (→ 6.1 Configure device, Page 8). |
| No current signal   | Cable interrupted                | ▶ Resolve interruption.                              |
|   | Plug not plugged in              | ▶ Connect plug correctly.                            |

Tab. 4 Troubleshooting

## 9 Appendix

### 9.1 Technical specifications

 Technical data, dimensions and accessories are described in the data sheet ([→ 1.2 Other applicable documents, Page 3](#)).

### 9.2 Plug assignment

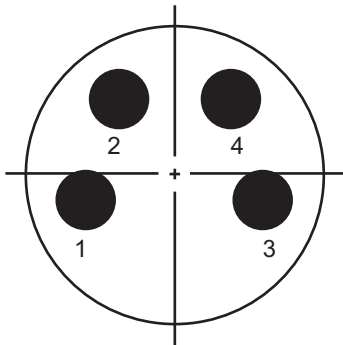


Fig. 3 Connection diagram

- 1 4-20 mA signal
- 2 Not assigned
- 3 Not assigned
- 4 4-20 mA signal