Operating instructions

Capacitive sensor
with adjustable switching delays

KI0058

Contents

1   Preliminary note

You will find instructions, technical data, approvals, accessories and further information using the QR code on the unit / packaging or at www.ifm.com.

1.1   Symbols used

✓	Requirement
▶	Instructions
▷	Reaction, result
[...]	Designation of keys, buttons or indications
→	Cross-reference
🛈	Important note Non-compliance may result in malfunction or interference.
🛈	Information Supplementary note

2   Safety instructions

- Read this document before setting up the product and keep it during the entire service life.

- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.

- Only use the product for its intended purpose ($\rightarrow$ → Intended use).

- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.

- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.

- Installation, electrical connection, set-up, operation and maintenance of the product must be carried out by qualified personnel authorised by the machine operator.

- Protect units and cables against damage.

3   Functions and features

The device monitors the levels of dry bulk materials and liquids.

The device is particularly suited for monitoring plastic granulates.

The sensing face of the device is rated for temperatures up to 110°C and can therefore be mounted in direct contact with the sight glass (without air gap).
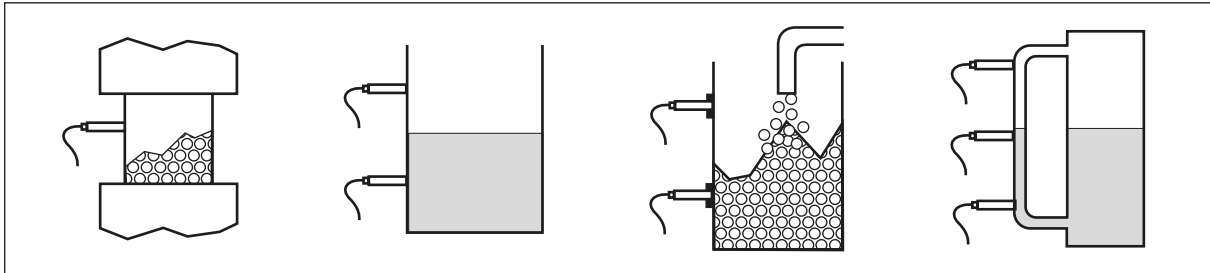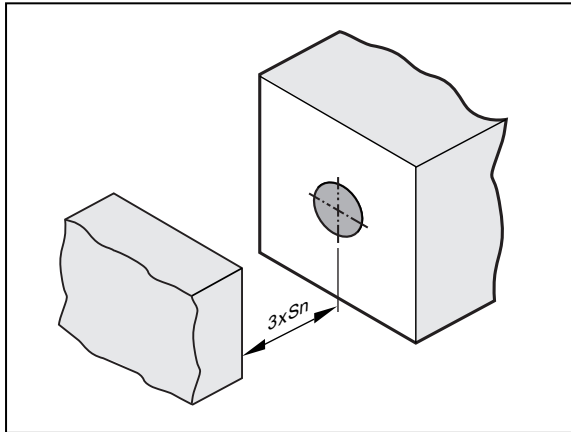
3.1   Application examples

Fig. 1: Application examples

4   Installation

> ⚠ For flush installation of non-flush units the sensor properties change and the sensor may remain permanently switched (loss of function).

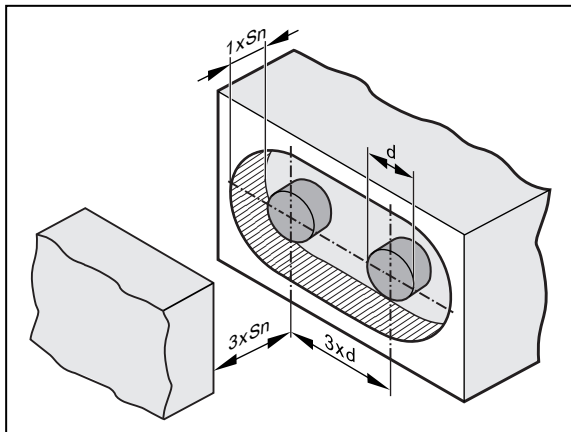## 4.1   Minimum distance for flush installation

Sn: Sensing range

Fig. 2: Minimum distance for flush installation

4.2   Minimum distance for non-flush installation

d: Diameter
Sn: Sensing range

Fig. 3: Minimum distance for non-flush installation

4.3   Minimum distance when installing several units
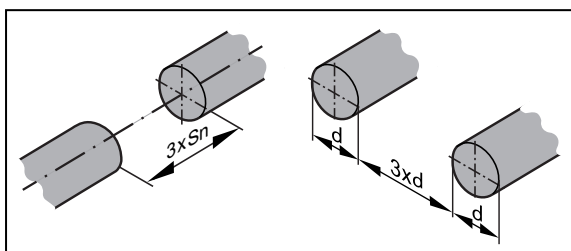
d: Diameter
Sn: Sensing range

Fig. 4: Minimum distance when installing several units

4.4   Notes on installation in tanks

▶ Mount the device as shown:

In contact with the medium

Fig. 5: Installation in contact with the medium

▶ In case of liquids use a mounting adapter (e.g. E11033).

Not in contact with the medium
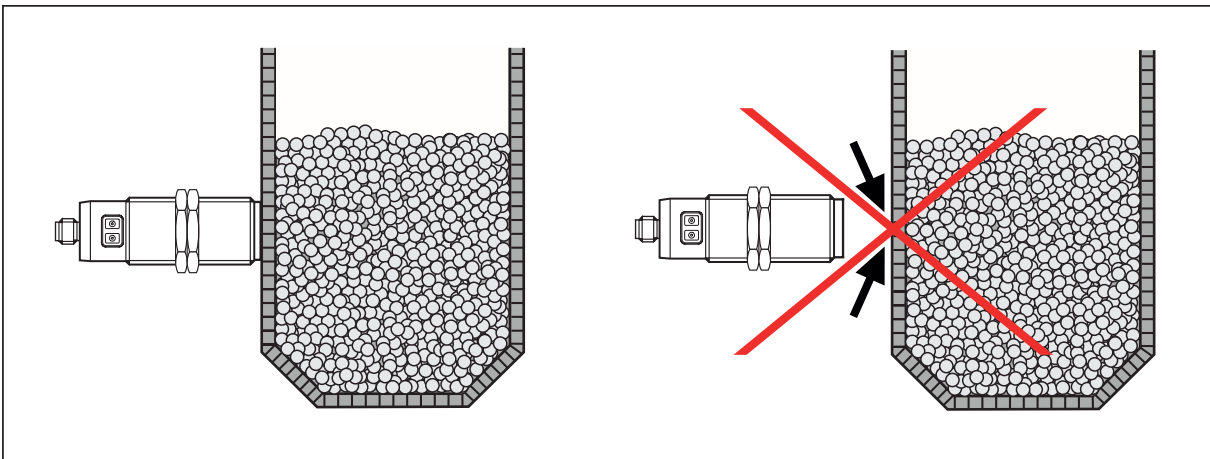
Fig. 6: Installation not in contact with the medium

5   Electrical connection

> [!] The unit must be connected by a qualified electrician.
>
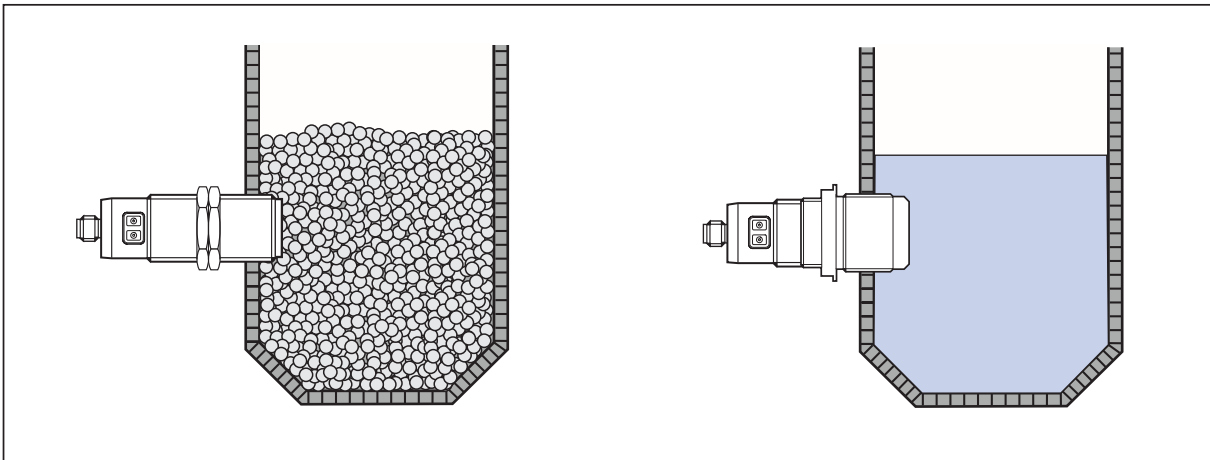> ▶ Observe the national and international regulations for the installation of electrical equipment.

▶ Disconnect power.

▶ Connect the unit as follows:
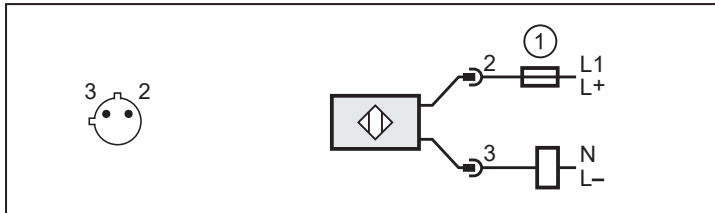
1:    Miniature fuse

> [!] Use a miniature fuse according to the technical data sheet, if specified. Recommendation: Check the safe functioning of the device after a short circuit.

For devices with two-wire technology:

The device is not short-circuit proof and not overload protected. Check the safe functioning of the device after a short circuit.

The device is a class A product to CISPR 11. The device may cause radio interference in domestic areas. Therefore the user may have to take appropriate measures, if necessary.

6   Operating and display elements
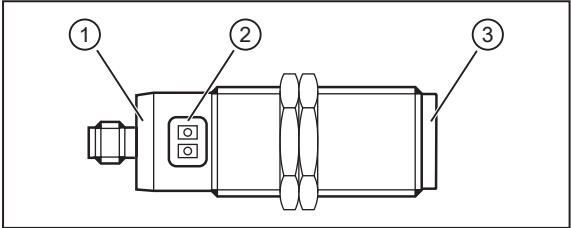
1:   LED ring yellow
2:   Programming buttons
3:   Sensing face

7   Settings

7.1   Basic teach empty state

Using the basic teach empty state, the device suppresses the installation environment. The basic teach empty state resets the device, an adjustment teach already carried out is deleted.

▶ Empty the tank until the level is at least 20 mm below the device.

Set the device as normally open (output closes when the tank is full):

▶ Press the button [OUT OFF] for 2-6 seconds.

▷ While pressing the pushbutton the LED flashes slowly. After releasing the pushbutton, the LED goes out.

Set the device as normally closed (output opens when the tank is full):

▶ Press the button [OUT ON] for 2-6 seconds.

▷ While pressing the pushbutton the LED flashes slowly. After releasing the pushbutton, the LED lights continuously.

The device is now ready for operation.

For the detection of media with a low dielectric constant (e.g. plastic granulates or oils) no further setting is required.

7.2   Adjustment teach full state

An adjustment teach full state is necessary for aqueous media. The sensitivity of the device is optimised. The adjustment teach full state can be repeated at any time, a basic teach empty state already carried out is not affected.

> [!] A basic teach empty state must be carried out prior to the adjustment teach full state!
>
> If it is not possible to empty the tank, a basic teach empty state can be carried out by simulating the empty state (e.g. adjustment when not installed, adjustment at a higher position).
>
> ▶ For optimum function of the device, carry out a modified basic teach empty state when the tank is emptied the next time.

▶ Fill the tank until the sensing face of the device is covered.

▷ For NO the LED lights, for NC it goes out.

Set the device as normally open (output closes when the tank is full):

▶ Press the button [OUT ON] for at least 6 seconds.

▷ While pressing the pushbutton the LED first flashes slowly, after 6 seconds more quickly. After releasing the pushbutton, the LED lights continuously.

Set the device as normally closed (output opens when the tank is full):

▶ Press the button [OUT OFF] for at least 6 seconds.

▷ While pressing the pushbutton the LED first flashes slowly, after 6 seconds more quickly. After releasing the pushbutton, the LED goes out.

7.3   Modified basic teach empty state

The modified basic teach empty state is recommended in case of deposits in the tank. It allows deposits to be largely suppressed.

The modified basic teach empty state is also recommended if it has not been possible to carry out a basic teach empty state (e.g. if the sensor is set up on a full tank).

The modified basic teach empty state can be repeated at any time, an adjustment teach full state already carried out is not affected.

▶ Empty the tank until the level is below the sensing face of the device.

▷ For NO the LED goes out, for NC the LED lights.

Set the device as normally open (output closes when the tank is full):

▶ Press the button [OUT OFF] for at least 6 seconds.

▷ While pressing the pushbutton the LED first flashes slowly, after 6 seconds more quickly. After releasing the pushbutton, the LED goes out.

Set the device as normally closed (output opens when the tank is full):

▶ Press the button [OUT ON] for at least 6 seconds.

▷ While pressing the pushbutton the LED first flashes slowly, after 6 seconds more quickly. After releasing the pushbutton, the LED lights continuously.

7.4   Switching delays

▶ Press the buttons [OUT ON] and [OUT OFF] at the same time for at least 20 seconds.

▷ After 20 seconds the LED flashes. The device is now in the programming mode. The switching output is enabled during programming.

▶ Press the button [OUT ON] or [OUT OFF] to set the delay time.

• Each push of the button [OUT OFF] sets the next level down.

• Each push of the button [OUT ON] sets the next level up.

The set level is indicated by the number of LED flashes.

The following levels can be set:

Step	Delay time in min	LED display (flashing)
1	15	1x
2	30	2x
3	45	3x
4	60	4x
5	0	5x

▶ Press the buttons [OUT ON] and [OUT OFF] at the same time for at least 2 seconds or wait for 20 seconds.

▷ The device applies the setting and goes back to the operating mode.

7.5   Lock / unlock

The device can be locked electronically to prevent unintentional settings. Factory setting: not locked.

Lock / unlock:

▶ Press the buttons [OUT ON] and [OUT OFF] at the same time for 10 s.

▷ Acknowledgement: LED state changes for a short time (the lit LED goes out briefly or the LED which is not lit lights briefly).

If the unit does not react, it may be locked.

8   Operation

▶ Check whether the unit operates correctly.

▶ Bring about a unit response by taking suitable measures.

LED display

LED yellow out: switching output disabled

LED yellow ON: switching output enabled

9   Maintenance, repair and disposal

The operation of the unit is maintenance-free.

To ensure correct functioning, please note the following:

▶ Keep the sensing face and any clear spaces free from deposits and foreign bodies.

It is not possible to repair the unit.

After use dispose of the device in an environmentally friendly way in accordance with the applicable national regulations.