

ifm electronic



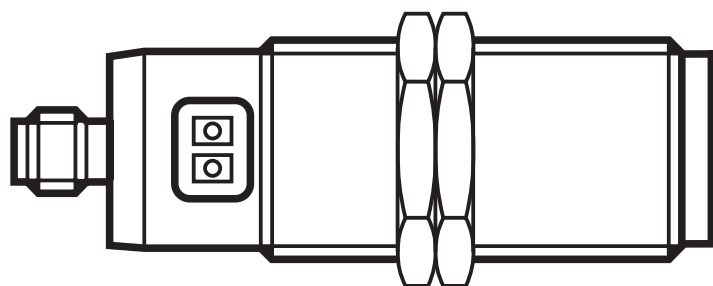
Operating instructions
Capacitive sensor

efector150[®]

KI (M30)

UK

704741/00 02/2010



Contents

- 1 Preliminary note3
- 2 Safety instructions3
- 3 Functions and features3
 - 3.1 Application examples4
- 4 Installation.....4
 - 4.1 Notes on flush and non-flush installation4
 - 4.2 Notes on installation in tanks5
- 5 Electrical connection.....6
 - 5.1 3-wire technology6
 - 5.2 2-wire technology7
- 6 Operating and display elements8
- 7 Settings.....8
 - 7.1 Basic teach empty state8
 - 7.2 Adjustment teach full state.....9
 - 7.3 Modified basic teach empty state10
 - 7.4 Locking / unlocking10
- 8 Operation.....11
- 9 Maintenance, repair and disposal.....11

1 Preliminary note

- Operating elements are indicated as follows:
Example: [OUT OFF] = Button "OUT OFF".
- An instruction is indicated by "►".
Example: ► Mount the unit as shown.
- A reaction to the action is indicated by ">".
Example: > Yellow LED on.



Important note

Non-compliance can result in malfunctions or interference.

UK



Information

Supplementary note.

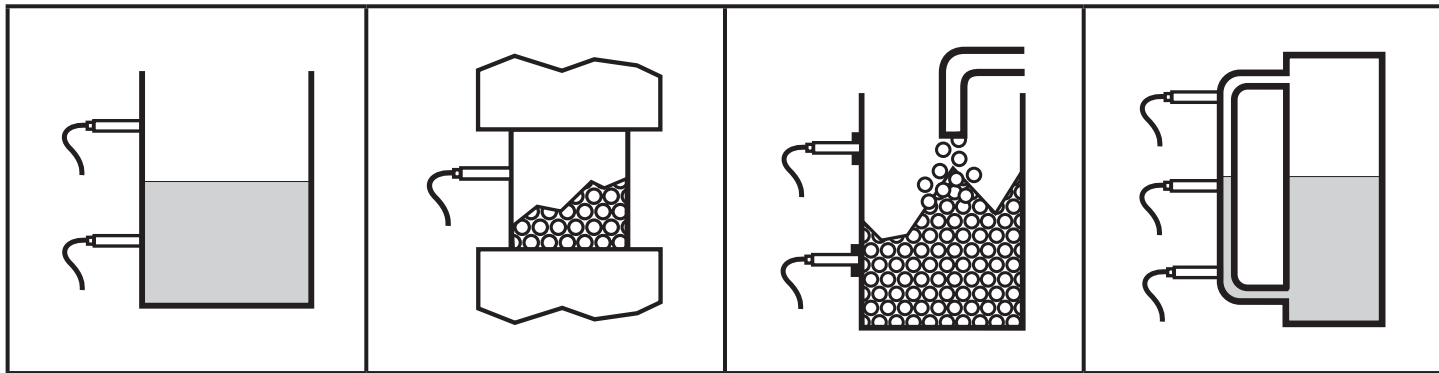
2 Safety instructions

- Please read the operating instructions prior to set-up of the devunit. Ensure that the product is suitable for your application without any restrictions.
- The unit conforms to the relevant regulations and EC directives.
- Improper or non-intended use may lead to malfunctions of the unit or to unwanted effects in your application.
- Installation, electrical connection, set-up, operation and maintenance of the unit must only be carried out by qualified personnel authorised by the machine operator.

3 Functions and features

- Capacitive sensor for monitoring levels of liquids and dry bulk material, preferably plastic granulates.
- Automatic adjustment to the medium to be detected by means of programming buttons.
- The sensing face is rated for temperatures up to 110 °C and can be mounted in direct contact with the sight glass (without air gap).

3.1 Application examples

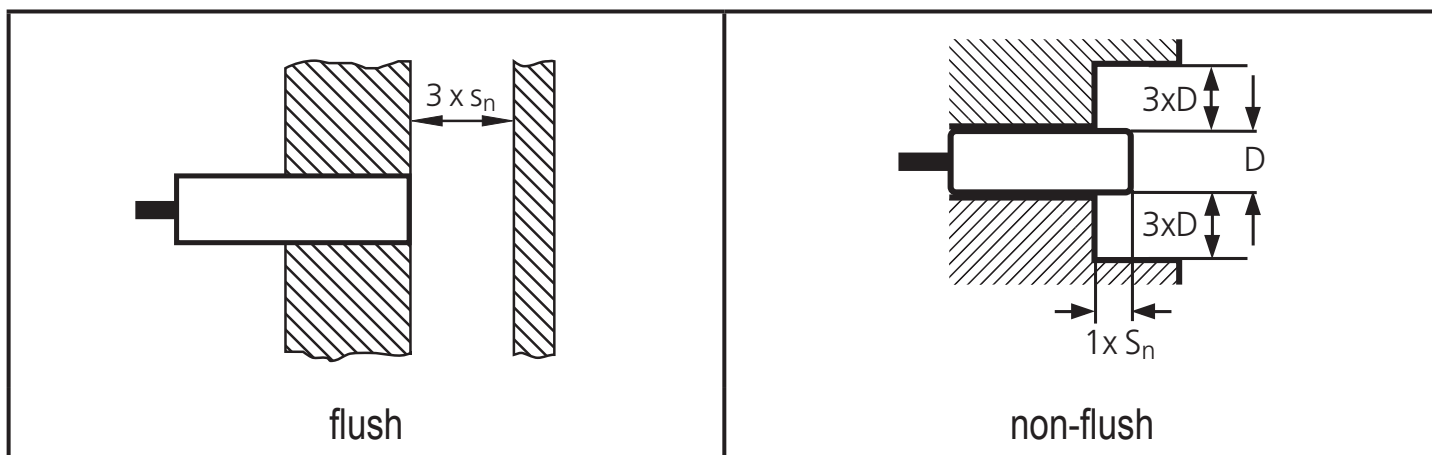


4 Installation

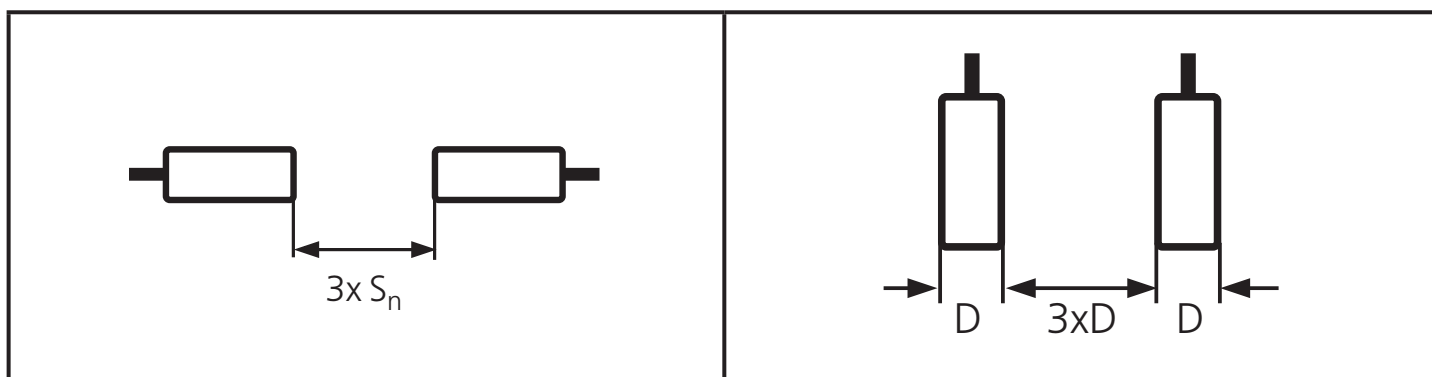
4.1 Notes on flush and non-flush installation

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

- Observe the free space around the sensing face.



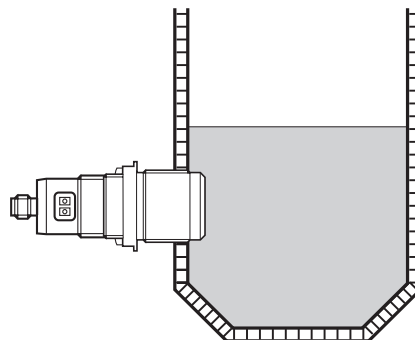
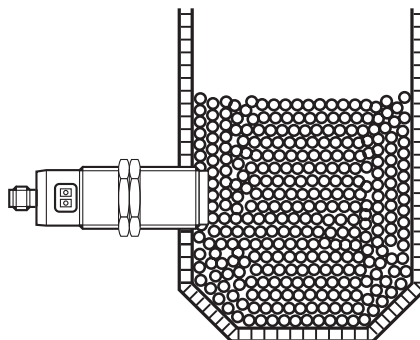
- Adhere to the minimum distances when mounting several sensors of the same type.



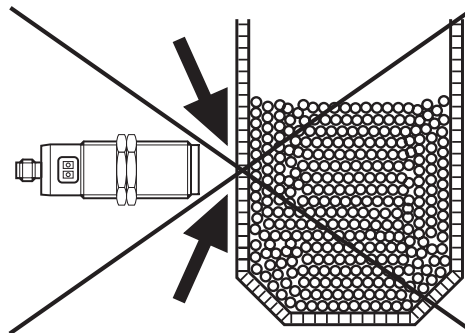
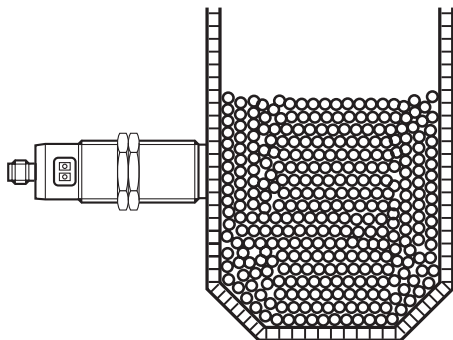
4.2 Notes on installation in tanks

► Mount the unit as shown:

- In contact with the medium
- In case of liquids use a mounting adapter (e.g. E11033).



- Not in contact with the medium (only for non-metallic tanks)



You can find mounting adapters at:

www.ifm.com → Select your country → Data sheet direct:

5 Electrical connection



The unit must be connected by a qualified electrician.

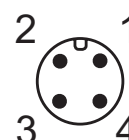
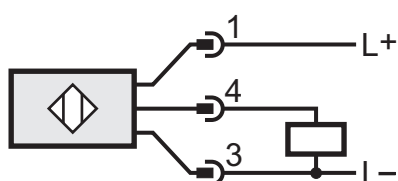
The national and international regulations for the installation of electrical equipment must be adhered to.

► Disconnect power

► Connect the unit

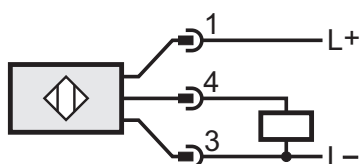
5.1 3-wire technology

p-switching (type ...FPKG...):

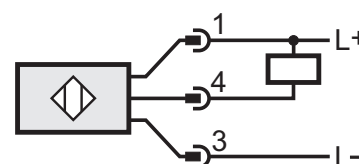


output with autodetect p-switching or n-switching (type ...FAKG...):

PNP



NPN

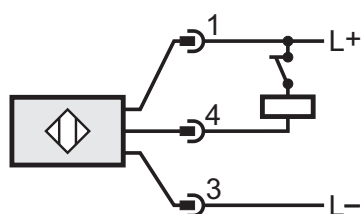


On power up, the unit detects automatically if the output is connected to L- (= PNP) or to L+ (= NPN).

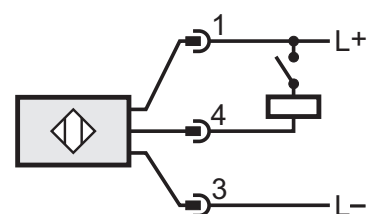
► Disconnect the unit to acknowledge a change of the load connection.



Automatic load detection is only ensured when a resistor is switched in series to a **closed** mechanical contact.



load detection is possible



load detection impossible

5.2 2-wire technology



Use a miniature fuse according to the technical data sheet, if specified.



1: miniature fuse

UK

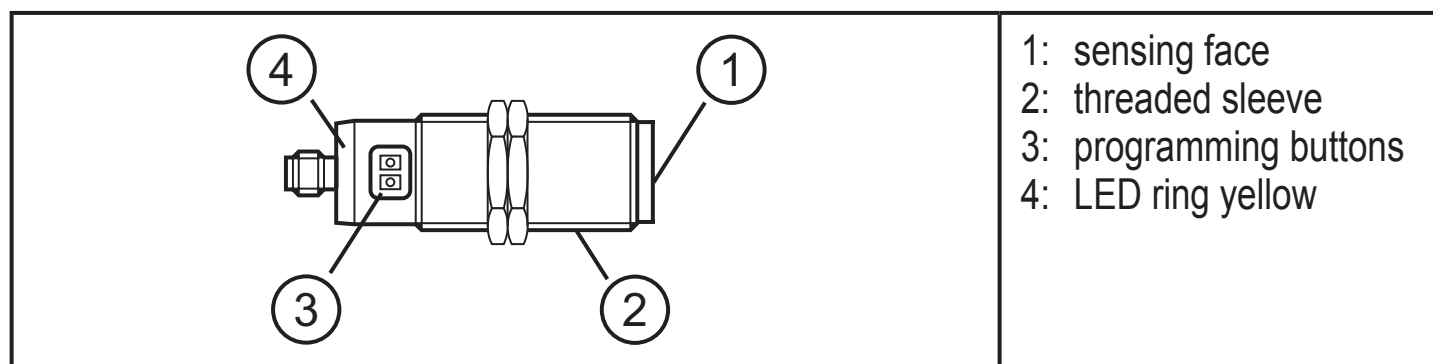


Units in 2-wire technology:

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

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

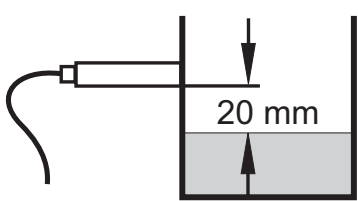
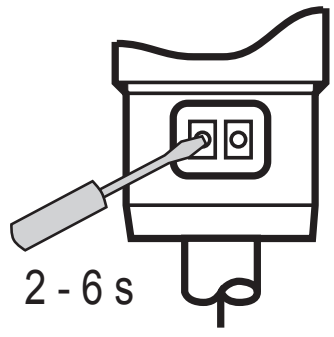
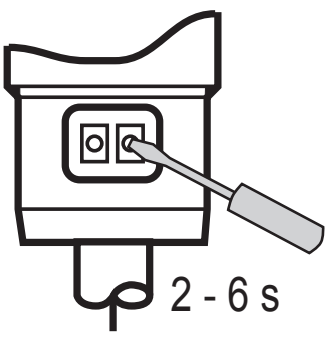
6 Operating and display elements



7 Settings

7.1 Basic teach empty state

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

<p>► Empty the tank until the level is at least 20 mm below the sensor</p>	
<p>Set the unit as normally open (output closes when the tank is full):</p> <p>► Press [OUT OFF] for min. 2 s (max. 6 s).</p> <p>> While pressing the pushbutton the LED flashes slowly. After releasing the pushbutton, the LED goes out.</p>	
<p>Set the unit as normally closed (output opens when the tank is full):</p> <p>► Press [OUT ON] for min. 2 s (max. 6 s).</p> <p>> While pressing the pushbutton the LED flashes slowly. After releasing the pushbutton, the LED lights continuously.</p>	

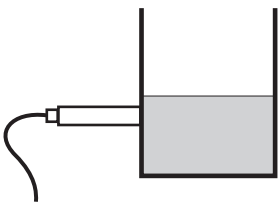
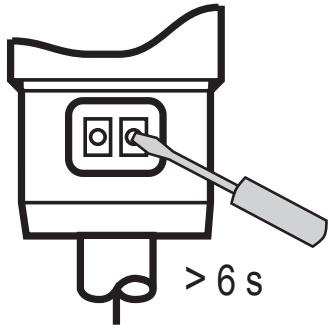
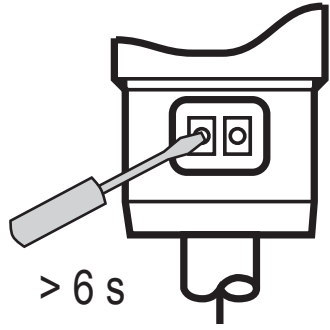
The unit is now ready for operation. For the detection of media with a low dielectric constant (e.g. plastic granulates or oils) no further setting is required.

7.2 Adjustment teach full state

Necessary for aqueous media. The sensitivity of the unit is optimised. Later on, the adjustment teach full state can be repeated at any time, an adjustment 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 (→ chapter 7.1 Basic teach empty 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 it is necessary to carry out the "modified basic teach empty state" (→ chapter 7.3 Modified basic teach empty state) when the tank is emptied the next time.

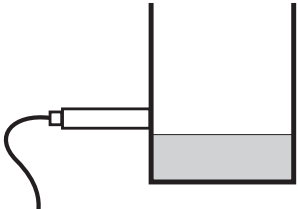
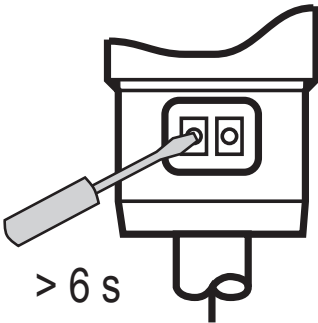
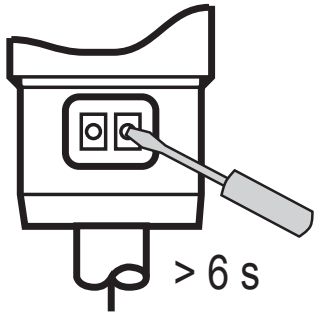
UK

<ul style="list-style-type: none"> ► Fill the tank until the sensing face of the unit is covered. > For NO the LED lights, for NC it goes out. 	
<p>Set the unit as normally open (output closes when the tank is full):</p> <ul style="list-style-type: none"> ► Press [OUT ON] for min. 6 s. > While pressing the pushbutton the LED first flashes slowly, after 6 s more quickly. After releasing the pushbutton, the LED lights continuously. 	
<p>Set the unit as normally closed (output opens when the tank is full):</p> <ul style="list-style-type: none"> ► Press [OUT OFF] for min. 6 s. > While pressing the pushbutton the LED first flashes slowly, after 6 s more quickly. After releasing the pushbutton, the LED goes out. 	

7.3 Modified basic teach empty state

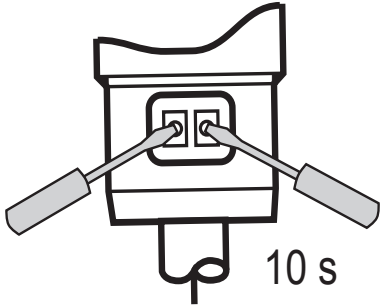
Recommended for deposits in the tank. Deposits are largely suppressed. This is also recommended if it has not been possible to carry out a basic teach empty state (e.g. if the sensor is set up on a full tank; details: → chapter 7 Adjustment teach full state)

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

<ul style="list-style-type: none"> ▶ Empty the tank until the level is below the sensing face of the unit. > For NO the LED goes out, for NC the LED lights. 	
<p>Set the unit as normally open (output closes when the tank is full):</p> <ul style="list-style-type: none"> ▶ Press [OUT OFF] for min. 6 s. > While pressing the pushbutton the LED first flashes slowly, after 6 s more quickly. After releasing the pushbutton, the LED lights continuously. 	
<p>Set the unit as normally closed (output opens when the tank is full):</p> <ul style="list-style-type: none"> ▶ Press [OUT ON] for min. 6 s. > While pressing the pushbutton the LED first flashes slowly, after 6 s more quickly. After releasing the pushbutton, the LED goes out. 	

7.4 Locking / unlocking

The unit can be electronically locked to protect it against unintentional setting.

<ul style="list-style-type: none"> ▶ To lock press [OUT ON] and [OUT OFF] simultaneously for 10 s. > Acknowledgement: LED state (yellow) changes for a short time (the lit LED goes out briefly or the LED which is not lit lights briefly). ▶ To unlock repeat this step. 	
--	---

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

8 Operation

Check whether the unit operates correctly. Bring about a sensor response by taking suitable measures.

Display by LEDs (independent of the programmed output configuration);

LED yellow OFF:	switching output disabled
LED yellow ON:	switching output enabled

UK

9 Maintenance, repair and disposal

The operation of the unit is maintenance-free. To ensure a correct function:

- Keep the sensing face and a clear space, if any, free from deposits and foreign bodies.

When removing the unit or changing the medium, a new adjustment might be necessary.

It is not possible to repair the unit.

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

Technical data and further information at
www.ifm.com → Select your country → Data sheet direct: