OCTOGON

MANUAL

FKKA

CAPACITIVE LEVEL SWITCH

Installation and user manual



Document	Version	Date	Applies to
Installation and user manual	V00x	10/2026	FKKA, all probe lengths and versions

This manual describes the FKKA capacitive point level switch: working principle, technical data, dimensions, electrical connection, installation in industrial and in hygienic process connections, and setting the switching point with the magnetic pen.

Contents

1 About this manual ... 2
1.1 Notices ... 2
1.2 Versions covered ... 2
2 Safety ... 3
2.1 Intended use ... 3
2.2 Hazardous media ... 3
2.3 Hygienic applications ... 3
3 Product description ... 3
3.1 Working principle ... 3
3.2 Features ... 3
3.3 Device overview ... 3
3.4 Technical data ... 4
3.5 Order code ... 4
4 Dimensions ... 5
5 Electrical connection ... 6
5.1 Connecting cables ... 6
6 Installation ... 6
6.1 Mounting positions ... 6
6.2 Lengthened probes ... 6
6.3 Industrial applications: G1/2 thread ... 6
6.4 Industrial applications: adapter or weld-in socket ... 7
6.5 Hygienic applications ... 7
6.6 Accessories for the process connection ... 7
7 Commissioning ... 7
7.1 Connection check ... 7
7.2 Setting the switching point with the magnetic pen ... 7

1 About this manual

Read this manual before installing the sensor and keep it available for later use. Values and order codes in this manual refer to the FKKA order code (section 3.5).

1.1 Notices

Notice	Meaning
Warning	Risk of injury or of a health hazard if the instruction is not followed.
Important	Pay particular attention to the following instruction.
Note	Further information.

1.2 Versions covered

Feature	Versions
Probe length	30 · 35 · 50 · 100 · 250 mm, custom length
Connection	M12 × 1 connector, or fixed cable outlet with 1 m or 2 m cable
Output	PNP or NPN
Switching logic	normally open (NO) or normally closed (NC)
Seal	standard or ED seal
Temperature	standard version or cooling version
Type marking on the label	LS280-... (see cover picture)

2 Safety

2.1 Intended use

The FKKA detects a point level - the presence or absence of a medium at the probe tip - in vessels and pipes. It detects media with a dielectric constant (DC) above 1.5. It is suitable for industrial and for hygienic applications.

2.2 Hazardous media

Warning Risk of injury due to hazardous media (such as acids or alkalis). Wear protective equipment. Empty vessels and pipes before installation.

2.3 Hygienic applications

Warning Health risk from contaminated media. Use only the weld-in sockets or adapters offered as accessories for this sensor (section 6.6). Do not use PTFE tape or elastomers to seal hygienic process connections. Welding must be performed only by welders trained in the sanitary field.

3 Product description

3.1 Working principle

The electrode integrated in the sensor tip forms a capacitor with its surroundings. The capacitance depends on the dielectric constant (DC value) of the medium at the tip. Together with a coil in the sensor electronics the capacitance forms a resonant circuit. The switching signal is triggered on the basis of the measured resonant frequency and an adjustable switching range (frequency scanning).

3.2 Features

- Detection of point level and object position by frequency scanning.
- Reliable detection of various media.
- Various process connections: G1/2 thread, sanitary clamp adapter, weld-in socket.
- Suitable for hygienic and for industrial applications.

3.3 Device overview

No.	Part
1	Sensor tip
2	LED
3	Cable outlet / connection

3.4 Technical data

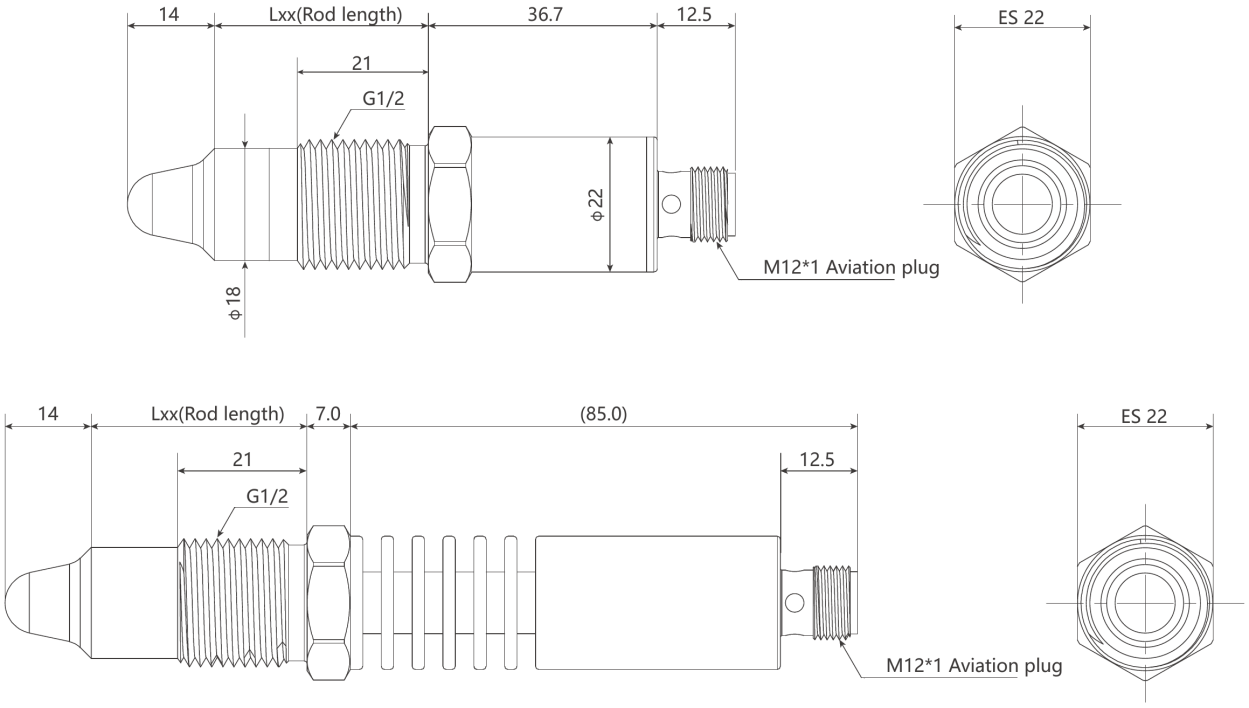
Item	Value
Measuring principle	point level switch, frequency scanning
Medium	dielectric constant DC > 1.5
Hysteresis	± 1 mm
Repeatability	± 1 mm
Response time	0.1 s typical, 0.2 s maximum
Damping time	0 ... 10 s, adjustable
Wetted parts	PEEK natural; stainless steel 316L (1.4404)
Surface roughness of wetted parts	Ra ≤ 0.8 µm
Output type	PNP or NPN
Switching logic	normally open (NO) or normally closed (NC)
Supply voltage	12 ... 30 V DC
Medium temperature	standard version –20 ... +80 °C; cooling version –40 ... +130 °C
Process connection	G1/2, hexagon ES 22
Electrical connection	M12 × 1 connector, 5-pin, or fixed cable outlet (1 m or 2 m)
EMC, emission	EN 61326, installed in a closed metal vessel
EMC, immunity	EN 61326, installed in a closed metal vessel

3.5 Order code

Field	Code	Meaning
Series	FKKA	capacitive level switch
Probe length	L030 · L035 · L050 · L100 · L250 · LXX	30 · 35 · 50 · 100 · 250 mm · custom length
Connection	M · Z · 1 · 2	M12 × 1 connector · fixed cable outlet · cable 1 m · 2 m
Output	– · N	PNP · NPN
Switching logic	– · C	normally open (NO) · normally closed (NC)
Seal	– · ED	standard · ED seal
Temperature	– · T	–20 ... +80 °C · cooling version –40 ... +130 °C

Example: FKKA-L030-M - probe length 30 mm, M12 connector, PNP, normally open, standard version.

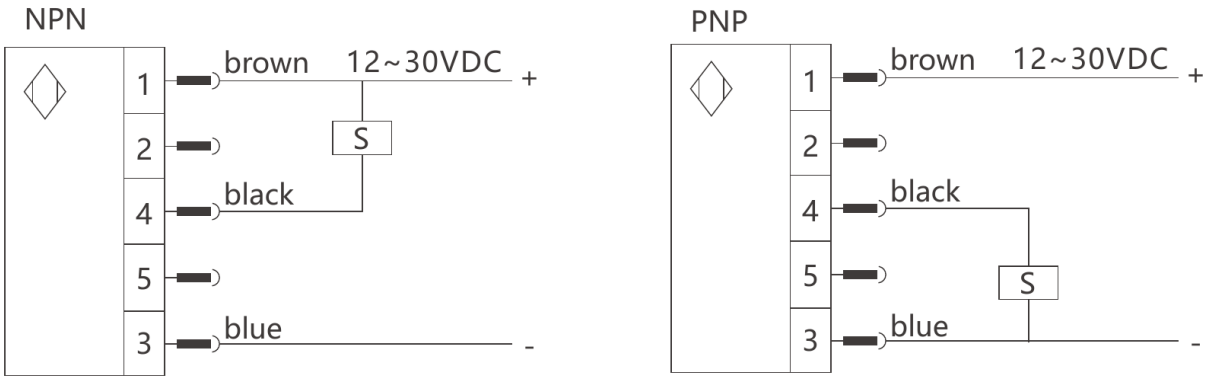
4 Dimensions



Top: standard and lengthened version, Lxx = probe length. Bottom: cooling version. Dimensions in mm.

Dimension	Value
Probe tip	14 mm
Probe length Lxx	according to the order code (30, 35, 50, 100, 250 mm or custom)
Probe diameter	Ø 18 mm
Thread	G1/2, length 21 mm
Hexagon	ES 22
Housing	Ø 22 mm, length 36.7 mm (standard and lengthened version)
Cooling version	7.0 mm behind the hexagon, then (85.0) mm to the end of the connector
Connector	M12 × 1, length 12.5 mm

5 Electrical connection



Left NPN, right PNP. S = load (switching input of the downstream device).

Pin	Wire colour	Function
1	brown	supply 12 ... 30 V DC (+)
2	–	not connected
3	blue	supply (–)
4	black	switching output
5	–	not connected

- PNP output: connect the load between pin 4 (black) and the negative supply (blue).
- NPN output: connect the load between pin 4 (black) and the positive supply (brown).

5.1 Connecting cables

M12 × 1 connecting cables, 5-pin, PUR or PVC, 2 · 5 · 10 m, straight or angled, are available as accessories. Accessories are ordered by description; please state the sensor type with the enquiry.

6 Installation

6.1 Mounting positions

The sensor can be installed at any point of the vessel:

Position	Function
On the top of the vessel	overfill protection
In the side wall, further down	maximum or minimum limit level
At the bottom or in the outlet pipe	dry-run protection, e.g. of a pump

6.2 Lengthened probes

- Limit level: installation with a pipe.
- Overfill protection with a lengthened probe from the top of the vessel.
- Limit level in pasty or powdery media with a lengthened probe.
- In pasty or powdery media, an inclined installation makes the sensor less prone to clogging.

6.3 Industrial applications: G1/2 thread

Important Vessels and pipes must not contain any medium during installation.

- Seal the thread of the sensor with PTFE tape.
- Screw in the sensor. Tightening torque: maximum 30 N·m.

6.4 Industrial applications: adapter or weld-in socket

For these process connections do not use PTFE tape or elastomers for sealing.

- Vessels and pipes must not contain any medium.
- Install the adapter or the weld-in socket without dead space.
- Screw in the sensor. Tightening torque: 15 ... 20 N·m.

With a seal ring

- Vessels and pipes must not contain any medium.
- Push the seal ring onto the sensor.
- Screw in the sensor. Tightening torque: 15 ... 20 N·m.

6.5 Hygienic applications

Observe the warning in section 2.3.

- Weld-in sockets or adapters must be installed hygienically and flushed internally.
- The weld must be smooth to Ra < 0.8 µm.
- The leakage hole must point downward.
- Screw in the sensor. Tightening torque: 10 ... 15 N·m.

Example for weld-in sockets in a round vessel or pipe wall: mounting positions within the upper 170° sector are shown as correct, positions within the lower 190° sector as wrong.

6.6 Accessories for the process connection

Accessory	Dimensions (mm)
Sanitary clamp adapter	for a sanitary clamp with standard outside diameter 50.5; length 28, Ø 30, internal thread G1/2, M4 threaded hole
Weld-in socket	length 28, Ø 30, internal thread G1/2
ED seal	for the G1/2 process connection

Accessories are ordered by description; please state the sensor type with the enquiry.

7 Commissioning

7.1 Connection check

Connect the sensor as described in chapter 5: brown to the positive supply, blue to the negative supply, black (switching output, NO or NC) to the downstream device.

7.2 Setting the switching point with the magnetic pen

The switching point is set in one step with a magnetic pen, without opening the sensor:

1. Bring the probe into contact with the medium to be detected and hold the magnetic pen at the sensing point of the sensor.
2. When the red and green lights flash alternately, remove the magnetic pen. The switching point is set.