

CKN

Submersible capacitive
level and pressure sensor



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1. Scope

The CKN sensor is developed to measure pressure and differences of levels in liquid with various biochemical mixture. It is ideal for controlling pumps and similar equipment.

The CKN may also be used to measure pressure, level and flow in tanks and water towers.

By using the CKN sensor you can make process optimizations and create a better flow profile on your pumps and save energy.

2. About the manual

The manual focus on the technical information regarding the submersible capacitive level and pressure sensor (CKN).

This manual also include examples on applications and start up procedures for the CKN.

3. Design

The Cerlic capacitive level and pressure sensor CKN consists of a capacitive cell with ceramic membrane. The sensor electronics is based on a microcontroller and has built in polynomial temperature compensation.

The ceramic membrane together with a stainless steel housing ensures a long life with low maintenance. It may also be used even if there is a risk for biological deposits.

In standard configuration the CKN is programmed to measure differences in level between 0 - 10 meter (33 feet). It is also possible to program the CKN to customized level within the 0 - 10 meter (33 feet) range.

The shielded two-wire cable to the sensor has a Hytrel® shield. Hytrel® is a special material that is highly resistant towards aggressive substances and liquids. Inside the cable is an air tube with contact to the outside atmosphere to compensate for variations in air pressure. By using this cable, the sensor uses the atmosphere pressure as reference for the measuring.

CKN-10 is delivered with 12 meter cable (40 feet)

CKN-20 is delivered with 22 meter cable (73 feet)

4. Measurement principle

The capacitive cell measures the difference in pressure that the liquid is creating on the ceramic membrane compared to the atmosphere. The pressure is linear to the height of the liquid but can be effected by flow. It is important that the CKN is installed correctly and is configured with the correct scale for accurate measuring. The CKN will use the preset scale (i.e. 0 - 10 meter) and convert the pressure difference to a 4-20mA linear signal.

5. Unpacking of sensor

Damages

In case of damages during transport, report ASAP to the transporting company and Cerlic. Returning of goods can only be done after agreement with Cerlic.

Packing

When returning a sensor it is recommended to use the original packing if possible. If not, make sure that packing is giving full protection to the goods.

Contents of the shipment

Verify that the contents of the shipment match with the order and delivery note.

Mounting option

- Cable support hook

Part No

21203369

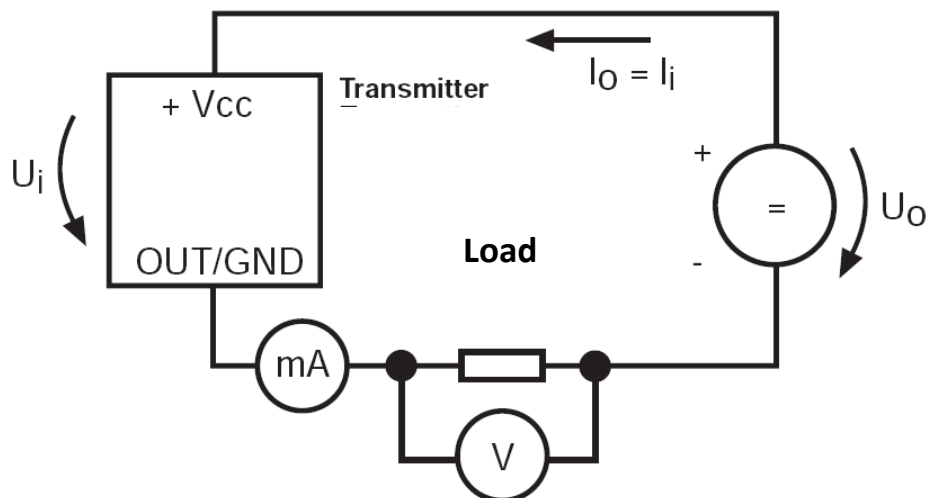
6. Installation

Electrical installation

When connecting the black and white wires from the CKN to the control system, black wire connects to (+) positive and white (-) connects to negative. See connection diagram below. If the wires are connected wrong, this can effect the measuring result or even damage the electronics.

Connection diagram

2-wire connection, 4 – 20 mA



| Signals | 4 – 20 mA | RS485 |
|-------------|-----------------------|------------------------|
| Voltages | $\leq 30 \text{ V}$ | $\leq 30 \text{ V}$ |
| Amp | $\leq 100 \text{ mA}$ | $\leq 88,5 \text{ mA}$ |
| Consumption | $\leq 0,64 \text{ W}$ | $\leq 0,583 \text{ W}$ |
| Capacitance | 0 nF | 350 nF |
| Inductance | 0 mH | 0 mH |

Submersible level and flow meter, CKN

The CKN must be mounted in a safe and secure way. The special designed cable hook secures the installation and makes the inspections and cleaning simple. It is very important that the sensor is located vertical in the same position/level after inspection.

Installations guide

- Mount the CKN so it is stable and safe but easy to remove for inspections. The mounting option, cable support hook art nr 212033369, is recommended.
- If the sensor is installed close to a blower or a rake it is recommended to mount the CKN in a protective tube, see appendix 2
- It is recommended to make a mark on the cable with a tape. With a known reference it can easily be verified that the CKN is remounted in the same location after inspection.
- Install the CKN and wait 30 minutes before connecting the power.

7. Cleaning

The CKN is resistant to biochemical deposits and is ideal for measuring levels in pump pits. To ensure the accuracy and a long life of the CKN, it is recommended that inspections of the sensor and membrane are performed 1- 2 times per year. Avoid using sharp objects when cleaning the membrane. Soft cloth or a soft plastic brush is recommended.

8. Calibration

The CKN sensor is calibrated at the factory according to the range specified on the order. Standard range is 0 - 10meter.

9. Scaling

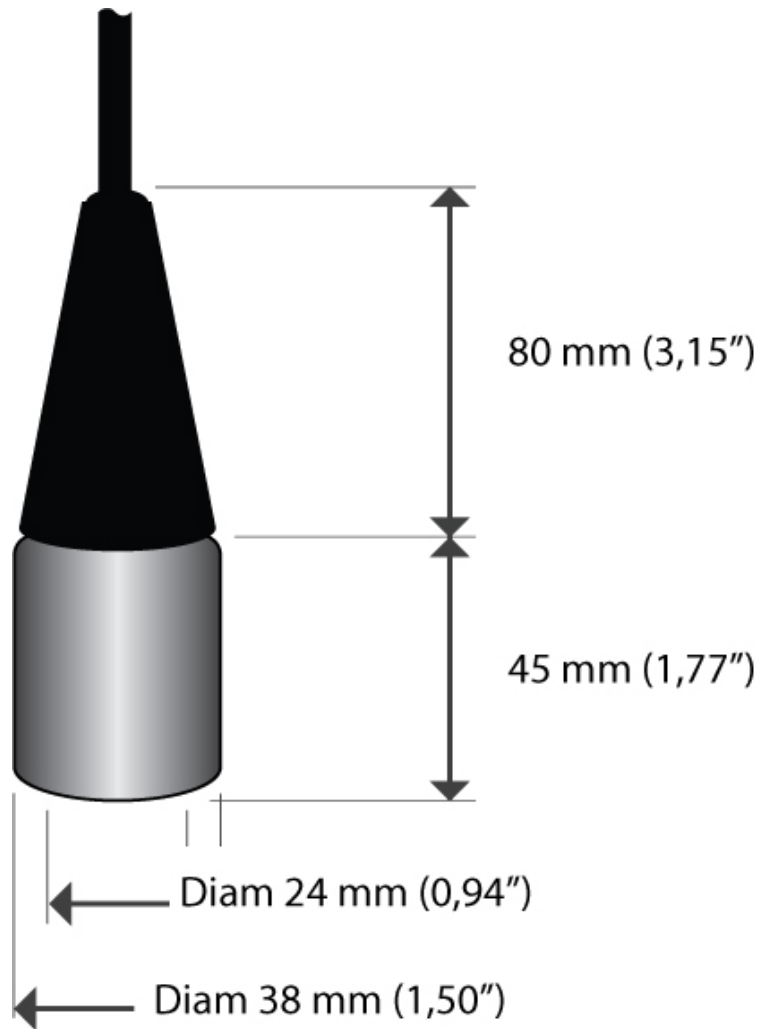
The CKN is analogue and scales the range from 0 = 4mA and Max range = 20mA. Make sure the proper scale is used for correct results.



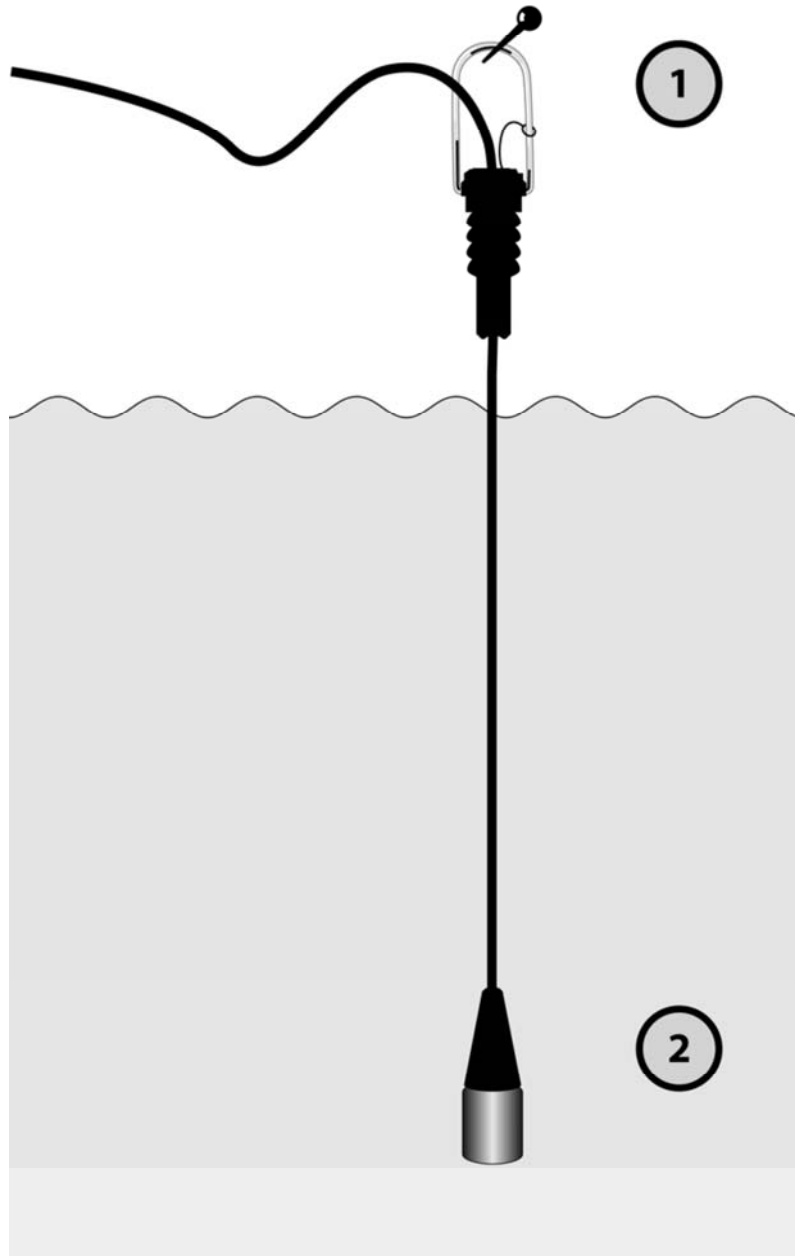
10. Technical Data: CKN

| | | |
|------------------------------|--------|---|
| CKN-10 | | P/N 11305812 |
| CKN-20 | | P/N 13305813 |
| Material | | - Housing; Stainless steel SIS2343 - Membrane; ceramic with gold plating |
| Size | | See chapter 11. |
| Weight | CKN-10 | 1, 2 kg (3lb) included 12 m (40feet) Hytrel® cable |
| | CKN-20 | 2 kg (4lb) included 22 m (73feet) Hytrel® cable |
| Protection class | | IP 68 Dust and water proof |
| Temperature range | | 0 - 80 °C (32 - 176°F) compensated range 10 - 50 °C (50 - 122°F) |
| Voltage supply | | 8-28 VDC |
| Output signal | | 4-20mA |
| Range | | 0 - 5/10/20 meter (0 - 17/40/73 feet) Standard 0 - 10 meter (0 - 40 feet). |
| Cable shield material | | Hytrel® |
| Linearity | | ±0,1 % FS (typical) ±0,2 % FS (max) |
| Customization | | Special measuring range |
| Option | | Cable support hook (P/N 21203369) |

11. Dimensions

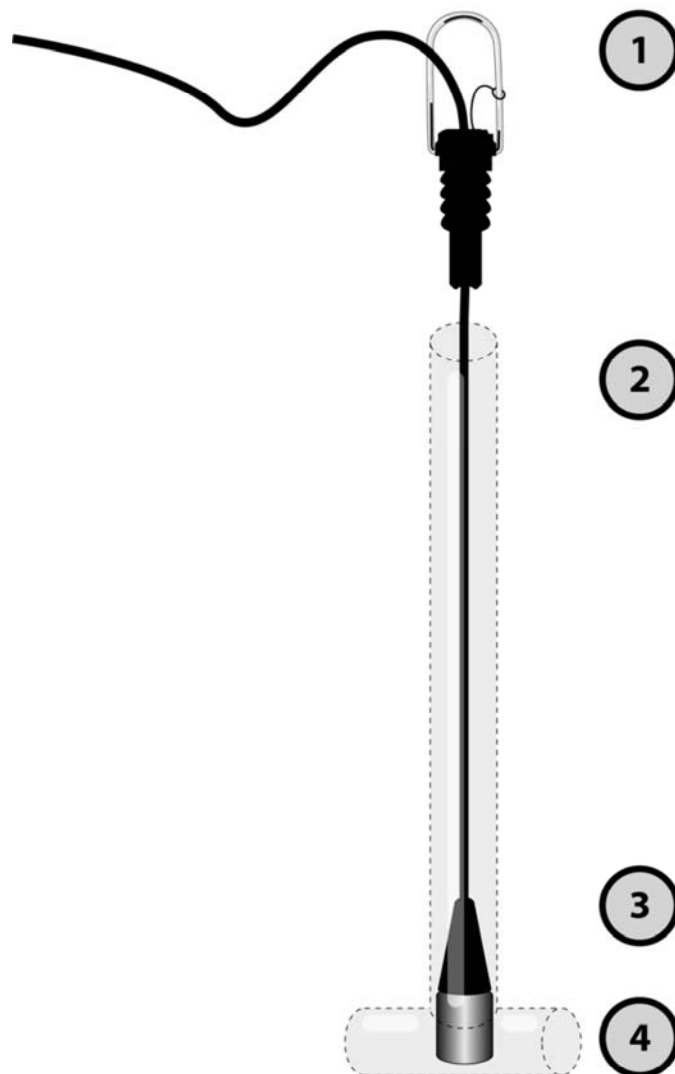


12. Mounting CKN using cable support hook



1. Cable support hook (Part No: 21203369)
2. CKN sensor

13. Mounting CKN in a protective tube



1. Cable support hook (Part No: 21203369)
2. Basin
3. Protective tube
4. CKN sensor

14. Support information

Please have the following information ready when contacting Cerlic.

Company _____

Name _____

Phone _____

E-mail _____

Sensor type _____

Position/Tag _____

Information below can be found on the sensor label

SerialNo _____

Settings that can be useful for support

Max _____

Min _____

High alarm _____

Low alarm _____

Alarm Rely _____