PHYWE excellence in science

Cobra SMARTsense Conductivity

12922-00

PHYWE Systeme GmbH & Co. KG
Robert-Bosch-Breite 10
D–37079 Göttingen

Telefon +49 (0) 551 604–0
Fax +49 (0) 551 604–107
E-mail info@phywe.de
Internet www.phywe.com

Fig. 1: 12922-00 Cobra SMARTsense Conductivity

Operating instructions

CE The unit complies with the applicable EC-guidelines

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1 SAFETY PRECAUTIONS

Caution!

- Carefully read these operating instructions completely before operating this instrument. This is necessary to avoid damage to it, as well as for user-safety.
- Only use the instrument for the purpose for which it was designed.
- Only use the instrument in dry rooms in which there is no risk of explosion.
- Protect the instrument from dust, moisture and vapours. Use a slightly moist lint-free cloth to clean the instrument. Do not use aggressive cleaning agents or solvents.
- Take care that no liquid penetrates in through the housing openings, as such penetration would result in damage to Sensor.
- Do not open the unit.

2 PURPOSE AND CHARACTERISTICS

The sensor is used for measuring the conductivity of aqueous solutions as well as temperature values and for transferring the values to a terminal device, e.g. a tablet computer, smartphone, etc., via Bluetooth.

3 FUNCTIONAL AND OPERATING ELEMENTS

3.1 Operating elements

The sensor has an on-button and two LEDs for indicating the Bluetooth and battery charge status.

On-Button

Pressed for longer 3s	Switch sensor on/off
Pressed 3x quickly	Start offline measurement
Pressed 2x quickly	Stop offline measurement

Bluetooth-LED

Flashing red every 2 seconds	Not connected
Flashing green every 2 seconds	Connected to the terminal device
Flashing green every 4 seconds	Running measurement

Battery charge LED

Flashing red every 5 seconds	Low battery

3.2 Measurement inputs

The front of the sensor is equipped with a fixed conductivity measuring cell with an integrated temperature sensor.

4 NOTES ON OPERATION

This device fulfils all of the technical requirements that are compiled in current EC guidelines. The characteristics of this product qualify it for the CE mark.

The individual connecting leads are each not to be longer than 2 m.

The instrument can be so influenced by electrostatic charges and other electromagnetic phenomena (HF, bursts, indirect lightning discharges) that it no longer works within the given specifications. Carry out the following measures to reduce or eliminate the effect of such disturbance: Ensure potential equalization at the PC (especially with Laptops). Use screening. Do not operate high frequency emitters (e.g. radio equipment or mobile radiotelephones) in the immediate vicinity. When a total failure of the instrument occurs, unplug it and plug it back in again for a reset.

5 HANDLING

This section describes the start-up of the sensor and the recording of measurement data. Please read this section thoroughly in order to avoid failures or operating errors.

5.1 Start-up

Switch the sensor on by pressing the on-button for more than 3 seconds. The Bluetooth LED lights up red. Start the software and select the sensor.

There is a 9-digit code on the back of the sensor (Fig.2). The last 4 digits of the code are displayed as the sensor name in the software (Fig.3). This enables the precise assignment of the sensors within the software.

Fig. 2

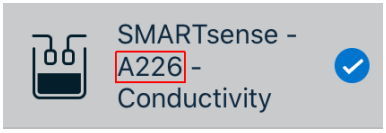


Fig. 3

5.2 Recording of conductivity values

To measure the conductivity of the various media, the measuring head of the conductivity measuring cell is completely plunged into the medium to be measured. If a whole series of different solutions is to be measured, we recommend starting with the solution with the lowest conductivity. Since some of the sample material is always carried over to the next sample, this method ensures that a potential error remains on an acceptable level as the contamination of a solution with a high level of conductivity with traces of a solution with a low level of conductivity leads to a smaller relative error than the other way round. In any case, the measuring head and electrodes must be rinsed with pure (demineralised or distilled) water when switching from one sample to another.

The solution should always remain slightly in motion during the measurement. This can be realised by stirring the liquid with a magnetic stirrer or similar or by moving the measuring probe carefully to and fro.

5.3 Offline measurement

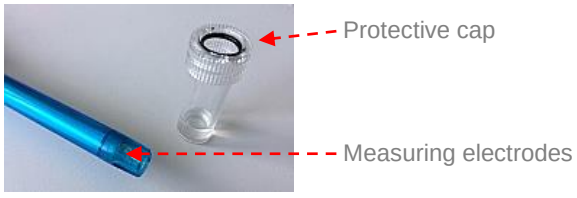
Switch on the sensor by pressing the power button for more than 3s. To start an offline measurement, press the power button 3 times in quick succession. The Bluetooth LED then flashes green 3 times in rapid succession to acknowledge the successful start. To stop a measurement, press the switch-on button 2x in quick succession. The Bluetooth LED also acknowledges this by flashing quickly.

Offline measurements can be read out via the measureAPP or measureLAB software. Furthermore, offline parameters such as data rate and measurement duration can be set. After the set measurement duration has elapsed, the offline measurement is automatically terminated. However, the measurement can always be ended prematurely by pressing the switch-on button.

5.4 Maintenance and cleaning of the measuring probe

In general, conductivity measuring cells are not subject to ageing. However, the measuring electrode can be corroded and, thereby, damaged by certain media (e.g. strong acids and lyes). This is why all of the measuring cells should be rinsed thoroughly with clean (demineralised or distilled) water whenever they have been used. If the measuring electrode is contaminated with grease or oil, it can be cleaned with warm water and a commercially available household detergent.

The measuring cell comes supplied with a protective cap which is filled with distilled water. Do not allow the measuring cell to dry out. This might cause the platinum black to crumble off which, in turn, would change the cell constant. This is why it should always be stored in pure water. When cleaning the measuring cell, avoid any mechanical stress on the measuring electrodes.



5.5 Calibration

In general, the conductivity measuring cell does not need to be calibrated if it is maintained properly.
If a calibration needs to be carried out, it is a two-point calibration. The calibration data are entered via the measurement software (App).

First calibration point

Dip the measuring cell into distilled/deionised water or ultra-pure water.

	Conductivity at 25°C
Ultra-pure water	0.055 µS/cm
Deionised water	1 µS/cm

Enter the value (see the table) as set point 1 and send it to the sensor.

Second calibration point

Dip the measuring cell into a calibration solution (e.g. 47070-02) and enter the conductivity value of the calibration solution as set point 2. Send this value to the sensor as well.
The calibration data are now stored in the sensor.

5.6 Replacing the battery

Remove the battery

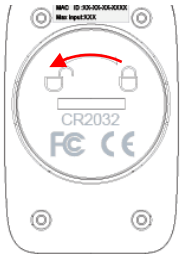


Fig. 4

Open the sensor by turning the screw cap on the back of the sensor counterclockwise e.g. with a coin.

Carefully lift the battery out of its socket with the aid of a small screwdriver or small scissors. Insert the screwdriver as shown in Fig. 5.

Fig. 5

Insert new battery

Slide the battery under the golden metal nose (Fig.6-1). Make sure that the battery is completely under the metal nose and is pushed completely to the upper edge.

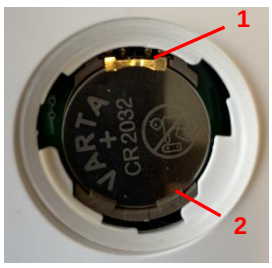


Fig. 6

Press the battery into the socket by applying light pressure on the opposite side.
The battery slides under the two plastic lugs (Fig. 6-2), which can also be noticed by a short "click".

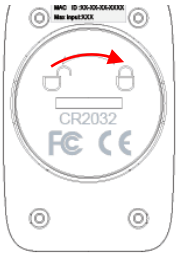


Fig. 7

Before closing the lid, make sure that the seal in the lid is not bent and lies cleanly on the edge of the lid. After closing, turn the lid clockwise to tighten it.

6 TECHNICAL DATA

Operating temperature range: 5 - 40°C
Rel. humidity < 80%

Conductivity

Measuring range	0…20000 µS/cm
Resolution	8 µS/cm
Temperature compensation	Autom. at 5…35°C

Temperature

Measuring range	0…60°C
Resolution	0.1 °C

Max. date rate	10 Hz
Battery type	CR2032
Max. wireless range (open field)	30 m
IP category	IP67
Dimensions (width x height x depth)	220 x 42 x 24 mm
Weight	60 g

7 SCOPE OF DELIVERY

The extent of delivery is as follows

- Cobra SMARTsense Conductivity 12922-00
- Protective cap for measuring cell
- Operating instructions

8 ACCESSORIES

The following accessories are available:

- Button cell CR2032, 3V 07922-15
- Cobra SMARTlink 12999-99
- Standard solution1413 µS/cm, 460 ml 47070-02
- USB-Bluetooth-Adapter 07936-00
- Software measureLAB 14580-61
- Free measureApp available from supplier portals

iOS **Android** **Windows**

9 CONFORMITY

PHYWE Systeme GmbH & Co.KG hereby declares that the radio system type 12922-00 complies with the 2014/53/EU directive. The complete text of the EC Declaration of Conformity is available at the following Internet address:
www.phywe.com/en/ec-declaration

10 DISPOSAL

The packaging mainly consists of environmentally-friendly materials that should be returned to the local recycling stations.

Do not dispose of this product with normal household waste. If this unit needs to be disposed of, please return it to the address that is stated below for proper disposal

PHYWE Systeme GmbH & Co. KG
Abteilung Kundendienst
Robert-Bosch-Breite 10
D–37079 Göttingen

Telefon +49 (0) 551 604-0
Fax +49 (0) 551 604-107