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Cobra4 Sensor-Unit CO_2: Gaseous carbon dioxide concentration

12671-01

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

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

Operating instructions

CE The unit complies with the corresponding EU guidelines

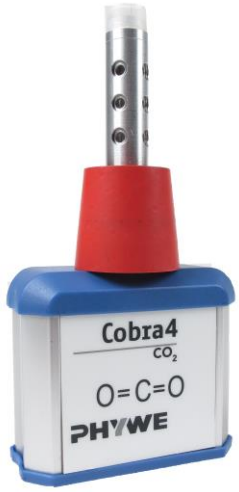

Fig. 1: 12671-01 Cobra4 Sensor-Unit CO_2

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1 SAFETY PRECAUTIONS

Attention!

- 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 Cobra4 Sensor-Unit 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 liquids enter through the housing openings, as such penetration would result in damage to the Cobra4 Sensor-Unit.
- When using the instrument in the open air, do not allow rainwater or splash water to enter into the housing.
- Only use the experimental set-up for the purpose for which it is intended.
- Do not open up the instrument.
- Only connect the data output of Cobra4 Sensor-Unit to the measured data recording instruments specifically intended for it.
- The present-day state of software development makes it impossible to guarantee that a product is free of faults. PHYWE Systeme GmbH & Co. KG therefore does not take on any liability for damages that occur during the installation or the use of the instrument.

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2 PURPOSE AND CHARACTERISTICS

The Cobra4 Sensor-Unit CO_2 serves to measure the concentration of gaseous CO_2.

The Cobra4 Sensor-Unit CO_2 can be connected to one of the following measured data recording instruments, as appropriate for the type of application, and transfer the data to it:

- a Cobra4 Wireless/USB-Link (12601-10) for tethered or wireless data transfer to a computer or a mobile device,
- a handheld Cobra4 Mobile-Link 2 instrument (12620-10),
- a Cobra4 Xpert-Connect (12625-01) for synchronous data transfer in connection with a Cobra4 Xpert-Link (12625-99).

The interface to a measured data recording instrument is at the front of the Sensor-Unit, whereby a mechanically secure click connection is ensured by the mushroom-shaped click-on connector and a hole.

3 FUNCTIONAL AND OPERATING ELEMENTS

3.1 Operating elements

The Cobra4 Sensor-Unit CO2 has no manual operating elements. Operation of it is carried out via a handheld Cobra4 Mobile-Link 2 or, in the case that it is connected to a Cobra4 Wireless/USB-Link or a Cobra4 Xpert-Connect, via a computer or mobile device. The connection between the Sensor-Unit and any one of the three measured data recording instruments is active as soon as it is made.

3.2 Functional elements

The concentration of gaseous CO_2 is measured with the measuring tube at the front end of the Sensor-Unit. The rubber stopper can be used to fix the sensor on an appropriate vessel (e.g. Erlenmeyer flask).

4 NOTES ON OPERATION

Together with the particular transmission instrument (Cobra4 Mobile-Link 2, Cobra4 Wireless/USB-Link, and Cobra4 Xpert-Connect), the Cobra4 Sensor-Unit CO_2 fulfils the technical requirements compiled in the current European Community Guidelines. The product characteristics justify the CE-mark.
Use of this instrument is only permissible under the supervision of qualified staff in a controlled electromagnetic environment of research, teaching and training facilities (schools, universities, institutes and laboratories).
Such an environment is one in the vicinity of which the use of radio emitters such as mobile phones is forbidden. Individual leads that are connected must not be longer than 2 m. The instrument can be so influenced by electrostatic charges and similar electromagnetic phenomena (HF, bursts, indirect lightning discharges, etc.) that it no longer works within the given specifications.
The following measures reduce or eliminate the effect of such disturbances:
Avoid fitted carpets; ensure potential equalization; experiment on a conductive, earthed pad; use screening, screened cables. Do not allow the use of high frequency emitters (radio equipment, mobile phones) in the immediate vicinity.

5 HANDLING

This section describes how to use the Sensor-Unit and record data. To avoid failure or improper operation, please read carefully through this section.

5.1 Putting into operation

For operation of some Cobra4 interfaces, PHYWE software is eventually required. Please make sure that the current version is installed on your device. Therefore read the operating instructions of the Cobra4 interface you want to use.

Connect the Cobra4 Sensor-Unit CO_2 to one of the Cobra4 measured data recording instruments by means of the click-catch 15-pin plug connector. The Sensor-Unit is then ready for use after a brief starting phase (self-calibration), as the voltage for it is supplied by the measured data recording instrument.
Further information on the control of measured data recording instruments is to be found in their operating instructions.

5.2 Recording of data

Connect the Sensor-Unit with the interface device.

Measurement principle
An infrared LED is located in the tip of the measuring tube. Its radiation is detected by an infrared sensor at the opposite end of the measuring tube (at the front end of the Sensor-Unit). The gaseous CO_2 diffuses through the holes into the tube. This is why it is important to ensure that the holes are completely open. The more CO_2 is contained in the tube, the more infrared radiation is absorbed, which is used in the Sensor-Unit to calculate the CO_2 concentration.

Measurement:
The sensor can either be placed in the measurement environment (e.g. the classroom, a terrarium etc.) or inserted into an appropriate vessel with the help of the rubber stopper (e.g. an Erlenmeyer flask). Due to the measuring principle and the mechanical design of the system (flow through the measuring tube), a response time of the system of approx. 10 minutes is to be expected. It is not until after this delay that reliable measurement values can be read off. The exchange of the air inside the tube and the surrounding can be improved by moving the sensor.

After the measurement:
After the sensor has been used, the measuring tube should be sealed by twisting it so that it is protected against the ingress of dust.

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6 TECHNICAL DATA

(typical for 25 °C)
Operating temperature range 5–40 °C
Relative humidity <80 %

Measuring range	0-10000 ppm
Resolution	2 ppm
Data transfer rate	1 Hz
Connector	Sub-D 15 pins
Dimensions (L x W x H)	140 mm x 70 mm x 30 mm
Weight	107 g

7 WASTE DISPOSAL

The packaging consists predominately of environmentally compatible materials that can be passed on for disposal by the local recycling service.

Should you no longer require this product, do not dispose of it with the household refuse.
Please return it to the address below for proper waste disposal.

PHYWE Systeme GmbH & Co. KG
Customer Service
Robert-Bosch-Breite 10
37079 Göttingen
Germany

Phone +49 (0) 551 604-274
Fax +49 (0) 551 604-246

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