PHYWE

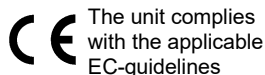| Cobra SMARTsense Skin Resistance | 12942-00 |

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Operating instructions

CE   The unit complies with the applicable EC-guidelines

Fig. 1: 12942-00 Cobra SMARTsense Skin Resistance

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1   SAFETY PRECAUTIONS

⚠ **Caution!**

- **Do not use Cobra SMARTsense Skin Resistance if a device connected to it is connected to the mains voltage!**
- 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 respiratory volume and volumetric flow rate and for transferring the values to a terminal device, e.g. a tablet computer, smartphone, etc., via Bluetooth or USB.

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The sensor is neither suitable nor approved for medical purposes. It is intended solely for didactic purposes. This device must not be used for defined measurements on humans in order to diagnose an illness or disease, i.e. it is not intended for monitoring, treating or alleviating illnesses or diseases. As a consequence, it is not subject to the strict constraints of the Medical Devices Act.

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

If the sensor is to be connected via USB, it is not necessary to press the power button longer 3s.

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 2 seconds	Low battery
Illuminated red	Active charging process
Illuminated green	Charging process completed

3.2 USB port

The battery, which is permanently installed in the sensor, is charged via the type C USB port. Furthermore, communication with a computer takes place via this interface.

4 NOTES ON OPERATION

For safety reasons, the Cobra SMARTsense sensor may only be used when the sensor is not connected to mains voltage!
To do this, make sure that either

    a) The Cobra SMARTsense sensor is not connected to a charger via USB.
    b) If a USB connection to a laptop is established, it is used in battery mode with the power supply disconnected, or
    c) If there is a USB connection to a standard PC or laptop with a power supply unit, these are connected to the mains voltage via a floating isolating transformer.

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.
This instrument is only to be put into operation under specialist supervision in a controlled electromagnetic environment in research, educational and training facilities (schools, universities, institutes and laboratories).
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. 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 on the sensor by pressing the power button for more than 3s. Now the Bluetooth LED flashes red. Start the software and select the sensor.

If the sensor is to be used via the USB interface, it does not need to be switched on. The sensor is connected directly to the end device using the supplied USB cable.

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.
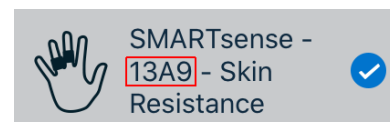

Fig. 2

Fig. 3

Selection of the sensor via the Bluetooth interface
Make sure that the Bluetooth interface is activated on the terminal device (PC/Tablet/Smartphone) and that the software is allowed to access the interface.

After the sensor has been selected in the software, the LED flashes green to indicate that the connection has been established correctly. After the sensor has been coupled with the software, the sensor is no longer visible to other users in the software, and therefore can no longer be selected.

If the sensor is switched on and not connected, it switches off automatically after 5 minutes.

Selection of the sensor via the USB interface
For this purpose the sensor must be plugged into the USB port of the end device. It is not necessary to switch on the sensor. The sensor is automatically recognized and displayed. It can be selected and connected directly.

2

Connecting the electrodes

Attach the disposable electrodes firmly to two fingers. The electrode should be on the fingertip. The exact location of the sensors is shown in Figure 2.
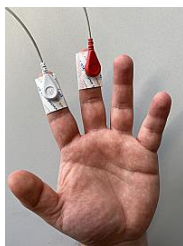

Fig. 2

5.2 Recording of measurement data

Measuring principle

A constant voltage is applied between the two electrodes. The current flowing between the two electrodes is directly proportional to the conductivity of the skin or indirectly proportional to the skin resistance. This current is detected by the sensor and translated into a voltage signal.

The electrical conductance (G) given in the Siemens unit is the reciprocal of the resistance (R).

Measurement

Start a measurement with measureAPP to see the course of the skin resistance.

Calibration

The sensor must be calibrated separately for each person, as the neutral skin conductance differs from person to person. After the electrodes have been attached to the fingers, the software can be used to check when a constant value is reached. After a test, a measurement or a question, the patient waits until the person-specific neutral skin conductance value is reached again. Only then is a new series of measurements taken.

For simplification and better application, the value should therefore be marked with the menu item "Set to zero".

Tip: The neutral skin conductance value should not be too low, otherwise a measurement will take an unnecessarily long time. Even a quiet environment or an armchair simplify relaxation.

5.3 Charging process

Use a USB-C cable to connect the sensor to a computer or USB charger (not included).

During the charging process, the battery charge LED lights up red. When the charging process is complete, the battery charge LED lights up green. The charging time for a completely discharged battery is 3 hours maximum.

⚠️ Disconnect the charger at the latest four hours after the completion of the charging process. Otherwise, the service life of the battery may be negatively affected.

6 TECHNICAL DATA

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

Measuring Range	0 … 10 µS
Resolution	0,01 µS
Max. Samplerate	100 Hz
Battery capacitiy	250 mAh
Max. wireless range (open field)	30 m
Dimensions (length x width x height)	105 x39 x26 mm
Weight	59 g

7 SCOPE OF DELIVERY

The extent of delivery is as follows

• Cobra SMARTsense Skin Resistance	12942-00
• Electrode connection cable	
• 4 EKG electrodes	
• USB cable type C	07935-00
• Operating instructions	

8 ACCESSORIES

• Cobra SMARTlink	12999-99
• USB-charger	07934-99
• Set with 20 Selfsticking Electrodes	12929-00
• USB-Bluetooth-Adapter	07936-00
• Software measureLAB	14580-61
• Free measureApp available from supplier portals	

iOS	Android	Windows

9 CONFORMITY

CE

PHYWE Systeme GmbH & Co.KG hereby declares that the radio system type 12942-00 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

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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

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11   SYMBOL DESCRIPTION

Caution!
Potentially harmful situation
(damage of property)
Generally dangerous spot
Follow operating instructions

Note
Important device information
Follow operating instructions