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## Operating instructions

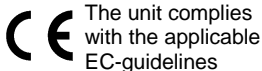


Fig. 1: 12919-00 Cobra SMARTsense Energy

## TABLE OF CONTENTS

- 1 SAFETY PRECAUTIONS
- 2 PURPOSE AND CHARACTERISTICS
- 3 FUNCTIONAL AND OPERATING ELEMENTS
- 4 NOTES ON OPERATION
- 5 HANDLING
- 6 TECHNICAL DATA
- 7 SCOPE OF DELIVERY
- 8 ACCESSORIES
- 9 CONFORMITY
- 10 DISPOSAL

## 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.
- The sensor is protected by self-resetting fuses (semiconductor elements which become highly resistive at higher currents and reduce the current flow. But the circuit is not completely separated!) However, avoid short-circuit currents greater than 5A and voltages greater than 36V. This can destroy the sensor

## 2 PURPOSE AND CHARACTERISTICS

The sensor is used to record current and voltage values and to transmit the measured values via Bluetooth or USB to any end device such as tablets, smartphones, etc.

### 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

Press the on-button for more than 3 seconds to switch the sensor on and off.

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

##### 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

#### 3.1 Function of the internal/external switch

The slide switch on the right side of the sensor switches between internal and external current measurement.



RL = 30 Ω

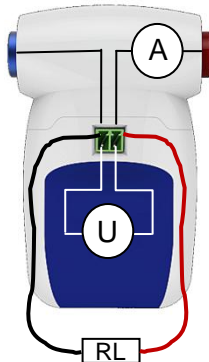


Fig.2 Int. current measurement    Fig.3 Ext. current measurement

#### 3.3 Measurement inputs

The safety sockets for the current and voltage measurement are located on the right and left on the face of the sensor.



Due to the low internal resistance of the sensor, a short circuit may quickly lead to high current flowing through the sensor. If this current exceeds 10 A, even briefly, the sensor may be destroyed. This is why a correct experiment set-up is of utmost importance.

#### 3.4 USB port

The battery, which is permanently installed in the sensor, is charged via the type C USB port. Furthermore, communication with the terminal device (Computer/Tablet) takes place via this interface.

### 4 NOTES ON OPERATION

The 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.

### 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 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.

#### 5.2 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.

A 9-digit code is printed on the back of the sensor (Fig.2). The last 4 digits of the code are displayed in the software as the sensor designation (Fig.3). This allows an exact assignment of the sensors possible with the software.

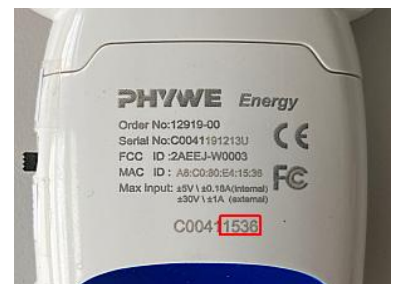


Fig. 4

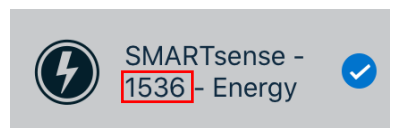


Fig. 5

#### 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.

## 6 TECHNICAL DATA

Operating temperature range: 5 - 40°C

Rel. humidity < 80%

### Voltage

#### Internal:

Measuring range	±5 V
Resolution	1 mV
Accuracy*	± 1 %

#### External:

Measuring range	±30 V
Resolution	20 mV
Accuracy*	± 1 %

### Current

#### Internal:

Measuring range	±0.18 A
Resolution	40 µA
Accuracy*	± 1 %
Overcurrent protection	max. 0.3 A
Self-resetting	30 Ω

Internal load resistance

#### External:

Measuring range	±1 A
Resolution	0.5 mA
Accuracy*	± 1 %
Overcurrent protection	max. 1.1 A
Self-resetting	

Max. data rate	1000 Hz
Max. perm. Current	±1.1 A
Max. perm. Voltage in the circuit	25 V
Battery capacity	250 mAh
Max. wireless range (open field)	30 m
Dimensions (length x width x height)	90 x 55 x 23 mm
Weight	49 g

\*referred to the full-scale value

## 7 SCOPE OF DELIVERY

- The extent of delivery is as follows
- Cobra SMARTsense Energy 12919-00
- External connection cable (4mm)
- USB connecting cable type C 07935-00
- Operating instructions

## 8 ACCESSORIES

The following accessories are available:

- Connecting cable, 32 A, 750 mm, red 07362-01
- Connecting cable, 32 A, 750 mm, blue 07362-04
- Cobra SMARTlink 12999-99
- USB-charger 07934-99
- USB connecting cable type C 07935-00
- Software measureLAB 14580-61
- Free measureApp available from supplier portals

iOS

Android

Windows



## 9 CONFORMITY



PHYWE Systeme GmbH & Co.KG herewith declares that the radio system type 12919-00 complies with Directive 2014/53/EU. The complete text of the EU Declaration of Conformity is available at the following Internet address:  
[www.phywe.com/en/ec-declaration](http://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

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