BG20

EN

OPERATING MANUAL
CARBON MONOXIDE
MEASURING DEVICE

TRT-BA-BG20-TC-001-EN

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Notes regarding the operating manual

Symbols

Danger!
Warns of a hazard which can lead to injuries.

Caution!
Warns of a hazard which can lead to damage to property.

Hazard due to toxic substances
Warns of a health hazard due to toxic substances.

The current version of the operating manual can be found at: www.trotec.de

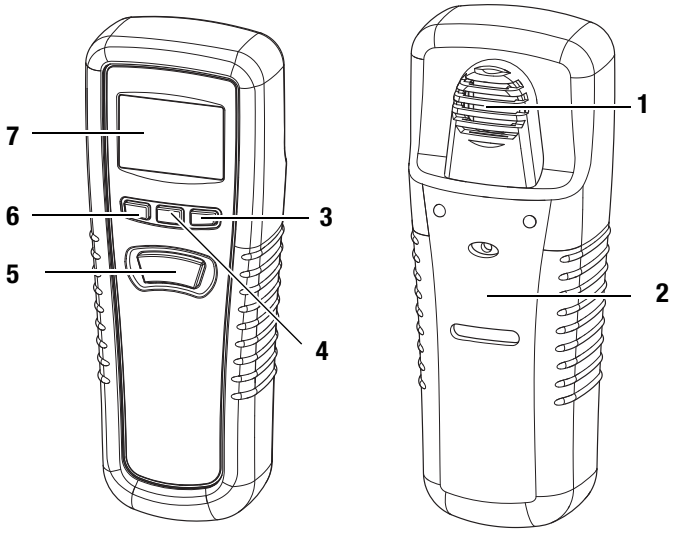
Legal notice

Information about the device

Description of the device

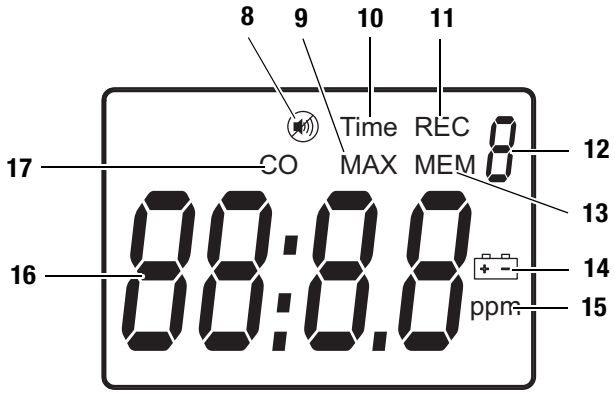
The carbon monoxide measuring device serves the purpose of measuring the concentration (ppm) of carbon monoxide (CO) in the air by means of an integrated sensor.
The device is designed for indoor use.
The device is equipped with an automatic switch-off and memory function.
In order to protect it from impact, scratching etc., the device comes equipped with a protective cover.

Device depiction



No.	Designation
1	Sensor
2	Protective cover
3	SEL button
4	Indicator LED
5	Power button
6	MODE button
7	Display

Display



No.	Designation
8	MUTE indication
9	MAX indication
10	Time indication
11	REC indication
12	Memory space indication
13	MEM indication
14	Battery indication
15	Indication of the unit ppm
16	Measurement value indication
17	CO indication

Technical data

Model:	BG20
Weight:	180 g
Dimensions (H x W x D):	160 x 56 x 40 mm
Measuring range:	0 ppm to 1000 ppm
Accuracy:	±10 ppm or ±5 % (depending on which value is larger)
Measuring range resolution:	1 ppm
Sensor type:	stabilised electrochemical gas-specific (CO)
Sensor life (typically):	5 years
Warm-up period:	< 20 seconds
Power supply:	9 V battery (NEDA 1604 or IEC 6F22)
Battery life:	approx. 50 hours for an alkaline cell
Operating temperature:	0 °C to 50 °C (32 °F to 122 °F)
Storage temperature:	-30 °C to 60 °C (-22 °F to 140 °F)
Operating humidity:	0 % RH to 99 % RH (non-condensing)

Scope of delivery

1 x Carbon monoxide measuring device BG20
1 x 9 V battery
1 x Device bag
1 x Getting started guide

Safety

Carefully read the operating manual before using the device and keep it within reach!

- Do not use the device in atmospheres containing oil, sulphur, chlorine or salt.
- Protect the device from permanent direct sunlight.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.
- Do not open the device with a tool except for battery change.
- Observe the storage and operating conditions (see chapter Technical data).

Intended use

Only use the carbon monoxide measuring device BG20 for indoor measurements of the carbon monoxide concentration in the air within the measuring range specified in the technical data.
To use the device for its intended use, only use spare parts which have been approved by Trotec.

Improper use

Do not use the device in potentially explosive atmospheres, or for measurements in liquids. Trotec accepts no liability for damages resulting from improper use. In such a case, entitlements to a warranty are forfeited. Any unauthorised modifications, alterations or structural changes to the device are forbidden.

Personnel qualifications

People who use this device must:

- be aware of the dangers that occur when working with carbon monoxide measuring devices.
- have read and understood the operating manual, especially the safety chapter.

Residual risks

Danger!
Even low concentrations of carbon monoxide (CO) are life-threatening! Carbon monoxide is toxic by inhalation! Make yourself familiar with the signs of CO poisoning and learn to recognize them. Immediately remove persons who have inhaled carbon monoxide to fresh air. Immediately seek medical help!

Danger!
Keep a sufficient distance away from sources of heat.

Danger!
Do not leave the packaging lying around. Children may use it as a dangerous toy.

Danger!
The device is not a toy and does not belong in the hands of children.

Danger!
Dangers can occur at the device when it is used by untrained people in an unprofessional or improper way. Observe the personnel qualifications.

Caution!
To prevent damages to the device, do not expose it to extreme temperatures, extreme humidity or moisture.

Caution!
Do not use abrasive cleaners or solvents to clean the device.

Examples for carbon monoxide concentration in the air

Examples for carbon monoxide concentrations and their effects:

0 to 1 ppm	Normal background levels
9 ppm	Max. permissible concentration for interior spaces
35 ppm	Max. average amount to which one may be exposed over a period of 8 hours. *
100 ppm	Exposure limit, persons ought to leave enclosed spaces. *
150 ppm	Slight headache after 1.5 hours
200 ppm	Mild headache, fatigue, nausea and dizziness
400 ppm	Frontal headache, life-threatening after 3 hours
800 ppm	Dizziness, nausea, convulsions, death within 2 to 3 hours
1600 ppm	Nausea within 20 minutes, death within 1 hour
3200 ppm	Headache, dizziness and nausea within 5 to 10 minutes. Death within 25 to 30 minutes.
12800 ppm	Death within 1 to 3 minutes

* according to OSHA = Occupational Safety & Health Association

Transport and storage

Transport

Use the supplied device bag to transport the device.

Storage

When the device is not being used, observe the following storage conditions:

- dry,
- protected from dust and direct sunlight,
- with a plastic cover to protect it from invasive dust, if necessary.
- The storage temperature is the same as the range given in the chapter Technical data.
- When storing the device for a long time, remove the batteries.

Preferably use the supplied device bag to store the device.

Operation

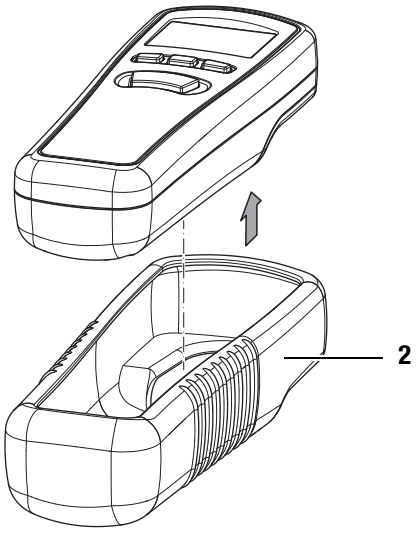
Inserting the battery

- Insert the supplied battery before first use.

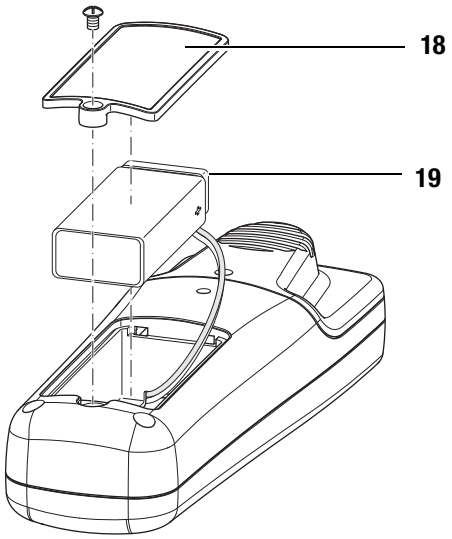
Caution!

Make certain that the surface of the device is dry and the device is switched off.

1. Remove the device from the protective rubber cover (2).
   – The protective rubber cover is fitted tightly. Push the protective cover above the display off the housing and remove it towards the rear.



2. Loosen the screw at the battery cover (18).



3. Use the battery clip (19) to connect the battery with correct polarity.
4. Screw the battery cover (18) back in.
5. Pull the protective rubber cover back over the device.

Switch-on

Note:

The device calibrates after each switch-on taking the CO concentration in the environment as basis. For reasons of safety however, regardless of the actual CO concentration in the environment upon switch-on, the device accepts no more than 10 ppm as upper limit!

Example:
Should the background concentration of CO amount to 30 ppm, the device will not use 30 ppm as reference value, and hence zero point, but instead maximally 10 ppm! The set alarm threshold of 30 ppm (see also *Carrying out a measurement*) would therefore be activated at an actual CO value of 40 ppm (display: 30 ppm!).

Always make sure to switch the device on in CO-free surroundings, e.g. in fresh air, for otherwise the displayed CO contents of the subsequent measurements will be incorrect!

1. Go to a place with a low CO concentration (e.g. fresh air).
2. Press the Power button (5).
   – The indicator LED (4) will briefly flash red and then be illuminated in green. The warm-up phase of the device incl. self-test is started.
3. Wait until the self-test is completed.
   – The device displays (7) a countdown from 10 to 0.
   – An acoustic signal indicates, that the self-test is completed.
   – The device is ready for operation.

Carrying out a measurement

Note:

Note that moving from a cold area to a warm area can lead to condensation forming on the device's circuit board. This physical and unavoidable effect can falsify the measurement. In this case, the display shows either no measured values or they are incorrect. Wait a few minutes until the device has become adjusted to the changed conditions before carrying out a measurement.

1. Direct the device towards the supposed CO source.
   – The measured value will be displayed in real time.
   – If the measured value amounts to more than 30 ppm, a repetitive acoustic warning signal will be emitted. The higher the CO content, the higher the repetition frequency. The LED (4) is illuminated in red.
   – If the measured value amounts to more than 200 ppm, a constant acoustic warning signal will be emitted. The LED (4) is illuminated in red.

Maximum value display

The device can display the maximum value determined since the beginning of the measurement. To do so, proceed as follows:

1. Press the MODE button (6) once.
   – The indications MAX (9) and REC (11) appear on the display.
   – The highest value measured appears in the measurement value display.

Measured value storage

Up to 10 measured values can be stored. In order to save one or several measured values, please proceed as follows:

1. Press the MODE button (6) three times.
   – The indications REC (11) and memory space (12) appear on the display.
   – The value 0 or else the storage location displayed when last calling up the measured value memory will appear in the memory space (12) display.
2. Press the SEL button (3) to save the current measured value.

Calling up the measured value memory

The device comes equipped with a measured value memory, in which up to 10 measured values can be stored. Saved measured values are preserved even after switch-off.
To call up saved measured values, please proceed as follows:

1. Press the MODE button (6) twice.
   – The indications MEM (13) and memory space (12) appear on the display.
2. Repeatedly press the SEL button (3) until the storage location with the desired number is displayed.

Calling up the alarm threshold

The value for the alarm threshold is stipulated, can however be called up at any time:

1. Press the MODE button (6) four times.
   – The value 30 ppm is displayed in the measurement value display (16).

Resetting the zero point

By means of resetting the zero point the prevailing CO concentration and hence the current measured value is defined as new reference value (see also *Switch-on*). Therefore, resetting the zero point should only be effected in the fresh air, thus in surroundings with the lowest possible CO concentration!
To do so, proceed as follows:

1. Go to a place with a low CO concentration (e.g. fresh air).
2. Press the MODE button (6) four times.
   – The alarm threshold (30 ppm) is displayed in the measurement value display (16).
3. Press and hold the SEL button (3) for approx. 8 seconds until *0* appears in the measurement value display.
   – The digit *0* flashes six times.
   – Then the device returns to the measuring mode.

Disabling the acoustic warning signal

1. Press the MODE button (6) six times until either *on* or *off* is displayed.
2. Press the SEL button (3) to select the desired setting.
   – When *on*, the acoustic warning signal is enabled.
   – When *off*, the acoustic warning signal is disabled. The MUTE indication (8) appears on the display.

Switching the display illumination on or off

Ex works the display illumination is switched off.
Press the SEL button (3) for approx. 2 seconds, whilst the device is in normal measuring mode.
   – The display's background illumination is switched on or off.

Switch-off

The device comes equipped with an automatic switch-off function and switches off automatically after 15 minutes of inactivity.

1. Press the Power button (5) to switch the device off.

Maintenance and repair

Battery change

The battery is to be changed when the battery indication (11) lights up in the display or the device can no longer be switched on. See Inserting the battery on page 4.

Sensor

The sensor life amounts to approx. 5 years.
During this time, we recommend checking/calibrating the sensor annually.

Cleaning

Clean the device with a soft, damp and lint-free cloth. Ensure that no moisture enters the housing. Do not use any sprays, solvents, alcohol-based cleaning agents or abrasive cleaners, but only clean water to moisten the cloth.

Repair

Do not modify the device or install any spare parts. For repairs or device testing, contact the manufacturer.

Disposal

In the European Union, electronic equipment must not be treated as domestic waste, but must be disposed of professionally in accordance with Directive 2002/96/EC of the European Parliament and Council of 27th January 2003 concerning old electrical and electronic equipment. At the end of its life, please dispose of this instrument in a manner appropriate to the relevant legal requirements.

Declaration of conformity

in accordance with the EC Low Voltage Directive 2006/95/EC and the EC Directive 2004/108/EC about electromagnetic compatibility.
We hereby declare that the carbon monoxide measuring device BG20 was designed, developed and produced in compliance with the named EC Directives.

The CE marking is found on the front of the device.

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