

# EN

**OPERATING MANUAL**  
HCHO/TVOC MEASURING  
DEVICE



**Table of contents**

Notes regarding the operating manual..... 2

Safety ..... 2

Information about the device..... 3

Transport and storage..... 6

Operation ..... 6


Maintenance and repair ..... 8


Errors and faults..... 8


Disposal ..... 8

**Notes regarding the operating manual**


**Symbols**


 **Warning of electrical voltage**  
 This symbol indicates dangers to the life and health of persons due to electrical voltage.

 **Warning**  
 This signal word indicates a hazard with an average risk level which, if not avoided, can result in serious injury or death.

 **Caution**  
 This signal word indicates a hazard with a low risk level which, if not avoided, can result in minor or moderate injury.

**Note**  
 This signal word indicates important information (e.g. material damage), but does not indicate hazards.

 **Info**  
 Information marked with this symbol helps you to carry out your tasks quickly and safely.

 **Follow the manual**  
 Information marked with this symbol indicates that the operating manual must be observed.

You can download the current version of the operating manual and the EU declaration of conformity via the following link:




BQ16



<https://hub.trotec.com/?id=39664>

**Safety**

**Read this manual carefully before starting or using the device. Always store the manual in the immediate vicinity of the device or its site of use.**

-  **Warning**  
**Read all safety warnings and all instructions.** Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.  
**Save all warnings and instructions for future reference.**
- Do not use the device in potentially explosive rooms or areas and do not install it there.
  - Do not use the device in aggressive atmosphere.
  - Do not immerse the device in water. Do not allow liquids to penetrate into the device.
  - The device may only be used in dry surroundings and must not be used in the rain or at a relative humidity exceeding the operating conditions.
  - 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.
  - Never charge batteries that cannot be recharged.
  - Different types of batteries and new and used batteries must not be used together.
  - Insert the batteries into the battery compartment according to the correct polarity.
  - Remove discharged batteries from the device. Batteries contain materials hazardous to the environment. Dispose of the batteries according to the national regulations.
  - Remove the batteries from the device if you will not be using the device for a longer period of time.
  - Never short-circuit the supply terminal in the battery compartment!
  - Do not swallow batteries! If a battery is swallowed, it can cause severe internal burns within 2 hours! These burns can lead to death!

- If you think batteries might have been swallowed or otherwise entered the body, seek medical attention immediately!
- Keep new and used batteries and an open battery compartment away from children.
- Only use the device, if sufficient safety precautions were taken at the surveyed location (e.g. when performing measurements along public roads, on building sites etc.). Otherwise do not use the device.
- Observe the storage and operating conditions (see Technical data).

### Intended use

This device is intended for measuring the concentration of HCHO (formaldehyde) and TVOC (volatile organic compounds) in the indoor air.

To use the device for its intended use, only use accessories and spare parts which have been approved by Trotec.

### Foreseeable misuse

The device may not be used for measurements in liquids.

The device may not be used in potentially explosive atmospheres, when wet or very humid.

Any unauthorised changes, modifications or alterations to the device are forbidden.

### Personnel qualifications

People who use this device must:

- be aware of the dangers that occur when working in environments contaminated with formaldehyde.
- have read and understood the operating manual, especially the Safety chapter.

### Residual risks



#### Warning of electrical voltage

There is a risk of a short-circuit due to liquids penetrating the housing!  
Do not immerse the device and the accessories in water. Make sure that no water or other liquids can enter the housing.



#### Warning of electrical voltage

Work on the electrical components must only be carried out by an authorised specialist company!



#### Warning

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



#### Warning

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



#### Warning

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



#### Caution

Keep a sufficient distance from heat sources.

#### Note

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

#### Note

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

## Information about the device

### Device description

The measuring device allows to easily and quickly monitor the air quality with respect to the content of formaldehyde (HCHO) and volatile organic compounds (TVOC).

Furthermore, a MAX/MIN function and a HOLD function are available for assessment of the measurements.

The measuring device comes equipped with a selectable display illumination.

When not in use, an automatic switch-off saves the battery.

### Examples for formaldehyde concentration in the air

Formaldehyde is a colourless gas which is often contained in the room air. Depending on the personal sensitivity, it is perceived as a pungent odour above certain concentrations.

Formaldehyde, also referred to as HCHO or methanal, was assigned to the hazard class Carcinogenic/category 1B and Germ cell mutagenic/category 2 with effect from 1 January 2016. Even small quantities of formaldehyde in the room air may affect human health. The consequences include concentration disorders, nervousness, headaches, dizziness, but also nausea, swelling of mucosa, conjunctival irritations and lacrimation. In extremely high concentrations, formaldehyde can cause pneumonia or toxic pulmonary oedema and is therefore fatal.

Moreover, the substance is suspected of having a sensitizing effect on the body with respect to allergies, and of promoting an aggravation of asthmatic symptoms. It is assumed that the adverse health impact of formaldehyde is not caused by the isolated substance but by mixtures of pollutants (VOC/TVOC) containing formaldehyde.

The following specifications serve as guide values, which were determined in international studies. They are not binding since the listed symptoms strongly depend on personal sensitivity!

0.05 to 0.125 ppm	Odour threshold
0.01 to 1.6 ppm	Irritation of mucous membranes (nose, throat) and eyes
2.0 to 3.0 ppm	Stinging in the nose, eyes, throat
4.0 to 5.0 ppm	Bearable for 30 minutes, increasing discomfort, lacrimation
10.0 to 20.0 ppm	Strong lacrimation already after a few minutes of exposure (lasting for up to 1 hour after exposure), immediate breathlessness, coughing, severe burning in throat, nose and eyes
30 ppm	Toxic pulmonary oedema, pneumonia, risk of death!

### TVOC – Total Volatile Organic Compounds

Nowadays, interior spaces contain numerous possible sources of volatile organic compounds, so-called VOCs. Such sources include sealants, furniture, varnishes and solvents, insulation material etc.

Every individual volatile organic compound can be associated with specific as well as unspecific health problems. Therefore, there is a maximum limit for the ambient concentration of each of these substances in interior spaces.

Due to the different chemical compositions and the associated different impact potential of each of these substances, an assessment of the overall group of substances is a rather complex issue. However, this is exactly what is tried to be done by way of calculating the sum of the concentrations of these individual compounds, i.e. by determining one collective value, the so-called TVOC value (Total Volatile Organic Compounds).

Owing to the complexity of VOCs, both the individual health effects on the human body and their intensity can be different and vary greatly in certain cases. Therefore, the TVOC concentration and its effects are purely indicative.

Even below the thresholds of an acute individual effect, TVOCs can affect the human well-being and health through so-called combination effects. A long-term exposure to even low TVOC concentrations, particularly to mixtures, can lead to unspecific symptoms and reactions including

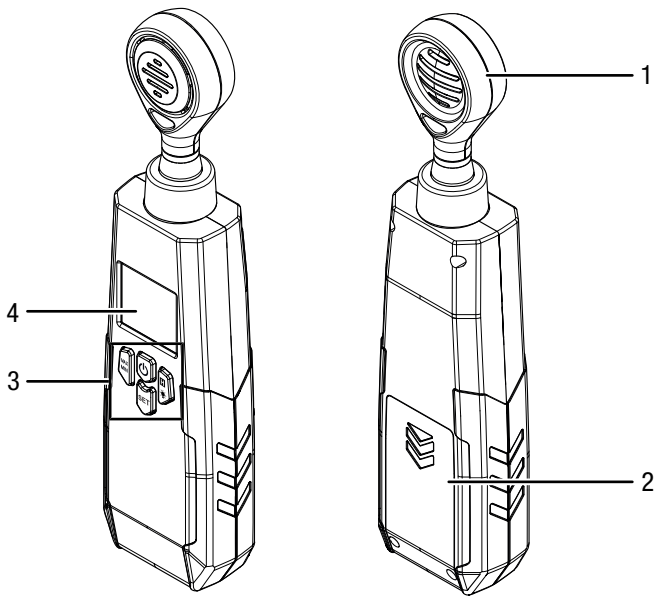
- perception of unpleasant odours and tastes
- runny nose and watery eyes
- irritation of eyes, nose, throat
- dry mucous membranes and dry skin, itching
- increased sensitivity to infections of the respiratory tract as well as
- neurotoxic symptoms (fatigue, headaches, reduced mental performance)

and even result in permanent health damage.

TVOC concentration (mg/m <sup>3</sup> )	Effect
< 0.20	No irritation or impairment of well-being
0.20 to 3.0	Irritation or impairment of well-being possible in case of interaction with other exposure parameters
3.0 to 25	Exposure results in an effect; headaches possible in case of interaction with other exposure parameters
> 25	Headaches; other neurotoxic effects apart from headaches possible

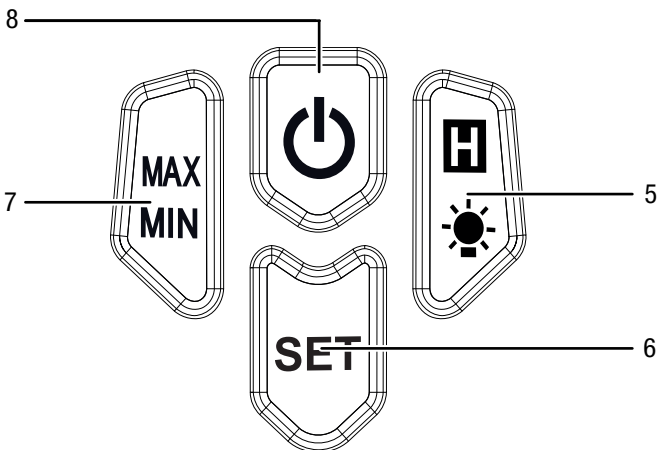
(Source: German Federal Environmental Agency, Federal Health Bulletin, B. Seifert, Guideline values for indoor air, Springer 1999)

Device depiction



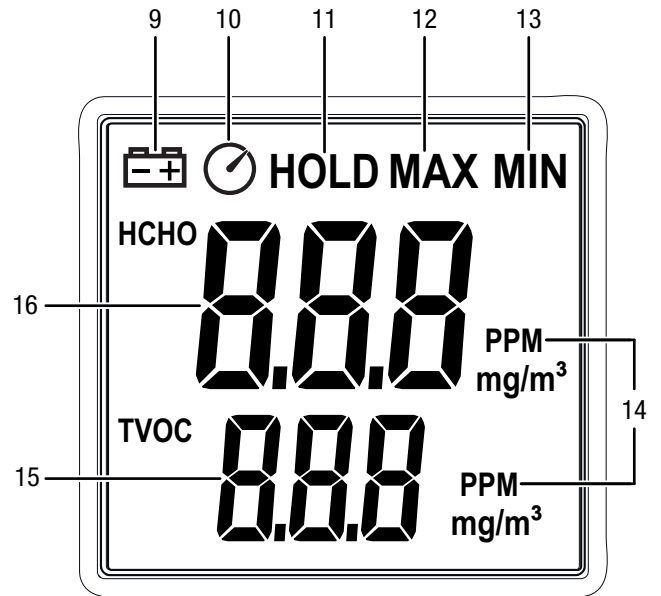
No.	Designation
1	Sensor
2	Battery compartment with cover
3	Operating elements
4	Display

Operating elements



No.	Designation
5	Lamp / <i>HOLD</i> button
6	<i>SET</i> button
7	<i>MAX</i> / <i>MIN</i> button
8	Power button

Display



No.	Designation
9	Battery indication
10	Indication for automatic switch-off
11	<i>HOLD</i> indication
12	<i>MAX</i> indication
13	<i>MIN</i> indication
14	PPM / mg/m <sup>3</sup> indication
15	TVOC measured value display
16	HCHO measured value display

**Technical data**

Parameter	Value
Model	BQ16
Dimensions (length x width x height)	230 mm x 55 mm x 35 mm
Weight	205 g
<b>HCHO (formaldehyde)</b>	
Measuring range	0.00 to 5.00 PPM 0.00 to 5.00 mg/m <sup>3</sup>
Resolution	0.01 PPM 0.01 mg/m <sup>3</sup>
Accuracy	±5 % FS*
<b>TVOC (volatile organic compounds)</b>	
Measuring range	0.00 to 9.99 PPM 0.00 to 9.99 mg/m <sup>3</sup>
Resolution	0.01 PPM 0.01 mg/m <sup>3</sup>
Accuracy	±10 % FS*
Operating conditions	0 °C to +50 °C with < 80 % RH
Storage conditions	-10 °C to +60 °C with < 80 % RH
Display	Backlit LCD display
Battery	9 V battery
Automatic switch-off	15 min if automatic switch-off is activated

\* FS = full scale (in relation to the full scale value)

**Scope of delivery**

- 1 x HCHO/TVOC measuring device BQ16
- 1 x 9 V battery
- 1 x Quick guide
- 1 x Device bag

**Transport and storage**

**Note**

If you store or transport the device improperly, the device may be damaged.  
Note the information regarding transport and storage of the device.

**Transport**

For transporting the device, use the bag included in the scope of delivery in order to protect the device from external influences.

**Storage**

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

- dry and protected from frost and heat
- protected from dust and direct sunlight
- with a cover to protect it from invasive dust if necessary
- the storage temperature complies with the values specified in the Technical data
- Remove the battery from the device.

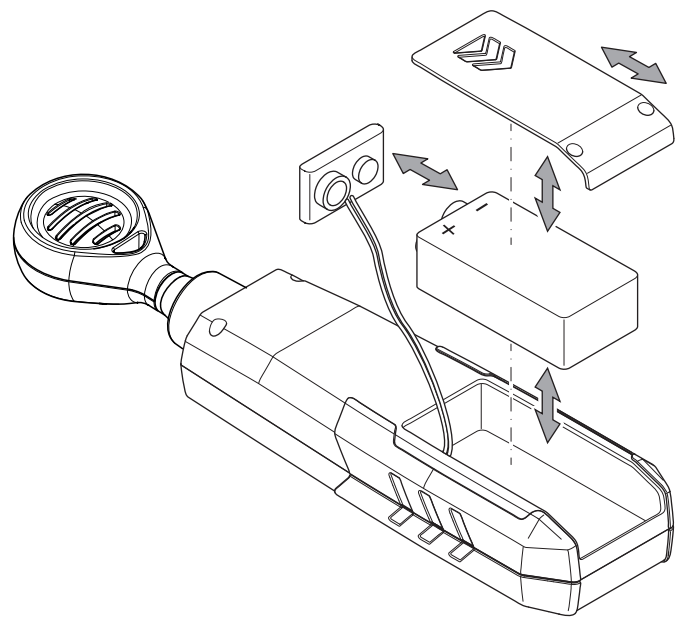
**Operation**

**Inserting the battery**

Insert the supplied battery before first use.

**Note**

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



1. Open the battery compartment at the rear of the device by sliding down the cover in the direction of the arrow.
2. Use the battery clip to connect the 9 V battery with correct polarity.
3. Place the battery with the battery clip into the battery compartment.
4. Slide the cover back onto the battery compartment until it locks in place.

## Switching the device on



### Info

Please 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. Take the device out of the packaging so that it can adapt to the climatic and chemical ambient conditions. This way the measurement is not affected by substances possibly contained in the packaging material.
2. Press the Power button (8) for approx. 2 s.
  - ⇒ The device switches on.
3. Wait for approx. 90 s until the TVOC sensor is ready for use. This is indicated by a countdown from 90 to 00 on the display for the TVOC measured value (15).

## Carrying out a measurement

1. Point the sensor (1) at the desired measuring range or the measuring environment to be examined.
2. Wait until the displayed value has stabilized. This process may take a few minutes depending, among other things, on whether the device has just been switched on or has already been operated for some time.
3. Read the HCHO value from measured value display (16) and the TVOC value from measured value display (15).

## Changing the unit PPM / mg/m<sup>3</sup>

If required, you can change the unit. When doing so, please observe the following conversion factor for HCHO and TVOC:  
1 ppm = 1.226 mg/m<sup>3</sup>.

1. Press the *SET* button (6) to change the displayed unit.

## HOLD function

1. Press the Lamp button (5).
  - ⇒ The *HOLD* indication (11) appears on the display.
  - ⇒ The current value will be held.
2. Press the Lamp button (5) again.
  - ⇒ The *HOLD* indication (11) disappears.
  - ⇒ The display again indicates the current measured value.

## MAX/MIN function

By use of the MAX/MIN function you can either read the highest or the lowest value of the current measurement interval.

1. Press the *MAX/MIN* button (7).
  - ⇒ The *MAX* indication (12) appears on the display.
  - ⇒ The display now shows the highest HCHO and TVOC values measured since the device was switched on.
2. Press the *MAX/MIN* button (7) again.
  - ⇒ The *MIN* indication (13) appears on the display.
  - ⇒ The display now shows the lowest HCHO and TVOC values measured since the device was switched on.
3. Press the *MAX/MIN* button (7) again to return to the real-time measured value display.

## Switching on the display illumination

- ✓ The measuring device is switched on.
1. Press the Lamp button (5) for approx. 3 s and let go of it again.
    - ⇒ The display illumination goes on.
  2. Press the Lamp button (5) for approx. 3 s once again and let go of it again.
    - ⇒ The display illumination switches off.

## Automatic switch-off

If the indication for automatic switch-off (10) is displayed, the device will switch off automatically when not in use for approx. 15 minutes.

To deactivate automatic switch-off, please proceed as follows:

- ✓ The measuring device is switched on.
1. Press the Power button (8) for approx. 3 s.
    - ⇒ The indication for automatic switch-off (10) disappears.
    - ⇒ Automatic switch-off is deactivated.

Repeat these steps to switch automatic switch-off back on.

## Switch-off

If the automatic switch-off function (10) is activated, the device will switch off after approx. 15 minutes of non-use.

1. Press the Power button (8).
  - ⇒ The device is switched off.
  - ⇒ The MAX and MIN values are reset.

**Maintenance and repair**

**Battery change**

A battery change is required when the Battery indication (9) lights up or the device can no longer be switched on (see chapter Inserting the battery).

**Cleaning**

Clean the device with a soft, damp and lint-free cloth. Make sure 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.

**Errors and faults**

The device has been checked for proper functioning several times during production. If malfunctions occur nonetheless, check the device according to the following list.

<b>Fault</b>	<b>Cause</b>	<b>Remedy</b>
The device can no longer be switched on.	The battery is dead.	Insert a new battery (see chapter Operation).
Display segments are only faintly visible or flicker.	The battery voltage is too low.	

**Disposal**

Always dispose of packing materials in an environmentally friendly manner and in accordance with the applicable local disposal regulations.



The icon with the crossed-out waste bin on waste electrical or electronic equipment stipulates that this equipment must not be disposed of with the household waste at the end of its life. You will find collection points for free return of waste electrical and electronic equipment in your vicinity. The addresses can be obtained from your municipality or local administration. You can also find out about other return options that apply for many EU countries on the website <https://hub.trotec.com/?id=45090>. Otherwise, please contact an official recycling centre for electronic and electrical equipment authorised for your country.

The separate collection of waste electrical and electronic equipment aims to enable the re-use, recycling and other forms of recovery of waste equipment as well as to prevent negative effects for the environment and human health caused by the disposal of hazardous substances potentially contained in the equipment.



In the European Union, batteries and accumulators must not be treated as domestic waste, but must be disposed of professionally in accordance with Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators. Please dispose of batteries and accumulators according to the relevant legal requirements.

**Only for United Kingdom**

According to Waste Electrical and Electronic Equipment Regulations 2013 (2013/3113) and the Waste Batteries and Accumulators Regulations 2009 (2009/890), devices that are no longer usable must be collected separately and disposed of in an environmentally friendly manner.



Trotec GmbH

Grebener Str. 7  
D-52525 Heinsberg

☎ +49 2452 962-400

☎ +49 2452 962-200

✉ [info@trotec.com](mailto:info@trotec.com)

[www.trotec.com](http://www.trotec.com)