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## OPERATING MANUAL GAS DETECTOR



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## Notes regarding the instructions

### 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 instructions must be observed.

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



BG40



<https://hub.trotec.com/?id=40707>

## 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.
- Observe the storage and operating conditions (see Technical data).
- High concentrations of highly flammable gases can cause explosions, fire, suffocation and other hazards. Please obtain information on the gas you are working with and take the appropriate precautions.
- Calibrate the device in an environment that is free from gases affecting the measurement.

## Intended use

Only use the device to detect the following flammable or interfering gases: Natural gas, methane, ethane, ethene, hexane, benzene, propane, ethylene, iso-butane, ethanol, acetaldehyde, formaldehyde, toluene, p-xylene, alcohol, ammonia, water vapour, petrol, turbine fuel, hydrogen, hydrogen sulphide, smoke, industrial solvents, paint thinners, naphtha, carbon monoxide.

Only use the device e.g. to detect gas leaks on pipelines or fittings.

The device is able to detect gas concentrations of 10 % LEL (Lower Explosion Limit).

The device is only intended for private, non-commercial use in interior spaces.

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

## Foreseeable misuse

Do not use the device in hazardous areas or in any areas where an explosive gas/air mixture is likely to prevail.

The device is not intended for professional/commercial use.

Do not use the device as monitoring device for your personal safety. The device is no protective equipment.

Do not use the device for measurements in liquids and at live parts. Trotec accepts no liability for damages resulting from improper use. In such a case, any warranty claims will be voided. Any unauthorised modifications, alterations or structural changes to the device are forbidden.

## Personnel qualifications

People who use this device must:

- have read and understood the instructions, 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 of explosive substances

Do not expose the batteries to temperatures above 60 °C! Do not let the batteries come into contact with water or fire! Avoid direct sunlight and moisture. There is a risk of explosion!



### Warning of explosive substances

There is a danger of explosion due to sparking. Switch on the measuring device in an atmosphere that is free from combustible gas. The device calibrates itself automatically after switch-on. If combustible gases are already present in the environment, any further measuring results can be distorted and combustible gases may remain undetected.



### Warning of explosive substances

Never charge the battery in a potentially explosive atmosphere.



### Warning

High concentrations of combustible gases cause a risk of explosion, fire and suffocation.

Make yourself familiar with the safety data sheet regarding the characteristics of the gas to be detected and take the necessary precautions.



### 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

Lithium-ion batteries might catch fire in case of overheating or damage. Ensure a sufficient distance to heat sources, do not subject lithium-ion batteries to direct sunlight and make sure not to damage the casing. Do not overcharge lithium-ion batteries. If the battery is not permanently installed in the device, only use smart chargers that switch off automatically when the battery is fully charged. Charge lithium-ion batteries in due time before they are discharged completely.



### 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 device BG40 detects the following combustible and/or unwanted gases: Natural gas, methane, ethane, ethene, hexane, benzene, propane, ethylene, iso-butane, ethanol, acetaldehyde, formaldehyde, toluene, p-xylene, alcohol, ammonia, water vapour, petrol, turbine fuel, hydrogen, hydrogen sulphide, smoke, industrial solvents, paint thinners, naphtha, carbon monoxide.

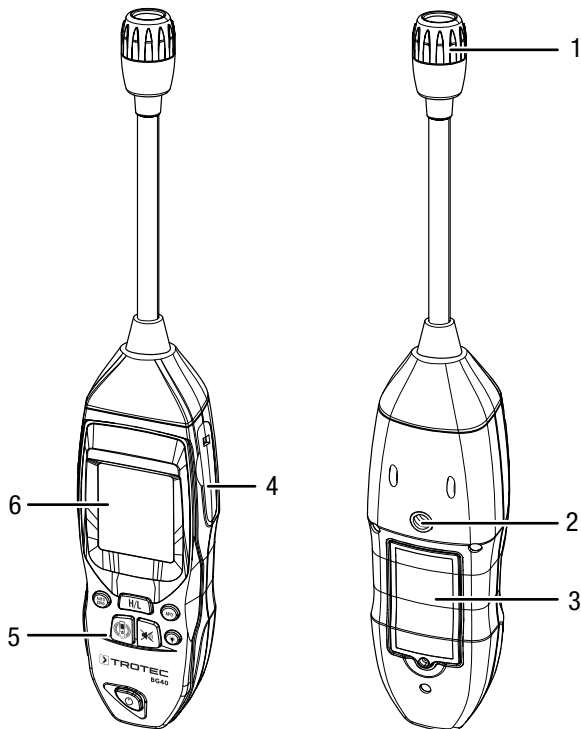
The measuring device is able to detect gas concentrations of as low as 10 % LEL (Lower Explosion Limit) and warns the user via both a visual and an acoustic alarm. The flexible gooseneck allows you to easily reach poorly accessible locations.

### Definition of LEL

- LEL = Lower Explosion Limit

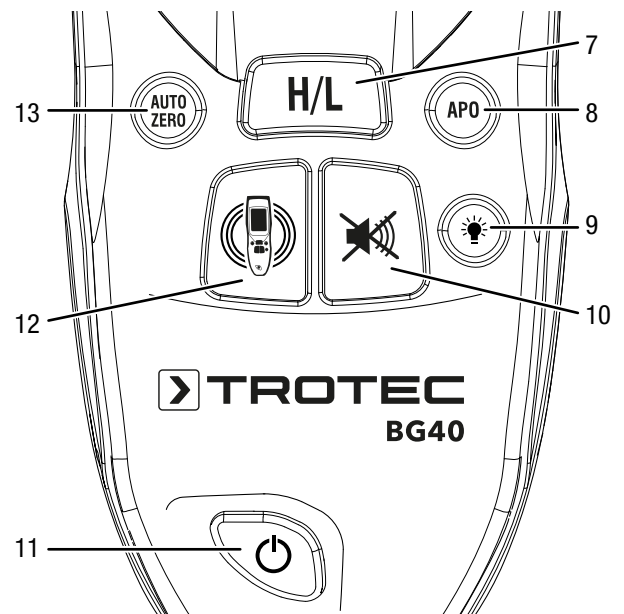
The LEL of a combustible gas is the minimum concentration of this gas at which the gas can start to burn when exposed to a source of ignition (e.g. a match). At concentrations below the LEL, the gas does not burn. Gas detectors for combustible gases are generally calibrated for 0 – 100 % LEL.

### Device depiction



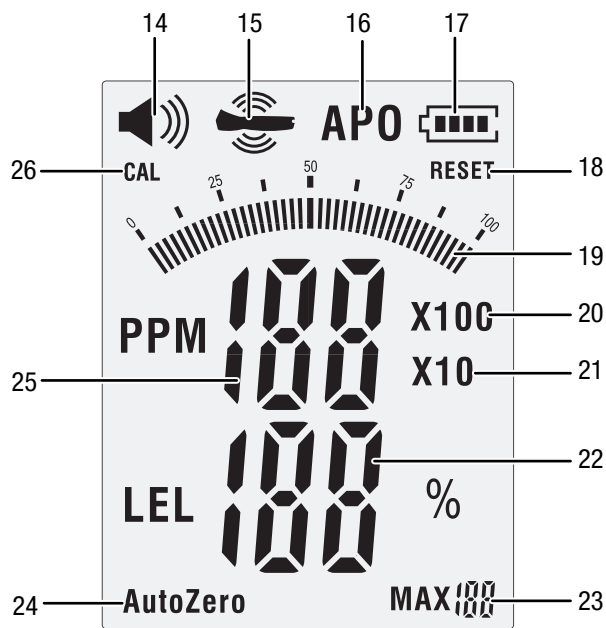
No.	Designation
1	Gooseneck probe
2	Tripod thread
3	Battery compartment with cover
4	Charging cable connection
5	Operating elements
6	Display

### Operating elements



No.	Designation
7	H/L button (adjustment of gas concentration measuring range)
8	Automatic switch-off button
9	Illumination button
10	Alarm button
11	Power button
12	Vibration button
13	Zero reset button

## Display



No.	Designation
14	Alarm indication
15	Vibration indication
16	Automatic switch-off indication
17	Battery indication
18	Reset indication
19	Indicator scale
20	Low sensitivity indication
21	High sensitivity indication
22	LEL (lower explosion limit) indication
23	Maximum gas concentration indication
24	AutoZero (zero reset enabled) indication
25	Concentration indication
26	Calibration indication

## Technical data

Parameter	Value
Measuring range	0 to 10000 ppm
Accuracy (repeatable)	50 ppm
Response time	2 s
Sensitivity	< 10 ppm (methane)
Standard calibration	Methane
Detectable gases	Natural gas, methane, ethane, ethene, hexane, benzene, propane, ethylene, iso-butane, ethanol, acetaldehyde, formaldehyde, toluene, p-xylylene, alcohol, ammonia, water vapour, petrol, turbine fuel, hydrogen, hydrogen sulphide, smoke, industrial solvents, paint thinners, naphtha, carbon monoxide.
Measuring range adjustment	<div> <div>x10</div> <div>&lt; 1,000</div> </div> <div> <div>x100</div> <div>&lt; 10,000</div> </div>
Warm-up time	Approx. 40 s
Power supply	1 x 3.7 V / polymer Li-ion battery
Operating conditions	0 to 40 °C with 10 to 85 % RH
Storage conditions	-10 to +60 °C
Dimensions (length x width x height)	45 x 60 x 220 (mm) (without probe)
Probe length	400 mm
Weight	410 g

## Alarm frequency depending on measuring range

Measuring range L (x10)	Measuring range H (x100)	Alarm frequency
0 ppm		Off
1 to 100 ppm	1 to 1000 ppm	1 Hz
101 to 400 ppm	1001 to 4000 ppm	1.2 Hz
401 to 700 ppm	4001 to 7000 ppm	1.65 Hz
701 to 1000 ppm	7001 to 10000 ppm	3.25 Hz
≥ 1000 ppm	≥ 10000 ppm	6.25 Hz

## Scope of delivery

- 1 x Device BG40
- 1 x Charger
- 1 x Quick guide

## 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.

The supplied Li-ion batteries are subjects to the requirements of dangerous goods legislation.

Observe the following when transporting or shipping Li-ion batteries:

- The user may transport the batteries by road without any additional requirements.
- If transport is carried out by third parties (e.g. air transport or forwarding company), special requirements as to packaging and labelling must be observed. This includes consulting a dangerous goods specialist when preparing the package.
  - Only ship batteries if their housing is undamaged.
  - Please also observe any other national regulations.

### 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

## Operation

### Charging the battery



#### Warning of explosive substances

Never charge the battery in a potentially explosive atmosphere.



#### Warning of electrical voltage

Before each use of the charger or power cable, check for damages. If you notice damages, stop using the charger or power cable!

### Note

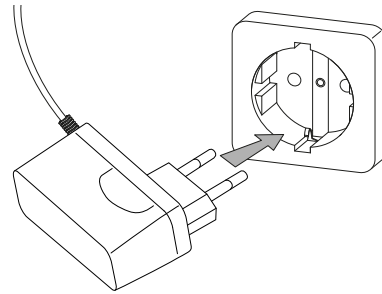
The battery can be damaged in case of improper charging.

Never charge the battery at ambient temperatures below 10 °C or above 40 °C.

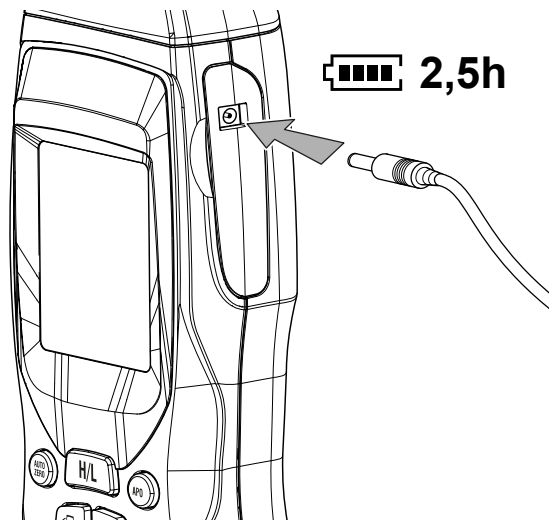
The battery is partially charged upon delivery to avoid damage to the battery caused by a deep discharge.

The battery should be charged prior to initial start-up and when the battery is low (battery indicator (17) flashes). To do so, please proceed as follows:

1. Plug the charger into a properly fused mains socket.



2. Connect the charging cable to the device connection.



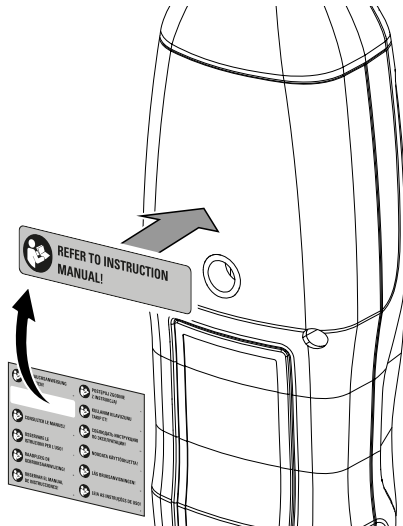
⇒ If the device is switched on, a charging indicator will appear on the display.

3. Wait until the battery is fully charged (approx. 2.5 h).
4. If necessary, check whether the battery is fully charged by switching the device on and checking the charging indicator.

## Attaching the warning sign

Prior to initial start-up, check whether the warning sign at the rear of the device is in your local language, if not, paste the proper one over it. The warning sign is supplied along with the device in several languages. Please proceed as follows to attach the warning sign to the rear of the device:

1. Remove the label in your local language from the supplied film.
2. Affix the label in the intended position at the rear of the device.



## Switch-on

### Note

Chemical cleaning agents often contain solvents and alcohols to which the appliance may react. It is not possible to avoid this cross-sensitivity which can lead to misleading results. For this reason, remove chemical cleaners from the detection area of the device prior to performing a leak detection.



### 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. Press and hold the Power button (11) for approx. 3 s.
  - ⇒ The device switches on.
  - ⇒ An acoustic signal is emitted and the device briefly vibrates.

2. After start-up, the device sensor is heated to operating temperature and an automatic calibration with the local gas concentration(s) is carried out simultaneously. This process takes approx. 40 seconds.
 

Due to this automatic calibration process, the device should only be switched on in an environment that is free from gases potentially affecting the measurement in order not to distort later measurements.

  - ⇒ The display shows a countdown from 40.
  - ⇒ Once the calibration is completed, an acoustic signal is emitted and the device briefly vibrates.



### Info

You cannot make any further settings, such as switching the vibration on or off, during calibration.

## Carrying out a measurement



### Info

Please note that the device is calibrated for methane. The displayed measured values for other gases are indicative. The actual concentrations may differ from the displayed value.

1. Use the H/L button (7) to set the measuring range to low (x10) so that the device also indicates lower gas concentrations from 10 ppm upwards.
2. Move the sensor towards the suspected leak.
  - ⇒ The current measurement result is shown by the deflection on the scale and as a numeric value in ppm and LEL.
  - ⇒ If a higher gas concentration is detected, the frequency of the acoustic and vibration alarm increases. For further information on the alarm frequency, please refer to the Technical data chapter.
3. If required, set the measuring range to high (x100) using the H/L button (7) to visualize gas concentrations > 1000 ppm with the device.
4. If required, carry out a zero reset (AutoZero).

## Setting the measuring range

1. Press the H/L button (7) to switch between the low (x10) and the high (x100) measuring range.

## Switching the background illumination on or off

1. Press the Illumination button (9) to switch the background illumination on or off.

## Switching the acoustic alarm on or off

The acoustic alarm is enabled when the device is switched on. The enabled acoustic alarm is indicated by the Alarm indication (14) on the display.

1. Press the Alarm button (10) to switch the acoustic alarm on or off.



### Info

The function only refers to the sounds emitted when the specified alarm thresholds are exceeded, not to the button tones. The button tones cannot be turned off.

### Switching the vibration alarm on or off

The vibration alarm is enabled when the device is switched on. The enabled vibration alarm is indicated by the Vibration indication (15) on the display.

1. Press the Vibration button (12) to switch the vibration alarm on or off.

### Zero reset (AutoZero)

This function serves to reset a measurement to zero. It resets the calibration carried out at device start-up and adopts the current concentration as the new zero.

This feature can be helpful in detecting leaks since it makes it easier to locate the place with the highest gas concentration and thus the potential point of leakage.

Before starting a new measurement with modified environmental conditions, always carry out a zero reset in an environment that is free from gases potentially affecting the measurement.

1. Press the Zero reset button (13).  
⇒ The *AutoZero indication* (24) appears on the display.
2. Press the Zero reset button (13) again to disable zero reset. Please note that the original calibration will **not** be restored! For this purpose, you have to reset or restart the device again.

### Automatic switch-off

If the Automatic switch-off indication (16) is displayed, the device will switch off automatically when not in use for approx. 10 minutes.

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

1. Press the Automatic switch-off button (8).  
⇒ The Automatic switch-off indication (16) disappears.  
⇒ Automatic switch-off is deactivated.

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

### Switching the device off

1. Press the power button (11) for approx. 2 s.  
⇒ A brief acoustic signal is emitted.  
⇒ The device switches off.

## Maintenance and repair

### Charging the battery



#### Warning of explosive substances

Never charge the battery in a potentially explosive atmosphere.

The battery should be charged if the battery indicator (17) on the device flashes or if the device can no longer be switched on (see chapter Charging 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.

Fault	Cause	Remedy
The device does not switch on.	The battery is empty.	Charge the battery as described in the Operation chapter.
The display flashes and the acoustic alarm sounds simultaneously.	The sensor or the sensor heating is defective.	Please contact the customer service.
With a fully charged battery and after a zero point reset has been performed, the device indicates an increased gas concentration even in a gas-free environment.		Please contact the customer service.

## 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 is taken from Directive 2012/19/EU. It states that this device 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.



**Li-Ion** 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 (SI 2013/3113) (as amended) and the Waste Batteries and Accumulators Regulations 2009 (SI 2009/890) (as amended), devices that are no longer usable must be collected separately and disposed of in an environmentally friendly manner.

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