



**PRO**

**GIS800-16**

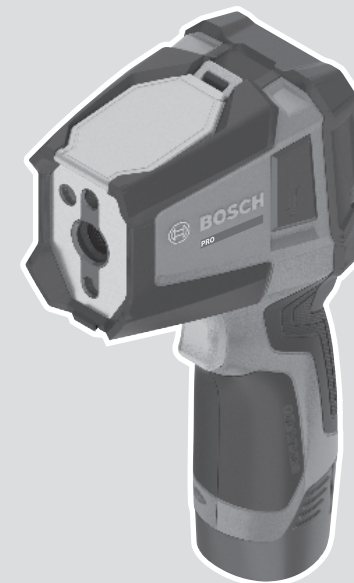
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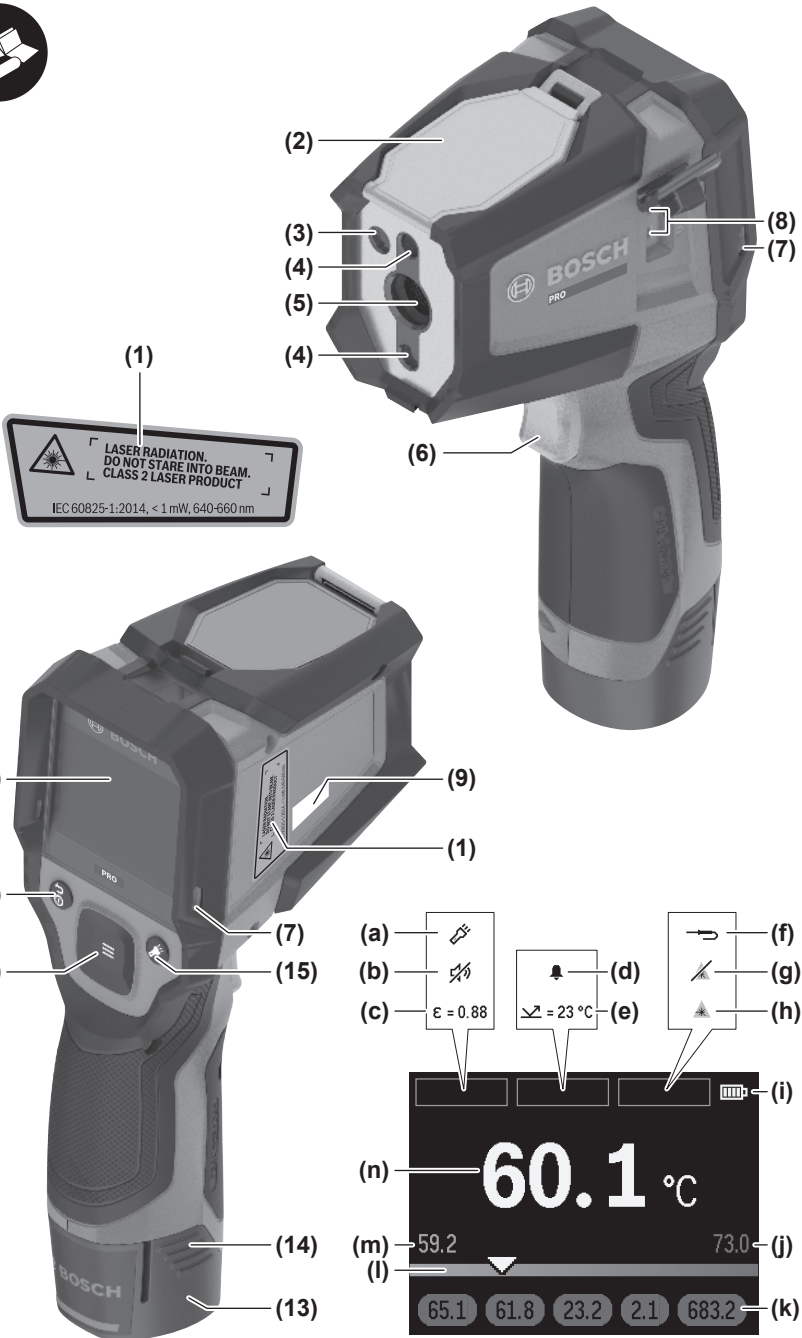
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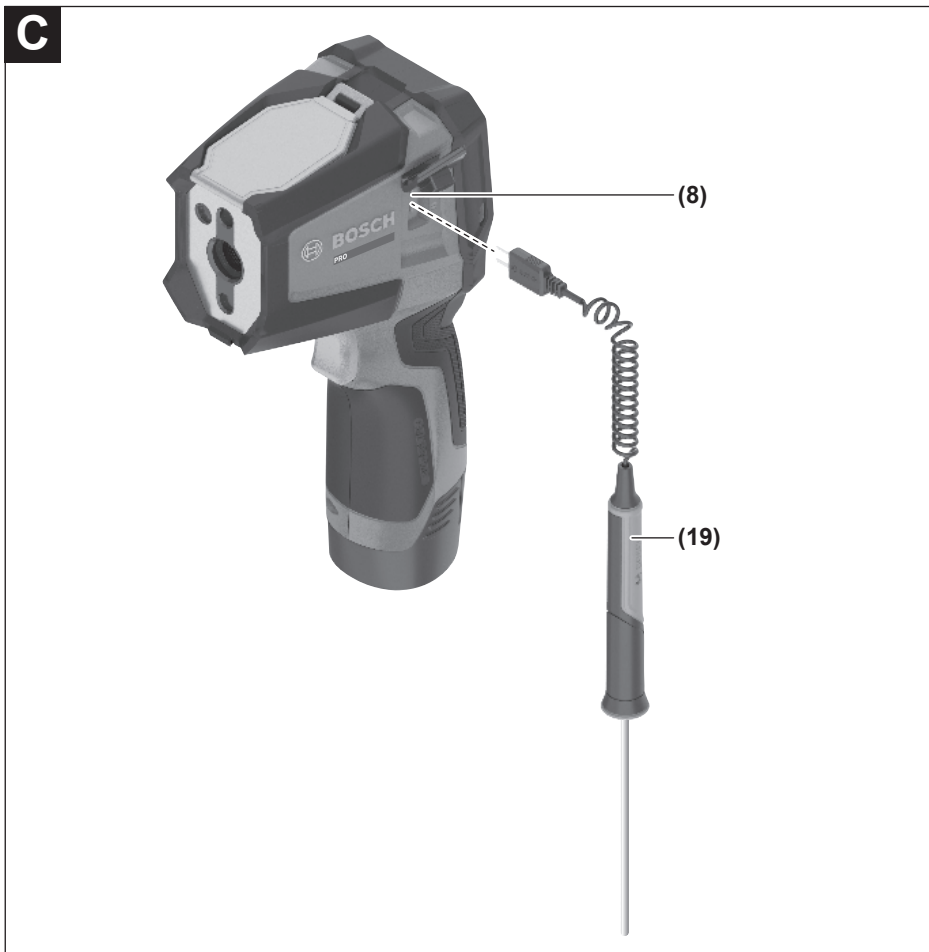
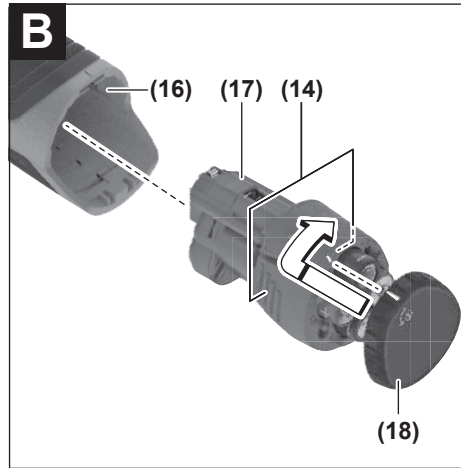
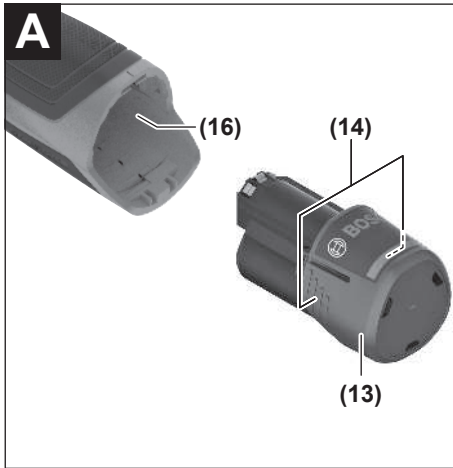


en Original instructions









# English

## Safety Instructions



All instructions must be read and observed in order for the measuring tool to function safely. The safeguards integrated into the measuring tool may be compromised if the measuring tool is not used in accordance

with these instructions. Never make warning signs on the measuring tool unrecognisable. **SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE AND INCLUDE THEM WITH THE MEASURING TOOL WHEN TRANSFERRING IT TO A THIRD PARTY.**

- ▶ **Warning!** If operating or adjustment devices other than those specified here are used or other procedures are carried out, this can lead to dangerous exposure to radiation.
- ▶ The measuring tool is delivered with a laser warning sign (marked in the illustration of the measuring tool on the graphics page).
- ▶ If the text of the laser warning label is not in your national language, stick the provided warning label in your national language over it before operating for the first time.



Do not direct the laser beam at persons or animals and do not stare into the direct or reflected laser beam yourself. You could blind somebody, cause accidents or damage

your eyes.

- ▶ If laser radiation hits your eye, you must close your eyes and immediately turn your head away from the beam.
- ▶ Do not make any modifications to the laser equipment.
- ▶ Do not use the laser goggles (accessory) as protective goggles. The laser goggles make the laser beam easier to see; they do not protect you against laser radiation.
- ▶ Do not use the laser goggles (accessory) as sunglasses or while driving. The laser goggles do not provide full UV protection and impair your ability to see colours.
- ▶ Have the measuring tool repaired only by a qualified specialist using only original replacement parts. This will ensure that the safety of the measuring tool is maintained.
- ▶ Do not let children use the laser measuring tool unsupervised. They could unintentionally blind themselves or other persons.
- ▶ Do not use the measuring tool in explosive atmospheres which contain flammable liquids, gases or dust. Sparks may be produced inside the measuring tool, which can ignite dust or fumes.
- ▶ Do not modify or open the battery. There is a risk of short-circuiting.

- ▶ In case of damage and improper use of the battery, vapours may be emitted. The battery can set alight or explode. Ensure the area is well ventilated and seek medical attention should you experience any adverse effects. The vapours may irritate the respiratory system.
- ▶ If used incorrectly or if the battery is damaged, flammable liquid may be ejected from the battery. Contact with this liquid should be avoided. If contact accidentally occurs, rinse off with water. If the liquid comes into contact with your eyes, seek additional medical attention. Liquid ejected from the battery may cause irritation or burns.
- ▶ The battery can be damaged by pointed objects such as nails or screwdrivers or by force applied externally. An internal short circuit may occur, causing the battery to burn, smoke, explode or overheat.
- ▶ When the battery is not in use, keep it away from paper clips, coins, keys, nails, screws or other small metal objects that could make a connection from one terminal to another. A short circuit between the battery terminals may cause burns or a fire.
- ▶ Only use the battery with products from the manufacturer. This is the only way in which you can protect the battery against dangerous overload.
- ▶ Only charge the batteries using chargers recommended by the manufacturer. A charger that is suitable for one type of battery may pose a fire risk when used with a different battery.



Protect the rechargeable battery against heat, e.g. including prolonged sun exposure, fire, water, and moisture. There is a risk of explosion and short circuit.

- ▶ Protect the measuring tool, particularly the area around the infrared lens and laser, from moisture, snow, dust and dirt. The reception lens could fog up or become contaminated and distort the measurements. Incorrect settings on the tool and other atmospheric influences may make the measurements inaccurate. Object temperatures could be shown to be hotter or colder than they are, which may present a danger if touched.
- ▶ Correct temperature measurements are only possible if the set emissivity and emissivity of the object agree, and the correct reflected temperature is set. Otherwise, object temperatures could be shown to be hotter or colder than they are, which may present a danger if touched.

## Safety Instructions When Using Temperature Probes

- ▶ Temperature probes must not be used in live electrical systems. This poses a risk to life!
- ▶ Using a temperature probe means contact with the object measured. Therefore, watch out for potential dangers due to temperature, voltage or a chemical reaction.

## Product Description and Specifications

Please observe the illustrations at the beginning of this operating manual.

### Intended Use

The measuring tool is intended for contactless measurement of surface temperature.

The measuring tool may not be used to measure the body temperature of humans or animals or for other medical purposes.

Using a temperature probe (connection type K), temperature measurement in liquids and gases is also possible. The temperature probe is connected to the measuring tool via the **(8)** interface intended for this purpose.

Surface temperature can also be measured by touching a surface with a temperature probe.

The light of this measuring tool is intended to illuminate the direct work area of the measuring tool and is not intended as a continuous worklight.

The laser points must not be used as a laser pointer. They are solely for marking out the area being measured.

The measuring tool is suitable for indoor and outdoor use.

### Product Features

The numbering of the product features shown refers to the illustration of the measuring tool on the graphic page.

- (1)** Laser warning label
- (2)** Protective cap for infrared reception lens
- (3)** Worklight
- (4)** Laser beam outlet aperture
- (5)** Infrared beam reception lens
- (6)** Measure/On button
- (7)** Hand strap attachment
- (8)** Type K connection for temperature probe

- (9)** Serial number
- (10)** Display
- (11)** On/off/back button
- (12)** Multi-function button
- (13)** Rechargeable battery<sup>a)</sup>
- (14)** Rechargeable battery/battery adapter release button
- (15)** Worklight on/off button
- (16)** Battery bay
- (17)** Battery adapter<sup>a)</sup>
- (18)** Battery adapter cap<sup>a)</sup>
- (19)** Temperature probe (type K)<sup>a)</sup>

a) **This accessory is not part of the standard scope of delivery.**

### Display elements

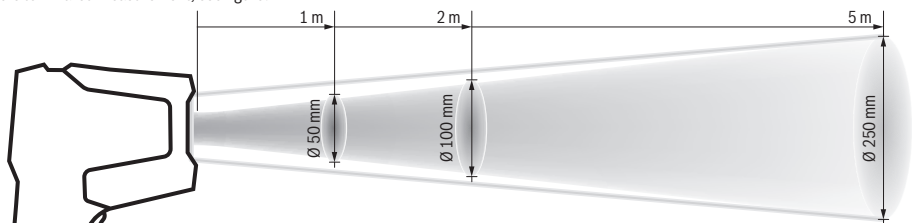
- (a)** Worklight symbol
- (b)** Audio signal off symbol
- (c)** Emissivity indicator
- (d)** Temperature alarm symbol
- (e)** Reflected temperature indicator
- (f)** Temperature probe connected symbol
- (g)** Laser off symbol
- (h)** Laser on symbol
- (i)** Battery charge indicator (optimised for lithium-ion rechargeable battery and non-rechargeable batteries)
- (j)** Maximum temperature in the measuring range indicator
- (k)** Saved measured values indicator
- (l)** Temperature scale indicator
- (m)** Minimum temperature in the measuring range indicator
- (n)** Current measured value indicator

### Technical Data

Infrared thermometer	GIS800-16
Article number	<b>3 601 K83 B..</b>
Working range	0.1–5 m
Measuring range <sup>A)</sup>	-40 °C to +800 °C
Temperature resolution	0.1 °C
Optics (measuring distance : measured surface ratio) <sup>B)C)</sup>	20 : 1
Size of display	2.4"
Laser class	2
Laser type	< 1 mW, 640–660 nm
Divergence of the laser beam (full angle)	< 1.5 mrad
Max. altitude	2000 m
Pollution degree according to IEC 61010-1	2 <sup>D)</sup>

Infrared thermometer		GIS800-16
Relative air humidity max.		90 %
Power supply		
– Rechargeable battery (Li-ion)		10.8 V/12 V
– Non-rechargeable batteries (alkaline manganese, with battery adapter)		4 × 1.5 V LR6 (AA)
– Rechargeable batteries (NiMH, with battery adapter)		4 × 1.2 V HR6 (AA)
Operating time		
– Rechargeable battery (Li-ion) <sup>E)F)</sup>		18 h
– Non-rechargeable batteries (alkaline manganese)		12 h
Weight <sup>G)</sup>		0.36 kg
Dimensions (length × width × height)		119 × 73 × 212 mm
Protection rating <sup>H)</sup>		IP54
Recommended ambient temperature during charging		0 °C to +35 °C
Permitted ambient temperature during operation		–10 °C to +50 °C
Permitted ambient temperature during storage without a rechargeable battery		–20 °C to +70 °C
Permitted ambient temperature during storage with a rechargeable battery		–20 °C to +50 °C
Recommended rechargeable batteries		GBA 10.8V... GBA 12V...
Recommended battery chargers		GAL 12... GAX 18...

- A) Maximum measuring range of the measuring tool – with contact temperature measurements, the temperature probe in use can have a smaller measuring range.  
 B) In accordance with standard VDI 5585 (average)  
 C) Refers to infrared measurement, see figure:



- D) Only non-conductive deposits occur, whereby occasional temporary conductivity caused by condensation is expected.  
 E) Depending on battery in use  
 F) At an ambient temperature of **20–30 °C**  
 G) Weight without lithium-ion rechargeable battery/battery adapter/non-rechargeable batteries (you can find the weight of the lithium-ion battery at [www.bosch-professional.com](http://www.bosch-professional.com).)  
 H) excluding lithium-ion battery pack/non-rechargeable batteries/rechargeable batteries, in the vertical position  
 The serial number **(9)** on the type plate is used to clearly identify your measuring tool.

### Measuring accuracy

At measured value	At aperture	At measuring distance	Measuring accuracy
<b>Surface temperature<sup>A)</sup></b>			
–40 °C to –30.1 °C	50 mm	10 cm to 50 cm	±5.0 °C
–30 °C to –20.1 °C	57 mm	10 cm to 50 cm	±4.5 °C
–20 °C to –10.1 °C	57 mm	30 cm to 100 cm	±3.5 °C
–10 °C to 0 °C	152 mm	30 cm to 100 cm	±2.5 °C
+0.1 °C to +100 °C	152 mm	30 cm to 100 cm	±1.5 °C
+100.1 °C to +500 °C	152 mm	30 cm to 100 cm	±1.5 %

At measured value	At aperture	At measuring distance	Measuring accuracy
+500.1 °C to +800 °C	50 mm	10 cm to 50 cm	±1.5 %
<b>Contact temperature (only with type K temperature probe)<sup>B)</sup></b>			
-40 °C to +333 °C	-	-	±2.5 °C
+333.1 °C to +400 °C	-	-	±0.75 %

A) At an ambient temperature of +21 °C to +25 °C, an emissivity of  $\geq 0.95$ , with worklight and laser switched off; plus usage-dependent deviation (e.g. reflection)

B) according to IEC EN 60584-1: Type K, Class 2

## Power supply

The measuring tool can be operated either with a **Bosch** lithium-ion battery, with commercially available non-rechargeable batteries or with commercially available NiMH rechargeable batteries.

### Operation with Lithium-Ion Rechargeable Battery (see figure A)

► **Use only the chargers listed in the technical data.** Only these chargers are matched to the lithium-ion battery of your measuring tool.

**Note:** Lithium-ion rechargeable batteries are supplied partially charged according to international transport regulations. To ensure full rechargeable battery capacity, fully charge the rechargeable battery before using your tool for the first time.

To **insert** the charged battery pack (13), slide it into the battery bay (16) until you feel it engage.

To **remove** the battery pack (13), press the release buttons (14) and pull the battery pack out of the battery bay (16). **Do not use force to do this.**

### Recommendations for Optimal Handling of the Battery

Protect the battery against moisture and water.

Only store the battery within a temperature range of -20 to 50 °C. Do not leave the battery in your car in the summer, for example.

A significantly reduced operating time after charging indicates that the battery has deteriorated and must be replaced.

Follow the instructions on correct disposal.

### Operation with Non-Rechargeable Batteries/ Rechargeable Batteries (see figure B)

Using alkali-manganese non-rechargeable batteries or NiMH rechargeable batteries is recommended for operation of the measuring tool.

The non-rechargeable or rechargeable batteries are inserted into the battery adapter.

► **The battery adapter is intended only for use in designated Bosch measuring tools and must not be used with power tools.**

Rotate the cap (18) of the battery adapter anticlockwise and remove the cap. Put the non-rechargeable or rechargeable batteries into the battery adapter (17). Make sure that the

polarity is correct and corresponds to the marking on the battery adapter.

Always replace all the batteries at the same time. Only use batteries from the same manufacturer and which have the same capacity.

Place the cap (18) back on the battery adapter. Pay attention to the markings on cap and battery adapter. Turn the cap clockwise to lock it in place.

To **insert** the battery adapter (17), push it into the battery bay (16) until you feel it engage.

To **remove** the battery adapter (17), press the release buttons (14) and pull the battery adapter out of the battery bay (16).

► **Take the batteries out of the measuring tool when you are not using it for a prolonged period of time.** The batteries can corrode during prolonged storage in the measuring tool.

## Operation

### Starting Operation

- **Protect the measuring tool from moisture and direct sunlight.**
- **Do not expose the measuring tool to any extreme temperatures or variations in temperature.** For example, do not leave it in a car for extended periods of time. In case of large variations in temperature, allow the measuring tool to adjust to the ambient temperature before putting it into operation. The precision of the measuring tool may be compromised if exposed to extreme temperatures or variations in temperature.
- **Make sure that the measuring tool is correctly acclimatised.** In case of large variations in temperature, acclimatisation can take up to **60** minutes. This may be the case, for example, if you store the measuring tool in a cool car and then perform a measurement in a warm building.
- **Avoid hard knocks to the measuring tool or dropping it.** After severe external influences and in the event of abnormalities in the functionality, you should have the measuring tool checked by an authorised **Bosch** after-sales service agent.

### Switching On For the First Time

You must set the language used in the display when you switch the measuring tool on for the first time or after resetting it to factory settings. To select a language, press the

multi-function button **(12)** up or down. Press the centre of the multi-function button **(12)** to confirm your selection. You can change the language via the main menu (see "Main Menu", page 11) at any time.

### Switching On and Off

To take a measurement, fold the protective cap **(2)** upwards. **Make sure that the infrared sensor is not closed off or covered while working.**

To **switch on** the measuring tool, press either the on/off button **(11)** or the centre of the multi-function button **(12)**. After a brief start sequence, the set values for emissivity and reflected temperature are shown on the display for a few seconds. The laser is still switched off.

To **switch off** the measuring tool, press the on/off button **(11)** for longer than 1 s. The measuring tool saves all settings including the last measured values and then switches itself off. Close the protective cap **(2)** to transport the measuring tool safely.

In the main menu, you can choose whether and after how long the measuring tool automatically switches off if you do not press any buttons (see "Main Menu", page 11).

### Illuminating the Area You Are Measuring

The measuring tool is equipped with a worklight **(3)**. It is intended to illuminate the direct work area of the measuring tool and is not intended as a continuous worklight.

Press the button **(15)** to switch the worklight **(3)** on or off. When the worklight is switched on, the worklight symbol **(a)** will appear on the display.

The worklight is automatically switched off after 2 minutes to avoid affecting the measuring accuracy. You can change the automatic switch-off time in the main menu (see "Main Menu", page 11).

## Measurement preparations

### Setting the Emissivity

The emissivity of an object depends on the material and the structure of its surface. This specifies how much infrared thermal radiation the object emits compared with an ideal radiant warmer (black body, emissivity  $\epsilon = 1$ ) and accordingly has a value between 0 and 1.

To determine the surface temperature, the tool performs a contactless measurement of the natural infrared thermal radiation emitted by the object at which the tool is aimed. To ensure correct measurement, the emissivity setting on the measuring tool must be checked **before every measurement** and adapted to the measuring object if necessary.

Press up or down on the multi-function button **(12)** to call up the set emissivity in the emissivity indicator **(c)** (together with the reflected temperature indicator **(e)**). Both values also appear for a few seconds on the display after switching on the measuring tool and after exiting the main menu.

You can change the emissivity via the main menu (see "Main Menu", page 11) at any time. You can select one of the preset emissivity levels or enter an exact numerical value.

The preset emissivities in the measuring tool are reference values.

### ► Temperature measurements will only be correct if the emissivity setting and the emissivity of the object match.

**Note:** If there are several objects with a different emissivity being measured within the measured area identified by the laser, the temperature measurement can be distorted.

### Setting the Reflected Temperature

The lower the emissivity of the object to be measured and the more thermal radiation the object to be measured reflects, the greater the effect of the reflected temperature on the measuring result. For this reason, set the correct reflected temperature particularly at low emissivity, as otherwise the measuring result may be significantly distorted.

In some situations (especially in indoor areas), the reflected temperature corresponds to the ambient temperature. However, the reflected temperature may also be significantly affected by objects with greatly deviating temperatures: For outdoor measurements, the sky may be reflected in the object to be measured, for example, when the sky is clear at a temperature as low as  $-40\text{ }^{\circ}\text{C}$ .

Press up or down on the multi-function button **(12)** to call up the set reflected temperature in the reflected temperature indicator **(e)** (together with the emissivity indicator **(c)**). Both values also appear for a few seconds on the display after switching on the measuring tool and after exiting the main menu.

You can change the reflected temperature via the main menu (see "Main Menu", page 11) at any time.

### Measuring Surface

The laser points generated by the measuring tool border the exterior circular measured area. The measured value **(n)** shows the average surface temperature within this area.

Increasing the distance between the measuring tool and the object (see "Technical Data", page 6) you are measuring will increase the distance between the laser points and consequently the size of the area measured.

### ► Do not direct the laser beam at persons or animals and do not stare into the laser beam yourself (even from a distance).

### Information about the Measuring Conditions

Highly reflective or shiny surfaces (e.g. shiny tiles or polished metals) may significantly distort or impair the results shown due to their often very low emissivities.

In this case, completely mask the measuring surface with a dark, matt adhesive tape that conducts heat well. When masking, bear in mind that the measuring surface increases with increasing measuring distance.

Allow the tape to briefly reach the correct temperature on the surface. Set the typically higher emissivity of the adhesive tape on the measuring tool.

Make sure that a favourable measuring angle is used on reflective surfaces in order to ensure that the thermal radiation reflected by other objects does not distort the result. For example, the reflection of your own emitted body heat may interfere with the measurement when measuring head-on from a perpendicular position. On a level surface, the temperature

of your body could therefore be displayed (reflected value), and these values do not correspond to the actual temperature of the measured surface (emitted value or real value of the surface).

Measuring through transparent materials (e.g. glass or transparent plastics) is fundamentally not possible.

Consequently, the more suitable and stable the measuring conditions are, the more accurate and reliable the measurement readings are. Not only do significant fluctuations in the temperature of the environmental conditions have an impact, the accuracy can also be impaired by significant fluctuations in the temperatures of the object being measured.

Infrared temperature measurement is impaired by smoke, steam/high humidity or dusty air.

Information for achieving improved measurement accuracy:

- Select the measuring surface so that the interfering factors are minimised. Bear in mind that the measuring surface increases with increasing measuring distance.
- Ventilate indoor areas prior to measurement, especially when the air is contaminated or extremely steamy. Once ventilated, allow the room to reacclimatise a while until it returns to the usual temperature.

## Measuring functions

### Surface Temperature Measurement

The surface temperature of objects in the area of the measuring surface is determined as an average value of the measuring surface. This means, you can, for example, check radiators or look for overheated machine parts.

If a measurement is started by pressing the measure button **(6)**, the laser for marking the measuring surface is also automatically switched on (the laser symbol **(h)** appears on the display). Upon completion of the measuring process, the laser switches off automatically and the laser symbol **(h)** disappears on the display.

► **Do not direct the laser beam at persons or animals and do not stare into the laser beam yourself (even from a distance).**

► **Never leave the measuring tool unattended when switched on, and ensure the measuring tool is switched off after use.** Others may be dazzled by the laser beam.

The laser can be deactivated in the main menu (see "Main Menu", page 11). In this case, the laser off symbol **(g)** will be shown on the display during the measurement.

Individual measurement:

- Briefly press the measure button **(6)**. Upon completion of the measuring process, the measured temperature appears in the measured value indicator **(n)**.

Continuous measurement:

- Press and hold the measure button **(6)** and, using slow movements, aim the laser at each of the surfaces to be measured, one by one.
- The measured value indicator **(n)** is continually updated. The temperature range of the continual measurement with the temperature scale **(l)** is shown; the current

measured value is marked on the scale. Once the difference between the measurements is at least 3 °C during the measurement, the minimum measured value will appear in the indicator **(m)** and the maximum measured value will appear in the indicator **(j)**.

- As soon as you release the measure button **(6)**, the measurement is completed. The last measured temperature is fixed in the measured value indicator **(n)**, as well as the last indicator on the scale **(l)**.

Saved measured values:

- The measured values of the individual measurements and the final values of the continuous measurements appear in the saved measured values indicator **(k)**. The most recent measured value is on the left-hand side of the display and the oldest is on the right-hand side. The measured values of the surface temperature measurement are in a black font on a grey field (in contrast to contact temperature measured values in a grey font on a black field).
- The measured values are saved when the measuring tool is switched off.
- You can delete the most recently saved measured value by briefly pressing the on/off button **(11)**.

### Contact Temperature Measurement (see figure C)

Contact temperature measurement enables the temperature of an object to be measured directly using a type K temperature probe **(19)**. This enables temperature measurements in media, liquids, air currents or on surfaces with a low emissivity (polished metals) in situations in which the infrared measurement has inherent disadvantages or is very difficult.

If necessary, additional temperature probes with a type K connection whose shape has been optimised for special applications are commercially available. Read and observe the information from the temperature probe manufacturer.

**Note:** Use type K shielded temperature probes only. Measurements may yield incorrect results if other types of temperature probes are connected.

Using a temperature probe principally requires direct contact with the object measured. Pay attention to the safety instructions because of the potential dangers.

Open the connection cover **(8)** and put the plug of the temperature probe into the connection **(8)**. Ensure that the polarity is correct according to the markings on the connection.

As soon as a temperature probe is connected, the temperature probe symbol **(f)** will appear on the display. For the contact temperature measurement, the measure button **(6)** must not be pressed and the laser is deactivated.

The measured value indicator **(n)** is continually updated. The temperature range of the continual measurement with the temperature scale **(l)** is shown; the current measured value is marked on the scale. Once the difference between the measurements is at least 3 °C during the measurement, the minimum measured value will appear in the indicator **(m)** and the maximum measured value will appear in the indicator **(j)**.

To achieve a reliable result for measurements in media, wait for the measured value to stop changing. This can take sev-

eral minutes depending on the medium and version of the temperature probe.

You can save a contact temperature measured value by briefly pressing the measure button **(6)**. The measured values appear (such as that of the surface temperature measurement) in the saved measured values indicator **(k)**. To distinguish between surface measured values, the saved contact temperature measured values are in grey font on a black field.

Close the connection cover **(8)** again after removing the temperature probe.

### Temperature Alarm

The measuring tool has a temperature alarm for the minimum temperature and the maximum temperature. You can set the values for which the alarm is triggered in the main menu (see "Main Menu", page 11). This applies to both surface and contact temperature measurements.

The temperature alarm can be switched on and off separately for the minimum and maximum temperatures in the quick settings of the main menu. If at least one alarm is switched on, the temperature alarm symbol **(d)** will appear on the display.

If the **minimum temperature alarm** is triggered, the temperature alarm symbol **(d)** and the measured value **(n)** will light up blue and the display will have a blue flashing border. If the audio signal is switched on, a warning signal will sound.

If the **maximum temperature alarm** is triggered, the temperature alarm symbol **(d)** and the measured value **(n)** will light up red and the display will have a red flashing border. If the audio signal is switched on, a warning signal will sound.

### Main Menu

Press the centre of the multi-function button **(12)** to get to the main menu.

**Note:** If a temperature probe is connected, none of the settings can be changed.

#### Navigating in the menu

- To scroll through a menu: Press the multi-function button **(12)** up or down.
- To switch to a submenu: Press the right or centre of the multi-function button **(12)**.
- To change a menu option with the on/off switch: Press left or right on the multi-function button **(12)**.
- To change a displayed numerical value: Press left or right on the multi-function button **(12)**. The value will change in faster steps if the button is pressed and held.
- To save a setting and to return to the previous, higher-level menu: Briefly press the back button **(11)**.
- To return to the measuring screen: Press the back button **(11)** or the measure button **(6)**.

#### Quick Settings

In the upper part of the main menu, you can find the quick settings for both temperature alarms, the audio signal and the display brightness.

- Press right or left on the multi-function button **(12)** to switch between the quick settings.
- Press the multi-function button **(12)** in the centre to switch a temperature alarm or the audio signal on and off or to change the display brightness.

**Note:** The temperature alarms and the audio signal are switched on or off in the quick settings with the values and settings that are set in the menu options. To change the values/settings, you must open the relevant menu option.

#### Main Menu Options

In the lower part of the main menu, you can find the following menu options:





- **<Set alarms>**
  - **<Low alarm>**: Set the temperature at which the minimum temperature alarm is triggered.
  - **<High alarm>**: Set the temperature at which the maximum temperature alarm is triggered.
- **<Measurement parameters>**
  - **<Emissivity>**: A selection of saved emissivities is available for some of the most common materials. To make the search easier, the values are combined into material groups in the emissivity catalogue. First select the relevant material group and then choose the relevant material in the **<Material catalogue>** menu item. If you know the exact emissivity of the object you want to measure, you can also set it as a numerical value in the **<User defined>** menu item.
  - **<Reflected temperature>**: Set the reflected temperature.
- **<Tool settings>**
  - **<Laser>**: You can switch the laser on or off via this menu item. The laser is used to indicate the measuring surface and should, therefore, only be deactivated in exceptional cases.
  - **<Sound>**: Under this menu item, you can change the sound settings. When you select **<General>**, an audio signal will sound when you switch the measuring tool on and off, during measurements or for errors. **<Alarms>** activates the audio signal when the temperature alarms are switched on. When you select **<Button clicks>**, an audio signal will sound every time a button is pressed.
  - **<LED switch off after ...>**: Under this menu item, you can select the time interval after which the worklight will automatically switch off if no buttons are pressed. You can also deactivate automatic switch-off by selecting the **<Never>** setting.
  - **<Tool switch off after ...>**: Under this menu item, you can select the time interval after which the measuring tool will automatically switch off if no buttons are pressed. You can also deactivate automatic switch-off by selecting the **<Never>** setting.
  - **<Language>**: Under this menu item, you can change the language used in the display.
  - **<Factory reset>**: Under this menu item, you can reset the measuring tool to factory settings. Select **<Reset>**

to delete all settings or **<Cancel>** to cancel the process.

- **<SW>**: Under this menu item, you can find the installed software version.

## Errors – Causes and Corrective Measures

In the event of a fault, the measuring tool will restart and can then continue to be used. If the fault persists, the following overview may help you.

Error	Cause	Corrective measure
Measuring tool cannot be switched on. 	Battery pack/batteries empty	Charge the battery pack or change the batteries.
	Battery (pack) fault	Change the rechargeable or non-rechargeable battery as necessary.
	Battery pack/batteries too hot or too cold	Allow the battery pack to reach the correct temperature or change the battery pack or batteries.
	Measuring tool too hot or too cold	Allow the measuring tool to reach the correct temperature.

## Glossary of terms

### Infrared thermal radiation

Infrared thermal radiation is electromagnetic radiation emitted by every object above 0 Kelvin ( $-273^{\circ}\text{C}$ ). The amount of radiation emitted depends on the temperature and the emissivity of the object.

### Emissivity

The emissivity of an object depends on the material and the structure of its surface. This specifies how much infrared thermal radiation the object emits compared with an ideal radiant warmer (black body, emissivity  $\epsilon = 1$ ) and accordingly has a value between 0 and 1.

### Reflected Temperature/Reflectivity of an Object

The reflected temperature is the thermal radiation that hits an object to be measured and is reflected by it. How much thermal radiation is reflected depends on the structure and material of the object to be measured (i.e. its reflectivity). The reflected temperature must be taken into consideration when measuring the surface temperature as otherwise the measuring result may be significantly distorted.

## Maintenance and Service

### Maintenance and Cleaning

Keep the measuring tool clean at all times. A dirty infrared reception lens **(5)** may impair the measuring accuracy.

Wipe off any dirt using a dry, soft cloth. Do not use any detergents or solvents.

When cleaning the measuring tool, ensure that no liquids enter the tool.

Clean the reception lens **(5)** and laser outlet aperture **(4)** very carefully:

Ensure that there is no lint on the reception lens or the laser outlet aperture. Do not attempt to remove dirt from the reception lens using pointed objects, and do not wipe over the reception lens (risk of scratching). If necessary, you can carefully blow away dirt using oil-free compressed air.

Please contact an authorised Bosch after-sales service centre if you want to have your measuring tool recalibrated. Only store and transport the measuring tool in the protective bag provided.

If the measuring tool needs to be repaired, send it off in the protective bag.

### After-Sales Service and Application Service

#### Malaysia

Tel.: (03) 79663194

In all correspondence and spare parts orders, please always include the 10-digit article number given on the nameplate of the product.

### Disposal

Measuring tools, rechargeable/non-rechargeable batteries, accessories and packaging should be sorted for environmental-friendly recycling.



Do not dispose of the measuring tools or battery packs/batteries with household waste.

Servicekontakte  
Service Contacts  
Contacts de Service  
Contactos de Servicio



<https://www.bosch-pt.com/serviceaddresses>

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