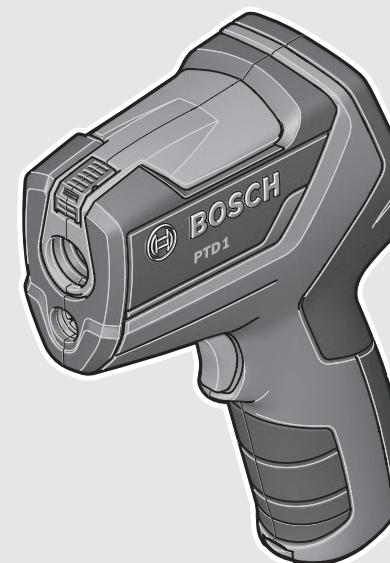


WEU

WEU



Robert Bosch GmbH
Power Tools Division
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Germany

www.bosch-pt.com

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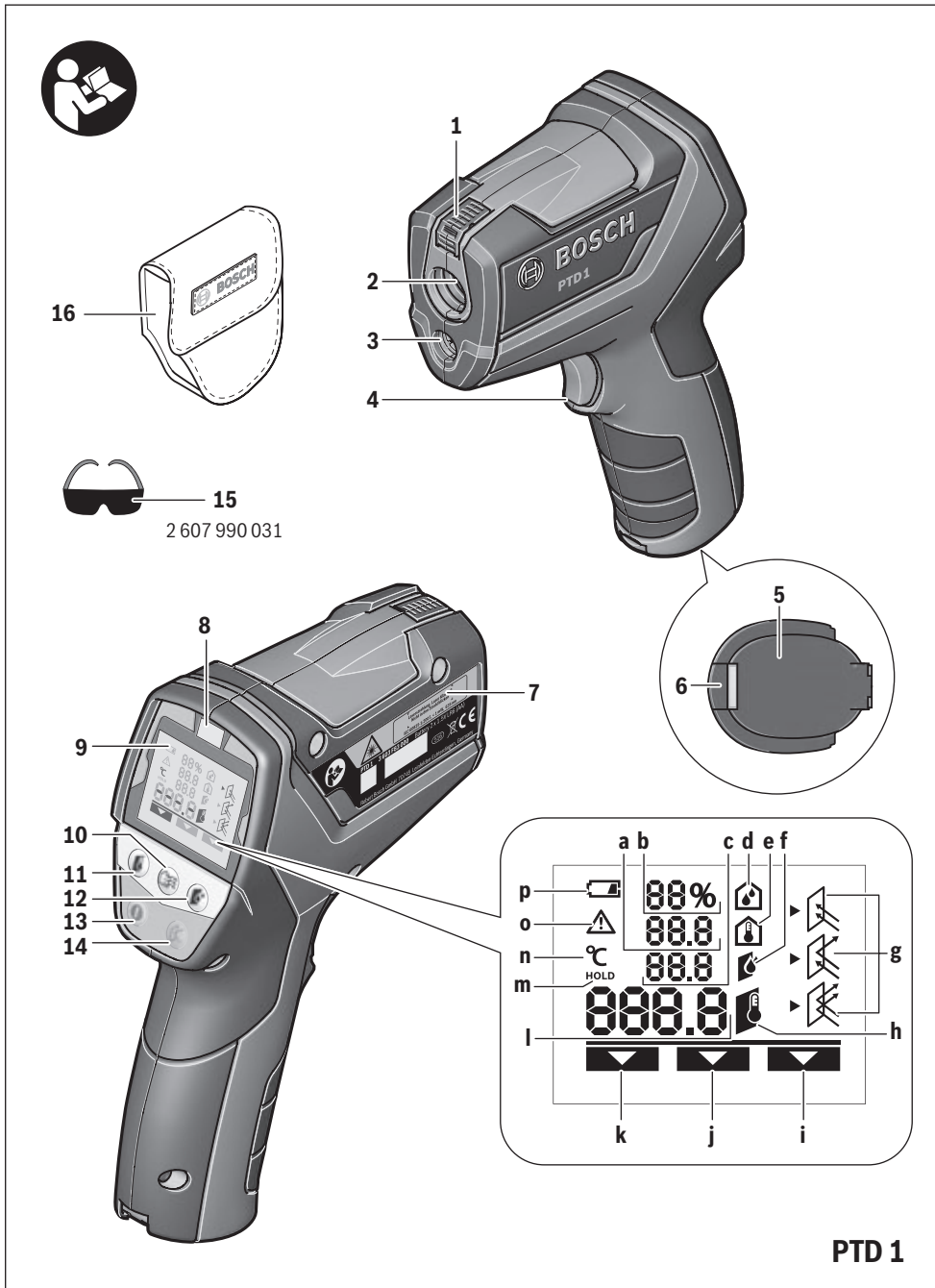
PTD 1

 **BOSCH**

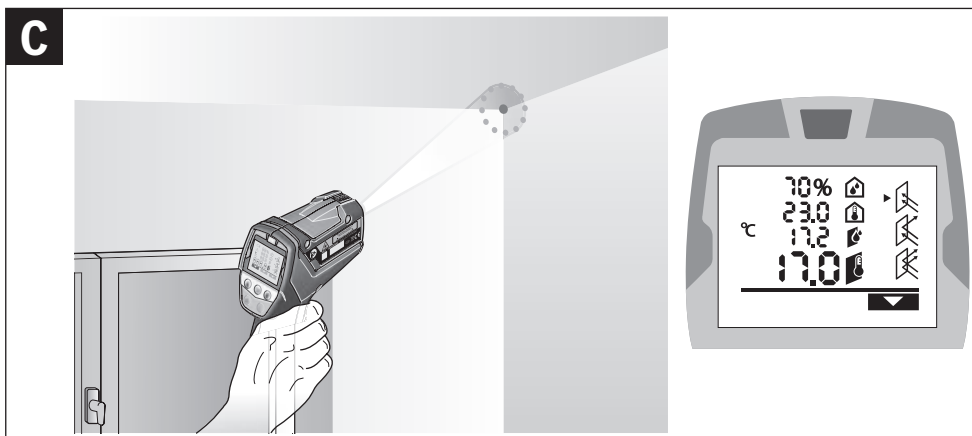
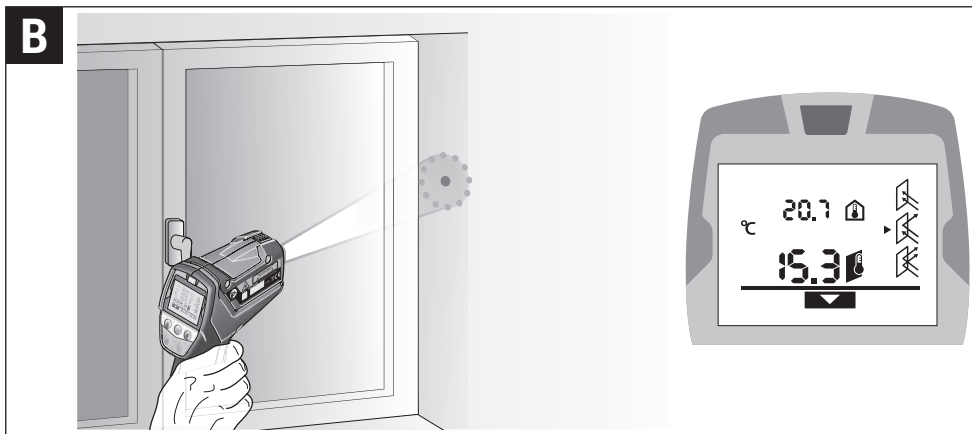
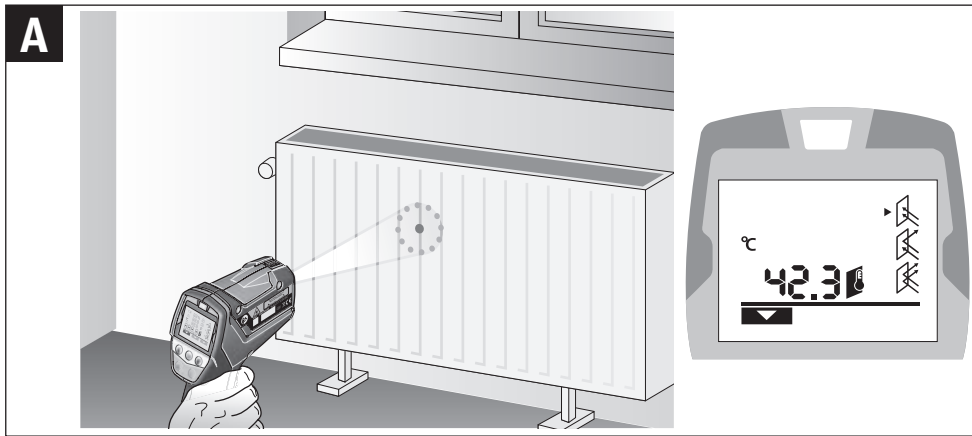
de Originalbetriebsanleitung
en Original instructions
fr Notice originale
es Manual original
pt Manual original
it Istruzioni originali
nl Oorspronkelijke gebruiksaanwijzing
da Original brugsanvisning

sv Bruksanvisning i original
no Original driftsinstruks
fi Alkuperäiset ohjeet
el Πρωτότυπο οδηγιών χρήσης
tr Orijinal işletme talimatı
ar تعليمات التشغيل الأصلية





4 |



English

Safety Notes



Working safely with the measuring tool is possible only when the operating and safety information are read completely and the instructions contained therein are strictly followed. Never make warning labels on the measuring tool unrecognisable. SAVE THESE INSTRUCTIONS.

- ▶ **Caution – The use of other operating or adjusting equipment or the application of other processing methods than those mentioned here, can lead to dangerous radiation exposure.**
- ▶ **The measuring tool is provided with a warning label (marked with number 7 in the representation of the measuring tool on the graphics page).**



- ▶ **If the text of the 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 laser beam yourself.** This measuring tool produces laser class 2 laser radiation according to IEC 60825-1. This can lead to persons being blinded.
- ▶ **Do not use the laser viewing glasses as safety goggles.** The laser viewing glasses are used for improved visualisation of the laser beam, but they do not protect against laser radiation.
- ▶ **Do not use the laser viewing glasses as sun glasses or in traffic.** The laser viewing glasses do not afford complete UV protection and reduce colour perception.
- ▶ **Have the measuring tool repaired only through qualified specialists using original spare parts.** This ensures that the safety of the measuring tool is maintained.
- ▶ **Do not allow children to use the laser measuring tool without supervision.** They could unintentionally blind other persons or themselves.
- ▶ **Do not operate the measuring tool in explosive environments, such as in the presence of flammable liquids, gases or dusts.** Sparks can be created in the measuring tool which may ignite the dust or fumes.
- ▶ **For technological reasons, the measuring tool cannot ensure 100 % certainty.** Environmental influences (e. g. dust or steam in the measuring range), variations in temperature (e. g. from fan heaters) as well as the quality and condition of the measuring surface (e. g. heavily reflecting or transparent materials) can lead to faulty measuring results.

Product Description and Specifications

Intended Use

The measuring tool is intended for contact-free measuring of surface temperature, ambient temperature and relative humidity. It calculates the dew point temperature and can be used to indicate thermal bridges and mould. The measuring tool cannot detect mould spores.

The measuring tool may not be used to measure the body temperature of humans or animals or for other medicinal purposes. The measuring tool is not suitable for measuring the surface temperature of gases or liquids.

The measuring tool is not intended for commercial use.

Product Features

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

- 1 Humidity and temperature sensor
- 2 Reception lens for infrared radiation
- 3 Exit opening for laser beam
- 4 Measuring button
- 5 Battery lid
- 6 Latch of battery lid
- 7 Laser warning label
- 8 Signal LED
- 9 Display
- 10 Thermal-bridge-mode button
- 11 Surface-temperature-mode button
- 12 Mould-warning-mode button
- 13 On/Off button
- 14 Emissivity degree button
- 15 Laser viewing glasses*
- 16 Protective pouch

* The accessories illustrated or described are not included as standard delivery.

Display Elements

- a Measured value of the ambient temperature
- b Measured value of the relative humidity
- c Dew point temperature
- d Symbol for relative humidity
- e Symbol for ambient temperature
- f Symbol for dew point temperature
- g Emissivity degree
- h Symbol for surface temperature
- i Mould-warning-mode indicator
- j Thermal-bridge-mode indicator
- k Surface-temperature-mode indicator
- l Measured value of the surface temperature
- m "HOLD" indicator
- n Unit of measure for temperature measurements
- o Error warning
- p Battery low indicator

12 | English

Technical Data

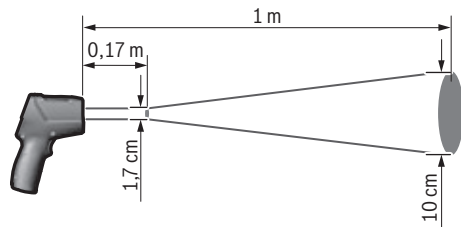
| Thermo detector | PTD 1 |
|--|---------------------|
| Article number | 3 603 F83 000 |
| Measuring range | |
| – Surface temperature | – 20... + 200 °C |
| – Ambient temperature | – 10... + 40 °C |
| – Relative humidity | 10... 90 % |
| Measuring accuracy (typically) | |
| Surface temperature^{1) 2)} | |
| – < + 10 °C | ±3 °C |
| – + 10... 30 °C | ±1 °C |
| – + 30... 90 °C | ±3 °C |
| – > + 90 °C | ±5 % |
| Ambient temperature | |
| – typically | ±1 °C |
| Relative humidity²⁾ | |
| – < 20 % | ±3 % |
| – 20... 60 % | ±2 % |
| – 60... 90 % | ±3 % |
| Optic (relation of measuring distance : measuring spot) ^{3) 4)} | 10 : 1 |
| Operating temperature | – 10... + 40 °C |
| Storage temperature | – 20... + 70 °C |
| Laser class | 2 |
| Laser type (typically) | 635 nm, < 1 mW |
| Batteries | 2 x 1.5 V LR06 (AA) |
| Rechargeable batteries | 2 x 1.2 V HR06 (AA) |
| Operating life time, approx. | 9 h |
| Weight according to EPTA-Procedure 01/2003 | 0.3 kg |
| Dimensions (length x width x height) | 124 x 53 x 180 mm |

1) At a measuring distance of 0.75 – 1.25 m to the surface

2) At an ambient temperature of 22 °C

3) Information according to VDI/VDE 3511 Page 4.3 (publication date: July 2005); applies for 90 % of the measuring signal. Deviations of the measuring results are possible in all ranges beyond the indicated dimensions in the Technical Data.

4) Refers to infrared measurement, see graphic:

**Assembly****Inserting/Replacing the Battery**

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

To open the battery lid **5**, press on the latch **6** and fold the battery lid up. Insert the batteries/rechargeable batteries. When inserting, pay attention to the correct polarity according to the representation on the inside of the battery lid.

The battery low indicator **p** indicates when the batteries/rechargeable batteries become empty:

- max. 30 % battery power,
- max. 10 % battery power.

When the battery low indicator **p** flashes, the batteries/rechargeable batteries must be replaced. Measurements are no longer possible.

Always replace all batteries/rechargeable batteries at the same time. Do not use different brands or types of batteries/rechargeable batteries together.

► **Remove the batteries/rechargeable batteries from the measuring tool when not using it for longer periods.**

When storing for longer periods, the batteries/rechargeable batteries can corrode and discharge themselves.

Operation

Initial Operation

- **Protect the measuring tool against moisture and direct sun light.**
- **Do not subject the measuring tool to extreme temperatures or variations in temperature.** As an example, do not leave it in vehicles for long time. In case of large variations in temperature, allow the measuring tool to adjust to the ambient temperature before putting it into operation. In case of extreme temperatures or variations in temperature, the accuracy of the measuring tool can be impaired.
- **Avoid heavy impact to or falling down of the measuring tool.**
- **Do not shut or cover off the humidity and temperature sensor 1, the reception lens 2 and the laser beam exit opening 3.**

Switching On and Off

For **switching on** the measuring tool, the following possibilities are given:

- Switch the measuring tool on with the **On/Off button 13**. After a short start-up sequence, the measuring tool is ready for operation with the settings (operating mode, emission degree) saved after switching off last. A measurement is not started as yet and the laser is switched off.
- Switch the measuring tool on with the **measuring button 4**. After a short start-up sequence, the laser is switched on and the measuring tool immediately starts a measurement with the settings (operating mode, emission degree) saved after switching off last.
- **Do not point the laser beam at persons or animals and do not look into the laser beam yourself, not even from a large distance.**

To save energy, the brightness of the display illumination is reduced 30 seconds each time after pressing a button. After pressing any button, the display illumination is switched on again at full brightness.

To **switch** the measuring tool **off**, press the On/Off button **13**. When no button on the measuring tool is pressed for approx. 4 minutes, the measuring tool automatically switches off to save the batteries.

Preparing for Measurement

Setting the Emissivity Degree for Surface-temperature Measurements

To determine the surface temperature, the natural infrared heat radiation emitted by the object is measured contact-free. For correct measurements, the emissivity degree set on the measuring tool (see "Emissivity Degree", page 15) must be checked and if required, adapted to the object being measured **prior to each measurement**.

You can select between three emissivity degrees. The commonly used materials specified in the Table below are exemplary for selection of the emissivity degree to be used.



High emissivity degree: Concrete (dry), bricks (red, course), sandstone (course), marble, roofing felt, stucco (course), mortar, gypsum, parquet flooring (matt), flooring panels, PVC, carpet, wallpaper (patterned), tiles (matt), glass, aluminium (anodised), enamel, wood, rubber, ice



Medium emissivity degree: Granite, paving stone, fibre board, wallpaper (lightly patterned), varnish (dark), metal (matt), ceramic, leather



Low emissivity degree: Porcelain (white), varnish (light), cork, cotton

For the selected examples, an emissivity degree is indicated as follows:

- High emissivity degree: 0.95
- Medium emissivity degree: 0.85
- Low emissivity degree: 0.75

To change the emissivity degree, press the emissivity degree button **14** until the appropriate emissivity degree for the next measurement is indicated in display element **g**.

- **Correct surface-temperature indications are only possible when the set emissivity degree and the emissivity degree of the object correspond.** Correct notes on thermal bridges and the risk of mould thus also depend on the set emissivity degree.

Measuring Surface for Surface-temperature Measurements

The laser circle generated by the measuring tool indicates the measuring surface; its infrared radiation is determined in the course of the contact-free surface-temperature measurement. The centre laser point marks the centre of the measuring surface. For optimal measuring results, align the measuring tool in such a manner that the laser beam impinges perpendicularly on this point of the measuring surface.

- **Do not point the laser beam at persons or animals and do not look into the laser beam yourself, not even from a large distance.**

The size of the laser circle and thus of the measuring surface increases with the clearance between the measuring tool and the object being measured. The optimal measuring distance is 0.5 m to 1 m.

- **Do not hold the measuring tool directly against hot surfaces.** The measuring tool can be damaged through heat.

The indicated measuring result is the mean value of the measured temperatures within the measuring surface.

Notes on the Measuring Conditions

Highly reflecting or transparent surfaces (e.g., shiny tiles, stainless steel fronts or cooking pots) can affect the surface-temperature measurement. If necessary, mask off the measuring surface with a dark, matt tape that conducts heat well. Allow the tape to briefly acclimatize to the surface.

On condition of the principle, taking measurements through transparent materials is not possible.

14 | English

The accuracy and reliability of the measuring results increase with better and more stable measuring conditions.

The humidity and temperature sensor **1** can become damaged through chemical contaminants, such as through the evaporation of paints or enamels. The infrared temperature measurement is affected through smoke, steam or dusty air. Therefore, ventilate the room before measuring, especially when the air is contaminated or steamy. For example, do not apply a measurement in the bathroom directly after showering. After ventilating, allow the room to acclimatize for a while until the usual temperature has been reached again.

Ambient temperature and relative humidity are measured directly on the measuring tool via the humidity and temperature sensor **1**. To achieve substantial results, do not hold the measuring tool directly above or next to interference sources such as radiators or open liquids. Make sure not to cover off the sensor **1**.

Measuring Functions

Single Measurement

Briefly pressing the measuring button **4** once switches the laser on and actuates a single measurement in the selected mode. The measuring procedure can take 1 to 2 seconds and is indicated through rotating display segments in line **l**.

The laser beam is switched off automatically upon completion of the measurement.

The last measuring results are indicated on the display; the "HOLD" **m** indicator flashes additionally. The signal LED remains unchanged for the last indication.

Continuous Measurement (Tracking)

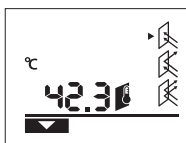
For continuous measurements, press and hold measuring button **4** in the selected mode. The laser remains switched on. Moving slowly, point the laser circle at all surfaces requiring temperature measurement, one after the other. For humidity and ambient-temperature measurements, slowly move the measuring tool around in the room.

The display indication as well as the signal LED **8** are continuously updated. As soon as releasing the measuring button **4**, the measurement is interrupted and the laser is switched off.

The last measuring results are indicated on the display; the "HOLD" **m** indicator flashes additionally. The signal LED remains unchanged for the last indication.

Surface-temperature-mode (see figure A)

In surface-temperature-mode, the surface temperature of an object is measured.



To switch to surface-temperature-mode, press the surface-temperature-mode button **11**. The surface-temperature-mode indicator **k** appears on the display for confirmation.

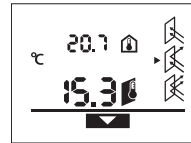
Press measuring button **4** and point the laser circle perpendicularly against the centre of the object being measured. Upon completion of the measurement, the measured surface temperature is displayed in line **l**.

In surface-temperature-mode, the signal LED **8** does not light up.

This mode, as an example, is suitable for measuring the temperature of radiators, underfloor heating systems or refrigerator interiors.

Thermal-bridge-mode (see figure B)

In thermal-bridge-mode, surface and ambient temperature are measured and compared with each other. In case of larger differences between both temperatures, a thermal-bridge warning is indicated (see "Thermal Bridge", page 15).



To switch to thermal-bridge-mode, press the thermal-bridge-mode button **10**. The thermal-bridge-mode indicator **j** appears on the display for confirmation.

Press measuring button **4** and

point the laser circle perpendicularly against the centre of the object being measured. Upon completion of the measurement, the measured surface temperature is displayed in line **l** and the measured ambient temperature in line **a**.

The measuring tool automatically compares the values and interprets the results as follows:

- **Green** signal LED **8**: Low temperature difference, no thermal bridges given.
- **Yellow** signal LED **8**: Temperature difference in limit range; thermal bridge possible in the measuring range; repeat the measurement at a later point of time.
- **Red** signal LED **8**: The flashing **symbol for surface temperature h** indicates that the surface temperature within the measuring surface significantly deviates from the ambient temperature. A thermal bridge is in the measuring range, which indicates poor insulation.

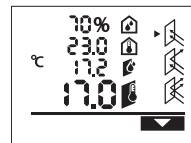
When the ambient temperature is low, the **symbol for ambient temperature e** additionally flashes. The room is too cold – when being normally heated, the low temperature indicates an overall poor insulation.

In case of thermal bridges, check the insulation in this area, perhaps with the support of a building expert.

Mould-warning-mode (see figure C)

In mould-warning-mode, the ambient temperature and the relative humidity (see "Relative Humidity", page 15) are measured. The dew point temperature is calculated based on both values (see "Dew Point Temperature", page 15). In addition, the surface temperature is also measured.

The dew point temperature is compared with the surface temperature and the result is interpreted as to the risk of mould.



To switch to mould-warning-mode, press the mould-warning-mode button **12**. The mould-warning-mode indicator **i** appears on the display for confirmation.

Press measuring button **4** and

point the laser circle perpendicularly against the centre of the object being measured. Upon completion of the measurement, the measured relative humidity is displayed in line **b**, the measured ambient tempera-

ture in line **a**, the calculated dew point temperature in line **c** and the measured surface temperature in line **l**.

The measuring tool automatically compares the values and interprets the results as follows:

- **Green** signal LED **8**: No risk of mould under the current conditions.
- **Yellow** signal LED **8**: The values are in the limit range; pay attention to room temperature, humidity and heat bridges, and repeat the measurement at a later point of time as required.
- **Red** signal LED **8**: There is an increased risk of mould, as the dew point temperature is significantly higher than the surface temperature, or because the humidity is too high. The flashing **symbol for relative humidity d** indicates too high humidity in the room, the flashing **symbol for ambient temperature e** indicates too low room temperature, the flashing **symbol for surface temperature h** indicates thermal bridges.

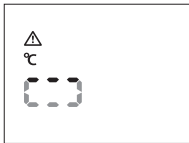
When the risk of mould is given, you should – depending on the cause – reduce the humidity through more frequent and thorough ventilation, increase the room temperature and eliminate thermal bridges. If required, refer to a building expert.

Note: The measuring tool cannot detect mould spores. It only indicates the possible formation of mould when the conditions remain the same.

Troubleshooting – Causes and Corrective Measures

All of the following error messages in the display are accompanied by the red signal LED **8**.

Measuring Tool not Acclimatized



The measuring tool was exposed to severe variations in temperature and did not have enough time to adapt.

The measuring tool switches off automatically after 5 seconds.

Wait approx. 10 to 30 minutes

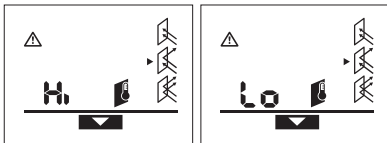
until the measuring tool has adapted to the current temperatures. The acclimatization is accelerated when the measuring tool is periodically moved around in the room.

Ambient Temperature not in Operating-temperature Range



The ambient temperature is too high or too low for operation of the measuring tool. The measuring tool switches off after 5 seconds; taking measurements in this environment is not possible.

Surface Temperature not within the Measuring Range



The surface temperature of the object in the laser circle is too high (“**Hi**”) or too low (“**Lo**”). The temperature of this object cannot be measured. Point the laser circle to another object and start a new measurement.

Internal Error



The measuring tool has an internal error and switches off after 5 seconds.

To reset the software, remove the batteries, wait a few seconds and then insert the batteries again.

If the error continues, have the measuring tool checked by an authorised Bosch after-sales service.

Definitions

Emissivity Degree

The emissivity degree of an object depends on the material and the structure of its surface. It indicates whether an object (in comparison with other objects with the same temperature) emits much or little infrared heat radiation.

Thermal Bridge

A thermal bridge is defined as an object that undesirably transmits heat from one side to the other.

As the surface temperature at thermal bridges is lower than in the rest of the room, the risk of mould increases significantly at these locations.

Relative Humidity

The relative humidity provides information on how intensive the air is saturated with water vapour. It is stated as a percentage of the maximum amount of water vapour that the air can absorb. The maximum amount of water vapour depends on the temperature: The higher the temperature, the more amount of water vapour the air can absorb.

When the relative humidity is too high, the risk of mould increases. Too low humidity can lead to health impairments.

Dew Point Temperature

The dew point temperature indicates the temperature at which the water vapour in the air starts to condense. The dew point temperature depends on the relative humidity and the air temperature.

When the temperature of a surface is below the dew point temperature, water begins to condense on this surface. The larger the difference of both temperatures and the higher the relative humidity, the greater the condensation.

Condensate on surfaces is a major cause for the formation of mould.

Maintenance and Service

Maintenance and Cleaning

Store and transport the measuring tool only in the supplied protective pouch **16**. Do not, as an example, store the measuring tool in a plastic bag, as the evaporation could damage the humidity and temperature sensor **1**. Do not attach stickers onto the measuring tool close to the sensor.

16 | English

Do not store the measuring tool for long periods out of a humidity range between 30 to 50 %. When the measuring tool is stored too moist or too dry, faulty measurements can occur when starting operation.

Keep the measuring tool clean at all times.

Wipe off debris using a moist and soft cloth. Do not use any cleaning agents or solvents.

When cleaning, fluids should not penetrate into the measuring tool.

Provide utmost caution when cleaning the humidity and temperature sensor **1**, the reception lens **2** and the laser beam exit opening **3**:

Pay attention that no lint is on the reception lens or the laser beam exit opening. Do not attempt to remove debris from the sensor or from the reception lens using pointed objects. If required, debris can be carefully removed with oil-free compressed air.

If the measuring tool should fail despite the care taken in manufacturing and testing procedures, repair should be carried out by an authorised after-sales service centre for Bosch power tools. Do not open the measuring tool yourself.

In all correspondence and spare parts orders, please always include the 10-digit article number given on the type plate of the measuring tool.

In case of repairs, send in the measuring tool packed in its protective pouch **16**.

After-sales Service and Customer Assistance

Our after-sales service responds to your questions concerning maintenance and repair of your product as well as spare parts. Exploded views and information on spare parts can also be found under:

www.bosch-pt.com

Our customer service representatives can answer your questions concerning possible applications and adjustment of products and accessories.

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Disposal

Measuring tools, accessories and packaging should be sorted for environmental-friendly recycling.

Do not dispose of measuring tools and batteries/rechargeable batteries into household waste!

Only for EC countries:

According to the European Guideline 2002/96/EC, measuring tools that are no longer usable, and according to the European Guideline 2006/66/EC, defective or used battery packs/batteries, must be collected separately and disposed of in an environmentally correct manner.

Batteries no longer suitable for use can be directly returned at:

Great Britain

Robert Bosch Ltd. (B.S.C.)
P.O. Box 98
Broadwater Park
North Orbital Road
Denham
Uxbridge
UB 9 5HJ
Tel. Service: +44 (0844) 736 0109
Fax: +44 (0844) 736 0146
E-Mail: boschservicecentre@bosch.com

Subject to change without notice.