



Operating Instructions

IR 110-6S Infrared Thermometer

Item No. 2450948

1 Intended use

The product is used for contact-free measurement of surface temperatures. The infrared sensor detects the emitted heat radiation of an object, and converts this information into a temperature value. The product is not suitable for measuring the body temperature of humans.

The product is suitable only for use in dry environments.

If you use the product for purposes other than those described, the product may be damaged. Improper use can result in short circuits, fires, or other hazards.

The product complies with the statutory national and European requirements. For safety and approval purposes, you must not rebuild and/or modify the product.

Read the operating instructions carefully and store them in a safe place. Make this product available to third parties only together with the operating instructions.

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2 Delivery content

- Product
- Laser warning labels
- Carrying bag
- 2x AAA batteries
- Operating instructions

3 Latest product information

Download the latest product information at www.conrad.com/downloads or scan the QR code shown. Follow the instructions on the website.

4 Symbols in this document



The symbol warns of hazards that can lead to personal injury. Read the information carefully.

5 Symbols on the product



The symbol warns of hazards from exposure to laser beams that can lead to eye injury.

6 Safety instructions



Read the operating instructions carefully and especially observe the safety information. If you do not follow the safety instructions and information on proper handling in this manual, we assume no liability for any resulting personal injury or damage to property. Such cases will invalidate the warranty/guarantee.

6.1 General information

- The device is not a toy. Keep it out of the reach of children and pets.
- Do not leave packaging material lying around carelessly. This may become dangerous playing material for children.
- If you have questions which remain unanswered by these operating instructions, contact our technical support service or other technical personnel.
- Maintenance, modifications and repairs must only be completed by a technician or an authorised repair centre.

6.2 Handling

- Please handle the product carefully. Jolts, impacts or a fall even from a low height can damage the product.

6.3 Operating environment

- Always comply with the accident prevention regulations for electrical equipment when using the product in commercial facilities.
- Trained personnel must supervise the use of electrical appliances in schools, training facilities and DIY workshops.
- Do not place the product under any mechanical stress.
- Protect the appliance from extreme temperatures, strong jolts, flammable gases, steam and solvents.
- Protect the product from high humidity and moisture.
- Protect the product from direct sunlight.

6.4 Laser

- When operating the laser equipment, always make sure that the laser beam is directed so that no one is in the projection area and that unintentionally reflected beams (e.g. from reflective objects) cannot be directed into areas where people are present.

- Laser radiation can be dangerous, if the laser beam or its reflection enters unprotected eyes. Before using the thermometer, familiarise yourself with the statutory regulations and instructions for operating such a laser device.
- Never look into the laser beam and never point it at people or animals. Laser radiation can seriously damage your eyes.
- If laser radiation enters your eyes, close your eyes immediately and move your head away from the beam.
- If your eyes have been irritated by laser radiation, do not continue to carry out tasks with safety implications, such as working with machines, working from great heights or close to high voltage. Do not drive any vehicles until the irritation has completely subsided.
- Do not point the laser beam at mirrors or other reflective surfaces. The uncontrolled, reflected beam may strike people or animals.
- Never open the device. Configuration or maintenance tasks must only be completed by a trained specialist who is familiar with the potential hazards. Improperly executed adjustments might result in dangerous laser radiation.
- The product is equipped with a class 2 laser. Laser signs in different languages are included in the package. If the sign on the laser is not in your local language, attach the appropriate sign to the laser.



Caution: Using equipment or procedures other than those described in these instructions could lead to exposure to dangerous radiation.

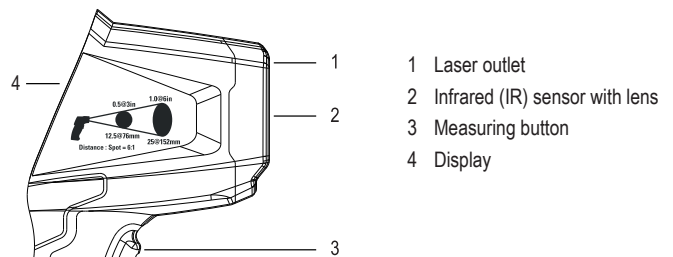
6.5 Batteries

- Correct polarity must be observed while inserting the batteries.
- The batteries should be removed from the device if it is not used for a long period of time to avoid damage through leaking. Leaking or damaged batteries might cause acid burns when in contact with skin, therefore use suitable protective gloves to handle corrupted batteries.
- Batteries must be kept out of reach of children. Do not leave batteries lying around, as there is risk, that children or pets swallow them.
- All batteries should be replaced at the same time. Mixing old and new batteries in the device can lead to battery leakage and device damage.
- Batteries must not be dismantled, short-circuited or thrown into fire. Never recharge non-rechargeable batteries. There is a risk of explosion!

6.6 Operation

- Consult an expert when in doubt about the operation, safety or connection of the appliance.
- If it is no longer possible to operate the product safely, take it out of operation and protect it from any accidental use. DO NOT attempt to repair the product yourself. Safe operation can no longer be guaranteed if the product:
 - is visibly damaged,
 - is no longer working properly,
 - has been stored for extended periods in poor ambient conditions or
 - has been subjected to any serious transport-related stresses.


7 Product overview



8 Inserting/changing batteries

1. Unlock and then remove the battery compartment cover at the bottom of the handle.
2. Pull out the battery tray.
3. Insert two AAA-sized batteries into the tray. Observe the polarity markings printed on the tray.
4. Slide the battery tray back in.
5. Reattach the battery compartment cover.

Note:

Replace the batteries if the battery symbol  is shown on the display.

9 Operation

9.1 Distance and precision

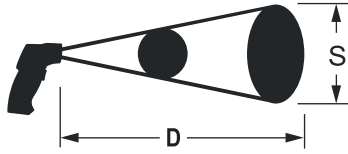


Fig. 1

To obtain accurate measurements, consider the following points when measuring:

- The measured object must be larger than the IR measuring spot **S** (fig. 1).
- The measured object should be at least twice the size of the IR measuring spot **S** (fig. 1).
- The smaller the object, the closer it must be to the thermometer.
- The D:S ratio is 6:1. At a distance **D** (fig. 1) of 6 cm, the size of the IR measuring spot is 1 cm.

9.2 Surface and environmental constraints

Not all surface materials are suitable for taking measurements. Observe the following constraints:

- Do not measure surface temperatures of shiny or polished metal surfaces.
- Do not measure through transparent surfaces such as glass. It will measure the surface temperature of the glass instead.
- Steam, dust, and smoke can affect the accuracy.

9.3 Switching on/off

1. Press the measuring button to switch the product on.
 - The display lights up.
 - The product turns off automatically after approx. 15 seconds of inactivity.

9.4 Enabling/disabling the target laser



The target laser helps you direct the infrared sensor at the desired location.



CAUTION

Eye injury from laserlight

- Do not point the laser beam at people or animals.

1. Press the measuring button to switch on.
2. Press the button  to enable/disable the target laser.
 - (If enabled) the symbol  is shown on the display.
 - (If enabled) the target laser is active while the measuring button is pressed.

9.5 Measuring temperature

Important:

Long measurements of high temperatures at close range cause the product to self-heat. This results in inaccurate measurements.

The higher the temperature, the greater the measuring distance and the shorter the measuring duration should be.

Precondition

- ✓ The product has adjusted to the ambient temperature. This can take up to 30 min.

Procedure

1. To measure, press and hold the measuring button and point the infrared sensor at the object.
 - The measured temperature and SCAN are shown on the display.
 - If the temperature lies outside the measuring range, the display shows - - - -.
2. Release the measuring button to freeze the measurement.
 - The last measured value and HOLD appear on the display.

9.6 Measuring differential temperature

With the differential temperature function you measure the difference between the highest and the lowest temperature reading relative to the temperature of a reference object. The first measurement serves as the reference temperature.

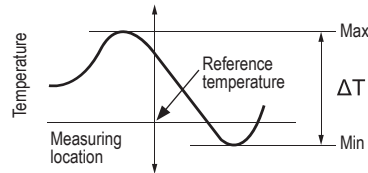


Fig. 2

The graph shows how temperature can vary across measuring locations (or measuring objects) in relation to the initially set reference temperature.

1. Press the measuring button to switch on.
2. Repeatedly press the button **MODE** until DIF is shown on the display.
3. Point the infrared sensor at the object.
4. Press and hold the measuring button to start taking measurements.
 - The display shows the current temperature and the temperature difference ΔT between the highest and the lowest temperature reading (fig. 2).

9.7 Displaying Maximum/Minimum/Average readings

Besides temperature, the product records and calculates maximum, minimum, and average temperature. You can set which reading is displayed when taking measurements.

1. Press the measuring button to switch on.
2. Repeatedly press the button **MODE** to select minimum (MIN), maximum (MAX), or average (AVG) temperature.

9.8 Setting temperature alarms

The temperature alarm function allows you to set a lower and upper temperature threshold. When measurements fall below the lower or exceed the upper threshold, an alarm sounds. Thresholds can be enabled independently of each other.

Setting thresholds

1. Press and hold the button **MODE** until $\epsilon =$ flashes on the display.
2. Repeatedly press the button **MODE** until **(H)** (upper threshold) or **(L)** (lower threshold) flashes on the display.
3. Press the button **▲** to activate the threshold.
 - The display switches from Off (deactivated) to On (activated).
4. Press the button **MODE** to confirm.
 - The temperature flashes on the display.
5. Use the buttons **▲** and **▼** to set the threshold temperature.
6. Continue pressing the button **MODE** until no symbols flash on the display.
 - The corresponding threshold symbol shows on the display.
 - You have set and activated the threshold.

Disabling thresholds

Refer to the procedure above for setting thresholds. Instead of activating them, you deactivate them.

10 Configuration

Use the configuration menu to change and adjust display and measurement settings.

10.1 Available settings

Setting	Display indicator	Description
Temperature unit	°C / °F	Select between degrees Celsius or degrees Fahrenheit.
Emissivity	$\epsilon =$	Set the emissivity level. Many organic materials have an emissivity of 0.95. Refer to "Emissivity reference values" for emissivity levels of different materials.

10.2 Adjusting settings

1. Press and hold the button **MODE** until $\epsilon =$ flashes on the display.
2. Repeatedly press the button **MODE** until the display indicator corresponding to the setting you intend to change flashes on the display.
3. Use the buttons **▲** and **▼** to adjust the setting values.
4. Press the button **MODE** to save the changes.
5. Exit the menu by pressing the button **MODE** repeatedly until no symbols flash on the display.
 - You have changed the setting.

11 Care and cleaning

11.1 Housing

Important:

- Do not use aggressive cleaning agents, rubbing alcohol or other chemical solutions. They damage the housing and can cause the product to malfunction.
- Do not immerse the product in water.

1. Use a dry, lint-free cloth to clean the product.

11.2 Infrared sensor lens

Important:

- Do not use any acidic, alcoholic or other solvents or rough, linty cloth to clean the lens.
- Avoid applying too much pressure when cleaning the lens.

1. Remove loose particles with clean compressed air and wipe off remaining residues with a fine lens brush.
2. Clean the surface using a lens cloth or a clean, soft, lint-free cloth. The cloth can be moistened with water or a lens cleaning solution to remove fingerprints and other residues.

12 Disposal

12.1 Product



Electronic devices are recyclable waste and must not be disposed of in the household waste. At the end of its service life, dispose of the product in accordance with applicable regulatory guidelines.

12.2 (Rechargeable) batteries

Remove any inserted (rechargeable) batteries and dispose of them separately from the product. You as the end user are required by law (Battery Ordinance) to return all used (rechargeable) batteries. Disposing of them in the household waste is prohibited.



Contaminated (rechargeable) batteries are labeled with this symbol to indicate that disposal in the domestic waste is forbidden. The designations for the heavy metals involved are: Cd = Cadmium, Hg = Mercury, Pb = Lead (name on (rechargeable) batteries, e.g. below the trash icon on the left).

Used (rechargeable) batteries can be returned to collection points in your municipality, our stores or wherever (rechargeable) batteries are sold. You thus fulfill your statutory obligations and contribute to the protection of the environment.

Before disposal, the exposed contacts of batteries must be fully covered with a piece of adhesive tape to prevent short-circuits. Even if batteries are depleted, the remaining energy can become dangerous in the event of a short-circuit (bursting, severe heating, fire, explosion).

13 Emissivity reference values

Note:

The emissivity levels listed in the following table are approximate values. Parameters such as the shape and characteristics of the material can affect the emissivity of an object.

Surface	Emissivity	Surface	Emissivity
Asphalt	0.90 – 0.98	Varnish (matt)	0.97
Concrete	0.94	Mortar	0.89 – 0.91
Ice	0.96 – 0.98	Paper	0.70 – 0.94
Ferric oxide	0.78 – 0.82	Plastic	0.85 – 0.95
Soil/humus	0.92 – 0.96	Sand	0.9
Hard plaster	0.80 – 0.90	Textiles	0.9
Glass, ceramics	0.90 – 0.95	Water	0.92 – 0.96
Rubber (black)	0.94	Bricks	0.93 – 0.96
Varnish	0.80 – 0.95		

14 Technical data

14.1 Power supply

Power supply 3 V, 2 x 1.5 V AAA battery

14.2 Measuring

Measuring range..... 0 to +110 °C (+32 °F to +230 °F)

Temperature range	Accuracy	Resolution
0 to +25 °C	±0.7 °C	0.1 °C (0.1 °F)
>+25 to <+45 °C	±0.3 °C	0.1 °C (0.1 °F)
+45 to +110 °C	±0.7 °C	0.1 °C (0.1 °F)

IR measurement optics..... 6:1

Emissivity..... 0.1 – 1.0

Response time..... 300 ms

14.3 Laser

Laser class 2

Laser wave length 630 – 670 nm

Laser output..... <1 mW

14.4 Other

Operating conditions..... 0 to +50 °C, 10 – 80 % RH

Storage conditions..... -10 to +60 °C, <80 % RH

Dimensions (W x H x D) 50 x 172 x 93 mm

Weight 236 g