

### INFRARED THERMOMETER IR 550-12D

ITEM NO. 10 99 96

#### INTENDED USE

The infrared thermometer allows contactless measurement of surface temperatures. It measures the temperature by means of the infrared energy emitted by each object. Due to the contactless measurement, the product is ideal for dangerous objects: objects that are difficult to access, moving objects or objects supplied with electrical voltage. It cannot measure through transparent surfaces such as glass, plastics, water etc. However, it always measures the surface temperature. The temperature measurement range is between -50 to +550 °C. A laser targeting equipment facilitates the specification of the measurement range.

The thermometer itself must not get in contact with the surface or object to be measured. Always maintain sufficient safety distance and observe the permitted ambient conditions.

Diagnostic application for medical purposes is not admissible.

A 9 V block battery is required for the voltage supply. Do not use any other source of energy.

This product complies with the applicable national and European regulations. For safety and approval reasons (CE), the entire product must not be modified or converted, and the casing must not be opened for any purpose other than battery replacement. If you use the product for purposes other than those described above, the product may be damaged or there might be a risk of injuries. Please read the operating instructions carefully and keep them. If you pass the product on to a third party, please hand over these operating instructions as well.

Always observe the safety notes included in these operating instructions.

#### 2. PACKAGE CONTENTS

Infrared thermometer	bag
Battery	operating instructions

#### 3. SAFETY INSTRUCTIONS AND HAZARD WARNINGS



Please read all the instructions before using this device; they contain important information on its proper operation.

##### a) Persons / product

The warranty will be void in the event of damage caused by failure to observe these safety instructions! We do not assume any liability for any resulting damage!

We shall not accept liability for damage to property or personal injury caused by incorrect handling or non-compliance with the safety instructions! Any warranty will be void in such cases.

Measurement devices and accessories should be kept away from children! Therefore, be especially careful when children are around.

Protect the product from extreme temperatures, direct sunlight, strong vibrations, high humidity and moisture and combustible gases, vapours and solvents.

Do not use the product inside of rooms, or in poor ambient conditions, where flammable gases, vapours or dust may be present or are present.

Do not use in the immediate proximity of strong magnetic or electromagnetic fields or transmission aerials. These can affect the measurement.

If safe operation is no longer possible, take the device out of service and secure it against unintended use. Safe operation is no longer possible, if the product:

- has visible damages,
- no longer functions properly,
- has been stored under adverse conditions or
- has been exposed to considerable strain during transport.

Never switch the device on immediately after having taken it from a cold to a warm environment. The condensation that forms might destroy your device. Likewise, the lens may become misty, which can lead to inaccurate measurements. Allow the device to reach room temperature before switching it on.

Water vapour, dust, fume and/or vapours may impair the optical characteristics and lead to faulty measurements!

Do not carelessly leave the packaging material lying around, since it could become a dangerous plaything for children.

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 a reflection enters the unprotected eye. Therefore, before using the laser equipment, 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 cause eye injuries.

If laser radiation reaches the eyes, the eyes must be closed immediately and the head has to be moved out of the laser beam.

Should your eyes feel irritated from laser radiation, do not perform any safety-related tasks such as operating machinery, working at high altitudes or close to high-voltage. Do not drive any vehicles until the irritation has 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! Setting or maintenance tasks must only be carried out by a trained specialist familiar with potential hazards. Improperly performed 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 written in the language of your country, please affix the appropriate sign onto the laser.

Caution: if operation settings or procedures other than those described here in these instructions are used, this could lead to exposure to dangerous radiation.

On industrial sites, the accident prevention regulations of the association of the industrial workers' society for electrical equipment and utilities must be followed.

In schools, training centres, computer and self-help workshops, the use of measuring instruments and accessories must be supervised by trained personnel in a responsible manner.

If you have doubts about how the equipment should be operated or how to connect it safely, consult a trained technician.

Please handle the product carefully. The product can be damaged if crushed, struck or dropped, even from a low height.

This device left the manufacturer's factory in a safe and perfect condition.

We kindly request that the user observes the safety instructions and warnings contained in the enclosed operating instructions so this condition is maintained and to ensure safe operation. Please pay attention to the following symbols:



A triangle containing an exclamation mark indicates important information in these operating instructions that is to be observed without fail.



The "arrow" symbol indicates where special tips and notes on operations are provided.



This product has been CE-tested and meets the necessary European guidelines.

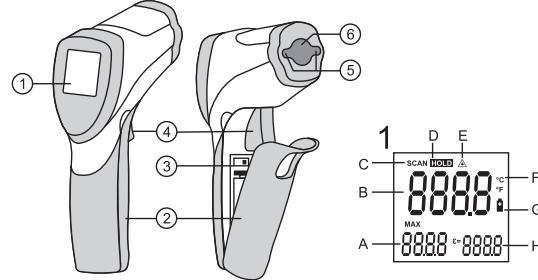
##### b) Batteries and rechargeable batteries

Remove the battery/the rechargeable battery, if you are not going to use the device for a while, to prevent damage from leaking. Leaking or damaged batteries/rechargeable batteries can cause acid burns upon contact with the skin. Thus, you should wear protective gloves when handling damaged batteries/rechargeable batteries.

Keep the batteries/rechargeable batteries out of the reach of children. Do not leave batteries lying around, as they may be swallowed by children or pets.

Do not dismantle batteries/rechargeable batteries, do not short-circuit them or throw them into a fire. Never try to charge batteries. There is a risk of explosion.

#### 4. DESCRIPTION OF THE PARTS



- 1 Illuminated display
- A Maximum value display for the highest measured value
- B Measuring value display
- C SCAN display for active reading
- D HOLD display for measurement pause
- E Laser warning display for active laser beam
- F Display for the preset temperature unit
- G Battery replacement display
- H Display of the permanently adjusted emission level (0.95)
- 2 Fold-out battery compartment
- 3 Selector switch for temperature unit (°C/F)
- 4 Measurement button
- 5 Target laser, left and right
- 6 Measurement hole

#### 5. INSERTING/REPLACING THE BATTERIES

For initial start-up the battery enclosed must be inserted. Fold the battery compartment lid forwards opening the battery compartment (2).

Remove the flat battery from the battery clip and connect a new battery of the same type with the correct polarity to the battery clip. The battery clip is constructed so the battery can only be connected with the correct polarity. Do not use force when plugging in!

Close the battery compartment by closing the battery compartment lid (2). Be careful not to pinch the cables.

Replace the battery if the battery symbol (1G) is shown on the display.



## 6. OPERATION

### a) Operating principle

Infrared thermometers (IR thermometers) measure the surface temperature of an object. The sensor on the product records the heat radiation emitted, reflected and transmitted through the object, and converts this information into a temperature value.

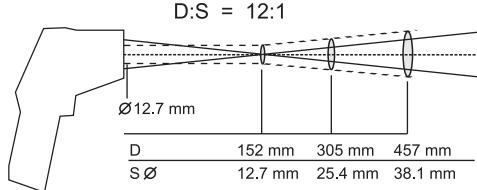
The emission level is a value used to describe the energy radiation characteristics of a material. The higher the value, the more capable the material is of emitting radiation. Many organic materials and surfaces have an emission level of approx. 0.95. Metallic surfaces or shiny materials have a lower emission level. This will cause an inaccurate reading. For this reason, a matt black layer of paint or matt adhesive tape should be applied to metallic shiny surfaces.

### b) IR measuring optics - ratio

#### measuring distance - measuring surface

(D:S = measuring distance:measuring surface)

In order to obtain precise measured results, the object to be measured must be larger than the measuring IR spot of the IR thermometer. The temperature recorded is the average temperature of the area measured. The smaller the object to be measured, the shorter the distance must be to the infrared thermometer. The precise size of the measuring spot is shown in the following diagram. It is also printed on the device. For precise measurements, the object to be measured should be at least twice the size of the measuring spot.



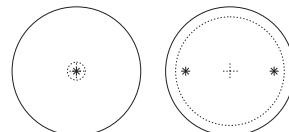
### c) Target laser

The target laser is automatically activated during each reading. A warning symbol (1E) is shown on the display if the measurement button is pressed. Never look into the measurement hole during a reading.

The target laser is constructed in dual design and marks the inner, approximate edge area of the measuring surface.

When both laser spots meet, the smallest measuring surface has been reached. The latter has a diameter of 12.7 mm

With larger distances, the two laser spots move apart, analogue to the measuring surface.



### d) Reading

Direct the measuring hole (6) perpendicular to the object to be measured. Make sure the object to be measured is not smaller than the IR-measuring surface of the device.

Press the measuring button (4) and hold it down. The measuring value (1B) is shown in the display. The displayed value corresponds with the average surface temperature of the IR-measuring surface. During the measurement, "SCAN" (1C) is shown in the display.

After releasing the measuring button (4), the last measured value will be displayed for approx. 7 seconds for a better readability. "HOLD" (1D) will also be displayed.

7 seconds after releasing the measuring button (4), the device turns off automatically.

If the temperature measuring range is exceeded, "----" is displayed.

To determine the warmest spot on the object to be measured, move the measuring device over the surfaces of the object covering all areas and pressing and holding down the measuring button (4). The highest temperature measured will be displayed as maximum temperature on the bottom left.

→ Shiny surfaces affect the measured result. To compensate, the shiny part of the surface can be covered with adhesive tape or matt black paint. The device cannot take measurements through transparent surfaces such as glass. Instead, it measures the surface temperature of the glass.

Longer measurements of high temperatures, with close measuring distance, lead to self-heating of the measuring device and thus to inaccurate measurements. In order to obtain exact measured values, remember the following rule of thumb: The higher the temperature the greater the measuring distance and the shorter the measuring time.

## 7. CLEANING AND MAINTENANCE

Apart from occasional cleaning and battery replacement, the device requires no servicing.

Always observe the following safety instructions before cleaning the device:

### a) Cleaning of the lens

Remove loose particles with clean compressed air and wipe off remaining residues with a fine brush. Clean the surface with a lens cleaning cloth or a clean, soft, lint-free cloth. To remove fingerprints and other fat residues, the cloth can be moistened with water or lens cleaning solution. Do not use any acidic, alcoholic or other solvents or rough, linty cloth to clean the lens. Avoid applying too much pressure during cleaning.

### b) Cleaning the housing

Do not use scouring, chemical or aggressive cleaning agents such as benzene, alcohol or such like. These might attack the surface of the device. Furthermore, the fumes are hazardous to your health and are explosive. Moreover, you should not use sharp-edged tools, screwdrivers or metal brushes or similar implements for cleaning.

For cleaning the device or the display and the measuring cables, use a clean, slightly damp, fuzz-free, antistatic cloth.

Should questions arise concerning the use of the device, feel free to contact our technical support at the following phone number:

Voltcraft®, 92242 Hirschau, Lindenweg 15, Tel. No. 0180 / 586 582 7.



## 8. DISPOSAL

### a) Product



Electronic devices are recyclable material and do not belong in the household waste.

Dispose of an unserviceable product in accordance with the relevant statutory regulations. Remove any battery/rechargeable batteries inserted and dispose of them separately from the product.

### b) Batteries and rechargeable batteries

As the end user, you are required by law (Battery Ordinance) to return all spent batteries/rechargeable batteries; disposal of them in the household waste is prohibited.



Batteries/rechargeable batteries contain harmful materials and are labelled with the symbol shown to indicate that disposal in the household waste is forbidden. The symbols of the relevant heavy metals are: Cd=cadmium, Hg=mercury, Pb=lead (marking can be seen on the battery/rechargeable battery, e.g. underneath the refuse bin symbol shown on the left).

You can return your used batteries/rechargeable batteries free of charge at the official collection points of your community, in our stores, or at places where batteries or rechargeable batteries are sold.

You thereby fulfil your statutory obligations and contribute to the protection of the environment.

## 9. TECHNICAL DATA

Operating voltage: ..... 9 V/DC (9 V block battery)

Response time: ..... <125 ms

IR spectrum: ..... 8 - 14 µm

Emission level ..... 0.95 permanent

Resolution ..... 0.1 °C

IR measuring optics: ..... 12:1

Laser: Rated power ..... < 1 mW, laser class 2, Wave length 630 - 670 nm

Operating temperature: ..... 0 to +50 °C

Operating humidity: ..... 10 to 90 % r. hum.

Storage temperature: ..... -10 to +60 °C

Storage humidity: ..... <80 % r. hum.

Weight: ..... 175 g

Dimensions (W x H x D): ..... 43 x 146 x 92 mm

Accuracy (for ambient temperatures of 23 to 25 °C, emission level 0.95):

Temperature measuring range	Accuracy	Repeatability
-50 to +20 °C	± 4 °C/± 8 °F	± 1.3 °C/2.3 °F
>20 to +300 °C	± 1.5% of the measured value or ± 1.5 °C/3 °F	± 0.5% or ± 0.5 °C/0.9 °F
>300 to +550 °C	± 2% of the measured value	

## EMISSION LEVEL OF DIFFERENT SURFACES

The emission levels listed in the table are approximate values. Different parameters such as geometry and the surface quality can affect the emission level of an object.

The product is equipped with a fixed emission level of 0.95. This level matches most non-metallic materials. The IR measuring method is suitable for bare metals only to a limited extent and requires a special surface treatment (e.g. matt insulation tape etc.).

Surface	Emission level
Aluminium, bare	0.04
Asphalt	0.90 - 0.98
Concrete	0.94
Ice	0.96 - 0.98
Ferric oxide	0.78 - 0.82
Hard plaster	0.80 - 0.90
Glass/porcelain	0.92 - 0.94
Rubber, black	0.94
wood	0.94
Surface	Emission level
Varnish, matt	0.97
Foodstuffs	0.93 - 0.98
Human skin	0.98
Plastic	0.94
Paper	0.97
Sand	0.90
Textiles	0.90
Water	0.92 - 0.96
Bricks, plastering	0.93 - 0.96

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