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# Manual

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## 1 Introduction

Thank you for purchasing a PCE-777N from PCE Instruments.

The contact-free thermometer PCE-777N can measure surface temperatures using an infrared sensor, over a great distance without interference.

This lightweight compact remote thermometer is characterised by ease of use and includes a convenient red laser pointer, enabling the user to aim precisely at the surface area, of which the temperature is to be measured. The device is suitable for use in industry, in the workshop, for service and maintenance, for example for heating and ventilation, air conditioning, vehicle maintenance, or for checking electrical installations and control cabinets. The display back lighting may be switched on or off. It enables temperature readings to be taken remotely, quickly and easily from a safe distance. Thus allowing the user to measure very high temperatures, moving objects, or surfaces that would otherwise be difficult to access. The emissivity of the thermometer is set at 0.95, therefore covering about 90 % of temperature measurement applications.

### 1.1 Delivery content

- 1 x Contact-free thermometer
- 1 x Battery
- 1 x Manual

## 2 Safety notes

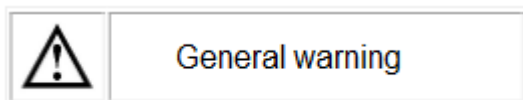
Please read the operating manual thoroughly before using the device.

No liability is accepted for damage to the equipment if the operating procedure, as specified in the manual, is not adhered to.



The thermometer uses a class 2 laser. Do not look into the laser pointer. This can lead to eye damage. The laser must not be switched on if anyone is in the field of vision. The laser beam must not be aimed at explosive gases.

### 2.1 Warning symbol



## 2.2 Warning

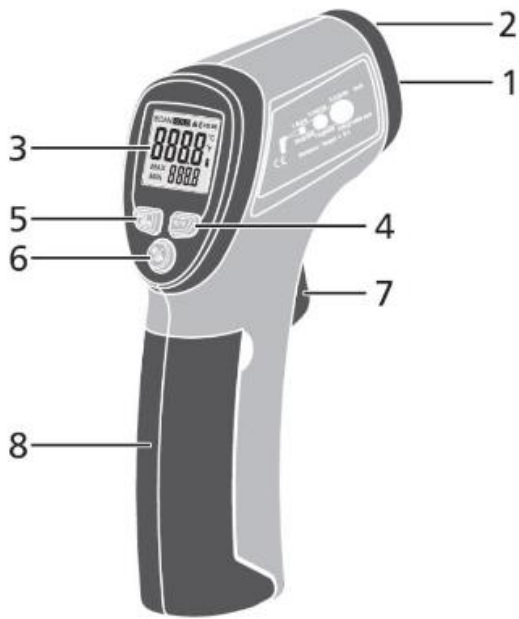
- If the safety notes are not adhered to, then the device could get damaged; also, this can lead to personal injury.
- Do not to expose the device to extreme environmental conditions, direct solar radiation, extreme humidity or moisture.
- Do not use the device with wet hands.
- No technical changes should be carried out on the device.
- The device should be cleaned with a damp and lint-free cotton cloth. Do not use scouring agents or solvents.
- The device is only allowed to be used with the offered PCE Instrument accessories or an equivalent replacement.
- Before each use, check the housing for any visible signs of damage. If any signs of damage are visible, do not use the device.
- The measuring device must not be used in environmental conditions that are not within the limits (temperature, humidity...) stated in the specification table.
- The measuring device must not be used in an explosive atmosphere.
- Before each use, please check the device by measuring a known factor.
- The measured value limits as stated in the specification table, must not be exceeded.
- The laser beam is not allowed to be aimed at people or at animals. The reflected beam off a shiny surface is not allowed to shine into anyone's eyes.
- Do not look into the laser beam.

If you have any queries, please contact PCE Instruments.

## 3 Specifications

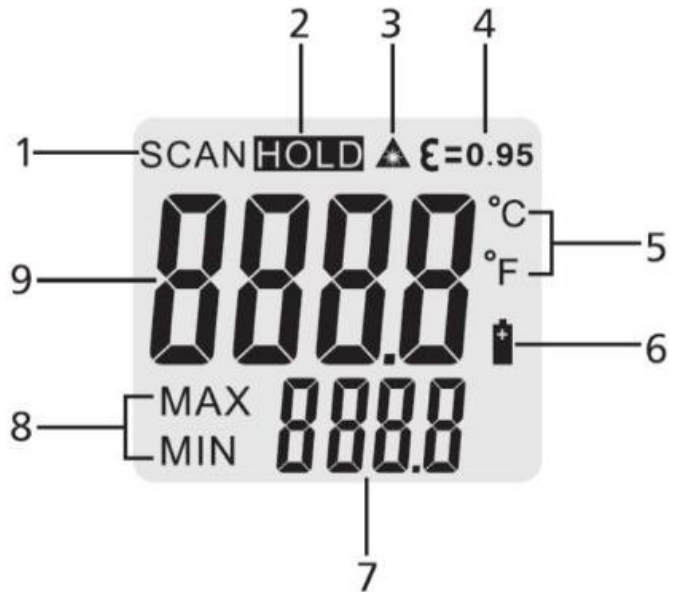
Temperature measuring range	-30 ... +260 °C / -22 ... 500 °F
Resolution	0.1 °C
Accuracy (Specified at 18 °C to 28 °C, <80 % RH)	±4 °C (in the range from -30 °C ... 0 °C) ±2 % or ±2 °C (in the range from 0 °C ... 260 °C)
Response time	<1 s
Spectral range	6 ~ 14 µm
Automatic switch off	after 8 s of inactivity
Power supply	9 V block battery
Dimensions	82 x 41.5 x 160 mm
Environmental conditions	Operation: 0 ... 50 °C, 10 % ... 90 % RH Storage: -20 °C ... 60 °C, <80 % RH
Weight	180 g
Measuring spot (measuring distance to measuring point size)	8:1
Emissivity (non-adjustable)	0.95
Laser point / target point	Visible single-point laser beam, performance <1 mW, wavelength 630 ~ 670 nm, class II
LC display	3-5 digits, backlit

#### 4 System description



- (1) Infrared sensor
- (2) Laser pointer
- (3) Display
- (4) Key for unit °C (Centigrade) / °F (Fahrenheit)
- (5) Selection key minimal / maximal value display
- (6) Key for laser and display backlighting
- (7) Measurement trigger
- (8) Battery compartment

- (1) Symbol for ongoing measuring process
- (2) Symbol for “frozen” measuring results (Data-Hold)
- (3) Symbol for active laser point
- (4) Emissivity (non-adjustable)
- (5) Symbol for unit °C/°F
- (6) Symbol for low battery level
- (7) MAX/MIN value
- (8) MAX/MIN symbol
- (9) Measuring results



## 5 Operation

### 5.1 Measuring process

Hold the device by the grip and aim at the object the surface temperature of which is to be measured. The device automatically compensates for any temperature fluctuations from the surrounding environment. Please note that it may take up to thirty minutes before the device fully registers major changes in the surrounding or ambient temperature. It is also advisable to wait several minutes between taking very high or very low readings. This will allow the infrared sensor time to regain its correct operating temperature before taking the next reading.

### 5.2 Switching device on and off

The device switches on automatically when the measuring trigger (7) is pressed. Keep the trigger pressed to carry out a measurement. Read the measuring values on the display. The device switches off after approx. 8 seconds of inactivity.

### 5.3 Measuring values “frozen” (Data-Hold)

After releasing the trigger (7), the measuring device automatically keeps the measuring value on the display for approx. 8 seconds. No additional user tasks are necessary.

### 5.4 Selection of the temperature unit (°C/°F)

To change the units between Centigrade and Fahrenheit keep the measuring trigger pressed. Then by pressing the °C (Centigrade) and °F (Fahrenheit) (4), the desired unit may be selected. The selected unit is then shown on the display.

### 5.5 MAX/MIN function

The function of the minimal and maximal value is controlled by pressing the selection key minimal / maximal value display (5) repeatedly. The activated function is indicated by a symbol on the display.

### 5.6 Laser pointer and display backlighting

Press and hold the measuring trigger and:

- press the laser activation key (6), to switch the laser pointer on. The laser pointer is activated. When it is switched on, a symbol appears on the display that the laser pointer (3) is activated.
- press the backlighting key (6) twice, to turn on the lighting.
- press the laser activating key (6) three times to switch the laser pointer off.
- press the backlighting key (6) four times to switch the lighting off.

## 5.7 General notes to the infrared measurement

### Fundamental principle

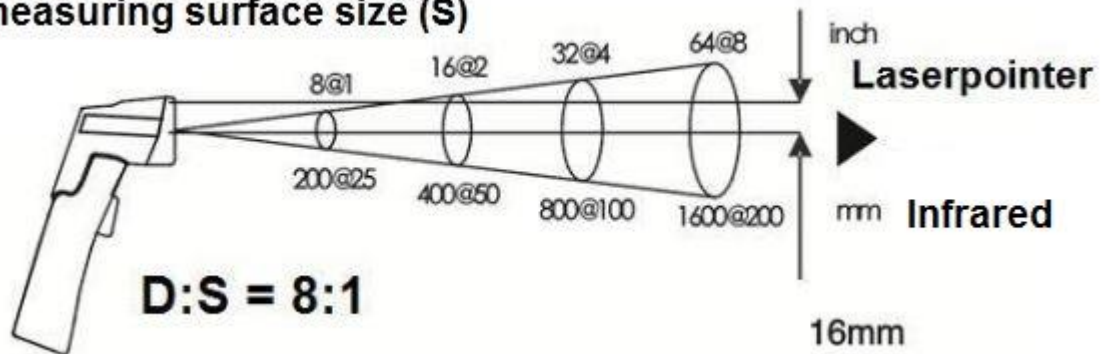
Infrared thermometers measure the surface temperature of an object. The device picks up the thermal emissions of an object, collects them and focusses them onto a sensor. The device electronics transfer the information into a temperature value that is then shown on the display. The laser pointer helps aim at the area to be measured.

### Field of View (FOV) / Field of vision / Measured surface

Ensure that the area to be measured is larger than the measuring surface of the device. The smaller the object is, the closer the device should be held towards the object. The general rule is that the object should be double the size of the measured surface.

### Distance (D)

### to measuring surface size (S)



### Measurement of metallic surfaces

It is recommended not to measure the temperature of shiny and polished metallic surfaces (stainless steel and aluminium) as the thermal emissions may fluctuate.

### Measurement through glass

The device cannot measure the temperature of transparent surfaces such as glass. Instead the temperature of the glass is measured.

### Influence of fog, dust, smoke, etc.

The reduced visibility may lead to incorrect readings.

## 6 Emissivities

Most organic material, such as painted and oxidised surfaces have an emissivity of approx.0.95 (non-adjustable value set in device). Some surfaces (e. g. shining metals) can lead to incorrect measurements. To compensate the effect, cover the measuring area with black tape, or a thin black coating of paint. Wait for the tape or the coating to have reached the same temperature as the surface. Measure the temperature of the black tape or the coating.

## 7 Maintenance and cleaning



Warning: To prevent incorrect measurements and any resulting personal injuries, replace the battery as soon as the battery symbol appears.

If the battery voltage is insufficient then the battery symbol appears on the display. Replace the 9 V battery, to prevent incorrect measurements and any resulting dangers. Remove the battery compartment cover to replace the battery and take the old battery out and insert a new 9 V battery. Then fit the compartment cover back on to the device.

### 7.1 Cleaning

The device should be cleaned with a damp and lint-free cotton cloth and if necessary with a gentle detergent. Do not use scouring agents or solvents.



## 8 Disposal

For the disposal of batteries, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

If you have any questions, please contact PCE Instruments.



## 9 Contact

If you have any questions about our range of products or measuring instruments please contact PCE Instruments.

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