

# EN

**OPERATING MANUAL**  
THERMAL IMAGING  
CAMERA





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## Notes regarding the operating manual

### Symbols

 **Danger!**  
Warns of a hazard which can lead to injuries.

 **Caution!**  
Warns of a hazard which can lead to damage to property.

The current version of the operating manual can be found at:



AC080V



<http://download.trotec.com/?sku=3110003031&id=1>

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The only party responsible for determining measured results to be valid, drawing conclusions and deriving actions is the user! Trotec accepts no claims of warranty for the correctness of the determined measured values or measured results. Further, Trotec accepts no liability whatsoever for possible mistakes or damage which have been caused by utilising the determined measured results. © Trotec

## Safety

**Carefully read the operating manual before using the device and keep it within reach!**

- Do not use the device in atmospheres containing oil, sulphur, chlorine or salt.
- Protect the device from permanent direct sunlight.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.
- Do not open the device with a tool.
- Observe the storage and operating conditions (see chapter Technical data).

### Intended use

Only use the device for the visualization of objects. To use the device for its intended use, only use accessories and spare parts which have been approved by Trotec.

### Improper use

Do not use the device in potentially explosive areas. Never use the device on persons or animals. Trotec accepts no liability for damages resulting from improper use. In such a case, entitlements to a warranty are forfeited. Any unauthorised modifications, alterations or structural changes to the device are forbidden.

### Personnel qualifications

People who use this device must:

- have read and understood the operating manual, especially the Safety chapter.

### Residual risks



#### Danger!

Keep a sufficient distance away from sources of heat.



#### Danger!

Do not leave the packaging lying around. Children might use it as a dangerous toy.



#### Danger!

The device is not a toy and does not belong in the hands of children.



#### Danger!

Dangers can occur at the device when it is used by untrained people in an unprofessional or improper way. Observe the personnel qualifications.



#### Caution!

To prevent damages to the device, do not expose it to extreme temperatures, extreme humidity or moisture.



#### Caution!

Do not use abrasive cleaners or solvents to clean the device.

**Information about the device**

**Device description**

The thermal camera AC080V creates a visible image depicting infrared radiation which is otherwise invisible to the human eye. The thermal image and temperature are displayed on the screen in real time. To improve the view, you can select various colour palettes for depicting the thermal image.

You are also able to automatically find and display the warmest and coolest measuring spot in the measured image.

For a measured result which is as precise as possible the ambient temperature, relative humidity, distance and degree of emission can be entered.

A list of degrees of emission for various surfaces is provided in chapter Degree of emission.

For a precise evaluation, the thermal image on the screen can be recorded and saved on the device.

The device control is based on the Android operating system for tablets.

The saved images can either be viewed directly on the screen or transferred to a PC with the supplied USB cable.

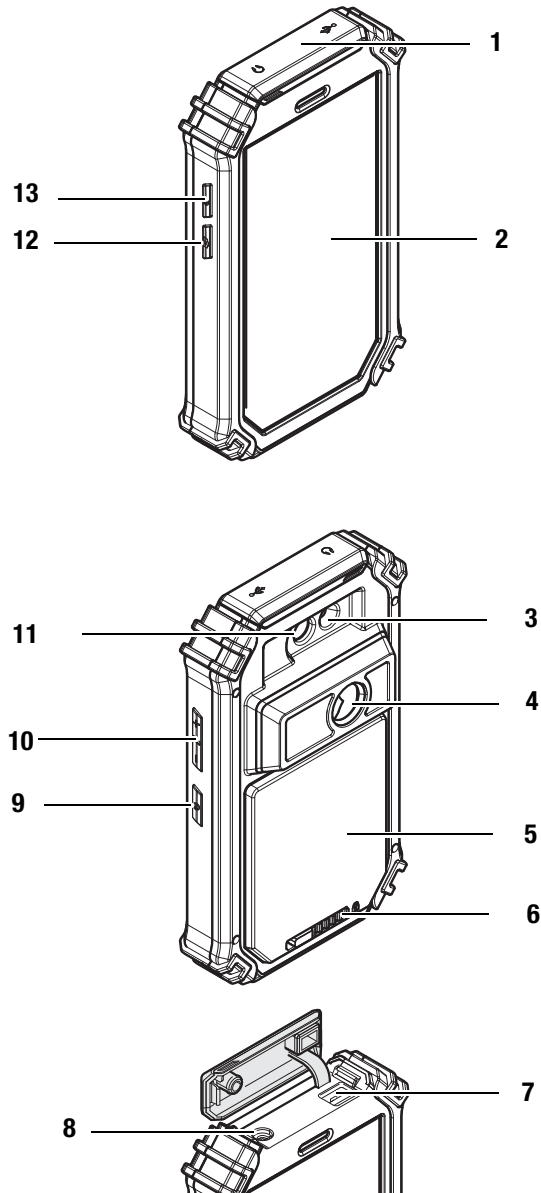
To edit the images, you can download the IR-Report 2.X STD software from the download (or service) section of [www.trotec.com](http://www.trotec.com).

**Note:**

Described in this operating manual is only the operation of the IR app for the AC080V. Further functions of the tablet or the Android operating system are not a part of this manual.

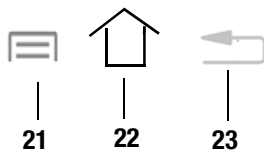
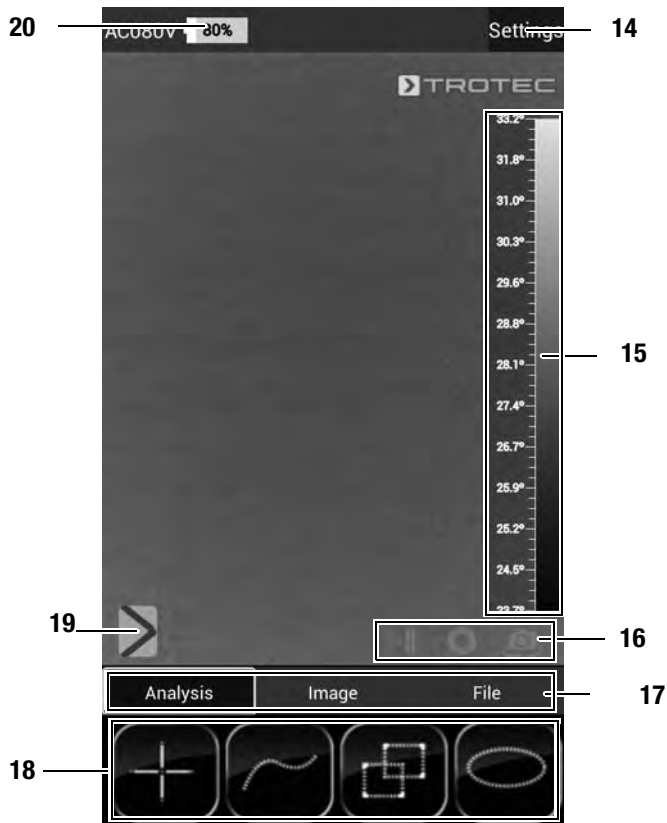
Additionally, to create short reports relating to the images, you can use the app IR-Wizard available free of charge. This software is a complimentary bonus that does not belong to the standard scope of delivery and is offered for use without support or warranty. The program interface (only available in selected languages) is generally easily comprehensible and can be used intuitively. Further information regarding the use is provided in the application.

**Device depiction**



| No. | Operating element                                       |
|-----|---|
| 1   | Protective cover for micro USB and headphone connection |
| 2   | Touch screen  |
| 3   | LED illumination  |
| 4   | Infrared camera   |
| 5   | Battery compartment with cover                          |
| 6   | Locking mechanism for the battery compartment           |
| 7   | USB connection  |
| 8   | 3.5 mm headphone connection                             |
| 9   | Power button  |
| 10  | Volume control button                                   |
| 11  | Camera (visual)   |
| 12  | Photo button (IR picture)                               |
| 13  | Shutter button  |

## Operating elements (AC080V app only)



| No. | Operating element                                    |
|-----|--|
| 14  | Settings menu button                                 |
| 15  | Temperature scale                                    |
| 16  | Camera control panel                                 |
| 17  | Mode menu bar  |
| 18  | Functions menu bar (example here: Analysis)          |
| 19  | Parameter button                                     |
| 20  | Charging status indicator                            |
| 21  | Menu button  |
| 22  | Home button  |
| 23  | Back button  |
| 24  | Still image button                                   |
| 25  | Calibration / automatic adjustment button            |
| 26  | Button to change between IR camera and visual camera |

## Technical data

|   |                                |  |
|---|--------------------------------|--|
| Model   | AC080V                         |  |
| Article number                                      | 3.110.003.031                  |  |
| Measurement   | Temperature range              | -20 °C to +350 °C  |
|   | Accuracy                       | ± 2 °C, ± 2 % of the measured value  |
| Radiometric image performance                       | Detector type                  | Focal Plane Array (FPA), uncooled microbolometer   |
|   | Detector resolution            | 160 x 120 pixels   |
|   | Spectral range                 | 8 to 14 µm   |
|   | Field of vision (FOV)          | 21° x 28°  |
|   | Geometric resolution           | 3 mrad   |
|   | Thermal sensitivity            | ≤ 0.08 °C at 30 °C   |
|   | Image repetition frequency     | 50/60 Hz   |
|   | Focus / min. focus distance    | Rigid / 0.5 m  |
| Visual image performance                            | Digital photo camera           | 8 megapixels, integrated photo lamp (LED)  |
| Image representation                                | Display                        | 5-inch LCD touchscreen, capacitive   |
|   | Image display                  | Pseudo colours, 6 colour palettes (IR image); 16.7 million colours (real image)  |
|   | Image display options          | IR image, IR video, real image   |
| Measurement and analysis                            | Measuring spots                | Five dynamic temperature measuring spots, individually configurable (MIN, MAX, ALARM)  |
|   | Measuring functions            | Isotherm, sector analysis (circle, rectangle), alarm function  |
|   | Degree of emission             | User-defined variably adjustable from 0.01 to 1.0  |
|   | Measurement correction         | Correction of the reflected object temperature; automatic corrections based on user-defined specifications regarding the distance, relative humidity and ambient temperature |
| System equipment                                    | Operating system and functions | Operating system based on Android 4.2 with integrated thermal image analysis software, report function, IR video player, internet browser                                    |
|   | Interfaces                     | USB, WLAN, GPS, Bluetooth  |
| Data storage  | Memory                         | 21 GB (5 GB internal flash memory + 16 GB integrated and non-exchangeable SD card)   |
|   | File format                    | Radiometric image: 14 bit JPEG; visual image: JPEG; non-radiometric thermographic video: MPEG-4  |
| Power supply  | Battery type                   | Standard, lithium-ion; rechargeable  |
|   | Operating time                 | ~ 2 h  |
| Surrounding conditions and physical characteristics | Temperature                    | 0 °C to +50 °C (operation)   |
|   | Type of protection             | IP54   |
|   | Shock / vibration              | 25 G / 2 G   |
|   | Dimensions                     | 174 x 102 x 35 mm  |
|   | Weight                         | 405 g  |

## Scope of delivery

- 1 x thermal camera AC080V
- 1 x rechargeable battery, Li-ion
- 1 x charger
- 1 x charging cradle
- 1 x changing adapter for different socket types
- 1 x USB cable
- 1 x transport case
- 1 x getting started guide

## Transport and storage

### Transport

Use the transport case included in the scope of delivery to transport the device.

### Storage

When the device is not being used, observe the following storage conditions:

- dry,
- protected from dust and direct sunlight,
- with a plastic cover to protect it from invasive dust, if necessary.
- The storage temperature is the same as the range given in the chapter Technical data.
- Remove the battery when storing the device for a longer period of time.
- Preferably use the supplied transport case to store the device.

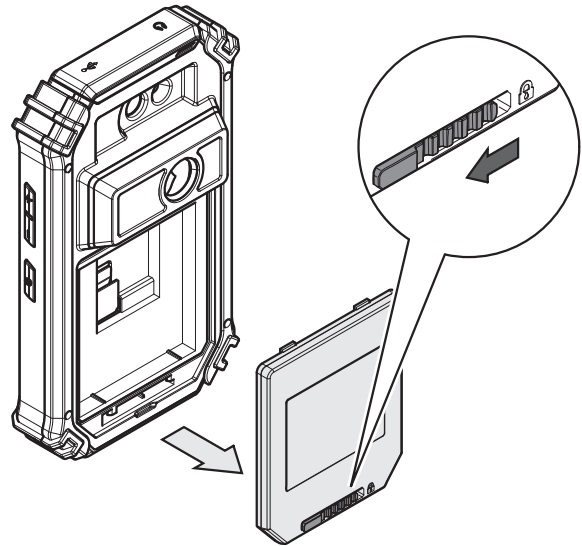
## Operation

### Inserting the battery

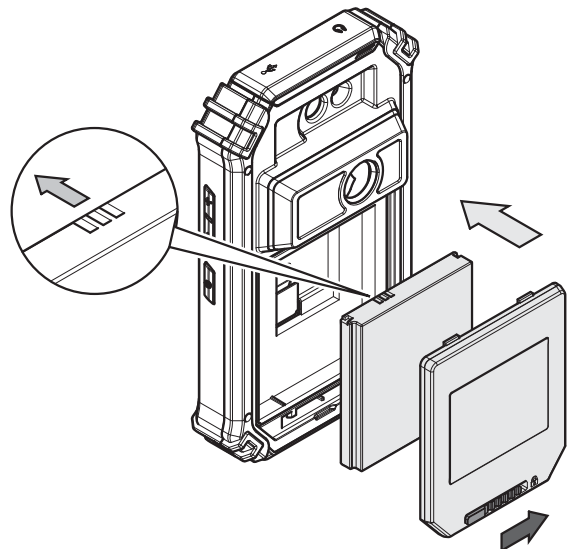


#### Caution!

Make certain that the surface of the device is dry and the device is switched off.



1. Slide the locking bar of the battery compartment to the left.
  - The battery compartment's lock is released.
2. Remove the cover (5) from the battery compartment.



3. Insert the battery into the compartment as indicated in the above figure.
4. Reattach the cover (5) to the battery compartment.
5. Slide the locking bar to the right.
  - The battery compartment is closed and locked.

### Switching the device on

- Press the Power button (9) for approx. 3 seconds.
  - The display switches on.
  - The operating system boots up.
  - The device is ready for operation.

### Setting the language

The app's language is controlled via the system settings of the Android operating system.

1. Call up the system settings.  
The system settings app has the following icon:



2. Find the menu item *Language & input*.
3. Set the desired language.
4. Press the Back button (23) to leave the system settings.

### Setting the time and date

Time and date of the app are controlled via the system settings of the Android operating system.

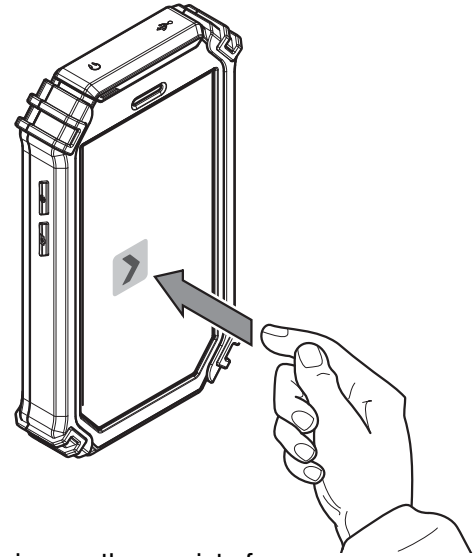
1. Call up the system settings.  
The system settings app has the following icon:



2. Find the menu item *Date & time*.
3. Adjust the time and date as desired.
4. Press the Back button (23) to leave the system settings.

### Start the AC080V app

In order to use the IR camera first start the AC080V app via the Android user interface.



- Touch the icon on the user interface.
  - The app starts.
  - The IR camera will be activated.
  - The thermal image will be displayed in real time.

Further information regarding the operation of the app can be found in chapter AC080V app.



## Calibrating the IR camera

1. Press the Shutter button (13).
  - The internal shutter of the IR camera closes briefly and an automatic adjustment (calibration) to the temperatures in the image section is performed.

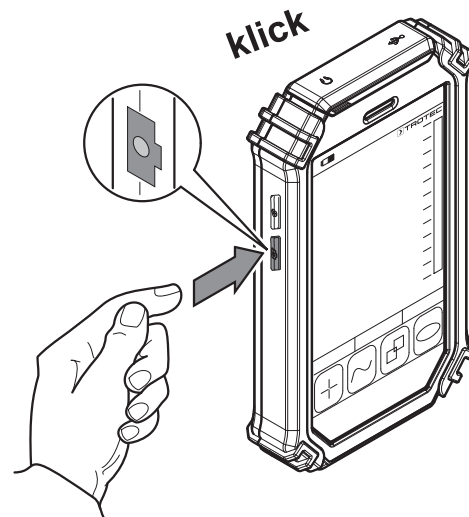
You can also calibrate the IR camera via the *AC080V* app. To do so, please proceed as follows:

1. Start the *AC080V* app.
2. Press the Calibration button (25).
  - The internal shutter of the IR camera closes briefly and an automatic adjustment (calibration) to the temperatures in the image section is performed.



## Taking/recording an infrared image/video

1. Start the *AC080V* app.
2. Change over to the *Image* or *Analysis* mode.
3. Point the camera at the object which you want to have a thermal image of.
4. Calibrate the IR camera (see Calibrating the IR camera).
5. Either press the Photo button (12) or the camera icon on the display ((*Image* mode)).



## Data transfer via USB

1. Connect the supplied micro USB data cable to the device.
2. Connect the data cable to a PC or notebook.
  - If the camera is not recognized by the computer, select the function *use as data store* when prompted:
    - To do so, open the Android USB settings by swiping the screen from the top edge to the bottom.
    - After successful detection the camera is displayed in the file browser of your PC/notebook as removable storage device; from there files can be transferred.

## Switching the device off

1. Press the Power button (9) for approx. 3 seconds.
2. Confirm the switch-off by pressing the button *Power Off*.
  - The device switches off.

**AC080V app**

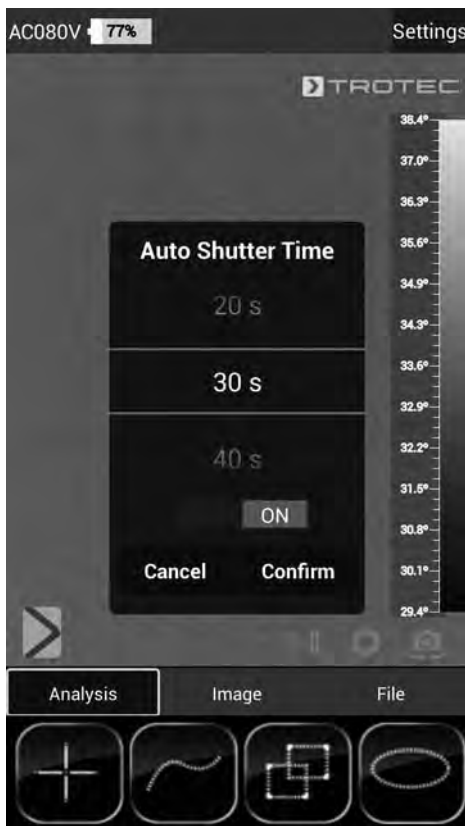
**Basic settings**

In this menu you can set the automatic calibration and view information regarding the device.

**Setting the automatic calibration**

You can specify the time after which the camera carries out an automatic adjustment.

1. Press the *Settings* button (14).  
– The menu will be displayed.
2. Touch the selection *Auto Shutter Time*.  
– The submenu for setting the time for an automatic calibration will be displayed.



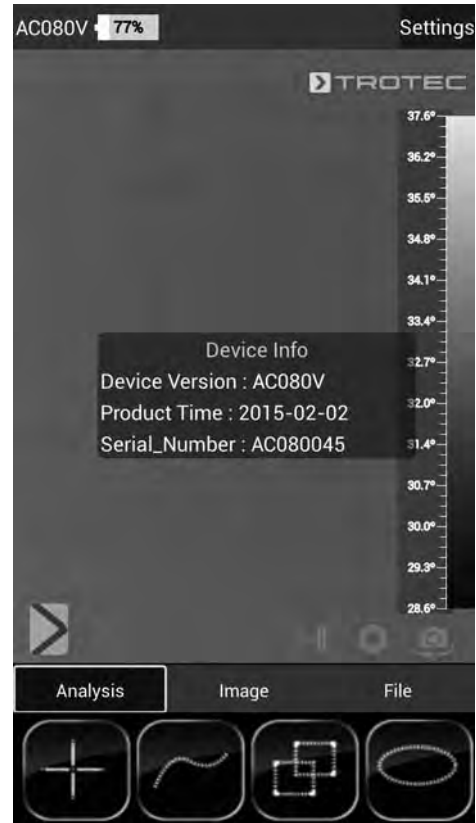
3. Select the desired time or disable automatic calibration.
4. Press *Confirm* to confirm and save the selection.  
If you do not want to save the change, press *Cancel*.
5. Press the Back button (23) to leave the menu.

**Note:**

If the automatic adjustment function of the camera is deactivated, it needs to be calibrated manually at regular intervals during operation, particularly before taking a picture, as owing to its operating principle the IR detector drifts and the camera could consequently display incorrect temperature values!

**Displaying device information**

1. Press the *Settings* button (14).  
– The menu will be displayed.
2. Select *Device Info*.  
– The device information will be displayed.



3. Press the Back button (23) to leave the device information.

## Advanced settings

1. Press the Parameter button (19).
  - The parameter menu bar will be displayed.



2. Press the desired button to access the corresponding menu:

| No. | Function                                  |
|-----|---|
| 30  | Calls up the <i>Parameter</i> menu.       |
| 31  | Calls up the <i>Colour settings</i> menu. |
| 32  | Calls up the <i>Photo settings</i> menu.  |

3. Press the Back button (23) to close the menu bar.

## Parameter menu

In this menu you can adjust general parameters such as the ambient temperature or the degree of emission.

1. Touch the parameter you want to edit.
  - A submenu with setting options for the selected parameter will be displayed. Displayed in our example is the submenu for the ambient temperature.



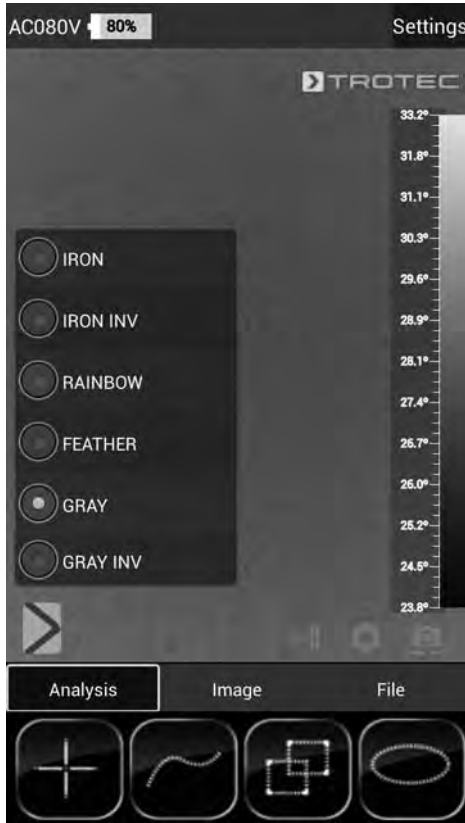
| Designation              | Meaning  |
|--------------------------|--|
| <i>Ambi. Temperature</i> | Setting the ambient temperature  |
| <i>Humidity</i>          | Setting the humidity level   |
| <i>Emissivity</i>        | Setting the degree of emission   |
| <i>Distance</i>          | Setting the distance to the measuring object   |
| <i>Refl. Temperature</i> | Setting the average value of the reflected temperatures from heat sources located in the background, which could influence the object to be thermographed. |
| <i>Unit Settings</i>     | Setting used units (metric, imperial)  |
| <i>Temperature Level</i> | Setting the measuring range  |

2. Select the desired value for the parameter.
3. Press *Confirm* to confirm and save the selection. If you do not want to save the change, press *Cancel*.
4. Press the Back button (23) to leave the menu or briefly touch a free area on the touch screen.

**Colour settings submenu**

In this submenu you can select the colour palette for the representation of the temperatures in the thermal image.

1. Press the button with the desired setting. The colour palette will be applied immediately and is visible in the background.

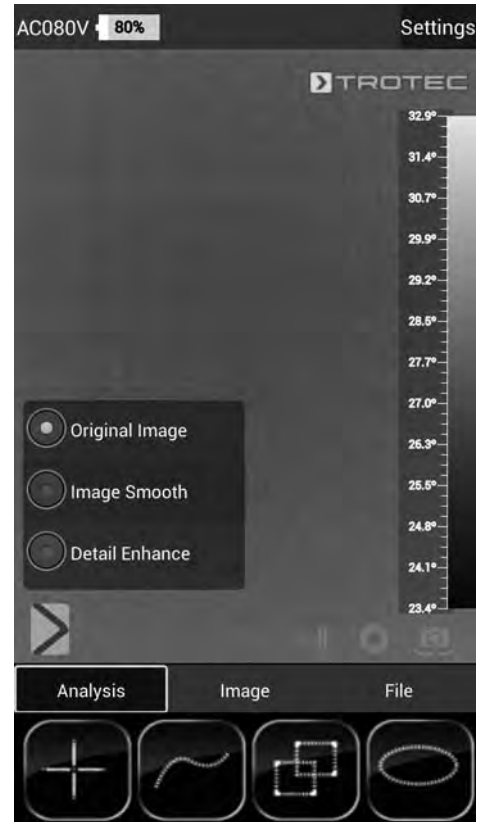


2. Press the Back button (23) to leave the submenu or briefly touch a free area on the touch screen.
  - The settings will be saved.

**Photo settings submenu**

In this submenu you can adjust the thermal image display.

1. Press the button with the desired setting. Selected in this example is the setting *Original Image*.



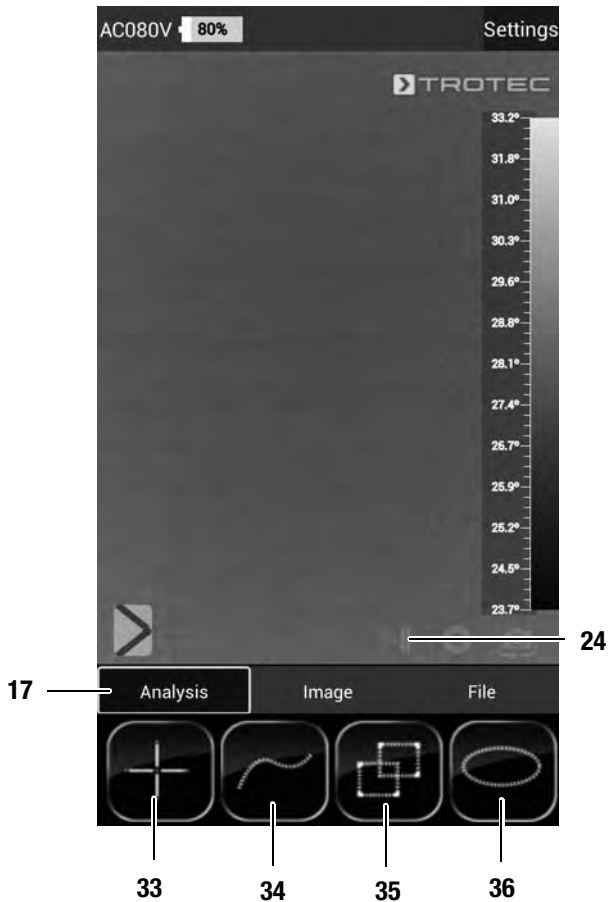
| Designation           | Meaning                                     |
|-----------------------|---|
| <i>Original Image</i> | Image is depicted normally.                 |
| <i>Image Smooth</i>   | Image is blurred.                           |
| <i>Detail Enhance</i> | Image is depicted with a higher resolution. |

2. Press the Back button (23) to leave the submenu or briefly touch a free area on the touch screen.
  - The settings will be saved.

## Analysis mode

In the analysis mode points, lines or areas can be marked on the display to be analysed in real time.

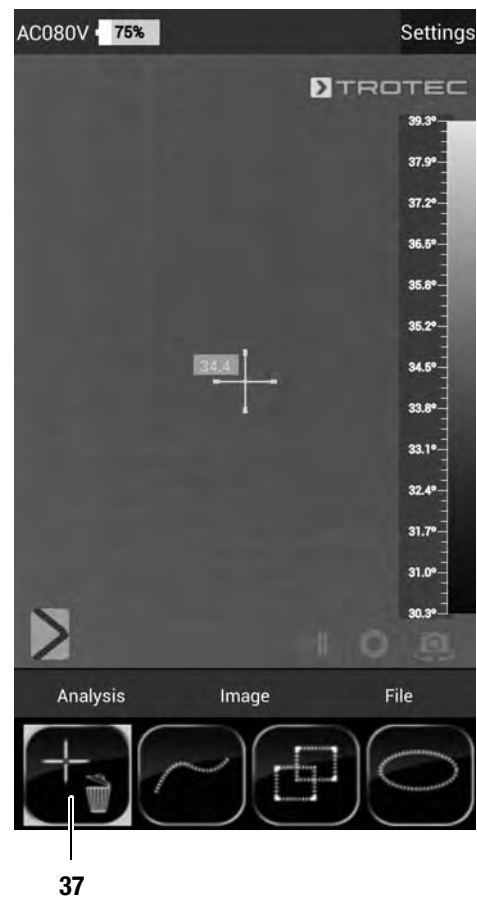
- Enable analysis mode by pressing the *Analysis* button in the Mode menu bar (17).



- You can press the Still image button (24) to freeze an image for analysis.

## Point analysis

1. Press the button for points (33).
  - Crosshairs appear on the display beside which the current temperature of the point is indicated.
2. Touch the specific display location to select the point to be analysed.
  - The button for points (33) will be enabled.
  - The button is now displayed as crosshairs with a recycle bin (37).
  - In order to delete the point, drag it to the corresponding button with the recycle bin (37).



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3. Touch a selected measuring spot for approx. one second; then a submenu opens in which the selected measuring spot can be individually configured as follows:
  - Alarm: visual and acoustic alarm signal when falling below (Below), exceeding (Above) or hitting (Equal) a set alarm temperature precisely.
  - Max: locates the hottest point in the image section
  - Min: locates the coldest point in the image section

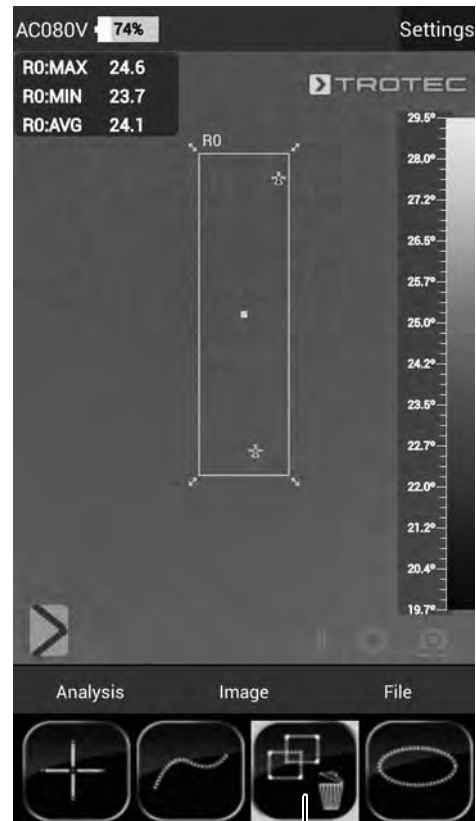


4. Press *Confirm* to confirm and save the selection. If you do not want to save the change, press *Cancel*.

**Area analysis**

On the screen you can draw up to two rectangular or circular areas respectively to carry out a separate area analysis within the thermogram.

1. Press the button for rectangles (35) or circles (36).
2. Touch the starting point on the display and then stretch the rectangle or circle to be analysed.
  - The rectangle or circle appears on the screen. Displayed in the top left corner of the screen is a panel indicating the maximum, minimum and average measured values within the area (*R* stands for rectangle, *C* for circle).
  - To adjust the size or direction of the respective area, touch one of the corners or the line and drag it to the desired shape/size.
  - To relocate an area in its entirety on the screen, touch its centre and drag it to the desired position.
  - The button for rectangles or circles will be enabled.
  - The button is now displayed with a recycle bin (example: rectangle (38)).
  - In order to delete the point, drag it to the corresponding button with the recycle bin.



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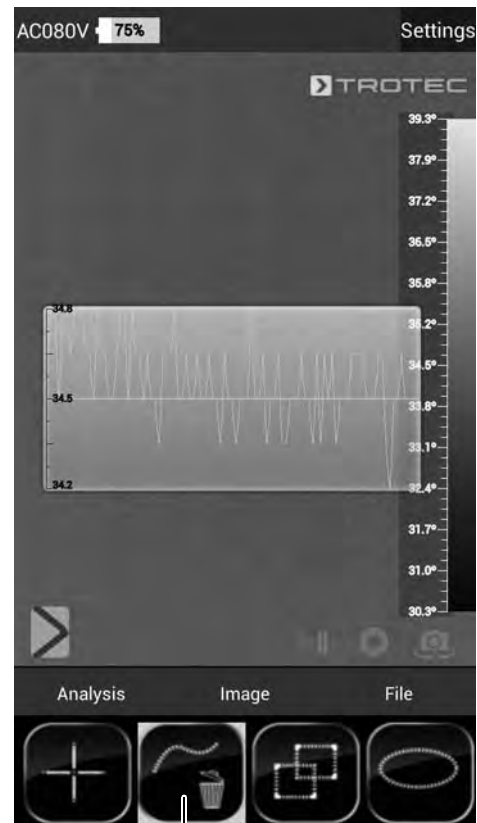
3. Touch the centre of a selected rectangular or circular area for approx. one second; then a submenu opens in which the maximum, minimum or average value can be (de-)activated.



4. Press *Confirm* to confirm and save the selection. If you do not want to save the change, press *Cancel*.

### Line analysis

1. Press the button for lines (34).
  - The line appears on the display. Above and below the line the temperature profile is displayed in form of a chart in the below thermogram area.
  - To relocate the line analysis, touch the analysis field and drag it to the desired thermogram area.
  - The button for lines (34) will be enabled.
  - The button is now displayed with a recycle bin (39).
  - In order to delete the line, drag it to the corresponding button with the recycle bin.

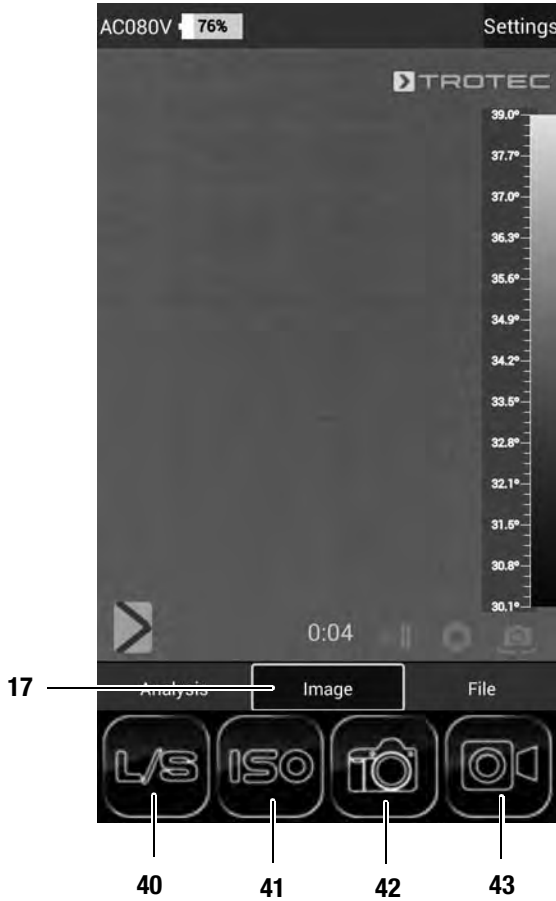


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**Image mode**

Via the image mode you can take pictures or record videos and make further settings regarding the images generated by the IR camera.

- Enable image mode by pressing the *Image* button in the Mode menu bar (17).



**Taking a picture**

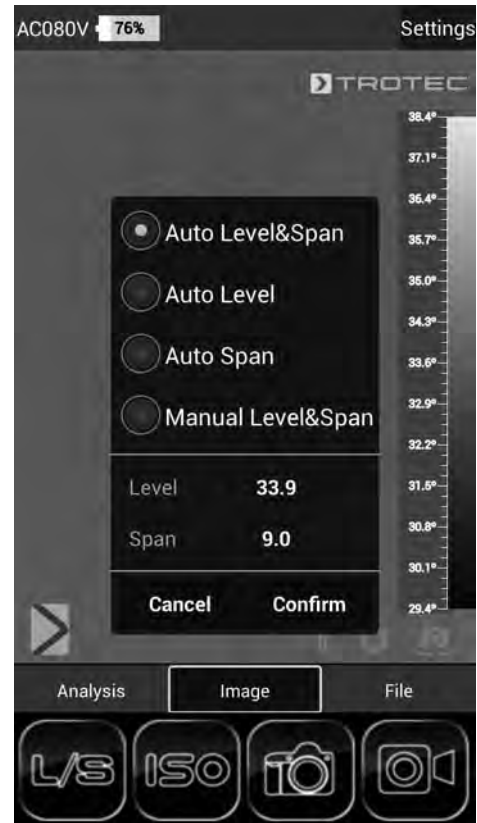
1. Press the *Camera* button (42).
  - The picture is taken and saved.

**Recording a video**

1. Press the *Video* button (43).
  - The recording starts.
  - The duration of the recording is displayed above the Mode menu bar.
2. Press the Video button (43) again (now displayed as pause symbol) to stop recording.
  - The video will be saved.

**Setting brightness and contrast**

1. Press the *L/S* button (40).
    - The brightness and contrast menu (*LEVEL & SPAN*) will be displayed.
    - Contrast (*SPAN*):  
set temperature range  
(e.g. from 5 °C to 30 °C => *SPAN* = 25 °C)
    - Brightness (*LEVEL*):  
average temperature referring to the set temperature range  
(in accordance with the above example = 17.5 °C)
- By reducing and shifting the span even the slightest of temperature differences can be visualized in practice, for instance for the localization of subsurface hot water pipes, specific structural-physical problems or industrial applications.



| Designation                  | Meaning   |
|------------------------------|---|
| <i>Auto Level&amp;Span</i>   | Brightness and contrast are automatically adjusted.                             |
| <i>Auto Level</i>            | The brightness is automatically adjusted. The contrast can be entered manually. |
| <i>Auto Span</i>             | The contrast is automatically adjusted. The brightness can be entered manually. |
| <i>Manual Level&amp;Span</i> | Brightness and contrast are adjusted manually.                                  |



2. Select the desired settings for brightness and contrast and enter the values by hand, if required.  
In addition to the manual input of direct numerical values, both brightness (*LEVEL*) and contrast (*SPAM*) can also be adjusted fluently by swiping the screen.
  - Contrast (*SPAM*):
    - Swiping down reduces the span and increases the contrast.
    - Swiping up increases the span and reduces the contrast.
  - Brightness (*LEVEL*):
    - Swiping right increases the average temperature. The image turns darker.
    - Swiping left decreases the average temperature. The image turns brighter.
3. Press *Confirm* to confirm and save the selection.  
If you do not want to save the change, press *Cancel*.

### Setting ISO mode

Isotherms are colours of the same temperature. In this mode the thermal imaging camera highlights all areas within a certain previously specified temperature range (isotherm window) by means of a selected, particularly noticeable colour. This can e.g. be drops below dew point at building surfaces or thermally critical areas in control cabinets etc.

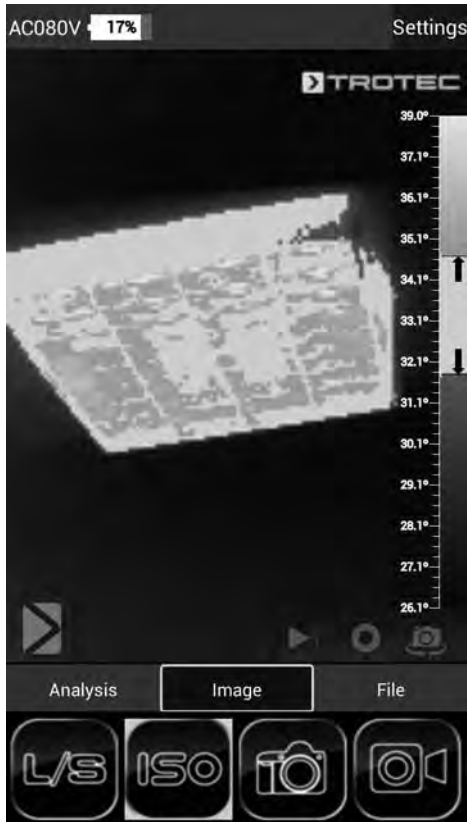
1. Press the *ISO* button (41).
  - The ISO mode menu will be displayed.



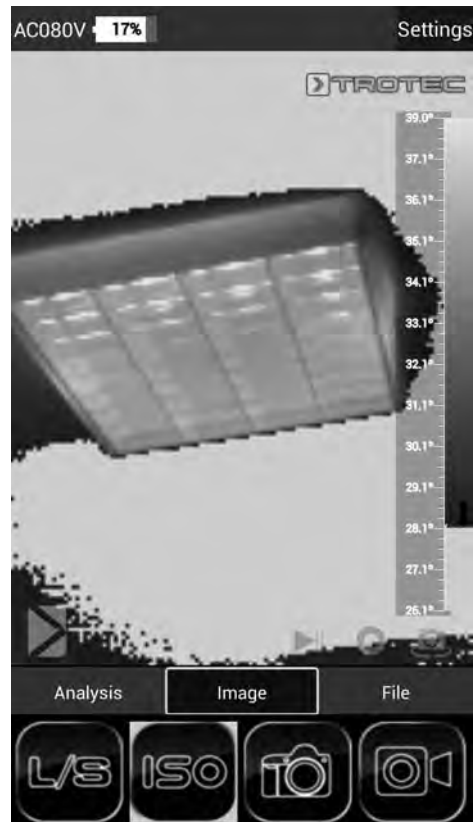
| Designation              | Meaning  |
|--------------------------|--|
| <i>ISO Mode: Between</i> | The isotherm window is situated in between the minimum and the maximum temperature of the currently displayed temperature scale of the camera. It can be varied freely by dragging the upper and lower limits (arrow). |
| <i>ISO Mode: Above</i>   | The isotherm window starts at the upper end of the temperature scale and can only be varied by dragging the lower limit.   |
| <i>ISO Mode: Below</i>   | The isotherm window starts at the bottom end of the temperature scale and can only be varied by dragging the upper limit.  |
| <i>ISO Color Picker</i>  | Select an isotherm colour from the ring. Touch the centre of the ring to confirm the selection.  |

2. Select the desired settings.
3. Press *Confirm* to confirm and save the selection.  
If you do not want to save the change, press *Cancel*.

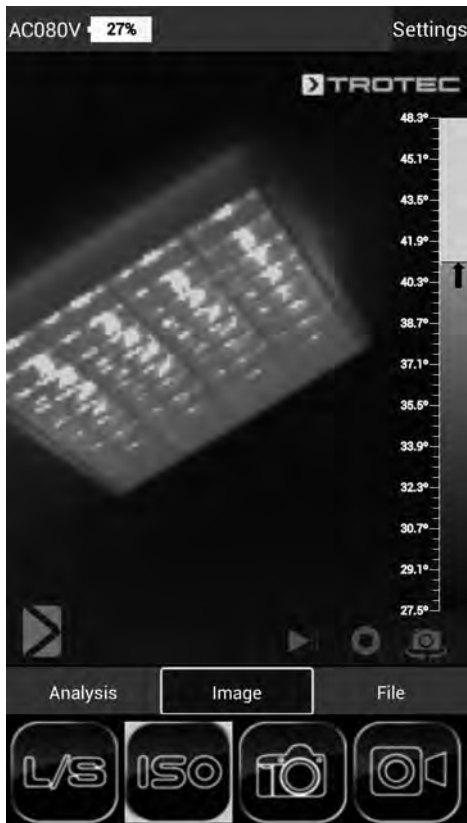
**Example ISO Mode: Between**



**Example ISO Mode: Below**



**Example ISO Mode: Above**



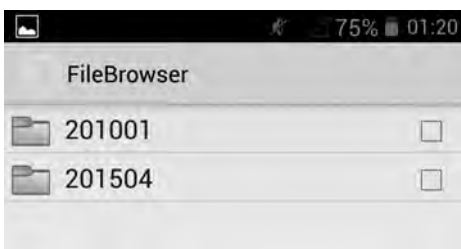
## File mode

In file mode you can view already taken/recorded pictures or videos.

1. Enable file mode by pressing the *File* button in the Mode menu bar (17).



– The file browser opens.



2. Select a folder.
  - The images and/or videos in the folder are displayed in a list.
3. Select a file.
  - The file will be displayed on the screen.

## Degree of emission

The degree of emission is used to describe the energy radiation characteristics of a material.

A material's degree of emission depends on various factors:

- composition,
- surface condition,
- temperature.

The degree of emission can be between 0.1 and 1 (, in theory).

The following rule of thumb can be assumed:

- When a material is rather dark and its surface texture matt, it probably has a high degree of emission.
- The brighter and smoother the surface of a material, the lower will be its degree of emission, presumably.
- The higher the degree of emission of the surface to be measured, the better it is suited for non-contact temperature measurement by use of a pyrometer or thermal imaging camera, since falsifying temperature reflections can be neglected.

Entering a degree of emission as accurate as possible is indispensable for a precise measurement.

Most organic materials have a degree of emission of 0.95. Metals or shiny materials come with a much lower value.

## Degree of emission table

| Material                         | Degree of emission |
|----------------------------------|--------------------|
| Aluminium, roughened             | 0.1 to 0.3         |
| Aluminium, alloy A3003, oxidized | 0.3                |
| Aluminium, oxidized              | 0.2 to 0.4         |
| Asbestos                         | 0.92 to 0.95       |
| Tarmac                           | 0.92 to 0.95       |
| Basalt                           | 0.7                |
| Concrete                         | 0.92 to 0.95       |
| Bitumen                          | 0.98 to 1.00       |
| Lead, oxidized                   | 0.2 to 0.6         |
| Lead, rough                      | 0.4                |
| Roofing felt                     | 0.95               |
| Ice                              | 0.98               |
| Iron (forged), blunt             | 0.9                |
| Iron, oxidized                   | 0.5 to 0.9         |
| Iron, rusted                     | 0.5 to 0.7         |
| Enamel varnish, black            | 0.95               |
| Earth                            | 0.92 to 0.96       |
| Paint (not alkaline)             | 0.90 to 0.95       |
| Paint (non-metal)                | 0.95               |
| Gypsum                           | 0.6 to 0.95        |
| Glass, pane                      | 0.85 to 0.95       |
| Rubber                           | 0.92 to 0.95       |
| Cast iron, molten                | 0.2 to 0.3         |
| Cast iron, not oxidized          | 0.2                |
| Skin                             | 0.98               |
| Haynes alloy                     | 0.3 to 0.8         |
| Radiator enamel                  | 0.95               |
| Timber (natural)                 | 0.9 to 0.95        |
| Inconel, electro-polished        | 0.15               |
| Inconel, oxidized                | 0.7 to 0.95        |

| Material                    | Degree of emission |
|-----------------------------|--------------------|
| Inconel, sand-blasted       | 0.3 to 0.6         |
| Limestone                   | 0.95 to 0.98       |
| Carborundum                 | 0.9                |
| Ceramics                    | 0.88 to 0.95       |
| Gravel                      | 0.95               |
| Carbon, graphite            | 0.7 to 0.85        |
| Carbon, not oxidized        | 0.8 to 0.9         |
| Plastic, non-transparent    | 0.95               |
| Copper, oxidized            | 0.4 to 0.8         |
| Varnish                     | 0.80 to 0.95       |
| Marble                      | 0.90 to 0.95       |
| Brass, highly polished      | 0.3                |
| Brass, oxidized             | 0.5                |
| Molybdenum, oxidized        | 0.2 to 0.6         |
| Nickel, oxidized            | 0.2 to 0.5         |
| Paper (any colour)          | 0.9                |
| Plastic                     | 0.85 to 0.95       |
| Plaster                     | 0.90 to 0.95       |
| Sand                        | 0.9                |
| Snow                        | 0.9                |
| Steel, heavy plate          | 0.4 to 0.6         |
| Steel, cold-rolled          | 0.7 to 0.9         |
| Steel, oxidized             | 0.7 to 0.9         |
| Steel, polished sheet metal | 0.1                |
| Steel, stainless            | 0.1 to 0.8         |
| Cloth                       | 0.95               |
| Wallpaper (non-metal)       | 0.95               |
| Textiles (non-metal)        | 0.95               |
| Titanium, oxidized          | 0.5 to 0.6         |
| Clay                        | 0.90 to 0.95       |
| Water                       | 0.93               |
| Cement                      | 0.90 to 0.96       |
| Brick (rough)               | 0.90 to 0.95       |
| Zinc, oxidized              | 0.1                |

## Errors and faults

| Error                                       | Cause                                  | Remedy  |
|---|--|---|
| Abortion of the AC080V app                  | Software crashed.                      | Start the software again.   |
| Lens aperture is stuck during calibration   | Shutter mechanism dirty or defective.  | <ul style="list-style-type: none"> <li>Restart the calibration.</li> <li>Try to carefully clean the aperture by blowing small dirt particles away.</li> <li>Send the device in for inspection.</li> </ul> |
| Camera does not take/record pictures/videos | Internal memory full.                  | Delete files no longer needed to free up storage space.   |
| Battery quickly discharged                  | Battery too old or damaged.            | Use a new battery.  |
| Battery not charging                        | Charging cable not inserted correctly. | Check the connection for proper fit.  |
|   | Battery too old or damaged.            | Use a new battery.  |
|   | Contacts dirty.                        | Use a dry, clean cloth to clean the contacts.   |

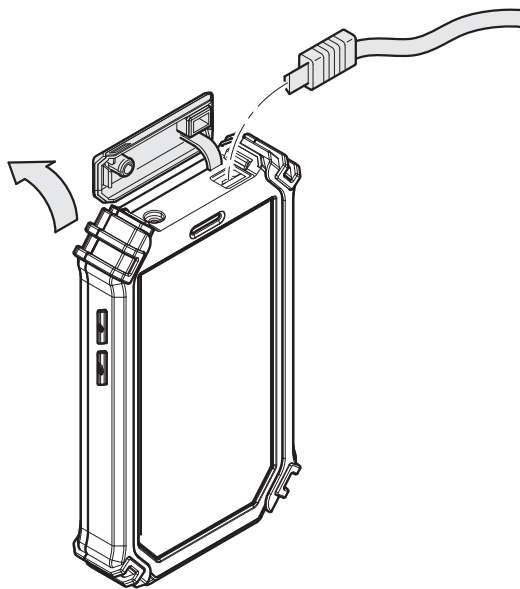
## Maintenance and repair

### Charging the battery

Charge the battery when the charging status indicator (20) falls below 10 %, when the device prompts you to or can no longer be switched on.

Ideally the battery is always charged by use of the charger included in the scope of delivery. Only use the supplied charger to do so! If the camera needs to be used while charging, please proceed as follows:

1. Plug the charger into a sufficiently fused power socket. Only use the original charger or one with identical specifications, for otherwise both battery and camera could be damaged!
2. Open the protective cover for the micro USB connection (1) at the device.
3. Connect the charger to the micro USB connection.



4. Disconnect the charging cable again, once the charging status indicates 100 %.

### Battery change

To change the battery, proceed as described under *Inserting the battery*. Remove the old battery before inserting a new one.

### Cleaning

Clean the device with a soft, damp and lint-free cloth. Ensure that no moisture enters the housing. Do not use any sprays, solvents, alcohol-based cleaning agents or abrasive cleaners, but only clean water to moisten the cloth.

### Repair

Do not modify the device or install any spare parts. For repairs or device testing, contact the manufacturer.

## Disposal



In the European Union, electronic equipment must not be treated as domestic waste, but must be disposed of professionally in accordance with Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE). At the end of its life, please dispose of this instrument in a manner appropriate to the relevant legal requirements.

In the European Union, rechargeable batteries must not be treated as domestic waste, but must be disposed of professionally in accordance with Directive 2006/66/EC of the European Parliament and Council of 6th September 2006 concerning batteries and accumulators. Please dispose of batteries in a manner appropriate to the relevant legal requirements.

## Declaration of conformity

in accordance with the EC Low Voltage Directive 2006/95/EC and the EC Directive 2004/108/EC about electromagnetic compatibility.

Herewith, we declare that the thermal camera AC080V was developed, constructed and produced in compliance with the named EC directives.

The  $\text{C} \in$  marking is found on the rear of the device.

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Heinsberg, 09/07/2015



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