I.R. thermography camera

C.A 1886
C.A 1888

ENGLISH

User's manual

CHAUVIN® ARNOUX
CHAUVIN ARNOUX GROUP

English

Thank you for buying a RayCAm **I.R. thermography camera**.
For best results from your device:

- **read this** user manual attentively,
- **observe** the precautions for its use

MEANING OF THE SYMBOLS USED

	Selective sorting of wastes for the recycling of electrical and electronic equipment within the European Union. In conformity with directive DEEE 2002/96/EC: this equipment must not be treated as household waste.
	Risk of danger. See explanations in this user manual Problems that may affect the operation of the I.R. camera.
	Notes completing the essential operating procedures.
	Laser radiation, do not look directly into the LASER beam.
	This marking certifies compliance with the European "Low Voltage" and "Electromagnetic Compatibility" directives (2006/95/CE and 2004/108/CE).

Characteristics of the laser: Class 2, < 1 mW, wavelength 635nm

WARNING
LASER RADIATION
DO NOT LOOK DIRECTLY INTO THE BEAM
CLASS 2 LASER DEVICE

CONTENTS

1. PRECAUTIONS OF USE

Before using the camera, make sure that you have read and understood the safety precautions described below. Make sure that the camera is used correctly.

Please refer to this manual each time you encounter a hazard symbol. To avoid exposure to laser radiation, injury, or damage to the device, and be sure that you use the camera in a risk-free way, observe the safety recommendations given below:

 Do not look directly into the laser beam. Do not point the laser beam at people.

 Do not use the instrument other than for its intended purpose; keep it out of reach of children and make sure that it is never treated as a toy.

 Do not aim the device towards the sun or other source of intense heat.

 Use only the recommended batteries and accessories. Do not leave the device connected to mains when not necessary.

 Avoid problems due to condensation.

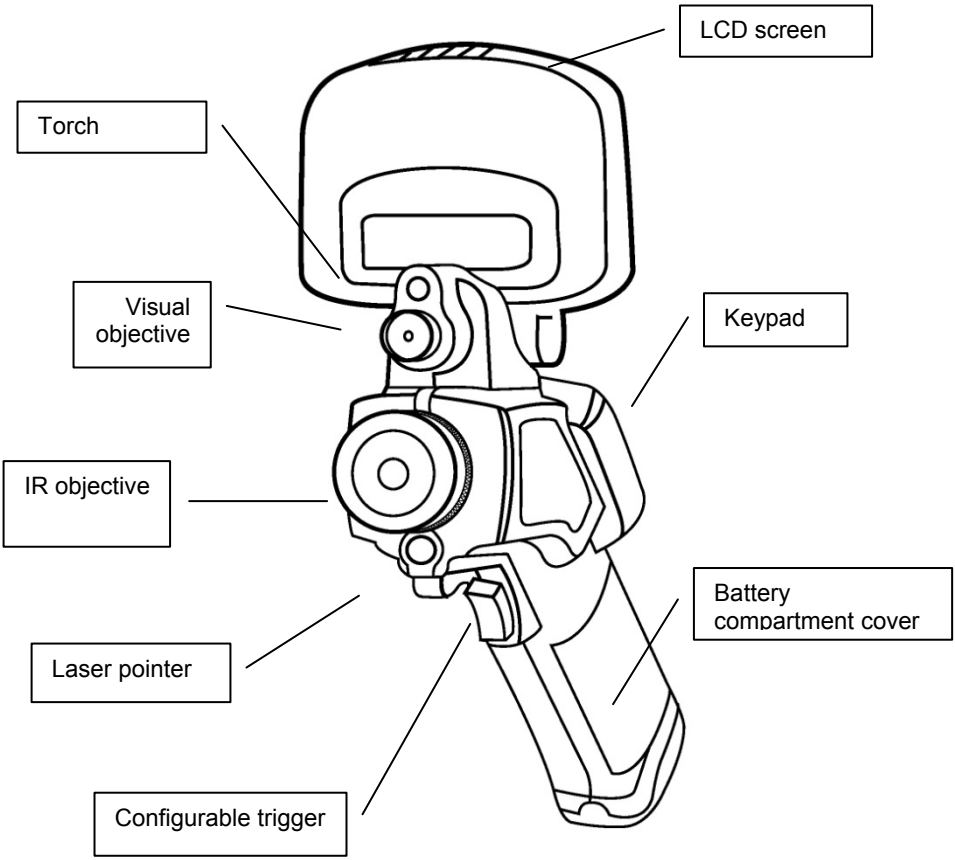
Moving the I.R. camera rapidly from a cold to a warm place can cause condensation (droplets of water) to form on its outside and inside surfaces.

You can avoid this problem by placing the camera in the plastic case and letting it warm slowly to the ambient temperature before withdrawing it from the case.

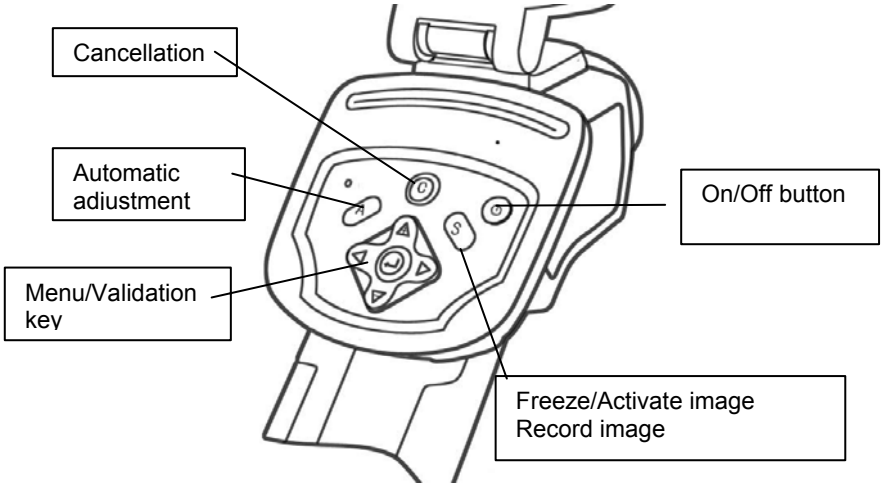
- When you switch on the camera, wait 10 to 15 minutes before recording your first thermograms, to be certain that the camera's temperature has stabilized and that your measurements are correct.
- Focus the objective correctly according to the distance to the target to be inspected.
- Device that may, but only under special conditions, be sensitive to electrostatic discharges (ESD).

2. DESCRIPTION

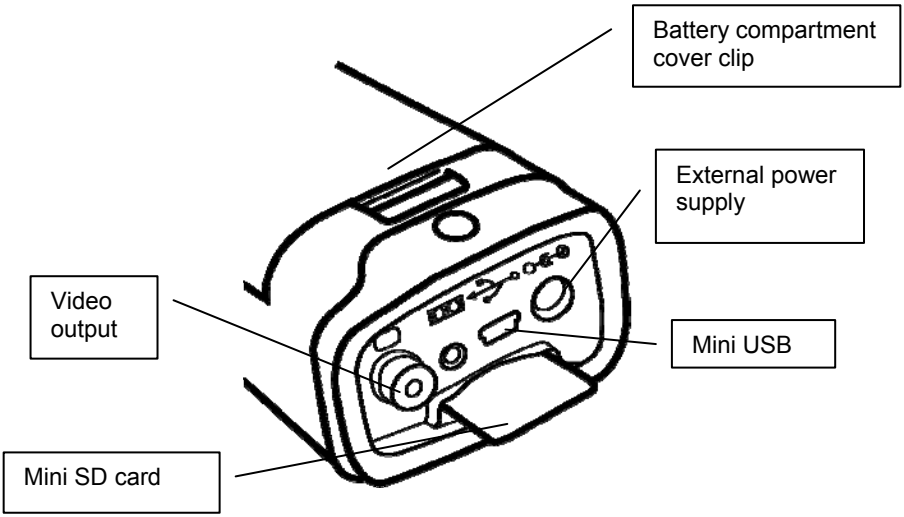
2.1 FRONT PANEL



2.2 KEYPAD



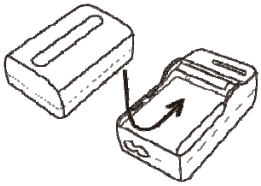
2.3 VIEW OF BACK AND BOTTOM



3. STARTING UP

3.1 CHARGING THE BATTERY

1. **Align the edge of the charger on the line marked on the battery and push the battery in until it locks.**



2. **Connect the power cord to the charger and plug into a power outlet.**

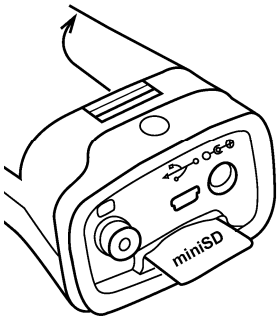
- The charging indicator lights red during recharging and green when charging is over.
- After recharging, disconnect the charger and withdraw the battery

- It is a lithium ion battery. It does not have to be fully discharged before recharging (no memory effect). The number of complete charging/discharging cycles is approximately 500; beyond this number, the battery loses its capacity and has to be recharged more often.
- The charging time varies with the ambient temperature and the initial charge condition.

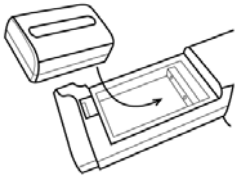
3.2 INSTALLING THE BATTERY

- The battery must be fully charged before it is used for the first time (the battery reaches its full capacity only after 5 complete charging/discharging cycles).

1. Switch off the camera. Push the clip of the battery compartment cover toward the front, then lift the cover.



2. Install the battery in its compartment, then push it in until it locks.



3. Close the battery compartment cover.

Withdraw the battery when you expect to leave the camera unused for an extended period (in order to avoid discharging too deeply): even when the camera is off, there is some consumption (C.A 1886: 8 mA; C.A 1888: 6,6 mA).

The Mini SD card must be formatted to FAT16 or FAT32, since otherwise the camera may fail to recognize it.

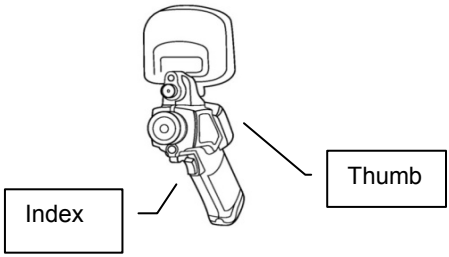
Symbols representing the battery charge condition

	Battery adequately charged
	Battery low
	Battery needs to be replaced or recharged

3.3 SWITCHING ON AND OFF

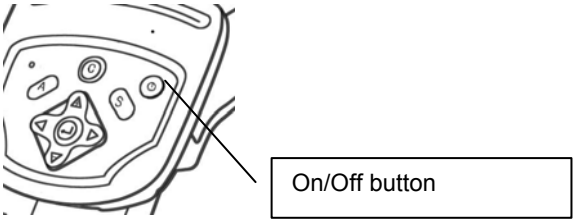
The power check light remains on for as long as the camera is on.

4. **Place your thumb above the keypad and your index finger in front of the configurable trigger.**



5. **Press the On/Off button and hold it down for three seconds.**

The power check light lights green.



6. **After a few seconds, the start-up screen is displayed.**
7. **Power down**

Press the On/Off button for three seconds.
The power supply indicator goes off.

3.4 CHECKING THE INFORMATION ON THE LCD SCREEN

The LCD screen provides a field of view corresponding to 100% of the actual shot

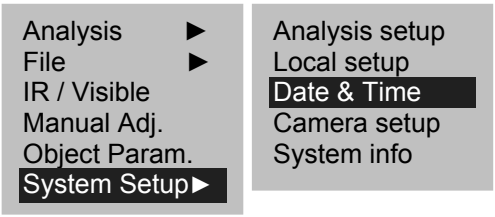
- About the status of the camera

Status of the camera	Menu	The device is in Menu mode
	Null	The device is not in Menu mode and no analysis tool has been selected.
	1 … 3	The analysis tool selected is cursor 1, 2, or 3.
	Cap	The analysis tool selected is the auto Max/Min detection cursor.
	Isot.	The analysis tool selected is isothermal analysis
	PRO.	The analysis tool selected is the profile of temperature
	AR1…5	The analysis tool selected is area 1 or area 2… or area 5.
	E	Emissivity in progress.
		A Mini SD card has been inserted
		The Bluetooth headset has been installed

3.5 SETTING THE DATE AND TIME

You must set the date and time when you switch the camera on for the first time.

1. **Check that the camera is in Null mode.**
2. **Press the MENU key and select the [System Setup] menu.**



3. **Select the [Date & Time] sub-menu.**
4. **Set the date and time**

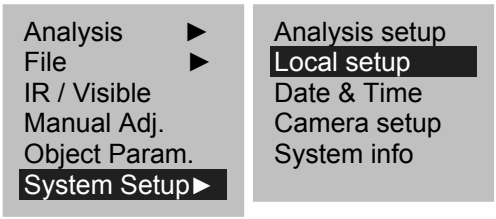
   - Press the UP or DOWN arrow to select the field to be modified.
   - Press the LEFT or RIGHT arrow to define the values.

5. **After completing the parameterizing, press the MENU/VALIDATION key to close the window and save the modifications, or the C key to exit without saving.**

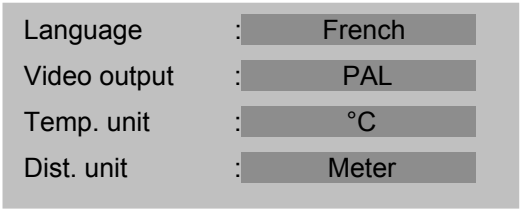
3.6 LOCAL SETTINGS

This menu is used to display the local parameters of your geographical zone.

1. **Check that the camera is in Null mode.**
2. **Press the MENU/VALIDATION key, then the UP or DOWN arrow to select the [System Setup] menu.**



3. **Press the UP or DOWN arrow to select [Local setup], then press the MENU/VALIDATION key.**



4. **Local parameters**
   - Press the UP or DOWN arrow to select the field to be modified.
   - Press the LEFT or RIGHT arrow to define the values.
5. **After completing the settings, press the Menu/Validation key to close the window and save the modifications, or the C key to exit without saving.**

- About the local settings

Language	Selects the language of the menus and messages.
Temp unit	Selects the temperature format of the camera: °C or °F.
Distance unit	Selects the unit of distance of the camera: Metres or Feet.
Video output	Selects the video output format of the camera: PAL or NTSC.

4. BASIC FUNCTIONS

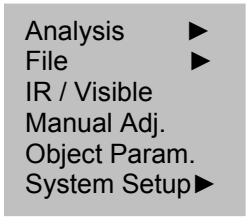
4.1 USING THE LCD SCREEN

1. **Open the LCD screen in the direction**
2. **Aim the I.R. camera at the target.**

- For a better temperature measurement, frame the subject in the centre of the LCD screen.
- The screen is switched to standby when you close it.

4.2 SELECTION OF MENUS AND PARAMETERS

1.  **Press the MENU/VALIDATION key to view the menus.**
2.  **Select the desired menu using the UP and DOWN arrows.**



3.  **Enter the menu by pressing the MENU/VALIDATION key.**
4.  **Modify the desired values/modes using the up, down, right, and left arrows.**
5.  **Validate the modifications using the MENU/VALIDATION key or exit without saving by pressing the C key.**

4.3 RESTORING THE DEFAULT SETTINGS

1. **Switch the I.R. camera off.**
2. **Press the On/Off and C buttons simultaneously.**
   Hold them down a few seconds.
   The camera reboots with the default parameters.

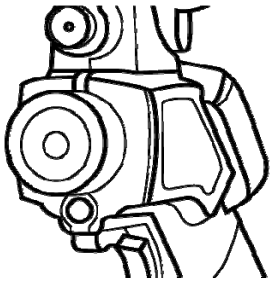
- The stored data are not deleted when you reset the camera.

5. TAKING SHOTS

5.1 ADJUSTING THE CAMERA

5.1.1 Manual focusing

1. **Check that the camera is in Null mode.**
2. **Aim the I.R. camera towards the target**
3. **Turn the focusing ring to focus on the target.**

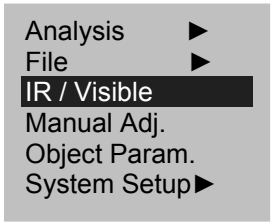


4. **Continue turning until the image is sharp**

5.1.2 I.R., Real, and Real + Mix Display.

This I.R. camera records visual images with its built-in digital device. This lets you record a real image and compare it to the thermal image.

1. **Press the "Menu/Validation" key to display the menu, then select "I.R./Visible".**



2. **Press the "left" or "right" arrow to select the percentage of infrared (possible only in "MixVision").**
   This percentage is the percentage of thermal image in the display (100% means pure I.R. image, 0% means real image only).

The various modes available:

I.R.
In this mode, only the I.R. image is displayed on screen.
All of the analysis tools are available in this mode.
6 sorts of palettes can be selected.

Vision
In this mode, only the visual image is displayed on screen.
The analysis tools are not all available in this mode.

MixVision
In this mode, the visual image appears in the background and the central window is the fusion zone. You can apply all of the analysis tools to this zone. You can also set the proportions of visual and thermal image using the "Percentage I.R." option.

5.2 PARALLAX ADJUSTMENT

Since the infrared and visual objectives are offset, the two images may be misaligned in the "MixVision" mode.

To align the two images:

1. **Make sure that you are in NULL mode**
2. **Hold the C key down and press; the left arrow to shift the image to the left; the right arrow to shift the image to the right; the up arrow to shift the image upward; the down arrow to shift the image downward.**

5.3 ADJUSTING THE IMAGE

You can set the brightness (Level) and contrast (Span) of the image captured by the I.R. camera manually or automatically.

5.3.1 Automatic adjustment

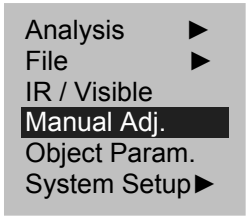
The I.R. camera adjusts the brightness and/or the contrast automatically when you press the A key.

5.3.2 Manual adjustment

You can adjust the image brightness and contrast in the menu or by pressing the arrows in NULL mode: press the UP or DOWN arrow to modify the contrast, the LEFT or RIGHT arrow to modify the brightness.

Manual adjustment in the menu:

1. **Press the MENU/VALIDATION key**
2. **Press the UP or DOWN arrow to select the [Manual Adj.] menu. Validate by pressing the MENU/VALIDATION key.**



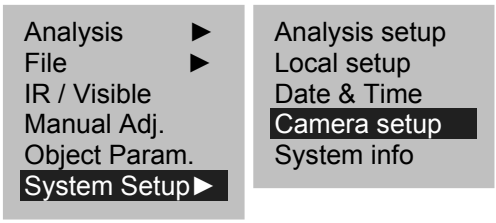
3. **Adjusting the brightness and contrast**
   - Press the LEFT or RIGHT arrow to select the field to be modified.
   - Press the UP or DOWN arrow to define the values.

4. **After this operation, press the MENU/VALIDATION key to save the modifications or the C key to close the menu window without saving.**

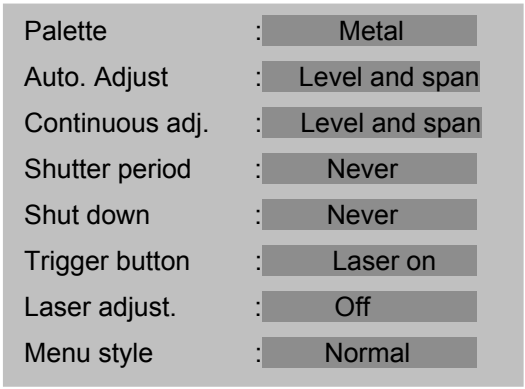
- To activate manual adjustment, make sure that continuous adjustment (Menu => Camera setup) is desactivated.

5.3.3 Adjusting the image

1. **Press the MENU/VALIDATION key.**
2. **Press the UP or DOWN arrow to select the [System Setup] menu, then press the MENU/VALIDATION key.**



3. **Press the UP or DOWN arrow to select [Camera setup], then press the MENU/VALIDATION key.**



4. **Define the adjustments of the image.**
   - Press the UP or DOWN arrow to select the field to be modified.
   - Press the LEFT or RIGHT arrow to define the values.
5. **After this operation, press the MENU/VALIDATION key to save the modifications or the C key to close the menu window without saving.**

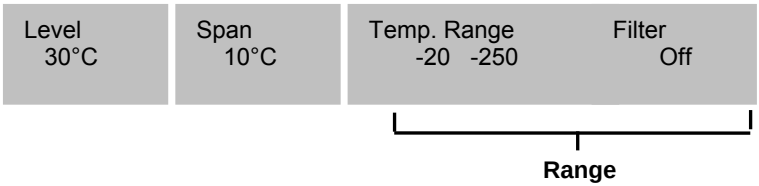
- About the adjustments of the image

<table>
<tr><td>Palette</td><td>Assigns the pseudo-colours of the thermal image. 6 palettes are provided: Metal, Reversed metal, Rainbow, Natural, Grey, and Reversed grey.</td></tr>
<tr><td>Auto Adjust.</td><td>Assigns the function of the A key. You may choose among three options: Level and contrast, level, or contrast.
<table>
<tr><td>Level and span</td><td>The device automatically adjusts the brightness and contrast of the image to their optimum levels.</td></tr>
<tr><td>Level</td><td>The device automatically adjusts the brightness of the image.</td></tr>
<tr><td>Span</td><td>The device automatically adjusts the contrast of the image.</td></tr>
</table></td></tr>
<tr><td>Continuous Adjust.</td><td>Determines whether the brightness and contrast of the image displayed on screen are adjusted automatically or not, continuously with no press.
<table>
<tr><td>Level and span</td><td>Automatic adjustment of the brightness and contrast.</td></tr>
<tr><td>Level</td><td>Automatic adjustment of the brightness.</td></tr>
<tr><td>None</td><td>No automatic adjustment of the brightness or contrast.</td></tr>
</table></td></tr>
<tr><td>Shutter period</td><td>Sets the period of auto-adjusting.</td></tr>
<tr><td>Shut Down</td><td>Set the period of shutting down the camera.</td></tr>
<tr><td>Trigger button</td><td>Set the control switch of the trigger button</td></tr>
<tr><td>Laser Adjust</td><td>Adjusts the Laser point in the LCD displayer.</td></tr>
<tr><td>Menu Style</td><td>Sets the menu style.</td></tr>
</table>

5.4 MEASUREMENT RANGE

You can switch from one temperature range to another, depending on the model of camera you have.

1. **Press the MENU/VALIDATION key.**
2. **Press the UP or DOWN arrow to select [Adjust Manual], then press the MENU/VALIDATION key.**
3. **Adjustment of measurement range.**
   - Press the LEFT or RIGHT arrow to select the range.
   - Press the UP or DOWN arrow to define the measurement range.
   - This option is not available when the image is frozen.



4. **When you have finished, press the MENU/VALIDATION key to close the menu window.**

5.5 FREEZE/ACTIVATE AN IMAGE

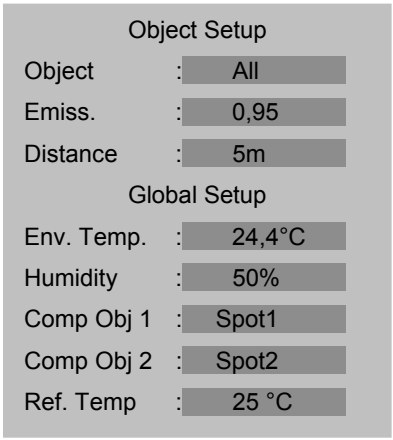
You can activate/freeze a thermal image by pressing the S key of the selector.

1. **Check that the camera is in NULL mode.**
2. **Press the S key to freeze the image.**
3. **Press the S key again to activate the image and return to continuous measurements.**

6. ANALYSIS FUNCTION

6.1 ADJUSTMENT OF THE ANALYSIS PARAMETERS

1. **Press the MENU/VALIDATION key.**
2. **Press the UP or DOWN arrow to select [Object Param.], then the MENU/VALIDATION key.**
3. **Press the UP or DOWN arrow to select the field to be modified.**
   Press the LEFT or RIGHT arrow to define the values.



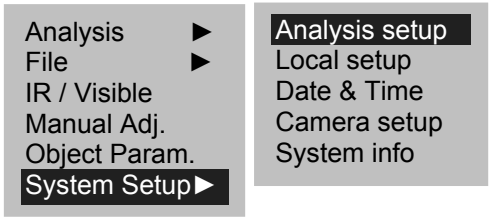
4. **When you have finished, press the MENU/VALIDATION key to save the modifications or the C key to close the menu window without saving.**

- About the analysis parameters

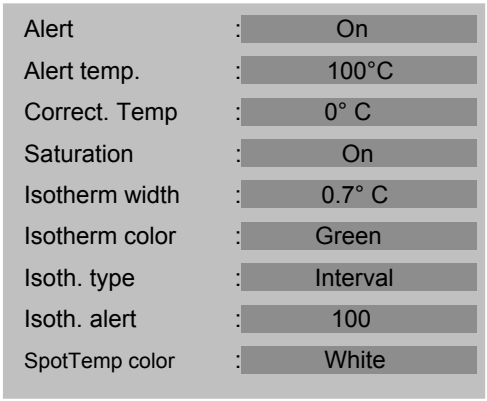
Object	Selects the object of which you want to set the parameters.
Emiss	Different objects have different emissivities; use different emissivities to measure different objects.
Distance	The distance between an object and the I.R. camera is not a constant. Set this value according to the distance to the target.
Env. Temp	Entry of the environment temperature.
Humidity	Entry of the ambient relative humidity.
Comp. Obj.	Comp Obj1 can be set as any spot and area; Comp Obj2 can be set as ref. temp. and any spot and area. Differential of their temperature will be showed at the right bottom corner of the screen. For example, Comp Obj1 is Spot 1(35.4°C) and Comp Obj2 is Ref Temp(30°C) , then the final reading will be 5.4°C.
Ref Temp	Sets a reference temperature to compare with the spot/area/profile tool.

6.2 ADJUSTMENT OF THE ANALYSIS PARAMETERS

1. **Press the MENU/VALIDATION key.**
2. **Press the UP or DOWN arrow to select the [System Setup] menu, then press the MENU/VALIDATION key.**
3. **Press the UP or DOWN arrow to select [Analysis], then the MENU/VALIDATION key.**



4. **Adjustment of an analysis parameter.**
   - Press the UP or DOWN arrow to select the field to be modified.
   - Press the LEFT or RIGHT arrow to define the values.



5. **When you have finished, press the MENU/VALIDATION key to save the modifications or the C key to close the window without saving.**

- About the analysis adjustments.

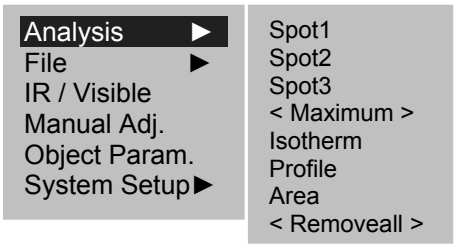
<table>
<tr><td>Alert</td><td>Activates or desactivates the temperature alert. When the parameter is set to "On":
- if the [Capture Spot] parameter is "Maximum" in the analysis tools, the alert is triggered as soon as the threshold set is exceeded.
- If the [Capture Spot] parameter is "Minimum", the alert is triggered as soon as there are temperatures below the threshold set.</td></tr>
<tr><td>Temp Alert</td><td>To set the temperature alert threshold.</td></tr>
<tr><td>Correct Temp</td><td>Corrects temperature measured by the camera so as to ensure the accuracy of the measurement in the event of drift of the camera.</td></tr>
<tr><td>Saturation Color</td><td>When it’s on, Green will take place of the color that stands for the highest temperature.</td></tr>
<tr><td>Isotherm width</td><td>Assigns the width of the interval. This width can be as little as 0.1°C.</td></tr>
<tr><td>Isotherm colour</td><td>Assigns the colour of the interval. The colours available are Transparent, Green, Black, and White.</td></tr>
<tr><td>Isotherm Type</td><td>Sets the isothermal analysis mode. Five modes are available: Interval, below, above, dual below and dual above.
<table>
<tr><td>Interval</td><td>Display the isothermal interval in one color and all the other parts are displayed in the normal pseudo color mode</td></tr>
<tr><td>Below</td><td>Display the isothermal interval and the parts with the lower temperature than the lower limit of the isothermal interval in the same color.</td></tr>
<tr><td>Above</td><td>Display the isothermal interval and the parts with the higher temperature than the upper limit of the isothermal interval in the same color.</td></tr>
<tr><td>Dual Below</td><td>Display the isothermal interval in a color and the parts with the lower temperatures than the lower limit of the isothermal interval in a different color.</td></tr>
<tr><td>Dual above</td><td>Display the isothermal interval in a color and the parts with the higher temperatures than the upper limit of the isothermal interval in a different color.</td></tr>
</table></td></tr>
<tr><td>Isotherm Alert</td><td>Assigns the isotherm alert temperature.</td></tr>
<tr><td>SpotTemp color</td><td>Set the color of the spot</td></tr>
</table>

6.3 PARAMETERIZING THE ANALYSIS TOOLS

This item describes how to adjust the thermal image analysis tools.

6.3.1 Analysis by point

1. **Press the MENU/VALIDATION key.**
2. **Press the UP or DOWN arrow to select the [Analysis] menu, then validate.**
3. **Adjustment of the point to be analyzed**
   - Press the UP or DOWN arrow to select a point (cursor 1 to 3), then the MENU/VALIDATE key. One or more reticles appear on screen.
   - Max Sp automatically tracks the hottest or coldest point on the screen.



4. **Moving the analysis point.**
   - Once the cursor has been selected (SP1 to SP3 is displayed in the bottom left corner), press the UP, DOWN, LEFT, and RIGHT arrows to move the active point.
   - The temperature of the active point is displayed in the top right corner.

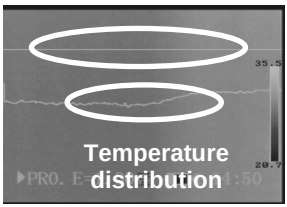
6.3.2 Isothermal analysis

1. **Press the MENU/VALIDATION key.**
2. **Press the UP or DOWN arrow to select the [Analysis] menu.**
3. **Press the UP or DOWN key to select [Isotherm], then press the MENU/VALIDATION key. Zones where the temperature is between IL and IH (the max and min values of the isotherm) are displayed in the same colour on screen.**
4. **Adjustment of the isothermal page**
   - Activate the isotherm (ISO is displayed in the bottom left corner).
   - Press the UP or DOWN arrow to shift the whole range of the isotherm.
   - Press the right or left arrow to diminish/expand the isothermal range.

- To change the type of isotherm, its width, its alert, and its colour, refer to the previous section.

6.3.3 Profile analysis

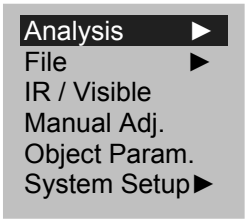
5. **Press the MENU / VALIDATION key.**
6. **Press the UP or DOWN arrow to select [Analysis] menu.**
7. **Press the UP or DOWN arrow to select [Profile], then press the MENU/VALIDATION key**



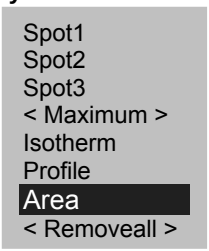
8. **Press the UP or DOWN key to move the profile.**

6.3.4 Area analysis

1. **Press the MENU / VALIDATION key.**
2. **Press the UP or DOWN arrow to select [Analysis] menu.**



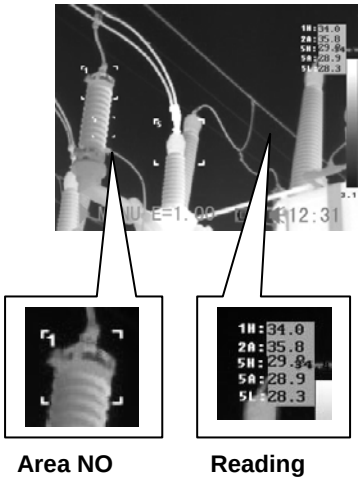
3. **Press the UP or DOWN arrow to select [Area], then press the MENU/VALIDATION key.**



4. Setting the analysis area.

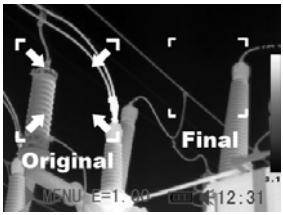
- Press the UP or DOWN to select an area.
- Press LEFT or RIGHT to select the Maximum or Minimum or Average temperature of the area.

< Area1 Min.>
< Area2 Min.>
< Area3 Max.>
< Area4 Max.>
Surface5

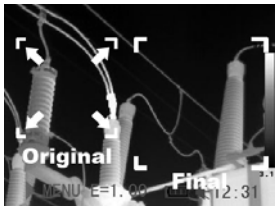


Area NO **Reading**

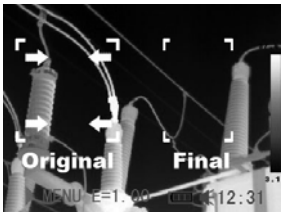
- A reading will appear at the top right corner. It is the reading of the highest/lowest/average temperature of the current area. H is short for highest temperature, L for lowest temperature, and A for average temperature.
- To change the shape of the analysis area, the following shortcuts apply



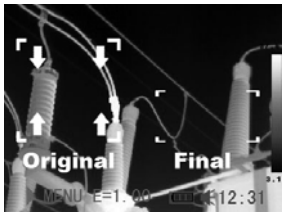
UPPER and LEFT arrow



UPPER and RIGHT arrow



LOWER and LEFT arrow



LOWER and RIGHT arrow

6.4 DESACTIVATING THE ANALYSIS TOOLS

This section describes how to remove the analysis tools used from the screen.

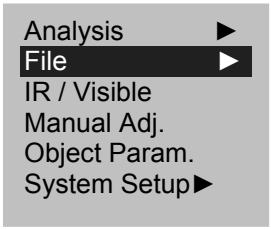
6.4.1 Deactivation of the analysis tools

1. **Press the MENU/VALIDATION key**
2. **Press the UP or DOWN arrow to select the [Analysis] menu.**
3. **Select the analysis tool you want to remove.**
4. **Press the C key to remove it.**
5. **To remove all of the analysis tools:**
   - Press the UP or DOWN key to select [Remove All], then the MENU/VALIDATION key.
   - All of the analysis tools are removed.

6.5 RECORDING THE IMAGE

You can record an image after freezing it or record it directly by holding the S key down for 3 seconds with the device in NULL mode.

1. **Press the MENU/VALIDATION key.**
2. **Press the UP or DOWN arrow to select the [File] menu.**



3. **Press the UP or DOWN arrow to select [Save], then the MENU/VALIDATION key to record the image.**
4. **The name of the image recorded is displayed on screen.**

- The image is recorded in the active directory. To change directories, go to "File setup" => Name of folder".

6.6 ASSOCIATING VOICE REMARKS WITH THE IMAGES (OPTION)

6.6.1 Voice recording

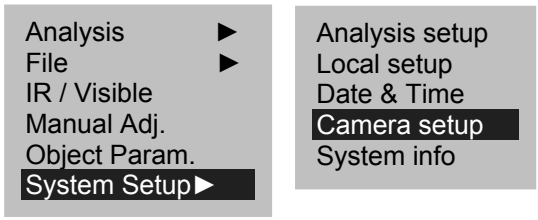
You can associate up to 30 seconds of voice remarks with an image.

1. **Install the Bluetooth headset (provided as an option).**
2. **Freeze an image and press the MENU/VALIDATION key.**
3. **Press the UP or DOWN arrow to select the [File] menu.**
4. **Press the UP or DOWN arrow to select [Voice REC], then press the MENU/VALIDATION key.**
   - The message [Voice Recording] is displayed on the LCD screen.
5. **Speak into the microphone of the headset. To stop recording, press the C key.**
6. **Recording the image.**

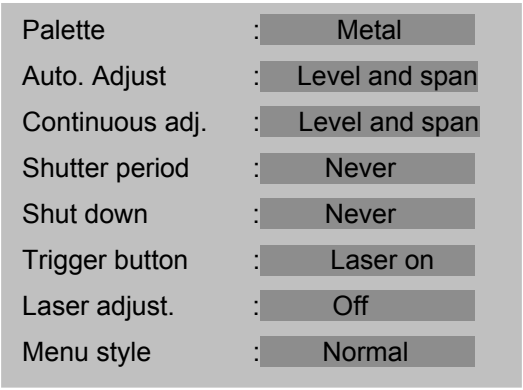
6.7 ADJUSTMENT OF THE TRIGGER

6.7.1 Adjustment of the release

1. **Press the MENU/VALIDATION key, then the UP or DOWN arrow to select the [System Setup] menu, then the MENU/VALIDATION key again.**



2. **Press the UP or DOWN arrow to select the [Camera setup] menu, then press the MENU/VALIDATION key.**



3. **Press the UP or DOWN arrow to select the [Trigger Button] menu, then the LEFT or RIGHT arrow to select the desired function.**

- About the configurable release function:

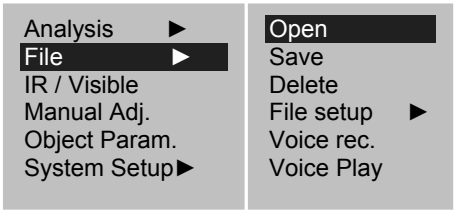
None	The function is inactive.
Save	Makes it possible to record the image by keeping the release pressed for 3 seconds
Auto Adjust.	Function identical to that of the A key.
Laser on	Used to activate the Laser pointer.  Do not aim the laser beam towards anyone's eyes, because a laser beam can damage eyesight.
Torch on	Used to activate the luminous torch. The luminous torch can be used to obtain sharp real images in darkness.
Freeze / Live	Used to activate/freeze a thermal image

7. READING AND ERASING

7.1 OPENING THE IMAGES

You can display recorded images and analyze them on the LCD screen.

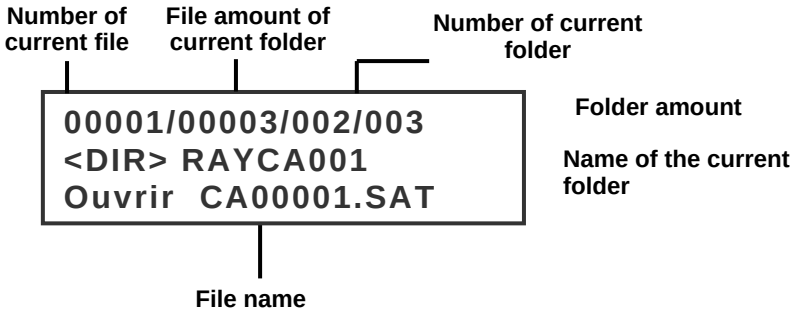
1. **Press the MENU/ENTER key.**
2. **Press the UP or DOWN arrow to select the [File] menu.**
3. **Press the UP or DOWN arrow to select [Open], then press the MENU/VALIDATION key.**



4. **Select an image and press the MENU/VALIDATION key to open it.**

- When you open an image, you can analyze it and associate a voice remark with it.
- Selecting an image

1. **When the [Open] or [Delete] option is selected in the [File] menu, the following message is displayed in the bottom left corner of the screen.**



2. **Press the C key, then the S key, to return to image analysis.**

- Select the directory name.

1. **Press the MENU/VALIDATION key.**
2. **Press the UP or DOWN arrow to select the [File] menu, then press the MENU/VALIDATION key.**
3. **Press the UP or DOWN arrow to select the [File setup] menu, then press the MENU/VALIDATION key.**
4. **Press the UP or DOWN key to select the [Directory Name] menu, then press the LEFT or RIGHT key to select the desired directory.**

- You can press the A, C, and S keys simultaneously to reset the directory name to RAYCA000.

7.2 PLAYING THE REMARKS (OPTION)

If a voice remark is associated with an image, you can listen to it on the camera.

1. **Install the Bluetooth headset (optional).**
2. **Open an image.**
3. **Press the MENU/Validation key, then the UP or DOWN arrow to select the [File] menu.**
4. **Press the UP or DOWN key to select [Voice Play], then press the MENU/VALIDATION key.**
   - The message [Playing Record] is displayed on the LCD screen.
5. **You can stop playing the voice remark by pressing the C key.**

7.3 ERASING THE IMAGES

Note that images once erased cannot be recovered.
So be very careful before erasing an image.

1. **Press the MENU/VALIDATION key, then the UP or DOWN arrow to select the [File] menu.**
2. **Press the UP or DOWN arrow to select [Delete], then press the MENU/VALIDATION key.**

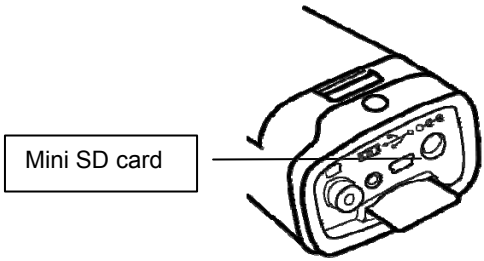
3. **Select an image, then press the MENU/VALIDATION key to delete it.**
4. **Press the C key to exit.**

8. TRANSFERRING IMAGES

8.1 TRANSFER BY MINI SD CARD

You can withdraw the Mini SD card from the device and load the images into your computer using the Mini SD card reader provided.

1. **Open the flap on the Mini SD card slot.**
2. **Press lightly on the card, then let it exit. It ejects automatically.**



3. **You can load the IR images directly from the Mini SD card or via a card reader.**

9. CONNECTIONS AND DOWNLOADING

9.1 CONNECTION TO A MONITOR

It is possible to use a video screen connected by a video cable (provided) to display and analyze the images you have taken.

1. **Switch the I.R camera off.**
2. **Connect the video cable to the video output jack on the bottom of the device.**

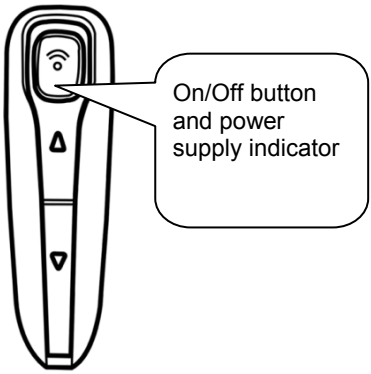
3. **Connect the other end of the video cable to the video input jack of the screen.**
4. **Switch on the screen and the I.R. camera.**

9.2 USING THE BLUETOOTH HEADSET (OPTION)

The device has a module that lets you use the Bluetooth headset (optional) to record voice remarks. To install the headset the first time, proceed as follows:

1. **Switch off the camera and the Bluetooth headset.**
2. **Start by powering up the Bluetooth headset. Press the On/Off button and hold it down for approximately 10 seconds. You will then see the power indicator start to flash, first red, then blue. The headset is in the coupling mode at the end of 120 seconds.**

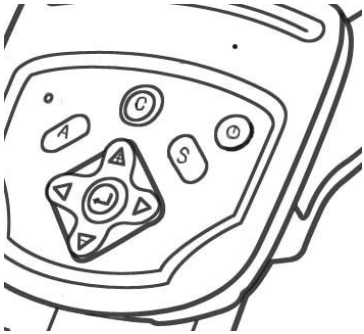
3. **Switch on the camera. The power indicator of the camera lights green while flashing blue. In this mode, the camera is getting ready to search for the Bluetooth headset.**



4. **Hold the On/Off button of the headset down for approximately 2 seconds to couple the headset and the camera. When the coupling has been performed, the power indicator of the headset flashes blue and that of the camera lights in green. You then see at bottom centre on the screen.**

- Switch off the camera and the Bluetooth headset after completing step 4.

5. **After this first coupling between the camera and the headset, you can simply power up the headset (the power indicator flashes blue), then the camera, and the coupling takes place.**



- Press the C and Enter keys simultaneously to clear the Bluetooth headset.

6. **When you are wearing the headset, you can record voice remarks or listen to those already recorded.**

10. TROUBLESHOOTING

Problem	Cause	Solution
The camera fails to operate	The device is off	• Switch the camera on. See "Switching On and Off"
	Battery voltage too low	• Fully charge the battery.
	Poor contact between the camera and the terminals of the battery	• Wipe the terminals with a clean, dry cloth.
The camera fails to record	Internal memory full	• If necessary, load the images into a computer and erase them in the camera to make room.
	Internal memory incorrectly formatted	• Format the internal memory to FAT16 format.
The battery unit discharges rapidly	Battery capacity reduced because left unused for a year or more after its last full charge.	• Replace the battery unit with a new one.
	Battery has reached end of life	• Replace the battery unit with a new one.
The battery fails to charge	Poor contact between the camera and the terminals of the battery	• Wipe the terminals with a clean cloth. • Connect the power cord to the battery charger and insert the other end firmly into a power outlet.
	Battery has reached end of life	• Replace the battery unit with a new one.

11. MAINTENANCE

For maintenance, use only the spare parts specified. The manufacturer cannot be held liable for any accident following a repair not done by its own customer service department or an approved repairer.

11.1 CLEANING AND MAINTAINING THE CAMERA

Proceed as follows to clean the housing of the camera, the lens, the LCD screen, and the other parts.

Housing of the device

Wipe with a soft cloth or a lens cleaning cloth

Lens

Eliminate dust and dirt using a blow brush, then eliminate any remaining dirt by wiping the lens gently with a soft cloth.

- Never use synthetic cleansers on the housing or on the lens.

LCD screen

Use a blow brush to eliminate dust and dirt. If necessary, wipe the screen gently with a soft cloth or a lens cleaning cloth to remove any adherent dirt.

- Never rub the LCD screen and never press firmly on its surface. These actions could damage it or cause other problems.

Never use thinners, benzene, synthetic cleansers, or water to clean the camera. These products could damage the equipment or alter its performance.

11.2 METROLOGICAL CHECK

Like all measuring or testing devices, the instrument must be checked regularly.

We recommend checking this instrument yearly. For checks and calibrations, contact one of our accredited metrology laboratories (information and contact details available on request), at our Chauvin Arnoux subsidiary or the branch in your country.

11.3 REPAIR

For all repairs before or after expiry of warranty, please return the device to your distributor.

12. WARRANTY

Except as otherwise stated, our warranty is valid for twelve months starting from the date on which the equipment was sold. Extract from our General Conditions of Sale provided on request.

The warranty does not apply in the following cases:

- Inappropriate use of the equipment or use with incompatible equipment,
- Modifications made to the equipment without the explicit permission of the manufacturer's technical staff,
- Work done on the device by a person not approved by the manufacturer,
- Adaptation to a particular application not anticipated in the definition of the equipment or not indicated in the user's manual,
- Damage caused by shocks, falls, or floods.

13. APPENDIX

13.1 TABLE OF EMISSIVITIES

Material	Temperature (°C)	Approximate emissivity
Metals		
Aluminium		
Polished aluminium	100	0.09
Commercial aluminium sheet	100	0.09
Oxidized chrome-anodised aluminium	25 ~ 600	0.55
Slightly oxidized aluminium	25 ~ 600	0.10 ~ 0.20
Highly oxidized aluminium	25 ~ 600	0.30 ~ 0.40
Brass		
Shiny brass (extreme polishing)	28	0.03
Oxidized brass	200 ~ 600	0.61 ~ 0.59
Chromium		
Polished chromium	40 ~ 1090	0.08 ~ 0.36
Copper		
Shiny copper	100	0.05
Highly oxidized copper	25	0.078
Copper oxide	800 ~ 1100	0.66 ~ 0.54
Molten copper	1080 ~ 1280	0.16 ~ 0.13
Gold		
Shiny gold	230 ~ 630	0.02
Lead		
Pure lead (no oxidation)	125 ~ 225	0.06 ~ 0.08
Slightly oxidized	25 ~ 300	0.20 ~ 0.45
Magnesium		
Magnesia	275 ~ 825	0.55 ~ 0.20
Magnesia	900 ~ 1670	0.20
Mercury	0 ~ 100	0.09 ~ 0.12

Nickel		
Polished by anodising	25	0.05
Electrolysed	20	0.01
Unpolished		
Nickel wire	185 ~ 1010	0.09 ~ 0.19
Nickel sheet (oxidized)	198 ~ 600	0.37 ~ 0.48
Nickel oxide	650 ~ 1255	0.59 ~ 0.86
Nickel alloy		
Nickel-chromium alloy wire (shiny) (refractory)	50 ~ 1000	0.65 ~ 0.79
Nickel-chromium alloy	50 ~ 1040	0.64 ~ 0.76
Refractory nickel-chromium	50 ~ 500	0.95 ~ 0.98
Nickel-silver alloy	100	0.14
Stainless steel		
18-8	25	0.16
304(8Cr, 18Ni)	215 ~ 490	0.44 ~ 0.36
310(25Cr, 20Ni)	215 ~ 520	0.90 ~ 0.97
Tin		
Commercial tinplate	100	0.07
Highly oxidized	0 ~ 200	0.60
Zinc		
Oxidation at 400°C	400	0.01
Shiny galvanized iron plate	28	0.23
Oxidized zinc powder	25	0.28
Non-metallic materials		
Brick	1100	0.75
Refractory brick	1100	0.75
Graphite (carbon black)	96 ~ 225	0.95
Enamel (white)	18	0.90
Asphalt	0 ~ 200	0.85
Glass (surface)	23	0.94
Refractory glass	200 ~ 540	0.85 ~ 0.95
Calcimine	20	0.90
Oak	20	0.90

14. TECHNICAL CHARACTERISTICS

Description	Characteristic	C.A 1886	C.A 1888
Detecter	Type	UFPA microbolometer	
	Spectral band	8 ~14µm	
	Resolution	160x120	384x288
Imaging performance	NETD	0.08°C@ 30°C	0.05°C@ 30°C
	Frequency	50 Hz (9Hz outside the UE area, Models P01651260E or P01651270E)	
	Objective/focusing	20°x15°	24°x18°
	IFOV (spatial resolution)	2.2mrad	1.1mrad
	Min. focal distance	0.1m	0.1m
Visual image	Digital video	640x480 pixels, "full colour"	
	Illuminator	Produces sharp, high-quality visual images in dark areas	
	Min. focal distance	0.1m	
Presentation of the images	Display of image	Infrared image, real image, or "Mix vision" function with adjustment of percentage of fusion of I.R. image	
	Video output	PAL/NTSC	
	LCD screen	3.5 inches	
	Display of images	Pseudo-colours, multiple palettes	
Functions	Image freeze	Image moving or frozen	
	Storage of files	Removable Mini SD card, up to 2 GB.	
Measurement	Temperature range	-20°C ~600°C (standard) Up to 1500°C optional.	
	Precision	±2°C or ±2%	

Description	Characteristic	C.A 1886	C.A 1888
Analysis functions	Points of analysis	4 points: 3 that can be positioned anywhere on the screen and 1 for automatic detection of Max or Min temp, profile, area analysis, isotherm, difference of temperature.	
	Tracking of temperature	Automatic tracking of the hottest or coldest point in the whole image	
	Temperature alarm	If a temperature alarm threshold is predefined, the camera beeps if it is exceeded.	
	Adjustment	Automatic or manual adjustment of brightness and contrast.	
	Correction	Emissivity, Distance, Ambient temperature, Relative humidity	
	Display of isotherms	Mono-colour display of a user-adjustable temperature interval.	
	Voice remarks	By Bluetooth (option).	
Software	Analysis software	Report generation software	
Laser pointer	Type	Class 2, < 1mW, Wavelength 635nm	
Battery system	Type	Rechargeable lithium battery	
	Life between charges	at least 3 hours	
Conformity	Electromagnetic compatibility	EN-61236-1:2006	
	Safety	EN-61010-1-Ed.2	
Environmental specification	Operating temperature range	-15°C to 50°C (-4°F to 122°F)	
	Storage temperature range	-40°C to 70°C (-40°F to 158°F)	
	Humidity	10% to 95%	
	Impact resistance	25G	
	Vibration resistance	2G	
	Protection	IP 54	
Physical characteristics	Weight	650g (with battery)	
	Dimension	211x80x195mm	

15. DELIVERY CONDITION

C.A 1886 I.R. thermography camera P01651260
C.A 1886 I.R. thermography camera (9Hz) P01651260E
C.A 1888 I.R. thermography camera P01651270
C.A 1888 I.R. thermography camera (9Hz) P01651270E

Delivered with:

- 1 battery charger
- 2 batteries
- 1 2GB Mini SD card
- 1 card reader
- 1 video cable
- RayCAm standard report on CD ROM
- 1 user manual on CD ROM, in 5 languages
- 1 test report
- 1 Carrying case

ACCESSORIES & SPARES

Battery..... P01296041
Sun guard P01651531
Adapter for photographic tripod..... P01651526
Mains power unit..... P01651527
Lens cap P01651522
USB cable..... P01295274
Cigar lighter adapter HX0061
Introduction to thermography ..... Contact us

CHAUVIN ARNOUX GROUP

08 - 2012
Code 693056A02 - Ed. 4

DEUTSCHLAND - Chauvin Arnoux GmbH
Straßburger Str. 34 - 77694 Kehl/Rhein
Tel: (07851) 99 26-0 - Fax: (07851) 99 26-60

ESPAÑA - Chauvin Arnoux Ibérica S.A.
C/ Roger de Flor N° 293, Planta 1- 08025 Barcelona
Tel: 902 20 22 26 - Fax: 934 59 14 43

ITALIA - Amra SpA
Via Sant'Ambrogio, 23/25 - 20050 Bareggia di Macherio (MI)
Tel: 039 245 75 45 - Fax: 039 481 561

ÖSTERREICH - Chauvin Arnoux Ges.m.b.H
Slamastrasse 29/2/4 - 1230 Wien
Tel: 01 61 61 961-0 - Fax: 01 61 61 961-61

SCANDINAVIA - CA Mätsystem AB
Box 4501 - SE 18304 TÄBY
Tel: +46 8 50 52 68 00 - Fax: +46 8 50 52 68 10

SCHWEIZ - Chauvin Arnoux AG
Moosacherstrasse 15 - 8804 AU / ZH
Tel: 044 727 75 55 - Fax: 044 727 75 56

UNITED KINGDOM - Chauvin Arnoux Ltd
Unit 1 Nelson Court – Flagship Square-Shaw Cross Business Park
DEWSBURY – West Yorkshire – WF12 7TH
Tel: 011628 788 888 – Fax: 01628 628 099

MIDDLE EAST - Chauvin Arnoux Middle East
P.O. BOX 60-154 - 1241 2020 JAL EL DIB (Beirut) - LEBANON
Tel: (01) 89 04 25 - Fax: (01) 89 04 24

CHINA - Shanghai Pu-Jiang - Enerdis Instruments Co. Ltd
3 F, 3 rd Building - N° 381 Xiang De Road - 200081 SHANGHAI
Tel: +86 21 65 21 51 96 - Fax: +86 21 65 21 61 07

USA - Chauvin Arnoux Inc - d.b.a AEMC Instruments
200 Foxborough Blvd. - Foxborough - MA 02035
Tel: (508) 698-2115 - Fax: (508) 698-2118

http://www.chauvin-arnoux.com

190, rue Championnet - 75876 PARIS Cedex 18 - FRANCE
Tél.: +33 1 44 85 44 85 - Fax: +33 1 46 27 73 89 - info@chauvin-arnoux.fr
Export: Tél.: +33 1 44 85 44 86 - Fax: +33 1 46 27 95 59 - export@chauvin-arnoux.fr