**Proper Environment**
- **Protection class**: Sensor: IP 65 (NEMA 4)
- **Controller**: IP 66 (NEMA 4)
- **Operating temperature**: Sensor: Depending on the sensor model between -20 °C ... 250 °C (-4 °F ... +482 °F)  
  Controller: 0 ... 85 °C (32 °F ... +185 °F)
- **Storage temperature**: Sensor: Depending on the sensor model between -40 °C ... 250 °C (-40 °F ... +482 °F)  
  Controller: 0 ... 85 °C (32 °F ... +185 °F)
- **Humidity**: 10 - 95 %, non-condensing

**Mechanical installation**
The thermoMETER CT sensors are equipped with a metric M12x1-thread and can be installed either directly via the sensor thread or by means of the hex nut (included in scope of supply) to the mounting bracket available. Various mounting brackets which make the adjustment of the sensor easier can be ordered additionally as accessories, also see operating instructions.
The thermoMETER CTH and CTP sensors are delivered with massive housing and can be installed via the M12x1-thread.

**Unpacking/Included in Delivery**
- 1 thermoMETER CT sensor
- 1 Controller
- 1 Connection cable
- 1 Control signal
- 1 Mounting nut
- 1 Assembly instruction
- 1 Specification, also see operating instructions

**Notes on CE Marking**
The following apply to the thermoMETER CT measuring system:
- EU Directive 2011/65/EU, "RoHS" Category 9
- EU Directive 2014/30/EU
- "Rohs" Category 9
The sensor satisfies the requirements if the guidelines in the operating instructions are maintained in installation and operation.

**Electrical Installation**

**Cable Connections**
For the electrical installation of the thermoMETER CT, please open at first the cover of the controller (4 screws).
For the cable connection, you will find the screw terminals in the lower section of the controller.

**Pin Assignment for CT-SF02, CT-SF15, CT-SF22, CT-SF25, CTH-SF02, CTH-SF10, CTP-7 and CTP-3 Models**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8 ... 36 VDC</td>
<td>Power supply</td>
</tr>
<tr>
<td>GND</td>
<td>Ground (0 V) of power supply</td>
</tr>
<tr>
<td>GND</td>
<td>Ground (0 V) of internal in- and outputs</td>
</tr>
<tr>
<td>OUTAMB</td>
<td>Analog output sensor temperature (mV)</td>
</tr>
<tr>
<td>OUTTCA</td>
<td>Analog output thermocouple (J or K)</td>
</tr>
<tr>
<td>OUTTCm</td>
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<td>F1-F3</td>
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</tr>
<tr>
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</tr>
<tr>
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<tr>
<td>WHITE</td>
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</tr>
<tr>
<td>GREEN</td>
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</tr>
<tr>
<td>YELLOW</td>
<td>Detector signal (+)</td>
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**Dimensions in mm (inches), not to scale**

**Power Supply**
Please use a power supply unit with an output voltage of 8 – 36 VDC/100 mA. The residual ripple should be max. 200 mV.
Please do never connect a supply voltage to the analog outputs.

**Ground Connection**
At the bottom side of the main board PCB, you will find a plug connector (jumper). Depending on the position, the ground connections (GND power supply/outputs) are connected with the ground of the controller housing. See Fig. 7, see Fig. 9. To avoid ground loops and related signal interferences, in industrial environments it might be necessary to interrupt this connection.
Remove the board in order to switch the jumper on the back of the board by loosening the two screws.
Please put the jumper in the corresponding position, see Fig. 8, see Fig. 10.

If the thermocouple output is used, the ground connection GND - Housing should generally be interrupted.

**Unpacking/Included in Delivery**
- 1 thermoMETER CT sensor
- 1 Controller
- 1 Connection cable
- 1 Control signal
- 1 Mounting nut
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**Pin Assignment for CTM-1, CTM-2, CTM-3 Models**

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**Power Supply**
Please use a power supply unit with an output voltage of 8 – 36 VDC/100 mA. The residual ripple should be max. 200 mV.
Please do never connect a supply voltage to the analog outputs.

**Ground Connection**
At the bottom side of the main board PCB, you will find a plug connector (jumper). Depending on the position, the ground connections (GND power supply/outputs) are connected with the ground of the controller housing. See Fig. 7, see Fig. 9. To avoid ground loops and related signal interferences, in industrial environments it might be necessary to interrupt this connection.
Remove the board in order to switch the jumper on the back of the board by loosening the two screws.
Please put the jumper in the corresponding position, see Fig. 8, see Fig. 10.

If the thermocouple output is used, the ground connection GND - Housing should generally be interrupted.

**Unpacking/Included in Delivery**
- 1 thermoMETER CT sensor
- 1 Controller
- 1 Connection cable
- 1 Control signal
- 1 Mounting nut
- 1 Assembly instruction
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Remove the board in order to switch the jumper on the back of the board by loosening the two screws.
Please put the jumper in the corresponding position, see Fig. 8, see Fig. 10.

If the thermocouple output is used, the ground connection GND - Housing should generally be interrupted.
**Cable Assembling**

**Mounting**
- The cable gland M12x1.5 of the controller allows the use of cables with an outer diameter of 3 to 5 mm.
- Remove the inner cable from the cable power supply, 50 mm signal outputs, 60 mm functional inputs.
- Cut the shield down to approx. 5 mm and spread the strands out.
- Extract about 4 mm of the wire insulation and tin the wire ends.
- Place the pressing screw, the rubber washer and the metal washers of the cable gland one after the other onto the prepared cable end.
- Spread the strands and fix the cable shield between two of the metal washers.
- Insert the cable into the cable gland until the limit stop.
- Screw the cap tightly.

Every single wire may be connected to the appropriate screw clamps according to their colors.

**...**

**Operation**

After powering up the supply voltage, the sensor starts an initializing routine for some seconds. During this time the display will show **INIT**. After this procedure, the object temperature is shown in the display. The display background color changes according to the alarm settings.

**Sensor Setup**

The programming keys **A** and **V** enable the user to set the sensor on-site. The current measuring value or the chosen feature is displayed. The display background color changes according to the alarm settings.

**...**

**Restoring Factory Setting**

To reset the thermoMETER CT to the factory settings, please first press the **V** button and then the **A** button and keep both pressed for 3 seconds. The display will show **RESET** for confirmation.

**Display Mode (Example)**

- **142C** Object temperature (after signal processing) [142 °C]
- **128H** Sensor temperature [128 °C]
- **25CB** Box temperature
- **T42CA** Current object temperature

**Shorting the Sensor Cable**

With all CT models (except for CTFM-3, CTFM-7, the sensor cable can be shorted if necessary. With the models CTFM-1, CTFM-2 and CTFM, the sensor cable can be shortened by max. 3 m. The CTM 3 models are only available with 3 m cable.

- **Shortening the wire** will cause an additional measuring error of about 0.1 K/m.

**Inputs and Outputs**

**Analog Outputs**

The thermoMETER CT has either one or two analog output channels.

**Digital Interfaces**

Please refer to the operating instructions for the description of the optional, digital interfaces. The following interfaces are available: USB, RS232, RS485, Profibus, Ethernet.

**Functional Inputs**

The three functional inputs F1 - F3 can be programmed with the CompactConnect software, only.

**Output Channel 1**

This output is used for output of the object temperature. Selection of the output signal is carried out via programming keys. The CompactConnect software enables to program the output channel 1 also as an alarm output.

**Ratio D = Distance from the front edge of the device to the measuring object / S = Spot Size**

The size of the object to be measured and the optical resolution of the infrared thermometer determine the maximum distance between sensor and object. In order to prevent measuring errors, the object should fill out the field of view of the sensor lens completely. Consequently, the spot size should at all times have at least the same size as the object or should be smaller than that.

**Examples**

<table>
<thead>
<tr>
<th>Models</th>
<th>D (mm)</th>
<th>S (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTFM-1</td>
<td>150</td>
<td>125</td>
</tr>
<tr>
<td>CTFM-2</td>
<td>300</td>
<td>250</td>
</tr>
</tbody>
</table>

**CompactConnect Software**

Insert the CompactConnect installation CD into the appropriate drive of your PC or download the software from our website at: [https://www.metrics-europe.de/download-software/compactconnect](https://www.metrics-europe.de/download-software/compactconnect).

If the auto run option is activated, the installation wizard will start automatically. Otherwise, please start CDSsetup.exe from the CD-ROM.

Please follow the instructions of the wizard until the installation is finished.

After installation, you will find the CompactConnect software on your desktop (as a program icon) and in the start menu. If you want to uninstall the CompactConnect software from your system, please use the **Uninstall** icon in the start menu.

You will find detailed software manual on the CompactConnect CD.

**System Requirements**

- Windows XP, Windows Vista, Windows 7, 8 and 10
- At least 128 Mb RAM
- USB interface
- CD-ROM drive
- Hard disc with at least 30 Mb free space

**Main Features**

- **...**
- **...**

A detailed description of the commands you will find on the CompactConnect software CD in the directory: Commands.