Warnings
- Connect the power supply and the display/output device according to the safety regulations for electrical equipment.
- Risk of injury, damage to or destruction of the sensor and/or the controller
- Avoid shocks and impacts to the sensor and the controller
- Damage to or destruction of the sensor and/or the controller

Avoid mechanical violence on the sensor.
- Damage to or destruction of the sensor
- The supply voltage must not exceed the specified limits.
- Damage to or destruction of the sensor and/or the controller

Protect the sensor cable against damage.
- Destruction of the sensor, failure of the measuring device

Never kink the sensor cable, do not bend the sensor cable in tight radii.
- The minimum bending radius is 14 mm (static). A dynamic movement is not allowed.
- Damage to the sensor cable, failure of the measuring device

Avoid exposure of sensor (both optics and housing) to cleaning agents that contain solvents.
- Damage to or destruction of the sensor
- Never damage to the sensor cable, failure of the measuring device

Avoid abrupt changes of the operating temperature.
- Inaccurate or incorrect measurements

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

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: -40 °C ... 85 °C (-40 °F ... +185 °F)
- Humidity: 10 - 95 %, non-condensing

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

You can download a PDF of detailed operating instructions from our website:

Fig. 1 Dimensional drawing of sensor
Fig. 2 Dimensional drawing of sensor with integrated CF lens

Fig. 3 Dimensional drawing of massive housing, CTH and CTP models
Dimensions in mm (inches), not to scale

With the CTF-202 / CTH-202 / CTP-202 models, the sensor cable must not be moved during the measurement.

> False measurement results

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/output) are connected with the ground of the controller housing, see Fig. 7, see Fig. 8. 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.

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.

This thermoMETER CT is not a 2-wire sensor!
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 insulation from the cable (40 mm 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 the two 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.

Metal washer
Rubber washer
Pressing screw
Shield

Fig. 11 Cable installation

Use shielded cables only!

The sensor shield has to be grounded!

Pressing screw again recalls the last enabled function.

Inserting the sensor cable

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

Shortening the sensor cable

The functional parameters

will change 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.

Please do never connect a supply voltage to the analog outputs.

The thermoMETER CT is not a 2-wire sensor! 

- Destruction of the output

Output Channel 1

This output is used for the output of 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.

Output Channel 2 (only CTSF02, CTSF15, CTSF22, CTH, CTP-7 and CTP-3)

The connection pin OUT-AMB is used for output of the sensor temperature. The CompactConnect software allows the programming of output channel 2 as an alarm output. Further details, see operating instructions.

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 DP, CAN-Bus, Modbus RTU or Ethernet.

Functional Inputs

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

Table of functional inputs

<table>
<thead>
<tr>
<th>Input</th>
<th>Description</th>
<th>F1 (digital)</th>
<th>F2 (analog)</th>
<th>F3 (analog)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger (a 0V - level on F1 resets the hold function)</td>
<td>(trigger)</td>
<td>(external emissivity adjustment [0 - 10 V]</td>
<td>(external compensation of ambient temperature/range is selectable via CompactConnect software. [0 - 10 V]; -40 - 900°C; preset range: [0 - 200°C])</td>
<td></td>
</tr>
<tr>
<td>Emissivity (digital choice via table)</td>
<td>F1 - F3 (digital)</td>
<td>Emissivity (digital choice via table)</td>
<td>A non-connected input represents: F1 = High, F2 = Low, F3 = High-level: +3 V ... +36 V Low-level: &lt; +0.4 V ... +36 V</td>
<td></td>
</tr>
</tbody>
</table>

Please note that according to the chosen output, different connection pins are used (OUT-mV or OUT-mA).

Display of the thermoMETER CT can show the following error messages:

- MV5 Signal output channel 1 [0 - 5 V]
- T10.000 Transmission [-1000]
- A-0.2 Signal output area [0.2 V]
- P-... Signal output peak [inactive]
- V-... Signal output peak [inactive]
- S-0.0 Lower limit temperature range [°C]
- S-0.00 Lower limit output signal [°C]
- S-0.000 Upper limit output signal [°C]
- U° Temperature unit [°C]
- 30.0 Lower alarm limit [30 °C]
- 100.0 Upper alarm limit [100 °C]
- XHEAD Ambient temperature compensation [Sensor temperature]

Radio 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 the field of view of the sensor lens completely. Consequently, the spot should at all times have at least the same size as the object or should be smaller than that.

Display of the thermoMETER CT can show the following error messages:

- CT-SF02, CT-SF15, CH-SF02, CTH and CTP-7 Models
- CTM-1, CTM-2, CTP-3 Models

System Requirements

- Windows 7, 8 and 10
- At least 128 MB free space
- USB interface
- CD-ROM drive
- Hard disc of at least 30 MB free space

Main Features

- Graphical display and recording of temperature readings for subsequent analysis and documentation.
- Complete setup of parameters and remote control of the sensor.
- Sophisticated signal processing features.
- Output scaling and parameter set up of functional inputs.

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

Visual Alarms

These alarms will cause a change of color of the LCD display and will also change the status of the optional relay interface. In addition, Alarm 2 can be used as open collector output at pin AL2 on the controller (24 V/ 50 mA).

The alarms are factory-set as follows:

- Alarm 1: Norm.close/Low-Alarm
- Alarm 2: Norm.open/High-Alarm

Both of these alarms will have effect on color setting of the LCD display:

BLUE Alarm 1 active
RED Alarm 2 active
GREEN No alarm active

For extended setup like as low or high alarm (via change of normally open/closed), selection of the signal source [TObj, Thread, TBox] a digital interface (e.g. USB, RS232) including the CompactConnect software is needed.