

# LEISTER

## Compact manual

EN

# G 1200

Thermocouple  
Quick Response Thermometer  
for exchangeable Type K sensors



Produced by

**GREISINGER**  
Member of GHM GROUP

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# Table of contents

<b>1</b>	<b>About this documentation .....</b>	<b>4</b>
1.1	Foreword .....	4
1.2	Legal notices .....	4
1.3	Further information .....	4
<b>2</b>	<b>Safety .....</b>	<b>5</b>
2.1	Explanation of safety symbols .....	5
2.2	Foreseeable misuse .....	5
2.3	Safety instructions .....	6
2.4	Intended use.....	6
2.5	Qualified personnel.....	6
<b>3</b>	<b>The device at a glance .....</b>	<b>7</b>
3.1	Display elements .....	7
3.2	Connections .....	7
3.3	Operating elements .....	8
<b>4</b>	<b>Operation .....</b>	<b>9</b>
4.1	Opening the configuration menu .....	9
4.2	Adjustment of the measuring input.....	10
<b>5</b>	<b>Measurement Basics.....</b>	<b>11</b>
5.1	Sensor/device accuracy.....	11
5.2	Possible measuring errors .....	11
5.2.1	Immersion depth.....	11
5.2.2	Surface effects and poor heat transfer .....	11
5.2.3	Cooling / evaporation.....	11
5.2.4	Response time .....	11
<b>6</b>	<b>Operation and maintenance .....</b>	<b>12</b>
6.1	Operating and maintenance notices.....	12
6.2	Battery.....	12

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6.2.1	Battery indicator.....	12
6.2.2	Changing battery .....	12
<b>7</b>	<b>Error and system messages.....</b>	<b>14</b>
<b>8</b>	<b>Technical data .....</b>	<b>15</b>
<b>9</b>	<b>Disposal .....</b>	<b>16</b>
<b>10</b>	<b>Service .....</b>	<b>17</b>
10.1	Manufacturer .....	17
10.2	Calibration and adjustment service .....	17
10.3	Accessories .....	18

# 1 About this documentation

## 1.1 Foreword

Read this document carefully and familiarise yourself with the operation of the device before you use it.

Keep this document ready to hand and in the immediate vicinity of the device so that it is available to the personnel/user for reference at all times in case of doubt.

The user must have carefully read and understood the operating manual before beginning any work.

## 1.2 Legal notices

The liability and warranty of the manufacturer for damages and consequential damages are voided with misuse, disregarding this document, disregarding safety notices, assignment of inadequately qualified technical personnel and arbitrary modifications of the device.

This document is entrusted to the recipient for personal use only.

Any transmission, duplication, translation into other languages or excerpts from this operating manual require the consent of the manufacturer.

The manufacturer assumes no liability for print errors.

## 1.3 Further information

Software version of the device:

- V1.0 or later

For the exact product name, refer to the type plate on the rear side of the device.



### NOTE

For information about the software version, press and hold the ON button to switch on for longer than 5 seconds. The series is shown in the main display and the software version of the device is shown in the secondary display.

## 2 Safety

### 2.1 Explanation of safety symbols



#### **DANGER**

This symbol warns of imminent danger, which can result in death, severe bodily injury, or severe property damage in case of non-observance.



#### **CAUTION**

This symbol warns of potential dangers or harmful situations, which can cause damage to the device or to the environment in case of non-observance.



#### **NOTE**

This symbol indicates processes, which can have a direct influence on operation or can trigger an unforeseen reaction in case of non-observance.

### 2.2 Foreseeable misuse

The fault-free function and operational safety of the device can only be guaranteed if applicable safety precautions and the device-specific safety instructions for this document are observed.

If these notices are disregarded, personal injury or death, as well as property damage can occur.



#### **DANGER**

#### **Incorrect area of application!**

In order to prevent erratic behaviour of the device, personal injury and property damage, the device must be used exclusively as described in the chapter Description in the operating manual.

- The device is not suitable for use in explosion-prone areas!
- The device must not be used for diagnostic or other medical purposes on patients!
- Not suitable for use with requirements on functional safety, e.g. SIL!
- Do not use in safety / emergency stop devices!

## 2.3 Safety instructions



### CAUTION

#### **Risk of injury at the temperature sensor!**

Devices with insertion probes entail the risk of stab injuries due to the pointed probe design.

There is a risk of burns when measuring in high (and very low) temperatures. Use gloves if necessary.



### CAUTION

Empty batteries and batteries of inferior quality can leak more easily, which can destroy the device. Please also observe the instructions in the chapter "Operation and maintenance".



### NOTE

This device does not belong in children's hands!



### NOTE

The device housing is not designed for continuous contact with foods.

For measurements in food in accordance with EC Regulation 1935 / 2004, suitable temperature probes must be used:

## 2.4 Intended use

The device is thermometer for type K interchangeable probes.

It is designed, with the appropriate probe, for precise and instantaneous temperature measurements in the following media:

- Liquids, gases, soft plastic materials, bulk material
- Food

## 2.5 Qualified personnel

For commissioning, operation and maintenance, the relevant personnel must have adequate knowledge of the measuring process and the significance of the measurements. The instructions in this document must be understood, observed and followed.

In order to avoid any risks arising from interpretation of the measurements in the concrete application, the user must have additional expertise. The user is solely liable for damages/danger resulting from misinterpretation due to inadequate expertise.

### 3 The device at a glance



#### 3.1 Display elements

##### Display



Battery indicator

Evaluation of the battery status



Unit display

Display of units or min/max/hold



Main display

Measurement of the current temperature or value for min/max/hold



Auxiliary display

Measurement of the current temperature in min/max/hold mode with unit

#### 3.2 Connections

Thermos couple plug

Connection for temperature sensor



#### CAUTION

The device ensures extensive protection against splashing water and rain. However, immersion in water is not possible due to the socket opening.

- Protect the connector opening / contacts from soiling and moisture!
- Dry damp device and plug connectors as quickly as possible!

### 3.3 Operating elements



#### On / Off button


Press briefly

Switch on the device

Activate / deactivate lighting

Long press


Switch off the device


 Reject changes in a menu




#### Up / Down button

Press briefly


 Display of the min/max value

 Change value of the selected parameter

Long press

 Reset the min/max value of the current measurement


Both simultaneously

 Rotate display, overhead display




#### Function button


Press briefly


 Freeze measurement (Hold)

 Call up next parameter

Long press, 2s

 Start menu "configuration", **CONF** appears in the display

*Operating status*  *device is in measured value display*




 *device is in a menu*



## 4 Operation

### 4.1 Opening the configuration menu

1. Press the *Function button* for 2 seconds to open the **Configuration** menu.
2. **CONF** appears in the display. Release the *Function button*.




Parameter	Values	Meaning
	 	
<b>PoFF</b>	<b>Shut-off time</b>	
	oFF	No automatic shut-off
	0:15, 0:30, 1:00, 4:00, 12:00	Automatic shut-off after a selected time in hours:minutes, during which no buttons have been pressed
<b>LtE</b>	<b>Backlight</b>	
	oFF	Backlight deactivated
	0:15, 0:30, 1:00, 2:00, 4:00	Automatic shut-off of the backlight after a selected time in minutes:seconds, during which no buttons have been pressed
	on	No automatic shut off of the backlight
<b>Unit</b>	<b>Display unit</b>	
	°C	Temperature display in °C
	°F	Temperature display in °F
<b>Init</b>	<b>Factory settings</b>	
	no	Use current configuration
	YES	Reset device to factory settings. After confirming with the <i>function-button</i> , the display shows: <b>Init done</b>

## 4.2 Adjustment of the measuring input

The temperature input can be adjusted with the zero point correction and the gradient correction. If an adjustment is made, you change the pre-adjusted factory settings.

This is signalled with the display text  $t.oF$  or  $t.SL$  when switching on.

1. Switch the device off.
2. Hold the *down button* and press the *On/Off button* briefly to switch on the device and open the **Adjustment** menu.
3. The display shows the first parameter. Release the *down button*.

Parameter	Values	Meaning
	 	
$t.oF$	<b>Zero point correction</b>	
	0.0	No zero point correction
	-5.0 ... 5.0	Zero point correction in °C. (at °F -9.0 .. 9.0)
$t.SL$	<b>Gradient correction of the temperature</b>	
	0.00	No gradient correction of the temperature
	-5.00 ... 5.00	Gradient correction in %

### Formula used by device:

Temperature = °C: Display = (measured value -  $t.oF$ ) \* (1 +  $t.SL$  / 100)

Temperature = °F: Display = (meas. value - 32 °F -  $t.oF$ ) \* (1 +  $t.SL$  / 100) + 32 °F

### Adjustment example:

*Temperature unit= °C, the adjustment is carried out in 2 separate steps at 0 °C (e.g. ice water) and at a reference temperature (e.g. clinical thermometer with water bath 37 °C).- First set the values of  $t.oF$  and  $t.SL$  in the adjustment menu to 0*

Zero point: - Set the temperature probe to 0 °C and let it adjust.

- Start the adjustment menu and enter the display value at 0 °C for  $t.oF$
- After leaving the menu, the device should now display 0.0 °C.

Slope: - Set the temperature sensor to the reference temperature and let it adjust.

- Calculate slope correction:  $t.SL = \left( \frac{\text{reference temperature}}{\text{display}} - 1 \right) * 100$
- Start adjustment menu and enter the calculated value at  $t.SL$
- Exit menu, the device should now display the reference temperature.

## 5 Measurement Basics

### 5.1 Sensor/device accuracy

The device can be equipped with different interchangeable sensors. The temperature sensors are divided into the following classes according to EN 60584-2.

class	deviation	temperature range
1	$\pm 1.5\text{ °C}$ or $\pm 0.4\%$ of measured value *	-40 ... 1000 °C
2	$\pm 2.5\text{ °C}$ or $\pm 0.75\%$ of measured value *	-40 ... 1200 °C
3	$\pm 2.5\text{ °C}$ or $\pm 1.5\%$ of measured value *	-200 ... 40 °C

\* = larger value counts

The system accuracy of the measuring chain (device + probe) is the sum of the accuracy of the probe and the accuracy of the characteristic curve and cold junction of the device.

### 5.2 Possible measuring errors

#### 5.2.1 Immersion depth

**Liquid:** Immerse to a depth of at least 20 mm and then stir. Otherwise, measuring errors can occur due to the heat transmission of the sensor tube if the immersion depth is too shallow.

**Gas:** Immerse as far as possible into the gas to be measured so that the measuring sensor is subjected to a heavy flow.

#### 5.2.2 Surface effects and poor heat transfer

Special measuring sensors are required for this purpose. Surface characteristics, design of the measuring sensor, heat transfer and environmental temperature influence the measurement result.

**NOTE:** Thermally conductive paste between the measuring sensor and surface can also increase measurement accuracy in some cases.

#### 5.2.3 Cooling / evaporation

When measuring the air temperature, the probe should be dry, otherwise the temperature measured will be too low.

#### 5.2.4 Response time

An adequate wait time must be observed for the measuring process before reading the measured value. The response time  $T_{90}$  describes the time in which the displayed measured value reached 90% of the end value.

## 6 Operation and maintenance

### 6.1 Operating and maintenance notices



#### NOTE

The device and temperature probe must be handled with care and used in accordance with the technical data. Do not throw or strike.



#### NOTE

Plugs and sockets must be protected from soiling.



#### NOTE

If the not used for an extended period of time, the batteries must be removed. Leaks from the batteries are avoided as a result.

### 6.2 Battery

#### 6.2.1 Battery indicator

If the empty frame in the battery display blinks, the batteries are depleted and must be replaced. However, the device will still operate for a certain length of time.

If the BAT display text appears in the main display, the battery voltage is no longer adequate for operation of the device. The battery is fully depleted.

#### 6.2.2 Changing battery



#### DANGER

##### **Danger of explosion!**

Using damaged or unsuitable batteries can generate heat, which can cause the batteries to crack and possibly explode!

- Only use high-quality and suitable alkaline batteries!

**⚠ CAUTION****Damage!**

If the batteries have different charge levels, leaks and thus damage to the device can occur.

- Only use high-quality and suitable alkaline batteries!
- Do not use different types of batteries!
- Remove depleted batteries immediately and dispose of them at a suitable collection point.

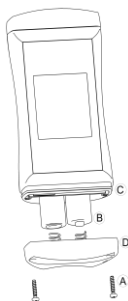
**! NOTE**

Unnecessary unscrewing endangers the protection against moisture and should therefore be avoided.

**! NOTE**

Read the following handling instructions before replacing batteries and follow them step by step.

If disregarded, the device could be damaged or the protection from moisture could be diminished.



1. Unscrews the Phillips screws (A) and remove the cover.
2. Carefully replace the two Mignon AA batteries (B). Ensure that the polarity is correct! It must be possible to insert the batteries in the correct position without using force.
3. The O-ring (C) must be undamaged, clean and positioned at the intended depth.
4. Fit the cover (D) on evenly. The O-ring must remain at the intended depth!
5. Tighten the Phillips screws (A).

## 7 Error and system messages

Display	Meaning	Possible causes	Remedy
----	No suitable measuring probe connected Measurement far outside of the measuring range	Incorrect measuring probe Measuring probe or device defect	Connect a suitable measuring probe Measurement leaves the permissible range Send in for repair
No display, unclear characters or no response when buttons are pressed	Battery depleted System error Device is defective	Battery depleted Error in the device	Replace battery Send in for repair
bAt	Battery depleted	Battery depleted	Replace battery
Err.1	Measuring range exceeded	Measurement too high Incorrect measuring probe connected Measuring probe or device defect	Stay within allowable measurement range Check measuring probe Send in for repair
Err.2	Measuring range is undercut	Measurement too low Incorrect measuring probe connected Measuring probe or device defect	Stay within allowable measurement range Check measuring probe Send in for repair
Err.7	System error	Cold junction outside operating range or defect	Stay within allowable operating temperature Send in for repair
555 Err	System error	Error in the device	Switch device on/off Replace batteries Send in for repair

## 8 Technical data

Sensor connection	Connection socket for miniature flat plug
Supported sensor type	Thermocouple type K (NiCr-Ni)
Measuring range	-65.0 ... +1200.0 °C (-85.0 ... +2192 °F)
Accuracy (at nominal temperature)	<i>Note: The system accuracy depends on the accuracy of the used temperature sensor!</i>
Device	±0.1 % of m.v. ±1 °C
Cold junction	±0.3 °C
Temperature drift	±0.01 % of m.v. / K ±0.025 °C / K
Measuring cycle	approx. 3 measurements per second
Display	3-line segment LCD, additional symbols, illuminated (white, luminous duration adjustable), Display orientation 180° rotatable (overhead display)
Additional functions	Min/max/hold
Adjustment	Offset and gradient correction
Housing	Break-proof ABS housing
Protection rating	IP40 (sensor socket) IP65 / IP67 (rest of the housing)
Dimensions L*W*H	108 * 54 * 28 mm
Weight	approx. 125 g, incl. batteries
Nominal temperature	25 °C
Operating conditions	-20 to 50 °C; 0 to 85 %RH (non-condensing)
Current supply	2 * AA batteries (mignon)
Current requirement	approx. 1 mA, approx. 3 mA with backlight
battery life	Service life > 2500 hours with alkaline batteries (without backlighting)

	Battery indicator	4-stage battery status indicator, Replacement indicator for depleted batteries: "BAT"
	Auto-power-OFF function	The device switches off automatically if this is activated
Directives and standards		<p>The devices conform to the following Directives of the Council for the harmonisation of legal regulations of the Member States:</p> <p>2014/30/EU EMC Directive</p> <p>2011/65/EU RoHS</p> <p>Applied harmonised standards:</p> <p>EN 61326-1:2013    Emission limits: Class B Immunity according to Table 1 Additional errors: &lt; 1 % FS</p> <p>EN IEC 63000:2018</p> <p>The device is intended for mobile use and/or stationary operation in the scope of the specified operating conditions without further limitations.</p>

## 9 Disposal

Separation by material and recycling of device components and packaging must take place at the time of disposal. The valid regional statutory regulations and directives applicable at the time must be observed.



### NOTE



The device must not be disposed of with household waste. Return it to us, freight prepaid. We will then arrange for the proper and environmentally-friendly disposal.

Private end users in Germany have the possibility of dropping off the device at the municipal collection centre. Batteries must be removed beforehand!

Please dispose of empty batteries at the collection points intended for this purpose



## 10 Service

### 10.1 Manufacturer

If you have any questions, please do not hesitate to contact us:

#### Contact

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**GHM GROUP - Greisinger**

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WEEE reg. no. DE 93889386



### 10.2 Calibration and adjustment service

The purpose of the calibration is to verify the precision of the measuring device by comparing it with a traceable reference.

Both ISO calibration certificates and DAkkS calibration certificates are available from Greisinger.

#### Explanation

The ISO standard 9001 is applied for the iso-calibration certificates.

These certificates are an affordable alternative to the DAkkS calibration certificates and provide information of the traceable reference, a list of individual values and documentation.

The DAkkS calibration is based on DIN EN ISO/17025, the accreditation basis is recognised worldwide. These certificates offer high-quality calibration and consistently high quality. The DAkkS calibration includes any necessary adjustment with the purpose of minimising a deviation of the measuring device.

#### NOTE

The device is delivered with a test report.

This confirms that the measuring device has been adjusted and tested, without making any statement about the accuracy of a temperature sensor.

#### NOTE

Only the manufacturer can check the basic settings and make corrections if necessary.

## 10.3 Accessories

### Spare parts:

<b>GB-AA-2</b>	art. no. 479249	Spare batteries AA (2 pcs.)
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### Suitable sensors:

<b>GTE 130 OK</b>	art. no. 601483	Insertion probe without cable, Ø1,5 mm
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<b>GF 1TK-T3</b>	art. no. 609695	Compact immersion probe with silicone handle, Ø3 mm
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<b>GF 1TK-E3</b>	art. no. 609697	Compact insertion probe with silicone handle, Ø3 mm
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<b>GF 1TK-E1.5</b>	art. no. 609699	Compact insertion probe with silicone handle, Ø1,5 mm
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<b>GF 1TK-L3</b>	art. no. 611299	Compact air probe with silicone handle, Ø3 mm
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<b>GTF 300</b>	art. no. 600072	Wire probe for measurements in fractions of a second
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<b>GTF 40K-620</b>	art. no. 610829	T-handle insertion probe for bulk material, soil, compost
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### Further accessories:

<b>ST-G1000</b>	art. no. 611373	Protective bag with belt clip
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<b>GCLIP 1000</b>	art. no. 475820	Metal belt clip, self-adhesive
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<b>G1000_BASE</b>	art. no. 481885	Table stand, wall holder
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<b>GKK 1000</b>	art. no. 611603	Case (235 x 185 x 48 mm), with punched lining for 1 device of the G1xxx-series
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<b>GKK 252</b>	art. no. 601056	Case (235 x 185 x 48 mm), with foam lining for universal use
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