




Mounting and Operating Manual

96x48 Panel Mount Controller

as of version 2.8

GIR 2000 Pt



-  Please read these instructions carefully before use!
-  Please consider the safety instructions!
-  Please keep for future reference!



WEEE-Reg.-Nr. DE 93889386

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1. Safety

1.1. General note

Read this document carefully and get used to the operation of the device before you use it. Keep this document within easy reach near the device for consulting in case of doubt.

Mounting, start-up, operating, maintenance and removing from operation must be done by qualified, specially trained staff that have carefully read and understood this manual before starting any work.

The manufacturer will assume no liability or warranty in case of usage for other purpose than the intended one, ignoring advices of this manual, operating by unqualified staff as well as unauthorized modifications to the device.

1.2. Intended use

The GIR 2000 Pt is a microcontroller based display, monitoring and controlling unit.

The devices are only to be operated in control panels ore suitable electric housings, where the connection terminal area is sufficiently protected against touch.

They are designed for industrial or commercial use.

Outdoor installation without suitable means of protection is not allowed.

The relay output is suitable to switch electrical loads with max 10 A resistive load at up to 250 V AC.

Prior to fulfil the referring requirements, the device has to be configured on the base of this manual. Wrong configuration may lead to malfunction in the application. The commissioning expert / the operator is liable for a suitable configuration.

The safety guidelines of the manual are followed!

The unit does not contain any components that you can service or repair yourself.

All the described operations are only to be performed of skilled personnel that are authorized by the operator.

Any other use or use exceeding this is considered as non-conforming and leads to the expiration of any liability or guarantee claims from the manufacturer.

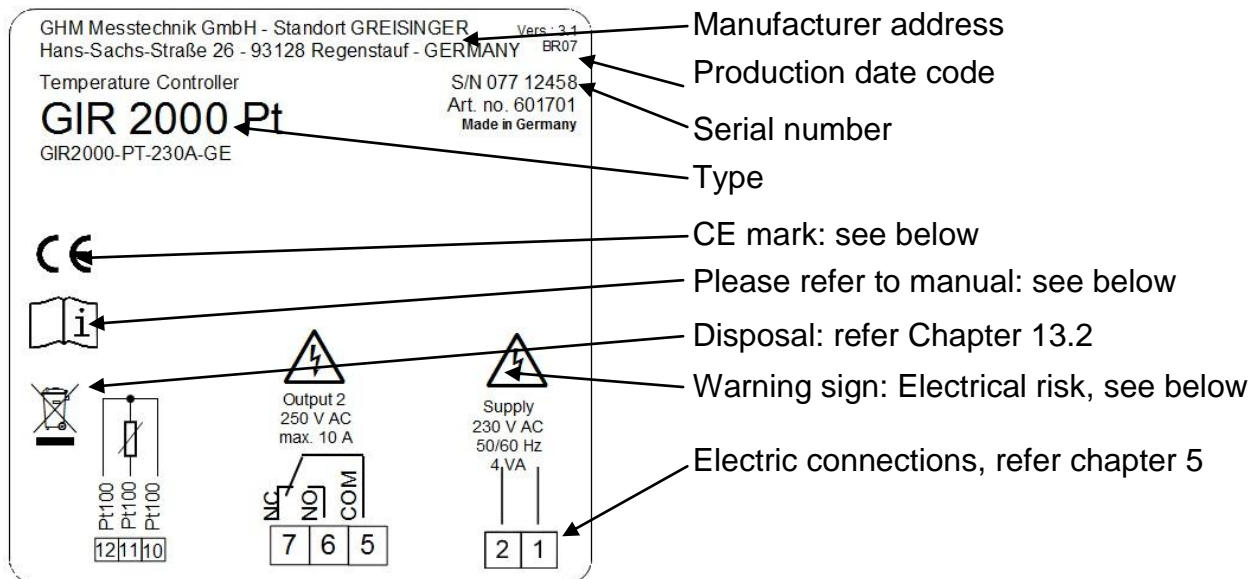
Note: Combination / connection to other electrical equipment with CE marking does not automatically deliver a conform system. A new evaluation of the system's conformity to the low voltage directive (2014/35/EU) and EMC directive (2014/30/EU) by the manufacturer may be necessary, eventually others have to be considered (e.g. machinery directive).

1.3. Skilled personnel

The mounting, electrical installation, start of operation, maintenance and decommissioning must only performed by a skilled electrician.

Users of the readily installed device have to be sufficiently skilled in the operation of the device and able to avoid risks. The operator of the arrangement is responsible for sufficient qualification the operators.

1.4. Type label



Symbol explanation



Electrical risk:

At electrical connections and components signed with this symbol there is a risk of electrical shock.



Please refer to manual:

Read the mounting- and operating manual carefully, before you connect and use the device.



CE mark:

With the CE-Sign declares the manufacturer, that the Product is conform with the prevailing requirements of EG.

1.5. Safety signs and symbols

Warnings are labelled in this document with the followings signs:



Caution!

This symbol warns of imminent danger, death, serious injuries and significant damage to property at non-observance.



Attention!


This symbol warns of possible dangers or dangerous situations which can provoke damage to the device or environment at non-observance.




Note!

This symbol point out processes which can indirectly influence operation, possibly cause incorrect measurement or provoke unforeseen reactions at non-observance.


1.6. Reasonably foreseeable misuse

- 
DANGER

This device must not be used at potentially explosive areas!
Do not use these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury or material damage.
Failure to comply with these instructions could result in death or serious injury and material damage.
- 
ATTENTION


This device must not be used at a patient for diagnostic or other medical purpose.

1.7. Safety guidelines

- Faultless operation and reliability in operation of the measuring device can only be assured if the device is used within the climatic conditions specified in the chapter "Specifications".
- Always disconnect the device from its supply before opening it. Take care that nobody can touch any of the unit's contacts after installing the device.
- Standard regulations for operation and safety for electrical, light and heavy current equipment have to be observed, with particular attention paid to the national safety regulations (e.g. VDE 0100).
- When connecting the device to other devices (e.g. the PC) the interconnection has to be designed most thoroughly, as internal connections in third-party devices (e.g. connection of ground with protective earth) may lead to undesired voltage potentials.
- 
DANGER

The device must be switched off and must be marked against using again, in case of obvious malfunctions of the device which are e.g.:

 - Visible damage.
 - Device does not work like prescribed.
 - Storing the device under inappropriate conditions for longer time.

When not sure, the device should be sent to the manufacturer for repairing or servicing.
- Modifications or repairs of the device may not be performed by the customer. For maintenance or repair the device must be sent to the manufacturer.
- 
ATTENTION

If the device is operated at an ambient temperature > 40 °C the connections may heat up above 60 °C.
Please keep this in mind when electing suitable connection cables.

2. Product description

2.1. Scope of supply

The scope of supply includes:

- monitoring- / controlling device
- 2 mounting brackets
- 1 sealing for front side IP 65: GGD4896
- screw-in/plug-in clamps (according to the model)
- mounting and operating manual

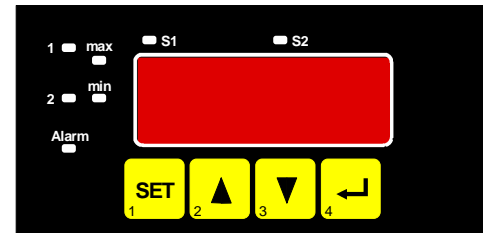
2.2. Function

The GIR 2000 Pt is a universally applicable microprocessor controlled displaying, monitoring and controlling device.

Input

The device supports one interface for the connection of:
- RTD (for Pt100).

Technical data see chapter 14 Specification or the corresponding designation on the label on the housing.



Switching output and alarm

The GIR 2000 Pt features one switching output, which can be configured as 2-point-controller or min./max. alarm.

The state of the switching output is displayed with the LED's "2".

An upcoming alarm condition is displayed by LEDs "alarm", "max" and "min".

Before the GIR 2000 Pt can be used, it has to be configured for the customer's application.



By calling a configuration menu (configuration of the measuring input, configuration of the analog output, configuration of the output function, offset- and slope-adjustment) the measurement and regulation of the device will be deactivated.

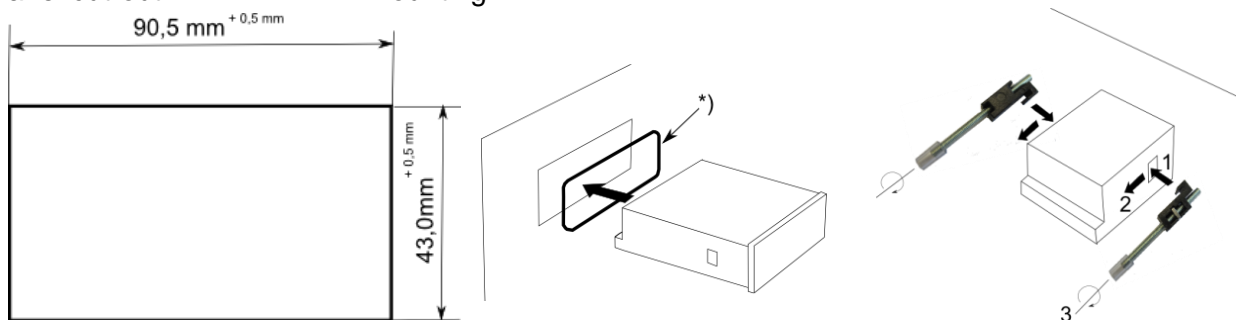
By leaving the menu the device will be reinitialized and the measuring/regulation will be started again.

At the input function "counter" the counter state will be reset by leaving the menu.

3. Mounting in panels / housings

Panel cut-out

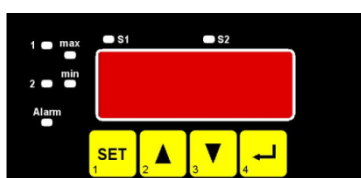
Mounting



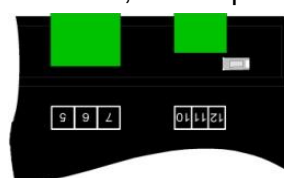
*) sealing GGD4896 is necessary for IP 65! Mount carefully for reliable tightness!

4. Display and operating elements

Front:



Backside, from top:



4.1. Display elements



Main display:

Display element to show minimum / maximum and measuring value.
It also displays errors and parameters.



LED 1:

without function



LED 2:

Indicates the state of output



LED alarm:

indicates state of alarm



LED max:

lights up when max. alarm



LED min:

lights up when min. alarm



LED S2:

without function



LED S1

Without function

4.2. Operating elements



Button 1:

activates menu "Switching points and alarm boundaries"

Button 1 + 5, >2s: activates menu "Configuration of Output functions"

Menu: **save value or step** to next parameter



Button 2:

display max. value

button 2 + 5, >2s: activates menu „Select input signal“

button 2 + 3, >2s: reset min-/max. value

Menu: press short = increase value

press long = roll-function with overflow-function *)



Button 3:

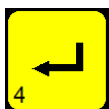
display min. value

button 3 + 5, >2s: activates menu „Offset- and slope adjustment“

button 3 + 2, >2s: reset min-/max. value

Menu: press short = decrease value

press long = roll-function with overflow-function *)

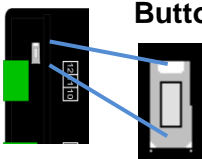


Button 4:

button 4 + 5: activates menu „Scaling analog output“

Menu: **cancel or terminate** the **dialog**.

value changes which are not saved with SET will be discharged.



Button 5:

button on the backside (between connection terminals and rear panel)

Function refer button 1..4

*) The buttons 2 and 3 are featured with a 'roll-function'. When pressing the button once the value will be raised (button 2) by one or lowered (button 3) by one. When holding the button pressed for longer than 1 sec. the value starts counting up or down, the counting speed will be raised after a short period of time. The device also features a 'overflow-function', when reaching the upper limit of the range, the device switches to the lower limit, vice versa.

5. Electric connection

Wiring and commissioning of the device must be carried out by skilled personnel only.



ATTENTION

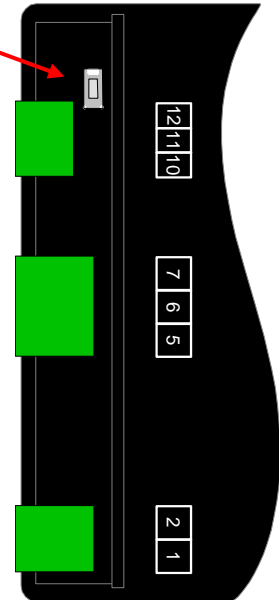
Use the device only for panel mounting or with suitable electrically housings.
The electrical connections must be protected against direct contact
Other way, the risk of an electric shock exists.
In case of wrong wiring the device may be destroyed. We cannot assume any warranty in case of wrong wiring of the device.

5.1. Terminal assignment: Standard

12	Pt100
11	Pt100
10	Pt100
7	Output 2: Relay, break contact *1 *2
6	Output 2: Relay, make contact *1 *2
5	Output 2: Relay, input *1 *2
2	Supply voltage 230 V AC *1
1	Supply voltage 230 V AC *1

*1 = or the corresponding designation on the label on the housing

button 5



5.2. Connection data



ATTENTION

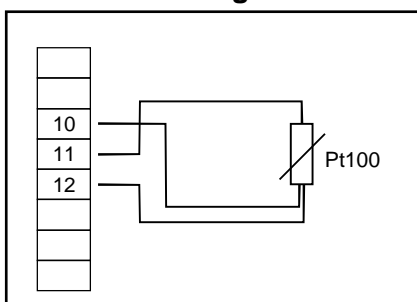
These limits must not be exceeded (not even for a short time)!

	between terminals	typical		limitations		notes
		min.	max.	min.	max.	
Supply voltage	1 - 2	207 V _{AC}	244 V _{AC}	0 V _{AC}	253 V _{AC}	or according to the type plate
Output 2: Relay: change-over contact	5, 6, 7				253 V _{AC} 10A ohmic load	or according to the type plate
Input Pt100	10 - 12			0 Ω	∞ Ω	active signal not allowed

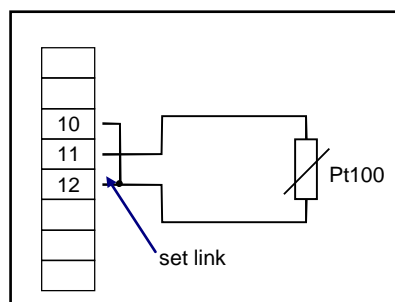
5.3. Connecting an input signal

Please take care not to exceed the limitations of the inputs when connecting the device as this may lead to destruction of the device.

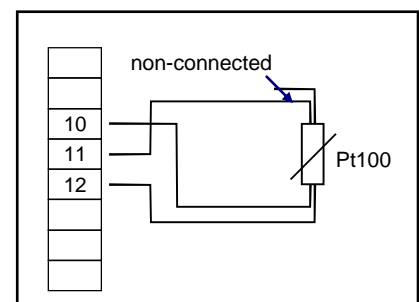
5.3.1. Connecting a Pt100 RTD probe



Pt100-RTD probe (3-wire)



Pt100-RTD probe (2-wire)



Pt100-RTD probe (4-wire)

5.4. Connecting switching outputs



In order to avoid unwanted or wrong switching processes, we suggest to connect the device's switching outputs after you have configured the device's switching outputs properly.



Please take care that you must not exceed the limits of the voltage and of the maximum current of the switching outputs (not even for a short period of time). Please take extreme care when switching inductive loads (like coils or relays, etc.). Because of their high voltage peaks, protective measures (e.g. RC-element) to limit these peaks have to be taken.

When switching high capacitive loads, it is necessary to limit the switch on current by a suitable current limiter (e.g. resistor) to the allowed maximum current.


Take care of light bulbs. Cause a low cold resistance, a high switch on current is possible.

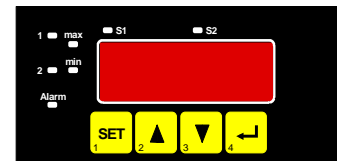


In case of configuring one output as an alarm output, the output will be active in idle state (no alarm present). The output relay opens when an alarm condition occurred

6. Configuration of the measuring input

Calling the Configuration



Press the pushbutton on the rear side (button 5) and  together for >2 seconds.




General description and notes to the operating of the menu

The display shows F_1 , L_1 ('INPUT').

With button  you can go to the next parameter resp. the new value will be **saved**

With button  or  you can go to the parameter setting and adjust its value there.




With button  settings will be **cancelled** resp. terminated. Changing, are not saved with SET, will be discharged.



If no key is pressed > 10 sec. the adjustment will be cancelled, the changing discarded and it will be changed to the parameter view.

If no key is pressed > 60 sec. the menu will be automatically closed.

6.1. Configuration: select filter

Parameter 	Value  	Description	Notes
$F_i L_t$	OFF, 0.01 ... 2.00 s	filter	see info filter

Finish configuration:

Press Button  till display shows inP again.

Now press button  to leave the menu.


$F_i L_t$: filter

this filter is a digital replica of a low pass filter..

If the digital filter is “off” the internal mains hum suppression of the GIR is deactivated. This adjustment is ideal for fastest response to even small changes of the signal, but the display gets more turbulent. Therefore the filter should be set to at least 0.01 for ‘ordinary’ application

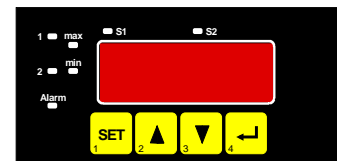
7. Configuration of the output functions

Calling the Configuration

Press the pushbutton on the rear side (button 5) and  together for >2 seconds.



The display shows “outP”.


The output can be scaled arbitrary within the display range.



General description and notes to the operating of the menu

With button  you can go to the next parameter resp. the new value will be **saved**

With button  or  you can go to the parameter setting and adjust its value there.

With button  settings will be **cancelled** resp. terminated. Changing, are not saved with SET, will be discharged.






If no key is pressed > 10 sec. the adjustment will be cancelled, the changing discarded and it will be changed to the parameter view.

If no key is pressed > 60 sec. the menu will be automatically closed.



A change of the input configuration can possibly influence the switching points and alarm boundaries. Therefore the output configuration and switching points / alarm boundaries adjustment should be done after the input configuration has been finished.

7.1. Selection of the output function

Output 	Function  	Output 2 (change-over contact)	Note	See chapter
<i>outP</i>	<i>no</i>	off	No output, only display unit	--
	<i>2P</i>	Switching function	2-point-controller	7.2
	<i>ALF2</i>	Min-/Max-alarm, inverse	Min-/Max-alarm, common	7.3

Finish configuration:

Press Button  till display shows *outP* again.




Now press button  to leave the menu.

The settings for the switching and alarm points can be made later in an extra menu.

7.2. 2-point-controller

This chapter describes how to configure the device as a 2-point-controller and how to adjust the switching values. This instruction demands that you selected “2P” as output function like it is explained in chapter 0.

The display must show *OutP*.

Parameter 	Value  	Note
<i>l.on</i>	Min. display range ... Max. display range	turn-on-point of switching function
<i>l.off</i>	Min. display range ... Max. display range	turn-off-point of switching function
<i>l.dEL</i>	<i>0.01 ... 2.00</i>	Delay of switching function (see info switching delay)
<i>l.Err</i>	<i>off</i>	Inactive in case of an error
	<i>on</i>	Active in case of an error

Finish parameter input:

Press Button  till display shows *outP* again.

Now press button  to leave the menu.

Switching delay:

The value for the switching-delay is the time [in sec] the device waits at least to switch on the output again after the output was switched off..




7.3. Min-/Max-Alarm

This chapter describes how to adjust the device's alarm boundaries for min-/max-alarm-monitoring. This instruction demands that you selected “AL.F1” as output function like it is explained in chapter 0.



The alarm-outputs are inverted!
This means, that the output will be active when there is no alarm!

The display must show *OutP*.

Parameter 	Wert  	Beschreibung
<i>AL Hi</i>	<i>ALL o</i> ... Max. display range	maximum alarm-value
<i>ALL o</i>	Min. display range ... <i>AL Hi</i>	minimum alarm-value
<i>A.dEL</i>	<i>0 ... 9999</i>	Alarm delay. Time [in sec] before the alarm gets active.

Finish parameter input:

Press Button  till display shows *outP* again.

Now press button  to leave the menu.

8. Offset- and slope-adjustment

The offset and slope-adjustment function can be used for compensating the tolerance of the used sensor.




The size of the offset- and slop-menu depends on the selected input signal.
Therefore it could happen that a menu item is not available or that the whole menu can not be called at all.



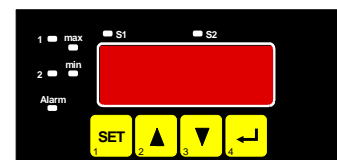
Check your offset and slope-adjustment after changing the input configuration.

Calling the configuration

Press the pushbutton on the rear side (button 5) and  together for >2 seconds.



The display shows "OFFS".


The output can be scaled arbitrary within the display range.



General description and notes to the operating of the menu

With button  you can go to the next parameter resp. the new value will be **saved**

With button  or  you can go to the parameter setting and adjust its value there.

With button  settings will be **cancelled** resp. terminated. Changing, are not saved with SET, will be discharged.






If no key is pressed > 10 sec. the adjustment will be cancelled, the changing discarded and it will be changed to the parameter view.

If no key is pressed > 60 sec. the menu will be automatically closed.

8.1. Menu calling and adjustment

The display must show **OFFS**.

Parameter 	Value  	Note
OFFS	$\pm 10\%$ FS	Offset The input of the offset will be in digit or °C/°F. The value that had been set will be subtracted from the measured value.
SCAL	$\pm 5.00\%$	Scale

Finish parameter input:

Press Button  till display shows **OFFS** again.

Now press button  to leave the menu.

Calculate correction:

Temperature:

Displayed value = (measured value – zero point offset) * (1 + slope adjustment [% / 100])

Examples for offset- and slope-adjustment:

Example 1: Connecting a Pt100-sensor (with an offset error depending on the cable-length of the sensor)

The device displays the following values (without offset- or slope-adjustment): 2°C at 0°C and 102°C at 100°C

Therefore you calculated: zero point: 2

slope: $102 - 2 = 100$ (deviation = 0)

You have to set: offset = 2 (= zero point-deviation)

scale = 0.00

9. Switching points and alarm-boundaries

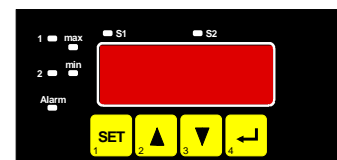


The difference between this menu and the output configuration menu is that only in the output configuration menu it is possible to select the output function and to adjust the delay and the preferred state of switching functions.

Calling the Menu



Press the  for >2 seconds.


Depending on the configuration you have made in the output configuration menu you will get different display values. Please follow the specific chapter for further information.



General description and notes to the operating of the menu

With button  you can go to the next parameter resp. the new value will be **saved**

With button  or  you can go to the parameter setting and adjust its value there.

With button  settings will be **cancelled** resp. terminated. Changing, are not saved with SET, will be discharged.



If no key is pressed > 10 sec. the adjustment will be cancelled, the changing discarded and it will be changed to the parameter view.

If no key is pressed > 60 sec. the menu will be automatically closed.




9.1. Menu calling

Selected <i>OutP</i>	Note	Go on in chapter
<i>no</i>	No output, device is only display <i>Menu not available</i>	--
<i>2P</i>	2-point-controller	9.2
<i>ALF1</i>	min-/max-alarm, common	9.3

9.2. 2-point-controller

This chapter describes device how to adjust the switching values of the device used as a 2-point-controller. This instruction demands that you selected "2P" as output function like it is explained in chapter 0.

The display must show *1.on*.

Parameter 	Wert  	Beschreibung
<i>1.on</i>	Min. display range ... Max. display range	turn-on-point of switching function
<i>1.off</i>	Min. display range ... Max. display range	turn-off-point of switching function

Finish parameter input:

Press Button  till display shows *1.on* again.

Now press button  to leave the menu.

Example: You want to control the temperature of a heating coil, with a hysteresis of +2°C, to 120°C. Therefore you will have to select the turn-on-point "1.on" to 120°C and the turn-off-point to "122°C". When your heating coil temperature falls below 120°C it will be turned on. When the temperature rises above 122°C the heating coil will be turned off.

Note: Depending on the inertia of your heating coil an overshooting of the temperature may be possible.

9.3. Minimum/maximum-alarm

This chapter describes how to adjust the device's alarm boundaries for min-/max-alarm-monitoring. This instruction demands that you selected "AL.F1" as output function like it is explained in chapter 0.




ATTENTION

The alarm-outputs are inverted!

This means, that the output will be active when there is no alarm!

The display must show *AL.Hi*.

Parameter 	Wert  	Beschreibung
<i>AL.Hi</i>	<i>ALLo</i> ... Max. display range	maximum alarm-value
<i>ALLo</i>	Min. display range ... <i>ALHi</i>	minimum alarm-value
<i>R.dEL</i>	<i>0 ... 9999</i>	Alarm delay. Time [in sec] before the alarm gets active.

Finish parameter input:





Press Button  till display shows **AL.Hi** again.

Now press button  to leave the menu.

Example: You want to have a temperature alarm-monitoring of a greenhouse. The alarm should start when the temperature rises above 50°C or falls below 15°C.
Therefore your settings will be 50°C for the maximum alarm-value "AL.Hi" and 15°C for the minimum alarm-value "AL.Lo".
=> The alarm will be starting after the temperature rises above 50°C and stays above 50°C for the entered delay time or after it had been falling below 15°C and stays below 15°C for the entered delay time.

10. Min-/max-value memory:

The device features a minimum/maximum-value memory. In this memory the highest and lowest performance data is saved.

Button			Note
	Min. value	Press shortly	the device will display "Lo" briefly, after that the min-value is displayed for about 2 sec..
	Max. value	Press shortly	the device will display "Hi" briefly, after that the max-value is displayed for about 2 sec.
 and 	Erase values	Press together for 2 s	the device will display "CLr" briefly, after that the min/max-values are set to the current displayed value.

11. Alarm display

If an output function with min-/max-alarm (out = AL.F1) is selected, LEDs will display the min-/max-alarm in case of its appearance.

Min-alarm: LEDs "alarm" and "min" glow

Max-alarm: LEDs "alarm" and "max" glow

If a system-alarm or system-error occurs, it will be handled like a min- and max-alarm. In this case the LEDs "min", "max" and "alarm" will glow. Additionally the error code will be displayed.

12. Error codes

When detecting an operating state which is not permissible, the device will display an error code. The following error codes are defined:

Err.1: Exceeding of the measuring range

Indicates that the valid measuring range of the device has been exceeded.

Possible causes: - Sensor broken.
- Sensor shorted.

Remedies: - The error-message will be reset if the input signal is within the limits.
- check sensor.

Err.2: Values below the measuring range

Indicates that the values are below the valid measuring range of the device.

Possible causes: - Sensor shorted.
- Sensor broken.

Remedies: - The error-message will be reset if the input signal is within the limits.
- Check sensor.

Err.7: System-error

The device features an integrated self-diagnostic-function which checks essential parts of the device permanently. When detecting a failure, error-message Err.7 will be displayed.

Possible causes: -Valid operating temperature has exceeded o has fallen below the valid temperature range.
- Device defective.

Remedies: - Stay within valid temperature range.
- Exchange the defective device.

Err.9: Sensor defective

The device features an integrated diagnostic-function for the connected sensor or transmitter. When detecting a failure, error-message Err.9 will be displayed.

Possible causes: - Sensor broken or shorted Pt100.

Remedies: - Check sensor or exchange defective sensor.

13. Decommissioning, reshipment and disposal

13.1. Decommissioning

Always disconnect the device before from its supply before decommission (e.g. at fuse). Valid general safety requirements shall be observed.

Please also make sure that connected Loads are disconnected also and are in a safe state.

13.2. Reshipment and disposal



All devices returned to the manufacturer have to be free of any residual of measuring media and other hazardous substances.

Measuring residuals at housing or sensor may be a risk for persons or environment



Use an adequate transport package for reshipment, especially for fully functional devices. Please make sure that the device is protected in the package by enough packing materials.

Add the completed reshipment form of the GHM website

<http://www.ghm-messtechnik.de/downloads/ghm-formulare.html>.



The device must not be disposed in the unsorted municipal waste! Send the device directly to us (sufficiently stamped), considering the above if it should be disposed. We will dispose the device appropriate and environmentally sound.

14. Specification

Absolute maximum ratings: see chapter 5.2. (Connection data)

Measuring input:

Input type	Signal I	Range	Resolution	Note
RTD probes	Pt100	-50.0 ... +200.0 °C (-58.0 ... +392.0 °F)	0.1 °C / °F	3-wire-connection max. perm. line resistance: 20 Ohm
		-200 ... +850 °C (-328 ... +1562 °F)	1 °C / °F	

Display range: (voltage-, current and frequency-measurement)
-1999 ... 9999 digits, initial value, terminal value and decimal point position arbitrary. Recommended range: < 2000 Digit

Accuracy: (at nominal temperature)

RTD: < 0.3% FS ±1Digit

Temperature drift: < 0.01% FS / K (Pt100 – 0.1 °C: < 0.015% FS / K)

Measuring freq.: approx. 4 measures / sec. (temperature-measurement) or

Display: approx. 13 mm height, 4-digit red LED-display

Operating: 4 push-buttons or by interface

Outputs: depending on design model

Switching outputs:^{*2} 1 volt-free Relay-output (standard)
or corresponding to designation on the label on the housing

Output: Relays: change-over contact, breaking capacity: max 10 A (ohmic load), 250 V_{AC}

Response time: ≤ 0.5 s

Functions: 2-point, min-/max-alarm common

Switching points: arbitrary

Power supply: 230 V_{AC} (± 10%), 50/60 Hz (standard)
or corresponding to designation on the label on the housing

Isolation: Overvoltage category II acc. EN 61010-01

Consumption: approx. 4 VA (analog output options approx. 5.5 VA)

Nominal temp.: 25 °C

Ambient conditions:

Operating ambient: -20 to +50 °C

Relative humidity: 0 to 80 %RH (non condensing)

Storage temp.: -30 to +70 °C

Max elevation: 5000 m above sea level

Housing: Panel mounting with brackets

Panel cut-out: 90.5^{+0.5} x 43.0^{+0.5} mm (B x H)

Dimensions: 96 x 48 mm (front dimensions W x H).

Installation depth: approx. 115 mm (incl. screw-in/plug-in clamps)

Connection: screw-in/plug-in clamps

Cross-sections: Signal terminals
0.14 to 1.5 mm² single-wire, fine-wire with sleeve
(sleeves with insulating enclosures max. 1 mm²)

Supply terminals
0.14 to 2.5 mm² single-wire, fine-wire with sleeve
(sleeves with insulating enclosures max. 1,5 mm²)

Protection data

Prot. class front: IP 54 acc. EN 60529, with sealing GGD4896: IP 65

Prot. class housing and connections:

IP 20 acc. EN 60529

Contamination class: 2 acc. EN 61010-01

Directives and standards: The instruments confirm to following European Directives:

2014/35 EU Low Voltage directive

2014/30/EU EMC Directive

2011/65/EU RoHS

Applied harmonized standards:

EN 61326-1 : 2013 emissions level: class B
emi immunity according to table 2
Additional fault: <1 %

EN 61010-1 : 2011