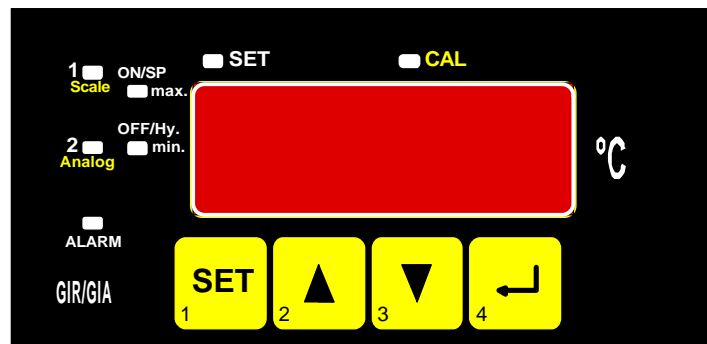# Connecting and Operating Manual

GIR200 Pt100

Version: 4.06

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In accordance with
EN50081-1 and EN50082-2
for unrestricted use in
housing and industrial areas

This connecting and operating manual may be subject to technical alternations.

Introduction

The GIR1002 Pt100 is a micro-processor controlled temperature controller for universal application.

The large 4-digit numeric LED as well as seven additional LEDs ensure a clear and well legible display of all measuring values and operating parameters.

The GIR200 Pt100 is designed for direct connection of a Pt100 temperature sensor in accordance with DIN 43760, CEI 751, BS 1 904 and NFC 42-330.

All parameters and limit values can be entered via four buttons located at the front side of the device.

The front side of the controller is splash water proof and wipe resistant fulfilling all requirements of the IP65 rating.

All programmable parameters of the GIR200 Pt100 are stored in an EEPROM and in case of a current failure they will be safe for at least ten years.

The GIR200 Pt100 is equipped with a self-diagnosis function constantly monitoring the essential parts of the controller for their trouble-free operation. Together with the self-diagnosis function the monitoring functions for „breaking of the measuring sensor" and „sensor short-circuit" as well as values falling below or exceeding the limited range ensure optimum operational reliability.

Safety Regulations

In order to exclude any risk whatsoever for the operator the following points have to be observed:

a) Immediately switch off the device in case of visible damage or obvious malfunctions.
b) Make it a rule to always disconnect voltage source and device before opening it up. The entire device and its connection have to be protected against touching electrical contacts after installation.
c) Standard regulations for operation and safety for electrical, light and heavy current equipment have to be observed, with attention having to be paid to national safety regulations (e.g. VDE 0100).
d) When connecting the GIR200 Pt100 to other devices (e.g. PC) the interconnection has to be designed most thoroughly as internal connections in third-party devices (e.g. connection GND with protective earth) may lead to undesired voltage potentials

⚠	**Warning:** When running electric devices parts of these devices will always be highly energised. Unless the warnings are observed serious personal injuries or damage to property may result. Skilled personnel only should be allowed to work with this device. For trouble-free and safe operation of the device please ensure professional transport, storage, installation and connection as well as proper operation and maintenance.

Skilled personnel

are persons familiar with installation, connection, commissioning and operation of the product and have a professional qualification relating to their job.

For example:

■ Training or instruction and qualification to switch on/off, isolate, ground and mark electric circuits and devices/systems.

■ Training or instruction according to the state of the art of safety technology to maintain and operate adequate safety equipment.

■ First-aid training.

Technical specification

Sensor connection:	Pt100, 4-wire, 3-wire- or 2-wire connection
	(automatic compensation of line resistance for 4-wire technology)
Measuring range:	-50.0°C up to +199.9°C
Resolution:	0.1 °C
Measuring accuracy:	±0.1% ± 1 Digit
Display:	red, 13mm high, 4 digit LED
Voltage Supply:	230V 50/60Hz or specified on device nameplate
Power consumption:	5W (230VAC), 3W (24VDC), 1.5W (12VDC)
Contol function:	2-level controller
Switching output:	1 volt-free relay, changeover contact
Switching capacity:	10A, 250V AC (ohmic load)
Nominal temperature:	25° C
Ambient temperature:	0 to 50° C
Atmospheric humidity:	0 to 80% r.h. (no condensing)
Housing:	standard rack housing,
	48 x 96 x 100 mm (H x W x D)
Mounting depth:	min 120mm (incl. plug-in terminal and wire connections)
Control panel cutout:	43 x 90.5 mm (H x W)
Connecting terminal:	screw-type/plug-in terminals

Electromagnetic compatibility

The GIR200 Pt100 corresponds to the essential protection ratings established in the Regulations of the Council for the Approximation of Legislation for the member countries regarding electromagnetic compability (89/336/EWG).

In accordance with EN50081-1 and EN50082-2 for unrestricted use in housing and industrial areas .

addtional error: < 1%

Electric connection

All connections for the GIR200 Pt100 are located at the back side of the device.
Connections are made via screw-type/plug-in terminals.
Make it a rule to mount screw-type/plug-in terminals while they are still loose and to put them on only afterwards. When mounting terminals already put on there is a risk that soldering eyelets may be pulled out. Please use suitable screw driver and do not tighten screws by force.

Supply voltage: 230V AC, 50/60Hz or instructions on device
Please make sure that the mains voltage applied corresponds to the supply voltage stated at the device nameplate.

Switching output: 1 volt-free relay (changeover contact)
**Switching capacity:**   10A, 250V AC (ohmic load)
When using inductives loads the contact has to be connected to a suitable RC-element (for example 'RC220').

Electric connection and commissioning of the device must be carried out by trained and skilled personnel.
Wrong connection may lead to the destruction of the controller, in which case we cannot assume any warranty.

Terminal Assignment

Terminal number	Max. terminal range	Assignment	Notes
1 2	2,5 mm²	Supply voltage Supply voltage	230 V AC 50/60 Hz or as specified on device housing
3 4 5	2,5 mm²	Relay, normally-closed Relay, input Relay, normally-open	Switching output
10 11 12 13	1,5 mm²	Sensor connection Sensor connection Sensor connection Sensor connection	Pt100

Assignment diagram

|	
1 2	Supply voltage
3 4 5	Switching output
	Configuration key
10 11 12 13	Pt100

GIR200 Pt100 (view from top)
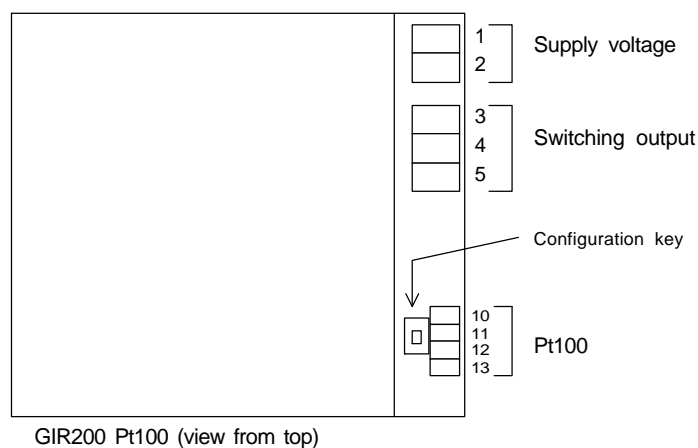
Sensor Connection

The Pt100 sensor should be connected to the GIR200 Pt100 by means of 4-wire technology as, then, line resistances (even if unsymmetrical) will not influence the measuring accuracy.

If 4-wire connection is not possible, the Pt100 sensor can also be connected to the GIR200 Pt100 by means of 2- or 3-wire technology according to the sketches below (please watch bridges!).
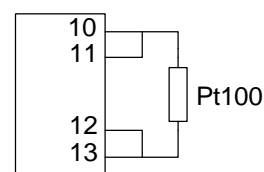
Long connecting lines may, however, lead to a wrong (too high) temperature display (fault depending on line resistance). In such a case we recommend to compensate for the fault by setting an offset value (shifting of zero point, please also refer to chapter „offset").
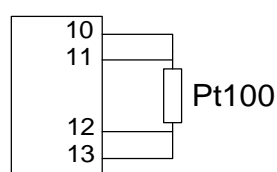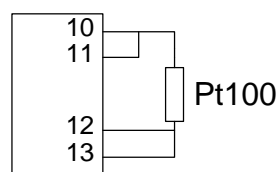
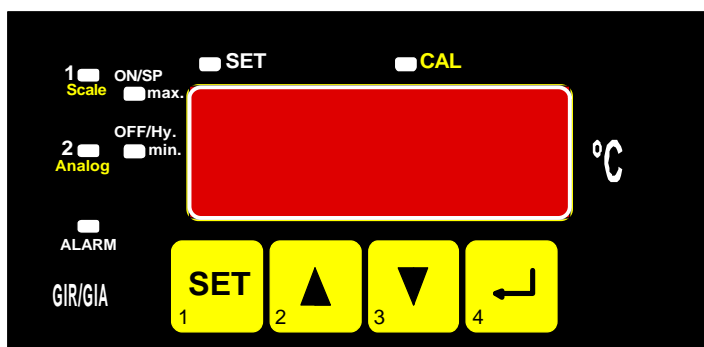4-wire connection   3-wire connection   2-wire connection

Operation

Display of Current Measuring Value

As soon as the supply voltage has been applied the GIR200 Pt100 will carry out a system test for approx. 8s. Then the current measuring value will be displayed, if a temperature probe is connected.

LED 1 gives status of relay 1 (LED illuminated: relay contact made).

Display/setting of making point for switching output 1

To be called up by:	pressing button 1 till LEDs „SET", „1" and „ON/SP" are illuminated.
Display:	The display shows the making point for switching output 1.
Setting:	Set making point/switching point by means of buttons 2 and 3. LEDs „1" and „ON/SP" will start flashing.

Buttons 2 and 3 are equipped with a scrolling function, i.e. the making point will be increased respectively decreased by 1 digit when button 2 respectively button 3 is pressed briefly (no more than 1 s). When pressing these buttons for a longer time (over 1 s) the values will start „scrolling" upwards respectively downwards. After „scrolling" of approx. 150 digits the „scrolling speed" will be increased by a factor of 10.

Use button 4 to acknowledge new making point.

LEDs „1" and „ON/SP" will stop flashing.

Switch over to display of current measuring value by pressing button 4 once again.

Display/setting of breaking point for switching output 1

To be called up by:	pressing button 1 till LEDs „SET", „1" and „OFF/Hy" are illuminated.
Display:	The display shows the breaking point for switching output 1.
Setting:	Set breaking point by means of buttons 2 and 3.
	LEDs „1" and „OFF/Hy" will start flashing.

Buttons 2 and 3 are equipped with a scrolling function, i.e. the making point will be increased respectively decreased by 1 digit when button 2 respectively button 3 is pressed briefly (no more than 1 s). When pressing these buttons for a longer time (over 1 s) the values will start „scrolling" upwards respectively downwards. After „scrolling" of approx. 150 digits the „scrolling speed" will be increased by a factor of 10.

Use button 4 to acknowledge new breaking point.

LEDs „1" and „OFF/Hy" will stop flashing.

Switch over to display of current measuring value by pressing button 4 once again.

Zero Point Offset (Offset):

The GIR200 Pt100 has been calibrated to the Pt100 sensor in our work in accordance with DIN43760 standards. After connecting it to the sensor and to the supply voltage the controller is ready for use without any further delay.

For some applications a zero point offset (offset) has to be carried out (e.g. for compensation of line resistance when using 2- or 3-wire technology for connection).

In such case please proceed as follows:

- **Press button 1 (front side)**
  Additionaly press miniature push button on the back side of the GIR200 Pt100 (located behind the sensor connection terminal) for approx. 1s till LED „CAL" (on front side) is illuminated.

- **LEDs „Scale", „OFF/Hy" and LED „CAL" are illuminated.**
  The display will show the offset value stored in the GIR200 Pt100 (zero point offset).
  Use buttons 2 and 3 to set new offset (LED „OFF/Hy" will start flashing) and acknowledge by pressing button 4.
  Example: If device displays 0.3°C instead of 0.0°C because of long probe connecting cables an offset value of 0.3 will compensate for this deviation, the display will be 0.0°C
  Please note: The value entered will influence the values displayed on the GIR200 Pt100. As a standard the offset value set should be 0.0.

Fault Codes

In case of unacceptable conditions in the system a fault code will be displayed.

Fault codes have been defined as follows:

FE 1:   Measuring range has been exceeded
This fault code indicates that the measuring range of the GIR200 Pt100 has been exceeded.
Possible fault cause: temperature to be measured exceeds 199.9°C
                               sensor damage
                               sensor connection interrupted
Remedies: FE 1 will be reset as soon as the measuring values are back within their permissible
          range. Please check your Pt100 sensor and sensor connecting cables.

FE 2:   Measuring values have fallen below permissible range
This fault code indicates that the measuring values of the GIR200 Pt100 have fallen below the permissible range.
Possible fault cause: temperature to be measured lower than -50.0°C
                               sensor damage
                               interruption/short-circuit in sensor connection
Remedies: FE 2 will be reset as soon as the measuring values are back within their permissible
          range. Please check your Pt100 sensor and sensor connecting cables.

Please Attention:
If fault codes are displayed or device has malfunction, please check first setpoints and offset settings of GIR200 Pt100.