



Installation and Operating Instructions

Compact controller series HT60
HT61 / HT62 / HT63 / HT64 / HT65

Contents

1. Safety

- 1.1 Intended usage
- 1.2 Non-Intended usage
- 1.3 Operator
- 1.4 Safety–relevant notices
- 1.5 Liability exclusion

2. General

- 2.1 Unpacking and inspecting
- 2.2 Standards and regulations

3. Important notice prior to commissioning

4. Introduction

- 4.1 Display and Illumination
- 4.2 Levels
- 4.3 Control elements

5. Commissioning

- 5.1 Installation
- 5.2 Electrical Connection
- 5.3 Connection diagram: mains and alarm terminal block
- 5.4 Connection diagram: sensor terminal block, inputs/outputs

6. Device configuration

- 6.1 Menu structure
- 6.2 Sub-menus on the Service level
- 6.3 Operating modes
 - 6.3.1 Automatic
 - 6.3.2 Program
 - 6.3.3 Optimisation
 - 6.3.4 Manual
 - 6.3.5 Locked
 - 6.3.6 Switch-on delay
- 6.4 Example configuration of the program function
- 6.5 Resetting to the factory setting
- 6.6 Adjustment of PID parameters

7. Alphanumeric codes (error messages)

8. Technical data

9. Connector assignment

10. Mounting plate / Fastening

11. Maintenance and Repair

12. Disposal



1. Safety

This chapter provides important information about the safe operation of your HT60 and the use of these instructions.

1.1 Intended Usage

The HT60 series regulator is a microprocessor-based temperature regulator for industrial applications which has its own surface-mount housing. The configurable regulator is used to impose control, according to the parameters set, on manufacturer-approved heating elements (resistive loads) with defined sensors.

1.2 Non-intended usage

All usage outside the scope of those described in Point 1.1 are non-intended usage and may be hazardous and/or lead to consequential damage.

1.3 Operator

Installation, electrical connection, commissioning, operating and maintenance of the HT60 may only be performed by trained professionals who have been authorised or instructed for these activities by the operating authority.

1.4 Safety-relevant notices

Safety notices in this guide are marked by symbols. These notices are placed immediately before the procedure step to which they apply and must be followed precisely in order to avoid hazardous situations for persons and property damage to objects.

The following pictograms are used to call attention to notices:



Attention! is used to call attention to potential health hazards or lethal situations.



Note! is used for notices which, if disregarded, could result in failures during operational processes.



Tip! is used to provide advice or additional information.

1.5 Liability exclusion

We herewith expressly serve notice that JCT Analysentechnik GmbH is not liable for any damage resulting from incorrect or negligent operation, maintenance or non-intended usage. This also applies to device modifications, attachments and conversions which could be detrimental to safety. In these cases the manufacturer's warranty is voided.

2. General

2.1 Unpacking and inspecting

The product must be inspected for possible shipping damage when it is unpacked. If damage is found then the freight carrier, railway company or postal authority is to be notified so that a damage report can be initiated.

2.2 Standards and regulations

This product complies with the following national and European regulations:



The "Low voltage equipment" directive (2014/35/EU)

The "Electromagnetic compatibility" directive (2014/30/EU)

3. Important notice prior to commissioning



According to EMC Directive 2014/30/EU, this device is only a component in an installation. Following incorporation in an installation or a system, the EMC Directive calls for repeated EMC testing. We refer to the fact that according to Directive 2014/30/EU, the commissioning engineer is obligated to observe this directive.

Following measurements made in practice, we interference-suppressed this device such that in operation with ohmic loads / heaters there should be no EMC interference. Above a load of 3 kW, a mains filter has to be used to ensure compliance with the prescribed limit values in accordance with EN 61326-1:2013 Chapter 7 (EN 55011, Group 1, Class B). Here we recommend the product Schaffner FN2020-16-06.



If an electrical heater or a heating device is used in unattended operation, we refer to the VDE (German association of electricians) regulations and the regulations from the professional associations which in such cases prescribe thermal monitoring (or a thermal limiter) or demand an intrinsically safe structure.



The following points can influence the control response and lead to critical operational states (overheating / fire hazard):

- Incorrect connection of mains cables and/or sensors
- Change of the control parameters (PID)
- Input of nonsensical temperature values, alarm and limiter parameters

The control device may only be installed and operated by trained specialists!

4. Introduction

4.1 Display and Illumination

The HT60 controller has a two-line character display with 16 characters/line and five keys. In the default state, the setpoint temperature is displayed in line 1 and the actual temperature in line 2.

SET :	R	50 °C
ACT :	H	38 °C

Additionally, the code for the set operating mode and a limiter alarm is displayed in line 1.

In line 2 an "H" is also shown if the heater is switched on, as well as codes for alarms and error messages. All codes are explained in Chapter 7 "Alphanumeric codes (error messages)".

After remaining a minute in one of the sub-menus the display jumps back to the default state.

If there is no operation in the default state within 30 minutes, the display illumination switches off. If the device is operated, the display illuminations switches on again. In the switched-off state the display is not illuminated.

(from software version 1.88)

In the service menu, the automatic deactivation of the display lighting can be switched off under "Light auto-off". The operating status of the controller can thus be visualized by means of lighting. (see also chapter 6.2).

4.2 Levels

Operator level:

Normal operating state if the controller is activated. Only the setpoint changes and the system information can be accessed here.

Service level:

You arrive in the Service level by entering a password. System parameters, such as the upper and lower alarm limit, alarm delay time, timer, PID parameters, as well as unit, language and sensor type, can be changed here. The various operating modes can also be selected.




Additional options:



In the purchased factory preprogrammed option package, the following menu items are additionally available on the Service level:

- Analog output
- External setpoint
- Program function





4.3 Control elements

Keys:

Meaning	Impact	Key
Escape	Back to the default state	
Button down	c) One step forward in the menu navigation d) Reduction of an input parameter in a sub-menu	
Reset	Reset of the limiter alarm. Deletes alarms triggered by the limiter. The limiter alarm may only then be deleted, however, once the cause for the alarm is eliminated.	

Button up	c) One step back in the menu navigation d) Increase of an input parameter in a sub-menu	
Enter	Confirmation of input of the settings made. Every change to a parameter in a sub-menu has to be acknowledged with this key!	

Key combinations:

 	Activate / deactivate controller. Attention must be paid that the Enter key is firstly pressed and held while the Esc key is then pressed.
 	A long keystroke (approx. 2s) deletes a pending alarm or an error message. The alarms may only then be deleted, however, once the cause for the error or alarm is eliminated. Resetting to factory setting (see Chapter 6.5)

5. Commissioning

Check the supply voltage on the type plate!

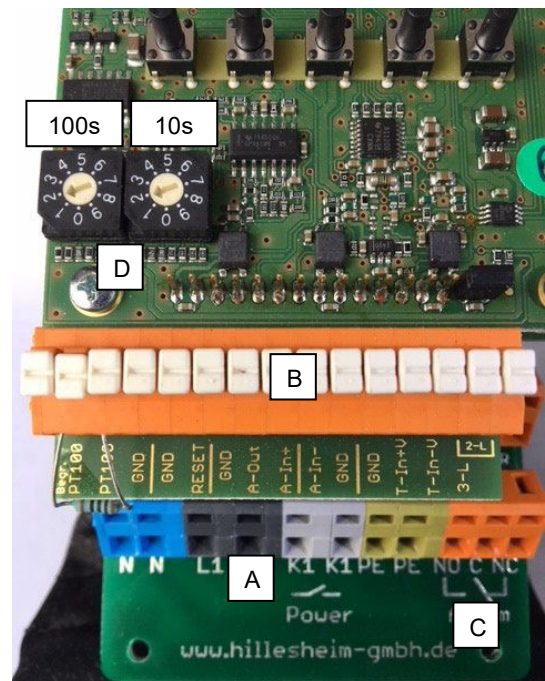


Controllers with option F24 in the type code only support PT100/PT1000 signals. Individual functions are only available from a certain firmware version. An update by customers is not possible.

Proceed as follows:

1. Perform assembly and electrical connection, apply supply voltage Chapter 5.1
2. Select Service level, undertake configuration of the system parameters (not applicable for factory configuration), set limiter temperature Chapter 6.2
3. Starting operation (Operator level → set setpoint, switch on controller) Chapter 6.1/6.2

- A Connection of mains and heater
- B Connection of measurement input/output
- C Alarm output (relay max. 24V; contact at rest -off-)
- D Limiter coding switch



5.1 Installation



Ensure that during installation and subsequent configuration of the controller, the load circuit is switched off. The controller should be assembled such that it is protected against impermissible humidity and strong contamination. The permissible ambient temperature of 0...+50°C may not be exceeded, even under unfavourable conditions.

1. Compare the supply voltage on the type plate with the mains connection voltage.
2. The controller is fastened to the corners of the cooling plate using 4 drill holes (∅ 4.2mm). The housing does not need to be opened for this. Use screws with 4 mm diameter, e.g. M4.

Physical separation of the controller and inductive loads / contactors has to be ensured.

5.2 Electrical Connection



Mains, actuator and measuring transducer connections have to be undertaken according to the connector assignment (Chapter 5.3 / 5.4).

The electrical cables have to be installed according the respective national requirements and the legal requirements (in Germany, e.g. VDE 0100). The device has protection class I in accordance with DIN 61010-1 / VDE 0411-1. Connection of the protective conductor to the load is established with internal terminals.


The controller has to be operated from a separate mains cable; no further control circuits (contactors, fans, etc.) may be directly connected from the connection terminals, they must be wired separately instead.

Use shielded measuring leads and earth them at one end. To avoid noise spikes on measuring/control lines, contactors and magnetic valves with adapted RC elements for suppression.

5.3 Connection diagram: mains and alarm terminal block

The following table describes the connector assignment for the mains and alarm terminal block from left to right:



No.	Description	Description	Colour
1	N	Mains voltage N	Blue
2	N	Heater N	Blue
3	L1	Mains voltage L1	
4	H	<p>Heater or jumper to K1. If the load is connected here, it is controlled directly from the controller triac. Alternatively, a jumper can be set from H to K1 on terminal 5. In this case the heater is connected on K1 of terminal 6. This protects the heater with an additional relay, which switches off with an alarm or error message and this interrupts the heating circuit unless you work with the limiter.</p> <p>If you work with the limiter, the relay K1 is not switched off with an alarm or error message. Instead of this, the limiter monitors the system with its preset temperature. If the limiter temperature exceeds the actual value, the relay K1 switches off and interrupts the heating circuit. The relay K1 is specified with 250V AC and 16A.</p> <p> The jumper from H to K1 is always factory set for safety reasons. It is recommend not to remove this jumper. If this is done nevertheless, the heating circuit is only driven by the controller triac. In the event of failure of the triac (breakdown), it may be permanently driven and therefore damage the heater. There is a fire hazard! The operator acts at their own risk!</p>	Black
5	K1	Relay K1 – 250V 16A	Grey
6	K1		Grey
7	PE	PE – protective conductor connection	Green
8	PE		Green
9	NO	Alarm relay; contact at rest -off- The alarm relay is only specified for low voltage up to max. 24V (1A)	Orange
10	C	Alarm relay; common contact	Orange
11	NC	Alarm relay; contact at rest -on-	Orange

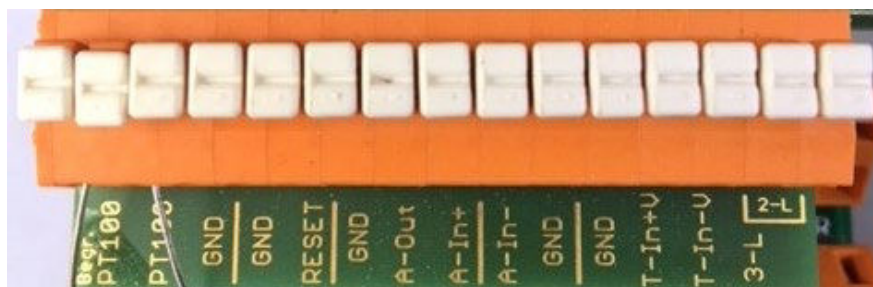
In normal operation of the controller, the alarm relay is switched on and connects NO and C. In the case of an alarm, the relay switches off and connects NC and C.



(from software version 1.88)

Alternatively, the alarm relay can also be used as a signal relay to display a good range of $\pm 10^\circ \text{C}$ of the current setpoint (see also section 6.2)

5.4 Connection diagram: sensor terminal block, inputs/outputs

The following table describes the connector assignment for the sensor terminal block from left to right:



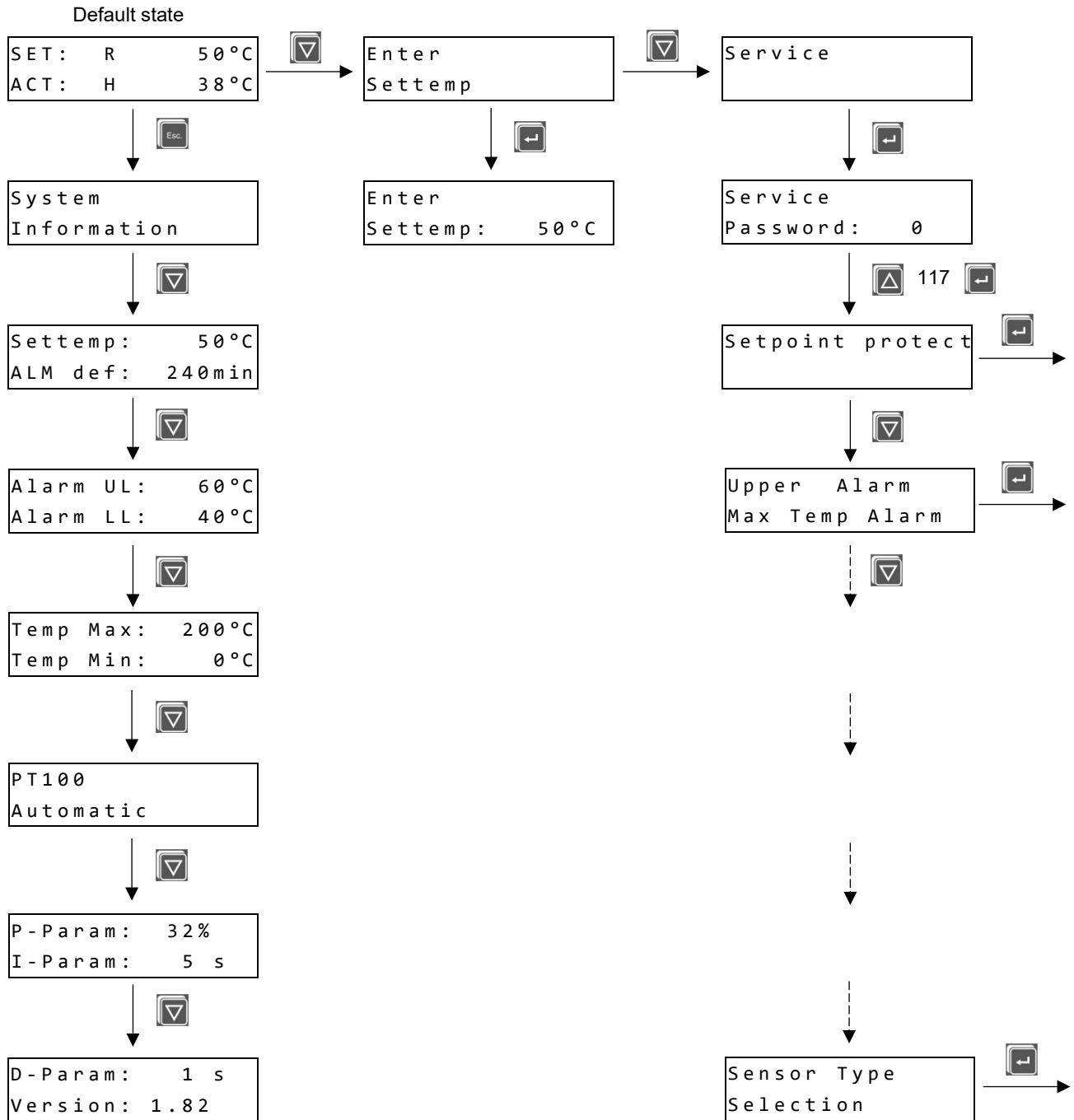
No.	Description	Description
1	Limiter PT100	Connections for PT100 of the limiter function The limiter monitors the actual temperature with a separate PT100 sensor which has to be connected in this case. If the actual temperature exceeds the limiter value, the relay K1 drops out and interrupts the heating circuit. The limiter temperature can be set with the decimal coding switch (see Chapter 5). The left coding switch defines the temperature in 100-degree steps. The right coding switch defines the temperature in 10-degree steps.
2	PT100  	Attention: The two coding switches must never be in the zero setting, as the limiter response is then undefined and faults can occur. If a load is controlled with the HT62, which has no 2nd sensor for the limiter function, a 100 Ohm resistor has to be connected to terminals 1 and 2. This does not ensure thermal protection by the limiter!
3	GND	Ground connection for optional shielding of the limiter PT100
4	GND	Ground connection of the external limiter reset
5	RESET	External limiter reset (e.g. from a control room)
6	GND	Ground connection of the analog output
7	A-Out	Analog output 0...10 V corresponds to 0...1000°C (optional) The analog output is part of the option package and has to be factory preconfigured.
8	A-In+	Input of the external setpoint 0...20 mA with polarity. The setpoint is calculated with the following formula: $\text{SetpointExternal} = (((\text{Temp Max} - \text{Temp Min}) / 10) * ((\text{ic} / 2) [\text{mA}]))) + \text{Temp Min}$ Here ic is the interface current in mA
9	A-In-	
10	GND	Ground connection for optional shielding of the analog input
11	GND	Ground connection for optional shielding of the temperature sensor
12	T-In+V **	Connection of the temperature sensor. Polarity has to be observed with temperature sensors.
13	T-In-V **	
14	3-L	Connection of the compensating cable with three-wire technology. If two-wire technology is used, a jumper has to be plugged between connection 14 and 15 on the contact strip above.
15	2-L (jumper)	Optional connection for jumper with two-wire technology

** Not applicable to controllers with F24 in the type designation (see Chapter 5.)

6. Device configuration

i Basic settings can be undertaken on the Service level. In addition, the controller is adapted to the control task and prepared for operation. The factory configuration has to be checked and possibly changed prior to initial operation.


6.1 Menu structure



6.2 Sub-menus on the Service level

A password has to be entered to get to the Service level and undertake changes or basic settings. Some additional options are only available as sub-menu if the option package has been purchased and factory preconfigured (these additional functions are greyed out in the following list).

Name of sub-menu / Display	Description
Ext. Settemp	Analog reference variable 0...20 mA; here 0 mA corresponds to the "Temp Min" value and 20 mA to the "Temp Max" value.
Setpoint protect	By activating this menu item, "Enter setpoint" is locked in the default state and then also no longer appears as a menu item. This avoids the setpoint being changed by unauthorized persons.
Upper Alarm Max Temp Alarm	Starting with the setpoint, the upper alarm limit can be entered here up to max. +50 degrees.
Lower Alarm Min Temp Alarm	Starting with the setpoint, the lower alarm limit can be entered here down to max. -50 degrees.
Enter Alarm defer Time	An alarm can e.g. be purposefully suppressed during the heating phase for the delay time entered (max. 240 min.). Changing this time, as well as changing the setpoint, starts the time interval afresh. Only low temperature alarms can be suppressed. The delay time ends when the setpoint is reached.
Enter Timer	The "Timer" menu item allows entries of 1...24 hours. If the switch-on delay operating mode is selected and the controller is activated, the heating process only begins once the set time has expired. During this time, the time remaining to the start appears in the first line of the "Default state display".
Fixpoint	This menu item determines whether a decimal point is displayed for the ACTUAL value.
Unit	Setting the unit of degrees Celsius or degrees Fahrenheit
Operation mode Selection	The following operating modes are selectable: <ul style="list-style-type: none"> ▪ Automatic ▪ Program ▪ Optimisation ▪ Manual ▪ Locked ▪ Switch-on delay See Chapter 6.3 for an explanation of the individual modes
Program	Up to 6 temperature/time settings in max. 6 steps are possible. Which temperature and time belong to which step is identifiable from the number behind the respective parameter. An example configuration of the program function is explained in Chapter 6.4.
Enter Temp Max	Upper temperature point of the controller scale
Enter Temp Min	Low temperature point of the controller scale
Enter P-Parameter	Input P parameter

Enter I - Parameter	Input I parameter
Enter D - Parameter	Input D parameter
Language Selection	Selection of menu language: German or English
Enter Password	The password for the Service menu can be changed here. The factory setting for the password is "117".
Sensor type Selection	Temperature sensors supported: <ul style="list-style-type: none"> ▪ PT100 ▪ PT1000 ▪ Ni120 ** ▪ FeCu-Ni type J ** ▪ NiCr-Ni type K **
Alarm Relais 	Definition of the functionality of the relay for outputting an alarm or a signal. Selection "On": Alarms such as under or over temperature can be output. Selection "Off": The relay is used to signal a good range of ± 10 °C from the currently set target value. If the relay is used as a signal relay (setting "Off"), the alarm function is deactivated! No critical operating states can be visualized or output to a control room via the relay contacts.
Start Slow	Automatic step-by-step increase in the setpoint temperature from 1 to a maximum of 10 °C / min until the actual operating temperature is reached. (Display "I") The device then switches to the "Automatic" operating mode. This function can be used for slow / gentle heating of consumers with high power. If there is no soft start, the function must be set to "Off". When executing the "Start Slow" function, you should also pay attention to the setting of the lower alarm value. If the alarm limit is selected to be lower than the temperature levels for slow start, undertemperature alarms can occur during the heating up. However, this does not affect operation.
Light Auto-Off	Setting the display lighting. Selecting "On": The display lighting indicates the operating status of the controller. The lighting is permanently activated during operation. Select "Off": The lighting is only activated during operation. If no button is pressed for 30 minutes, the lighting switches off.

** Not applicable to controllers with F24 in the type designation (see Chapter 5.)

6.3 Operating modes

6.3.1 Automatic (display "R")

Normal control operation to the selected temperature setpoint

6.3.2 Program (display "SET:P0 ...")

The operating mode program only works after prior configuration of the relevant temperature/time steps in the Program menu item. A maximum of 6 program steps can be set. The end of the program always has to be defined in the last program step. The following options are available here:

- Rep = Program loop is started again at the end of the last program step
- Auto = At the end of the last program step, the controller goes into automatic mode and drives to the predefinedsetpoint. Attention: If the difference between the predefined setpoint and the temperature value in thesecond to last program step is higher than the alarm limits set, a temperature alarm may occur onswitching to the automatic mode.
- Off = At the end of the last program step, the controller switches off

6.3.3 Optimisation (display "O")

Optimisation can only take place in the steady state of the control system (control deviation max. $\pm 0.3K$). After switching into the optimization mode, the system waits until the temperature has stabilised within narrow limits. If stabilisation is not possible, the process is aborted and the system switches to automatic operation.

Under the "System Information" menu, the message "Opt. failed" is displayed. Should the temperature stabilisation be successful, the system starts to excite oscillation in the control loop. The PID parameters are determined in this process. Once the PID determination has run successfully, the new PID data record is saved and the "Opt. successful" text is displayed in the "System Information" menu. The factory preset PID parameters are largely compatible with our loads. Optimisation is therefore not required.





6.3.4 Manual (display "M")

In the "M" operating mode for manual operation, the set value for heating can be changed on a percentage basis. Attention: In this operating mode there is no control and therefore also no switching off. The operator always has to oversee the process.

6.3.5 Locked (display "-")

By selecting the Locked operating mode, the controller is deactivated and can only be subsequently reactivated by entering the password and then selecting an operating mode in the Service menu.

6.3.6 Switch-on delay (display: "Timer: time to start")

By entering a number of hours in the "Timer" menu item, subsequent selection of the "Switch-on delay" operating mode and activation of the sensor (key combination  ) the controller switches to heating after the timer expires. The current remaining runtime to the start is always shown in the display.

6.4 Example configuration of the program function

Step	Temperature [°C]	Time [min]	Display
1	60	3	SET:P0 60°C
2	70	8	SET:P1 61..62..63.. ..70°C
3	70	18	SET:P2 70°C
4	95	30	SET:P3 71..72..73.. ..95°C
5	0	Off	SET:P4 SET: - 60°C
6	0	0	

The sequence of the program entered starts with switching to the "Program" operating mode and activation of the controller. The controller accepts the 1st temperature value as the new setpoint. Until the temperature is attained, the display P0 is displayed for program step 0.

After attaining the temperature, the time starts to run and P1 appears in the display. In the example case, this temperature is now maintained for 3 min. Thereafter, the setpoint is set to 70°C and is increased incrementally within the next 5 min. As soon as 70°C is attained, the display changes to "P2". 70°C is kept constant for the next 10 min.

The display then jumps to "P3", the new setpoint (95°C) is accepted and in turn is approached within the next 12 min. Once the 95°C is attained, the display jumps briefly to "P4" and the controller switches off.



The setpoint from step 1 is now showed on the display.




If the difference between the last and first program setpoint (in the example 35°C) or between the last program setpoint (in the example 95°C) and the setpoint saved in the automatic mode is greater than the max. alarm limit set (e.g. +10°C), the program end generates a high temperature alarm. This can be acknowledged as soon as the actual temperature has again dropped below the set max. alarm limit.

6.5 Resetting to the factory setting

The controller can be reset to the factory setting. All parameters and the password are then overwritten with the factory configured values. To reset, the controller must firstly be separated from the power supply.

In the switched-off state, the key combination   is pressed and held while the power supply is switched on again.

As soon as "PC-Init" appears in the display, the keys can be released again. The  key is then pressed. The controller is reset and restarted.

6.6 Adjustment of the PID parameters

In general, the controller is matched to our heating systems and it is not necessary to adjust the PID parameters. In individual cases, an adjustment may be necessary, e.g. for very powerful heating systems. The parameters are adjusted in 3 steps.


1. The P parameter essentially determines the speed at which the setpoint is controlled.
 If the heating reaches the actual temperature only very slowly, increase the setpoint → Increase P-value
 The heating oscillates strongly and for a long time above → Reduce the P-value
 Control behavior good → not change P-value

2. The I parameter determines the reset time of the heating.
 The controller reacts slowly → Reduce the I-value
 The controller reacts too quickly → Increase I-value
 The controller reacts well → not change I-value



3. The D parameter influences the temperature fluctuations with fast heating.
 The controller swings over → Increase D-value
 Controller behavior is unstable → Reduce D-value
 The controller reacts well → not change the D-value

7. Alphanumeric codes (error messages)

Upper display line:

Alphanumeric code	Meaning	Action
-	Controller switches off	--
C	Automatic control operation	--
P	program operation	--
M	Manual operation	--
O	Optimisation	--
Timer	Switch-on delay	--
A	Limiter alarm	Reset with  key. The cause of the alarm must be previously eliminated.
E	Internal error (hardware)	The error cannot be rectified by the user. The device as to be sent to the manufacturer for repair.
I	Start Slow	--

Lower display line:

Alphanumeric code	Meaning	Action
H	Heater on	--
A	Low/high temperature alarm	Reset with   double keystroke. Acknowledgement of a high temperature alarm is only possible once the actual temperature has dropped below the max. alarm limit again. A low temperature alarm is automatically acknowledged as soon as the actual temperature drops below the alarm limit.
E	Errors with one of the following additional codes:	
b	Sensor break	Replace temperature sensor
s	Sensor short-circuit (only with Ni120, PT100, PT1000)	Check temperature sensor and measurement input
r	uple reverse polarity	Check measurement input
h	Setpoint outside permitted limits	Check setpoint and "Temp. max." parameter. Decrease setpoint or increase "Temp. max."
i	Internal error	The error cannot be rectified by the user. The device has to be sent to the supplier for repair.

8. Technical data

	HT63	HT61, HT62	HT64	HT65
Power supply	230V AC 50/60Hz (optional 115V AC)	230V AC 50/60Hz (optional 115V AC)	230/400V AC 50/60Hz	230V AC 50/60Hz
Switching power	2300W (10A)	3680W (16A)	3x2300W (3x10A)	1x4600W (1x20A)
Controller output	Electronic switch (triac) 10A	Electronic switch (triac) 16A	Solide State Relais	Solide State Relais
Inputs/outputs	Alarm relay 24V/1A Analog output 0 - 10V Analog input 0 - 20mA			
Max. terminal cross section	Power supply board 2.5 ² ; sensor board 0.75 ²			
Protection type	I			
DIN 40050 protection type	IP65 in the connected state			
Ambient temperature	0...+50°C (storage temperature -40°C to +70°C)			

The controller's own consumption is around 3 watts. The power loss on the triac is around 1 watt per channel and switched ampere, depending on the duty cycle. With a load of 10 amps and a duty cycle of 50%, the power loss is around 5 watts.

Setting ex works for HT63					
Control range	PT100	PT1000	FeCu-Ni	NiCr-Ni	Ni120
0 – 100°C	HT63 - 10P	HT63 – 10M	HT63 – 10F	HT63 – 10N	HT63 – 10C
0 – 200°C	HT63 - 20P	HT63 – 20M	HT63 – 20F	HT63 – 20N	HT63 – 20C
0 – 250°C	HT63 - 25P	HT63 – 25M	HT63 – 25F	HT63 – 25N	HT63 – 25C
0 – 500°C	HT63 - 50P	HT63 – 50M	HT63 – 50F	HT63 – 50N	
0 – 800°C			HT63 – 80F	HT63 – 80N	

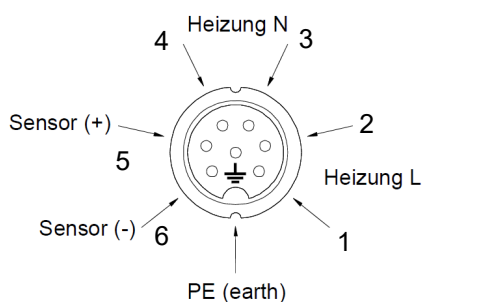
Setting ex works for HT61 and HT62	
Sensor type	PT100
Control range	0 – 200°C

Setting ex works: PID parameters		
P	I	D
32%	5s	1S

9. Connector assignment

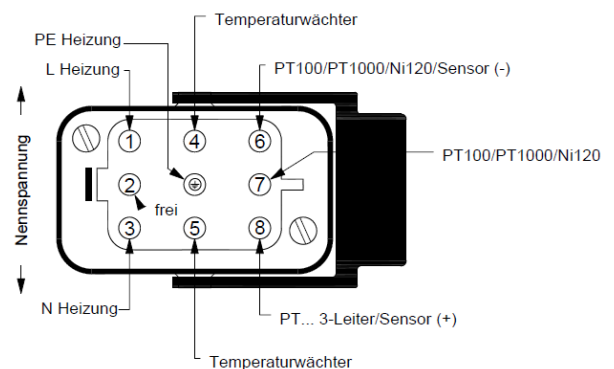
HT63

Flange socket 6+PE, max. 10A (Binder series 693)



HT61

socket 8+PE, max. 16A (Harting HAN Q8)



HT62

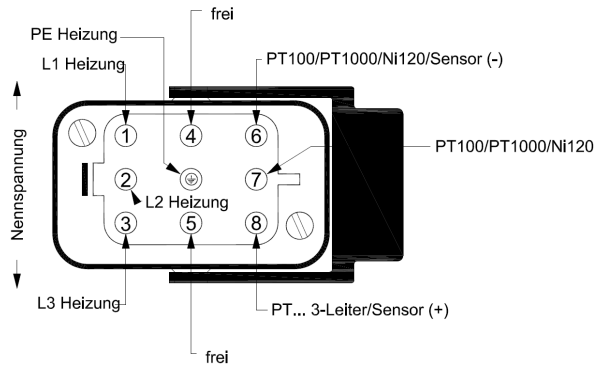
Terminal connection according to connection diagrams under item 5.3 and 5.4. Cable routing only via the PG cable glands 2 x PG9 for mains / heater, 2 x PG7 for sensors and signals.

To connect the self-locking terminals on the power supply board, a screwdriver is placed in the upper square opening of the terminal and this is opened with gentle leverage. After removing the screwdriver blade, the connection is locked.

The terminals on the sensor/signal board are opened by pressing the white spring pins and closed by releasing them again. The terminals are only approved for the connection of one conductor.

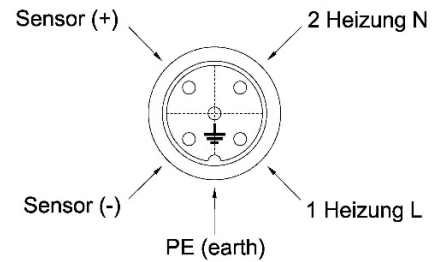
HT64

socket 8+PE, max. 16A (Harting HAN Q8)

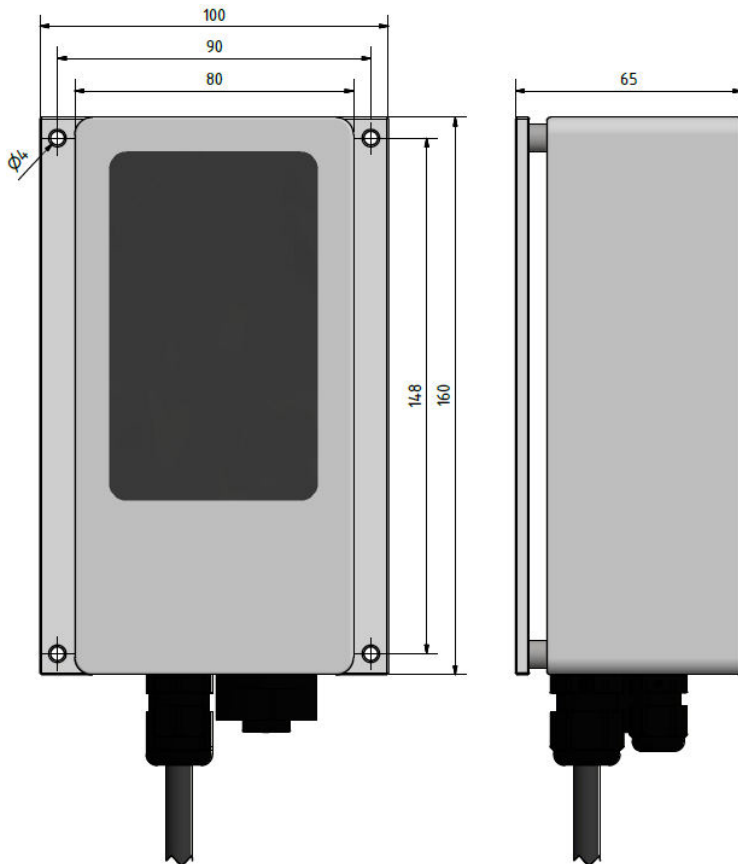


HT65

Flange socket 4+PE, max. 20A (Binder Serie 694)



10. Mounting plate / Fastening



HT64 and HT65

Plate width 180mm, otherwise like sketch

11. Maintenance and Repair

Inspect the integrity of the heater lines in regular intervals in accordance with DGUV regulation 3 (German occupational regulations). DGUV regulation 3 stipulates the required safety-technical procedures that are deemed necessary by the occupational guild. The occupational guild for fine mechanics and electrical engineering has an institute which researches electrical accidents. This institute pointed out in its 1974 report that a considerable reduction in accident frequency can be achieved through repetitive testing of electrical equipment and materials. This is why, in addition to commissioning inspections, revision inspections, and maintenance inspections, the accident prevention regulations entitled "Electrical Equipment and Materials" (DGUV regulation 3) also call for repetitive inspections. We recommend an annual review (VDE 0702).

12. Disposal

Packaging

Materials used to package the device for transport are to be disposed of in an environmentally-friendly manner by giving them to the appropriate local disposal facilities.

Device components

Defective components are to be collected and disposed according to applicable regulations. The same applies to the device itself.