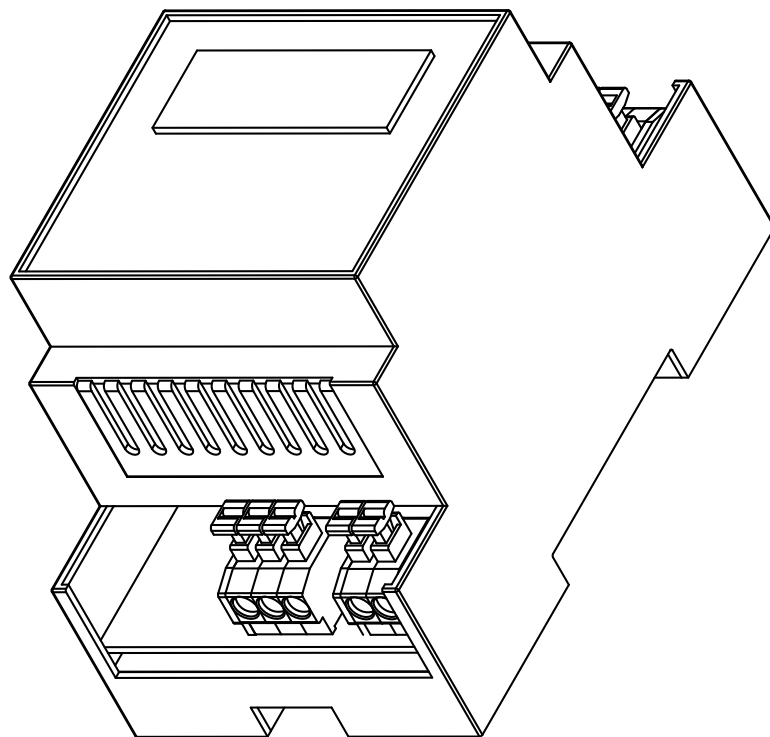


# OPERATION- MANUAL



## ELTC-21 & ELTC-22

Temperature controller up to 400°C  
for DIN rail mounting

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For proper and safe use of the ELTC-21 and ELTC-22 temperature controller, please follow these instructions. Please keep these instructions for future reference (e.g. in the system documentation).

## RESERVATION

Subject to technical changes. Changes, errors and misprints do not constitute grounds for claims for damages. For safety components and systems, the assembly instructions as well as the relevant and currently valid standards and regulations must be observed.

eltherm GmbH Ernst-Heinkel-Str. 6-10 57299 Burbach T.: +49 2736 4413-0 F.: +49 2736 4413-50 info@eltherm.com	Document: 864305061009X <b>BU-093</b>		<b>Operation manual</b> <b>ELTC-21 &amp; ELTC-22 temperature controller</b> <b>up to 400°C for DIN rail mounting</b>	
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	Revision: <b>7</b>	Julian Engel	Date:	15.06.2023

## INTRODUCTION

The electronic temperature controller of the ELTC type series is a controller with digital display for wall mounting. The temperature measured with a Pt100 temperature sensor is processed and displayed by a microcontroller. After an actual value/ setpoint comparison, the output relays are then switched according to the configuration. Cable glands and terminals are built in for electrical connection. The device is supplied in a splash-proof plastic housing with a transparent housing cover including accessories. The temperature controller is also suitable for connection of temperature sensors type ELTF-PTEx in hazardous areas.

### Display conventions

Particularly important points in these instructions are indicated by the following symbols:



#### DANGER

indicates an extremely dangerous situation.  
If it is not avoided, there is a danger to life or at least a high risk of serious injury.



#### ATTENTION

indicates a potentially dangerous situation.  
If not avoided, there is a risk of damage or malfunction.



#### WARNING

indicates a potentially dangerous situation.  
If it is not avoided, there is a risk of injury or at least a high risk of damage.



#### NOTE

important information and instructions for safe, effective and environmentally sound use.

## RECEIPT OF GOODS

Upon receipt of the goods, check the controllers and accessories and compare the information on the type plate with the information on the delivery bill to ensure that the correct material has been delivered.

## STORAGE



#### NOTE

Storage should be in a dry place at an ambient temperature of -25°C to 60°C.

## SCOPE OF DELIVERY

The scope of delivery of the article includes:

Qty.	Item
1 Pcs.	Temperature controller
1 Pcs.	Operation manual DE & EN

## DISPOSAL



#### NOTE

The WEEE logo (shown above) indicates that this product should not be disposed of with other waste.  
For more information on disposal and and recovery of waste electrical and electronic equipment For more information on the disposal and recovery of waste electrical and electronic equipment (WEEE) and collection points, please contact your local waste management company or the manufacturer from whom you purchased the product.

## FUNCTIONAL DESCRIPTION & TECHNICAL DATA

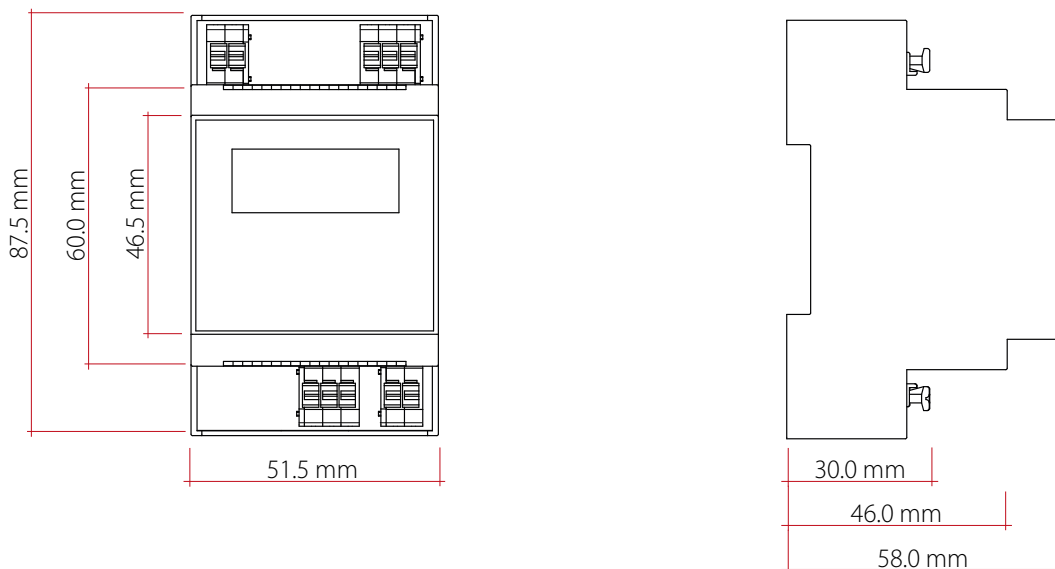
### FUNCTIONAL DESCRIPTION

If the actual value (P01) falls below the setpoint (P10 minus hysteresis P11), relay K1 switches the heating on. The integrated alarm relay enables error messages via a changeover contact in case of over / under temperature, sensor interruption or sensor short circuit. In the event of sensor errors, relay K1 switches the heating line off or on, depending on the configuration of the controller.

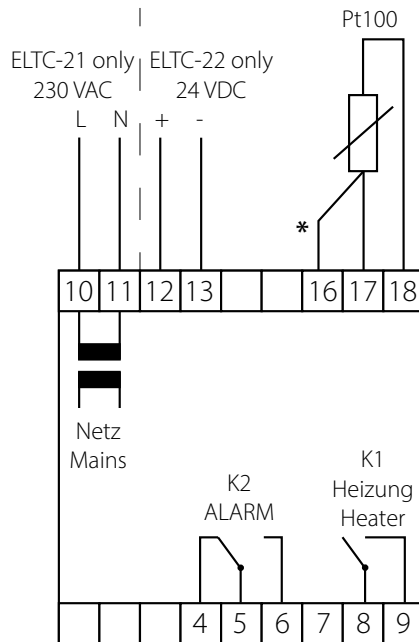
### TECHNICAL DATA

Controller type	ELTC-21 (Art.0610093)	ELTC-22 (Art. 0610094)
Nominal voltage	187...253 VAC, 50/60 Hz	24 VDC / 18 VAC, $\pm 10\%$
Current consumption	max. 30 mA	max. 100 mA
Relay K1	16 A res., 80 A max. 20 ms	16 A res., 80 A max. 20 ms
Relay K2 (alarm)	8 A res. / max. 230 VAC (changeover contact)	1 A res. / max. 24 VDC (changeover contact)
Operating temperature	-25 to +55°C	-25 to +55°C
Storage temperature	-25 to +60°C	-25 to +60°C
Setting range	0 to +400°C, configurable	0 to +400°C, configurable
Display range	-50 to +400°C	-50 to +400°C
Accuracy	$\pm 1K, \pm 2$ Digits (-50 to 400°C)	$\pm 1K, \pm 2$ Digits (-50 to 400°C)
Display	LED, red, 13 mm / 1,2 mm, red	LED, red, 13 mm / 1,2 mm, red
Sensor connection	Pt100 2-wire & Pt100 3-wire	Pt100 2-wire & Pt100 3-wire
Connection terminals	0.2...1.5mm <sup>2</sup> copper wire, stripping length 9...10mm	0.2...1.5mm <sup>2</sup> copper wire, stripping length 9...10mm
Housing material	ABS, black	ABS, black
Housing dimension	51,5 x 87,5 x 58 mm (WxHxD)	51,5 x 87,5 x 58 mm (WxHxD)
Protection class	IP 54 from the front, IP 30	IP 54 from the front, IP 30
Type of mounting	DIN rail TS	DIN rail TS
Weight	approx. 0,2 kg	approx. 0,2 kg

### Dimensions



## CONNECTION PLAN



Terminal	Connection
4	Alarm relay NC
5	Alarm relay COM
6	Alarm relay NO
7	-
8	Power supply heater
9	Heater connection
*16	Connection Pt100 3-wire compensation (not necessary with 2-wire)
17	Connection Pt100 (red)
18	Connection Pt100 (white)
<b>Only ELTC-21</b>	
10	Mains supply input (L)
11	Mains supply input (N)
<b>Only ELTC-22</b>	
12	Mains supply input (+)
13	Mains supply input (-)

## SPECIAL NOTES

### Installation and safety information

#### ATTENTION

- Electrical connection / commissioning must be carried out by a qualified electrician.
- The relevant local safety regulations must be observed. Observe the connection values according to the type plate and these instructions.
- When selecting the installation site, observe the IP protection class and permissible operating temperature. Locations protected from direct precipitation and sunlight are advantageous.
- Operation only with closed cover, tightened screw connections / blind plugs and installed seals. Avoid damage, tensile stress, kinking and torsion of the connected lines.
- The sensor lines must be shielded when extended, the shielding must be grounded on one side near the controller. The cable must not be laid parallel to lines carrying mains voltage. The total line resistance must not exceed 10 ohms.
- Make sure that the connection terminals have the correct size and dimensioning to accommodate the conductors.

#### ATTENTION

- Persons involved in installations and testing of electrical trace heating systems should be appropriately qualified to perform the required actions
- Electrical heat-tracing systems should be installed under the direction of a qualified electrician who has completed supplemental training on electrical heat-tracing systems
- Critical work, such as making connections or terminations, should be performed only by qualified personnel

#### DANGER

A residual current circuit breaker is required for each circuit.

#### DANGER

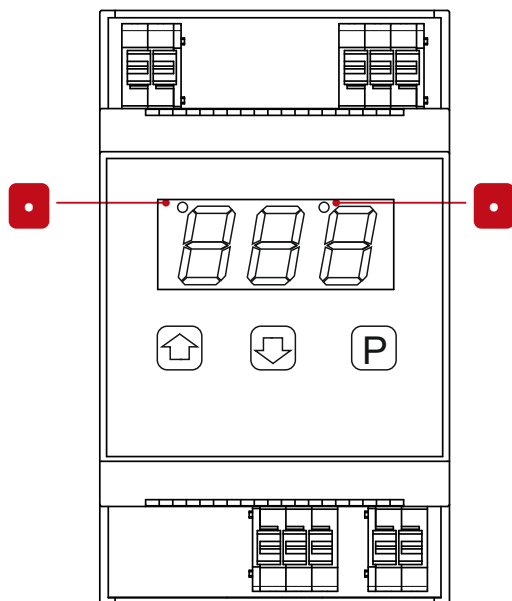
Before starting work on heating or connection lines or terminals, make sure that the corresponding circuit is switched off and secured against unintentional reconnection

#### NOTE

After switching on the controller, the display shows the current actual value.

## OPERATION

### OPERATING PANEL



After switching on, the type number ("C-2") and software version of the device appear and after approx. three seconds the measured actual value. If the "P" key is pressed briefly, the "Set" display appears and then the setpoint value is displayed with an automatic return after 5 seconds. If the "P" key is pressed for approx. 3 seconds, the parameter list "P10" is displayed. If the "P" key is held down for a further 3 seconds, "dC" for degrees Celsius or "dF" for degrees Fahrenheit is displayed.

#### Selecting and changing parameters

To reach the parameter list, "P" must be pressed for approx. 3 seconds until "P10" appears in the display.

##### Press „P" for 3 seconds

Parameter no. appears

##### Press „↑/↓"

Select parameters

##### Press „P"

Parameter value appears

##### Press „↑/↓"

Change parameters

##### Press „P"

New value saved, back to parameter no.

##### Press „↑/↓" till „P01" or T > 1 minute

Exit input mode

#### LEDs in Display

1st"." = Control relay ON

2nd"." = Alarm relay activated (=switched OFF)

A flashing of the LEDs indicates a function delay.

#### Keys

"↑" = Increase values

"↓" = Decrease values

"P" = Programming key

#### Protection against unauthorized operation

The control setpoints can basically be set without restriction, provided they are not limited by "P13/P14". All other parameters are protected by a code.

If a code is required, the display shows "C00". Use the arrow keys "↑/↓" to set the required code number "C42" and confirm with "P".

After approx. 1 minute without pressing any key, the code is requested again.

#### Autoscrolling

If you hold down the arrow keys "↑/↓", the values continue to scroll automatically.

#### Error messages

In the event of an error, the display shows an error code. Sensor errors are displayed with a delay of approx. 10 seconds.

#### Error codes

- E01 = Sensor short circuit or temperature < -60°C
- E02 = Sensor interruption or temperature > 410°C
- E03 = 3rd wire is missing or  $R \geq 10\Omega$
- C00 = Protected parameters, code entry required

## PARAMETERS AND THEIR MEANING

In [...] the factory settings are indicated.

Parameter	Meaning and range
P01	display only
Actual value	
P10	range P13...P14, [5°C]
Control setpoint	
P11	range 2...10K, [2K]
Switching hysteresis	
P12	0..30 min., [0 min], resolution 1 min.
Minimum standstill time (relay K1)	
P13	range P14...+390°C, [+390°C]
Maximum adjustable setpoint	
P14	range -50°C...P13, [0°C]
Smallest adjustable setpoint	
	0 = Pt100, 3-wire, °C (resolution 1K)
P20	[1] = Pt100, 2-wire, °C (resolution 1K)
Sensor type	2 = Pt100, 3-wire, °F (resolution 2°F)
	3 = Pt100, 2-wire, °F (resolution 2°F)
P21	-30...+10K, [0]
Sensor correction	
P30	P31...400°C, [400°C]
Overtemperature alarm	
P31	-60...P30, [-60°C]
Undertemperature alarm	
P32	0...99 min., [0 min.] resolution 1 min.
Alarm delay in opera- tion	
P33	0...500 min., [0 min.]
Alarm delay after switch-on	
	0 = relay K2 (active) energizes on sensor error Load relay K1 drops in case of sensor error
	[1] = relay K2 (passive) drops in case of sensor error Load relay K1 drops in case of sensor error
	2 = K2 works as enable relay Load relay K1 drops in case of sensor error
P34	3 = Relay K2 (active) energizes in case of sensor error Load relay K1 energizes in case of sensor error
Alarm relay mode (Relay K1 and K2)	4 = Relay K2 (passive) drops in case of sensor error Load relay K1 energizes in case of sensor error
	5 = K2 works as enable relay Load relay K1 energizes in case of sensor error



### ATTENTION

P34=3, P34=4 and P34=5 is only permissible for frost protection applications and use of self-regulating trace heaters.

#### Mode Enable relay

In this operating mode (P34=2 or 5), relay K2 switches independently of P32 and P33 as soon as the actual value is within P30 and P31.

#### Mode Alarm relay

(P34 = 0 or 1) : If the actual temperature is below P31 when the device is started, P33 is used once as the alarm delay to give more time to the system. In normal operation, P32 is used as alarm delay.

#### Notes on commissioning



### ATTENTION

The settings of the controller must be checked during commissioning.



### NOTE

The temperature control device and the temperature sensor(s) should be calibrated against the factory setting during commissioning if necessary.

#### Declaration of Conformity



We declare that the described product fully complies with Directives 2014/35/EU, 2014/30/EU and 2011/65/EU. If you need a detailed declaration of conformity, please contact us.

## DOWNLOADS

You can find helpful downloads for this or other products under the following link:

<https://eltherm.com/downloads>



## NOTES

	Parameter	Own settings
	P10	
	P11	
	P12	
	P13	
	P14	
	P20	
	P21	
	P30	
	P31	
	P32	
	P33	
	P34	



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