

eltherm



MEASUREMENT AND
CONTROL TECHNIQUE



eltherm – competent in measuring, controlling, monitoring and indicating

eltherm Elektrowärmetechnik GmbH is the specialist of electrical heat tracing systems. All electrical heat tracing systems must be temperature controlled. Even self regulating heating cables should be temperature controlled for saving energy costs.

As a producer of heating cables we are faced in our day by day work with the requirements of temperature controlling devices. Therefore, we are able to compile for our customers the best practice measurement and control programme which they need to fulfil the constantly raising requirements in quality, accuracy and safety.

Thus, we are not only a specialist in electrical heat tracing but also a specialist in

- Measuring
- Controlling
- Monitoring
- Indicating

Our particular strength is our flexibility. Apart from complex problem definitions in the individual or small-lot production, we are able to offer also simple and rugged solutions for standard applications. For this purpose, the feasibility is the most important aspect. Therefore, the features of our programme are a high controlling quality, fast commissioning, rugged enclosure material and an optimized cost-performance ratio.

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Type

Measuring range

Enclosure (WxHxD) mm

Standard rail

Wall enclosure

Supply Voltage

12–24 V AC

16–30V DC

230 V AC

Measurement

PT 100

Thermocouple Type J

Thermocouple Type K

Alarm indication

Analogue output

Digital display

Power consumption

IP protection class front

Switching capacity

For hazardous areas

Page



**Modutronic
ELT-GP1**

**Modutronic
ELT-GP2**

**Modutronic
ELT-GP3**

**ex-box
DIS**

**ex-box
LED**

**ex-box
LIM**

EL-CTB (C)

ELTC 1-4

ELTC/H 1-4

0...+100°C ●
0...+200°C ●
0...+400°C ●
0...+800°C ●

0...+100°C ●
0...+200°C ●
0...+400°C ●
0...+800°C ●

0...+400°C ●
0...+800°C ●

-40...+300°C

-40...+300°C

-40...+300°C

-

-

-

175x125x75

45x118x137

213x185x117

170x130x140

170x130x140

170x130x140

140x120x120

130x130x75

130x130x75



Capillary



5 VA

5 VA

5 VA

5 VA

5 VA

IP 67

IP 20

IP 67

IP 65

IP 65

IP 65

IP 66

IP 66

IP 66

16 A

12 A

16 A

16 A

16 A

16 A

16 A

16 A

16 A



6

7

7

10

10

11

12

13

14





● Standard

○ Option

◐ Alternatives

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ELTC 05	ELTC 11	ELTC 40	ELTC 60	DHB 350 ^{*1}	DHB 330 ^{*2} 1763	tekmar ^{*3}	ELHC ^{*4}	ELHKV ^{*5}
-	-	-99...+999°C	-99...+999°C	-20...+80°C	0...+99°C	-	-	-
130x130x75	35x70x79	84x42x85	64x62 (D/mounting depth)	90x71x58	90x71x58	115x88x66	DIN: 45x75x120 enclosure: 130x130x75	295x458x129 ELHKV-E1-1
●	●			●	●	●	●	●
		○	○					
		○	○					
●	●	○	○	●	●	●	●	●
								230/400 V AC
●	●	●	●					
	○							
	○							
		○ ^{*6}						
		●	●	●	●			
5 VA	3 VA	4 VA	4 VA	5 VA	3 VA	10 VA		
IP 66	IP 20	IP 65	IP 65	IP 20	IP 20	IP 20	IP 50	IP 54
16 A	10 A	12 A	16 A	13 A	13 A	16 A	2 A	
15	16	17	18	19	20	20	21	22

*1 = Ice and snow sensor

*2 = Power output

*3 = Ice and snow sensor

*4 = Heating circuit monitor

*5 = Control panels

*6 = only available for 40/5

Modutronic

Sensible Temperature Control

Sensible temperature control is essential for modern, complicated manufacturing plants and production processes. Modutronic has been developed to meet the high demands of industry. It guarantees constant ambient temperatures which are a prerequisite of numerous processes.

Modutronic is an innovation in the range of electrical temperature control and suitable for all industrial applications.



Multi purpose applications

The modular design principle enables accurate temperature control/indication up to 800 °C. Applications range from frost protection impulse, measuring and analysis lines as well as to temperature maintenance in tanks and vessels. This is essential for transport and production processes in the following industries:

- Refining
- Petrochemical plants
- Chemical plants
- Food industry
- Pharmaceutical industry
- Plastic industry
- Sewage treatment plant
- etc.

Competence and Know-How

As a competent partner in the electrical surface heating industry we have committed ourselves to the specific problems of heating and temperature control. From the initial design, engineering, and manufacturing through to the delivery and installation – eltherm is your partner to talk to. Our solutions are economic and efficient.

Ingenious Technique

Modutronic provides one or two load relays and two signal relays for the alarm- and limit-value-indication. The temperature set point can be changed by a potentiometer or an integrated serial interface. Coloured LED's indicate the operating status. Add on capabilities are possible at any time if required. Thus Modutronic can be adapted to all measurement and control demands.

There are two types of enclosures:

- for wall installation
- for standard rail installation

All safety relevant components meet the VDE requirements, are EMC tested according to the EN standards and are tagged with the CE label

The Difference to Conventional Controllers

Modutronic is so flexible that, thanks to the modular design, various variants of application-orientated equipment can be created. The high-precision control input with integrated PID control algorithm together with the eltherm heat-tracing systems guarantee an exact temperature maintenance. The serial interface allows the customer-specific configuration of the controller.



Electronical Display and Control Unit ELT-ANZ

Application

The display and control unit is used for remote monitoring and control of up to 24 connected controllers of the GP series. It is designed for installation in control panels.

Technical Data:

Display	illuminated LC-display, 2x16 characters
Operating	menu drive with entry keys
max. bus length	100 m
max. number of slave controllers	24
Switching capacity	2 A/230 V, change-over contact for general fault
Cross section for connection	max. 2.5 mm ² (supply), max 1.5 mm ² (signals) Wago-connectors
Power consumption	max. 5 VA
Nominal Voltage	230 V 50/60 Hz +/-10%
IP rating	IP 20, front panel IP 54
Dimensions (WxHxD)	96 x 96 x 119 mm, enclosure polyphenylene oxide PPO, front panel PVC
Delivery programme	Wago-connectors, bus-interface, RS 232-interface, relay change-over contact (centralized alarm)



Electronical Temperature Controller Type ELT-GP1

Application

Process temperatures up to 800°C for wall installation.

Technical Data

Nominal voltage	230 V, 50 Hz
Power consumption	max. 5 VA
Controller temperature range	0°C to 100°C 0°C to 200°C 0°C to 400°C 0°C to 800°C
Switching capacity	16 A
Accuracy	
with PT 100	+/- (0.5°K+0.5 % of meas.r.)
with thermocouple type K	+/- (1.0°K+1.0 % of meas.r.)
with thermocouple type J	+/- (1.5°K+1.5 % of meas.r.)
Resolution (internal)	0.1°C (PT 100) 0.4°C (thermocouples)
Measurement current (PT 100)	approx. 0.75 mA
Enclosure	polycarbonate enclosure with transparent cover and cable gland
IP Rating	IP 67
Ambient conditions	0° to 40°C max. 90 % rel. humidity (non-condensing)
Dimensions	175 x 125 x 75 mm (WxHxD)



Explosive atmospheres

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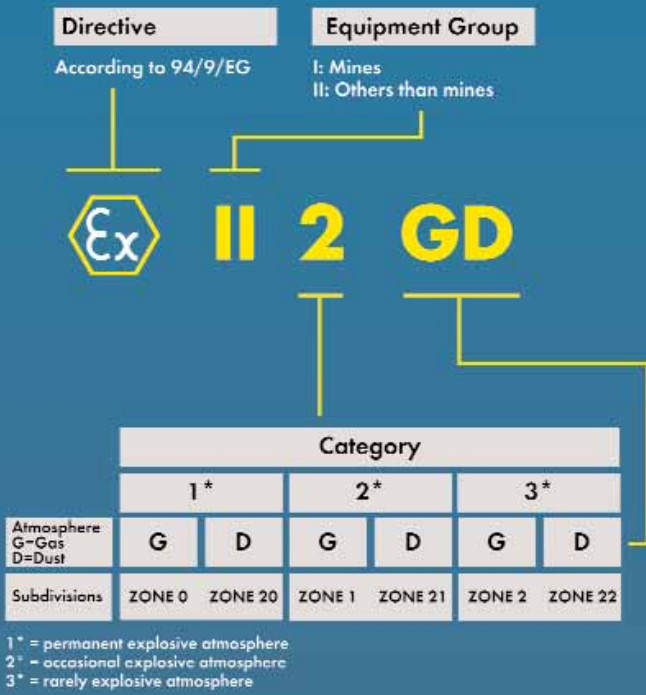


Marking of equipment for use in explosive atmospheres at a glance

Ex II 2GD

E Ex em [ib] IIC T6

Conditions in hazardous areas/Zones According to ATEX



Apparatuses used in temperature classes Marking according to Standard



E Ex em [ib] IIC T6

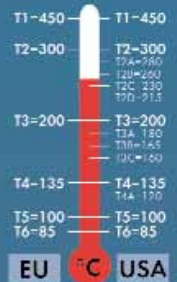
General Requirements

[ia]/[ib]: Intrinsic safety

- q: Powder filling
- m: Encapsulation
- o: Oil immersion
- e: Increased safety
- d: Flameproof enclosure
- p: Pressurisation
- n: "non sparking"

Temperature-classes

Apparatus may be used in temperature classes



Hazardous Areas in detail

Gas			Dust		
EU (ATEX)	USA CLASS I (New) NEC 505	USA CLASS I (Old) NEC 500	EU (ATEX)	USA CLASS II (Combustible Dust)	USA CLASS III (Incombustible Fibres & Flyings)
Zone 0	Zone 0	DIV 1	Zone 20	DIV 1	DIV 1
Zone 1	Zone 1	DIV 2	Zone 21	DIV 2	DIV 2
Zone 2	Zone 2	DIV 2	Zone 22	DIV 2	DIV 2
II C	II C	A B	conductive	E	-
II B	II B	C	Non	F	-
II A	II A	D	conductive	G	-

Groups: IIA: Propane IIB: Ethylene IIC: Hydrogene
A: Acetylene B: Hydrogene C: Ethylene D: Propane

Groups valid for USA, for Europe according to standard EN 50114
E: Metallic powder F: Carbon powder G: Grain powder

IP-Protection class

IP 1-digit	Access	Solid foreign objects	IP 2-digit	Water penetration
0	non-protected	non-protected	0	non-protected
1	protected against large surface body parts (e.g. Hand)	protected against solid objects >50mm	1	protected against vertically falling water drops
2	protected against body parts (e.g. Finger tip)	protected against solid objects >12,5	2	protected against vertically falling water drops when enclosure tilted up to 15°
3	With tools or wires >2,5mm	protected against solid objects >2,5mm	3	protected against spraying water up to 60° from vertical
4	With tools or wires >1mm	protected against solid objects >1mm	4	protected against splashing water from any direction
5	total protection	Dust protected	5	protected against jets of water from any direction
6	total protection	Dust tight	6	protected against powerful jets of water from any direction
7	total protection	Dust tight	7	protected against immersion
8	total protection	Dust tight	8	protected against immersion under pressure

ex-controller, ex-box LED, ex-box DIS,



ex-box DIS



Description

ex-box DIS: In accordance with the latest EX-protection directives 94/9/EG (ATEX 95) this electronic temperature controller has been designed and developed, especially for its use in hazardous areas, as a separate controller/limiter or as a combination of both. Programming and operation is done alternatively via the integrated operating panel with display or via the external hand held controller "ex-control". An interface allows the communication with a superposed PC.

Attributes

- Rugged enclosure IP 65
- Operation and programming in hazardous area
- Optional hand held controller (ex-control)
- Optional as controller or limiter
- Data transfer to superposed PC, intrinsically safe
- Fail alarm, high safety
- Switching capacity 16A
- Integrated heating circuit monitoring
- Programmable parameters are identical with ex-control (p. 12)

Technical Data ex-box DIS

with ex-box enclosed operation panel:
 Certificate IBEExU 04 ATEX 1165
 Classification II 2GD E Ex em [ib] IIC T4 IP65 T100
 Dimensions 190 x 140 x 150 mm (WxHxD)
 (incl. wall mounting bracket, excl. glands)
 Enclosure material aluminium
 IP rating IP 65
 Ambient temperature - 32 to 60°C
 Cable entrance 2 x M20
 1 x M25
 Display 2 x 4 35-segment LED
 Supply Voltage 230V +/- 10%
 Power Supply 230V / 16A, 2-pole
 Alarm output optically separated 100mA
 Interface current loop, intrinsically safe
 Measurement entrance Pt-100 2/3 core, intrinsically safe
 Measurement range -40 C° to +300°C
 Control range over entire measurement range
 Control characteristics dual mode controller
 Weight approx. 3.5 kg (without mounting bracket)



ex-box LED



Description

ex-box LED: Please see the ex-box DIS with ex-control except for the following: no personal computer interface, but interface for ex-control.
 LED green: ok, no heating
 LED orange: ok, heating on
 LED red blinking: alarm or fault but still ready for operation
 LED red permanent: severe fault, separation from supply

Technical Data ex-box LED

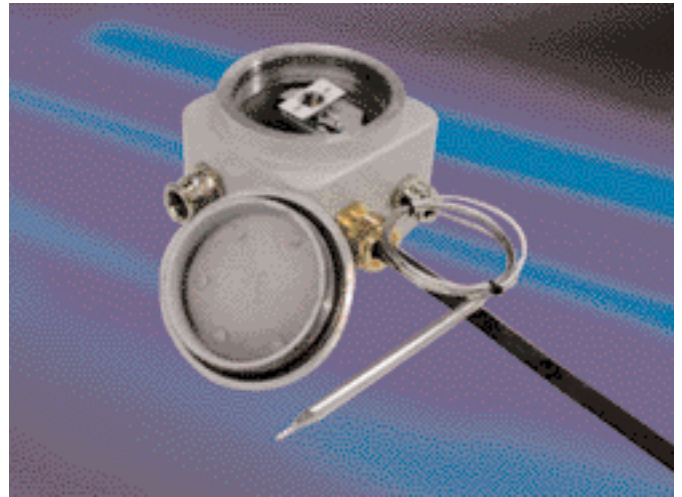
Certificate IBEExU 04 ATEX 1165
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 Dimensions 190 x 140 x 150 mm (WxHxD)
 (incl. wall mounting bracket, excl. glands)
 Enclosure material aluminium
 IP rating IP 65
 Ambient temperature - 32 to 60°C
 Cable entrance 2 x M20
 1 x M25
 Supply Voltage 230V +/- 10%
 Power Supply 230V / 16A, 2-pole
 Alarm output optically separated 100mA
 Interface intrinsically safe for ex-control
 Measurement entrance Pt-100 2/3 core, intrinsically safe
 Measurement range -40 C° to +300°C
 Control range over entire measurement range
 Control characteristics dual mode controller
 Weight approx. 3.5 kg (without mounting bracket)

Ex-Capillary Thermostat EL-CTC EL-CTB

Type series EL-CTB und EL-CTC

Technical Data

Protection class	.II 2 GD EEx d IIB T6 (Type -CTB) II 2 GD EEx d IIC T6 (Type -CTC) (Attention: The equipment group may change when customer installed cable entrances are used !)
Ambient temperature	-.32 to +50°C
Switching capacity	.16 A / 230 V
Control characteristics	.2-point
Hysteresis	.2.5% of scale end value
Capillary tube	.stainless steel, Mat. 1.457
Enclosure	.aluminium dimensions (WxHxD) 140 x 120 x 120 mm
IP rating	.IP 66
Cable entrance	.1 x M20 for non shielded cables diameter 10-14 mm 1 x thread M 20 x 1.5 (Type -CTB) 1 x moulded cable entry with 1 m sheathed flexible cable 3 x 1.5 mm ² for connection to a separate, Ex-certified terminal box (Type -CTC)
Terminal block	.2 pcs. + PE, max. cross section 0.2 – 6.0 mm ²



Description:

The capillary thermostat EL-CT is for use in hazardous areas Zone 1 for gas and dust as a surface thermostat on pipes and vessels. There are different temperature ranges possible. The material of the capillary tube is stainless steel. The rugged enclosure is made of aluminium. Version B or C are usable for the related gas groups IIB or IIC.

Order-No.:	Length	ø-of capillary tube	Temperature range	Capillary
OX63050	155 mm	8 mm	-0 to +50°C	2000 mm
OX63200	105 mm	8 mm	0 to +200°C	3000 mm
OX63501	150 mm	8 mm	+20 to +500°C	2000 mm
OX63030	110 mm	8 mm	-50 to +30°C	2000 mm

Electronic Surface and Ambient Thermostat ELTC 1, 2, 3, 4

ELTC 1-4

Electronic Temperature Controller

- Type ELTC/1** Control range..... 5 to + 15°C
- Type ELTC/2** Control range..... 0 to + 100°C
- Type ELTC/3** Control range..... 0 to + 250°C
- Type ELTC/4** Control range..... +150 to + 400°C

Applications

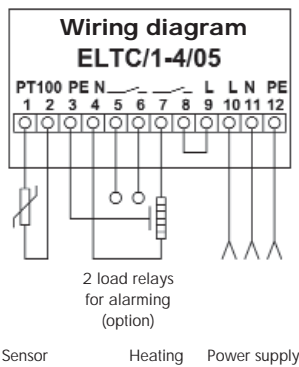
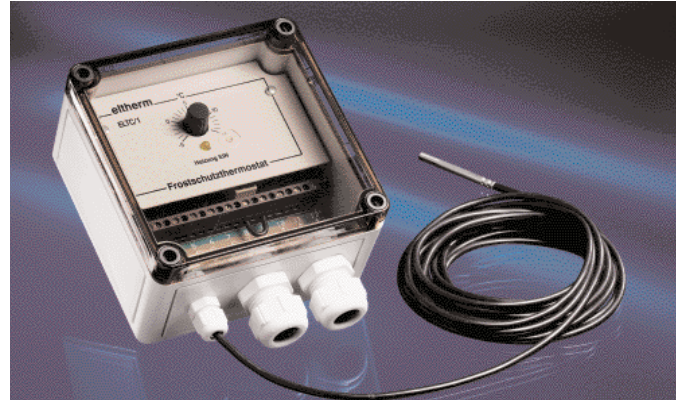
Frost protection and electrical trace heating systems. Used for surface and ambient applications.

Description

The electronic temperature controller type ELTC is designed for use as an ambient thermostat or surface thermostat with remote sensor. Cable glands and terminals are provided for the power connection. The unit is supplied in a weather proof plastic enclosure for wall mounting, with a transparent cover. The controller should be protected from direct sunlight when used outdoors.

Technical Data

- Hysteresis adjustable 1 to 50 K (symmetric to set point)
- Switching capacity 16 A / 230 V, 1- or 2-pole (or 10A/400V)
- Connection cable max. 2.5 mm² (pull cage)
- Power consumption max. 5 VA
- Nominal Voltage 230 V 50/60 Hz +/- 10%
- IP rating IP 65
- Ambient temperature - 30 to + 80°C
- Dimensions (WxHxD) 130 x 130 x 75 mm
polystyrene enclosure
- Including cable gland
1xM12/2xM16/1xM25,
2-wire PT 100 mit 5 m PVC connecting cable, Type 2 and 3 with 3 m Teflon connecting cable
Typ 4 without PT 100



Electronic frost protection thermostat

ELTC 05

Electronic frost protection thermostat ELTC 05–Frostcontrol

Applications

Frost protection applications. To be used as surface and ambient thermostat for series heating cables and self-regulating heating cables.

Function

If the sensed temperature is lower than the adjusted set point of +3°C, the relay contact closes and the heating switches on.

Description

The electronic temperature controller type ELTC 05-Frostcontrol is designed for use as an ambient thermostat or surface thermostat with remote sensor. Cable glands and terminals are provided for the power connection.

The unit is supplied in a weatherproof plastic enclosure, with a grey cover. The controller should be protected from direct sunlight when used outdoors.

For ambient thermostat applications (Air thermostat) the sensor cable is to be shortened so that the sensor cover can be mounted inside of the M12 cable gland. 15mm of the sensor cover should be exposed after securing the sensor into the gland.

Technical Data

Nominal Voltage 230V, 50/60 Hz +/- 10%
(other voltages upon request)

Switching capacity 16A

Hysteresis approx. 1 K

Measurement entrance 2-wire PT 100 with
5 m PVC connection cable

Control range ELTC/05 unchangeable set point +3°C

Ambient temperature -30 to +80 °C

Control characteristics dual mode controller

Output 1 relay contact

LED heating on (yellow)

Enclosure material polycarbonate

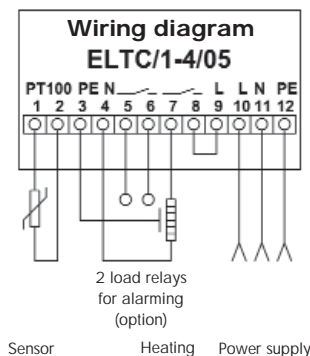
Dimensions (WxHxD) 130 x 130 x 75mm

IP Rating IP 65

Weight 520g

Cable entrance: 1xM12; 2xM25

Order-no. 0610002



Electronic ON/OFF temperature controller ELTC 11

Electronic temperature controller ELTC 11

Description

The electronic temperature controller ELTC-11 is operating in ON/OFF mode, with standard socket for standard rail installation. The set value is entered via a button at the front of the controller. Additionally the set point button has an adjustable temperature range limit. For the temperature measurement all Pt100 sensors with two-wire-connections are usable. Sensor and sensor cable are controlled for break or short circuit. In case of an error, the relay switches off. The switching status is indicated with a yellow LED.

Limiting the set value

- Remove the knob for the setting
- Set the indicator that is underneath the knob to the desired setting.
- Replace the knob

Set point range

ELTC-11:	-20°C to 40°C	Order no. TB 00010
ELTC-11/N:	0°C to 100°C	Order no. 0610070
ELTC-11/M:	0°C to 200°C	Order no. 0610071
ELTC-11/H:	0°C to 250°C	Order no. 0610072



Technical Data

Hysteresis	adjustable from 0.25...5%
Measuring accuracy	±2%
Ambient temperature	-10°C...50°C
LED	yellow
Relay contact	10A max.
Nominal voltage	230V (± 10%)
Power consumption	3VA
Electrical connection	screwed contact, 1x4mm ²
Mounting position	any
IP Rating	IP20
Dimensions	35x70x7
Weight	200g, approx.

Wiring diagram

L1:	Phase
N:	Neutral
11:	PT 100
12:	PT 100
41:	Contact opened
42:	Pole
43:	Contact closed

Micro Processor Controlled Temperature Controller ELTC 40.1/.3/.5 and 40.1.1

Electronic temperature controller

ELTC 40/1 230V Order-no. 0621140
 ELTC 40/5 230V Order-no. 0621141
 ELTC 40/1.1 24V Order-no. 0621142

Application

The micro processor controlled ELTC-40 is specially designed for thermostatic control applications. The unit works together with resistance sensors PT100. The unit is supplied with 230 V or 12–24 V and has one output relay. The relay mode is indicated via a LED. ELTC 40 has a 3 digit red illuminating display. The parameters can be programmed to different functions with three keys.

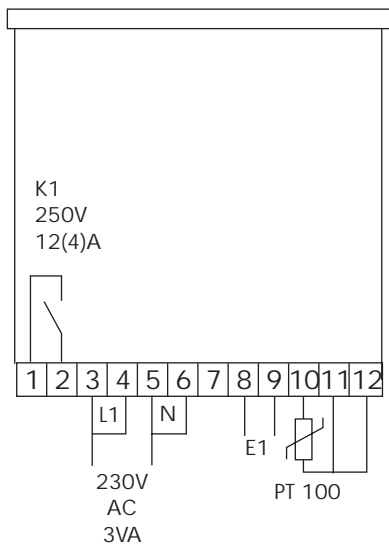
Technical Data

Measuring range PT 100 -80° C to 400° C
 Hysteresis 0.5 K +/- 0.5 % of scale range
 Display three digit 7-field LED-display,
 13 mm high, for indication of
 temperature, colour red
 three LED lamps, diameter 3 mm for
 display of status
 lamp1: status of output K1
 lamp 2: status of digital input E1
 lamp 3: Alarm status for ELTC 40.5
 Output K1: relay, 16(4)A-contact, 250 V,
 max. 12 A
 Input E1: entry for external potential-free
 switch

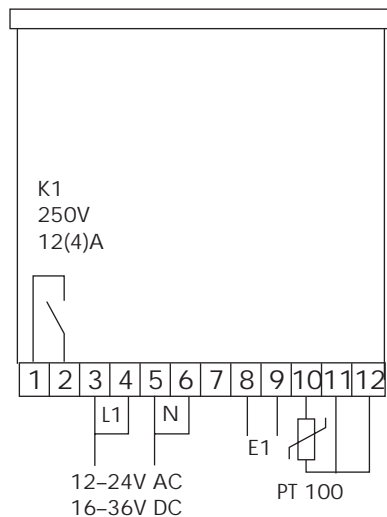


Nominal Voltage 230 V, 50/60 Hz, -15/+10%,
 ELTC 40/1.1 12–24 V
 power consumption max. 4 VA
 IP Rating IP 65 front
 Ambient temperature 0° C up to +55° C
 Dimensions front panel 84 x 42 mm
 panel cutout 68 x 32 mm
 depth approx. 85 mm
 mounting with fixing bowl
 Weight 140 g
 Connection 12-pole terminal screw,
 matrix 5,0 mm, for cable up to 2.5 mm²

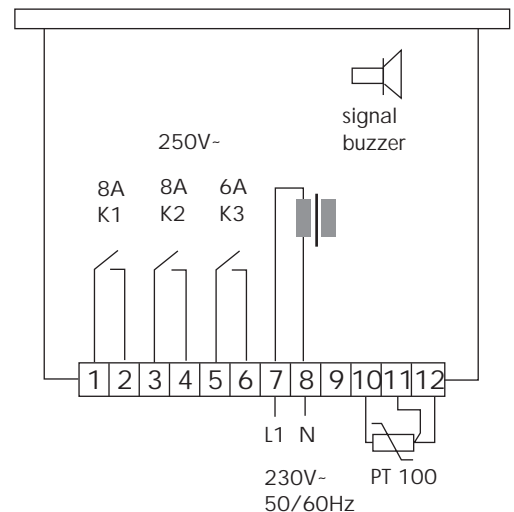
40/1
Wiring diagram



40/1.1
Wiring diagram



40/5
Wiring diagram



Micro Processor Controlled Temperature Controller ELTC 60

Electronic temperature controller ELTC-60

Application

The micro processor controlled ELTC-60 series is specially designed for thermostatic control applications with high accuracy. ELTC 60 has a 3 digit red illuminating display. The unit works with resistance sensors PT100. The unit is supplied with 230 V AC (2 wires). The parameters and set points can be programmed to different functions with three keys.

- set point
- hysteresis at set-point
- set point limit below
- set point limit above
- correction of actual value
- keyboard interlocking

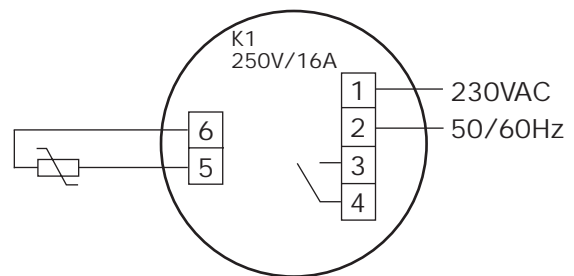
Other characteristics of the unit, such as basic function of the outlet-relay, monitoring functions, control characteristics, etc., can on demand be factory preset.



Technical Data

Measuring range	PT 100 -60°C up to 400°C
Hysteresis:	0.5 or resp. 1 K (acc. to the display sharpness)
Display	three digit LED display, 13 mm high, colour red
Display range	-99...999°C temperature values in °C
Nominal value range	-60...400°C. The set range of the nominal value can be limited to the lower and upper value
Controller type	the contact for output 1 can be programmed by factory
Controller characteristics	thermostat with adjustable hysteresis
Control parameter	the controller is supplied with standard adjustments
Alarm function	for sensor-break or fault function the display indicates flashing "FIH" or "FIL"
Output	1 relay contact, 230VAC, 16A, 1 make contact
Nominal Voltage	230V AC, -15...+10% 50/60Hz.
Power consumption	max. 20 mA

Wiring diagram



Ambient temperature	0...+55°C
Weight	approx. 65g, without sensor
IP Rating	IP 65 Front

Dimensions

Front panel diameter	64 mm
Panel section diameter	60 mm
Depth	62 mm with connection
Connections	flat pin terminals 6.3 mm for power supply and relays output flat pin terminals 2.8 x 0.5mm for sensor
Mounting	with steel-bow
Order no.	0620601

Electronic Power Control

Therm-Control Type DHB 330

Function

Therm-Control is an electronic device to control heating cables .

Electronic power control:

The requested maintenance temperature of the heating cables/pipe surfaces can be adjusted within the range of 35° to 75°C (Factory adjustment 59°C).

Disinfections operation:

Once a week for 6 h the heating can be operated in the highest heating cable temperature. This operation is released with the adjustment of the day of the week in the "disinfection level". It starts automatically when reaching the "switch-off period". Due to the increased water temperatures this operation should be activated during night time.

Timer:

The integrated timer enables a switching off of the heating once a day (24 h). If this function is not requested please set "switch-on-time" and switch-off-time to 00.00 h! The timer provides an operation reserve of 12 h.

Limitation of initial power consumption:

The power consumption of the heating cables mainly depends on the temperature of the pipe surface and the environment. DHB 330 limits the power consumption during max. 8 min. after each start, which avoids an overloading of the net on cold days. Then the control is released.



Technical Data

Measuring range	Hb 60: 35 to 59 °C
	Hb 70: 35 to 75 °C
Nominal Voltage	230 V ~ +10 to -15%
Frequency	50 Hz
Switching capacity	13 A
Power consumption	3 VA
Operation reserve	12 h
IP Rating	IP 20
Ambient temperature	-10 to 50 °C
Max. band length	depends on the type of heating cable
Dimensions	90 x 71 x 58 mm
Weight	250 g
Attachment	for standard rail installation in control panels
Order no.0640021

Electronic Temperature and Moisture Control

Ice-Control Type DHB 350

Function

Ice control is an electronic device to control heating cables for heating of fall pipes and gutters.

Ice sensor:

The ice sensor switches on the heating cables only if frost temperature (< 3 °C) and melt water are detected simultaneously. If the moisture sensor switches off, a post heating time starts. This time is adjustable from 0 to 120 minutes.

Limitation of initial power consumption:

The power consumption of the heating cables mainly depends on the ambient temperature. DHB 350 limits the power consumption during max. 8 min. after each start, factory preset which avoids an overloading of the net on cold days. Then the control is released.

Technical Data

Temperature switch point	+3 °C
Hysteresis.	+/- 0.5 K
Post heating time.	0 to 120 minutes
Nominal voltage.	230 V ~ +10 to -15%
Frequency	50 Hz
Switching capacity	13 A
Power consumption	5 VA
IP Rating	IP 20
Ambient temperature.	-10 to 50 °C
Max. heating circuit length.	depends on the type of heating cable
Temperature sensor type.	NTC
- sensor cable length.	5 m
- max. sensor cable length.	50 m (for lengths over 25 m, a shielded cable is required)
- ambient temperature.	-20 to 80 °C



Moisture sensor Type	PTC
- sensor cable length.	5 m
- max. sensor cable length.	50m (for lengths over 25 m, a shielded cable is required)
- ambient temperature.	-20 to 80 °C
Dimensions.	90 x 71 x 58 mm
Weight	300 g
Attachment	for standard rail installation in control panels
Order no	0641011

Ice and Snow Sensor Type tekmar 1773

Function

In combination with a moisture and temperature sensor, tekmar 1773 detects ice and snow at the earliest time and switches on a defrost system to keep a controlled area free of ice and snow. For applications in gutters, flat roofs or other free spaces, the ice sensor Type 3352 is required. Until now, all known ice and snow detectors had the disadvantage of periodical maintenance on the sensors, caused by environmental influences, measuring current, etc., particularly the accuracy of the moisture detection was injured. This solution guarantees maintenance free, safe and economic operation even for high environmental load and avoids additional costs.

Technical Data

Nominal voltage.	230 V ~ ±6 %, 50 Hz
Power consumption.	10 VA
Output contact	230 V ~, 6 A, potential-free
Ambient temperature.	50 °C
Isolation check	4 kV
IP rating.	II installation on standard rails acc. to DIN 43880
Socket-No.	9218
Weight	380 g, approx.
Order no	TB30004



tekmar is a registered trademark of tekmar company.

Heating Circuit Monitor ELHC/2

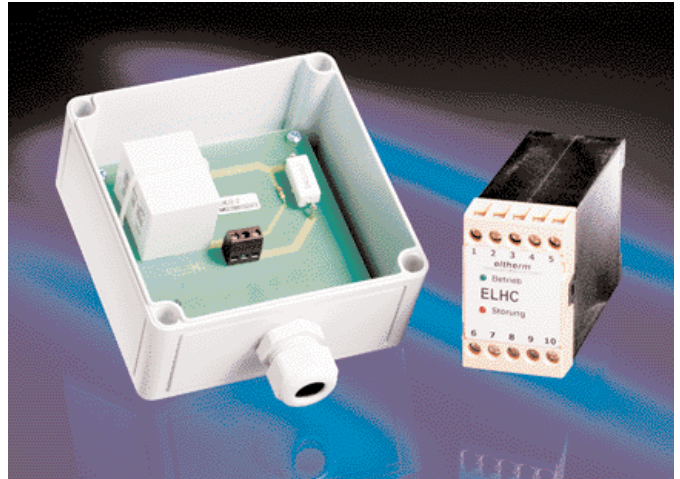
Heating Circuit Monitor Type: ELHC

Description

The heating circuit monitor type ELHC/2 consists of the electronics ELHC/2.1 and an end of the line device ELHC/2.2. It controls either self regulating heating cables or series heating cables.

In case of a disconnection of a supply cable, an error message via a potential-free change-over contact occurs. Simultaneously, the error is indicated by a red LED (if the nominal voltage supplies the system).

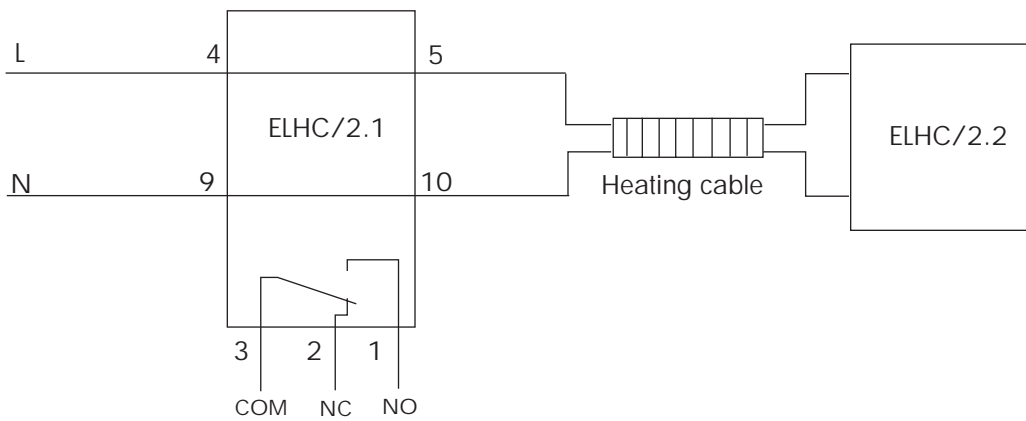
The power supply of heating cable and ELHC/2 is the same, thus ELHC/2 can only monitor the heating system when the system is in operation. For switched off heating systems ELHC/2 indicates a failure.



Technical Data

Nominal Voltage	230V/50 Hz
Heating current	
Switching capacity	min. 0.15 A max. 16 A
Output	1 Change-over contact
Contact switching capacity	250VAC/2A
Enclosure	for standard rail installation (ELHC 2.1); enclosure material plastics
Dimensions	130x130x75 mm (WxHxD) ELHC 2.2 45x75x120mm (WxHxD) ELHC 2.1
IP Rating	IP 50
Weight	250g
Ambient temperature	0°C to +50°C

Wiring diagram



Control Cabinets ELHKV

Complete Control Cabinets for ELSR Heating Cable Type ELHKV

The control cabinets ELHKV are designed for the supply and control of heat tracing systems with self regulating heating cables.

For each single heating circuit breakers, leakage-protective switches, contactors, control lamps, main switches, fault indicating relays for central control stations are completely installed and wired.

The standard design ELHKV-ST allows a switching of three heating groups via an external thermostat. In case of ELHKV-E1 each heating circuit is separately supplied and switched via an external thermostat.

Wallenclosure	IP Rating 54/65
Power supply	400/230 VAC
	3-phase current with neutral and earth



ELHKV-E1-1

Complete control cabinet for 1 heating circuit
(W x H x D) 295 x 458 x 129 mm
Order-no. 0640001

ELHKV-E1-2

Complete control cabinet for 2 heating circuits
(W x H x D) 295 x 583 x 129 mm; Order-no. 0640002

ELHKV-ST-3

Complete control cabinet for a group of three
(W x H x D) 295 x 458 x 129 mm; Order-no. 0640003

ELHKV-ST-6

Complete control cabinet for two times a group of three
(W x H x D) 295 x 583 x 129 mm; Order-no. 0640006

ELHKV-ST-9

Complete control cabinet for three times a group of three
(W x H x D) 295 x 708 x 129 mm; Order-no. 0640009

ELHKV-ST-12

Complete control cabinet for four times a group of three
(W x H x D) 590 x 583 x 129 mm; Order-no. 0640012



Control Cabinets Special Designs

Special solutions: eltherm Control Cabinets

From simple applications to complex switchboard plants.

Based on our longterm experience, combined with developed standard components and modules, eltherm designs, assembles and delivers complete control cabinets for mainly every range of electrical heat tracing. Here we consider existing customer systems to avoid stocking of spare parts, as well as special demands of our customers in terms of accuracy, safety and usability. We also take into consideration that a control cabinet must be user friendly, should be assembled according to VDE standards and needs a clear operating manual and understandable documentation, which are related to the delivered product.



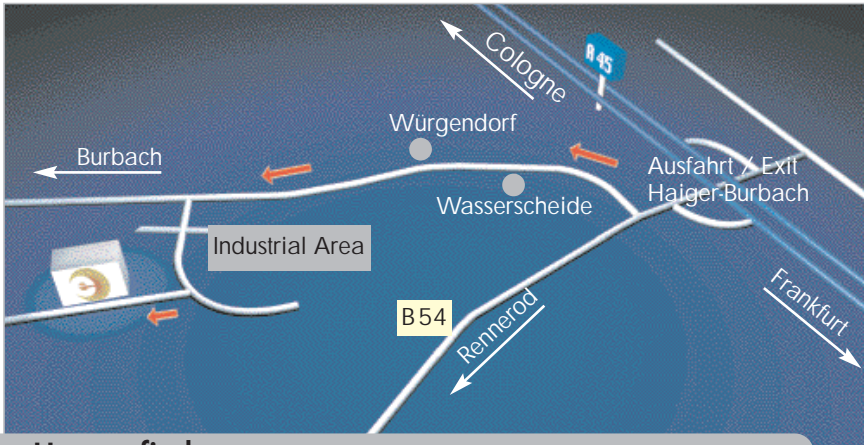
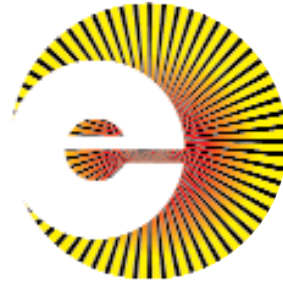
Opto-electronic control of antenna heating systems. Record of ambient conditions:

- Air temperature
- Ice and snow inside the parabolic antenna reflector
- Antenna temperature

Operating modes: manually, automatically or via remote control



eltherm



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