

Operating Manual

TRM Electronic Temperature Controller

ELTC-14 /Hx-14

Part Nos.: 0620004, 0620006, 0620007, 0620008



IMPORTANT SAFETY NOTES!



Please read this manual carefully before using this product. Warranty claims cannot be considered if damage is caused by failure to comply with these operating instructions! This documentation was compiled with the utmost care, however, we cannot guarantee for its correctness in every respect.

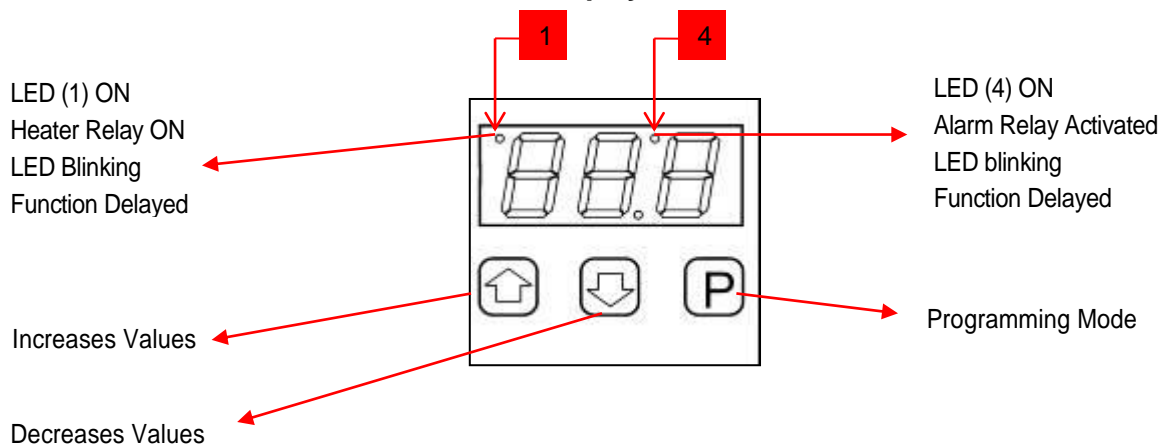
Product Description

The TRM Series EL-TC 14X electronic temperature controllers are designed for monitoring and control of heating and heat tracing circuits. The temperature controller comes complete with a single circuit 20A switching output and additional 8A alarm relay. The controller is designed to operate with 3-wire or 2-wire Pt100 RTD temperature sensors (optionally supplied by TRM). ELTC-14 series controllers are supplied fully integrated in weather-proof enclosures, suitable for wall mounting, complete with transparent cover to allow for viewing and access to the front panel and user interface of the controller.

Controller Operation

Operation of the controller and the user interface is very simple. After power-on, the type/model number of the controller appears on the front panel of the device (displays “C14”), followed by a 3 second delay after which the actual temperature will be displayed. Pressing the programming (P) button allows for viewing of the temperature set point, displayed as ‘Set’, followed by the set point temperature. The menu automatically returns to the main display (actual temperature) after 5 seconds. Access to the controller parameter list is achieved by pressing and holding the “P” button for 3 seconds (after which “P10” appears on the display). Pressing and holding button “P” for an additional 3 seconds provides display “P” of “dC” for degrees Centigrade or “dF” for degrees Fahrenheit.

ELTC-14 Display / User Interface



Operational Description

The controller (via relay K1) will automatically switch the heating circuit ON when the actual temperature (**P01**) falls below the control temperature setpoint (**P10** minus hysteresis **P11**).

In the event of an error condition, the integrated alarm relay (**K2**) switches (via the SPDT contact, configurable as either NC or NO) to indicate one or all of the following error conditions:

- over / under temperature
- sensor-interrupt
- short circuit.

During sensor malfunction, relay K1 switches/cycles continuously on or off, depending on configuration.

Changing Parameters

To access and view the controller parameter list, press and hold the „P“ button for 3 seconds until „P10“ appears on the display. The following key strokes may be entered for viewing and adjusting* parameter values. Refer to Page 5 of this manual for a complete list of controller parameters.

- **Press and hold „P“ for 3 sec.**
 - Parameter No. appears (P10)
- **„▲ / ▼“**
 - Pushing the ‘up’ or ‘down’ arrows allow for scrolling through the parameter list (P1 – P34)
- **Press „P“ again**
 - Displays the programmed/set parameter value
- **„▲ / ▼“**
 - Pushing the ‘up’ or ‘down’ arrows will ‘increase’ or ‘decrease’ the parameter values accordingly
- **Press „P“ again**
 - Saves the new value/set point, the display reverts back to the adjusted parameter No.
- **Press „▲ / ▼“ until „P1“ appears, then press “P” (or wait for less than 1 Min.)**
 - Exits the settings menu

Parameter Protection

The temperature control set point (high/low set points, or P13 and P14 respectively) may be changed without passcode protection, and set points may be changed using the procedure described above.. All other parameters are passcode protected. The display will prompt when a passcode is required (display will indicate „C00“).

To enter the passcode, use the arrow keys to enter the passcode number (C42). Confirm by pressing the “P” button.

If no key is entered, the access code request is automatically cancelled after approx. 1 minute and the display returns to the normal view.

Autoscrolling

Menu values scroll through the menu by keeping the ,▲ / ▼'-keys depressed .

Error Messages

When an error condition occurs, the display will indicate the error code after an approx. 20 second delay.

Error Code Messages

E01 RTD/Pt100 temp sensor short circuit or temperature below -76°F (-60°C)
E02 RTD/Pt100 temp sensor interrupt (open) or temperature above 770°F (410°C)
E03 Temp. sensor third wire missing/not connected or Resistance (R) is equal to or above 10 ohms
C00 passcode entry required
E07 Alarm/Fault relay K1 open
E08 Alarm/Fault relay K1 short circuit
E09 Internal error

Error codes E07...E09: controller fault condition.

Check device/controller type

After controller is energized, the controller model/type number appears (**C14 for model ELTC-14**), followed by a 3 second delay after which the actual temperature will be displayed.

Switching Temperature Scales (degF to deg C / deg C to deg F)

Changing sensor probe type (P20) automatically changes the temperature scale and associated set points to the respective temperature scale (e.g. sensor type 0 and 1 display in deg C / sensor type 2 and 3 display in deg F).

Parameter List and Description

- P01 ..Actual Sensor Temp.** °C/°F (disp.only)
- P10 ..Control Setpoint**
Affects relay 1, range P13...P14, [41°F/5°C]
- P11 ..Switching hysteresis from set point (P10)**
range 2..10K [2K]
- P12 ..Min. Relay Idle Time (Relay K1)**
0..30.0 Min., [0.0 Min], resolution 0.1 min.
- P13 Highest Adjustable Control Setpoint**
Range min (see P14) to max 734°F (390°C), [734°F/390°C]
- P14 ..Lowest Adjustable Control Setpoint**
Range -58°F (-50°C) to max (see P13), [32°F/0°C]
- P20 ..Sensor/Probe Type**
0 = RTD/Pt100, 3-wire, °C (Resolution 1K)
[1] = RTD/Pt100, 2-wire, °C (Resolution 1K)
2 = RTD/Pt100, 3-wire, °F (Resolution 2°F)
3 = RTD/Pt100, 2-wire, °F (Resolution 2°F)
- P21 ..Sensor Correction** -30...+10K, [0]
- P30 ..High Temp. Alarm Threshold**
Min or P31 to 752°F (400°C), [752°F/400°C]
- P31 ..Low Temp. Alarm Threshold**
-76°F (-60°C) to max or P30, [-76°F/-60°C]
- P32 ..Alarm Delay while in Operation**
0...99 min., [0.0 Min., Resolution 0.1 Min.]
- P33 ..Alarm Delay while Power-on/Energized**
0...500 min., [0 min.]
- P34 ..Alarm Relay Mode (Relay K2)**
0 = Relay ON at probe fault
[1] = Relay OFF at probe fault
2 = Relay works as releasing relay



Values in [...] are factory set default settings

Releasing Relay Mode

In this mode (when **P34 = 2**) relay K2 switches independently from alarm delay timers (P32 and P33) when the actual high/low temp threshold ranges are between high and low set points P30 and P31.

Alarm Relay Modes

(**P34 = 0 or 1**): If, after initial power on, the actual temperature falls below the low temp alarm threshold (P31), the alarm delay (P33) is used as the alarm relay to provide additional time for warm-up. In normal operating conditions, the alarm delay P32 is used as an alarm delay parameter.

Controller Technical Data / Specifications

Controller Type/Model	ELTC-14
Operating Voltage	100...240 VAC, 50/60 Hz
Power Consumption	max. 5 W
Relay K1	20A resistive/ max 250 VAC
RelayK2	8A resistive / max. 250 VAC
ambient temperature	-13 to 131°F (-25 to.+55°C)
storage temperature	-22 to 140°F (-30 to.+60°C)
adjustable range	32 to 734°F (0 to 390°C), optional configuration
display range / resolution	-58 to 752°F (-50 to 400°C)
accuracy	± 1K, ± 2 digits -58 to 752°F (-50 to 400°C)
display / relay indicators	LED (red), 11mm
terminals	Sensor: AWG 16...24 copper wire, length (exposed wire) 3/8" (9 to 10mm) Others: AWG 14...24 copper single-wire, length (exposed wire) 1/4" (5...6mm)



Installation/ Safety Instructions

- Electrical installation and commissioning must be performed by authorized personnel only
- Please note and adhere to all local electrical safety requirements!
- Please note maximum ratings as per provided type label!
- Observe ingress protection (IP) and NEMA rating requirements and permitted operating temperature when choosing the location of the controller. Recommended and preferred mounting locations include protection against precipitation and direct sunlight. Operate only with closed lid, tightened cable entries and installed seals
- Avoid tension and pulling stress of the cables terminated to the controller
- If the sensor cables need to be extended, use a shielded cable and connect one end of the shield to a ground terminal near the controller. Do not install the cable in parallel with main AC voltage wiring. The total sum of wire resistance should not exceed 10 ohms. When power is connected to the controller, the front panel will display the actual sensor temperature.

ELTC-14 Parts List and Connection Details

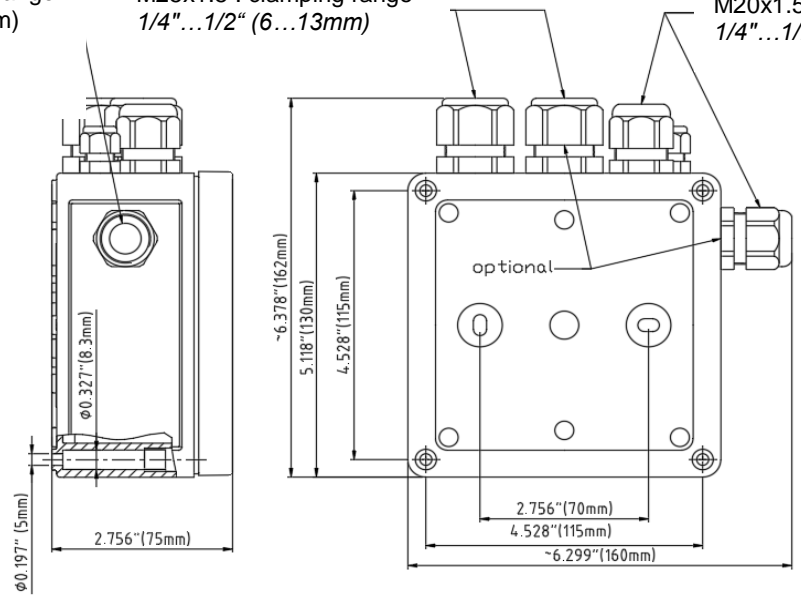
Controller Model	Assembly Description	Item/Part No.
ELTC-14	2 cable glands M25x1.5 2 cable glands M20x1.5 1 cable gland M12x1.5 2 O-rings M25 2 O-rings M20 1 O-ring M12 2 multiple seals 2x1/4" (2x6 mm) 1 locking nut M20x1.5 1 locking nut M25x1.5	0620007

Dimensions

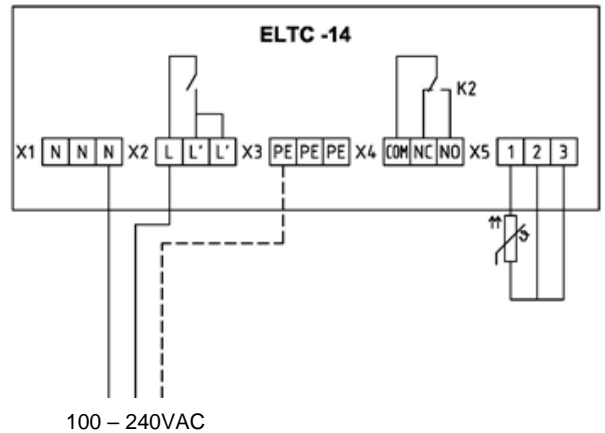
M12x1.5 : clamping range
1/8" ... 1/4" (3...6.5mm)

M25x1.5 : clamping range
1/4" ... 1/2" (6...13mm)

M20x1.5 : clamping range
1/4" ... 1/2" (6...12mm)



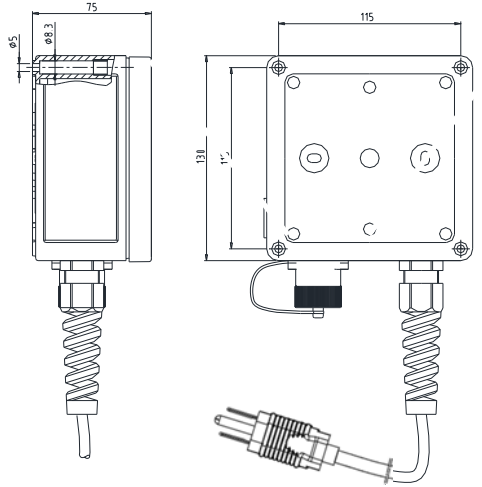
Electrical Connection



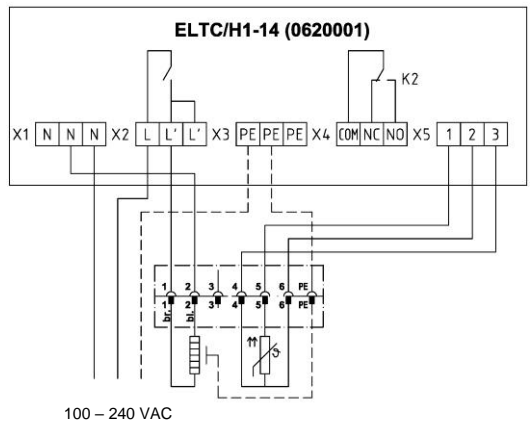
ELTC/H1A-14 Parts List and Electrical Connection Details

Controller Model	Assembly Description	Item/ Part No.
ELTC/H1A-14	panel jack 7-pole (10A), connection cable with plug /	0620004

Dimensions



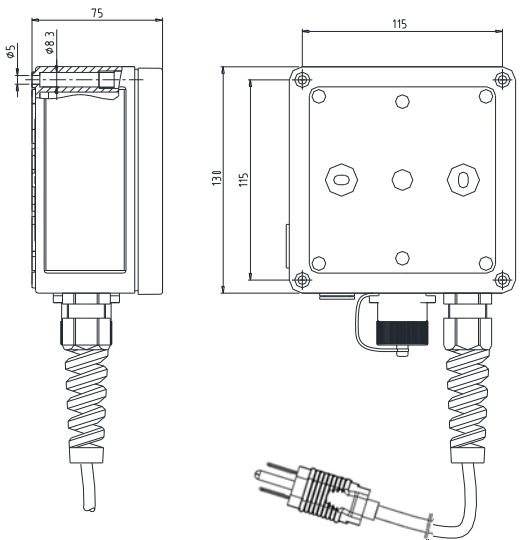
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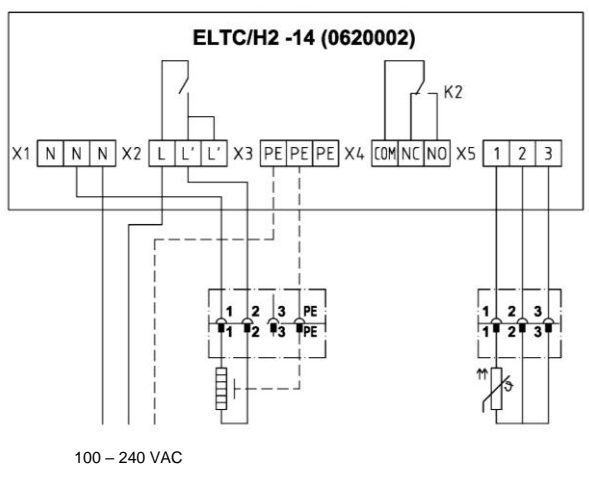
ELTC/H2A-14 Parts List and Electrical Connection Details

Controller Model	Assembly Description	Item /Part No.
ELTC/H2A-14	panel jack 3 and pole (16A), connection cable with plug /	0620006

Dimensions



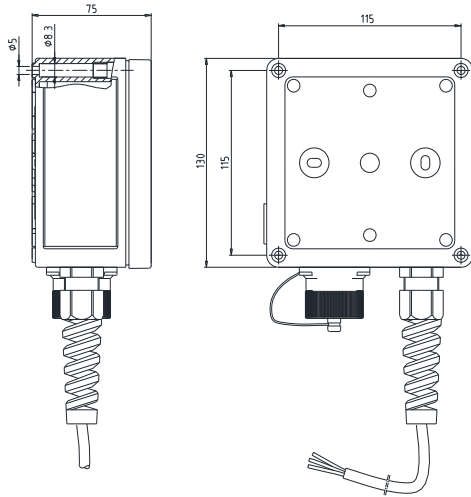
Electrical Connection



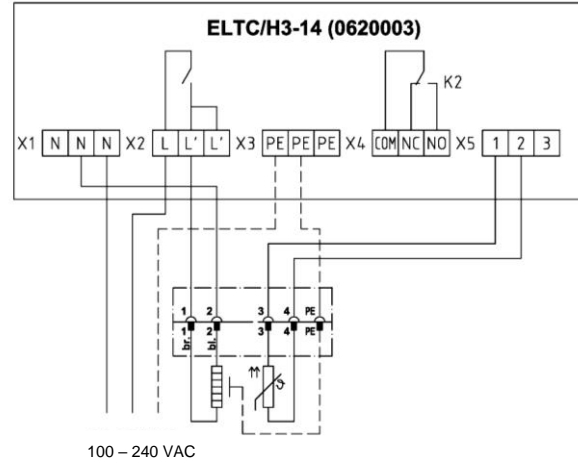
ELTC/H3-14 Parts List and Electrical Connection Details

Controller Model	Assembly Description	Item / Part No.
ELTC/H3-14	panel jack 5-pole (20A), connection cable without plug /	0620008

Dimensions



Electrical Connection



Electrical Connection Board Descriptions

- X1.1
X1.2
X1.3 → Common/ Line Neutral (N)
- X2.1 AC supply Line or Hot (L or H)
- X2.2 Connection Heating Cable A
- X2.3 Connection Heating Cable B
- X3.1
X3.2
X3.3 → Common Ground Protection (PE) Connection
- X4.1 Alarm Relay COM
- X4.2 Alarm Relay NC
- X4.3 Alarm Relay NO
- X5.1 Connection RTD / PT100 Sensor
- X5.2 Connection RTD / PT100 Sensor
- X5.3 Connection RTD / PT100 3-Wire (not required when using 2-wire-sensor)

