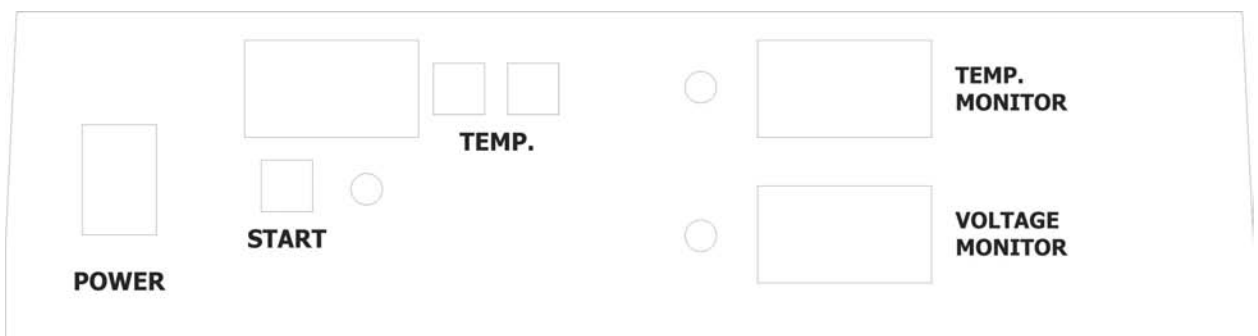# TEC-BT temperature controller

User manual

Overview

TEC-BT thermocontroller is designed to control the temperature of the objects and to stabilize its temperature at the certain level. The target temperature is set either manually via front panel user interface or digitally via RS-232 machine interface. The actual object's temperature is measured and provided to the operator.


Description

Front panel description

POWER switch – turns thermo controller on and off
TEMP. indicators – depict the temperature set points
TEMP. buttons – change the temperature set points

TEMP. MONITOR – depicts the actual temperature
VOLTAGE MONITOR – is inactive in the present version

Red LED is active when thermocontroller heats the Peltier. Green LED is active when thermocontroller cools the Peltier. Both LEDs are active when the actual temperature is equal to the temperature set point.

START button – enables output and starts operations in selected mode with selected parameters; the second pressure on this button stops operations
when START button is pressed the red LED nearby indicates this

Back panel description
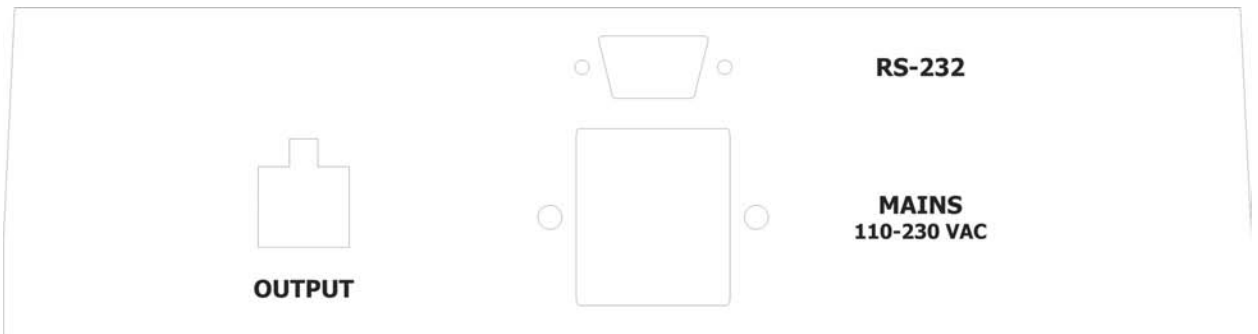
MAINS connector (cable is supplied with the module) – connects module to the mains (110/230 VAC, 50/60 Hz). This connector contains 5A fuse.

OUTPUT connector (cable is supplied with the module) – connects the load (Peltier and thermistor) to the module.

RS-232 connector (cable is supplied with the module) – connects module to the computer.

OUTPUT connector description

PIN (color)	DESIGNATION	DESCRIPTION
1,2 (red)	TEC +	Peltier positive
3,4 (blue)	NTC	NTC termistor connections
5,6 (black)	TEC –	Peltier negative

Safety

- Do not remove coverage case from the module
- Do not self-repair the module
- Do not operate with disconnected load
- Do not connect / disconnect cables while module is turned on
- Do not turn the module on if it has been already damaged with water, chemicals, mechanical or electrical shock

Operations

1. Connect Peltier (observing the polarity) and 10kOhm NTC to the thermocontroller, connect thermocontroller to the mains
2. Turn POWER switch on
3. Select desired temperature using the corresponding buttons (TEMP.)
4. Press START button. Since that moment module will start the operations. It will be indicated with the corresponding LED
5. Press START button again to stop operations
6. Turn the POWER switch off

Operations (RS-232 interface)

1. Ensure that POWER switch is off, ensure that computer is off
2. Connect module to the computer using the corresponding cable
3. Turn POWER switch on, turn the computer on
4. Run HyperTerminal or analogous software
5. Send to the driver commands that set desired parameters of operations. Send to the driver "r 1" command to start operations
6. Send to the driver "r 0" command to stop operations
7. Turn POWER switch off

> **Note:** it's possible but it's not recommended to use
> RS-232 and front panel user interfaces at the same time

Specifications

ELECTRICAL

Input	110/230VAC, 50/60 Hz; 2.0 A max
Output voltage	–20..+20 V
Output current	up to 10A
Output power	up to 150W
Feedback loop	10kOhm NTC termistor
Output temperature range	10…40 ºC (other on request)
Temperature accuracy	0.1 ºC
Cooling	forced air cooling with the embedded fan

MECHANICAL SPECIFICATION

Size (LxWxH)	225 x 200 x 60 mm
Weight	1,5 kg

RS-232 interface

RS-232 connection parameters: 38400 bps, 8 data bits, 1 stop bit, no parity.

Command format is: {command} {data (optionally)} {end-of-line}
- command is 1 character long (see list below)
- data is ASCII-string of adjusting value
- end-of-line symbols are \r\n or \n

List of available commands:
- t {temperature} – sets temperature set point (10.0 to 40.0 °C, accuracy 0.1 °C)
- T – returns temperature set point
- C – returns the actual temperature (temperature monitor)
- r {0/1} – starts/stops the module ("r 1" starts; "r 0" stops)
- R – returns the actual state of the module (1 – module is in run mode)
- e {0/1} – turns on/off echoing of symbols in RS-232 ("e 0" – no echo)

Example: "t 25.1" sets the temperature to 25.1 °C.