

Temperature Controller – 5A/40W

Benchtop Drivers

Platform Drivers

OEM Drivers

Laser Diode Mounts

Laser Diodes

Pigtailed Lasers

Laser Modules

Accessories



TED350

Includes Power Cord and Cable for Connection to Our Mounts with DB9 Interface

TED350
±5A / 40Watts
Thermoelectric
Temperature Controller

Introduction

The TED350 is a precision temperature controller designed to power thermoelectric cooler (TEC) elements with currents up to $\pm 5A$. The controller is equipped with a PID feedback circuit. This independent control of the P (proportional) gain, the I (integral) offset control, and the D (differential) rate control allows the user to adjust the TED350 to obtain the optimal performance for a wide variety of thermal loads.

FEATURES

Temperature Display/Set Point

An easy-to-read, 4 1/2-digit LED display is used to monitor the setup and control parameters. The displayed parameters include the set temperature, the actual temperature, the heating or cooling current, as well as the current limit for the TE cooler. Additionally, the TEC voltage and window thresholds can be displayed.

The temperatures are displayed with a resolution of $0.01^{\circ}C$ when using the AD590 temperature sensor, or 1Ω when a thermistor is being used.

The temperature set point can be set by using either the front panel control knob, or for applications where the prevention of inadvertent adjustment is required, the TED350 offers a limited access set point that overrides the front panel "Adjust" control.

The T_{set} temperature can also be controlled via an analog input signal. As an example, this feature supports the construction of a control loop for stabilizing the wavelength of the laser diode by utilizing the temperature dependence of the laser wavelength.

TEC Protection

The TED350 is designed for maximum protection of the TEC element. When the controller is enabled, an LED indicator signals that the driver is activated.

An adjustable TEC output current limit, which can be set anywhere within the controller's range, prevents the controller from overdriving the TEC element.

OPERATION

Adaptability to Different Thermal Loads

The PID controls are located on the front panel for easy access when optimizing the response of the TED350 for particular applications. The proportional gain optimizes the response time of the feedback loop, while the integral gain provides precise zero-offset regulation. The derivative gain optimizes the dynamic response of the feedback loop to account for rapid changes in the thermal load.

Temperature Window

When used in conjunction with our LDC340, a temperature window (high and low threshold) can be set on the TED350. When the window is exceeded, the laser diode is protected by shutting down the laser drive current.

Highlights

- $\pm 5A/40W$ Low Noise TEC Output
- Temperature Stability $\leq 0.001^{\circ}C$
- Two Operating Modes: Constant Temperature & Constant TEC Current with Pre-Setting of the Desired TEC Current
- Operates With All Common Sensors: Thermistor, AD590/AD592, LM135/LM335 (Pt100 upon request)
- Set Temperature Protection Against Accidental Adjustment
- Adjustable Current Limit and Temperature Limit
- 4 1/2-digit LED Display of All Important Parameters
- Separate Control of the P-, I-, & D-Gains for Perfect Adaptation to the Thermal Load
- Analog Control of Temperature Set Point via the Input TUNE IN
- Temperature Window Protection Output to Switch Off the Laser (In Combination With LDC340)

Fault Indication

If the system detects incorrect or missing temperature sensors, or connection problems between sensor and controller, the output gets switched off, an LED fault indicator is lit, and a control signal is triggered that can be used to shut down the laser diode.

All LED faults are accompanied by a short audible warning signal. For safe and continuous operation at ambient temperatures of up to $40^{\circ}C$, the TED350 is equipped with a cooling fan and over-temperature protection.

RELATED ITEMS

Temperature Sensors

The TED350 is compatible with a number of common temperature sensors: thermistors up to $200k\Omega$, integrated circuit (IC) sensors (AD590/AD592, LM135/LM335, and LM35), and Pt100 RTD Sensors (on request).

Temperature Controller – 5A/40W (cont.)

A front panel selector switch facilitates selection of the thermal sensor. When a thermistor is used, the temperature is displayed as the resistance value of the thermistor and ranges from -30°C to over 200°C.

When an IC sensor is used, the temperature is displayed directly in °C with a resolution of 0.01°C. The TED350 also supports the use

of a platinum resistive temperature detector, Pt100 RTD (on request). When using this sensor the TED350 converts the highly predictable resistance values directly into °C.

The temperature control range is from -45°C to 145°C when an IC sensor is used, this is limited by the rating of the particular sensor).



TED350 Rear Panel

Precision Temperature Control for basic research, industrial R&D, and high-precision manufacturing.

TC200 General Purpose Heater Controller – Ideal for controlling resistive heating devices, such as our PPLN ovens. See Page 970



TC200

Specifications

TEC Output

- Control Range of TEC Current: -5A to +5A
- Compliance Voltage: >8V
- Maximum Output Power: 40W
- Resolution TEC Current: 1mA
- Accuracy TEC Current: ±20mA
- Resolution TEC Voltage: 1mV
- Accuracy TEC Voltage: ±40mV
- Noise and Ripple, Typ: <2mA

TEC Current Limit

- Setting Range: 0 to ≥5A
- Resolution: 1mA
- Setting Accuracy: ±50mA

Temperature Control Input

- Control Voltage: -10 to 10V

Thermistor Sensors

- Control Ranges (Switchable): 10Ω to 19.99kΩ, 100Ω to 199.9kΩ
- Resolution: 1Ω or 10Ω
- Accuracy: ±5Ω or ±50Ω
- Stability: <0.5Ω or <5Ω

IC-Sensors (AD590/AD592, LM135/LM335, and LM35)

- Control Range: -45°C to + 145°C
- Resolution: 0.01°C
- Accuracy: ±0.1°C
- Stability: <0.001°C

Pt100 Sensor in Exchange for LM35 (upon request)

- Control Range: -45°C to +145°C
- Resolution: 0.01°C
- Accuracy: ±1°C
- Stability: <0.005°C

Temperature Control Input

- IC-Sensors Coefficient: 2°C/V ±5%
- Thermistor Coefficient: 20kΩ or 200kΩ
- Range: 0.2kΩ/V or 2kΩ/V±5%

Control Output

- Load Resistance: >10kΩ
- IC-Sensors Coefficient: 50mV/°C
- Thermistor Coefficient (20kΩ/200kΩ Range): 500/50mV/kΩ

Temperature-Window Protection

- Setting Range TWIN: 0.5°C to 20°C
- Setting Range: RWIN 20kΩ and 200kΩ
- Range: 50Ω to 2kΩ and 500Ω to 20kΩ

Connectors

- Sensor, TE Cooler, TEC ON Signal: 15-pin D-Sub Jack
- Control Input: BNC
- Control Output: BNC
- Temperature-Window Protection: BNC
- Chassis Ground: 4mm Banana Jack
- IEEE-488.2 Interface: 24-pin IEEE-488 (Optional)

General Data

- Line Voltage: 100/115/230V+15%/–10%
- Line Frequency: 50 to 60Hz
- Max. Power Consumption: 140VA
- Operating Temperature: 0°C to + 40°C
- Storing Temperature: -40°C to +70°C
- Warm-Up Time: 10min
- Weight: <7.0kg
- Dimensions (W x H x D): 220 x 110 x 351mm

Banana Jack

- IEEE-488.2 Interface: 24-pin IEEE-488 (Optional)

Need More Information?

Download a copy of the Operator's Manual at www.thorlabs.com. Search for "TED350."

ITEM	\$	£	€	RMB	DESCRIPTION
TED350	\$ 1,600.00	£ 1,008.00	€ 1,488.00	¥ 15,280.00	Temperature Controller ±5A/40W
TED350-IEEE	\$ 1,960.00	£ 1,234.80	€ 1,822.80	¥ 18,718.00	Temperature Controller ±5A/40W, IEEE-488 Interface