TDU-5000A (R/G) series

Peltier Controller Driver

Overview

The TDU-5000A(R/G) series is a DIN-sized one-channel digital peltier controller driver.

The unit furnishes a temperature converter, a PID controller and a bipolar-constant-current driver in its compact body (96 x 96 x 140.3mm). So just by supplying the DC power, temperature control of the peltier device can be practiced. Moreover, although the unit is compact, it has achieved a maximum driving current of 10A and can drive a peltier device of maximum 150W. Its maximum control stability is ±0.002℃ (Type G). This high stability should contributes especially to the optical and bio fields.

Also both serial and parallel interfaces are built-in. So the machine meets various system requirements by communicating with PC.

Features

1. This DIN-sized instrument (96W x 96H mm) is composed of a temperature converter, a PID controller and a bipolar-constant-current driver. The compact body requires no selection for an installation place.

2. Despite its compactness, a maximum driving current of 10A has been realized, and a peltier device of up to 150W can be driven.

3. Thermosensors are selectable from any of the three types: a thermistor, a PT100Ω resistance temperature detector or a thermocouple.

4. A maximum control stability is ±0.002℃. (Type G using a thermistor). So it perfectly supports applications which require extremely sensitive temperature control. (A maximum control stability of Type R is ±0.02℃.)

5. Various security functions backup protecting the peltier device. (upper/lower-limit temperature monitor, heat-sink temperature monitor, sensor open/short monitor, peltier open/short monitor, and power-supply voltage monitor)

6. The auto-tuning function helps to eliminate the time-consuming work of PID parameter setting.

7. Not only temperature of the peltier device but also that of the heater can be controlled.

8. Both RS-232C and RS-422 serial interfaces are equipped for supporting PC command control.

9. A parallel interface is equipped for inter-acting with other external devices. It makes easy to build the machine into a complex system. (interlock input, start-control input, alarm output, and reached-the-target-temperature output)

Specifications

(When not specified, specs are the same for both Type G and R.)

1. Temperature Measurement Unit

Applicable Thermosensor	Three-wired platinum resistance temperature detector Pt100Ω Thermistor (10KΩ@25℃ 3000<B<4000) Thermocouple (Type K, J and T)
Measurable Temperature Range	−100℃ ～ +200℃ (Pt100Ω) −50℃ ～ +150℃ (Thermistor) −100℃ ～ +200℃ (Thermocouple)
Measurement Accuracy	±0.02℃ (excluding sensor accuracy)
Measuring Method/Resolution	Type R: 16bit⊿ΣAD/0.01℃, Type G: 24bit⊿ΣAD/0.001℃

2. Control Unit

Control Channel	1CH
Control Method	Digital PID control
Control Cycle	0.15sec ～ 37.5sec (automatically set by the auto-tuning function)
Control Stability	Type R: ±0.02℃ Type G: Thermistor:±0.002℃, Pt100Ω:±0.004℃, Thermocouple:±0.02℃
Setting Resolution	0.01℃
Auto-tuning	Supported

3. Driving Unit

Driving Method	MOS FET bipolar-high-efficient-constant-current drive
Max. Driving Voltage	±24V
Max. Driving Current	±10A
Max. Driving Power	150W (V x A = W)

(Note: Each and all of the voltage, current and power must not exceed their maximum driving values.)

4. Measuring Items

Peltier Current	0 ～ ±10A (accuracy: ±0.2%/FS)
Peltier Voltage	0 ～ ±25V (accuracy: ±0.2%/FS)
Peltier Heatsink Temperature	0 ～ 100℃ (accuracy: ±1℃)
Supply Voltage	0 ～ 28V DC (accuracy: ±0.2%/FS)

5. Display Settings

Display Method	A green-5-digit-7-segment LED and LED indicators
Setting Method	Selecting system using tactile switches

6. Interfaces

Serial Interface	RS-232C and RS-422 (equipped as standard)
Parallel I/O	Interlock input (b contact or negative logic TTL input) Start-control input (b contact or negative logic TTL input) Alarm output (negative logic open-corrector output) Reached-the-target-temperature output (negative logic open-corrector output)

7. Error Monitors — Upper/lower-limit temperature monitor, Heat-sink temperature monitor, Temperature sensor open/short monitor, Peltier open/short monitor, Power-supply voltage monitor

8. Connectors

Peltier Connector	Connector part No.: RDG1-15SEI (HIROSE)
I/O Connector	Connector part No.: K61X-E15S (KYCON)

9. General

Operating Temperature	0℃ ～ 40℃ (No condensing)
Saving Temperature	−10℃ ～ 60℃ (No condensing)
Power	DC+21.5V ～ DC+26.5V 200VA or lower
Dimensions	96(W) x 96(H) x 140.3(D) mm (excluding protrusions)

10. Accessories — A set of Peltier-device connector, I/O connector and Rubber feet (Panel attachment parts are option.)

Specifications and design may change without advance notice.

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