THERMO ELECTRIC PELTIER CONTROLLER
Model TA-PB-2

Patented *1

◆ Features ◆

Compact High Precision Peltier (Uni-Thermo recommended) Controller

Temperature Control ◆ ±0.1 °C
External Dimensions ◆ W 178 × D 93(D110*) × H 44.5 mm
(*: When connectors are installed, excluding jumpers)
Weight ◆ approx. 415 g

Multifunctional, high performance and high cost performance

Peltier Drive voltage ◆ Standard 1 V ~ 50 V 12 A max.
Standard Temp. Control Range ◆ −100 °C ~ +150 °C (Settings can be changed)

Simple Method of Operation

Easy to adjust temperature setting parameters
(TFT touch screen, free PC application, Auto PID Tuning)

Equipped with communication function for external devices

External setting, control and monitoring is possible from a PC or
PLC via USB-C and 3-wire RS232.
Free PC app compatible with Windows included
(can check temperature graphs,display TX and RX messages and record logs)

Compatible with Various Sensor Types

Supports Pt100, thermistors, and thermocouples with
DIP switch hardware configuration and easy software operation.
Look-up table settings are available for all sensors, so the thermocouple
inputs are compatible with almost all thermocouples for
which a table can be provided, including not only K but also T.
External temperature information can be used as the control temperature.
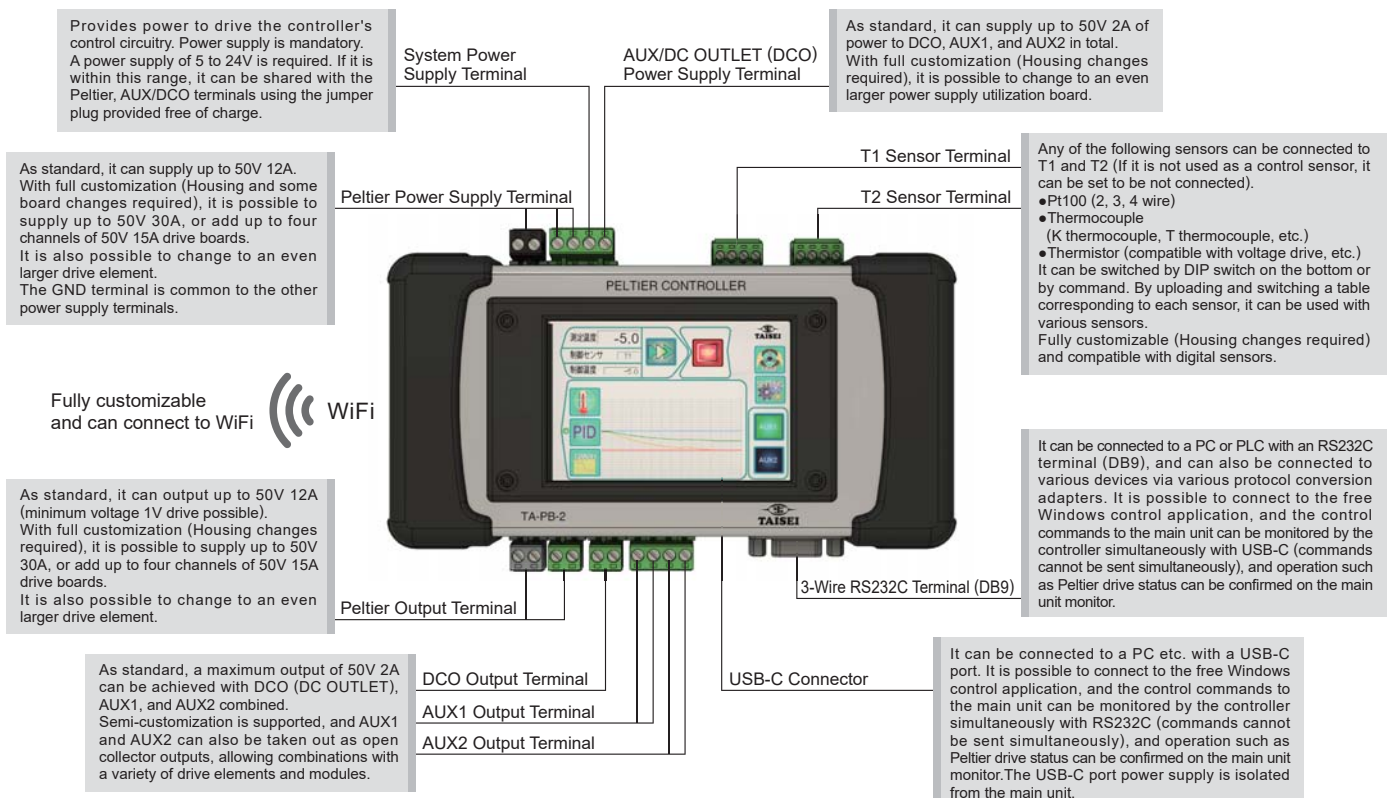
Easy Automatic Operation

The simple program ADF (AUTO-DRIVE FILE) is easily created
from the log. Not only can the controller be automatically controlled with
the free PC app, but the program can also be uploaded to the main unit and
used autonomously. The startup ADF setting can also be used to
automatically operate immediately after startup.

CAUTION : Sensor, Peltier product, power supply,
connectable equipment etc. are all sold separately.
*1: Acquired patent: Patent No. 6627951

🖊 Connect Diagram and Extensibility (Semi Custom, Full Custom Correspondence)

Provides power to drive the controller's control circuitry. Power supply is mandatory. A power supply of 5 to 24V is required. If it is within this range, it can be shared with the Peltier, AUX/DCO terminals using the jumper plug provided free of charge.

System Power Supply Terminal

AUX/DC OUTLET (DCO) Power Supply Terminal

As standard, it can supply up to 50V 2A of power to DCO, AUX1, and AUX2 in total. With full customization (Housing changes required), it is possible to change to an even larger power supply utilization board.

As standard, it can supply up to 50V 12A. With full customization (Housing and some board changes required), it is possible to supply up to 50V 30A, or add up to four channels of 50V 15A drive boards. It is also possible to change to an even larger drive element. The GND terminal is common to the other power supply terminals.

Peltier Power Supply Terminal

T1 Sensor Terminal

T2 Sensor Terminal

Any of the following sensors can be connected to T1 and T2 (If it is not used as a control sensor, it can be set to be not connected).
● Pt100 (2, 3, 4 wire)
● Thermocouple
  (K thermocouple, T thermocouple, etc.)
● Thermistor (compatible with voltage drive, etc.)
It can be switched by DIP switch on the bottom or by command. By uploading and switching a table corresponding to each sensor, it can be used with various sensors.
Fully customizable (Housing changes required) and compatible with digital sensors.

Fully customizable and can connect to WiFi — WiFi

It can be connected to a PC or PLC with an RS232C terminal (DB9), and can also be connected to various devices via various protocol conversion adapters. It is possible to connect to the free Windows control application, and the control commands to the main unit can be monitored by the controller simultaneously with USB-C (commands cannot be sent simultaneously), and operation such as Peltier drive status can be confirmed on the main unit monitor.

As standard, it can output up to 50V 12A (minimum voltage 1V drive possible). With full customization (Housing changes required), it is possible to supply up to 50V 30A, or add up to four channels of 50V 15A drive boards. It is also possible to change to an even larger drive element.

Peltier Output Terminal

3-Wire RS232C Terminal (DB9)

As standard, a maximum output of 50V 2A can be achieved with DCO (DC OUTLET), AUX1, and AUX2 combined. Semi-customization is supported, and AUX1 and AUX2 can also be taken out as open collector outputs, allowing combinations with a variety of drive elements and modules.

DCO Output Terminal
AUX1 Output Terminal
AUX2 Output Terminal

USB-C Connector

It can be connected to a PC etc. with a USB-C port. It is possible to connect to the free Windows control application, and the control commands to the main unit can be monitored by the controller simultaneously with RS232C (commands cannot be sent simultaneously), and operation such as Peltier drive status can be confirmed on the main unit monitor.The USB-C port power supply is isolated from the main unit.

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Specifications

Temperature Range	$-100\ ℃ \sim +150\ ℃$
Temperature Setting	Possible in increments of 0.1 ℃
Temperature Indication	Possible in increments of 0.1 ℃
Indicator, Function, Display Language	●Temperature display, graph display, device control and setting input with 3.5 inch TFT touch screen. ●Various operations are possible using the free app (compatible with Windows 7/10/11). ●(Fully customizable) Connect via WiFi using the built-in WiFi server, controllable from a PC with a browser (Win, Mac, Linux), tablet (including iPad) or smartphone (iOS and Android), and can be linked to the cloud. ●Display language can be switched between Japanese and English.
Control Method	●Supports PID control, P control (Ki, Kd values are set to 0), and PI control (Kd value is set to 0). ●ON/OFF control (using the app or the built-in AUTO-DRIVE). ●Open loop drive by direct input of PWM value (using the app or the built-in AUTO-DRIVE). ●Supports high frequency temperature setting change control (using the app or the built-in AUTO-DRIVE).
PID Parameter	Kp, Ki, and Kd can be entered in 0.001 increments.
AUTO Tuning	AUTO tuning support Automatic input for Kp, Ki or Kp, Ki, Kd. In addition, various parameters for AUTO tuning can be changed.
Peltier Drive Method	PWM drive or ON/OFF drive
Temp. Sensor	Supports Pt100 (2, 3, 4 wire), thermocouple (K), and thermistor (supports Ref. voltage and ratiometric measurement, reference resistor connection is required for all thermistors) as standard. Also, by assigning a sensor table to each sensor, high accuracy measurement is possible. Using the sensor table, it supports thermocouples other than K and various thermistors other than 10k. All settings can be made by the user. Fully customizable, it supports digital sensors via I2C connection. External temperature information can be used as the control temperature. "No sensor" setting is possible regardless of whether a channel other than the control channel is connected. Control is possible using Tcalc, which is calculated based on temperature information from two channels (VCP: Virtual Control Point).
Safety Function	Equipped with multiple features such as measures to prevent runaway due to disconnection of a sensor. Also, with full customization, additional safety measures such as detection of abnormal temperature rise of Peltier units using thermistor temperature measurement are possible.
Safety Operation Function	Operation management of the main unit setting screen with PIN is possible.
Automatic Control	Equipped with Auto-Drive File (ADF), a proprietary macro automatic control method, it supports all commands available on TA-PB-2, as well as branching when temperature thretholds are reached and repeated operations. Logs created using the free PC app can be edited with a text editor or spreadsheet software. They are then loaded the PC app for verification, and then uploaded almost as is to the main unit with the push of a button, enabling automatic operation on the main unit. It is also possible to set the ADF to run automatically with the start-up of the main unit. With this function, programming knowledge is almost unnecessary for automatic operation.
Log Function	Short and long logs can be created using the PC application, and TX, RX, or both TX/RX logs can be created. Command list type and table format logs can also be created.
Input / Output Connector	Input: System power, Peltier power, AUX power, DCO power, Sensor 1, Sensor 2 Output: Peltier output, AUX output 1, AUX output 2, DCO output Uses terminal blocks made by Phoenix which can be plugged and unplagged for all signals except USB-C and D-sub 9. Special connectors etc. are unnecessary.
Power Supplies	Peltier power supply: Max. 50 V/12 A (Max. 50 V/30 A with full customization) System power supply: $5 \sim 24$ V DCO, AUX1, AUX2 power supply: Channel total 50 V/2 A GND is common to all power supply terminals. If the system power supply voltage range is $5 \sim 24$ V, a single voltage can be provided to all power supply terminals using the free three-terminal jumper plug.
Communication	Input/Output: 3-wire RS232 (Tx, Rx, GND), USB-C Fully customizable, providing I2C port and TTL serial signal port input/output ports.
Working Environment	Clean inside area environment
Working Temp. Range	$-10\ ℃ \sim +50\ ℃$, $+20\ ℃ \sim +25\ ℃$ recommended (No evidence of dew in any case)
Storage Temp. Range	$-30\ ℃ \sim +85\ ℃$, $+20\ ℃ \sim +25\ ℃$ recommended (No evidence of dew in any case)
Working Humidity Range	85 % max. (No evidence of dew)
Outer Dimensions	W 178 × D 93 (D110 mm*) × H 44.5 mm (*：When connectors are installed, excluding jumpers)
weight	approx. 415 g

⚠ * Specifications of products are subject to change without notice.