

TRT-2416 operation manual

Thank you for purchasing our TRT-2416. Please thoroughly read this manual. This manual is a brief version of the operation manual.

Cautions For safety purpose, following symbols are used in this manual.

	Warning	The case that a user may receive fatal damage, electric shock, or severe burn injury when the product is incorrectly used
	Cautions	The case that a user may receive minor injury or the equipment may get damage
	Warning	Verify correct wiring before turning on electricity since incorrect wiring may cause an equipment failure or a fire. Modification of this equipment may cause malfunctioning or a fire. Do not add modification on this equipment. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
	Cautions	Wiring – If the current would be large in the output terminal (OUT 1, OUT 2) as well as in the power terminal (DC24V + -), use wire material thick enough for such current (within the current rating).

- Hand over this operation manual to a person who actually operates the product. - Do not reprint or duplicate this manual without permission.
- Content of this manual may be subject to modification without prior notice.

Verification of the product

- 1) Verification of the model: Refer the model name printed in the packing box to the order sheet.
- 2) Model: TRT-2416

Environmental condition

- (1) Service temperature/humidity range:
0-50 °C / 20-90 % RH (no dew condensation)
- (2) Storage temperature/humidity range:
-20-70 °C (no freezing or dew condensation) / 5-95 % RH (no dew condensation)
- (3) Installation environment :
 - 1) No corrosive gases, dust, oil as well as less temperature changes.
 - 2) As far away as possible from an electric noise source, and little effect from electromagnetic field
 - 3) A location with as few mechanical vibrations or impact as possible.
 - 4) No direct sunlight
 - 5) Installation category I / Pollution Degree 2

Specifications

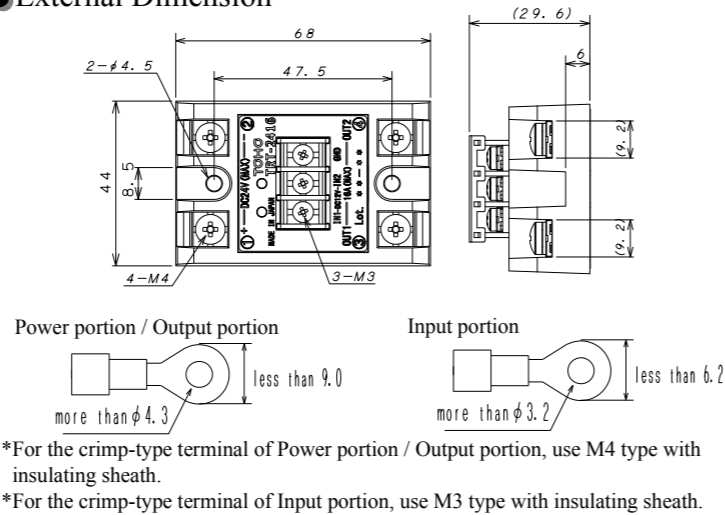
Rating

Input	Input Point	2-points (IN 1, IN 2, GND common)
	Input Kind	Voltage DC 12V <ON>, DC 0V <OFF>
	Min. Input Time	More than 2ms (Level Input)
	Input Resistance	2.8kΩ Standard
Output	Connection Method	Terminal Block (M3 screw)
	Output Point	1-point
	Output Kind	Connected to Peltier Drive Output (OUT 1, OUT 2)
	Output Type	ON/OFF (MOS FET Output: For Peltier Drive, with inverting function)
Output	Output Voltage	± (DC 8 ~ 24V) The voltage is dependent on external power voltage, polarity is dependent on the inverting function.
	Max. Output Current	16A (Refer to Table of Output Characteristic)
	Connection Method	Terminal Block (M4 screw)
Service temperature/humidity range	0-50 °C / 20-90 % RH (no dew condensation)	
Storage temperature/humidity range	-20-70 °C (no freezing or dew condensation) / 5-95 % RH (no dew condensation)	
Installation gradient	Base plane 0 or 90 degrees (vertically with output side in upward direction)	
Mounting	Use M4 screw to attach the product.	
Weight	100 g or less	
Isolation	Non-isolated with power circuit, non-isolated with Peltier drive circuit.	
External code and standard	None	

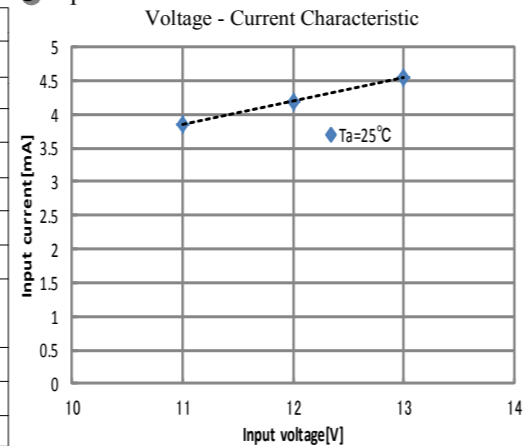
Characteristics

Input	ON voltage	DC 12V ±1V	
	OFF voltage	DC 0V ~ 1V	
	Input current	5mA MAX (at ON)	
Output	Output specification	MOS FET Output (for Peltier drive with polarity reversion function)	
Display	monitor display	Input 1	Red LED (φ3mm) 1 pc. The red LED lamp will light-up when the input from the SSR drive output of Input 1 becomes ON (12V)
		Input 2	Green LED (φ3mm) 1 pc. The Green LED lamp will light-up when the input from the SSR drive output of Input 2 becomes ON (12V)
Power supply voltage	DC8 - 24V±10% (permissible range) * Commonly used with Peltier drive (output).		

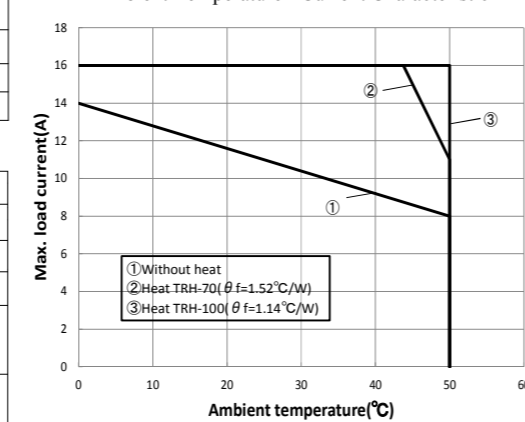
External Dimension



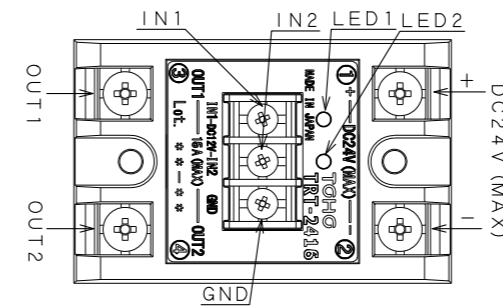
Input Characteristic



Output Characteristic



Names and Functions

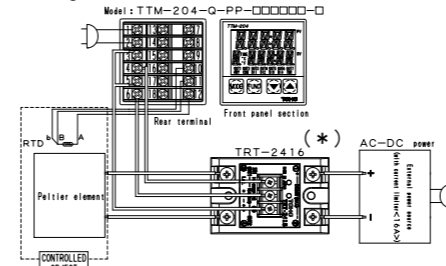


IN1,2, GND	Input from the temperature controller (SSR drive output)
OUT 1,2	Peltier drive output
DC24V(+,-)	External Power Input

Wiring (TRT-2416)

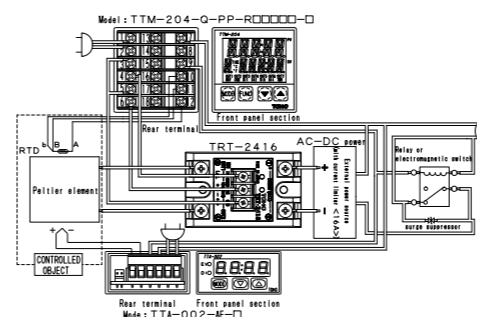
Below diagram shows the sample wiring when the product is connected to TTM-204 Temperature Controller.

When power source with current limiter is used as an external power source.



(*) In case the external power source is not fitted with current limiting function, please use FUSE (Max. 10A).
(FUSE is not necessary if the power source fitted with current limiting function is used.)

When using a fuse for the external power source.



Cautions

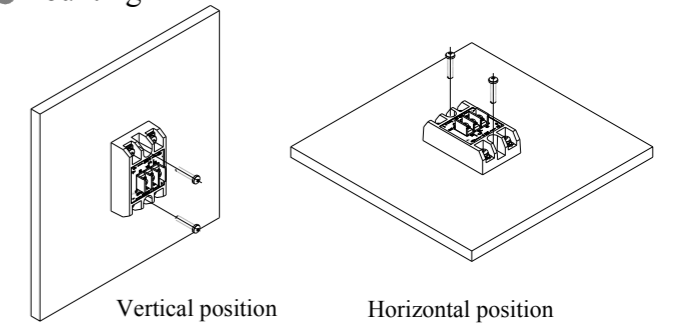
- *Due to risk of electric shock, do not touch the terminals while the power is running through the unit.
- *Since the unit is designed to radiate heat from the bottom, do not cover this portion with insulating materials.
- * We shall not be held responsible for any damages that may occur as a result of excessive usage beyond the ranges and specifications mentioned in this specification manual.
- *Please use the unit with utmost care and safety in mind in such a way that the unit be used with some allowance to its rating and performance, and to limit the damage to minimum in case of trouble.
- *Regardless of the place of use, the unit may bring about serious effect due to aging or trouble of the unit. It is therefore advised to install proper external protective circuits and perform regular maintenance.
- *If this product is used with output current of 16A, only the external power source fitted with current limiting function may be used.
(In case the power source is not fitted with current limiting function, please make use of the FUSE (Max. 10A) between the power source and the unit. In this case, up to 10A can be used.)
- * The parts used in the unit may change without prior notice due to procurement related consequence, and if the parts will not have any problem in its performance.
- * (CAUTION !! REGARDING POWER LINE SERGE)
please avoid common connection of the induced load such as relay to the power source for driving the Peltier Relay.
- * When making one-on-one connection of the several Temperature Controllers to several Peltier Relays, do not connect more than two pairs to one power source.

Movement of Input (1, 2) and Output (1, 2)

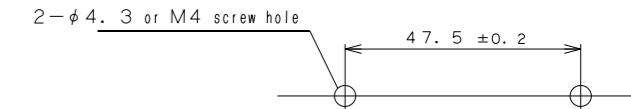
Condition	IN1	IN2	OUT1	OUT2
Heating	12V	0V	+	-
	When IN 1 is ON, the output condition <OUT 1 = +, OUT 2 = -> will be retained even if the voltage of IN 2 changes.			
Cooling	0V	12V	-	+
	When IN 2 is ON, the output condition <OUT 1 = -, OUT 2 = +> will be retained even if the voltage of IN 1 changes.			
OFF	0V	0V	No Output	No Output

- ※1 The table of real value shows the input 1, 2 to be the input voltage from the temperature controller.
ON (12V) OFF (0V) is shown to be the temperature controller output.
- ※2 The table of real value shows the output 1, 2 to be the Peltier drive output polarity.
In case the <Output 1=+, Output 2=->, current flows from output 1 side to output 2 side.
- ※3 Heating and cooling will change depending on the direction in which the Peltier element is attached.

Mounting

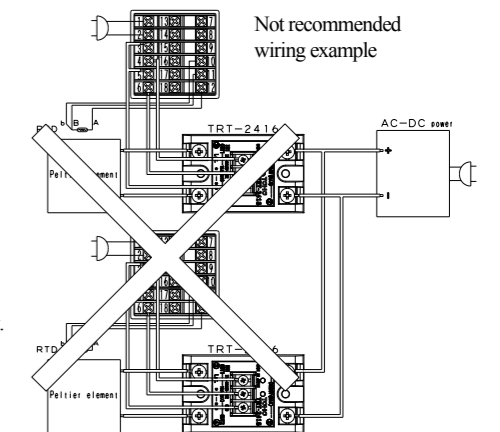


- *Base plane 0 or 90 degrees (vertically with output side in upward direction)
- *Use M4 screw to attach the product.
- *Kindly contact us for any questions regarding the use of heat radiator.



Warning

- * The tightening torque for the terminal block screw is as follows:
0.4N·m [Input Portion]
0.49 N·m [Power source / Output Portion]
0.66 N·m [Main body attachment portion]
- * If the polarity (+, -) is specified, be careful with its wiring.



TOHO TOHO ELECTRONICS INC.

Head office: 2-4-3 Nishihashimoto, Midori-Ku, Sagami-hara-Shi, Kanagawa 252-0131 Japan
TEL: +81-42-700-2100, FAX: +81-42-700-2112

Webpage: <http://www.toho-inc.co.jp>
E-mail: overseas@toho-inc.co.jp