

Independent Single Display PID Temperature Controllers



TR1D Series CATALOG

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

The specifications, dimensions, etc are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- Compact, space-saving design with 22.5 mm width size
- 50 ms high-speed sampling and $\pm 0.3\%$ display accuracy
- Simultaneous heating/cooling and automatic/manual control function
- Switch between current output and SSR drive output
- Easy mount on DIN rails (patent)*1
- RS485 communication output model available
 - Protocol: Modbus RTU or ASCII
 - Communication speed: up to 115,200 bps
- Parameter setting via PC (USB or RS485 communication)
 - Comprehensive device management software (DAQMaster) provided
- Heater disconnect alarm function (CT input)
 - Current transformer (CT) sold separately: CSTC-E80LN, CSTC-E200LN, CSTS-E80PP
 - Screen protection function

*1 Korea Patent Registration 10-2019-0158569, Korea Design Registration 30-1065663, China Design Registration 202030164351.2

Ordering Information

Model	Control output1	Control output2	Option output	Additional function
TR1D-14RN ⁰¹⁾	Relay	-	-	-
TR1D-14RR	Relay	Relay ↔ Alarm	-	CT input, Dual alarm output ⁰²⁾
TR1D-R4RR	Relay	Relay ↔ Alarm	Transmission	CT input, Dual alarm output ⁰²⁾
TR1D-T4RR	Relay	Relay ↔ Alarm	Communication	CT input, Dual alarm output ⁰²⁾
TR1D-14CN ⁰¹⁾	Current/SSR	-	-	-
TR1D-14CC	Current/SSR	Current/SSR ↔ Transmission	-	CT input
TR1D-R4CC	Current/SSR	Current/SSR ↔ Transmission	Transmission	CT input, Dual transmission output
TR1D-T4CC	Current/SSR	Current/SSR ↔ Transmission	Communication	CT input

01) The model does not support terminal for the control output 2 is not available to use heating&cooling control and alarm outputs at the same time.

02) It is not possible to use dual alarm output and heating&cooling control at the same time.

Product Components

- Product
- Instruction manual

Software

Download the installation file and the manuals from the Autonics website.

■ DAQMaster

DAQMaster is comprehensive device management program. It is available for parameter setting, monitoring.

Specifications

Series	TR1D Series	
Power supply	100 - 240 VAC ~ 50/60 Hz	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	≤ 8 VA	
Sampling period	50, 100, 250 ms	
Input specification	Refer to 'Input Type and Using Range'.	
Option input	CT input	<ul style="list-style-type: none"> • 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000, • Measurement accuracy: $\pm 5\%$ F.S. ± 1 digit
Control output	relay	250 VAC ~ 3 A 1a
	SSR	12 VDC ± 3 V, ≤ 20 mA
	Current	DC 4-20 mA or DC 0-20 mA (parameter), Load: $\leq 500 \Omega$
Option output	Alarm	AL1, AL2: 250 VAC ~ 3 A 1a
	Transmission	DC 4-20 mA (Load resistance: $\leq 500 \Omega$, Output accuracy: $\pm 0.3\%$ F.S.)
	RS485 comm.	Modbus RTU / ASCII
Display type	7 segment (red), 4-digit	
Control type	ON/OFF, P, PI, PD, PID Control	
Hysteresis	Control output: 1 to 100 °C/°F (0.1 to 100.0 °C/°F) Alarm output: 1 to 100 °C/°F (0.1 to 50.0 °C/°F)	
Proportional band (P)	0.1 to 999.9 °C	
Integral time (I)	0 to 9,999 sec	
Derivative time (D)	0 to 9,999 sec	
Control cycle (T)	Relay output: 0.5 to 120.0 sec, SSR drive output: 0.5 to 120.0 sec	
Manual reset	0.0 to 100.0%	
Dielectric strength	Between the power part and the case: 3,000 VAC ~ 50/60 Hz for 1 min	
Vibration	0.75 mm amplitude at frequency of 5 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours	
Relay life cycle	Mechanical	OUT1/2, AL1/2: $\geq 5,000,000$ operations
	Electrical	OUT1/2, AL1/2: $\geq 100,000$ operations (resistance load: 250 VAC ~ 5 A)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)	
Insulation type	Double insulation or reinforced insulation (dielectric strength between the power part and the case: 3 kV)	
Noise immunity	Square shaped noise (pulse width: 1 μ s) by noise simulator ± 2 kV R-phase, S-phase	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Approval	CE	
Unit weight (packaged)	≈ 123.5 g (≈ 194.5 g)	

Communication Interface

■ RS485

Communication protocol	Modbus RTU / ASCII
Application standard	EIA RS485 compliance with
Maximum connection	31 units (address: 01 to 127)
Synchronous method	Asynchronous
Communication method	Two-wire half duplex
Communication effective range	≤ 800 m
Communication speed	4,800 - 9,600 (default) - 19,200 - 38,400 - 57,600 - 115,200 bps (parameter)
Response time	5 to 99 ms (default: 20 ms)
Start bit	1 bit (fixed)
Data bit	8 bit (fixed)
Parity bit	None (default), Odd, Even
Stop bit	1 bit, 2 bit (default)

• It is recommended to use Autonics communication converter. Please use twisted pair wire, which is suitable for RS485 communication.

Input Type and Using Range

• The setting range of some parameters is limited when using the decimal point display.

Input type	Decimal point	Display Method	Using range(°C)	Using range(°F)	
Thermo-couple	K (CA)	1	ℋℋℋℋ	-50 to 1,200	-58 to 2,192
		0.1	ℋℋℋℋ	-50.0 to 999.9	-58.0 to 999.9
	J (IC)	1	ℋℋℋℋ	-30 to 800	-22 to 1,472
		0.1	ℋℋℋℋ	-30.0 to 800.0	-22.0 to 999.9
	L (IC)	1	ℋℋℋℋ	-40 to 800	-40 to 1,472
		0.1	ℋℋℋℋ	-40.0 to 800.0	-40.0 to 999.9
	T (CC)	1	ℋℋℋℋ	-50 to 400	-58 to 752
	0.1	ℋℋℋℋ	-50.0 to 400.0	-58.0 to 752.0	
R (PR)	1	ℋℋℋℋ	0 to 1,700	32 to 3,092	
	0.1	ℋℋℋℋ	0 to 1,700	32 to 3,092	
RTD	DPT100 Ω	1	ℋℋℋℋ	-100 to 400	-148 to 752
		0.1	ℋℋℋℋ	-100.0 to 400.0	-148.0 to 752.0
	CU50 Ω	1	ℋℋℋℋ	-50 to 200	-58 to 392
		0.1	ℋℋℋℋ	-50.0 to 200.0	-58.0 to 392.0
	Nickel120 Ω	1	ℋℋℋℋ	-80 to 260	-112 to 500

■ Display accuracy

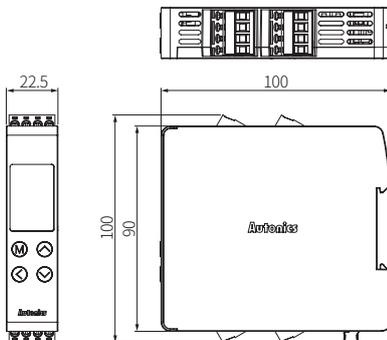
• The setting range of some parameters is limited when using the decimal point display.

Input type	Using temperature	Measurement accuracy
Thermocouple RTD	At room temperature (23°C ± 5°C)	(PV ± 0.3% or ± 1°C higher one) ± 1-digit • Thermocouple R (PR), S (PR) below 200 °C: (PV ± 0.5% or ± 3°C higher one) ± 1-digit, Over 200 °C: (PV ± 0.5% or ± 2°C higher one) ± 1-digit, • Thermocouple L (IC), RTD Cu50 Ω: (PV ± 0.5% or ± 2°C higher one) ± 1-digit
	Out of room temperature range	(PV ± 0.5% or ± 2°C higher one) ± 1-digit • Thermocouple R (PR), S (PR): (± 1.0% or ± 5°C higher one) ± 1-digit • Thermocouple L (IC), RTD Cu50 Ω: (PV ± 0.5% or ± 3°C higher one) ± 1-digit

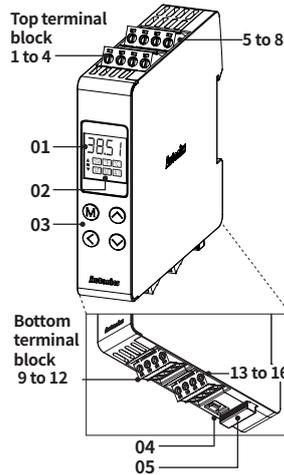
• When multiple products (or more) are mounted without separation, ± 1°C is added to all accuracy.

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.



Unit Descriptions



01. PV / SV display part (Red)

RUN mode: Displays PV (Present value) and SV (Setting value).
Parameter: Displays name and setting value of parameters.

02. Indicator

Indicator	ON condition
SV	SV display
OUT □	Control output □ ON
AL1	AL1 alarm output ON
■	The difference between PV and SV is less than 2°C
▲/▼	The difference between PV and SV is greater than 2°C
°C or °F	'2-2 Temperature unit' parameter setting

03. Control key

[M]: MODE key
[▲] / [▼]: Setting value control key

04. PC loader port

Communication converter (Sold separately) connection

05. Bracket handle

Use to mount and detach the DIN rail.