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 ±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	Relay	-	Alarm output 1	-
TR1D-14RR	Relay	Relay ↔ Alarm output 2	Alarm output 1	CT input
TR1D-R4RR	Relay	Relay ↔ Alarm output 2	Alarm output 1, Transmission output 1	CT input
TR1D-T4RR	Relay	Relay ↔ Alarm output 2	Alarm output 1, RS485 communication	CT input
TR1D-14CN	Current/SSR	-	Alarm output 1	-
TR1D-14CC	Current/SSR	Current/SSR ↔ Transmission output 2	Alarm output 1	CT input
TR1D-R4CC	Current/SSR	Current/SSR ↔ Transmission output 2	Alarm output 1, Transmission output 1	CT input
TR1D-T4CC	Current/SSR	Current/SSR ↔ Transmission output 2	Alarm output 1, RS485 communication	CT input

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	• 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000, • Measurement accuracy: ±5% F.S. ±1digit
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: ≤ 500 Ω
Option output	Alarm	AL1, AL2: 250 VAC~ 3 A 1a
	Transmission	DC4-20 mA (Load resistance: ≤ 500 Ω, Output accuracy: ±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: ≥ 5,000,000 operations
	Electrical	OUT1/2, AL1/2: ≥ 100,000 operations (resistance load: 250 VAC~ 5 A)
Insulation resistance		≥ 100 MΩ (500 VDC⎓ 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 μs) 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 EAC
Unit weight (packaged)		≈ 123.5 g (≈ 194.5 g)

CE EAC

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)
EEPROM life cycle	≈ 1,000,000 operations (Erase / Write)

- 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	KCA.H	-50 to 1,200	-58 to 2,192
		0.1	KCA.L	-50.0 to 999.9	-58.0 to 999.9
	J (IC)	1	JIC.H	-30 to 800	-22 to 1,472
		0.1	JIC.L	-30.0 to 800.0	-22.0 to 999.9
	L (IC)	1	LIC.H	-40 to 800	-40 to 1,472
		0.1	LIC.L	-40.0 to 800.0	-40.0 to 999.9
	T (CC)	1	tCC.H	-50 to 400	-58 to 752
		0.1	tCC.L	-50.0 to 400.0	-58.0 to 752.0
	R (PR)	1	rPr	0 to 1,700	32 to 3,092
	S (PR)	1	SPr	0 to 1,700	32 to 3,092
RTD	DPt100 Ω	1	dPt.H	-100 to 400	-148 to 752
		0.1	dPt.L	-100.0 to 400.0	-148.0 to 752.0
	CU50 Ω	1	CU5.H	-50 to 200	-58 to 392
		0.1	CU5.L	-50.0 to 200.0	-58.0 to 392.0
	Nickel120 Ω	1	nI 12	-80 to 260	-112 to 500

■ Display accuracy

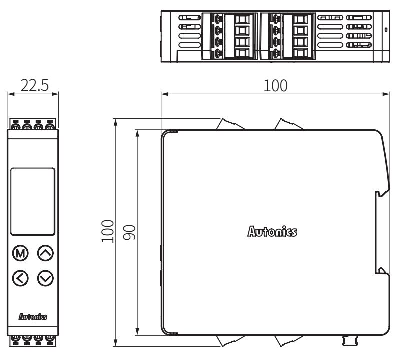
- The setting range of some parameters is limited when using the decimal point display.

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

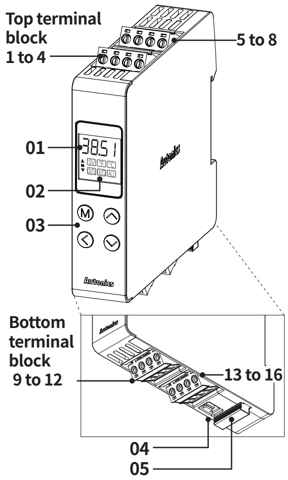
- When multiple products (or more) are mounted without separation, ±1°C is added to all accuracy.

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 contition
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.

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