Refrigeration Temperature Controllers

TC3YT Series INSTRUCTION MANUAL

TCD210159AC

Autonics

Thank you for choosing our Autonics product.

Read and understand the instruction manual and manual thoroughly before using the product.

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

Keep this instruction manual in a place where you can find easily.

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

Follow Autonics website for the latest information.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ▲ symbol indicates caution due to special circumstances in which hazards may occur.

↑ Warning Failure to follow instructions may result in serious injury or death

- 01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.(e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
 Failure to follow this instruction may result in personal injury, economic loss or fire.
- 02. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present

Failure to follow this instruction may result in explosion or fire.

03. Install on a device panel to use.

Failure to follow this instruction may result in electric shock.

04. Do not connect, repair, or inspect the unit while connected to a power

Failure to follow this instruction may result in fire or electric shock.

05. Check 'Connections' before wiring.

Failure to follow this instruction may result in fire.

06. Do not disassemble or modify the unit.

Failure to follow this instruction may result in fire or electric shock.

⚠ Caution Failure to follow instructions may result in injury or product damage

01. When connecting the power input and relay output, use AWG 28 to 12 (0.50 mm²) cable or over and tighten the terminal screw with a tightening torque of 0.3 to 0.4 N.m.

When connecting the sensor input and communication cable without dedicated cable, use AWG 28 to 16 cable and tighten the terminal screw with a tightening torque of 0.3 to 0.4 N.m.

Failure to follow this instruction may result in fire or malfunction due to contact failure.

02. Use the unit within the rated specifications.

Failure to follow this instruction may result in fire or product damage

- **03.** Use a dry cloth to clean the unit, and do not use water or organic solvent.

 Failure to follow this instruction may result in fire or electric shock
- 04. Keep the product away from metal chip, dust, and wire residue which flow into the unit.

Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Check the polarity of the terminals before wiring the temperature sensor. For RTD temperature sensor, wire it as 3-wire type, using cables in same thickness and length.
 For thermocouple (CT) temperature sensor, use the designated compensation wire for
- Keep away from high voltage lines or power lines to prevent inductive noise. In case
 installing power line and input signal line closely, use line filter or varistor at power line
 and shielded wire at input signal line. Do not use near the equipment which generates
 strong magnetic force or high frequency noise.
- strong magnetic force or high mediately holse.

 Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.

- Do not use the unit for other purpose (e.g. voltmeter, ammeter), but temperature controller.
- Make a required space around the unit for radiation of heat. For accurate temperature measurement, warm up the unit over 20 min after turning on the power.
- Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power.
- Do not wire to terminals which are not used.
- This unit may be used in the following environments.
- Indoors (in the environment condition rated in 'Specifications')
- Altitude Max. 2,000 m
- Pollution degree 2
- Installation category II

Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website.

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Control output

16: 250 VAC 16 A 1c

• Control method

B: ON/OFF / Proportional

• Power supply

4: 100 - 240 VAC

R: Relay

G Relay type
3: 250 VAC 3 A 1c

Product Components

Product
 Instruction manual
 Bracket ×2

Specifications					
Series		TC3YT Series			
Power s	upply	100 - 240 VAC∼ 50/60 Hz			
Permiss range	ible voltage	90 to 110 % of rated voltage			
Power c	onsumption	≤ 4 VA			
Samplin	g period	500 ms			
Input sp	ecification	Refer to 'Input Type and Using Range'.			
Control	output	250 VAC~ 3 A 1c / 250 VAC~ 16 A 1c (model)			
Display	type	7 segment (red), LED type			
Control	type	ON/OFF, Proportional control			
Hysteres	sis	1 to 100 °C			
Proportional band		0 to 100%			
Offset co	orrection	0 to 100%			
Control	period	1 to 120 sec			
Relay	Mechanical	≥ 10,000,000 operations			
life cycle	Electrical	≥ 100,000 operations (250 VAC ~ 3 A load resistance) ≥ 100,000 operations (250 VAC ~ 16 A load resistance)			
Dielectri	ic strength	Between the charging part and the case: 2,000 VAC ~ 60 Hz for 1 min			
Vibratio	n	$0.75\mathrm{mm}$ amplitude at frequency of 10 to 55Hz in each X, Y, Z directio for 1 hours			
Insulation	on resistance	≥ 100 MΩ (500 VDC= megger)			
Noise immunity		±2 kV square shaped noise (pulse width 1 μs) by noise simulator 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 (no freezing or condensation)			
Protecti	on structure	IP65 (IEC standards)			
Certifica	ation]A] 20 (A)			
Unit weight		• TC3YT-B4R3: ≈ 99 g • TC3YT-B4R16: ≈ 103 g			

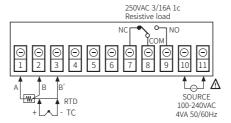
Input Type and Using Range

Input type	nput type		Using range (°C)	Using range (°F)
Thermocouple	K (CA)	KCA	0 to 999	32 to 999
Thermocoupte	J (IC)	JIC	0 to 400	32 to 752
DTD	Pt H	PT.H	0 to 400	32 to 752
RTD	Pt L	PT.L	-99 to 199	-146 to 390

■ Display accuracy

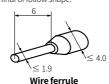
(PV $\pm 0.5\%$ or $\pm 1^{\circ}$ C higher one) rdg ± 1 digit

Connections



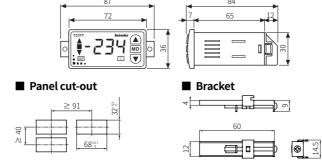
Crimp Terminal Specifications

• Unit: mm, Use the crimp terminal of follow shape

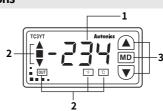


Dimensions

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



Unit Descriptions



1. Temperature display part (Red)

- Run mode: Displays PV (Present value)
- Setting mode: Displays parameter name

2. Indicator

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Display	Name	Description					
■ (green)	Deviation	The difference between PV and SV is less than 2°C					
▲ / ▼ (red)	Deviation	The difference between PV and SV is greater than 2°C					
OUT (red)	Control output	Control output is ON					
°C, °F (yellow)	Temperature unit	Set temperature unit is ON (parameter)					

3. Input key

Display	Name
[MD]	Mode key
[▲], [▼]	Setting value control key

Errors

Display	Description	Troubleshooting	
٥٩٥	Flashes at 1 sec when input sensor is disconnected or sensor is not connected.	Check input sensor status.	
ннн	Flashes at 1 sec when PV is higher than input range. $^{01)}$	When input is within the	
LLL	Flashes at 1 sec when PV is lower than input range. (1)	rated input range, this display disappears.	

⁰¹⁾ Be careful that when HHH / L L L error occurs, the control output may occur by recognizing the maximum or minimum input depending on the control type.

Initial Display When Power is ON

When power is supplied, series and model name are flashed twice sequentially (for 1 sec), and enter into RUN mode.

	1. Input secification	2. Control output	3. RUN mod
Temperature display part	JI C	rLY	250

Mode Setting



Parameter Setting

- Some parameters are activated/deactivated depending on the model or setting of other parameters. Refer to the descriptions of each item.
- [MD] key: Move to next item after saving / Return to upper level with save (≥ 3 sec)
 [▲] key: Select parameter
- [▲], [▼] key: Change setting value
- \bullet If there is no key input over 1 min, return to the RUN mode without saving.

■ Parameter 1 group

Parameter		Display	Default	Setting range	Condition
1-1	Proportional band	ρ	٥	0 (ON/OFF control) to 100%	-
1-2	Proportional control cycle	Ł	10	1 to 120 sec	1-1 Proportional band: > 0
1-3	Offset correction for proportional control	r5t	50	0 to 100%	-
1-4	ON/OFF control hysteresis	нч5	5	1 to 100 °C	1-1 Proportional band: = 0
1-5	Input correction	1 n.b	0	-30 to 30 °C	1-1 Proportional band: > 0

Parameter 2 group

_	- Turameter 2 group							
Parameter		Display Default Setting range		Condition				
2-1	Input specification	I n.E.	JI C	Refer to 'Input Type and Using Range: Input specification'.	-			
2-2	SV high limit	H.5 C	400	Refer to 'Input Type and Using				
2-3	SV low limit	L.5 [0	Range: Using range'.	-			
2-4	Control output mode	o.F Ł	HEE	HET: Heating, COL: Cooling	-			
2-5	Error, output	o.Er	oFF	ON, OFF	-			
2-6	Temperature unit	Unt	٥.	°C, °F	-			
2-7	Lock	Lo[oFF	OFF LOCI: Lock parameter 2 group LOC2: Lock parameter 1/2 group LOC3: Lock parameter 1/2 group, SV setting	-			