

Autonics

DUAL INDICATOR TEMPERATURE CONTROLLER

TCN4 SERIES

MANUAL



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

- ※ Please keep these instructions and review them before using this unit.
 - ※ Please observe the cautions that follow;
 - Warning** Serious injury may result if instructions are not followed.
 - Caution** Product may be damaged, or injury may result if instructions are not followed.
 - ※ The following is an explanation of the symbols used in the operation manual.
 - Caution:** Injury or danger may occur under special conditions.
- In case of using this unit with machinery (Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device.**
It may cause a fire, human injury or damage to property.
 - Install the unit on a panel.**
It may cause electric shock.
 - Do not connect, inspect or repair this unit when power is on.**
It may cause electric shock.
 - Wire properly after checking terminal number.**
It may cause a fire.
 - Do not disassemble the case. Please contact us if it is required.**
It may cause electric shock or a fire.

Caution

- This unit shall not be used outdoors.
It may shorten the life cycle of the product or cause electric shock.
- When connect wire, AWG 20(0.50mm²) should be used and screw bolt on terminal block with 0.74N.m to 0.90N.m strength.
It may cause a malfunction or fire due to contact failure.
- Please observe the rated specifications.
It may shorten the life cycle of the product and cause a fire.
- Do not use beyond of the rated switching capacity of relay contact.
It may cause insulation failure, contact melt, contact failure, relay broken and fire etc.
- In cleaning unit, do not use water or organic solvent. And use dry cloth.
It may cause electric shock or a fire.
- Do not use this unit in place where there are flammable or explosive gas, humidity, direct ray of the light, radiant heat, vibration and impact etc.
It may cause a fire or an explosion.
- Do not inflow dust or wire dregs into the unit.
It may cause a fire or a malfunction.
- Please wire properly after checking the terminal polarity when connecting temperature sensor.
It may cause a fire or an explosion.
- In order to install the units with reinforced insulation, use the power supply unit which basic insulation level is ensured.

Ordering information

T	CN	4	S	-	2	4	R	
Control output	R	Relay contact output + SSRP output (AC power)	Relay contact output + SSR output (AC/DC power)					
Power supply	2	24VAC 50/60Hz, 24-48VDC						
Sub output	4	100-240VAC 50/60Hz						
Size	S	DIN W48 X H48mm	M	DIN W72 X H72mm	H	DIN W48 X H96mm	L	DIN W96 X H96mm
Digit	4	4Digit(9999)						
Setting type	CN	Dual display type, set by touch switch						
Item	T	Temperature controller						

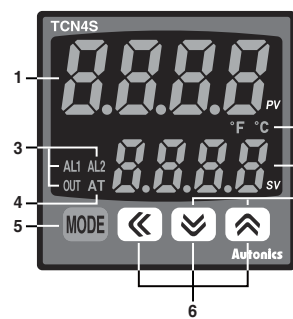
※The above specifications are subject to change without notice.

Specification

Series	TCN4S	TCN4M	TCN4H	TCN4L
Power supply	AC Power 100-240VAC 50/60Hz	AC/DC Power 24VAC 50/60Hz, 24-48VDC		
Allowable voltage range	90 to 110% of rated voltage			
Power consumption	Max. 5VA(100-240VAC 50/60Hz, 24VAC 50/60Hz) Max. 3W(24-48VDC)			
Display method	7 Segment LED(PV: Red, SV: Green)			
Character size	PV(WXH) 7.0 X 15.0mm SV(WXH) 5.0 X 9.5mm	9.5 X 20.0mm 7.5 X 15.0mm	7.0 X 14.6mm 6.0 X 12.0mm	11.0 X 22.0mm 7.0 X 14.0mm
Input type	RTD DIN Pt100Ω, Cu50Ω (Allowable line resistance max.5Ω per a wire)	K(CA), J(IC), L(IC), T(CC), R(PR), S(PR)		
Display accuracy ^{※1}	Based on room temperature (23°C ± 5°C): (PV ± 0.5% or ±1°C higher one) rdg ± 1 Digit In case of out of room temperature range: (PV ± 0.5% or ±2°C higher one) rdg ± 1 Digit			
Control	Relay 250VAC 3A 1a	SSR 12VDC±2V 20mA Max.		
Alarm output	AL1, AL2 Relay: 250VAC 1A 1a			
Control method	ON/OFF control, P, PI, PD, PID control			
Hysteresis	1 to 100°C/0.1 to 50.0°C			
Proportional band(P)	0.1 to 999.9%			
Integral time(I)	0 to 9999 sec.			
Derivative time(D)	0 to 9999 sec.			
Control period(T)	0.5 to 120.0 sec.			
Manual reset	0.0 to 100.0%			
Sampling period	100ms			
Dielectric strength	AC power 2000VAC 50/60Hz 1min.(Between input terminal and power terminal)	AC/DC power 1000VAC 50/60Hz 1min.(Between input terminal and power terminal)		
Vibration	0.75mm amplitude at frequency of 5 to 55Hz in each X, Y, Z directions for 2 hours			
Relay life cycle	Control output Mechanical: Min. 5,000,000 operations, Electrical: Min. 200,000 operations (250VAC 3A resistive load)	Alarm output Mechanical: Min. 5,000,000 operations, Electrical: Min. 300,000 operations (250VAC 1A resistive load)		
Insulation resistance	Min. 100MΩ(at 500VDC megger)			
Noise immunity	Square-wave noise by noise simulator(pulse width 1μs) ±2KV R-phase and S-phase			
Memory retention	Approx. 10 years (When using non-volatile semiconductor memory type)			
Environment	Ambient Temperature -10 to 50°C, Storage: -20 to 60°C	Ambient humidity 35 to 85%RH, Storage: 35 to 85%RH		
Unit weight	Approx. 100g	Approx. 133g	Approx. 124g	Approx. 179g

- ※1: For display accuracy
- In case of room temperature (23°C ± 5°C)
 - Below 200°C of thermocouple R, S is PV ± 0.5% or ±3°C higher one ± 1 digit
 - Over 200°C of thermocouple R, S is PV ± 0.5% or ±2°C higher one ± 1 digit
 - Thermocouple L (IC), RTD CU50Ω is PV ± 0.5% or ±2°C higher one ± 1 digit
 - In case of out of room temperature range
 - Below 200°C of thermocouple R, S is PV ± 1.0% or ±6°C higher one ± 1 digit
 - Over 200°C of thermocouple R, S is PV ± 0.5% or ±5°C higher one ± 1 digit
 - RTD CU50Ω is PV ± 0.5% or ±3°C higher one ± 1 digit
- ※Environment resistance is rated at no freezing or condensation.

Parts description

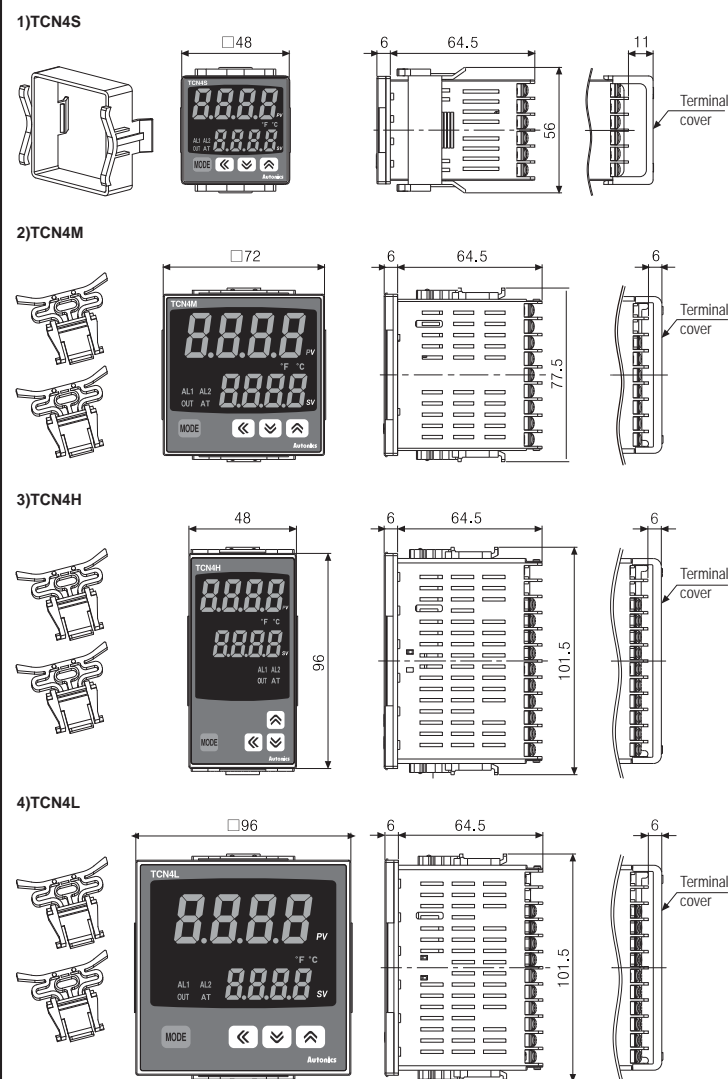


- Present temperature (PV) display (Red)**
1) RUN mode: Present temperature (PV) display
2) Parameter setting mode: Parameter display
- Set temperature (SV) display (Green)**
1) RUN mode: Set temperature (SV) display
2) Parameter setting mode: Parameter setting value display
- Control/Alarm output display lamp**
1) AL1/AL2: When AL1, AL2 alarm output ON, this lamp turns ON.
2) OUT: When control output ON, this lamp turns ON. During SSRP control output type in CYCLE/PHASE control, this lamp turns ON when MV is over 3.0%.
- Auto tuning lamp**
AT lamp flashes by every 1 sec during operating auto tuning.
- Key**
Used when entering into parameter setting group, returning to RUN mode, moving parameter, and saving setting values.
- Adjustment**
Used when entering into set value change mode, digit moving and digit up/down.
- Digital input key**
Press \square + \square keys for 3 sec. to operate the set function (RUN/STOP, alarm output reset, auto tuning) in digital input key [d1 - t].
- Temperature unit (°C/°F) indicator**
It shows current temperature unit.

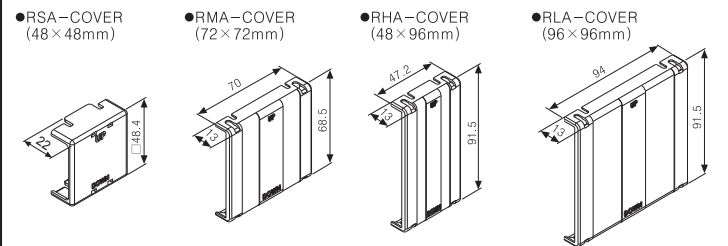
Input sensor and temperature range

Input sensor	Display	Temperature range(°C)	Temperature range(°F)		
Thermocouple	K(CA)	ECRH	-50 to 1200	-58 to 2192	
	J(IC)	ECRL	-50.0 to 999.9	-58.0 to 999.9	
	L(IC)	JICH	-30 to 800	-22 to 1472	
	T(CC)	JICL	-30.0 to 800.0	-22.0 to 999.9	
	R(PR)	LICH	-40 to 800	-40 to 1472	
	S(PR)	LICL	-40.0 to 800.0	-40 to 999.9	
		TCC	ECCH	-50 to 400	-58 to 752
		TCC	ECCL	-50.0 to 400.0	-58.0 to 752.0
RTD	DPt100Ω	rPr	0 to 1700	32 to 3092	
	CU50Ω	sPr	0 to 1700	32 to 3092	
		dPEH	-100 to 400	-148 to 752	
	dPEL	-100.0 to 400.0	-148.0 to 752.0		
	CU5H	-50 to 200	-58 to 392		
	CU5L	-50.0 to 200.0	-58.0 to 392.0		

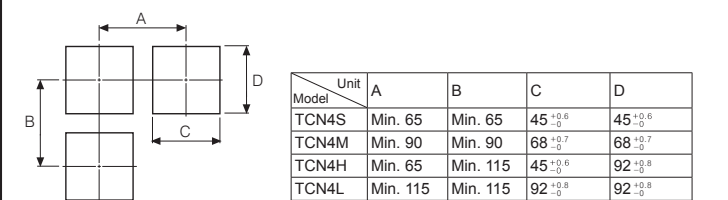
Dimensions



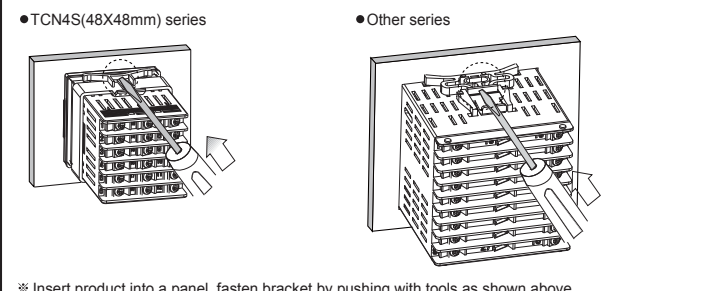
Terminal cover(Sold separately)



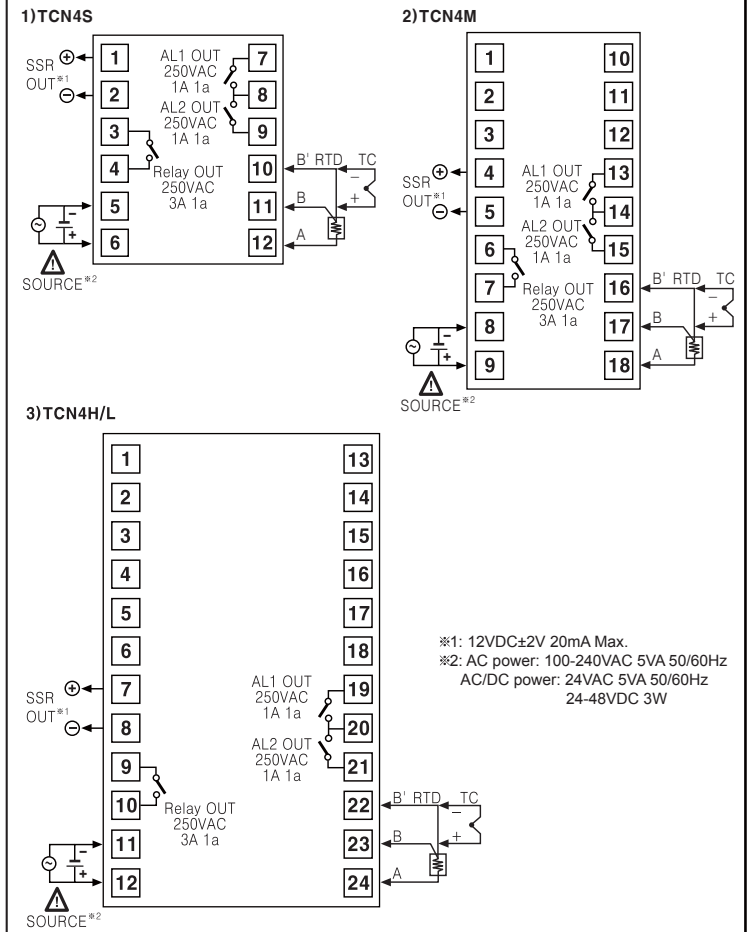
Panel cut-out



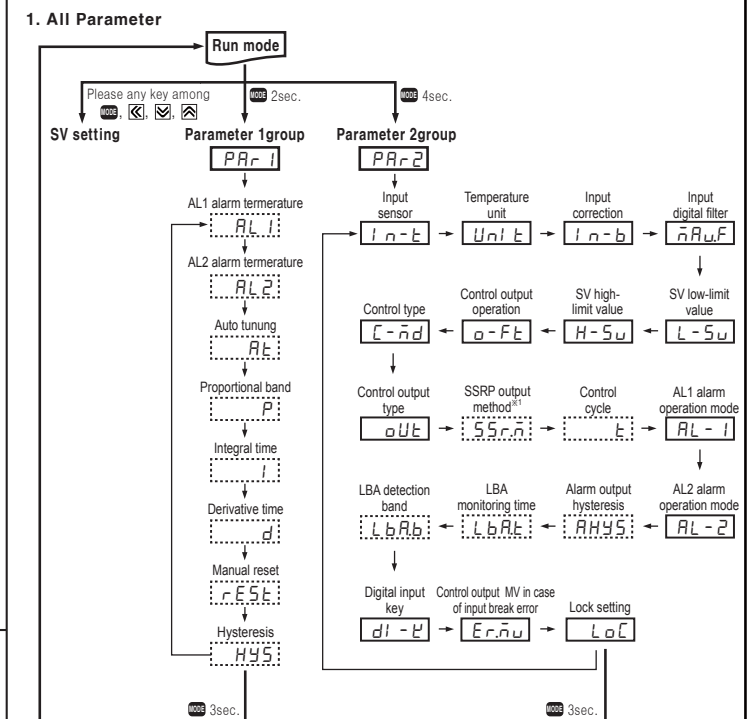
Installation



Connections



Flow chart for setting group



- ※ Press \square key over 3 sec in any setting group, it saves the set value and returns to RUN mode. (Exception: Press \square key once in SV setting group, it returns to RUN mode).
- ※ If no key entered for 30 sec., it returns to RUN mode automatically and the set value of parameter is not saved.
- ※ Press \square key again within 1 sec. after returning to RUN mode, it advances of the first parameter of previous setting group.
- ※ Press \square key to move next parameter.
- ※ Parameter marked in \square might not be displayed depending on other parameter settings.
- ※ Set parameter as 'Parameter 2group → Parameter 1group → Setting group of set value' order considering parameter relation of each setting group.
- ※1: It is not displayed for AC/DC power model (TCN4□22R).

