

Two segment display PID temperature controller TCN4 SERIES

OPERATION INSTRUCTIONS



For your safety, please read the following before use

※ "Pay attention to safety" is to use the product safely and correctly to prevent dangerous accidents. Please observe the following contents.

※ Attention to safety can be divided into two parts: warning and attention

WARNING Failure to do so may result in serious injury or injury.

NOTICE Failure to do so may result in minor injury or product damage.

※ The symbols in the operating instructions are as follows

▲ Accidents or dangers may occur under special conditions

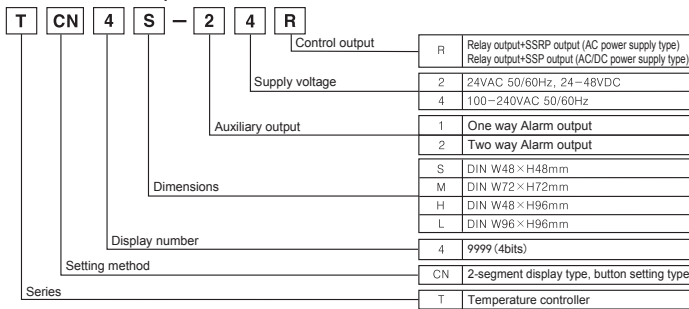
WARNING

- When it is used for machines that have great impact on personal and property (such as nuclear power control, medical devices, ships, vehicles, railways, aviation, inflammable devices, safety devices, disaster prevention / anti-theft devices), double safety protection devices must be installed. Otherwise, it may cause fire, personal injury or property loss.
- The panel must be installed when using. Otherwise, there is a risk of electric shock.
- Do not carry out maintenance work under power on state. Otherwise, there is a risk of electric shock.
- Please confirm the terminal number before wiring. Otherwise, it may cause fire.
- The product shall not be modified except for the maintenance personnel of the company. Otherwise, electric shock or fire may be caused.

NOTICE

- Do not use the product outdoors. Otherwise, the service life of the product may be shortened.
- When wiring the power input terminal and relay output terminal, please use AWG 20 (0.50mm²) cable, and keep the screw tightening torque between 0.74N·m ~ 0.90N·m. Poor contact may cause fire. Please use the product within the rated specifications. Otherwise, the service life of the product will be shortened and there will be fire hazard.
- Please use the load less than the allowable capacity of the relay for electric shock. Otherwise, it will cause poor insulation, contact adhesion, poor contact, relay damage, fire, etc.
- Do not use water or mending solvent when cleaning, but wipe with towel. Otherwise, contact or fire may be caused.
- Avoid using the product in inflammable, explosive, humid, direct sunlight, thermal radiation, vibration and other places. Otherwise, the ash may cause fire or explosion.
- Do not allow dust or cable residue to enter the product interior. Otherwise, it may cause fire or damage to the product.
- Please connect the thermocouple wiring correctly after confirming the polarity of the terminal. Otherwise, it may cause fire or explosion.
- In order to achieve the purpose of strengthening insulation, please use the power supply device that can ensure the strengthened insulation above.

Model description



Name of each part

- Current value (PV) display (red)
The current measured value (PV) is displayed in the operation mode, and the internal parameter name is displayed in the setting mode.
- Set point (SV) display (green)
The set value (SV) of control target is displayed in operation mode, and the current setting value of the parameter is displayed in the setting mode.
- Control alarm output indicator
- Out: the light is on when the main control output is on.
- ※ When SSR controls the cycle / phase control of driving output mode, the light will be on when the operation amount exceeds 5.0% (except AC power supply type)
- AL1 / AL2: when the alarm output is on, the light will be on.
- Self tuning indicator: when self-tuning is performed, the at lamp flashes in a cycle of 1 second.
- MODE key: used to enter parameter group setting, return to operation mode, switch parameter group and save setting value.
- Direction key: used to enter the setting value change mode or move the number of digits to change the value up / down.
- Function key
- Function key: (MODE) + (Direction key) press 3 seconds at the same time to start the [d-k] digital input key function (run / stop, alarm clear, self-tuning setting).
- Temperature unit (C / F) indicator: displays the current temperature unit.

Specifications

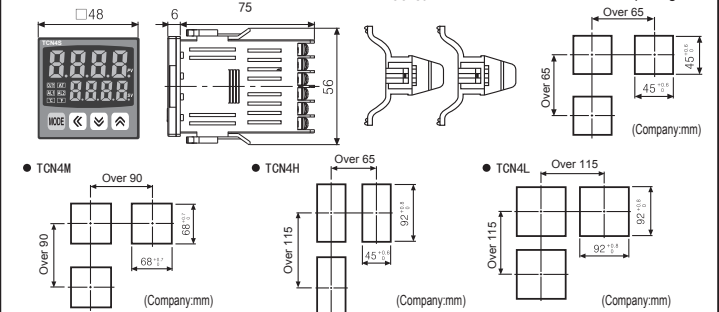
SERIES	TCN4S	TCN4M	TCN4H	TCN4L
Power supply AC Power supply type	100-240VAC 50/60Hz			
Voltage AC/DC Power supply type	24VAC 50/60Hz, 24-48VDC			
Allowable voltage range	90% ~ 110% of rated voltage			
Power consumption	Below 5VA (100-240VAC 50/60Hz, 24VAC 50/60Hz) Below 3W (24-48VDC)			
Display mode	7segment LED (PV: Red, SV: Green)			
Operator Size	PV(W×H) 7.0×15.0mm SV(W×H) 5.0×9.5mm	9.5×20.0mm 7.5×15.0mm	7.0×14.6mm 6.0×12.0mm	11.0×22.0mm 7.0×14.0mm
Input type	Thermal resistance DP1100Ω, Cu50Ω (Allowable single wire impedance Below 5Ω) Thermocouple K(CA), J(IC), L(IC), T(CC), R(PR), S(PR)			
Relay capacity	Thermal resistance (※ 1) At room temperature (23°C ± 5°C): (PV ± 0.5% or ± 1°C) ± 1 bit Thermocouple Outside normal temperature: (PV ± 0.5% or ± 2°C) ± 1 bit			
Control output	Relay 250VAC 3A 1a S S R Below 12VDC ± 2V 20mA			
Alarm output	AL1, AL2 relay: 250VAC 3A 1A			
Control Mode	ON/OFF, P, PI, PD, PID CONTROL			
Control Accuracy	1 ~ 100°C / 0.1 ~ 50.0°C			

- (※ 1): ○ Normal atmospheric temperature (23°C ± 5°C)
 - Thermocouple R, s below 200°C (PV ± 0.5% or ± 3°C) ± 1 bit
 - Above 200°C (PV ± 0.5% or ± 2°C) ± 1 bit
 - Thermocouple L (IC), thermal resistance cu50Ω (PV ± 0.5% or ± 2°C) ± 1 bit
 ○ Outside normal temperature
 - Thermocouple R, s below 200°C (PV ± 1.0% or ± 6°C) ± 1 bit
 - Above 200°C (PV ± 0.5% or ± 5°C) ± 1 bit
 - Thermal resistance cu50Ω (PV ± 0.5% or ± 3°C) ± 1 bit

SERIES	TCN4S	TCN4M	TCN4H	TCN4L
Proportional band (P)			0.1-999.9°C	
Integral time (I)			0-9999S	
Differential time (D)			0-9999S	
Control period (T)			0.5-120.0S	
Manual reset			0.0-100.0%	
Sampling period			100ms	
Withstand AC Power supply type	2000vac 50 / 60Hz 1 min (between input terminal and power supply terminal)			
DC Power supply type	1000VAC 50 / 60Hz 1 min (between input terminal and power supply terminal)			
Vibration resistance	5 ~ 55Hz (cycle 1 minute) amplitude 0.75mm x, y, z direction 2 hours			
Relay life	Mechanics OUT: 500 More than 10000 times, AL1 / 2: more than 5 million times Electrical OUT: 20 More than 10000 times (250VAC 3A resistive load), AL1 / 2: more than 30000 times (250VAC 1A resistive load)			
Insulation impedance	Above 100M Ω (500VDC as reference)			
Anti-interference	Square wave interference of jamming simulator (pulse width 1 μs) ± 2KV, R phase, S phase			
Memory preservation	About 10 years (using nonvolatile semiconductor storage)			
Ambient temperature	-10-50°C (not frozen)			
Storage temperature	-20-60°C (not frozen)			
Ambient humidity	35-85%RH, Storage: 35-85%RH			
Insulation type	Double insulation or enhanced insulation (identification: □ detect the dielectric strength between the input part and the power supply part: AC power supply type: 20kV / DC power supply type: 10kV)			
Authentication	CE			
Weight	About 100g	About 133g	About 124g	About 179g

※ The above weight does not include the outer packing.

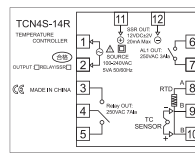
Outline dimension drawing



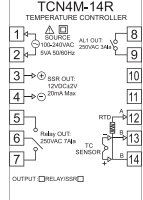
Connection diagram

※ TCN4 series is built-in main control output, relay output and SSRP output mode, which can be selected by users according to needs.
 The output modes of AC / DC power supply products are relay output and SSR output, without SSRP output mode.

TCN4S



TCN4M/4H/4L



Alarm mode

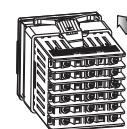
Mode	Name
$R\bar{n}\bar{0}$	No alarm
$R\bar{n}1$	Deviation upper limit alarm
$R\bar{n}2$	Deviation lower limit alarm
$R\bar{n}3$	Upper and lower limit of deviation alarm
$R\bar{n}4$	Upper and lower limit of deviation reverse alarm
$R\bar{n}5$	Absolute value upper limit alarm
$R\bar{n}6$	Absolute value lower limit alarm
$S\bar{b}R$	Sensor disconnection alarm
$L\bar{b}R$	Heater disconnection alarm

Parameter group 2 setting

Parameter	Factory settings
Input sensor	I n b 2 KCRH
Temperature unit	U n t e °C
Input bias correction	I n b 0 000
Input digital filtering	A n R u F 000 f
Lower limit of service temperature range	L - S u - 050
Upper limit of service temperature range	H - S u 1200
Control output action	a - F b HERe
Control mode	C - F b P1 d
Control output type	o u t e r - L y
SSR control output type	S S R o u t 5 S n d
Control period	t 0 200
AL1 Alarm mode	AL - 1 AL R AL
AL2 Alarm mode	AL - 2 AL R AL
Alarm output hysteresis value	AL H y S 00 f
LBA monitoring time	L b a R t 0000
LBA detection width	L b a R b 0002
Function key function	d f - E S t P
Function key function	E r A u 0000
Lock key setting	L o c k o F F

Product installation method

TCN4S(48x48mm)series

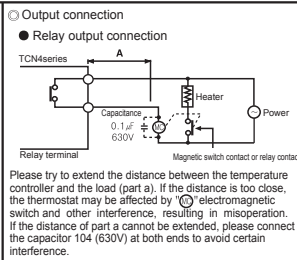


Factory settings

Parameter group 1 setting

Parameter	Factory settings
SV set point	- 0
AL1 alarm temperature	AL 1 1250
AL2 alarm temperature	AL 2 1250
Self tuning	R t o F F
Proportional band	P 0 100
Integral time	I 0000
Differential time	d 0000
Manual reset	r E S t 0500
Hysteresis setting	H y S 002

- In parameter group 2, select one of the standard on / off control [std], cycle control [CYC], and phase control [LPHAS] for SSR. M parameter setting. Note: zero trigger SSR should be connected in cycle control (random trigger SSR is also applicable), and random trigger SSR should be connected in phase control in order to use cycle control [cyc] and phase control [PHAS].



Input specifications and application scope

Input sensor	Display	Input range (°C)	Input range (°F)	
(ThermoCouple)	K (CA)	P C R H	-50 ~ 1200	-58 ~ 2192
	J (IC)	P C R L	-50.0 ~ 999.9	-58.0 ~ 999.9
	L (IC)	J I C H	-30 ~ 800	-22 ~ 1472
		J I C L	-30.0 ~ 800.0	-22.0 ~ 999.9
	T (CC)	L I C H	-40 ~ 800	-40 ~ 1472
		L I C L	-40.0 ~ 800.0	-40 ~ 999.9
(RTD)	R (PR)	P C C H	-50 ~ 400	-58 ~ 752
	S (PR)	P C C L	-50.0 ~ 400.0	-58.0 ~ 752.0
	DP1100Ω	R P R	0 ~ 1700	32 ~ 3092
		S P R	0 ~ 1700	32 ~ 3092
	Cu50Ω	d P E H	-100 ~ 400	-148 ~ 752
		d P E L	-100.0 ~ 400.0	-148.0 ~ 752.0
	C U 5 H	-50 ~ 200	-58 ~ 392	
	C U 5 L	-50.0 ~ 200.0	-58.0 ~ 392.0	

Parameter group setting

