N1

Digital-display PID temperature controller

TCD / TCR Series

Manual Instructions

Pls read the following safety considerations before use

▣ Safety Considerations

※ Please observe all safety considerations for safe and proper product operations to avoid hazards.

※ Safety considerations are categorized as follows.

⚠Warning Failure to follow these instructions may result in serious injury or death.

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

⚠Warning

1. 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,fire,or economic loss.
2. The unit must be installed on a device panel before use. Failure to follow this instruction may result in electric shock.
3. Do not connect,repair,or inspect the unit while connected to a power source. Failure to follow this instruction may result in electric shock.
4. Check the terminal numbers before connecting the power source. Failure to follow this instruction may result in fire.
5. Do not disassemble or modify the unit,Please contact us if necessary. Failure to follow this instruction may result in electric shock or fire.

⚠Caution

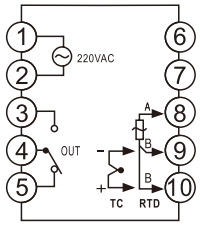
1. Do not use the unit outdoors. Failure to follow this instruction may result in shorten the life cycle of the unit,or electric shock.
2. When connecting the power input and relay output cables,use AWG20(0.05m^2)cables and make sure to tighten the terminal screw bolt above 0.74N.m to 0.90N.m. Failure to follow this instruction may result in fire due to contact failure.
3. Use the unit within the rated specifications. Failure to follow this instruction may result in shorten the life cycle of the unit.or fire.
4. Do not use loads beyond the rated switching capacity of the relay contact. Failure to follow this instruction may result in insulation failure.contact melt,contact failure,relay broken or fire.
5. Do not use water or oil-based detergent when cleaning the unit.Use dry cloth to clean the unit. Failure to follow this instruction may result in electric shock or fire.
6. Do not use the unit where flammable or explosive gas,humidity,direct sunlight,radiant heat, vibration,or impact may be present. Failure to follow this instruction may result in fire or explosion.
7. Keep dust and wire residue from flowing into the unit. Failure to follow this instruction may result in fire or product damage.
8. Check the polarity of the measurement input contact before wiring the temperature sensor. Failure to follow this instruction may result in fire or explosion.
9. For installing the unit with reinforced insulation,use the power supply unit which basic level is ensured.

▣ Model instructions

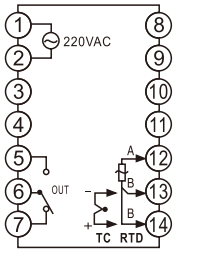
TC □-□-□ □

Input type	K	K-type thermocouple
	E	E- type thermocouple
	J	J- type thermocouple
	Pt	Pt100 –type thermal resistance
	Cu	Cu50-type thermal resistance
Control method	1	Position control heating
	2	Position control cooling
	3	Time proportion control heating
Size	S	W48 × H48mm Hole W45 × H45mm
	H	W48 × H96mm Hole W45 × H92mm
	M	W72 × H72mm Hole W68 × H68mm
	L	W96 × H96mm Hole W92 × H92mm
Type	D	digital dial switch settings
	R	digital dial settings
Item	TC	Temperature controllers

▣ Connection



TC□-S



TC□-H/M/L General

▣ Specifications

Power supply		220VAC
Allowable voltage range		90–110%of rated voltage
Power consumption		under 5VA
Input type	TC	K E J
	RTD	Pt100 Cu50
Display accuracy		±0.5%
Control output		Relay contact output 250VAC 5A 1 NO 1NC
Control method		ON/OFF Position control
		Time proportion control
RESET adjustment range		0–10℃
Sampling period		100ms
Relay life cycle		Mechanical above 2.5 million times Electrical above 100000times
Dielectric strength		3000VAC 50/60Hz for 1min.(between all terminals and case)
Vibration		0.75mm amplitude at frequency 5 to 55HZ(for 1 min.) in each X,Y,Z direction for 2 hours.
Insulation resistance		Min.100MΩ (at 500VDC megger)
Noise resistance		Square shaped noise by noise simulator (pulse width 1 μs) ±2kV R–phase ,S–phase
Memory retention		Approx.10years(non–volatile semiconductor memory type)
Environment	Ambient temp	–5~40℃ storage:–10~50 ℃
	Ambient humi	35%~85%RH storage:35~85%

▣ Operation

1) Power on Initialization



2) Input specification



K	K-type thermocouple
E	E- type thermocouple
J	J- type thermocouple
Pt	Pt100 –type thermal resistance
Cu	Cu50-type thermal resistance

3) control method



1-0	Position control heating
2-0	Position control cooling
3-0	time proportion control heating

4) Display the current temperatue value



▣ Temperature setting and control

1. Position control: after the power on,set the required temperature setting value and start operation.
   When the display temperature is lower than the set value, the ON green light is bright, and the constant open contact of the output relay connects and the constant closed contact disconnects;
   When the display value reaches or exceeds the set value,the OFF red light is bright, and the constant open contact of the output relay disconnects and the constant closed contact is connected.

2. Time proportion control: after the power on,set the required temperature setting value and start operation.
   When the display temperature value does not enter the proportional band, the ON green light is bright, the constant open contact of the output relay connects and the constant closed contact disconnects;
   When the display temperature value enter the proportional band,the relay starts to switch regularly, the higher the temperature, the shorter the output time will be, and vice versa. It's also a way to control the temperature by changing the average heat power of the load.

3. The using method of panel "RESET" for protentiometer :
   When time proportion controls the heating system balance,the display value is lower than the set value of the static error correction due tohigh or low of the heating power of the load. The adjustment of the potentiometer can eliminate the deviation in order to adapt to different conditions.

※ The default value of position return difference is 2 ℃.
※ The proportional band defaults to 10 ℃.
※ RESET adjustment range is 0–10 ℃.

▣ Fault information

Information	explain	remedy
HHH	Input broken,reverse connection input range overstep	check the fault information
LLL	Input broken,reverse connection input range overstep	check the fault information

▣ Caution

1. Pls separate the unit wiring from high voltage lines or power lines to prevent inductive noise.
2. Install a power switch or circuit breaker to control the power supply.
3. Keep away from the high frequency instruments.
   (High frequency welding machine&sewing machine,large capacity SCR controller)
4. This unit may be used in the following environments.
   ① It shall be used indoor ② pollution degree 2
   ③ Altitude up to 2000m ④ installation category Ⅱ

※ Failure to follow these instructions may result in product damage.

V22.7