

## INSTRUCTION MANUAL

### TM-2000

Before operating this instrument, please read this manual carefully and fully understand its contents.

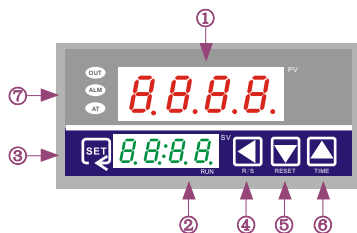
#### WARNING

- If failure or error of this instrument could result in a critical accident of the system, install an external protection circuit to prevent such an accident.
- Do not turn on the power supply until all of the wiring is completed. Otherwise electric shock, fire or malfunction might result.
- Use this instrument within the scope of its specifications. Otherwise fire or malfunction might result.
- Do not use this instrument in the places subject to flammable or explosive gas.
- Do not touch high voltage blocks, such as power supply terminals. Otherwise electric shock may result.
- Never disassemble, repair or modify this instrument by yourself. This might cause malfunction.

#### Technical Data

1. Independent process and set point displays
2. PID control with auto tuning
3. Main control output: Relay; SSR; SCR
4. Selectable heating/cooling control.
5. Timer and temperature controller united in one unit
6. Two modes to start timer function:
  - A) timer starts at power on
  - B) timer starts when process value arrived at setpoint
7. Environment
  - 0 ~ 50℃ ambient temperature
  - 45 ~ 85% non-condensing humidity
8. Power supply
  - 100~240VAC 50-60Hz
  - Consumption: 4VA

#### Operation Introduction



- ① PV displaying window  
To show the present temperature value.
- ② SV displaying window  
To show the temperature setpoint and the time setpoint value. The right low decimal point and the middle time mark points are blinking when timer is active. When the time arrive, it will show "end" in this window.



- ③ Function key  
Press **1** second to enter LEVEL 1 parameter menu: SP and ST you can set the temperature and time setpoint which you need. After setting finished, press again set key to quit the menu.



Press **3** seconds to enter LEVEL 2 parameter menu: AL1; ATU; P; I; d; T; Sc; LCK see the introduction in \*parameter menu section.

- ④ Shift key  
Shift the digit to the bit you want to set.
- ⑤ Down key; RESET key  
There are two functions for this key:  
Down key: count down values when you change the setpoint.  
RESET key: when the time is up, output is cut. If the user want to restart, press this key 3 seconds.
- ⑥ Up key; TIME key  
There are two functions for this key:  
Up key: count up the values when you change the setpoint  
TIME key: press this key to switch the displaying of time and temperature setpoints.

- ⑦ Indicating LED lamp

OUT: light on when the output is active

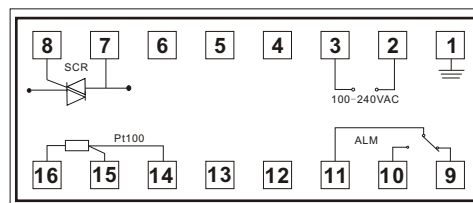
ALM: light on when the alarm is active

AT : light on when the auto-tuning is active

#### Parameter Menu

Character	Description	Setting range	Default setting
LEVEL1	SP	Set temperature	Full measuring range
	ST	Set time	0-100 hours
LEVEL2	AL1	Alarm 1	High process value
	ATU	Auto tuning	0: AT active 1: AT inactive
Press	P	Proportional band	Range is 1 to 200; when P=0, it is ON/OFF control
"SET"	I	Integral time	0-3600s
	d	Differential time	0-3600s
3	T	Proportion cycle	1 to 100s
	Sc	Cold junction compensation	-100 to 100℃ or -100.0 to 100.0℃
seconds	LCK	Function lock	0 - 2
LEVEL3	SL0	Not available	0000
	SL1	Decimal point: 0=no decimal point; 1=decimal point active	0000
Press	SL2	Measurement range lower point	0000
	SL3	Measurement range higher point	0300
"SET"	SL4	Mode of Alarm One: 0=no alarm; 1=high process alarm; 2=low process alarm; 3=high deviation alarm; 4=low deviation alarm	0001
	SL5	No alarm 2	0000
+ ▲ + ▼	SL6	Deadband of alarm	0005
	SL7	Control method: 0=PID direct action; 1=PID reverse action 2=ON/OFF control; 3=display mode	0001
+ ▲ + ▼	SL8	Auto-tuning percentage; default 100%	0100
	SL9	Timer modes: 0=timer starts at power on; 1=timer starts when PV arrived at setpoint	0001
+ ▲ + ▼	SLA	Not available	0800

#### Wiring Diagram



#### Distributor

