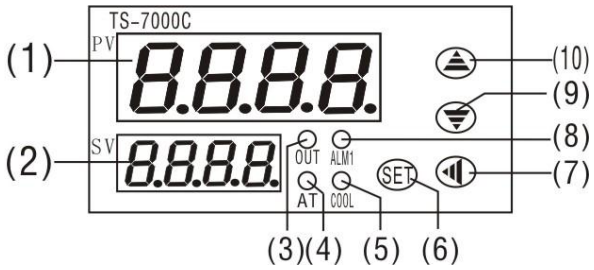
Instruction manual (Model TS-7000C)

1、 **Primary technical standard:**

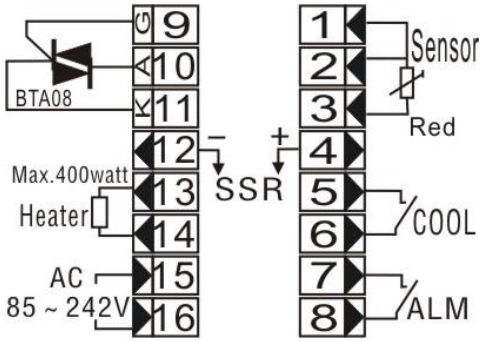
- Input: PT100
- Temperature range: C: 0 to 100C ; F: 32F to 212F
- Measure error: ±0.5% F.S ±1byte
- Input power: AC85～242V, 50Hz
- Working condition: Temperature: 0～50C, Humidity:≤85%RH, without corrode and strong electric radiation
- Output: triac 8A bi-directional silicon controlled; driving 20A solid state relay

2、 Name and functions of the sections



(1) PV display window: Indicates the temperature measured value
(2) SV display window: Indicates the setting value
(3) OUT indication: When heater is on the LED is ON.
(4) AT indication: When set auto tuning the LED is ON.
(5) Cooling indication: When cooling control LED is blinking.
(6) SET key: When the function key.
(7) Data shift key (＜) :
(8) ALM1 indication: When have alarm output the LED is ON.
(9) Decrease key (∨) : Decreases numeric value of the setting value.
(10) Increase key (∧) : Increases numeric value of the setting value.

3. Connection scheme

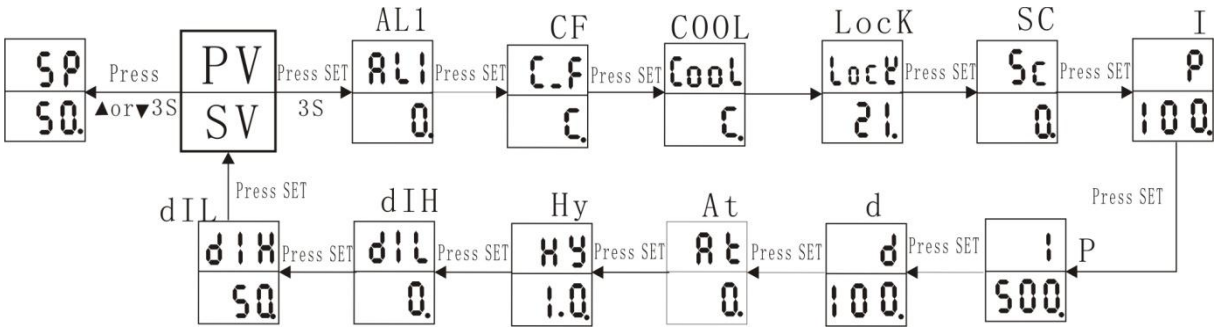


4. Setup flow chart

Series		Indication	Name	Setting range	Manual	Preset
First step menu		SP	Setting control point	All range dIL～dIH	Press ⧾ or∑ key 3s to enter the setting condition	37.5
Second Step	1	AL1	Alarm 1	dIL～dIH	Setting of maximum alarm temp.	39.0
	2	CF	Temperature unit	℃、℉	C: ℃ F: ℉	C

menu	3	COOL	Cooling setting value	dIL～dIH	When the measured temperature higher than this value, the cooling control has output and the red LED with the “COOL” indication is blinking. As the measured temperature reach the cooling setting value ,the meter’s mainly controller will stop automatically.	39.0
	3	Lock	Electronic lock	0～50	When LC=0, the first and second step menu settings are changeable. The third and fourth step not. When LC=12, the first, second and third step menu settings are changeable. The fourth step not. When LC=21, all the parameters can be set and displayed.	0
Third step menu	4	SC	Measurement deviation revisal	±20.0	Calibration setting by input of minus or positive value to get right temperature indication (PV)	0.0
Fourth step menu	5	P	Proportion area	0～9999	When the P↑,the proportion and differential function↑; if P↓, the proportion and differential function↓. When P=0, the meter is ON/OFF control	100
	6	I	Integral time	0～3000s	When the I↓,the calculus function↑; if the I↑,the calculus function↓. When I=0, have no calculus function, it is PD adjustment instrument	500
	7	d	Differential time	0～2000s	When the d↓,the proportion and calculus function↑; if the d↑, the proportion and calculus function ↓,but the differential function↑. When d≤t, it has no differential function	100
	8	At	Auto tuning	0～1	1- Auto Tune on 0- Auto Tune off	0
	9	Hy	Main control by drop in level	0～50.0	When P=0, have this parameter	0.5
	10	dIL	Low value of completed	0～dIH	Minimum temperature setting	0.0
	11	dIH	High value of completed	dIL～50.0	Maximum temperature setting	50.0

5、Display status



6、Operating procedure

- Connect the power supply to 15 and 16. The PT100 sensor you connect to 1, 2 and 3 as the connection schedule. After this, turn on the power and then the instrument will at first begin to auto-test: All LEDS and indicating lamps (except OUT lamp) will be lighted to test the lighting-system whether good or not. If unlighted indicating LED are found, please stop using and return this product for repair. (This procedure lasts for 0.5s). Normal display condition, it shows the measured value in the PV window at the upper row and display the setting value in the SV window at the lower row.·
- Temperature setting value: press the z key 3s to enter into SP. The upper window will show "SP". Now the setting parameters can be changed by pressing the z or∑ key to adjust the setting value. The ◀ key can be used for easier setting by moving the digital point. Note that this key only can be used for: temperature settings in degree Fahrenheit and for the P, I and D setting. If no key is pressed for 10 seconds the controller will go back to the display function.
- All parameters can be set by pressing the SET key for 3 seconds. The settings are protected with a lock code. This is to avoid wrong setting by users without any knowledge of this product.

  Lock=0 SP, AL1 , C&F, COOL can be set

  Lock=12 same as above + SC can be set too (calibration)

  Lock=21 All parameters can be set
- AUTO TUNE FUNCTION

  This controller is called a PID controller because the working of this controller is based on the P, I and D settings. This controller is preset to standard values but to get the best working results the parameters have to be set to the optimum values. This can be done in 2 ways. One is manual setting by calculations or just trying. The easiest way is using the AT (Auto Tune) function.

  Press SET and change the AT into 1. Make sure the cabinet starts in a cold situation. For good setting the difference in temperature between the starting temperature and the setting temperature must be as much as possible. For incubators be sure that before starting the AT function the incubator is COLD.

  You can check if the AT function is working by the LED (AT) blinking in the display. Now the program is trying to find the best settings for the P, I and D values. The total setting for AT will take about 15-60 minutes according to the specific situation.

  After the AT automatic setting is ready you can see that the LED (AT) stops blinking.

  Please check the new P, I and D settings and write down.

  Now you check the results of see if you are satisfied with the new accuracy of this controller. If not you can do the AT function again

7、Error information

HH	The sensortype is not corresponding (wrong value/high limit)
LL	The sensortype is not corresponding (wrong value/low limit)
Oral	Broken sensor or wrong connected