TC300SK

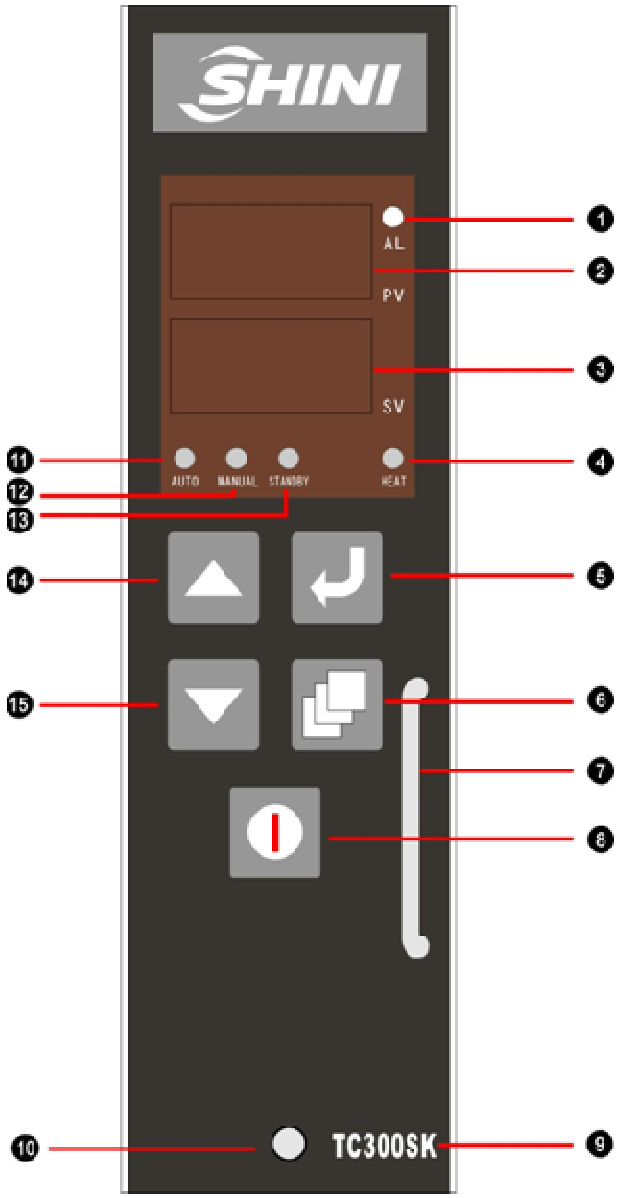
Operation Manual of Temperature Control Card

Date：Jan. 2020

Ver.：Ver.A (English)

Contents

1. Panel Operation Instruction



1. Alarm indicator light 2. Display the measured value PV 3. Display the set value SV 4. Heating indicator light 5. Function selection key 6. Model selection key 7. Core handle 8. Power switch 9. Model 10. Set screw 11. Auto mode indicator light 12. Manual mode indicator light 13. Standby mode indicator light 14. Temp. set increase key 15. Temp. set decrease ke

2. Working Princple of the Temperature Control Box

Temperature control box is a device that can maintain constant temperature set by the customer, which mainly through product internal microprocessor (MCU) to detect the heating elements, and then control the silicon controlled or solid-state relay via the microprocessor internal program for temperature control. Temperature control accuracy and stability mainly depend on following important factors:

1> Temperature measurement: sample period parameters, data filtering, circuit measuring, cold-end compensation, etc. to determine the temperature measurement accuracy;

2> PID control: Adjust the output, related parameter proportion, integral and differential through changing the ratio of connected frequency and disconnected frequency in a certain time;

3> PIDD control: Control related parameter proportion, integral and differential by changing the frequency connection phase angle;

4> Automatic adjustment: automatically provide the leading factor by analyzing the heating wire's capacity and mould's thermal constant (it still can control the temperature accurately when the latent heat factor and heat dissipation variable factor affect the temperature).

5> Output mode: Change according to the environment;

PIDD mode：it can reach accurate temperature control, but the power noise is greater that of PID mode;

PID mode: low current noise, but its control ability of specific temperature is poor than that of PIDD mode, which has great impact on the load.

Temperature Control Box Meter Core Specification

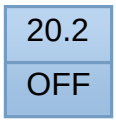
- Indoor use
- Power input voltage:AC85V-270V,50/60HZ,15A
- Load:15A,100W-3600W;
- Output type:PIDD(phase shift pulse width regulation).PID(solid state)
- Thermocouple type:J or K type thermocouple
- Temp. control range:50C-530C
- Temp. stability:+0.5%
- Temp. control type:FUZZY+PIDDartificial intelligence+ phase-shifting control
- Automatic ambient temperature compensation of internal loop measurement
- Soft start to eliminate mould leakage caused by moisture
- F1,F2:250V-15A(Special fuse)
- F3:250-1A

3. Product Function Introduction

- Adopt FUZZY PIDD control technology, and it can automatically suit any heating mode without setting PID parameters, greatly improving the working efficiency;
- Auto embient temperature line compensation that makes more accurate temp. value of this controller;
- Thermocouple error monitor:
- The controller can detect the thermocouple reverse direction and open circuit; When the thermocouple fault is detected, the controller will act according to the error type and controller mode to automatically identify the thermocouple and heater; There's alarm indication if there's wrong connection. The thermocouple is protected with alarm indication;
- Controller internal measurement broken loop detection;
- Heater current monitoring;
- Output disconnection inspection and output short circuit protection that prevent temperature control card damage, and with alarm indication;
- Manual power output mode；
- Software locking function;
- 380V power input protection with alarm indication; When the alarm of voltage input voltage error occur, please turn off the power immediately and check the input voltage to prevent meter damage;
- Comprehensive error code output that can find your problem easily;

4. Operation Mode

4.1 Temperature displays when powered on;



It displays when the thermocouple is connected and the machine doesn't work after powered on

It displays when the thermocouple is not connected and the machine doesn't start after powered

4.2 Power on/off:

Through on/off key to start up and shut down:

Click  key to start up and press  key for 3S to shut down:

4.3 Setting temperature

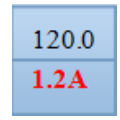
Set required temperature through the up/down key

Click the up/down key once

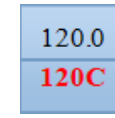
4.4 Check the output percentage % and output current:

Click key once Click key once Click key once

output percentage%



output current A

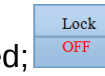


return display setting value

4.5 Function key locking setting

Click + function locking keys quickly, and click + function unlocking keys quickly;

Click set + model key quickly, and the locking is activated;



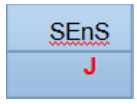
Click set + model key quickly, and the unlocking is activated;

4.6 Shortcut menu

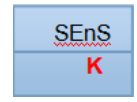
Press and hold key to enter thermocouple type switch menu

Click up/down key to switch the thermocouple type

Click key once again to enter upper limit temp. setting menu

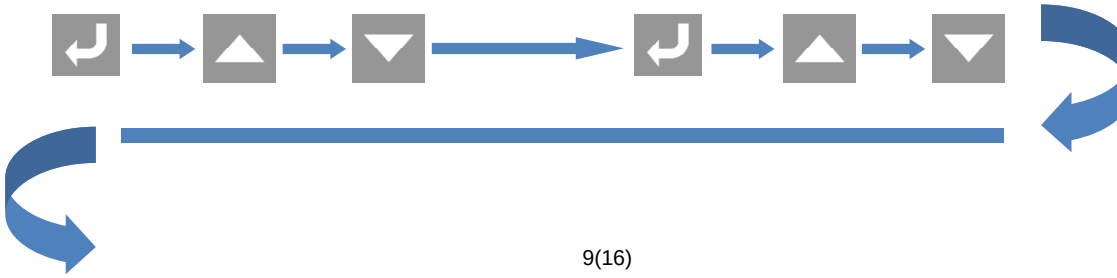


thermocouple J



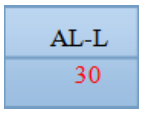
thermocouple K

upper limit temp. setting click up/down key

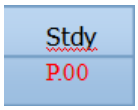


Click ↵ once again to enter lower limit temperature setting menu

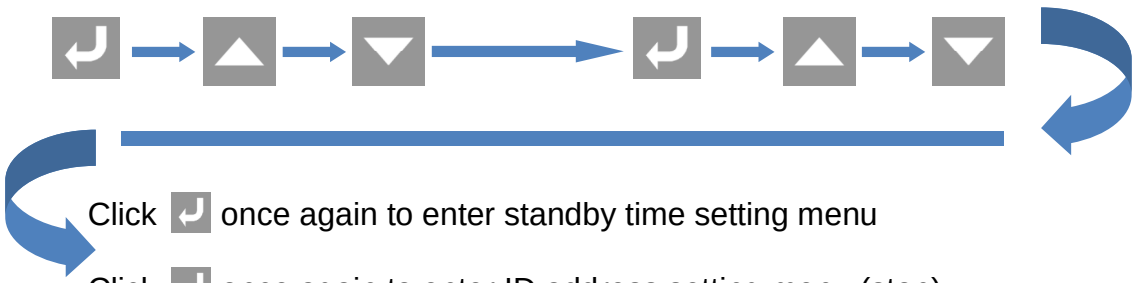
Click ↵ once again to enter standby temperature (P) setting menu



lower limit temp. setting point click up/down key

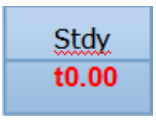


standby temp. (P) setting point click up/down key

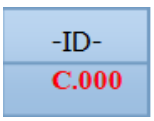


Click ↵ once again to enter standby time setting menu

Click ↵ once again to enter ID address setting menu (stop)

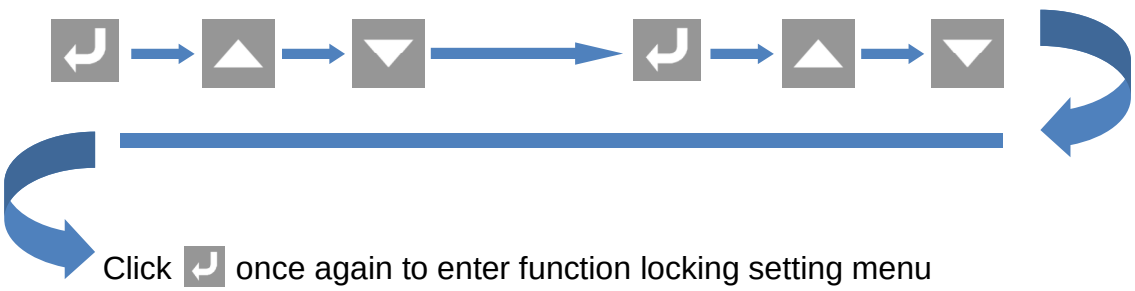


standby time setting click up/down key



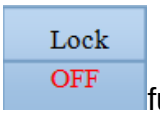
ID address setting click up/down key

0-999 mins.

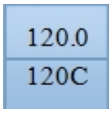


Click ↵ once again to enter function locking setting menu

Press ⧉ key and hold on to exit the menu



function key locking setting click up/down key

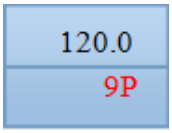


Press  key and hold on to exit the menu

OFF unlocking/ON locking

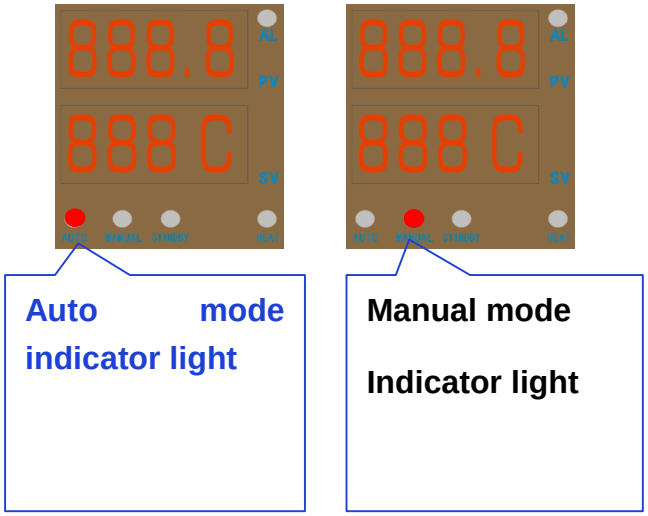
4.7 Manual output setting（output percentage % setting）

In auto mode, press  key and hold on to enter manual mode menu



press  key and hold on to enter manual mode menu

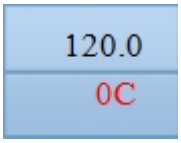
Through up/down key to adjust output percentage 0-100%



Press key, the indicator light in auto mode will shift to manual mode

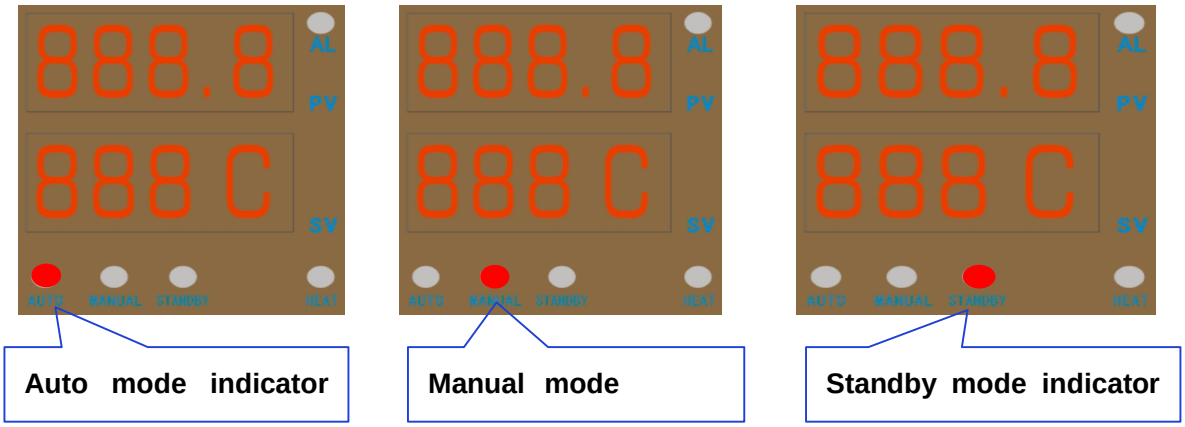
4.8 Standby mode

In manul mode, press key once again and hold on to enter standby mode menu



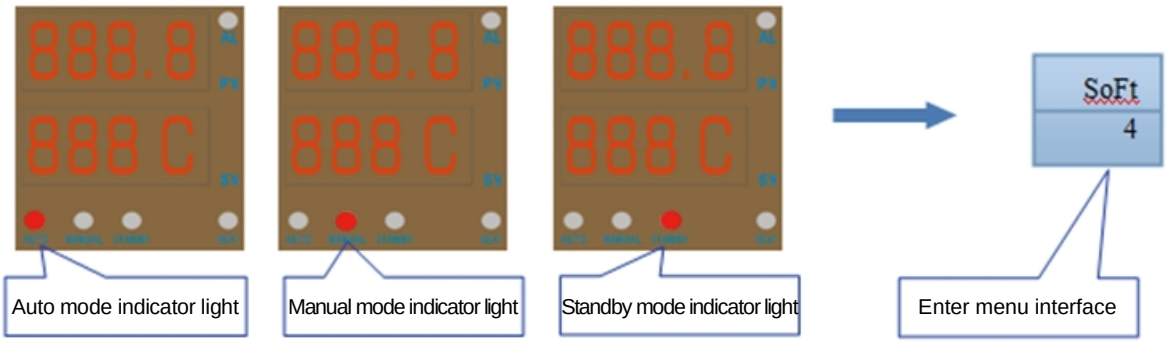
Press key and hold on to enter standby mode menu

The standby mode setting is in the shortcut menu

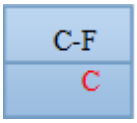


4.9 Parameter setting menu

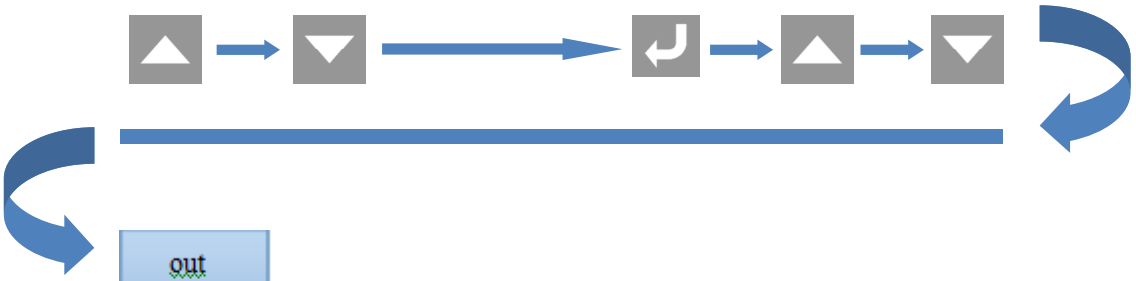
In auto mode, press key and hold on to enter manual mode menu, and press key and hold on to enter standby mode menu; In standby mode, press key+ key together and hold on to enter parameter setting menu, which through clicking key to browse the menu.

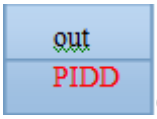


Enter soft start time setting menu, and click up/down key to set soft start time 1/2/3/4(mins.)



Click  key to enter temp. unit setting and click up/down key to set the temp. unit C/F

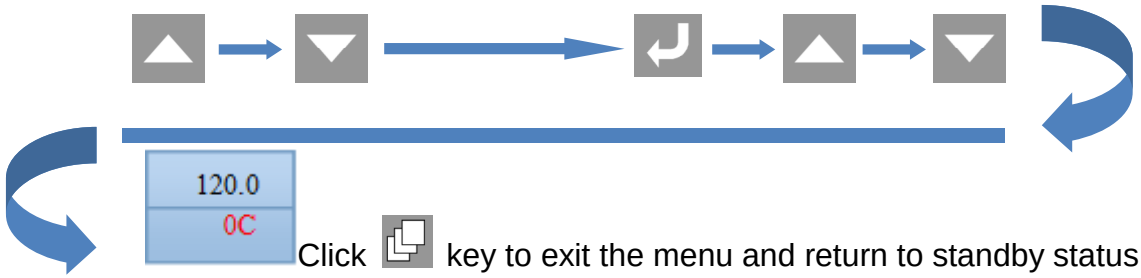




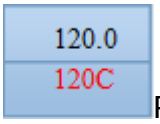
Click  key to enter output mode setting, and click up/down key to select PID/PIDD mode

Click  key to enter PID auto tuning setting and click up/down key for auto tuning setting 0/1/2

Note: These keys must be operated by professionals.



Click key to exit the menu and return to standby status



Press key once again to exit the menu and return to auto mode control status

Error Table

No.	Errors	Description	Check Items
1.	tC oPEn	thermocouple open circuit	Use a multimeter to check whether the thermalcouple is open or not connected properly
2.	tC SHrt	thermocouple short circuit	Check whether the thermalcouple squeezed.
3.	tC rEu	thermocouple reverse connected	Reconnect the thermalcouple
4.	tc bAd	thermocouple error	Check whether the heating wire and thermalcouple are wrongly connected, and press the key if the connection is correct.
5.	bAd	silicon control	Use the multimeter to check whether the

	Scr	broken	silicon controlled is damaged
6.	HEAt oPEn	output open circuit	Use a multimeter to check whether the heating wire is open or not connected properly
7.	out SHrt	output short circuit	Check whether the heating wire is squeezed
8.	F1-2 brk	fuse broken	Check fuse F1 and F2, replace the 15A fuse if disconnected;

Factory Settings

No.	Menu	Set Value
1	Thermocouple model setting	J
2	Temperature unit setting	°C
3	High temperature alarm	30°C
4	Low temperature alarm	-30°C
5	Soft start setting	On
7	Manual output percentage	0%
8	Set work temperature	120°C