Operation Manual of Temperature Control Box

It is hot runner dedicated temperature controller applicable to all hot runner heater with load below 15A. Appearance and installation of this device are up to international standard and it is suitable for any standard case. Its power supply wiring and load connection are of standard structure. Each control card controls heater temperature of one loop. The temperature card is easy to plug and unplug and can be exchanged with temperature card by other manufacturers.

Functions and features:

◆Operation interface of the temperature control card adopts soft touch key and double-row four-bit LED display. It has three LED indicators which show device operation status.

◆Simple operation, high precision of temperature control , new user enters working state quickly

◆Temperature control card applies international standard structure, easy to replace and allows exchange with other manufacturer's products.

◆Each temperature control card has the same function, therefore they are mutually exchangeable, easy for users to inspect and store spare parts.

◆It can set up both type K and J thermocouple sensor signals and features accurate temperature nonlinear processing and integrated cold junction compensation.

◆ It applies zero-trigger control mode and PWM pulse width output adjustment.

◆ Two types of temperature settings and display: degree centigrade and Fahrenheit degree.

◆ Thermocouple offline alarm, thermocouple offline automatic protection

◆ Alarm of thermocouple reverse connection, automatic protection over reverse connection of thermocouple

◆Alarm of open circuit of heating ring, and automatic protection over open circuit of heating ring

◆ Alarm of silicon controlled breakdown

◆ FUZYY+PID control algorithm, PID parameter may be set up online automatically or manually

◆ Soft start heating mode of hot runner, heating power and time of soft start may be set at will

◆ Besides automatic control, it has manual control mode for heating under special circumstances.

◆ It has misconnection 380V voltage protection function to make sure temperature control card is safe.

Specifications

Operating environment temperature	32^0 to 131^0F (0^0 to 55^0C)
Storage environment temperature	-40^0 to 158^0 F (-40^0 to 70^0C)
Sensor type	Type J or K thermocouple sensor
Temperature range of sensor type	32^0 to 860^0 F (0^0 to 450^0C)
Temperature accuracy	Within 0.3%
Fuse protection	220V 15A double-way high-speed fuse
Type of control output	Bi-directional silicon controlled 15A 220VAC
Power supply	86－240VAC 50/60Hz

Operation panel instructions:

PV line is designed to be a four-digit nixie tube. In normal condition, it shows temperature of control target and in event of alarm, it shows malfunction code:

Temperature out of range

Thermocouple is offline or no thermocouple is connected

Reverse connection of thermoelectricity polarity

Heating ring is disconnected or no heating ring

Silicon controlled breakdown and short circuit

Thermocouple short circuit

SP line is designed to be a four-digit nixie tube. In normal condition, it shows setting temperature:

Setting temperature is 200 ℃

Setting temperature is 200 ℉

Three indicators are soft start indicator, automatic operation indicator and manual indicator from left to right.

After initial power on, system enters soft start status. Dehumidify heating ring. Output power and operation time of soft start can be set up by menu. When soft start, this indicator flashes.

When system enter automatic constant temperature operation status, this indicator flashes.

When system enters manual operation status, this indicator flashes

Actual temperatur

Setting temperatur

LED
Running state

KEY
Input key

Alarm description:
Thermocouple offline
Thermocouple connected reversely
Heater is disconnected
Silicon controlled breakdc

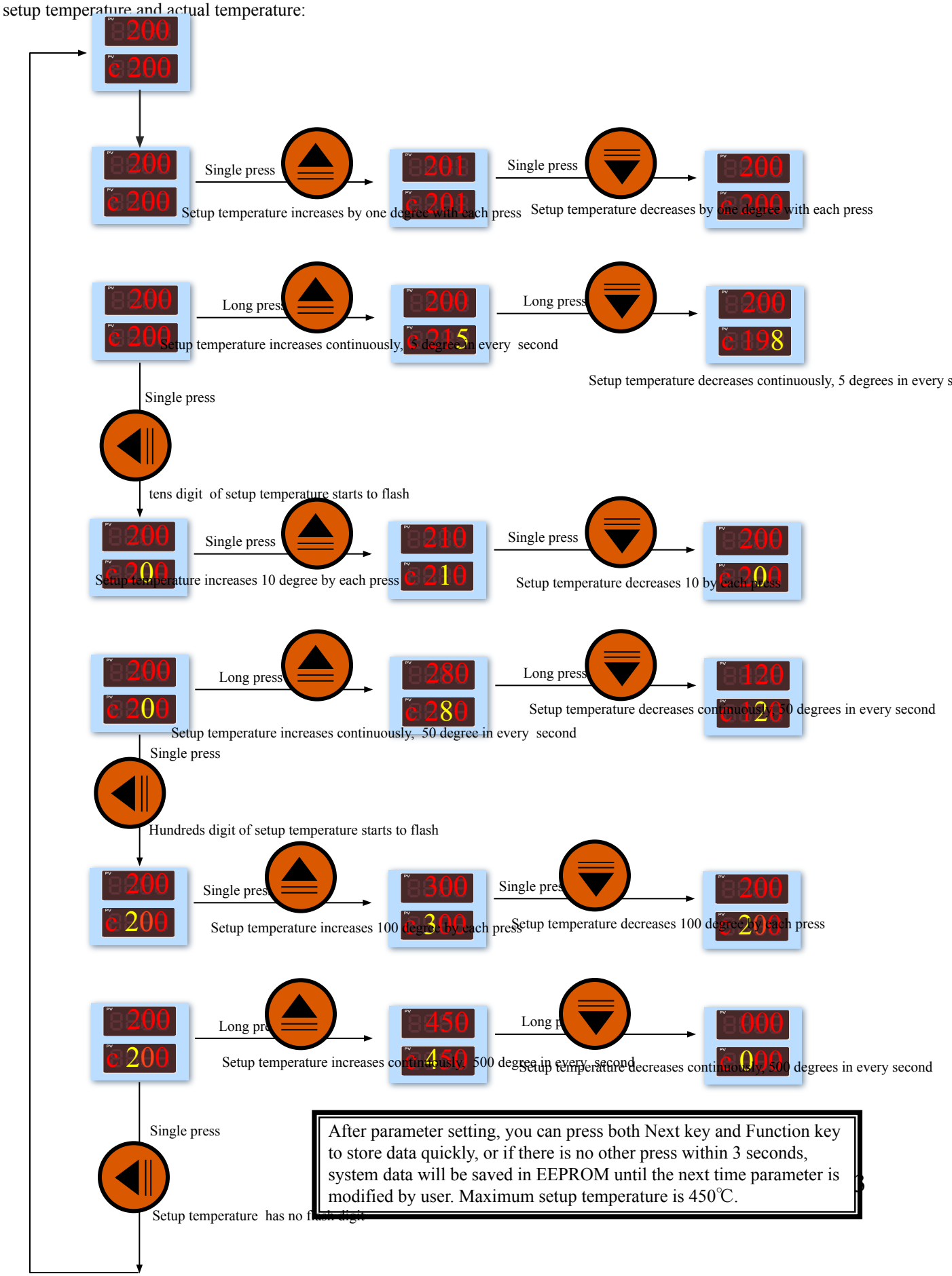
Handle position

Power switch

Lock position

How to set up temperature

When system powers on and passes self-inspection, it enters operation status and displays setup temperature and actual temperature:



Status transition and display

After power on the controller, if initial target temperature is lower than 100 and it is in soft start mode, then system enters soft start mode automatically. If system is in soft start mode after starting up, flashes in every second. Soft start time and output power can be set up in the menu.

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When soft start is over, it enters automatic operation mode and flashes in every second. After system power on, if it is detected that target value is higher than 100 degree or soft start mode is off, then it enters automatic operation mode.

* * * * *

In automatic operation status, long press to enter manual state.

In manual status, long press to return to automatic operation state.

In manual operation status, flashes in every second.

In manual operation status, SV screen shows manual output power, SP shows current state. Method of manual output power is the same as temperature setup .

It shows current actual status. It may be actual temperature or alarm code.

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It shows percentage of manual output power, 99% at maximum and 0% at minimum.

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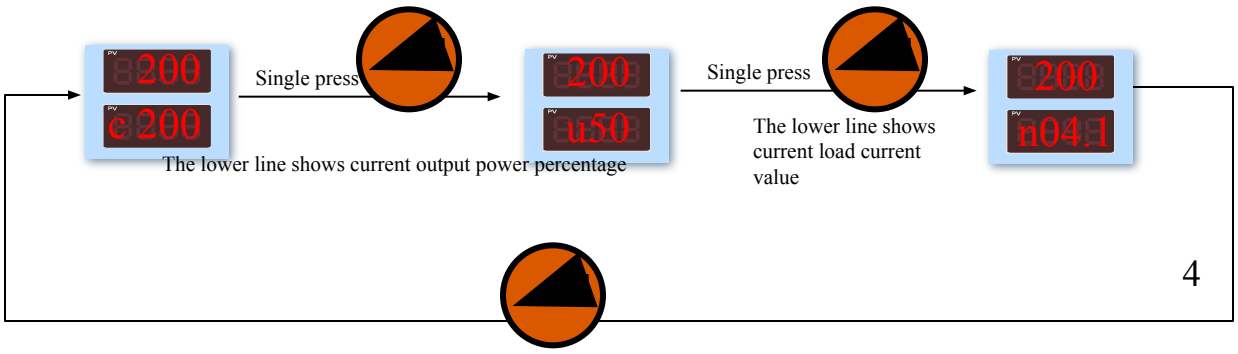
Operation parameter monitoring

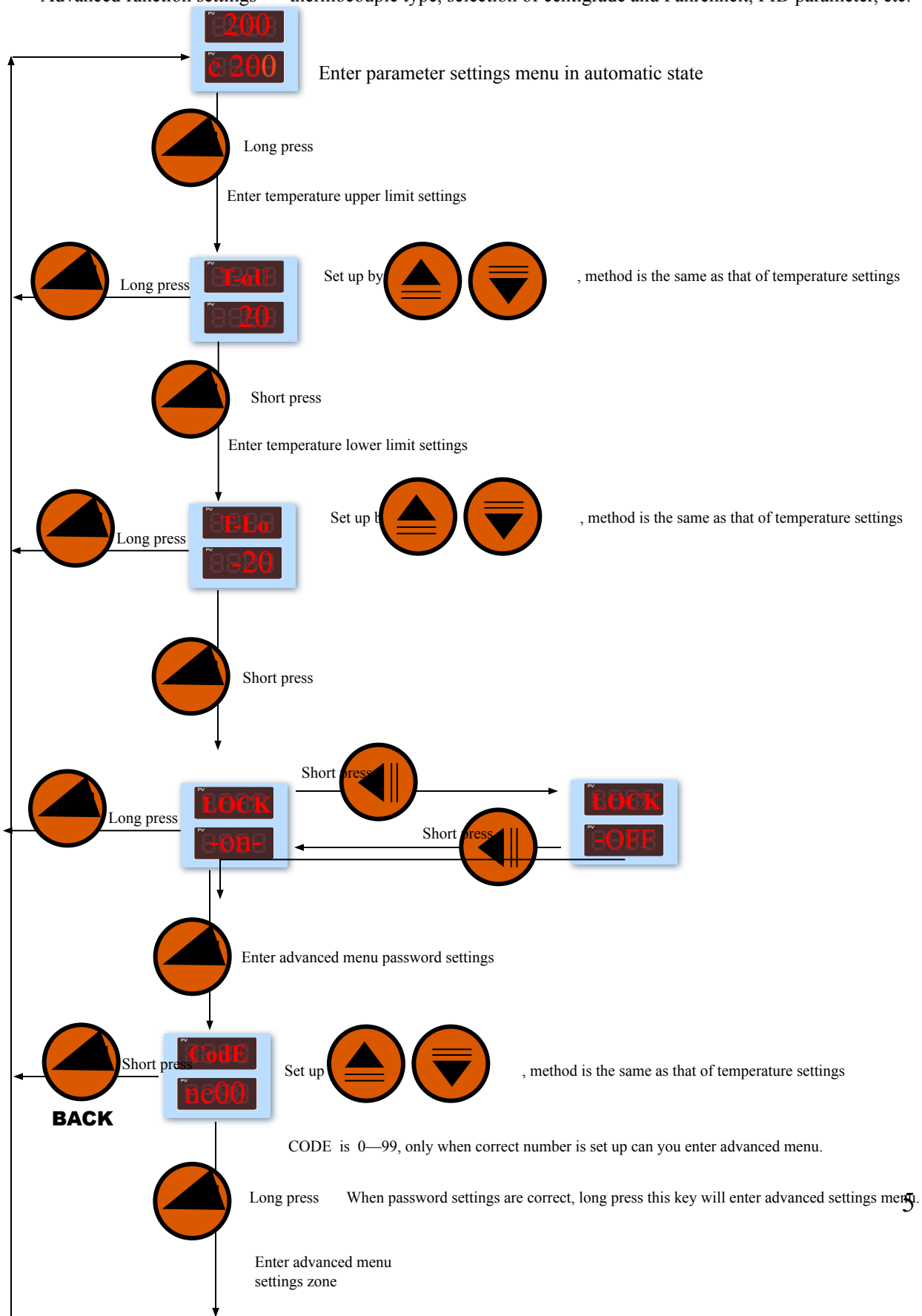


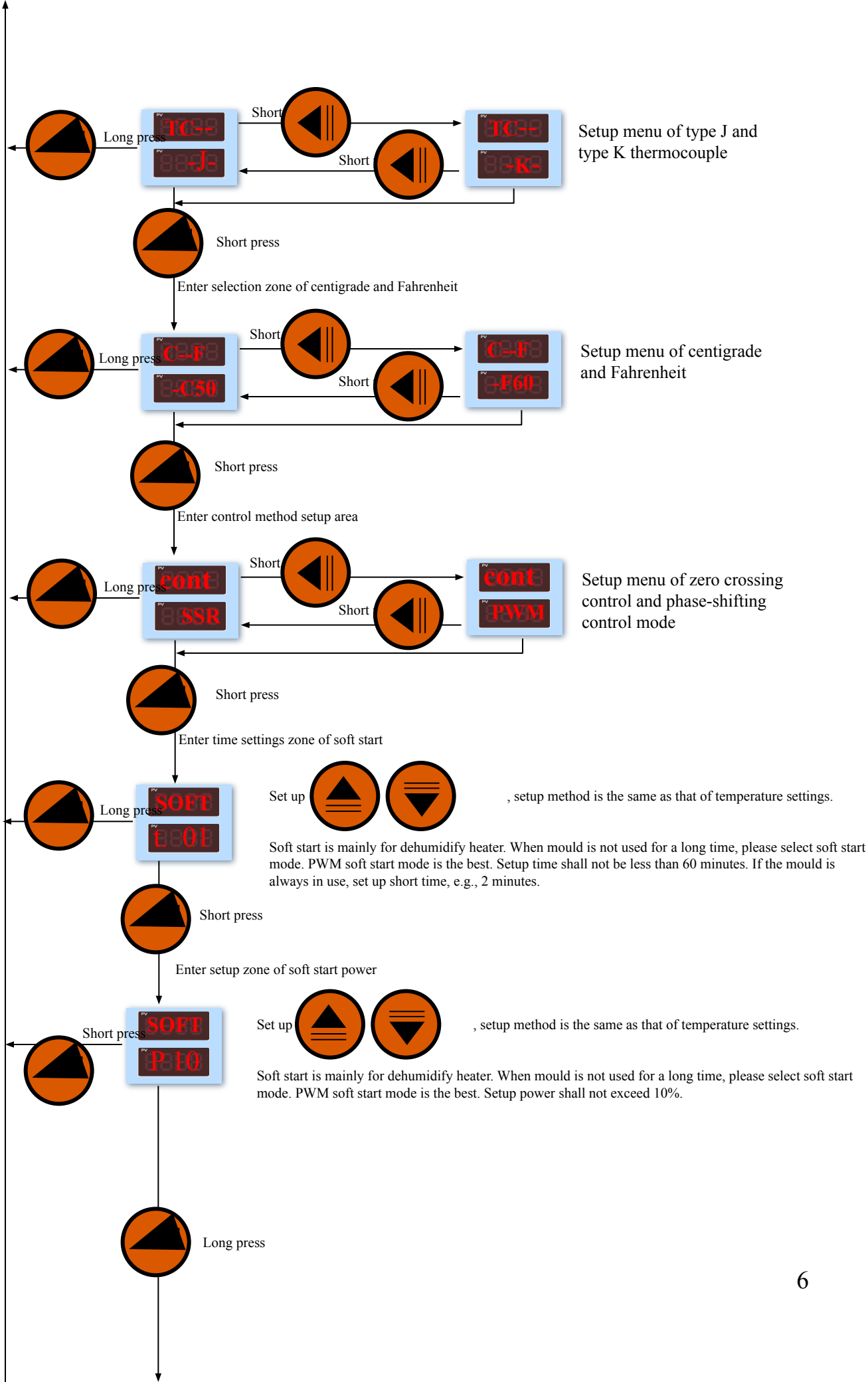
Function parameter settings

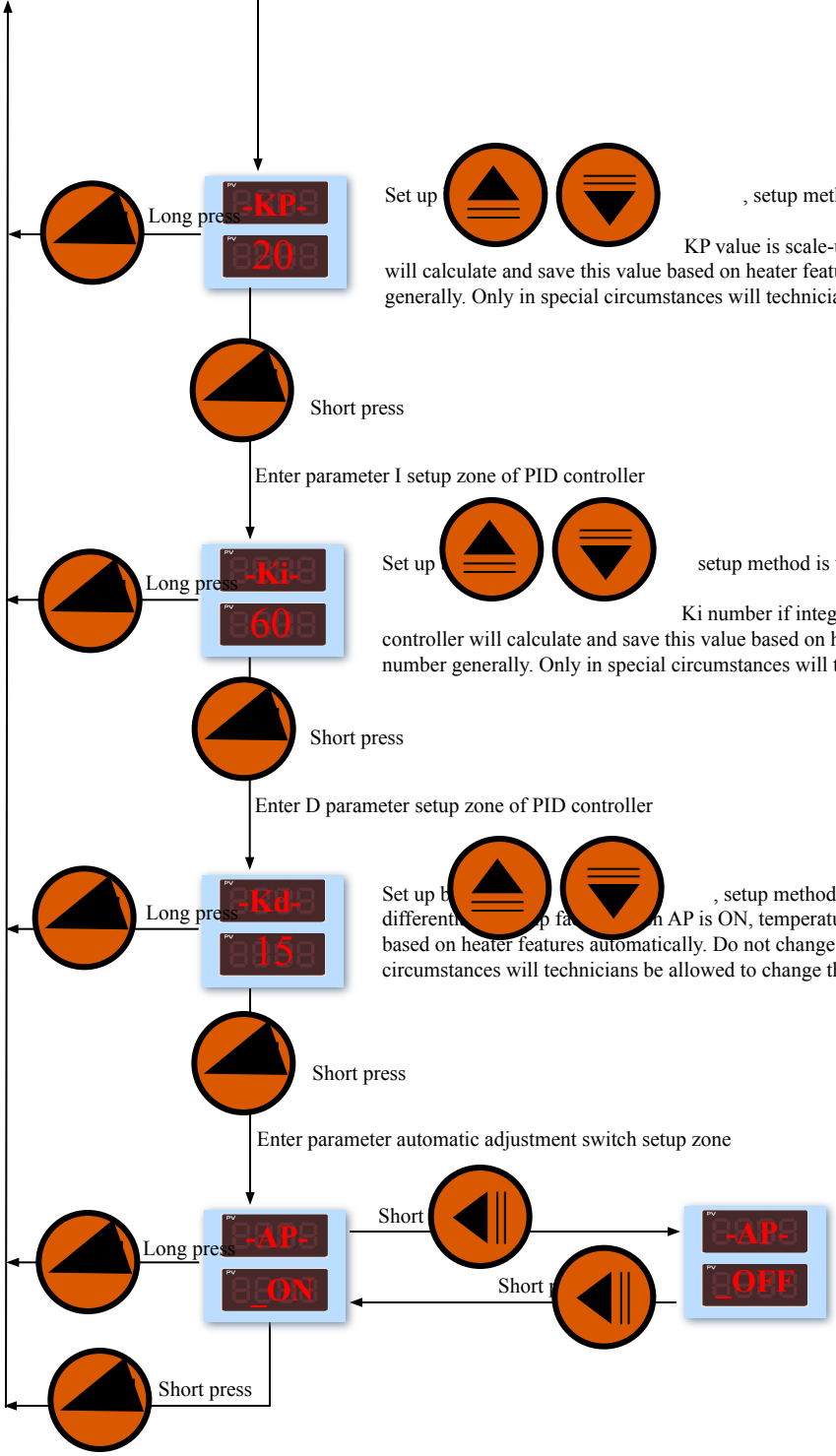
Function parameter settings include:

Regular function settings—temperature alarm upper limit, temperature alarm lower limit, soft start power, soft start time, soft start switch

Advanced function settings-----thermocouple type, selection of centigrade and Fahrenheit, PID parameter, etc.




Long press
Short
TC--
-J-
Short
TC--
-K-
Setup menu of type J and type K thermocouple
Short press
Enter selection zone of centigrade and Fahrenheit
Long press
Short
C--F
-C50
Short
C--F
-F60
Setup menu of centigrade and Fahrenheit
Short press
Enter control method setup area
Long press
Short
cont
SSR
Short
cont
PWM
Setup menu of zero crossing control and phase-shifting control mode
Short press
Enter time settings zone of soft start
Long press
SOFT
t 01
Set up
, setup method is the same as that of temperature settings.
Soft start is mainly for dehumidify heater. When mould is not used for a long time, please select soft start mode. PWM soft start mode is the best. Setup time shall not be less than 60 minutes. If the mould is always in use, set up short time, e.g., 2 minutes.
Short press
Enter setup zone of soft start power
Short press
SOFT
P 10
Set up
, setup method is the same as that of temperature settings.
Soft start is mainly for dehumidify heater. When mould is not used for a long time, please select soft start mode. PWM soft start mode is the best. Setup power shall not exceed 10%.
Long press



Set up , setup method is the same as that of temperature settings.

KP value is scale-up factor. When AP is ON, temperature controller will calculate and save this value based on heater features automatically. Do not change this number generally. Only in special circumstances will technicians be allowed to change this number.

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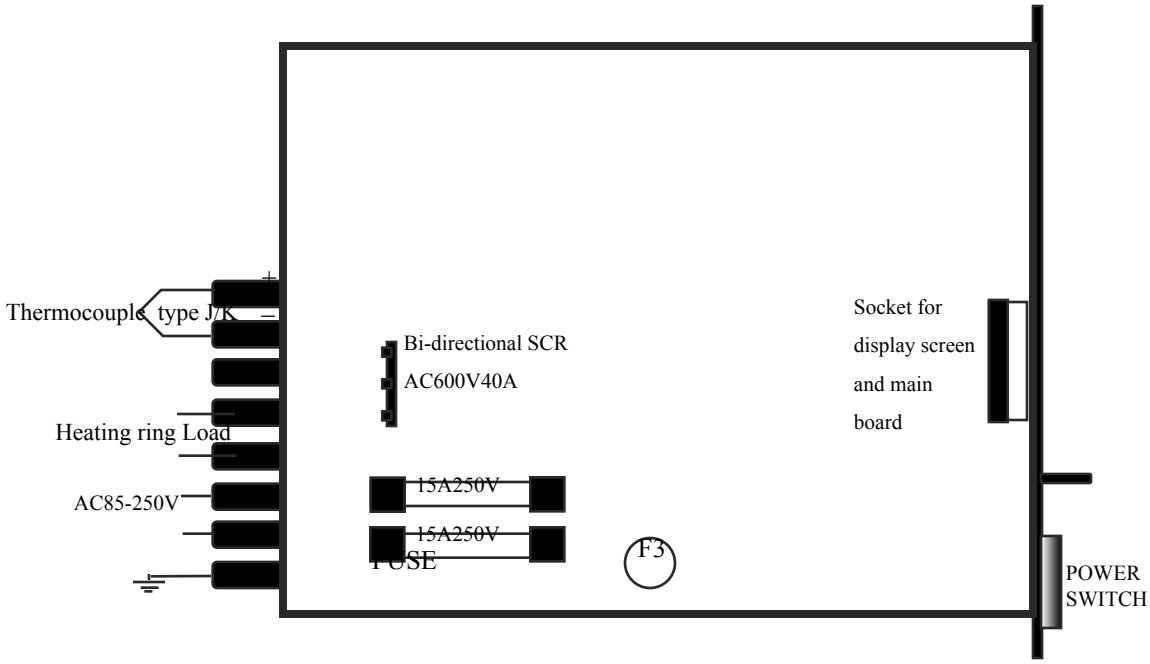
Generally, AP is ON.

When AP is ON, controller tests heater functions automatically during each power on and temperature rise. When temperature controller gets accurate heater parameter, it performs accurate control.

When AP is OFF, controller will not test heater function, but withdraw parameter from previous record. If temperature controller controls the same heating ring, it is stable.

Hardware description



Fault diagnosis

E- 01	Thermocouple offline alarm: there are two causes, one is thermocouple damage, the other is loose connection. Check each joint connection, otherwise, send back to factory for repair.
E- 02	Alarm of reversed thermoelectricity polarity connection: please check if positive and negative polarities of t
E- 03	Alarm of disconnected heating ring: check if heating ring related joints are loose, if circuit is disconnected, check if fuse has open circuit or heating ring is damaged
E- 04	Alarm of silicon controlled breakdown short circuit: silicon controlled is damaged. Please replace it.

No display:

Check if power switch is on?

Check if external power supply and wiring are normal? Zero line must be correctly connected and ground wire connected reliably, otherwise send back to factory for maintenance.

Golden finger goes black: please check if socket spring for golden finger connection loses flexibility. Replace it with new socket.

Note: before power on, please confirm if wiring is correct? Power voltage for temperature control card is AC220V. Wiring among temperature control box, connection line and mould must be consistent. If power on in event of wrong wiring, it may cause permanent damage to temperature control card.