HG-TC300A
染色机控制电脑
HG-TC300A CONTROLLER
FOR
DYEING MACHINE

使用说明书
USER'S MANUAL

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I. Overview:

HG-TC300A Microprocessor Controller For Dyeing Machine adopts LCD screen with both Chinese and English display method. It adopts friendly man-machine interface. Simple operation makes it is possible for you to finish most of the operation according to the interface even without the user's manual. With the perfect effect of controlling temperature, this machine can be widely applied for different objects of controlling temperature, such as: Normal temperature Dyeing machine, High temperature dyeing machine and yarn dyeing machine.

1) Output to connect

Relay output 8 (Relay output: 240VAC 3A)

Respectively control: main pump, heating, cooling, fill, cooling water drain, **decompression**, direct heating, positive turn, negative turn, calling.

2) Temperature control specifications:

Temperature measurement component:

Pt100 platinum resistance.

Test temperature range: 000℃~153℃

Temperature control range: 030℃ ~145℃

Temperature control speed: 0.1℃~9.9℃/min

Temperature s control accuracy: isotherm state+_0.5℃

Temperature control method: optimized automatically control

3. Programmable functions:

Programmable process number: 100(0~99), 100(0~99) programmable steps per process.

4. Protective function

(1) The parameters of programmed technics process won't be lost after sudden power cutting with the advanced IC equipment.

(2) If there is suddenly power off while the machine is working, the present data can be kept and go on working if the power come again.

(3) It will alarm and stop working when the temperature is over 150 ℃.

5. Power working range

Power supplying range: AC180~250V 50/60HZ

Power consume of the whole machine:≤6 W

6.Working environment:

Working temperature: ≤50 ℃,

Relative humidity ≤90%

7. Dimension of apparatus:

160(W)X160(H)X 160(L) mm³ .

Installing hole dimension: $152 \times 152 (mm^2)$

Installing way: embedded way of tray

II．**Operating Guide**

1) Functions of Keyboard

0~9 numeric key: enter 0~9 number.

RST key: make the computer reset.

RUN key: make computer enter working state.

STOP key: make the computer enter pause state.

ESC key: make the computer out from present state and return to main interface.

OK key: make pick out menu enter submenu or store function for technics program and setting parameter; press this key to stop calling when it is calling.

$\triangle \triangledown$ key: up and down key for the cursor to move up and down.

$\triangleleft \triangleright$ key: left and right moving key to control cursor move left and right, it can be used as choosing function when cursor is in function sector; as look at last step and next step when cursor is in subroutine sector; as choosing language when the cursor is in parameters setting.
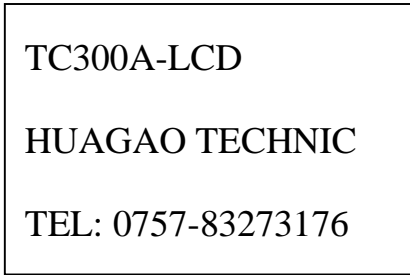
[+] key ----During programming, press this key together with [S] key,

insert 1 step.

[--] key -----during programming, press this key together with [S] key,
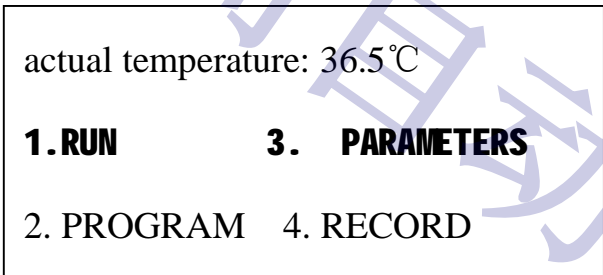
delete 1 step.

2). Main interface

After the power connect, the information interface will be

shown first Picture I

Picture 1

```
TC300A-LCD

HUAGAO TECHNIC

TEL: 0757-83273176
```

If the computer was not under the running state before

power-cut last time, the computer will shift to main interface in

one second. (The interface of restoration state)

```
actual temperature: 36.5℃

1.RUN           3．PARAMETERS

2. PROGRAM   4. RECORD
```

Picture 2

Actual temperature means exact temperature of dyeing

container.

If the computer is under technology running state, it will

show the running interface:

Picture 3

actual temperature: 36.5℃
setting temperature: 065.0℃
speed rate: 2.5   time: 30
technics: 01—03   heating

This interface shows that the computer is under heating condition from present temperature 36.5℃ to seted temperature 65.0℃ .up-gradient of temperature is 2.5 ℃/min , isotherm phase is 30 minutes. The design of the third step (L03) of the first technics(F01), can keep the normal operation from unexpected power-cut while the computer is operating. If you need to quit from operation and retune to the reset condition, press STOP key first then press RST key, you can return to the picture 2.

3) Operation menu

The main interface menu under reset condition are follows
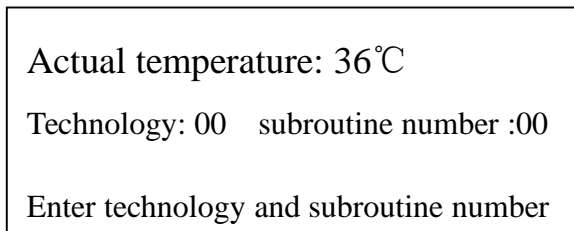
1.RUN 2.PROGRAM 3.PARAMETER 4. RECORD

You can use (1~4) key to choose menu event your expect, then press OK key; If you choose operation, you can directly press RUN key to enter:

a) RUN (运行)

Under main interface (picture2), press 1 key or directly
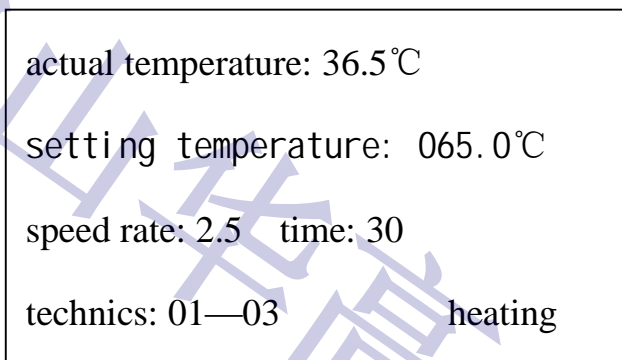
press RUN key to enter running interface:

Picture 4

> Actual temperature: 36℃
>
> Technology: 00   subroutine number :00
>
> Enter technology and subroutine number

Now enter the number of the needed technology and subroutine, then press "OK" key or "RUN" key to enter into running interface (picture 5) and begin to run.
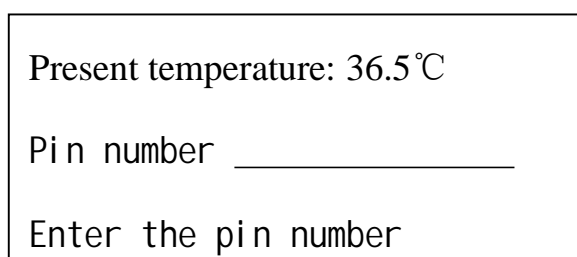
> actual temperature: 36.5℃
>
> **setting temperature: 065.0**℃
>
> speed rate: 2.5   time: 30
>
> technics: 01—03   heating

Picture 5

b) Program   （编程）

Under main interface, press "2"   key , then press confirm key to enter the following interface
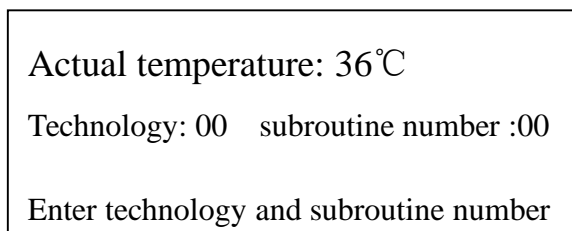
Picture 6

> Present temperature: 36.5℃
>
> **Pin number** _____
>
> **Enter the pin number**

Enter 6 pin numbers , then press confirm key then enter into the following interface(picture 7) the original pin number is "000000" . In order to protect the techinics parameters not to be

modified, the customer should change the pin number into any for numbers for easily remember.
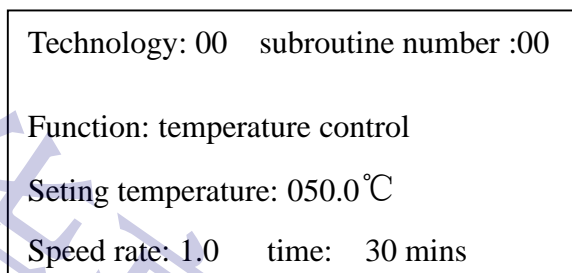
Picture 7

Actual temperature: 36℃
Technology: 00   subroutine number :00
Enter technology and subroutine number

Enter the technology and subroutine number , then press "confirm" key to enter the program state interface.(picture 8)

Picture 8

Technology: 00   subroutine number :00
Function: temperature control
Seting temperature: 050.0℃
Speed rate: 1.0   time: 30 mins

Remark: in the above picture , the data of aim , speed , time are

Now can use ◁ key or ▷ to choose function, press "▽", the cursor move to next line; use ◁   ▷and numeric key to set parameters. Press confirm key to store after each step program to the last step. Press ESC to return to main interface.

Program rules of control function:

1) main pump open

function sector program "open main pump", temperature sector program "0", speed rate sector program "0", time sector program time data. During the running of this step, if time sector program time data, the main pump will stop and enter into next

step when time is out. If program "00" in time sector, the computer will jump to next step after compute begins to run and keep running until the end or programmed ending.

2) main pump stop

this function is used to stop the running of main pump

3) positive and negative turn open 1

this function is used to control the circle times of positive and negative turn. Positive turn sector program its circle times; negative turn sector program its circle times; interval sector program interval time(unit second). If just need positive turn, program negative sector as "0". Use（常闭点）to count circle times.

4) positive and negative turn open 2

this function is used to control the time of positive and negative turn. Positive turn sector program its time; negative turn sector program its time; for example , 0.1 min or 6 seconds , interval sector program interval time(unit second). If just need positive turn, program negative sector as "0", interval time is "0". The time range of positive and negative turn is 0.0—9.9 mins. Interval time range is 00—99 seconds

5) positive and negative turn open 3

this function is used to control the time of positive and negative

turn. Positive turn sector program its time; negative turn sector program its time; for example , 0013 seconds or 13 seconds , interval sector program interval time(unit second). If just need positive turn, program negative sector as "0", interval time is "0". The time range of positive and negative turn is 0.0—9.9 mins. Interval time range is 00—99 seconds

6) positive and negative turn stop

this function is used to stop the above three ways of positive and negative turn running

7) temperature control

program the object temperature in temperature sector; program up and down gradient of temperature in speed rate sector; program isotherm phase in time sector(00—99mins); if the setting temperature is higher than actual temperature , that means heating; if the setting temperature is lower than actual temperature, that means cooling. When first heat should open the coldness relief at the same time. Open coldness relief should be set "3. parameters" in "start time" sector and stop it when time is out. During heat and isotherm phase should open coldness relief, interval time is set "3. parameter" in interval time sector. When open cooling should open coldness relief at at the same time. When speed rate program 9.9℃/min, it means direct

heat or direct decreasing temperature. Direct heating is to open the direct heat and direct adding till set temperature then stop. Direct decreasing temperature is to open cooling till set temperature and stop.

8) pressure relief

no process control. During running state, when actual temperature is lower than setting pressure relief temperature , open pressure relief , pressure relief temperature is set in pressure relief temperature of "3. parameter" ; when the actual temperature is higher than setting pressure relief temperature, close pressure relief. It will be 85℃ to control if there is no any setting.

9) pause

when program "pause" in any step during craft process, it will escape from control state and alarm when it runs to this step, but the positive and negative turn will go on working and press "confirm" key to cancel alarm. It is convenient for the jokey to carry out the other craft operation. Press "▽" to move to next line after finishing then press "RUN" key to go on running.
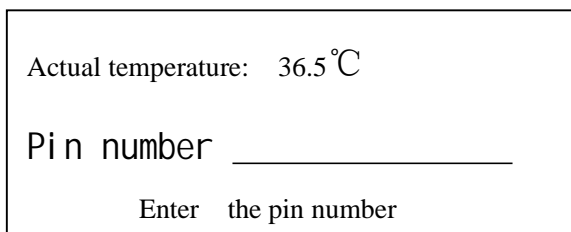
10) stop

It is the last step of craft process and every craft must have this step. The computer will display "finish" , the other sector such as "temperature sector, speed rate sector, time sector will display "0" automatically. Press "confirm" then finish the whole craft.

c) Parameter

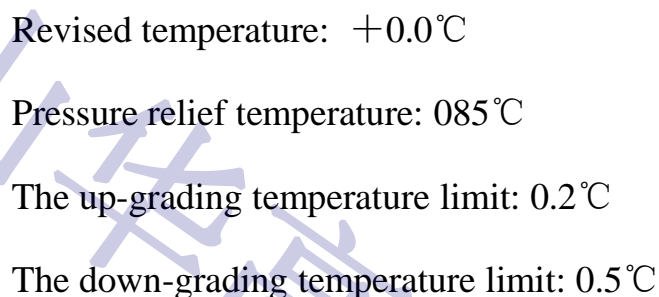Under the main interface state, press "3" key to enter the following interface.

Picture 9

Actual temperature:　36.5℃

Pin number ＿＿＿＿＿＿＿＿

Enter　the pin number

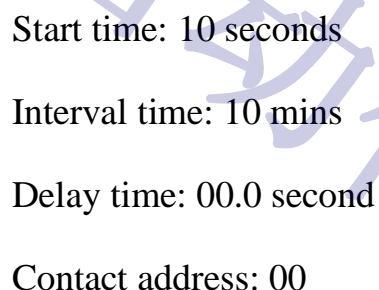Enter the pin number : "000000" then press confirm key, enter into parameter interface.(picture 10)

Picture 10

Revised temperature: ＋0.0℃

Pressure relief temperature: 085℃

The up-grading temperature limit: 0.2℃

The down-grading temperature limit: 0.5℃

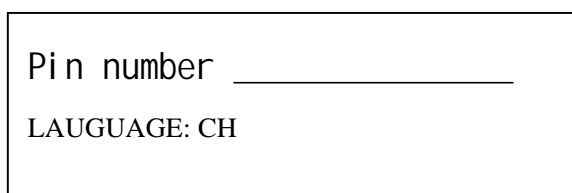Press ▽ key to enter into the following interface(picture 11)

Picture 11

Start time: 10 seconds

Interval time: 10 mins

Delay time: 00.0 second

Contact address: 00

Press ▽ key to enter into the following interface(picture 12)

Picture 12

Pin number ＿＿＿＿＿＿＿

LAUGUAGE: CH

As picture 10, if there is deflection between actual temperature

and display temperature, we can adjust by temperature revising. Revising range: $\pm 9.9\,℃$. the pressure relief temperature are free to be set, if there is no any setting, we can use $85\,℃$ to control. The function of up and down-grading temperature limit: during isotherm state, open heating till the object temperature when the temperature is lower than $0.2\,℃$; open cooling if the temperature is higher than $0.5\,℃$.

As picture 11, start time is the time when first open heating as well as coldness relief; the interval time is the time when open coldness relief ; delay time is the delay stop time of positive turn ; contact address is the code number of centralized control.

As picture 12, the pin number can be changed into any numbers for easily remember, then press "confirm" key, return to the main interface. Language sector can use $\triangleright$ key to choose Chinese or English way.

d) Record (记录)

Under main interface , press "4" to enter into the following

interface (picture 13)

picture 13

| Actual temperature: 36.5℃ |
| curve: 00   technics :00 |
| Enter history curve number |

under this interface, we can look over ten latest runned

technology curve. Curve 0 is the latest technology curve; Curve 1 is the second new technology curve; in this case, curve 9 is the oldest technology curve. The technology number here stands for the technology it belongs to. Under this interface, enter the curve needed to look over, then press "confirm" key is ok. Just as the following picture(picture 14) （图片 14 略）

in the above picture, y-axis is temperature, the abscissa is time. The start point of temperature is 30℃ , the highest is 150℃ , the interval of y-axis is 2℃; the interval of abscissa is 10 mins. The time of each page is 112 mins. Every curve includes two pages, we can use $\triangleright$ key to page up and down and we can use the 左三角 key to return to history curve interface (picture 13), press "escape" to main interface.

4．program examples

(take the third step technology as example, step number starts from 0 (F03 L00)

<div align="center">130℃ isotherm phase 35 minutes</div>

<div align="center">1.5℃/min</div>

80 ℃ isotherm phase 30 minutes

2.5℃/min   2.0℃/min

normal temperature   50℃ to finish

positive turn 3 mins, interval 10 seconds, negative turn 2 mins
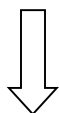
the above technology curve can be shown as the following table.

14

Subroutine number	functions	Temp (positive turn)	Speed rate (interval)	Time (negative turn)
0	Positive turn 3 mins, interval 10 seconds, negative turn 2 mins	003.0	10	2.0
1	Up-grading temp 2.5℃/min, heat to 80℃ isotherm phase 30 mins	080.0	2.5	30
2	Up-grading temp 1.5℃/min, heat to 130℃ isotherm phase 35 mins	130.0	1.5	35
3	down-grading temp 2.0℃/min, cool to 80℃ no isotherm phase	050.0	2.0	00
4	end	000.0	0.0	00

Program procedurals as following:

Press "ESP" key to enter the main interface (press "stop" key first if it is under running state)

```
actual temperature: 36.5℃

1.RUN          3.   PARAMETERS

2. PROGRAMTEL: 4. RECOND
```

press "2" key

```
Present temperature: 36.5℃

Pin number _____

Enter the pin number
```

Press pin number "000000", press "confirm' key

```
Actual temperature: 36℃

Technology: 00    subroutine number :00

Enter technology and subroutine number
```

enter technology number "03", subroutine number :00 then press confirm key

```
Technology: 03    subroutine number :00
Function: end

Seting temperature: 000.0℃

Speed rate: 0.0     time:    00 mins
```

press " ▷ "key to function "positive and negative turn open 2",enter the data of "0" step: positive turn 3 mins, interval 10 seconds, negative turn 2 mins

```
Technology: 03    subroutine number :00
Function: positive and negative open 2
Positive turn: 003mins
interval: 10 seconds
negative turn 2.0 mins
```

Press "confirm" key

```
Technology: 03    subroutine number :01

Function: end

Seting temperature: 000.0℃

Speed rate: 0.0     time:    00 mins
```

set the data of the first step in the same way. Press " ▷ "key to function "temperature control" , up-grading temp to 80℃, speed rate 2.5℃/min, isotherm 30 mins

```
Technology: 03    subroutine number :01

Function: temperature control

Setting temperature: 080.0℃

Speed rate: 2.5.     time:    30 mins
```

press confirm key

```
Technology: 03    subroutine number :02

Function: end

Seting temperature: 000.0℃

Speed rate: 0.0    time:   00 mins
```

set the data of the second step

```
Technology: 03    subroutine number :02

Function: temperature control

Setting temperature: 130.0℃

Speed rate: 1.5.    time:   35 mins
```

press confirm key

```
Technology: 03    subroutine number :03

Function: end

Setting temperature: 000.0℃

Speed rate: 0.0    time:   00 min
```

set the data of the third step

```
Technology: 03    subroutine number :03

Function: temperature control

Setting temperature: 050.0℃

Speed rate: 2.0.    time:   00 min
```

press confirm key

```
Technology: 03    subroutine number :04

Function: end

Setting temperature: 000.0℃

Speed rate: 0.0    time:   00 min
```

press "confirm" key , press "esp" key to return to main interface

```
actual temperature: 36.5℃
1.RUN        3.  PARAMETERS
2. PROGRAMTEL: 4. RECOND
```

5. running example

```
actual temperature: 36.5℃
1.RUN        3.  PARAMETERS
2. PROGRAMTEL: 4. RECOND
```

press "RUN" key or "1" key

```
Actual temperature: 36.5℃

Technology: 00    subroutine number :00

Enter technology and subroutine number
```

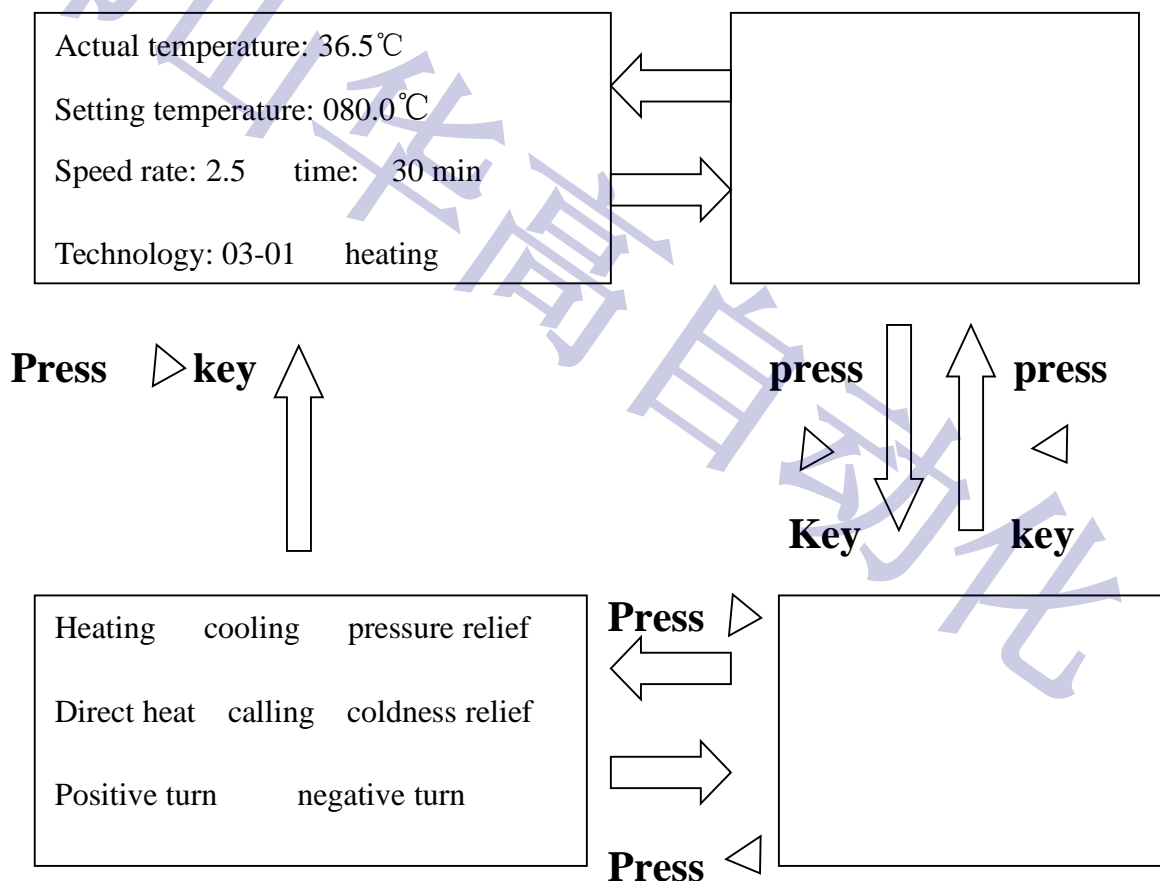press technology 03 , subroutine number 00

```
Actual temperature: 36.5℃

Technology: 00    subroutine number :00

Enter technology and subroutine number
```

press "confirm" key or "RUN" key to enter into running state:

00 step (positive and negative turn 2) ---run to next step

```
Actual temperature: 36.5℃

Setting temperature: 080.0℃

Speed rate: 2.5     time:   30 min

Technology: 03-01     heating
```

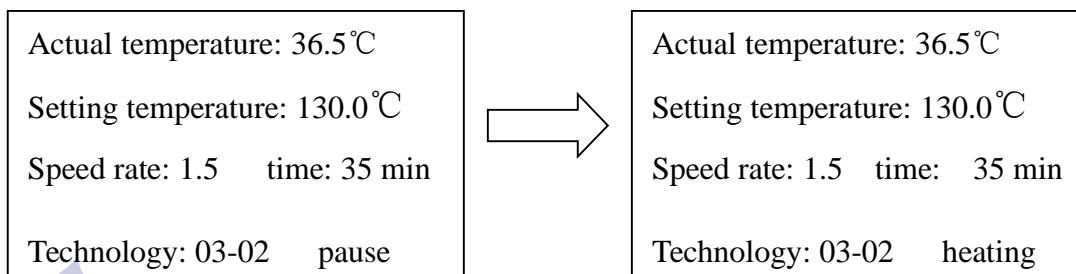In order to better see the actual running circs, we design three ways of running interface

```
Actual temperature: 36.5℃

Setting temperature: 080.0℃

Speed rate: 2.5     time:   30 min

Technology: 03-01     heating
```

Press ▷**key**   **press** ⬆ **press**

                                                              ▷   ◁

                                                         Key ⬇   **key**

```
Heating     cooling    pressure relief

Direct heat   calling   coldness relief

Positive turn        negative turn
```
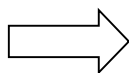
Press ▷

Press ◁

6. technology leap running

Under running state

```
Actual temperature: 36.5℃

Setting temperature: 080.0℃

Speed rate: 2.5    time:   30 min

Technology: 03-01   heating
```

```
Actual temperature: 36.5℃

Setting temperature: 080.0℃

Speed rate: 2.5    time:   30 min

Technology: 03-01   pause
```

$$\Longrightarrow$$

| Actual temperature: 36.5℃ |
| Setting temperature: 130.0℃ |
| Speed rate: 1.5   time: 35 min |
| Technology: 03-02   pause |

$\Longrightarrow$

| Actual temperature: 36.5℃ |
| Setting temperature: 130.0℃ |
| Speed rate: 1.5   time: 35 min |
| Technology: 03-02   heating |

7. Operation Attentions (操作注意事项)

a. While programming, the speed rate of up and down-gradient temperature can't be "00", but "99"

b. If you need to exit from operation under Operation condition and return to reset condition, you should press operation key first then reset key

c. Each technology need one-step to stop (make all as 0) , otherwise the computer will have errors.

d. if the computer is stop working, press 'RST'' key to reset.

III.   Installation and Adjusting （安装调试）

It is better to install the computer in a place with low temperature ,best dry, well ventilated and no dust. You had better keep the computer from transducer which has strong electromagnetism. the power cable of the computer had better not share with the electric appliances of the big power . The

temperature probe line of PT100 should adopt three cores shield cable, combining will shield the layer connects to earth line of electric appliances controlling cabinets or machine hulls.

This computer is valuable and need to be best carefully protected, prohibition against touch or squeeze LCD manifestation window, prevent from dye liquid or water, and keep the front-panel clean.

IV Temperature checking methods

use standard six resistance box to replace PT100 output

Temperature	Pt100 resistance figure

Three minutes pre-heating after switching the computer, the bottom choose 50, and high point for 130 as the final figure

V. The back line diagram of the computer 电脑背面接线图

Public line (公共线)

Heating（加热） Cooling 冷却 pressure relief （卸压）

Coldness relief 排冷 direct heating 直加 standby 备用

positive turn 正转 negative turn 反转 Public line (公共线)

Alarm /Call 呼叫 routing switch 行程开关

communication 通讯

VI After service (售后服务)

Our company supply one year free guarantee for the product and

forever after service. If you have any problem while using our product, please contact with us anytime. We are always at your service

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