HG-TC2006A
染色机控制电脑
HG-TC2006A CONTROLLER
FOR
DYEING MACHINE

使用说明书
USER'S MANUAL

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Directory

I. Overview: (概述)

HG-TC2006 Microcessor Controller For Dying Machine adopts Chinese vision screen, adopting 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.

Main technique functions:

1) Output to connect (输出接口)

relay output 7 (Relay output: 240VAC 3A)

one for heating control, one for cooling , one for positive turn, one for negative turn,

one for **Direct heating,** one for **Cooling outlet**,and one for calling..

2) Temperature control specifications:(测温性能)

temperature measurement component:

Pt100 platinum heat resistance.

Test temperature range: 000℃---153℃

temperature Control range: 030℃ ---145℃

temperature s Control Speed: 0.1℃---9.9℃/min

temperature s Control accuracy: isotherm state±0.5℃

temperature control method: optimized automatically control

3). Programmable functions: （可编程功能）

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

4). Protective function (保护功能)

   (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 running, the present data can be kept and go on working if the power comes again.

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

5. Power working range

   Power supplying range: AC(180—250)V 50/60HZ

   Power consume of the whole machine:≤5 W

6．Working environment:

Working temperature: ≤50 ℃，

Relative humidity ≤90%

7. Dimension of apparatus:

   (96)W*(96)H* (100)L **mm³**

   Installing hole dimension: 91×91 **mm²**

   Installing way: embedded way of tray

II. **Operating Guide**（使用说明）

1) Functions of Keyboard

RST key: make the computer return the main interface of reset state, running state need to press RUN key first.

RUN key: make computer enter working state, that key is for replying to use, under running state press key, then the computer pause working; under pause state press RUN key, then computer works.

Confirm key: make pick out menu enter submenu or save function for finishing of technics program and parameter setting.

▷ key   right moving key to control cursor move right , press once, move right one bit. Under programming state, this key can be used with "RUN' key and "NUM' key. When it is with "RUN' key, inset one step technic data before the present step; when it is with   "NUM' key, require about the technics data of last step.

▽ key   down key for the cursor to move down, press once, move to next line. Under programming state, this key can be used with "RUN' key and "NUM' key. When it is with "RUN' key, delete technics data of present step; when it is with "NUM' key, require about the technics data of next step.

Number key   Used for key-inning "0-9"

2) Main interface

After the power connect, the information interface will be shown first if the computer was not under the running state before power-cut last time.

Picture 1

> # HG2006A

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)
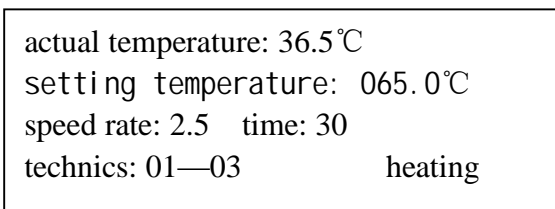
Picture 2

> actual temperature: 36.5℃
> **1.RUN   3. PARAMETERS**
> 2. PROGRAMTEL: 4. RECOND
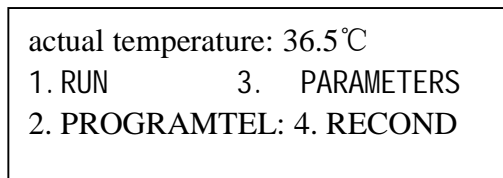
actual temperature means exact temperature of dying container.

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 setting 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 operation key first then RST key ,you can reshow the picture 1.

3) Operation menu

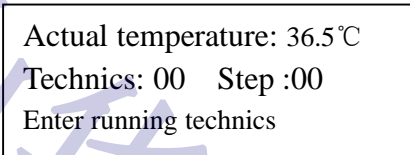the main interface menu under reset condition are follows

1 RUN   2. PROGRAM   3. PARAMETER   4. RECORD

you can use ▷ key to choose menu event your expect ,then press confirm key ;If you choose operation , you can directly press RUN key to enter :

a) RUN

Under reset state (picture2),choose running event and press confirm key or directly press RUN key to enter running interface:
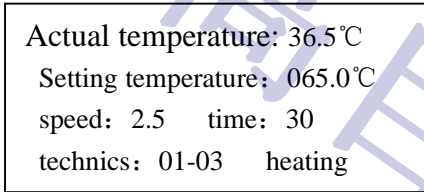
Picture 4

```
Actual temperature: 36.5℃
Technics: 00    Step :00
Enter running technics
```

Now enter the technics number and step number, press "Confirm" key or "RUN" key , computer will enter running interface.
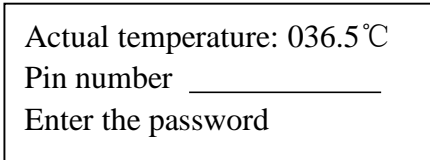
Picture 5

```
Actual temperature: 36.5℃
 Setting temperature：065.0℃
 speed：2.5    time：30
 technics：01-03    heating
```

b) Program

Under reset state, press "PROGRAM"key, then press "confirm" key to enter the following interface (picture 6)
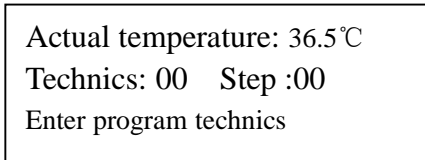
Picture 6

```
Actual temperature: 036.5℃
Pin number _____
Enter the password
```

Now enter four digit password, then press 'confirm' key to the following interface (picture 7) .The original password is "0000". In order to prevent the parameters from being changed by others , you should change it into four easy-remembered number when you first time use this computer .

picture 7

```
Actual temperature: 36.5℃
Technics: 00    Step :00
Enter program technics
```

Now enter technics number and step number, press "confirm" key to program interface(picture 8)

picture 8

| technics：00   step ：00 |
| function：temperature control |
| set temperature：050.0 |
| speed rate：1.0   time：30 |

Press confirm key to save technics after each step program. Press "RST" to return to main interface (picture 2).

1) 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 , 000.3 min or 18 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

2) positive and negative turn stop

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

3) temperature control

program the object temperature in temperature sector; program up and down gradient of temperature in speed rate sector（0.1～9.9℃/min）; 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. There are two ways of output: relay output (3 lines) and Stimulant amount output , 4—20mA (1 line), you can choose either of them (choose in "output" of "3. parameter")

4）pause

when program "pause" in any step during craft process, it will escape from control state and alarm when it runs to this step. It is convenient for the worker to carry out the other craft operation. Press " ▷ " to move to next line after finishing then press "RUN" key to go on running.

5) 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. When the computer runs to this step, it will finish control state and alarm.

c) Parameter

Under the main interface state, press "confirm' key after choosing "parameter" event to enter the following interface (picture 9).

Picture 9

| Actual temperature: 36.5℃ |
| password _____ |
| Enter the password |

Enter the The original password is "0000", then press confirm key, enter into parameter interface.(picture 10)

Picture 10

> Revised temperature: ＋0.0℃
> Adjust before heat preservation: 085℃
> lower limit of heat preservation: 0.2℃
> Upper limit of heat preservation: 0.5℃

Picture 11

> Proportion :　　　005
> Integral time:　　010 second
> Differential time: 020.0 second

Picture 12

> Contact address: 00
> Password　　0000
> LAUGUAGE: CH

As picture 10, if there is deflection between actual temperature and display temperature, we can adjust by temperature revising. Revising range: ±9.9℃.

Function of adjusting before heat preservation: when temperature enter the range of adjusting before heat preservation, the computer will slower the speed rate of up-grading temperature for stable heat preservation and reduce over adjusting. For example: set 1.0℃ as adjusting before heat preservation，set temperature as 100℃，the computer will slower the speed rate of up-grading temperature when heating to99℃.

Function of adjusting before heat preservation

Function of upper limit of heat preservation: under heat preservation state, open cooling when the temperature is 0.5℃ over set temperature.(as picture 10)

Function of lower limit of heat preservation: under heat preservation state, open heating when the temperature is 0.2℃ below set temperature. (as picture 10)

Proportion：it will work when set 4—20mA as output way，the original digit of factory is 010。If you find it is over adjusting, output digit wave is big and test digit appear surge, you can reduce the digit. (as picture 11)

Integral time：it will work when set 4—20mA as output way，the original digit of factory is 005。If you find it is over adjusting, output digit wave is big and test digit appear surge, you can reduce the digit. (as picture 11)

Differential time：it will work when set 4—20mA as output way，the usual digit is 5—30。(as picture 11)

heating way：relay output and 4--20mA output, press"▷"key to choose the way of output。(as picture 11)

Contact address：the code of centralized control。(as picture 12).

password：the original password can be changed into any other four digit number, press

"confirm" key to return to the main interface(picture 2)language event can use " 　　 "key to choose Chinese or English way. (as picture 12)

d) Record (记录)

Under main interface , press "RECORD" then press "confirm" key 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)
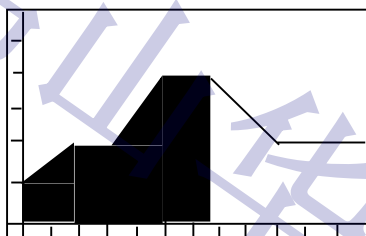

Picture 14

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 big interval of y-axis is 20℃; the interval of abscissa is 10 mins. The time of each page is 120 mins. Every curve includes two pages, we can use ▷ key to page up and down and we can use the ▽ key to return to history curve interface (picture 13), press "reset" to main interface (picture 2).

4. program examples

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

80℃ isotherm phase 30 minutes

2.5℃/min   2.0℃/min

normal temperature   50℃ to finish
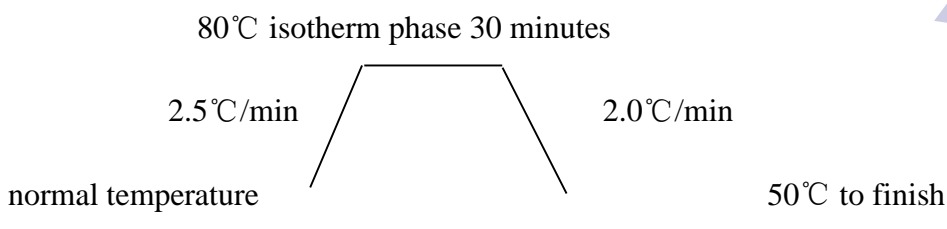
the above technology curve can be shown as the following table.

Subroutine number	functions	Temp	Speed rate	Time
0	Up-grading temp 2.5℃/min, heat to 80℃ isotherm phase 30 mins	080.0	2.5	30
1	down-grading temp 2.0℃/min, cool to 80℃ no isotherm phase	050.0	2.0	00

Program procedurals as following:

Press " RST" 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
```

↓ Choose "PROGRAM" key then press "Confirm" key

```
Present temperature: 36.5℃
password _____
Enter password
```

↓

```
Actual temperature: 36℃
Technology: 00    subroutine number :00
Enter program technics
```

↓ enter technics number"03",   subroutine number "00",
press "confirm" key

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

Set temperature: 000.0℃

Speed rate: 0.0     time:   00 mins
```

↓ press" ▷ "key to temperature control function, enter the data of step
0, , heat to 80℃, isotherm phase 30 mins Up-grading temp 2.5℃/min

```
Technology：03    subroutine number ：00
Function：temperature control
Set temperature：080.0
Speed rate：2.5      time:：30
```

↓ Set the data of step 1 in the same way

```
Technology: 03    subroutine number :01
Function: end

Set temperature: 000.0℃

Speed rate: 0.0     time:   00 mins
```

Press "confirm" key

```
Technology: 03    subroutine number :01
Function：temperature control
Set temperature：050.0
Speed rate：2.0：00
```

```
Technology: 03    subroutine number :02
Function: end
Set temperature：000.0
Speed rate：0.0   time：00
```

Press "RST"to the main interface

```
actual temperature: 36.5℃
1.RUN         3．PARAMETERS
2. PROGRAMTEL: 4. RECOND
```
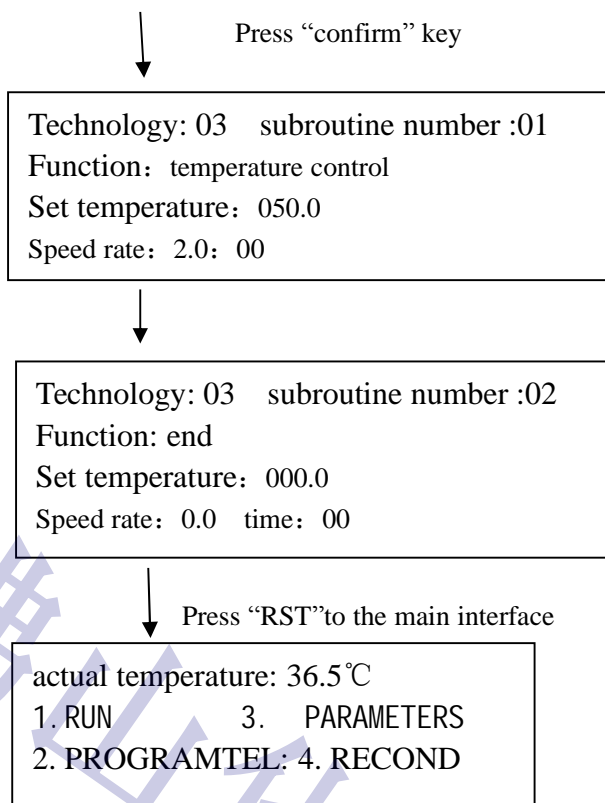
5．Insert step example（insert one step before step 1 technics 3）
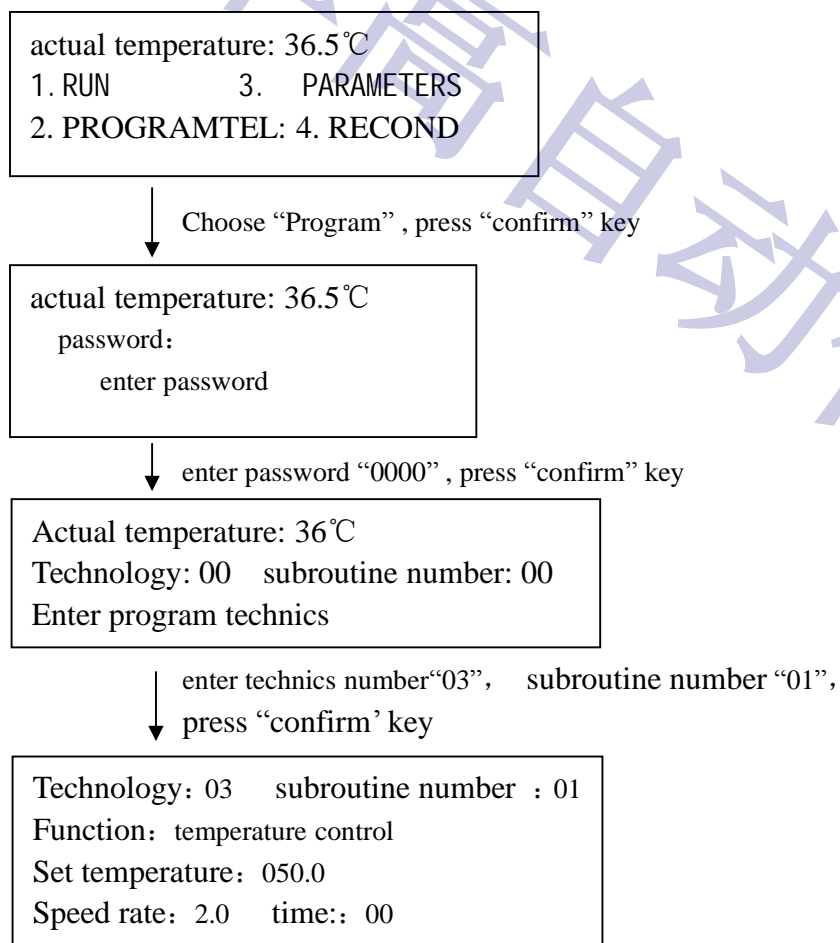
```
actual temperature: 36.5℃
1.RUN         3．PARAMETERS
2. PROGRAMTEL: 4. RECOND
```

Choose "Program" , press "confirm" key

```
actual temperature: 36.5℃
  password：
     enter password
```

enter password "0000" , press "confirm" key

```
Actual temperature: 36℃
Technology: 00    subroutine number: 00
Enter program technics
```

enter technics number"03"，   subroutine number "01"，
press "confirm' key

```
Technology：03    subroutine number  ：01
Function：temperature control
Set temperature：050.0
Speed rate：2.0   time:：00
```

press "RUN "key together with " ▷" key

Technology: 03   subroutine number :01
Function: end
Set temperature：000.0
Speed rate：0.0   time：00

set the data of insert step

Technology：03   subroutine number ：01
Function：temperature control
Set temperature：065.0
Speed rate：2.5   time:：10

Press "confirm" key to safe the data of insert step
Finish insert step

Technology：03   subroutine number ：02
Function：temperature control
Set temperature：050.0
Speed rate：2.0   time:：00

Press "RST" to the main interface

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

6.Delete step example（delete step 1 technics 3）

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

Choose "Program" , press "confirm" key

actual temperature: 36.5℃
 password：
    enter password

Enter password "0000", press "confirm" key

Actual temperature: 36℃
Technology: 00   subroutine number: 00
Enter program technics

enter technics number"03"， subroutine number "01",
press "confirm' key

Technology：03　subroutine number ：01
Function：temperature control
Set temperature：065.0
Speed rate：2.5　time:：10

press "RUN "key together with "▽' key

Technology：03　subroutine number ：01
Function：temperature control
Set temperature：050.0
Speed rate：2.0　time:：00

Finish delete step , press "RST" to the main interface

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

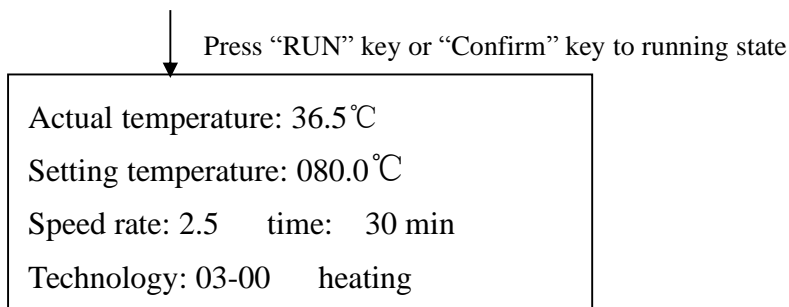7. **Running example**（from technics 3，run from step 00）

Main interface

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

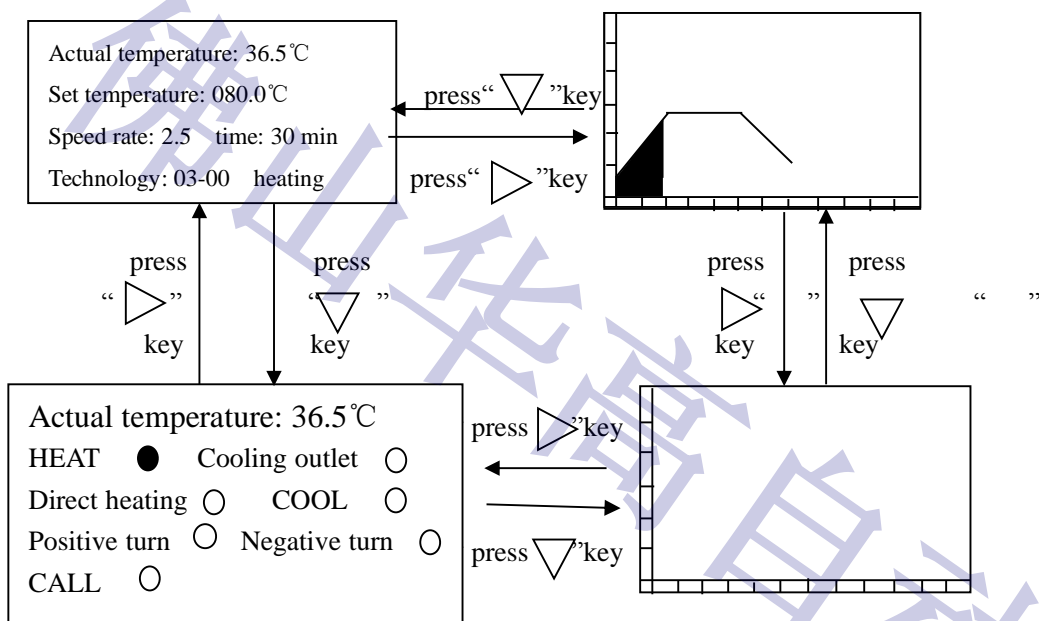Press "RUN" key or choose "RUN" key then press "confirm" key

Actual temperature: 36.5℃
Technology: 00　subroutine number :00
Enter running technics

Enter technics 03，subroutine number 00

Actual temperature: 36.5℃
Technology: 03　subroutine number :00
Enter running technics

Press "RUN" key or "Confirm" key to running state

Actual temperature: 36.5℃

Setting temperature: 080.0℃

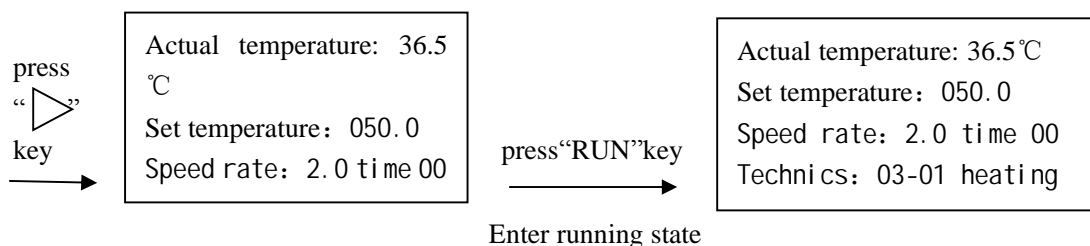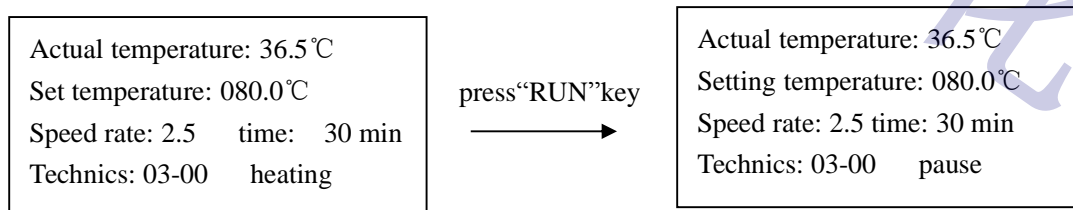Speed rate: 2.5   time: 30 min

Technology: 03-00   heating

While heating, the computer will alarm if the temperature don't increase in four minutes.

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

Actual temperature: 36.5℃
Set temperature: 080.0℃
Speed rate: 2.5   time: 30 min
Technology: 03-00   heating

press"▽"key

press"▷"key

press "▷" key

press "▽" key

press "▷" key

press "▽" key

Actual temperature: 36.5℃
HEAT   ●   Cooling outlet   ○
Direct heating ○   COOL   ○
Positive turn   ○   Negative turn   ○
CALL   ○

press "▷"key

press "▽"key

8. technology leap running

Under running state

Actual temperature: 36.5℃
Set temperature: 080.0℃
Speed rate: 2.5   time: 30 min
Technics: 03-00   heating

press"RUN"key

Actual temperature: 36.5℃
Setting temperature: 080.0℃
Speed rate: 2.5 time: 30 min
Technics: 03-00   pause

press "▷" key

Actual temperature: 36.5 ℃
Set temperature：**050.0**
Speed rate：2.0 time 00

press"RUN"key

Actual temperature: 36.5℃
Set temperature：**050.0**
Speed rate：2.0 time 00
Technics：03-01 heating

Enter running state

9. Operation Attentions

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 state and return to reset state, you should press RUN key first then RST key

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

III. Installation and Adjusting

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	Temperature	Pt100 resistance figure
0℃	100.000Ω	50℃	119.400Ω
10℃	103.900Ω	100℃	138.500Ω
20℃	107.790Ω	130℃	149.820Ω
30℃	111.678Ω	150℃	157.370Ω

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
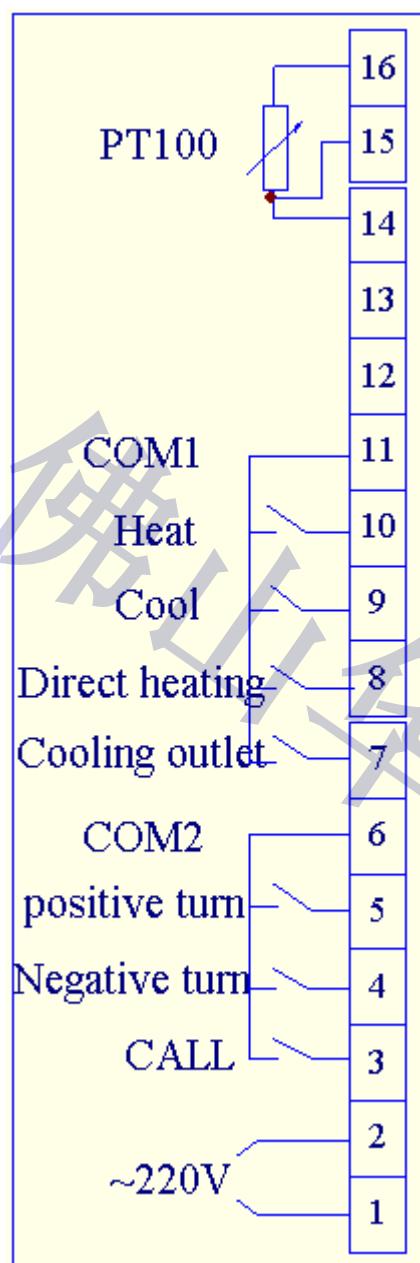
VI   After service (售后服务)

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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