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Thanks for choosing PHRS-GUI

This equipment is based on micro-computer system, and is equipped with centralized monitoring, standard bus network, modularized construction and touch-panel operation. It is designed special for hot runner system use.

**Temperature control system:** Each temperature module control 4 zones temperature, 24pcs of module can be installed in this equipment, so the maximum configuration is 96 zones temperature control loop.

**Sequence control system:** Each sequence module supply 8 timer controller, 3pcs of sequence module can be installed in this equipment, so the maximum configuration is 24 zones timer.

**Function and characteristic**

**PHRS-GUI** belong to compact, intensive and multiloop hot runner controller. Temperature control and sequence control are integrated to one system. Especially suit to control the hot runner system which is used for producing the Preform of bottle and bottle cap.

**PHRS-GUI** adopt touch-panel interface, it can display complete running information and easy to use for new buyer.

**PHRS-GUI** adopt modularized construction, modules are interchangeable each other, this reduce spare parts store, save time and money for our customer.

Provide 2 types of thermocouple, K-type or J-type, it can be select in the menu.

Provide 2 types output mode: PAC (Phase-angle shift trigger) or SSR (over zero triggering), it can be select in the menu.

In the menu, you can select displaying temperature as Celsius or Fahrenheit

**Alarm function:**
- object’s temperature over upper limit or lower than lower limit
- thermocouple open circuit or reverse polar connection
- heater open circuit or short circuit
- TRIAC broken

**Serial model**

<table>
<thead>
<tr>
<th>model</th>
<th>Description</th>
<th>Cabinet</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHRS-GUI96</td>
<td>49~96 zones temperature loop</td>
<td>vertical type</td>
<td>10” touch panel</td>
</tr>
<tr>
<td>PHRS-GUI48</td>
<td>25~48 zones temperature loop</td>
<td>Vertical type</td>
<td>10” touch panel</td>
</tr>
<tr>
<td>PHRS-GUI24</td>
<td>4-24 zones temperature loop</td>
<td>Vertical type</td>
<td>8” touch panel</td>
</tr>
<tr>
<td>Specification</td>
<td>TDC800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td><strong>Mould matched</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>universal mould hot runner system</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zones</strong></td>
<td>maximum 96 temperature zones and 24 sequence control zones</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>10&quot; color touch panel</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cabinet type</strong></td>
<td>vertical</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>AC240VAC ±10% 47~63Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power factor</strong></td>
<td>0.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rated current</strong></td>
<td>AC 20A for each single temperature loop</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum current</strong></td>
<td>Maximum AC 20A for each single loop</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fuse</strong></td>
<td>AC250V 20A size Φ6×30</td>
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<td></td>
</tr>
<tr>
<td><strong>Total power</strong></td>
<td>3.0KW * loop number</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermocouple Type</strong></td>
<td>J or K set in the menu</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature system</strong></td>
<td>0°C or 0°F set in the menu</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td>0 ~450 °C 32 ~842 °F</td>
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<td></td>
</tr>
<tr>
<td><strong>Monitoring mode</strong></td>
<td>1. local or remote monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control algorithm</strong></td>
<td>FUZZY + PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Auto turn</strong></td>
<td>Enable or disable set in the menu</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Manual mode</strong></td>
<td>YES</td>
<td></td>
<td></td>
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<tr>
<td><strong>Heater dehumidify</strong></td>
<td>power and time can be setting while dehumidify running</td>
<td></td>
<td></td>
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<tr>
<td><strong>Output mode</strong></td>
<td>Phase angle move(PAM) or zero-crossing-trigger (SSR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cooling mode</strong></td>
<td>forced air cooling</td>
<td></td>
<td></td>
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<tr>
<td><strong>Protection class</strong></td>
<td>IP20</td>
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<td></td>
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<tr>
<td><strong>Ambient temperature</strong></td>
<td>-10°C----+50°C</td>
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<td></td>
</tr>
<tr>
<td><strong>Store temperature</strong></td>
<td>-30°C----+60°C</td>
<td></td>
<td></td>
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<tr>
<td><strong>relatively humidity</strong></td>
<td>&lt;95% No condensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Height over sea</strong></td>
<td>Under 1000M</td>
<td></td>
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</tbody>
</table>
Chapter 1  installation and connection

1. Security rules
Please read the manual and security notice before fixing and using.
Please read and follow all the Alarm tag stick on the equipment.
Insure the alarm and tag under vision.
Only personal or proper technicians can operate the equipment.
The equipment use AC240V voltage which is dangerous to person, so please connect the equipment to earth reassuring.
Make sure any control port and module plug in and out be under power off to avoid permanent damage.

Danger
Point out that without right protection measure will cause death, serious injury or substance damage.

Warn
Point out that without right protection measure will cause death, serious injury or substance damage.

Caution
Point out without right protection measure will cause slight injury or substance losses.

Operator
Only authorized person can operate the system, to run, stop, clear, ground and connect the electro circuit.

Use
Equipment can only be used follow the application by catalog or technical description; can only operate by the authorized personal under right usage. Can only transport, store, setting and install by scheduled manner. Only elaborately operation and particularity maintenance, the system can play a much more good role in production.

Confine
Being established in industrial application micro-electronic control system, this equipment is specially used on hot runner system, prohibited use on other purpose. The equipment collect software, micro-electronic, strong electricity, drive in one, which usage needs regular personal. Improper operation may cause injury or damage.
2. Attention before usage

1) Pay attention to wiring status of junction box on the mould and thermocouple type (T/C).
2) Check if the power lines are separated from the T/C lines and they are matched with each other.
3) Check if the trunk specification fits to the controller.
4) Check the junction box and power line and cable.
5) Check resistance and insulation state of the heater, then check if T/C wire is connected.
6) Check if the mould fixed on the injection machine and connect with the cable.
7) Check if the power switch is on.
8) If Input Voltage (220V/380V) fits to the controller voltage specification, connect Power Cable. (Input voltage is indicated on the label of the controller case. If the input voltage does not fit to that written on the label, ask a local office and correct the controller wiring. False wiring would cause malfunction and damage on the unit).
9) Ensure earth wire of the controller, or it'll cause module damage.
10) Turn on the main power switch first.
11) Set a appropriate temperature degree.
12) Examine the temperature reached and stabilized on the degree.

3. Function description

◆ Each control module installing RS485 inside, which enable all modules and touch panel can connect to one communication bus, thus get monitoring to the whole system by the large colorized touch screen, it can be also used to PC control for long-distance monitoring. By this manner, it'll save the customer cost.

◆ Temperature control adopts FUZZY control mode. System can learn to know Heater character parameter online, thus adopt exact object model to make precisely control to ensure much more acceptable product.

◆ Output of controller may be chosen between zero-crossing trigger mode or phase-shift control mode. Thereby, different electrical environment can match with different customer demand.

◆ Temperature double Celsius and Fahrenheit Degree. System can work in normal under 50Hz and 60Hz electric network. Thus it can be use both in China and export to a third country.

◆ System prepare J and K thermocouple, which can be set by menu conveniently. If customer require more type of thermocouple for choice, they can make to order.

◆ In allusion to the characteristic of hot runner and mould heating, system outfit dehydrating function. Its initial soft-start heating can be able to protect the heated coil into a longevity usage.
◆ In terms of equipment running management, system software design includes energy consumption measurement and current measurement, equipment effective running timer, alarm information storage, meanwhile equips abnormal detection and protection for thermocouple, heater, triac, fuse and such element like this.
◆ Module use plug-in structure as standard insert card type. As a result of module structure, once the equipment broken, it needs replace the broken module only, which consumedly save consumer’s maintenance time.
4. Model and Naming rule

PHRS-GUI 156  96—156 Zones
PHRS-GUI 96    40—96 Zones
PHRS-GUI 40    4—40 Zones

◆ Model for order:

PHRS-GUI 96  80

Zones, 80 means 80 Zones

Cabinet type: 156, 96, 40

Touch panel controller

PHRS-GUI 156
10” panel
40 pcs of modules

PHRS-GUI 96
10” touch panel
28 pcs of modules

PHRS-GUI 40
10” touch panel
12 pcs of modules
5. Structure of the controller

- Color touch panel
- Alarm Lamp
- Power indicator
- Auto-circuit breaker
- Power switch
- Control module
- Power cable
6. Power supply connection

**Power supply**
- **AC380V~ AC400V  50/60Hz**
- **AC220V~ AC240V  50/60Hz**

**Note:**
- Only the temperature controller is made as AC380V standard.
- Please connect to power supply as the drawing show, otherwise it can not work correctly.
- PE, ground wire must be connect, otherwise personal injury may happen.
7. Connect controller with mould

Standard connection:

Note:
Before connect controller to mould, check and ensure controller, mould and cable have the same standard of wire, each of them must be matched with each other. Otherwise will cause badly damaged to the equipment.
8. Define the module’s position

Touch paneled connect with controller modules by communication bus, so each module must have a unique communication address. Each module’s communication address is defined according to module’s position in the controller box.

For PHRS-GUI 40:
As shown in the figure, from left to right, the module’s number is 01, 02, 03……
For module 01, the communication address is 01 which control zones 01---04
For module 02, the communication address is 02 which control zones 05---08
For module 03, the communication address is 03 which control zones 09---12
And so on……….
For PHRS-GUI 96:
The 1st floor, from left to right, module’s number are 01,02,03,04,05,06
The 2nd floor, from left to right, module’s number are 07,08,09,10,11,12
The 3rd floor, from left to right, module’s number are 13,14,15,16,17,18
The 4th floor, from left to right, module’s number are 19,20,21,22,23,24

For module 01, the communication address is 01 which control zones 01---04
For module 02, the communication address is 02 which control zones 05---08
For module 03, the communication address is 03 which control zones 09---12
And so on……….
9. Electrical connection diagram

For AC380V power supply

AC380V
A
B
C
N
PE

Communication BUS

Module 1
PE
AC1
AC2
OUT-1
OUT-1
OUT-2
OUT-2
OUT-3
OUT-3
OUT-4
OUT-4
TC1-
TC1+
TC2-
TC2+
TC3-
TC3+
TC4-
TC4+
A
B

Module 2
PE
AC1
AC2
OUT-1
OUT-1
OUT-2
OUT-2
OUT-3
OUT-3
OUT-4
OUT-4
TC1-
TC1+
TC2-
TC2+
TC3-
TC3+
TC4-
TC4+
A
B

Module 3
PE
AC1
AC2
OUT-1
OUT-1
OUT-2
OUT-2
OUT-3
OUT-3
OUT-4
OUT-4
TC1-
TC1+
TC2-
TC2+
TC3-
TC3+
TC4-
TC4+
A
B
10. Module sketch map

Communication bus 485 A 485 B
Connect thermocouple TC4- TC4+
Connect thermocouple TC3- TC3+
Connect thermocouple TC2- TC2+
Connect thermocouple TC1- TC1+
Power supply AC220V N
Connect heater OUT-4
Connect heater OUT-3
Connect heater OUT-2
Connect heater OUT-1
Power supply AC220V L

Communication address
Setting switch
ON

AC250V 20A F1
AC250V 20A F2
AC250V 20A F3
AC250V 20A F4
AC250V 20A F5
AC250V 20A F6
AC250V 20A F7
AC250V 20A F8

TRIAC 1
TRIAC 2
TRIAC 3
TRIAC 4

Connect thermocouple
Connect thermocouple
Connect thermocouple
Connect heater
11. Set communication address

1. 8-bit switch is used for setting communication address.
2. In one system, each module must have a unique address. Two modules cannot have the same address in one system.
3. The communication address of every module must correspond with its location.

**Address and switch position (blank space = off)**

<table>
<thead>
<tr>
<th>Card Address (Label)</th>
<th>DIP Switch</th>
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<tbody>
<tr>
<td></td>
<td>S8  S7  S6  S5  S4  S3  S2  S1</td>
</tr>
<tr>
<td>1</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>2</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>3</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>4</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>5</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>6</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>7</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>8</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>9</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>10</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
</tr>
<tr>
<td>11</td>
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</tr>
<tr>
<td>12</td>
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<td>20</td>
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</tr>
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<td>21</td>
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<td>22</td>
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<td>23</td>
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<td>24</td>
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<td>25</td>
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<tr>
<td>26</td>
<td>ON  ON  ON  ON  ON  ON  ON  ON</td>
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12. Layout plan

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<th>W1</th>
<th>D</th>
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<tr>
<td>PHRS-GUI 56</td>
<td>625</td>
<td>465</td>
<td>480</td>
<td>365</td>
<td>1568</td>
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<tr>
<td>PHRS-GUI 96</td>
<td>503.5</td>
<td>343.5</td>
<td>480</td>
<td>365</td>
<td>1568</td>
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<tr>
<td>PHRS-GUI 40</td>
<td>546</td>
<td>546</td>
<td>365</td>
<td>365</td>
<td>757</td>
</tr>
</tbody>
</table>
1. Running mode description

**AUTO** Mode:
this is the most common mode, controller trace setpoint and maintain temperature automatically.

**STANDBY** Mode:
under standby mode, setting temperature will goes down to standby setpoint and keep it for standby time, after then increase temperature return to the original setpoint automatically.
For example:
the original setpoint =200°C
the standby power=75%, (so the standby setpoint=75%*200°C=150°C)
the standby time=60 minute
T1 is the point to begin standby running

controller running curve is shown as follow:

**MANUAL** Mode:
under Manual mode, the controller will close all alarm functions, and output power only according to setting by user.
2. Soft start description

If a heater be stored or do not use for a long time, the isolation material may become very wet. So apply high voltage or large current may damage the heater and controller. Soft start helps to prevent quick heating while the heater in wet condition,

3. AUTO TURN Description

Different heater has different character parameters. In order to get a precise temperature control, the controller have to learn to know the character parameters of heater. So when the controller connect with a new heater for the first time, strongly suggest do the ‘AUTO_TURN’ process.

AUTO_TURN is a very complicated process, in order to get accurate characteristic parameters of heater, please do as follow steps:

1. Before start heating, the setpoint - object’s temperature >= 80°C
2. Set the Turn_On / Turn_Off switch as ‘Turn_On’
3. Start heating: ON
4. Do not change any ‘parameters’ or ‘order’ before the object’s temperature reach to setpoint.
4. PAC output

advantage------output continuous and steady voltage, heater working under low voltage and low current, it is good to heater life and control temperature accurately.
disadvantage------generate larger electromagnetic interference, it will disturb power supply and other equipment around.

5. SSR output

advantage------generate little electromagnetic interference, small disturbing to power supply.
disadvantage------output voltage jumping between 0Vac and 220Vac, it is not good to heater life and can not control temperature accurately
Chapter 3 Touch panel operation

1. Menu tree

Three level menu:
First level:  main interface,  communication setting,  global setting,  on line help.
Second level:  in one picture, you can monitor 12 zones with necessary parameters
Third level:  in one picture, you can monitor 1 zone with all parameters

Start interface

main interface  Communication set  Global set  on line help

01-12zones  13-24zones  25-36zones  85-96zones

And so on

25th zone  26th zone  36th zone

13th zone  14th zone  24th zone

01st zone  02nd zone  12th zone
2. Starting interface

Touch key to turn to relevant interface

Change over language

English  Chinese
3. Net. Setting interface

- Touch key to change over between ‘ENABLE’ and ‘DISABLE’

- ‘ENABLE’ means the module communication valid
- ‘DISABLE’ means the module communication invalid

Touch panel swap data with the modules by communication bus. If one module’s communication status is set as ‘DISABLE’, the touch panel could not find this module, so the operator can not monitor this module.

- If you need module working properly, you have to set it as ‘ENABLE’

- If you do not need one module working, or it is damaged, or it is removed from the slot, you will set this module as ‘DISABLE’, otherwise the panel will respond you very slow.
4. Global setting

This is a global setting interface, any setpoint or order will be transfer to all temperature zones in this system.

For example: touch the key 'Global-ON', then all the zones begin running.

Touch the key 'Global-OFF', then all the zones stop running.

The method of operate:

1. About order, press the key directly, the order will be transfer to all zones.

2. About setpoint, input data in the left frame first, then press key at right side, all the zones will receive the same setting.

<table>
<thead>
<tr>
<th>Global Setting</th>
<th>Welcome</th>
<th>Main Control</th>
<th>Net Setting</th>
<th>Sequence</th>
<th>Recipes</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOP</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Global ON</td>
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<td></td>
<td>Global-OFF</td>
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<tr>
<td>CAK</td>
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<td>SSR</td>
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<tr>
<td>SOFT START DISABLE</td>
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<tr>
<td>AUTO MODE</td>
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</tbody>
</table>

Note: This is global setting page, setting are valid for all zones.

Function: When all of zones need the same parameters or functions, setting here is very fastest. When setting parameter or data, input correct data first, then press the key in the right side.

The setting of thermocouple type and output mode is protected by 3-level password. The setting of control mode and current limit value are protected by 0-level password.

The sequence global setting:

- 0: A MODE
- 1: B MODE
- 2: C MODE
- 3: D MODE

0.00

Setting Temperature

0
5. Main control interface

In this interface, all zones can be monitored, the maximum zones are 96. For each zone, we can monitor setpoint, temperature and running status.

For example, 24 zones display as follows.

| Zones A01—A04 (first row) | Belongs to 01# module |
| Zones A05—A08 (second row) | Belongs to 02# module |
| Zones B01—B04 (third row) | Belongs to 03# module |
| Zones B05—B08 (fourth row) | Belongs to 04# module |
| Zones C01—C04 (fifth row) | Belongs to 05# module |
| Zones C05—C08 (sixth row) | Belongs to 06# module, it is set as ‘DISABLE’ in the ‘Net. Setting interface’, so it becomes blank here. |

In this interface, the operator cannot change anything, if you want to change setpoint value or operate the zones, press ‘SET’ key.
6. Branch control interface

In the branch control interface, every page displays 12 zones. The temperature setpoint can be changed as necessary, ON/OFF control can be executed, temperature, output, current, and running status can be monitored.

Zone number: Press here to enter the 'zone control interface'.

Object’s temperature

ON/OFF switch

Running status

Temperature system
Temperature setpoint
Output power %
Output current A
7. Zone control interface

Zone control interface display all parameters of a zone, part of parameters can only be changed by engineer who has professional knowledge. This interface suitable for special control or equipment fault diagnosis.

Temperature setpoint, 0 ~ 450 ºC
Object’s Temperature
Output voltage, 0%=0VAC, 100%=220VAC
Load current

The 3 parameters are very important for temperature control algorithm, they are generated automatically by the controller for each different heater. Different heater has different PID parameters. Strongly suggested that don’t change the parameters except professional engineer for special use.
ON / OFF : Start or stop heating
IC-J / CA-K : thermocouple type
   IC-J  means J type thermocouple
   CA-K  means K type thermocouple
PAC / SSR : output mode
   PAC  means phase angle move mode
   SSR  means zero cross over mode
0°C / 0°F : temperature system selection
Turn on / Turn off: Enable or Disable automatic calculating PID parameters

Note: when the controller connect with a new heater for the first time, strongly suggest setting the switch as ‘Turn On’.

AUTO_TURN is a very complicated process, in order to get accurate characteristic parameters of heater, please do as follow steps:

1. Before start heating, the setpoint - object’s temperature >=80°C
2. Set the Turn_On / Turn_Off switch as ‘Turn_On’
3. Start heating: ON
4. Do not change any ‘parameters’ or ‘order’ before the object’s temperature reach to setpoint.

Factory reserve

Input the output voltage while in manual mode
the standby temperature = 0%---100% * setpoint
Input the standby time: unit=minute

Setting the output voltage for soft start running 0%---30%
Setting the soft start time unit= minute
Enable or disable soft start
Shift the running mode

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ready</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto</td>
<td>Standby</td>
<td>Manual</td>
</tr>
</tbody>
</table>

Display real-time running status

Display current setting mode

Select running mode
8. Help interface

press help key at the start interface, you can go into on-line help interface

Running model explaine

AUT0 Model:
This is the most common model, controller maintains temperature automatically.

STANDBY Model:
Under stand by model, setting temperature will go to standby value and keep it till a stand by time and then controller will increase temperature return to the original setting value automatically.

For example:
The original setting is 200°C
The Standby value is 75°C
The Standby time is 60 Min
T1 is the point to begin Standby running

Controller running curve is show as chart of right side

MANUAL Model:
If select MANUAL model, the controller will store all alarm functions, and output power only relay on setting by user.
### Running status

<table>
<thead>
<tr>
<th>Display content</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>READY</td>
<td>Power ON</td>
<td></td>
</tr>
<tr>
<td>STOP</td>
<td>Stop heating</td>
<td></td>
</tr>
<tr>
<td>SOFT START</td>
<td>Running in soft start</td>
<td></td>
</tr>
<tr>
<td>AUTO TURN</td>
<td>calculating PID parameters</td>
<td></td>
</tr>
<tr>
<td>AUTO RUN</td>
<td>Running in auto status</td>
<td></td>
</tr>
<tr>
<td>STANDBY</td>
<td>Running in standby</td>
<td></td>
</tr>
<tr>
<td>MANUAL</td>
<td>Running in manual</td>
<td></td>
</tr>
</tbody>
</table>

### Alarm message

<table>
<thead>
<tr>
<th>Display message</th>
<th>Function</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV.HI</td>
<td>object's temperature is too high</td>
<td>(setpoint + Temperature high alarm) &lt; Object’s temperature</td>
</tr>
<tr>
<td>PV.LO</td>
<td>object's temperature is too low</td>
<td>(setpoint – Temperature low alarm) &gt; Object’s temperature</td>
</tr>
<tr>
<td>TC.OP</td>
<td>Thermocouple open</td>
<td></td>
</tr>
<tr>
<td>TC.RE</td>
<td>Thermocouple reverse</td>
<td></td>
</tr>
<tr>
<td>TC.ST</td>
<td>Thermocouple shorted</td>
<td></td>
</tr>
<tr>
<td>HT.OP</td>
<td>Heater open</td>
<td></td>
</tr>
<tr>
<td>HT.ST</td>
<td>Over current</td>
<td></td>
</tr>
<tr>
<td>TR.ST</td>
<td>Triac damaged</td>
<td></td>
</tr>
<tr>
<td>FU.OP</td>
<td>Fuse broken</td>
<td></td>
</tr>
</tbody>
</table>

### Factory Setting

<table>
<thead>
<tr>
<th>No.</th>
<th>Menu</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setpoint</td>
<td>200°C</td>
</tr>
<tr>
<td>2</td>
<td>Temperature high alarm</td>
<td>50°C</td>
</tr>
<tr>
<td>3</td>
<td>Temperature low alarm</td>
<td>-50°C</td>
</tr>
<tr>
<td>4</td>
<td>Standby</td>
<td>Standby Time 60M</td>
</tr>
<tr>
<td>5</td>
<td>Running mode</td>
<td>AUTO</td>
</tr>
<tr>
<td>6</td>
<td>Current max. Limit</td>
<td>CT-H 20.0A</td>
</tr>
<tr>
<td>7</td>
<td>Current Min. Limir</td>
<td>CT-L 0.05A</td>
</tr>
<tr>
<td>8</td>
<td>Thermocouple type</td>
<td>(IC-J) J</td>
</tr>
<tr>
<td>9</td>
<td>Output Mode</td>
<td>PAC</td>
</tr>
<tr>
<td>10</td>
<td>Display unit</td>
<td>0.1°C</td>
</tr>
<tr>
<td>11</td>
<td>Soft start enable</td>
<td>ON</td>
</tr>
</tbody>
</table>
### Hotrunner Controller Manual

### Set-up Guide

#### 1. Thermocouple Short

- **Phenomenon:** Thermocouple short
- **Probable Cause:** Thermocouple reverse
- **Check Point:**
  - +/- polarity of sensor (T/C) is changed
  - Check connection and change polarity of T/C at connector affected to mold

#### 2. Heater Open

- **Phenomenon:** Heater open
- **Probable Cause:** - Heater was disconnected
- **Check Point:**
  - Check resistance of heater with tester, If it is blown out replace heater

#### 3. Triac Open

- **Phenomenon:** Triac open
- **Probable Cause:** - TRIAC attached to heat radiation
- **Check Point:**
  - Check pin in TRIAC
  - 2 or 3 pins may short circuit

#### 4. Fuse Broken

- **Phenomenon:** Fuse broken
- **Probable Cause:** - Fuse is disconnected by momentary over-current
- **Check Point:**
  - Replace fuse (250V 15A)

#### 5. Temperature Rises Continuously

- **Phenomenon:** Temperature rises continuously
- **Probable Cause:** - TRIAC attached to heat radiation board of controller is damaged.
- **Check Point:**
  - Check pin in TRIAC
  - 2 or 3 pins may short circuit

#### 6. Temperature Drops Continuously

- **Phenomenon:** Temperature drops continuously
- **Probable Cause:** - FS1 of FS2 fuse blown out
- **Check Point:**
  - Change fuse
  - Check resistance of heater with tester
  - Check connection of heater
  - Check sensor disconnection

#### 7. Severs Temperature (Deviation between set temp. & Sensing Temp.)

- **Phenomenon:** Severs temperature
- **Probable Cause:** - Sensor (T/C) disconnection
- **Check Point:**
  - Check contact state of sensor
  - Check sensor type

#### 8. Controller Temp. rise, but heater in actual mold is overheated

- **Phenomenon:** Controller Temp. rise, but heater in actual mold is overheated
- **Probable Cause:** - T/C wire is pressed by mold or it coat is peeled, so as to contact mold or line.
- **Check Point:**
  - Check and replace T/C wire

#### 9. Setting temperature of controller equals with present temp., but the heater in actual mold is overheated or cold

- **Phenomenon:** Setting temperature of controller equals with present temp., but the heater in actual mold is overheated or cold
- **Probable Cause:** - T/C Sensor type between mold and controller is different
- **Check Point:**
  - Make T/C (sensor) type of mold with that of controller.