



PHRS-GUI

Hot Runner Controller Manual



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Hotrunner Controller Manual

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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

model	Description	Cabinet	Remark
PHRS-GUI96	49~96 zones temperature loop	vertical type	10" touch panel
PHRS-GUI48	25~48 zones temperature loop	Vertical type	10" touch panel
PHRS-GUI24	4-24 zones temperature loop	Vertical type	8" touch panel



◆ Specification

Type	TDC800
Mould matched	universal mould hot runner system
Zones	maximum 96 temperature zones and 24 sequence control zones
Interface	10" color touch panel
Cabinet type	vertical
Power supply	AC240VAC $\pm 10\%$ 47~63Hz
Power factor	0.98
Rated current	AC 20A for each single temperature loop
Maximum current	Maximum AC 20A for each single loop
Fuse	AC250V 20A size $\Phi 6 \times 30$
Total power	3.0KW * loop number
Thermocouple Type	J or K set in the menu
Temperature system	$^{\circ}\text{C}$ or $^{\circ}\text{F}$ set in the menu
Temperature range	0 ~450 $^{\circ}\text{C}$ 32 ~842 $^{\circ}\text{F}$
Monitoring mode	1. local or remote monitoring
Control algorithm	FUZZY + PID
Auto turn	Enable or disable set in the menu
Manual mode	YES
Heater dehumidify	power and time can be setting while dehumidify runing
Output mode	Phase angle move(PAM) or zero-crossing-trigger (SSR)
Cooling mode	forced air cooling
Protection class	IP20
Ambient temperature	-10 $^{\circ}\text{C}$ ---+50 $^{\circ}\text{C}$
Store temperature	-30 $^{\circ}\text{C}$ ---+60 $^{\circ}\text{C}$
relatively humidity	<95% No condensing
Height over sea	Under 1000M

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.

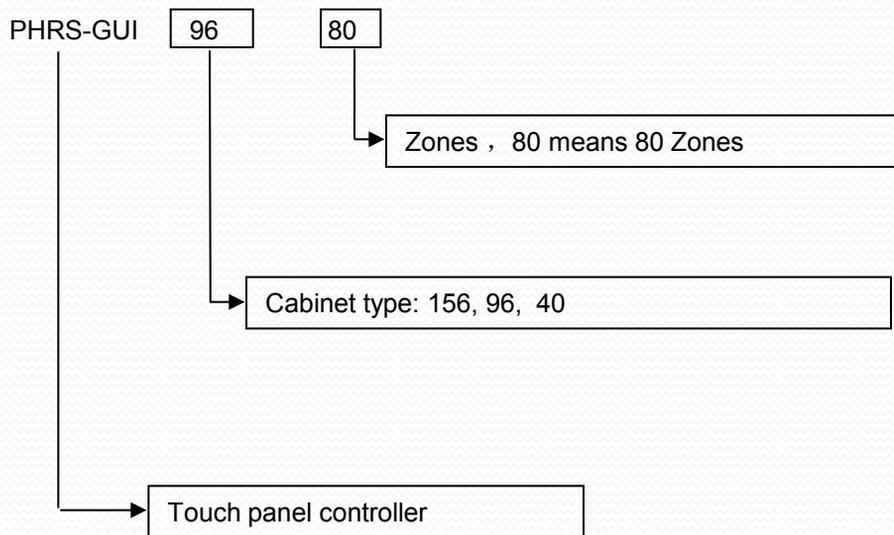


- ◆ In terms of equipment running management, system software design includes energy consumption measurement and current measurement, equipment effective running timer, alarm information storage, meanwhile equips abnormal detection and protection for thermocouple, heater, triac, fuse and such element 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:

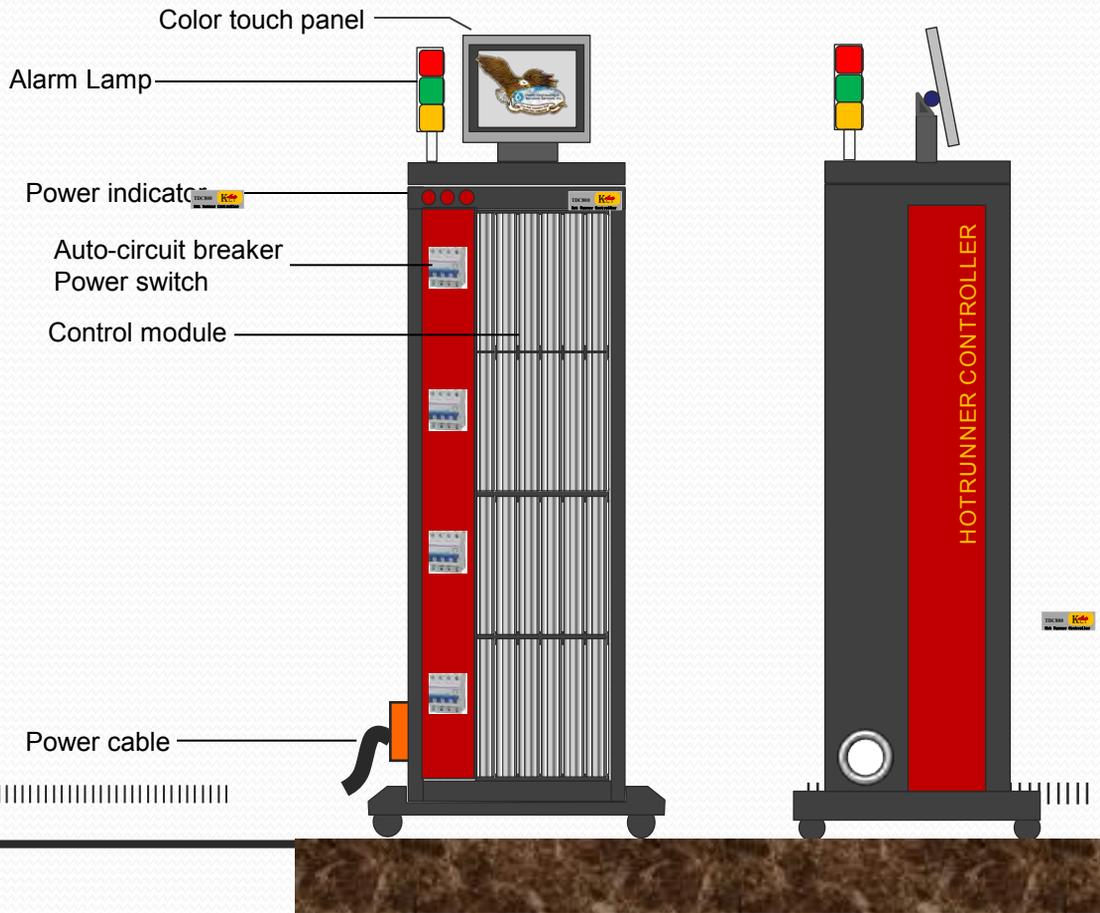


PHRS-GUI 156
10" panel
40 pcs of modules

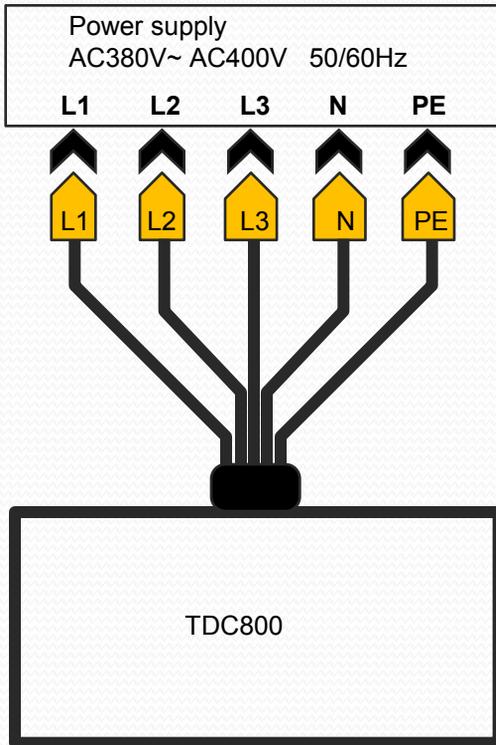
PHRS-GUI 96
10" touch panel
28 pcs of modules

PHRS-GUI 40
10" touch panel
12 pcs of modules

5. Structure of the controller

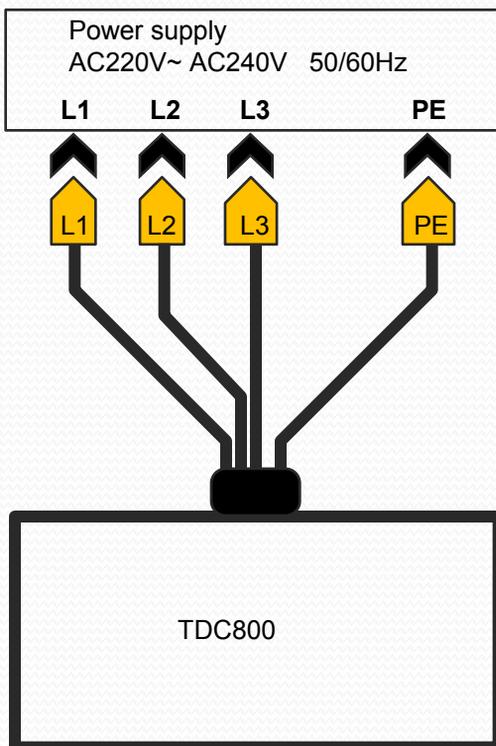


6. Power supply connection



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

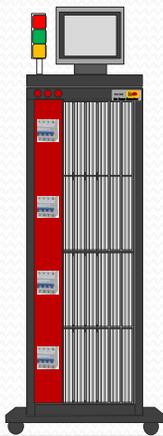
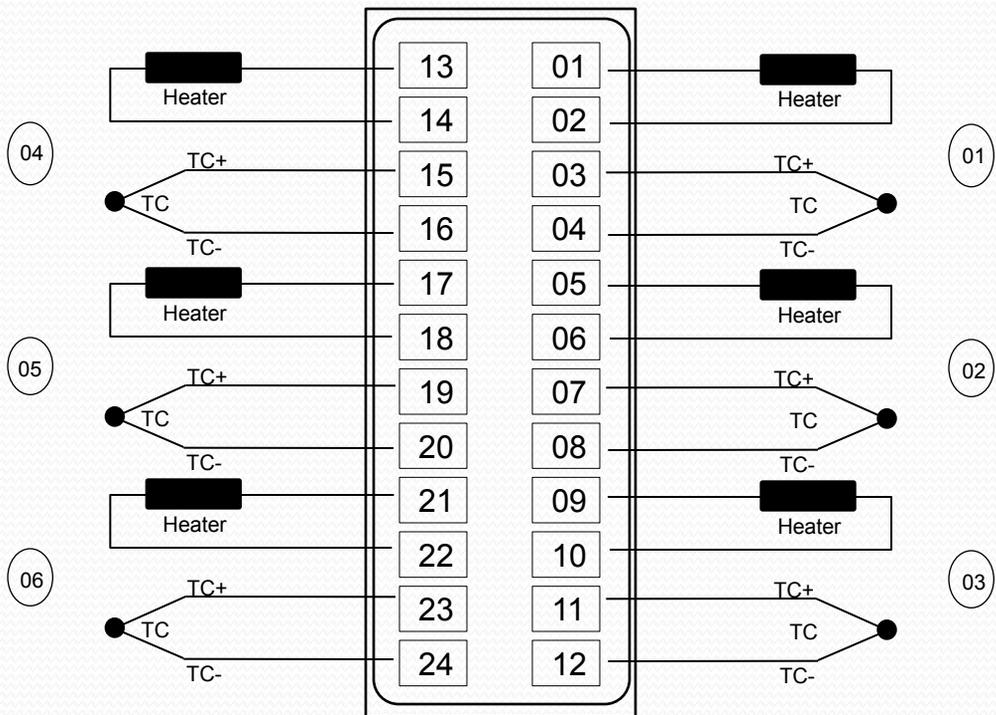


Note:

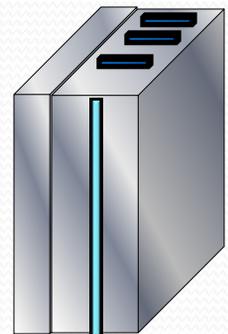
- only the temperature controller is made as AC220V standard.
- please connect to power supply as the drawing show, otherwise it can not work correctly
- PE, ground wire must be connect, otherwise personal injury may happen

7. Connect controller with mould

Standard connection:



Mold Cable

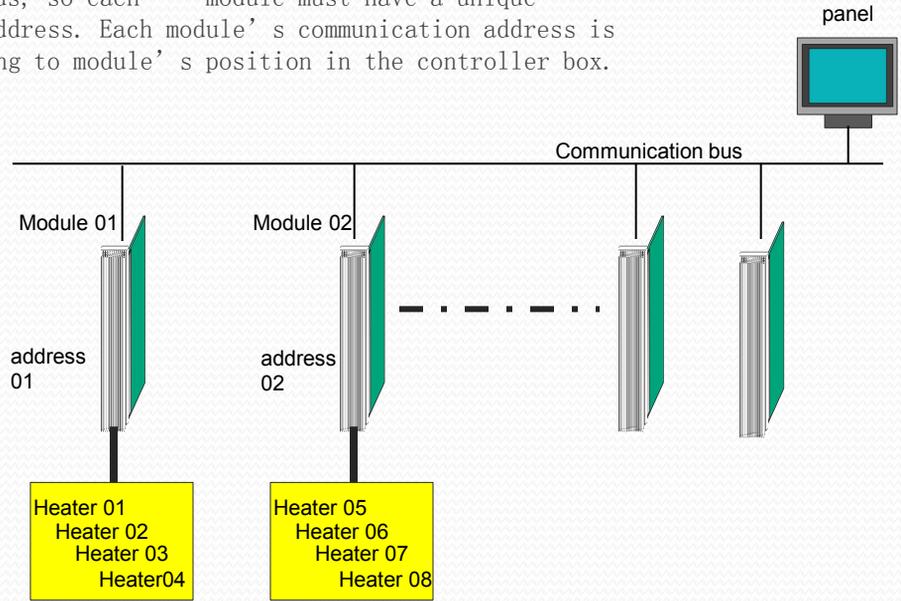


Note:

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 panel 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:

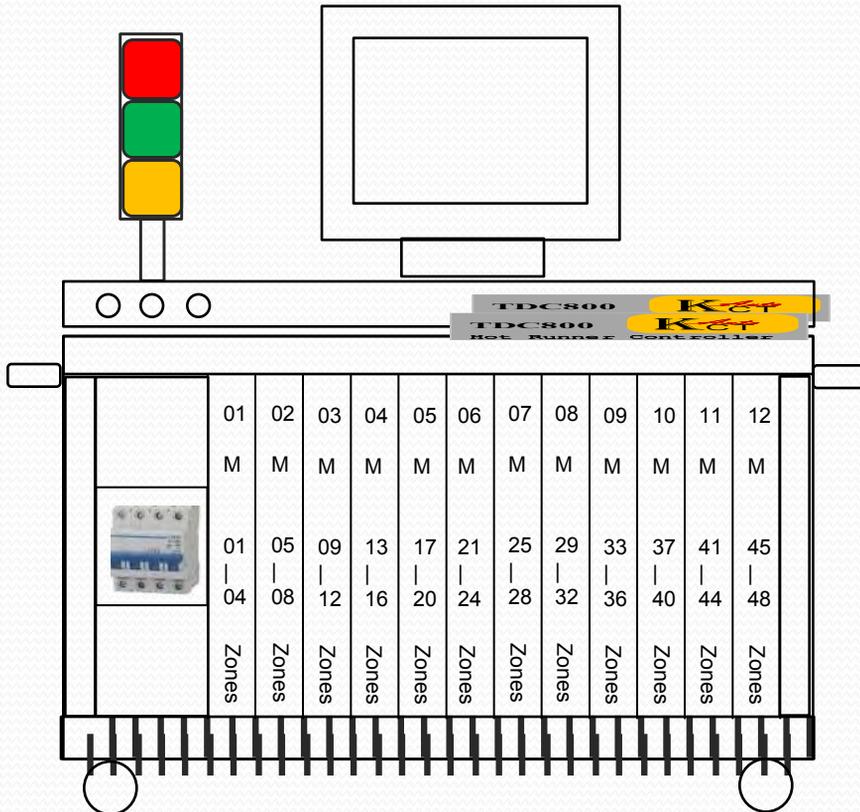
As shown in the figure, from left to right, the module's number is 01, 02, 03.....

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

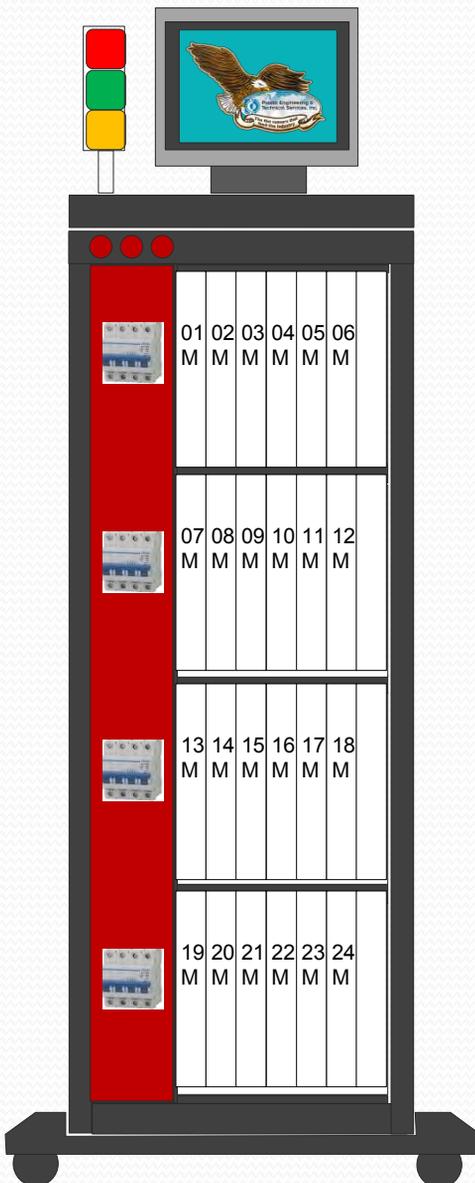
The 4th floor, from left to right, module' s number are 19, 20, 21, 22, 23, 24

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

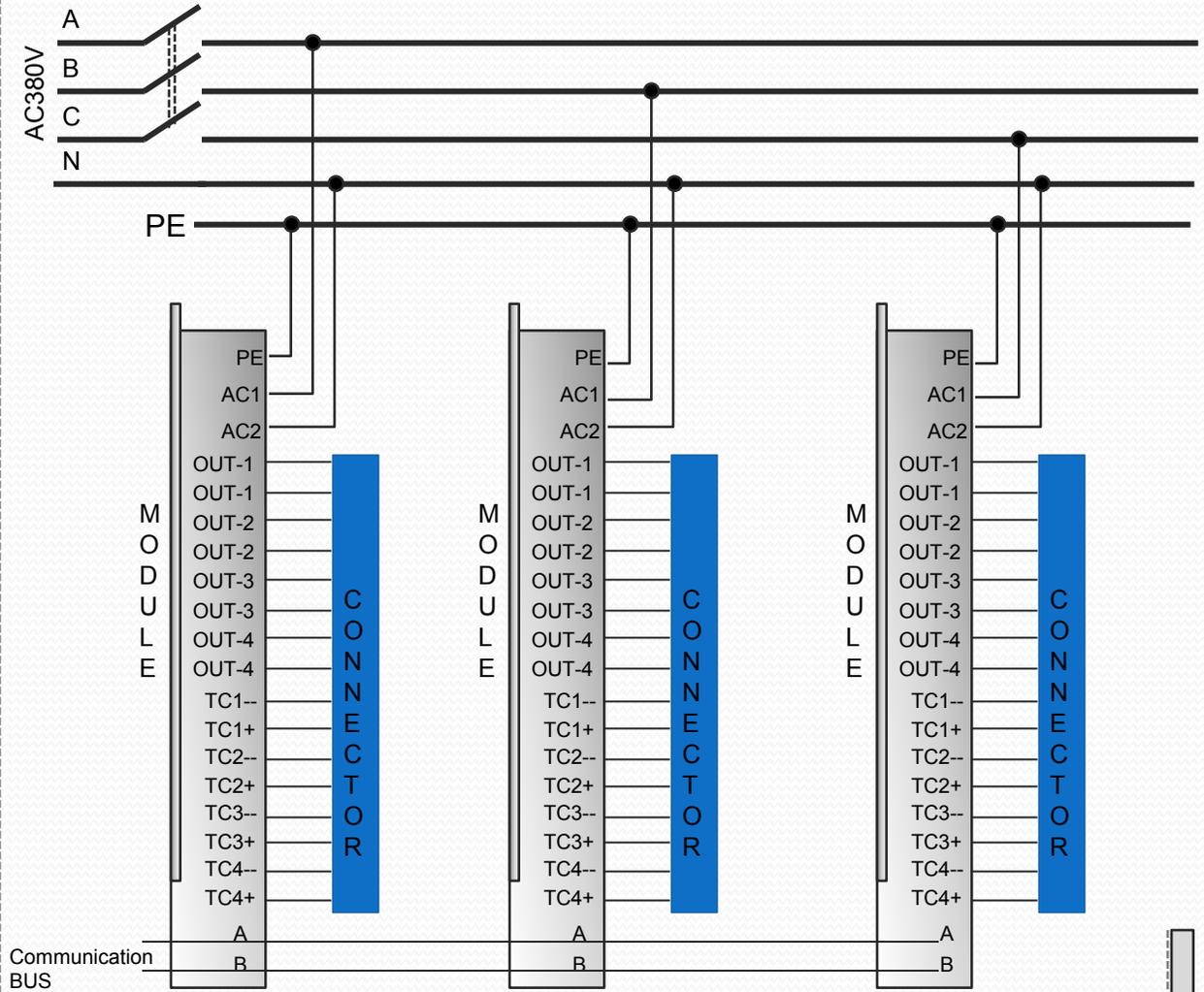
And so on.....



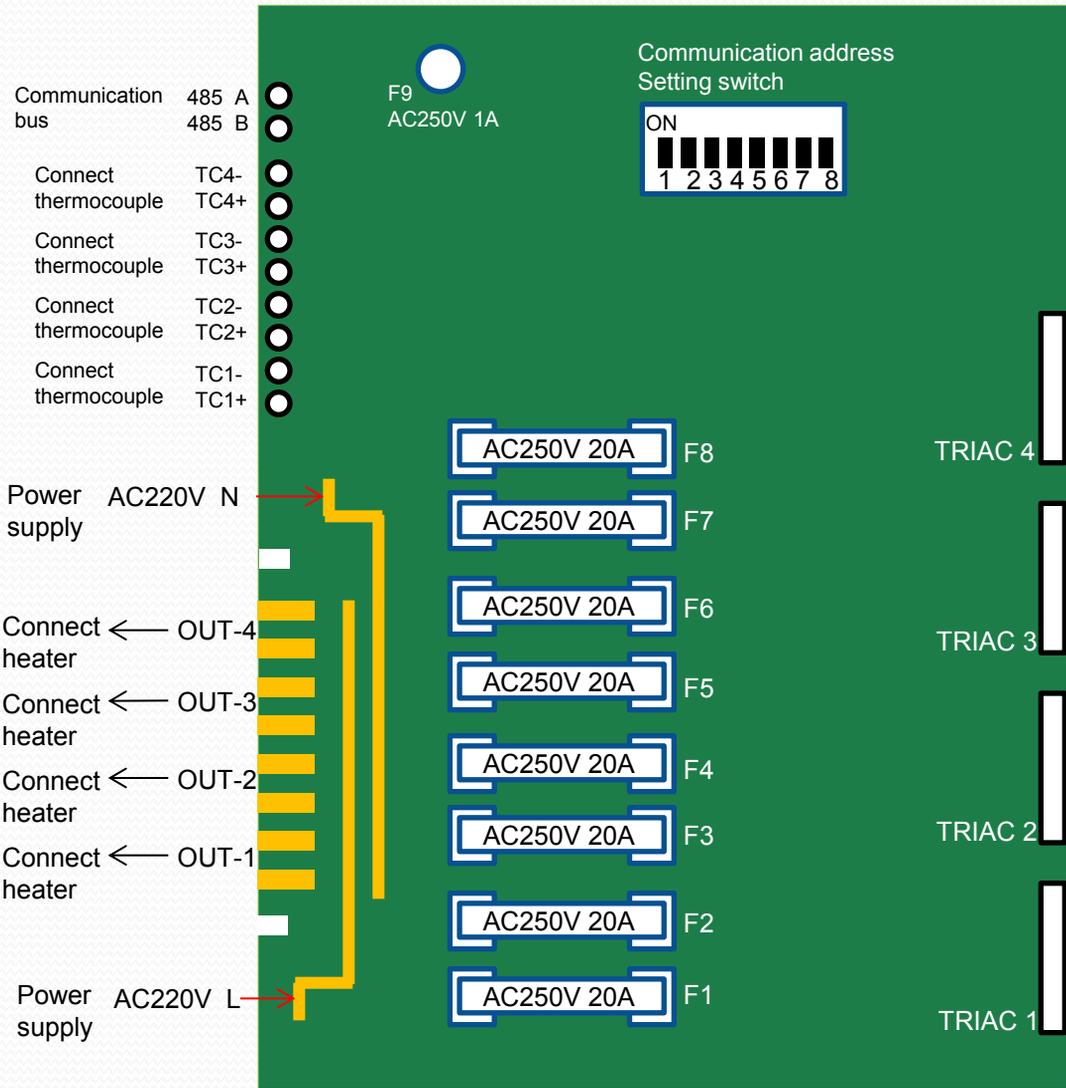


9. Electrical connection diagram

For AC380V power supply



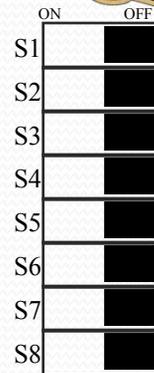
10. Module sketch map





11. Set communication address

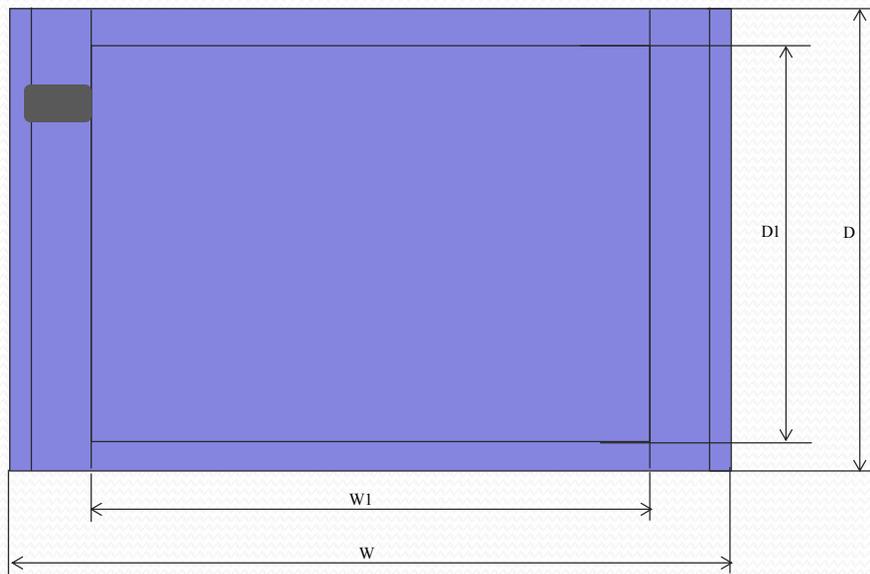
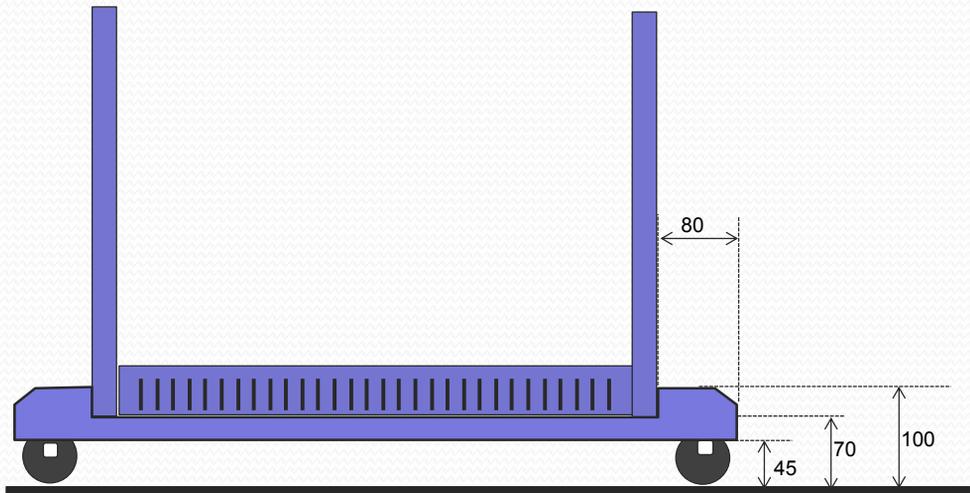
1. 8-bit switch is used for setting communication address
2. in one system, each module must has a unique address,. Two modules can not have same address in one system.
3. the communication address of every module must correspond with it's location.



Address and switch position (blank space = off)

Card Address (Label)	DIP Switch							
	S8	S7	S6	S5	S4	S3	S2	S1
1	ON	ON	ON	ON	ON	ON	ON	
2	ON	ON	ON	ON	ON	ON		ON
3	ON	ON	ON	ON	ON	ON		
4	ON	ON	ON	ON	ON		ON	ON
5	ON	ON	ON	ON	ON		ON	
6	ON	ON	ON	ON	ON			ON
7	ON	ON	ON	ON	ON			
8	ON	ON	ON	ON		ON	ON	ON
9	ON	ON	ON	ON		ON	ON	
10	ON	ON	ON	ON		ON		ON
11	ON	ON	ON	ON		ON		
12	ON	ON	ON	ON			ON	ON
13	ON	ON	ON	ON			ON	
14	ON	ON	ON	ON				ON
15	ON	ON	ON	ON				
16	ON	ON	ON		ON	ON	ON	ON
17	ON	ON	ON		ON	ON	ON	
18	ON	ON	ON		ON	ON		ON
19	ON	ON	ON		ON	ON		
20	ON	ON	ON		ON		ON	ON
21	ON	ON	ON		ON		ON	
22	ON	ON	ON		ON			ON
23	ON	ON	ON		ON			
24	ON	ON	ON			ON	ON	ON
25	ON	ON	ON			ON	ON	
26	ON	ON	ON			ON		ON

12. Layout plan



Type	W	W1	D	D1	H
PHRS-GUI 56	625	465	480	365	1568
PHRS-GUI 96	503.5	343.5	480	365	1568
PHRS-GUI 40	546	546	365	365	757

Chapter 2 function and principle



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:

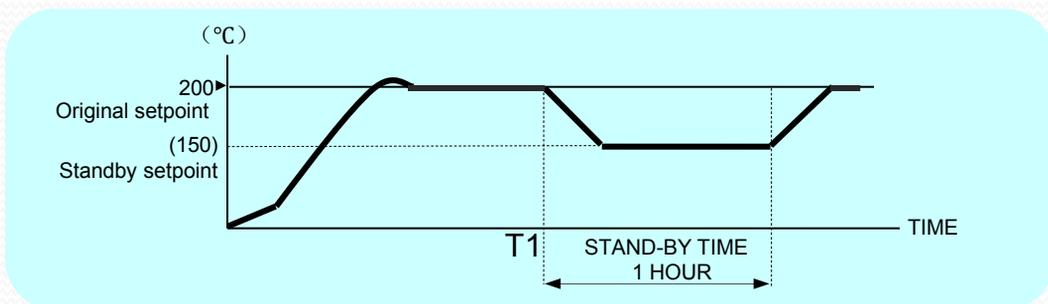
the original setpoint =200°C

the standby power=75%, (so the standby setpoint=75%*200°C=150°C)

the standby time=60 minuite

T1 is the point to begin standby running

controller running curve is shown as follow:

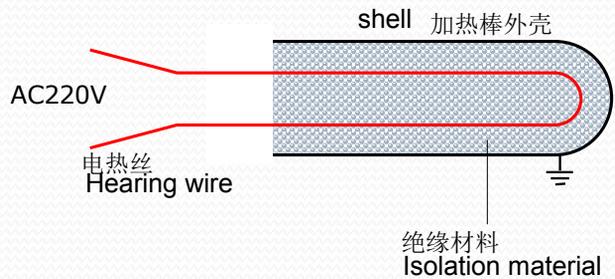


MANUAL Mode:

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.

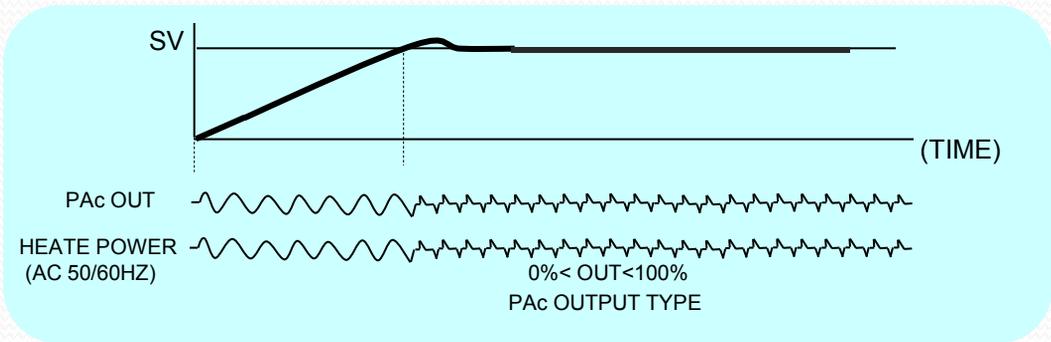
AUTO_TURN is a very complicated process, in order to get accurate characteristic parameters of heater, please do as follow steps:

- 1.Before start heating , the setpoint - object's temperature $\geq 80^{\circ}\text{C}$
- 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.



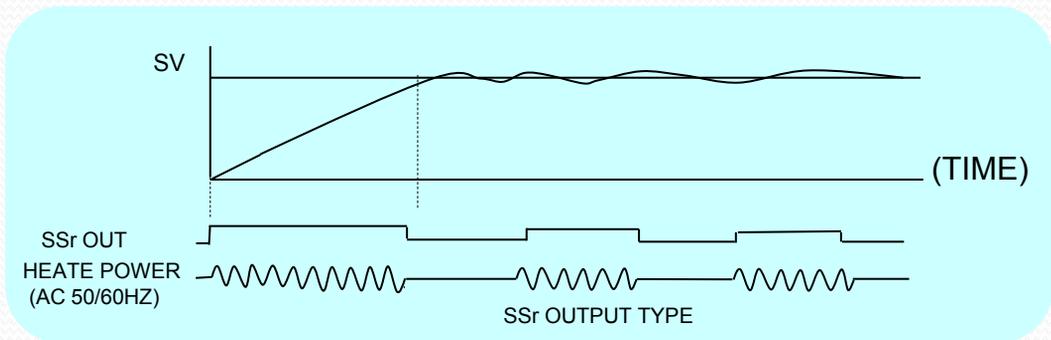
4. PAC output

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 wil 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



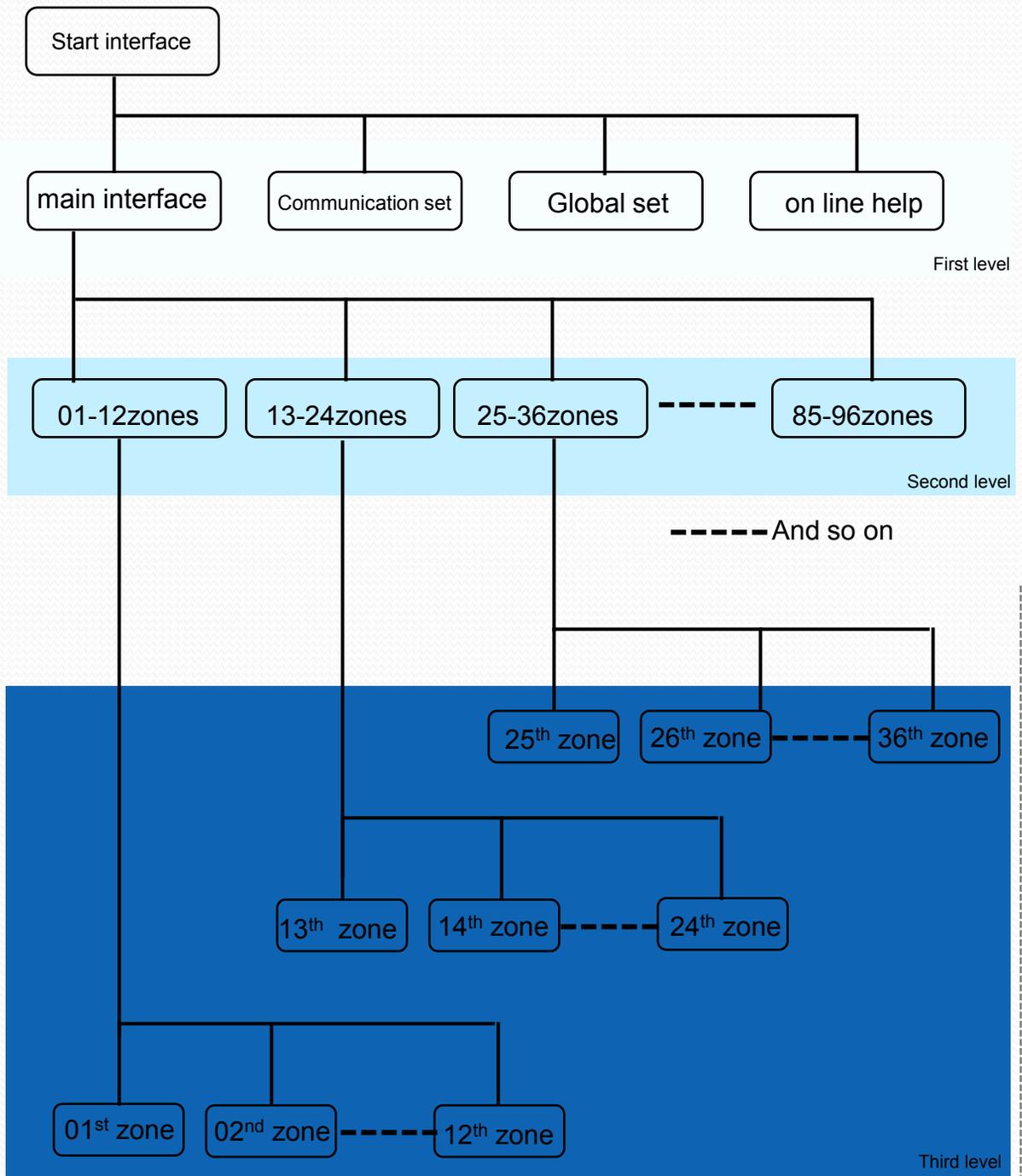
1. Menu tree

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





2. Starting interface



Touch key to turn to relevant interface

English Chinese

Change over language

3. Net. Setting interface

Module Net Setting

Welcome
Main Control
Global Setting
Sequence
Recipes
Help

Name	Adr.	State
MODULE 01	1	Enable
MODULE 02	2	Enable
MODULE 03	3	Enable
MODULE 04	4	Enable
MODULE 05	5	Enable
MODULE 06	6	Disable

Note:

Module 01 control the 01-04 zones and the communication address is 1.
 Module 02 control the 05-08 zones and the communication address is 2.
and the rest may be deduced by analogy.
 if Module is set as 'enable', the module will be online(working)
 if Module is set as 'disable', the module will be offline(stop work)

1. disable the module if it is damaged.
2. disable the module if it is power off
3. disable the module if it is not in the slot

Set module communication address:
 this switch is located in the PCB board, the address setting in accordance with binary code

Module station	8 bit switch for communication address							
	8	7	6	5	4	3	2	1
Adr. 01	ON	ON	ON	ON	ON	ON	ON	OFF
Adr. 02	ON	ON	ON	ON	ON	ON	OFF	ON
Adr. 03	ON	ON	ON	ON	ON	ON	OFF	OFF
Adr. 04	ON	ON	ON	ON	ON	OFF	ON	ON
Adr. 05	ON	ON	ON	ON	ON	OFF	ON	OFF
Adr. 06	ON	ON	ON	ON	ON	OFF	OFF	ON
Adr. 07	ON	ON	ON	ON	ON	OFF	OFF	OFF
Adr. 08	ON	ON	ON	ON	OFF	ON	ON	ON
Adr. 09	ON	ON	ON	ON	OFF	ON	ON	OFF

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.

Global Setting		Welcome	Main Control	Net. Setting	Sequence	Recipes	Help
STOP	Global-ON Global-OFF	0	SETTING Temperature	<p>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 4-level password.</p>			
CA-K	CA-K	0.0 %	SETTING Soft power start				
SSR	PAC phase shift SSR zero-trigger	0 Min	SETTING Soft start time				
AUTO TURN OFF	AUTO TURN OFF Auto turn	0.0	SETTING Upper limit of temperature				
		0.0	SETTING Lower limit of temperature				
		0.00	SETTING Upper limit of current				
		0.00	SETTING Lower limit of current				
SOFT START DISABLE	SOFT START ENABLE SOFT START DISABLE	0 %	SETTING Standby rate of temperature				
		0 M	SETTING Standby time				
	AUTO MODE STAND BY MODE						

SEQUENCE GLOBAL SETTING

0.00	Time 1 Setting
0.00	Time 2 Setting
0.00	Time 3 Setting
0.00	Time 4 Setting
0	Mode Setting

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

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



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.

Main				Welcome	Net. Setting	Global Setting	Sequence	Recipes	Help							
A01	201	0.0	Ready	A02	202	0.0	Ready	A03	203	0.0	Ready	A04	204	0.0	Ready	01-12 SET
A05	205	0.0	Ready	A06	206	0.0	Ready	A07	207	0.0	Ready	A08	208	0.0	Ready	
B01	209	0.0	Ready	B02	210	0.0	Ready	B03	211	0.0	Ready	B04	212	0.0	Ready	
B05	300	0.0	Ready	B06	300	0.0	Ready	B07	300	0.0	Ready	B08	350	0.0	Ready	
C01	270	0.0	Ready	C02	256	0.0	Ready	C03	314	0.0	Ready	C04	253	0.0	Ready	13-24 SET
C05				C06				C07				C08				

running status declare:

- READY: Ready for operation
- STOP: Stop running
- SOFT: Soft Start
- TURN: Auto Turn
- AUTO: Auto Running
- STANDBY: Standby Running
- MANUAL: Manual Running
- TC.HI: Alarm Temperature is too high
- TC.LO: Alarm Temperature is too low
- TC.OP: Alarm Thermocouple Open
- TC.RE: Alarm Thermocouple reverse
- TC.ST: Alarm Thermocouple short circuit
- HT.OP: Alarm Heater open circuit
- HT.ST: Alarm Heater over load
- TR.ST: Alarm Traic short circuit
- FU.OP: Alarm Fuse broken

**HOT RUNNER CONTROLLER
24 ZONE TEMPERATURE CONTROL
Ver 1.4**

← 'SET' key to branch control interface

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

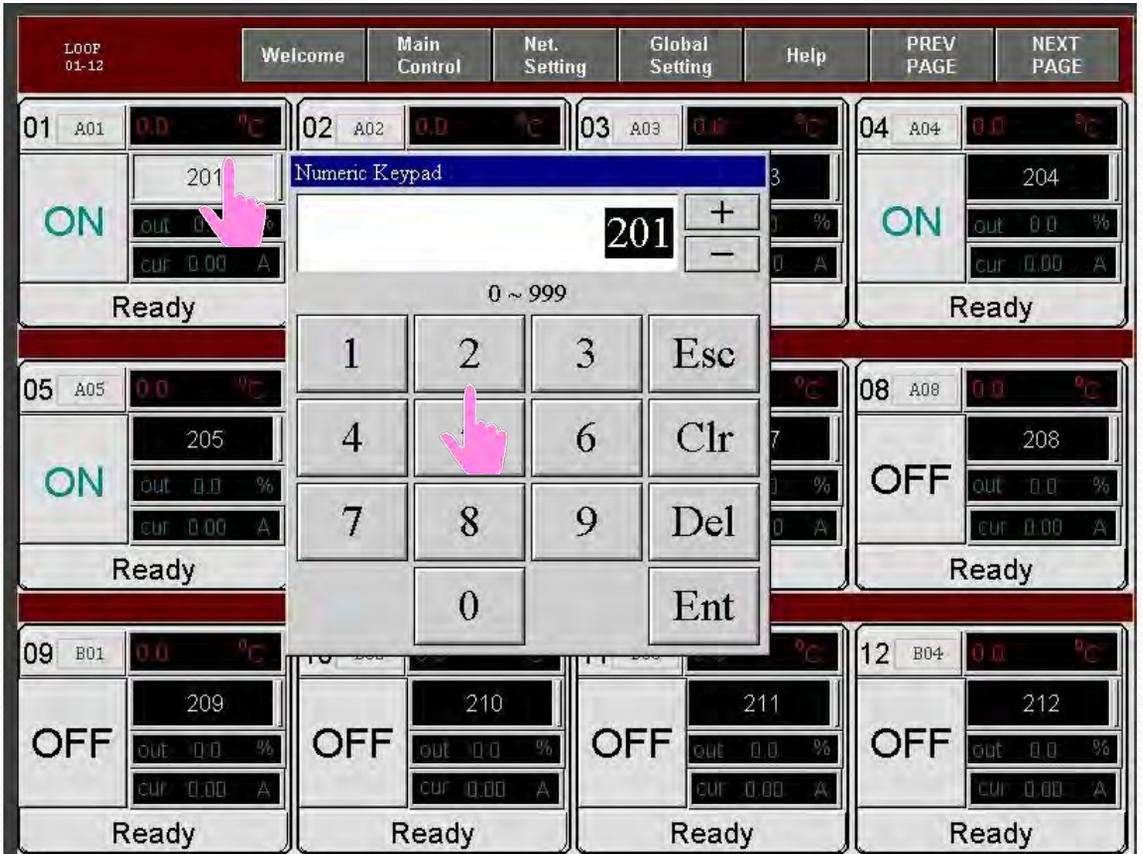
Zones C01—C04 (fifth row) belongs to 05# module

Zones C05—C08 (sixth row) belongs to 06# module, it is set as 'DISABLE' in the 'Net. Setting interface', so it become blank here.

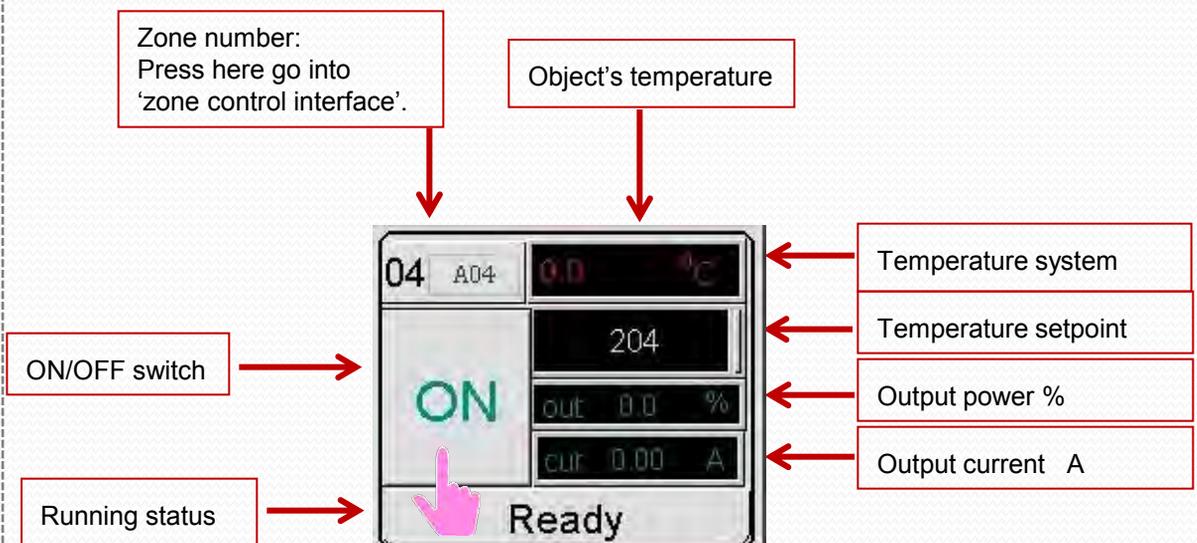
In this interface, the operator can not change anything, if you want change setpoint value or operate the zones, press 'SET' key.



6. Branch control interface



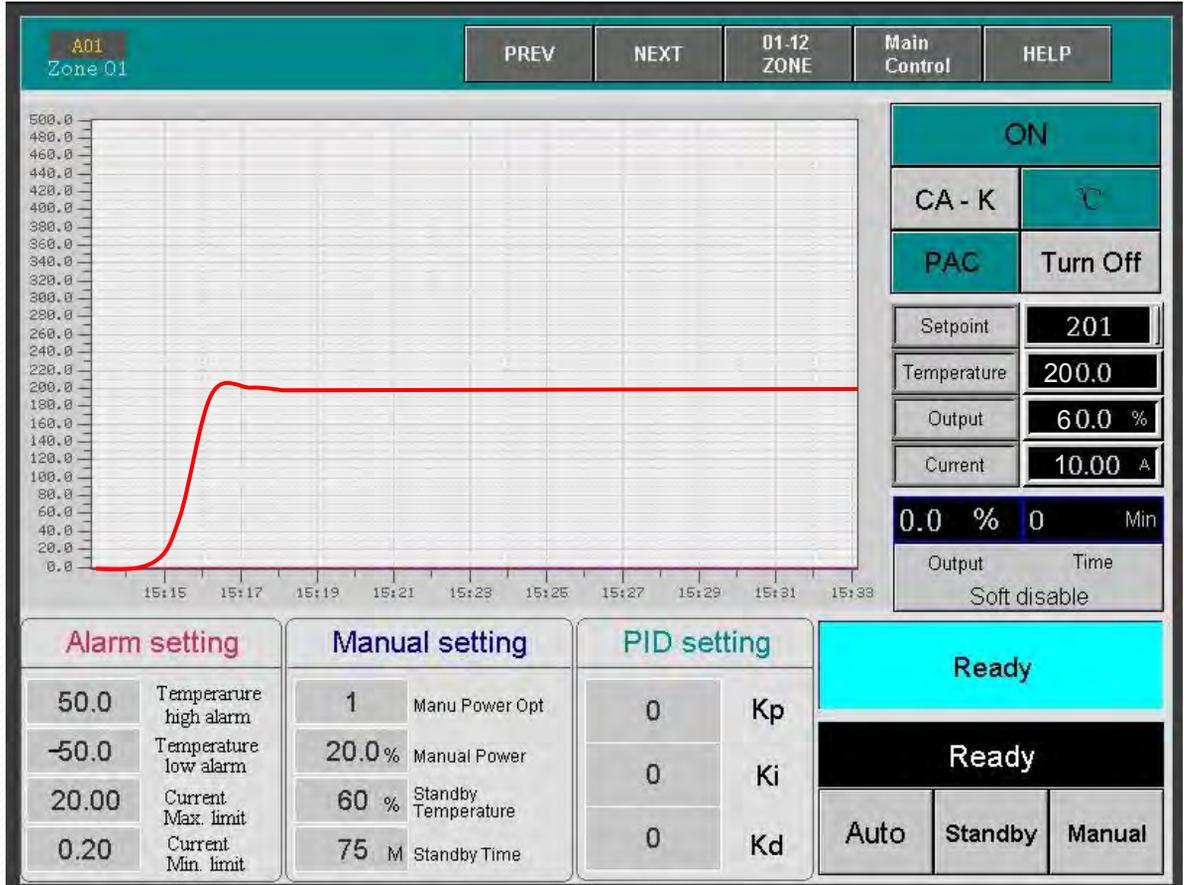
in the branch control interface, every page display 12 zones, temperature setpoint can be changed as necessary, ON/OFF control can be execute, temperature, output, current and running status can be monitor.





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.



Setpoint	201
Temperature	0.0
Output	0.0 %
Current	0.00 A

Temperature setpoint, 0 ~ 450 °C

Object's Temperature

Output voltage, 0%=0VAC, 100%=220VAC

Load current

PID setting	
0	Kp
0	Ki
0	Kd

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
- °C / °F : temperature system selection
- Turn on / Turn off: Enable or Disable automatic calculating PID parameters

ON	
CA - K	°C
PAC	Turn Off



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 $\geq 80^{\circ}\text{C}$
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.

Manual setting

1	Manu Power Opt	Factory reserve
20.0%	Manual Power	Input the output voltage while in manual mode
60%	Standby Temperature	the standby temperature = 0%---100% * setpoint
75 M	Standby Time	Input the standby time: unit=minute

0.0 % 0 Min

Output
Time

Soft disable

- 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



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

HELP 05 17:08:33 PREV NEXT Welcome Net. Setting Global Setting Main Control

Running model explain

AUTO Model:
This is the most common model, controller maintain temperature automatically.

STANDBY Model:
Under standby model, setting temperature will goes down 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 200C
The Standby value is 75%
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 close all alarm functions, and output power only relay on setting by user.

Chapter 4 attachment



Running status

Display content	Description	Note
READY	Power ON	
STOP	Stop heating	
SOFT START	Running in soft start	
AUTO TURN	calculating PID parameters	
AUTO RUN	Running in auto status	
STANDBY	Running in standby	
MANUAL	Running in manual	

Alarm message

Display message	Function	Note
PV.HI	object's temperature is too high	(setpoint + Temperature high alarm) < Object's temperature
PV.LO	object's temperature is too low	(setpoint - Temperature low alarm) > Object's temperature
TC.OP	Thermocouple open	
TC.RE	Thermocouple reverse	
TC.ST	Thermocouple shorted	
HT.OP	Heater open	
HT.ST	Over current	
TR.ST	Triac damaged	
FU.OP	Fuse broken	

Factory Setting

No.	Menu	Setting
1	Setpoint	200°C
2	Temperature high alarm	50°C
3	Temperature low alarm	-50°C
4	Standby	Standby Time 60M
		Standby Power 75%
5	Running mode	AUTO
6	Current max. Limit	CT-H 20.0A
7	Current Min. Limir	CT-L 0.05A
8	Thermocouple type	(IC-J) J
9	Output Mode	PAC
10	Display unit	0.1°C
11	Soft start enable	ON

Hotrunner Controller Manual



trouble shooting

No	Phenomenon	Probable Cause	Check Point
1	Thermocouple open	-Sensor (T/C) was disconnected	-Check T/C wire with tester -When disconnected replace it
2	Thermocouple short	-Sensor (T/C) wire is short on output side	Check if T/C wire is mal-contacted at Connector of pressed by mold
3	Thermocouple reverse	-+/-polarity of sensor (T/C) is changed	-Check connection and change polarity of T/C at connector affected to mold
4	Heater open	-Heater was disconnected	-Check resistance of heater with tester, If it is blown out replace heater
5	Heater short	-Short circuit in heater or short in heater wire -Capacity of heater is too high (20A or more)	-Check short circuit of heater or short in heater line with tester. -Make wiring so that capacity of heater may lower than 15A
6	Triac open	-TRIAC attached to heat radiation	-Check pin in TRIAC -2 or 3 pins may short circuit
7	Fuse broken	-fuse is disconnected by momentary over-current	-Replace fuse (250V 15A)
8	Temperature rises continuously	-TRIAC attached to heat radiation board of controller is damaged.	-Check pin in TRIAC -2 or 3 pins may short circuit
9	Temperature drops continuously	-FS1 of FS2 fuse blown out -Heater blown out -Heater wire disconnection -Sensor (T/C) disconnection	-Change fuse -Check resistance of heater with tester -Check connection of heater -Check sensor disconnection
10	Severs temperature (Deviation between set temp.& Sensing Temp.)	-Sensor contact is unstable -Sensor type is different each other	-Check contact state of sensor -Check sensor type
11	Controller Temp. rise, but heater in actual mold is overheated	-T/C wire is pressed by mold or it coat is peeled, so as to contact mold or line.	-Check and replace T/C wire
12	Setting temperature of controller equals with present temp., but the heater in actual mold is overheated or cold	-T/C Sensor type between mold and controller is different EX: CA(K) - IC(J) IC(J) - CA(K)	-Make T/C (sensor) type of mold with that of controller.