User Guide

Compact and smart controller for 6 or 12 zones

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1. Safety Precautions

To ensure the safe and effective operation of the HRC Multi-Cavity Hot Runner Control System, please read through this user manual carefully before operating the system and follow the warnings and instructions provided. Precautions before use:

1. Must be installed on a flat, stable floor in a well-ventilated area. Avoid humid, dusty or high-temperature environments. Installation in the above environments increases the risk of equipment failure or malfunctions and may even cause a fire.

2. Pay attention to the type of power supply, voltage and power capacity before connecting the HRC system to the power supply. Using a power supply that does not meet specifications will cause serious system damage. When the main power switch is turned on, if the Over Voltage Source (OVS) light lights up it means the power supply's voltage is too high (≧ 280Vac). The main power switch must be turned off at once and the power distribution verified.

3. Before turning on the main power switch for the HRC system, make sure that the system ground (FG) is properly connected. Improper grounding may lead to electrocution of personnel or damage to equipment.

4. Check that the HRC system and mold cable connection type are compatible with each other before connecting. Incompatible connection type poses an electrocution hazard and will damage equipment.

5. Make sure that the HRC system cooling fan is working at all times. A blockage will impact on heat dissipation so always keep the fan clean and running.

6. Do not attempt to modify or change this control system without proper training. Improper modifications may lead to electrocution, injury, equipment damage, fire and other hazards.

7. Immediately turn off the main power switch if there is any smoke, sparks, strange smells or odd noises during the operation of the HRC system and have a technician conduct an inspection. Do no turn on the power again before the problem is resolved.

8. The HRC system may only be maintained by trained personnel. The main power switch must be turned off before maintenance. Disassembling the HRC system while the power is connected poses serious electrocution hazard.

9. Storage temperature: -20~70°C/-4~158°F

Operation temperature: -10~50°C/14~122°F Operation humidity: 0~80%RH (No condensation)

2. Features

The power configuration is simple and easy to change, making it compatible with most electrical systems around the world.

2. Automatic detection of short-circuit protection of heater.

3. Multiple types of module anomaly detection for quick troubleshooting.

4. Simple and easy to use HMI interface.

5. Mold self-diagnostics function that shortens maintenance time by quickly identifying problems with the control module and molds.

6. If thermocouple abnormality occurs, can choose automatic switching to Manual, Slave , mode to maintain the output, so that the product can be produced continuously.

7. Synchronous heating function to avoid power being tripped by excessive loading. This also prevents residue in the tip from becoming carbonized by high temperatures for extended periods of time and impacting product quality.

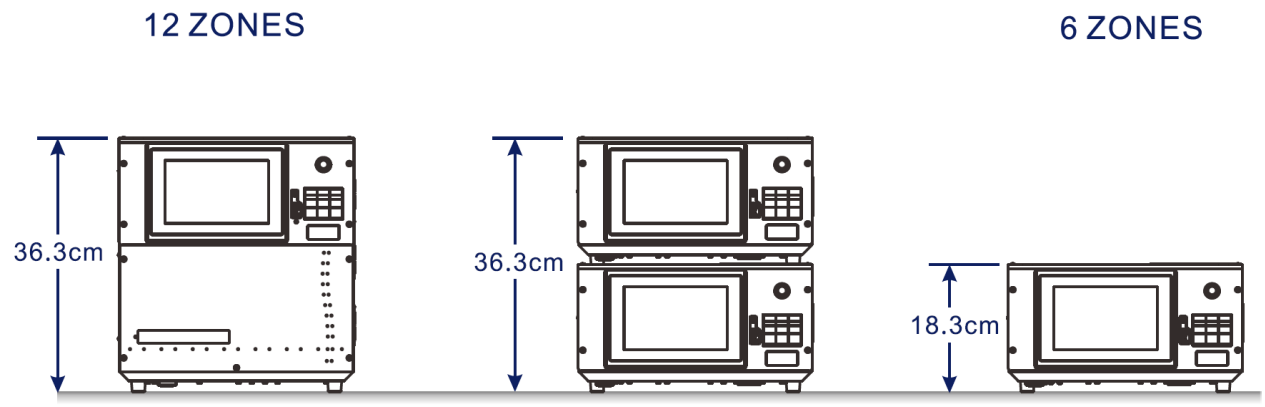
8. Synchronous cooling and standby function for the tip to prevent tip deformation due to the tip and manifold cooling at different rates.

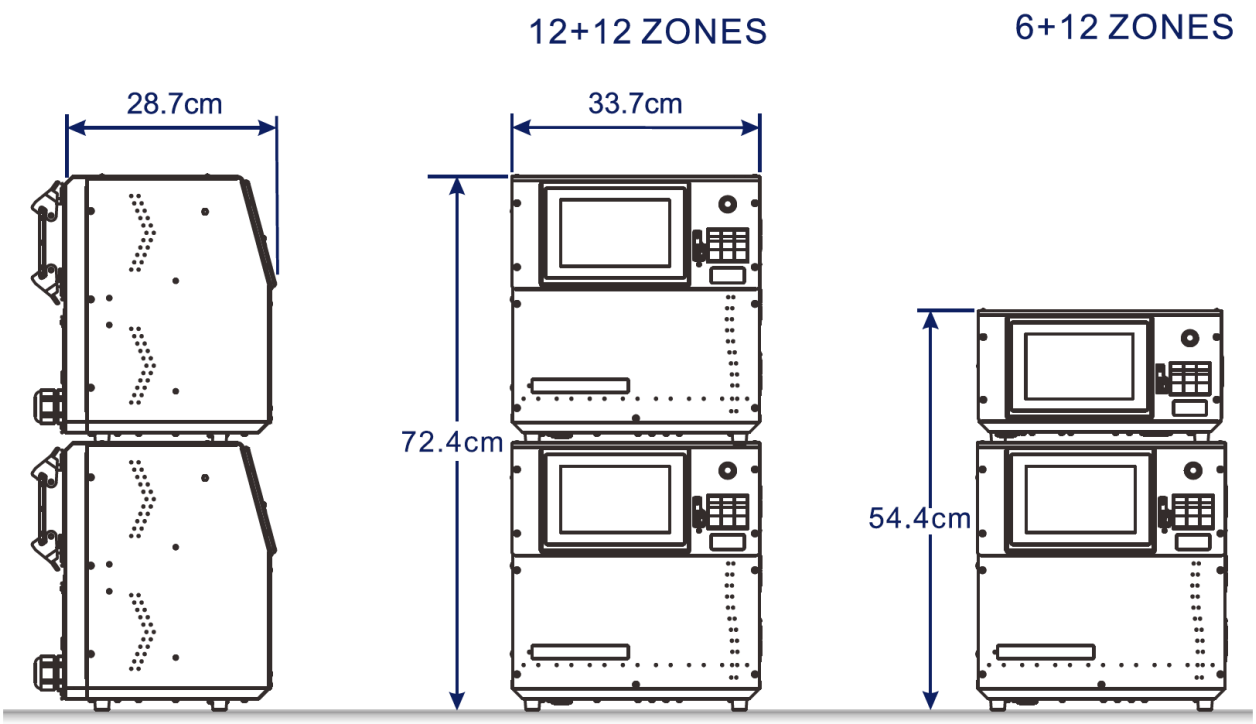
9. The three-phase of power balance efficiency statistics can provide the basis for the user to adjust the power load balance to reduce the power loss.

10. The mold leakage detection function can detect the initial mold leakage, and early detection of leakage can avoid serious damage to the mold and save huge mold maintenance costs.

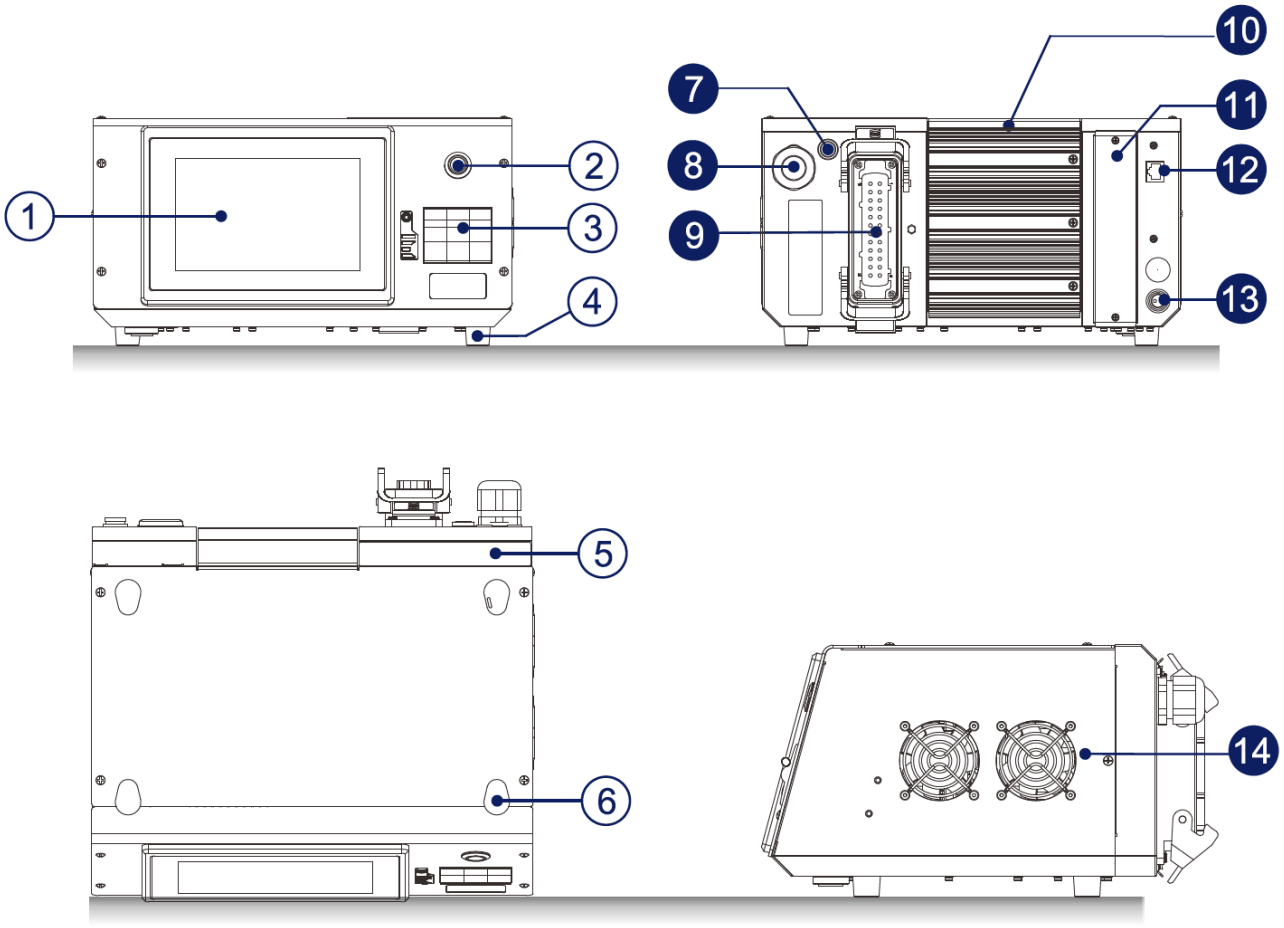
3. Appearance and electronic control system

3.1. Appearance (Dimensions, Components)



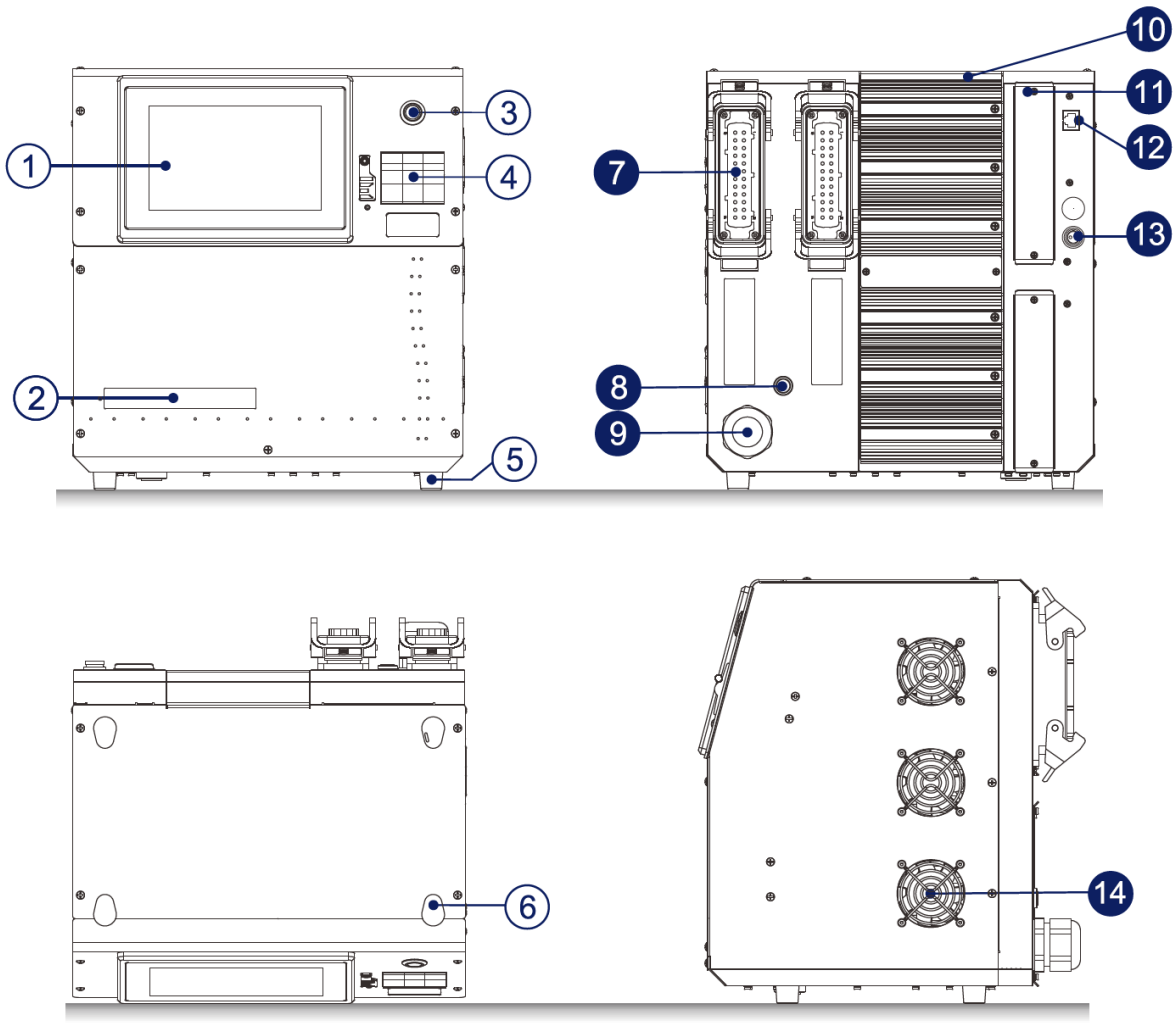


HRC600 Components



1. HMI
2. Power indicator
3. Main power switch / NFB
4. Feet
5. Power supply instructions
6. Stacking points
7. Overvoltage source indicator (OVS)
8. Power cable
9. Multi-pole connector
10. Output module
11. Temperature control module
12. VNC Port
13. IO Port
14. Fan

HRC1200 Components



1. HMI
2. Power supply instructions
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8. Overvoltage source indicator (OVS)
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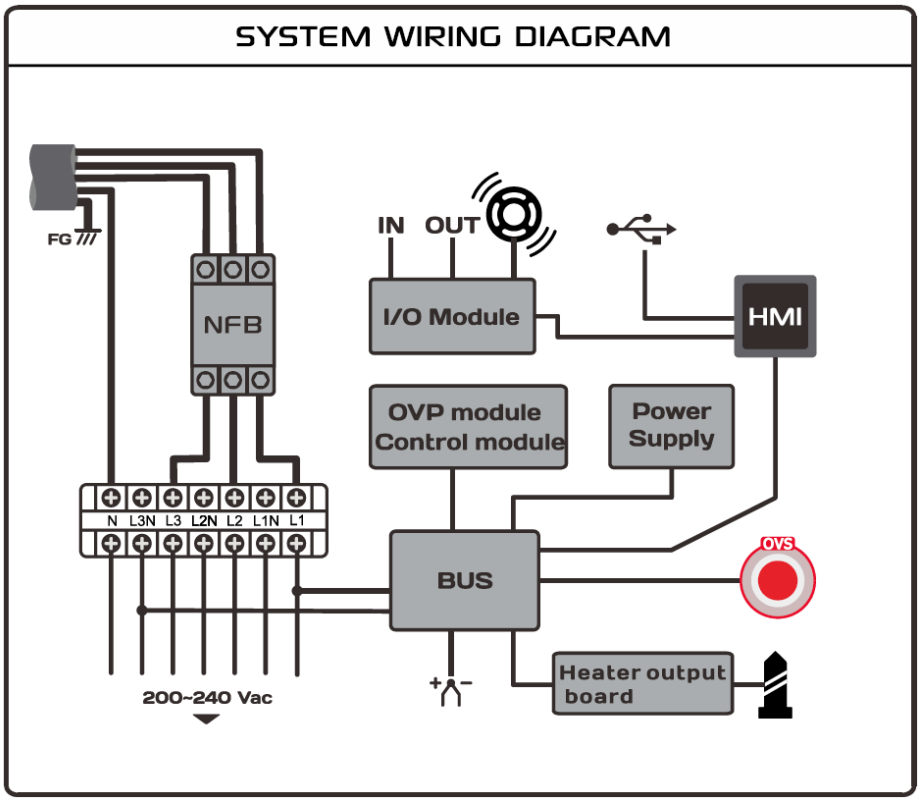
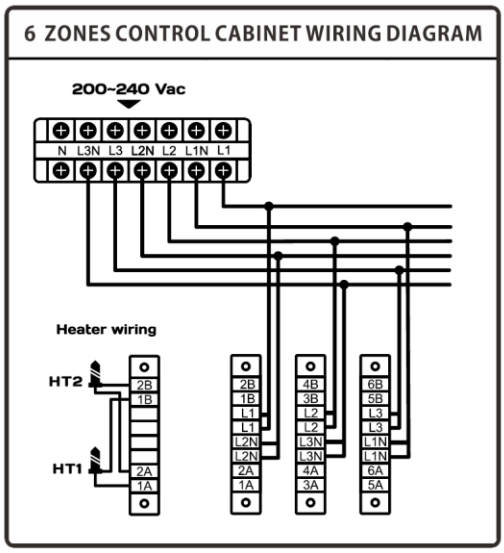
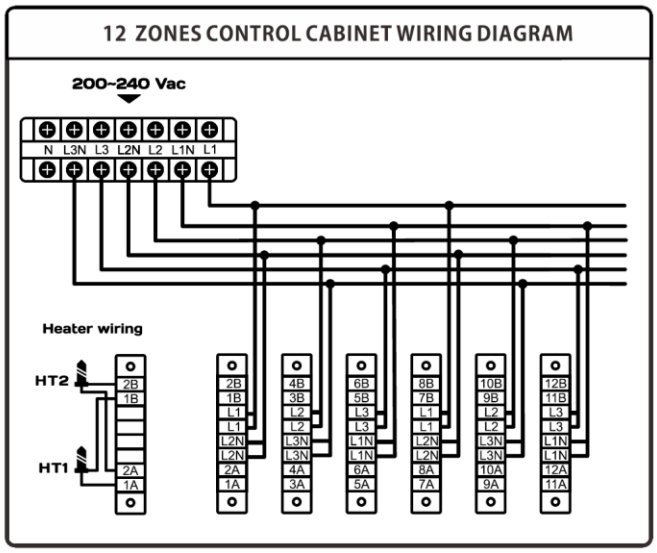
10. Output module
11. Temperature control module
12. VNC Port
13. IO Port
14. Fan

3.2. Electronic Layout







3.3. Temperature Control Module

1. Number of zones controlled: 6 zones.

2. Power Input: 1Φ, 230Vac±10% (overvoltage protection)/24Vdc±5%,

50/60Hz.

3. Power Consumption: 24Vdc/4W

4. Thermocouple: J/K type

5. Temperature Control Range: 0~600°C/32~999°F

6. Control Precision: ±0.25%FS

7. Measurement Precision: ±0.25%FS

8. Fuse: 250Vac/5A, 20mm

9. Output Mode: Zero cross/Phase angle.(compatible output module)

10. Detection Functions: temperature detection/Current detection (compatible output module)/Overvoltage Protection(≧280Vac start)

11. Temperature Alarm Mode: Higher limit/Lower limit/Standby higher limit/Standby lower limit/Absolute alarm.

12. Anomaly Detection:

- Thermocouple: Short/Break/Reverse.
- Heater: Short/Break/Overload.
- TRIAC: Short.(compatible output module)
- Fuse break.(compatible output module)

13. Communication Mode: RS-485 (Standard MODBUS, Isolated)/

UART (Choose one of two)

14. Communication Rate: 38400/57600

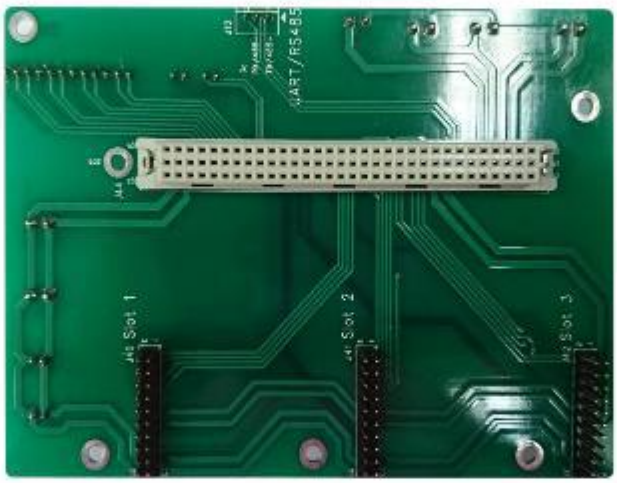
15. ID Setup: DIP switch Setup

16. Storage Temperature: -20~70°C/-4~158°F

17. Operating Temperature: -10~50°C/14~122°F

18. Operation humidity: 0~80%RH (No condensation)

3.4. Bus Board



1. Slot: 4 (For three output modules and one control module.)
2. Storage Temperature: -20~70°C/-4~158°F
3. Operating Temperature: -10~50°C/14~122°F
4. Operation humidity: 0~80%RH(No condensation)

3.5. Output Module

1. Number of zones controlled: 2 zones.

2. Power Input: 230Vac±10%/24Vdc±5%, 50/60Hz

3. Power Output: 3450W, 230Vac/15A(per zone)

4. Fuse: Quick response ceramic 500Vac/20A, 30mm

5. Output Mode: Zero cross/Phase angle.(compatible control module)

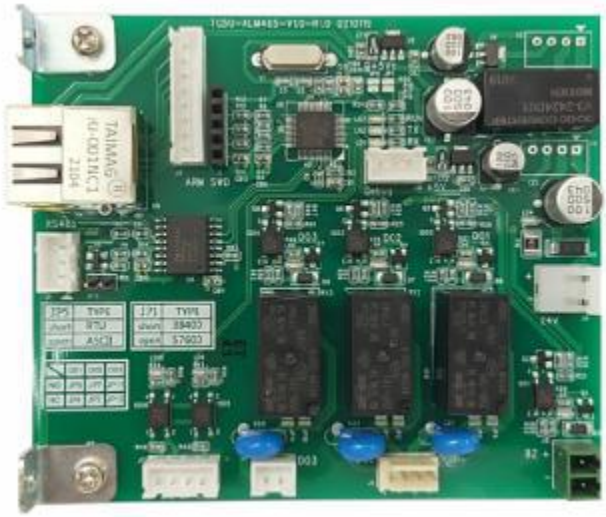
6. Detection Functions: Current detection, TRIAC Short, Fuse Break(Must be compatible control module)

7. Storage Temperature: -20~70°C/-4~158°F

8. Operating Temperature: -10~50°C/14~122°F

9. Operation humidity: 0~80%RH(No condensation)

3.6. I/O Board



1. Power Input: 24Vdc±5% 3W

2. Communication mode： RS-485 （Standard MODBUS，Isolated）

3. Storage Temperature： -20~70° C / -4~158° F

4. Operating Temperature： -10~50° C / 14~122° F

5. Operation humidity： 0~80%RH (No condensation)

6. ID：Set 255

7. Communication speed： 38400 / 57600

8. Output: 2 zones, dry contact / 3A

9. Input: 2 zones, 24Vdc±5%

3.7. HMI Module

1. Screen size: 7"

2. Resolution: 800*480

3. Screen type: TFT Color touch screen(LED Backlight), 65536 color

4. Backlight life: 20,000 hr

5. LCD screen brightness: 400(cd/m2)

6. Touch panel: 4-wire resistive

7. Input voltage: 24 VDC±10%(Isolated)

8. Power consumption: 20 W

9. Operating temperature: 10°C ~50°C

10. Relative humidity: 10%~90%

11. Cooling method: Natural cooling

12. Communication mode: RS-485(Standard MODBUS)

4. Convenient Functions

4.1. Mould Self-Diagnostics

Due to the complexity of molds, HRC system offers convenient molds self-diagnostics function to shorten mold maintenance times. This diagnostics function provides the user with a simple way to troubleshoot most temperature controller and mold malfunctions.

1. Thermocouple anomaly(Short /Break/Reverse)

2. Heater anomaly(Short/Break/Overload)

3. Fuse anomaly(Break)

4. TRIAC anomaly(Short)

5. Mold wrong wiring

When the temperature control module detects a dangerous or anomalous situation, it automatically cuts the power output to prevent danger to personnel and equipment.(Please see section 6.3 for details)

4.2. Thermocouple Abnormal Behavious

The complex structure and large number of temperature control zones used by multi-cavity hot runner molds means that thermocouples(especially at the tip) will inevitably fail during production, forcing a maintenance shutdown that impacts production.

The HRC system offers three loop break modes that allows production to continue and maintenance to be deferred until the end of the current production run(Please see 6.2 details):

1. Manual: The user can pre-define the appropriate manual output percentages for each zone. If a thermocouple fails in one zone, the HRC system will automatically switch temperature control for that zone to manual so the heater will continue to maintain the production temperature and keep production running.

2. Slave: Multi-cavity molds are mostly used for producing similar products. Molds for the same product use similar heaters and component structures as well so the production temperatures are quite similar as well. The user can identify mold cavities with similar production conditions and set up master-slave relationships in advance. If the thermocouple

for a zone fails and a master-slave relationship had previously been defined, the HRC system will automatically transmit the output percentage from a zone with working temperature control to the zone with the failed thermocouple. This maintains more precise temperature control than manual mode for that zone and allows production to continue.

3. Continue: When the mold is heated to the target temperature(SV)for a few minutes and thermocouple abnormality occurs. If this function is selected, the heater can be continuously output, maintaining the steady-state output ratio before the abnormality to maintain production. However, if this function is selected, and abnormality occurs when the mold has not been heated to the target temperature, but the system has not yet obtained the steady-state output ratio, the output will be reduced to 0, means the heating operation is stopped.

4.3. Synchronous Heating

Check each heaters type in the mold matches the selected function before using

Multi-cavity molds have lot of heating components(tip, manifold)and consume more power. When system sets all heaters to start increasing the temperature, the huge power consumption may often cause the main power switch break due to over current. There is also a relatively big difference between the heating time for tips and manifolds. When tips reach the set temperature, they will still need to wait for the manifolds to reach the set temperature before production beginning. Remaining plastic in the tip may be degraded by being exposed to high temperature for an extended period of time and impacting product quality or even resulting in tip blockages.

To solve the above problems, the HRC system has synchronous heating function, While the manifolds are heated up, if the tips have start ST, tips will first complete the ST operation with 100% output for a period of time, then output in a smaller percentage and follow the manifolds temperature, revert to self-control until they are close to the set temperature. This can solve the problems of power break and plastics degraded.(Please see 6.3 details)

4.4. Synchronous Cooling

Check each heaters type in the mold matches the selected function before using

Some multi-cavity molds have very sophisticated tip structures. During shutdown and cooling, the tip will cool at a faster rate than manifolds. When the temperature difference becomes too great, the uneven temperature in the mold body can cause the tip to warp and in serious cases may even impact tip service life. The HRC system offers a synchronous cooling function during shutdown. The system automatically keeps all heaters cooling at the same rate to reduce malfunctions caused by excessive temperature difference. (Please see 6.3 details)

4.5. Leakage detection

Please refer to the instructions manual for use to achieve its performance before using this function.

After hot runner mold is used for a period of time, it may cause the plastic to leakage from the juncture due to temperature, pressure, tightness change, etc. When plastic leaks from the mold, the thermocouple and heater may be damaged, it needs to be repaired or replaced. Sometime the cost of repairs is very huge. If the leakage can be found at an early stage, it will save a lot of maintenance costs, can also shorten mold repair time and faster resume production again.

PS: This function is based on the analysis of existing data and can not replace the external leakage detection. If the system needs external leakage detection, please contact us.

5. Preparations

5.1. Connection between HRC system and Mould

In order to keep the entire multi-cavity hot runner system working properly, the user must perform the following checks before connecting the HRC system with the mold:

1. Confirm that the operating environment is stable, non-humid, low-dust and at a suitable temperature.

2. Confirm that the power cable is not damaged and securely connected.

3. Confirm that the HRC system and mold are properly grounded.

4. Check that the HRC systems main power switch is set to "OFF".

5. Confirm that the HRC system and the mold are properly connected.

6. Confirm that the wiring between the HRC system and mold are not damaged and that the connection type matches the way that the HRC system and the mold are connected.

7. Only when all of the above checks have been completed can the user connect the HRC system and the mold, turn on the power and prepare to commence production.

5.2. Parameter setup

After power on, select one zone to set. Start setting the basic parameters after entering the module setting page:

1. Setting Value: The setting value(SV)for the current zone. Click and select to set(0~ Temperature limit).

2. TC Type: Thermocouple type(J/K).

3. HT Type: Heater type(Tip/Manifold).

4. Soft Start: Enable heater drying function.

5. ST Mode: Enable Self-tuning mode(No/Once/Every).

6. Trigger Mode: Output trigger mode selection, P.A.(Phase angle)/

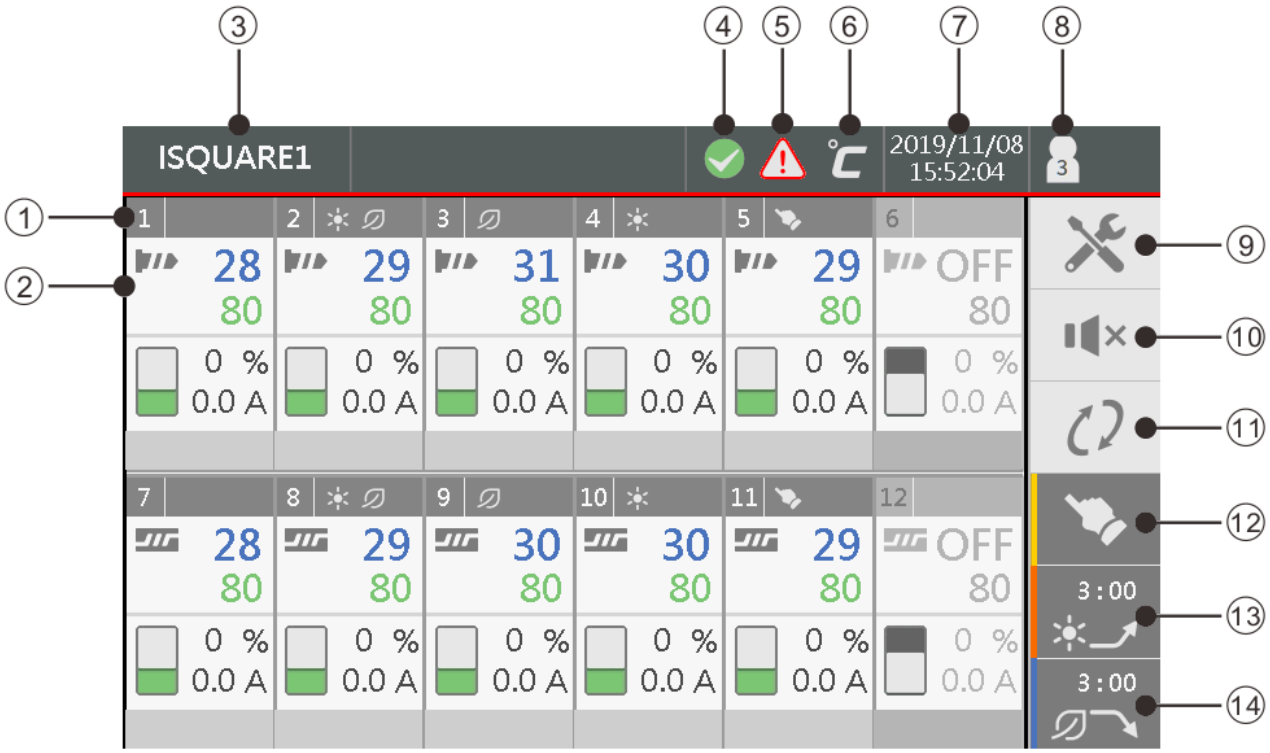
Z.C.(Zero cross).

7. Thermocouple anomaly(Loop Break): Operating mode when thermocouple anomaly occur(stop/manual/slave/continue).

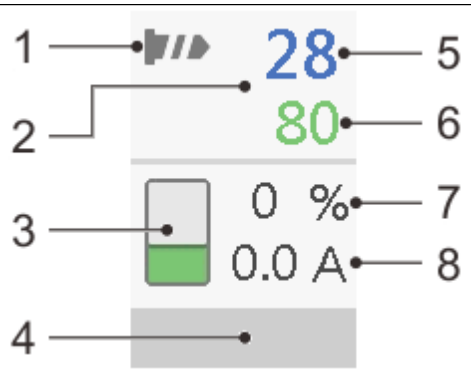
Once the basic parameters have been set, if the parameters for other zones are the same then copy the parameters as shown in 6.2 details.

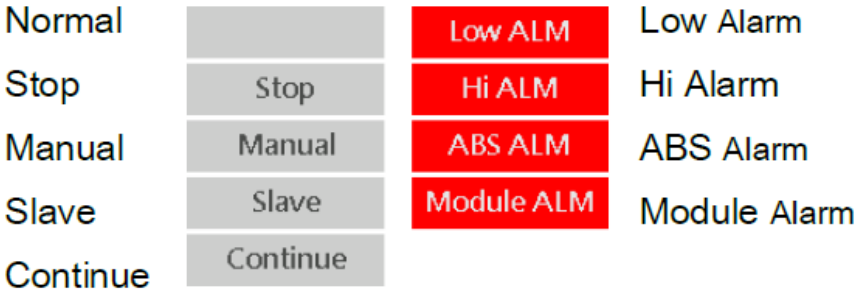
6. HMI Instructions

6.1. Monitoring

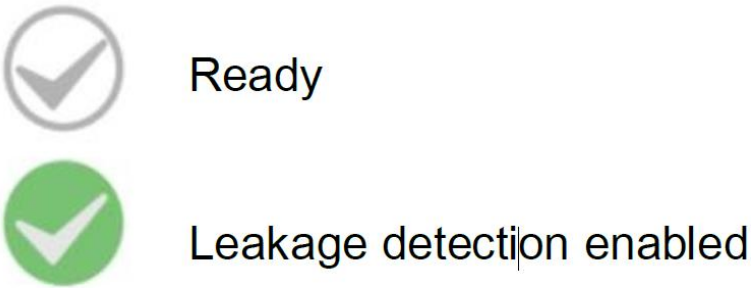
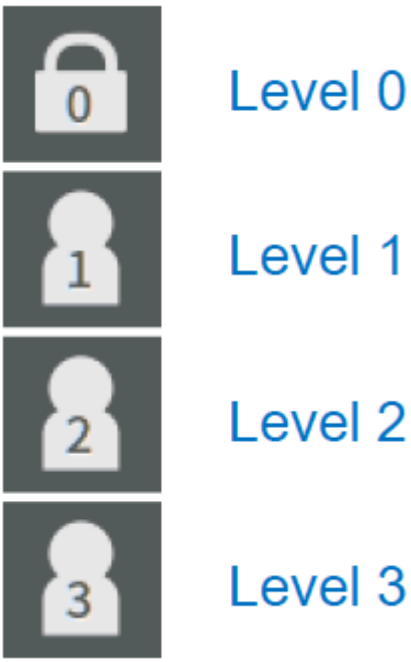


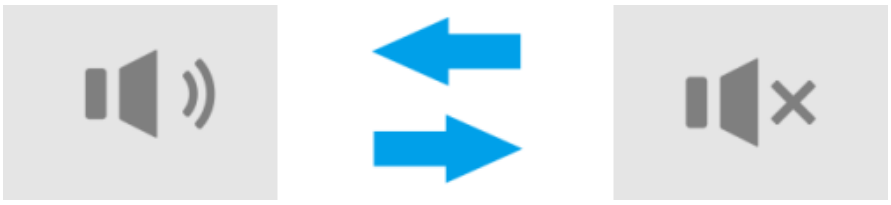
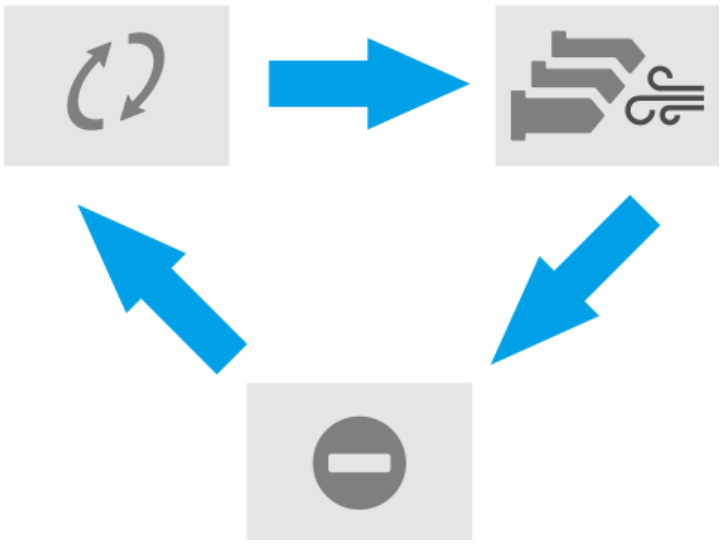
①	Zone	 Display each zone number and status, click to enter the zone parameter setting page.(Refer zone parameter settings, see 6.2 details)

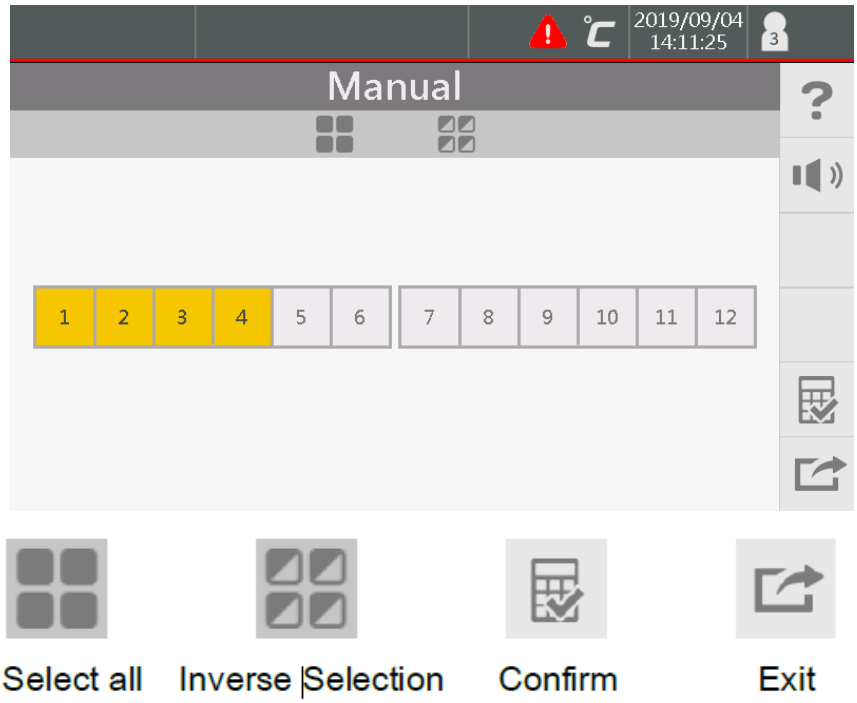
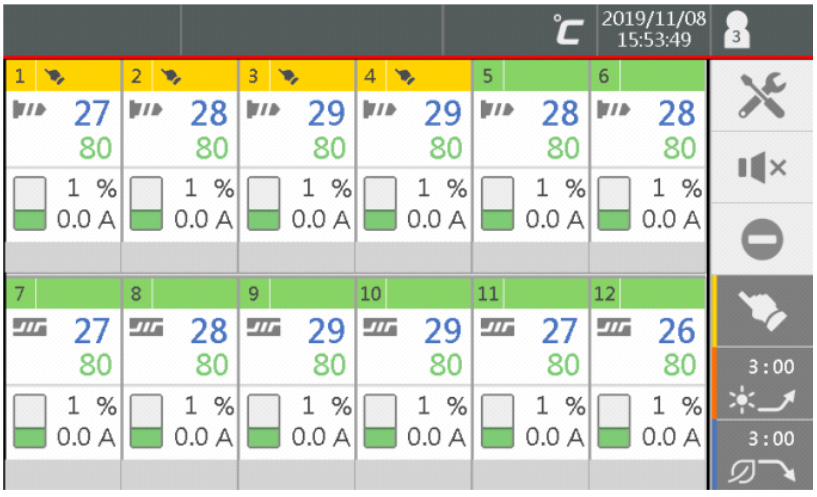
<table>
<tr>
<td>②</td>
<td>Zone Status</td>
<td>


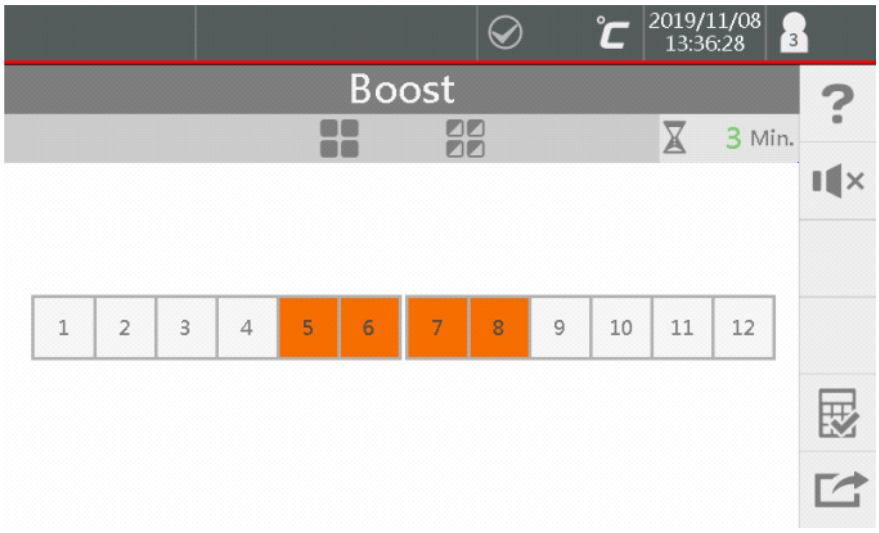
1. Heater Type
 Tip
 Manifold
2. Temperature setting
3. Zone Switch
4. Zone Satus and Alarm Message


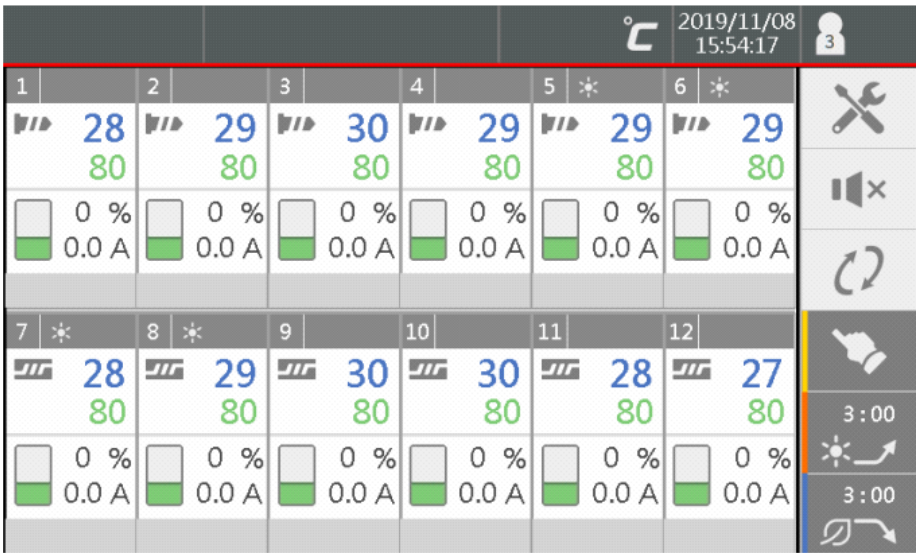
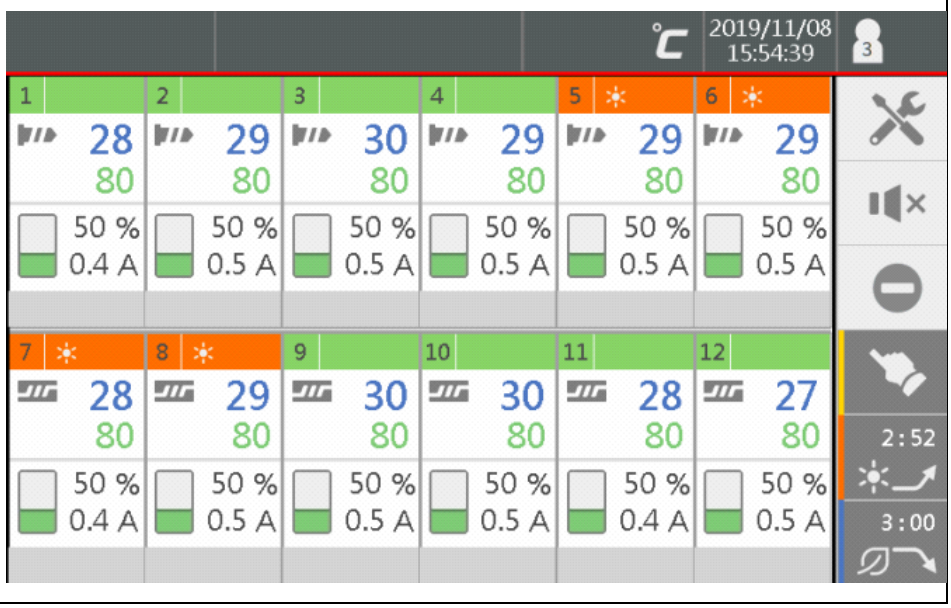
5. Actual temperature
6. Setting Temperature
7. Heater Output Percentage
8. Heater Output Current
</td>
</tr>
<tr>
<td>③</td>
<td>Mould Name</td>
<td>Mold name, set by mold management page.(detailed settings, see 6.3 details)</td>
</tr>
</table>

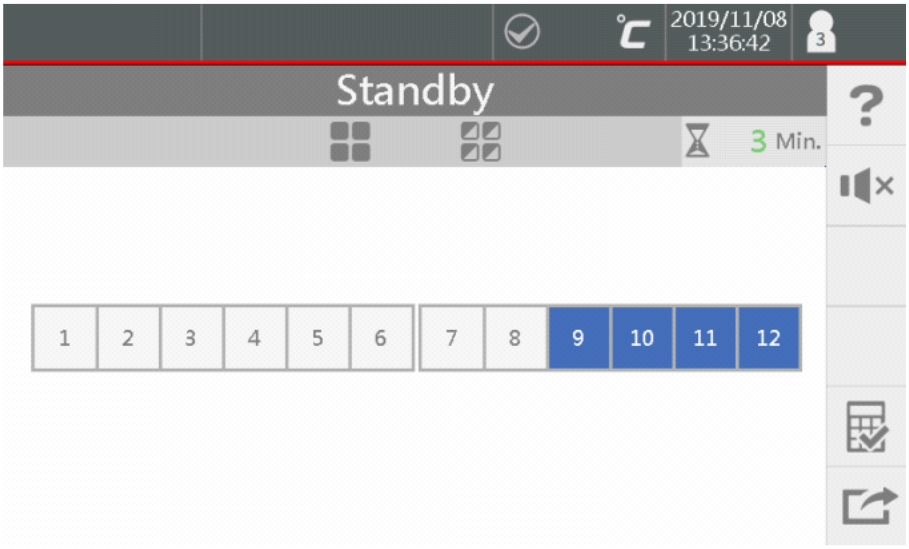
④	Leakage Detection	Leakage detection indicator, Click to enter leakage detection page. 
⑤	Alarm	Flashes when alarm occurs. Click to enter the alarm log page 
⑥	Temperature unit	Temperature unit-°C/°F.
⑦	Date and Time	Current date and time, reset in the system settings page(detailed settings, see 6.3 details)
⑧	Login Level	Current Login level. 
⑨	Settings page	Click to enter system settings page.

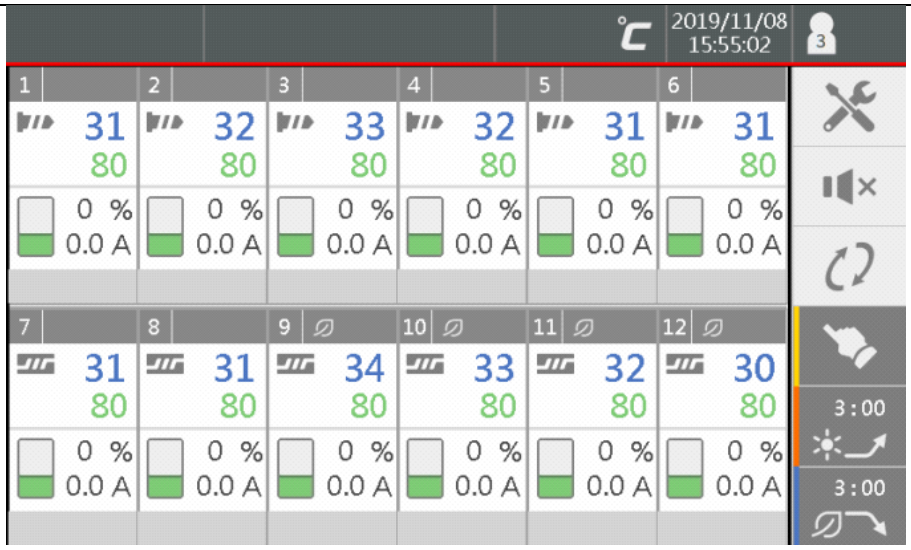
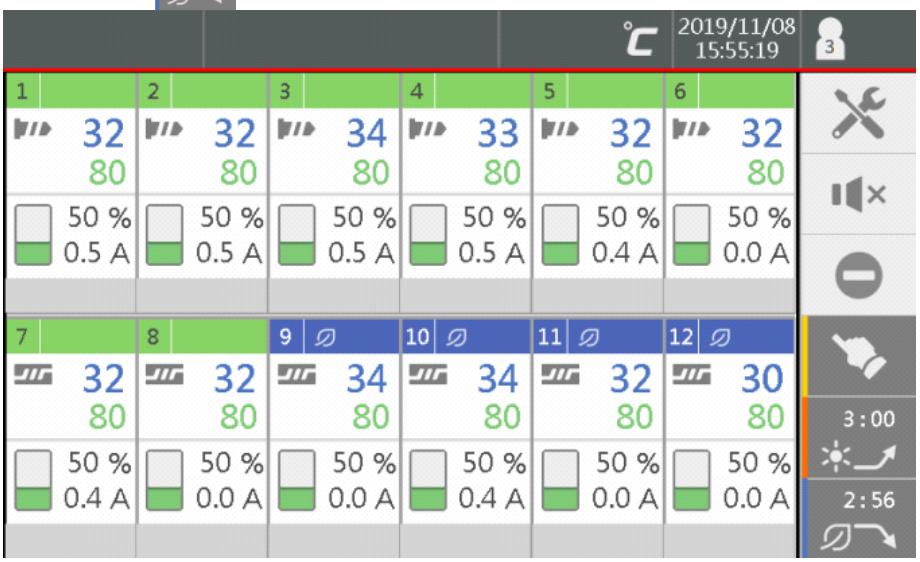
⑩	Buzzer Switch	Click to switch buzzer status  *Note: This button is not currently status; It's the status of clicking to go. For example: Button display  represent status is off the buzzer, click button to turn on the buzzer.
⑪	Stop/Start	Stop/Start button. Press to enter the state.  In the start mode, if the synchronous cooling function is enabled, after this button is pressed, the synchronous cooling function will be executed first, and then the system will be stopped.  *Note: This button is not currently status; It's the status of clicking to go. For example: Button display  Indicates current state is Stop, Click button to Start.

⑫	Manual Setup	Click the button to enter manual settings page, select the zone which requires manual mode, then click the confirmation button to complete the setting.  After the manual mode is set, the manual mode icon will appear in the zone which the manual is selected in the monitoring page. In start state, the zone status color changes to yellow. 

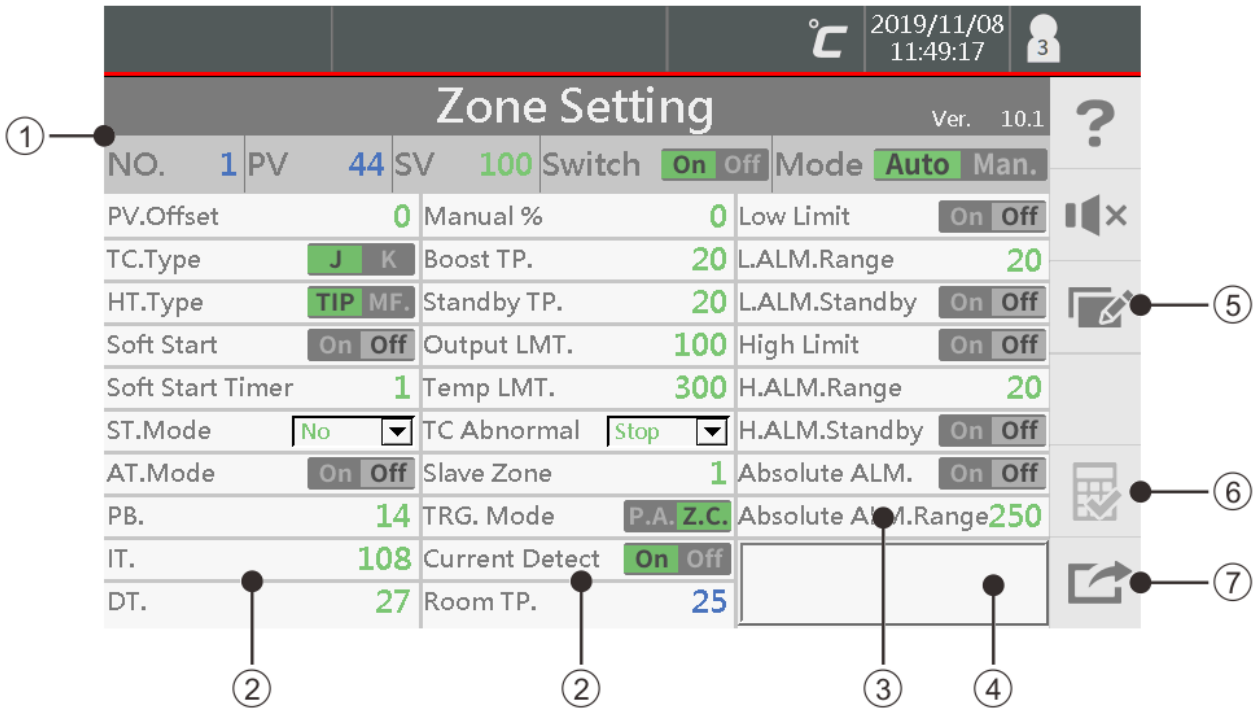
⑬	Boost Setup	Click the button to enter Boost settings page, select the zone which requires Boost mode, then click the confirmation button to complete the setting.   Select all Inverse Selection Confirm Exit  Timer Click the timer button and enter the required boost time. After completing the boost timer setting, click the confirmation button to complete the boost timer setting. The boost temperature can be set in the zone parameter setting page (see chapter 6.2 for details). After the boost mode is set, the boost icon will appear in the zone which the boost is selected in the monitoring page. In start state, the zone status color changes to orange.

⑬	Boost Setup	 In start mode, press and hold  for 2 seconds to enter Boost mode, if the zone has been selected boost mode, the zone will be displayed in orange and the timer will start counting down. If the temperature reaches the Boost temperature within the time, the system will maintain the temperature; The function is automatically stopped if the time is up. In the star mode, press and hold for 2 seconds  to stop Boost function. 

⑭	Standby Setup	Click the button to enter Standby settings page, select the zone which requires Standby mode, then click the confirmation button to complete the setting   Timer Click the timer button and enter the required standby time. After completing the standby timer setting, click the confirmation button to complete the Standby timer setting. The standby temperature can be set in the zone parameter setting page (see chapter 6.2 for details). After the standby mode is set, the standby icon will appear in the zone which the standby is selected in the monitoring page. In start state, the zone status color changes to blue.

⑭	Standby Setup	 In start mode, press and hold  for 2 seconds to enter Standby mode, if the zone has been selected Standby mode, the zone will be displayed in blue and the timer will start counting down. If the temperature reaches the standby temperature within the time, the system will maintain the temperature; The function is automatically stopped if the timer runs out. In the star mode, press and hold  for 2 seconds to stop Standby mode. 

6.2. Zone Parameter Setup

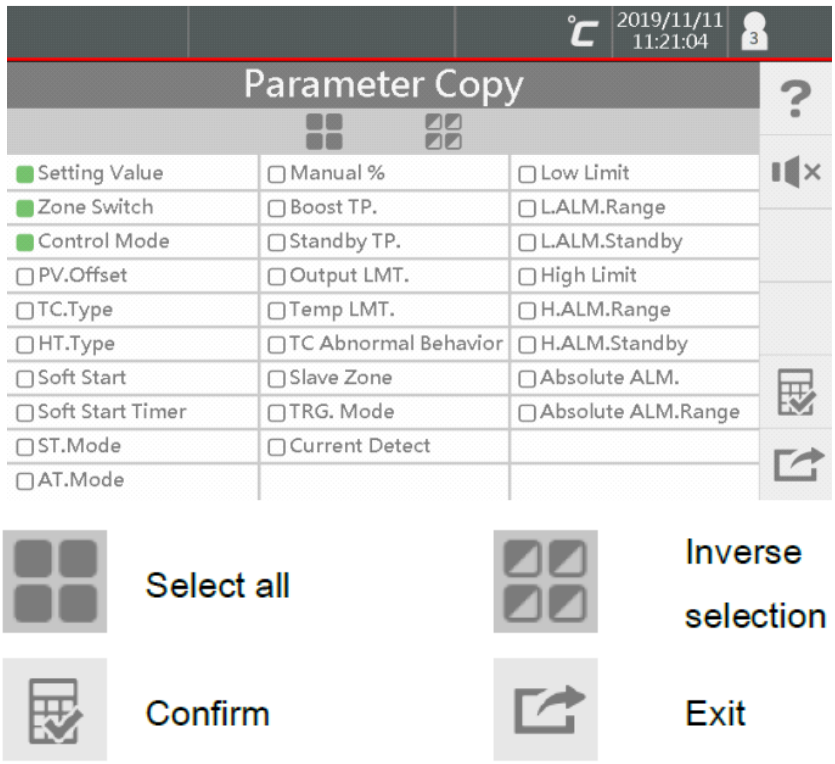


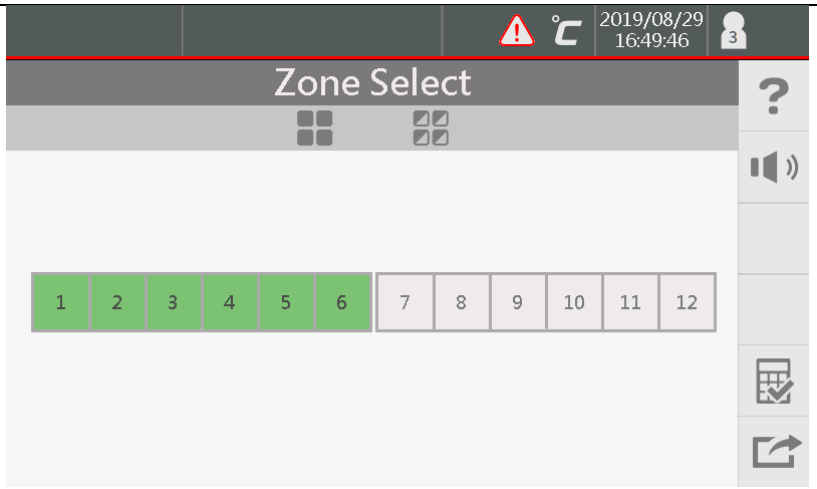
①	Zone Setting	1. NO.: Zone number. 2. PV: The present temperature value(PV)of zone. 3. SV: The setting value(SV)of zone. Click to set it. 4. Switch: Zone switch. 5. Mode: Control mode - Auto/Manual
②	Control	1. PV Offset: Offset value of PV 2. TC.Type: Thermocouple type - J/K. 3. HT.Type: Heater type - TIP/M.F(Manifold)。 4. Soft Start: Switch of heater drying function. 5. Soft Start Time: Timer of heater drying. 6. ST. Mode: Self-Tuning mode - No/Once/Every. ST mode: Automatically execute PID algorithm at start up. (No: No algorithm / Once: Only one algorithm / Every: Execute algorithm every start up) Note: "every" is generally used, and it is not necessary to set when the temperature control is normal.

②	Control	7. AT. Mode: Auto-Tuning mode. Application: When ST MODE is already in use, and the temperature control will still oscillate. Step 1: When the temperature has reached the set value, you can start AT. At this time, it will heat up and cool down to calculate a more accurate PID value. Step 2: To avoid parameter calculation PID when restarting, please set ST mode to NO. 8. PB.: Proportional band. (Temperature control area) (ex: This value can be increased when the temperature is exceeded for the first time) 9. IT.: Integral time. (Accumulate Electric energy time) (ex: When it takes a long time to reach a ready state, this value can be reduced) 10. DT.: Differential time. (ex: Slowing effect when the temperature changes quickly) When modifying the PID value, you must have PID knowledge. When the temperature is still not ideal after ST & AT is used, you need to manually set the PID. 11. Manual %: Manual output percentage. 12. Boost TP.: Boost temperature. 13. Standby TP.: Standby temperature. 14. Output LMT.: Maximum output percentage(0~100%). 15. Temp LMT.: Maximum setting value of temperature.

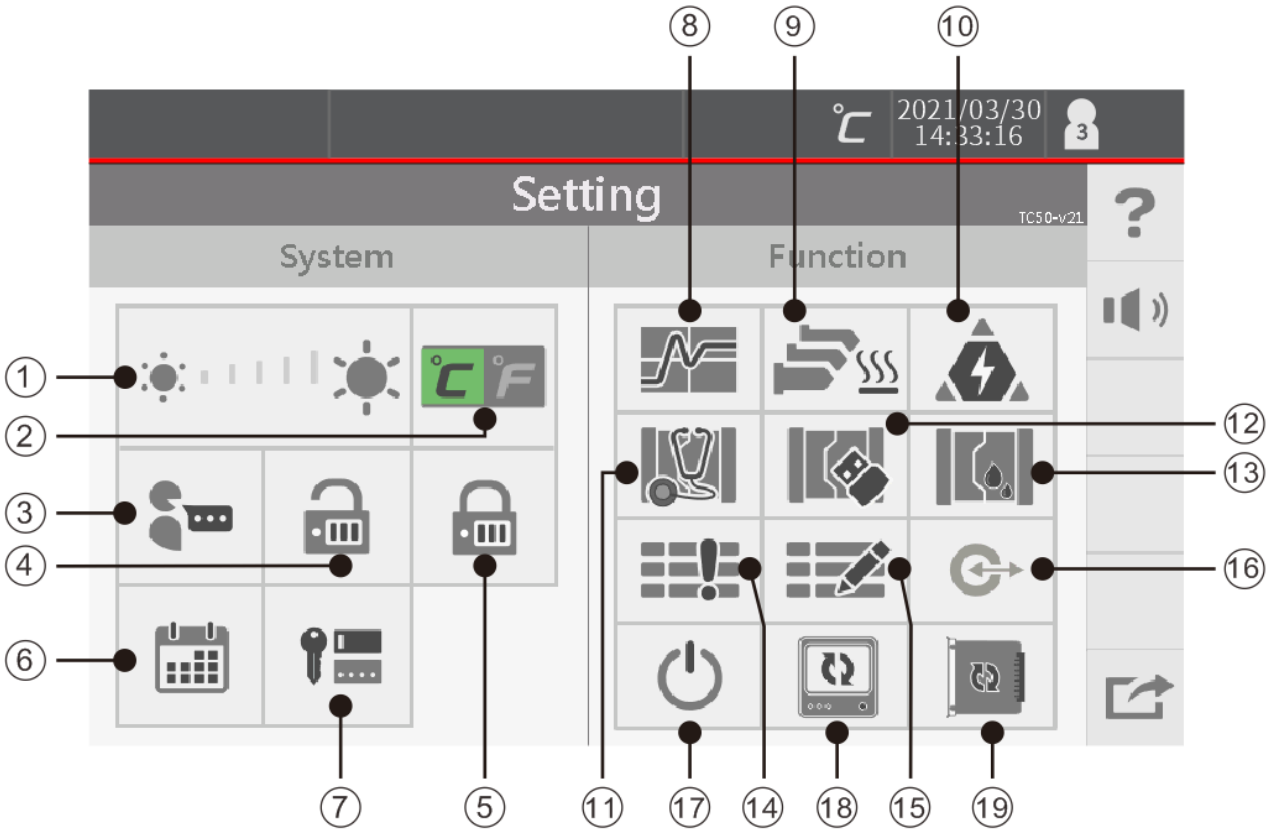
②	Control	16. TC Abnormal Behavior: Behavior if thermocouple abnormal (Stop/Manual/Slave/Continue). Stop: Stop output in the event of thermocouple abnormal. Manual: Automatically switch temperature control to Manual mode after thermocouple abnormal. Follow the manual output percentage so the heater maintains the production temperature and keeps production running. ※The manual output percentage must be set in Control Parameters. Slave: Follow the output percentage of the zone slaved after thermocouple abnormal. This enables more precise temperature control and keeps production running. ※The zone to slave to must be set in control parameter. Continue: When the mold is heated to the target temperature (SV) for a few minutes and thermocouple abnormality occurs, if this function is selected, the heater can be continuously output, maintaining the steady-state output ratio before the abnormality to maintain production. However, if this function is selected, and abnormality occurs when the mold has not been heated to the target temperature, but the system has not yet obtained the steady-state output ratio, the output will be reduced to 0, means the heating operation is stopped. 17. Slave Zone: The output follows to the zone, if thermocouple breaks.
②	Control	18. TRG. Mode: Trigger mode Z.C.(Zero cross)/P.A.(Phase angle).

		19. Current Detect: Current detection switch. 20. Room TP.: Ambient temperature of control module.
③	Alarm	1. Low Limit: Alarm activates when PV is lower than "SV - L. ALM. Range". 2. L.ALM. Range: Low limit alarm range. 3. L.ALM. Standby: After control is started or SV is changed, alarm is not activated when the first time that PV is lower than "SV - L. ALM. Range". 4. High Limit: Alarm activates when PV is higher than the "SV + H. ALM. Range". 5. H.ALM. Range: High limit alarm range. 6. H.ALM. Standby: After control is started or SV is changed, alarm is not activated when the first time that PV is higher than "SV + H. ALM. Range". 7. Absolute ALM.: Alarm activates when PV is higher than "ABS. ALM. Range". 8. Absolute ALM. Range: The present temperature value (PV) of the absolute alarm is activated.
④	Status	Alarm Message: The abnormal message for that zone. ● Lower limit alarm ● Higher limit alarm ● Absolute alarm ● Thermocouple break ●Thermocouple reversed ● Thermocouple short ● Heater overload ● Heater short ● Heater break ● TRIAC short ● Fuse break ● Abnormal temperature rise ● Leakage Detected

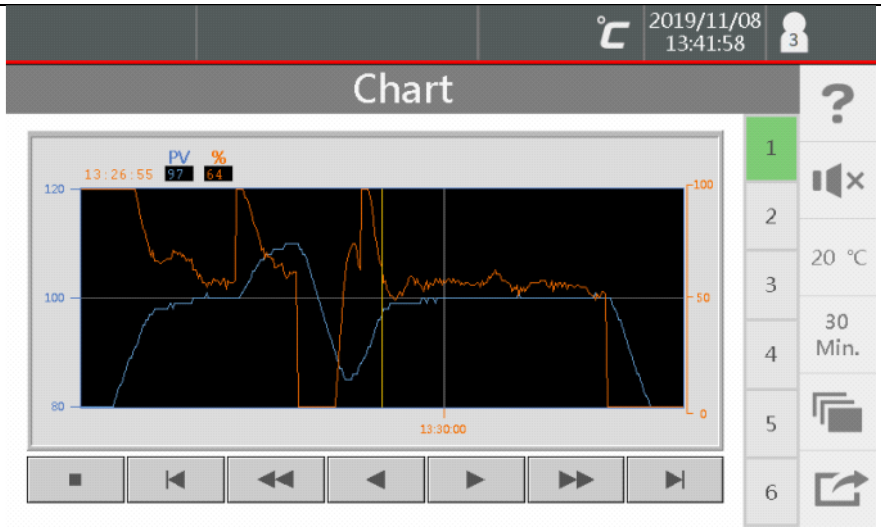
⑤	Parameter Copy	Group copy  Select the parameters which to copy, or use the "Select All" and "Inverse selection" functions to quickly select the parameters and "confirm" to enter the zone select.

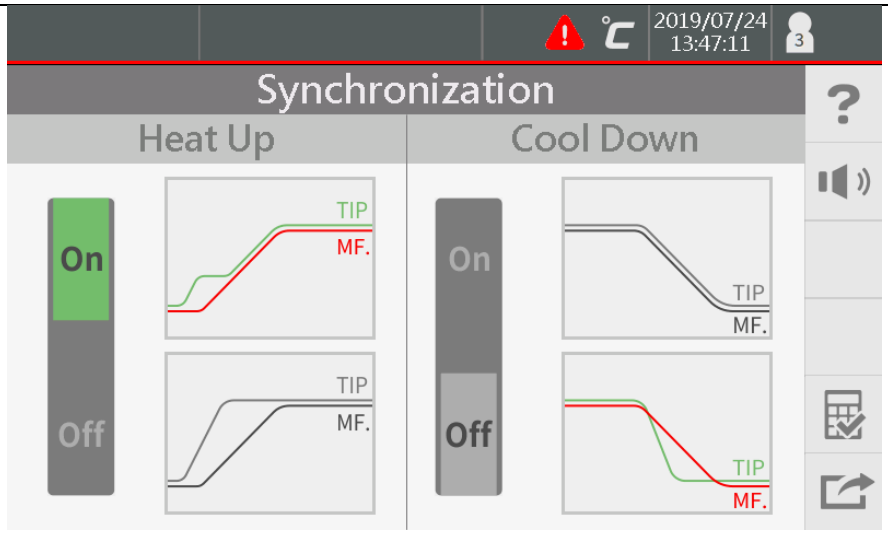
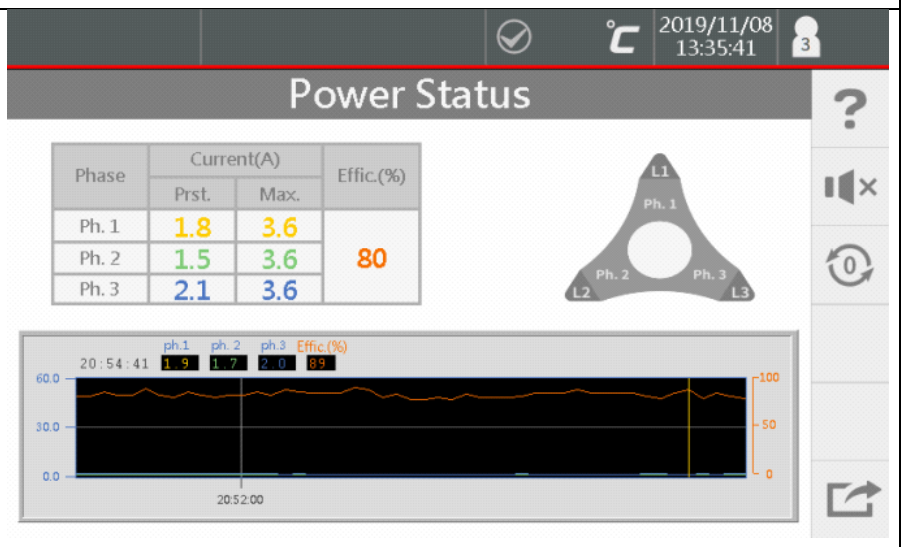
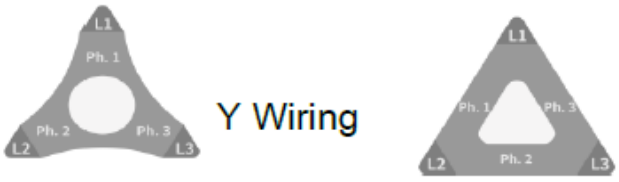
⑤	Parameter Copy	  Confirm  Exit "Confirm" to complete group copy.
⑥	Confirm	
⑦	Exit	

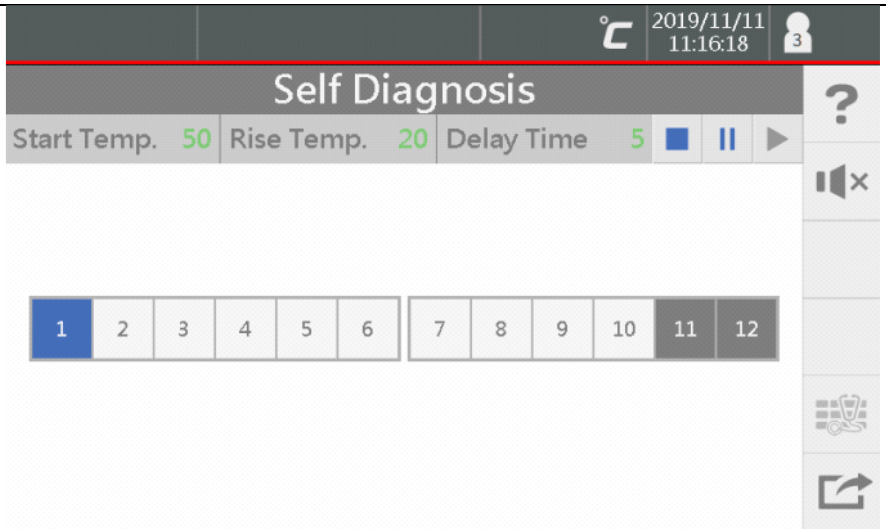
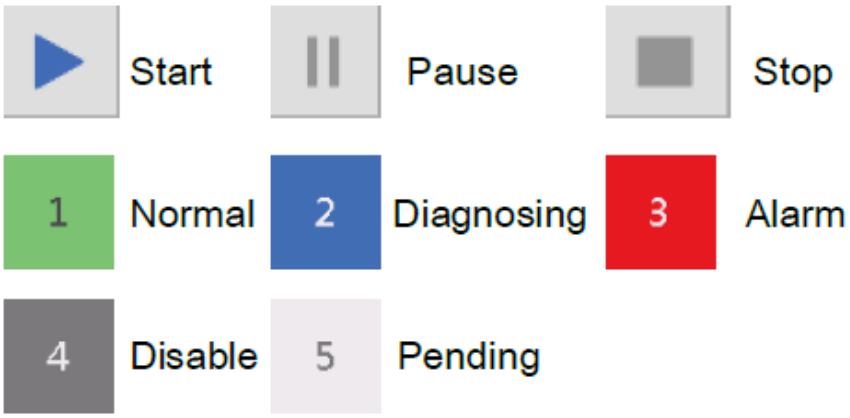
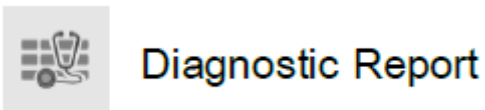
6.3. System Setup

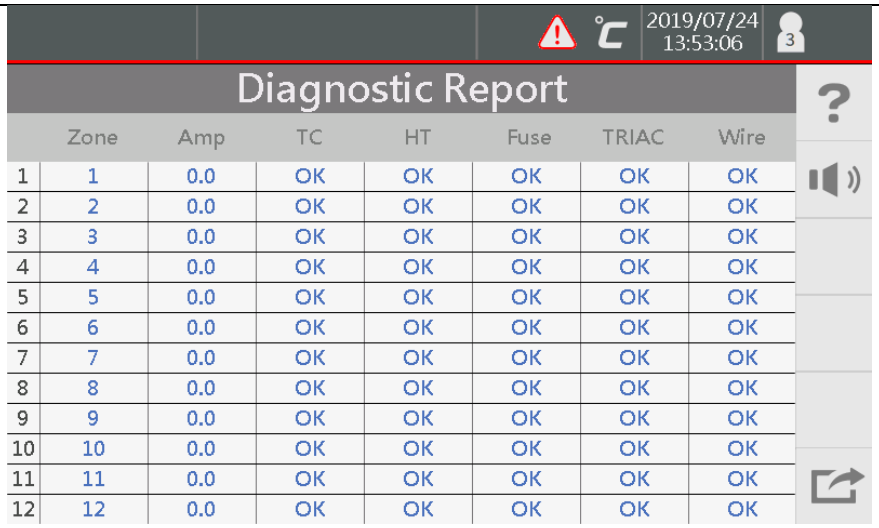
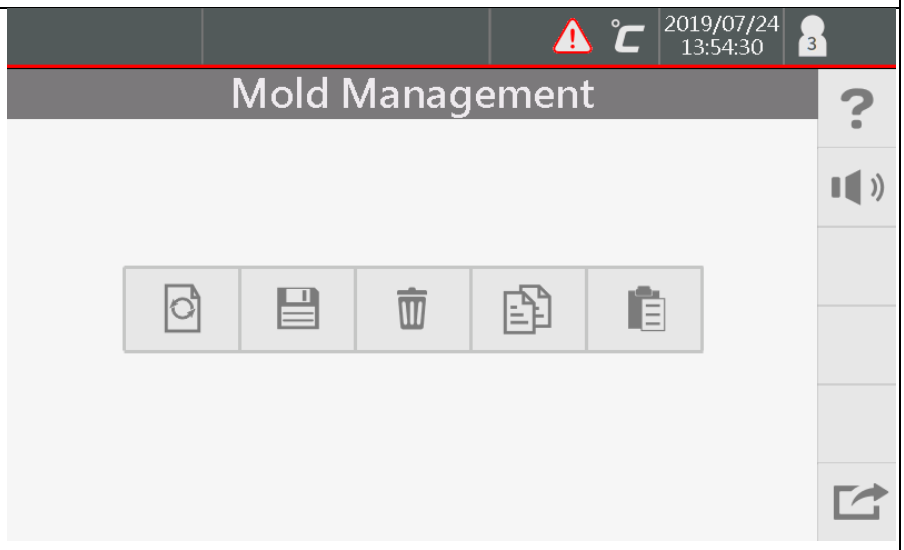


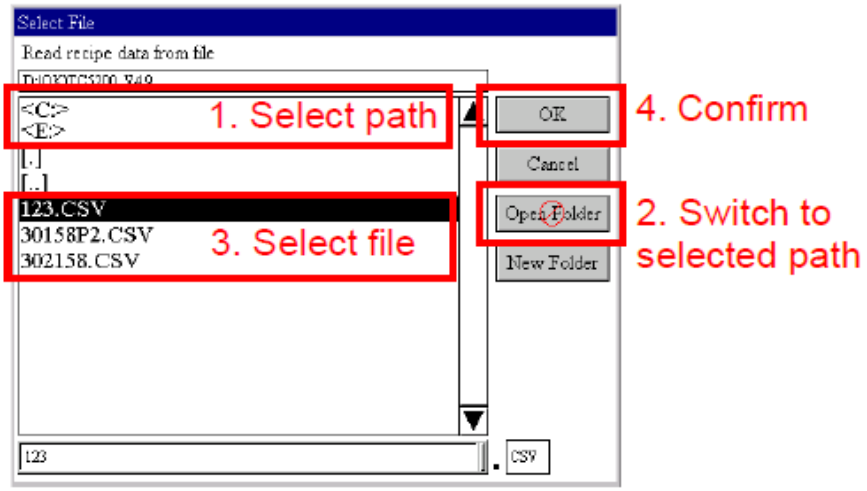
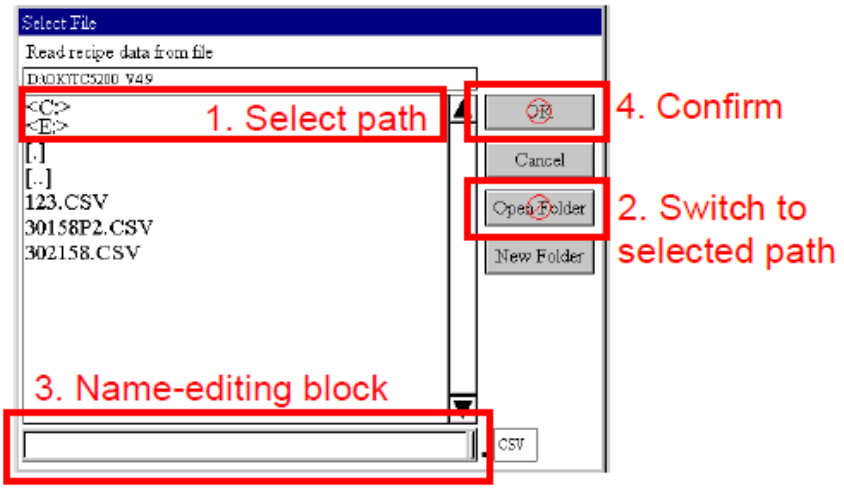
1	Brightness	Adjust the screen brightness.
2	Temperature Unit	Celsius(°C)/Fahrenheit(°F).
3	Language	Traditional Chinese/English.
4	Login	Input a password to enter the corresponding management level.
5	Logout	Leave the management level of the login.
6	Date-Time	System date and time settings.
7	Password Management	Manage passwords for corresponding level.

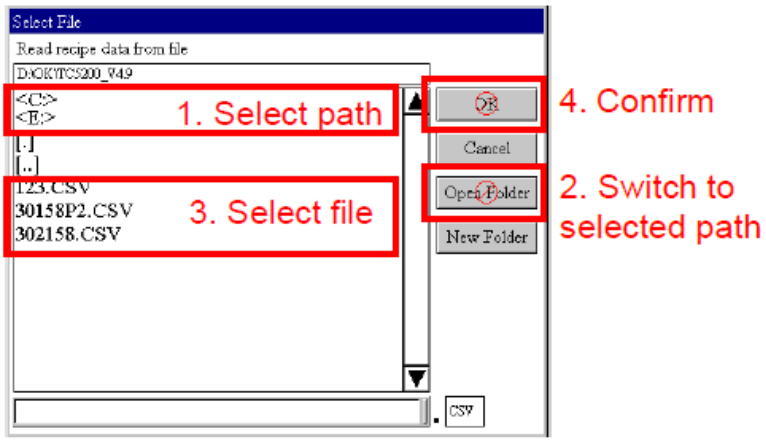
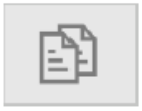
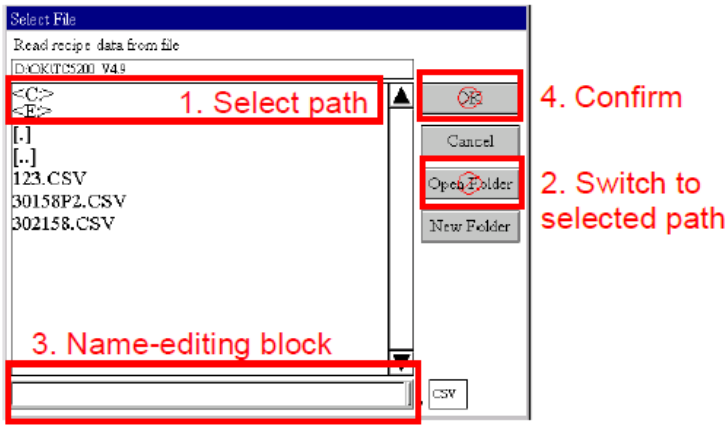
⑧	Curve record	 1 Zone selected. 5 ℃ Temperature range: Selectable display temperature range. (5°C→10°C→20°C→50°C→100°C→200°C→5°C) 30 Min. Time interval: Selectable display time interval. (1 min → 10 min → 30 min → 1 hour → 2 hours → 3 hours → 4 hours →1 min) Next page. Time Axis Control: Move to the end. Time Axis Control: Move to the front. Time axis control: Reverse(Longer). Time axis control: Forward(Longer). Time axis control: Reverse. Time axis control: Forward.

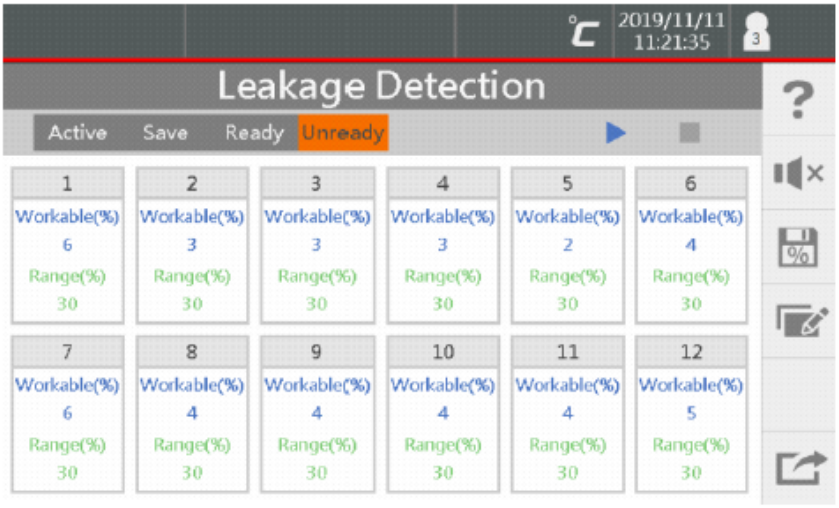
⑨	Synchronisation	 Synchronous heat up and cool down function selection.
⑩	Power status	  Tri-phase balance efficiency is calculated using the loads of each phase in the electrical system. The user can use the tri-phase balance efficiency to adjust the heater configuration. Tri-phase balance reduces power loss.

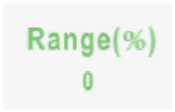
⑪	Diagnosis	  Start Temperature.: Set up the starting temperature of self-diagnosis. If zone's temperature is higher than the starting temperature, system will wait for the temperature which is lower than the starting temperature and then perform self-diagosis. Rising Temperature.: the rising value of the temperature after heating during diagnosis. Delay Time: The interval time of the diagnosis of each zone. 

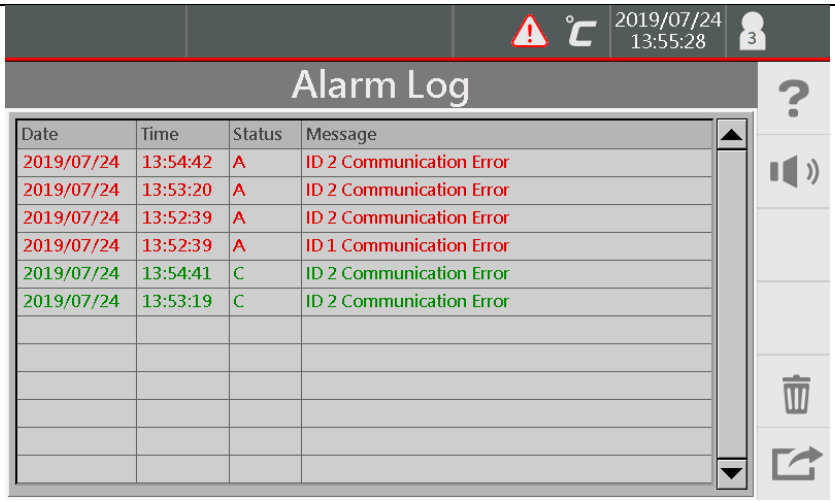
⑪	Diagnosis	 Zone / Amp / TC / HT / Fuse / TRIAC / Wire 1 1 0.0 OK OK OK OK OK 2 2 0.0 OK OK OK OK OK 3 3 0.0 OK OK OK OK OK 4 4 0.0 OK OK OK OK OK 5 5 0.0 OK OK OK OK OK 6 6 0.0 OK OK OK OK OK 7 7 0.0 OK OK OK OK OK 8 8 0.0 OK OK OK OK OK 9 9 0.0 OK OK OK OK OK 10 10 0.0 OK OK OK OK OK 11 11 0.0 OK OK OK OK OK 12 12 0.0 OK OK OK OK OK
⑫	Mould Management	  Load File Select path of the file to load, then press "Open Folder" to switch to the path. <C:> HMI local disk <E:> USB drive Select the required file, then press "OK" to load the stored parameters into the HMI and write them to the mold's zone parameters.

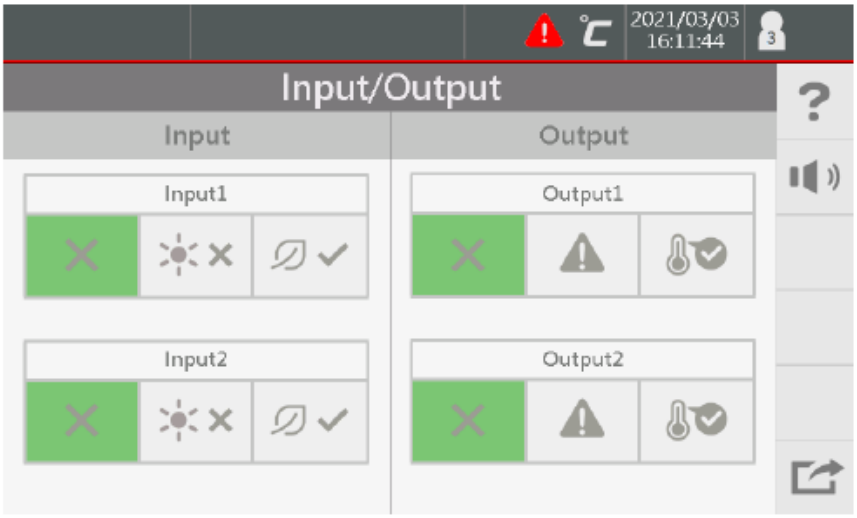
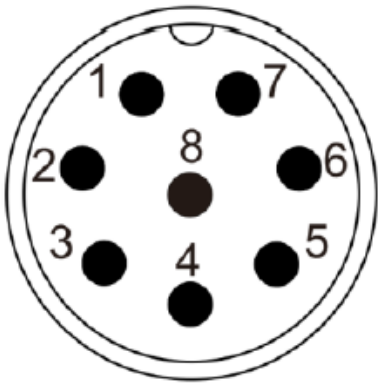
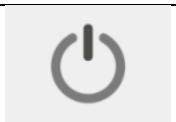
⑫	Mould Management	※Here the file name is the name of the working mold   Save File Select the path of the file to store, then press "OK" to switch to the path. Select the name-editing block (blank area) at the bottom of the window. After renaming it, press "Ent" and then "OK" to save. Or just select the original file, then press "OK' to overwrite.   Delete

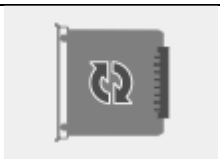
⑫	Mould Management	Select the path of the file to delete, then press "OK" to switch to that path. Select the file to delete, then press "OK".   Copy File Select the path of the file to copy, then press "OK" to switch to the path. Select the file to copy, then press "OK". Press  Select a path to paste the copied file, then press "OK" to switch to the path. Select the name-editing block (blank area) at the bottom of the window. After renaming it, press "Ent" and then "OK" to save. 

⑬	Leakage Detection	 Active Leakage detecting Save Save detection parameters. Ready Ready (Stable temperature) Unready Unready (Unstable temperature) Synchronize to set all zones leak alarm detection range (%). Start leakage detection Stop leakage detection Save parameter Range(%) 0 Set the zone leak alarm detection range individually.

⑬	Leakage Detection	Must confirm that the mold can be produced normally before setting this function parameter. Setting step 1. Must be press  when the mold is changed. Record the output energy of the zone. After the temperature is steady. system will display Save , system will automatically save the parameter and display Ready . This parameter will be the basis for the decision of leakage detection. 2. Set the zone leak alarm detection range:  All zones sync setting.  Single zone setting. The setting value of the leakage alarm range should be higher than 5% to avoid misjudgment. The recommended values are as follows; Manifold: 5~10% Tip: 5~20% 3. Press  to start leakage detection and the system will display Active .

⑭	Alarm Log	 Date: Date of alarm log, select column title to sort by date. Time: Time of alarm log, select column title to sort by time. Status: Alarm change status, select column title to sort by status. Message: Detailed alarm message.  Clear alarm log.
⑮	Operating Log	  Clear operating log.

⑯	I/O explanation	   PIN 1---IN1+ (Red) PIN 2---IN2+ (Whitr) PIN 3---IN1- (Green) PIN 4---IN2- (Black) PIN 5---OUT1 (Yellow) PIN 6---OUT1 (Blue) PIN 7---OUT2 (Orange) PIN 8---OUT2 (Brown) Input signal-----DC24V Output signal-----Relay
⑰	Safe Shutdown	 If the operators want to turn off the power of machine controller, we can click this button to save the data completely before the HMI stops working.

⑱	HMI programs update	 After updating the operating system's and application's programs from USB drive, the original programs and HMI data will be replaced by the new programs.
⑲	Module programs update	 Update firmware programs from USB.

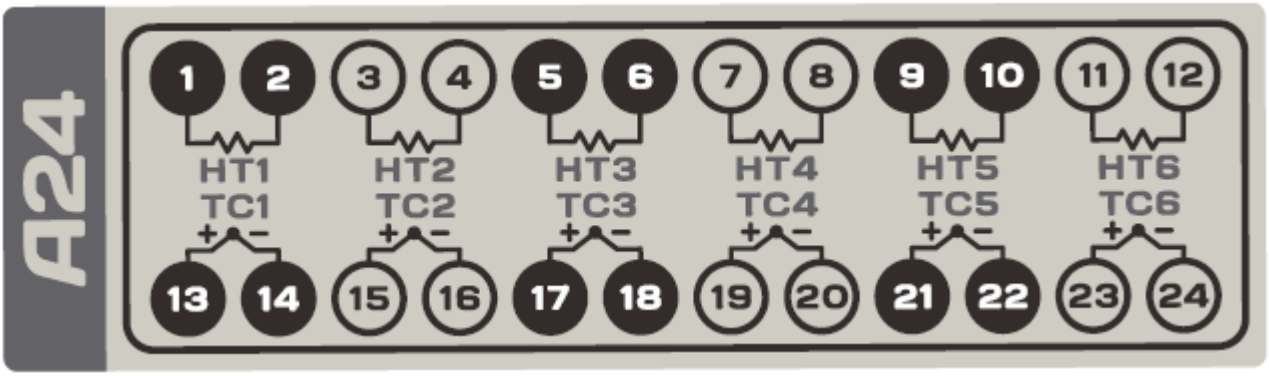
7. Troubleshooting

Problem	Check
Nothing happens after turning on power.	• Is the main power on? • Check if power cable (wiring) is connected properly
No communications.	• Is the control module loose? • Is the control module broken?
Unstable temperature control.	• See 6.2 Set ST mode to “Every” • See 6.2 Set AT mode to “On”
Thermocouple breaks alarm.	• Is the thermocouple damaged or broken? • Is the wiring loose?
Thermocouple reversed alarm.	• Is the thermocouple wiring wrong?
Thermocouple short alarm.	• Is the thermocouple damaged or short circuited? • Is the module wet or is there condensation on it? • Is there any foreign matter on the PCB?
Heater over load alarm.	• Check if the load specifications meet the specifications • Turn on soft start function • Set the zone output limit
Heater short alarm.	• Is the heater damaged or broken? • Is the module wet or is there condensation on it? • Is there any foreign matter on the PCB?
Heater (loop) break alarm.	• Is the heater damaged or broken? • Is the wiring loose?
TRIAC short alarm	• Replace the output module

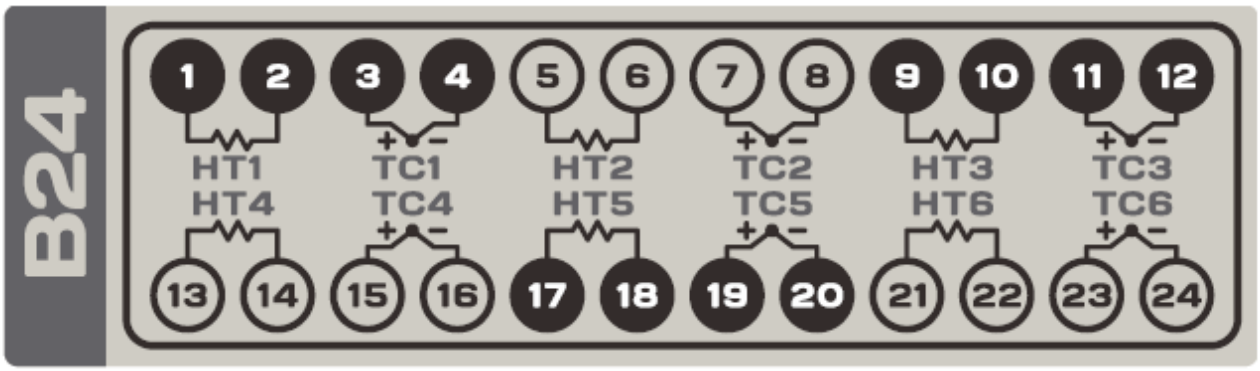
Abnormal temperature increase alarm	• Are the heaters properly installed? • Are the thermocouples properly installed
Fuse break alarm.	• Replace fuse for that zone
Leakage detection alarm.	• Check if the mould is leaking • Check if the leakage detection setting is suitable.

8. Connector wiring

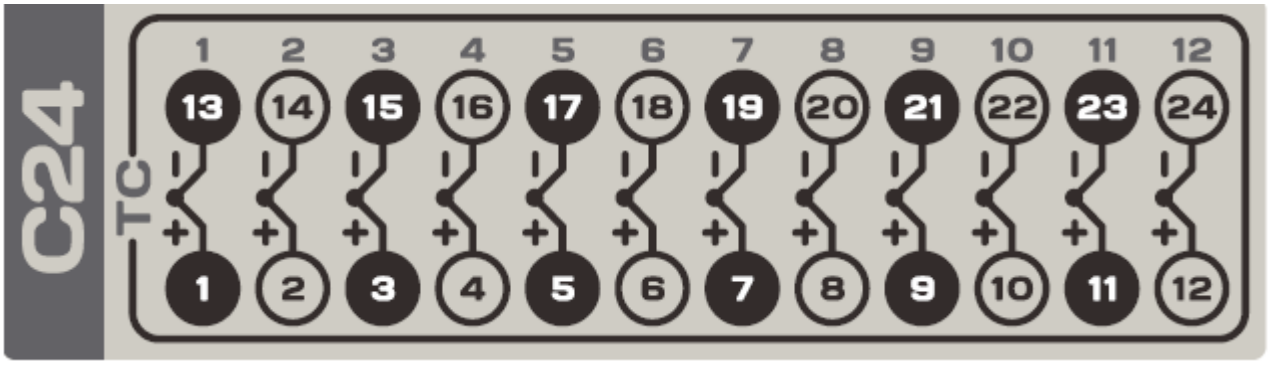
8.1. Connection type A

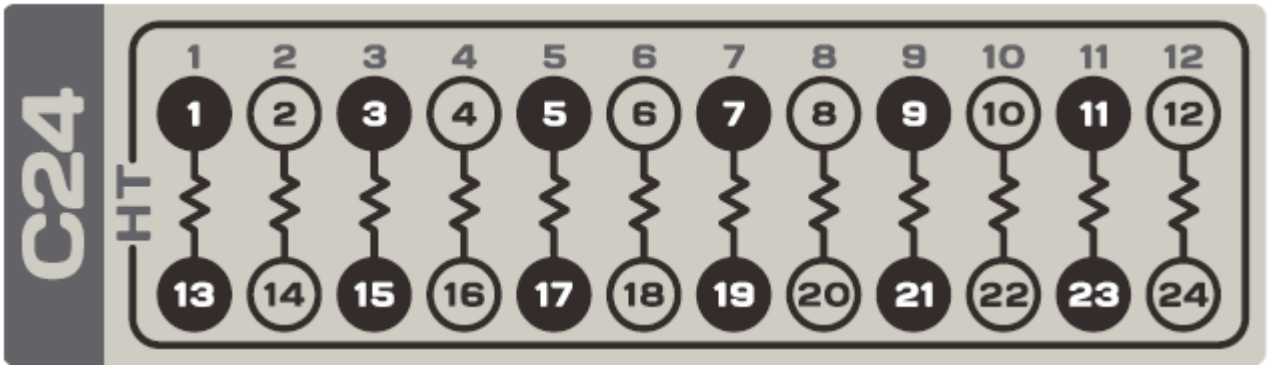


8.2. Connection type B



8.3. Connection type C



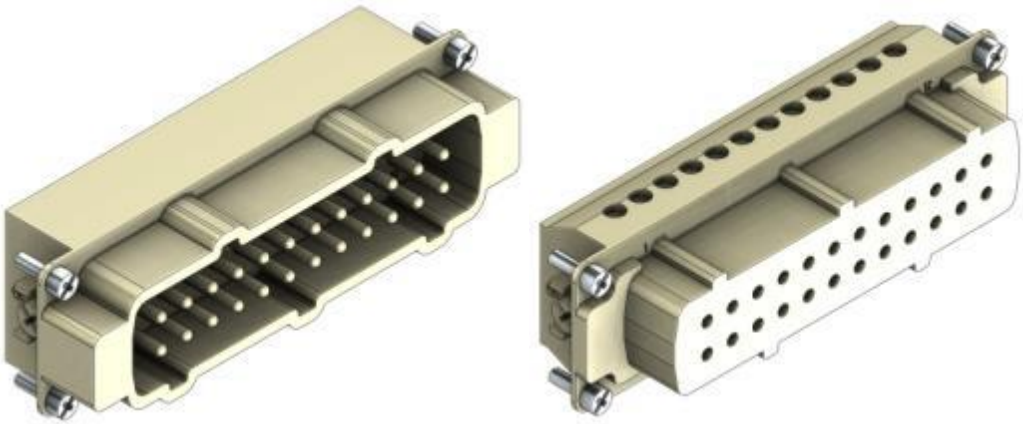


9. Optional accesories

Extension cable:

USB flash drive:

Multi-pole connector



Change log

Date of change	Change	Version
04-08-2023	Product release	001