mastip™
hot runner solutions

Meticom TC5100 / TC5200 Temperature Control System User Guide

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1.1 Safety

Mastip products are designed to be safe and simple to operate. When operating any electrical / electronic equipment, ensure the correct safety standard procedures are observed to protect yourself and the equipment. Always ensure that all wiring complies with local regulations.

Mastip Technology recommends that you:

1. Do not apply voltage to a controller that exceeds the specified rating.
2. Do not operate this controller without its covers and panels.
3. Do not operate this controller when wet.
4. Do not operate this controller in an explosive and corrosive atmosphere.
5. Do not use any power supply configuration that is not within the limit specified.
6. Use only correct fuse type specification.

1.2 Installation Environment

To ensure the safe and effective operation of the TC5100 / TC5200 Hot Runner Temperature Controller, please read through this user manual carefully before operating and follow the warnings and instructions provided.

Precautions before use:

1. The contents of this device require special equipment; any installation or repairs must be performed by a trained and qualified electrical technician. Please contact Mastip for repair's or further information.
2. The temperature controller must be installed on a flat, stable floor in a well-ventilated area. Avoid humid, dusty or high-temperature environments. Where rollers are used, ensure they are locked after installation to avoid any movement.
3. Ensure the power supply matches the power configuration, voltage and current draw of the controller before connecting the TC5100 / TC5200 temperature controller to the power supply. Using a power supply that does not meet specifications may lead to electrocution of personnel or damage to equipment.
4. Check that the TC5100 / TC5200 temperature controller, mold power and thermocouple cable wiring are compatible with the mold wiring configuration before connecting. Incompatible connection configurations may lead to electrocution of personnel or damage to equipment.
5. Before turning on the mains power switch for the TC5100 / TC5200 temperature controller, ensure the system ground (FG) is properly connected. Improper grounding may lead to electrocution of personnel or damage to equipment.
6. If the Over Voltage Source (OVS) light is lit then the power supply's voltage is too high (>280Vac), immediately turn off and disconnect the mains power supply and have a trained electrical technician diagnose the power supply issue.
7. Ensure the temperature controller cooling fan is working, clean and not blocked.
8. If there are any signs of electrical issues during operation immediately turn off the mains power switch and disconnect from the power supply, and have a trained electrical technician conduct an inspection and diagnosis. Do not connect to the mains power or turn on the mains power until the problem is resolved.
9. The temperature controller may only be maintained by trained electrical technicians. The main power switch must be turned off and the unit disconnected from the mains power supply before maintenance is performed.

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10. Storage Temperature: -20°C ~ 70°C (-4°F ~ 158°F)
    Operating Temperature: -10°C ~ 50°C (14°F ~ 122°F)
    Operating Humidity: 0~80% RH (non-condensing).

1.3 Cables

To keep the entire hot runner system in working order, the user must perform the following checks before connecting the temperature controller with the mold:

1. Confirm the mains power cable is not damaged and is securely connected.
2. Confirm the temperature controller and mold are properly grounded.
3. Confirm the power and thermocouple cables between the temperature controller and mold are not damaged, and that the cable wiring configuration matches the temperature controller and mold wiring configurations.
4. Confirm the temperature controller and mold power and thermocouple cables are connected correctly and connector latches are locked.
5. Confirm the temperature controller mains power switch is set to "OFF" before connecting the mains power supply.

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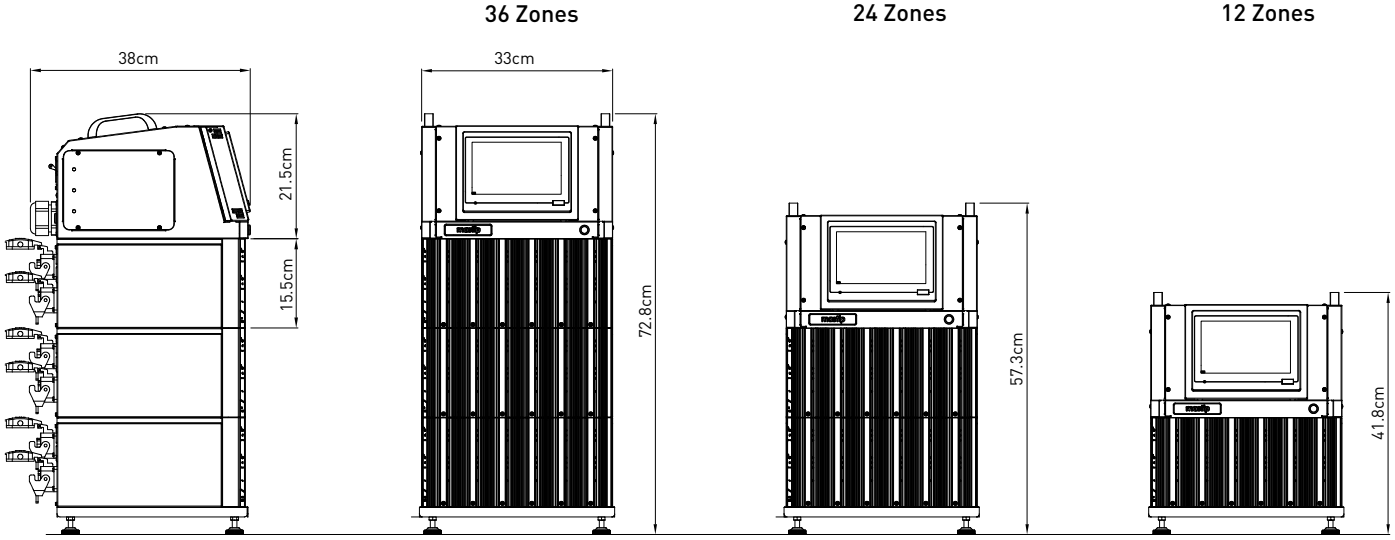
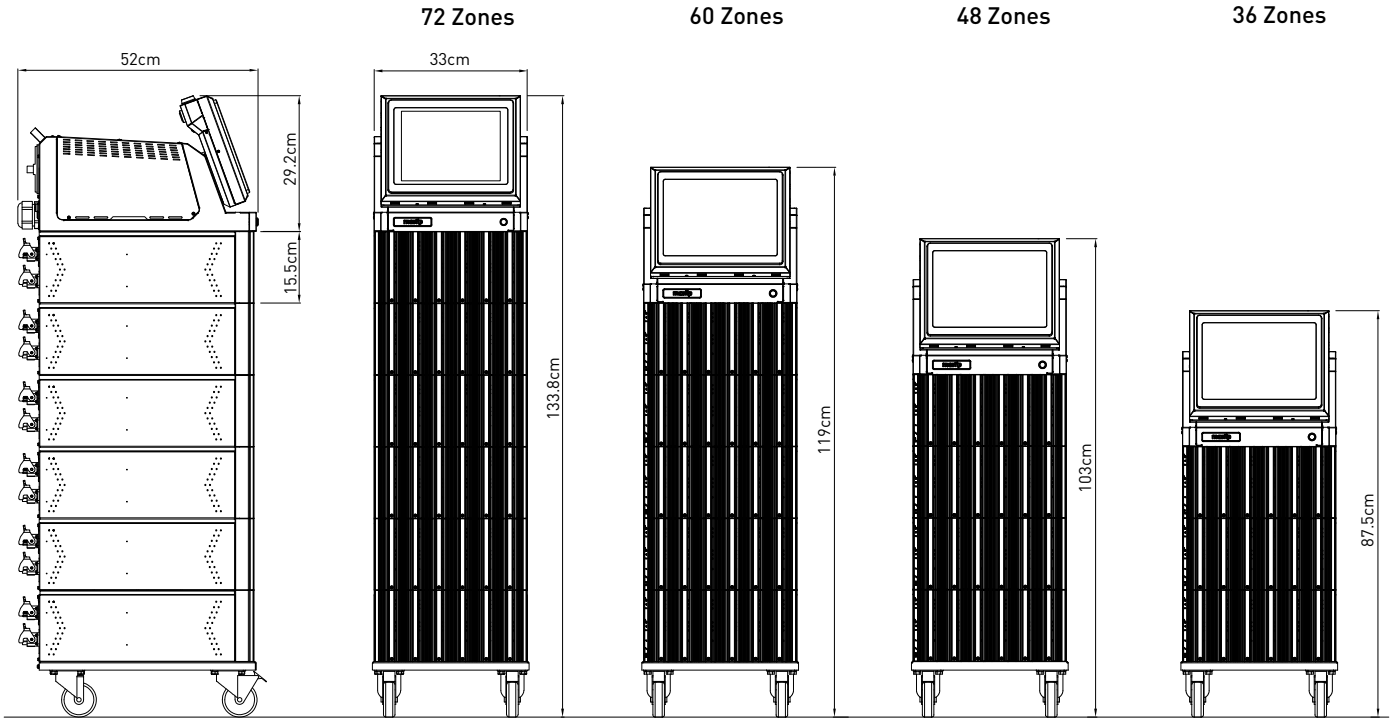
2.1 TC5100 System Size



2.2 TC5200 System Size



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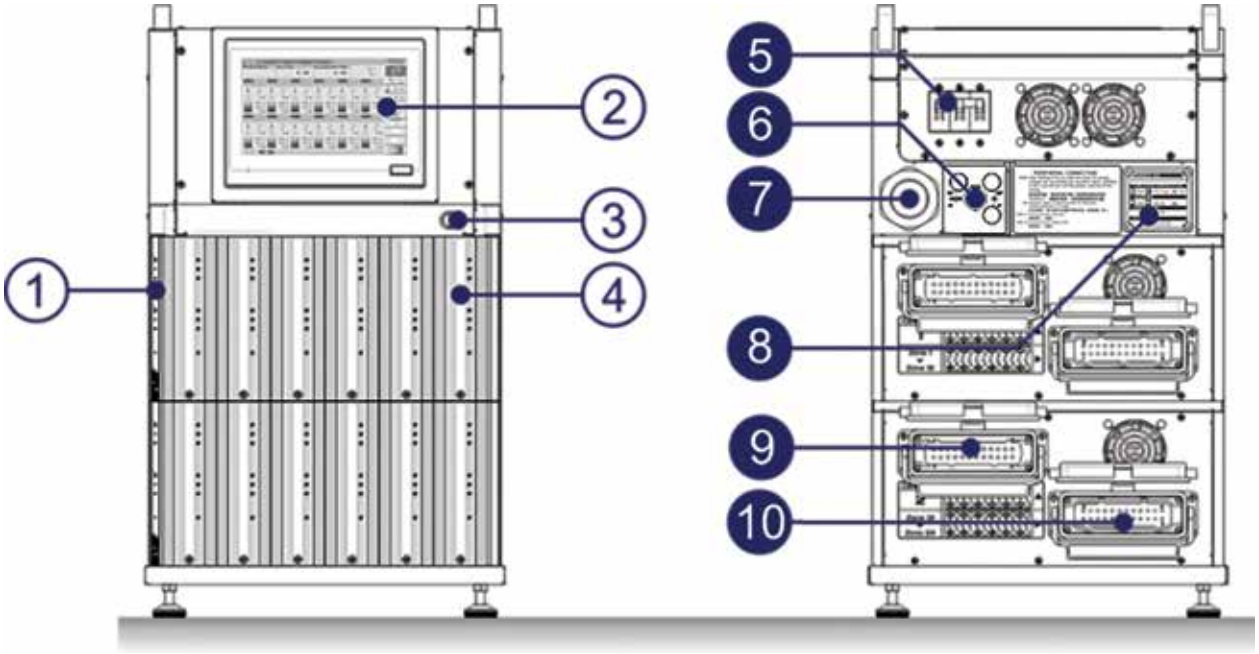
2.3 TC5100 System Layout

Front view

Rear view



1. Zone marking
2. Interface Unit (HMI)
3. Power indicator
4. Temperature control module
5. Main power switch / NFB
6. Overvoltage source indicator (OVS)
7. Power Cable
8. Machine name plate
9. Multi-pole connector 1
10. Multi-pole connector 2

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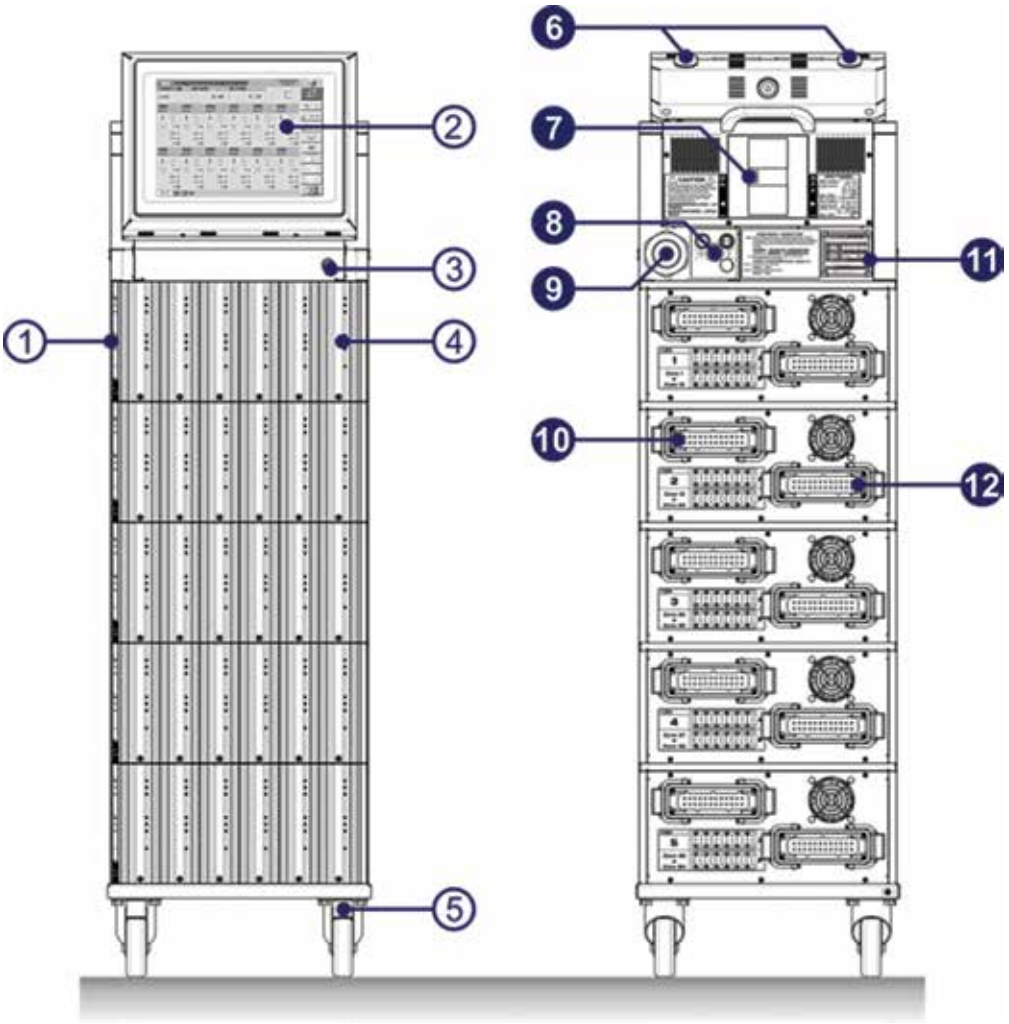
2.4 TC5200 System Layout

Front view

Rear view



1. Zone marking
2. Interface Unit (HMI)
3. Power indicator
4. Temperature control module
5. Lockable roller
6. System status indicator
7. Main power switch / NFB
8. Overvoltage source indicator (OVS)
9. Power Cable
10. Multi-pole connector 1
11. Machine name plate
12. Multi-pole connector 2

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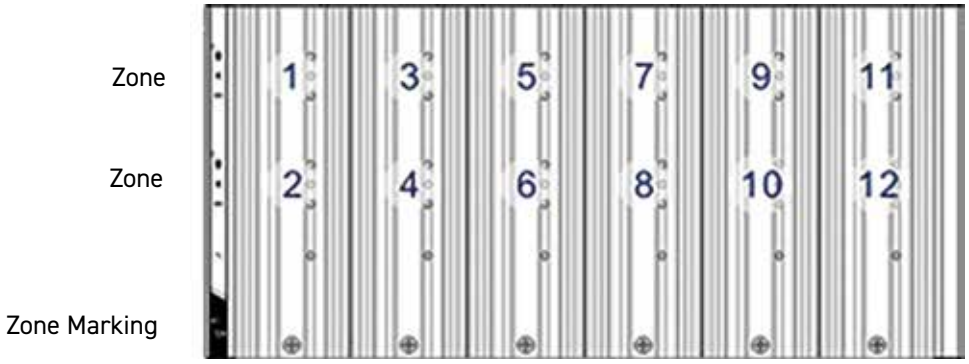
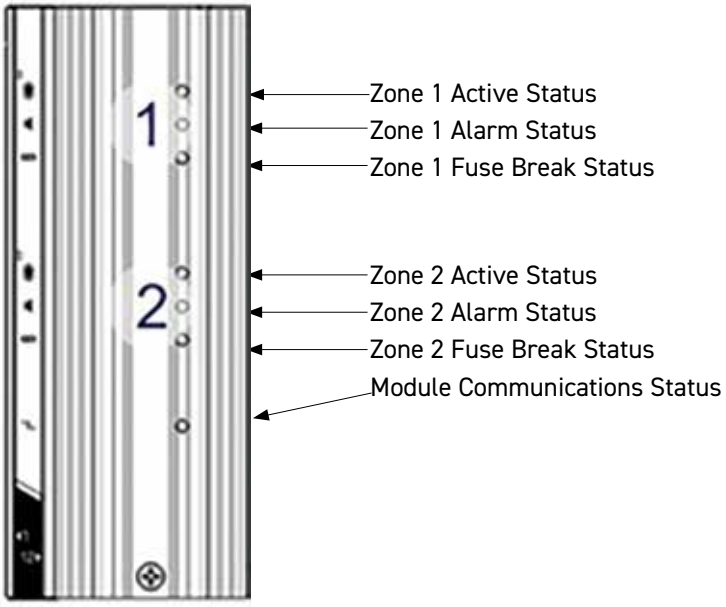
2.5 Module Zone Layout

The layout of the zones in each Temperature Control Module layer is shown below. Multiple Temperature Control Module layers are automatically numbered from top to bottom layer.



Each module contains LED lights for simple assessment of each zone and module status.



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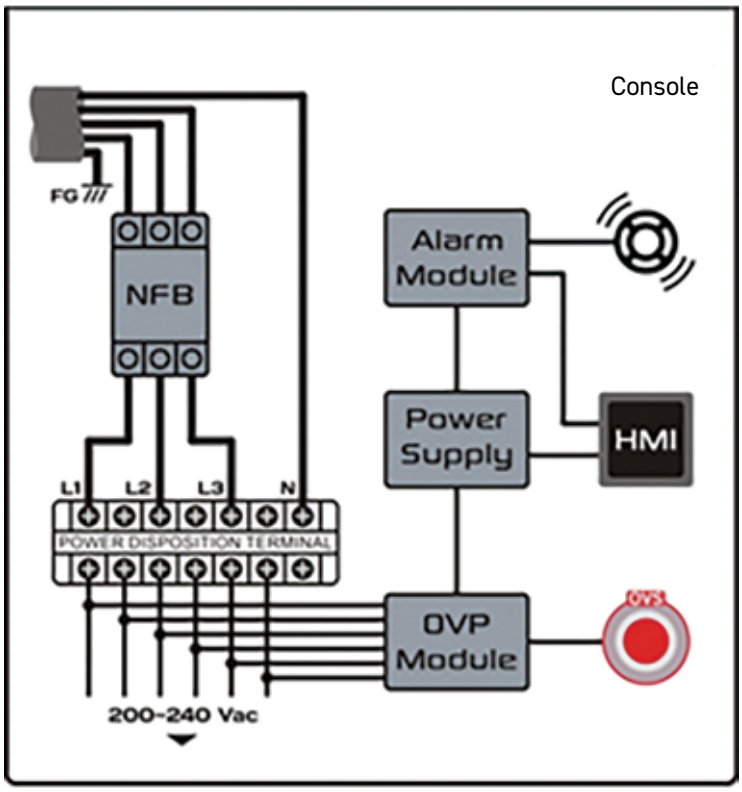
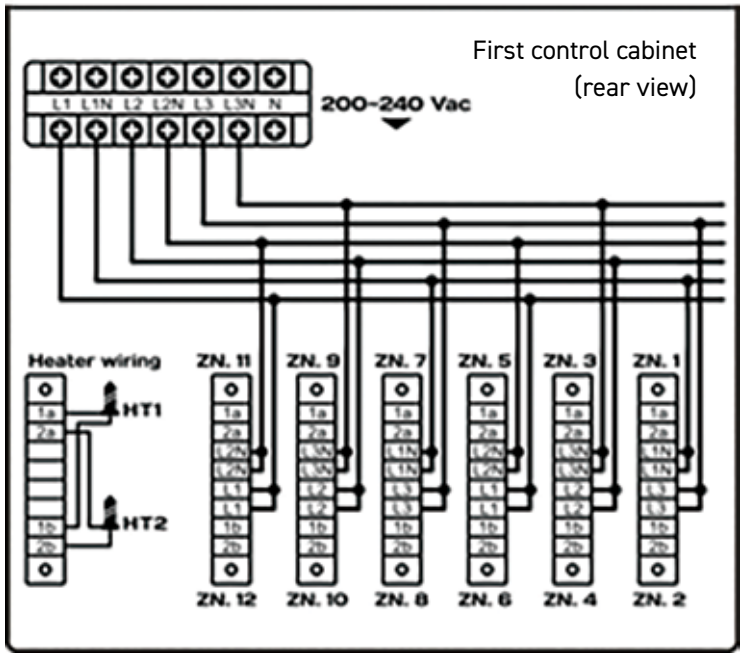
2.6 TC5100 Electrical Diagram

System Wiring Diagram



Control Cabinet Wiring Diagram



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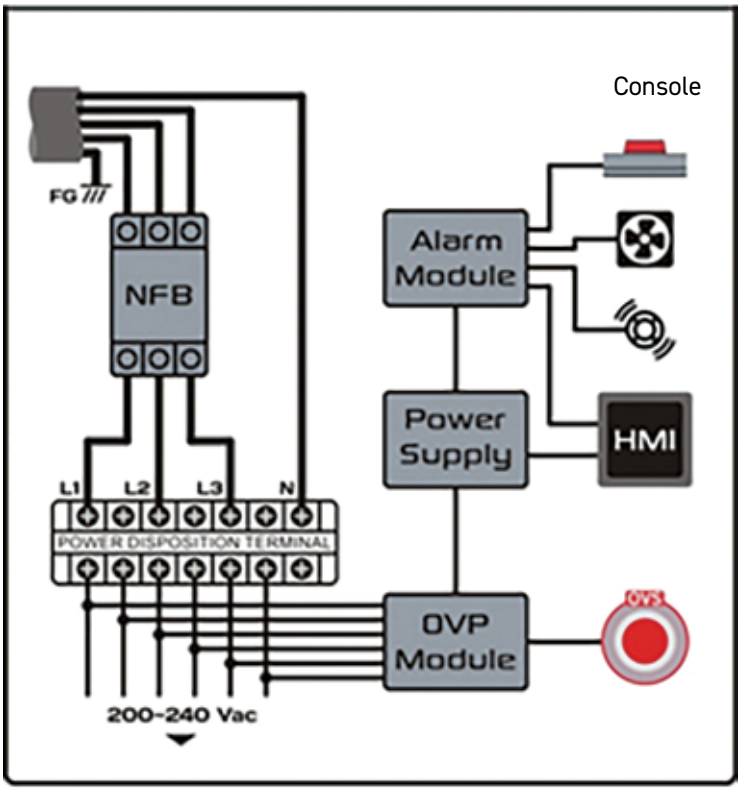
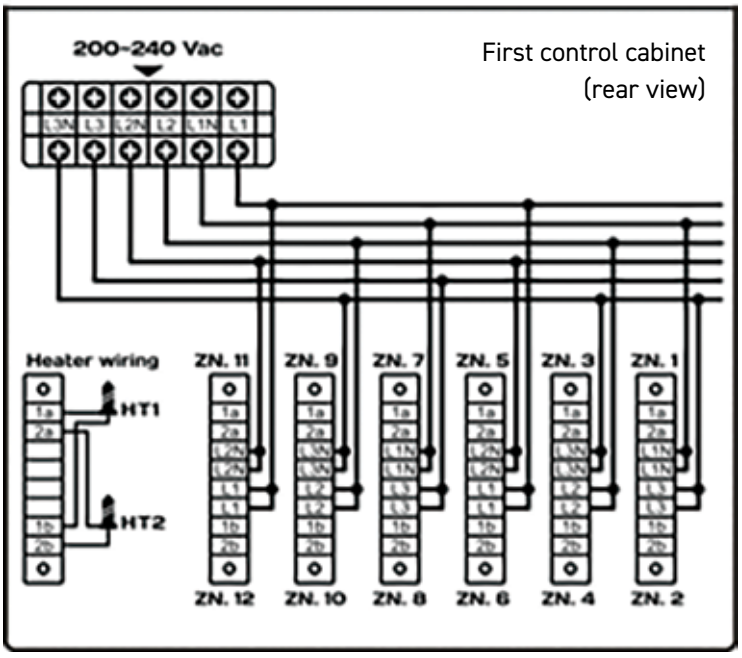
2.7 TC5200 Electrical Diagram

System Wiring Diagram



Control Cabinet Wiring Diagram



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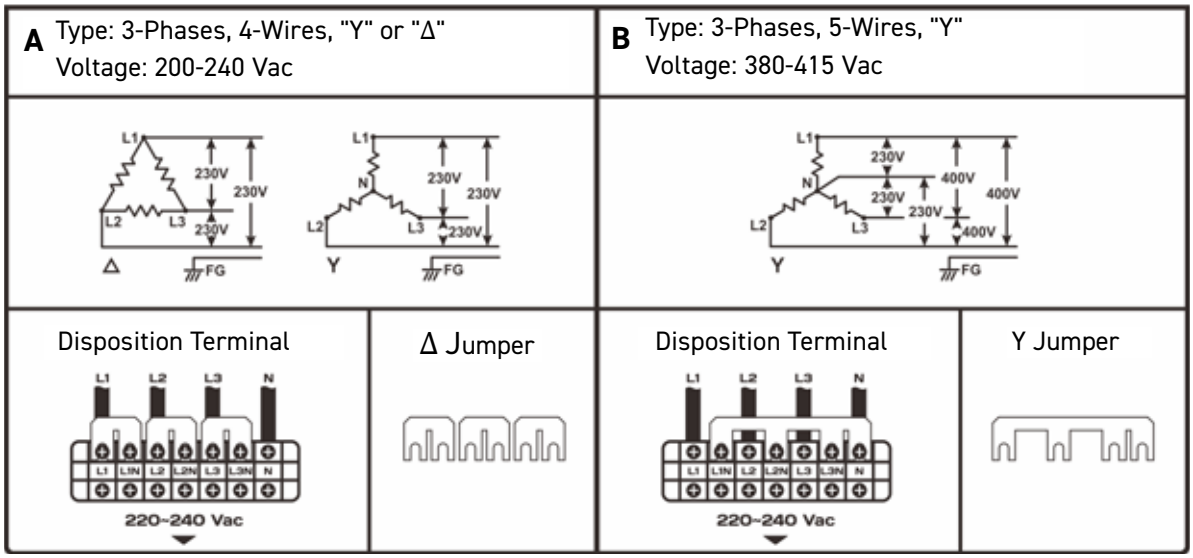
2.8 Power Supply Configuration

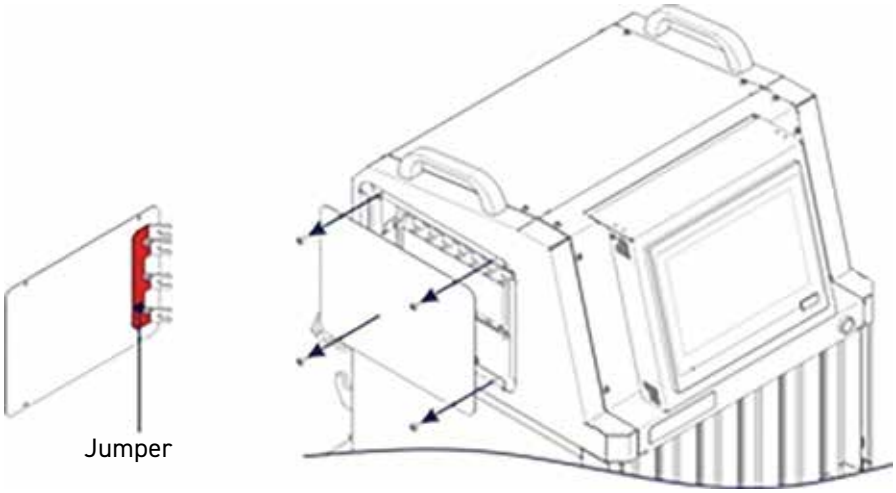
The TC5100 / TC5200 temperature controller can be connected to either 3-phase 4-wire Y / Δ type (230Vac) or 3-phase 5-wire Y type (415Vac) mains power supplies. Each controllers power configuration can be changed to suit the supply, ensuring the power that is delivered to each layer and zone in the control cabinet is correct. Any changes to the power configuration must be carried out by trained electrical technicians.

Power Supply Configuration



2.9 TC5100 Y / Δ Power Configuration

To change the power configuration on the TC5100 temperature controller, remove the side panel. Use the jumpers attached to the inside panel to set the configuration required as shown in the above diagram.



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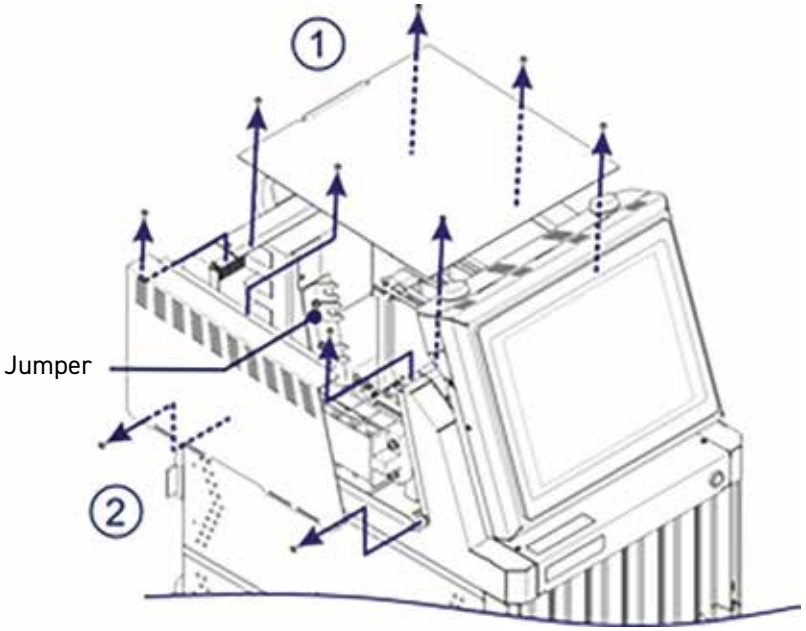
2.10 TC5200 Y / Δ Power Configuration

To change the power configuration on the TC5200 temperature controller, remove the top cover and side panel. Use the jumpers attached to the inside rack to set the configuration required as shown in the above diagram.



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3.1 General Features

- Up to 120 zones of temperature control
- Automatic PID control or manual percentage power per zone
- Simple to use Interface Unit (HMI)
- Power usage display per zone
- Selectable temperature scales (°C / °F)
- J or K type thermocouple per zone
- Multiple zone setup function
- Power phase balance detection and display
- Overvoltage Protection
- Easy power configuration setup
- Synchronous Heating or Timed Warming functions
- Synchronous Cooling function
- Automatic heater detection and monitoring
- Automatic thermocouple detection, monitoring and break behaviour
- Easy mold and module diagnostics
- Automatic return to stop mode after power interruption
- Easy service and maintenance
- Audible alarm with 6 modes
- Selectable Power Trigger Mode (Phase Angle / Zero Cross)
- Save / Load programs to internal memory or external USB drive

3.2 Power Output Detection and Diagnostics

The TC5100 / TC5200 temperature controllers are equipped with convenient power output diagnostic functions to help reduce mold setup and maintenance times. The diagnostic functions provide the user with a simple way to troubleshoot common temperature controller and mold operation issues, such as:

- Heater: Short / Break / Overload
- Thermocouple: Short / Break / Reverse
- TRIAC: Short
- Fuse: Open Circuit

When the temperature control module detects a potential issue, it will automatically cut the power output to help prevent risk of harm.

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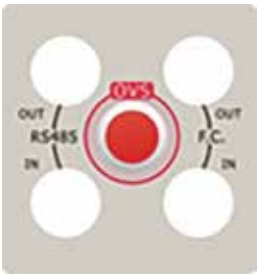
3.3 Overvoltage Protection

The controller utilises power overvoltage protection to reduce the risk of supplying the modules with the incorrect voltage. After the mains power is turned on check the "Overvoltage Source (OVS)" light on the rear of the cabinet. If the OVS light is lit, then the voltage delivered to one of the control cabinets is connected incorrectly and exceeds 280Vac. The temperature controller mains power must be turned off immediately and the power input and configuration corrected.

Do NOT use the temperature controller if the OVS light is on!



3.4 Thermocouple Break Detection

If a thermocouple failure is detected in the system, the TC5100 / TC5200 temperature controllers are equipped with two optional thermocouple loop break (LB) behaviour modes. These behaviour modes can be used to allow production to continue, deferring maintenance until the end of the current production run:

- Manual Mode: During setup the break behaviour is set to Manual, and percentage power output for each zone pre-defined. If the thermocouple fails for that zone, the temperature control will automatically change to operate in manual mode.
- Slave Mode: During setup, mold cavities with similar operating conditions can be identified and the break behaviour for these zones can be set to Slave (copy) and another zone predefined. If the thermocouple fails, the temperature control for that zone will automatically change to copy the percentage power from the predefined zone. Slave mode is typically used where multi-cavity molds are producing the same product using the same hot runner configuration.

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3.5 Synchronous Heating and Timed Warming

Synchronous Heating and Timed Warming functions can be used to allow the system zones to arrive at the set temperature at a similar time. These functions help reduce excessive power consumption during the initial heat up on hot runner systems with high current draw creating an overload condition. Polymer residence time is also reduce preventing the polymer from degrading due to extended heating times.

- Synchronous Heating: Creates a lower percentage power for the nozzle heater zones controlled by the manifold heater zones. Independent temperature control is resumed when approaching the set temperature.
- Timed Warming: The manifold is heated to a pre-set temperature, then the nozzles are heated to their pre-set temperature. Independent temperature control is resumed when approaching the set temperature.

When activated the Synchronous Heating or Timed Warming icon will be shown at the bottom of the main menu.

3.6 Synchronous Cooling

Synchronous Cooling can be utilised during mold shutdown to allow all the zones to cool at a uniform rate. Synchronous Cooling helps to cool the mould at a more uniform temperature and can help to improve the service life of the hot runner and mold.

When activated the Synchronous Cooling icon will be shown at the bottom of main menu.

3.7 Control Mode Operation

Percentage Power operation uses a pre-set percentage of the maximum heater power output for each zone to operate the heaters, bypassing the PID control. When operating in Percentage Power mode any zones operating will display the “%” Percentage Power icon beside the corresponding Zone number.

3.8 Boost Operation

The Boost operation allows the user to temporarily increase the temperature by a preset amount specified for each zone. This feature can be used where a system may require an elevated temperature to start, and then lowered to the SV temperature when the mold is cycling normally. Zones with boost mode preset will display the "↑" Boost icon beside the corresponding zone no.

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3.9 Standy Operation

Standby operation allows the user to temporarily decrease the temperature by a pre-set amount specified for each zone. This feature can be used to allow the user to spend some time to complete any setup or modification to the operating parameters, or if the mold or molding machine needs to be stopped temporarily. Standby mode reduces the risk of the polymer in the runner system degrading if left at an elevated temperature for too long.

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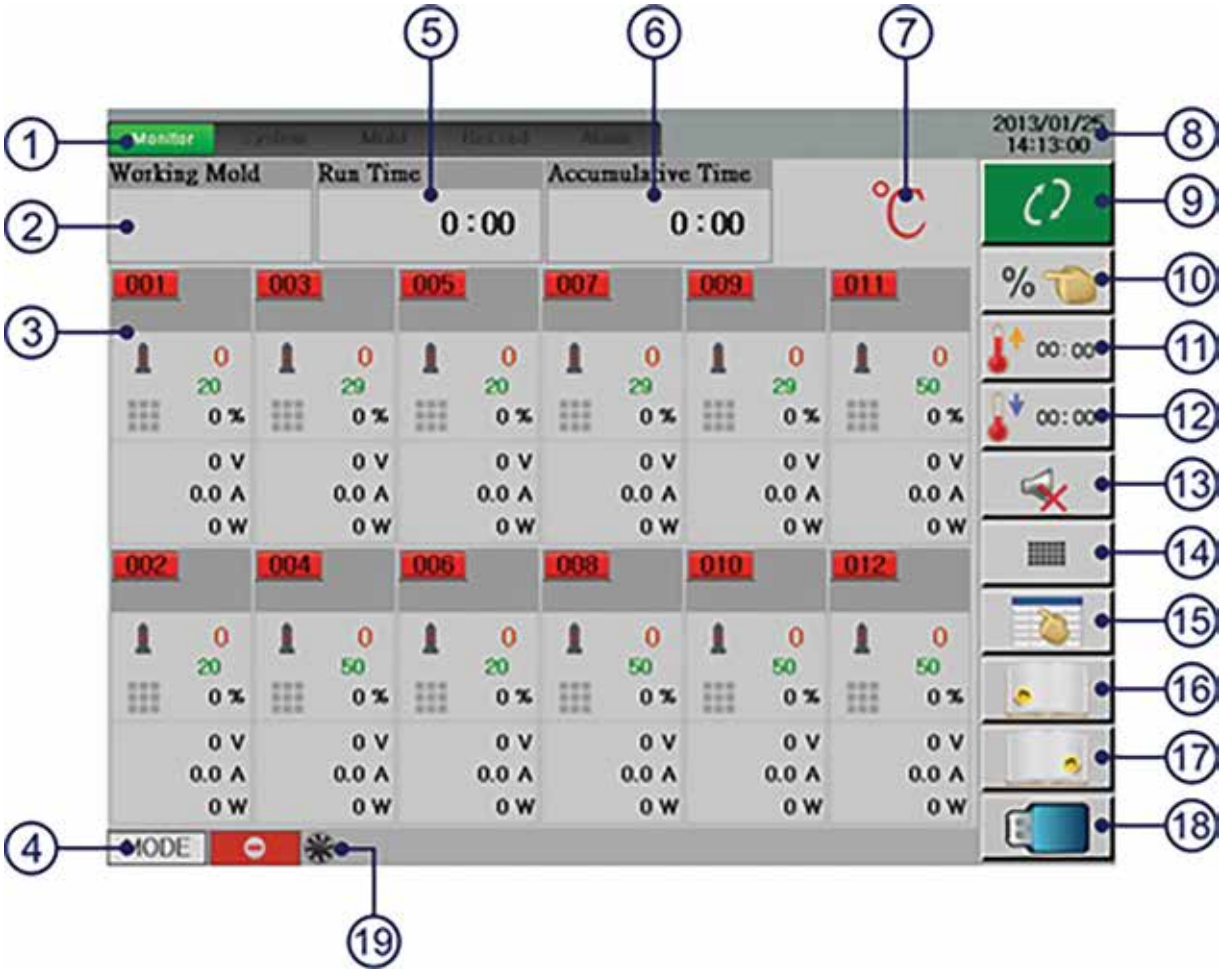
4.1.1 Monitor Menu Page



1. Main Menu Tabs
2. Working Mold Name
3. Zone Status
4. Current Operating Mode
5. Session Run Time
6. Controller Total Accumulative Run Time
7. Temperature Unit
8. Time and Date
9. Run / Stop Operation
10. Control Mode
11. Boost Mode
12. Standby Mode
13. Alarm On / Off
14. Zone Display
15. Zone Monitor Display
16. Previous Page
17. Next Page
18. Save Screenshot to USB
19. Fan Status (TC5200 only)

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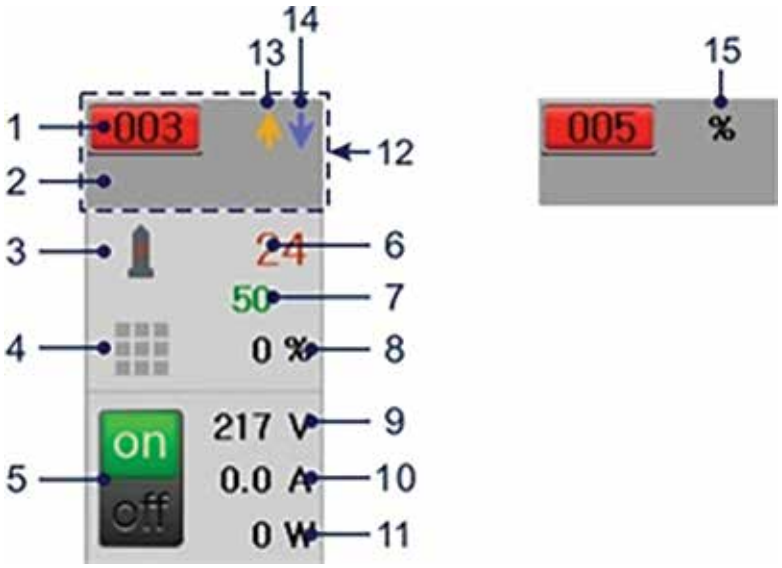
4.1.2 Zone Status Window

The Zone Status Window displays a basic overview of operation and performance for each zone on the Monitor main menu page. The layout allows for easy viewing of the status of each zone, as well as comparing multiple zones in the system.



1. Zone Number. Operational status is shown by the icon colour

Running (Green)

Boost (Orange)

Manual (Light Grey)

Stop (Red)

Standby (Blue)

OFF (Dark Grey)

2. Zone name
3. Heater type

Tip / Nozzle

Manifold

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4. Output power level
5. Zone switch: ON / OFF
6. Process value (PV)
7. Set value (SV) (temperature or percentage output)
8. Process percentage output power
9. Zone voltage
10. Zone amperage
11. Zone power consumption
12. Zone parameters
13. Boost operation
14. Standby operation
15. Control Mode operation

4.1.3 Start Stop Function

Run: Select to start controller operation

Stop: Select to stop controller operation

Synchronous Cooling: Select to start Synchronous Cooling operation (when set up)

4.1.4 Control Mode

To set control mode:

1. Login to the controller.
2. To set a single zone select the Zone Parameter Setup window. Change the Control Mode to Man (Manual) and set the power percentage required for that zone. Select the Confirm button to set.
3. If multiple zones are required to be set to Manual and the values are already set, then press the Control Mode icon and select the required zones. Select the Confirm button to set.

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4. If multiple values and zones are required to be set see Group Setup.

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4.1.5 Boost Mode

To operate Boost mode:

1. Login to the controller.
2. To set a single zone enter the Zone Parameter setup and set up the Boost TP increase temperature value.
3. If multiple parameters and zones are required to be set see Group Setup.
4. Press the Boost button and select zones required, set the amount of time to activate Boost Mode for, and then press "Confirm". Zones with Boost set will show the Boost icon

e zone no.

Select All

Clear Selection

Time Setting

Confirm

Exit

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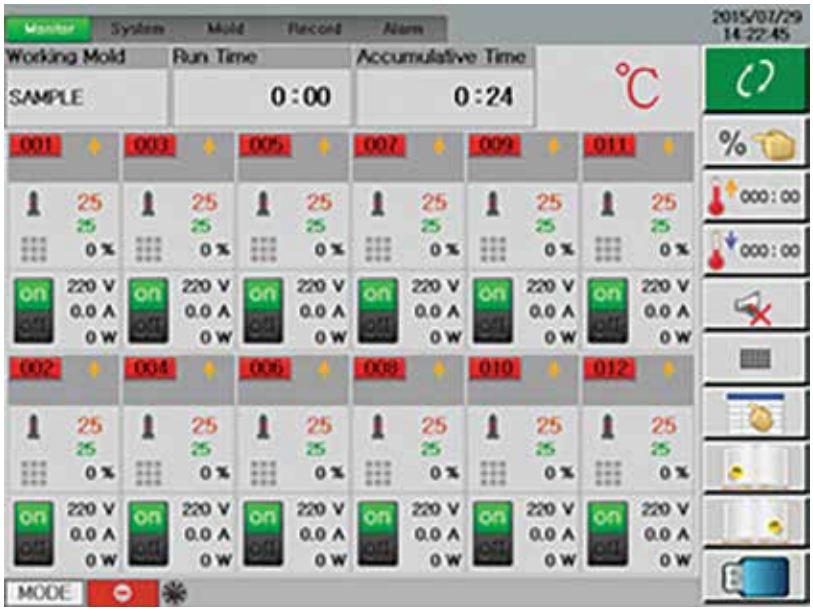
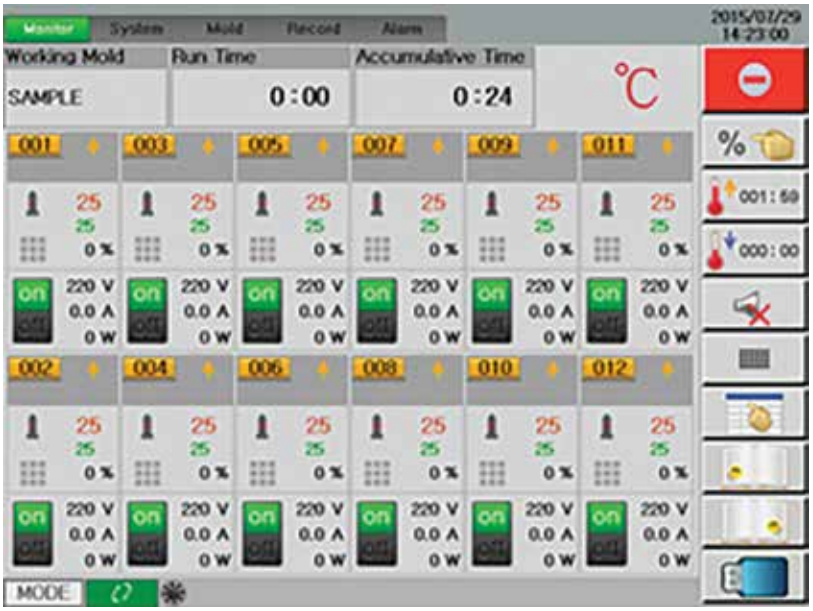


5. With the controller in Run mode, hold

or 4 seconds to turn on Boost mode. (The colour of the zone number will change to orange when boost mode is operating).



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4.1.6 Standby Mode

To operate Standby Mode:

1. Login to the controller.
2. To set a single zone enter the Zone Parameter setup and set up the Standby TP decrease temperature value.
3. If multiple parameters and zones are required to be set, see Group Setup.
4. Press the Standby button and select zones required, set the amount of time to activate Standy Mode for, and then press "Confirm". Zones with Standby set will show the Standby icon

one number.

Select All

Clear Selection

Time Setting

Confirm

Exit

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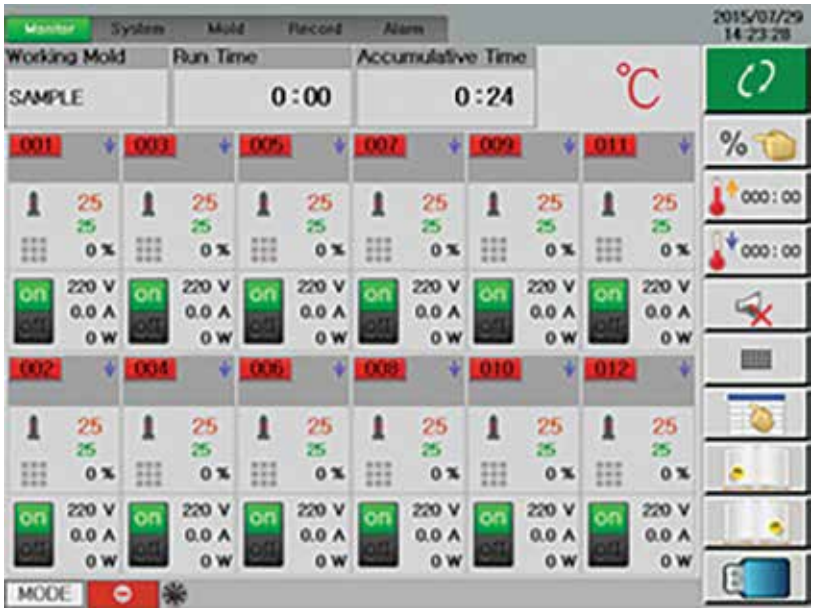
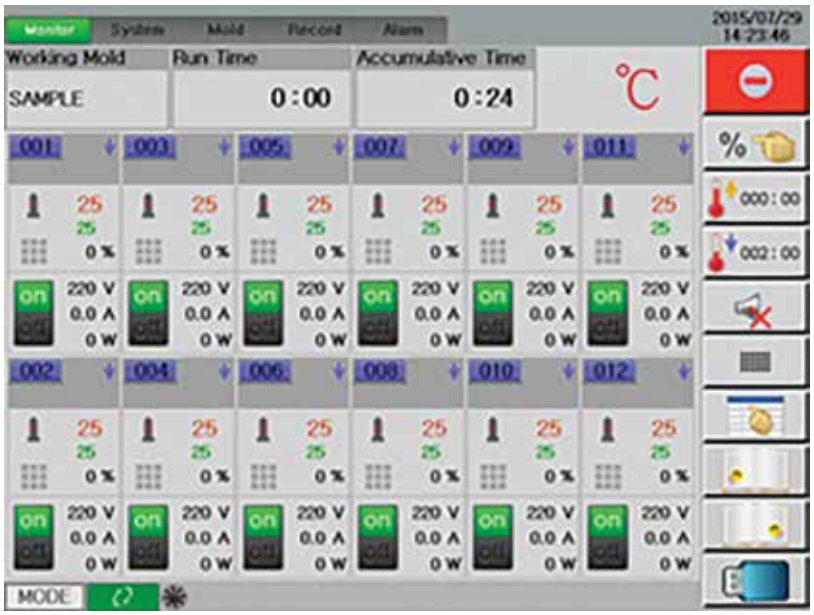


5. With the controller in Run mode, hold the

utton for 4 seconds to turn on Standby mode. (The colour of the zone number will change to blue when boost mode is operating).



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4.1.7 Audible Alarm

Press to turn on audible alarm.

Press to turn off audible alarm. (Note: alarm icon, error messages and module light will still be displayed when audible alarm is off).

4.1.8 Menu Page Format

Each press of the button changes the number of zones displayed in the Monitor tab.

4.1.9 Monitor Page Movement

Zone Selection: Choose the range of zones to display from the pop-up menu. (1 – 12; 13 – 24 etc).

Next Page: This button appears if the total numbers of zones exceed the maximum number that can be displayed in the Monitor page.

Previous Page: This button appears if the total numbers of zones exceed the maximum number that can be displayed in the Monitor page.

4.1.10 Save Screenshot to USB

When a USB Drive is inserted into the Interface Unit the USB drive button will appear. Press the USB Drive button to save a screenshot of the current page to the USB drive.

Note: The USB drive must be in either FAT16 or FAT32 format.

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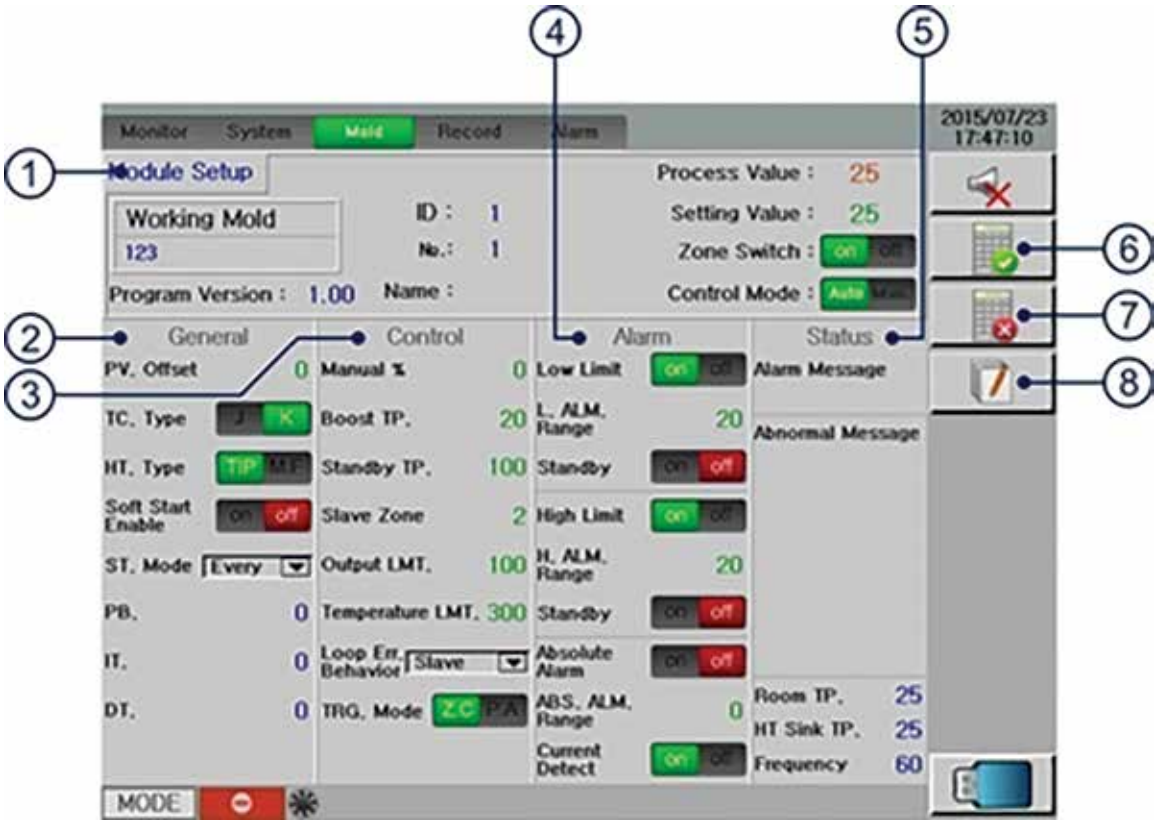
4.2.1 Zone Parameter Setup

For quick access to the Zone Parameter Setup touch the Zone Status Window next to the zone number

Normal Mode



1. Module Setup
2. General Parameter Setup
3. Control Parameter Setup
4. Alarm Paremeter Setup
5. Zone Status
6. Confirm Settings
7. Cancel Settings
8. Group Setup

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4.2.2 Module Setup

- Setting Value: The set value (SV) temperature
- Zone Switch: Activate the zone (On / Off)
- Control Mode: Auto (PID temperature control) or Manual (% power)

4.2.3 General Parameter Setup

- PV. Offset: Manual correction of PV temperature deviation
- TC Type: Thermocouple type (J / K)
- HT Type: Heating zone type [TIP / M.F. (Nozzle / Manifold)]
- Soft Start: Enable heater soft start function
- ST Mode: Enable Self-tuning mode (No / Once / Always)

4.2.4 General Parameter Setup

- Manual %: Set the Control Mode power output percentage
- Boost TP: Set the boost increase amount
- Standby TP: Set standby decrease amount
- Slave Zone: Set the zone to slave to in the event of a thermocouple failure
- Output LMT: The maximum output percentage can be set for each zone to minimise total power overload. (0~100%)
- Temperature LMT: The maximum set temperature can be set to minimise accidentally setting over temperature SV. [Default is set to 400°C (750°F)]
- Loop Err. Behaviour: Thermocouple Loop Break Behaviour (Stop / Manual / Slave)
- TRG Mode: Power Trigger mode [Z.C. (Zero cross) / P.A. (Phase angle)]

4.2.5 Alarm Parameter Setup

- Low Limit: Alarm activation when PV drops below the “L.ALM Range” temperature tolerance (On / Off)
- L. ALM. Range: Maximum below temperature deviation
- Low Standby: No activation of Low Limit Alarm the first time that PV is lower than "L. ALM. Range" tolerance
- High Limit: Alarm activation when PV increases above the "H. ALM. Range" temperature tolerance (On / Off)
- H. ALM. Range: Maximum over temperature deviation
- High Standby: No activation of High Limit Alarm the first time that PV is higher than "H. ALM. Range" tolerance
- Absolute Alarm: Alarm activation when the PV is higher than the specific temperature set at "ABS. ALM. Range"
- ABS. ALM. Range: A specific temperature for the alarm to activate
- Current Detect: Temporarily disable the current detection alarm when the current sensor has failed. (Not recommended)

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4.2.6 Zone Parameter Status

The Zone Parameter Status window displays information about any alarms or abnormal behaviour found in each zone. This can be used to identify and troubleshoot any issues that may be found in the system. Typical messages found are:

Alarm Message:

- Lower limit alarm
- Absolute alarm
- Higher limit alarm

Abnormal Message:

- Thermocouple break
- Control loop break
- Thermocouple reversed
- Memory read / write error
- Thermocouple short
- Abnormal temperature increase
- Heater overload or short
- Fuse Open Circuit
- TRIAC short or Heater ground anomaly

The Module status window also displays information about the general operating conditions of the module:

Room TP.: Ambient temperature of control module

HT Sink TP.: Temperature of control module's heat sink.

Frequency: Power supply frequency

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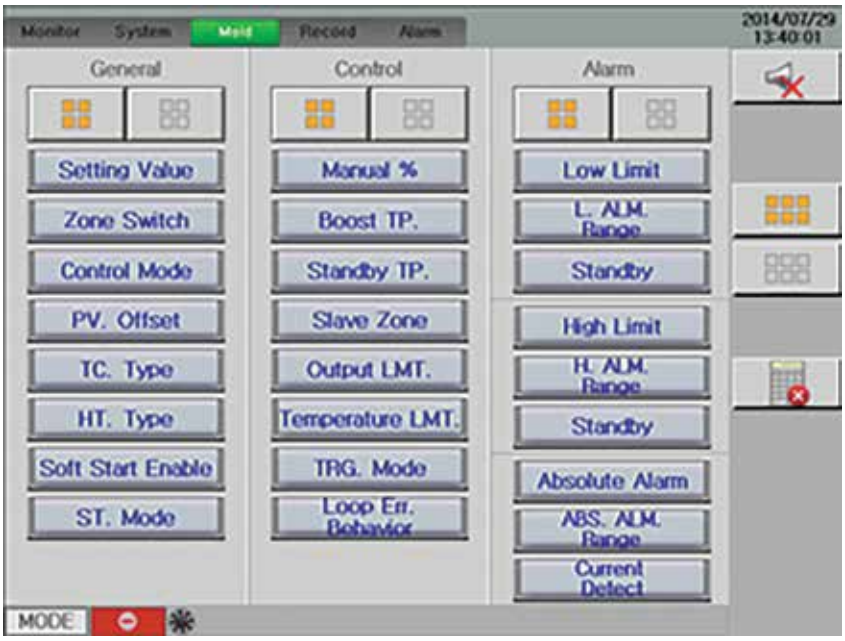
4.2.7 Group Setup

To quickly set up zones with the same parameters, multiple zones can be set at the same time using a pre-set single zone:

1. Login to the controller
2. Go to the Mold menu page, select Module Setup and select the zone to copy the settings from.
3. Select the Group Setup button .
4. Select all the parameters you want to copy to the other zones.
5. Select "Confirm".
6. Select the zones to copy the parameters to and select “Confirm” to complete the group setting.



Partial Select All

Partial Clear Selection

Select All

Clear Selection

Confirm

Selection Exit

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Select All

Clear Selection

Confirm

Exit

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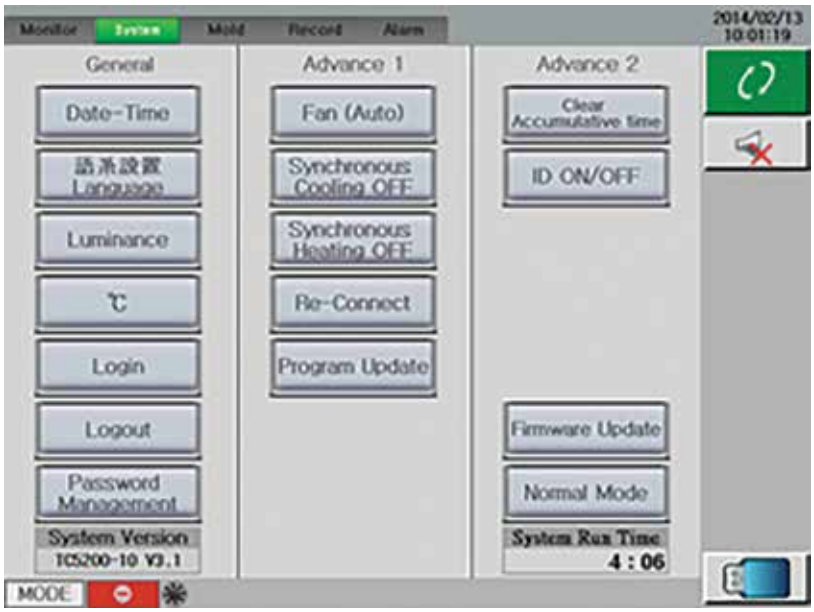
4.3.1 System Menu Page



1. General Parameters
2. Advanced 1 Parameters
3. Advanced 2 Parameters

4.3.2 General Parameters

- Date-Time: Select to adjust the system Date or Time.
- Language: Select to change the menu language. [English, Traditional Chinese, Simplified Chinese]
- Luminance: Screen brightness adjustment
- Temperature Unit: Change the temperature unit (°C / °F)
- Login: Input a password to enter the corresponding security access level
- Logout: Logout and return to the default security access Level 0
- Password Management: Change the default password (dependant on management level)

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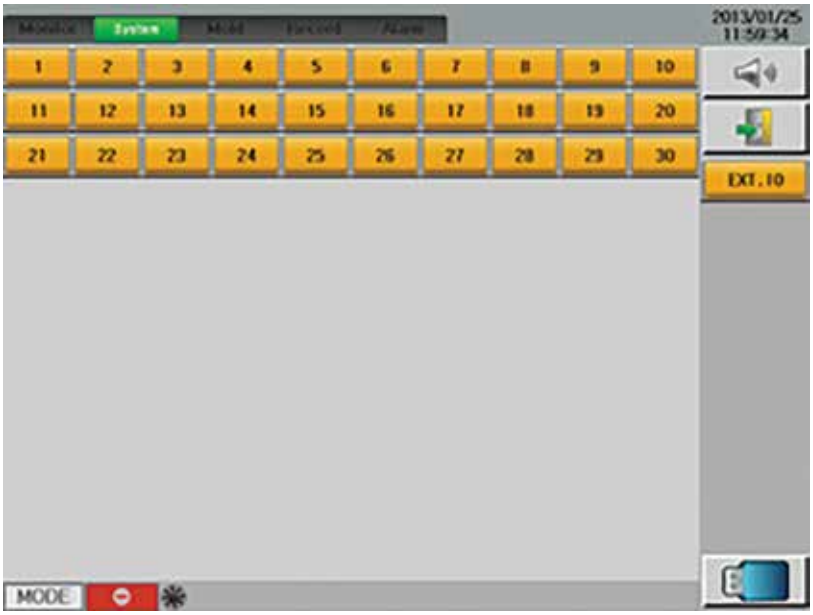
4.3.3 Advanced 1 Parameters

- Fan: Set fan to Auto / On. (TC5200 only)
- Turn Synchronous Cooling on or off
- Select Synchronous Heating ON / Synchronous Heating OFF / Timing Warming
- Re-Connect: Re-connect Interface unit to the module
- Program Update (Button only appears when USB drive is inserted):
  - Select the path to the update file then press "Confirm" [<C:>=HMI local disk, <E:>=USB drive)
  - Select the PRP file to update to then press "Confirm" to begin update process
  - When the file has been read the system will return to the welcome screen. Remove the USB drive, turn off the mains power and restart the TC5100 / TC5200. **Do not turn off the mains power or restart until the system has updated and returned to the welcome screen!**

4.3.4 Advanced 2 Parameters

- Clear Accumulative Time: Reset Accumulative time to zero.
- ID ON/OFF: Turn off unused or problematic IDs. (Connected ID is orange colour; disconnected ID is grey colour)
- Normal / Simple Mode: change Zone Parameter Setup display mode [Normal / Simple] In Normal mode all settings are available.



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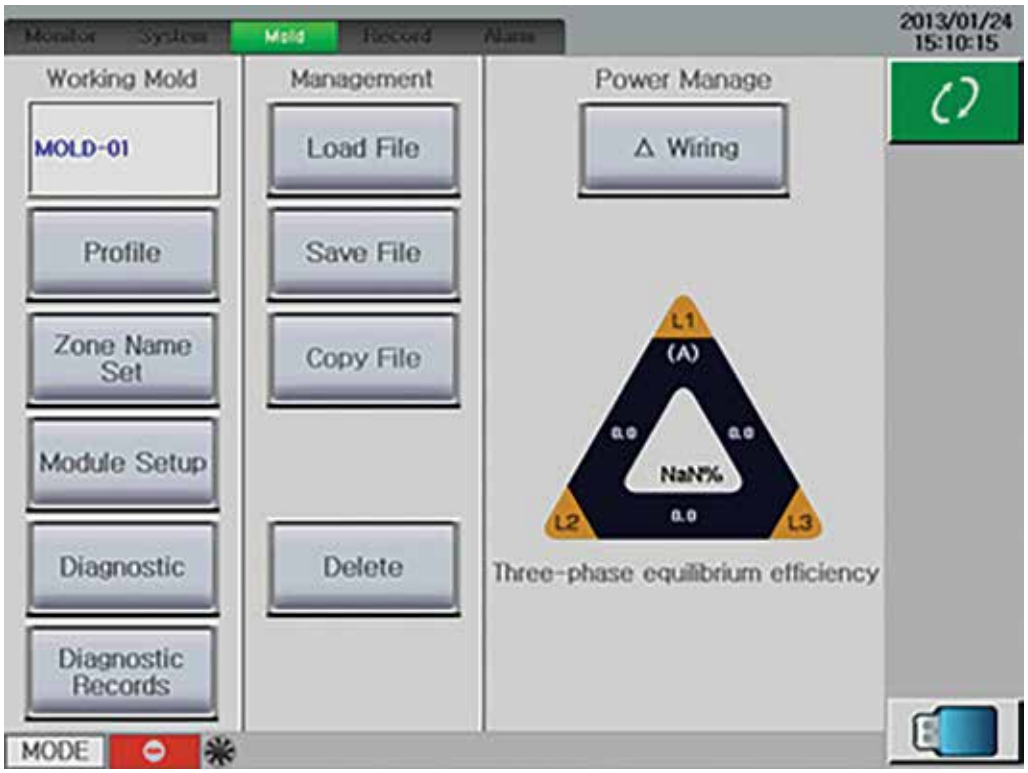
4.4.1 Mold Menu Page



1. Working Mold
2. Memory Management
3. Power Management

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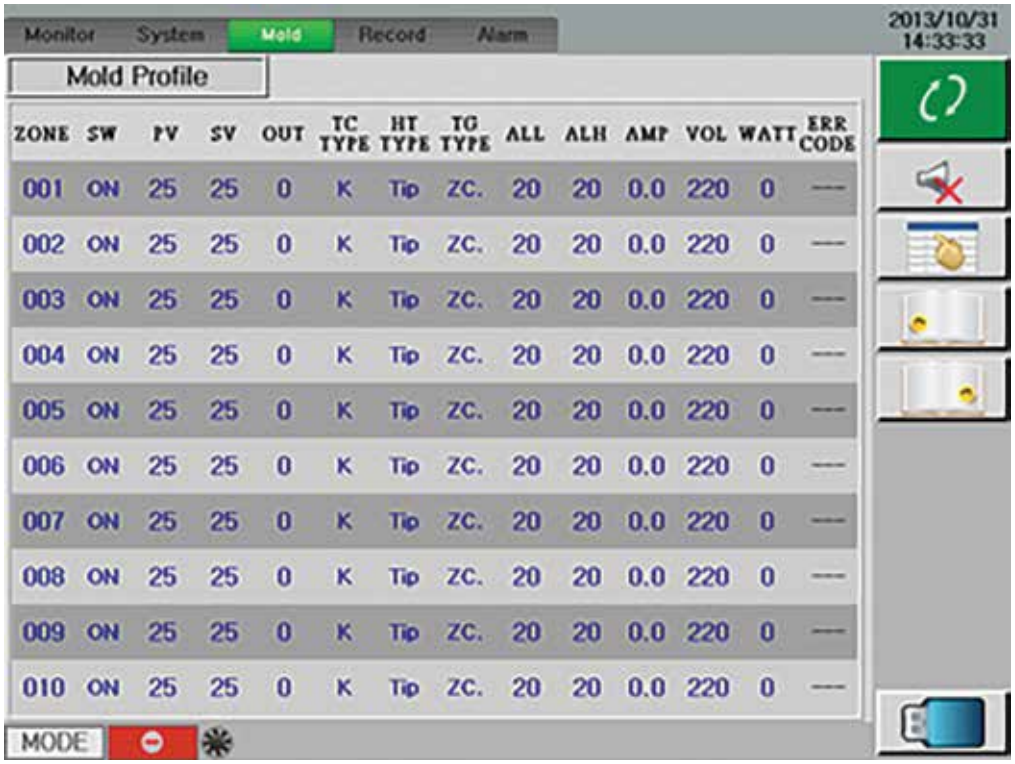
4.4.2 Working Mold

Mold Name
Name of current mold and settings file.

Profile
Displays the general setup and status values for each zone.



Page Menu

Previous Page

Next Page

ZONE: Zone number
SW: Zone switch status
PV: Process value temperature
SV: Set value temperature
OUT: Output percentage power
TC TYPE: Thermocouple type set for zone
HT TYPE: Heater type set for zone
TG: Power Trigger mode
ALL: Alarm lower limit
ALH: Alarm higher limit
AMP: Amperage
VOL: Voltage
WATT: Power rating
ERR CODE: Error code (if applicable)

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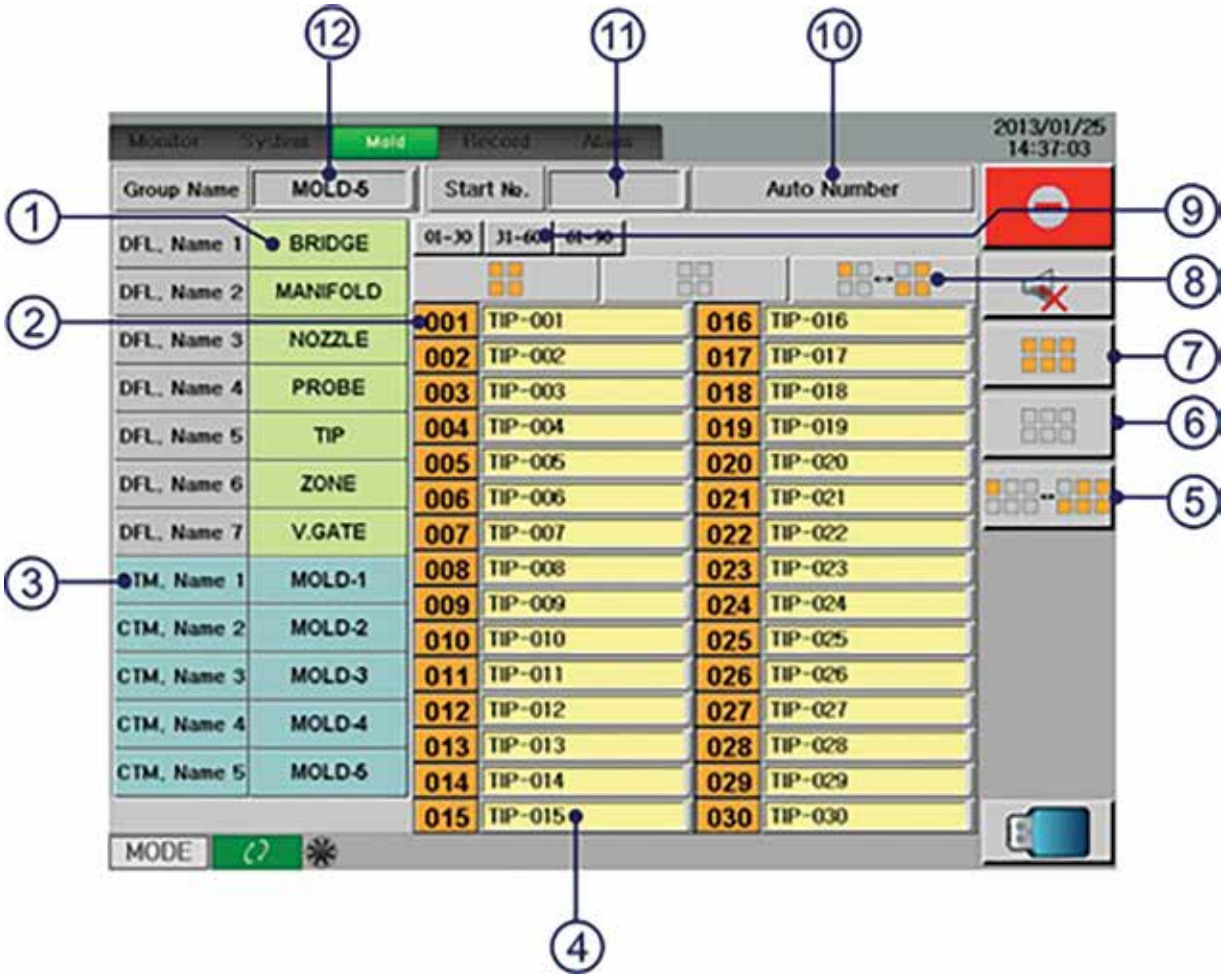
4.4.3 Zone Naming



1. DFL Name: Default group name (not editable)
2. Zone: Zone Number
3. CTM. Name: Custom group name (editable)
4. Assigned zone name
5. Invert selection for all zones
6. Clear Selection
7. Select All
8. Invert selection for selected zone
9. Zone group display tab
10. Automatic Assign Number
11. Starting Assign Number
12. Group name

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4.4.4 Setting Zone Names

Individual zones or groups of zones can be assigned default or customised names for easy identification.

Group Zone Name Assigning

Names can be assigned to the different zones using the preloaded default names to make them easier to identify. To assign names to the zones:

1. Logon to the controller.
2. Select the “DFL. Name” or “CTM. Name” you wish to assign.
3. Select the Zone Numbers you wish to assign the name to.
4. Where multiple zones are being named, enter the Starting Assign Number to the start of the numbering sequence.
5. Select Auto Number to apply.

Custom Zone Group Name Creation

1. Select the Group Name field, enter the custom name to be used and select Ent.
2. Select the "CTM. Name" to apply the name to, select "Auto Number" to apply

Manual Zone Name Assigning

1. Select the zone to apply the name to.
2. Enter the name to apply to the zone.
3. Select “Auto Number” to apply.

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4.5.1 Diagnostics

Diagnostic

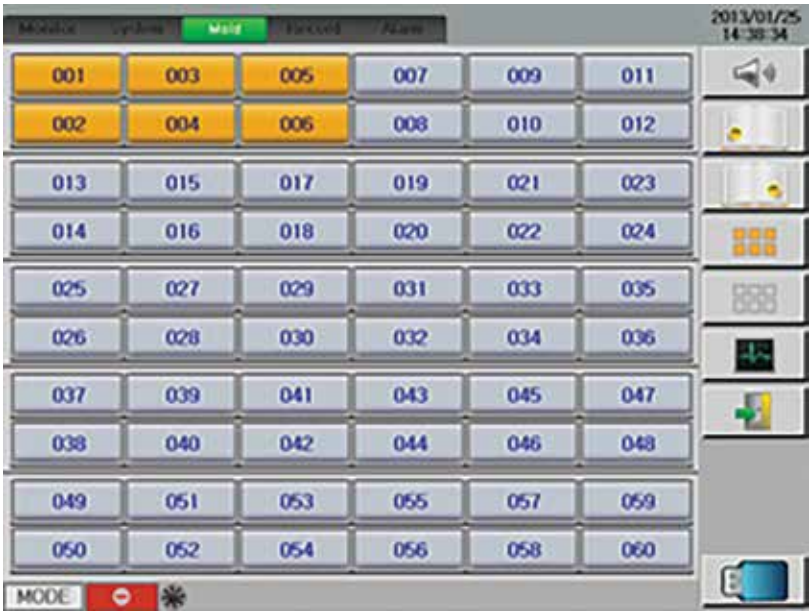
The controller contains general diagnostic functions which can be used to check the thermocouple, heater and electrical connections are operating correctly for each zone.

Note: Diagnostics can only operate when the controller is in Stop mode

.

To use the controller diagnostics function:

1. Select the zones to perform the diagnostics on, then press to enter Diagnostics page.



Previous Page

Next Page

Select All

Clear Selection

Diagnostics Page

Exit

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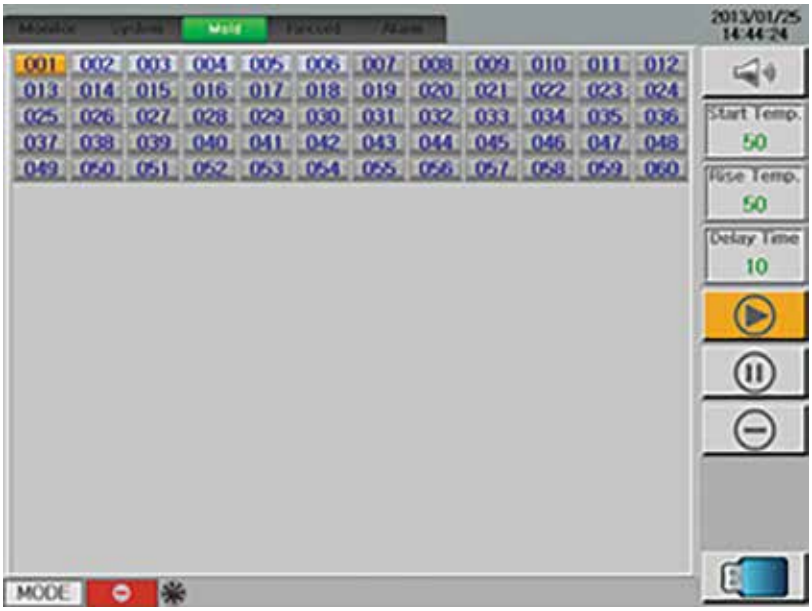

2. Set the Start Temp. (If zone temperature is higher than the Start Temp then the next zone will be diagnosed first).
3. Set the Rise Temp, amount the system will heat up during diagnosis.
4. Set the Delay time (seconds) between each zone diagnostics.
5. Select “Start” to begin diagnostics.
6. Select “Pause” if the diagnostics require pausing after the current zone diagnostics is complete. To resume diagnostics press "Start".
7. Select “Stop” to immediately stop the diagnosis of all zones.

4.5.2 Zone Diagnostics Status

During diagnostics the zone icons change colour depending on the diagnostics status.

Normal (Green)

Alarm (Red)

Analysing (Orange)

Pending (Light Grey)

Not Selected (Dark Grey)

4.5.3 Diagnostics Results

When the diagnostics are complete the results are displayed on the Diagnosis Record page, and any zone icon with an error will show in red colour to notify it is in an Alarm status. To see the alarm, select the zone number to open the Module Status window for that zone and look on the Alarm Message and Abnormal Message window.

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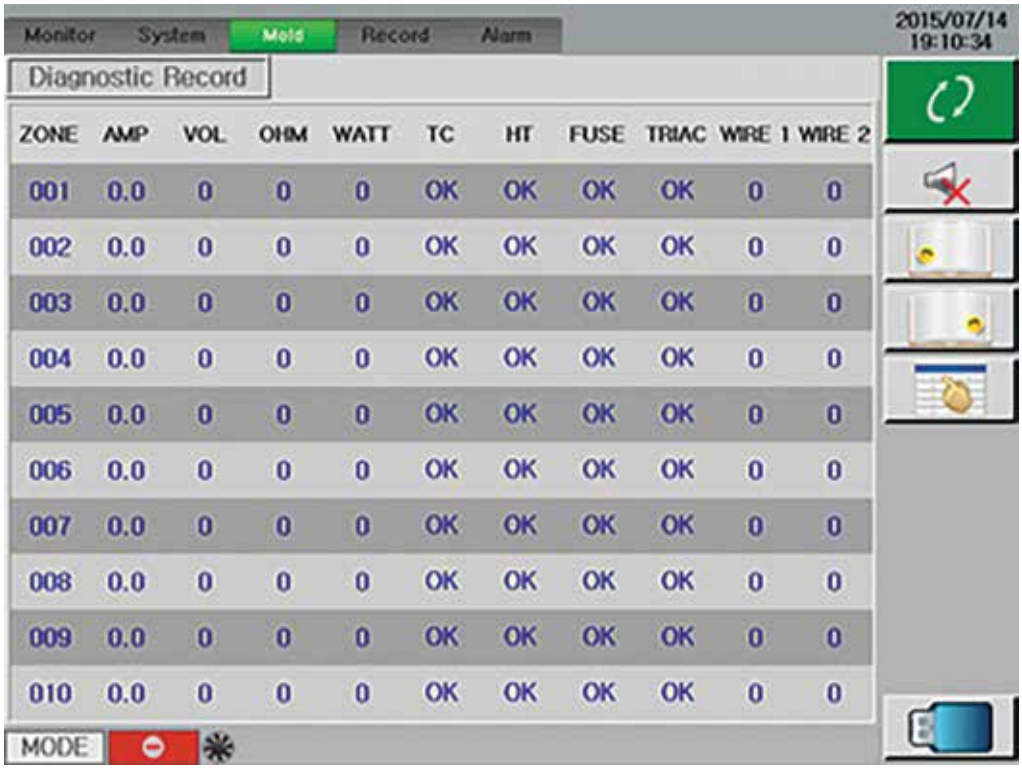
4.5.4 Diagnostics Record

The Diagnosis Record page gives a simple layout of the results from the diagnostics performed



ZONE	AMP	VOL	OHM	WATT	TC	HT	FUSE	TRIAC	WIRE 1	WIRE 2
001	0.0	0	0	0	OK	OK	OK	OK	0	0
002	0.0	0	0	0	OK	OK	OK	OK	0	0
003	0.0	0	0	0	OK	OK	OK	OK	0	0
004	0.0	0	0	0	OK	OK	OK	OK	0	0
005	0.0	0	0	0	OK	OK	OK	OK	0	0
006	0.0	0	0	0	OK	OK	OK	OK	0	0
007	0.0	0	0	0	OK	OK	OK	OK	0	0
008	0.0	0	0	0	OK	OK	OK	OK	0	0
009	0.0	0	0	0	OK	OK	OK	OK	0	0
010	0.0	0	0	0	OK	OK	OK	OK	0	0

Previous Page

Next Page

Page Menu

ZONE: Zone Number

AMP: Heater amperage

VOL: Heater voltage

OHM: Heater resistance

WATT: Heater power rating

TC: Thermocouple status

HT: Heater status

FUSE: Fuse status

TRIAC: TRIAC status

WIRE 1: Zone with a wiring error

WIRE 2: Zone number which WIRE 1 is incorrectly wired to

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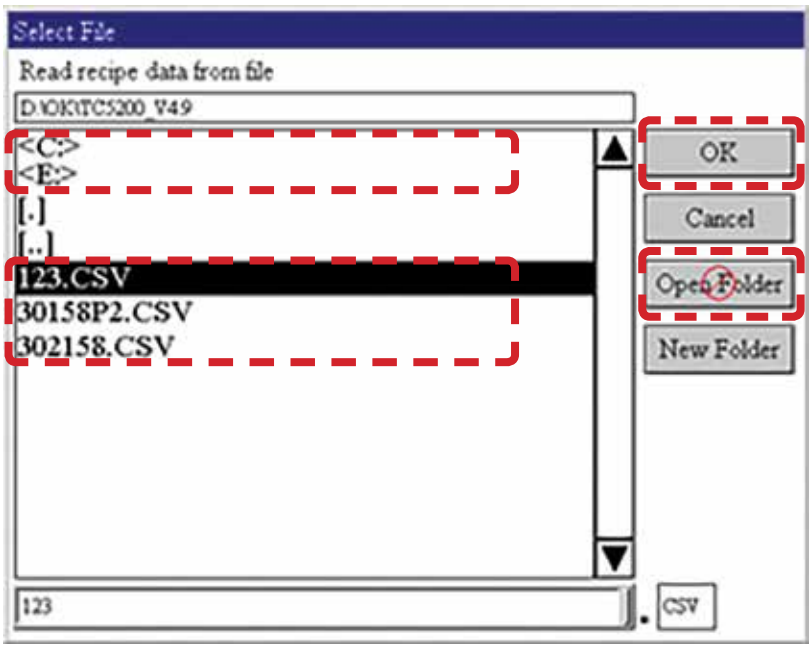
4.6.1 Memory Management

For simple and fast mold setup the TC5100 / TC5200 controllers can save and load settings files either from the local memory or from a USB drive.

4.6.2 Load File

1. Select Load.
2. Select path of the Mold setting file to load [<C:> = local drive, <E:> = USB drive], (select folder then press "Open Folder" to negotiate path).
3. Select the required file, then press "OK" to load the stored parameters.



4.6.3 Save File

1. Select Save.
2. Select path of the file to save [<C:> = local drive, <E:> = USB drive], (select folder then press "Open Folder" to negotiate path).
3. Either
   a. To save using the default Mold name select “OK”.
   b. To save over an existing file select the file and then “OK” to save.
   c. To create a custom file name, select the name editing area at the bottom of the window, change the file name and press "Ent" and then "OK" to save.

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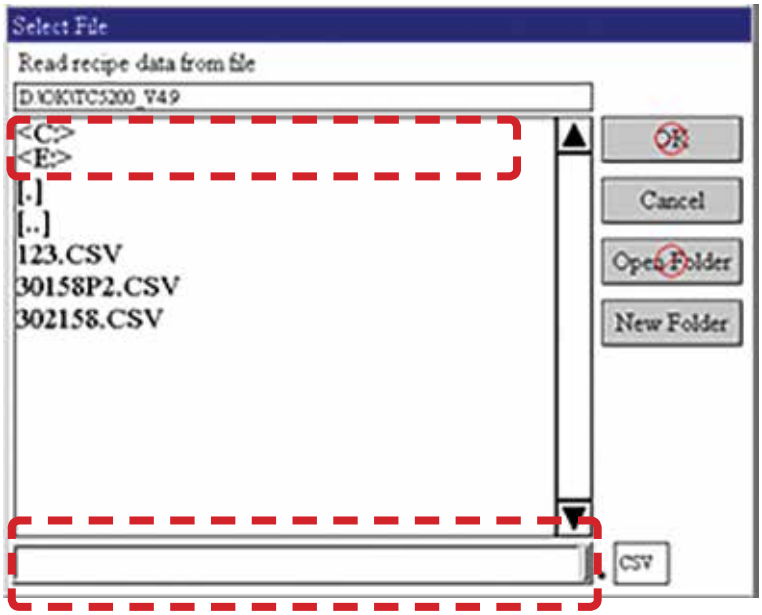
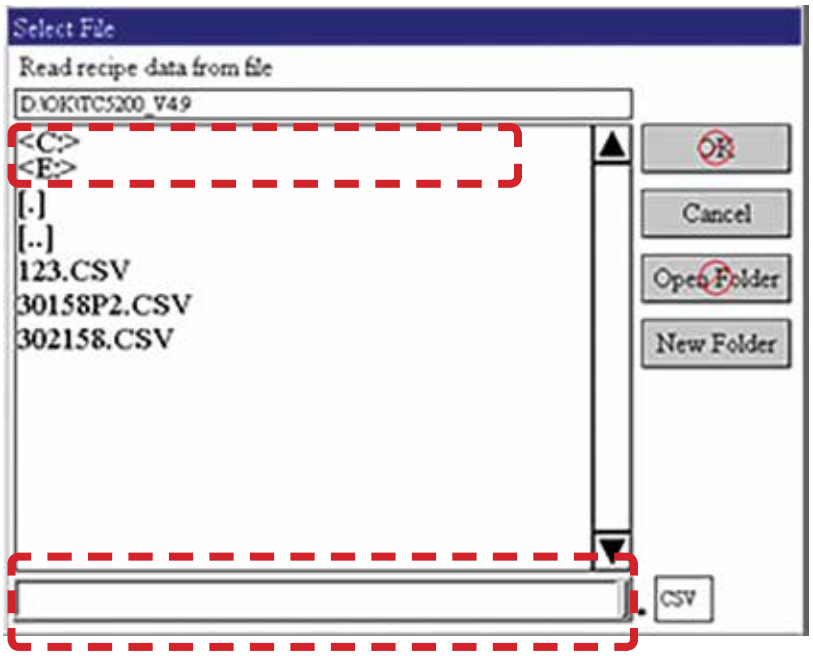


4.6.4 Copy File

1. Select Copy.
2. Select path of the file to copy [<C:> = local drive, <E:> = USB drive], (select folder then press "Open Folder" to negotiate path).
3. Select the file to copy, then press "OK".
4. Select path to copy the file to and select "OK" [<C:> = local drive, <E:> = USB drive], (select folder then press "Open Folder" to negotiate path).
5. Select the name editing area at the bottom of the window and enter the new file name and press "Ent" and then "OK" to save.



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4.6.5 Delete File

1. Select path of the file to delete [<C:> = local drive, <E:> = USB drive], (select folder then press "Open Folder" to negotiate path).
2. Select the file to delete, then press "OK".

4.7.1 Power Management

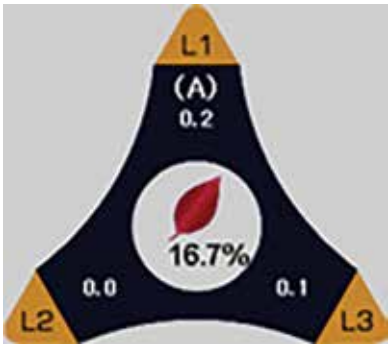
The Power Management window allows a simple method of viewing the power load and balance efficiency across the phases of the Y (Wye / Star) or Δ (Delta) power supply configurations. The Y or Δ display show the line phase numbers (L1, L2, L3) and the dynamic amperage drawn by each phase.

When required, during the system setup this display can be used to adjust the heater configuration to optimise the balance efficiency and reduce power loss.

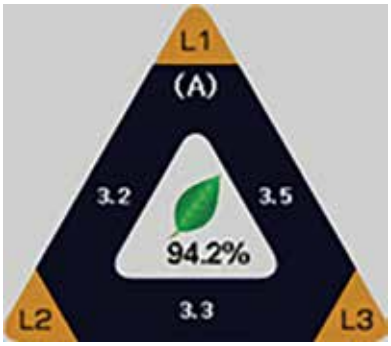
4.7.2 Wiring

Press the Wiring button to change the display between Y and Δ display.

Y Wiring



Δ Wiring



System Efficiency

90~100%	80~89%	70~79%	70%↓

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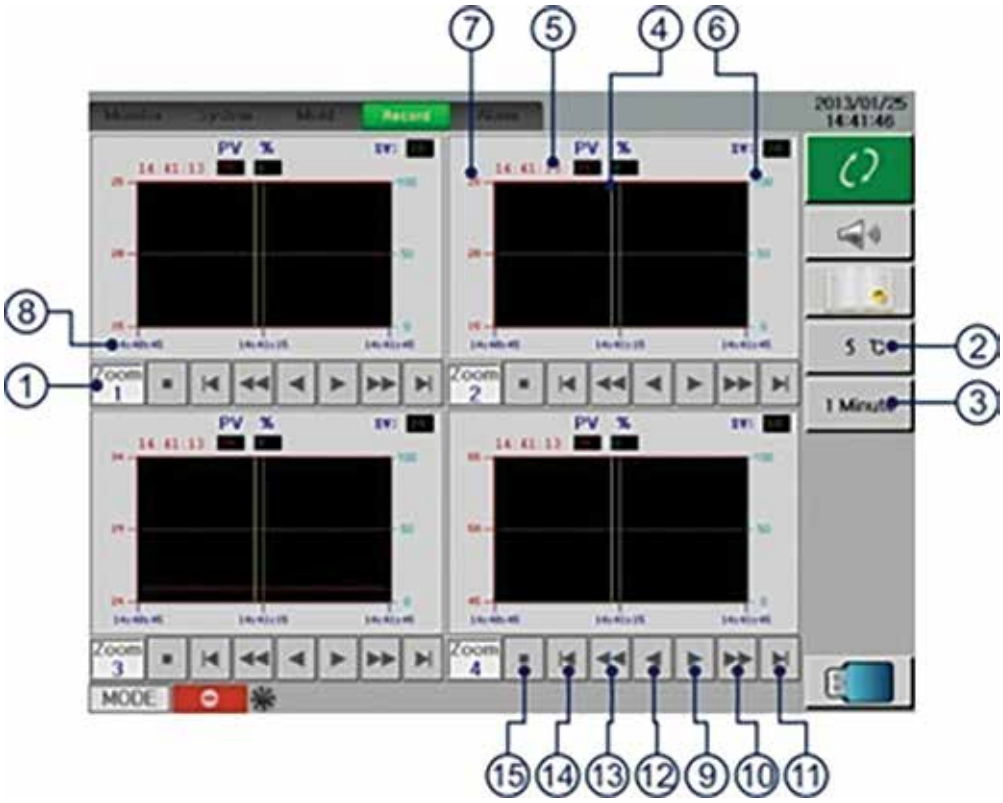
4.8 Record Menu Page



1. Display Zone: Select to set zone to inspect
2. Termperature Interval: Select to cycle through the temperature display intervals. (5°C → 10°C → 20°C → 50°C → 100°C → 200°C → 5°C)
3. Time Interval: Select to cycle through the time display intervals. (1 minute → 10 minutes → 30 minutes → 1 hour → 2 hours → 3 hours → 4 hours → 1 minute)
4. Extract line: Select any part of the graph to display the yellow extract line. Drag to the time to inspect.
   Extract line position and time
5. Output axis: % Power Output
6. Temperature axis: Current temperature interval
7.
8. Time axis: Current time interval
9. Time axis control: Play Forward
10. Time axis control: Fast Forward
11. Time axis control: Move to the front
12. Time axis control: Play Reverse
13. Time axis control: Fast Reverse
14. Time axis control: Move to the back
15. Time axis control: Pause

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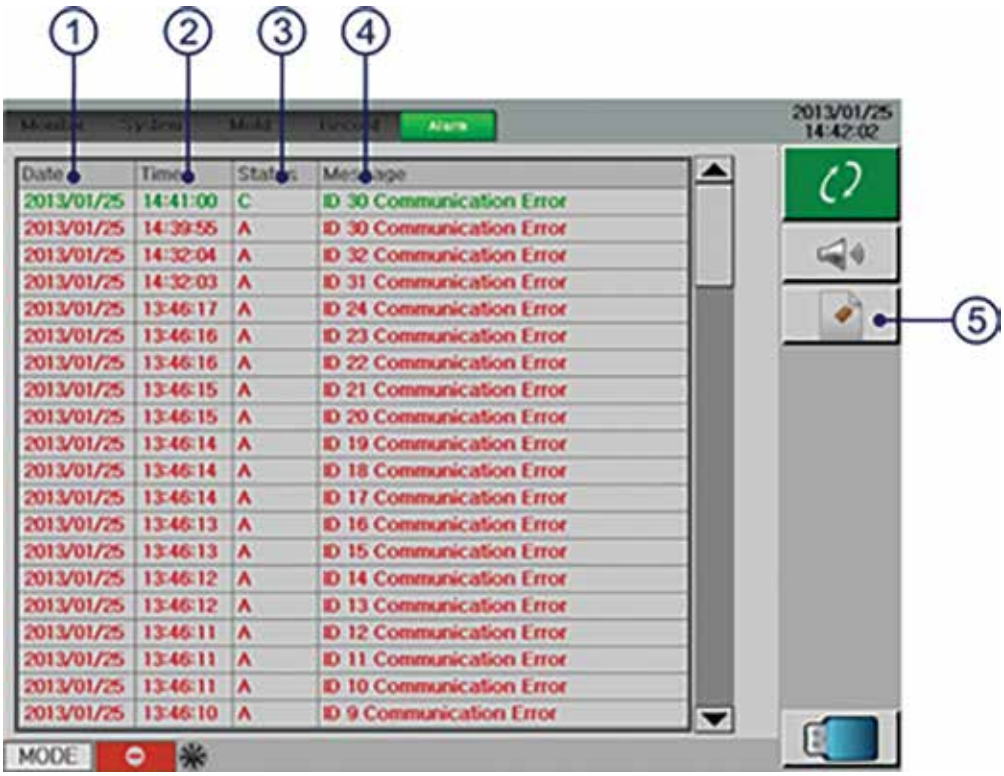
4.9 Alarm Record Menu Page



1. Date: Alarm date
2. Time: Alarm time
3. Status: Alarm status. Colour shows alarm is Active (Red), Stop (Green)
4. Message: Zone ID and alarm messages
5. Clear the alarm log

4.10 Quick Setup

After turning on the mains power, the basic parameters shown below must be set in the Zone Parameter Setup to ensure correct operation.

1. SV: Temperature set value.
2. TC Type: Thermocouple Type (J / K).
3. HT Type: Heating zone type [TIP / M.F. (Nozzle / Manifold)].
4. Soft Start Enable: Heater soft start requirement [On / Off].
5. ST Mode: Enter auto tuning requirement [Off / Once / Always].
6. LB Behaviour: Thermocouple Loop Break Behaviour [Stop / Manual / Slave].

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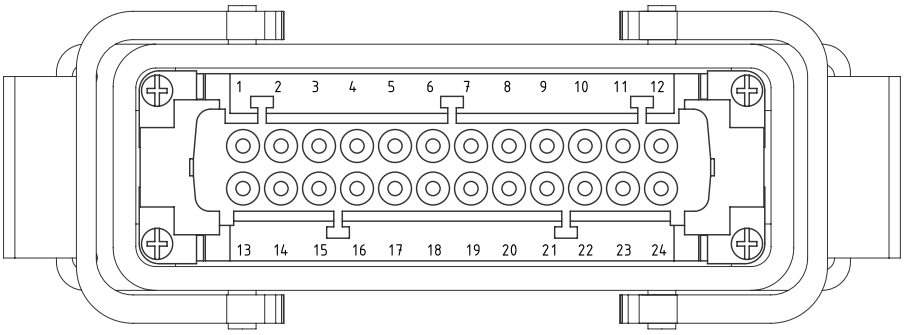
5.1 24 Pin Controller Female Power Output Connector



12 Zone, 24 Pin Mould Connector		
Zone	Pin	Connection
1	1	Power
	13	Return
2	2	Power
	14	Return
3	3	Power
	15	Return
4	4	Power
	16	Return
5	5	Power
	17	Return
6	6	Power
	18	Return
7	7	Power
	19	Return
8	8	Power
	20	Return
9	9	Power
	21	Return
10	10	Power
	22	Return
11	11	Power
	23	Return
12	12	Power
	24	Return
	⏚	Ground

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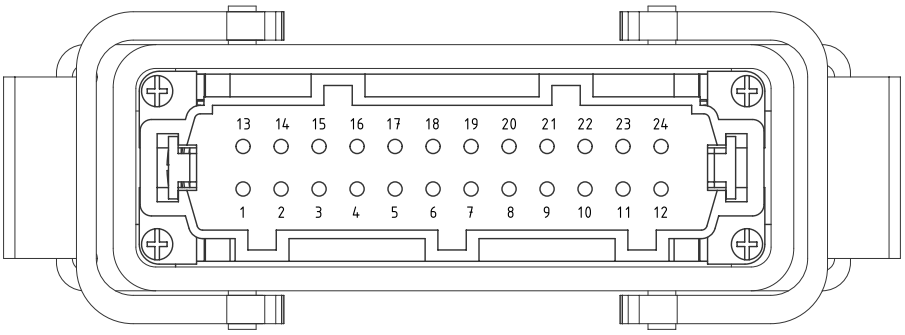
5.2 24 Pin Controller Male Thermocouple Connector



12 Zone, 24 Pin Mould Connector		
Zone	Pin	Connection
1	1	Thermocouple +
	13	Thermocouple -
2	2	Thermocouple +
	14	Thermocouple -
3	3	Thermocouple +
	15	Thermocouple -
4	4	Thermocouple +
	16	Thermocouple -
5	5	Thermocouple +
	17	Thermocouple -
6	6	Thermocouple +
	18	Thermocouple -
7	7	Thermocouple +
	19	Thermocouple -
8	8	Thermocouple +
	20	Thermocouple -
9	9	Thermocouple +
	21	Thermocouple -
10	10	Thermocouple +
	22	Thermocouple -
11	11	Thermocouple +
	23	Thermocouple -
12	12	Thermocouple +
	24	Thermocouple -
	⏚	Ground

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6.1 Troubleshooting

Problem	Solution
Nothing happens after turning on power	• Check mains power supply • Check mains power is turned on • Check power supply configuration is set correctly • Check mains power Overload light • Check the power cable wiring and connections
No communications between module and Interface Unit	• Check if control module is secure • Check if control module is broken • Perform module connection reset
Unstable temperature control	• Perform Auto tune, set ST mode to "Always" • Check thermocouple is secure in place • Check heaters are secure in place • Check thermocouple zone is correct
TC Break / Reversed Alarm	• Check thermocouple wires for break • Check thermocouple wires are connected in correct configuration (+ / -)
Thermocouple Short Alarm	• Check thermocouple wires are connected correctly • Check thermocouple wires for a short circuit
Heater Alarm	• Check heater continuity • Check heater for short
Control Circuit Alarm	• Check heater for short • Check heater and thermocouple for lose connections • Check if control module is secure • Check if control module is broken
TRIAC Short Alarm	• Change control module
Abnormal Temperature Increase Alarm	• Check heaters are secure in place • Check thermocouple is secure in place • Check thermocouple zone is correct
Circuit Breaker Alarm	• Change fuse for that zone

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7.1 Access Security Levels

The TC5100 / TC5200 temperature controllers have 4 levels of security access. The user level access is password controlled to ensure correct security measures are in place.

To prevent unnecessary tampering with the controller settings some basic security actions are in place:

- When the controller is first turned on the default security level will automatically be set to Level 0
- If a higher user access level presses the Logout button the default security level will automatically be set to Level 0
- If a higher user access level has been left inactive for some time the controller will automatically log the user out and return to Level 0
- Level 0 will only allow the user to make changes to the SV temperature

7.2 Access Level Description

User Access Levels:

- Level 0: Default Operation
- Level 1: General User
- Level 2: Mold Setup & Maintenance Engineer
- Level 3: Complete Controller Setup

Assign the level of user access in accordance with the user job descriptions to avoid the user making changes to unfamiliar parameter settings.

- If required, the Access Level Passwords should be changed from the default and recorded in a safe place to avoid lower access level users gaining access to unfamiliar parameter settings. Go to System Menu - Password Management.

Default User password:

- Level 1: 1111
- Level 2: 2222
- Level 3: 3333

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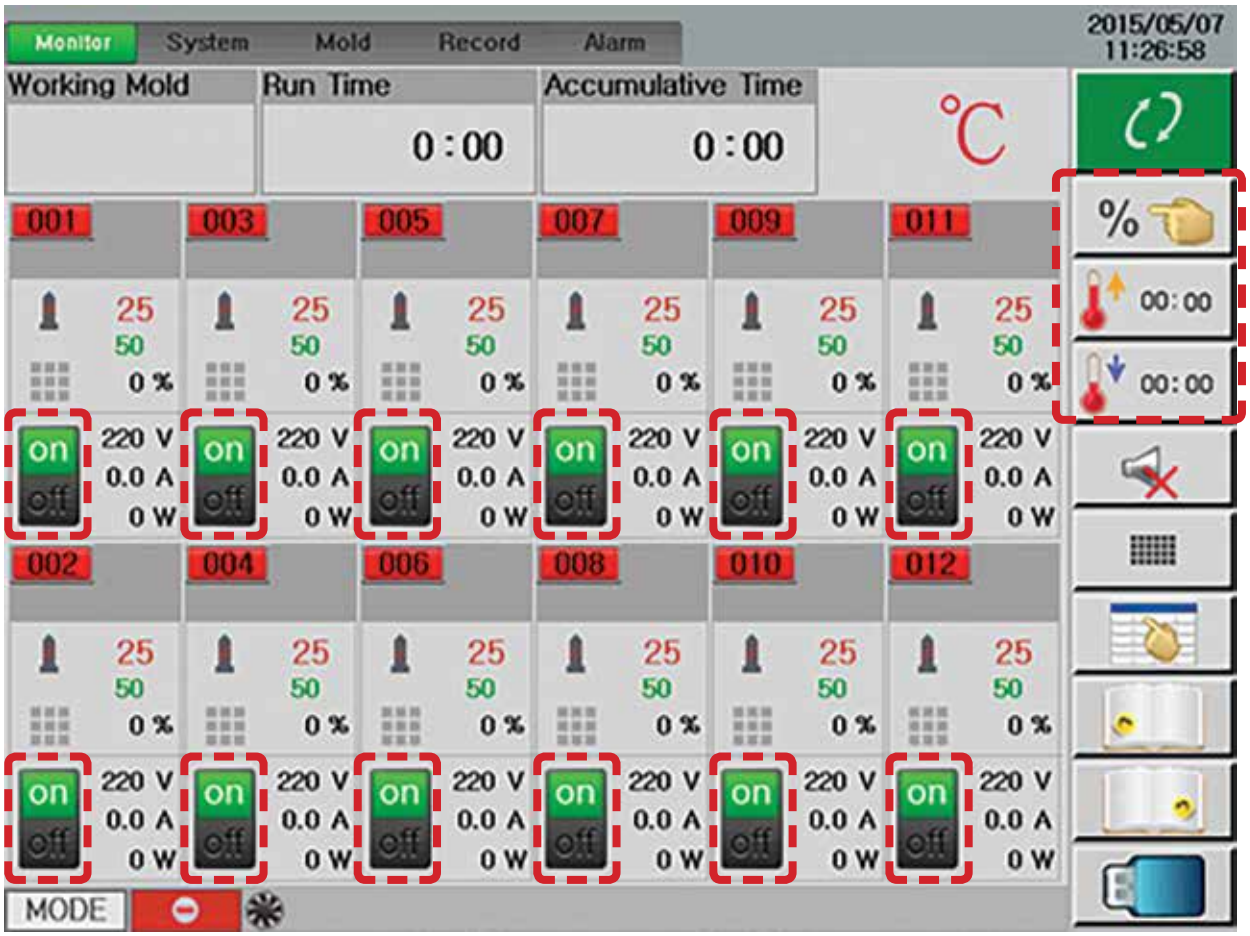
7.3 Monitor Menu Page Access Levels



User Level 1 and above can change the marked zones

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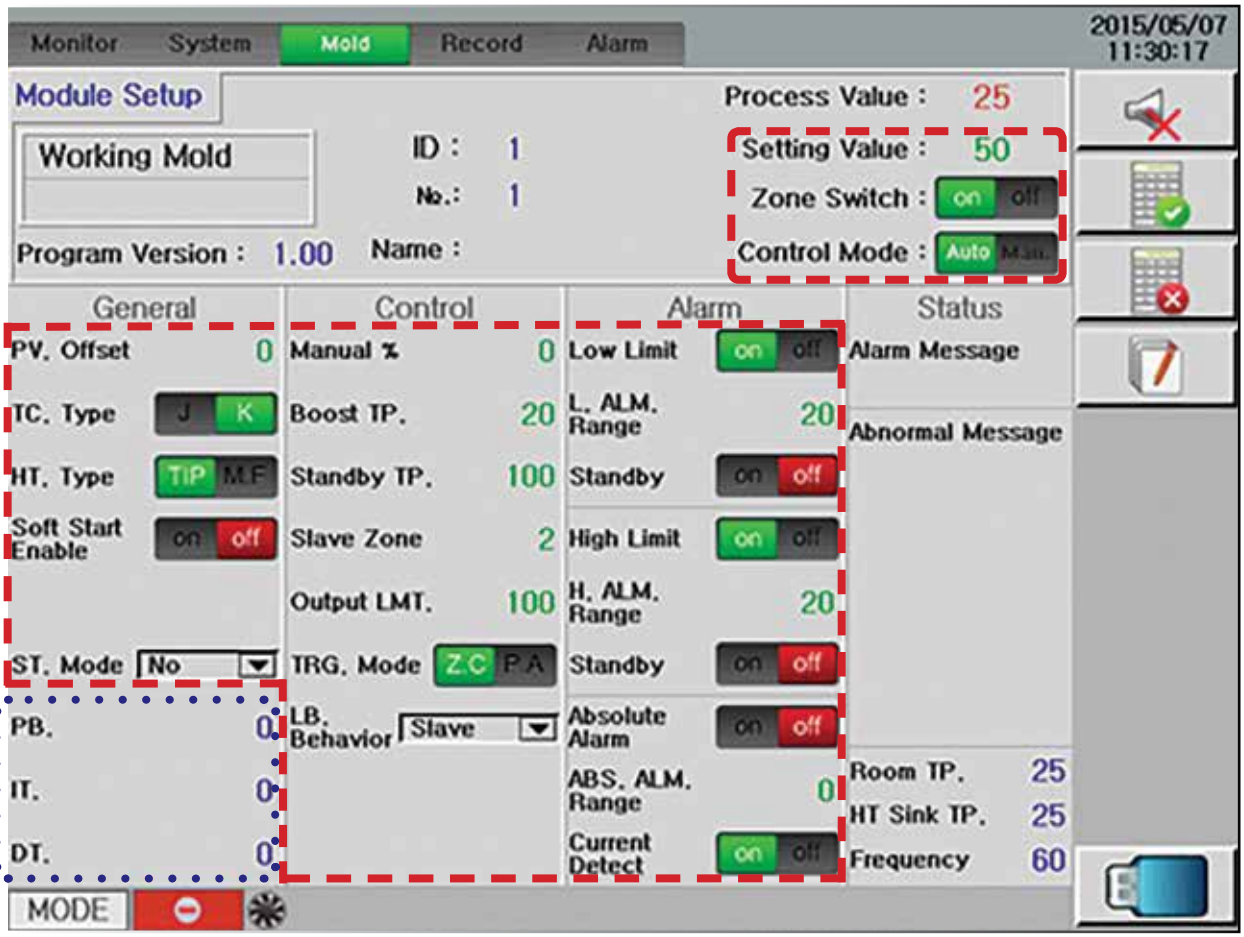
7.4 Zone Parameter Setup Page Access Levels



User Level 1 and above can change the marked zones

User Level 3 can change the marked zones

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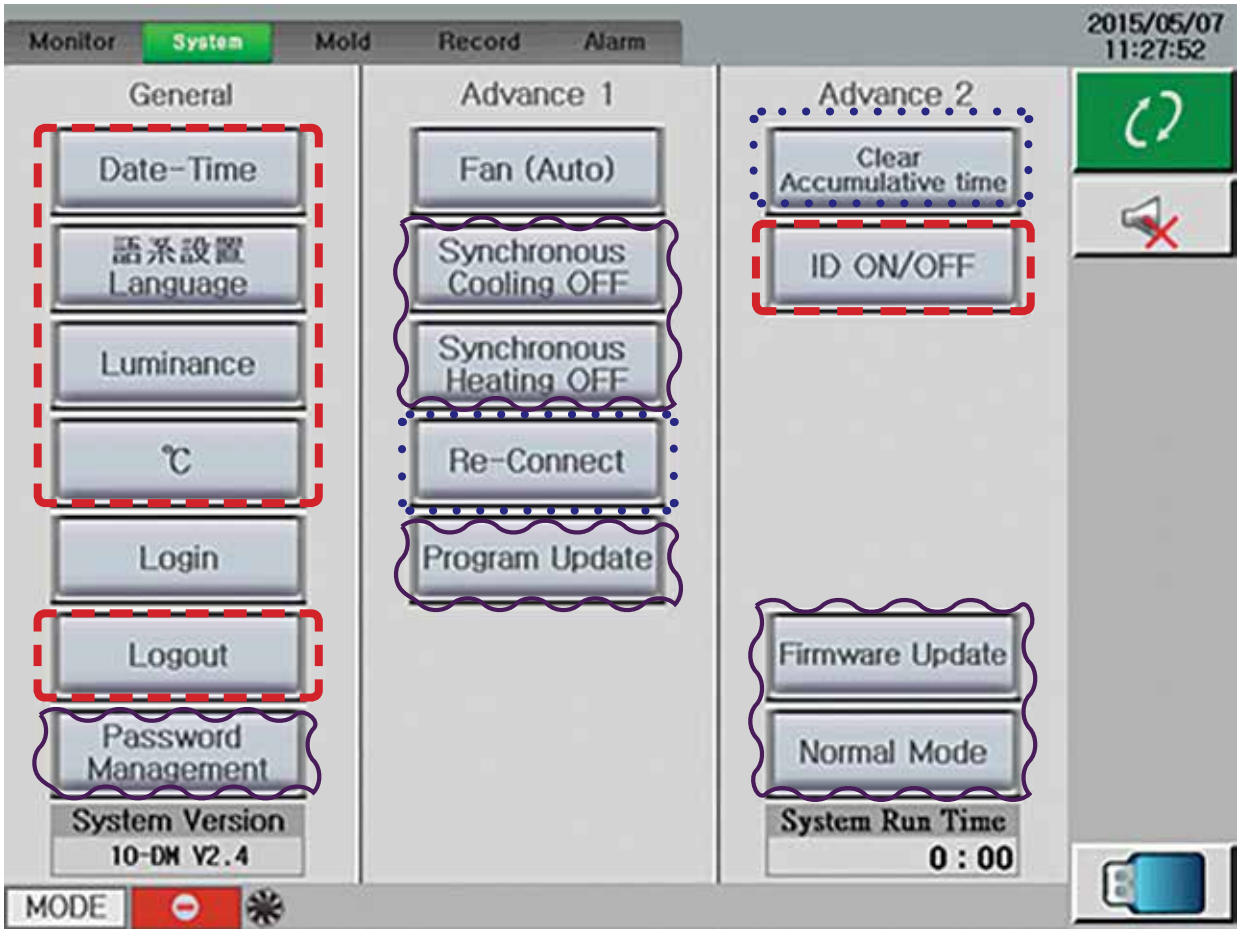
7.5 System Menu Page Access Levels



User Level 1 and above can change the marked zones

User Level 2 and above can change the marked zones

User Level 3 can change the marked zones

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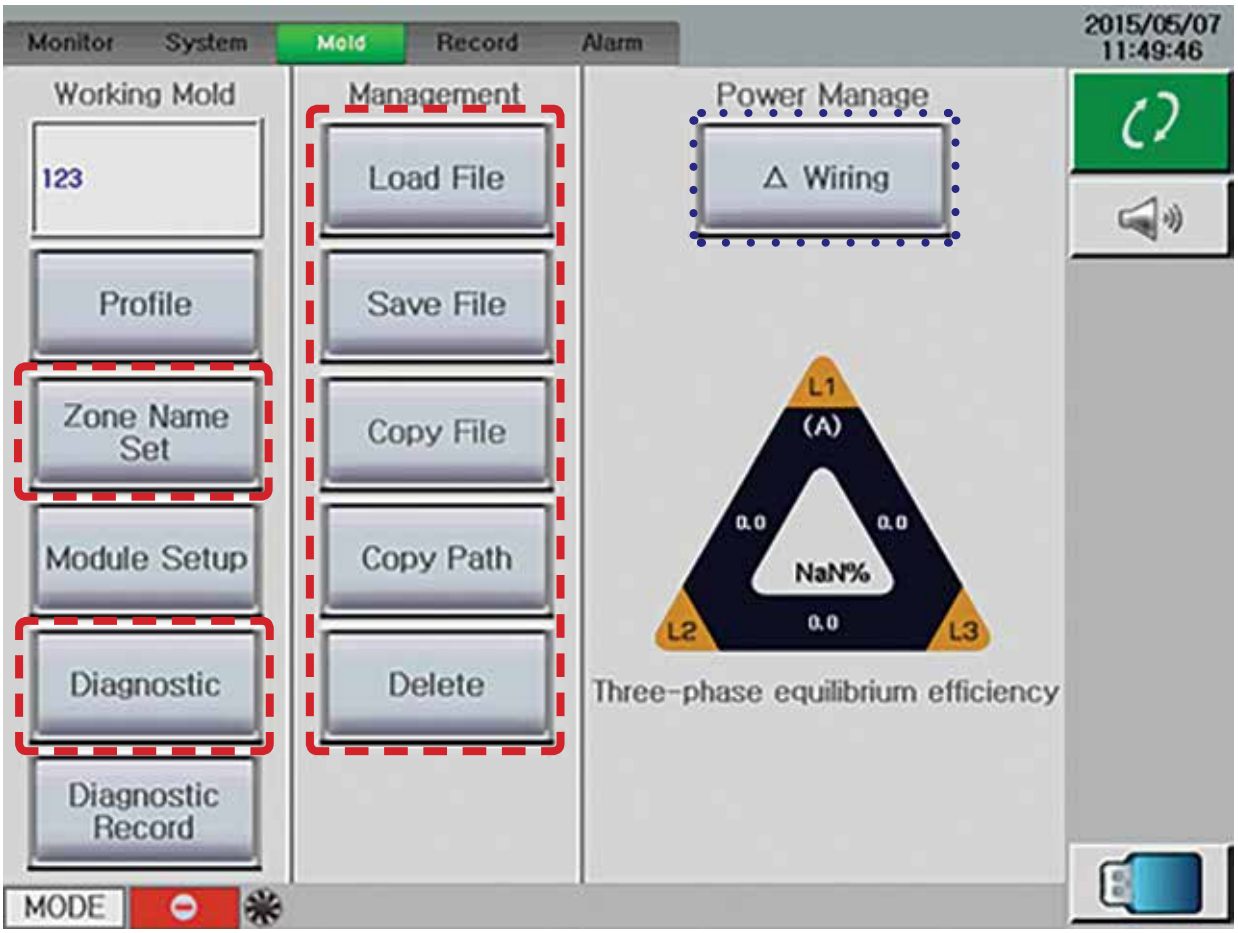
7.6 Mold Maintenance Menu Page Access Levels



User Level 1 and above can change the marked zones

User Level 3 can change the marked zones

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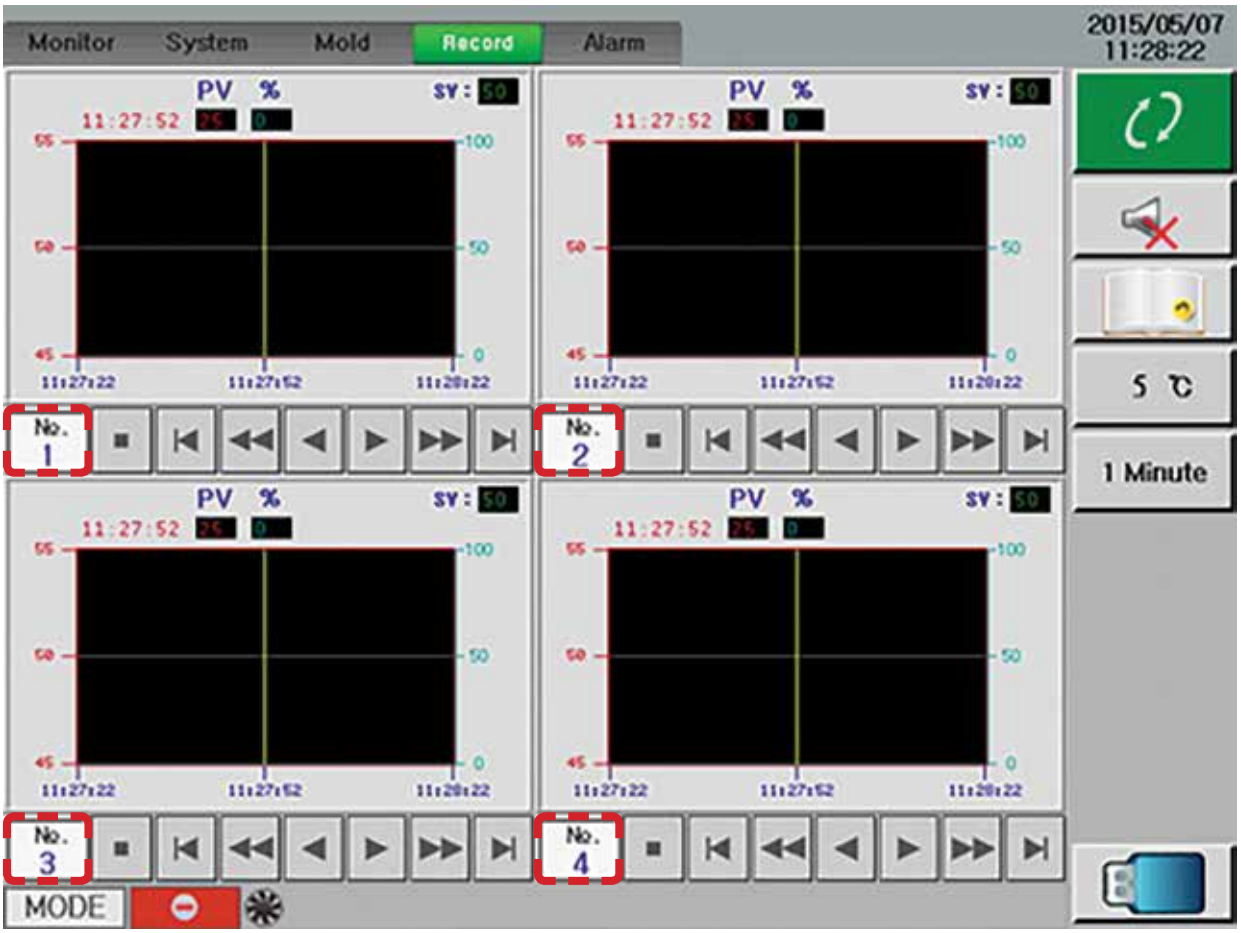
7.7 Record Menu Page Access Levels



User Level 1 and above can change the marked zones

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