MANUFACTURER AND GLOBAL SUPPLIER OF TEMPERATURE CONTROL SYSTEMS

**MOLD CONTROL SYSTEMS, INC.**

# SITC-15 Temperature Controller
# GITC-15 Temperature Controller
# Mainframe
# Operation Manual




Contents:




PH: (407)855-2899 FAX: (407)855-2855

www.moldcontrol.com

# SITC-15 Quick Reference

Change set-point temp - ▼ or ▲ to desired set-point temp.

Change mode - press MODE SEL until flashing LED is under desired mode, then ENTER

Change parameters - press PMTR until desired perameter is found. Use ▼ or ▲ to adjust the parameter. ENTER when finished.

Display Amps/Volts - press AMPS VOLT

### Set-Point Value Display


%⚡ When decimal is lit, manual percentage power is engaged

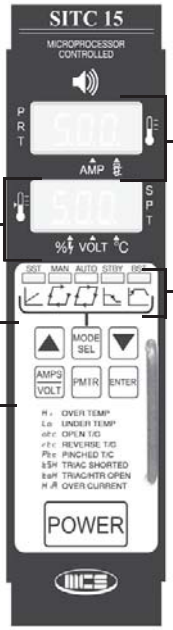
V When decimal is lit, voltage is displayed ± 3%

°C When decimal is lit, temp. is displayed in Celsius

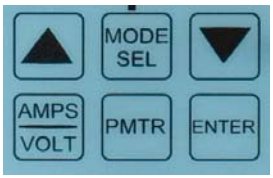
### Process Value Display


A When decimal is lit, amperage is displayed

When decimal is lit, output power is on




### User Input Keypad




▲ ▼ Up/down keys For adjustment of setpoint/ parameters

MODE SEL Mode Select key Manual, Auto, Standby, and Boost

AMPS VOLT Amps/Volt key View Current and voltage

PMTR Parameter key Scroll through parameters

ENTER Enter key Save changes

### Mode Indicator LEDs

SOFT - Soft Start

MAN - Manual/Open loop

AUTO - Auto/Closed loop

STBY - Standby Mode

BST - Boost Mode

Figure 1

# GITC-15 Quick Reference

Global power on/off - press GLBL POWER ENTER START

Global setpoint - set desired setpoint, then press GLBL PMTR ENTER START

Global mode - press GLBL MODE SEL ENTER START

Global parameters - GLBL PMTR ENTER START

**Set-Point Value Display**


When decimal is lit, manual percentage power is engaged

When decimal is lit, output power is on

When decimal is lit, voltage is displayed ± 3%

**Process Value Display**


When decimal is lit, K type T/C is selected

When decimal is lit, amperage is displayed

When decimal is lit, temp. is displayed in Celsius

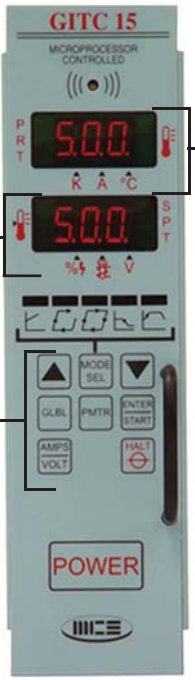
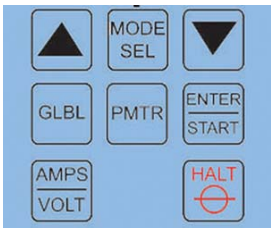



Figure 2

**User Input Keypad**




GLBL — Global key *See Global Functions (Pg. 4)*

ENTER START — Enter/Start key Save changes or press once to exit Halt, or twice to start

HALT — Halt key Halts the controller (inhibits output)

# Basic Operation Procedures

The SITC-15 and GITC-15 temperature controllers are ready to run from factory settings.

**Global Functions for GITC only:**
**GLOBAL FUNCTIONS** allow individual controller parameters or modes to be sent to the system or groups of controllers. Group setup is configurable in parameter **(GITC P01)**. Up to 4 groups can be set.

**GLOBAL POWER ON/OFF**: power on or off all controllers from any controller.
**Key sequence: *GLBL***, ***POWER***, then ***ENTER/START***
**Note***: If a controller is manually powered off, the function is disabled until powered back on manually.

**GLOBAL SETPOINT/PARAMETERS**: Adjust setpoint or parameters on a single unit, and send the settings to all controllers.
**Key sequence: *GLBL***, ***PMTR***, then ***ENTER/START***

**GLOBAL MODE CHANGE:** Change the mode on a single unit, then change mode system wide or within a group. (e.g. STANDBY or BOOST)
**Key sequence: *GLBL***, ***MODE***, then ***ENTER/START***

**GLOBAL CURRENT/VOLTAGE VIEW:** View current and voltage on all controllers in the system.
**Key sequence: *GLBL***, ***AMPS/VOLT***, then ***ENTER/START***

**Note*:** If changes need to be made to individual controllers, just apply changes and press *ENTER*.

---

**Basic Operation:**
Turn power on by pressing the *POWER* button.

**SOFT START mode:** The controller will start in SOFT START mode if the process value is below 212° F or 100° C. After the SOFT START duration time (parameter (SITC - P16); (GITC - P20), the controller will go into AUTO mode (factory default).

**Note***: MODE changes cannot be made during SOFT START mode unless the lock is disabled in parameter (SITC - P17); (GITC - P21).

**SETPOINT CHANGE:** To change the setpoint value, use the *UP* and *DOWN* keys to select the desired temperature then press *ENTER*. The minimum and maximum values for temperature and setpoint are 32° - 999° Fahrenheit (5° - 650° Celsius).

**Mode:**
There are 4 running modes available: manual (open loop), automatic (closed loop), standby (idle), and boost. A solid lit LED indicates the mode the controller is in.

**To change mode:**
Press the *MODE SELECT* key until the blinking LED is over the desired mode, then press the *ENTER* key. A solid lit LED will indicate the current running mode.

**Note***: To exit the mode function with no changes, press the *MODE SELECT* then the *UP* or *DOWN* key.

Siren will momentarily sound when status changes occur (GITC only) (e.g. when BOOST is enabled).

***ENTER MUST BE PRESSED AFTER ANY ADJUSTMENT (SUCH AS SETPOINT, PARAMETER, OR MODE) IS MADE TO STORE NEW INFORMATION.***

**Standby and Boost:**
The controller has two configurations for standby and boost modes: auto or manual.

**Standby:**
AUTO-STANDBY - controller goes to the preset standby set-point temperature set in parameter (SITC - P15); (GITC - P19).

MANUAL-STANDBY - controller goes to the preset % power set in parameter (SITC - P14); (GITC - P18).

The controller will remain in STANDBY mode until it is manually changed to another mode, or by pressing *MODE SELECT* then *UP* or *DOWN*.

**Boost:**
AUTO-BOOST - controller goes to the preset BOOST set-point temperature set in parameter (SITC - P12); (GITC - P16).

MANUAL-BOOST - controller goes to the preset % power set in parameter (SITC - P13); (GITC - P17).

Controller will remain in BOOST mode until preset time has elapsed, set in parameter (SITC - P11); (GITC - P15).

**Parameter Changes:**
1. Press the *PMTR* key until the desired parameter is reached. (List of parameters is available on (SITC - Pg. 7) (GITC - Pg. 8).

2. Press the *UP* or *DOWN* key to change the options for the selected parameter.

3. When complete, press the *ENTER* key to store to memory. (Changes can be made to all parameters before pressing *ENTER*).

To exit at any time, press the *ENTER* key.

**Error Reset:**
Upon detection of TOH, TSH, or HIA, the controller must be powered off, then on, to clear the error once the issue has been corrected. Refer to Pg. 9 for error codes.

**Special Functions (GITC ONLY):**
**Even Temperature Rise:** controllers will follow the slowest rising temperature in the system. Even temperature rise is an active procedure, so fluctuation will occur during rise.

**Thermocouple Slaving at Startup:** At startup, in the event of a thermocouple break, the controller will slave from a controller in the same group.

**Live-Swap:** In the event of a controller change-out, the new controller will automatically inherit the parameters and settings of the previous controller.

**External Alarm Output:** Relay for external alarm or light. Pinout on page: 14

**Remote Standby Input:** Switch input for system standby. Pinout on page: 14

# SITC Parameters

| # | Parameters | Defaults |
|---|---|---|
| P01 | Auto Power On - (YES or NO) | YES |
| P02 | Control Type - Power Control Type Phase or Burst mode (PH or BT) | PH |
| P03 | Over Current Limit - (1 - 21) Amps | 16 |
| P04 | Celsius or Fahrenheit (°C or °F) | F |
| P05 | Thermocouple Type - (J or K) | J |
| P06 | Over-temp. Alarm Limit - (8° - 30° Fahrenheit), (6° - 17° Celsius) | 30 |
| P07 | Under-temp. Alarm Limit - (5° - 30° Fahrenheit), (5° - 17° Celsius) | 30 |
| P08 | T/C Pinched - (1 - 250) seconds or (000 = disabled) | 60 |
| P09 | Open TRIAC, Heater - (1 - 240) seconds or (000 = disabled) | 30 |
| P10 | APO Enable - (YES or NO) | YES |
| P11 | Boost Time Setting - (5 - 999) seconds | 30 |
| P12 | Boost Temperature - (5° - 250° Fahrenheit), (5° - 120° Celsius) | 75 |
| P13 | Manual Boost Power - (5 - 100%) | 25% |
| P14 | Manual Standby Power - (5 - 100%) | 10% |
| P15 | Standby Temperature - (50° - 350° Fahrenheit), (50° - 175° Celsius) | 250 |
| P16 | Soft Start Time - (0 - 20) minutes | 5 |
| P17 | Soft Start Lock - (YES or NO) | YES |
| P18 | Audible Alarm - (YES or NO) | YES |
| P19 | Keypad Lock - (YES or NO) | NO |
| P20 | Frequency (Hertz) DISPLAY ONLY | |
| P21 | Tune Stabilization - (50 - 100) | 60 |

# GITC Parameters

| # | Parameters | Defaults |
|---|---|---|
| P01 | Group - (1 - 4) | 1 |
| P02 | TRIAC Shorted Time (0-20) | 10 |
| P03 | Even Temperature Rise - (YES or NO) | YES |
| P04 | Thermocouple Slaving - (YES or NO) | YES |
| P05 | Auto Power On - (YES or NO) | YES |
| P06 | Control Type - Power Control Type Phase or Burst mode (PH or BT) | PH |
| P07 | Over Current Limit - (1 - 21) Amps | 16 |
| P08 | Celsius or Fahrenheit (°C or °F) | F |
| P09 | Thermocouple Type - (J or K) | J |
| P10 | Over-temp. Alarm Limit - (8° - 30° Fahrenheit), (6° - 17° Celsius) | 30 |
| P11 | Under-temp. Alarm Limit - (5° - 30° Fahrenheit), (5° - 17° Celsius) | 30 |
| P12 | T/C Pinched - (1 - 250) seconds or (000 = disabled) | 60 |
| P13 | Open TRIAC, Heater - (1 - 240) seconds or (000 = disabled) | 30 |
| P14 | APO Enable - (YES or NO) | YES |
| P15 | Boost Time Setting - (5 - 999) seconds | 30 |
| P16 | Boost Temp. - (5° - 250° Fahrenheit), (5° - 120° Celsius) | 75 |
| P17 | Manual Boost Power - (5 - 100%) | 25 |
| P18 | Manual Standby Power - (5 - 100%) | 10 |
| P19 | Standby Temp. - (50° - 350° Fahrenheit), (50° - 175° Celsius) | 250 |
| P20 | Soft Start Time - (0 - 20) minutes | 5 |
| P21 | Soft Start Lock - (YES or NO) | YES |
| P22 | Audible Alarm - (YES or NO) | YES |
| P23 | Siren Enable LOCAL (per module) - (YES or NO) | YES |
| P24 | Siren Enable GLOBAL - (YES or NO) | YES |
| P25 | Address - DISPLAY ONLY | |
| P26 | Tune Stabilization - (50 - 100) | 60 |
| P27 | Keypad Lock - (YES or NO) | NO |

# Parameter Description

| SITC-15 | GITC-15 | Description |
|---|---|---|
| | P01 | **Group** - Set controller for specified group 1 - 4. |
| | P02 | **TRIAC Shorted Time** - Time, in seconds, the controller will take to detect a TRIAC Shorted error. |
| | P03 | **Even Temperature Rise** - Controllers follow slowest rising temperature in the system. |
| | P04 | **Thermocouple Slaving at Startup** - At startup, in the even of a thermocouple break and controllers are below 140°F, the controller will slave from a controller in the same group. |
| P01 | P05 | **Auto Power On** - After a power outage, controller will automatically power up upon the return of power if enabled. |
| P02 | P06 | **Control Type** - Power output type (PH or BT)<br>PH - half cycle phase mode<br>BT - burst cycle mode |
| P03 | P07 | **Over Current Limit Detection** - Maximum amperage controller will allow for load (Over Current Condition (HIA)). Recommended for user to adjust to heater current +10% for better protection. |
| P04 | P08 | Select degrees Celsius (°C) or Fahrenheit (°F). |
| P05 | P09 | **T/C Type** - Select thermocouple types J or K. |
| P06 | P10 | **Over-temp. Alarm Limit** - Alarm when process temperature is over setpoint value as set in parameter. |
| P07 | P11 | **Under-temp. Alarm Limit** - Alarm when process temp. is under the setpoint value as set in parameter. |
| P08 | P12 | **T/C Pinched** - Time, in seconds, that the controller will take to detect a pinched or shorted thermocouple. (There is current, no rise in temperature). |
| P09 | P13 | **Open TRIAC/Heater** - Time, in seconds, that the controller will take to detect an open TRIAC, open heater, or open wire. (No current and no rise in temperature). |
| P10 | P14 | **APO Enable** - In the event of a T/C break and the controller is at set point, the controller uses the last average output power (APO) to maintain temperature. (Automatic Bumpless Transfer). T/C must be repaired as soon as possible. |
| P11 | P15 | **Boost Time Setting** - Time, in seconds, desired for boost mode. |

# Parameter Description (c)

| SITC-15 | GITC-15 | Description |
|---|---|---|
| P12 | P16 | **Auto Mode Boost Temp.** - Boost temperature over setpoint. (Boost temp. + setpoint) |
| P13 | P17 | **Manual Mode Boost Power** - Manual percentage power output during boost mode for a set time (P15). |
| P14 | P18 | **Manual Mode Standby Power** - Manual percentage power output during standby mode. |
| P15 | P19 | **Auto Mode Standby temp.** - Standby/idle setpoint value. |
| P16 | P20 | **Soft-Start Time** - Time duration, in minutes, that the controller is in Soft-Start. (Bake Out) |
| P17 | P21 | **Soft-Start Lock** - Prevents users from changing mode while in soft-start. |
| P18 | P22 | **Audible Alarm Enable/Disable** - controller audible alarm. |
| | P23 | **Local Siren Enable/Disable** - siren alarm for the individual controller. |
| | P24 | **Global Siren Enable/Disable** - siren alarm global. |
| | P25 | **Zone Address** - Controller zone location in mainframe (Display only). |
| P20 | | **Frequency** - AC line frequency (Display only). |
| P21 | P26 | **Tuning Stabilization** - Adjustment for heaters with lagging thermocouple or low mass (quick heat dissipation heaters). If there is fluctuation of temperature, adjust higher (recommended maximum of 75). |
| P19 | P27 | **Keypad Lock** - **YES:** Disables all keys, except for the *PMTR* key, to prevent unwanted changes. **NO:** All keys enabled. |

# Display Codes

Display Codes: Displayed on PRT (process temperature display)

| Display Code | Description | Explaination |
|---|---|---|
| Hi | High Temperature | Process temp. over setpoint value. |
| Lo | Low Temperature | Process temp. under setpoint value. |
| OTC | Open Thermocouple | Thermocouple is open or break. |
| RTC | Reverse Thermo-couple | Thermocouple wire reversed. |
| PTC | Pinched Thermo-couple | Thermocouple has been shorted/ pinched. |
| TOH | Open TRIAC/Heater | TRIAC, heater is open. |
| TSH | TRIAC/Heater Shorted | TRIAC or heater shorted. (100% power output) |
| HIA | Over Current Detec-tion | Load has exceeded the amperage set in parameters. |
| APO | Average Power Output | Thermocouple is open and APO is currently running. |
| GLO | Global Function | Global key has been pressed. (GITC only) |

**NOTE: Power off controller before removing or inserting into mainframe**

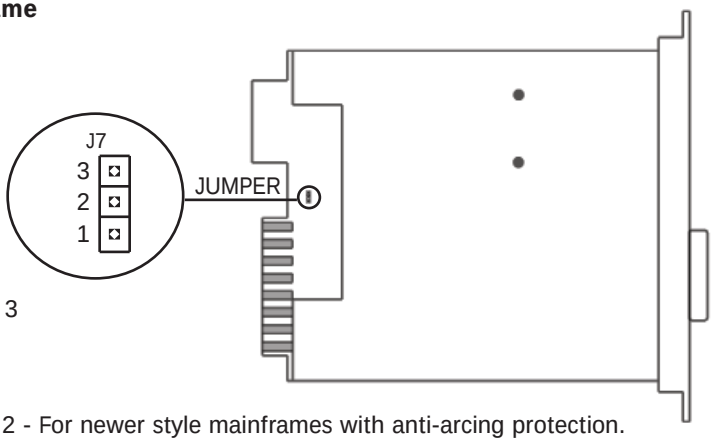



Figure 3

Pin 1 & 2 - For newer style mainframes with anti-arcing protection.
Pin 2 & 3 - For older style mainframes without anti-arcing protection.

Anti-Arcing Protection: Jumper J7 is to prevent damage to the contact points of the controller when removed from the mainframe while power is still on. J7 is set to pins 1 & 2 by factory default. If the controller is placed in an older mainframe without anti-arcing protection, place jumper on pins 2 & 3. If jumper is placed incorrectly, a TOH error may occur (NO POWER OUPUT).

# Mainframe Installation

***INSTALLATION AND SERVICE SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY!***

LOCATION:
The proper location is important for dependable service. The control systems should be located so as to allow free air movement into and out of the mainframe. Consideration should be given to allow the least exposure to heat, dust/dirt, moisture, and corrosive vapors. The front of the system must be readily accessible for set up and adjustment purposes.

It is recommended that a service disconnect switch be installed. This will provide a convenient means to completely disconnect all power from the temperature control system.

CONNECTING INPUT POWER:
1. Remove the input power access panel, located on the right side of the mainframe by removing the 8 phillips head screws. (Fig 4a)

2. Select input cable size and configuration based on load requirements and local electrical codes. Feed the cable through the cable clamp of the panel. (Fig 4b)

4. Strip wires and insert into the terminal block and tighten screws securely. (Fig 4a)

5. Replace the access panel.

6. Take up excess slack in the cable and secure with the strain relief clamp.

7. Route the AC input cable to a branch circuit (service) disconnect switch and connect to the fused side of the switch. Be sure the ground lead is attached to a proper earth ground.

8. Insert appropriate fuses for the main service fuse box.

# Mainframe Input Power Diagram

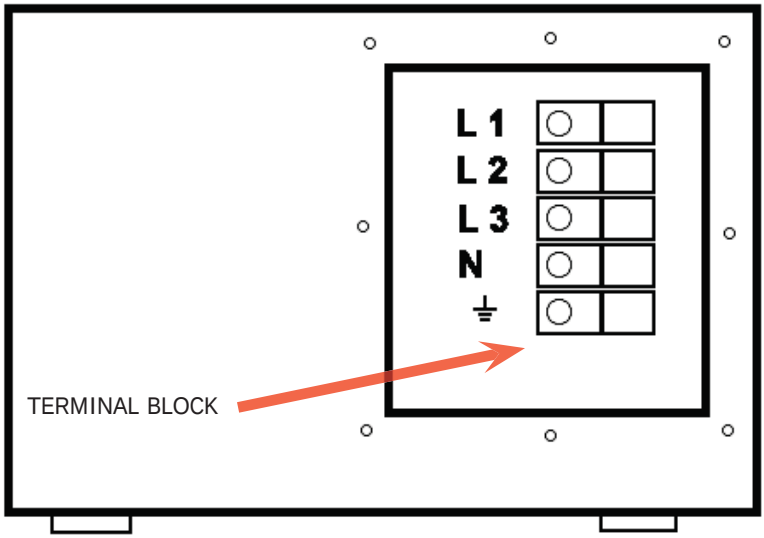



Figure 4a

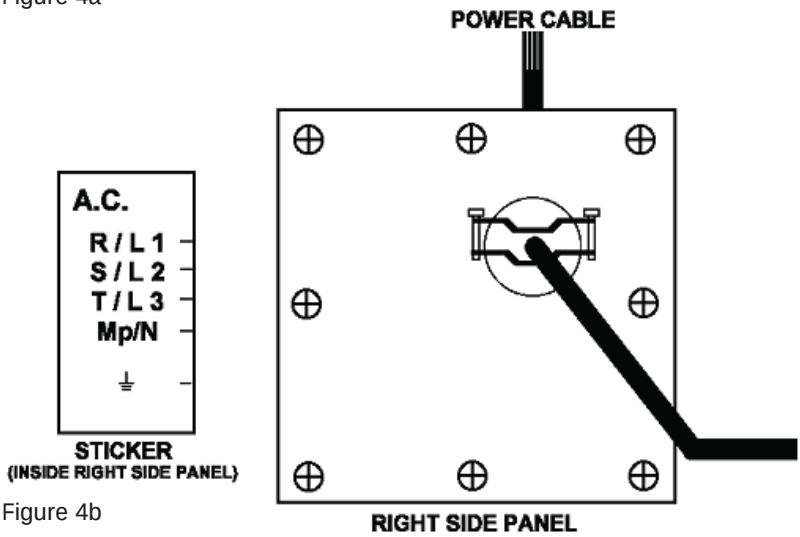



Figure 4b

Note:
Domestic: L1, L2, L3 + ground
Export: L1, L2, L3 + Neu + ground
Single Phase: L1 + Neu + ground

# Mainframe Interconnection to Mold Terminal Box

Figure 5

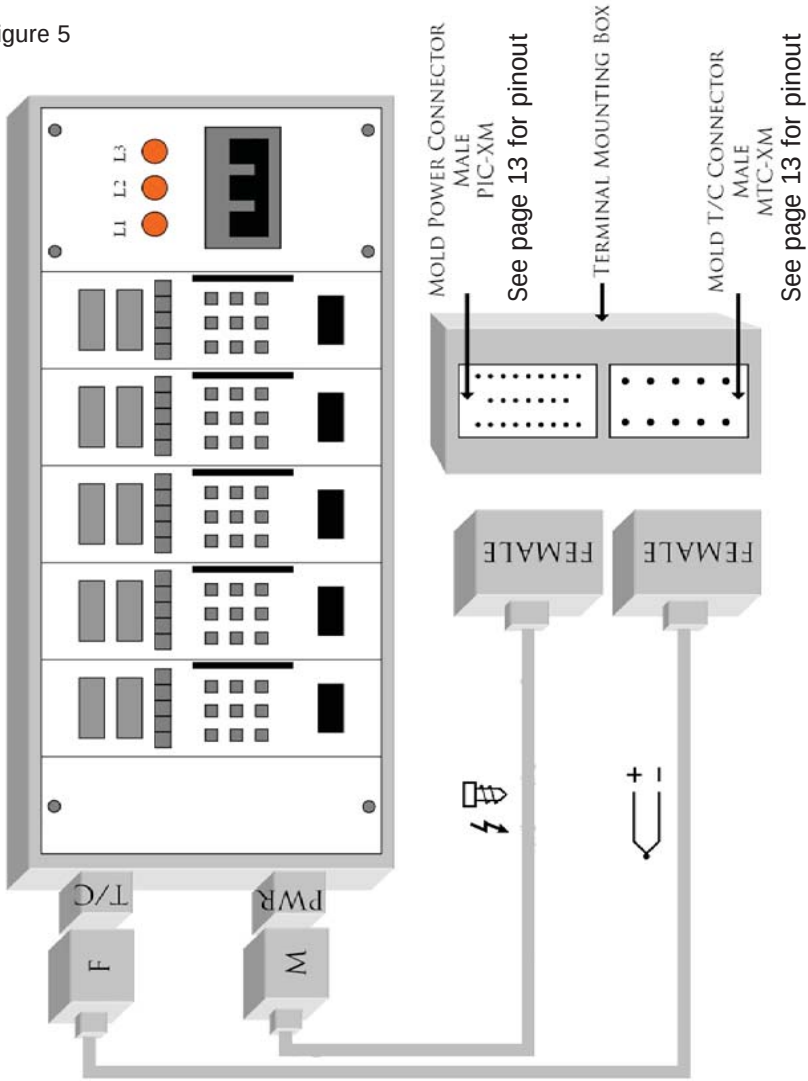
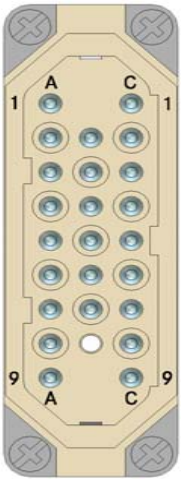


Figure 6a

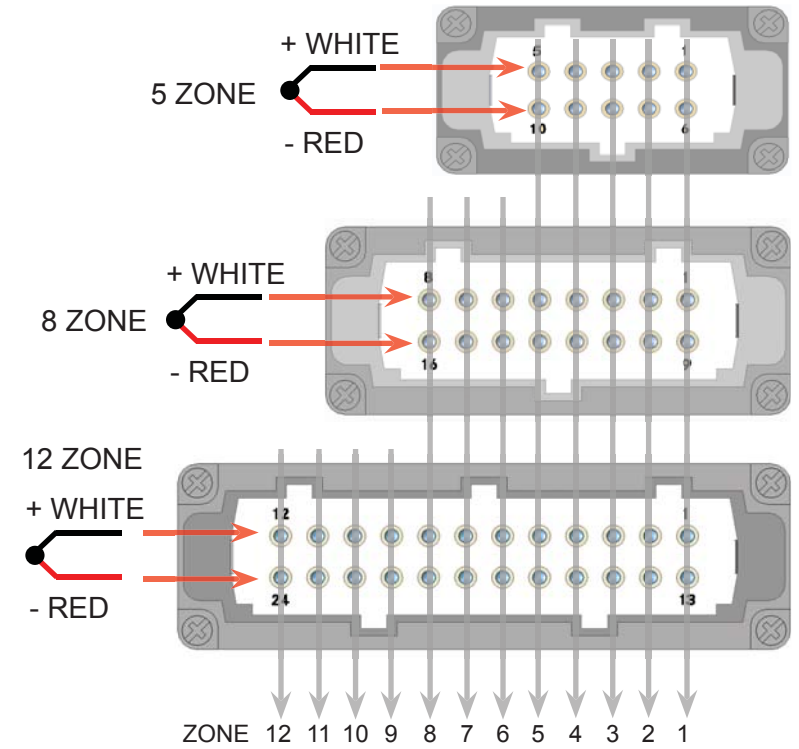
## Power Connector Pinout




| Pin | Zone | Pin | Zone | Pin | Zone |
|---|---|---|---|---|---|
| A1 | Zone 1 | | | C1 | Zone 8 |
| A2 | | B2 | Zone 5 | C2 | |
| A3 | Zone 2 | B3 | | C3 | Zone 9 |
| A4 | | B4 | Zone 6 | C4 | |
| A5 | Zone 3 | B5 | | C5 | Zone 10 |
| A6 | | B6 | Zone 7 | C6 | |
| A7 | Zone 4 | B7 | | C7 | Zone 11 |
| A8 | | B8 | | C8 | |
| A9 | Zone 12 | | | C9 | Zone 12 |

## T/C Connector Pinout

Figure 6b



# MFCP Mainframe (GITC ONLY)

MFCP mainframes come with communication and interface board with siren, which enables global functions, grouping, thermocouple slaving, even temperature rise, and Live Swap features. External alarm relay, and remote standby interface connector is located on the right side above the power input panel. Figures 7, a, and b below shows connector and external wiring circuits needed for these functions.

## Alarm/Relay Output & Remote Standby Input Connector


Figure 7

| Pin # | Function |
|---|---|
| 1 | Remote Standby Input |
| 2 | |
| 3 | Alarm/Relay Output |
| 4 | |

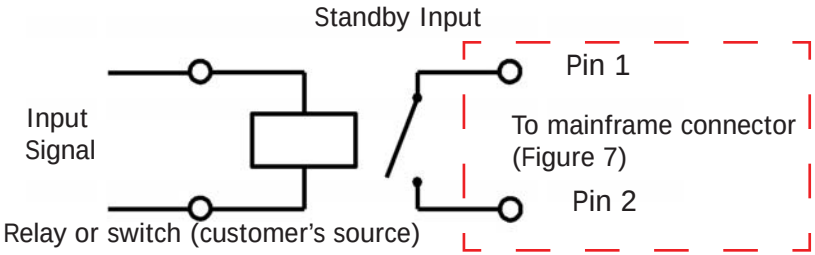



Figure 7a

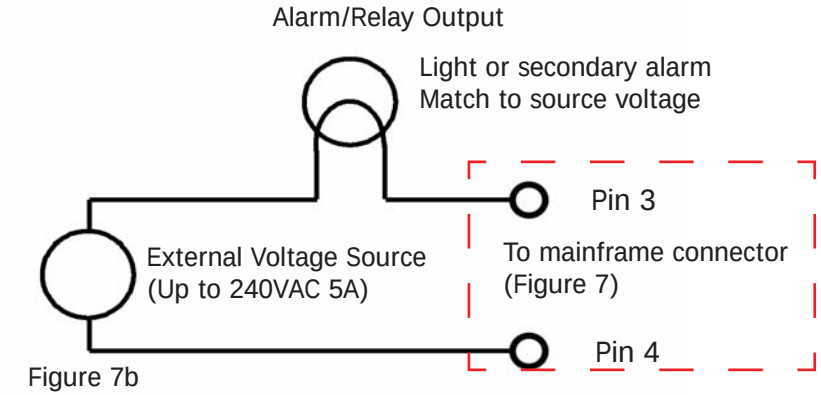
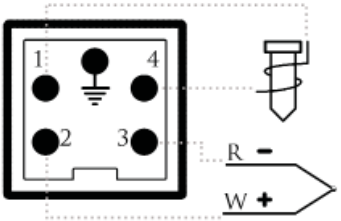



Figure 7b

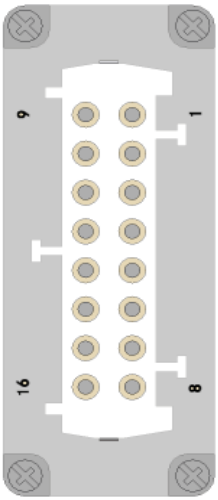
# 1 & 2 Zone Mainframe Power and Thermocouple Connector

Figure 8




| Pin # | Function |
|---|---|
| 1 | Power Output |
| 2 | T/C + |
| 3 | T/C - |
| 4 | Power Output |
| 5 | GND |

# 3 Zone Mainframe Power and Thermocouple Connector




| Pin # | Function | Pin# |
|---|---|---|
| 1 | Zone 1 Power Out | 9 |
| 2 | Zone 2 Power Out | 10 |
| 3 | Zone 3 Power Out | 11 |
| 4 | NC | 12 |
| 5 | NC | 13 |
| 6 | Zone 1 T/C Input | 14 |
| 7 | Zone 2 T/C Input | 15 |
| 8 | Zone 3 T/C Input | 16 |

Figure 9

Note:
1, 2, and 3 zone mainframes are wired for single phase 240VAC operation.

## Warranty

This product is guaranteed to be free from defects in materials and workmanship for a period of two years from the date of delivery. If the unit should malfunction, it must be returned to the factory for evaluation. Upon examination, if the unit is found to be defective, at our option, it will be repaired or replaced at no cost to the customer.

**Warranty does not cover: contact points, fuses, or triacs.**

**Warranty is null and void when: Signs of abuse or tampering are found, incorrect fuse type is used, application of High Voltage rated over the system's required specifications, or application of High Voltage to thermocouple inputs.**

MCS accepts no responsibility or liablity for the APPLICATION by the customer of temperature controllers. This liability is assumed by the customer. Upon inspection, if the returned product does not meet our warranty requirements, customer may be subject to a reasonable service charge. There are no warranties, expressed or implied, for temperature controllers except as stated herein. In no event shall MCS be liable for consequential, incidental, or special damages beyond our control. The buyer's sole remedy for any breach of this agreement shall not exceed the purchase price paid by the buyer to MCS.

Manufactured by:
Mold Control Systems, Inc.
10501 S. Orange Ave. STE #108
Orlando, FL 32824
PH: 407-855-2899
FAX: 407-855-2855