

**Main Frame Installation & Operation Manual  
Standard 10 Amp System  
1 & 2 Zones**

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**MF-1 & MF-2**

**OPERATING  
INSTRUCTIONS**

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**\*\*Please read these instructions thoroughly before using this system.\*\***

**IMPORTANT:** Make sure the main frame circuit breaker is “OFF” before inserting or removing control modules.

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September, 15 2005*

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#### **ELECTRICAL LOCKOUT:**

**THE ELECTRICAL POWER SOURCE MUST BE LOCKED OUT WHENEVER ANYONE IS WORKING ON THE EQUIPMENT.**

Each maintenance person should have a personal padlock, with only one key. When working on any equipment this person should use the padlock to lock out the electrical controls. It is most important that the only available key for the lock be in the pocket of the person who is working on the temperature control equipment. If other persons work on the same equipment, each should use their own different lock at a separate lockout station for the controls of the equipment. Accidental startup of the equipment may have tragic results.

In no case should the removal of or any work be performed on the temperature control modules or main frames without following proper electrical lockout procedures.

#### **LIFTING APPARATUS:**

Temperature control equipment, like any other type of equipment, requires normal periodic maintenance or relocation if the user is to get the most for the investment in the equipment. One of the most flagrant safety violations is the use of inadequate and unsafe lifting equipment. The temperature control equipment or parts thereof should be assembled, disassembled and moved with lifting facilities that have the capability of gently and slowly lifting and lowering the equipment or various parts.

**WHEN USING A CRANE OR FORK LIFT, OPERATE WITHIN ITS RATED CAPACITY, THE SAFE RATED CAPACITY INCLUDES WEIGHT OF HOOKS, BLOCKS, AND ANY OTHER HANDLING DEVICES, SUCH AS CABLES, SLINGS, SPREADER BARS, ETC. CONSIDER THE WEIGHT OF ALL THESE AS PART OF THE LOAD TO BE LIFTED.**

#### **WARNING:**

When inserting or removing control modules from the main frame, power must be turned off on both the module and main frame. If the module is inserted or removed while under a load, severe damage will result to both the control module and the main frame. Before replacing the module, the main frame must be inspected for damage by a qualified technician. Damage caused to control module and main frame as a result of improper insertion or removal, will not be covered under warranty.

#### **PLANT SAFETY:**

The safety procedures mentioned here do not eliminate all safety hazards found in the area of operation. However, they do highlight some procedures that have been found through long experience to improve safety conditions around temperature control systems. International Temperature Control Inc. welcomes inquiries about other suggested safety procedures for use around their equipment.

#### **OUT OF SERVICE:**

When the system is out of service, both the control module and main frame must be turned off.

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International Temperature Control, Inc. 1 and 2 Zone Modular 10 amp systems are designed to accurately manage heater band and mold probe temperatures. Designed to accept any ITC temperature control module, they operate in a closed loop environment utilizing Type “J” or “K” thermocouples.

ITC’s 1 and 2 Zone modular main frame systems are comprised of three basic components:

1. Main Frame
2. Mold to Main Frame Interface (Cable)
3. Temperature Control Module

The instructions contained herein are detailed instructions which apply specifically to International Temperature Control, Inc. 1 & 2 zone systems.

#### **WARNING:**

In most applications, only one heater element can be used per temperature control module. Current draw can fluctuate dramatically if multiple heater elements are wired together. If heaters are wired in parallel, care must be taken to insure that the total wattage of the heaters do not exceed the modules rating. If multiple heaters are wired in series, the effective wattage of the circuit drops dramatically. The use of more than one heater in a circuit should only be contemplated if a qualified electrical engineer designs the circuit.

It is highly recommended that a qualified electrician perform the input power wiring for this control system.

#### **DESCRIPTION:**

Unless otherwise specified, standard 1 & 2 zone main frames are wired to accept 208/240vac, Single Phase, 3 wire (2 AC power leads, plus one ground lead), 50/60 Hz power. If you are unsure of the voltage available, do not connect input power to this system without clarification as you may cause severe damage to the unit.

Units that will operate from 480vac power source will require a step down transformer to convert 480vac to 240vac before it enters the main frame. If the step down transformer is ordered from International Temperature Control, Inc., it will be pre-wired to the main frame.

#### **SITE LOCATION:**

- Location of the main frame is important for proper operation and dependable service.
- Ventilation - The main frame must be located so air can move freely in and out of the housing and must not be exposed to excessive heat (maximum operating ambient air temperature 100° F).
- The main frame must be located to minimize dust, dirt, moisture, vibration and caustic vapors, as they all have a detrimental affect on the equipment.
- The unit must be positioned so the front and rear are readily accessible for setup, adjustment and service.
- Unit must be placed close enough to the mold so all cables can be conveniently run and connections made without undo strain on cables or connectors.
- Place main frame so it will not be damaged by normal plant activities.

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#### **POWER CONNECTION:**

All electrical connections, and servicing must be only preformed by qualified electrical technicians. All electrical connections and servicing must be done in accordance with safe electrical practices. Consult your local electrical code prior to electrical installation. Follow proper lock out & tag out procedures before any work is done on the unit.

*NOTE: It is recommended that a fused disconnect box be installed. This will provide a convenient means to implement lock out & tag out procedures and completely disconnect all input power to the main frame.*

Electrical Installation: (Reference enclosed drawing)

#### **WARNING:**

Never attempt to perform any wiring or service to this unit with the power cable connected to a power source. Disconnect the input power cable from the power source before attempting any service to this unit.

- International Temperature Control, Inc., supplies it's standard 1 & 2 zone main frames with a male power receptacle for same and efficient set up.
- Be sure the input power cable meets all electrical codes and system load requirements.
- Separate the supplied female AC input power cord plug (1Z-IPP) into two parts: the front socket with 3 screws down terminals and the body assembly with adjustable cable clamp.
- Strip back 1-1/8 inches of the power cable outer jacket.
- Strip back 5/8 inch of insulation from each of the three individual leads.
- Insert the power cable through the back of the Input Power Plug (1Z-IPP) body assembly so that the cable is sticking out the front.
- Connect each of the three power leads to the three unscrewed terminals on the front plug. Do this by pushing down on the screw, insert the wire, release the screw and tighten the screw.
- Make sure the ground wire is secured under the green hex screw and that the ground wire (usually green) terminates to earth ground on the other end. Wiring errors or an ungrounded main frame may make the main frame electrically hot and extremely dangerous.
- Line up the keyway notch on the plug and snap the wired socket into the body assembly and securely tighten.
- After connecting the Input Power Cord Plug (1Z-IPP) to the main frame end of the cable, connect the power cable to a 240vac single phase, disconnect box and attach the leads to the fused/protected side of the switch. It is imperative that the green ground lead be properly attached to a good earth ground. Test connection to earth ground.
- Fully push the Input Power Plug (1Z-IPP) into the 3-prong AC power input socket located on the rear right hand corner on the top of the main frame.
- Install appropriate size fuses in the main disconnect service box.

#### **WARNING:**

Exposed electrical leads can cause shock or electrocution. Do not connect or apply power to main frame when any cover is open or removed.

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#### **1 & 2 ZONE MAIN FRAME:**

A single zone main frame controls one (1) mold heater, while a 2-zone system can control two (2) mold heaters. The main frames are designed to accept any ITC Control Module. The main frame is the heart of a hot runner temperature control system, by converting 240vac external power into a usable configuration. By means of a complex algorithm the temperature control module interprets data from the thermocouple and modulates power to the mold heater in a fashion which will hold a constant temperature.

1. The maximum load for a standard 1 & 2 zone main frames is 10 amps per zone. This is limited by wire size and connector ratings.
2. Air vents are provided in the bottom and sides of the main frame for cooling. Caution must be taken to prevent impeding the natural air flow, as damage could result.
3. A 5-pin female connector with latch is mounted on the top of the unit to accept a cable interface to the mold.
4. An external 3-prong male AC input power receptacle is supplied.

#### **MAIN FRAME TO MOLD INTERFACE & CONNECTORS:**

The main frame is connected to the mold heater and thermocouple by means of a five-pin system. A five-pin combination heater and thermocouple connector is provided to efficiently interface with the mold. This interface is basically accomplished through a single 5-wire shielded cable consisting of two heater leads, two thermocouple leads, and a ground lead.

1. **Combination Heater/Thermocouple Cable Assembly (one cable per zone):**  
The standard Shielded Combination Heater/Thermocouple Cable (PTC1-10 or -20) connects on one end to the Female Frame Connector (1Z-FC) which is located on the right hand side of the top of the main frame. The opposite end of the cable connects to the Male Mold Connector (1Z-MC) which is located on or near the mold. This item is ordered separately.
2. **Male Mold Connector (one connector per zone):**  
The 5-prong Male Mold Connector (1Z-MC) mounts on or near the mold and accepts the female end of the Combination Heater/Thermocouple Cable Assembly (PTC1-10 or -20). This item is ordered separately.
3. **Female Frame Connector (one connector per zone):**  
For a single zone main frame, the 5-Prong Female Frame Connector (1Z-FC) is located on the right hand side of the top of the main frame. For a 2-zone main frame, the second connector is also located on the right hand side of the top just ahead of the first zone connector.

#### **INSERTING AND REMOVING MODULES:**

1. Inserting or removing modules while module and main frame is on could expose the operator to dangerous electrical power. It could also destroy the module and damage the main frame

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2. Turn OFF the module and main frame. Lock out & tag out power to the main frame prior to removing or installing temperature control modules.
3. Remove module from main frame by gently, but firmly pulling straight out.
4. Insert module by first lining up top and bottom of module with card guides in the main frame.
5. Push module gently, but firmly into main frame card guides until it is fully seated in the edge connector located at the back of the main frame.

#### ANTI-ARCING FEATURE

All ITC temperature control systems are equipped with our innovative **Anti-arcing** feature that will help prevent damage to the control module and main frame in the event the module is inadvertently removed under load. This feature should not be considered a substitute for proper handling procedures, but rather a supplemental protection mechanism.

If a control module is inserted into a main frame not equipped for **Anti-arcing**, the instrument will not provide power to the heater and a “tOh” error code will be displayed. If this condition occurs, the **Anti-arcing** jumper can be moved from the #2 & #3 enabled position to the #1 & #2 disabled position. By repositioning the jumper in the **Anti-arcing** disabled position, the module will function in main frames not equipped with the **Anti-arcing** feature. **Disabling the anti-arcing feature can void your two-year warranty in the event the module is removed from main frame under load, as a resulting in damage to printed circuit board traces.**

**NOTE:** This feature will only work with ITC’s updated TC-2000 main frames, and should not be considered a substitute for proper handling procedures. Disabling the anti-arcing feature could void your two-year warranty if damage occurs.

**NOTE:** The **Anti-arcing** feature will not prevent damage if the jumper is not in the enabled position.

**NOTE:** The **Anti-arcing** feature of this module will not prevent damage if the module is used in a main frame not properly equipped for **Anti-arcing**.

ITC main frames manufactured prior to March 2000 were not equipped with the **Anti-Arcing** feature.

They can be upgraded with **Anti-Arcing** by installing Contact (MF-ECC) in position #3 of Card Edge Connector (MF-EC). Please consult the factory. (*Refer to the enclosed Anti-arcing sheet for more information.*)

#### **CAUTION:**

Install Main Frame Blank Plates (MFBP) over any empty slots. **NEVER** operate the system with an uncovered slot, since it will expose you to dangerous electrical power which can cause sever electrical shock.

#### **WARNING:**

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#### SPECIFICATIONS:

Voltage .....	208 to 240vac, three phase
Frequency .....	50/60 Hz
Maximum Amperage Per Zone .....	10 Amps
Physical Configuration .....	Modules plug in for easy interchangeability
Compatibility .....	Compatible with "G" Series Controllers
1 & 2 Zone Main Frame Size .....	10-3/4" High (with handle) 7-1/4" wide, 10" deep
Weight .....	7 pounds Approx. Less modules and cables
Construction .....	Welded steel, steel handle for portability, in line module circuit board connectors with large connectors for reliability, top and bottom card guides
Special Features .....	Anti-Arching capability with proper ITC module

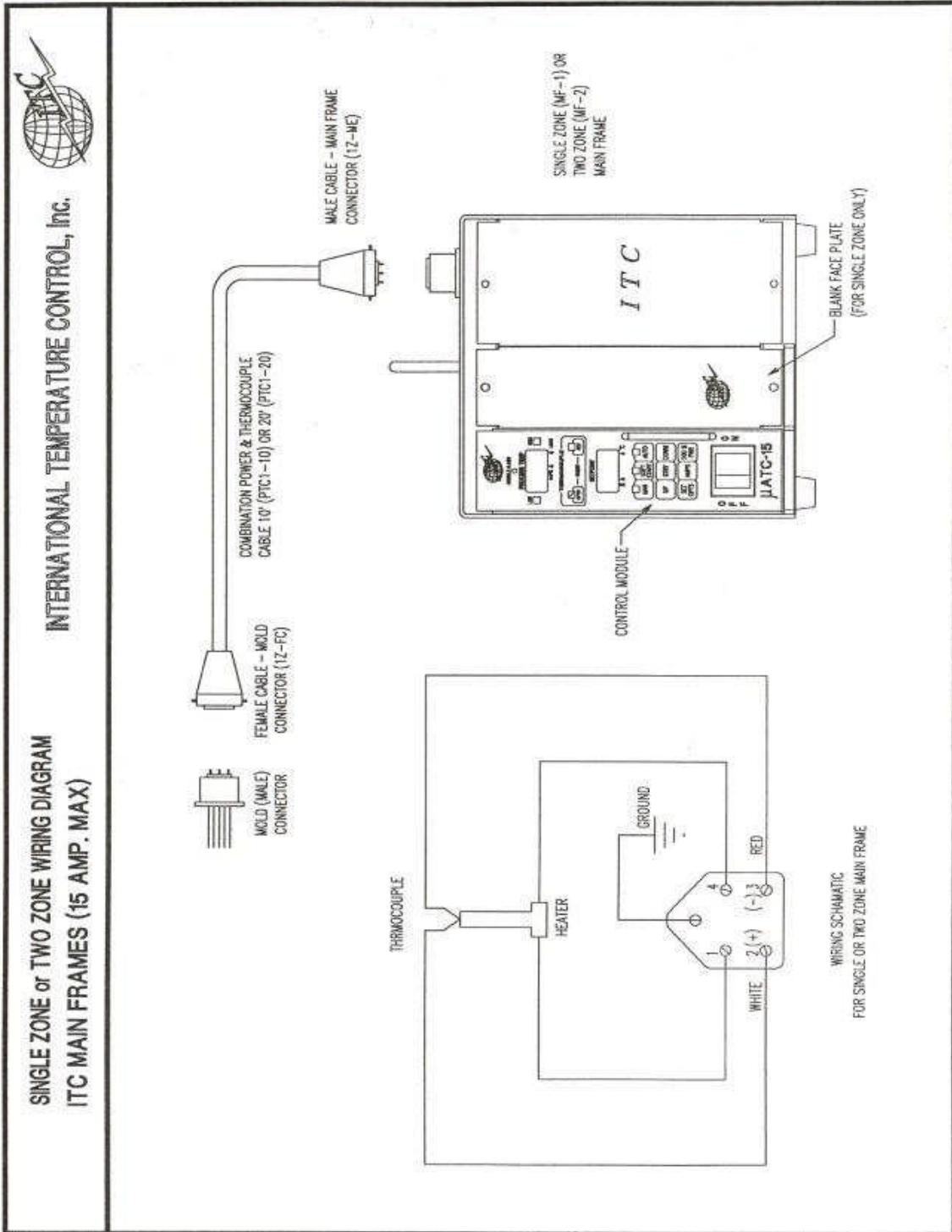
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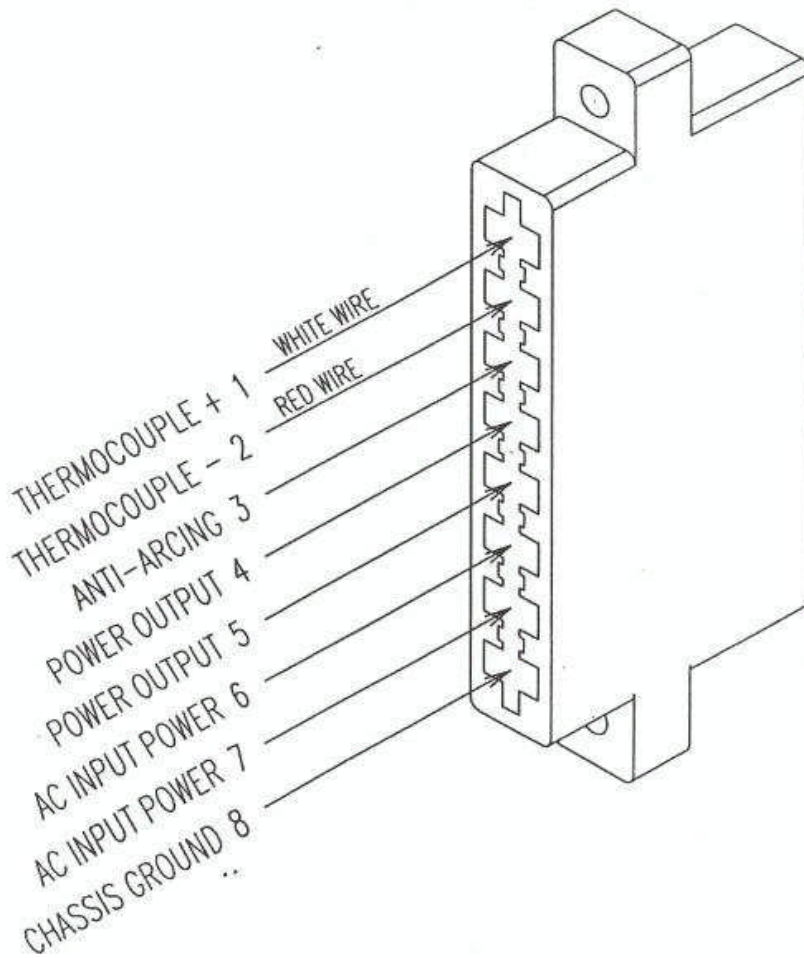
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INTERNATIONAL TEMPERATURE CONTROL, Inc.

#### MAIN FRAME CONTROL MODULE CONNECTOR

#### AMP - CR



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