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# SERIES IMP | IMP/P

HOT RUNNER CONTROLLERS

*Instruction  
Manual*





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# IMP SERIES OPERATING INSTRUCTIONS

## ALARM/MODE DISPLAY

DISPLAY	ALARM SYMBOLS
	OVER TEMPERATURE
	UNDER TEMPERATURE
	THERMOCOUPLE OPEN
	NO HEAT
	THERMOCOUPLE REVERSED

## DOT INDICATORS

	POWER BEING DELIVERED TO LOAD
	MANUAL MODE ON (DISPLAY INDICATES PERCENTAGE OF POWER)
	REMOTE AND STANDBY OPERATION

**DIGITAL SETPOINT SWITCH**  
ACCURATELY SETS A  
SETPOINT TEMPERATURE

STANDBY (WARM) REGION

**PERCENTAGE POWER ADJUSTMENT KNOB**  
CONTROLS PERCENTAGE OF POWER  
SUPPLIED TO LOAD IN MANUAL

**POWER SWITCH**

- I ON
- O OFF

**MODE SELECT TOGGLE SWITCH**  
DISPLAY    MODE SYMBOLS

- OPEN LOOP (MANUAL MODE)
- CLOSED LOOP (AUTO MODE)
- COMPUSTEP® START-UP  
ON DURING FIVE MINUTE  
COMPUSTEP TIME PERIOD



TEMPERATURE AND  
PERCENTAGE POWER  
DISPLAY

# IMP/P SERIES PORTABLE SINGLE ZONE HORIZONTAL CONTROLLER

DIGITAL SETPOINT SWITCH  
ACCURATELY SETS A  
SETPOINT TEMPERATURE

STANDBY (WARM) REGION

POWER SWITCH

- | ON
- OFF

MODE SELECT TOGGLE SWITCH

DISPLAY      MODE SYMBOLS

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ALARM/DISPLAY

DISPLAY      ALARM SYMBOLS

- OVER TEMPERATURE
- UNDER TEMPERATURE
- THERMOCOUPLE OPEN
- NO HEAT
- THERMOCOUPLE REVERSED

TEMPERATURE AND PERCENTAGE  
POWER DISPLAY



DOT INDICATORS

- POWER BEING DELIVERED TO LOAD
- % MANUAL MODE ON  
(DISPLAY INDICATES PERCENTAGE  
OF POWER)

PERCENTAGE POWER ADJUSTMENT KNOB  
CONTROLS PERCENTAGE OF POWER  
SUPPLIED TO LOAD IN MANUAL

## Section One

# Operating Instructions

### *IMP Series 15 and 30 Amp Temperature Controllers*

### *IMP/P Series 10 and 15 Amp Temperature Controllers*

## 1.1 General Description

The IMP and IMP/P Series are microprocessor-based PID controllers specifically designed to perform most operator functions automatically. The IMP Series are plug-in units, while the IMP/P Series are portable, standalone instruments. Both are self-adjusting and capable of maintaining a very high degree of temperature accuracy over a wide range of operating conditions.

Simplified controls and the use of status symbols allow the operator to make adjustments easily. The status display also provides visual indication of normal or abnormal operating conditions in both controller and load.

All that is required of the operator is to set the temperature desired. From that point on, the controller will automatically perform all the operations required to achieve and maintain the selected temperature. Included in the design is a built-in safety feature that will automatically interrupt the controller output power when any thermocouple (T/C) fault is detected, when operating in closed-loop mode. In open-loop operation, the display shows percentage of power as set by the power control potentiometer (0-100%).

## 1.2 Installation (IMP Series Only)

All IMP Series controllers are ready to use as shipped from the factory. Prior to installation into a mainframe, make sure the voltage, Hz, and degree options are as ordered and correspond to the Product ID label.

To install a plug-in controller into a mainframe, release the locking device on the lower edge of the unit by pulling the plunger gently away from the panel. Align the upper and lower edges of the printed circuit board on the controller with the mainframe card guide slot and slide in until the rear connector is completely engaged. Lock the controller into the frame by depressing the plunger on the locking device.

## CAUTION

*Never insert or remove a controller from a mainframe with the AC power on. Hazardous potentials exist on components inside the mainframe and controller. Always disconnect AC power to the mainframe when servicing.*




## 1.3 Operation

*Note: Any flashing display indicates that the controller has detected a fault. Refer to section on Faults.*

### Automatic Closed-Loop Operation



1. Position Mode select switch to closed-loop ("O").
2. Set temperature on Setpoint switch.
3. Turn on AC power.
4. After a short reset delay, the measured temperature will be displayed. If the temperature is 30°F (17°C) or more below setpoint, the under temperature alarm display (lower segment of the leftmost digit) will flash. If the temperature is 30°F (17°C) or more above setpoint, the over temperature alarm display (upper segment of the leftmost digit) will flash. During alarm conditions,

temperature display will also flash. If the temperature is within alarm limits, the display will stop flashing, and the leftmost digit will display closed-loop mode (“O”).



5. Power to load indicator (the decimal point of the leftmost digit) will be on if any power is being applied to the load.
6. When any of the T/C faults are detected, output power will be cut off automatically and the temperature display will be blanked out. The leftmost digit will show “” for (T/C open), “” for (T/C reverse) or “” for No Heat and flash twice per second.

## Automatic Operation with CompuStep® System

When starting from cold, it is recommended that the CompuStep system be used to lengthen heater life considerably.

1. Position the mode select switch to CompuStep mode (“”).
2. Set the desired temperature on the setpoint switch.
3. Turn on the AC power.
4. After reset delay, the measured temperature will be displayed. If temperature is less than 200°F (93°C) the controller will enter the CompuStep mode. This is indicated by the step symbol “” on the leftmost digit. During this mode, the controller gradually increases power to load in small steps. After 5 minutes or when the temperature reaches 256°F (124°C), the controller will exit from CompuStep mode and automatically go to setpoint. Any thermocouple faults detected during the 5-minute interval will cause the CompuStep mode to end prematurely. When CompuStep ends, the controller will operate as described in the Automatic Closed-Loop Operation section. If temperature is above 200°F (93°C), controller will bypass CompuStep and go directly to setpoint.

## Manual Open-Loop Operation

1. Position the mode select switch to open-loop (“”).
2. Turn the AC power on.
3. After reset delay, the controller will display the percentage of output power as adjusted by the power control knob. The percentage power indicator will be on. Thus 0.00 corresponds to 0% (no power) and 1.00 corresponds to 100% (full power). The leftmost digit will display open-loop mode (“”). 75% power is shown as 0.75.

## Manual Control Pre-Set

The following procedure can be used to pre-set the Manual Power Control Knob position in the event of a thermocouple break in closed-loop operation.

A good thermocouple is required to start with, as this procedure compares the temperature attained using automatic (closed-loop) control with that obtained using manual (open-loop) control. When the temperature is the same using either automatic or manual control, then the position of the Manual Power Control Knob is correct.

## Procedure for Manual Control Pre-Set

- a. Adjust controller for closed-loop operation and obtain good molded parts. This will adjust the controller to the proper temperature.
- b. Position the module select switch to open-loop and set the manual control knob to roughly 25%. Wait for 10 seconds, then momentarily switch to closed-loop mode to examine the temperature. If it is above the set point, the manual power is too high to maintain proper temperature. If it is below setpoint, the manual power is too low. Adjust the power control knob accordingly, wait for 10

seconds, then re-examine the temperature by switching momentarily to closed-loop mode. Repeat this procedure until the temperature is the same in either automatic or manual control.

## Faults

1. Over temperature alarm:  
A constant over temperature alarm is most likely caused by a shorted triac in the controller or incorrect or shorted mold wiring. Switch module power off as quickly as possible and replace controller or correct wiring error. Check for thermocouple or heater cross wiring.
2. Under temperature alarm:  
Under temperature alarm is normal during system start-up before the setpoint is reached. If under temperature persists, a No heat fault will occur.
3. Thermocouple open or reversed:  
If any T/C fault is detected during closed-loop operation, the output power will be cut off. If it is necessary to apply power to the load during a T/C fault condition, the controller can be switched to manual mode. The output power will be a function of the manual control knob setting. Since the controller is now operating in open-loop mode, extreme care must be taken when adjusting to prevent excess output power that would overheat the load.
4. No heat:  
The IMP series controller has included in its microprocessor a program that detects that the temperature is not rising as it should in response to full power output. "No heat" is defined as the condition under which the temperature does not increase more than 2°F during a

60-second interval during start-up. It takes 60 seconds to detect "No heat" when power is first turned on in closed-loop mode.

If CompuStep is active, the test is not performed until after CompuStep is finished (5 minutes). When "No heat" alarm is detected, output power is cut off.

## What to do:

- a. Try resetting the controller by turning its AC power OFF and then ON.
- b. If "No Heat" persists, then the problem could be one of the following.
  - 1) Open heater or load.
  - 2) Thermocouple shorted. Switch to manual mode to override this condition.
  - 3) Load circuit open. This can be caused by an open power cable, an open connector or a failed triac in the controller. Exchange the module with a known good module to eliminate suspect triac or module.
  - 4) Slow heater. Use higher power heater or operate in manual mode until setpoint is achieved.
  - 5) Thermocouple too far away from heat source that causes less than 2°F (1°C) rise in 60 seconds due to thermal lag. Move thermocouple as close to heater as possible or use heater with built in thermocouple.
  - 6) To defeat "No Heat" circuit, if not used or required, remove jumper J4 and that circuit will no longer be active.



## User's Selected Jumper Option

1. For degree Celsius operation, install shunt on PC board marked J1 (marked C on newer models)
2. For 120 Vac input operation, install the 2 jumpers on the PC board as shown.
3. For 240 Vac input operation, install the 1 jumper on the PC board as shown.

*Note: If units are factory wired for 240 Vac, remove 240 V jumper prior to installing a 120 V jumper.*

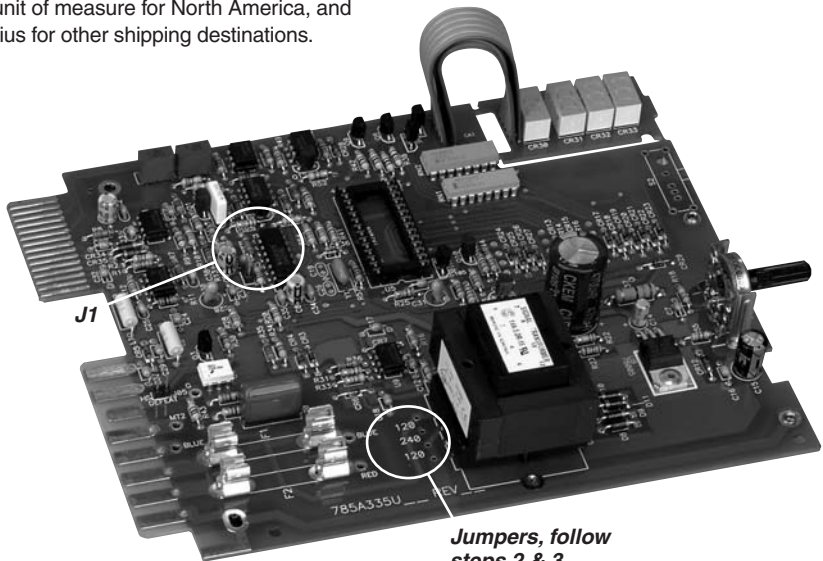
## SafeChange™ Hot Swap Feature

Controllers are shipped with SafeChange disabled, because the controller will not work if the SafeChange feature is enabled, but the mainframe does not support SafeChange. You can enable SafeChange quickly and easily using a jumper as described in this section.

Basic set up choices are made using DIP switches as described in this section. The switches in a Series IMP Hot Runner controller are set at the factory for J thermocouple as the input type, with Fahrenheit as the unit of measure for North America, and Celsius for other shipping destinations.

1. Checking Mainframe for SafeChange Capability  
**Do not enable SafeChange unless the mainframe supports this feature.**  
 To check the mainframe for SafeChange capability:
  - a. Turn off power to the mainframe.
  - b. Remove a blanking panel or a controller that is OFF, so you can look into the mainframe.
  - c. Look at the lower connector block on the backplane.
    - 1) If a metal clip is in the third position from the top in the connector block, then the mainframe supports SafeChange. SafeChange should be enabled on the controller before installing it in the mainframe to reduce the possibility of damage to the controller.

*Use of the SafeChange feature does not eliminate the need for careful installation and removal of controllers. Always turn off power to the controller and the mainframe when installing or removing a controller.*



**Jumpers, follow steps 2 & 3**

2) If the third position in the connector block does not contain a metal clip, then the mainframe does not support SafeChange. You can add a clip to convert the mainframe.

2. Enabling the SafeChange Feature

Controllers are shipped with SafeChange disabled, because the controller will not work if the SafeChange feature is enabled, but the mainframe does not support SafeChange.

You can enable SafeChange quickly and easily.

**To enable the SafeChange feature, remove the jumper block from JP6.**

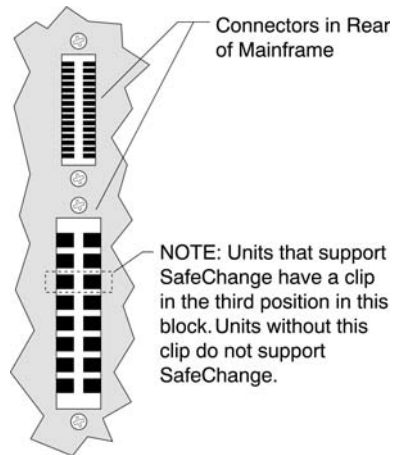
If you don't see JP6, the controller in hand may pre-date the SafeChange feature. In addition to JP6 in the location shown above, controllers that support SafeChange also have one edge connector shorter than the others. If all the edge connectors are the same length, the controller does not support the SafeChange feature.

3. Adding a SafeChange Clip to the Mainframe

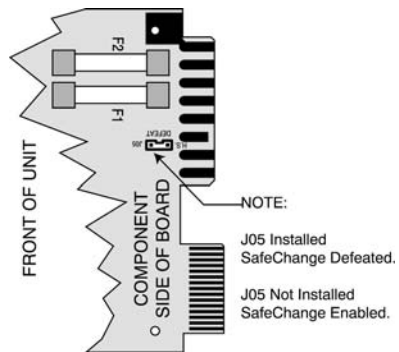
You can convert an older mainframe to support SafeChange. To make the conversion, you must add a clip to the third position in the lower connector block (on the backplane) in every slot; see the illustration. The clip is p/n 216D001U01.

To install the clip:

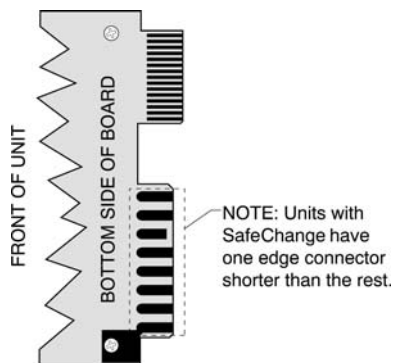
- Turn off power to the mainframe.
- Remove the back cover of the mainframe.
- Position the clip in the third (open) position in the lower connector block, and press. The clip will snap into position.



**Location of Clip in Mainframe to Support SafeChange**

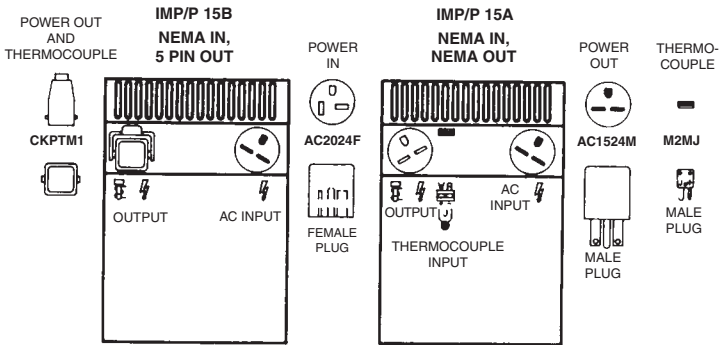
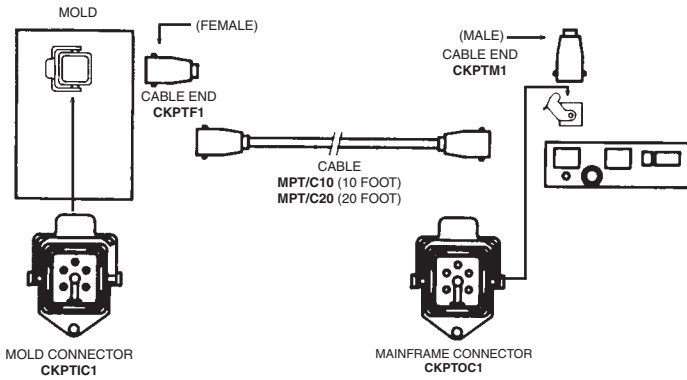


**Location of SafeChange Jumper JP6**

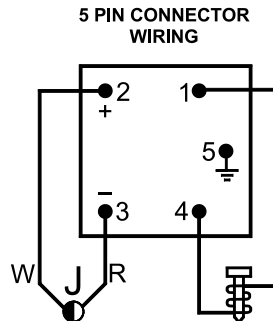
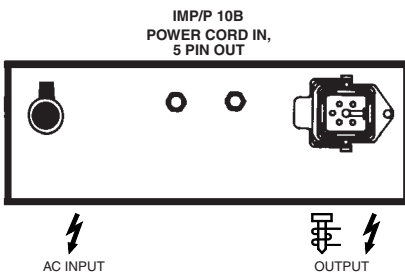


**SafeChange Edge Connector**

# SERIES IMP/P WIRING & CONNECTION DIAGRAM



# SERIES IMP/P WIRING & CONNECTION DIAGRAM



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