SERIES
RMA

HOT RUNNER
CONTROLLER

Instruction Manual

Table of Contents

1.1 Precautions

After unpacking, inspect the instrument for any physical damage that may have occurred in shipping. Save all packing materials and report any damage to the carrier immediately.

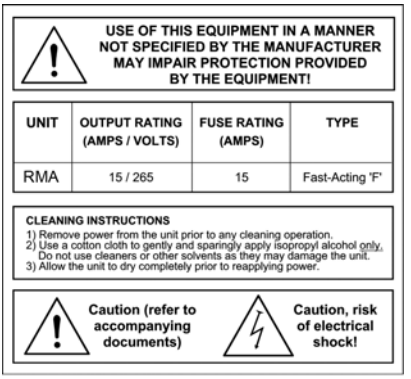
Notes on CE EMC Compliance

CE This unit is compliant with the following standards when properly installed into a grounded metal housing: (EMC testing was conducted with a load of 1Amp and setpoint of 400°F.)

EMC Directive (89/336/EEC)
EN 50081-1 (1992 edition)
EN 50082-1 (1992 edition)
Low Voltage Directive (73/23/EEC)
EN 61010-1 (1992 edition, Amendments 1, 2, 3, 4 and 11)

WARNING

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



Safety Warning

In addition to presenting a potential fire hazard, high voltage and high temperature can damage equipment and cause severe injury or death. When installing or using this instrument, follow all instructions carefully and use approved safety controls (high limit, etc.). Only suitably trained personnel should perform electrical wiring of connections.

Do not locate this instrument where it may be subjected to excessive shock, vibration, dirt, moisture, oil, or other liquids.

Safe operating temperature range is 32 to 131°F (0 to 55°C).

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! Because these temperature controls or associated equipment may not always failsafe, an approved temperature and/or pressure safety control should be used for safe operation.

1.2 Installation

Set jumper configuration to desired operation (see jumper table). To install the controller in a mainframe, release the locking device on the lower edge of the unit by pulling the plunger gently away from the panel. NOTE: For CE units use appropriate tool to remove locking screw. Align the upper and lower edges of the controller printed circuit board with the respective card guides on the mainframe and slide the unit all the way into the mainframe until the rear connector is completely engaged. Lock the controller into the frame by depressing the plunger on the locking device.

Factory Default Settings

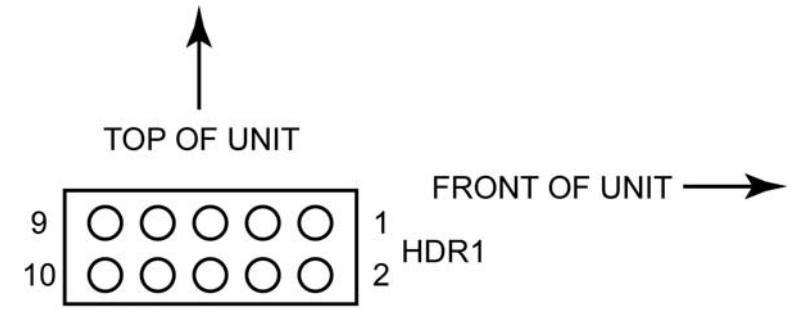
MENU

SETPOINT	100°F (37.8°C)
DEVIATION ALARMS	± 30°F (± 17°C)

JUMPERS

PINS 1 & 2 (CLOSED)	FAILSAFE ENABLED
PINS 3 & 4 (OPEN)	DEGREES FAHRENHEIT
PINS 7 & 8 (OPEN)	SOFT START ENABLED

Jumper Selections



JMPER PINS 1 & 2 = FAILSAFE ENABLED
JMPER PINS 3 & 4 = DEGREES CELCIUS
JMPER PINS 7 & 8 = SOFT START DISABLED

1.3 Entering and Changing Parameter Values

1) Heat On Indicator & CompuStep® Indicator (Orange)
2) Process Temperature Display (3 Digit / Orange)
3) Setpoint, Percent Output, or Heater Current Display (3 Digit / Green)
4) Degrees F, Degrees C, or Percent Indicator (Green)
5) Up Arrow
   Increases temperature setpoint in normal mode or increases values in menu mode (Hold for fast-step progression)
6) Down Arrow
   Decreases temperature setpoint in normal mode or decreases values in menu mode (Hold for fast-step progression)
7) Alarm Indicator (Orange)
8) Manual Mode Indicator (Green)
9) Closed Loop Indicator (Green)
10) Auto / Manual Mode
    (LED On Indicates "Manual")
11) Power
    (MUST BE OFF TO REMOVE OR INSTALL UNIT)

1.4 Enabling SafeChange™ and Setting Switches

Introduction

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. The jumpers in a Series RMA Hot Runner controller are set at the factory for Fahrenheit as the unit of measure for North America, and Celsius for other shipping destinations. Read and heed the warnings and cautions in the front of this manual before checking the mainframe for SafeChange capability or changing jumper settings.

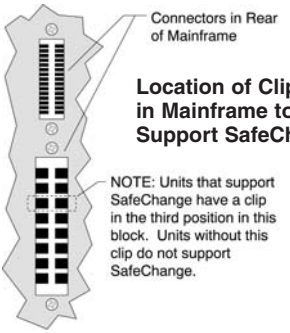
Checking Mainframe for SafeChange Capability

Do not enable SafeChange unless the mainframe supports this feature.

To check the mainframe for SafeChange capability:

1. Turn off power to the mainframe.
2. Remove a blanking panel or a controller that is OFF, so you can look into the mainframe.
3. Look at the lower connector block on the backplane.

If a metal clip is in the third position in the connector block, then the mainframe supports SafeChange. You should enable SafeChange on the controller before installing it in the mainframe to reduce the possibility of damage to the controller.



Location of Clip in Mainframe to Support SafeChange

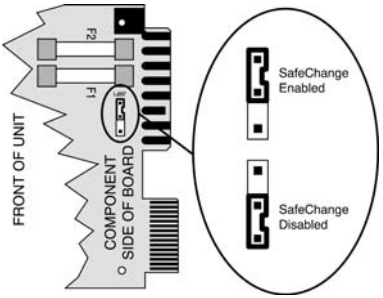
Use of the SafeChange feature does not eliminate the need for careful installation and removal of controllers. Always turn off power to the controller and the mainframe when installing or removing a controller.

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.

Enabling the SafeChange Feature

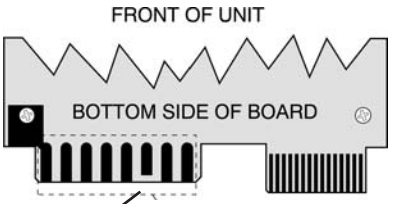
Controllers are shipped with SafeChange disabled, because the controller will not work if the SafeChange feature is enabled, but the mainframe does not support SafeChange.

To enable the SafeChange feature, set the jumper on JMP1 as shown.



Location of SafeChange Jumper JMP1

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.



NOTE: Units with SafeChange have one edge connector shorter than the rest.

1.5 Modes of Operation

Manual Mode

To switch to Manual Mode from Auto Mode, press the MODE key until the "Manual" LED illuminates. This mode allows the operator to adjust the Manual Output Percentage (0 to 100%) by pressing the UP/DOWN arrow keys.

Auto Mode

To switch to Auto Mode from Manual Mode, press the MODE key until the "Manual" LED turns off. This mode allows the operator to adjust the setpoint temperature value by pressing the UP/DOWN arrow keys.

1.6 Functions

COMPUSTEP® / BAKE OUT / SOFT START

Gradually applying power to the heaters extends the life of the heaters and the mold. Phase angle firing is used to implement the CompuStep feature. The CompuStep will last for 5 minutes or until the temperature reaches 200°F (94°C).

MANUAL CONTROL MODE

Switching between Auto and Manual Mode is easily accomplished by pressing the MODE key to toggle between both states. In Manual Mode, the LED indicator labeled "Manual" is illuminated. In Auto Mode, it is not.

Manual control is also activated at zero percent when input error conditions arise and under these circumstances is activated automatically regardless of the "MODE" key Enable state. The initial control percent, established when manual control is activated, is dependent upon the cause of activation. When entered normally because of operator actions, a bumpless transfer is attempted. Pressing the "MODE" Key again (when in manual mode) returns the control to automatic mode.

BUMPLESS TRANSFER

The RMA employs an intelligent bumpless transfer. When the process is within five degrees of setpoint, the controller periodically records the output percent necessary to maintain setpoint. When an operator initiated transition to Manual Control occurs, the recorded output percentage is used. This is adjustable 0 - 100%.

SENSOR ERROR DETECTION

When a sensor error is detected, the upper display will alternately flash between "tC" and the cause of the thermocouple error. "rEU" occurs if the thermocouple is reversed, and "oPn" occurs if the thermocouple is open. The alarm LED will illuminate, and the output will be disabled. When "rEU" or "oPn" occur, the unit goes into Manual Mode 0%.

NORMAL OPERATING MODE DISPLAY FUNCTIONS

In the absence of any special circumstances or error conditions, the upper display of the RMA is dedicated to the presentation of the Process Value when the unit is in Normal Operating MODE. The Process Value is displayed in accordance with the temperature scale established by the "Units" jumper.

PRESET DEVIATION ALARMS

The RMA provides two deviation alarms, preset to 30°F or 17°C above and below setpoint value. If the process temperature falls below the setpoint minus the low deviation alarm value, or if the process temperature rises above the setpoint plus the high deviation alarm value, the controller enters the alarm state. The Alarm LED will illuminate.

Error Codes

ERROR CODE	DESCRIPTION
LPbr	Loop Break
tC	OPn (display alternates) Open Thermocouple
tC	rEu (display alternates) Reverse Thermocouple
HI	Over Temperature (Alarm LED Lights)
Lo	Under Temperature (Alarm LED Lights)

1.7 Specifications

Operating Temperature	32 to 150°F (0 to 65°C)
Shipping Temperature	-40 to 158°F (-40 to 70°C)
Humidity	10 to 95% Non-Condensing
Sensor Type	J Thermocouple (grounded/ ungrounded)
Sensor Range	100 to 650°F (32 to 343°C)
Sampling Rate	10 Hz (100 ms)
Noise Rejection	Series Mode > 70 dB
Temperature Accuracy	±0.3% of span.
Repeatability	± 0.1% of span.
Displays	7-Segment LEDs; 3-digit upper (orange) and 3-digit lower (green)
Upper Display Height	14.2 mm / 0.56˝
Lower Display Height	9.15 mm / 0.36˝
Alarm Status Indication	Orange LED
Manual Mode Indicaton	Green LED
Closed Loop Indicaton	Green LED
Control Output Device Type	Triac, 15 A at 120/240 Vac
Operator Activation/ Interface	3 Momentary Switches, 16 A Power Switch
Power Requirements	115 to 240 V 50/60 Hz Nominal CE Compliant

1.8 Repairs and Spare Parts

It is recommended that units requiring service be returned to an authorized service center. Before a controller is returned for service, please consult the service center nearest you. In many cases, the problem can be cleared up over the telephone. When the unit needs to be returned, the service center will ask for a detailed explanation of problems encountered and a Purchase Order to cover any charge. This information should also be put in the box with the unit. This should expedite return of the unit to you.

DISCLAIMER

This document is based on information available at the time of its publication. While efforts have been made to render accuracy to its content, the information contained herein does not purport to cover all details or variations in the hardware, nor to provide for every possible contingency in connection with the installation and maintenance. Features may be described herein which are not present in all hardware. The manufacturer assumes no obligation of notice to holders of this document with respect to changes subsequently made.

Two-Year Limited Warranty

THIS EQUIPMENT IS WARRANTED TO BE FREE FROM DEFECTS OF MATERIAL AND WORKMANSHIP. IT IS SOLD SUBJECT TO OUR MUTUAL AGREEMENT THAT THE LIABILITY IS TO REPLACE OR REPAIR THIS EQUIPMENT AT ITS FACTORY, PROVIDED THAT IT IS RETURNED WITH TRANSPORTATION PREPAID WITHIN TWO (2) YEARS OF ITS PURCHASE.

THE PURCHASER AGREES THAT THE MANUFACTURER ASSUMES NO LIABILITY UNDER ANY CIRCUMSTANCES FOR CONSEQUENTIAL DAMAGES RESULTING FROM ITS USE OR FROM IMPROPER HANDLING OR PACKAGING OF SHIPMENTS RETURNED TO THE FACTORY.

COMPONENTS WHICH WEAR OR WHICH ARE DAMAGED BY MISUSE ARE NOT WARRANTED. THESE INCLUDE CONTACT POINTS, FUSES, ELECTROMECHANICAL RELAYS, AND TRIACS. UNITS WHICH HAVE BEEN MODIFIED BY A CUSTOMER IN ANY WAY ARE NOT WARRANTED.

Other than those expressly stated herein, THERE ARE NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, AND SPECIFICALLY EXCLUDED BUT NOT BY WAY OF LIMITATION, ARE THE IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY.

IT IS UNDERSTOOD AND AGREED THE SELLER'S LIABILITY WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, IN NEGLIGENCE OR OTHERWISE SHALL NOT EXCEED THE RETURN OF THE AMOUNT OF THE PURCHASE PRICE PAID BY THE PURCHASER AND UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES. THE PRICE STATED FOR THE EQUIPMENT IS A CONSIDERATION IN LIMITING SELLER'S LIABILITY. NO ACTION, REGARDLESS OF FORM, ARISING OUT OF THE TRANSACTIONS OF THIS AGREEMENT MAY BE BROUGHT BY PURCHASER MORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED.

SELLER'S MAXIMUM LIABILITY SHALL NOT EXCEED AND BUYER'S REMEDY IS LIMITED TO EITHER (i) REPAIR OR REPLACEMENT OF THE DEFECTIVE PART OR PRODUCT, OR AT SELLER'S OPTION (ii) RETURN OF THE PRODUCT AND REFUND OF THE PURCHASE PRICE, AND SUCH REMEDY SHALL BE BUYER'S ENTIRE AND EXCLUSIVE REMEDY. THE SPECIFICATIONS PUT FORTH IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE.