

Series RMA Hot Runner Controller Operator's Guide



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Precautions

Warning



Use of this equipment in a manner not specified by the manufacturer may impair protection provided by the equipment.

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.

Hazardous potentials exist on components inside the mainframe and controller. Always disconnect AC power to the mainframe when servicing the controllers or the mainframe.

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

The controller power switch must be in the "OFF" position before you put a controller into an energized mainframe, or remove a controller from an energized mainframe. If the mainframe supports the SafeChange™ feature, enable SafeChange on the controller to reduce the possibility of damage to the controller when installing or removing a controller from the mainframe. Controllers are shipped with the SafeChange feature disabled. To determine whether the mainframe supports SafeChange and to enable SafeChange, follow the instructions in the *Series RMA Hot Runner Controller Setup and Operation Manual*.

Turn off power to the controller before cleaning the exterior of the controller. When cleaning the controller, follow the instructions in the *Series RMA Hot Runner Controller Setup and Operation Manual*.

Failure to observe these precautions can result in exposure to a potentially lethal shock hazard.

Changing switch and jumper settings, and all wiring should be done by an experienced technician. The controller and wiring should be installed in accordance with national and local electrical codes. To avoid serious personal injury and damage to equipment, follow all warnings and cautions provided in the manual supplied with the mainframe.

Caution



If a controller shows signs of having been damaged during shipping, do not power up or install the controller. Save all packing materials and report any damage to the carrier immediately.

When the controller is powered up, the output may be activated. Consider the effects on your process before powering up the controller.

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

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.

Specified operating ambient temperature is 32 to 150 °F (0 to 65 °C).



Notes on CE EMC Compliance

This unit is compliant with the following standards when properly installed into a grounded metal housing. EMC testing was conducted with a load of 1 amp 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)



USE OF THIS EQUIPMENT IN A MANNER NOT SPECIFIED BY THE MANUFACTURER MAY IMPAIR PROTECTION PROVIDED BY THE EQUIPMENT!

UNIT	OUTPUT RATING (AMPS / VOLTS)	FUSE RATING (AMPS)	TYPE
RM SERIES	15 / 265	15	Fast-Acting 'F'

CLEANING INSTRUCTIONS

- 1) Remove power from the unit prior to any cleaning operation.
- 2) Use a cotton cloth to gently and sparingly apply isopropyl alcohol only. Do not use cleansers or other solvents as they may damage the unit.
- 3) Allow the unit to dry completely prior to reapplying power.



Caution (refer to accompanying documents)



Caution, risk of electrical shock!

For more detailed cleaning instructions, see the *Series RMA Hot Runner Controller Setup and Operation Manual*.

1. Introduction

1.1 About This Guide

This manual contains instructions for operating Series RMA Hot Runner controllers.

Instructions for setting up, maintaining, and cleaning the controllers are in the *Series RMA Hot Runner Controller Setup and Operation Manual*.

Instructions for wiring, installing, and troubleshooting the controllers are in the manual supplied with the mainframe.

1.2 About the Controllers

1.2.1 Zones Controlled

Each RMA unit is designed to control one temperature zone.

1.2.2 Modes of Operation

Series RMA controllers can operate in:

- closed loop mode – Output is automatically calculated by controller, based on the difference between the setpoint and the process value.
- manual – You set the output percentage.

Instructions for changing the mode, setpoint, and output percentage are on page 3.

1.2.3 Soft Start for Heater Bake Out

All Series RMA Hot Runner controllers support a soft start feature to extend the life of the heaters and the molds.

The soft start allows slow dissipation of moisture in heaters by gradually applying power to the heaters.

The orange soft start indicator (item 1 in the photo on page 2) is on during soft start in closed loop (auto) mode.

1.2.4 Deviation Alarms

Each Series RMA Hot Runner controller supports deviation alarms. The orange ALARM LED (item 11 in the photo on page 2) lights if the process value:

- falls below the zone setpoint minus the low alarm value (30 °F), or
- rises above the zone setpoint plus the high alarm value (30 °F).

The alarm status indicator remains lit as long as the process value deviates from the setpoint by at least 30 °F.

While a zone is in alarm, **HI** or **LO** is also displayed.

1.2.5 Loop Break Detection

When loop break detection has been enabled during setup, the controller monitors input change.

If the input value does not change within five minutes while the controller is operating in closed loop (auto) mode, the controller goes to manual mode with 0% output, which can then be adjusted. See page 4 for error messages.

1.2.6 Sensor Error Monitoring

The controller can detect a reversed sensor or open sensor. See page 4 for error messages.

1.2.7 Current Display

The operator can display the output current (expressed in tenths of an amp). Instructions for displaying the current output are on page 3.

2. Operation

2.1 RMA Front Panel



1 – soft start indicator – lit (orange) when soft start is active

2 – output status indicator – lit (orange) when output is on

3 – process value (PV) display; alternates with error message if necessary; operator can choose to display output current (in tenths of an amp)

4 – Celsius indicator – lit (green) when PV and SP are displayed in degrees C

5 – output percentage indicator – lit (green) when manual mode output % is displayed on lower line

6 – Fahrenheit indicator – lit (green) when PV and SP are displayed in degrees F

7 – setpoint (SP) display (closed loop mode) or output percent (manual mode)

8 – up key – increases setpoint (closed loop mode) or output percent (manual mode); press and hold for rapid change

9 – mode key – changes mode; active indicated by lit LED (12–13)

10 – down key – decreases setpoint (closed loop mode) or output percent (manual mode); press and hold for rapid change

11 – alarm indicator – lit (orange) when PV varies from the SP by the deviation alarm value (low or high)

12 – manual mode indicator – lit (green) when output percent can be set by operator

13 – closed loop (normal) mode indicator – lit when automatic control is active

14 – power switch

Power must be off when removing or installing controller.

2.2 Operation Basics

2.2.1 See PV

To see the process value: Look at the top line of the display for the PV. The top line shows the PV for the zone, unless the controller detects an error. Error messages are on page 4.

2.2.2 See if Output is On

To see if the output is on: Look at the Heat indicator above the PV. This orange indicator is on when the output is on.

2.2.3 Monitor for Alarms

To watch for deviation alarms: Look at the orange ALARM LED.

This LED lights if the process value goes above or below the zone setpoint by the deviation alarm value (30 °F).

The alarm status indicator remains lit as long as the process value deviates from the setpoint by at least 30 °F.

While a zone is in alarm, **HI** or **LO** is also displayed.

2.2.4 Change Mode

To change the mode: Press **MODE** to light the LED for the mode you want.

2.2.5 Change Setpoint or Output

To change the setpoint (closed loop mode) or output (manual mode): Press the **▲** or **▼** key until the displayed value has been changed to the new value you want.

2.2.6 Display Current Output

To display the current output: Press and hold the **MODE** key for more than a second. As long as the **MODE** key is pressed, the current output will be displayed instead of the PV. The current is expressed in tenths of an amp and alternates with **-A-**. For example, if the output is 8.3 amps, the controller will display **083** (alternating with **-A-**).

2.3 What Happens When You Power Up the Controller

2.3.1 Turn on Controller

Turn on the controller by pressing the "I" end of the 16 A power switch on the front panel. When an RMA controller is powered up, it displays its firmware level. Next, all segments of the display and all LED indicators light. The output remains off.

2.3.2 Put Controller in Closed Loop Mode

To put the controller into closed loop mode: Push the **MODE** button. What happens next depends on the process value. A soft start may be done; see description below.

2.3.3 Watch Soft Start

A soft start is executed:

- every time the controller starts and the process value is less than 200 °F (93 °C), and
- every time the controller is returned to closed loop (automatic) operation and the PV is less than 200°F (93 °C).

To stop the soft start (not recommended): Press the **MODE** key to take the controller out of closed loop (auto) mode. Press the **MODE** key again to return the controller to closed loop mode.

3. Error Messages

3.1 Introduction

Usually the controller displays the process variable on the top line and the setpoint on the lower line of the display.

However, when the controller detects a problem with the input, messages are displayed to alert you to conditions that require your immediate attention.

3.2 Summary of Error Messages

If the controller detects a problem, an error message will be displayed. These messages are summarized below.

	Open Sensor Detected	Loop Break Detected	Reversed Sensor Leads Detected
top line display	goes high first briefly (see Note 1 below), then OPn / tC	goes low first (see Note 1 below), then after five minutes Err	goes low first (see Note 2 below), then rEu / tC / changing numerical values
lower line display	0 (zero output %)	LDP / Ht	0 (zero output %)
output	off (0%)	on while low, then off (see Note 1)	on while low, then off (see Note 2)
alarm LED	on	on	on

Note 1: At first, a falsely increasing process value is displayed on the top line; the setpoint remains on display on the lower line, and the output remains on until the process value is greater than the setpoint.

Note 2: At first, **L0** alternates with display of the decreasing process value on the top line; the setpoint remains on display on the lower line, and the output remains on until the sensor error is detected.