

SERIES *RMB/6 and RMB/12*
Non-Modular Hot Runner Controller
OPERATION MANUAL



INTRODUCTION

Congratulations on your purchase of an Athena Series RMB/6 or RMB/12 Non-Modular Hot Runner Temperature Controller. These controllers are designed for ease of use and reliability wherever accurate control is required. This manual covers the use of both the RMB/6 and the RMB/12 models.

After following the instructions for installation, simply step through and set your operating parameters using the controller's easy menu system. The instrument may then be automatically or manually tuned to your process for optimum setpoint control.

As you look through this manual, you will notice *blue italicized text* appearing with, or adjacent to, the operating information. These notes impart important information about the controller and may answer questions you may have about its setup or operation. If you still have questions or require any assistance, please contact your Athena representative or call technical support at (+1) 610-828-2490.

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.

APPROVALS



E66598 Temperature Indicating and
Regulating Equipment.



E66598 Temperature Indicating and
Regulating Equipment.

SAFETY 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. Electrical connections and wiring should be performed only by suitably trained personnel.

Do not locate this instrument where it is subject to excessive shock, vibration, dirt, moisture, oil, or other liquids. The safe operating temperature range for this unit is 32°F to 140°F (0°C to 60°C).

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



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.

Turn off power to the controller before cleaning the exterior of the controller.


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

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 hardware setup instructions.

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

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1. INTRODUCTION

1.1 ABOUT THIS MANUAL

This manual contains all the information needed to configure and operate the RMB/6 and RMB/12 Non-Modular Hot Runner controllers.

Wiring diagrams, mounting instructions, and other information about installing the hardware are on the installation diagrams shipped with the unit.

1.2 FEATURES AND BENEFITS OF RMB/6 AND RMB/12 CONTROLLERS

1.2.1 MULTI-ZONE CONTROL WITH CONVENIENT USER INTERFACE

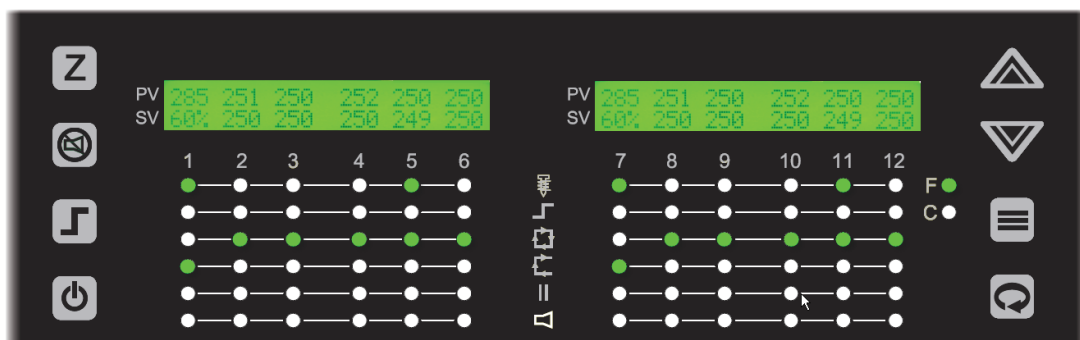
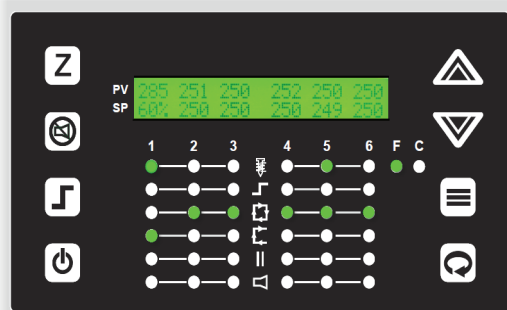
A single RMB/6 Hot Runner controller can provide microprocessor-based control of up to six zones; a single RMB/12 Hot Runner controller can control up to twelve zones. Zones can be configured individually or all zones can be configured simultaneously.

During operation the front panel simultaneously displays the process value and setpoint for every zone. LEDs for each zone indicate the type of control (open or closed loop), output status, alarm status, boost status, and standby status. Buttons on the front panel make it easy to change the setpoint, mode, and configuration parameter values for one selected zone or all zones.

The front panel also has buttons to:

- start the boost for all zones,
- put all zones in Idle or all Idle zones in the Run state,
- silence the audible alarm.

When necessary, access to function buttons on the front panel can be restricted. See Section 7



1.2.2 PID CONTROL WITH AUTOTUNING

Note Use of a fixed output percentage is also possible under other circumstances. Configuration parameters let you specify a fixed output to be used as a failsafe action, a different fixed output percentage to be used in standby mode, and another fixed output percentage used during the boost function

When an RMB/6 or RMB/12 zone is in Normal (closed loop) mode, Proportional-Integral-Derivative (PID) control is provided. The RMB/6 and RMB/12 Hot Runner controllers also support Manual (open loop) mode that overrides automatic control. In Manual mode you control the output by entering a fixed output percentage value. A zone's transfer from PID to manual is "bumpless" when the process value is within 9 °F (5 °C) of the setpoint.

Using PID control, the controller modulates output power by adjusting the output power percentage within a configurable proportional band. Power is proportionally reduced as the process temperature gets closer to the setpoint temperature.

The configurable derivative action affects the output based on the rate of change of the process value.

The integral action affects the output based on the duration of the process value's variation from the setpoint. In the RMB/6 and RMB/12 Hot Runner controllers, the integral (reset) action is always equal to six times the configured derivative (rate) action.

An Autotune function is standard on every RMB/6 and RMB/12 Hot Runner controller. This feature for easy tuning of the proportional and derivative components of the control algorithm can be initiated every time the controller is powered up, once when the controller is set up regardless of success (and again by changing a parameter value), once only if successful (repeated at each power up until successful), or never. Instructions for tuning the controller automatically and manually are in Section 6.

1.2.3 COMPUSTEP® SOFT START FOR HEATER BAKE OUT


All RMB/6 and RMB/12 Hot Runner controllers support the CompuStep soft start feature, which allows slow dissipation of moisture in heaters by gradually applying power to the heaters. Using this feature helps extend the life of the heaters and the molds. When a soft start is executed, single cycle bursts start at 5% output power and step up the output 5% every 30 seconds.

- The soft start when the controller is in Normal (closed loop) mode lasts five minutes or until the process temperature reaches 200 °F (93 °C).
- The soft start when the controller is in Manual (open loop) mode continues until the output is the lower of 50% or the target Manual mode output percent.


By default, a soft start will be executed:

- every time the controller starts (after being taken out of Idle) and the process value is less than 200 °F (93 °C), and
- every time the controller is returned to Normal (automatic) operation and the PV is less than 200 °F (93 °C).

1.2.4 PROGRAMMABLE BOOST FUNCTION

Every RMB/6 and RMB/12 Hot Runner controller supports a boost function. For each zone you can use the Boost Config menu to configure a special setpoint (closed loop boost) or a special fixed output percentage (open loop boost) to be used when the boost button  is pressed.

The boost function will remain active until:

- the configured boost duration time has expired, or
- you use the mode/enter button  to take a zone out of boost mode before the expiration of the boost duration.

1.2.5 PROCESS-PROTECTION FEATURES

Process-protection features are standard on all RMB/6 and RMB/12 controllers. These features include:

- high and low deviation alarms
- high temperature safety limit
- loop break detection
- failsafe operation in case of sensor problems


1.2.6 SECURITY



The RMB/6 and RMB/12 front panels include buttons that can be used to change the selected zone's setpoint and mode, and to boost the output temporarily by a configurable amount. Users who know the Supervisor password can limit access to these buttons on the front panel, plus limit configuration access. (Units are shipped with password protection disabled.)


1.3 WHAT HAPPENS WHEN YOU POWER UP THE CONTROLLER

When an RMB/6 or RMB/12 Hot Runner controller is powered up using the switch on the back, all LEDs and all elements in the LCD display light briefly, and then software versions (of the display and the controller hardware) are displayed.

At the conclusion of the startup process, the process values and setpoints for all zones are displayed. Only the green LED for the display unit of measure (Fahrenheit or Celsius) is lit. All zone outputs will be off because the unit starts up with all zones in the Idle state.

Briefly pressing the run/idle button  on the front of the case puts all zones that are currently Idle in the Run state. (Pressing the button again for at least two seconds puts all zones in Idle.)

In each zone's column of LEDs, the green LED in the closed loop  or open loop  row is lit to indicate the type of control.

The green LEDs in the output  row indicate whether the zones' outputs are on (LED lit) or off. For more information about the user interface, see the Section 3.

When zones go into the Run state, the effect on each zone's output depends on the value of the Startup Mode parameter configured using the Control Config menu. See section 5.4 for details.

SET UP

2. SETUP SEQUENCE





The following list summarizes the configuration and startup tasks to be accomplished once the controllers are wired as shown on the diagrams shipped with the unit.

Information about all configuration parameters, including parameter interactions and valid ranges, is in Section 5.







- 1) Turn on the controller using the switch on the back. When the unit is powered up, the controller goes through its startup sequence (see 1.4), and then the process value and setpoint for every zone (the standard operating display) are shown. **All zones will be Idle (all outputs off).**

If the controller has already been wired to the sensors and heaters, do NOT push the run/idle button on the front of the case until after you have configured the zones and entered custom setpoints. **When zones are taken out of Idle, their outputs may go on unless you change the default parameter values.**





- 2) Take unneeded zones out of service by setting them to Offline.
 - a) Select a zone by pressing the zone selection button  until only that zone's PV and SP are displayed. (Zone numbers are above the column of status LEDs for each zone.)
 - b) Access the mode-selection function by pressing the mode/enter button .
 - c) Step through the possible modes by pressing the  button repeatedly until "Offline" is displayed.
 - d) Exit the mode-selection function by pressing the menu-access/exit button . A confirmation message will be displayed briefly and then the PV and SP for the zone will be displayed as "OFF."
- 3) Notice that the green F (for Fahrenheit) or C (for Celsius) LED is lit. This LED indicates the unit of measure for the process values and setpoints displayed. Units ordered for the "Domestic Market" are set to display temperatures in degrees Fahrenheit. Units ordered for "Export" or "CE" are set to display temperatures in Celsius.

If you want to change the unit of measure used for temperature displays:

- a) With any zone selected, press and hold the menu-access/exit button  until the name of a configuration menu is displayed.
- b) Step through the menus by pressing  repeatedly until the Display Config menu name is displayed.
- c) To access the Display Units parameter, press . The currently selected unit of measure will alternate with the parameter name on the lower line of the display. Notice that an asterisk * is displayed instead of a zone number. This asterisk indicates that the parameter applies to all zones.
- d) Change the unit of measure by pressing  or .
- e) Exit the menu system by pressing and holding  for several seconds. The PV and SP for all zones (except any offline zones) will be displayed in the selected unit of measure. Other temperature values previously entered while a different unit of measure was in use will be converted automatically.

4) If the factory settings listed in section 3.6 are not appropriate for your application, you can change a parameter value for one or all zones.


a) To select one zone, press  repeatedly until only that zone's PV and SP are displayed.

To select all zones, press  repeatedly until the PV and SP for all zones are displayed with asterisks between the PV and SP for Zones 3 and 4 (see below) on an RMB/6 unit. (On an RMB/12 unit, asterisks will also be displayed between the PV and SP for Zones 9 and 10.)




b) Press and hold  to enter the menu system.

c) Step through the menus by pressing  repeatedly until the name of the menu you want is displayed.

d) Step through the menu items by pressing  until the parameter you want is displayed, alternating with its current value.

e) Change the value by pressing  or . When changing a numerical value, you can hold down an arrow button for fast changes.



f) Exit the menu system by pressing and holding  for several seconds.

Note that the default High [Temperature] Safety [Limit] (a Supervisor parameter) is Off by default. If you want the controller to turn off the output to a zone that exceeds the high limit, change the value of the High Safety parameter.

Note The Factory Configuration password is available only from Athena Technical Support.


TIP If all zones are in the same mode (Normal or Manual), you can select all zones as described above, and then change the setpoint temperature or manual mode output percentage for all zones simultaneously..

5) RMB/6 and RMB/12 units are shipped with the Supervisor password set to 100, which disables password protection. If you want to limit access to the Superv [Supervisor] Config menu, change the Supervisor password from the default 100. As long as the password is 100, no password will be required to access all functions (except settings on the Factory Config menu).


6) Change Normal mode (closed loop) setpoints or Manual mode (open loop) output percentage by selecting a zone, and then pressing  or  to change the setpoint or output percent. A few seconds after you stop pressing an arrow button, the main display (PV and SP) will return.


7) Autotune all zones that will operate in Normal (closed loop) mode; see Section 6. When Autotuning has been completed successfully for all Normal zones, the controller is ready to use. The appropriate green status LED in the column of LEDs for each zone will be lit:

 for Normal (open loop)

 for Manual (closed loop)

 for Standby

If the zone is configured to start up in Idle after the run/idle button  has been pressed, no status LED will be lit.

Whenever a zone's output is on, its green output  LED is lit.

USER INTERFACE

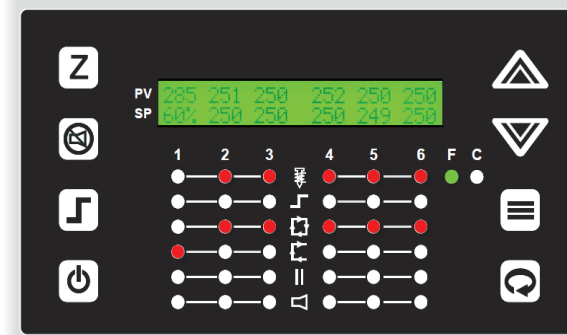
3. USER INTERFACE

3.1 OVERVIEW

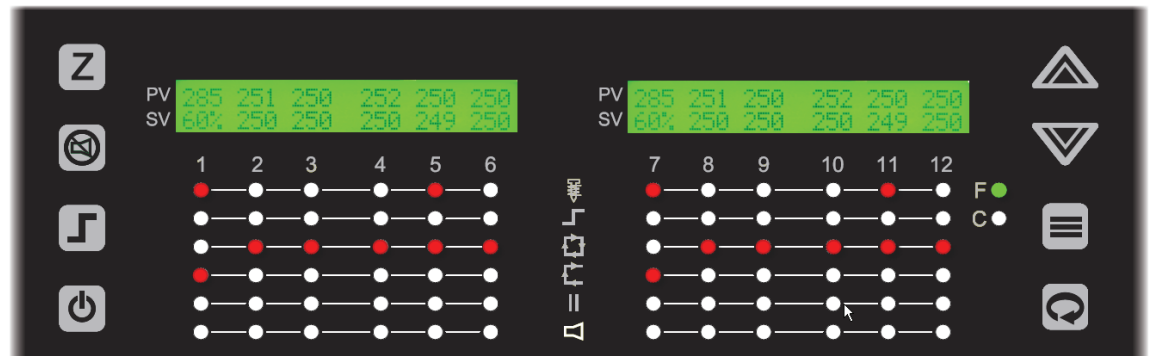
During operation, the front panel contains a two-line display that displays the PV (process value) and SP (Normal (closed loop) mode setpoint or Manual (open loop) mode output percentage) for each zone during normal operation. Zone numbers are under the display. PV and SP values are displayed in the unit of measure (degrees F or degrees C) indicated by the lit green "F" or "C" LED.

This display can also be used to view and change controller settings as described in subsection 3.5. Parameters are grouped into menus. An overview of the menus is in section 3.6

If a zone is in alarm, an alarm code alternates with the SP value. Alarm codes and priorities are listed in Section 4.5.









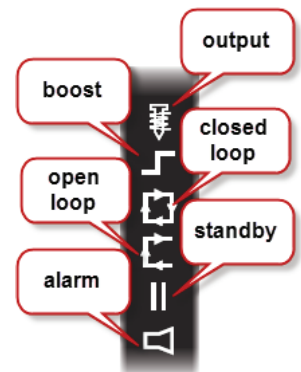
RMB/6 OPERATING DISPLAY



RMB/12 OPERATING DISPLAY

A column of LEDs for each zone indicates statuses for the zone and its output. The rows of LEDs are:

- output:**  lit green when the zone's output is on
- boost:**  lit green when the zone is in Boost mode
- closed loop:**  lit green when the zone is in a closed loop mode, such as Normal, Closed Loop Boost, Normal Soft Start, etc.
- open loop:**  lit green when the zone is in an open loop mode, such as Manual or Open Loop Boost
- standby:**  lit green when the zone is in Standby mode or Hardware Standby mode
- alarm:**  flashes red when the zone is in alarm

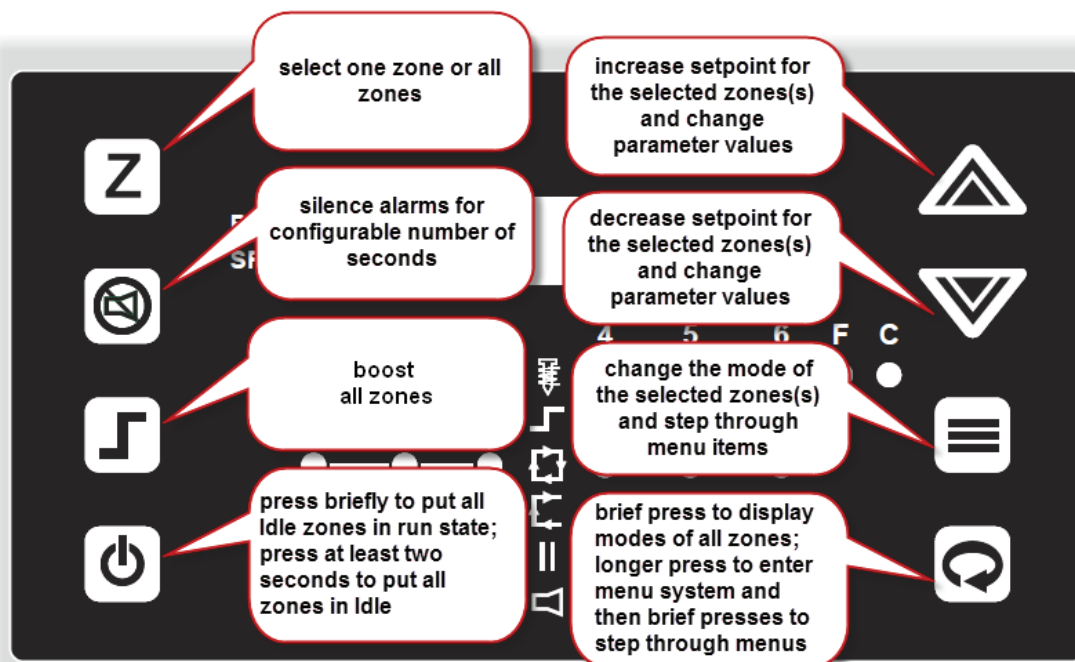


(more information about alarm indication is in section 4.2)

SYMBOLS ON LED ROWS

Buttons provide access to all controller functions. The purposes of the buttons are shown below.

The Superv [Supervisor] Config menu can be used to disable the boost and mode buttons, and to prevent operators from changing the setpoint or configuration parameter values. If you cannot make changes you need, talk to your supervisor.



BUTTON FUNCTIONS

3.2 SELECTING ONE OR ALL ZONES


To select one zone, press **Z** repeatedly until only that zone's PV and SP are displayed. To select all zones, press **Z** repeatedly until the PV and SP for all zones are displayed with asterisks between the PV and SP for Zones 3 and 4 (see below) on an RMB/6, and between Zones 3 and 4, and Zones 9 and 10 on an RMB/12.



MODES OF OPERATION

3.3 MODE OF OPERATION

3.3.1 VIEWING CURRENT MODE

The current mode of all zones and their output percentages can be displayed by briefly pressing the menu-access/exit button . Mode indicators and their meanings are listed in the next subsection.

3.3.2 MODE INDICATORS

In addition to indicators for the selectable modes (see 3.3.3 and 3.3.4), additional mode indicators are displayed under special circumstances, such as when Autotune or soft start is active.

The mode indicators are:

- HSB** = hardware standby (external signal put whole controller on standby)
- NRM** = Normal (closed loop)
- NTU** = Normal auto tuning (Autotuning in process)
- NSS** = Normal soft start—Gradual warming if the process value is less than the lower of the setpoint or 200 °F (93 °C)
- NRB** = Normal mode boost (using configured boost setpoint)
- MAN** = manual (open loop)
- MAB** = manual mode boost (using configured boost percentage)
- SBY** = standby (using configured standby setpoint in Normal mode or fixed output percent in Manual mode)
- SSS** = standby soft start—If zone is set to start up in Standby, it will gradually warm to the Standby setpoint if process value is less than the lower of the Standby setpoint or 200 °F (93 °C).




IDL = idle (no output)

FSF = failsafe (in state configured using Superv [Supervisor] menu)

OFF = offline (unused zone)

3.3.3 CHANGING MODE

To change mode of operation:

- 1) Select one zone or all zones as described above.
- 2) Access the mode-selection function by pressing .
- 3) Step through the selectable modes (see below) by pressing the  button repeatedly until the mode you want is displayed.
- 4) Confirm the selection and exit the mode-selection function by pressing . A confirmation message will be displayed briefly, and then the normal operating display returns.

3.3.4 MODES AVAILABLE FOR SELECTION

The modes available for selection are:


Normal—zone uses closed-loop PID automatic control based on the entered SP and measured PV

Standby—zone uses Standby Setpoint or Standby Percentage as configured using the Control Config menu.

Manual—zone uses open-loop control; you set output percentage

Boost—for the configured Boost Duration time, the zone uses the Boost Setpoint or Boost Percentage configured with Boost Config menu.

Idle—zone's output is off until another mode is selected using the front panel

 OR —



is pressed to put all Idle zones in the Run state

Offline—zone's output is off and PV is not monitored by the controller

NOTE: The Superv [Supervisor] Config menu can be used to disable the boost and mode buttons, and to prevent operators from changing the setpoint or configuration parameter values. If you cannot make changes you need, talk to your supervisor.






3.4 CHANGING THE SETPOINT


To change Normal mode (closed loop) setpoint or Manual mode (open loop) output percentage:

- 1) Select a zone or, if all zones are in the same mode (Normal or Manual), select all zones as described in section 3.2.
- 2) Press  or  to change the setpoint or output percent. A few seconds after you stop pressing an arrow button, the main display (PV and SP) will return.


3.5 CHANGING A CONFIGURATION PARAMETER VALUE

To view and change parameter values:

- 1) Select one zone or all zones as described in section 3.2.
- 2) Press and hold  to enter the menu system.
- 3) Step through the menus by pressing  repeatedly until the name of the menu you want is displayed. Notice that if you selected all zones before entering the menu system (or if the parameter, such as Display Units, applies to all zones), an asterisk * is displayed instead of a zone number. This asterisk indicates that the change will apply to all zones.
- 4) Step through the menu items by pressing  until the parameter you want is displayed, alternating with its current value.
- 5) Change the value by pressing  or . When changing a numerical value, you can hold down an arrow button for fast changes.

To change the value of this parameter for a different zone, press  repeatedly until the number of the zone you want is displayed.

To change a different parameter for the selected zone, repeat steps 3 through 5 as needed.

To leave the menu system, press and hold  for several seconds.

CONFIGURATION MENUS

NOTE: A password-protected Factory menu is also available. The password is available only from the Athena technical support team.

3.6 CONFIGURATION MENUS AND FACTORY SETTINGS

There are five distinct configuration menus, namely:

- Input Configuration
- Boost Configuration
- Control Configuration
- Display Configuration
- Alarm Configuration

with parameters in each menu that need to be set for your process. When a parameter is accessed, the display of its name alternates with the display of its current value. At the factory, all zones' settings are identical. Information about each parameter and how to set it is described in Section 5.

Additionally, there is a Supervisor Configuration, and a Factory Configuration menu which have limited accessibility.

ALARMS


4. ALARMS AND ALARM INDICATION

4.1 TYPES OF ALARMS

The RMB/6 and RMB/12 Hot Runner controllers support high and low deviation alarms, configurable separately for each zone (see subsection 5.6). The unit also recognizes process problems (such as loop break, reversed and open sensors, and process temperature exceeding configured safety limit) and problems with its own operation.

4.2 ALARM INDICATION

When a zone is in alarm:

- its red alarm  LED flashes rapidly (Slow flashes mean an alarm was detected, but the problem does not affect operation now. For example, a zone's red alarm LED flashes slowly if an open thermocouple is detected, but the zone is operating in Manual mode (in which no sensor value is used by the controller to calculate the output))
- the alarm relay closes
- a code for the type of alarm alternates with display of the setpoint (Normal mode or other closed-loop mode such as closed-loop boost) or output percentage (Manual mode or other open-loop mode such as open-loop standby); and
- unit beeps until the alarm condition is cleared or the zone is put in Idle mode or the alarm is silenced (see below).


4.3 SILENCING ALARM BEEP

You can temporarily silence the alarm beep by pressing the alarm silence button .

Beeping will be silenced for the configured number of seconds. (The default is 120 seconds.)

4.4 EXTERNAL INDICATION



An output on the back of the controller allows external devices (such as horns or lights) to be connected to the controller for alarm annunciation. For more information about this feature, see the diagrams shipped with the controller.

This alarm output is not affected when the alarm silence button  on the front of the controller is pressed.

4.5 ALARM PRIORITIES

If a zone has more than one alarm condition, the code for the highest-priority alarm is displayed. Alarm priorities are in the table below.

Priority	Code	Condition	Controller Response	How Alarm Is Cleared
1	Ovt	internal over-temperature	all outputs off	turn off controller; make sure fan and vents are not blocked; wait for controller to cool; turn on controller; if error recurs, contact technical support
2	ER1 or ER2	problem with controller's internal operation	all outputs off	cycle power to controller; if error recurs, contact technical support


Priority	Code	Condition	Controller Response	How Alarm Is Cleared
3	TCr	reversed thermocouple detected	zone goes to configured failsafe state	use  button to put the zone in Idle as described in section 3.3.3, and then after problem is fixed, put zone in Normal (closed loop) or Manual (open loop) mode
4	SAF	high-temperature safety limit exceeded (configured in Superv. Config menu; default is feature disabled)	zone output off if feature is enabled	
5	TCo	open thermocouple detected	zone goes to configured failsafe state (configured in Superv. Config menu)	
6	LPB	loop break detected	zone output off	
7	HID	high deviation alarm	zone output off	clears automatically when alarm condition clears
8	LOD	low deviation alarm	zone output on	
9	Tu0 Tu3 Tu5 Tu8 Tu9	Autotuning error	zone output off	<p>use  button to put the zone in Idle as described in section 3.3.3, and then after problem is fixed, try tuning again</p> <p>For more information about tuning and Autotuning errors, see Section 6.</p>


PARAMETERS


INPUT PARAMETERS




How Do I Get Here?


1. If this is for one zone, press the **Z** button until the desired zone is highlighted. If this is for all zones, press the **Z** button until all zones are shown with two asterisks between zones 3&4 (or 6&7 on RMB/12), ie center of display, are shown.

2. Press and hold  for several seconds to enter the menu system.

3. Press  until the Input Menu is displayed.

4. Press  until the desired parameter is displayed.

5. Use  or  to change the value. Press  again to move to the next parameter.

6. When all changes are complete, press and hold  to exit the menu system.

5. PARAMETER CHARACTERISTICS

5.1 INTRODUCTION

This section contains information about every configuration parameter, including valid ranges, control mode(s) to which the parameter applies, and interactions among parameters. For an overview of configuration menus and parameters, see section 3.6.

5.2 INPUT PARAMETERS

5.2.1 INTRODUCTION

You can use the Input Config menu to specify for the selected zone(s):



- bias (if any) to be applied to the input,
- setpoint range, and
- input type

5.2.2 INPUT PARAMETERS AND SETTINGS

Name	Applies To				Range / Choices	Default	Description and Interations
	Selected Zone	All Zones	Closed Loop Control	Open Loop Control			
Bias	X		X	X	-100 to 100 °F -55 to 55 °C	zero degrees	number of degrees that will be added to or subtracted from the measured process value before it is displayed
Low Setpoint Limit	X		X		32 to 999 °F 0 to 537 °C	32 °F 0 °C	lowest and highest values that can be entered as setpoint (before bias is applied); also limits configurable range of boost setpoint and standby setpoint
High Setpoint Limit	X		X		32 to 999 °F 0 to 537 °C	999 °F 537 °C	
Input Type		X	X	X	J Thermo K Thermo	spec'd when unit was ordered	switching to input type that does not match the type specified when the unit was ordered can cause small errors (1-5 degrees) in temperature measurements

5.3 BOOST PARAMETERS


5.3.1 INTRODUCTION


A boost button  is on the RMB/6 and RMB/12 front panel. When you press , the output of a zones will be increased temporarily.


You can use the Boost Config menu to specify:

- whether the boost function will be closed loop (based on a setpoint) or open loop (based on a specified output percent)
- boost setpoint and duration for closed loop boost
- boost output percentage and duration for open loop boost


How Do I Get Here?




1. If this is for one zone, press the  button until the desired zone is highlighted. If this is for all zones, press


the  button until all zones are shown with two asterisks between zones 3&4 (or 6&7 on RMB/12), ie center of display, are shown.

2. Press and hold  for several seconds to enter the menu system.


3. Press  until the Boost Menu is displayed.

4. Press  until the desired parameter is displayed.

5. Use  or  to change the value. Press  again to move to the next parameter.

6. When all changes are complete, press and hold  to exit the menu system.

5.3.2 BOOST PARAMETERS AND SETTINGS



Name	Applies To				Range / Choices	Default	Description and Interations
	Selected Zone	All Zones	Closed Loop Control	Open Loop Control			
Boost Type		X	X		Open Loop Closed Loop	Closed Loop	type of control used after  is pressed; applies only to zones running in Normal mode; zones running in Manual mode always use Closed Loop boost
Boost Duration	X		X	X	Boost Off 15 seconds 30 seconds 45 seconds 60 seconds 75 seconds 90 seconds 105 seconds 120 seconds	Boost Off	Length of Boost
Boost Setpoint	X		X		Low Setpoint Limit to High Setpoint Limit (from Input Config menu)	77 °F 25 °C	setpoint used in Closed Loop boost
Boost Percentage	X			X	0 to 100%	0 (off)	output percent used in Open Loop boost

CONTROL PARAMETERS

5.4 CONTROL PARAMETERS



5.4.1 INTRODUCTION


You can use the Control Config menu to specify how the selected zone(s) will be controlled:


- at startup (after you have pressed the run/idle button  to take the controller out of Idle),
- during Normal operation,
- when the  button has been used to put the zone in Standby or when a zone configured to start up in Standby mode comes out of Idle, and
- when an external signal has been used to put the whole controller in Hardware Standby.


The Control Config menu is also used to specify whether and how often Autotuning (described in Section 6) is done.




How Do I Get Here?


1. If this is for one zone, press the  button until the desired zone is highlighted. If this is for all zones, press the  button until all zones are shown with two asterisks between zones 3&4 (or 6&7 on RMB/12), ie center of display, are shown.

2. Press and hold  for several seconds to enter the menu system.

3. Press  until the Control Menu is displayed.




4. Press  until the desired parameter is displayed.

5. Use  or  to change the value. Press  again to move to the next parameter.

6. When all changes are complete, press and hold  to exit the menu system.

5.4.2 CONTROL PARAMETERS AND SETTINGS

Name	Applies To				Range / Choices	Default	Description and Interactions
	Selected Zone	All Zones	Closed Loop Control	Open Loop Control			
Standby Type	X		X	X	Open Loop Closed Loop	Open Loop	type of control used while the controller's front panel buttons have been used to put the selected zone(s) in standby mode: closed loop (Standby Setpoint used) or open loop (Standby Percentage used)
Standby Setpoint	X		X		Low Setpoint Limit to High Setpoint Limit (from Input Config menu)	77 °F 25 °C	setpoint used when zone is in closed loop standby mode
Standby Percentage	X			X	0 to 100%	zero	output percent used when zone is in open loop standby mode
Proportional Band	X		X		1 to 999 °F 1 to 537 °C	24 °F 13 °C	width of the band below the setpoint within which the controller will modulate the output as the process value approaches the setpoint; Autotuning sets this value automatically ; see Section 6
Derivative (rate)	X		X		0.0 to 999 seconds	7 seconds	time period used by the derivative component of the control algorithm when analyzing load changes; Autotuning sets this value automatically ; see Section 6

Name	Applies To				Range / Choices	Default	Description and Interactions
	Selected Zone	All Zones	Closed Loop Control	Open Loop Control			
							The integral action for PID control is not configurable; the integral (reset) action is always equal to six times the configured derivative (rate) action.
PID Autotune	X		X		Disable Once (then disabled after successful Autotune) Enable (Autotunes every time controller is powered up) One Try Only (and then disabled, even if Autotune was not successful)	One try only	whether and when Autotune should be done.
Startup Mode	X		X	X	Auto (Normal closed loop) Standby Manual (open loop) Idle (remains  in Idle after  is pushed to set controller to Run state) Last Active Mode (same mode as last time controller was running)		mode used for the zone when the controller goes from Idle to Run (because operator pushed  on the front of the case)

DISPLAY PARAMETERS

5.5 DISPLAY UNITS

5.5.1 INTRODUCTION

On the front panel the lit green LED labeled F or C indicates the units of measure for the process values and setpoints displayed.










Units ordered for the “Domestic Market” (“D” as the “Market” character in the model number on the tag on the case) are set to display temperatures in Fahrenheit. Units ordered for “Export” (“X” as the “Market” character) or “CE” (“CE” as “Market” characters; see model number breakdown in 1.3) are set to display temperatures in Celsius.

You can use the Display Config menu to change the unit of measure used for displayed temperatures.

5.5.2 DISPLAY PARAMETERS AND SETTINGS


Name	Applies To				Range / Choices	Default	Description and Interactions
	Selected Zone	All Zones	Closed Loop Control	Open Loop Control			
Display Units		X	X	X	Degrees F Degrees C	°F	unit of measure used for all zones for all displayed temperatures, including parameter values; changing Display Units causes all temperatures already entered as parameter values or setpoints to be converted to the newly selected unit of measure when displayed


How Do I Get Here?


1. If this is for one zone, press the  button until the desired zone is highlighted. If this is for all zones, press the  button until all zones are shown with two asterisks between zones 3&4 (or 6&7 on RMB/12), ie center of display, are shown.
2. Press and hold  for several seconds to enter the menu system.
3. Press  until the Display Menu is displayed.
4. Press  until the desired parameter is displayed.
5. Use  or  to change the value. Press  again to move to the next parameter.
6. When all changes are complete, press and hold  to exit the menu system.

ALARM PARAMETERS


How Do I Get Here?




1. If this is for one zone, press the  button until the desired zone is highlighted. If this is for all zones, press


the  button until all zones are shown with two asterisks between zones 3&4 (or 6&7 on RMB/12), ie center of display, are shown.

2. Press and hold  for several seconds to enter the menu system.

3. Press  until the Alarm Menu is displayed.

4. Press  until the desired parameter is displayed.

5. Use  or  to change the value. Press  again to move to the next parameter.


6. When all changes are complete, press and hold  to exit the menu system.

5.6 ALARM PARAMETERS


5.6.1 INTRODUCTION

On the front panel the lit green LED labeled F or C indicates the units of measure for the process. High and low deviation alarms are supported for each zone. (Section 4 contains information about alarm indication and effects on outputs.)

You can use the Alarm Config menu to specify for the selected zone(s):

- how many seconds after zone is taken out of Idle the controller should wait before indicating a low alarm (Alarm Inhibit)
- number of degrees the process value must exceed the setpoint before the zone goes into alarm (High Deviation)
- number of degrees the process value must fall short of the setpoint before the zone goes into alarm (Low Deviation)
- the number of seconds the audible alarm on the RMB/6 or RMB/12 unit will be silenced when  (on the front of the controller's case) is pressed; this value applies to ALL zones in alarm.

5.6.2 ALARM PARAMETERS AND SETTINGS

Name	Applies To				Range / Choices	Default	Description and Interations
	Selected Zone	All Zones	Closed Loop Control	Open Loop Control			
Inhibit Seconds	X		X	X	0 - 999 seconds	0 (Off)	number of seconds the controller should wait after zone is taken out of Idle before signaling a low alarm
High Dev Setpoint	X		X	X	1 to 999 °F 1 to 537 °C	30 °F 17 °C	number of degrees the process value must exceed the setpoint to trigger the alarm state
Low Dev Setpoint	X		X	X	1 to 999 °F 1 to 537 °C	30 °F 17 °C	number of degrees the process value must exceed the setpoint to trigger the alarm state
Alarm Silence Seconds		X	X	X	0 - 600 seconds	120 seconds	number of seconds the audible alarm on the controller will be silenced when  is pressed.

SUPERVISOR PARAMETERS

5.7 SUPERVISOR PARAMETERS








5.7.1 INTRODUCTION

You can use the Superv [Supervisor] Config menu to specify the values of several parameters related to process protection for the selected zones. You can also use this menu to set up parameters that apply to the whole controller.



The Superv Config menu can be password protected. RMB/6 and RMB/12 controllers are shipped with the Supervisor password set to 100, which disables this feature. You can use this menu to specify a different password. Only users who know your new three-digit password will be able to view and change parameters in the Superv Config menu.

5.7.2 SUPERVISOR PARAMETERS AND SETTINGS

How Do I Get Here?


2. Press and hold  for ten (10) seconds to enter the Supervisor menu system.
3. The display will 'scroll' through the settings for each of the parameters shown. To manually select and scroll through the parameters, press  until the Input Menu is displayed.
4. Press  until the desired parameter is displayed.
5. Use  or  to change the value. Press  again to move to the next parameter.
6. When all changes are complete, press and hold  to exit the menu system.

Name	Applies To				Range / Choices	Default	Description and Interactions
	Selected Zone	All Zones	Closed Loop Control	Open Loop Control			
Set Superv. Password		X	X	X	100 - 999	100 = Off	password needed to access parameters in Superv [Supervisor] Config menu
Fail Safe Action	X		X	X	Off Auto Average Fixed Output Pct.	Auto Average	output action to be used when controller detects an open or reversed sensor: off, automatically calculated based on past good output values (if no history of Normal mode output values, then zero), or failsafe fixed output percent
Low Reading	X		X	X	—	—	lowest process value for selected zone since the last time the reading was reset by pressing the up or down arrow button
High Reading	X		X	X	—	—	highest process value for selected zone since the last time the reading was reset by pressing the up or down arrow button
High Safety (High Temperature Safety Limit)	X		X	X	33 to 999 °F 1 to 537 °C	OFF	output will be turned off if process value reaches this temperature
Fail Safe FOP (fixed output percentage)	X		X		0 to 100%	0%	output percent used only if open or reversed sensor is detected and Fail Safe Action is set to Fixed Output Pct.
Loop Break Time (sec.)	X		X	X	OFF 10 to 999 seconds	300 seconds	time period during which the input should change 1% of supported sensor span (9.67 °F or 5.37 °C) in response to output action if the sensor is working correctly and the input wiring is intact

Name	Applies To				Range / Choices	Default	Description and Interactions
	Selected Zone	All Zones	Closed Loop Control	Open Loop Control			
Soft Start	X		X		Disable Enable	Enable	gradual increase of output to slowly dissipate moisture in heaters; see 1.2.3
Mode Key Enable		X	X	X	Disable Enable	Enable	enables/disables  button
Boost Key Enable		X	X	X	Disable Enable	Enable	enables/disables  button
SP Change Enable		X	X	X	Disable Enable	Enable	enables/disables use of front panel buttons to change Normal mode setpoint and Manual mode output percentage
Congig Enable		X	X	X	Disable Enable	Enable	enables/disables use of front panel buttons to change configuration parameter values
Reset PID Parameters	X		X		Yes No	No	return tuning parameters to their default settings, undoing Autotuning or manual tuning
Load Defaults	X		X	X	Yes No	No	return configuration parameter values to their default settings as described in 8

6.2 PROCEDURE FOR AUTOTUNING


To Autotune:


- 1) Make sure the controller is in Idle state (only the green F or C LED lit).
- 2) After configuring any parameters that you want to change from the defaults, enter a setpoint that is representative of the setpoint you expect to use when the selected zones are in Normal mode operation.
- 3) If Autotuning has been attempted in the past, the Autotune feature may be disabled. To force an Autotune operation, use the Control Config menu to set the PID Autotune parameter to Enable.
- 4) Cycle the power to the controller.
- 5) At this point the controller may execute a CompuStep soft start.
 - If you want the soft start to continue to its normal conclusion (recommended), do not press any buttons.
 - If you want to terminate the soft start (not recommended), use the mode button  to set the selected zones' mode to Normal.

During the Autotune operation, the display for the selected zones blinks "Tun." **Unless you want to terminate the Autotune by changing a zone's mode, do not press any buttons during the Autotune operation.** The lower line will continue to display the setpoint you entered in Step 2.

When the controller has completed Autotuning a zone successfully, the controller will save the tuning parameter values in the Proportional Band and Derivative (rate) parameters for all zones that have Autotuned successfully. (The new tuning values can be viewed using the Control Config menu.)

If Autotune was unsuccessful for a zone, the zone will:

- use default values for PID parameters,
- go into alarm (red LED lit in the  row),
- display its process value alternating with one of the tuning error codes listed in 6.3, and
- go to configured failsafe state; the effect on a zone's output depends on how you configured the Fail Safe Action parameter in the Superv [Supervisor] Config menu.

To clear the error display and put the zone(s) in standby mode, use the mode button . (The effect on each zone's output depends on the standby configuration selections you made using the Control Config menu.)

Fix the problem (see error code meanings in next subsection) and try tuning again.

Once Autotune has been completed successfully for all Normal zones ("NRM" mode displayed) use the Control Config menu to disable PID Autotune.

6.3 AUTOTUNE ERRORS

The Autotune error codes are in the table below.

Error Code	Description
Tu3	Setpoint is lower than the process value. Check the setpoint; if it is realistic for your process, then check the thermocouple leads; they may be reversed.
Tu5	The initial process value and the setpoint are not far enough apart. For Autotune to work, the difference must be at least 9 °F (5 °C).
Tu8	The startup curve (change in PV) was not acceptable to the Autotune algorithm. This problem could be caused by a process upset that occurred during tuning. Try Autotuning again when the process is stable. If the error recurs, your process is not suitable for Autotuning. Use manual tuning as described in 6.4.
Tu9	The Autotuning timed out, because the process was unresponsive (or extremely slow to respond). Your process is not suitable for Autotuning. Tune the controller manually as described in 6.4.

MANUAL TUNING

6.4 MANUAL TUNING (ZEIGLER-NICHOLS PID METHOD)

6.4.1 INTRODUCTION

This tuning method may be used if the spread between initial process temperature and process operating temperature is small, or if the process is too slow for Autotuning. Manual tuning requires that zones be tuned one at a time and that the PV be tracked over time. (Graph the displayed PV against time manually.) All zones should be running while manually tuning one zone.

After you have finished manual tuning, you can change the Startup Mode parameter setting and enable soft start (recommended).

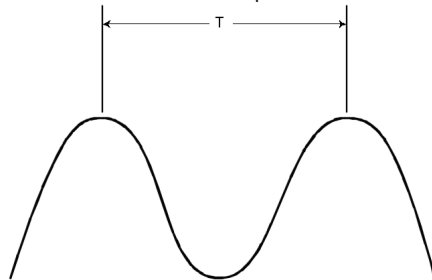
6.4.2 PROCEDURE

To do manual tuning:

- 1) After configuring any parameters that apply to your control strategy, enter a setpoint that is representative of the setpoint you expect to use when the selected zone is in Normal operation.
- 2) Go to the Control Config menu.
- 3) For now, leave the Proportional Band set to 24 °F (13 °C), but change the Derivative (PID rate) to 0 seconds.
- 4) In the Control Config menu, set the PID Autotune parameter to Disable.
- 5) Return to the standard operating display and watch the behavior of the displayed process value. When the temperature reaches setpoint, plot a graph of the displayed process value against time or record the time period between temperature peaks. (Be patient. It may be several minutes before you see up and down changes (oscillation) in the process value for a manifold zone.)
- 6) If the temperature (process value) will not oscillate, then decrease the proportional band value by repeatedly halving the value (dividing it by 2) until a small, sustained temperature oscillation is seen.

Alternatively, if the temperature (process value) oscillates severely, double the proportional band value (multiple it by 2) repeatedly until a small, sustained temperature oscillation is observed.

- 7) Measure the period in seconds of one cycle of oscillation ("T" on the diagram below).



- 8) Divide the period of oscillation (T) by 8. The resulting number (quotient) is the correct Derivative parameter value (rate) time in seconds.
- 9) Access the Control Config menu and enter the Derivative value obtained in Step 8. The integral time will be set automatically to 6 times the rate. (You cannot view the integral term value.)
- 10) If the process is stable, manual tuning is completed. However, if slight oscillation is observed, multiply the current proportional band value by 1.66 and enter the product as the new PID Proportional Band value to complete the tuning procedure for this zone.

RESTRICTING ACCESS

*Deviation, Inverse
Band, and Normal
Band Alarms track
with setpoint.*








7. RESTRICTING ACCESS TO CONTROLLER FUNCTIONS

7.1 INTRODUCTION

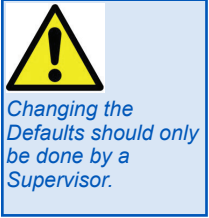
If you have access to the Superv [Supervisor] Config menu, you can disable any of the following: the soft start feature (not recommended), boost button , mode button , use of the front-panel buttons to change setpoints or configuration parameters.

7.2 PROCEDURE

To disable/enable a button or function:

- 1) Select any zone by pressing .
- 2) Access the menu system by pressing  until a menu name is displayed, and then press  repeatedly until the name of the Superv Config menu is displayed.
- 3) Step through the parameters by pressing  repeatedly until the name of the function you want to disable is displayed.
- 4) Choose “Disable” or “Enable” by pressing  or .
- 5) Exit the menu system by pressing and holding  until the standard operating display (PV and SP) is displayed.

8. RESETTING PARAMETERS TO THE DEFAULT VALUES



8.1 INTRODUCTION

Using this function returns all configuration parameter values for the selected zone(s) to their defaults (shown in Section 5). The setpoints for the selected zone(s) will be changed to 77 °F (25 °C).










Reloading defaults never affects the following settings that apply to the whole controller: display units, input type. These settings that apply to the whole controller are not reset, even if all zones are selected before loading defaults.

When all zones have been selected for resetting defaults, some settings that apply to the whole controller WILL be reset to the defaults shown in shown in Section 5. These values that are returned to the defaults include the Supervisor password (which will be reset to 100, disabling password protection) and access control settings described in Section 7.

After loading defaults, you will need to cycle power to the controller before you can resume operation.

8.2 PROCEDURE

To load defaults to selected zones:

- 1) Put the controller in the Idle state by pressing  for at least two seconds. (When the whole controller is in the Idle state, only the green F or C LED will be lit.)
- 2) Select the zone for which you want to load defaults by pressing  until only that zone's SP and PV are displayed. Alternatively, select all zones by pressing  until all zones' SP and PV are displayed with asterisks * * between the values for zones 3 and 4 on the RMB/6, or between 3 and 4, and 9 and 10 on the RMB/12.
- 3) Access the menu system by pressing  until a menu name is displayed, and then press  repeatedly until the name of the Superv Config menu is displayed.
- 4) Step through the parameters by pressing  repeatedly until Load Defaults is displayed.
- 5) Choose "Yes" by pressing  or .
- 6) Exit the menu system by pressing and holding  until "Power Cycle the System" is displayed.
- 7) Cycle power to the controller. When powered up, the controller will use the default settings for the zone(s) selected in step 2.

GLOSSARY

ALARM DELAY - the time delay between the detection of the alarm condition and the initiation and indication of the output action.

ALARM INHIBIT - prevents low setpoint alarm activation during cold startup applications.

AUTOTUNING - "Autotuning" or "self-tuning" simplifies process control by determining the tuning parameters based on an automated analysis of the controlled process's behavior. An autotuning proportional-integral-derivative (PID) controller measures the process's input and output, then updates its own tuning parameters so as to meet the closed-loop performance specifications. These automatic procedures often involve a mathematical model of the process's input/output relationship derived from process data augmented by information provided by an experienced operator.

"Self-tuning" refers to such procedures continuously executed while the controller is online regulating the process. "Autotuning" refers to on demand procedures executed while the controller is offline. However, the two terms often are used interchangeably because both self-tuning and autotuning controllers automatically tune themselves.

BIAS - allows the operator to compensate for any difference between sensor temperature and the point to be measured. The process display and setpoint will be offset by the value entered in the Bias parameter in the input menu. Ex: Desired temperature is 150 degrees. Sensor is adjacent to heater and reads 50 degrees higher than the actual process temperature. Enter bias of -50. Enter setpoint of 150. Process will display 150 even though sensor will be measuring 200 degrees.

BLANKING - controls the time the setpoint value display remains on. After the set time, the setpoint value display turns off. Pressing any button causes the setpoint value display to reappear for the selected time interval.

CYCLE TIME - The period of time in which the controller's output completes an on-off cycle (Proportional Output Type only).

Example: Output type = Mechanical relay
 Cycle time = 10 seconds
 Output power = 50%
 Controller output = 5 seconds closed, 5 seconds open

DEADBAND - In On/Off temperature control, it is the band above or below the setpoint where there is no output action. It has the effect of moving the apparent setpoint.

DERIVATIVE (rate) - Adjusts the controller gain quickly in response to load changes.

FAILSAFE STATE - designates the percentage of power output that the controller defaults to after it detects a loop break condition and after the loop break time has elapsed.

FILTER (in Display menu) - changes the filtering speed for the process value display only. It does not affect control. This parameter is mainly used to slow down the flickering of the display when the decimal position chosen is greater than zero.

FILTERING (in Input menu) - sets the time period over which the process value is averaged.

HIGHEST READING - records the highest process value read by the controller. It may be reset to zero by using the Raise or Lower arrow keys.

HYSTERESIS - In On/Off temperature control, hysteresis represents the band where the output changes state from deactivated to activated. It prevents chattering around the setpoint and prevents rapid output cycling.

INTEGRAL (automatic reset) - slowly adjusts the position of the Proportional Band (range of power output) to eliminate offset error.

LOOP BREAK - a condition where the input is not changing or responding properly to the output action. This could be caused by a thermocouple or input failure, or a heater or load failure.

LOOP BREAK TIME - the time interval from when the controller detects a loop break condition and the initiation of the failsafe state.

LOWEST READING - records the lowest process value read by the controller. May be reset to zero by using the Raise or Lower arrow keys.

LOWER SETPOINT LIMIT - prohibits users from adjusting the setpoint lower than the selected value.

MANUAL RESET - an adjustment that moves the Proportional Band up or down by a fixed percentage so that more or less power is applied at setpoint. It is used to eliminate offset error.

ON/OFF OUTPUT TYPE - In a heating application, the controller applies 100% output power if the process temperature is below the setpoint and 0% at the setpoint. For a cooling application, the controller applies 100% output power if the process temperature is above the setpoint and 0% output power at the setpoint. There are only two output states: fully on and fully off.

Applications for On/Off Control:

1. When temperature oscillation is acceptable.
2. When constant cycling of mechanical devices is prohibited (Compressors, Blowers, etc.)
3. Under-powered processes

OUTPUT LOW LIMIT % - Prohibits the controller's output from going below the specified percentage.

OUTPUT HIGH LIMIT % - Prohibits the controller's output from going above the specified percentage.

PID OUTPUT TYPE (Proportional - Integral - Derivative) - The controller modulates output power by adjusting the output power percentage within a proportional band. Power is proportionally reduced as the process temperature gets closer to the setpoint temperature. PID control helps reduce overshoot on start-up, enhances stability, and compensates for process lag. The PID parameters are automatically calculated for a particular application during the autotune procedure.

Applications for PID Control:

1. Where process temperature lags exist
2. When load changes are present
3. When overshoot is prohibited
4. When very accurate control is required

PROPORTIONAL BAND - the band (expressed in degrees of temperature) in which the controller modulates its power percentage.

TEMPERATURE LAG - The product of thermal resistance and thermal capacity. Also defined as delay of the transmission of heat from the controlled element to the sensor caused by thermal mass of the process material and/or process container, or the distance between the control element and the sensor.

UPPER SETPOINT LIMIT - prohibits users from adjusting the setpoint higher than the selected value.

Before you call, please look at this section to see if your question is covered here. If you do call for technical assistance, be ready to supply the following information:

- complete model number of controller
- symptoms of the problem
- unusual events, if any, that preceded the problem
- remedies you have already tried

Q. How do I change from thermocouple to RTD (or vice versa)?

A. To change the type of sensor used (or to switch to a linear input), go to the input menu and change the input type specified. If you change to a linear input type, you can use input menu parameters to scale the input.

Unless the controller was ordered with the "calibrate all" choice, you must also re-calibrate the controller for the new sensor type. (To determine whether the controller in hand was calibrated at the factory for all input types, check the model number on the label on the controller. The meaning of each character in the model number is in the installation manual supplied with the controller.)

Because all temperature inputs (RTD and thermocouple) require the same input jumper settings, you do not have to change JMP01 or JMP02 on the processor board. However, if you change from a temperature input to a voltage signal above 100 mV or to a current input, you must change the jumper settings.

Q. Why doesn't the PV displayed match the value on a thermometer in the process?

A. Unless the thermometer and the sensor providing input to the controller are very close to one another, their readings will not match in some applications, because of temperature variations within the process. However, if you want the controller to maintain the setpoint value at the location of the thermometer, instead of at the location of the sensor, use the input menu's bias parameter for RTD or thermocouple inputs. Applying bias allows you to compensate for any difference between sensor temperature and the location to be measured. The process variable and setpoint will be offset by the value entered for the bias parameter.

For example, suppose you want the process to be 150 °F. However, the sensor providing input to the controller is so close to the heater that it reads 50 degrees higher than the process at the location of interest to you. Enter -50 as the bias value. Enter the setpoint of 150. The setpoint 150 will be displayed. However, the controller will use a setpoint of 200. The process value displayed will also be offset, so that when the temperature at the sensor location next to the heater is 206 °F, the controller shows 156, the temperature at the location of interest in the process.

Q. Why does my compressor cycle so often?

A. If the controller's output type parameter is set to PID, the controller attempts to moderate the rate of change of the PV. PID control is not appropriate for devices such as compressors that are either on or off. Change the output type to on/off.

- When the on/off output action is configured for reverse action (heating applications), the controller will apply 100% output if the process temperature is below the setpoint and 0% if the PV is at the SV.
 - When the on/off output action is configured for direct action (cooling applications), the controller will apply 100% output if the process temperature is above the setpoint and 0% if the PV is at the SV.
- The result of switching from PID to on/off will be a reduction in the cycling of the compressor. The trade-off is greater oscillation of the process temperature. (If there is still too much cycling, introduce hysteresis to the on/off control.

Q. Why doesn't the controller communicate with the host computer?

A. When a controller has been communicating successfully with a MODBUS master or Multi-Comm host computer, then stops communicating, the cause is most likely damage to the network wiring. However, before going to search for the fault, take a quick look at the communication settings on the serial menu. Make sure that the controller ID has not been changed, and that the other communication settings match those used by the host.

Q. Why isn't the setpoint displayed all the time?

A. The controller's dSPL (display) menu contains a bLAn (setpoint blanking) parameter that can be used to specify the number of seconds the setpoint is displayed. Once the configured time period has elapsed the setpoint display will go blank and remain blank until any key is pressed. Pressing any key will cause the controller to display the setpoint again. The setpoint will remain on display until the period specified in the setpoint blanking parameter has elapsed.

If you want the setpoint to be displayed all the time while the unit is in a control mode, turn off the blanking function by setting the setpoint blanking parameter to OFF.

Q. The last digit of the PV display changes very frequently. How can I slow it down?

A. If the display is configured to show one or more decimal places, those values might change frequently, sometimes so quickly that the value is hard to read. Go to the **dSPL** (display) menu and increase the value of the **dFIL** (display filter) parameter. The display filter parameter is used to specify the minimum time period between changes of the displayed PV value. The display filter value has no effect on control.

In contrast, the input menu's input filter does affect control, because the input filter is used to specify the time period over which the controller will average the input values before using the value in the calculation of control output values.

Q. Why is the setpoint changing? I haven't touched the controller!

A. The setpoint used (and displayed) when the controller is operating in "normal" mode (automatic) is not always entered by the operator.

- The active setpoint can come from a recipe;
- The active setpoint can be written to the controller from a host computer;
- A second setpoint can be used when an external device triggers an optional switch in the controller;
- The setpoint can come from an external device by means of an optional analog input.

For the algorithm used by the controller to determine which setpoint is the "active" setpoint, that is, the setpoint being used now.

TWO-YEAR LIMITED WARRANTY

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UNIT REPAIRS

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.

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 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. Athena Controls assumes no obligation of notice to holders of this document with respect to changes subsequently made.

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