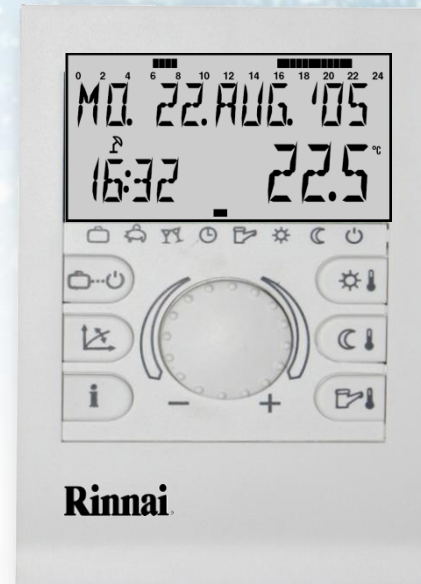# Rinnai®

Condensing Boiler
RS100 Controller Training Program

RS100 –Programmable Wall Thermostat with room setback

- The RS100 connects directly to the boiler and acts as a central thermostat for the entire structure
- Direct communication with the boiler allows it to fire based on the area's immediate needs
- Operation is controlled by simple rotary push button technology
- Digital display (with backlight):
  - Fahrenheit or Celsius
  - Ability to display outdoor temperature
  - Ability to display supply temperature
  - Ability to display system pressure
  - Indication of operating capacity (% of Btu)
  - Error and warning reporting
- Multiple programming options
  - Vacation program
  - Three event programs per day
  - Three weekly programs
  - Summer setback economy mode
- Anti-Legionella programming available for domestic hot water
- Two-wire connection—no battery needed for power
- Integrated battery for memory saves settings during power outage
  - Battery will last five years in off mode—it is not used when powered

Rinnai

Applications for the RS100 Room controller

The RS100 is a room controller and not an on/off room thermostat. It is intended to work only with Rinnai boilers. When used in conjunction with a Rinnai boiler it will sense the room temperature and use it to influence the supply water temperature. This will allow less cycling of the boiler and a more efficient installation. The RS100 is designed to control a single circuit of heating.

There are two basic applications for the RS100:
- In single zone systems, as a remote boiler display with influence from the room or area where the controller is installed
  - This can be done with only room influence and no outdoor reset influence
  - Since the RS100 is constantly reporting room conditions to the boiler, the boiler can still modulate effectively—constant outdoor temperature reporting is not needed for normal operation (it is still beneficial for freeze protection)
  - The RS100 should be installed in the coldest room

- In multiple zone systems, as a remote boiler display only with no room influence from the controller
  - This can be done with or without the room temperature displayed
  - This would be considered a 100% outdoor reset boiler where the pump runs continuously and the load is based solely on the outside temperature
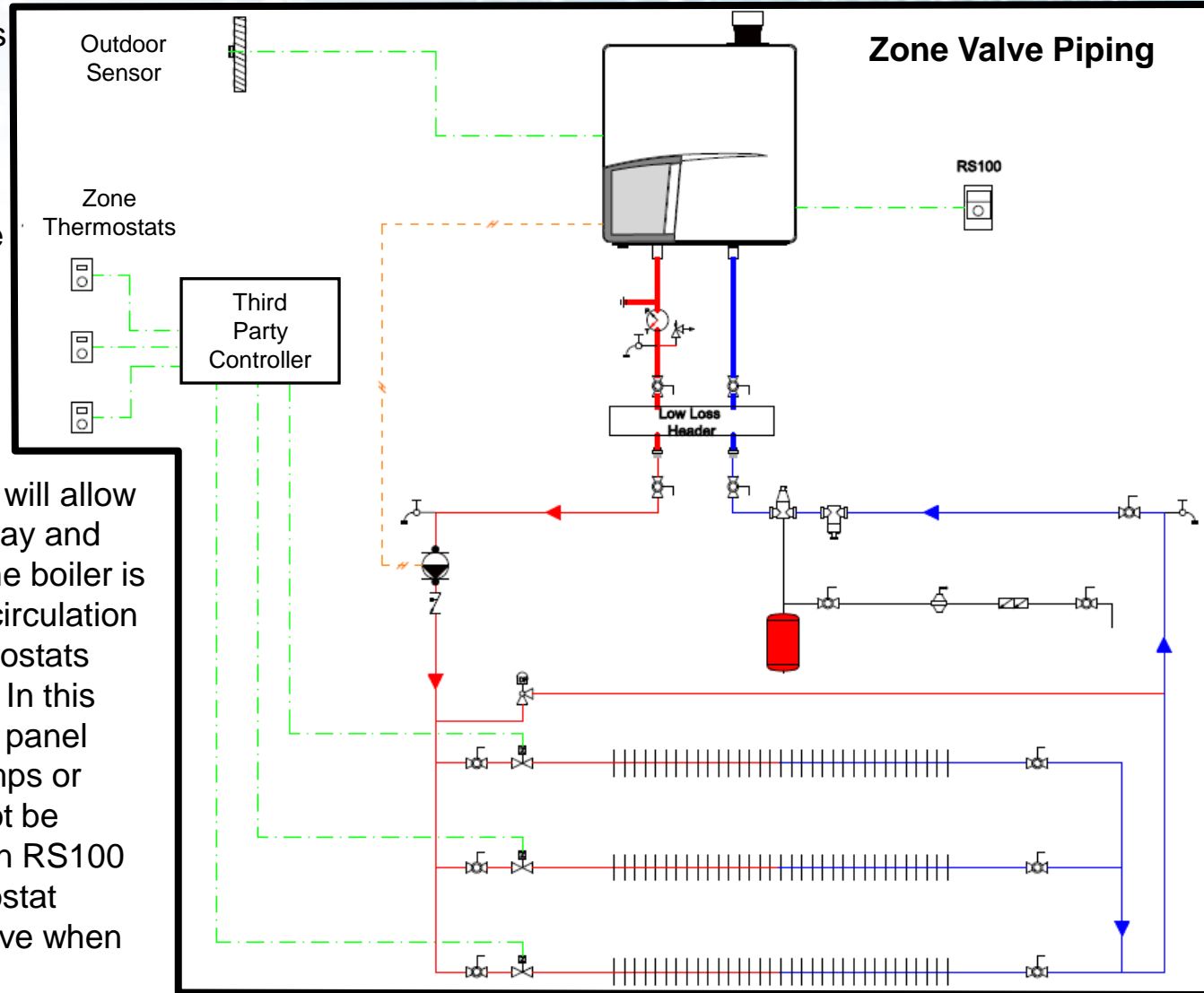 - The RS100 can be installed in any room in this application

The RS100 can be used to control a single heating zone system. A single heating zone system has only one loop of heating. The placement of the RS100 is very important; it must be placed in the coldest room within the single zone system. If the RS100 is not placed in the coldest room there is a chance that the room will not receive enough heat and therefore not be comfortable. The RS100 needs no additional installer level programming to work for this installation.
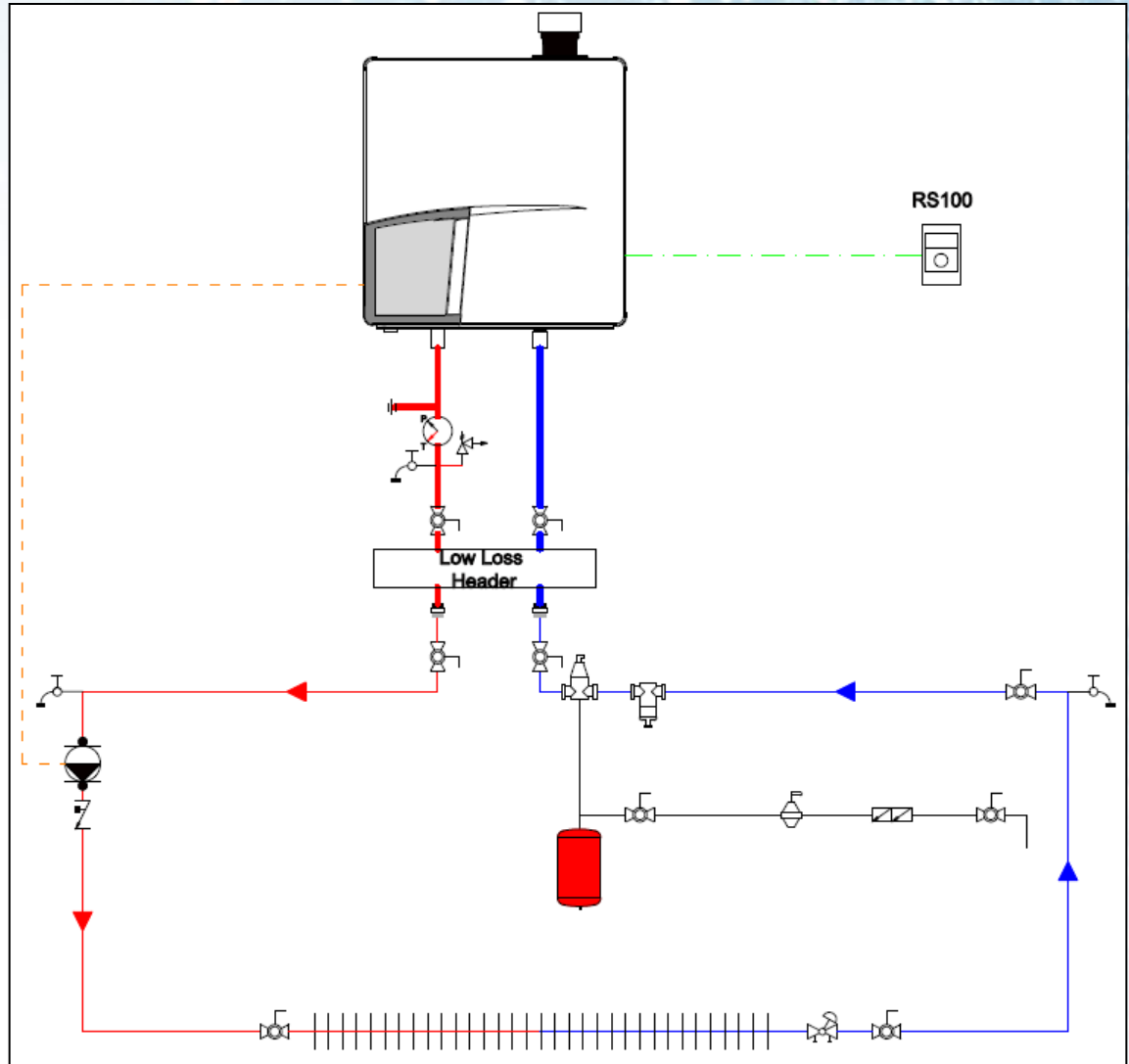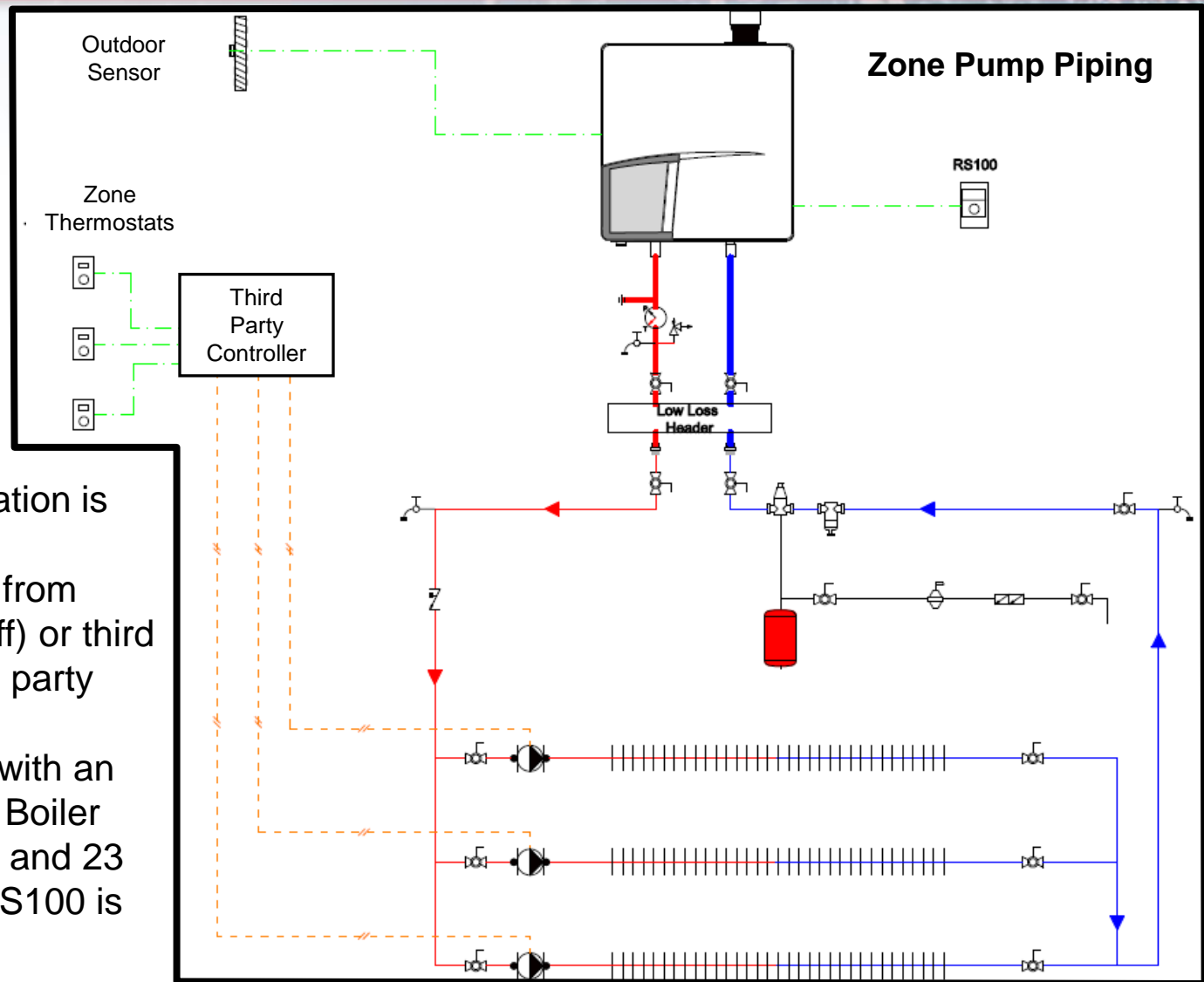
Scope of Use-
Multiple Zone System (Outdoor Reset mode)

If multiple zones are used, it is likely not beneficial to have a single zone controlling the boiler's demand. The RS100 can be used where its room information does not influence the boiler's demand. Its clock functions are still active as well as the ability to adjust a theoretical temperature for comfort.

In this application, the RS100 will allow the boiler to switch between day and night outdoor reset curves. The boiler is then operating with constant circulation and no input from room thermostats (on/off) or third party controls. In this application, a third party relay panel should be used to control pumps or zone valves. The panel cannot be connected to the boiler with an RS100 also connected. Boiler thermostat terminals 22 and 23 are inactive when the RS100 is connected.

Zone Valve Piping

Outdoor Sensor

RS100

Zone Thermostats

Third Party Controller

Low Loss Header

Rinnai.

Zone Pump Piping

Outdoor Sensor

RS100

Zone Thermostats

Third Party Controller

Low Loss Header

The boiler in this application is operating with constant circulation and no input from room thermostats (on/off) or third party controls. The third party control panel cannot be connected to the boiler with an RS100 also connected. Boiler thermostat terminals 22 and 23 are inactive when the RS100 is connected.
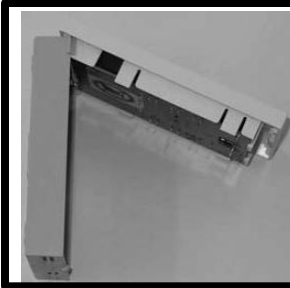
INSTALLATION

BASICS

THIS IS AN OVERVIEW ONLY—PLEASE REFER TO EACH BOILER OR CONTROLLER INSTALLATION MANUAL THAT IS SHIPPED WITH THE PRODUCT FOR THE MOST UP TO DATE INFORMATION. CONTACT RINNAI TECHNICAL SUPPORT IF NEEDED
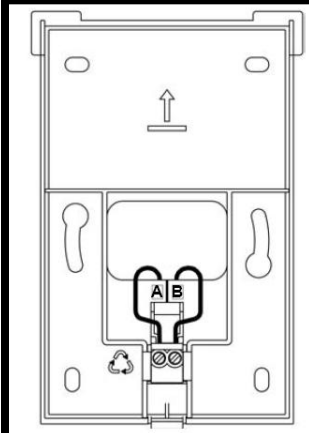
Electrical Connections

Below is the connection for the RS100. Please refer to the installation manual and Rinnai's recommended application guide for more details or contact Rinnai's Engineering Department as needed

120 V~ Power supply			120 V~ External pump			120 V~ External controller			120 V~			8U.35.22.00	Cylinder connection three-way valve				DHW sensor		Outside sensor		Bus Controller		Room therm. On / Off		External safety contact		24 V~ 100 mA	
⏚	N	L	⏚	N	L	⏚	N	L	⏚	N	L		CH	DHW	N						A	B						
1	2	3	4	5	6	7	8	9		10	11		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

Release the tab at the bottom of the controller to access the connection points

Outdoor reset sensor (included with boiler) connects here. When power is first applied to the boiler, if the outdoor reset sensor is not connected, the boiler will not incorporate any outdoor temperature monitoring

On/Off room thermostat or control (no voltage, dry contact), jumping these points will cause the boiler to fire if there is no RS100 connected. If an RS100 is connected at terminals 20 and 21, the boiler will ignore these terminals.

Connect the wires to the back panel of the controller. Ensure wire "A" from the controller is connected to terminal 20 (wire "A") on the Boiler. Ensure wire "B" is connected to 21.

Note: If these are swapped the RS100 will not exit "Auto Set" upon booting.

The RS100 will connect to terminals 20 and 21
- **Controller wire should be no longer than 164 ft**
- **Controller wire should be 18 (AWG) Gauge**
- **Controller wire should be shielded if near high voltage (120 V or higher) or if a long distance-the ground should be connected at the boiler (not at the controller)**
- **Mount the controller in the coldest area of the structure**
  - **Do not mount in direct sun**
  - **Do not mount too close to a heat emitter (where the emitter could falsely influence the controller)**
  - **Do not mount near lighting that could falsely influence the controller**

BASIC

OPERATION

THIS IS AN OVERVIEW ONLY—PLEASE REFER TO EACH BOILER OR CONTROLLER INSTALLATION MANUAL THAT IS SHIPPED WITH THE PRODUCT FOR THE MOST UP TO DATE INFORMATION. CONTACT RINNAI TECHNICAL SUPPORT IF NEEDED

RS100 – Display during initialization

The following sequence will occur every time power is reset or the "reset" button on the boiler is pressed
This process takes about 30 seconds
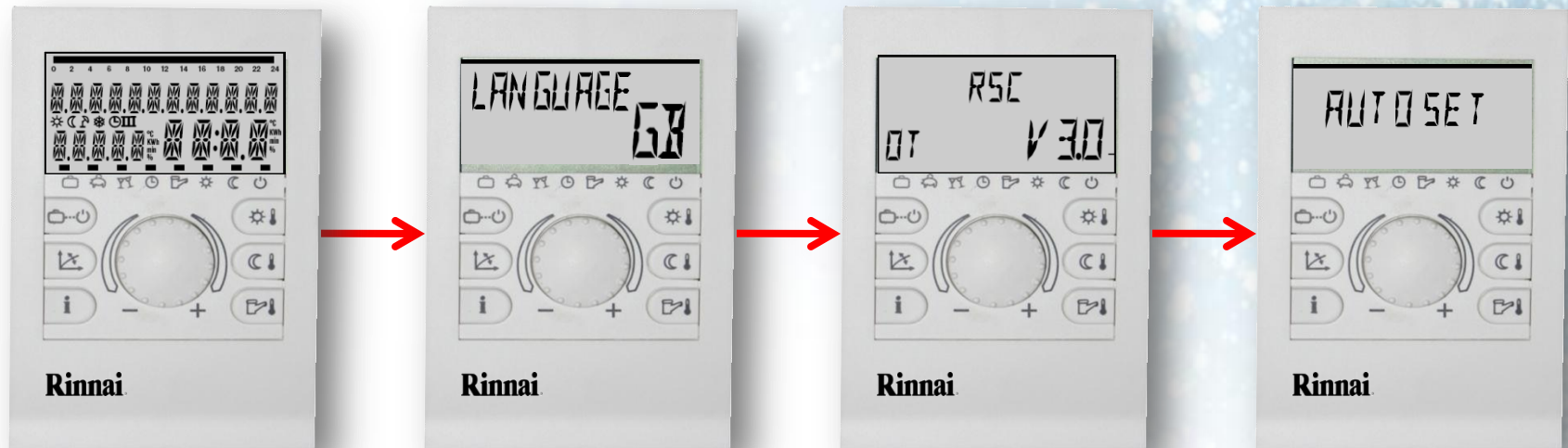
A display test will occur where all characters are illuminated

The selected language will display.
"GB" = English
If factory defaults are restored to the controller, this should be changed to "GB"
Pressing the dial will exit the language display quicker

The current software version will display (Version 2.3 is current as of 10/09)

Auto set will display for a few seconds. **NOTE:** If the A and B wires are reversed from the controller to the boiler, the controller will not exit this page

RS100 Navigation Overview

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After entering a chapter or display, any setting available to change will be flashing.

A new setting can then be "dialed in"

Pressing the rotary button will save the new setting

Turning the dial will move to other settings that can be altered on that page
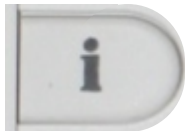
Pressing the Information button will move to the previous page

Continually pressing the information button will ultimately move back to the operation page

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RS100 – Normal Operation Display

Current heating mode

☀ =daytime heating mode

☾ =nighttime (setback) heating mode

🌡 =summer switch off activated

❄ =frost protection activated

🕐 **I** =If multiple time programs are enabled (P1-P3), this clock with I, II, or III will indicate which program is currently selected

24 hour clock with status bar indicating operating times during current day (currently operating between 6-8 am and 4-10 pm)

Day, Date, Month, Year (currently Monday, 22nd of August, 2005)

MO. 22.AUG. '05

☀ ☾ 🌡 ❄ 🕐 III

16:32   **22.5** °C

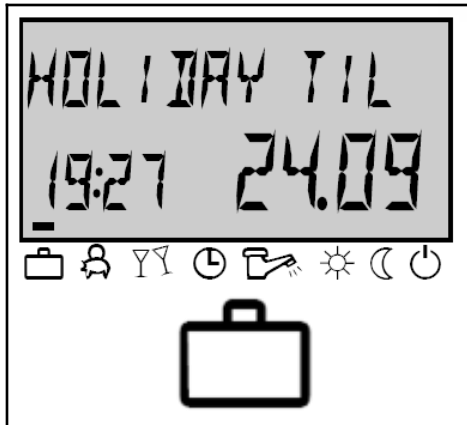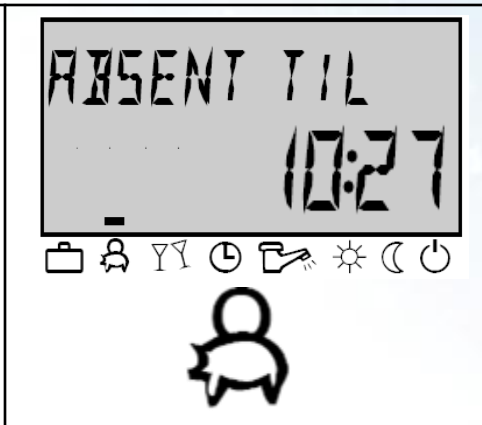Room or boiler (T1) operating temp in Celsius or Fahrenheit

Time (24 hour clock)

Status bar indicating current operating mode (currently indicating boiler is operating in timer mode)

RS100 Operational Modes

**This allows selection of unique operational modes-a cursor is displayed above the selected mode.
Any unique operating mode and its settings will be cancelled when a new unique mode is selected.**

HOLIDAY TIL
19:27 24.09

Vacation mode-Heating will be inactive until the specified date (this example is September 24).At 0:00 (midnight) on this date, operation will resume. This can be set 250 days in advance. DHW operation is set to freeze protection (100°F default).

ABSENT TIL
10:27

Absent / Economy setback-Heating will be inactive until specified time (this example is 10:27 am). This can be set between 0.5-24 hours OR if P1 is selected, heating will resume at the ON point of the next heating event.

PARTY TIL
10:27

Party mode-Heating will remain in operation until specified time (this example is 10:27 am). This can be set between 0.5-24 hours OR if P1 is selected, heating will resume at the ON point of the next heating event.

MO. 22.AUG. '05
19:27 56.5 °C

Operating Times-Heating and DHW will operate based on the times and temperatures set in the "Timeprograms" chapter. If P1-P3 is selected, there will be up to three different schedules to select.

NOTE: While in these modes, a brief press of the dial will allow immediate temperature adjustment.

NOTE: During normal operation in RC mode, the area/room temperature is displayed—not the set point.

RS100 Operational Modes

This allows selection of unique operational modes-a cursor is displayed above the selected mode. Any unique operating mode and its settings will be cancelled when a new unique mode is selected.

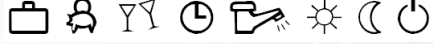| SUMMER 10:27 24.0°C	HEATING 19:27 72.0°C	REⅡ HEATING 19:27 45.0°C	STANDBY 19:27 19.0°C
DHW only will operate based on the times and temperatures set in the "Timeprograms" chapter. If P1-P3 is selected, there will be up to three different schedules to choose. In this mode, heating will not operate—frost protection is enabled.	Continuous heating and reduced hot water operation according to temperature set points	Continuous reduced heating and reduced hot water operation according to set back temperature set point	Heating and DHW are in standby. Frost protection is enabled.

NOTE: During normal operation in RC mode, the area/room temperature is displayed—not the set point.

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Outdoor reset curve adjustment (K-Factor)

NOTE: If set to RC mode, adjusting this value will not have any effect on the controller or boiler.

This button adjusts the relation of boiler temperature to outside temperature. Ideally the slope should create an intersection between maximum boiler temperature and outdoor design temperature (climate zone temperature)

Example: If outdoor design temp is 14°F and max boiler supply is set to 122°F (perhaps for in-floor heating), a value of 1.00 should be entered here.

If the user wants to adjust this (because the area does not seem to heat well) it should be done in increments of 0.10 every 2 days to allow the boiler time to adjust to the changes.

Default setting is 1.50

Max boiler temp is 176°F

RS100 User Buttons

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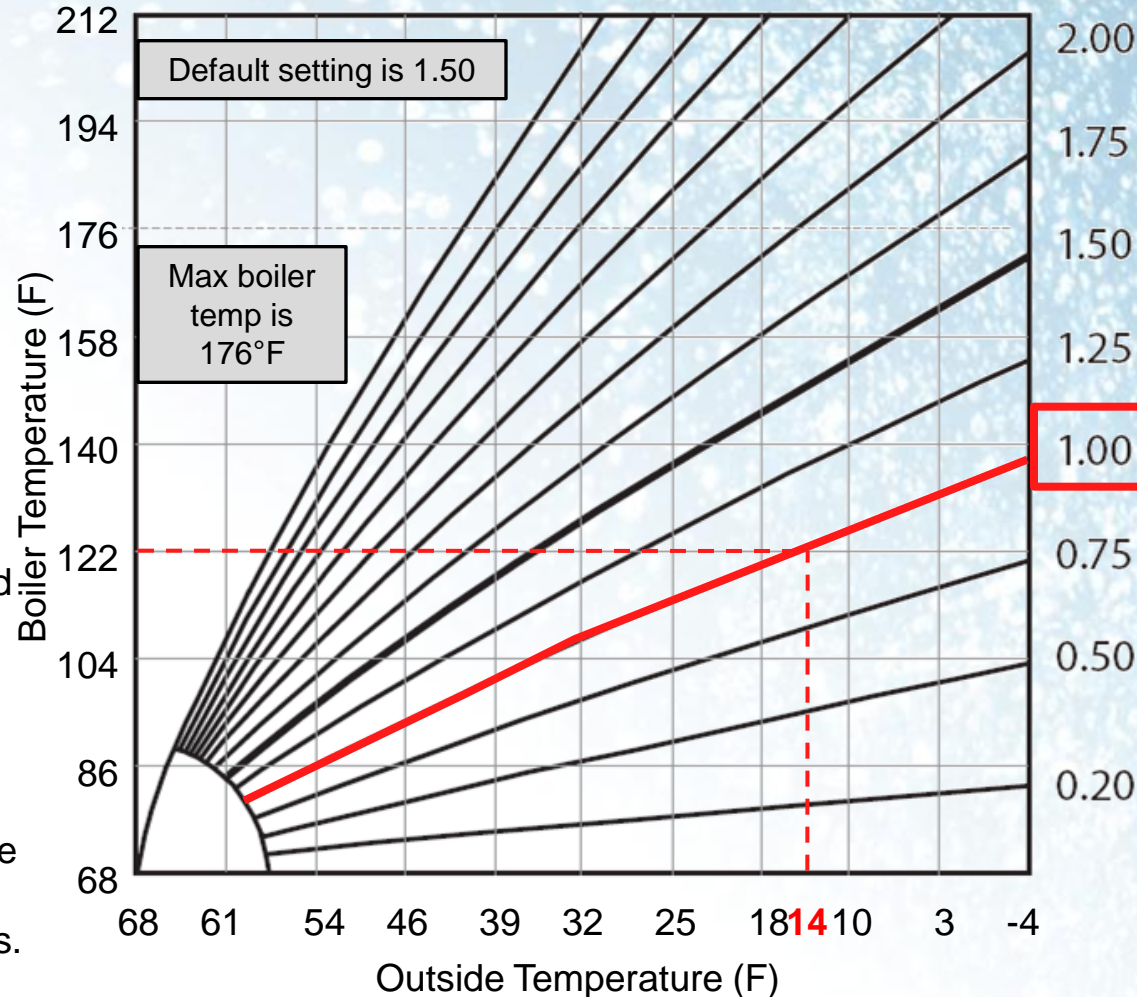
	Information display	Briefly pressing this button displays the following information (turning the dial clockwise will advance to the next reading):

- **Outside**—displays current outside temperature reading from the outdoor reset sensor
  - Pressing the dial will show the average temperature over the last 24 hour period
- **Out. Min/Max**—displays the low and high temperatures recorded over the last 24 hour period
  - NOTE: Outside information will not display if there is not an outside sensor (T4)
- **Heat Gener**.—displays the current boiler supply water temperature (T1)
  - Pressing the dial will show the average temperature over the last 24 hour period
- **Modulation**—Shows percentage of modulation when boiler is in operation
- **Hydrau. Press**—displays current pressure in Bar as detected by the boiler pressure sensor (P1)
  - To convert to PSI multiply by 14.7
- **DHW**—displays temperature of DHW sensor (T3). If no DHW sensor is in use display will indicate "OFF" or if an ON/OFF type sensor is used for an indirect tank display will indicate that sensor's current state (ON/OFF)
  - Pressing the dial will show the current temperature set point
  - Combi models will not display this temperature as it is controlled internally.
- **Room temp HC**—displays current room temperature
  - Pressing the dial will show the average temperature over the last 24 hour period
- **Auto-P1 Day DHW; and,**
- **Auto-P1 Day HC**—Both of these will display the following for heating or DHW
  - Operational mode: Auto, Holiday, Absence, Party, etc
  - P1 indicates the current program. This will not show if P1-P3 is not activated
  - Boiler status: ON indicates the pump (and diverter valve) is servicing this side of the system (DHW or HC)

NOTE: Holding the Info button for 3 seconds will allow adjustment of the time these values will display (0.5-10 minutes). OFF will allow the display to follow the System setting (default 2 minutes).

RS100 User Buttons

Daytime room temperature setting

Briefly pressing this button displays current daytime area (room) set point. Turning the dial will adjust this value. The dial must then be pressed to enter the new value

Nighttime room temperature setting

Briefly pressing this button displays current nighttime area (room) set point. Turning the dial will adjust this value. The dial must then be pressed to enter the new value

DHW temperature setting

Briefly pressing this button displays current DHW set point. Turning the dial will adjust this value. The dial must then be pressed to enter the new value

After entering the correct menu, dial in the correct setting then press the rotary button to save

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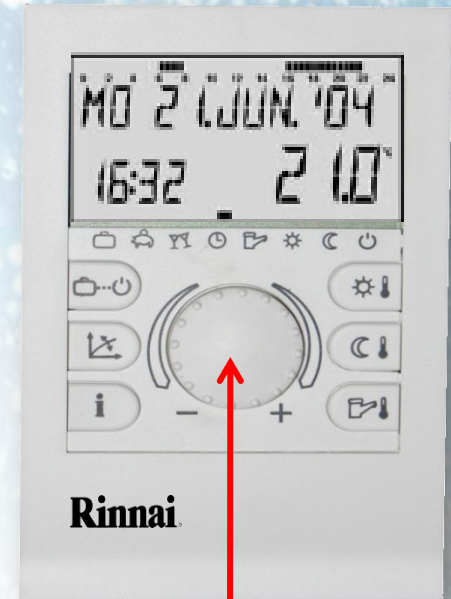
Pressing and holding the following buttons for three seconds will immediately display the following.

Operational mode is changed back to Auto.
Programmed timers will take effect

Operational mode is changed to Party. A value will be displayed and available to change if needed.

Operational mode is changed to Absent/Economy . A value will be displayed and available to change if needed.

After entering the correct menu, dial in the correct setting then press the rotary button to save

Operational mode is changed to a one-time hot water boost while in setback. This value can be adjusted from 0.5 to 240 minutes. When the boost time or day time DHW temperature is reached, DHW is maintained again at the setback temperature.
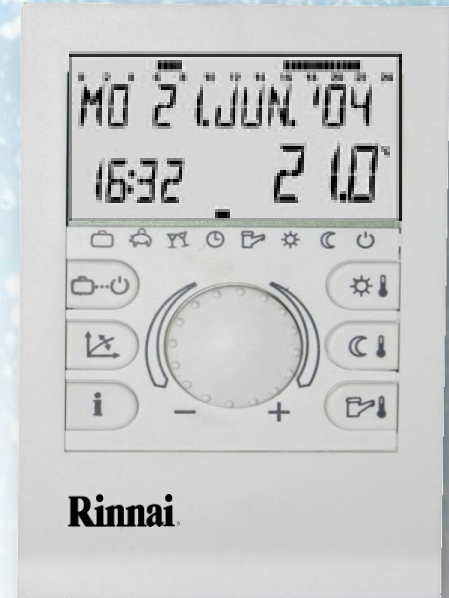
USER
AND
INSTALLER SETTINGS

THIS IS AN OVERVIEW ONLY—PLEASE REFER TO EACH BOILER OR CONTROLLER INSTALLATION MANUAL THAT IS SHIPPED WITH THE PRODUCT FOR THE MOST UP TO DATE INFORMATION. CONTACT RINNAI TECHNICAL SUPPORT IF NEEDED

Parameter Access

There are two levels of access for making parameter changes:

- The user level allows clock and timer changes and basic system changes
- To access this level, hold the rotary dial for approximately 3 seconds

Hold the rotary dial for 3 seconds for consumer level parameter access
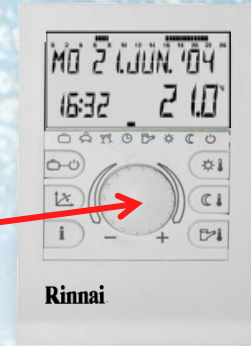
- The installer level allows access for all pertinent parameters
- To access this level, hold the heating and DHW buttons imultaneously for approximately 3 seconds
- Code access will then display—using the dial to enter each digit, enter code "1234"
- Installer access is then granted:

  INSTALLER OK

  - At this point, repeat the user level access procedure to enter the parameter menus--with this code, user level and installer level will be accessible

  - After 2 Minutes of inactivity, these menus will be exited automatically (this value can be changed)

Hold the heating and DHW buttons simultaneously for 3 seconds for installer level access

Parameter Chapters
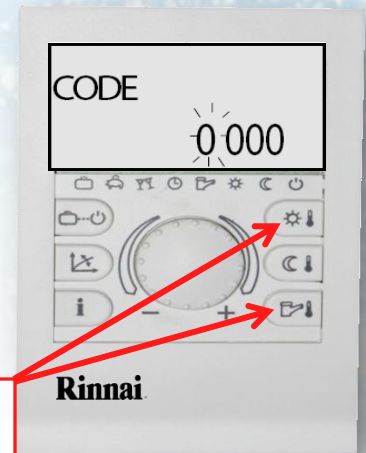
Once in the parameter menu, there are eight chapters that allow specific adjustments. Some parameters (or whole chapters) may only be accessible from the installer level access:

- **TIMEPROGRAMS**—Allows changes to individual time programs
  - This entire section can be accessed by the user
- **HYDRAULIC**—Allows changes to heating and DHW pump assignments
  - This chapter is not available at the consumer level
- **SYSTEM**—Allows changes to general system parameters
- **DHW**—Allows changes to DHW parameters (excluding time programs)
  - This chapter is not available on combi models or if there is no sensor at terminals 16 and 17 (DHW priority)
- **UNMIXED CIRCUIT**—Allows changes to the heating only parameters (excluding time programs)
- **ALARM**—Allows display of last five errors
  - This chapter is not available at the consumer level
- **SENSOR ADJUSTMENT**—Allows calibration of the RS100 temperature sensor
  - This chapter is not available at the consumer level
- **TIME / DATE**—Allows changes to current time and date

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- When entering the Time Program chapter, timers for only heating (HC) or only DHW (DHW) can be selected

- Up to three events per day can be selected with a unique temperature (in Farhenheit or Celsius)

  - By default HC has one daily event from 6 am-10 pm

  - By default DHW has one daily event from 5 am-10 pm

  - Outside of these times, the setback temperature will be observed if no other events are added

    - By default HC will observe the nighttime outdoor reset curve or room setback temp of 61°F depending on which type of application (Outdoor Reset mode or RC)

    - By default DHW will maintain 100°F (this is adjustable)

  - If a second or third event is added, the day and "2" or "3" will display

    - "3" will not display until a second event is entered

    - "2" or "3" will not display if the previous event ends at 24:00 (midnight)
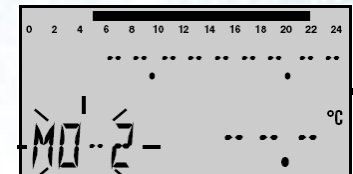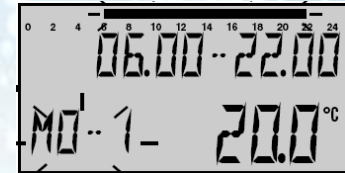
Time Programs-Copy Feature

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- After setting one day's time events, they can be copied in several different ways:
    - From one day to another

| COPY | | COPY MO |
| FROM -MO- | → | TO -TU- |

    - From one day to Monday through Friday (1-5)

| COPY | | COPY MO |
| FROM -MO- | → | TO -1-5 |
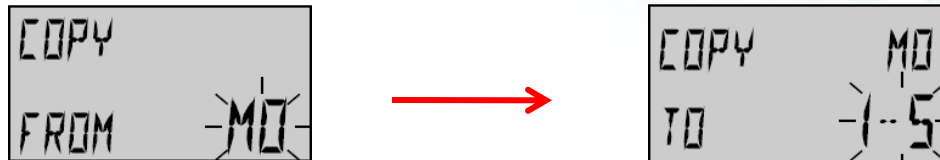
    - From one day to Saturday and Sunday (6-7)

| COPY | | COPY MO |
| FROM -MO- | → | TO -6-7 |
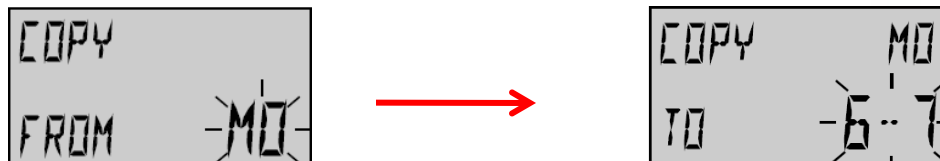
    - From one day to the entire week (1-7)

| COPY | | COPY MO |
| FROM -MO- | → | TO -1-7 |
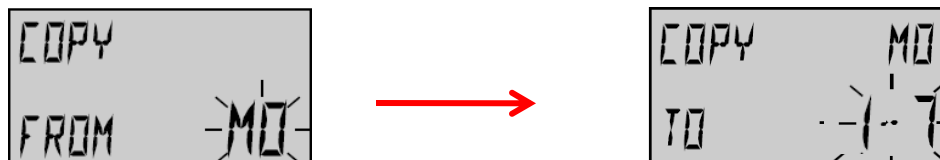
To copy:
- Enter the "TIMEPROGRAMS"
- Select "HC" or "DHW"
- Dial the rotary button backwards (CCW) one click
- The copy feature will be visible

Hydraulic Parameters

- Hydraulic parameters should very rarely be adjusted
- Hydraulic parameters are only available with the installer code (1234)

PARA	Description	Range / Explanation		Factory Setting
2	DHW assignment	OFF	Disables DHW recognition (Any DHW features, info, etc will not display). It is not a requirement to set this to OFF if there is not DHW	1
		1	Enables DHW recognition	
5	Unmixed (heating) circuit assignment	OFF	Disables central heating circuit (never set this to OFF)	2
		2	Enables central heating circuit recognition	
		6	Constant control-this forces the boiler to operate at the max temperature—set at Para 12 in the Unmixed Circuit Chapter. This could reduce efficiency and comfort. (This is not recommended)	

System Parameters

- Some System parameters are accessible but should never be adjusted. This is indicated with N/A at the description. Ensure factory settings are always maintained at these parameters

- System parameters that are available at the user level are indicated below

PARA	Description	Range / Explanation		Factory Setting	User Access
1	Language	D-German, F-French, I-Italian, GB-English Rinnai controllers are programmed to English NOTE: GB = Default at shipment D=Default at System Reset		GB	Yes
2	Number of enabled time programs	P1	Only one time program enabled	P1	Yes
		P1-P3	Three time programs enabled-This would be applicable for a user that worked rotating shifts, etc		
3	Separate operational mode control of CH/DHW	1	Common adjustments for CH and DHW	1	Yes
		2	Separate adjustments for CH and DHW-If this is selected, the operational mode will first ask for CH or DHW before entering a specific operational mode. Under normal operation the status bar for operational mode will not be visible		

System Parameters (continued)

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PARA	Description	Range / Explanation		Factory Setting	User Access
4	Summer setback temperature	OFF	No summer setback	68°F	Yes
		System frost setting (Para 5) to 86°F	When the outdoor sensor detects the selected temperature, the heating side of the boiler will not operate		
5	System frost protect	OFF	No function	37°F	No
		-4°F to Summer setback (Para 4)	When the outdoor sensor detects the selected temperature, pump circulation will begin. This overrides parameter 23 in the boiler.		
9	Climate Zone	-4°F to 68°F	Outdoor design temperature-this is determined by the geography of the installation. This overrides parameter 7 inside the boiler. It is not needed when the RS100 is in RC mode.	10°F	No
10	Building construction	1	Light Construction	1	No
		2	Medium Construction		
		3	Heavy (Tight) Construction		
NOTE: Light Construction = default at shipment, medium = default at system reset; This parameter does not have an effect if in RC mode.					

System Parameters (continued)

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PARA	Description	Range / Explanation		Factory Setting	User Access
11	Time to return to normal display	OFF	No automatic return	2 minutes	Yes
		0.5 to 5 minutes	Time before controller will return to its normal operating screen (from point of no activity		
13	N/A	OFF-ON	This should not be altered	OFF	No
Reset	Reset to factory values	When entering this parameter, "SET" will appear. Holding the dial for 5 seconds will cause the controller to re-initialize. Default settings will be loaded based on the controller's current access level. Example: At the User Level, only parameters accessible by the user are reset RESET SYST. -SET- • Time and date will not be reset • Language will default to German, GB must be set at initialization for English			Yes

DHW Parameters

- Some DHW parameters are accessible but should never be adjusted. This is indicated with N/A at the description. Ensure factory settings are always maintained at these parameters
- DHW parameters that are available at the user level are indicated below
- This chapter is not available on combi boilers or if there is no sensor at terminals 16 and 17 (DHW priority)

PARA	Description	Range / Explanation		Factory Setting	User Access
1	DHW economy (nighttime setback) temp	50°F to DHW max temp (PARA 6)	Temp for DHW during night time setback.	100°F	Yes
NOTE: 100°F=Default at shipment, 68°F=Default at System Reset					
2	DHW Legionella Protection	OFF	No Legionella protection	Monday	Yes
		Mo-Su, ALL	One day only or every day (ALL)		
3	DHW Legionella time of operation	0:00 to 23:00	This is not available if PARA 2 is OFF	2:00 (am)	No
4	DHW Legionella operation temp	50°F to DHW max temp (PARA 6)	This is not available if PARA 2 is OFF. Do not adjust lower than 140°F	149°F	No
6	DHW max temp	68°F to 176°F	This overrides boiler PARA 31.	149°F	No
NOTE: This value will go to 203°F but the boiler will never eclipse 176°F; NOTE: During a split load between heat and DHW, the supply temp is based on DHW needs—do not use on direct-coupled in-floor radiant systems					
16	N/A	N/A	This should not be altered	131°F	Yes

Unmixed (HC) Circuit Parameters

- Some HC parameters are accessible but should never be adjusted. This is indicated with N/A at the description. Ensure factory settings are always maintained at these parameters

- HC parameters that are available at the user level are indicated below

PARA	Description	Range / Explanation		Factory Setting	User Access
1	Type of reduced (night time setback) operation	ECO	Economy-HC is off unless outdoor freezing temperature is detected. The heating system therefore will not operate unless this freezing threshold temperature is detected	RED	Yes
		RED	Reduced-HC will operate on the night time heating curve (recommended)		
2	Do not use	1.00-10.00	Do not use	1.3	No

PARA	Description	Range / Explanation		Factory Setting	User Access
3	Controller application type (Outdoor reset or RC mode)	OFF	Outdoor reset mode: The RS100 doesn't use the room temp for operation. Boiler supply temp is displayed (pressing the dial displays room temp).	1	Yes
		1	Room Control/RC Mode: Controller fully enabled (recommended)		
		3	Outdoor reset mode: The RS100 doesn't use the room temp for operation but it will be displayed		
If OFF or 3 is selected the boiler's pump continuously operates. The boiler will fire based on the outside sensor. NOTE: 1=Default at shipment, 3=Default at System Reset					
4	Controller effect type (Parameter 3 must be set to 1)	OFF	The boiler's pump continuously operates. The boiler will fire based on the outside sensor. Boiler supply temp is displayed.	RC	Yes
		10-500%	Do not use these settings		
		RC	The boiler will operate based only on the RS100's area temperature sensor		
NOTE: RC=Default at shipment, OFF=Default at System Reset					
5	N/A	OFF /ON	This should not be altered	OFF	Yes

Unmixed (HC) Circuit Parameters (continued)

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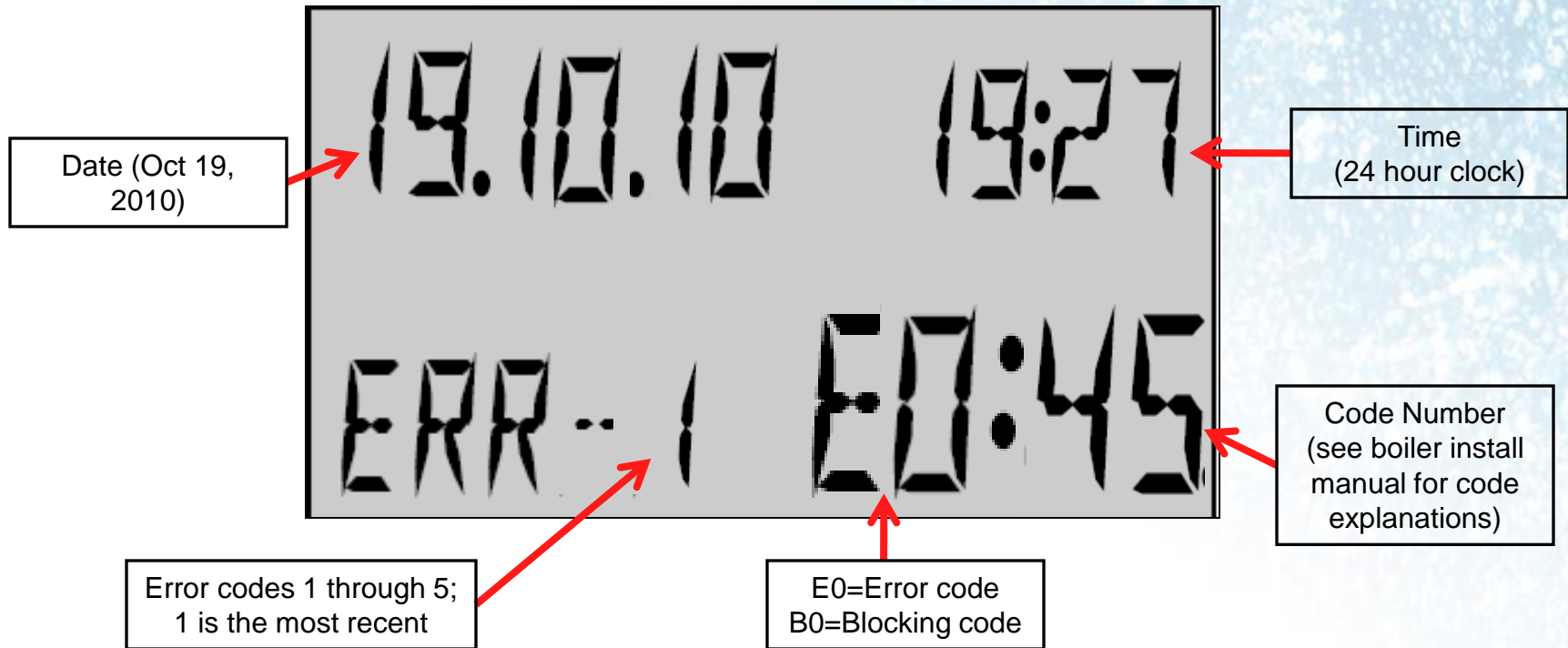| PARA	Description	Range / Explanation		Factory Setting	User Access
6	Inrush optimization	OFF	Not active	OFF	Yes
		1-8 hours	The amount of time the boiler will allow itself to operate before a heating event begins in order to be at the desired temperature of that event. NOTE: This value is the allowed time to operate—the boiler may not use the entire value		
8	Room frost protection	OFF	Not active	50°F	No
		41-86°F	If in vacation or economy/absent mode, or if ECO is selected at PARA 1, the boiler will fire if this temp is detected by the RS100 (in the room).		
NOTE: If the RS100 is set for outdoor reset mode (PARA 3=OFF or 1, PARA 4=OFF), a modem-driven switch can be placed in parallel with the outdoor sensor. When this switch closes, the RS100 will use this parameter to engage freeze protection. This allows a user to remotely preheat a second home.					
9	Exceeding room temp control	OFF	Not Active	Off	No
		33-41	This setting will turn off the boiler if it senses the preset overshoot. The boiler will restart at the set point minus -1°F. NOTE: The conversion to Fahrenheit is incorrect. Use this key: 33=1°F overshoot, 34=2°F …41=9°F;		
NOTE: This parameter is ignored if Para 3=OFF or 3 or Para 4=OFF					

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PARA	Description	Range / Explanation		Factory Setting	User Access
12	Min. temp limit	50°F to max temp	Minimum boiler temperature limit in heating mode NOTE: This overrides Boiler Para 27	68°F	No
13	Max. temp limit	Min. temp to 176°F	Maximum boiler temperature limit in heating mode.	176°F	No
NOTE: If parameter 1 in the boiler is lower, it will override this setting; NOTE: This value will go to 203°F but the boiler will never eclipse 176°F; NOTE: 176°F=Default at shipment, 158°F=Default at System Reset					
14	NA	-9 to 36°F	Not for use with the RS100. Do not adjust	0°F	No
23	NA	1 to 100	Do not adjust (temp)	8	No
24	NA	5–240	Do not adjust (minutes)	15	No
25	Daytime room temp base value	41 to 86°F	Daytime base value for room temp (Note: This setting is not needed as there is a button on the front for it)	70°F	Yes
26	Nighttime room temp base value	41 to 86°F	Nighttime base value for room temp (Note: This setting is not needed as there is a button on the front for it)	61°F	Yes
27	K-Factor (curve slope)	0.2 to 3.5	Higher number=steeper the curve. NOTE: this can be adjusted from the front panel button. It is not needed if Para 3=1 and Para 4=RC.	1.50	Yes

Alarm Messages

- The last 5 alarm messages can be viewed in the Alarm chapter.
  - The alarm number (1 through 5), the alarm code, date and time will display
  - During a live error or blocking code, the display will alternate between the code and the normal operating display

Date (Oct 19, 2010)

Time (24 hour clock)

19.10.10   19:27

ERR.. 1   E0:45

Error codes 1 through 5; 1 is the most recent

E0=Error code
B0=Blocking code

Code Number (see boiler install manual for code explanations)

Sensor Adjustment Chapter

- Sensor adjustment allows an offset or calibration value to be applied to the RS100
- This is only accesible from the installer access level

PARA	Description	Range / Explanation		Factory Setting	User Access
1	RS100 internal temperature sensor	-9 to +9°F	Calibration value of the sensor	0°F	No

Time Adjustment Chapter

- Time adjustment allows date, day, and time for the RS100
- This is accesible from the user level (except Parameter 4)

PARA	Description	Range / Explanation	Factory Setting	User Access
1	Time	0:00 to 23:59	NA	Yes
2	Year	2001 to 2099	NA	Yes
3	Day / Month	01.01 to 31.12 (dd/mm) ; The correct day will automatically display	NA	Yes
4	Automatic adjustment for Daylight Saving Time	OFF / ON	If set to ON, time will change the last Sunday in March and October. NOTE: This is not the North American standard for time change. It is recommended NOT to set this to ON NOTE: OFF=Default at shipment, ON=Default at System Reset	OFF	No

BOILER PARAMETER SETTINGS

THIS IS AN OVERVIEW ONLY—PLEASE REFER TO EACH BOILER'S INSTALLATION MANUAL THAT IS SHIPPED WITH THE PRODUCT FOR THE MOST UP TO DATE INFORMATION. CONTACT RINNAI TECHNICAL SUPPORT IF NEEDED

Boiler Parameters (in relation to the RS100)

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- **When using an RS100, the only adjustment that must be made at the boiler is PARA 73—most others can be made at the RS100**

  - **Boiler parameter 2 or 14 may need to be set to establish an appropriate gradient control line (the defualt is 10°F/min)**

- When connecting an RS100, please observe the following notes at each parameter:

Parameter Chapter				
PARA	Default	Range	Description	RS100 Note
1	176°	68 to176°F	Maximum supply temp in heating mode	This will override the RS100's setting if lower (UC PARA 13)
2	00	01-04	Curve preset for type of heat emitters-see reset curve slide	This is not overridden—but should still be set from the RS100
5	2.3	0.2-3.5	K Factor of outdoor reset curve (this depends on PARA 2)	The RS100 heat curve button and/or UC PARA 27 overrides this setting
6	1.4	1.1-1.4	Outdoor reset curve exponent	RS100 overrides this setting
7	14°F	-4°F to 32°F	Outdoor reset curve coldest design day setting	RS100 System PARA 9 overrides this setting
10	0°	-8°F to 10°F	Day temperature calibration (outdoor reset curve)	RS100 will override these settings—no parameter is available or needed to do so as it is constantly sampling the room and adjusts as needed
11	0°	-8°F to 10°F	Night temperature calibration (outdoor reset curve)	

Boiler Parameters (in relation to the RS100)

• When connecting an RS100, please observe the following notes at each parameter (continued):

Parameter Chapter				
PARA	Default	Range	Description	RS100 Note
14	10°F/min	0-28°F/min	Gradient acceleration—this is set when para 2 is selected based on application or it can be set here	This is not adjustable from the RS100
15	00	00 or 01	Booster after night reduction 00=no, 01=yes	RS100 UC PARA 6 will override this setting
23	26°	-4°F to 50°F	Freeze protection activation temperature	RS100 System PARA 5 will override this setting
27	32°	0°F to 158°F	Minimum T-set value for heating mode (reset curve base point)	RS100 UC PARA 12 will override this setting
31	146°F (154°F)	104°F to 176°F	DHW tank temperature adjustment (154°F is default for the Q175C Combi model and not available to change. E series Combi models are set to 132°F and not able to change too)	RS100 DHW PARA 6 will override this setting
73	0	0 to 100	Vent and Altitude Compensation	RS100 doesn't effect (ensure this is set in every boiler though)

TROUBLESHOOTING

THIS IS AN OVERVIEW ONLY—PLEASE REFER TO EACH BOILER OR CONTROLLER INSTALLATION MANUAL THAT IS SHIPPED WITH THE PRODUCT FOR THE MOST UP TO DATE INFORMATION. CONTACT RINNAI TECHNICAL SUPPORT IF NEEDED

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- When troubleshooting with an RS100, consider the following:
  - Jumping the thermostat terminals (22 and 23) to force the boiler to fire will do nothing unless the RS100 is disconnected from 20 and 21
  - If the RS100 is not set for RC, the room conditions will not influence the boiler
  - If the RS100 is set for RC, outside temperature will not influence the boiler except for freezing or summer setback conditions
  - If max temp at the boiler is lower than the max temp at the RS100, the boiler's value will have precedence
  - If there is a complaint of lack of heating or too much heat (heating or DHW mode)
    - First, ensure the boiler functions correctly without an RS100 and there are no system issues
      - If there is a diverter valve on the boiler, ensure it is in the right position and functioning correctly
  - Ensure clock settings are correct (including the temp) and heating when needed
  - Ensure the RS100 is not physically located in an environment that could cause it to report invalidly (if in RC mode only)
  - Ensure vacation, absent, setback, or standby modes aren't selected (lack of heating)
  - Ensure boiler max and min temps are correct
  - Ensure DHW settings are correct
  - Ensure UC Para 1 is set to RED (lack of heating)
  - Ensure party mode isn't engaged (too much heat)
  - If needed, validate all parameters-reset to factory defaults if needed (make sure system unique parameters are then reset)

Thank You for being a part of

Rinnai's Product Expansion –

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RS100 Boiler Controller