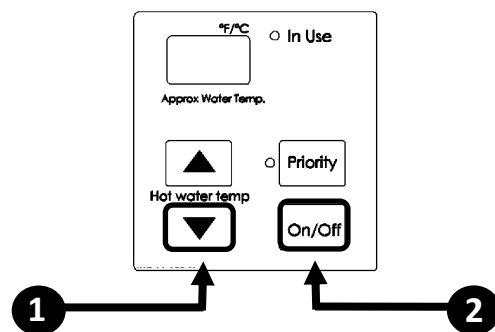




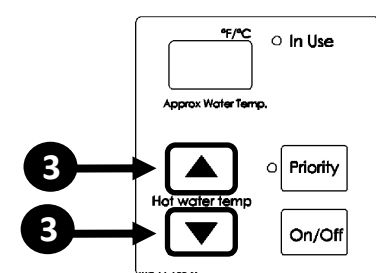
## PERFORMANCE DATA

### To Obtain Performance Data:

- Press and hold the ▼ (Down) button.
- While holding the ▼ (Down) button for 2 seconds, press and hold the "On/Off" button (hold both buttons simultaneously).



- Use the ▲ (Up) and ▼ (Down) buttons to scroll to the desired performance information described below.



### Performance Data Table

| #  | DATA  | UNIT                      |
|----|---|---------------------------|
| 01 | Water Flow Rate                                   | x0.1 gal/min              |
| 02 | Outgoing Temperature                              | °F                        |
| 03 | Combustion Hours                                  | x100 Hours                |
| 04 | Combustion Cycles                                 | See following information |
| 05 | Fan Frequency                                     | Hz                        |
| 06 | Additional Controllers Connected                  | See following information |
| 07 | Water Flow Control Position                       | 0=Mid, 1=Open, 2=Closed   |
| 08 | Inlet Temperature                                 | °F                        |
| 09 | Fan Current                                       | x10 mA                    |
| 10 | Total Bath Fill Amount                            | gallons                   |
| 11 | HEX Outlet Temperature                            | °F                        |
| 12 | By-Pass Flow Control Position                     | Degrees of opening        |
| 15 | Freeze Protection Temperature (Indoor Unit Only)  | °F                        |
| 17 | Freeze Protection Temperature (Outdoor Unit Only) | °F                        |
| 19 | Pump Hours  | x100 Hours                |
| 20 | Pump Cycles                                       | See following information |
| 21 | Exhaust Temperature                               | °F                        |

| 04         | Combustion Cycles                   |
|------------|-------------------------------------|
| 20         | Pump Cycles                         |
| DISPLAY    | CYCLE COUNT                         |
| 000 to 999 | x100 (0 to 99,900)                  |
| 10- to 99- | x10,000 (100,000 to 990,000)        |
| 1-- to 5-- | x1,000,000 (1,000,000 to 6,000,000) |

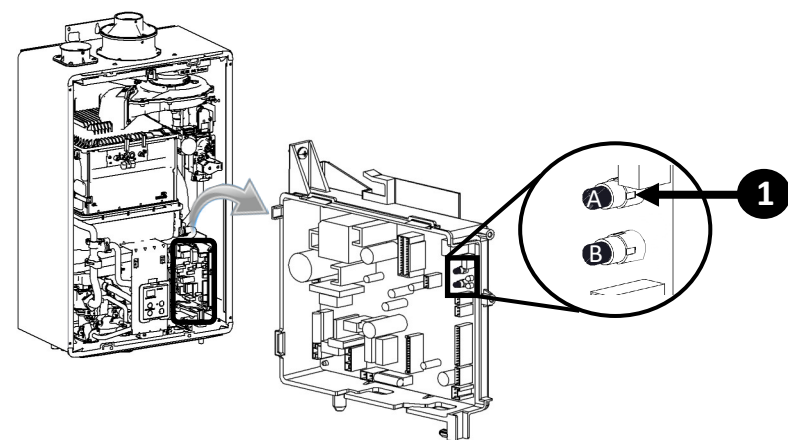
| 06               | Controllers Connected |               |  |
|------------------|-----------------------|---------------|--|
| CONTROLLER MODEL | CONNECTED             | NOT CONNECTED |  |
| MC               | --1                   | --0           |  |
| BC               | -1-                   | -0-           |  |
| BSC & BSC2       | 1-- , 2-- (QTY2)      | 0--           |  |

Default display is 100.  
- depends on connection status of another controller.

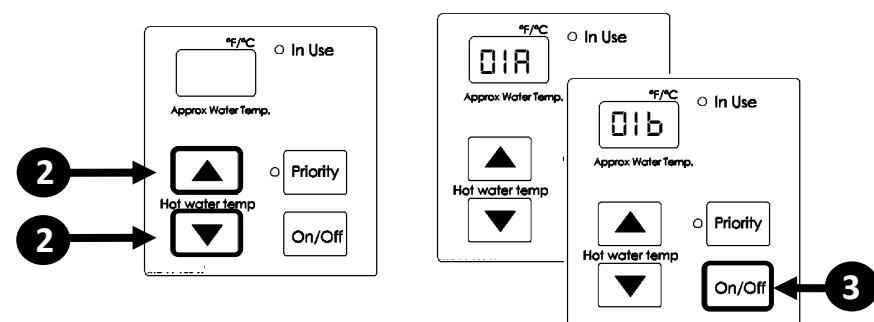
## PARAMETER SETTINGS

### To Adjust the Parameters:

- Press the "A" button for 1 second.



- Use the ▲ (Up) and ▼ (Down) button on the controller to select a setting number (See Parameter Settings Table).



- Once the desired setting number is selected, use the "On/Off" button on the controller to change the selection for the setting number. Example: Display will change from 01A to 01b for Maximum Temperature setting (as shown below).
- To exit the parameters, press the "A" button on the PC board for 1 second.

### Parameter Settings Table

Default is A for all settings below except 10, 12, 13, and 14 which are factory set.

| SETTING # | SETTING DESCRIPTION  | SELECTION                |                                  |                                    |                                     |
|-----------|--|--------------------------|----------------------------------|------------------------------------|-------------------------------------|
|           |  | A                        | B                                | C                                  | D                                   |
| 01        | Maximum Set Temperature                                    | Residential: 120°F       | Residential: 140°F               |                                    |                                     |
| 02        | High Altitude (Installation Location)                      | 0 - 2,000 ft (0 - 610 m) | 2,001 - 5,400 ft (610 - 1,646 m) | 5,401 - 7,700 ft (1,646 - 2,347 m) | 7,701 - 10,200 ft (2,347 - 3,109 m) |
| 03        | Service Soon <sup>1</sup>                                  | Disabled                 | 0.5 Year                         | 1 Year                             | 2 Years                             |
| 04        | Recirculation Settings                                     | No Recirculation         | Recirculation (Dedicated)        | Recirculation (Crossover)          |                                     |
| 05        | Recirculation Mode <sup>2</sup>                            | Economy                  | Comfort                          | Commercial <sup>3</sup>            |                                     |
| 07        | Units in Standby (EZConnect™)                              | 2                        | 1                                |                                    |                                     |
| 10        | Gas Type (Factory Set)                                     | NG                       | LPG                              |                                    |                                     |
| 11        | Maximum Flow Rate <sup>4</sup>                             | Standard                 | High                             |                                    |                                     |
| 12        | Water Heater Model (Factory set values and not adjustable) | Without Pump             | With Pump (RUR)                  | With Pump (RSC)                    |                                     |
| 13        |  | 199 (3237)               |                                  | 160 (2530)                         |                                     |
| 14        |  | Internal (Indoor)        | External (Outdoor)               |                                    |                                     |
| 15        | Low Activation Mode  | On                       | Off                              |                                    |                                     |
| 16        | Pump Speed   | Max                      | Low                              |                                    |                                     |
| 17*       | First Day Pump Operation                                   | Pump Off                 | Pump On                          |                                    |                                     |

- Refer to the Installation and Operation Manual for more information on this setting.
  - Setting 05 is available only if setting 04b, 04c, or 04d is selected.
    - Economy mode** cycles the pump less often, using less energy to maintain the circulation loop temperature.
    - Comfort mode** cycles the pump more frequently, ensuring the loop temperature remains higher (but also uses more energy).
  - BMS = Building Management System
  - Selecting "High" will increase the water flow rate to the maximum capacity.
  - Commercial mode should not be used for residential applications. Application of commercial mode may result in excessive machine wear and energy consumption.**
  - Low Activation Mode must be in the ON position (15R) if crossover recirculation is selected.
- \*For the first 24-hours of operation, Smart-Circ will learn hot water usage patterns and operate pump based on the learned patterns. On the first day, when the tankless water heater has no learned patterns, the unit can be set to no pump operation (Pump Off/No Recirc) for the first 24 hours or to the pump operating (Pump On/Recirc) every 15 to 30 minutes for the first 24 hours.

## ELECTRICAL DIAGNOSTICS

NOTE: Wiring diagram is available in manual and on the inside front cover.

### Important Safety Notes

There are a number of (live) tests required when performing electrical diagnostics on this product. Proceed with caution at all times to avoid contact with energized components inside the water heater. Only trained and qualified service technicians should attempt to repair this product. Before checking for resistance readings, disconnect the power source to the unit and isolate the item from the circuit (unplug it).

### Freeze Protection

This unit has freeze protection heaters mounted at different points to protect the water heater from freezing. All of them should display a positive resistance reading.

### Flame Rod

Place one lead of your meter to the flame rod and the other to ground. With the unit running you should read between 5 - 150 VAC. Set your meter to the micro (μ) amp scale and arrange meter leads in line with the flame rod. You should read 1 μ amp or greater for proper flame circuit. In the event of low flame circuit, remove the flame rod and check for carbon or damage. The flame rod gasket must be replaced after it is removed.

### Amp Fuses

This unit has two glass fuses located on the PC Board, one inline (10) amp and one (4) amp glass fuse. Remove the fuses and check continuity through it. If you have continuity through each fuse then it is functioning. Otherwise the fuse is blown and must be replaced.

### Thermistors

Check all thermistors by inserting meter leads into each end of the thermistor plug. Set your meter to the 20 K scale and read resistance. Applying heat to the thermistor bulb should decrease the resistance. Applying ice to the thermistor bulb should increase the resistance.

Below are examples of typical temperatures and resistance readings.

| Temperature | Resistance Readings |
|-------------|---------------------|
| 59°F        | 11.4 - 14KΩ         |
| 86°F        | 6.4 - 7.8KΩ         |
| 113°F       | 3.6 - 4.5KΩ         |
| 140°F       | 2.2 - 2.7KΩ         |
| 221°F       | 0.6 - 0.8KΩ         |

### Electrical Circuit Table

| COMPONENT                              | WIRE COLOR   | VOLTAGE         | RESISTANCE       | PCB       |           |       |
|--|--------------|-----------------|------------------|-----------|-----------|-------|
|  |              |                 |                  | CONNECTOR | CONNECTOR | PIN   |
| Spark Electrode                        | Red-Black    | 11~13VDC*       | 34 K ~ 40 K ohms | D2        | D         | 12-21 |
| Combustion Fan                         | Red-Black    | 7~48VDC*        | N/A              | D3        | D         | 4-6   |
|  | White-Black  | 10~12VDC*       | N/A              | D3        | D         | 10-6  |
|  | Yellow-Black | 11~13VDC*       | N/A              | D3        | D         | 8-6   |
| Water Flow Control Device              | Red-Pink     | N/A             | 44~52 ohms       | D4        | D         | 18-20 |
|  | White-Blue   | N/A             | 44~52 ohms       | D4        | D         | 16-14 |
|  | Grey-Orange  | 12~14VDC        | N/A              | D4        | D         | 30-12 |
| Venturi Control Device                 | Blue-White   | N/A             | 35~41 ohms       | D5        | D         | 5-7   |
|  | Yellow-Red   | N/A             | 35~41 ohms       | D5        | D         | 11-9  |
|  | Black-Red    | 12~14 VDC       | N/A              | D5        | D         | 30-12 |
|  | Black-Brown  | less than 1VDC* | N/A              | D5        | D         | 30-25 |
|  | Black-Grey   | less than 1VDC* | N/A              | D5        | D         | 30-23 |
| By-Pass Flow Control Device            | Red-Pink     | N/A             | 44~52 ohms       | D6        | D         | 15-13 |
| Gas Solenoid Valve                     | White-Blue   | N/A             | 44~52 ohms       | D6        | D         | 17-19 |
| Outgoing Thermistor                    | White-White  |                 |                  | H1        | H         | 3-2   |
| Inlet Thermistor                       | White-White  |                 |                  | H1        | H         | 8-11  |
| Exhaust Thermistor                     | White-White  | N/A             | See Example      | H3        | H         | 4-2   |
| Heat Exchanger Thermistor              | White-White  |                 |                  | H4        | H         | 2-5   |
| Freeze Protection Thermistor           | Yellow-Black |                 |                  | H5        | H         | 2-6   |
| Overheat Switch                        | Black-Black  | 11~13 VDC       | less than 1 ohm  | H6        | H         | 28-14 |
| Water Flow Sensor                      | Black-Red    | 11~13 VDC       | N/A              | H7        | H         | 30-12 |
|  | Yellow-Black | 4~7 VDC*        | N/A              | H7        | H         | 12-30 |
| Integrated Pump (Integrated pump only) | White-Black  | AC108~132 VAC   | N/A              | B1        | B         | 1-2   |
|  | White-Red    | 11~14VDC*       | N/A              | G4        | G         | 1-6   |
| Additional Controller(s)               | White-White  | 10~13 VDC       | N/A              | K         | -         | -     |

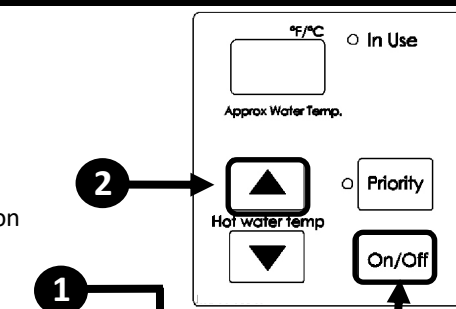
(\* Value to be measured while unit is in operation)

## DIAGNOSTIC CODES

Visit [www.rinnai-lms.com](http://www.rinnai-lms.com) for additional troubleshooting resources

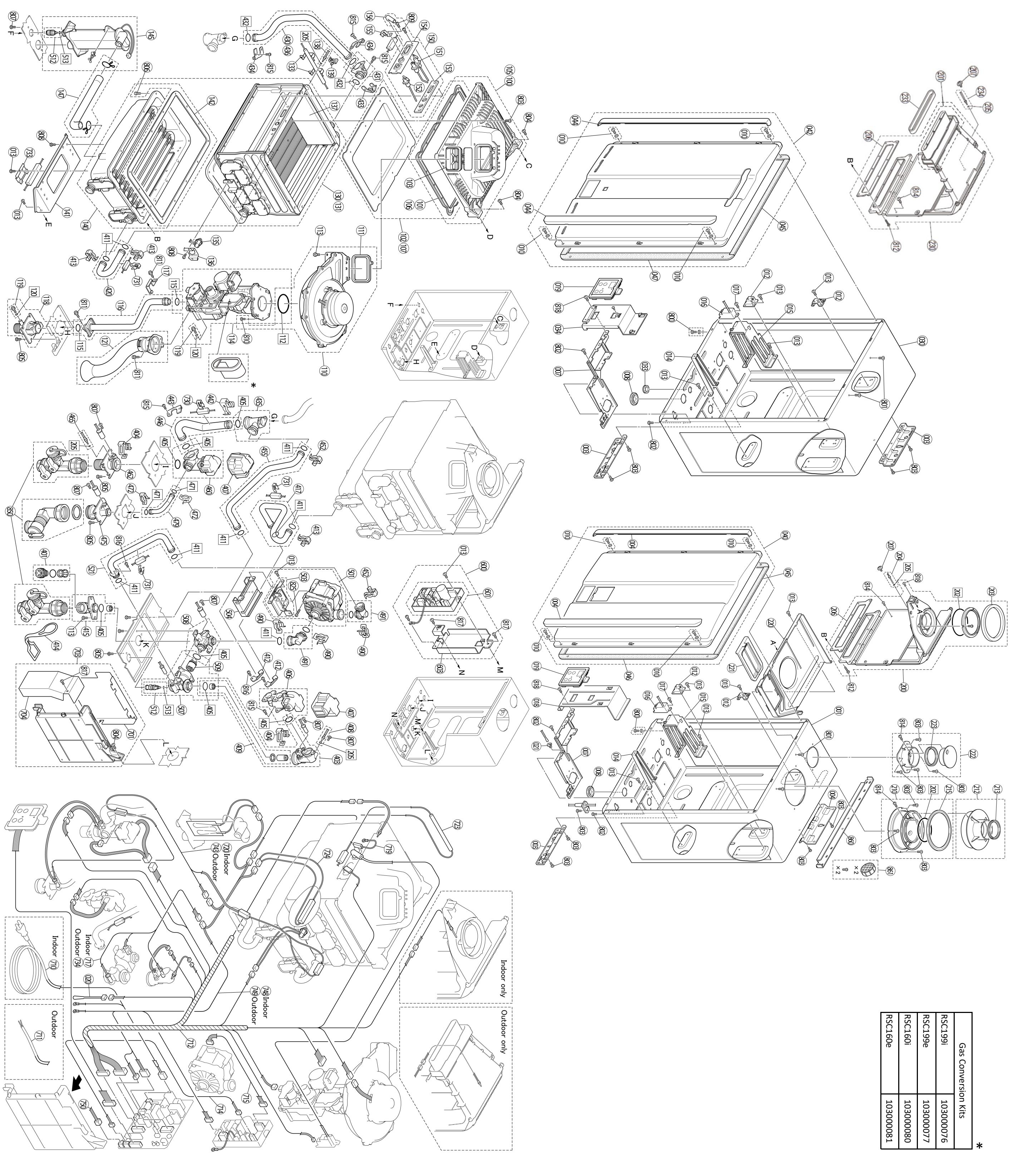
### To Display Diagnostic Codes:

- Turn off the water heater by pressing the "On/Off" button.
- Press and hold the "On/Off" for 2 seconds and then the ▲ (Up) button simultaneously.
- The last 9 maintenance codes display and flash one after the other.
- To exit diagnostic codes and return the water heater to normal operation, press and hold the "On/Off" button for 2 seconds and then the ▲ (Up) button simultaneously.
- Turn on the water heater by pressing the "On/Off" button.



|    |  |  |   |
|----|--|--|---|
| 03 | <b>Power Interruption During Bath Fill</b><br>(Water will not flow when power returns)<br>• Turn off all hot water taps. Press ON/OFF twice.   | 51   | <b>Inlet Thermistor</b><br>• Check sensor wiring for damage.<br>• Measure resistance or voltage of sensor. (See Electrical Diagnostics)<br>• Clean sensor of scale build-up.<br>• Replace sensor.   |
| 05 | <b>By-Pass Flow Control</b><br>• Measure resistance or voltage values of the by-pass flow control (See Electrical Diagnostics).<br>• Replace By-Pass flow control device.  | 52   | <b>Gas Valve</b><br>• Check flame rod and wire for damage.<br>• Check gas solenoid valve for open or short circuit. (See Electrical Diagnostics)<br>• Replace gas valve assembly.<br>• Please call Rinnai technical department.   |
| 10 | <b>Air Supply or Exhaust Blockage/Condensate Trap is Full</b><br>• Ensure condensate line is not blocked.<br>• Ensure internal air filter is clean with no obstructions. (Indoor Only)<br>• Ensure High Altitude setting. (See Parameter Settings)<br>• Ensure Combustion air and Exhaust vents are not blocked and approved venting materials are being used. (Indoor Only)<br>• Ensure vent length is within limits. (Indoor Only)<br>• Check fan for debris and ensure wheel turns freely.<br>• Verify check valve is not stuck between fan casing and burner body.   | 54   | <b>High Exhaust Gas Temperature</b><br>• Ensure condensate line is not blocked<br>• Ensure Heat Exchanger fins are clean and not blocked.<br>• Confirm inlet water temperature is not too high.<br>• Clear diagnostic code by resetting the main power supply to the water heater.  |
| 11 | <b>No Ignition (Heater Not Turning On)</b><br>• Check that the gas is turned on at the water heater, meter, or cylinder.<br>• If the system is propane, make sure that gas is in the tank.<br>• Ensure gas type and inlet gas pressure are correct.<br>• Bleed all air from gas lines.<br>• Check the ground wire for the PC Board.<br>• Ensure flame rod wire is connected.<br>• Ensure igniter is operational. (See Electrical Diagnostics)<br>• Check gas solenoid valves for open or short circuits. (See Electrical Diagnostics)<br>• Verify gas orifice is correct.<br>• Ensure condensate line is not blocked | 61   | <b>Combustion Fan</b><br>• Check the motor wire harness for loose or damaged connections.<br>• Measure resistance or voltage of motor wire harness. (See Electrical Diagnostics)<br>• Ensure the combustion fan spins freely.   |
| 12 | <b>No Flame</b><br>• Check that the gas is turned on at the water heater, gas meter, or cylinder.<br>• If the system is propane, make sure that gas is in the tank.<br>• Ensure flame rod wire is connected.<br>• Ensure gas type and inlet gas pressure is correct.<br>• Bleed all air from gas lines.  | 63   | <b>Recirculation Low Flow</b><br>• Ensure the inlet water filter is clean and free of debris.<br>• Ensure parameter settings are correctly set for recirculation mode.<br>• Ensure pump supply voltage.<br>• Ensure air is removed from the recirculation line.   |
| 14 | <b>Heat Exchanger Overheat</b><br>• Measure resistance or voltage of Overheat Switch. (See Electrical Diagnostics)<br>• Check heat exchanger surface for hot spots which indicate blockage due to scale build-up.<br>• Refer to instructions in manual for flushing heat exchanger. Hard water must be treated to prevent scale build-up or damage to the heat exchanger.<br>• Ensure it is not forced Hi setting.   | 65   | <b>Water Flow Control</b><br>• Measure resistance or voltage values of the water flow control (See Electrical Diagnostics)<br>• The water flow control valve has failed to close during the bath fill function. Immediately turn off the water and discontinue the bath fill function. Contact a licensed professional to service the appliance.  |
| 15 | <b>Venturi Control</b><br>• Ensure the Venturi motor is operating correctly. (See Electrical Diagnostics)<br>• Replace gas valve assembly.<br>• Clear diagnostic code by resetting the main power supply to the water heater.  | 70   | <b>PC Board</b><br>• Replace PC Board   |
| 16 | <b>High Outgoing Temperature</b><br>(safety shutdown because water heater is too hot)<br>• Confirm fan motor is functioning correctly.<br>• Replace the gas valve assembly.  | 71   | <b>Solenoid Valve Circuit</b><br>• Ensure dip switch on PC board is in the OFF position.<br>• Ensure gas control wire is not loose or damaged.<br>• Ensure heater circuit is not grounded.<br>• Replace PC Board.   |
| 17 | <b>Venturi Blockage</b><br>• Ensure Venturi isn't blocked.<br>• Please call Rinnai technical department.   | 72   | <b>Flame Rod</b><br>• Check flame rod and wire for damage.<br>• Verify HEX is not leaking.  |
| 19 | <b>Electrical Grounding</b><br>• Check all components for electrical short.  | 55   | <b>(SS) Service Soon (Flush Heat Exchanger)</b><br>• 55 is a time-based service indicator set during installation. Refer to the Installation and Operation Manual for additional details on setting and changing the 55 indicator.<br>• 55 indicates that it is time for service. The heat exchanger should be flushed to prevent damage. Refer to the Installation and Operation Manual for more information. <b>Hard water must be treated to prevent scale build-up or damage to the heat exchanger.</b><br>• To reset the 55 code, push the On/Off button on the temperature controller 5 times in 5 seconds. |
| 21 | <b>Data Transfer Error</b><br>• If the PCB has been replaced, ensure the data transfer process has been completed.   | <b>NO CODE - Nothing happens when water flow is activated</b><br>• Verify you have at least the minimum flow rate required to fire unit.<br>• Measure the resistance or voltage of the water flow control sensor. (See Electrical Diagnostics)<br>• Clean inlet water supply filter.<br>• On new installations ensure hot and cold water lines are not reversed. |   |
| 25 | <b>Condensate Pump (Accessory)</b><br>• Confirm wire connections and harness are good.<br>• Ensure condensate reservoir is empty and condensate pump is operating.   | <b>5E Cascade Diagnostic Display (Commercial units only)</b><br>• With cascade connections, display will flash between "5E" and the selected set temperature when an error code is displayed on any secondary unit.  |   |
| 32 | <b>Outgoing Thermistor</b><br>• Check sensor wiring for damage.<br>• Measure resistance or voltage of sensor. (See Electrical Diagnostics)<br>• Clean sensor of scale build-up.<br>• Replace sensor.   | <b>FF Maintenance Indicator</b><br>• Placeholder in Diagnostic code history indicating that a service provider performed maintenance or service.<br>• Enter this code after performing service by pressing ▲ (Up), ▼ (Down) and "On/Off" simultaneously.<br>• FF is visible on the monitor.  |   |
| 33 | <b>Heat Exchanger Thermistor</b><br>• Check sensor wiring for damage.<br>• Measure resistance or voltage of sensor. (See Electrical Diagnostics)<br>• Clean sensor of scale build-up.<br>• Replace sensor.   |  |   |
| 38 | <b>Exhaust Thermistor</b><br>• Check sensor wiring for damage.<br>• Measure resistance or voltage of sensor. (See Electrical Diagnostics)<br>• Replace sensor.   | <p>If recirculation water temperature is not adequate, confirm pump speed is set to Max (Parameter 16a). Recirculation flow rate must be greater than 0.4 GPM (1.5 L/min).</p>   |   |

| Gas Conversion Kits |          |
|---------------------|----------|
| RSC191              | 10300076 |
| RSC199e             | 10300077 |
| RSC160i             | 10300080 |
| RSC160e             | 10300081 |



| ITEM | DESCRIPTION                      | PART NUMBER | RSC191i | RSC199e | RSC160i | RSC160e | ITEM | DESCRIPTION                         | PART NUMBER | RSC191i | RSC199e | RSC160i | RSC160e | ITEM | DESCRIPTION                             | PART NUMBER  | RSC191i | RSC199e | RSC160i | RSC160e |
|------|----------------------------------|-------------|---------|---------|---------|---------|------|-------------------------------------|-------------|---------|---------|---------|---------|------|---|--------------|---------|---------|---------|---------|
| 003  | Lower Wall Mount Bracket         | 109000281   | 1       | 2       | 1       | 2       | 138  | Thermistor                          | 105000262   | 1       | 1       | 1       | 1       | 430  | Connection Pipe Assembly-Large          | 107000273    | 1       | 1       | 1       | 1       |
| 004  | Upper Wall Mount Bracket         | 109000594   | 1       | 1       | 1       | 1       | 139  | Clip                                | 105000090   | 1       | 1       | 1       | 1       | 431  | Heat Exchanger Pipe Connection          | 107000274    | 1       | 1       | 1       | 1       |
| 007  | Connection Reinforcement Plate   | 109000055   | 1       | 1       | 1       | 1       | 140  | Secondary Heat Exchanger            | 107000266   | 1       | 1       | 1       | 1       | 432  | O-Ring                                  | 107000325    | 3       | 3       | 3       | 3       |
| 008  | Rubber Bushing                   | 109000634   | 1       | 1       | 1       | 1       | 141  | Secondary Heat Exchanger Bracket    | 109000615   | 1       | 1       | 1       | 1       | 433  | Pipe Bracket                            | 109000637    | 1       | 1       | 1       | 1       |
| 010  | Residential Screw and Washer     | 106000645   | 4       | 4       | 4       | 4       | 142  | Secondary Heat Exchanger Gasket     | 109000616   | 1       | 1       | 1       | 1       | 434  | Retention Clip                          | 109000496    | 2       | 2       | 2       | 2       |
| 011  | Commercial Screw and Washer-Bk   | 109000056   | 8       | 8       | 8       | 8       | 145  | Condensate Trap                     | 107000267   | 1       | 1       | 1       | 1       | 435  | Hot Water Connection Fitting            | 107000275    | 1       | 1       | 1       | 1       |
| 012  | Combustion Chamber Support Plate | 109000597   | 2       | 2       | 2       | 2       | 147  | Condensate Drain tube               | 107000268   | 1       | 1       | 1       | 1       | 436  | Connection Pipe Assembly-Small          | 107000276    | 1       | 1       | 1       | 1       |
| 013  | Truss Screw                      | 109000598   | 19      | 19      | 19      | 19      | 150  | Electrode/Flame Rod Assembly        | 105000232   | 1       | 1       | 1       | 1       | 442  | Clip                                    | 107000276    | 1       | 1       | 1       | 1       |
| 014  | Pump Circuit Bracket             | 109002000   | 1       | 1       | 1       | 1       | 151  | Electrode                           | 105000233   | 1       | 1       | 1       | 1       | 443  | Retention Clip                          | U211-332X01  | 1       | 1       | 1       | 1       |
| 015  | Igniter Bracket                  | 109000539   | 1       | 1       | 1       | 1       | 152  | Flame Rod                           | 105000234   | 1       | 1       | 1       | 1       | 446  | Hot Water Supply Connection Pipe        | 109000638    | 1       | 1       | 1       | 1       |
| 016  | Igniter Assembly                 | 109000230   | 1       | 1       | 1       | 1       | 153  | Electrode Packing                   | 109000617   | 1       | 1       | 1       | 1       | 452  | Clip                                    | 109000639    | 1       | 1       | 1       | 1       |
| 017  | Grounding Screw                  | CP-80M52    | 1       | 1       | 1       | 1       | 154  | Electrode Plate                     | 109000618   | 1       | 1       | 1       | 1       | 455  | Bypass Tube (seal) - P                  | 107000297    | 1       | 1       | 1       | 1       |
| 018  | Controller Bracket FF            | 109000600   | 1       | 1       | 1       | 1       | 155  | Electrode Heater Bracket            | 109000619   | 1       | 1       | 1       | 1       | 460  | Hot Water Servo Valve Assembly          | 104000279    | 1       | 1       | 1       | 1       |
| 019  | Controller                       | 105000260   | 1       | 1       | 1       | 1       | 156  | Electrode Sleeve                    | 109000620   | 1       | 1       | 1       | 1       | 462  | Hot Water Supply Connection             | 10700202     | 1       | 1       | 1       | 1       |
| 020  | Thermistor Sensor                | 105000261   | 1       | 1       | 1       | 1       | 200  | Exhaust Duct Assembly FF            | 108000082   | 1       | 1       | 1       | 1       | 465  | Thermistor                              | 105000982    | 1       | 1       | 1       | 1       |
| 021  | TH Packing                       | 109000490   | 1       | 1       | 1       | 1       | 201  | Exhaust Port                        | 108000129   | 1       | 1       | 1       | 1       | 471  | O-Ring                                  | 107000328    | 4       | 4       | 4       | 4       |
| 022  | Rubber Bush                      | CF79-4120-A | 1       | 1       | 1       | 1       | 202  | O-Ring                              | 108000018   | 2       | 2       | 2       | 2       | 472  | Clip                                    | 109000278    | 2       | 2       | 2       | 2       |
| 034  | Controller Bracket W             | 109000603   | 1       | 1       | 1       | 1       | 203  | Exhaust Duct Packing                | 109000621   | 1       | 1       | 1       | 1       | 475  | Pressure Relief Valve Connection        | 107000282    | 1       | 1       | 1       | 1       |
| 040  | Front Cover Panel Assembly FF    | 109000604   | 1       | 1       | 1       | 1       | 204  | Thermistor                          | 105000235   | 1       | 1       | 1       | 1       | 479  | Relief Pipe Assembly                    | 107002001    | 1       | 1       | 1       | 1       |
| 042  | Front Cover Panel Assembly W     | 109000606   | 1       | 1       | 1       | 1       | 205  | O-Ring                              | 107000323   | 4       | 4       | 4       | 4       | 490  | Clip                                    | 109000203    | 3       | 3       | 3       | 3       |
| 044  | Screw Cover                      | 109000230   | 2       | 2       | 2       | 2       | 206  | Exhaust Packing                     | 109000646   | 1       | 1       | 1       | 1       | 491  | Pump Connection                         | 107002004    | 2       | 2       | 2       | 2       |
| 046  | Front Panel Packing-Side FF      | 109000120   | 2       | 2       | 2       | 2       | 207  | Thermistor Screw                    | 109000624   | 1       | 1       | 1       | 1       | 501  | Circulation Pump Assembly               | 107002005    | 1       | 1       | 1       | 1       |
| 049  | Front Panel Packing-Side FF      | 109000608   | 2       | 2       | 2       | 2       | 210  | Fuel Connection Assembly            | 108000083   | 1       | 1       | 1       | 1       | 503  | Arb-vibration Stand                     | 109002003    | 1       | 1       | 1       | 1       |
| 100  | Burner Gasket-Large              | 106000114   | 1       | 1       | 1       | 1       | 212  | Exhaust Pipe Connection Port - 2"   | 108000084   | 1       | 1       | 1       | 1       | 504  | Pump Filing Stand                       | 109002004    | 1       | 1       | 1       | 1       |
| 101  | Burner Gasket-Small              | 106000115   | 1       | 1       | 1       | 1       | 221  | Air supply filter                   | 108000085   | 1       | 1       | 1       | 1       | 509  | Circular Valve                          | 107000134    | 2       | 2       | 2       | 2       |
| 103  | Combustion Check Valve Assembly  | 106000142   | 1       | 1       | 1       | 1       | 225  | Air supply pipe seal ring           | 108000017   | 1       | 1       | 1       | 1       | 508  | Circular joint Connection w/Check Valve | 107000206    | 1       | 1       | 1       | 1       |
| 105  | Burner Plate Assembly-Large      | 106000114   | 1       | 1       | 1       | 1       | 230  | Exhaust Duct Assembly W             | 108000094   | 1       | 1       | 1       | 1       | 601  | Pump Circuit                            | 105002005    | 1       | 1       | 1       | 1       |
| 106  | Burner Plate Assembly-Small      | 106000115   | 1       | 1       | 1       | 1       | 231  | Front Exhaust Seal W                | 108000094   | 1       | 1       | 1       | 1       | 603  | Pump Circuit Plate                      | 109002001    | 1       | 1       | 1       | 1       |
| 107  | Burner Gasket-Small              | 106000116   | 1       | 1       | 1       | 1       | 233  | Front Exhaust Seal W                | 10500263    | 1       | 1       | 1       | 1       | 701  | PCB Electrical Cover                    | 109000066    | 1       | 1       | 1       | 1       |
| 110  | Combustion Fan Assembly          | 108000081   | 1       | 1       | 1       | 1       | 234  | Thermistor                          | 107000317   | 1       | 1       | 1       | 1       | 703  | PC Board Assembly                       | 105002002    | 1       | 1       | 1       | 1       |
| 111  | Fan Mounting Packing             | 109000611   | 1       | 1       | 1       | 1       | 401  | Water Supply Filter Plug Assembly   | 107000317   | 1       | 1       | 1       | 1       | 704  | PCB EC Cover                            | 109002006    | 1       | 1       | 1       | 1       |
| 112  | O-Ring                           | 109000612   | 1       | 1       | 1       | 1       | 403  | Water Flow Sensor Assembly          | 109000636   | 3       | 3       | 3       | 3       | 710  | Power Cord Assembly FF                  | 105000238    | 1       | 1       | 1       | 1       |
| 113  | Hexagon Head Screw               | 109000612   | 1       | 1       | 1       | 1       | 404  | Clip                                | 107000324   | 9       | 9       | 9       | 9       | 711  | Power Cord Assembly W                   | 105000239    | 1       | 1       | 1       | 1       |
| 114  | Gas Valve Assembly With Orifice  | 106000117   | 2       | 2       | 2       | 2       | 405  | O-Ring                              | 107000270   | 1       | 1       | 1       | 1       | 712  | Sensor Harness                          | 105000240    | 1       | 1       | 1       | 1       |
| 115  | O-Ring                           | 109000252   | 1       | 1       | 1       | 1       | 406  | Bypass Servo Assembly               | 107000093   | 2       | 2       | 2       | 2       | 714  | Pump Sensor Harness                     | 105002003    | 1       | 1       | 1       | 1       |
| 116  | Gas Connection Pipe              | 106000118   | 1       | 1       | 1       | 1       | 407  | Cover                               | 107000028   | 1       | 1       | 1       | 1       | 715  | Pump Harness-2                          | 105002004    | 1       | 1       | 1       | 1       |
| 117  | Gas Tube Bracket                 | 109000635   | 1       | 1       | 1       | 1       | 408  | Inlet Water Thermistor              | 107000318   | 1       | 1       | 1       | 1       | 717  | Ceramic Valve heater FF                 | 109000604    | 1       | 1       | 1       | 1       |
| 118  | Inlet Gas Supply Connection      | 106000119   | 1       | 1       | 1       | 1       | 411  | Flow Turbine Assembly               | M108-2,14   | 1       | 1       | 1       | 1       | 719  | Igniter Ground Harness                  | 105000243    | 1       | 1       | 1       | 1       |
| 119  | Inlet Gas Test Port Screw        | 106000138   | 2       | 2       | 2       | 2       | 412  | Retention Clip                      | AHE9-310    | 3       | 3       | 3       | 3       | 723  | HEX Freeze Protection Heater Assembly   | 105000246    | 1       | 1       | 1       | 1       |
| 120  | O-Ring                           | M10B-13-4   | 2       | 2       | 2       | 2       | 413  | O-Ring                              | 109000018   | 1       | 1       | 1       | 1       | 724  | Sec. HEX Freeze Protection Heater Assy  | 105000247    | 1       | 1       | 1       | 1       |
| 121  | Noise Filter                     | 106000120   | 1       | 1       | 1       | 1       | 414  | Plug Band                           | 109000014   | 3       | 3       | 3       | 3       | 730  | Heater Clip A                           | AU124-618X01 | 1       | 1       | 1       | 1       |
| 130  | Heat Exchanger Assembly-Large    | 107000264   | 1       | 1       | 1       | 1       | 415  | 3/4 Water Supply Connection Port B  | 107000400   | 1       | 1       | 1       | 1       |      |   |              |         |         |         |         |
| 131  | Heat Exchanger Assembly-Small    | 107000264   | 1       | 1       | 1       | 1       | 417  | Water Supply Connection Pipe (pair) | 107002000   | 1       | 1       | 1       | 1       |      |   |              |         |         |         |         |
| 133  | Heater Bracket                   | 109000613   | 2       | 2       | 2       | 2       | 420  | Secondary Connecting Pipe Assembly  | 107000272   | 1       | 1       | 1       | 1       |      |   |              |         |         |         |         |
| 135  | Over Heat Sensor (OHS)           | 105000231   | 1       | 1       | 1       | 1       |      |                                     |             |         |         |         |         |      |   |              |         |         |         |         |
| 136  | OHS Bracket                      | 109000614   | 1       | 1       | 1       | 1       |      |                                     |             |         |         |         |         |      |   |              |         |         |         |         |
| 137  | Heat Exchanger Insulator         | 107000265   | 1       | 1       | 1       | 1       |      |                                     |             |         |         |         |         |      |   |              |         |         |         |         |