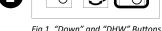
# ERFORMANCE DATA

o Obtain Performance Data: Press and hold the (Down) button for two

seconds (Fig 1). While holding the (Down) button, press and hold the "Domestic Hot Water" (DHW) button (hold both buttons at the same time)

Use the (Up) and (Down) buttons to scroll to the desired information described in Table 1. Performance Data (Fig 2).

The data for the performance number automatically appears in the display (Fig 3). To exit performance data, repeat step 2 above.



108-132 VAC

Less than 1 VDC

11-14 VDC

4-7 VDC2 More than 6 Hz (0.26 GPM)

11-14 VDC

0 kPa: 655-745 mV; 200 kPa: 2,155-2,245 mV; 400 kPa: 3,655-3,745 mV

11-14 VDC

108-132 VAC

11-14 VD0

11-14 VDC 11-14 VDC

20-30 VAC (possible to measure at Output terminal as substitute position

Fig 2. "Up" and "Down" Buttons Fig 3. Data Appearing in Display

Table	1. Performance Data	#	Data	Unit	
#	Data	Unit	17	Venturi Position	0=Closed, 1=Ope
Đ١	Water Pressure	PSI/bar <sup>1</sup>	18	Venturi Cycles	x100
02	Water Flow Rate	x0.1 GPM/LPM <sup>1</sup>	50	Pump Cycles	x100
83	Supply Temperature	°F/°C <sup>1</sup>	51	Pump Hours	x10
84	Return Temperature	°F/°C <sup>1</sup>	55	Pump for Boiler	0=OFF, 1=ON
85	Freeze Protection Temperature	°F/°C <sup>1</sup>	53	Pump for System (Pump 1)	0=OFF, 1=ON
06	Exhaust Temperature	°F/°C <sup>1</sup>	24	Pump for System (Pump 2)	0=OFF, 1=ON
07	Outgoing Temperature	°F/°C <sup>1</sup>	31	Outdoor Temperature	°F/°C <sup>1</sup>
88		°F/°C <sup>1</sup>	32	Additional Controllers Connected	See Table 3
10	Heat Exchanger Outlet Temperature	°F/°C <sup>1</sup>	40	Energization Hours	x100
H	Fan Frequency	Hz	丩	Combustion Hours	x10
13	Water Flow Control Position	0=Mid, 1=Open, 2=Closed	42	Combustion Cycles	x100
14	Bypass Flow Control Position	Degrees of Opening	43	Combustion Hours (DHW)	x10
15	3-Way Valve Control Position	0=Mid, 1=DHW, 2=CH	44	Combustion Cycles (DHW)	x100
15	3-Way Valve Control Cycles	x100	45	Commissioning Cycles	x1

**DIP SWITCHES** 

Units of Measurement	Table 2. Units	of Meas	urement	
<ol> <li>Press the "Mode" button.</li> <li>Press the ▲ (Up) or ▼ (Down)</li> </ol>	Units of Measurement	Temp.	Water Flow	Pressui
arrows to select a unit of	1: English	°F	gal/min	psi
measurement (refer to Table 2).	2: Metric	°C	L/min	bar

Table 3. Connecting Additional Controllers

Control			
Controller Model	Connected	Not Connected	
Controller Panel	1	_	
Additional Controller (BC)	1_	0_	Note: BC, BSC an
Additional Controller (BSC)	_1	_0	BSC2 are PCB recognition
Additional Controller (BSC2)	1	0	position.
			•

SW1 Forced Hi/Low Fire Modes (Section 12 in Manual)

# **ELECTRICAL DIAGNOSTICS**

Table 4. Diagnostic Points				PC	В
COMPONENT	WIRE COLOR	VOLTAGE	RESISTANCE	Connector	PIN
Power Supply	Black-White	108-132 VAC	N/A	CN24	1-3
Flame Rod	Yellow-Body	More than 2 VAC <sup>2</sup>	N/A	CN1	2
Spark Electrode	Red-Black	11-14 VDC <sup>2</sup>	N/A	CN1	11-22
	Red-Black	7-48 VDC <sup>2</sup>	N/A	CN1	3-5
Combustion Fan	White-Black	2-14 VDC <sup>2</sup>	N/A	CN1	5-9
	Yellow-Black	11-14 VDC	N/A	CN1	5-7
	Red-Pink	N/A	40-60Ω	CN1	18-20
	White-Blue	N/A	40-0012	CN1	14-16
Water Flow Control Device	Grey-Orange	11-14 VDC	N/A	CN1	11-29
	Brown-Grey	Servo Valve Fully Open or Closed: Less than 1 VDC Servo Valve in a Mid Position: 4-6 VDC	N/A	CN1	25-29
	Blue-White	N/A	33-43Ω	CN1	17-19
	Yellow-Red (No.9)	N/A	33-4312	CN1	13-15
Venturi Control Device	Black-Red (No.3)	11-14 VDC		CN1	11-29
	Black-Brown	Close Position: Less than 1 VDC Open Position: 4-6 VDC	N/A	CN1	26-29
	Black-Grey	Close Position: 4-6 VDC Open Position: Less than 1 VDC		CN1	24-29
By-Pass Flow Control Device	Red-Pink	N/A	40-60Ω	CN1	10-12
By-Fass Flow Control Device	White-Blue	·	40-0012	CN1	6-8
	Brown-Grey	Servo Valve Fully Open or Closed: Less than 1 VDC Servo Valve in a Mid Position: 4-6 VDC	N/A	CN1	23-29
3-way Valve	Orange-Grey	11~14 VDC	·	CN1	11-29
•	Pink-Red	N/A	40-60Ω	CN11	1-2
	White-Blue	N/A	40-0012	CN11	3-4
Gas Solenoid Valve	Yellow-Black	11-14 VDC <sup>2</sup>	15-25Ω	CN1	28-30
Outgoing Thermistor	White-White		·	CN11	18-19
Catgoing memistor	White-White		59°F: 11.4-14kΩ	CN11	10-13
Inlet Thermistor	White-White		86°F: 6.4-7.8kΩ 113°F: 3.6-4.5kΩ	CN11	17-19
Exhaust Thermistor	White-White		113 F: 3.6-4.5KΩ 140°F: 2.2-2.7kΩ	CN11	16-19
Heat Exchanger Thermistor	White-White	N/A	221°F: 0.6-0.8kΩ	CN11	15-19
Committee and the a	14/l=:+= 14/l=:+=			CNI11	12 10

## **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 boiler. 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).

## Refer to the Wiring Diagram attached to the back of the boiler front cover.

**Electrical Diagram** 

### Flame Rod

Place one lead of your meter to the flame rod and the other to the ground. When the unit is attempting to ignite, you should read more than 2 VAC.

#### Amp Fuses

CN11

CN11

CN18 1-2

CN18 3-4

CN1 11-29

9(CN11)-29(CN1)

CN1 11-29

6(CN11)-29(CHN1)

8(CN11)-29(CN1)

CN21 1-2

CN2 1-4 CN29 1-3

CN8

This selects the venting material used. The boiler is set from the factory to be installed in a PVC venting system. If CPVC, PP, or other approved venting is used, this may be adjusted. See section "5.4 PVC Venting Safety Switch" for more information.

7(CN11)-27(CN1)

10-14

32°F: 38k-43k 50°F: 22k-26k 68°F: 14k-17k

Less than 1Ω

N/A

N/A

nnect the connector and measure at the

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

## -SW3 Data Transfer Mode

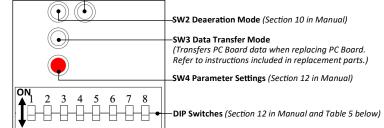


Fig 4. PC Board DIP Switches and Buttons

Tab	ole 5. DIP Switch Functions	Table 6. High Altitude	DIP Switche	es
#	DIP Switch Function	ALTITUDE	DIP Switch 6	DIP Switch
1	Outdoor Temperature Sensor: Enables or disables outdoor temperature sensor.  OFF (Default): Outdoor Temperature Sensor in Use ON: Outdoor Temperature Sensor Not in Use	0-2,000 ft (0-610 m) (Default)	OFF	OFF
2	Thermostat Usage: Changes mode between Thermostat Usage and Central Heating (CH) Button. OFF (Default): Thermostat Used ON: CH button used. Boiler fires based on return water temperature	2,001-5,400 ft (610-1,646 m)	ON	OFF
3	DHW Recirculation: Enables DHW Recirculation function for Pump 2 connection.  OFF (Default): Pump 2 Connection Enabled for Second CH Zone Pump  ON: DHW recirculation ON (Pump 2 connection for DHW Recirculation Pump)	5,401-7,700 ft (1,646-2,347 m)	OFF	ON
4	Simultaneous CH and DHW: Enables simultaneous operation between CH and DHW.  OFF (Default): DHW Priority; ON: Simultaneous CH and DHW Permitted	7,701-10,200 ft (2,347-3,109 m)	ON	ON

4	Simultaneous CH and DHW: Enables simultaneous operation between CH and DHW.  OFF (Default): DHW Priority; ON: Simultaneous CH and DHW Permitted
5	Gas Valve Solenoid: Manually shuts down the integrated solenoid gas valve.  OFF (Default): Normal Operation; ON: Fixed Closed (prevents boiler operation)
6	Altitude Setting: Sets the appropriate elevation of the boiler installation.  OFF/ON: Depends on Altitude. See "Table 6. High Altitude DIP Switches" for specific DIP switch settings.
7	Altitude Setting: Sets the appropriate elevation of the boiler installation.  OFF/ON: Depends on Altitude. See "Table 6. High Altitude DIP Switches" for specific DIP switch

Vent Type Selection: Selects the venting material used. The boiler is set from the factory to be

installed in a PVC venting system. If CPVC, PP, or other approved venting is used, this setting mabe adjusted. See Section 5 in Manual for more information. OFF (Default): PVC ON: Higher Temperature Exhaust Vent Material (PP, CPVC, or Stainless Steel)

### PARAMETER SETTINGS

Freeze Protection Thermisto

Fransformer

Overheat Switch

Water Flow Sensor

**Nater Pressure Sensor** 

Water Level Electrode

Integrated Pump

Control Panel

To access the parameter settings, press and hold the red button on the PC Board for  $\,$ five seconds (Fig 5).

White-White

Black-Black

White-Grey

Black-Black

Black-Red

Yellow-Black

Red-Black

White-White

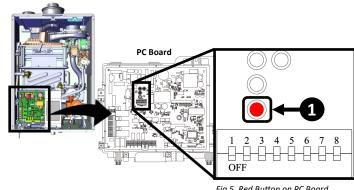
White-Black

Red-Black

Black-Black

Yellow-Black

Red-Red



Fia 5. Red Button on PC Board

Press the "Mode" button on the controller (Fig 6).

Press the (Up) or (Down) arrows to select a parameter setting. Press the

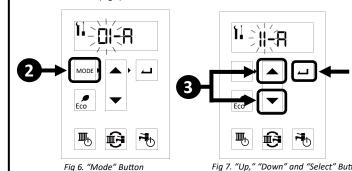


Fig 7. "Up," "Down" and "Select" Buttons

Press the (Up) or (Down) arrows to change the selection for the setting number (such as 11-A or 11-b). Then, press the "Select" button (Fig 8).

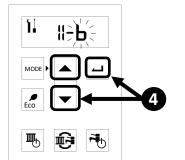


Fig 8. "Up," "Down" and "Select" Buttons To exit parameter settings and enter normal operation mode, press either the red

button on the PC Board or the "Mode" button on the controller. For more information on parameter settings, refer to the I-Series Condensing Boiler

nstallation and Operation Manual.

		rameter Settings					Record date and na	rameter when individu	al parameters have been a	idiusted factory default
	Parameter Number	Setting Description		Selection			Parameter Value	Date Adjusted	Parameter Value	Date Adjusted
			Α	b	С	d				
	00	Pressure Indication on the Control Panel.	Yes	No						
		The current pressure will cycle on the controller display.								
_	Ol	Outdoor Reset Curve.	Curve 1	Curve 2	Curve 3	Curve 4				
		This parameter is available when Dip Switch 1 is in the OFF (default) position. Select the proper curve from below.								
	02	Boost This parameter is available when Dip Switch 1 is in the OFF (default) position. Boost Mode increases the CH set temperature above the outdoor reset curve target when the boiler has been running on an unusually long call for heat.	No	30 Minutes	60 Minutes					
	03	Maximum Outdoor Temperature at which the Boiler will Fire in CH Mode.	No	77°F /2F°C\		•				
	u o	Parameter is available when DIP switch 1 is in the OFF (default) position. This sets the maximum outdoor temperature the boiler will fire in CH mode.	Maximum	77°F (25°C)						
	ın	Maximum DHW Set Point Temperature.	120°F (49°C)	140°F (60°C)						
7	10	This selects the maximum DHW set point temperature.	120 F (49 C)	140 F (60 C)						
	#	How Long Diverter Valve is in DHW Position.	3 Minutes	10 Seconds						
-1		This selects the length of time the 3-way valve will stay in the DHW position after using DHW even if a CH demand is present.	5	10 00001103						
	12	DHW Recirculation Piping Setup.	Crossover	Dedicated						
Ш	"-	This parameter is available when DIP switch 3 is in the ON position. Ensure this setting corresponds to the DHW recirculation piping.	Valve	Return						
	13	DHW Recirculation with Timer Relay Input. This parameter is available when DIP switch 3 is in the ON position. This enables an external timer to also control the timing for DWH recirculation to more directly correspond to the customers needs.	Yes	No						
	14	CH Temperature Limitation During Simultaneous Operation. This parameter is available when DIP switch 3 or 4 is in the ON position. This enables the CH temperature setting to be limited during simultaneous DHW and CH operation.	Yes	No						
	IS	3-Way Valve Position During Simultaneous Operation.  This parameter is available when DIP switch 3 or 4 is in the ON position. This adjusts the 3-way valve position to open the CH side more for when the flow of the CH side is reduced due to DHW demand. This may restrict the DHW capacity.	Normal	Additional CH						
	16	LC (Limescale Condition) Check.	Available	No Detection	-					
		This setting enables the boiler to check for limescale conditions in the DHW side of the plate heat exchanger.								
	lΠ	Adjust DHW Temperature Setting.	0°F (0°C)	1.8°F (1°C)	3.6°F (2°C)	5.4°F (3°C)				
		Enables the DHW output temperature to be adjusted without adjusting the set point temperature to make up for system temperature losses.	100		` ′	(3 C)				
	18	DHW Continuous Operation Time. This setting adjusts the maximum continuous operating time of DHW, whether in DHW priority or simultaneous modes.	120 Minutes	60 Minutes	180 Minutes	Unlimited				
		Linked Operation Between CH Pump 1 and 2.	Williates	Williates	Williates					
	40	This parameter enables linked operation between the CH Pump 1 and 2.	No	Yes (Linked Together)						
		Linked Operation Between Main Boiler Pump and CH Pump 1.		Yes (Linked Together)	-					
	41	This enables the linked operation between the main boiler pump and CH pump 1.	No	(If selected, hydraulic						
		Main Pump Runs When the Target Temperature is Achieved.								
	42	This selects the mode of the main pump running when the target setpoint is achieved.	Continuously	Intervals						
ns		External Pump Runs When the Setpoint Temperature is Achieved.	Same as							
	43	This selects the mode of the external pump(s) running when the target setpoint is achieved.	Main Pump	Does Not Run						
	44	External Pump Runs When Freeze Protection is in Operation.	Does Not	Camp as Main Dun-						
	77	This selects how the external pump operates when freeze protection is in operation.	Run	Same as Main Pump						
	45	Freeze Protection Level.	Default	When Boiler is Installed				<u> </u>		
	נו	This selects the freeze protection level. Selecting "B" will prevent the boiler from operating in freeze protection mode more than necessary.	Derault	When boller is ilistalled						
		The Differential Temperature from Ceasing Fire to Firing Again.	Normal	Quick						
		How much temperature drop is permitted by the supply water thermistor before the boiler will fire again.		The state of the s						
	46	CH Setting Temperature.		perature Drop						
		168-182°F (75-82°C)	27°F (15°C)							
		86-166°F (30-74°C)	15°F (8°C)	9°F (5°C)						
	47	The Time Which the Boiler is not Allowed to Fire Again for CH.	Normal (3 Minutes)	Quick						
		This selects the time which the boiler will not be able to fire again for CH after the burner has shutdown.	(3 iviiilutes)	(10 Seconds)	-					
	49	Will the boiler shut down on a high return water temperature.  This cotting is for whether the boiler will shut down at high return water temperatures.	Yes	No						
	60	This setting is for whether the boiler will shut down at high return water temperatures.  Not Available.		l lot Available						
			l '	IOL AVAIIANIC						
	RO	Gas Type.	Natural Gas	Liquid Propane						
		For selecting gas type when conducting gas conversion.		Liquia . Topune						
	RI	Not Available.	ı	lot Available						
		Vent Material Used		I					1	· · · · · · · · · · · · · · · · · · ·

#### **DIAGNOSTIC CODES** To Display Diagnostic Codes: Press and hold the "DHW" button for two seconds and then the \_\_\_ (Up) button simultaneously (Fig 9). The last nine maintenance codes display and flash one after the other. CH To exit diagnostic codes and return the boiler to normal operation, press and hold the "DHW" button for two seconds, and then the (Up) button simultaneously. Fig 9. "Up" and "DHW" Buttons able 9. Diagnostic Code Continuous DHW This code will display when DHW is in continuous operation for extended periods of time. Ensure there are no open faucets. Ensure there are no leaks in fixtures or the plumbing system. Air Supply or Exhaust Blockage/Condensate Trap is Full Fan current initial check error Ensure condensate line and trap is not blocked. Ensure internal air filter is clean with no obstructions. Ensure high altitude setting is set properly (See Table 6. High Altitude DIP Switches). Ensure either the exhaust ring or intake cap is removed properly. Ensure vent length is within limits. Check fan for debris and ensure wheel turns freely. Verify fan check valve is not stuck between fan casing and burner body No Ignition (Unit Not Turning On) Ignition Error. Check that the gas is turned on at the boiler, gas meter, and/or propane cylinder. If the unit is installed in a propane system, ensure that gas is in the tank. Rleed all air from the gas lines Check the ground wire for the PC Board. Ensure the flame rod wire is connected Ensure the igniter is operational.<sup>3</sup> Ensure the venting is installed in accordance with the I-Series Boiler Installation and Operation manual. Check that the surface of the electrode and flame rod are clean. Check gas solenoid valves for open or short circuits.3 Verify gas orifice installed is correct for the gas system the unit is installed in. Check flame rod voltage to ground during ignition. Flame Failure PC Board Boiler has flame failure Check that the gas is turned on at the boiler, gas meter, and/or propane cylinde If the unit is installed in a propane system, ensure that gas is in the tank. Ensure the venting is installed in accordance with the I-Series Boiler Installation and Operation Manual. Ensure the flame rod wire is connected. Ensure the gas type and inlet gas pressure are correct. Bleed all air from the gas lines. Check the ground wire to the PC Board. Check flame rod voltage to ground during ignition Flame Rod Heat Exchanger Overhea Overheat switch is tripped Measure the resistance of the Overheat Switch.<sup>3</sup> Check the heat exchanger surface for hot spots which may indicate blockage due to scale buildup. Ensure the boiler pump is not locked up. Ensure that all of the valves in the CH circuit are open. Ensure the boiler and CH circuit does not have a freezing condition. The surface of the heat exchanger may turn to a black color as stainless steel is tempered even in normal conditions. This does not indicate an abnormal condition Check for damage on the exhaust, seal, and venting. Ensure the parameter A0 corresponds to the gas type the unit is installed in Ensure the gas orifice is the proper orifice for the gas type in use. Ensure deaeration has been performed. **Venturi Control** Venturi operation error. Ensure the venturi motor is operating correctly. Replace the gas valve assembly High Outgoing Temperature Safety shutdown because DHW outgoing temperature is too hot. Check sensor wiring for damage of outgoing thermistor. Measure resistance of outgoing thermistor.<sup>3</sup> Ensure the gas valve has no damage and the orifice is installed correctly. Replace the gas valve assembly. Venturi Blockage Check the venturi and silencer for blockage. Before resetting this error, check if the condensate drain is blocked and if the venting is connected properly. Electrical Grounding Secondary circuit ground fault. Check all electrical compone Condensate Pump (Accessory) Boiler will operate for 60 seconds. Confirm wire connections and harnesses are good. Ensure the condensate reservoir is empty and condensate pump is operation Freeze Protection Thermistor Check sensor wiring for damage. Measure the resistance of the sensor. Replace if necessary. Outgoing Thermistor Check sensor wiring for damage. Clean sensor of any scale buildup present. Measure the resistance of the sensor. Replace if necessary Heat Exchanger Thermistor Check sensor wiring for damage. Measure the resistance of the sensor. Replace if necessary. Inlet Thermistor Check sensor wiring for damage. Measure the resistance of the sensor. Replace if necessary Supply Thermistor Ensure the gas pressure is proper. Check sensor wiring for damage. Clean the surface of the sensor Measure the resistance of the sensor. Check the return thermistor. Replace if necessary Exhaust Thermistor Check sensor wiring for damage Clean the surface of the sense Measure the resistance of the sensor Check the return thermistor. Replace if necessary. Check sensor wiring for damage. Measure the resistance of the sensor. Replace if necessary. Outdoor Thermistor Ensure that DIP switch 1 is set to the appropriate position. Check sensor wiring for damage. Measure the resistance of the sensor. Replace if necessary. Pressure Sensor Check sensor wiring for damage. Measure the voltage of the sensor. Replace if necessary. High/Low Water Pressure • If the water pressure is too low, add water into the system until at least 13 PSI is Ensure there are no leaking components in the CH system. If the pressure is too high, adjust the pressure to a maximum of 30 PSI. Ensure the pressure relief valve and water fill are working correctly. Ensure deaeration has been performed. 나는 Low Water Cut-Off (LWCO) Ensure the LWCO device is working correctly. Ensure the LWCO jumper is connected properly when LWCO is not in use. Ensure the output is 24 VAC on the PCB. If it is not, check the transformer harness and output of transformer. Solenoid Valve Circuit Check the flame rod and wire for damage. Close the gas shut off valve installed near the boiler. Ensure the flame rod and wire are not wet. Check the output from the PC Board to the solenoid gas valve. If the output from the PC Board is abnormal, replace the PC Board. If the output from the PC Board is normal, replace the gas control. 541 High Exhaust Temperature No Code CH capacity is insufficient Check the exhaust thermistor wiring for damage Clean the surface of the thermistor Measure the resistance of the exhaust thermistor.<sup>3</sup> If the sensor has been replaced and the error still appears, check the return • If the boiler is used in a hard water area, flush the DHW plate heat exchanger. Combustion Fan Check the motor wire harness for loose or damaged connections. Cannot turn off ECO mode Measure resistance and voltage of motor wire harness. Ensure the combustion fan spins freely.

See "Electrical Diagnostics" section of this document.

Heat Exchanger Overheat (140), Venturi Control (150), High Exhaust Temperature (540), and Freeze issue (890) can be reset by shutting down power to Venturi (170) and Solenoid Valve Circuit (520) can be reset by pushing and holding buttons SW1 and 2 for five seconds. stion Error During DHW Error can be reset by closing faucet. Other error can be reset by Domestic "On/Off' outton or "Central Heating" (CH) button.

- Ensure the DHW recirculation matches the Parameter 12 setting as described in "Table 7. Parameter Settings."
- Ensure the dedicated return line is properly installed.
  Ensure the inlet water filter and bypass filter are clean and free of debris.
- Ensure the DHW recirculation pump is connected to the DHW Pump
- Ensure the capacity of the recirculation pump is sized appropriately for the piping (DHW recirculation pump should be higher than 1.3 GPM).
   Ensure air is removed from the recirculation line. ₩ater Flow Control

- Measure the resistance values and voltage of the water flow control. Ensure the harness and connector are not wet.
- If the voltage from the PC Board is abnormal, replace the PC Board; otherwise, replace the water flow servo valve.
- Measure the resistance values and voltage of the bypass servo valve.<sup>3</sup> Ensure the harness and connector are not wet.
- If the voltage from the PC Board is abnormal, replace the PC Board; otherwise, replace the bypass servo valve
- 3-Way Valve
- Measure the resistance values and voltage of the 3-way valve control.3 Replace the 3-way valve control device.
- Check the CH system water quality to confirm it is within recommended range and to prevent valve failures. Hot Water Supply Temperature Abnormality
- If the DHW water temperature is higher than the set point temperature because the boiler bypass servo fails to close.

  Measure resistance values and voltage of the bypass flow control. <sup>3</sup>

- Replace the bypass flow control device if needed; otherwise, check the inlet thermistor and heat exchanger thermistor wiring for damage.

- Measure the resistance of the sensor.
   Clean the sensor of any scale buildup present.
- Replace if needed.
- PC Board circuit error
   Replace PC Board.
- Solenoid Valve Circuit
  - Ensure Dip switch 5 on the PC Board is in the OFF position (default). Ensure the gas control wire is not loose or damaged
     Replace the PC Board.
- Check the flame rod and wire for damage.
- Ensure the flame rod and wire are not wet.
   If there is no issue with the flame rod or wiring, replace the PC Board.
- Freeze Issue The boiler checks the heat exchanger temperature at the time of operation.
- If the temperature is too low, an error will occur.
   Check if there is freezing in the boiler or CH system
- PC Board Mismatch
- This code occurs when the PC Board and the internal logic do not match.
- Check if the software versions of the board and operation board do not
- Scale Buildup in Heat Exchanger Flush the DHW plate heat exchanger.
- The LC code will reset automatically when scaling is removed. If the LC code remains, check the DHW thermistor, flow sensor or boiler pump.

#### Maintenance Indicator

#### This code is a placeholder in diagnostic code history indicating

NE:FFF a service provider performed maintenance or service. Enter this code after performing service by pressing the following buttons at the same time: Up, Down, and DHW.

"FFF" appears on the monitor

Nothing happens when DHW water flow is activated Verify the minimum flow rate required to fire the boiler is seen. Measure the resistance of the flow control sensor.

- Clean the inlet water supply filter.
- On new installations, ensure the hot and cold water lines are not reversed.
   Confirm the inlet water temperature is not too high.
- Ensure the integrated boiler pump operates properly
- Ensure the DHW operation switch is on.
- Decreasing or fluctuating DHW water flow volume

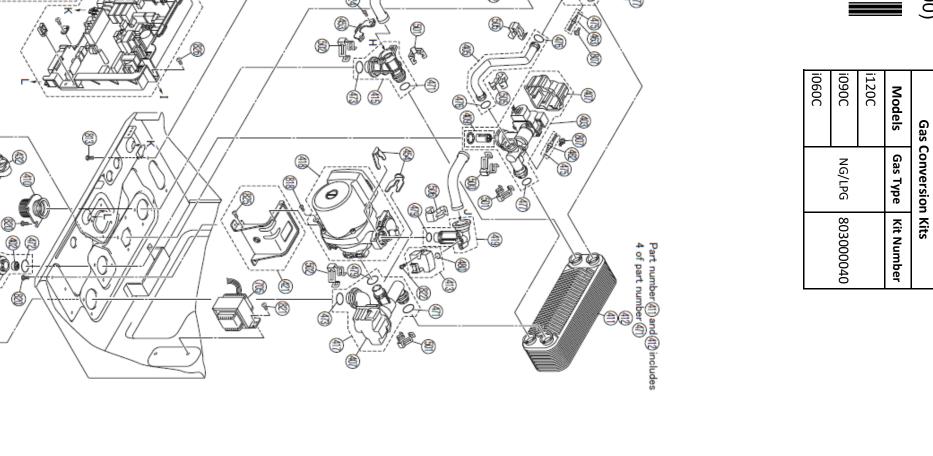
### Ensure the gas pressure is proper

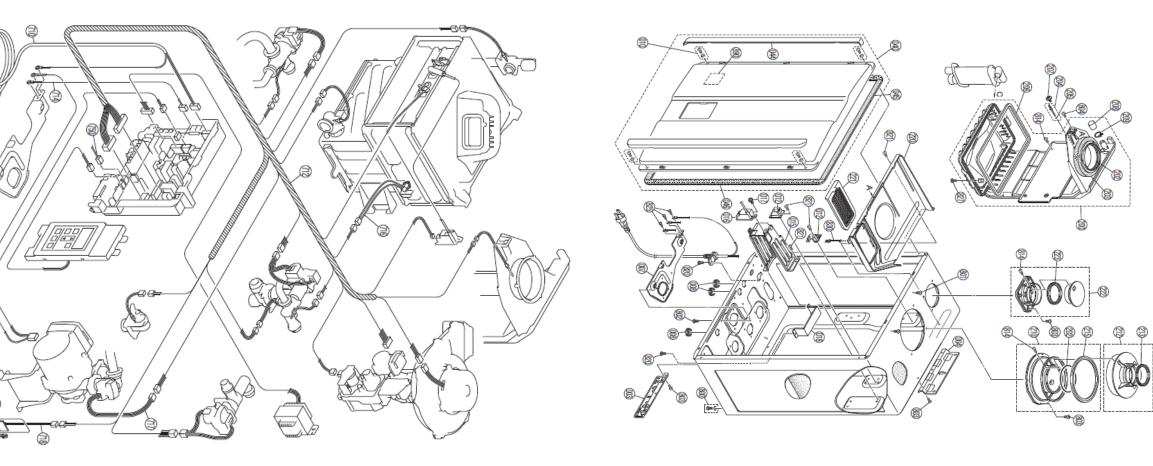
- Ensure the water pressure is proper.
  Ensure the inlet water filter for DHW is clean.
- Ensure there is no limescale buildup present. Ensure the vent and vent settings are properly set up.
- If a DHW recirculation system is used, the DHW flow volume may vary slightly. Ensure all air has been purged from the system.
- Ensure the pump is set to speed 3. During simultaneous CH and DHW operation mode, it is possible to see decreased DHW flow.
- Fluctuating DHW outgoing temperature
- Ensure the water pressure is proper.
   Ensure the DHW thermistor, flow servo, and bypass servo are in good
- Ensure the inlet filter for DHW is clean.
- If a DHW recirculation system is used, the DHW temperature may vary slightly.
   Ensure all air is removed from the system.
- Boiler does not start heating with a heating demand present
- Supply temperature or return temperature inside the boiler may be too hot. Ensure the pump operates properly.
- If there is a demand important important in the for operation.
- The boiler does not operate with the CH setting button
- If DIP switch 2 is OFF, CH operation (the light on the CH button is off) will function via the room thermostat.

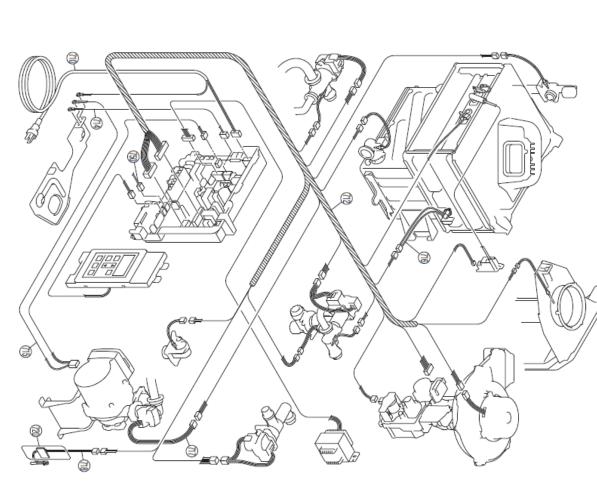
## DHW recirculation does not begin

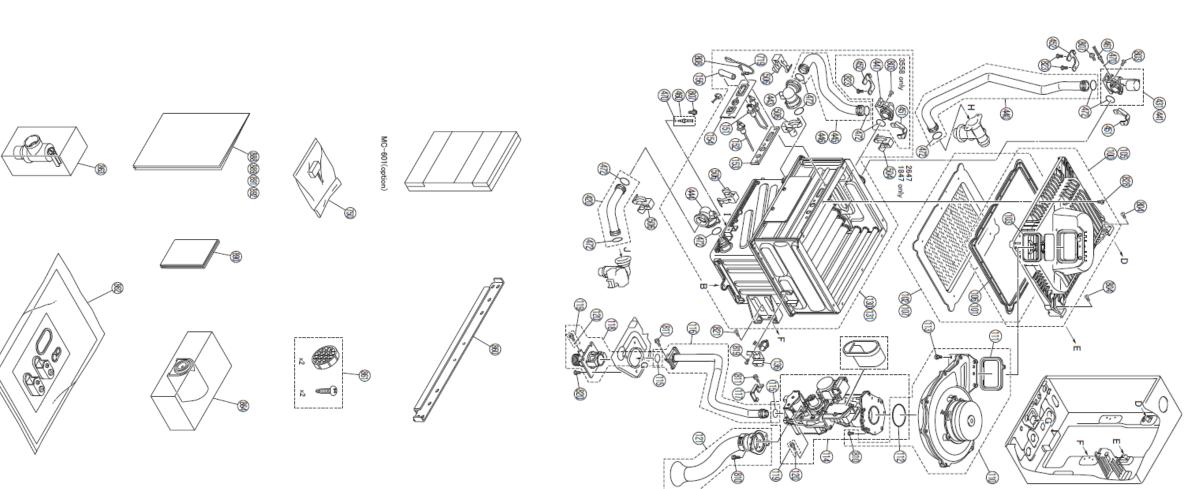
- Ensure the DHW recirculation pump is connected to the DHW\_Pump terminal. Ensure DIP switch 3 is ON. Ensure the DHW recirculation plumbing type is set properly per Parameter 12 as described in "Table 7. Parameter Settings."
- Ensure the DHW recirculation with timer relay input is set properly per Parameter 13 as described in "Table 7. Parameter Settings."
- Ensure the wiring to the external timer is correct.
- Ensure the external timer is ON, if in use.
- The recirculation logic has an OFF interval after use. Simultaneous DHW and CH is not functional
- Ensure DIP switch 4 is ON.
- If CH set point temperature is lower than 140°F, it is not permitted (this includes outdoor reset temperature settings).
- Ensure the DHW inlet temperature is not too hot. Ensure the heating load for DHW and CH are within limits to handle both
- Cannot change the DHW set point temperature
- When DHW is being produced, the temperature setting can only be adjusted between 98°F and 110°F. Supply temperature is different from the setting temperature on the controller  $% \left( 1\right) =\left( 1\right) \left( 1\right) \left($
- During outdoor sensor control, the supply temperature will vary dependent on the outdoor temperature.
   During simultaneous operation of DHW and CH, the supply temperature for CH is based on DHW control.
- Ensure the parameters are properly set for the installation. During simultaneous operation of DHW and CH, flow volume to heating can be reduced.
- Pump or fan is operating even with no demand
- The boiler may start or operate the pump for freeze protection operation. The pump may intermittently operate to prevent it from becoming stuck.
- During DHW recirculation, ECO switch will always be on.











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Exhaust nine connection port - 2 inch	Flue Connection Assembly	Band	Combustion Analysis Port Cap	Thermistor Screw	Exhaust Duct Seal	O-ring	Thermistor	Exhaust Duct Packing	O-ring	Exhaust Duct Assy	Electrode Sleeve	Electrode Plate	Electrode Packing	Flame Rod	Electrode	Condensate Drain tube	Band RC98HPi/e, Cond Drain Tube, Bottom KT	Condensate Trap	OHS Bracket	Heat Exchanger Assembly-Medium	Heat Exchanger Assembly-Large	Noise Filter	O-ring	Inlet Gas Test Port Screw	Inlet Gas Supply Connection	Gas Tube Bracket	Gas Connection Pipe	O-ring	Gas Valve Assembly	Hexagon Head Screw	O-ring	Fan Mounting Packing	Combustion Fan Assembly	Burner Plate Assembly-Medium	Burner Gasket-Medium	Burner Assembly-Medium	Combustion Check Valve Assembly	Burner Plate Assembly-Large	Ritrier Gasket-Large	Front Panel Packing-Side FF		Screw Cover	Front Panel Assy	Plate HEX Bracket	Grounding Screw	Igniter Assembly	Igniter Bracket	Combustion Chamber Support Plate	Residential Screw and Washer	Rubber Bushing	Connection Reinforcement Plate	Upper Wall Mount Bracket	Lower Wall Mount Bracket	DESCRIP
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