

Diagnostic Use of the Controller

- 1. To display error codes, press the ON/OFF button followed by the **\(\Lambda \)** thermostat button to cycle through the error codes.
- 2. To display the water flow through the water heater, press the **\(\Lambda \)** thermostat button (hold for 2 seconds) and then press the ON/OFF button while continuing to hold the ▲ thermostat
- 3. To display the outlet water temperature, press the ▼ thermostat button (hold for 2 seconds) and then press the ON/OFF button while continuing to hold the ▼ thermostat button.

To Change the Temperature Scale (°F / °C)

With the water heater turned off, press and hold the ON/OFF button until the display changes to the other temperature scale (about 5 seconds).

To Turn Off the Controller Sound (Mute)

To turn the sound off (mute), press and hold both the ▲ and ▼ thermostat buttons until a "beep" is heard (about 5 seconds).

Gas Pressure Setting

NOTE: For additional installation and commissioning information refer to the Operation and Installation Manual.



WARNING

This appliance must be installed, serviced and removed by a trained and qualified person. During pressure testing of the consumer piping, ensure gas valve is turned off before unit is shut off. Failure to do so may result in serious injury to yourself or damage to the unit.

APPLIANCE OPERATING PRESSURES

		Table 1										
		Water Inlet Max	Gas Inlet Min./Max		Force	d Low	Force	d High				
		I III OT WAX	NAT.G	LPG	NAT. G	LPG	NAT. G	LPG				
	RL75i	150 PSI	5"W.C. /10.5"W.C.	8"W.C. /13.5"W.C.	0.59"W.C.	0.97"W.C.		4.7"W.C.				
	RL94i							5.4"W.C.				
on	nmissioning											

With all gas appliances in operation at maximum gas rate, the flowing inlet pressure at the incoming test point on the Rinnai water heater should read 5" W.C. - 10.5" W.C. on natural gas and 8" W.C. - 13.5" W.C. on propane gas. If the pressure is lower, the gas supply is inadequate and the unit will not operate to specification. Check the gas meter regulator and pipework for correct operation/sizing and correct as required.

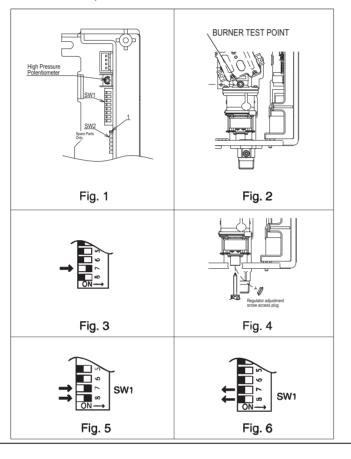
Gas Pressure Setting

Ensure gas pressure check under Commissioning has been completed first! The regulator is electronically controlled and factory pre-set. Under normal circumstances it does not require adjustment during installation. Make adjustments only if the unit is not operating correctly and all other possible causes for incorrect operation have been eliminated.

- 1. Turn OFF the gas supply.
- 2. Turn OFF the 120 V power supply.
- 3. Remove the front panel from the appliance.
- Check the gas type using the data plate on the side of the unit. If using a spare PC board, check that the gas type switches are in the correct position (dip switch 1 of SW2: ON for natural gas, NG, and OFF for propane, LPG). See dip switch settings section below. (ON is towards the right and OFF is towards the left.)
- 5. Attach the pressure gauge to the burner test point, located on the gas control (Fig. 2).
- 6. Turn ON the gas supply.
- 7. Turn ON the 120 V power supply.
- 8. If a controller is installed, turn the unit ON with the controller. Select the maximum delivery temperature and open all available hot water taps at full.
- 9. Set the unit to "Forced Low" combustion by setting No. 7 dip switch of the SW1 set to ON (Fig. 3). 10. Check the burner test point pressure.
- 11. Remove the rubber access plug and adjust the regulator screw on the modulating valve (Fig. 4) as required in Table 1. Replace the rubber access plug.
- 12. Set the unit to "Forced High" combustion by setting both No. 7 and No. 8 dip switches of the SW1 set to ON (Fig. 5). Ensure maximum water flow.
- Check the burner test point pressure.
- 14. Adjust the high pressure potentiometer (POT) on the PC board as required to the pressure shown in Table 1.
- 15. Return the unit to normal operation by setting dip switches 7 and 8 of the SW1 set back to OFF (Fig. 6). Close all water
- 16. Turn OFF the gas supply and 120 V power supply. 17. Remove the pressure gauge and install sealing screw.
- 18. Turn ON the gas supply and 120 V power supply.
- 19. Operate the unit and check for gas leaks at the test point.
- 20. Install the front panel.

MEASUREMENT POINT

COMPONENT



RANGE OF VALUE

REMARKS

Troubleshooting

Important Safety Notes

Γhere are a number of live tests that are required when troubleshooting this product. Extreme caution should be used 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

Heat Exchanger and Outgoing Water Temperature 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. Appying heat to the thermistor bulb should decreaase the resistance. Applying ice tothe thermistor bulb should increase the resistance

Frost Protection:

This unit has frost protection heaters mounted at different points to protect the water heater from freezing.

Amp Fuses:

This unit has one inline (5) amp glass fuse. Remove the fuse and check continuity through it. If you have continuity through the fuse then it is good. Otherwise the fuse is blown and must be replaced.

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 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

00111 0112111	CN	WIRE COLOUR				
REMOTE CONTROLLER	A ₁	Bk-Bk	DC11-13V			
THERMAL FUSE	B ₁ /E ₁	W-W	BELOW 1Ω			
MOD. SOLENOID VALVE	B ₂	0-0	DC2-15v / 67-82Ω			
		P-Bk	DC11-13v / 37-43Ω			
SOLENOID VALVE 1	B ₄	B-Bk	DC11-13v / 37-43Ω			
SOLENOID VALVE 2	B₅	Y-Bk	DC11-13v / 37-43Ω			
SOLENOID VALVE 3						
SOLENOID VALVE 4	B ₇	0-Bk	DC11-13v / 37-43Ω			
FLAME ROD 1	B ₈	Y-FR	OVER 1 4 A (DURING OPERATION)			
FLAME ROD 2	M ₁	R-FR	OVER 1 4 A (DURING OPERATION)			
SURGE PROTECTOR	C ₁	W-Bk	AC108-132V			
SURGE PROTECTOR	C ₂	W-Bk	AC108-132V			
MAIN POWER CODE	C ₃	W-Bk	AC108-132V			
ANTI-FROST			88-120 Ω	W MODEL		
HEATER	L'4	W-W	156-211 Ω	FF MODEL		
IGNITOR	Dı	Gy-Gy	AC108-132V (DURING IGNITION)			
HEAT EXCHANGER TH	E ₂	W-W	15℃/59℉:11.4-14.0 kΩ			
OUTGOING WATER TH1	E ₃	W-W	30°C/86°F: 6.4-7.8 kΩ 45°C/113°F: 3.6-4.5 kΩ			
OUTGOING WATER TH2	E ₄	B-B	60°C/140°F: 2.2-2.7 kΩ			
AIR TEMPERATURE TH	E ₅	W-W	105℃/221℉:0.6-0.8 kΩ	FF MODEL ONLY		
BURNER THERMISTOR	E ₆	Bk-Bk	15℃/59℉:21.5-23.8 kΩ 30℃/86℉:14.7-16.2 kΩ 200℃/392℉:0.98-1.02 kΩ 400℃/752౯:210.0-223.9 Ω 600℃/1112౯:85.7-92.7 Ω	FF MODEL ONLY		
WATER FLOW SENSOR	E ₇	R-Bk	DC11-13v	ON: 1.5L/MIN(20Hz) OVER 1980 PULSE/MIN OFF: 1.0L/MIN(13Hz)		
WATER TEOM SERSOR	/	Y-Bk	DC4-7V (PULSE 20-300Hz)	OFF: 1.0L/MIN(13Hz) OVER 1380 PULSE/MIN		
BY-PASS FLOW CONTROL DEVICE	G ₁	Br-W O-W Y-W	DC12V (DC2-6V DURING OPERATION)	2735 MODEL ONLY		
CONTINUE BETTOE		R-W	15-35Ω			
		R-0 P-0 B-0 W-0	DC11-13V (DC5-7V DDURING OPERATION)			
WATER FLOW CONTROL DEVICE	G ₂	R-P B-W	30-50 Ω			
		V C	BELOW DC1V (LIMITTER ON)	EIIII ODEN DOCITION		
		Y-Gy	DC4-6V (LIMITTER OFF)	FULL OPEN POSITION		
		D- C-	BELOW DC1V (LIMITTER ON)	FULL CLOSE POSITION		
		Br-Gy	DC4-6V (LIMITTER OFF)	1 FULL CLUSE PUSITION		
		R-Bk	DC15-46V			
COMBUSTION FAN	L ₁	Y-Bk	DC11-13V			

Dip Switches Settings

These models have a default maximum temperature setting of 120°F (49°C). The maximum temperature setting can be increased to 140°F (60°C) by setting dip switch 6 to ON in the SW1 bank of 8 dip switches.

NAT.G → 0N O ■ F ■ F ■

RL94i (VB2735FFUD-US)

RL75i (VB2528FFUD-US)

Move switch 1 to OFF for long flue lengths. See below Adjustment for long flue length:

1. Determine theequivalent length using the

(Two 45° elbows = one 90° elbow)

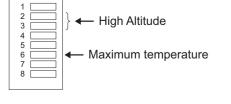
Equivalent length = Straight lengths + [no. of 90°

2. If the equivalent length is greater than 21 ft then move switch no. 1 to OFF. If the equivalent

tength is longer than 41 ft the heater may not

work properly. The installer should be called.

Adjust switches 2 and 3 in the bank of 8 depending on your altitude according to the table below.



WARNING

DO NOT adjust the other dip switches unless specifically instructed to do so. Incorrect Dip Switch Settings can cause the Rinnai water heater to operate in an unsafe condition and may damage the water heater and void the warranty.

formula:

elbows x 6]

SW No.	NOTES										
2	High Altitude	Off	Off Level 0 0-2000ft		Level 1 2001-5200ft	On	Level 2 5201-7700ft	On	Level 3		
3	High Altitude	Off	(0-610m)	On	(610-1585m)	Off	(1585-2347m)	On	7701-10200ft (2347-3109m)		

Error Codes

- 02 No burner operation during freeze protection mode
- 03 Power interruption during Bath fill (Water will not flow when power returns)
- Turn off all hot water taps. Press ON/OFF twice.

10 Air Supply or Exhaust Blockage

- · Ensure Rinnai approved venting materials are being used.
- Check that nothing is blocking the flue inlet or exhaust.
- · Check all vent components for proper connections.
- · Ensure vent length is within limits.
- Ensure condensation collar was installed correctly.
- · Verify dip switches are set properly.
- · Check fan for blockage.

· Bleed all air from gas lines.

11 No Ignition

- · Check that the gas is turned on at the water heater, gas meter,
- Ensure gas type and pressure is correct.
- Ensure gas line, meter, and/or regulator is sized properly.
- · Verify dip switches are set properly.
- · Ensure appliance is properly grounded.
- Disconnect EZConnect or MSA controls to isolate the problem.
- · Ensure igniter is operational.
- · Check igniter wiring harness for damage. Check gas solenoid valves for open or short circuits.
- · Remove burner cover and ensure all burners are properly
- · Remove burner plate and inspect burner surface for condensation or debris.

12 Flame Failure

- · Check that the gas is turned on at the water heater and gas meter. Check for obstructions in the flue outlet.
- Ensure gas line, meter, and/or regulator is sized properly.
- · Ensure gas type and pressure is correct.
- · Bleed all air from gas lines.
- · Ensure proper Rinnai venting material was installed.
- · Ensure condensation collar was installed properly.
- · Ensure vent length is within limits.
- · Verify dip switches are set properly. • Ensure appliance is properly grounded.
- Disconnect keypad.
- Disconnect EZConnect or MSA controls to isolate the problem.
- · Check power supply for loose connections.
- Check power supply for proper voltage and voltage drops.
- · Ensure flame rod wire is connected.
- · Check flame rod for carbon build-up. • Disconnect and re-connect all wiring harnesses on unit and PC
- · Check all components for electrical short.
- Check gas solenoid valves for open or short circuits.
- Remove burner plate and inspect burner surface for condensation or debris · Check the ground wire for the PC Board.

14 Thermal Fuse

- · Check gas type of unit and ensure it matches gas type being used.
- Check for restrictions in air flow around unit and vent terminal. · Check for low water flow in a circulating system causing short-
- · Check for foreign materials in combustion chamber and/or

• Ensure dip switches are set to the proper position.

- exhaust piping. Check heat exchanger for cracks and/or separations. · Check heat exchanger surface for hot spots which indicate
- blockage due to scale build up. Refer to instructions in manual for flushing heat exchanger.
- Measure resistance of safety circuit. • Ensure high fire and low fire manifold pressure is correct.
- Check for improper conversion of product.

16 Over Temperature Warning

- · Check for restrictions in air flow around unit and vent terminal.
- · Check for low water flow in a circulating system causing shortcycling
- · Check for foreign materials in combustion chamber and/or exhaust piping.
- Check for clogged heat exchanger.

31 Burner Sensor Error

· Replace sensor.

- · Measure resistance of sensor. Replace sensor
- 32 Outgoing Water Temperature Sensor Fault
- · Check sensor wiring for damage.
- · Measure resistance of sensor.
- · Clean sensor of scale build up.
- 33 Heat Exchanger Outgoing Temperature Sensor Fault
 - · Check sensor wiring for damage.
 - Measure resistance of sensor.
- Replace sensor. 34 Combustion Air Temperature Sensor Fault
- · Check for restrictions in air flow around unit and vent terminal. · Check sensor wiring for damage.
- · Measure resistance of sensor.

· Clean sensor of scale build up.

- · Clean sensor of scale build up.
- Ensure fan blade is tight on motor shaft and is in good
- · Replace sensor.

52 Modulating Solenoid Valve Signal Abnormal · Check modulating gas solenoid valve wiring harness for loose

- or damage terminals.
- · Measure resistance of valve coil.

61 Combustion Fan Failure

- · Ensure fan will turn freely.
- · Check wiring harness to motor for damaged and/or loose
- connections Measure resistance of motor winding.

65 Water Flow Servo Faulty (does not stop flow properly) If blank screen is present on remote control then the flow control

has shorted out. Unplug flow control. If remote lights up and unit starts operating then replace flow control assembly.

71 SV0, SV1, SV2, and SV3 Solenoid Valve Circuit Fault

· Replace the PC Board.

72 Flame Sensing Device Fault

- Ensure flame rod is touching flame when unit fires.
- Check all wiring to flame rod for damage.
- Remove flame rod and check for carbon build-up; clean with
- · Check inside burner chamber for any foreign material blocking flame at flame rod.
- · Measure micro amp output of sensor circuit with flame present Replace flame rod.
- 73 Burner Sensor Circuit Error
- Replace sensor _C Scale Build-up in Heat Exchanger (when checking

· Check sensor wiring and PCB for damage.

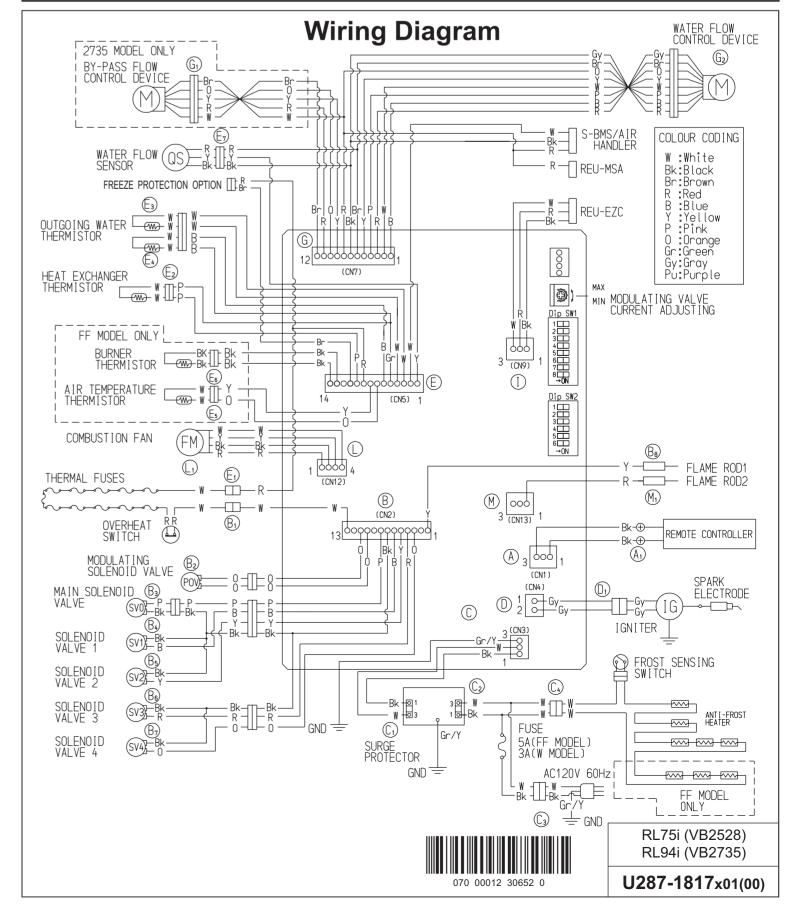
- maintenance code history "00" is substituted for "LC")
- · Replace heat exchanger
- **No Code** (Nothing happens when water flow is activated.)
- · Clean inlet water supply filter. • On new installations ensure hot and cold water lines are not

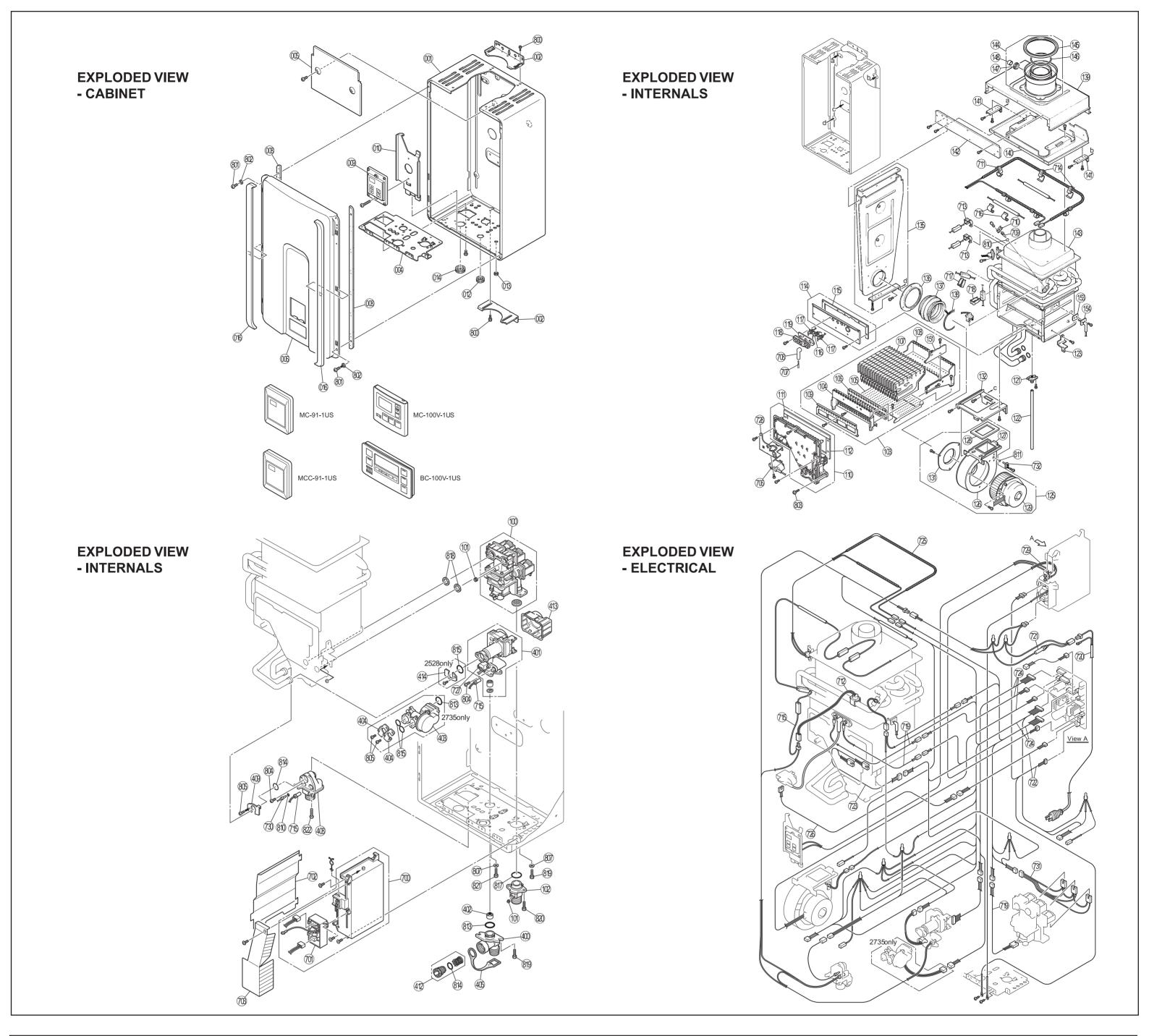
• Flush heat exchanger. Refer to instructions in manual.

- · Check for bleed over. Isolate unit from building by turning off hot water line to building. Isolate the circulating system if present. Open your pressure relief valve; if unit fires, there is bleed over in your plumbing.
- Ensure you have at least the minimum flow rate required to fire
- Ensure turbine spins freely.

terminals for controls.

- · Measure the resistance of the water flow control sensor. Remote control does not light up but you have 12 VDC at the





Parts with an * are kits and include other required parts such as gaskets or O-rings.	RL75i (VB2528)	DADTOLICT		RL94i (VB2735)	RL75i (VB2528)			RL94i (VB2735)	RL75i (VB2528)		
The isolation valves and pressure relief valve are sold as an accessory kit, P/N WRIK-LF-F.		RL94i (VB2735)	3L75 VB2	PARTS LIST		3L94 VB2	3L.75 VB2			3L94 VB2	RL75 VB2
Item Description	Part Number	Qty	Qty	Item Description	Part Number	Qty	Qty	Item Description	Part Number	Qty	Qty
001 MAIN BODY (FFU)	109000185	1	1	132 COMBUSTION CHAMBER BRACKET	U245-255X04	1	1	712 FROST SENSING SWITCH	105000127	1	1
002 WALL HANG BRACKET	109000186	2	2	135 AIR INLET BOX ALL ASSY	108000013	1	1	713 HEATER FIXING PLATE	109000202	2	2
004 CONNECTION REINFORCEMENT	109000188	1	1	136 JOINT BRACKET	U245-408	1	1	714 HEATER FIXING PLATE	109000203	2	2
005 HEAT PROTECTION PLATE	U245-107	1	1	137 SEAL PACKING	U245-409X01	1	1	715 VALVE HEATER(120V)ASSY	105000129	1	1
006 FRONT PANEL	109000191	1	1	138 JOINT FIXING BRACKET	U245-567	1	1	716 HEATER FIXING PLATE	CF29-742X01	2	2
008 FRONT PANEL PACKING	109000077	2	2	139 AIR INLET DUCT	108000014	1	1	717 HEATER FIXING PLATE	AU111-653	1	1
009 TEMPERATURE CONTROL	103000010	1	1	140 EXHAUST TUBE FRAME	109000207	1	1	718 HEATER FIXING PLATE	AU100-721X03	1	1
010 TEMPERATURE CONTROL PLATE	109000193	1	1	141 EXHAUST TUBE FRAME SUPPORT	U245-435	2	2	719 AWG18 HARNESS	105000130	1	1
012 RUBBER BUSH-A	CF79-41020-A	1	1	142 INLET BOX CAP	U245-419X01	1	1	720 POWER CORD	CP-90580	1	1
013 SEAL PACKING (GRAY)	AU105-113	1	1	143 HEAT EXCHANGER ASSEMBLY	104000182*	1		721 FUSE HARNESS	105000132	1	1
014 RUBBER BUSH	U245-125	1	1	143 HEAT EXCHANGER ASSEMBLY	104000183*		1	722 POWER HARNESS	105000107	1	1
016 SCREW COVER	109000197	2	2	144 FLUE CONNECTION ASSEMBLY	108000015	1	1	723 CONNECTION HARNESS	105000118	1	1
100 GAS CONTROL ASSEMBLY	104000021*	1	1	145 INLET SEALING	108000017	1	1	724 SENSOR HARNESS-1	105000135	1	
101 TEST PORT SET SCREW	AU39-965X01	2	2	146 O-RING	108000018	1	1	724 SENSOR HARNESS-3	105000136		1
102 3/4 GAS INLET	CU195-1866	1	1	147 PIPE SEAL	108000019	1	1	725 FUSE HARNESS-26-4	105000121	1	1
103 BURNER UNIT ASSY (LPG)	106000060	1	1	148 CAP	108000020	1	1	726 IGNITOR HARNESS	105000112	1	1
103 BURNER UNIT ASSY (NG)	106000057	1	1	151 BURNER FIXING PLATE	109000200	1	1	727 MR SENSOR	105000041	1	1
104 U BURNER CASE FRONT PANEL	CH51-209X04	1	1	153 BURNER SENSOR PACKIN G	109000149	1	1	728 IGNITOR FIXING PLATE	109000204	1	1
105 BURNER CASE BOTTOM PANEL	106000041	1	1	154 BURNER THERMISTOR	105000100	1	1	729 TEMP CONTROL HARNESS	105000042	1	1
106 PACKING	BH51-218X01	1	1	400 WATER INLET	H73-501-2	1	1	730 TWIN THERMISTOR	104000208*	1	1
107 BURNERS	106000054	16	16	401 WATER FLOW SERVO & SENSOR	104000162*	1		731 CONNECTION HARNESS	105000120	1	1
108 BURNER CASE BACK PANEL	106000042	1	1	401 WATER FLOW SERVO & SENSOR	104000163*		1	732 INLET AIR THERMISTOR	105000029	1	1
109 24 DAMPER (LPG)	H73-115	1	1	402 RECTIFIER	M8D1-15X01	1	1	800 SCREW	ZIHD0510UK	8	8
109 24 DAMPER E (NG)	106000058	1	1	403 BY-PASS SERVO ASSY	104000198*	1		801 TRUSS SCREW	CP-30580	4	4
110 MANIFOLD ASSEMBLY (LPG)	106000045	1	1	404 FIXING BRACKET	AH69-310	2		802 NYLON WASHER	CF83-41430	4	4
110 MANIFOLD ASSEMBLY (NG)	106000059	1	1	405 PLUG BAND	109000018	1	1	803 SCREW	108000021	3	3
111 COMBUSTION CHAMBER PACKING	AU155-207-2	1	1	408 HOT WATER OUTLET(3/4 NPT)	107000087	1	1	804 SCREW	U217-449	2	2
112 COMBUSTION CHAMBER PACKING BOTTOM	106000050	1	1	409 STOP BRACKET	AU162-1876X01	1	1	805 SCREW	CP-20883-408UK	3	2
114 COMBUSTION CHAMBER FRONT	109000168	1	1	412 FILTER ASSY	H98-510-S	1	1	807 PLASTIC WASHER	AU48-174X01	6	6
115 COMBUSTION CHAMBER PACKIN G-2	106000046	1	1	413 COVER	109000130	1	1	810 O-RING	M10B-2-4	2	2
116 ELECTRODE KIT INCLUDES 1 ELECTRODE	104000192*	1	1	414 FIXING BRACKET	AU195-321X01		1	811 O-RING	M10B-2-3	1	1
117 FLAME ROD \AND 2 FLAME RODS	104000192*	2	2	700 PCB A	104000164*	1		813 O-RING	M10B-2-18	2	1
118 ELECTRODE HOLDER	109000127	1	1	700 PCB A	104000166*		1	814 O-RING	M10B-2-16	2	2
119 ELECTRODE PACKING	109000126	1	1	701 SUB PCB	105000067	1	1	815 O-RING	M10B-2-14	2	1
121 BACK PRESSURE JOINT	U242-312	1	1	702 COVER	109000164	1	1	817 O-RING	M10B-1-24	1	1
122 TUBE- G	109000198	1	1	703 EC COVER	109000173	1	1	818 PACKING	C36E1-6X01	2	2
123 PCB FIXING PLATE-VB	109000199	1	1	706 IGNITOR	105000068	1	1	819 HEXAGON HEAD SCREW	ZQAA0512UK	4	4
125 FAN MOTOR ALL ASSEMBLY	104000161*	1	1	707 HIGH TENSION CORD	BH38-710-240	1	1	820 HEXAGON HEAD SCREW	ZQAA0514UK	2	2
126 FAN CASING ALL ASSEMBLY	108000049	1	1	708 ELECTRODE SLEEVE	AU206-218	1	1	821 HEXAGON HEAD SCREW	ZQAA0508UK	2	2
127 FAN CONNECTING BRACKET	BH29-606X09	1	1	709 THERMISTOR	104000207*	1	1	822 SCREW	ZBA0512UK	3	3
128 FAN CONNECTING BRACKET PACKIN G	AU183-562	1	1	710 RETAINER (LARGE)	CP-90172	1	1	888 MANUAL	U287-1930	1	1
129 FAN MOTOR	108000051	1	1	711 TEMPERATURE FUSE FIXING	U217-676X02	4	4	889 TECH SHEET	U287-1817	1	1
131 JOINT FIXING PIPE	U245-566	Т	1								