



Tankless Water Heater Service Manual

V Series

Trade Name	Model	Trade Name	Model
R42e	REU-V1616W	R53i	REU-V2520FFU
C42e	REU-V1616WC	C53i	REU-V2520FFUC
R53e	REU-V2020W	R53i	REU-V2520FFUD
C53e	REU-V2020WC	C53i	REU-V2520FFUCD
R70e	REU-V2526W	R85i	REU-V2532FFU
R85e	REU-V2532W	C85i	REU-V2532FFUC
C85e	REU-V2532WC	R85iPLUS	REU-V2532FFUD
R85ePLUS	REU-V2532WD	C85iPLUS	REU-V2532FFUCD
C85ePLUS	REU-V2532WCD	R98i	REU-V3237FFU
R98e	REU-V3237W	C98i	REU-V3237FFUC
C98e	REU-V3237WC	R98iASME	REU-V3237FFU-ASME
R98eASME	REU-V3237W-ASME	C98iASME	REU-V3237FFUC-ASME
C98eASME	REU-V3237WC-ASME		

VA Series

Trade Name	Model	Trade Name	Model
V53e	REU-VAM1620W	R50LSi	REU-VA2019FFUD
R63LSe	REU-VA2024WD	R75LSi	REU-VA2528FFUD
R75LSe	REU-VA2528WD	R75LSi	REU-VA2528FFUD(A)
R75LSe	REU-VA2528WD(A)	R94LSi	REU-VA2535FFUD
R94LSe	REU-VA2535WD	R98LSi	REU-VA3237FFU
R98LSe	REU-VA3237W	R98LSiASME	REU-VA3237FFU-ASME
R98LSeASME	REU-VA3237W-ASME		

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Key to Trade Names in this Manual:

R/C Indicates both the residential and commercial versions. R/C42e includes R42e and C42e.

(PLUS) Indicates that the Designer Plus models are included. R/C85ePLUS includes R85e, C85e, and R85ePLUS. On the side of the water heater, the trade name includes a "D", as in R85De.

(ASME) Indicates that the ASME models are included. R98LSe(ASME) includes the R98LSe and R98LSeASME.

General Information

Safety Definitions



This is the safety alert symbol. This symbol alerts you to potential hazards that can kill or hurt you and others.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

Using this Manual

Repairs should be performed by a qualified service technician.

The following information can be referenced for additional information.

- Operation and Installation Manual
- Hot Water System Design Manual
- Technical Sheets
- Technical Bulletins

Technical Support

Technicians are available to assist in servicing issues. Contact Rinnai Technical Services at 1-800-621-9419.

Recommended Tools

- Volt/Ohm/Amp meter with test probes
- Digital manometer or U tube type manometer with 14 inch water column (W.C.) scale, a hose and two 1/8 inch taps
- assorted wrenches including a 3/16 Allen wrench
- assorted screw drivers
- leak solution or leak detector
- Teflon tape



There are a number of live tests that are required when fault finding this product. Extreme care should be used at all times to avoid contact with energized components inside the water heater. Before checking for resistance readings disconnect the power source to the unit and isolate the item from the circuit (unplug it).



Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

If any of the original wire as supplied with the appliance must be replaced, it must be replaced with type 18 AWG wire or its equivalent.

Specifications

V Series - Commercial - Outdoor

Trade Name	Model	Max. BTU	Min. BTU	Max Flow [1] gal/min (liters/min)	Temperature Range
C42e	REU-V1616WC	120,000	17,100 (NG) 17,800 (LP)	4.2 (16)	120 - 185 °F (49-85 °C)
C53e	REU-V2020WC	150,000	19,000 (NG) 20,200 (LP)	5.3 (20)	120 - 185 °F (49-85 °C)
C85e	REU-V2532WC	199,000	15,000	8.5 (32)	98 - 185 °F (37-85 °C)
C85ePLUS	REU-V2532WCD	199,000	15,000	8.5 (32)	98 - 185 °F (37-85 °C)
C98e	REU-V3237WC	237,000	19,000	9.8 (37)	98 - 185 °F (37-85 °C)
C98eASME	REU-V3237WC-ASME	237,000	19,000	9.8 (37)	98 - 185 °F (37-85 °C)

V Series - Commercial - Indoor

Trade Name	Model	Max. BTU	Min. BTU	Max Flow [1] gal/min (liters/min)	Temperature Range
C53i	REU-V2520FFUC	180,000	15,000	5.3 (20)	120 - 185 °F (49-85 °C)
C53iPLUS	REU-V2520FFUCD	180,000	15,000	5.3 (20)	120 - 185 °F (49-85 °C)
C85i	REU-V2532FFUC	180,000	15,000	8.5 (32)	98 - 185 °F (37-85 °C)
C85iPLUS	REU-V2532FFUCD	180,000	15,000	8.5 (32)	98 - 185 °F (37-85 °C)
C98i	REU-V3237FFUC	237,000	19,000	9.8 (37)	98 - 185 °F (37-85 °C)
C98iASME	REU-V3237FFUC-ASME	237,000	19,000	9.8 (37)	98 - 185 °F (37-85 °C)

V Series - Residential - Outdoor

Trade Name	Model	Max. BTU	Min. BTU	Max Flow [1] gal/min (liters/min)	Temperature Range
R42e	REU-V1616W	120,000	17,100 (NG) 17,800 (LP)	4.2 (16)	98 - 140 °F (37-60 °C)
R53e	REU-V2020W	150,000	19,000 (NG) 20,200 (LP)	5.3 (20)	98 - 140 °F (37-60 °C)
R70e	REU-V2526W	199,000	15,000	7.0 (26)	98 - 140 °F (37-60 °C)
R85e	REU-V2532W	199,000	15,000	8.5 (32)	98 - 140 °F (37-60 °C)
R85ePLUS	REU-V2532WD	199,000	15,000	8.5 (32)	98 - 140 °F (37-60 °C)
R98e	REU-V3237W	237,000	19,000	9.8 (37)	98 - 140 °F (37-60 °C)
R98eASME	REU-V3237W-ASME	237,000	19,000	9.8 (37)	98 - 140 °F (37-60 °C)

V Series - Residential - Indoor

Trade Name	Model	Max. BTU	Min. BTU	Max Flow [1] gal/min (liters/min)	Temperature Range
R53i	REU-V2520FFU	180,000	15,000	5.3 (20)	98 - 140 °F (37-60 °C)
R53iPLUS	REU-V2520FFU	180,000	15,000	5.3 (20)	98 - 140 °F (37-60 °C)
R85i	REU-V2532FFU	180,000	15,000	8.5 (32)	98 - 140 °F (37-60 °C)
R85iPLUS	REU-V2532FFUD	180,000	15,000	8.5 (32)	98 - 140 °F (37-60 °C)
R98i	REU-V3237FFU	237,000	19,000	9.8 (37)	98 - 140 °F (37-60 °C)
R98iASME	REU-V3237FFU-ASME	237,000	19,000	9.8 (37)	98 - 140 °F (37-60 °C)

[1] Minimum activation flow is approximately 0.6 gallons/minute (2.3 liters/min)

Specifications

VA Series (LS Series) - Residential or Commercial - Outdoor

Trade Name	Model	Max. BTU	Min. BTU	Max Flow [1] gal/min (liters/min)	Temperature Range
R63LSe	REU-VA2024WD-US	150,000	21,500 (NG) 20,600 (LP)	6.3 (24)	98 - 140 °F (37-60 °C) [2]
R75LSe	REU-VA2528WD-US	199,000	15,000	7.5 (28)	98 - 140 °F (37-60 °C) [2]
R75LSe	REU-VA2528WD(A)-US	180,000	15,000	7.5 (28)	98 - 140 °F (37-60 °C) [2]
R94LSe	REU-VA2535WD-US	199,000	15,000	9.4 (35)	98 - 140 °F (37-60 °C) [3]
R98LSe	REU-VA3237W-US	237,000	19,000	9.8 (37)	98 - 140 °F (37-60 °C) [3]
R98LSeASME	REU-VA3237W-ASME	237,000	19,000	9.8 (37)	98 - 140 °F (37-60 °C) [3]

VA Series (LS Series) - Residential or Commercial - Indoor

Trade Name	Model	Max. BTU	Min. BTU	Max Flow [1] gal/min (liters/min)	Temperature Range
R50LSi	REU-VA2019FFUD-US	150,000	15,000	5.0 (19)	98 - 140 °F (37-60 °C) [2]
R75LSi	REU-VA2528FFUD-US	199,000	15,000	7.5 (28)	98 - 140 °F (37-60 °C) [2]
R75LSi	REU-VA2528FFUD(A)- US	180,000	15,000	7.5 (28)	98 - 140 °F (37-60 °C) [2]
R94LSi	REU-VA2535FFUD-US-N	199,000	15,000	9.4 (35)	98 - 140 °F (37-60 °C) [3]
R94LSi	REU-VA2535FFUD-US-P	190,000	15,000	9.4 (35)	98 - 140 °F (37-60 °C) [3]
R98LSi	REU-VA3237FFU-US	237,000	19,000	9.8 (37)	98 - 140 °F (37-60 °C) [3]
R98LSiASME	REU-VA3237FFU-ASME	237,000	19,000	9.8 (37)	98 - 140 °F (37-60 °C) [3]

VA Series - Residential - Outdoor

Trade Name	Model	Max. BTU	Min. BTU	Max Flow [1] gal/min (liters/min)	Temperature Range
V53e	REU-VAM1620W-US	120,000	19,000 (NG) 20,200 (LP)	5.3 (20)	98 - 140 °F (37-60 °C)

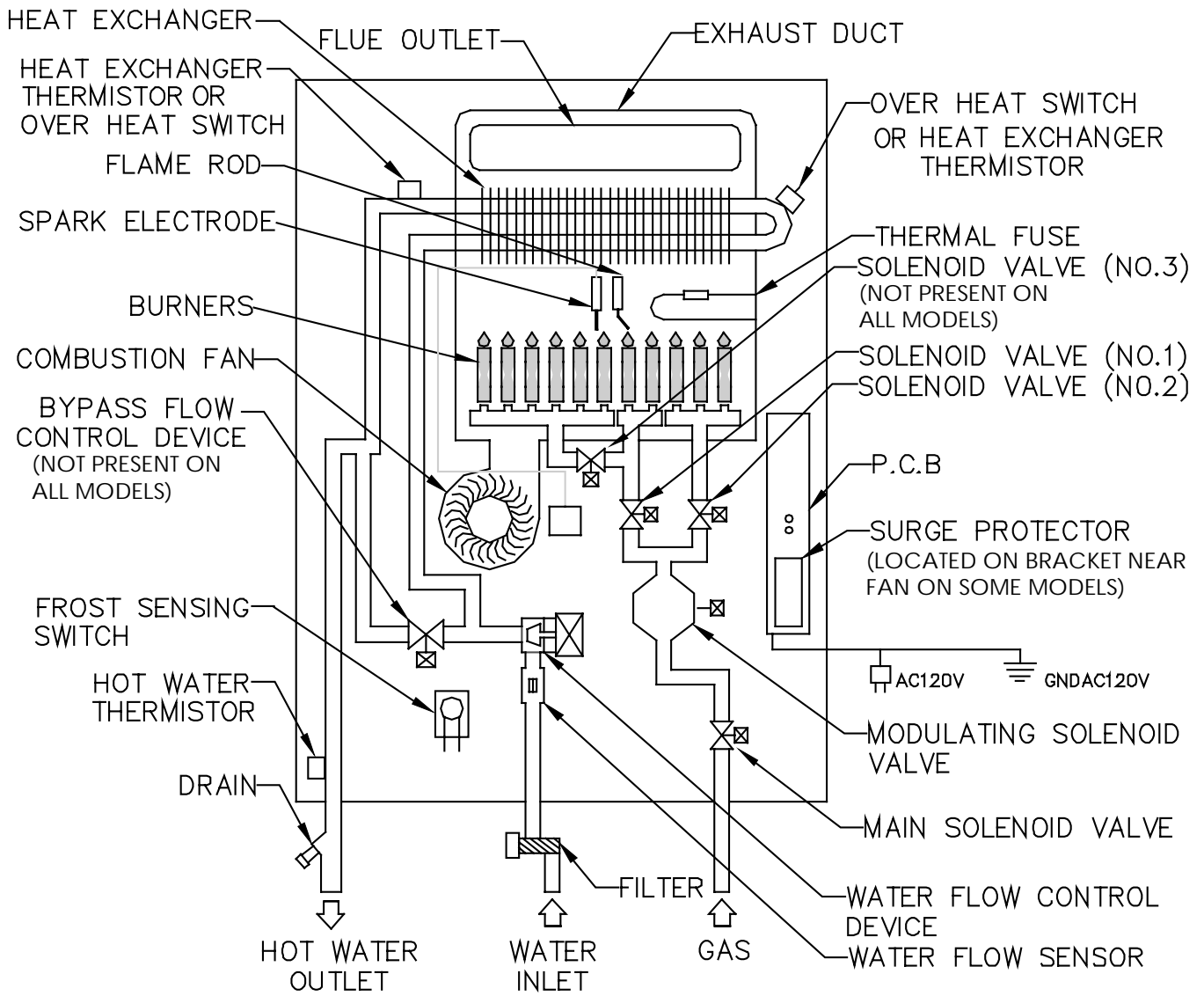
[1] Minimum activation flow is approximately 0.6 gallons/minute (2.3 liters/min)

[2] Max temperature is 160 °F (71 °C) with the MCC-91 controller for commercial and hydronic applications only.

[3] Max temperature is 185 °F (85 °C) with the MCC-91 controller for commercial and hydronic applications only.

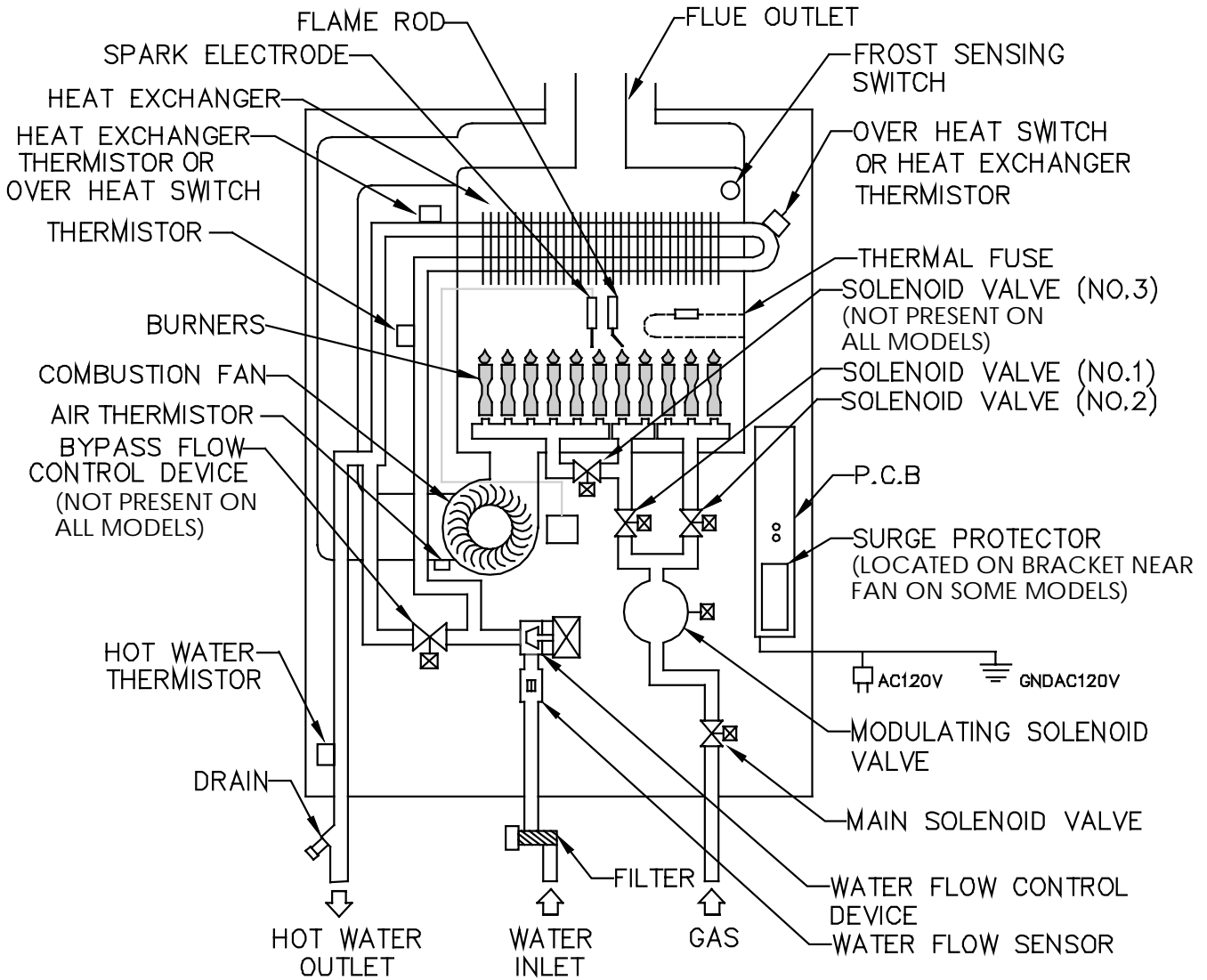
Schematic Diagrams

Outdoor Model



Schematic Diagrams

Indoor Model



Fault Isolation

The Rinnai water heater has the ability to check its own operation continuously. If a fault occurs, an error code will flash on the display of the remote controller. This assists with diagnosing the fault and may enable you to overcome a problem without a service call.

⚠ WARNING Some of the checks below may need to be done by a qualified service technician. Call a service technician for any remedy that involves gas or electricity. Call a service technician if you have any doubt or reservation about performing the remedy yourself.

Accessing Operating Information

Models MC-91 and MCC-91

To display the most recent error codes press and hold the “On/Off” button for 2 seconds. While holding the “On/Off” button press the ▲ button. The last 9 error codes will flash one after the other. To exit this mode press the “On/Off” and ▲ button as before.

To display the water flow through the water heater press and hold the ▲ button for 2 seconds and without releasing the ▲ button press the “On/Off” button.

To display the outlet water temperature press and hold the ▼ button for 2 seconds and without releasing the ▼ button press the “On/Off” button.

Operation

- 1. Water Flow Begins.**
 - Water Flow Sensor sends pulses to the PC Board.
 - PC Board senses flow greater than 0.6 GPM (approximate).
 - Firing Sequence begins.
- 2. Firing Sequence.**
 - PC Board monitors inlet/outlet water temperature, temperature set point, and water flow rate.
 - Combustion fan energized. Purges combustion chamber.
 - Spark igniter begins sparking.
 - Gas control valve opens to minimum fire rate.
 - Flame rod proves ignition.
 - Spark igniter stops sparking.
- 3. Normal Operation.**
 - PC Board monitors flame rod, fan motor frequency, outlet water temperature, controller temperature set point and water flow rate.
 - Gas control valve modulates gas input to required firing rate.
 - Combustion fan speed is adjusted for the required firing rate.
 - Water flow control valve is adjusted as needed.
- 4. Shut-down Sequence.**
 - PC Board senses flow rate less than 0.5 gpm (approximate).
 - Gas control valve closes.
 - Water flow control valve resets to standby position.
 - Combustion fan runs for a short period of time at low speed.
- 5. Standby Mode.**
 - PC Board monitors water temperature and remote controls.
 - Freeze protection is activated as needed.

Fault Isolation

Code	Fault	Remedy
02	No burner operation during freeze protection mode	Service Call
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	<p>Ensure Rinnai approved venting materials are being used.</p> <p>Check that nothing is blocking the flue inlet or exhaust.</p> <p>Check all vent components for proper connections.</p> <p>Ensure vent length is within limits.</p> <p>Ensure condensation collar was installed correctly.</p> <p>Verify dip switches are set properly.</p> <p>Check fan for blockage.</p>
11	No Ignition	<p>Check that the gas is turned on at the water heater, gas meter, or cylinder.</p> <p>Ensure gas type and pressure is correct.</p> <p>Ensure gas line, meter, and/or regulator is sized properly.</p> <p>Bleed all air from gas lines.</p> <p>Verify dip switches are set properly.</p> <p>Ensure appliance is properly grounded.</p> <p>Disconnect EZConnect or MSA controls to isolate the problem.</p> <p>Ensure igniter is operational.</p> <p>Check igniter wiring harness for damage.</p> <p>Check gas solenoid valves for open or short circuits.</p> <p>Remove burner cover and ensure all burners are properly seated.</p> <p>Remove burner plate and inspect burner surface for condensation or debris.</p>
12	Flame Failure	<p>Check that the gas is turned on at the water heater and gas meter. Check for obstructions in the flue outlet.</p> <p>Ensure gas line, meter, and/or regulator is sized properly.</p> <p>Ensure gas type and pressure is correct.</p> <p>Bleed all air from gas lines.</p> <p>Ensure proper Rinnai venting material was installed.</p> <p>Ensure condensation collar was installed properly.</p> <p>Ensure vent length is within limits.</p> <p>Verify dip switches are set properly.</p> <p>Ensure appliance is properly grounded.</p> <p>Disconnect keypad.</p> <p>Disconnect EZConnect or MSA controls to isolate the problem.</p> <p>Check power supply for loose connections.</p> <p>Check power supply for proper voltage and voltage drops.</p> <p>Ensure flame rod wire is connected.</p> <p>Remove flame rod and check for carbon build-up; clean with sand paper or emery cloth.</p> <p>Disconnect and reconnect all wiring harnesses on unit and PC board.</p> <p>Check all components for electrical short.</p> <p>Check gas solenoid valves for open or short circuits.</p> <p>Remove burner plate and inspect burner surface for condensation or debris.</p>

Fault Isolation

Code	Fault	Remedy
14	Thermal Fuse	<p>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-cycling. Ensure dip switches are set to the proper position. Check for foreign materials in combustion chamber and/or 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.</p>
16	Over Temperature Warning	<p>Check for restrictions in air flow around unit and vent terminal. Check for low water flow in a circulating system causing short-cycling. Check for foreign materials in combustion chamber and/or exhaust piping. Check for clogged heat exchanger.</p>
32	Outgoing Water Temperature Sensor Fault	<p>Check sensor wiring for damage. Measure resistance of sensor. Clean sensor of scale build-up. Replace sensor.</p>
33	Heat Exchanger Outgoing Temperature Sensor Fault	<p>Check sensor wiring for damage. Measure resistance of sensor. Clean sensor of scale build-up. Replace sensor.</p>
34	Combustion Air Temperature Sensor Fault	<p>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. Ensure fan blade is tight on motor shaft and is in good condition. Replace sensor.</p>
52	Modulating Solenoid Valve Signal Abnormal	<p>Check modulating gas solenoid valve wiring harness for loose or damaged terminals. Measure resistance of valve coil.</p>
61	Combustion Fan Failure	<p>Ensure fan will turn freely. Check wiring harness to motor for damaged and/or loose connections. Measure resistance of motor winding.</p>
65	Water Flow Control Fault	<p>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 state qualified or licensed contractor to service the appliance.</p>
71	SV0, SV1, SV2, and SV3 Solenoid Valve Circuit Fault	<p>Check wiring harness to all solenoids for damage and/or loose connections. Measure resistance of each solenoid valve coil.</p>
72	Flame Sensing Device Fault	<p>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 sand paper or emery cloth. 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.</p>
LC	Scale Build-up in Heat Exchanger (when checking maintenance code history, "00" is substituted for "LC")	<p>Flush heat exchanger. Refer to instructions in manual. Replace heat exchanger. NOTE: The LC code is the only code that will allow the unit to keep running. The display will alternate between the LC code and the temperature setting. The controller will continue to beep. The LC code will reset if power is turned off and then on.</p>
No code	Nothing happens when water flow is activated.	<p>Clean inlet water supply filter. On new installations ensure hot and cold water lines are not reversed. 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 water is flowing, there is bleed over in your plumbing. Ensure you have at least the minimum flow rate required to fire unit. Ensure turbine spins freely. Measure the resistance of the water flow control sensor.</p>

Electrical Diagnostic Points

R/C42e, R/C53e

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
(TR) Transformer				
Black - White	90 - 100 VAC	51-63 ohms	F9	1 ~ 2
Blue - Brown	108 - 132 VAC	51-63 ohms	F7	1 ~ 3
(SV1, SV2, SV3, POV) Gas Valve and Modulating Solenoids				
(Main) Pink - Black	80 - 100 VDC	1.7 - 2 K ohms	E1	1 ~ 2
(SV1) Black - Blue			E2	2 ~ 3
(SV2) Black - Yellow			E3	2 ~ 4
(POV) Pink - Pink	2 - 15 VDC	67 - 81 ohms	C2	3 ~ 4
(M) Water Flow Servo				
Red - Blue	11 - 13 VDC	22 - 26 ohms	B1	9 ~ 10
Gray - Brown	4 - 6 VDC	N/A	B1	5 ~ 7
Gray - Yellow	N/A	N/A	B1	5 ~ 8
Gray - Orange	11 - 14 VDC	N/A	B1	5 ~ 6
NOTE: At the B connector on the PCB: gray wire turns to black, orange wire turns to red				
(QS) Water Flow Sensor				
Black - Red	11 - 13 VDC	5.5 - 6.2 K ohms	B3	5 ~ 6
Yellow - Black	4 - 7 VDC	1 - 1.4 mega ohms	B3	1 ~ 5
Bypass Flow Control (only on R/C85e, R/C85ePLUS, R/C85i, R/C85iPLUS)				
Brown - White	2 - 6 VDC (unit in operating mode)	15 - 35 K ohms	G1	4 ~ 5
Orange - White				2 ~ 5
Yellow - White				1 ~ 5
Red - White/Ground				3 ~ 5
(IG) Ignition System				
Gray - Gray	90 - 100 VAC	N/A	F1	1 ~ 2
(FM) Combustion Fan Motor				
Red - Black	6 - 45 VDC	N/A	A1	1 ~ 2
White - Black	5 - 10 VDC	9.2 - 9.4 K ohms	A1	2 ~ 4
Yellow - Black	11 ~ 13 VDC	3.5 - 3.9 K ohms	A1	2 ~ 3
With the meter set on hertz scale, 60-350 hertz should be across the red and yellow wires at terminals 2 and 3.				

Electrical Diagnostic Points

R/C42e, R/C53e

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
Thermal Fuse / Overheat Switch				
Red - Red	12 VDC	below 1 ohm	B - C	B6 ~ C1
Flame Rod				
Place one lead of the meter to the flame rod and the other to ground. With the unit running, 5-150 VAC should be read. Set the meter to the μ amp scale and series the meter in line with the flame rod. Proper flame circuit should read 1 μ amp or greater. If not, then remove the flame rod and check for carbon and damage.				
Thermistors				
Check all thermistors by inserting meter leads into each end of the thermistor plug. Set the meter to the 20 K ohm scale and read resistance. Applying heat to the thermistor bulb should decrease the resistance. Applying ice to the thermistor bulb should increase the resistance. Typical resistance values are: 11.4-14 K ohm for 59°F; 6.4-7.8 K ohm for 86°F; 3.6-4.5 K ohm for 113°F; 2.2-2.7 K ohm for 140°F; 0.6-0.8 K ohm for 221°F				
Outgoing Water Thermistor				
White - White	see above		B	B3 ~ B4
Heat Exchanger Temperature Thermistor				
White - White	see above		B	B3 ~ B12
Surge Protector				
Blue - Brown	108 - 132 VAC	N/A	F4	1 ~ 2
Blue - Brown	108 - 132 VAC	N/A	F3	1 ~ 3
With the power off, check the continuity through the surge protector. Check by placing one meter lead on the top pin #1 and bottom pin #2. Check by placing one meter lead on the top pin #3 and bottom pin #1. If there is continuity across both sets of points, then the surge protector is good.				
Controller				
Terminals D1	10 - 13 VDC digital	1.5 - 1.9 K ohms	D	1 ~ 3
Frost Protection				
There are electrical heating elements mounted at different points to protect the water heater from freezing.				
heaters located on the hot water outlet line		26 - 30 ohms		
heater located on heat exchanger piping		81 - 86 ohms		
heater located on water flow sensor		16 - 19 ohms		
Amp fuses				
There are two inline 3 amp glass fuses. Remove the fuse and check continuity through it. If there is continuity then the fuse is good.				

Electrical Diagnostic Points

R70e, R/C85e(PLUS),
R/C53i(PLUS), R/C85i(PLUS)

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
(TR) Transformer				
Black - White	90 - 100 VAC	51-63 ohms	F9	1 ~ 2
Blue - Brown	108 - 132 VAC	51-63 ohms	F7	1 ~ 3
(SV1, SV2, SV3, POV) Gas Valve and Modulating Solenoids				
(Main) Pink - Black	80 - 100 VDC	1.7 - 2 K ohms	E1	1 ~ 2
(SV1) Black - Yellow			E2	2 ~ 3
(SV2) Black - Blue			E3	2 ~ 4
(SV3) Black - Brown			E4	2 ~ 5
(POV) Pink - Pink	2 - 15 VDC	67 - 81 ohms	C2	3 ~ 4
(M) Water Flow Servo				
Red - Blue	11 - 13 VDC	22 - 26 ohms	B	9 ~ 10
Gray - Brown	4 - 6 VDC	N/A	B	5 ~ 7
Gray - Yellow	N/A	N/A	B	5 ~ 8
Gray - Orange	11 - 14 VDC	N/A	B	5 ~ 6
NOTE: At the B connector on the PCB: gray wire turns to black, orange wire turns to red				
(QS) Water Flow Sensor				
Black - Red	11 - 13 VDC	5.5 - 6.2 K ohms	B	5 ~ 6
Yellow - Black	4 - 7 VDC	1 - 1.4 mega ohms	B	1 ~ 5
Bypass Flow Control (only on R/C85e, R/C85ePLUS, R/C85i, R/C85iPLUS)				
Brown - White	2 - 6 VDC (unit in operating mode)	15 - 35 K ohms	G1	4 ~ 5
Orange - White				2 ~ 5
Yellow - White				1 ~ 5
Red - White/Ground				3 ~ 5
(IG) Ignition System				
Gray - Gray	90 - 100 VAC	N/A	F8	1 ~ 2
(FM) Combustion Fan Motor				
Red - Black	6 - 45 VDC	N/A	A1	1 ~ 2
White - Black	5 - 10 VDC	9.2 - 9.4 K ohms	A1	2 ~ 4
Yellow - Black	11 ~ 13 VDC	3.5 - 3.9 K ohms	A1	2 ~ 3
With the meter set on hertz scale, 60-350 hertz should be across the red and yellow wires at terminals 2 and 3.				

Electrical Diagnostic Points

R70e, R/C85e(PLUS),
R/C53i(PLUS), R/C85i(PLUS)

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
Thermal Fuse / Overheat Switch				
Red - Red	12 VDC	below 1 ohm	B - C	B6 ~ C1
Flame Rod				
Place one lead of the meter to the flame rod and the other to ground. With the unit running, 5-150 VAC should be read. Set the meter to the μ amp scale and series the meter in line with the flame rod. Proper flame circuit should read 1 μ amp or greater. If not, then remove the flame rod and check for carbon and damage.				
Thermistors				
Check all thermistors by inserting meter leads into each end of the thermistor plug. Set the meter to the 20 K ohm scale and read resistance. Applying heat to the thermistor bulb should decrease the resistance. Applying ice to the thermistor bulb should increase the resistance. Typical resistance values are: 11.4-14 K ohm for 59°F; 6.4-7.8 K ohm for 86°F; 3.6-4.5 K ohm for 113°F; 2.2-2.7 K ohm for 140°F; 0.6-0.8 K ohm for 221°F				
Outgoing Water Thermistor				
White - White	see above		B	B3 ~ B4
Heat Exchanger Temperature Thermistor				
White - White	see above		B	B3 ~ B12
Surge Protector				
Blue - Brown	108 - 132 VAC	N/A	F6	1 ~ 2
Blue - Brown	108 - 132 VAC	N/A	F7	1 ~ 3
With the power off, check the continuity through the surge protector. Check by placing one meter lead on the top pin #1 and bottom pin #2. Check by placing one meter lead on the top pin #3 and bottom pin #1. If there is continuity across both sets of points, then the surge protector is good.				
Controller				
Terminals D1	10 - 13 VDC digital	1.5 - 1.9 K ohms	D	1 ~ 3
Frost Protection				
There are electrical heating elements mounted at different points to protect the water heater from freezing.				
heaters located on the hot water outlet line		26 - 30 ohms		
heater located on heat exchanger piping		81 - 86 ohms		
heater located on water flow sensor		16 - 19 ohms		
Amp fuses				
There are two inline 3 amp glass fuses. Remove the fuse and check continuity through it. If there is continuity then the fuse is good.				

Electrical Diagnostic Points

R/C98e(ASME),
R/C98i(ASME)

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
(SV1, SV2, SV3, POV) Gas Valve and Modulating Solenoids				
(Main) Pink - Black	11 - 13 VDC	24 - 28 ohms	F1	4 ~ 5(F)
(SV1) Black - Red			F2	3 ~ 4(F)
(SV2) Black - Orange			F3	2 ~ 4(F)
(SV3) Black - Yellow			F4	1 ~ 4(F)
(POV) Orange - Orange	3 - 15 VDC	67 - 81 ohms	E2	3 ~ 4(E)
(M) Water Flow Servo				
Red - Blue	11 - 13 VDC	N/A	G6	5 ~ 6(G)
Gray - Brown (closed position)	below 1 VDC	Limiter On	G6	8 ~ 11(G)
	4 - 6 VDC	Limiter Off		
Gray - Yellow (open position)	below 1 VDC	Limiter On	G6	7 ~ 11(G)
	4 - 6 VDC	Limiter Off		
NOTE: At the G connector on the PCB: gray wire turns to black				
(QS) Water Flow Sensor				
Black - Red	11 - 13 VDC	N/A	G3	9 ~ 15(G)
Yellow - Black	4 - 7 VDC	N/A	G3	11 ~ 15(G)
Bypass Flow Control				
Brown - White	2 - 6 VDC (unit in operating mode)	15 - 35 K ohms	H1	1(H) ~ 9(G)
Orange - White				3(H) ~ 9(G)
Yellow - White				4(H) ~ 9(G)
Red - White/Ground				2(H) ~ 9(G)
NOTE: At the G connector on the PCB: white wire turns to red				
(IG) Ignition System				
Gray - Gray	90 - 100 VAC	N/A	C1	1 ~ 2(C)
(FM) Combustion Fan Motor				
Red - Black	6 - 45 VDC	N/A	B1	1 ~ 2(B)
White - Black	5 - 10 VDC	N/A	B1	2 ~ 4(B)
Yellow - Black	11 ~ 13 VDC	N/A	B1	2 ~ 3(B)
With the meter set on hertz scale, 17-460 hertz should be across the white and black wires at terminals 2 and 4.				

Electrical Diagnostic Points

R/C98e(ASME),
R/C98i(ASME)

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
Thermal Fuse				
Blue - Red	12 VDC	below 1 ohm	E6	10(G) ~ 1(E)
Overheat Switch				
Blue - Red	12 VDC	below 1 ohm	F1	N/A
Flame Rod				
Place one lead of the meter to the flame rod and the other to ground. With the unit running, 5-150 VAC should be read. Set the meter to the μ amp scale and series the meter in line with the flame rod. Proper flame circuit should read 1 μ amp or greater. If not, then remove the flame rod and check for carbon build-up. Clean with sand paper or emery cloth.				
Thermistors				
Check all thermistors by inserting meter leads into each end of the thermistor plug. Set the meter to the 20 K ohm scale and read resistance. Applying heat to the thermistor bulb should decrease the resistance. Applying ice to the thermistor bulb should increase the resistance. Typical resistance values are: 11.4-14 K ohm for 59°F; 6.4-7.8 K ohm for 86°F; 3.6-4.5 K ohm for 113°F; 2.2-2.7 K ohm for 140°F; 0.6-0.8 K ohm for 221°F				
Outgoing Water Thermistor				
White - White	see above		G5	12 ~ 13(G)
Heat Exchanger Temperature Thermistor				
White - White	see above		G4	4 ~ 13(G)
Surge Protector				
Black - White	108 - 132 VAC	N/A	D1	1 ~ 2(D)
Black - White	108 - 132 VAC	N/A	D2	
With the power off, check the continuity through the surge protector. Check by placing one meter lead on the top pin #1 and bottom pin #2. Check by placing one meter lead on the top pin #2 and bottom pin #1. If there is continuity across both sets of points, then the surge protector is good.				
Controller				
Black - Black	10 - 13 VDC digital	N/A	A1	1 ~ 3(A)
Frost Protection				
White - White	120 VAC *	150 ohms	D4	N/A
White - White	60 VAC *	360 ohms	D5	N/A
White - White	60 VAC*	360 ohms	D6	N/A
* only when Frost Sensing Switch (D3) is ON				
Amp fuses				
There are two inline 3 amp glass fuses. Remove the fuse and check continuity through it. If there is continuity then the fuse is good.				

Electrical Diagnostic Points

V53e, R63LSe

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
(SV1, SV2, SV3, POV) Gas Valve and Modulating Solenoids				
(Main) Pink - Black	11 - 13 VDC	37 - 43 ohms	F5	8 ~ 9
(SV1) Black - Blue		35 - 41 ohms	F6	9 ~ 10
(SV2) Black - Yellow		37 - 43 ohms	F7	9 ~ 11
(POV) Pink - Pink	2 - 15 VDC	67 - 81 ohms	F3	3 ~ 4
(M) Water Flow Servo				
Red - Blue	11 - 13 VDC	22 - 28 ohms	E5	9 ~ 8
Gray - Brown	4 - 6 VDC	N/A	E5	4 ~ 5
Gray - Yellow	N/A	N/A	E5	4 ~ 6
NOTE: At the E connector on the PCB: gray wire turns to black				
(QS) Water Flow Sensor				
Black - Red	11 - 13 VDC	5.5 - 6.2 K ohms	E2	3 ~ 4
Yellow - Black	4 - 7 VDC	1 - 1.4 mega ohms	E2	1 ~ 4
(IG) Ignition System				
Gray - Gray	90 - 110 VAC	N/A	B1	1 ~ 2
(FM) Combustion Fan Motor				
Red - Black	6 - 45 VDC	N/A	D1	1 ~ 2
White - Black	5 - 10 VDC	9.2 - 9.4 K ohms	D1	4 ~ 2
Yellow - Black	11 ~ 13 VDC	3.5 - 3.9 K ohms	D1	3 ~ 2
With the meter set on hertz scale, 60-420 hertz should be across the white and black wires at terminals 2 and 4.				

Electrical Diagnostic Points

V53e, R63LSe

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
Thermal Fuse / Overheat Switch				
Red - White	12 VDC	below 1 ohm	E6 F1	E5 ~ F1
Flame Rod				
Place one lead of the meter to the flame rod and the other to ground. With the unit running, 5-150 VAC should be read. Set the meter to the μ amp scale and series the meter in line with the flame rod. Proper flame circuit should read 1 μ amp or greater. If not, then remove the flame rod and check for carbon and damage.				
Thermistors				
Check all thermistors by inserting meter leads into each end of the thermistor plug. Set the meter to the 20 K ohm scale and read resistance. Applying heat to the thermistor bulb should decrease the resistance. Applying ice to the thermistor bulb should increase the resistance. Typical resistance values are: 11.4-14 K ohm for 59°F; 6.4-7.8 K ohm for 86°F; 3.6-4.5 K ohm for 113°F; 2.2-2.7 K ohm for 140°F; 0.6-0.8 K ohm for 221°F				
Outgoing Water Thermistor				
White - White	see above		E4	2 ~ 3
Heat Exchanger Temperature Thermistor				
Pink - White	see above		E3	2 ~ 10
Surge Protector				
Black - White	108 - 132 VAC	N/A	C2	1 ~ 3
Black - White	108 - 132 VAC	N/A	C1	
With the power off, check the continuity through the surge protector. Check by placing one meter lead on the top pin #1 and bottom pin #3. Check by placing one meter lead on the top pin #3 and bottom pin #1. If there is continuity across both sets of points, then the surge protector is good.				
Controller				
Terminals A1	10 - 13 VDC	1.5 - 3.0 K ohms	A	1 ~ 3
Frost Protection				
heaters located on the hot water outlet line		180 - 207 ohms		
heater located on heat exchanger piping		156 - 180 ohms		
heater located on water flow sensor		24 - 28 ohms		
Amp fuses				
There are two inline 3 amp glass fuses. Remove the fuse and check continuity through it. If there is continuity then the fuse is good.				

Electrical Diagnostic Points

R50LSi, R75LSe, R75LSi,
R94LSe, R94LSi

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
(SV1, SV2, SV3, POV) Gas Valve and Modulating Solenoids				
(Main) Pink - Black	11 - 13 VDC	36.8 - 44.8 ohms	H5	6 ~ 7
(SV1) Black - Yellow			H6	5 ~ 6
(SV2) Black - Blue			H7	4 ~ 6
(SV3) Black - Brown			H8	3 ~ 6
(POV) Pink - Pink	2 - 15 VDC	67 - 81 ohms	H3	9 ~ 10
(M) Water Flow Servo				
Red - Blue	11 - 13 VDC	22 - 26 ohms	F7	9 ~ 10
Gray - Brown	4 - 6 VDC	N/A	F7	5 ~ 7
Gray - Yellow	N/A	N/A	F7	5 ~ 8
NOTE: At the F connector on the PCB: gray wire turns to black, orange wire turns to red				
(QS) Water Flow Sensor				
Black - Red	11 - 13 VDC	5.5 - 6.2 K ohms	F2	1 ~ 3
Yellow - Black	4 - 7 VDC	1 - 1.4 mega ohms	F2	2 ~ 3
Bypass Flow Control (only on R94LSe and R94LSi)				
Brown - White	2 - 6 VDC (unit in operating mode)	15 - 35 K ohms	G1	1 ~ 5
Orange - White				2 ~ 5
Yellow - White				3 ~ 5
Red - White/Ground				4 ~ 5
(IG) Ignition System				
Gray - Gray	90 - 110 VAC	N/A	C1	1 ~ 2
(FM) Combustion Fan Motor				
Red - Black	6 - 45 VDC	N/A	E1	1 ~ 2
White - Black	5 - 10 VDC	9.2 - 9.4 K ohms	E1	2 ~ 4
Yellow - Black	11 ~ 13 VDC	3.5 - 3.9 K ohms	E1	2 ~ 3
With the meter set on hertz scale, 60-420 hertz should be across the red and yellow wires at terminals 2 and 4.				

Electrical Diagnostic Points

R50LSi, R75LSe, R75LSi,
R94LSe, R94LSi

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
Thermal Fuse / Overheat Switch				
Red - Red	11 - 13 VDC	below 1 ohm	F6 H1	F6 ~ H12
Flame Rod				
Place one lead of the meter to the flame rod and the other to ground. With the unit running, 5-150 VAC should be read. Set the meter to the μ amp scale and series the meter in line with the flame rod. Proper flame circuit should read 1 μ amp or greater. If not, then remove the flame rod and check for carbon and damage.				
Thermistors				
Check all thermistors by inserting meter leads into each end of the thermistor plug. Set the meter to the 20 K ohm scale and read resistance. Applying heat to the thermistor bulb should decrease the resistance. Applying ice to the thermistor bulb should increase the resistance. Typical resistance values are: 11.4-14 K ohm for 59°F; 6.4-7.8 K ohm for 86°F; 3.6-4.5 K ohm for 113°F; 2.2-2.7 K ohm for 140°F; 0.6-0.8 K ohm for 221°F				
Outgoing Water Thermistor				
White - White	see above		F5	3 ~ 4
Heat Exchanger Temperature Thermistor				
Pink - White	see above		F4	3 ~ 11
Intake Air Thermistor (only on R50LSi, R75LSi, R94LSi)				
Orange - White	see above		F3	3 ~ 12
Surge Protector				
Black - White	108 - 132 VAC	N/A	D2	1 ~ 3
Blue - Brown	108 - 132 VAC	N/A	D1	1 ~ 3
With the power off, check the continuity through the surge protector. Check by placing one meter lead on the top pin #1 and bottom pin #3. Check by placing one meter lead on the top pin #3 and bottom pin #1. If there is continuity across both sets of points, then the surge protector is good.				
Controller				
Terminals B1	10 - 13 VDC	1.5 - 3.0 K ohms	B	1 ~ 3
Frost Protection				
There are electrical heating elements mounted at different points to protect the water heater from freezing.				
heaters located on the hot water outlet line		180 - 207 ohms		
heater located on heat exchanger piping		156 - 180 ohms		
heater located on water flow sensor		24 - 28 ohms		
Amp fuses				
There are two inline 3 amp glass fuses. Remove the fuse and check continuity through it. If there is continuity then the fuse is good.				

Electrical Diagnostic Points

R98LSe(ASME),
R98LSi(ASME)

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
(SV1, SV2, SV3, POV) Gas Valve and Modulating Solenoids				
(Main) Pink - Black	11 - 13 VDC	24 - 28 ohms	H3	6 ~ 7
(SV1) Black - Red		37 - 43 ohms	H4	5 ~ 6
(SV2) Black - Orange		37 - 43 ohms	H5	4 ~ 6
(SV3) Black - Yellow		37 - 43 ohms	H6	3 ~ 6
(POV) Orange - Orange	2 - 15 VDC	67 - 81 ohms	H2	9 ~ 10
(M) Water Flow Servo				
Red - Blue	11 - 13 VDC	22 - 28 ohms	F5	9 ~ 10
Gray - Brown	4 - 6 VDC	N/A	F5	5 ~ 7
Gray - Yellow	N/A	N/A	F5	5 ~ 8
NOTE: At the F connector on the PCB: gray wire turns to black				
(QS) Water Flow Sensor				
Black - Red	11 - 13 VDC	5.5 - 6.2 K ohms	F2	1 ~ 3
Yellow - Black	4 - 7 VDC	1 - 1.4 mega ohms	F2	2 ~ 3
Bypass Flow Control				
Brown - White	2 - 6 VDC (unit in operating mode)	15 - 35 K ohms	G1	1 ~ 5
Orange - White				2 ~ 5
Yellow - White				3 ~ 5
Red - White/Ground				4 ~ 5
(IG) Ignition System				
Gray - Gray	90 - 110 VAC	N/A	C1	1 ~ 2
(FM) Combustion Fan Motor				
Red - Black	6 - 45 VDC	N/A	E1	1 ~ 2
White - Black	5 - 10 VDC	9.2 - 9.4 K ohms	E1	2 ~ 4
Yellow - Black	11 ~ 13 VDC	3.5 - 3.9 K ohms	E1	2 ~ 3
With the meter set on hertz scale, 60-420 hertz should be across the red and yellow wires at terminals 2 and 4.				

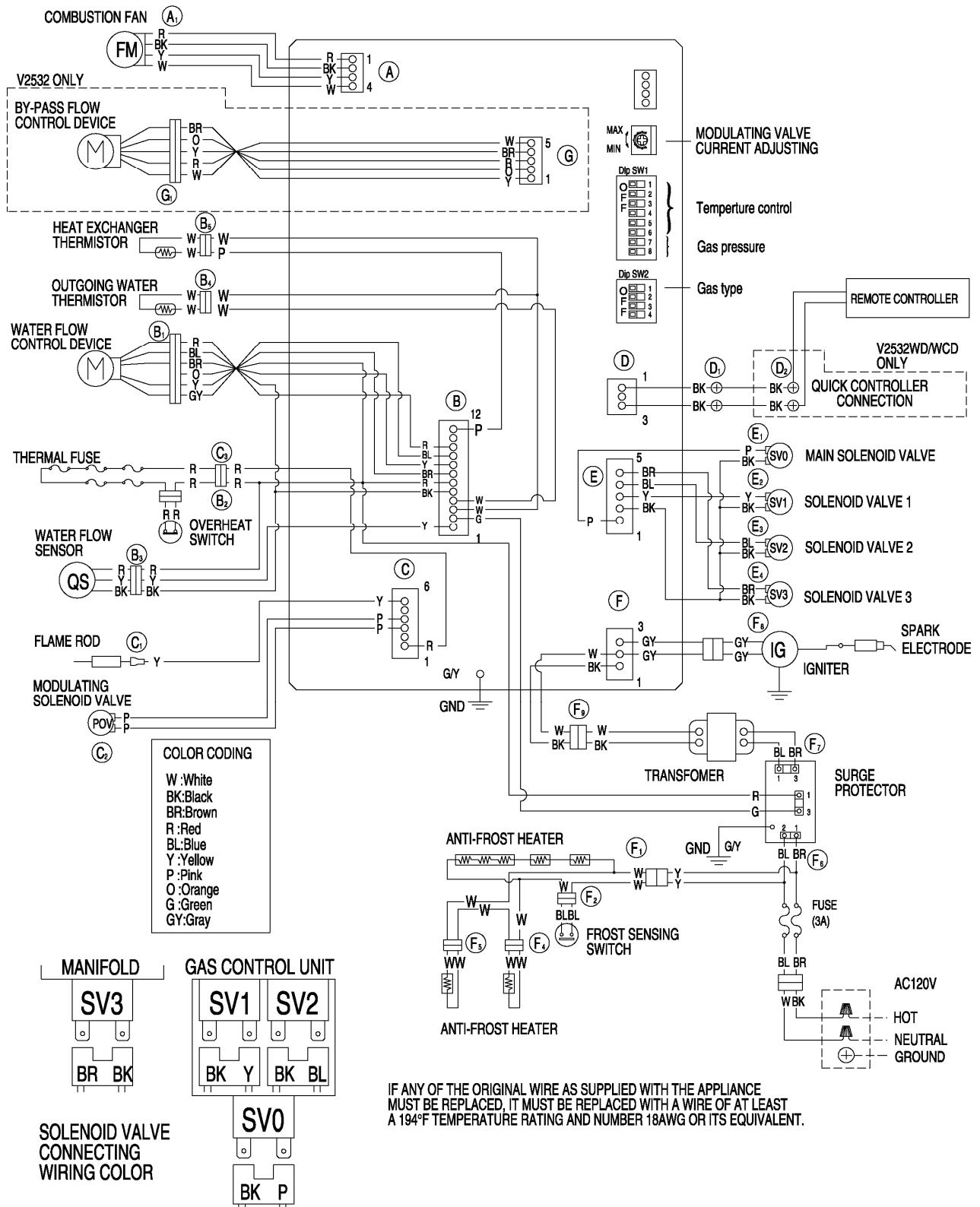
Electrical Diagnostic Points

R98LSe(ASME),
R98LSi(ASME)

Wire Color	Voltage	Resistance	Connector No.	Pin No.'s
Thermal Fuse / Overheat Switch				
Red - White	11 - 13 VDC	below 1 ohm	F6 H1	F6 ~ H12
Flame Rod				
Place one lead of the meter to the flame rod and the other to ground. With the unit running, 5-150 VAC should be read. Set the meter to the μ amp scale and series the meter in line with the flame rod. Proper flame circuit should read 1 μ amp or greater. If not, then remove the flame rod and check for carbon and damage.				
Thermistors				
Check all thermistors by inserting meter leads into each end of the thermistor plug. Set the meter to the 20 K ohm scale and read resistance. Applying heat to the thermistor bulb should decrease the resistance. Applying ice to the thermistor bulb should increase the resistance. Typical resistance values are: 11.4-14 K ohm for 59°F; 6.4-7.8 K ohm for 86°F; 3.6-4.5 K ohm for 113°F; 2.2-2.7 K ohm for 140°F; 0.6-0.8 K ohm for 221°F				
Outgoing Water Thermistor				
White - White	see above		F4	3 ~ 4
Heat Exchanger Temperature Thermistor				
Pink - White	see above		F3	3 ~ 11
Surge Protector				
Black - White	108 - 132 VAC	N/A	D2	1 ~ 3
Blue - Brown	108 - 132 VAC	N/A	D1	1 ~ 3
With the power off, check the continuity through the surge protector. Check by placing one meter lead on the top pin #1 and bottom pin #3. Check by placing one meter lead on the top pin #3 and bottom pin #1. If there is continuity across both sets of points, then the surge protector is good.				
Controller				
Terminals B1	10 - 13 VDC	1.5 - 3.0 K ohms	B	1 ~ 3
Frost Protection				
There are electrical heating elements mounted at different points to protect the water heater from freezing. Voltage through this circuit should be 120 VAC.				
heater located on the hot water outlet line		335 - 385 ohms		
heater located on heat exchanger piping		156 - 180 ohms		
heater located on water flow sensor		335 - 385 ohms		
Amp fuses				
There are two inline 3 amp glass fuses. Remove the fuse and check continuity through it. If there is continuity then the fuse is good.				

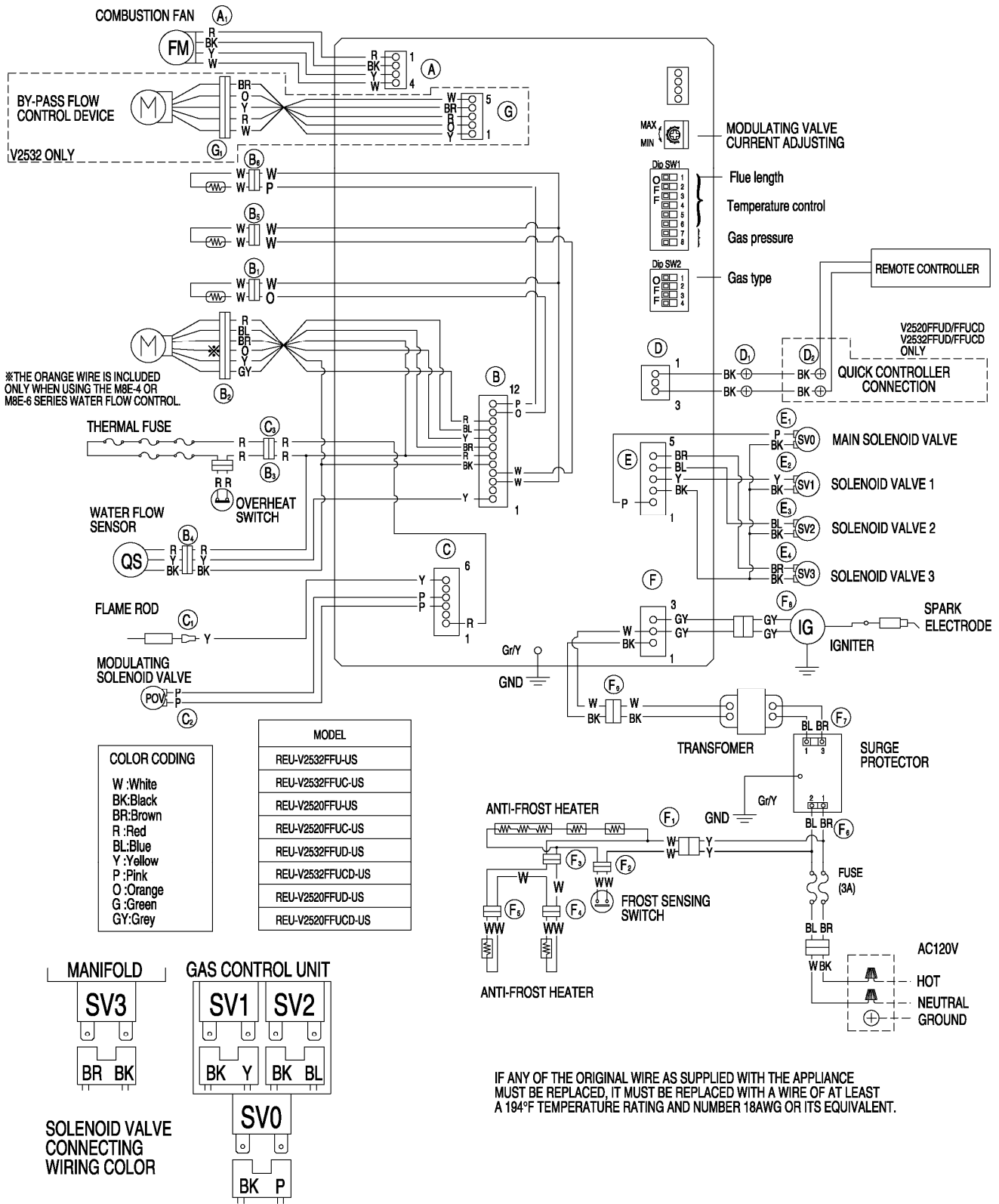
Wiring Diagram

R70e, R/C85e(PLUS)



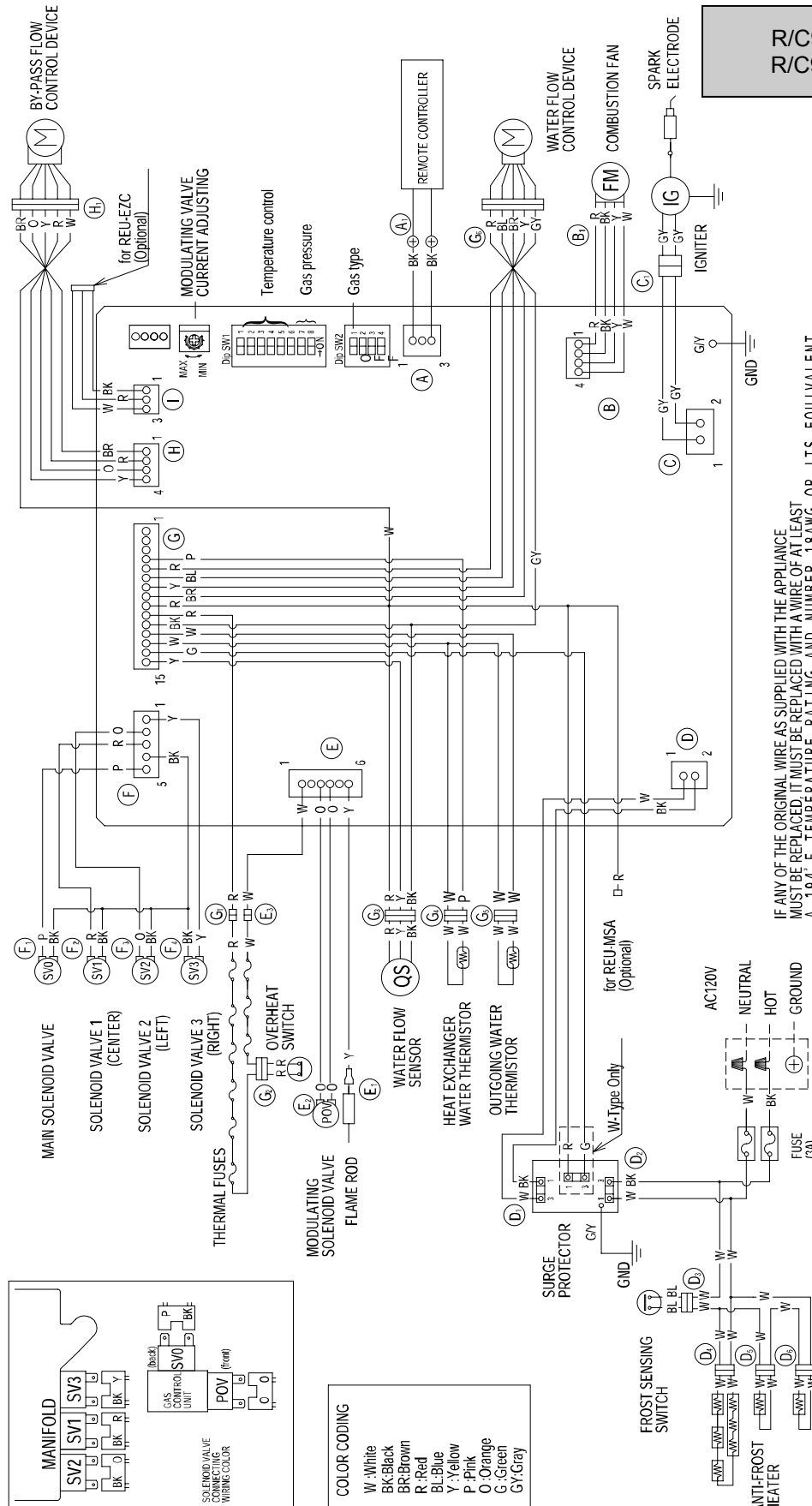
Wiring Diagram

R/C53i(PLUS),
R/C85i(PLUS)



Wiring Diagram

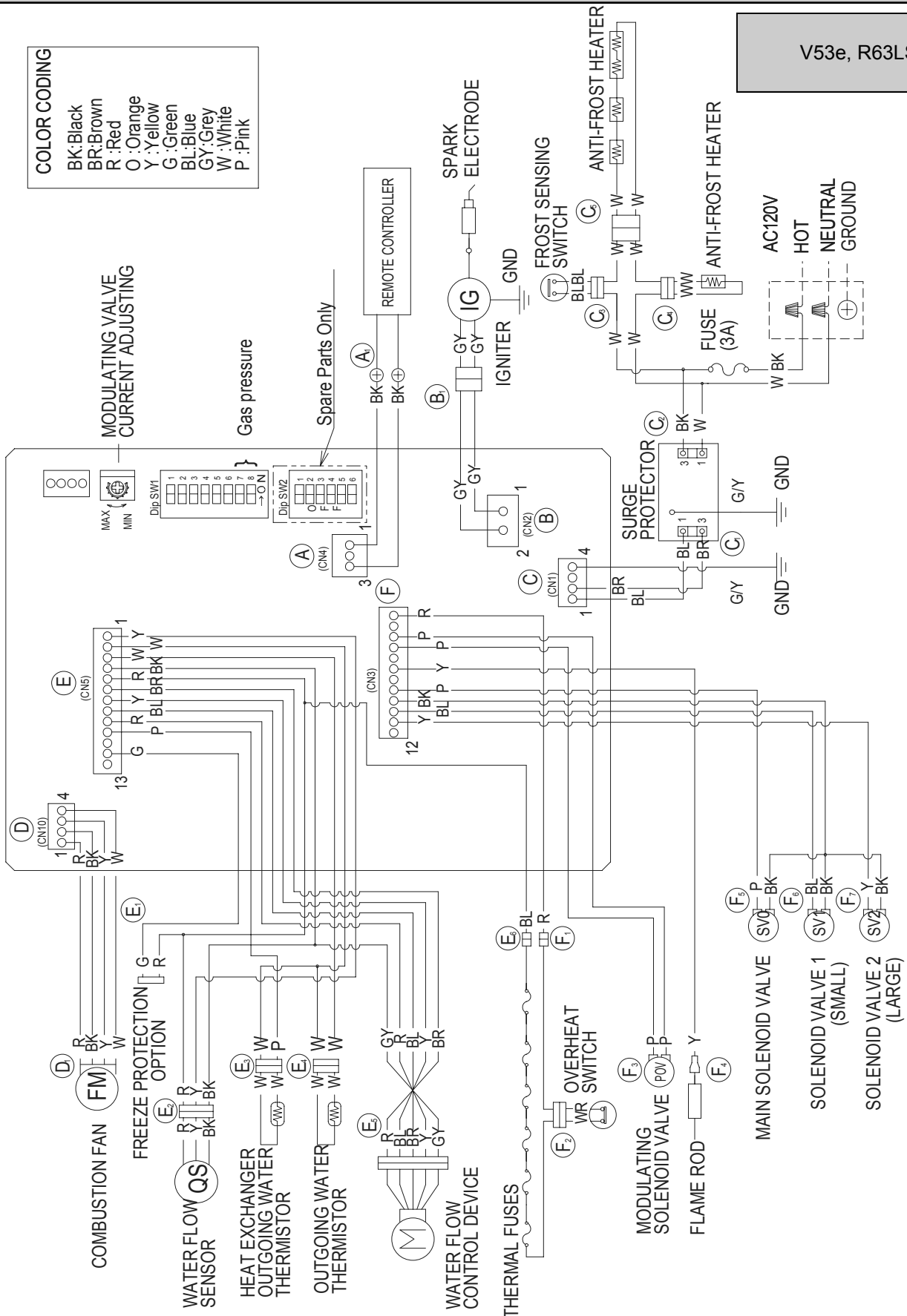
**R/C98i(ASME),
R/C98e(ASME)**



Wiring Diagram

V53e, R63LSe

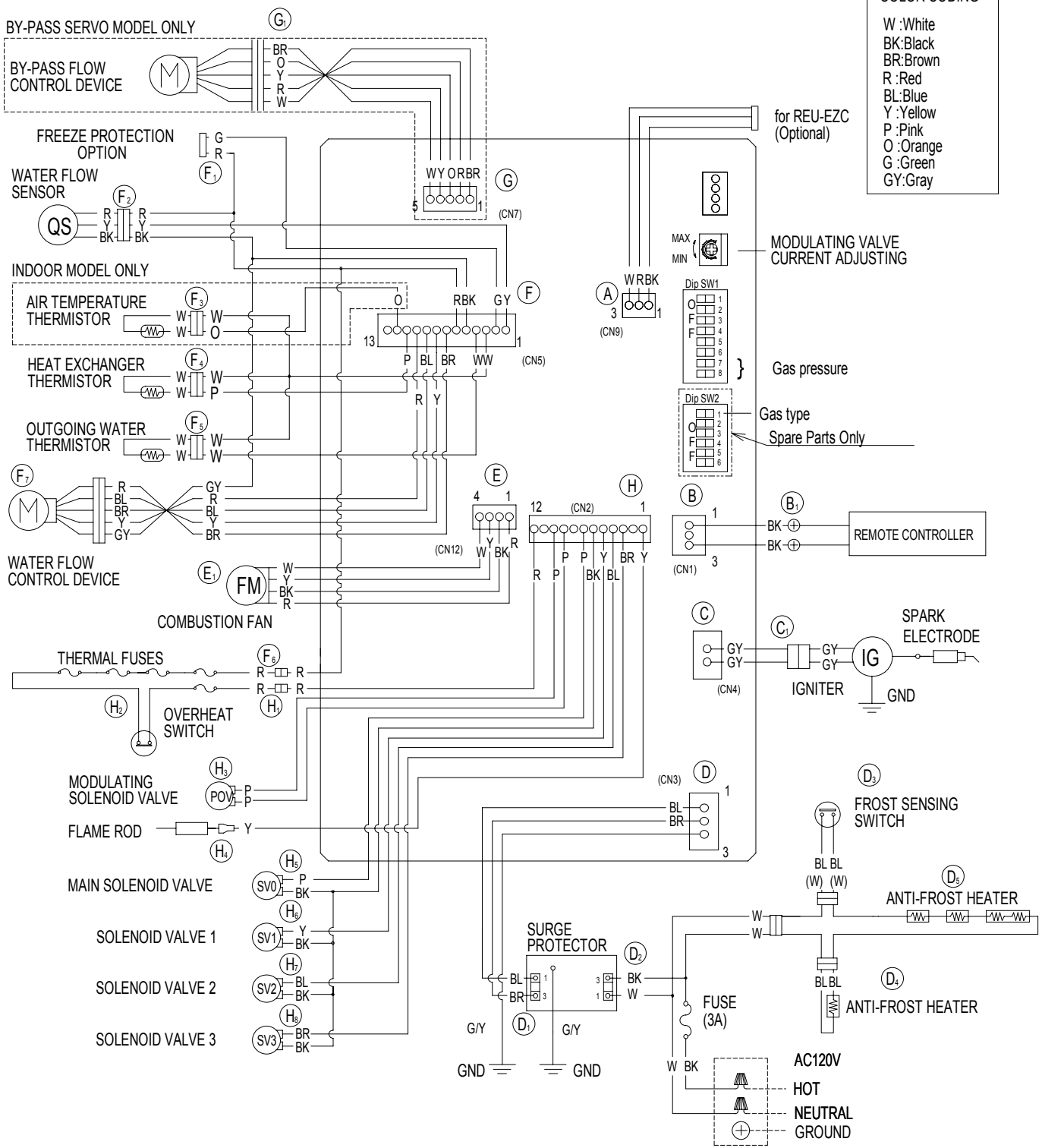
COLOR CODING	
BK:	Black
BR:	Brown
R:	Red
O:	Orange
Y:	Yellow
G:	Green
BL:	Blue
GY:	Grey
W:	White
P:	Pink



Wiring Diagram

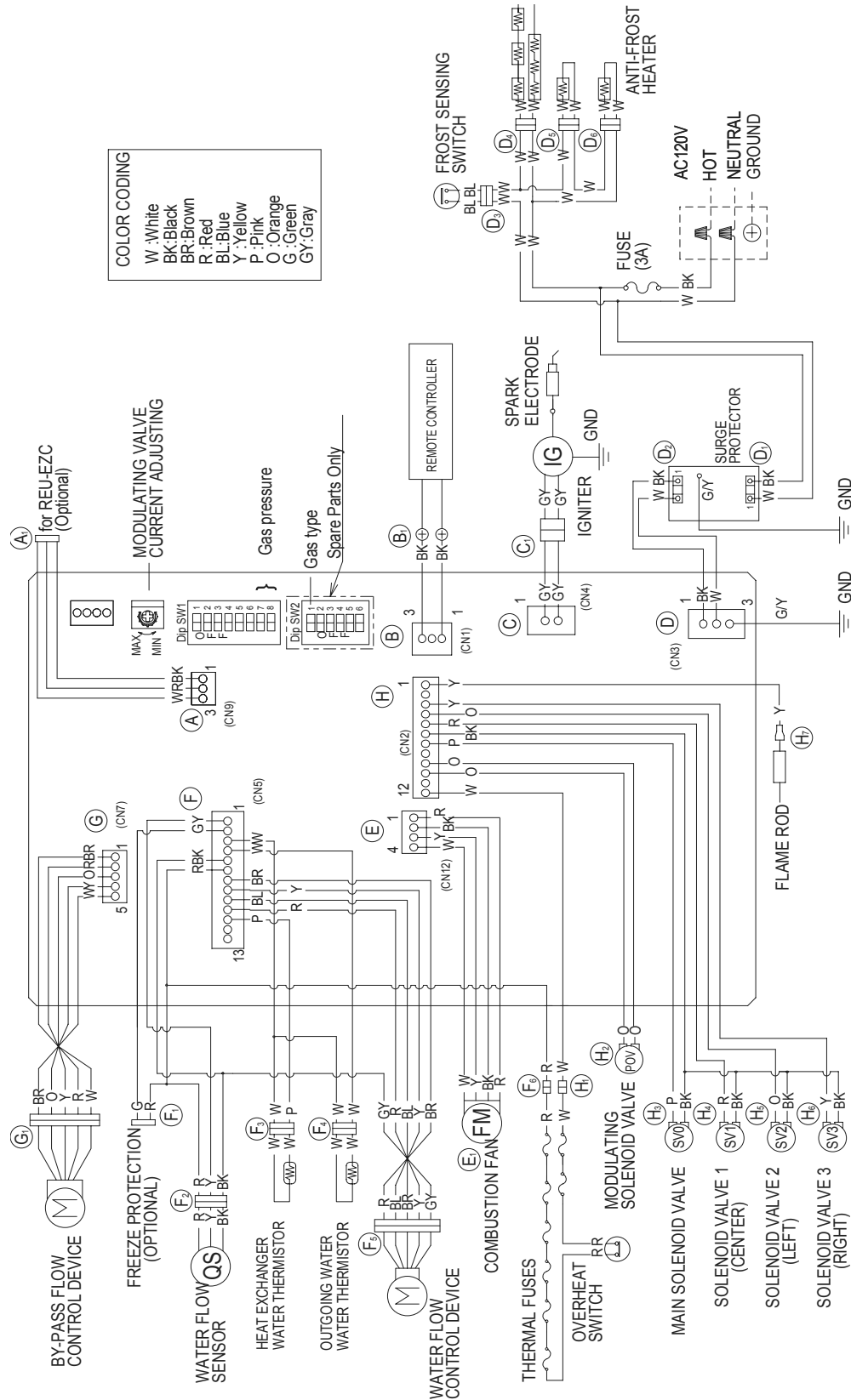
**R50LSi, R75LSe, R75LSi,
R94LSe, R94LSi**

COLOR CODING	
W	:White
BK	:Black
BR	:Brown
R	:Red
BL	:Blue
Y	:Yellow
P	:Pink
O	:Orange
G	:Green
GY	:Gray



Wiring Diagram

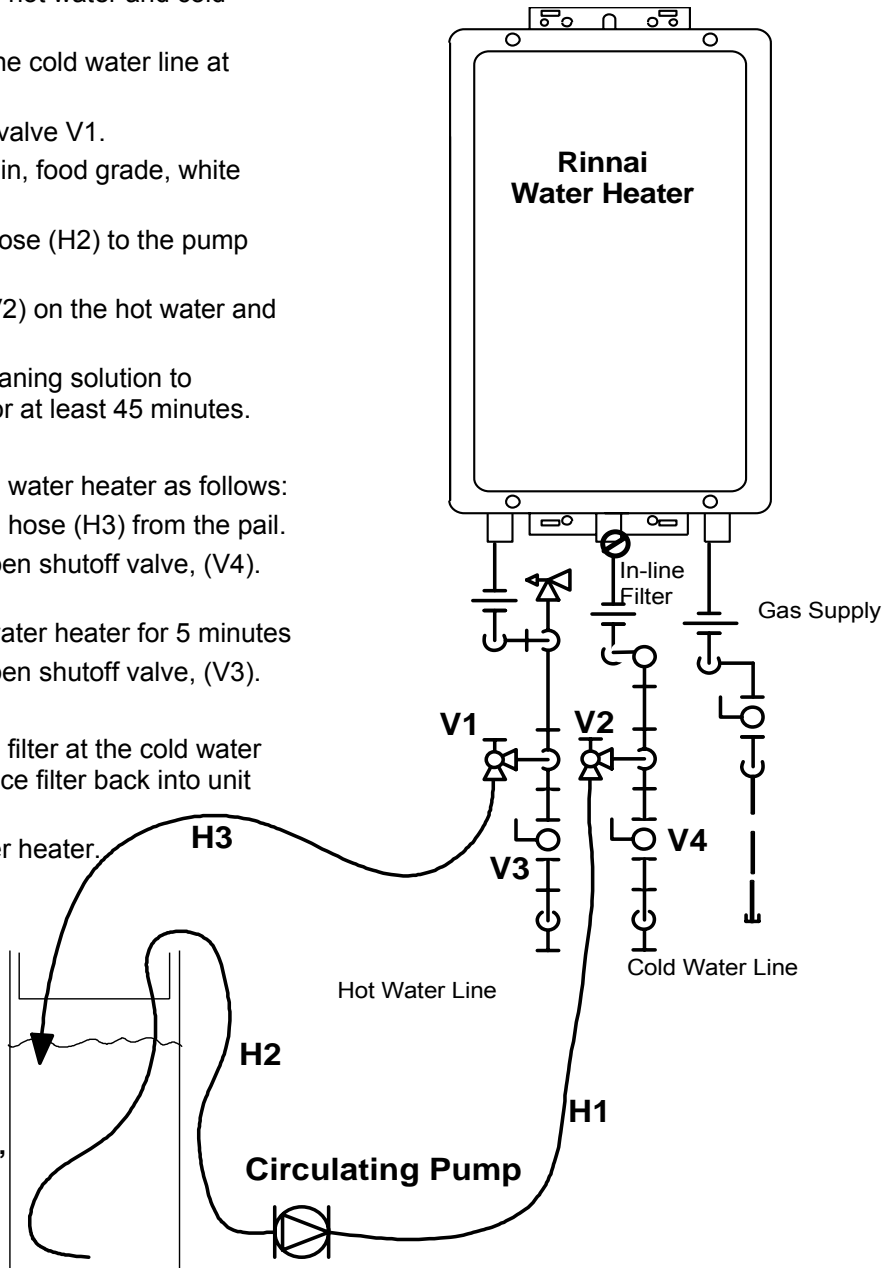
R98LSe(ASME),
R98LSi(ASME)











Flushing the Heat Exchanger

An "LC" or "00" error code indicates the unit is beginning to lime up and must be flushed. Failure to flush the appliance will cause damage to the heat exchanger. Damage caused by lime build-up is not covered by the unit's warranty. After flushing, reset the LC fault code by turning off the power to the unit and turning the power back on.

1. Disconnect electrical power to the water heater.
2. Close the shutoff valves on both the hot water and cold water lines (V3 and V4).
3. Connect pump outlet hose (H1) to the cold water line at service valve V2.
4. Connect drain hose (H3) to service valve V1.
5. Pour approximately 4 gallons of virgin, food grade, white vinegar or citric acid into pail.
6. Place the drain hose (H3) and the hose (H2) to the pump inlet into the cleaning solution.
7. Open both service valves (V1 and V2) on the hot water and cold water lines.
8. Operate the pump and allow the cleaning solution to circulate through the water heater for at least 45 minutes.
9. Turn off the pump.
10. Rinse the cleaning solution from the water heater as follows:
 - a. Remove the free end of the drain hose (H3) from the pail.
 - b. Close service valve, (V2), and open shutoff valve, (V4). Do not open shutoff valve, (V3).
 - c. Allow water to flow through the water heater for 5 minutes
 - d. Close service valve, (V1), and open shutoff valve, (V3).
11. Disconnect all hoses.
12. With (V4) closed, remove the in-line filter at the cold water inlet and clean out any residue. Place filter back into unit and open (V4).
13. Restore electrical power to the water heater.



KEY

	3/4" Ball Valve		Pressure Regulator
	3/4" Union		Circulating Pump
	Check Valve		Boiler Drain Valve
	Pressure Relief Valve		Solenoid Valve

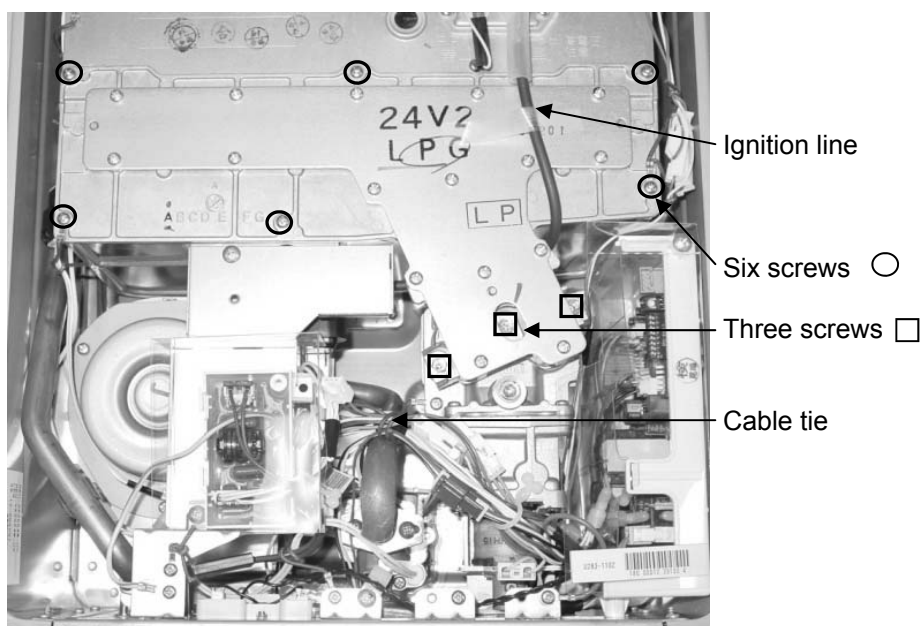
Component Replacement Instructions

Gas Control Assembly

R/C42e, R/C53e, V53e, R63LSe

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Remove four screws securing the front panel. Remove front panel.
4. Move aside the ignition line by pulling it out from the clear plastic tubing. (Figure 1)
5. Remove the six screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly). (Figure 1)
6. Remove the three screws that attach the gas manifold to the gas valve. Pull out the gas manifold. (Figure 1)

Figure 1



7. Remove the screw on the gas valve holding the cable tie.
8. Remove the 3 screws attaching the gas connection to the underneath side of the water heater. (Figure 2)

Figure 2



9. Pull the gas connection down to disconnect it from the gas control assembly.
10. Pull out the gas control assembly. Remove the wire harness from the 4 solenoids.

Component Replacement Instructions

Gas Control Assembly

R/C42e, R/C53e, V53e, R63LSe

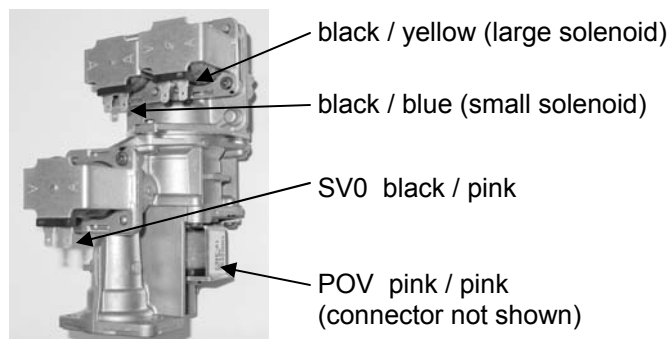


WARNING

Failure to correctly assemble the components according to these instructions may result in a gas leak or explosion.

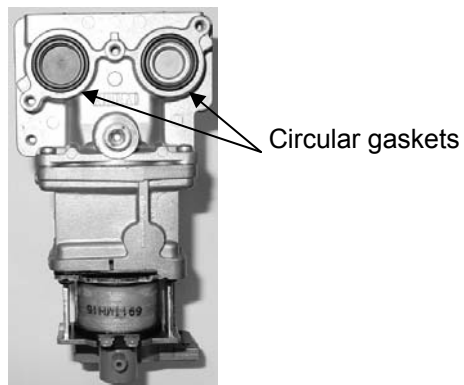
11. Install the gas valve and attach the wire harness to the 4 solenoids. (Figure 3)
12. Install the gas connection with 3 screws.

Figure 3



13. Replace the two circular gaskets (included in kit) in the gas valve. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. (Figure 4)
14. Start the three screws that attach the gas manifold to the gas valve. Tighten the six screws that hold the gas manifold to the combustion chamber. Finish tightening the three screws that hold the gas manifold to the gas valve.
15. Attach ignition line.
16. Perform the Gas Pressure Setting Procedure.

Figure 4



Component Replacement Instructions

Gas Control Assembly

R/C53i(PLUS), R70e, R/C85e(PLUS), R/C85i(PLUS), R50LSi, R75LSe, R75LSi, R94LSe, R94LSi

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Remove four screws securing the front panel. Remove front panel.
4. Pull out wire harness connector at the gas manifold assembly. See Figure 1.
5. Move aside the ignition line by pulling it out from the clear plastic tubing.
6. Remove the six screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly).
7. Remove the three screws that attach the gas manifold to the gas valve. Pull out the gas manifold.

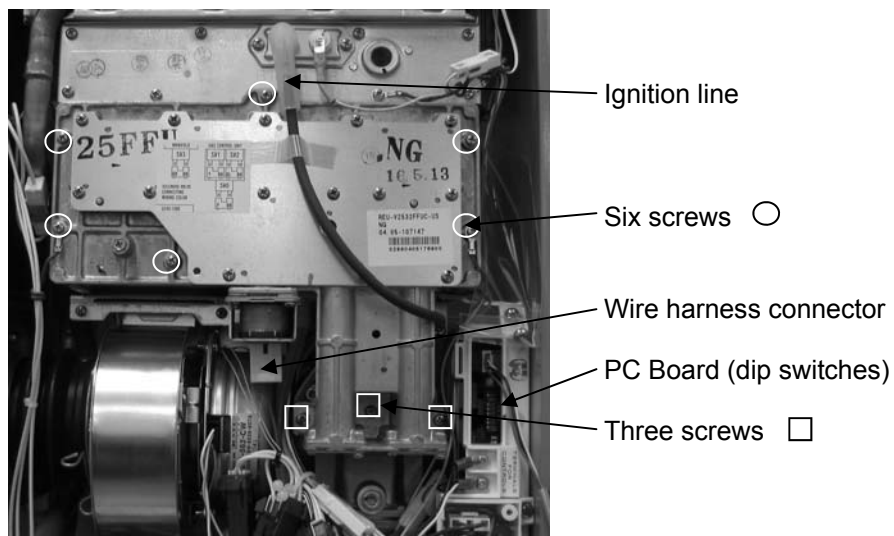


Figure 1

8. Remove the four screws attaching the gas connection to the underneath side of the water heater. See Figure 2.

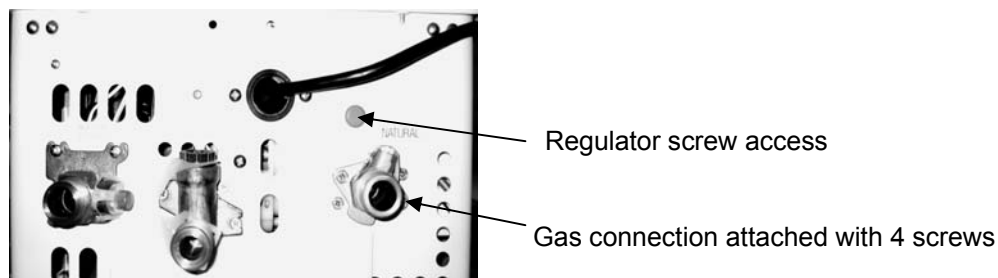


Figure 2

9. Pull the gas connection down to disconnect it from the gas control assembly.
10. Pull out the gas control assembly. Remove the wire harness from the 4 solenoids.

WARNING Failure to correctly assemble the components according to these instructions may result in a gas leak or explosion.

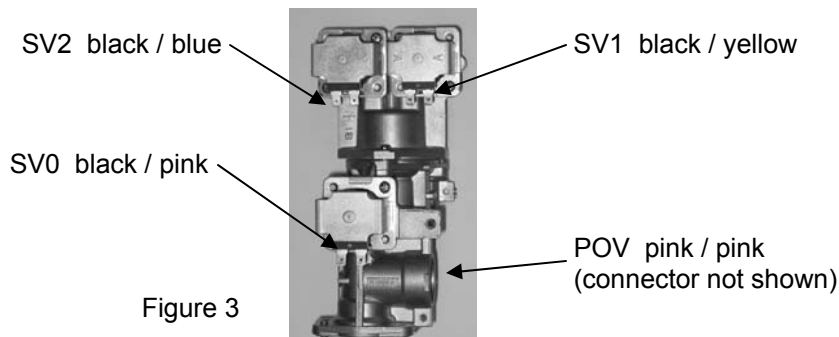
11. Replace the O-ring (included in kit) where the assembly attaches to the gas connection. Make sure the old O-ring is removed and discarded. Install the new gas control assembly.

Component Replacement Instructions

Gas Control Assembly

R/C53i(PLUS), R70e, R/C85e(PLUS), R/C85i(PLUS),
R50LSi, R75LSe, R75LSi, R94LSe, R94LSi

12. Attach wire harness to the 4 solenoids as shown in Figure 3 below.



13. Install the gas manifold using 2 new packings (included in kit) between the manifold and the heat exchanger. Replace the two circular gaskets (included in kit) in the gas valve. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. (Figure 5).

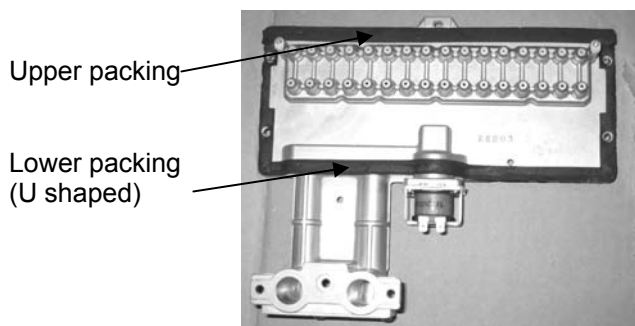


Figure 4

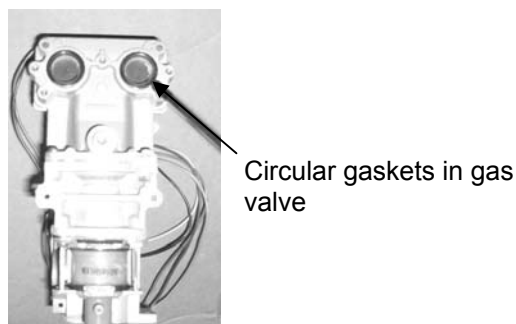


Figure 5

14. Start the three screws that attach the gas manifold to the gas valve. Tighten the six screws that hold the gas manifold to the combustion chamber. Finish tightening the three screws that hold the gas manifold to the gas valve.
15. Attach wiring harness connector (black & brown wires) to the gas manifold.
16. Attach ignition line.
17. Perform the Gas Pressure Setting Procedure.

Component Replacement Instructions

Gas Control Assembly

R/C98e(ASME), R/C98i(ASME),
R98LSe(ASME), R98LSi(ASME)

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Remove four screws securing the front panel. Remove front panel.
4. On indoor models, remove the bracket holding the controller (1 screw). (Figure 1)
5. Move aside the ignition line by pulling it out from the clear plastic tubing. (Figure 1)
6. Remove the 5 screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly). (Figure 2)
7. Remove the 2 screws that attach the gas manifold to the gas valve. These screws are machine screws and must be used at these locations. (Figure 2)
8. Pull out the gas manifold and remove the connector at the ignitor at the left side of the gas manifold.
9. Remove the 3 screws attaching the gas connection to the underneath side of the water heater. (Figure 3)
10. Remove the screw attaching the gas valve to the rear of the case.
11. Pull the gas connection down to disconnect it from the gas control assembly.

Bracket screw

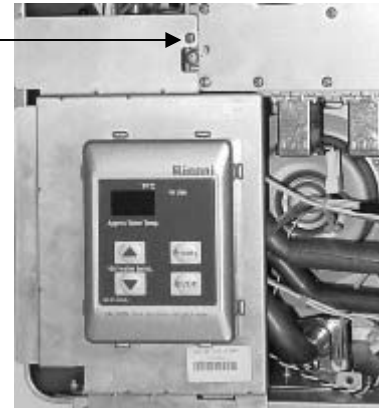


Figure 1
(indoor models)

5 screws ○
(gas manifold)

2 machine screws □
(gas valve)

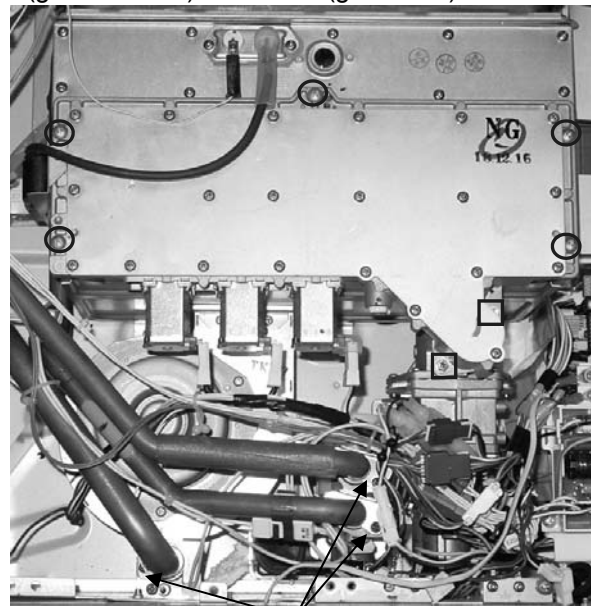
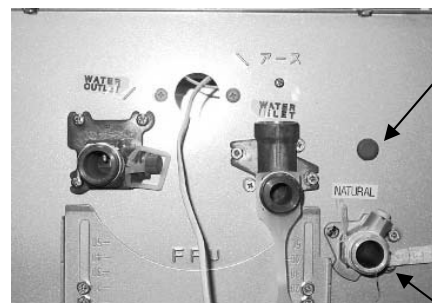


Figure 2

Water line connections



Regulator
screw
access

Gas connection
attached with 3 screws

Figure 3

Component Replacement Instructions

Gas Control Assembly

R/C98e(ASME), R/C98i(ASME),
R98LSe(ASME), R98LSi(ASME)

WARNING Failure to correctly assemble the components according to these instructions may result in a gas leak or explosion.

12. Pull out the gas control assembly. Remove the wire harness from the 2 solenoids.
13. Install the gas valve and attach the wire harness to the 2 solenoids. (Figure 4)

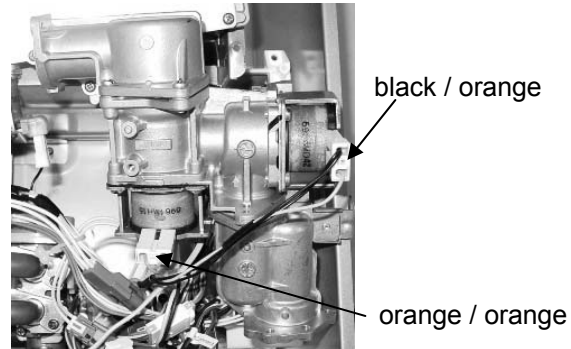


Figure 4

14. Install the gas connection with 3 screws.
15. Replace the circular gasket (included in kit) in the gas valve. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. (Figure 5)
16. Start the 2 screws that attach the gas manifold to the gas valve. Tighten the 5 screws that hold the gas manifold to the combustion chamber. Finish tightening the 2 screws that hold the gas manifold to the gas valve.
17. Attach ignition line.
18. On indoor models, install the bracket with the controller.
19. Perform the Gas Pressure Setting Procedure.

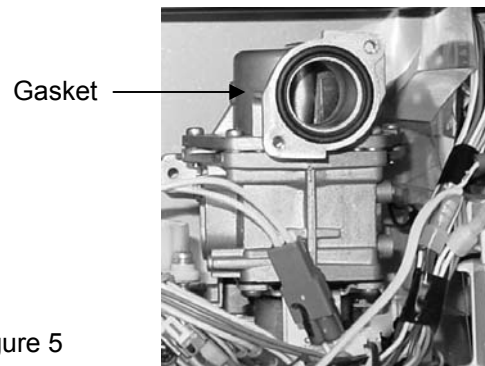


Figure 5

Component Replacement Instructions

Fan

R/C42e, R/C53e, V53e, R63LSe

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply.
4. Remove four screws securing the front panel. Remove front panel.
5. On the V53e and R63LSe, remove the screws (3) holding the bracket with the surge protector. (Figure 1)
6. Disconnect the wire harness at the fan assembly. (Figure 2)
7. On the V53e and R63LSe, remove the screw attaching the bracket with the ignitor to the bottom of the burner case. (Figure 2)
8. Remove the three screws attaching the fan sub-assembly to the fan casing. (Figure 3)
9. Pull out the fan sub-assembly.
10. Install the new fan sub-assembly and tighten with three screws.
11. On the V53e and R63LSe, install the bracket with the ignitor with one screw.
12. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
13. On the V53e and R63LSe, install the bracket with the surge protector with three screws.
14. Install front panel using 4 screws.
15. Turn on water supply, power supply, and gas supply.

Figure 1

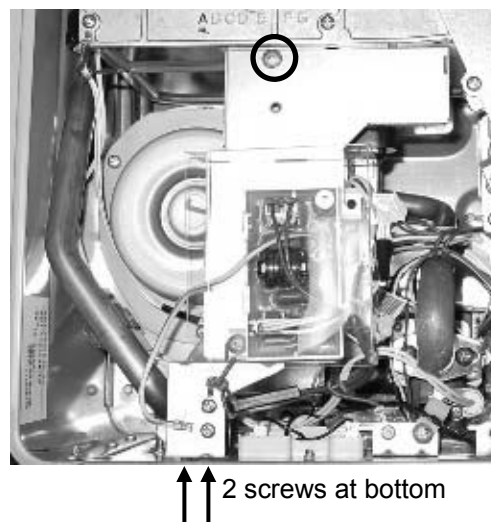


Figure 2

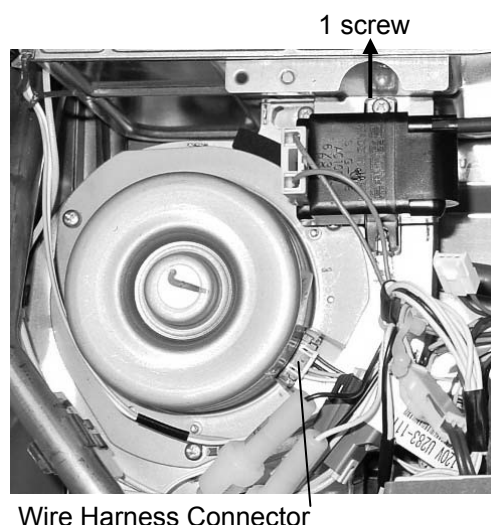
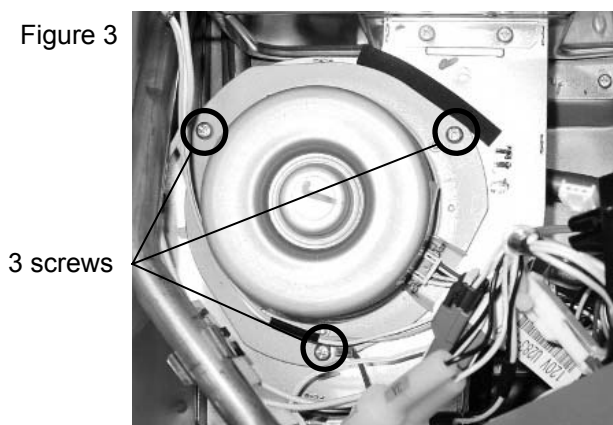


Figure 3



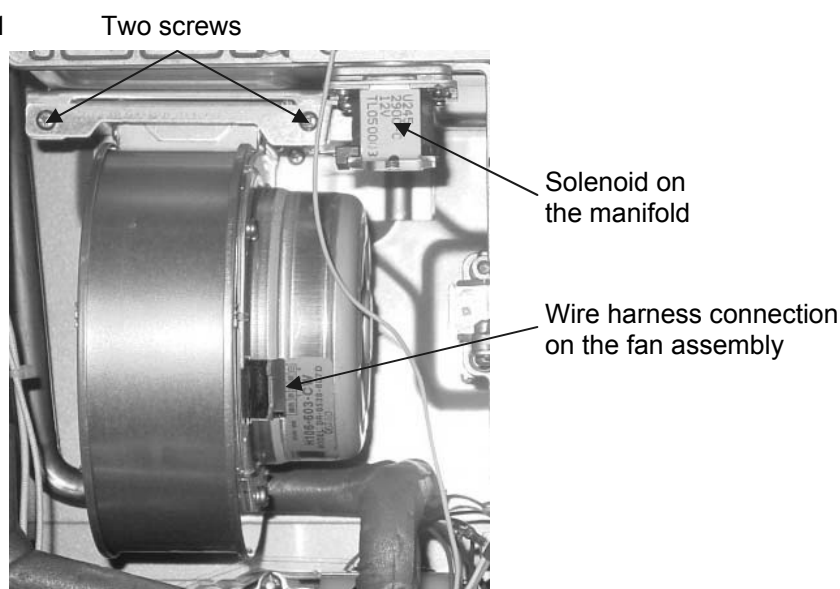
Component Replacement Instructions

Fan

R70e, R/C85e(PLUS),
R75LSe, R94LSe

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply.
4. Remove four screws securing the front panel. Remove front panel.
5. Disconnect wire harness at the fan assembly. Disconnect the air temperature thermistor (two white wires) at the connection with the white and orange wires within the wire bundle.
6. Pull out the harness attached to the solenoid on the manifold to make room to pull out the fan assembly.
7. Remove the two screws that attach the fan assembly to the bottom of the burner.

Figure 1



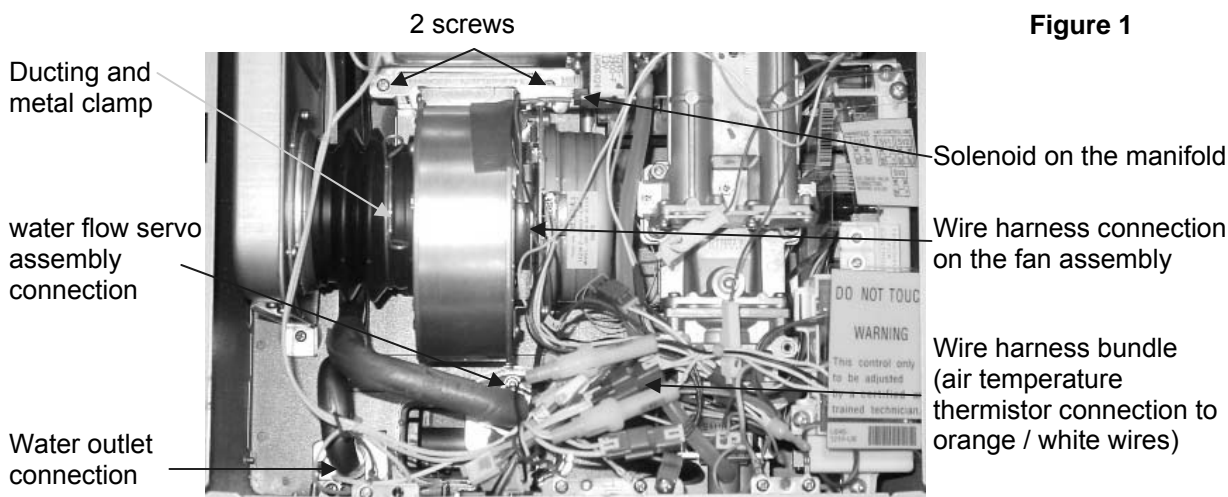
8. Pull out the fan assembly.
9. Install the fan assembly by inserting the tab on the fan assembly into the slot at the base of the heat exchanger and attaching with two screws.
10. Attach the wire harness to the solenoid on the gas manifold (brown, black wires).
11. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
12. Attach the air temperature thermistor (white, white wires) to the wire harness.
13. Install front panel using 4 screws.
14. Turn on water supply, power supply, and gas supply.

Component Replacement Instructions

Fan

R/C53i(PLUS), R/C85i(PLUS),
R50LSi, R75LSi, R94LSi

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply.
4. Remove four screws securing the front panel. Remove front panel.
5. Disconnect wire harness at the fan assembly. Disconnect the air temperature thermistor (two white wires) at the connection with the white and orange wires within the wire bundle.
6. Pull out the harness attached to the solenoid on the manifold to make room to pull out the fan assembly.
7. Loosen the ducting from the fan assembly by pinching open the metal clamp.



8. Remove the two screws that attach the fan assembly to the bottom of the burner.
9. Pull out the fan assembly.
10. Install the fan assembly by inserting the tab on the fan assembly into the slot at the base of the heat exchanger and attaching with two screws.
11. Push ducting over fan assembly inlet and secure with metal clamp.
12. Attach the wire harness to the solenoid on the gas manifold (brown, black wires).
13. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
14. Attach the air temperature thermistor (white, white wires) to the wire harness.
15. Install front panel using 4 screws.
16. Turn on water supply, power supply, and gas supply.

Component Replacement Instructions

Fan

R/C98e(ASME), R/C98i(ASME),
R98LSe(ASME), R98LSi(ASME)

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply.
4. Remove four screws securing the front panel. Remove front panel.
5. On indoor models, remove the bracket holding the controller (1 screw). (Figure 1)
6. Disconnect the wire harness at the fan assembly. (Figure 2)
7. Remove the three screws attaching the fan motor to the fan casing. (Figure 3)
8. Pull out the fan motor.
9. Install the new fan motor and tighten with three screws.
10. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
11. On indoor models, install the bracket with the remote controller.
12. Install front panel using 4 screws.
13. Turn on water supply, power supply, and gas supply.

Bracket screw

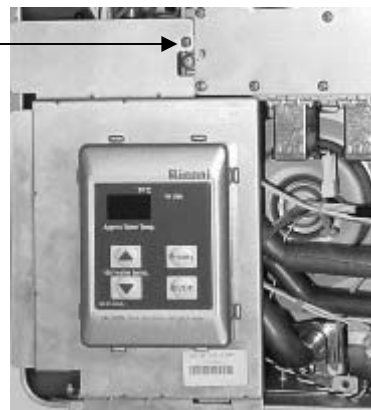
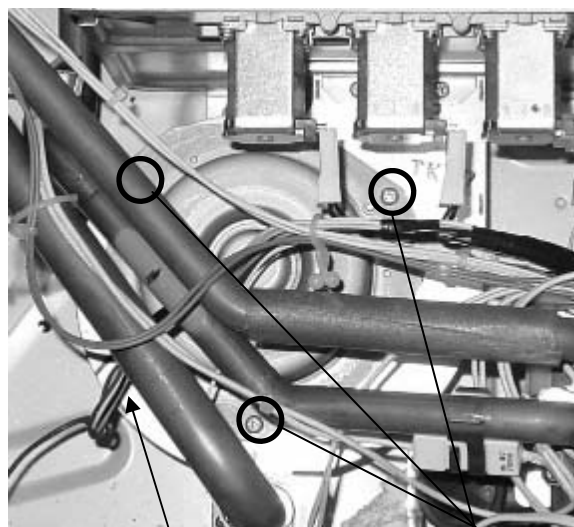


Figure 1
(indoor models)



Wire Harness Connector

3 screws

Figure 2

Component Replacement Instructions

PC Board

R/C42e, R/C53e

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply.
4. Remove four screws securing the front panel. Remove front panel.
5. Remove the plastic guard covering the front of the PC board.
6. Remove the controller connections.
7. Remove the screws securing the grounding cables.
8. If a surge protector with terminals is installed, then remove this board by removing two screws. This board should be re-installed on the replacement PC board.
9. Remove the two screws at the top and bottom of the PC board.
10. Pull out the PC board, remove plastic cover, and remove the connections.
11. Adjust dip switches on the new PC board.

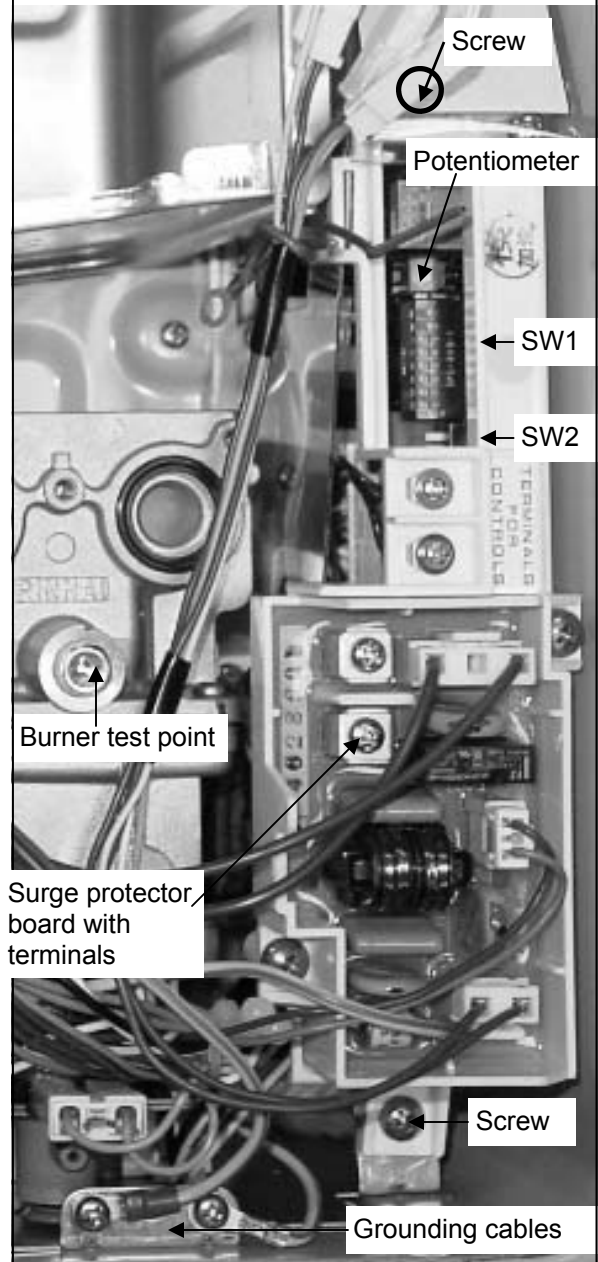
Switches 1-8 (SW1): Configure the dip switches the same as on the original PC board. If necessary, refer to the Dip Switch section or to the Operation and Installation Manual for more information on these dip switches.

Switches 1-4 (SW2): Configure according to the table.

SW2 setup

1	OFF - Propane Gas ON - Natural Gas
2	OFF position for models prior to these serial numbers: (on these units, the front panel does not have an "R" or "C" trade name, unless the front panel has been replaced) V1616W, V1616WC 06.02-000001 V2020W, V2020WC 05.07-000001 V2532W, V2532WC 05.05-117257 V2532FFU, V2532FFUC 05.05-117257 V2520FFU, V2520FFUC 05.05-109539 V2526W 05.05-110434 ON position for other models, serial numbers
3	OFF position
4	OFF - Residential Models ON - Commercial Models

Figure 1



12. Attach connections and plastic cover.
13. Insert PC board and attach with two screws.
14. Attach the grounding cables with screws.
15. Attach connections for the controller.
16. Perform the Gas Pressure Setting Procedure.

Component Replacement Instructions

PC Board

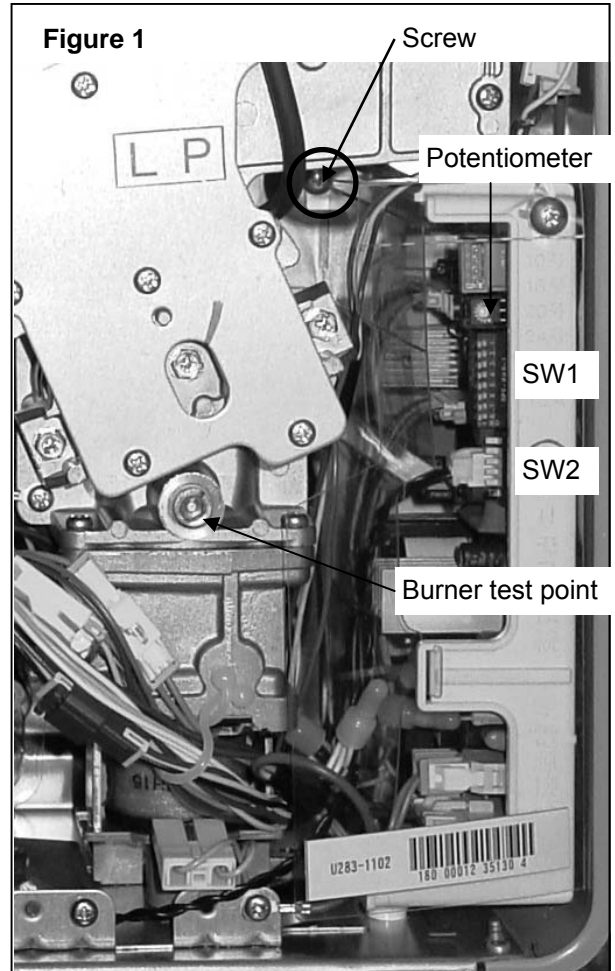
V53e, R63LSe

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply.
4. Remove four screws securing the front panel. Remove front panel.
5. Remove the screw connecting the PC board to the back of the water heater casing.
6. Pull out the PC board and remove the connections.
7. Adjust dip switches on the new PC board. Replacement PC boards have an additional bank of 6 dip switches. Adjust as follows:

Switches 1-8 (SW1): Configure the dip switches the same as on the original PC board. If necessary, refer to the Dip Switch section or to the Operation and Installation Manual for more information on these dip switches.

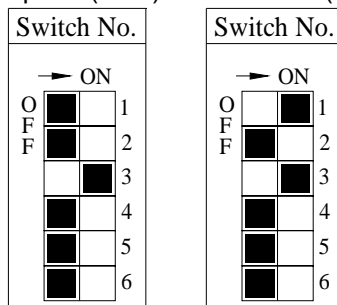
Switches 1-6 (SW2): Configure according to the diagrams below based on your model and gas type.

8. Attach connections and insert PC board. Insert the tab on the PC board into the hole in the bottom of the case. Attach with one screw.
9. Perform the Gas Pressure Setting Procedure.



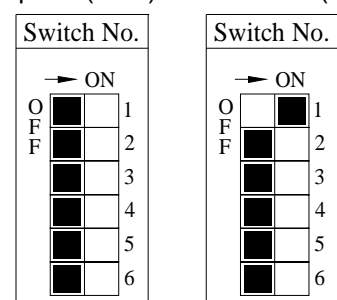
SW2 setup for V53e

Propane (LPG) Natural Gas (NG)



SW2 setup for R63LSe

Propane (LPG) Natural Gas (NG)



Component Replacement Instructions

PC Board

R/C53i(PLUS), R70e, R/C85e(PLUS), R/C85i(PLUS), R50LSi, R75LSe, R75LSi, R94LSe, R94LSi

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply.
4. Remove four screws securing the front panel. Remove front panel.
5. Remove the plastic guard covering the front of the PC board.
6. Remove the controller connections.
7. If a surge protector with terminals is installed, then remove this board by removing two screws. This board should be re-installed on the replacement PC board.
8. Remove the two screws at the top and bottom of the PC board.
9. Pull out the PC board, remove plastic cover, and remove the connections.
10. Adjust dip switches on the new PC board.

Switches 1-8 (SW1): Configure the dip switches the same as on the original PC board. If necessary, refer to the Dip Switch section or to the Operation and Installation Manual for more information on these dip switches.

V Series (R70e, R/C85e, R/C53i, R/C85i)

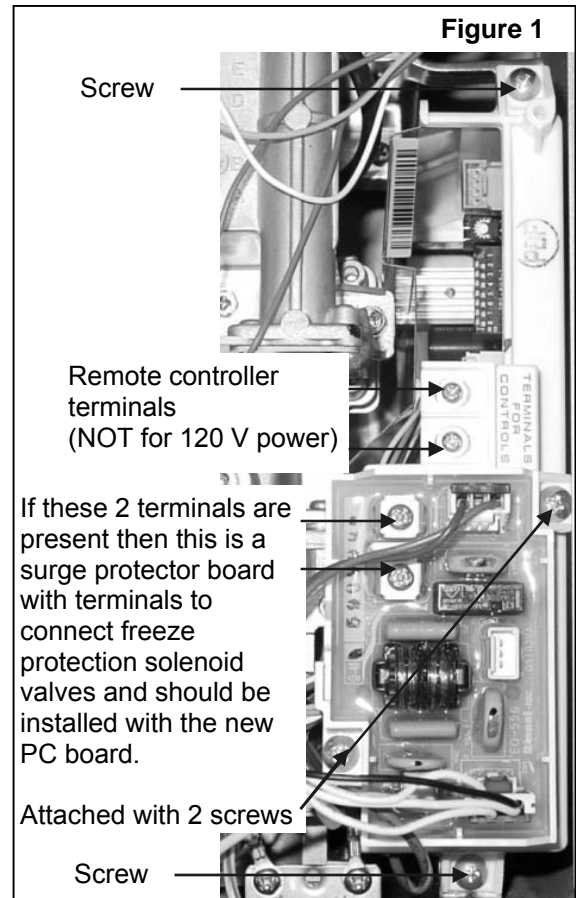
Switches 1-4 (SW2): Configure according to the table.

VA Series (R50LSi, R75LSe, R94LSe, R75LSi, R94LSi)

Switches 1-6 (SW2):

Replacement PC boards for the VA series have an additional bank of 6 dip switches. Configure according to the diagrams based on your model and gas type.

11. Attach connections and plastic cover.
12. Insert PC board and attach with two screws.
13. If a surge protector with terminals was installed on the original PC board, remove it and install it on the new PC board. See Figure 1.
14. Attach connections for the remote controller.
15. Attach plastic guard.
16. Perform the Gas Pressure Setting Procedure.



Component Replacement Instructions

PC Board

R/C53i(PLUS), R70e, R/C85e(PLUS), R/C85i(PLUS),
R50LSi, R75LSe, R75LSi, R94LSe, R94LSi

SW2 setup for V Series (R70e, R/C85e, R/C53i, R/C85i)

1	OFF - Propane Gas ON - Natural Gas												
2	<p>OFF position for models prior to these serial numbers: (on these units, the front panel does not have an "R" or "C" trade name, unless the front panel has been replaced)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">V1616W, V1616WC</td> <td style="width: 50%;">06.02-000001</td> </tr> <tr> <td>V2020W, V2020WC</td> <td>05.07-000001</td> </tr> <tr> <td>V2532W, V2532WC</td> <td>05.05-117257</td> </tr> <tr> <td>V2532FFU, V2532FFUC</td> <td>05.05-117257</td> </tr> <tr> <td>V2520FFU, V2520FFUC</td> <td>05.05-109539</td> </tr> <tr> <td>V2526W</td> <td>05.05-110434</td> </tr> </table> <p>ON position for other models, serial numbers</p>	V1616W, V1616WC	06.02-000001	V2020W, V2020WC	05.07-000001	V2532W, V2532WC	05.05-117257	V2532FFU, V2532FFUC	05.05-117257	V2520FFU, V2520FFUC	05.05-109539	V2526W	05.05-110434
V1616W, V1616WC	06.02-000001												
V2020W, V2020WC	05.07-000001												
V2532W, V2532WC	05.05-117257												
V2532FFU, V2532FFUC	05.05-117257												
V2520FFU, V2520FFUC	05.05-109539												
V2526W	05.05-110434												
3	OFF position												
4	OFF - Residential Models ON - Commercial Models												

Component Replacement Instructions

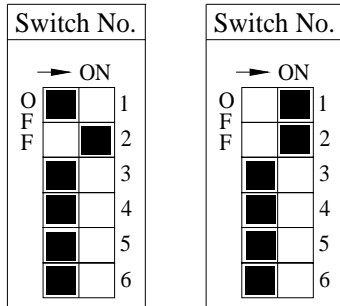
PC Board

R/C53i(PLUS), R70e, R/C85e(PLUS), R/C85i(PLUS), R50LSi, R75LSe, R75LSi, R94LSe, R94LSi

VA Series (R50LSi, R75LSe, R94LSe, R75LSi, R94LSi)

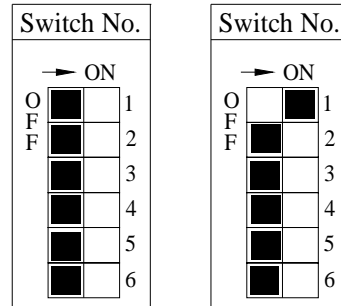
SW2 setup for R94LSi (REU-VA2535FFUD-US) (REU-VA2535FFUD-UC)

Propane (LPG) Natural Gas (NG)



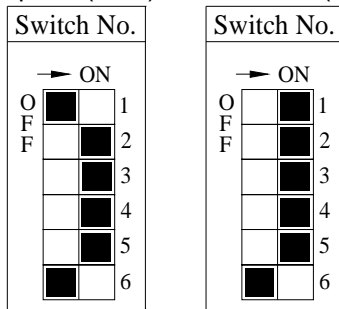
SW2 setup for R94LSe (REU-VA2535WD-US) (REU-VA2535WD-UC)

Propane (LPG) Natural Gas (NG)



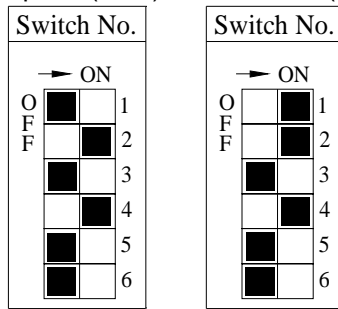
SW2 setup for R50LSi (REU-VA2019FFUD-US)

Propane (LPG) Natural Gas (NG)



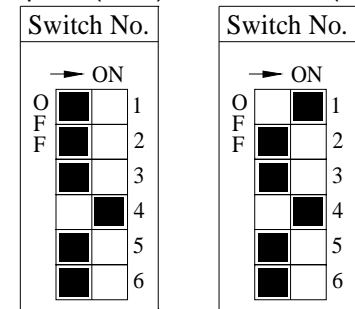
SW2 setup for R75LSi (REU-VA2528FFUD-US)

Propane (LPG) Natural Gas (NG)



SW2 setup for R75LSe (REU-VA2535WD-US)

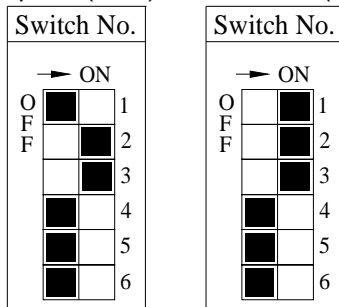
Propane (LPG) Natural Gas (NG)



NOTE: The diagrams below are for the -UC models of the R50LSi, R75LSi, and R75LSe.

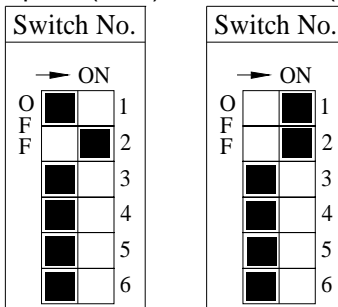
SW2 setup for R50LSi (REU-VA2019FFUD-UC)

Propane (LPG) Natural Gas (NG)



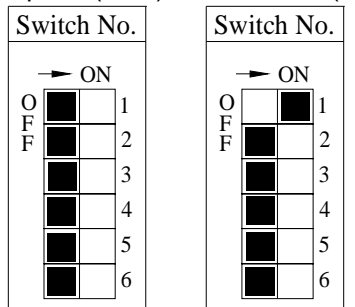
SW2 setup for R75LSi (REU-VA2528FFUD-UC)

Propane (LPG) Natural Gas (NG)



SW2 setup for R75LSe (REU-VA2535WD-UC)

Propane (LPG) Natural Gas (NG)



Component Replacement Instructions

PC Board

R/C98e(ASME), R/C98i(ASME),
R98LSe(ASME), R98LSi(ASME)

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Remove four screws securing the front panel. Remove front panel.
4. Remove the surge protector (2 screws)
5. Remove the 2 screws connecting the PC board to the water heater casing.
6. Pull out the PC board and remove the connections.
7. Adjust dip switches on the new PC board.

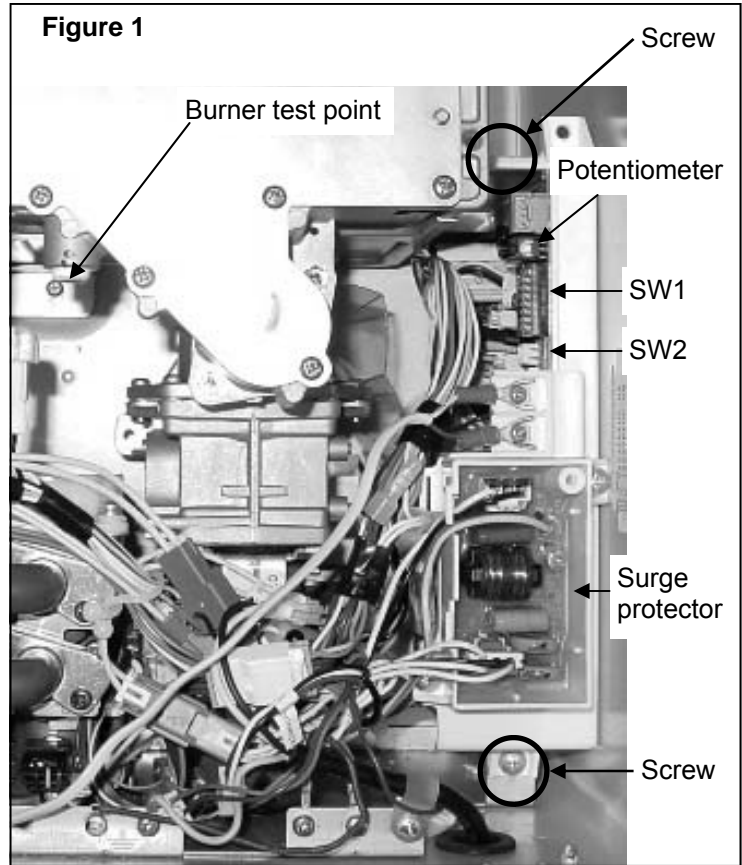
Switches 1-8 (SW1):

Configure the dip switches the same as on the original PC board. If necessary, refer to the Dip Switch section or to the Operation and Installation Manual for more information on these dip switches.

Switches 1-4 (SW2) or Switches 1-6 (SW2):

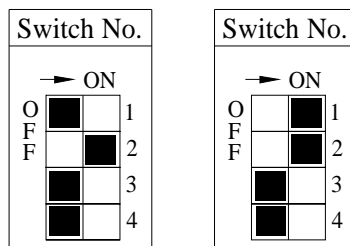
Configure according to the diagrams based on your model and gas type.

8. Attach connections and insert PC board. Attach with 2 screws.
9. Attach the surge protector with 2 screws.
10. Perform the Gas Pressure Setting Procedure.



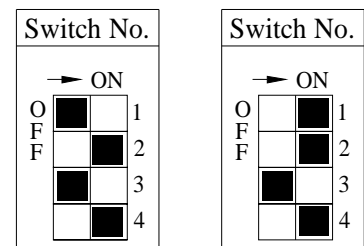
SW2 setup for R98e, R98i

Propane (LPG) Natural Gas (NG)



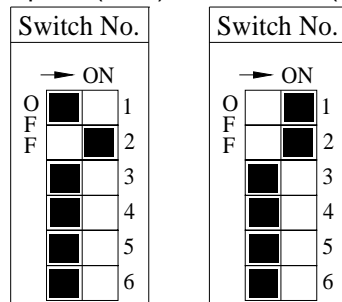
SW2 setup for C98e, C98i

Propane (LPG) Natural Gas (NG)



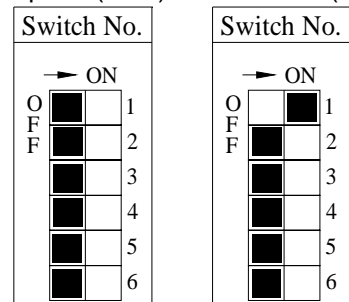
SW2 setup for R98LSi

Propane (LPG) Natural Gas (NG)



SW2 setup for R98LSe

Propane (LPG) Natural Gas (NG)



Component Replacement Instructions

Water Flow Control Assembly

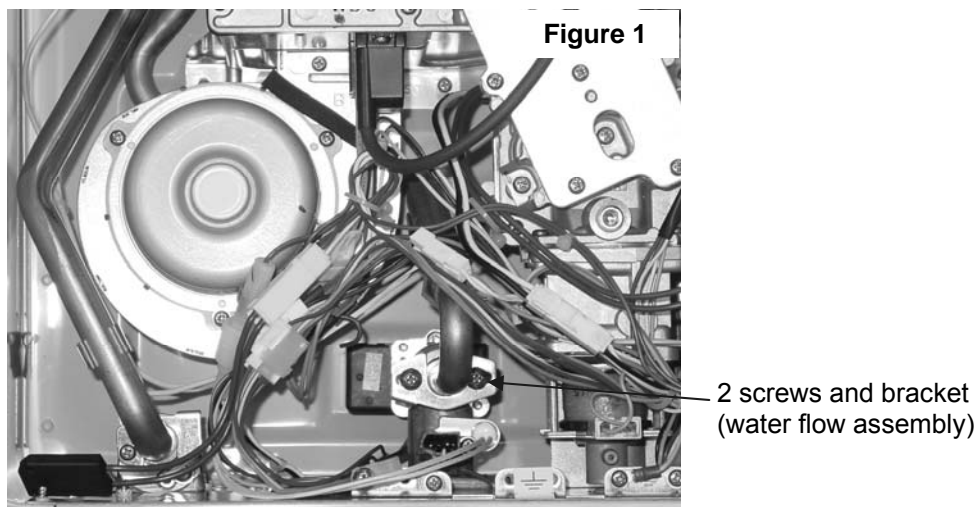
R/C42e, R/C53e

NOTICE Due to design changes, the new valve may appear different than the installed valve in color, size, and in the number of wires in the harness connections.

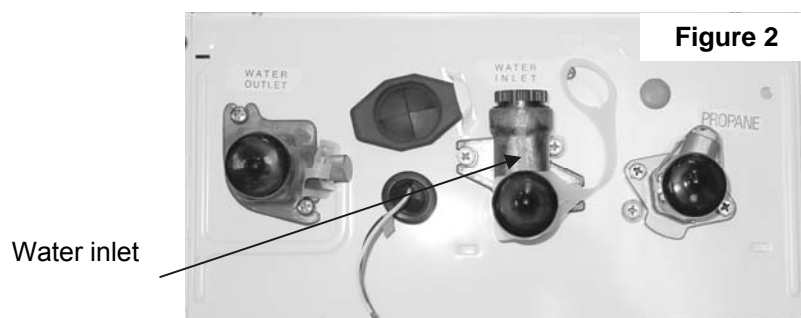
1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.

Remove the water flow assembly

5. Remove 2 screws and bracket at the water flow assembly. The bracket can be left on the water line. Pull out the water line. (Figure 1)



6. Remove the 3 screws attaching the water inlet to the underneath side of the water heater. (Figure 2).

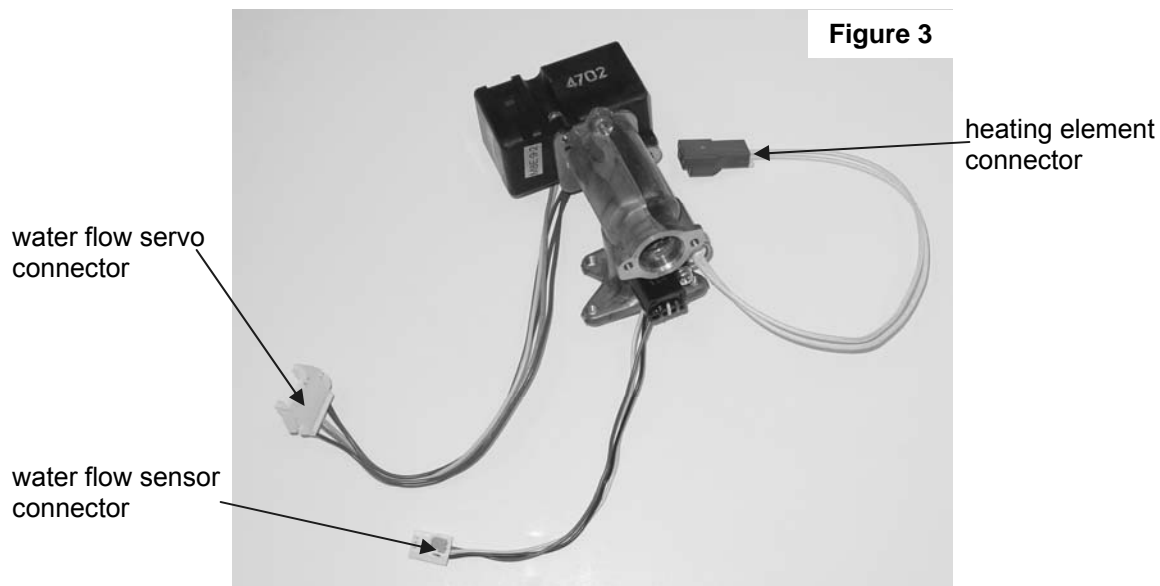


Component Replacement Instructions

Water Flow Control Assembly

R/C42e, R/C53e

7. Pull out the water flow servo assembly and disconnect the cable harnesses. (Figure 3)
 - A. water flow sensor harness (black/yellow/red wires)
 - B. remove water flow servo harness (red/blue/brown/yellow/gray or red/blue/brown/orange/yellow/gray wires)
 - C. heating element



Assemble

8. Place the new water flow assembly inside the water heater and attach the cable harnesses.
9. Replace the O-ring on the water inlet (included in kit). Attach the water flow assembly through the bottom of the compartment to the water inlet using 3 screws. The shorter screw can be installed first to connect the water flow assembly to the bottom of the compartment. Then install the 2 longer screws through the water inlet.
10. Replace the O-ring on the water line (included in kit). Attach the water line to the water flow assembly with 2 screws and bracket.
11. Install the front panel using 4 screws. Turn on the water supply, power supply, and gas supply.
12. Open a hot water tap and ensure there are no leaks at the water heater.

Component Replacement Instructions

Water Flow Control Assembly

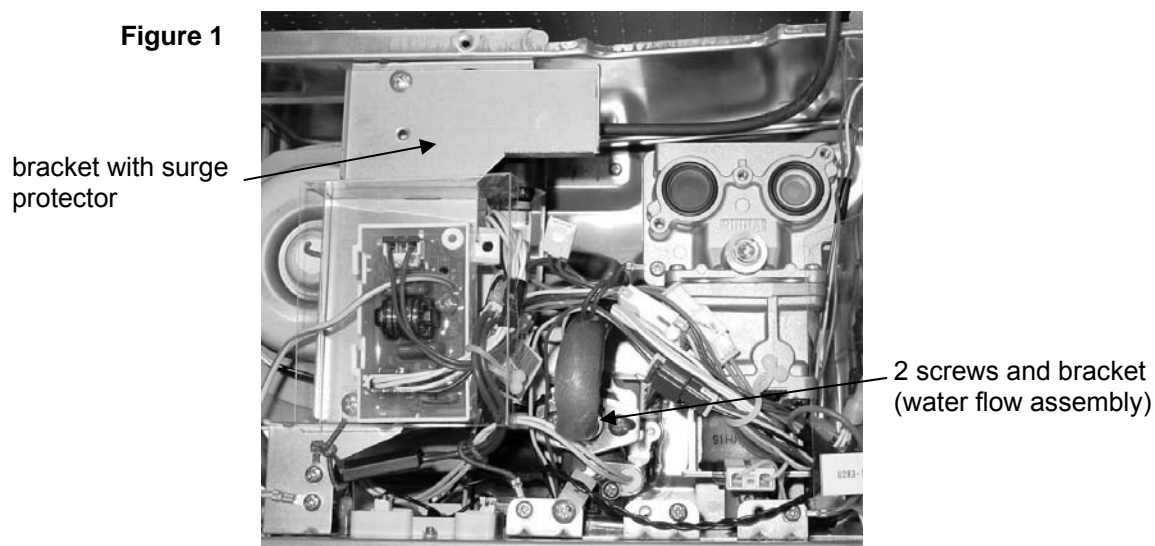
V53e, R63LSe

1. Turn off the gas supply.
2. Disconnect the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.

Remove the water flow assembly

5. Remove the bracket holding the surge protector.
6. Remove 2 screws and 1 bracket at the water flow assembly. Pull out the water line. (Figure 1)

Figure 1



7. Remove the 3 screws attaching the water inlet to the underneath side of the water heater. (Figure 2).

Figure 2



Component Replacement Instructions

Water Flow Control Assembly

V53e, R63LSe

8. Pull out the water flow servo assembly and disconnect the cable harnesses. (Figure 3)
 - a. water flow sensor harness (black/yellow/red wires)
 - b. remove water flow servo harness (red/blue/brown/yellow/gray or red/blue/brown/orange/yellow/gray wires) at the water flow assembly
 - c. heating element



Assemble

9. Place the new water flow assembly inside the water heater and attach the cable harnesses.
10. Replace the O-ring on the water inlet (included in kit). (Figure 4) Attach the water flow assembly through the bottom of the compartment to the water inlet using 3 screws. The shorter screw can be installed first to connect the water flow assembly to the bottom of the compartment. Install the 2 longer screws through the water inlet.



11. Replace the O-ring on the water line (included in kit). Attach the water line to the water flow assembly with 2 screws and bracket.
12. Install the bracket with the surge protector.
13. Install the front panel using 4 screws.
14. Turn on the water supply, power supply, and gas supply.
15. Open a hot water tap and ensure there are no leaks at the water heater.

Component Replacement Instructions

Water Flow Control Assembly

R/C53i(PLUS), R50LSi,
R75LSe, R75LSi

NOTICE

Due to design changes, the new valve may appear different than the installed valve in color, size, and in the number of wires in the harness connections.

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.

Remove the water flow assembly

5. Remove 1 screw and bracket at the water flow assembly. The bracket can be left on the water line. Pull out the water line. (Figure 1)

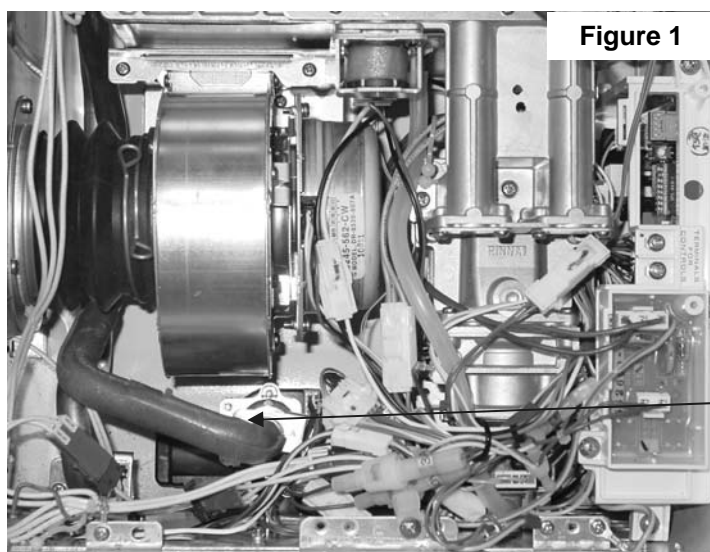


Figure 1

1 screw and bracket
(water flow assembly)

6. Remove the 4 screws attaching the water inlet to the underneath side of the water heater. (Figure 2).

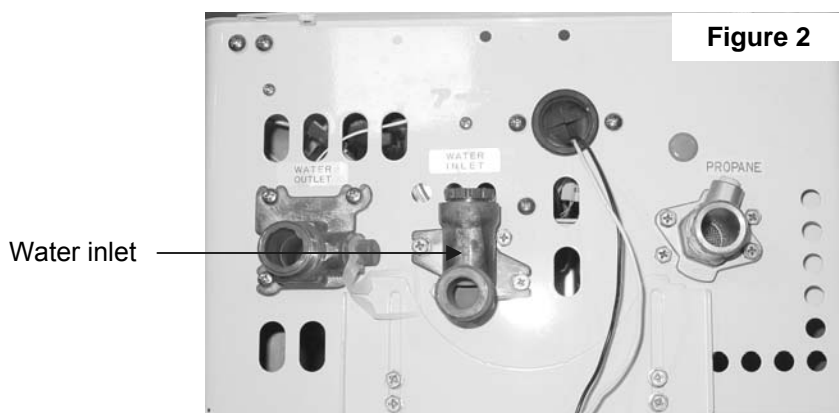


Figure 2

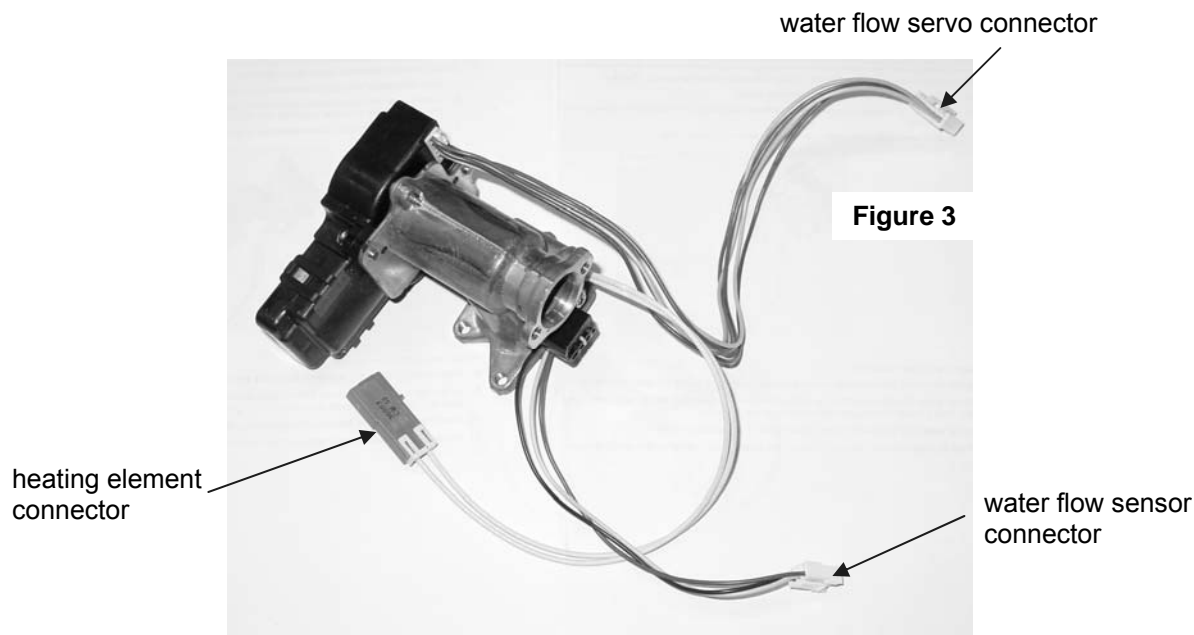
Water inlet

Component Replacement Instructions

Water Flow Control Assembly

R/C53i(PLUS), R50LSi,
R75LSe, R75LSi

7. Pull out the water flow servo assembly and disconnect the cable harnesses. (Figure 3)
 - A. water flow sensor harness (black/yellow/red wires)
 - B. water flow servo harness (red/blue/brown/yellow/gray or red/blue/brown/orange/yellow/gray wires)
 - C. heating element



Assemble

8. Place the new water flow assembly inside the water heater and attach the cable harnesses.
9. Replace the O-ring on the water inlet (included in kit). Attach the water flow assembly through the bottom of the compartment to the water inlet using 4 screws. The 2 shorter screws can be installed first to connect the water flow assembly to the bottom of the compartment. Then install the 2 longer screws through the water inlet.
10. Replace the O-ring on the water line (included in kit). Attach the water line to the water flow assembly with 1 screw and bracket.
11. Install the front panel using 4 screws.
12. Turn on the water supply, power supply, and gas supply.
13. Open a hot water tap and ensure there are no leaks at the water heater.

Component Replacement Instructions

Water Flow Control Assembly

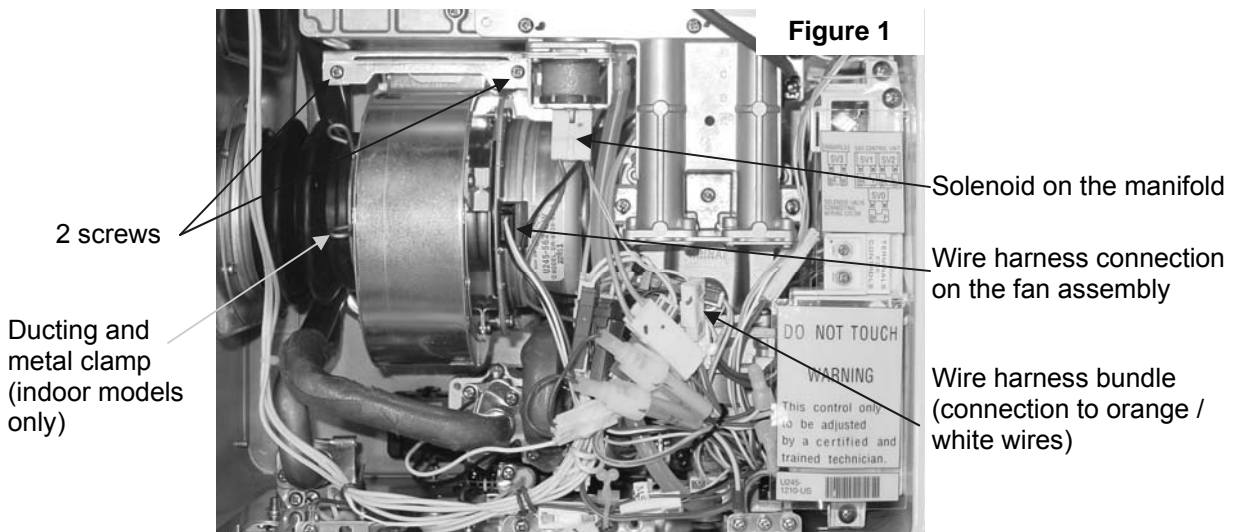
R/C85e(PLUS), R/C85i(PLUS),
R94LSe, R94LSi

NOTICE Due to design changes, the new valve may appear different than the installed valve in color, size, and in the number of wires in the harness connections.

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.

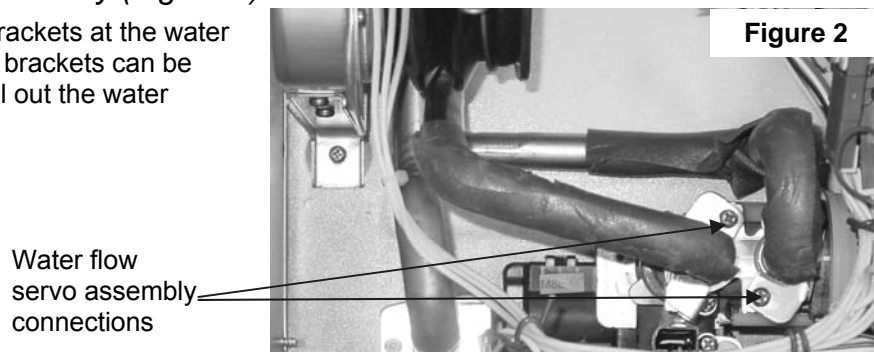
Remove Fan Assembly (Figure 1)

5. Disconnect wire harness at the fan assembly. Disconnect the air temperature thermistor (two white wires) at the connection with the white and orange wires within the wire bundle.
6. Pull out the harness attached to the solenoid on the manifold to make room to pull out the fan assembly.
7. Remove the 2 screws that attach the fan assembly to the bottom of the burner.
8. On indoor models, loosen the ducting from the fan assembly by pinching open the metal clamp.
9. Pull out the fan assembly.



Remove the water flow assembly (Figure 2)

10. Remove 2 screws and 2 brackets at the water flow servo assembly. The brackets can be left on the water lines. Pull out the water lines.

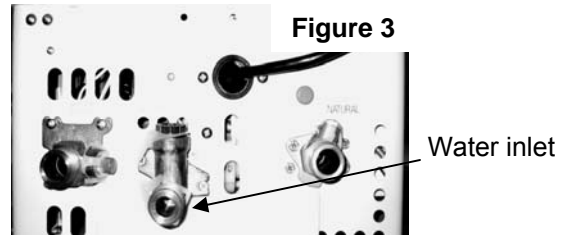


Component Replacement Instructions

Water Flow Control Assembly

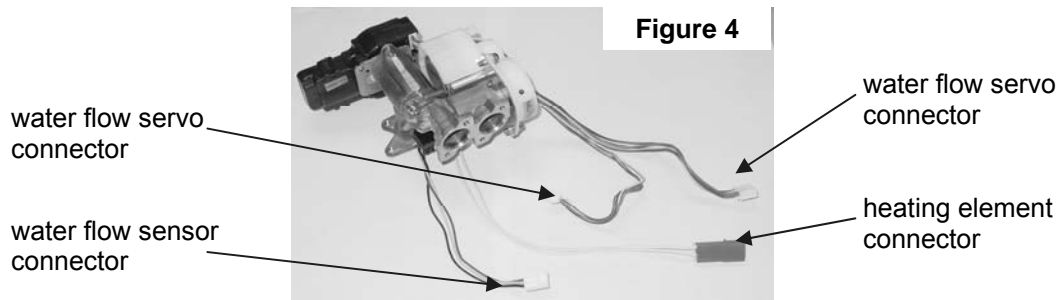
R/C85e(PLUS), R/C85i(PLUS),
R94LSe, R94LSi

11. Remove the 4 screws attaching the water inlet to the underneath side of the water heater.



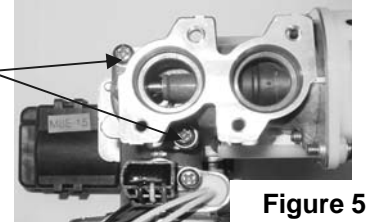
12. Disconnect the cable harnesses (Figure 4):

- water flow sensor harness (black/yellow/red wires)
- bypass servo assembly harness (white/red/yellow/orange/brown wires)
- water flow servo harness (red/blue/brown/yellow/gray or red/blue/brown/orange/yellow/gray wires)
- heating element



13. Pull out the water flow servo assembly and bypass servo assembly.

14. Remove 2 screws in order to separate the bypass servo assembly from the water flow servo assembly. (Figure 5)



Assemble

15. Replace the O-ring (included in kit) between the water flow servo assembly and the bypass servo assembly. Attach the new water flow servo assembly to the bypass servo assembly with 2 screws.
16. Place inside the water heater and attach the cable harnesses.
17. Replace the O-ring on the water inlet (included in kit). Attach the water flow assembly to the water inlet using 4 screws. The 2 shorter screws can be installed first to connect the water flow assembly to the bottom of the compartment. Then install the 2 longer screws through the water inlet.
18. Replace the O-ring on the water lines (included in kit). Attach the two water lines to the bypass servo assembly with 1 screw each.
19. Install the fan assembly by inserting the tab on the fan assembly into the slot at the base of the heat exchanger and attaching with two screws.
20. On indoor models, push the ducting over the fan assembly inlet and secure with the metal pinch clamp.
21. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
22. Install the front panel using 4 screws.
23. Turn on the water supply, power supply, and gas supply.
24. Open a hot water tap and ensure there are no leaks at the water heater.

Component Replacement Instructions

Water Flow Control Assembly

R/C98e(ASME), R/C98i(ASME),
R98LSe(ASME), R98LSi(ASME)

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.
5. Remove 2 screws and 2 brackets at the water flow servo assembly. Pull out the water lines. (Figure 1)
6. Remove the water flow sensor and the heating element. (Figure 1)
7. Remove the 4 screws attaching the water inlet to the underneath side of the water heater. (Figure 2)
8. Pull out the water flow servo assembly and bypass servo assembly. Remove the wire harness from the water servo valve. (Figure 3)
9. Remove 2 screws in order to separate the bypass servo assembly from the water flow servo assembly. (Figure 3)
10. Replace the O-ring (included in kit) between the water flow servo assembly and the bypass servo assembly. Attach the new water flow servo assembly to the bypass servo assembly with 2 screws.
11. Attach the wire harness to the water servo valve.
12. Place inside the water heater.
13. Attach the water flow assembly to the water inlet using 4 screws. The 2 shorter screws can be installed first to connect the water flow assembly to the bottom of the compartment. Install the 2 longer screws through the water inlet.
14. Insert the heating element and attach the water flow sensor.
15. Replace the O-ring on the water lines (included in kit). Attach the two water lines to the bypass servo assembly with 1 screw each.
16. Install the front panel using 4 screws.
17. Turn on the water supply, power supply, and gas supply.
18. Open a hot water tap and ensure there are no leaks at the water heater.

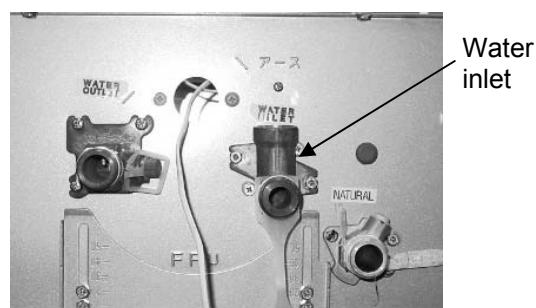
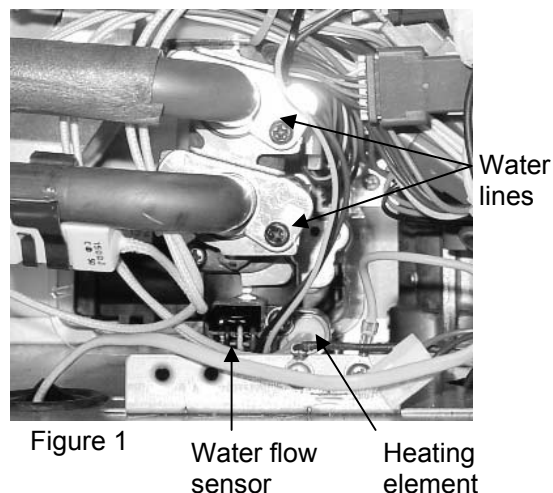


Figure 2

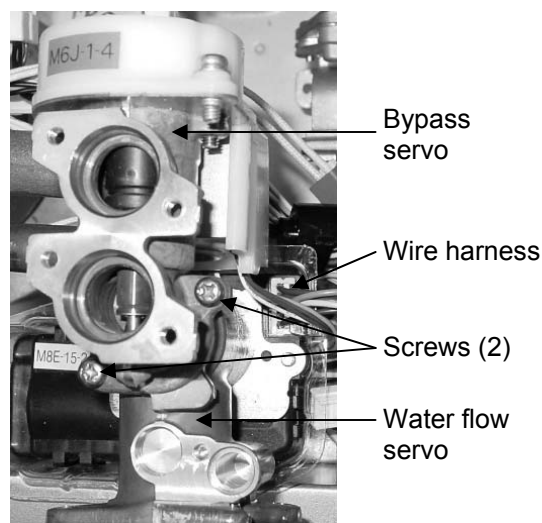


Figure 3

Component Replacement Instructions

Heat Exchanger

R/C42e, R/C53e, V53e, R63LSe

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.
5. On the V53e and R63LSe, remove the screws (3) holding the bracket with the surge protector. (Figure 1)
6. Disconnect the wire harness at the fan assembly. (Figure 2)
7. On the V53e and R63LSe, remove the screw attaching the bracket with the ignitor to the bottom of the burner case. (Figure 2)
8. Remove screws and brackets securing the water line connections. (Figure 1)
9. Remove the 6 screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly). (Figure 1)
10. Remove the 3 screws that attach the gas manifold to the gas valve. These screws are machine screws and must be used at these locations. (Figure 1)
11. Pull out the gas manifold.

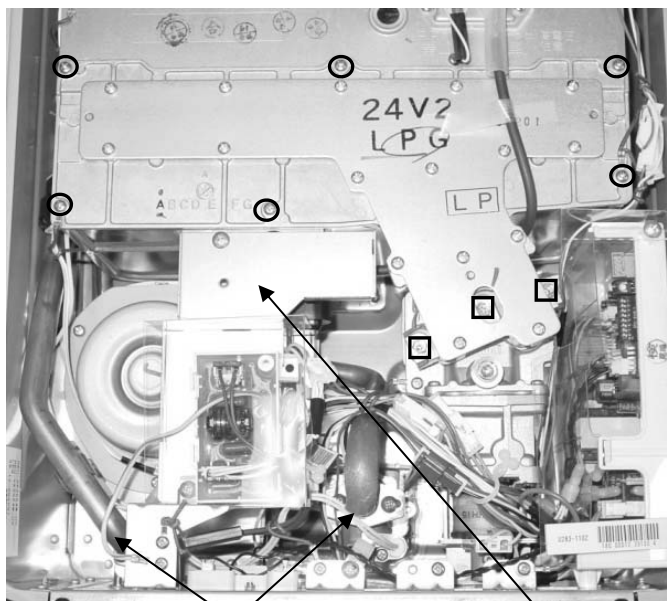


Figure 1

Water Connections

Bracket

6 screws ○
(gas manifold)

3 machine screws □
(gas valve)

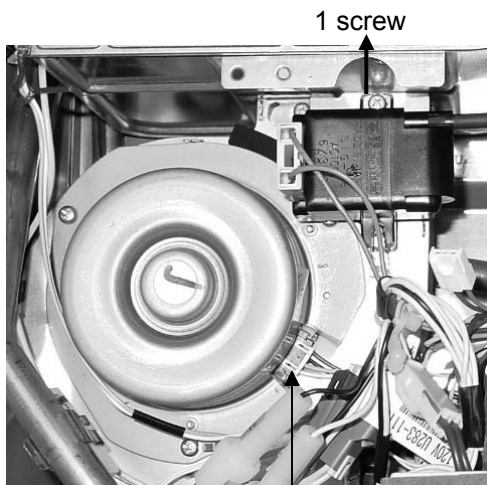


Figure 2

Wire Harness Connector

Component Replacement Instructions

Heat Exchanger

R/C42e, R/C53e, V53e, R63LSe

12. Remove the clips and screws (5 for the V53e and R/C42; 6 for the R/C53 and R63LSe) attaching the burner cover plate to the combustion chamber. (Figure 3)
13. Remove the 2 screws attaching the burner to the heat exchanger. Pull out the burner. (Figure 3)
14. Remove the wire harness attachments - sensors, heating elements, fusible link brackets. Ensure that the small O-ring at the thermistor is removed.
15. Remove the 4 screws connecting the heat exchanger to the casing. (Figures 4 and 5)
16. Pull out the assembly. Remove the brackets on the side and back holding the fusible link. Disconnect the red wire to the overheat switch from the rest of the wire harness in order to slide off the fusible link.
17. Remove the fan assembly (4 screws) and install it on the new heat exchanger.
18. Remove the flue outlet (7 screws) and install it on the new heat exchanger.
19. Install the largest O-ring (included in kit) over the water outlet tube and the smaller O-ring (included in kit) over the water inlet tube. (Figure 1)
20. Install the fusible link onto the new heat exchanger. Connect the red wire to the wire harness.
21. Attach brackets at the back and side holding the fusible link.
22. Install the 4 screws at the top and bottom of the heat exchanger to the casing. (Figures 4 and 5)
23. Insert the burner and place the burner cover plate into position. Attach the burner cover plate first with screws (5 for the V53e and R/C42; 6 for the R/C53 and R63LSe) and then attach the burner with 2 screws. (Figure 3)

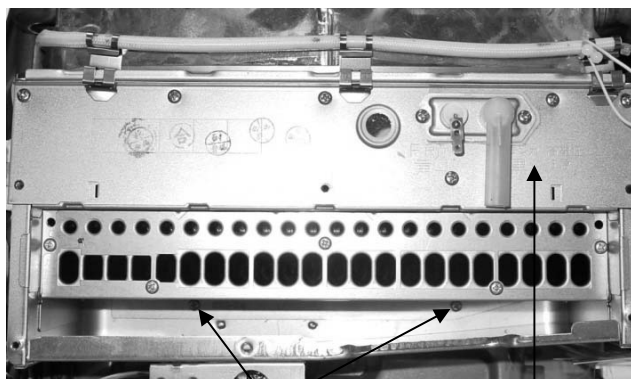


Figure 3 Screws attaching burner Burner cover plate

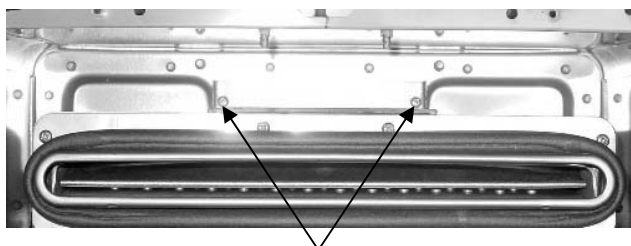


Figure 4 Top attachment screws

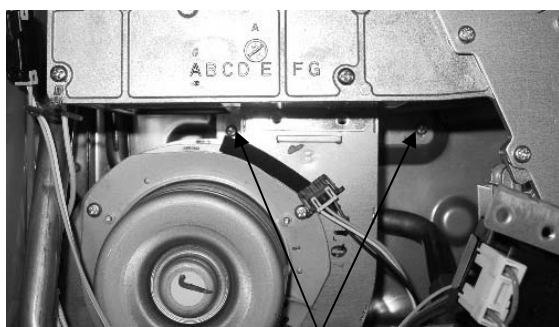


Figure 5 Bottom attachment screws

Component Replacement Instructions

Heat Exchanger

R/C42e, R/C53e, V53e, R63LSe

24. Make sure that the black gaskets (Figure 6) are intact on the gas control assembly. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve.
25. Attach the gas manifold with 3 machine screws at the gas control assembly. (Figure 1)
26. Attach the gas manifold with 6 screws at heat exchanger. (Figure 1)
27. Connect wire harness attachments. Replace the O-ring (included in kit) at the thermistor.
28. Install the bracket with the ignitor. (Figure 2)
29. Attach the ignition line at the burner cover plate.
30. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
31. Attach the brackets to the water line connections. (Figure 1)
32. On the V53e and R63LSe, install the bracket with the surge protector (3 screws). (Figure 1)
33. Install the front panel using 4 screws.
34. Turn on the water supply, power supply, and gas supply.
35. Check for gas leaks.

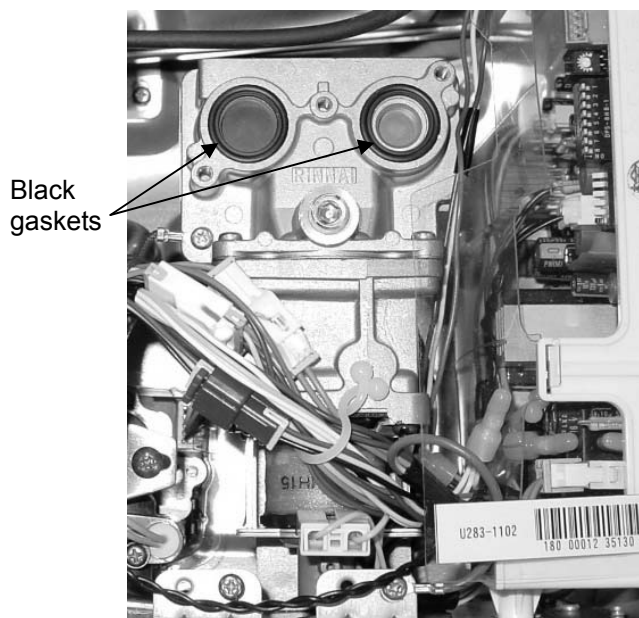


Figure 6

Component Replacement Instructions

Heat Exchanger

R70e, R75LSe

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.

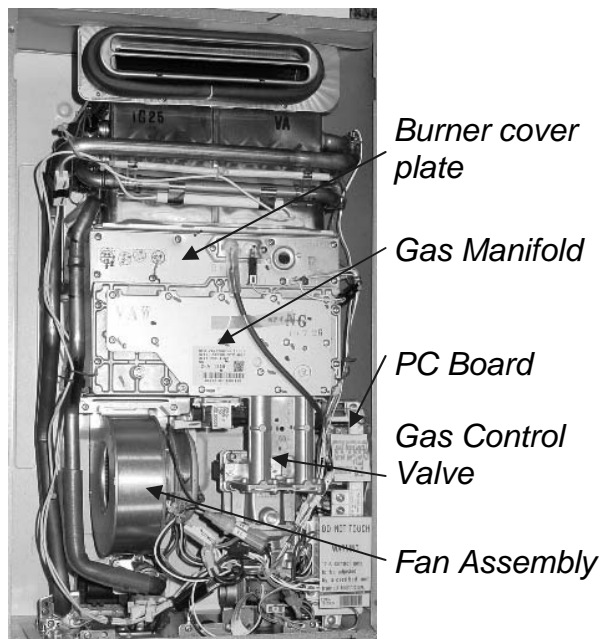


Figure 1

Remove Fan Assembly (Figure 2)

5. Disconnect wire harness at the fan assembly. Disconnect the air temperature thermistor (two white wires) at the connection with the white and orange wires within the wire bundle.
6. Pull out the harness attached to the solenoid on the manifold to make room to pull out the fan assembly.
7. Remove the 2 screws that attach the fan assembly to the bottom of the burner.
8. Pull out the fan assembly.

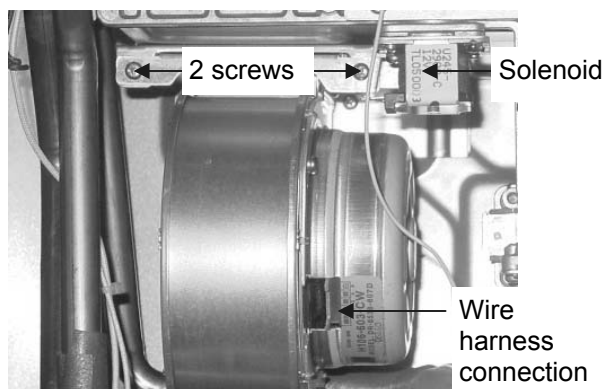


Figure 2

Disconnect Water Lines (Figure 3)

9. Remove 1 screw from the water outlet bracket. Remove the bracket by rotating and moving it up toward the bend in the tube where the diameter is smaller.
10. Remove 1 screw and 1 bracket at the water flow servo assembly.



Figure 3

Component Replacement Instructions

Heat Exchanger

R70e, R75LSe

Disconnect PC Board (Figure 4)

11. Remove 1 screw connecting the PC Board to the heat exchanger assembly.

Remove Gas Manifold (Figure 4)

12. Remove the 6 screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly).
13. Remove the 3 screws that attach the gas manifold to the gas valve. These screws are machine screws and must be used at these locations.
14. Pull out the ignition line and remove the gas manifold.

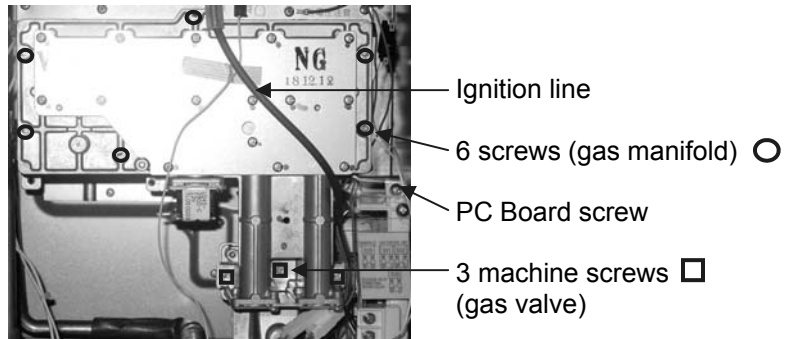


Figure 4

Remove Burner and Burner Cover Plate (Figure 5)

15. Remove the 8 screws attaching the burner cover plate to the combustion chamber. Move the cover plate to the side. It is not necessary to disconnect the wire harness from the burner cover plate.
16. Remove the 2 screws attaching the burner to the heat exchanger. Pull out the burner.
17. Unscrew the ignition line connection. (Figure 5)

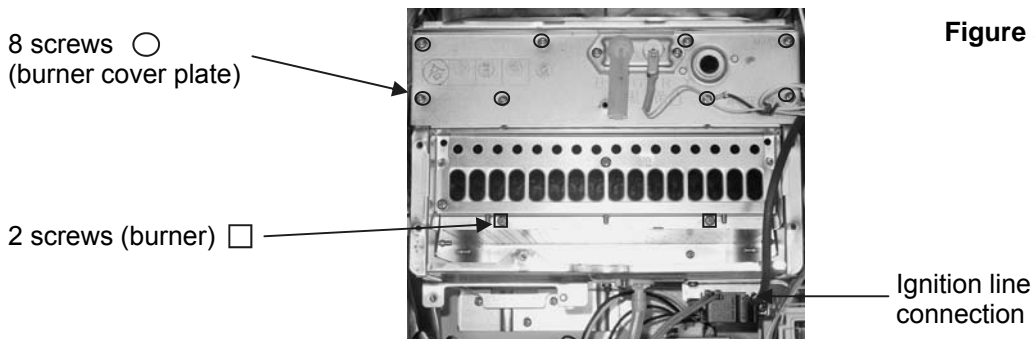


Figure 5

Disconnect Wire Harness Attachments and Screws Holding the Heat Exchanger

18. Remove the wire harness attachments - sensors, heating elements, fusible link brackets. Ensure that the small O-ring in the thermistor is removed. (Figure 6)
19. Remove 3 screws behind the fan. (Figure 7)
20. Remove 2 screws above the exhaust. Pull assembly from the unit. (Figure 8)

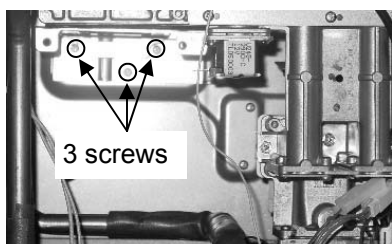


Figure 7

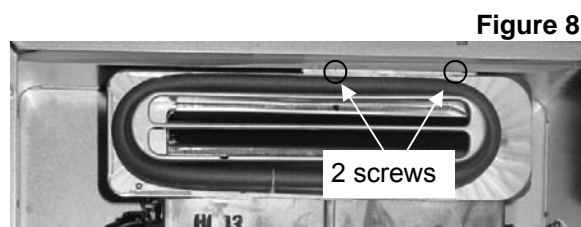


Figure 8

Component Replacement Instructions

Heat Exchanger

R70e, R75LSe

! WARNING Failure to correctly assemble the components according to these instructions may result in a gas leak or explosion.

Installation

21. Install the largest O-ring (included in kit) over the water outlet tube and the two smaller O-rings (included in kit) over the bypass servo tubes. (Figure 3)
22. Remove any other attached items and install on the new heat exchanger.
23. Install the new heat exchanger using 2 screws above the exhaust and 3 screws behind the fan. (Figures 7, 8)

Connect Pressure Tube and Wire Harness Attachments

24. Connect wire harness attachments.
25. Connect the pressure tube.
26. Attach the ignition line connection with 1 screw.

Install Burner and Burner Cover Plate (Figure 5)

27. Replace the combustion chamber packing (included in kit) removing any residue from old packing. Insert the burner and place the burner cover plate into position. Attach the burner cover plate first with 8 screws and then attach the burner with 2 screws.

Install Gas Manifold and Connect PC Board

28. Make sure that the two black packings (Figure 9) are intact on the gas control assembly. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. Attach the gas manifold with 3 machine screws at the gas control assembly. Replace the lower and upper packings (included in kit) for the manifold plate removing any residue.
29. Attach the gas manifold with 6 screws at heat exchanger.
30. Attach the ignition line at the burner cover plate.
31. Attach the PC Board to the heat exchanger with 1 screw.

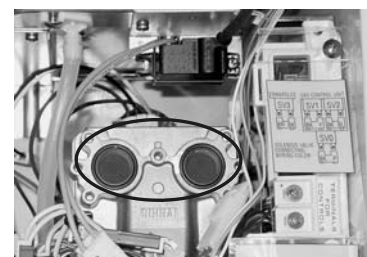


Figure 9

Connect Water Lines (Figure 3)

32. Attach the water outlet line and bracket with 1 screw.
33. Attach the line to the water flow servo assembly with 1 screw and 1 bracket.

Install Fan Assembly (Figure 2)

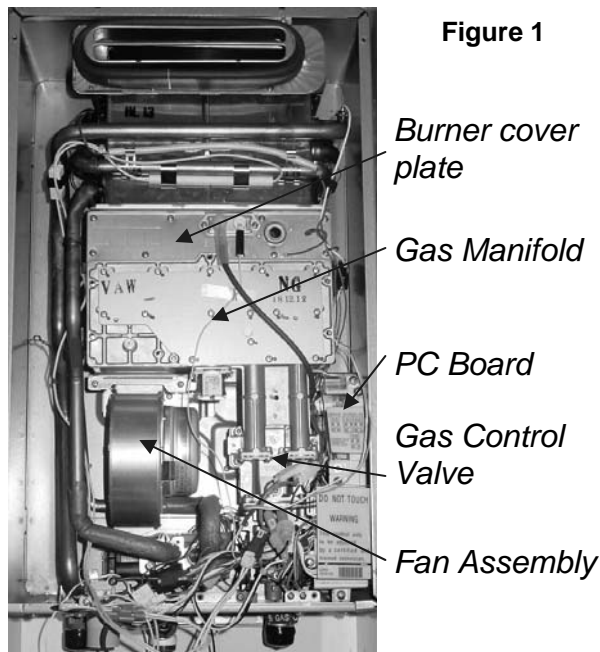
34. Install the fan assembly by inserting the tab on the fan assembly into the slot at the base of the heat exchanger and attaching with two screws.
35. Attach the wire harness to the solenoid on the gas manifold (brown, black wires).
36. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
37. Attach the air temperature thermistor (white, white wires) to the wire harness.
38. Install the front panel using 4 screws.
39. Turn on the water supply, power supply, and gas supply.
40. Check for gas leaks.

Component Replacement Instructions

Heat Exchanger

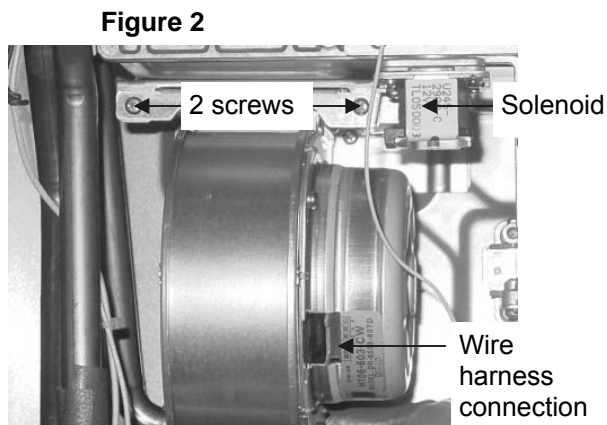
R/C85e(PLUS), R94LSe

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.



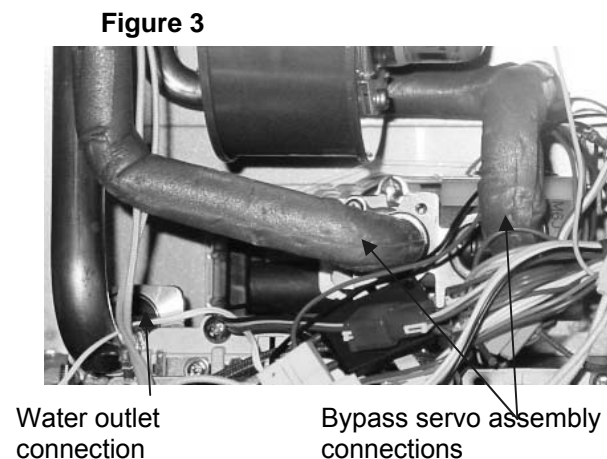
Remove Fan Assembly (Figure 2)

5. Disconnect wire harness at the fan assembly. Disconnect the air temperature thermistor (two white wires) at the connection with the white and orange wires within the wire bundle.
6. Pull out the harness attached to the solenoid on the manifold to make room to pull out the fan assembly.
7. Remove the 2 screws that attach the fan assembly to the bottom of the burner.
8. Pull out the fan assembly.



Disconnect Water Lines (Figure 3)

9. Remove 1 screw from the water outlet bracket. Remove the bracket by rotating and moving it up toward the bend in the tube where the diameter is smaller.
10. Remove 2 screws and 2 brackets at the bypass servo assembly.



Component Replacement Instructions

Heat Exchanger

R/C85e(PLUS), R94LSe

Disconnect PC Board (Figure 4)

11. Remove 1 screw connecting the PC Board to the heat exchanger assembly.

Remove Gas Manifold (Figure 4)

12. Remove the 6 screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly).
13. Remove the 3 screws that attach the gas manifold to the gas valve. These screws are machine screws and must be used at these locations.

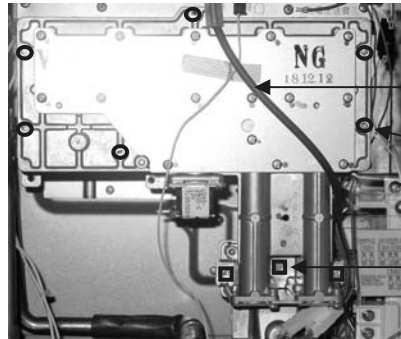


Figure 4

- Ignition line
- 6 screws (gas manifold) ○
- PC Board screw
- 3 machine screws □ (gas valve)

Remove Burner and Burner Cover Plate (Figure 5)

14. Pull out the ignition line and remove the gas manifold.
15. Remove the 8 screws attaching the burner cover plate to the combustion chamber. Move the cover plate to the side. It is not necessary to disconnect the wire harness from the burner cover plate.
16. Remove the 2 screws attaching the burner to the heat exchanger. Pull out the burner.

8 screws ○
(burner cover plate)

2 screws (burner) □

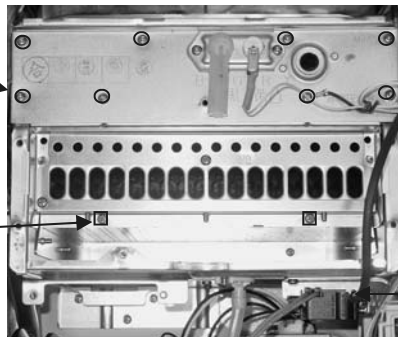


Figure 5

Ignition line
connection

Disconnect Wire Harness Attachments and Screws Holding the Heat Exchanger

17. Unscrew the ignition line connection. (Figure 5)
18. Remove the wire harness attachments - sensors, heating elements, fusible link brackets. Ensure that the small O-ring in the thermistor is removed. (Figure 6)
19. Remove 3 screws behind the fan. (Figure 7)

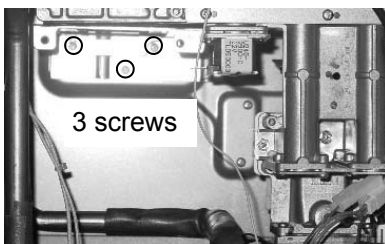


Figure 7

3 screws

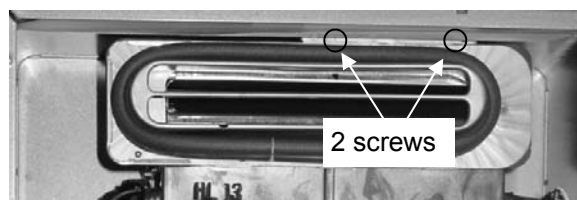


Figure 8

2 screws

Component Replacement Instructions

Heat Exchanger

R/C85e(PLUS), R94LSe

! WARNING Failure to correctly assemble the components according to these instructions may result in a gas leak or explosion.

Installation

20. Remove 2 screws above the exhaust. Pull assembly from the unit. (Figure 8)
21. Install the largest O-ring (included in kit) over the water outlet tube and the two smaller O-rings (included in kit) over the bypass servo tubes. (Figure 3)
22. Remove any other attached items and install on the new heat exchanger.

Connect Pressure Tube and Wire Harness Attachments

23. Install the new heat exchanger using 2 screws above the exhaust and 3 screws behind the fan. (Figures 7, 8)
24. Connect wire harness attachments.

Install Burner and Burner Cover Plate (Figure 5)

25. Connect the pressure tube. Attach the ignition line connection with 1 screw.

Install Gas Manifold and Connect PC Board

26. Replace the combustion chamber packing (included in kit) removing any residue from old packing. Insert the burner and place the burner cover plate into position. Attach the burner cover plate first with 8 screws and then attach the burner with 2 screws.
27. Make sure that the two black packings (Figure 9) are intact on the gas control assembly. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. Attach the gas manifold with 3 machine screws at the gas control assembly. Replace the lower and upper packings (included in kit) for the manifold plate removing any residue.

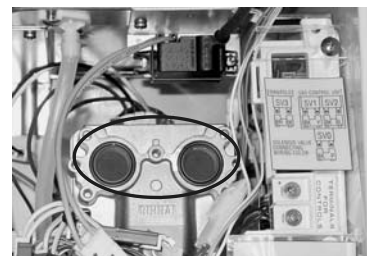


Figure 9

Connect Water Lines (Figure 3)

28. Attach the gas manifold with 6 screws at heat exchanger.
29. Attach the ignition line at the burner cover plate.

Install Fan Assembly (Figure 2)

30. Attach the PC Board to the heat exchanger with 1 screw.
31. Attach the water outlet line and bracket with 1 screw.
32. Attach the two lines to the bypass servo assembly with 1 screw and 1 bracket for each line.
33. Install the fan assembly by inserting the tab on the fan assembly into the slot at the base of the heat exchanger and attaching with two screws.
34. Attach the wire harness to the solenoid on the gas manifold (brown, black wires).
35. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
36. Attach the air temperature thermistor (white, white wires) to the wire harness.
37. Install the front panel using 4 screws. Turn on the water supply, power supply, and gas supply. Check for gas leaks.

Component Replacement Instructions

Heat Exchanger

R/C53i(PLUS), R75LSi

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.

Remove Fan Assembly (Figure 2)

5. Disconnect wire harness at the fan assembly. Disconnect the air temperature thermistor (two white wires) at the connection with the white and orange wires within the wire bundle.
6. Pull out the harness attached to the solenoid on the manifold to make room to pull out the fan assembly.
7. Remove the 2 screws that attach the fan assembly to the bottom of the burner.
8. Loosen the ducting from the fan assembly by pinching open the metal clamp.
9. Pull out the fan assembly.

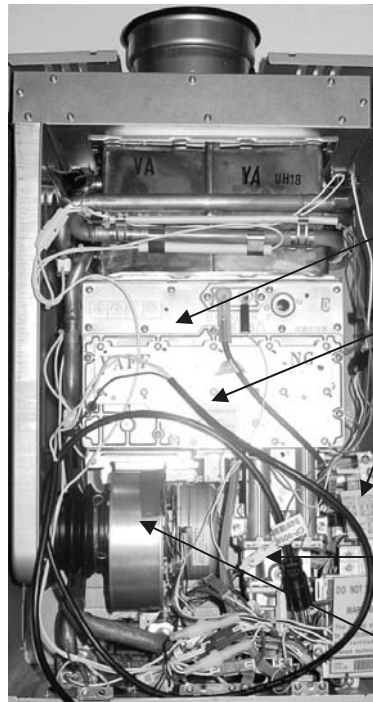


Figure 1

Burner cover plate

Gas Manifold

PC Board

Gas Control Valve

Fan Assembly

Disconnect Water Lines and PC Board (Figure 2)

10. Remove 1 screw from the water outlet bracket. Remove the bracket by rotating and moving it up toward the bend in the tube where the diameter is smaller.
11. Remove the screw and bracket at the water flow servo assembly.
12. Remove 1 screw connecting the PC Board to the heat exchanger assembly.

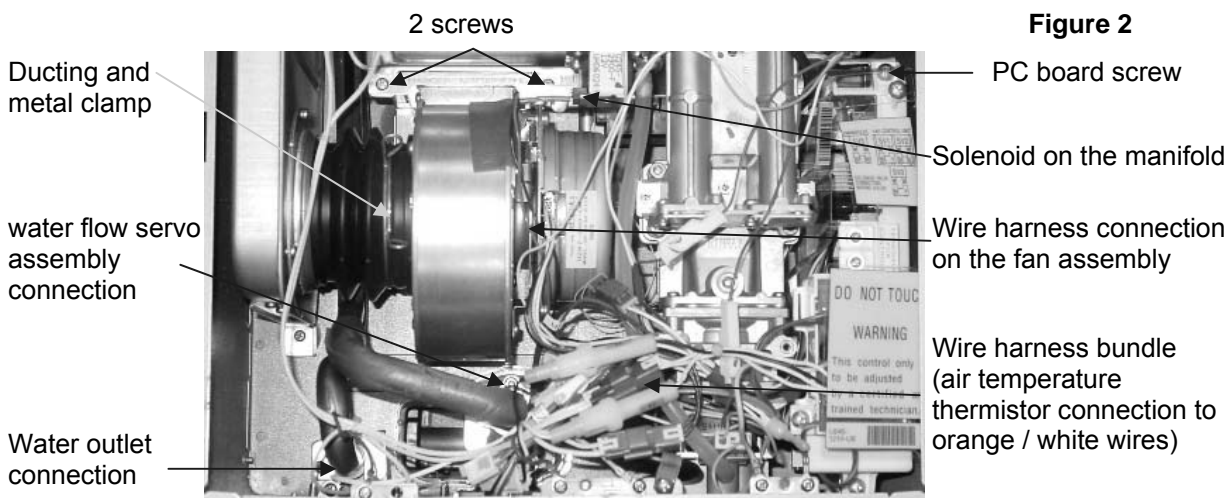


Figure 2

Ducting and metal clamp

water flow servo assembly connection

Water outlet connection

2 screws

PC board screw

Solenoid on the manifold

Wire harness connection on the fan assembly

Wire harness bundle (air temperature thermistor connection to orange / white wires)

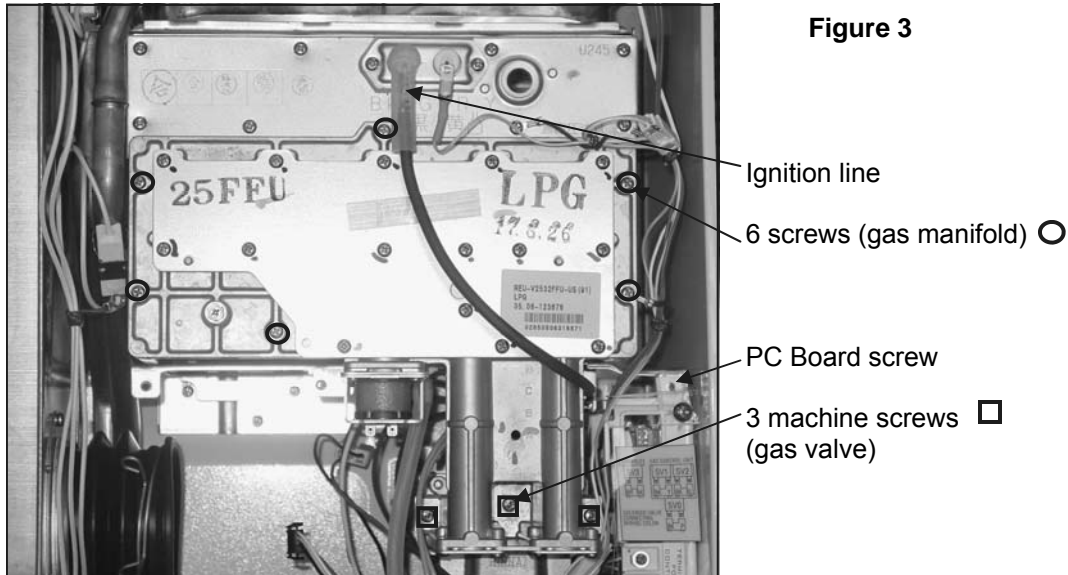
Component Replacement Instructions

Heat Exchanger

R/C53i(PLUS), R75LSi

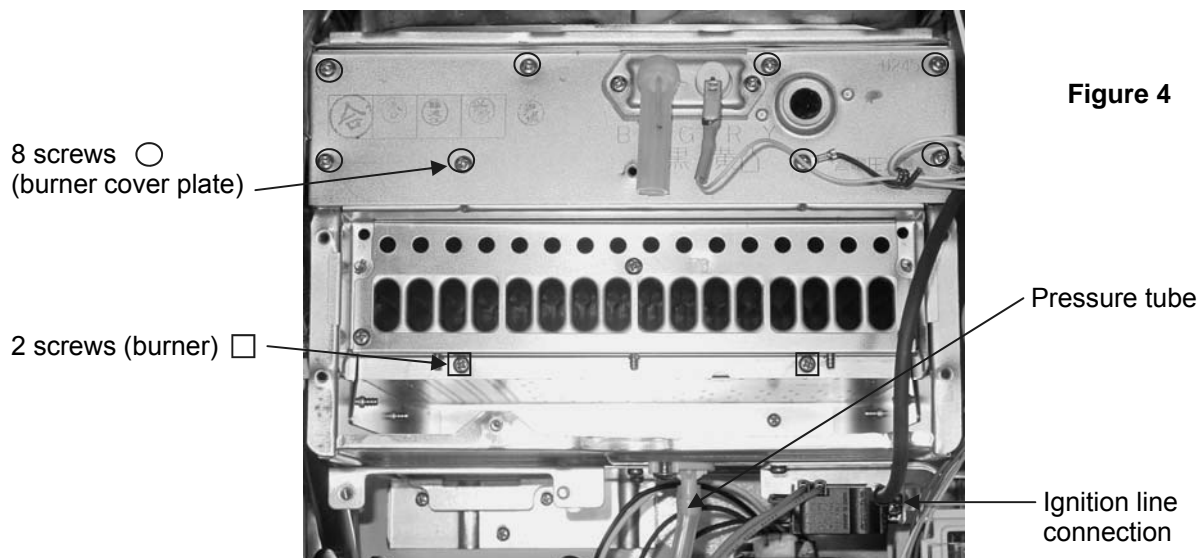
Remove Gas Manifold (Figure 3)

13. Remove the 6 screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly).
14. Remove the 3 screws that attach the gas manifold to the gas valve. These screws are machine screws and must be used at these locations.
15. Pull out the ignition line and remove the gas manifold.



Remove Burner and Burner Cover Plate (Figure 4)

16. Remove the 8 screws attaching the burner cover plate to the combustion chamber. Move the cover plate to the side. It is not necessary to disconnect the wire harness from the burner cover plate.
17. Remove the 2 screws attaching the burner to the heat exchanger. Pull out the burner.
18. Disconnect the pressure tube from the heat exchanger and unscrew the ignition line connection.



Component Replacement Instructions

Heat Exchanger

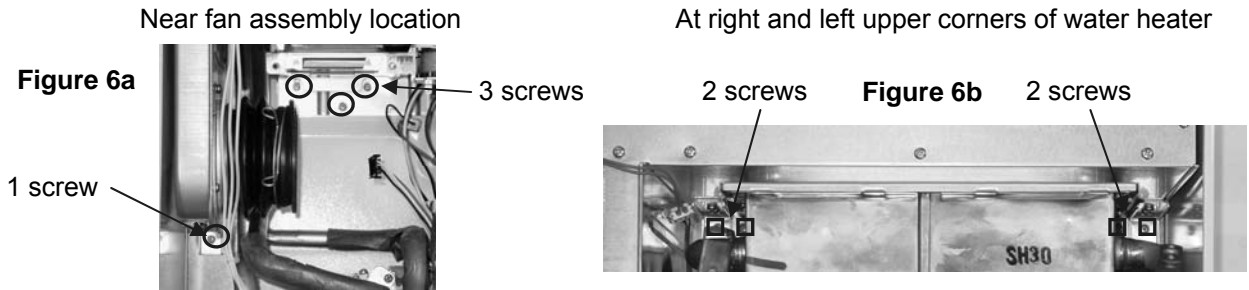
R/C53i(PLUS), R75LSi

Disconnect Wire Harness Attachments

19. Remove the wire harness attachments - sensors, heating elements, fusible link brackets. Ensure that the small O-ring in the thermistor is removed.

Remove Heat Exchanger and Air Intake/Exhaust

20. Remove 8 screws connecting the assembly to the water heater casing assembly. (Figures 6a, 6b)

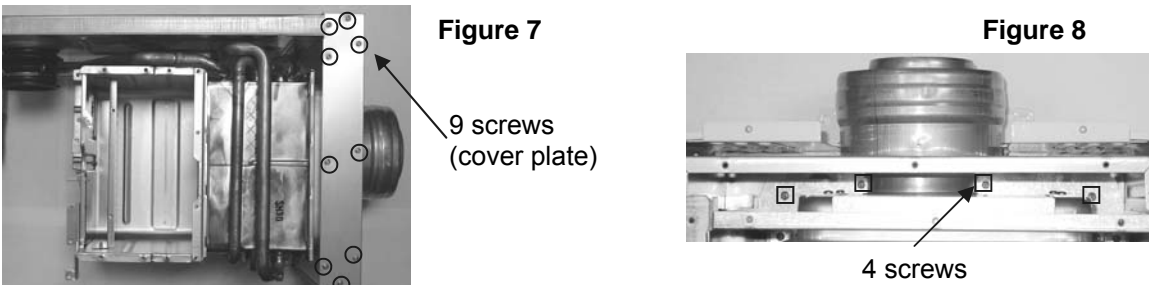


Separate the Heat Exchanger from the Air Intake/Exhaust

21. Pull out the assembly. Remove 3 brackets on the side and back holding the fusible link.

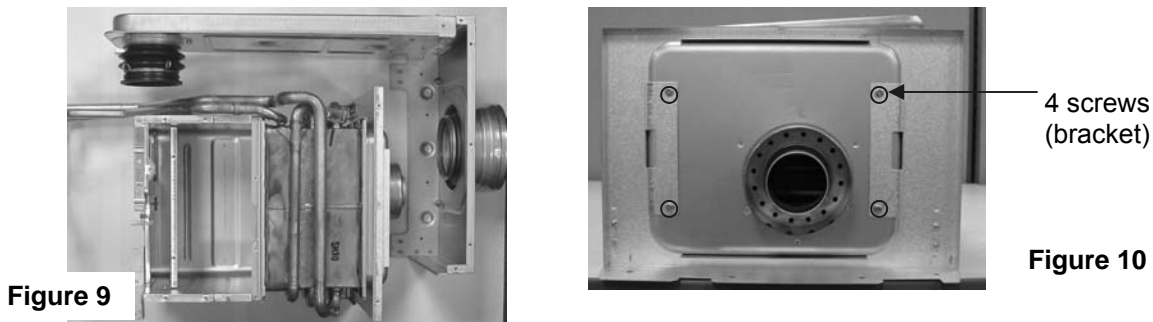
22. Remove the 9 screws at the cover plate over the air intake passage. (Figure 7)

23. Remove the 4 screws attaching the heat exchanger to the air intake/exhaust assembly. (Figure 8)



24. Pull apart the heat exchanger and air intake/exhaust assembly. (Figure 9)

25. Remove 4 screws attaching the bracket on top of the heat exchanger. Pull off the bracket. (Figure 10)



WARNING Failure to correctly assemble the components according to these instructions may result in a gas leak or explosion.

Component Replacement Instructions

Heat Exchanger

R/C53i(PLUS), R75LSi

Install Packings and Bracket

26. Install the O-ring (included in kit) over the water outlet tube and the O-ring (included in kit) over the water flow servo tube. (Figure 2)
27. Install the bracket over the replacement heat exchanger. Push evenly on both sides of the bracket. Attach with four screws. (Figure 10)

Combine the Heat Exchanger and the Air Intake/Exhaust Assembly

28. Push the heat exchanger into the air intake/exhaust assembly. Attach with four screws. (Figure 8)
29. Attach the cover plate over the air intake passage with 9 screws. (Figure 7)

Install Heat Exchanger and Air Intake/Exhaust Assembly (Figures 6a, 6b)

30. Attach the fusible link to the back (2 brackets) and side (1 bracket). Slide the assembly into the casing assembly and attach with 8 screws starting at the top of the water heater.

Connect Pressure Tube and Wire Harness Attachments

31. Connect wire harness attachments. (Figure 5)
32. Connect the pressure tube. Attach the ignition line connection with 1 screw. (Figure 4)

Install Burner and Burner Cover Plate (Figure 4)

33. Replace the combustion chamber packing (included in kit) removing any residue from old packing. Insert the burner and place the burner cover plate into position. Attach the burner cover plate first with 8 screws and then attach the burner with 2 screws.

Install Gas Manifold and Connect PC Board

34. Make sure that the two black packings (Figure 11) are intact on the gas control assembly. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. Attach the gas manifold with 3 machine screws at the gas control assembly. Replace the lower and upper packings (included in kit) for the manifold plate removing any residue.
35. Attach the gas manifold with 6 screws at heat exchanger.
36. Attach the ignition line at the burner cover plate.
37. Attach the PC Board to the heat exchanger with 1 screw.

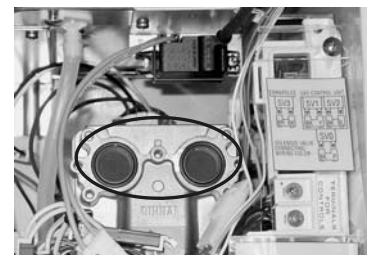


Figure 11

Connect Water Lines (Figure 2)

38. Attach the water outlet line and bracket with 1 screw.
39. Attach the two lines to the bypass servo assembly with 1 screw and 1 bracket for each line.

Install Fan Assembly (Figure 2)

40. Install the fan assembly by inserting the tab on the fan assembly into the slot at the base of the heat exchanger and attaching with two screws.
41. Push the ducting over the fan assembly exit and secure with the metal pinch clamp.
42. Attach the wire harness to the solenoid on the gas manifold (brown, black wires).
43. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
44. Attach the air temperature thermistor (white, white wires) to the wire harness.
45. Install the front panel using 4 screws.
46. Turn on the water supply, power supply, and gas supply.
47. Check for gas leaks.

Component Replacement Instructions

Heat Exchanger

R/C85i(PLUS), R94LSi

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.

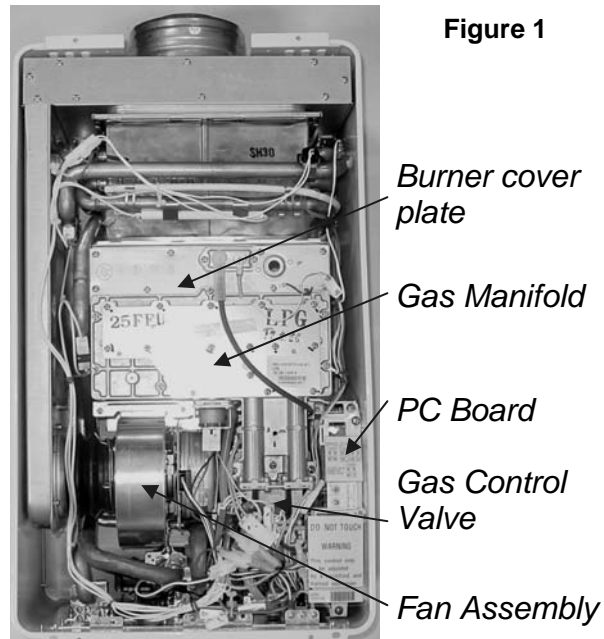


Figure 1

Remove Fan Assembly (Figure 2)

5. Disconnect wire harness at the fan assembly. Disconnect the air temperature thermistor (two white wires) at the connection with the white and orange wires within the wire bundle.
6. Pull out the harness attached to the solenoid on the manifold to make room to pull out the fan assembly.
7. Remove the 2 screws that attach the fan assembly to the bottom of the burner.
8. Loosen the ducting from the fan assembly by pinching open the metal clamp.
9. Pull out the fan assembly.

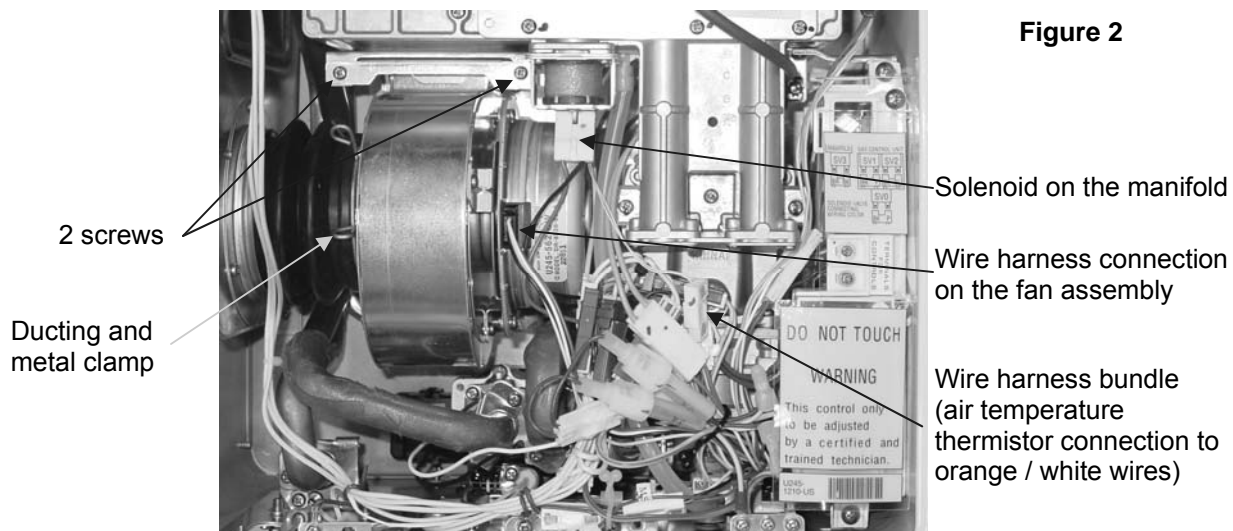


Figure 2

Component Replacement Instructions

Heat Exchanger

R/C85i(PLUS), R94LSi

Disconnect Water Lines (Figure 3)

10. Remove 1 screw from the water outlet bracket. Remove the bracket by rotating and moving it up toward the bend in the tube where the diameter is smaller.
11. Remove 2 screws and 2 brackets at the bypass servo assembly.

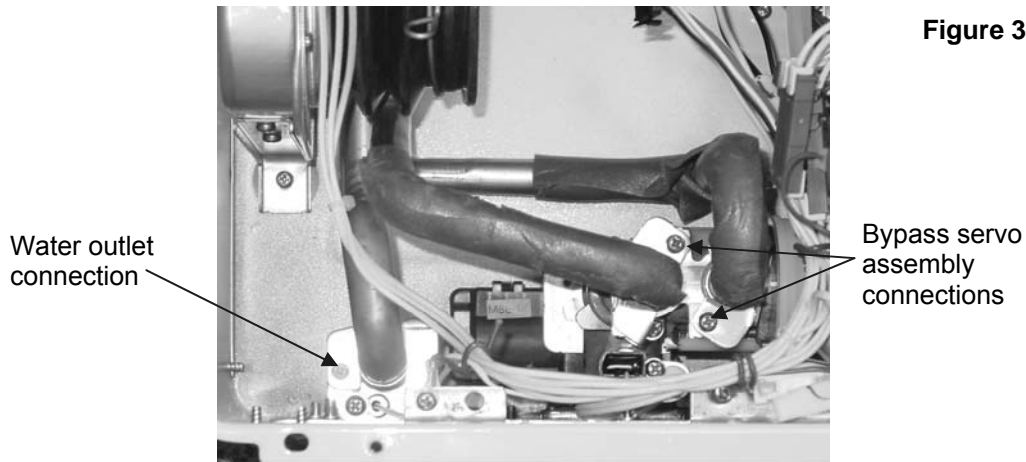


Figure 3

Disconnect PC Board (Figure 4)

12. Remove 1 screw connecting the PC Board to the heat exchanger assembly.

Remove Gas Manifold (Figure 4)

13. Remove the 6 screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly).
14. Remove the 3 screws that attach the gas manifold to the gas valve. These screws are machine screws and must be used at these locations.
15. Pull out the ignition line and remove the gas manifold.

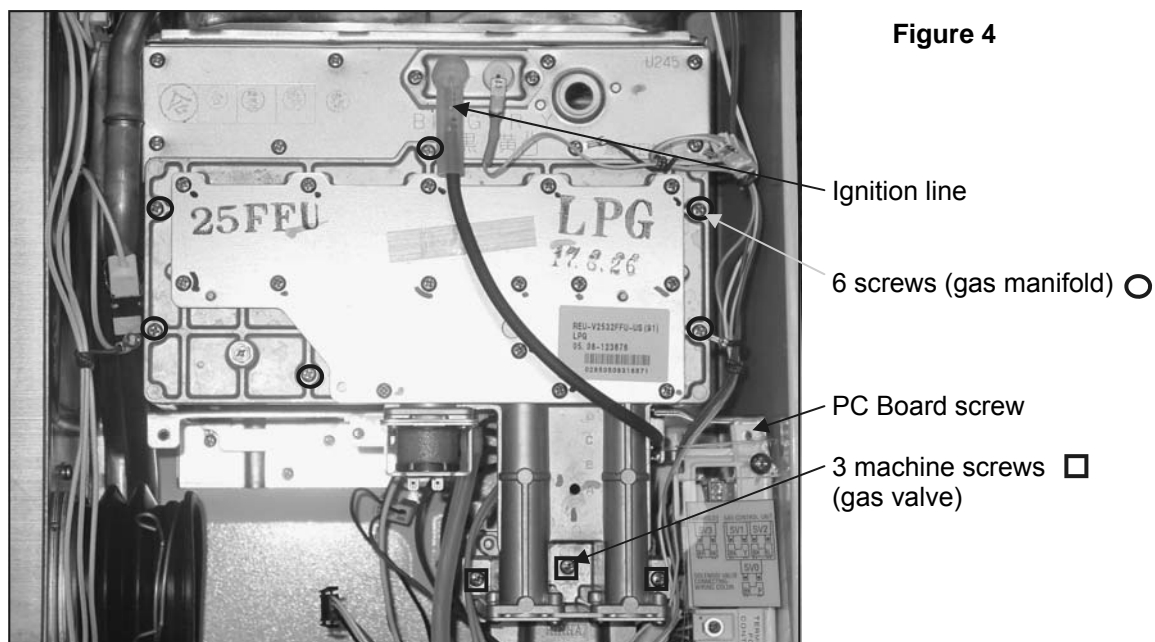


Figure 4

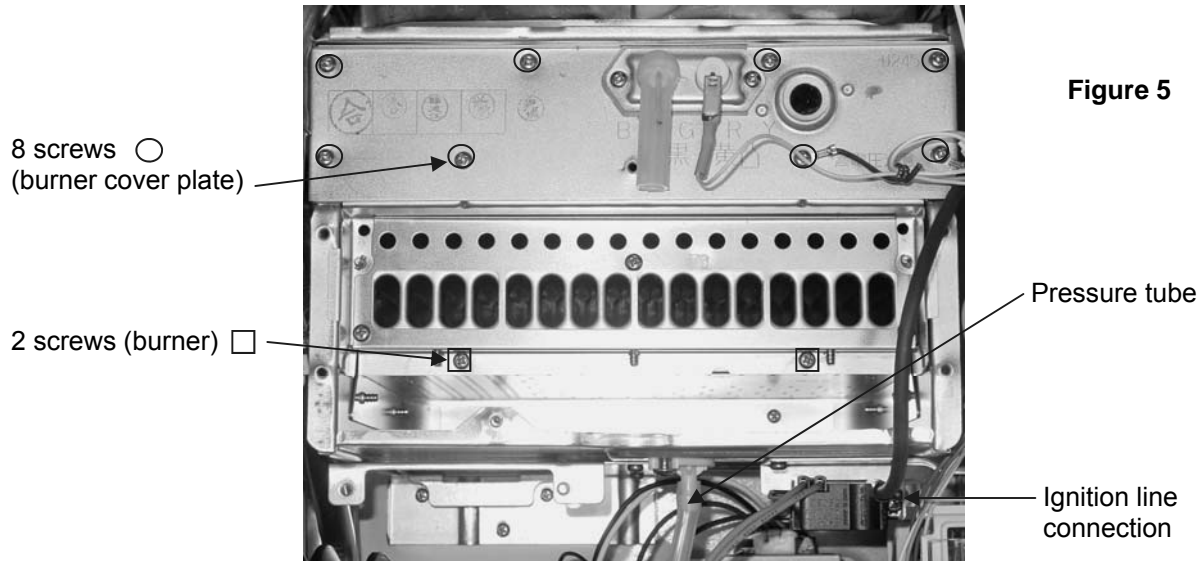
Component Replacement Instructions

Heat Exchanger

R/C85i(PLUS), R94LSi

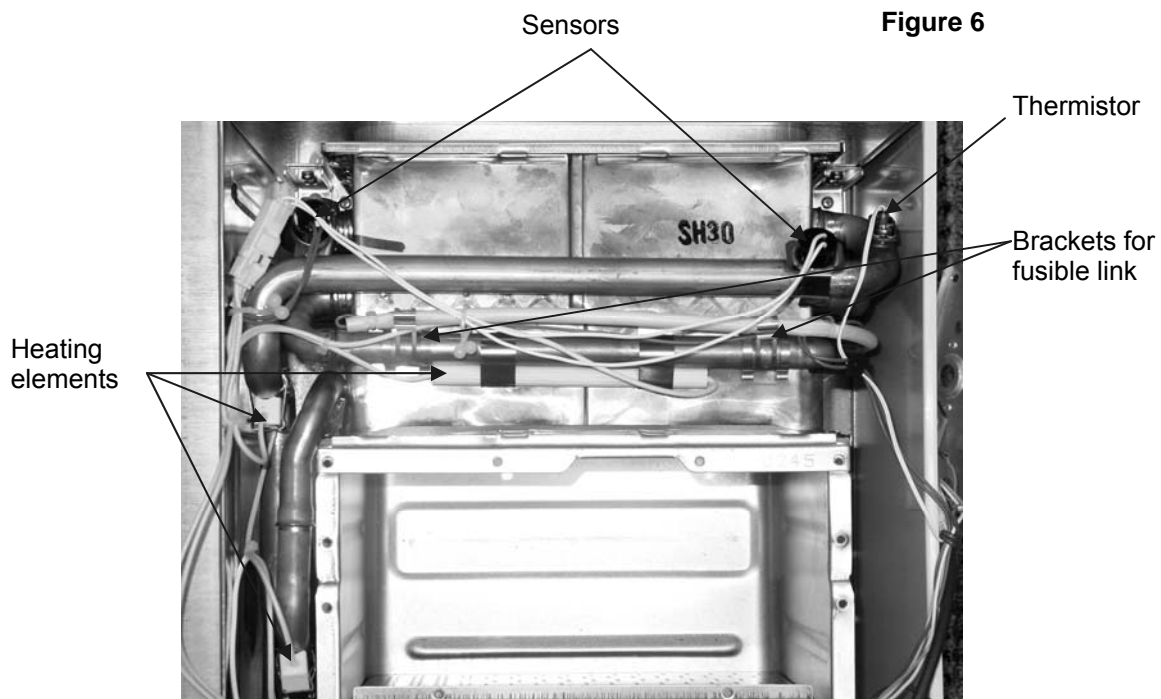
Remove Burner and Burner Cover Plate (Figure 5)

16. Remove the 8 screws attaching the burner cover plate to the combustion chamber. Move the cover plate to the side. It is not necessary to disconnect the wire harness from the burner cover plate.
17. Remove the 2 screws attaching the burner to the heat exchanger. Pull out the burner.



Disconnect Gas Line and Wire Harness Attachments

18. Disconnect the pressure tube from the heat exchanger and unscrew the ignition line connection. (Figure 5)
19. Remove the wire harness attachments - sensors, heating elements, fusible link brackets. Ensure that the small O-ring in the thermistor is removed. (Figure 6)



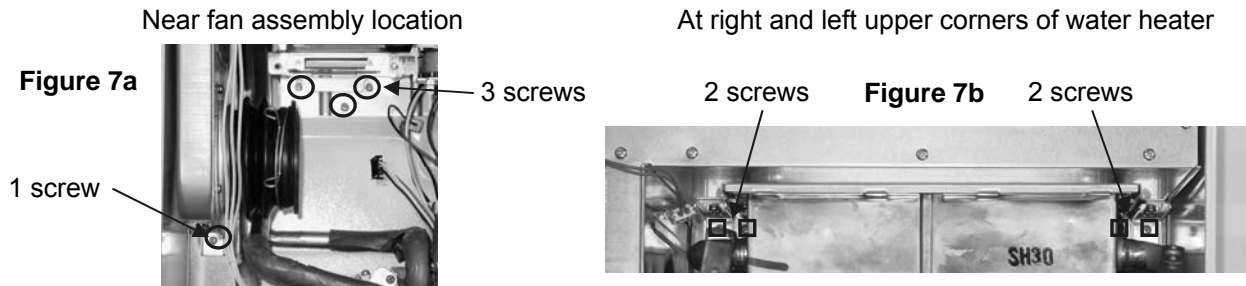
Component Replacement Instructions

Heat Exchanger

R/C85i(PLUS), R94LSi

Remove Heat Exchanger and Air Intake/Exhaust

20. Remove 8 screws connecting the assembly to the water heater casing assembly. (Figures 7a, 7b)

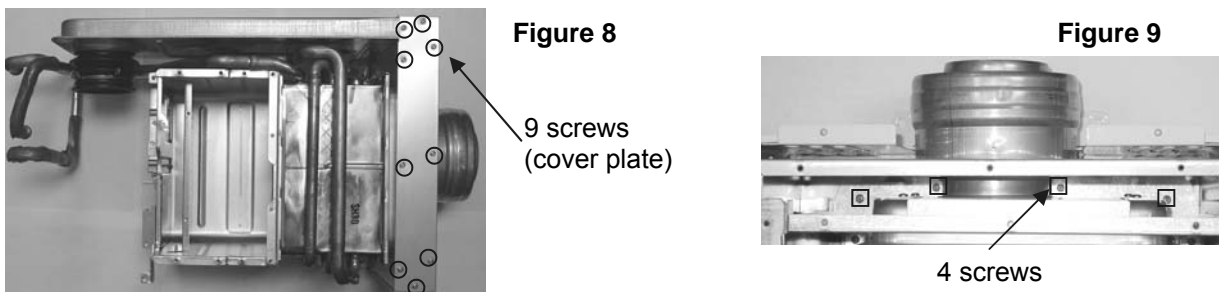


Separate the Heat Exchanger from the Air Intake/Exhaust

21. Pull out the assembly. Remove 3 brackets on the side and back holding the fusible link.

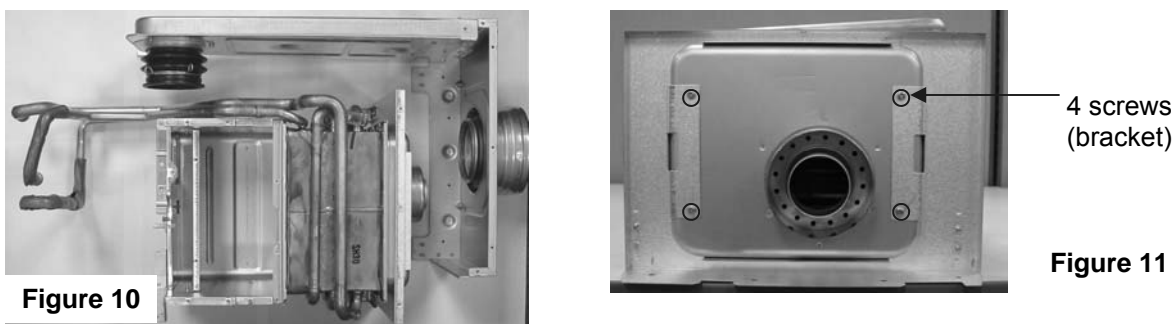
22. Remove the 9 screws at the cover plate over the air intake passage. (Figure 8)

23. Remove the 4 screws attaching the heat exchanger to the air intake/exhaust assembly. (Figure 9)



24. Pull apart the heat exchanger and air intake/exhaust assembly. (Figure 10)

25. Remove 4 screws attaching the bracket on top of the heat exchanger. Pull off the bracket. (Figure 11)



WARNING Failure to correctly assemble the components according to these instructions may result in a gas leak or explosion.

Install Packings and Bracket

26. Install the largest O-ring (included in kit) over the water outlet tube and the two smaller O-rings (included in kit) over the bypass servo tubes. (Figure 3)

27. Install the bracket over the replacement heat exchanger. Push evenly on both sides of the bracket. Attach with four screws. (Figure 11)

Component Replacement Instructions

Heat Exchanger

R/C85i(PLUS), R94LSi

Combine the Heat Exchanger and the Air Intake/Exhaust

28. Push the heat exchanger into the air intake/exhaust assembly. Attach with four screws. (Figure 9)
29. Attach the cover plate over the air intake passage with 9 screws. (Figure 8)

Install Heat Exchanger and Air Intake/Exhaust Assembly (Figures 7a, 7b)

30. Attach the fusible link to the back (2 brackets) and side (1 bracket). Slide the assembly into the casing assembly and attach with 8 screws starting at the top of the water heater.

Connect Pressure Tube and Wire Harness Attachments

31. Connect wire harness attachments. (Figure 6)
32. Connect the pressure tube.
33. Attach the ignition line connection with 1 screw. (Figure 5)

Install Burner and Burner Cover Plate (Figure 5)

34. Replace the combustion chamber packing (included in kit) removing any residue from old packing. Insert the burner and place the burner cover plate into position. Attach the burner cover plate first with 8 screws and then attach the burner with 2 screws.

Install Gas Manifold and Connect PC Board (Figure 4)

35. Make sure that the two black packings (Figure 12) are intact on the gas control assembly. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. Attach the gas manifold with 3 machine screws at the gas control assembly. Replace the lower and upper packings (included in kit) for the manifold plate removing any residue.
36. Attach the gas manifold with 6 screws at heat exchanger.
37. Attach the ignition line at the burner cover plate.



Figure 12

Connect Water Lines (Figure 3)

38. Attach the PC Board to the heat exchanger with 1 screw.
39. Attach the water outlet line and bracket with 1 screw.
40. Attach the two lines to the bypass servo assembly with 1 screw and 1 bracket for each line.

Install Fan Assembly (Figure 2)

41. Install the fan assembly by inserting the tab on the fan assembly into the slot at the base of the heat exchanger and attaching with two screws.
42. Push the ducting over the fan assembly exit and secure with the metal pinch clamp.
43. Attach the wire harness to the solenoid on the gas manifold (brown, black wires).
44. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
45. Attach the air temperature thermistor (white, white wires) to the wire harness.
46. Install the front panel using 4 screws.
47. Turn on the water supply, power supply, and gas supply.
48. Check for gas leaks.

Component Replacement Instructions

Heat Exchanger

R/C98e(ASME), R98LSe(ASME)

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.
5. Disconnect wire harness at the fan assembly, the electrical connections to the 3 solenoid valves, and the ignition line.
6. Remove 3 screws and brackets securing the water line connections. (Figure 1)
7. Remove the 5 screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly). (Figure 1)
8. Remove the 2 screws that attach the gas manifold to the gas valve. These screws are machine screws and must be used at these locations. (Figure 1)
9. Pull out the gas manifold and remove the connector at the ignitor at the left side of the gas manifold.
10. Remove the 9 screws attaching the burner cover plate to the combustion chamber. (Figure 2)
11. Remove the 2 screws attaching the burner to the heat exchanger. Pull out the burner. (Figure 2)
12. Remove the wire harness attachments - sensors, heating elements, fusible link brackets. Ensure that the small O-ring at the thermistor is removed.
13. Remove the 4 screws connecting the heat exchanger to the casing. (Figure 3)
14. Pull out the assembly. Remove the brackets on the side and back holding the fusible link. Slide off the fusible link.

5 screws ○
(gas manifold)

2 machine screws □
(gas valve)

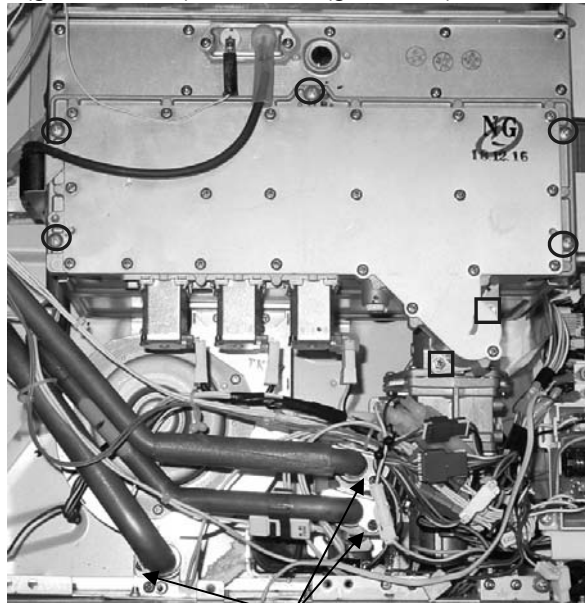


Figure 1

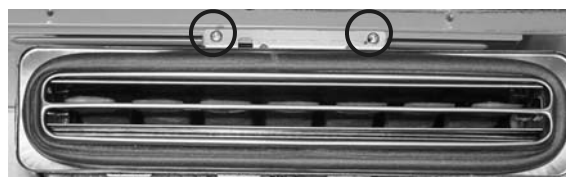
Water line connections



Figure 2

9 screws ○
(burner cover plate)

2 screws □
(burner)



Top screws

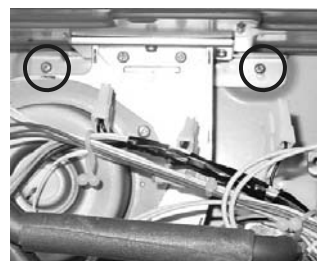


Figure 3

Bottom screws

Component Replacement Instructions

Heat Exchanger

R/C98e(ASME), R98LSe(ASME)

15. Remove the fan assembly (4 screws) and install it on the new heat exchanger. (Figure 4)
16. Remove the flue outlet (6 screws) and install it on the new heat exchanger. (Figure 5)
17. Install the largest O-ring (included in kit) over the water outlet tube and the two smaller O-rings (included in kit) over the water inlet tubes. (Figure 4)
18. Slide the fusible link between the water outlet and inlet tubes and onto the new heat exchanger. (Figure 4)
19. Attach brackets at the back and side holding the fusible link.
20. Install the 4 screws at the top and bottom of the heat exchanger to the casing. (Figure 3)
21. Insert the burner and place the burner cover plate into position. Attach the burner cover plate first with 9 screws and then attach the burner with 2 screws. (Figure 2)
22. Replace the electrode gasket. (Figure 6)
23. Make sure that the black gasket (Figure 7) is intact on the gas control assembly. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. Replace the lower and upper gaskets (included in kit) for the manifold plate removing any residue. (Figure 8)
24. Attach the electrical connector to the ignitor on the manifold and attach the gas manifold with 2 machine screws at the gas control assembly. (Figure 1)
25. Attach the gas manifold with 5 screws at heat exchanger. (Figure 1)
26. Connect wire harness attachments.
27. Attach the ignition line at the burner cover plate.
28. Attach the 3 electrical connectors to the solenoid valves.
29. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
30. Attach the brackets to the water line connections. (Figure 1)
31. Install the front panel using 4 screws. Turn on the water supply, power supply, and gas supply. Check for gas leaks.

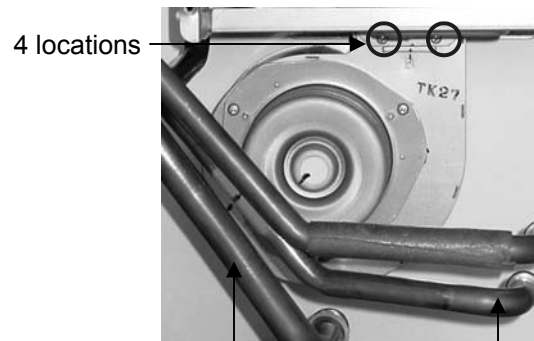


Figure 4
Water outlet tube
Water inlet tubes

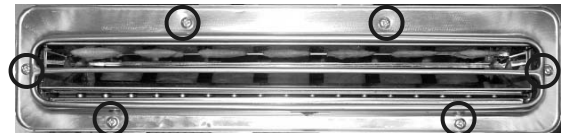


Figure 5

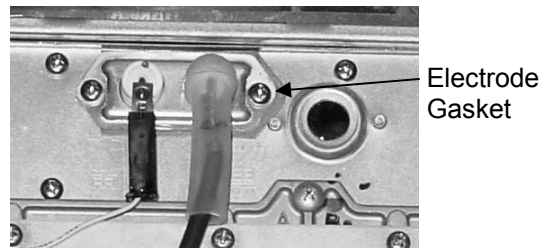


Figure 6

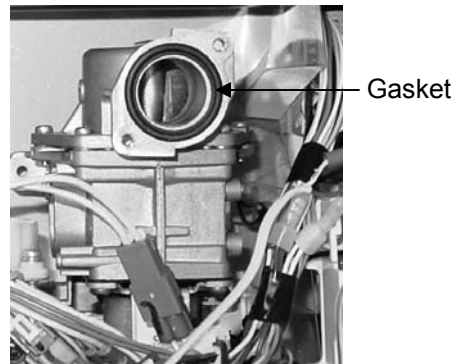


Figure 7

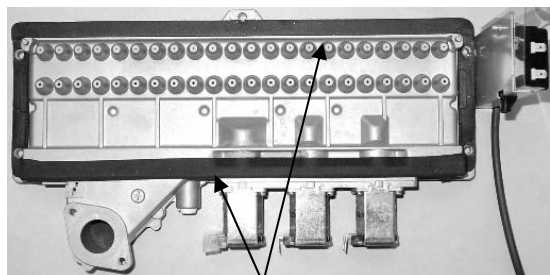


Figure 8

Gaskets

Component Replacement Instructions

Heat Exchanger

R/C98i(ASME), R98LSi(ASME)

1. Turn off the gas supply.
2. Turn off the 120 V power supply.
3. Turn off the water supply. Drain all water from the appliance.
4. Remove four screws securing the front panel. Remove front panel.
5. Remove the bracket holding the controller (1 screw). (Figure 1)
6. Disconnect wire harness at the fan assembly, the electrical connections to the 3 solenoid valves, and the ignition line.
7. Remove 3 screws and brackets securing the water line connections. (Figure 2)
8. Remove the 5 screws that attach the gas manifold to the combustion chamber (part of the heat exchanger assembly). (Figure 2)
9. Remove the 2 screws that attach the gas manifold to the gas valve. These screws are machine screws and must be used at these locations. (Figure 2)
10. Pull out the gas manifold and remove the connector at the ignitor at the left side of the gas manifold.
11. Remove the 9 screws attaching the burner cover plate to the combustion chamber. (Figure 3)
12. Remove the 2 screws attaching the burner to the heat exchanger. Pull out the burner. (Figure 3)
13. Remove the wire harness attachments - sensors, heating elements, fusible link brackets. Ensure that the small O-ring at the thermistor is removed.

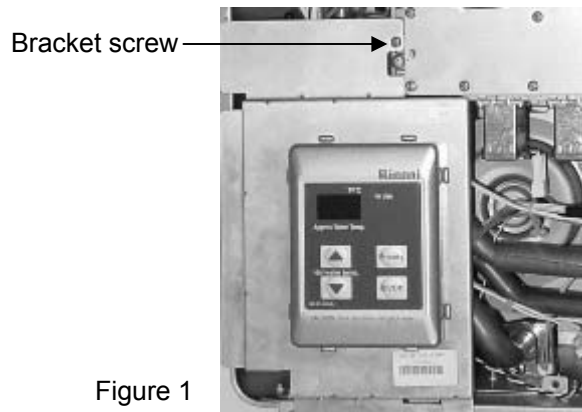


Figure 1

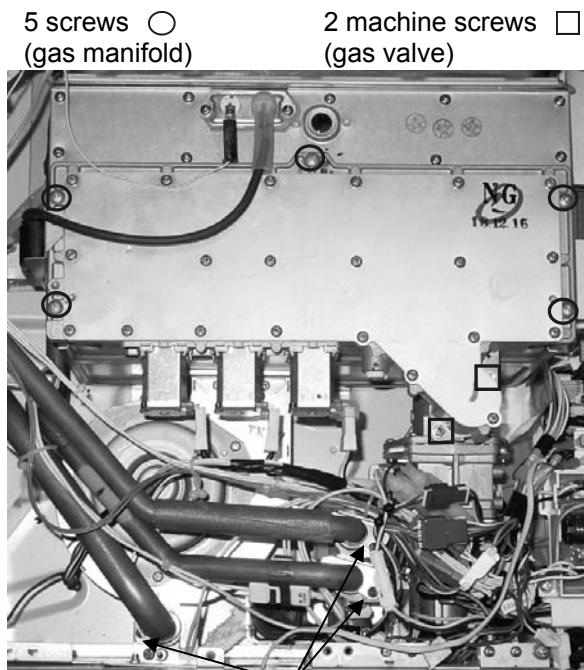


Figure 2

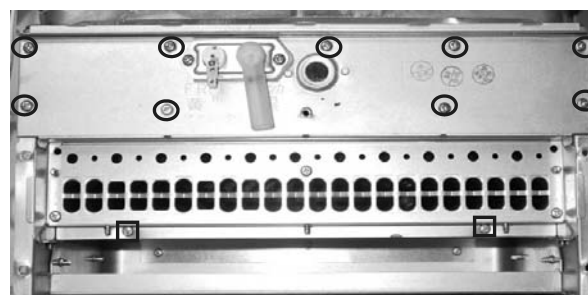


Figure 3 9 screws (burner cover plate) 2 screws (burner)

Component Replacement Instructions

Heat Exchanger

R/C98i(ASME), R98LSi(ASME)

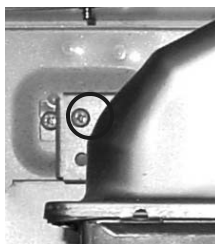
14. Remove the 3 screws at the seal plate at the top of the water heater. Remove the seal plate and gasket. (Figure 4)
15. Remove flue outlet vent (4 screws). (Figure 5)
16. Remove the 4 screws connecting the heat exchanger to the back of the casing. (Figure 6)
17. Pull out the assembly. (It is hooked on brackets in the casing.) Remove the brackets on the side and back holding the fusible link. Slide off the fusible link.
18. Remove the fan assembly (4 screws) and install it on the new heat exchanger. (Figure 7)
19. Install the largest O-ring (included in kit) over the water outlet tube and the two smaller O-rings (included in kit) over the water inlet tubes. (Figure 7)
20. Slide the fusible link between the water outlet and inlet tubes and onto the new heat exchanger. (Figure 7)
21. Attach brackets at the back and side holding the fusible link. Install the heat exchanger hooking it on the brackets in the back.
22. Install the 4 screws at the top and bottom of the heat exchanger to the back of the casing. (Figure 6)
23. Install the flue outlet vent (4 screws) and seal plate (3 screws) and gasket at the top of the water heater. (Figures 4 and 5)



Figure 4



Figure 5



Top left screw



Top right screw

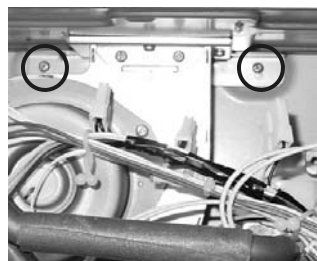


Figure 6 Bottom screws

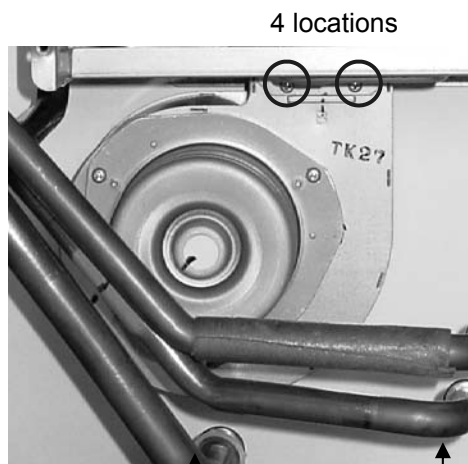


Figure 7

Water outlet tube

Water inlet tubes

Component Replacement Instructions

Heat Exchanger

R/C98i(ASME), R98LSi(ASME)

24. Insert the burner and place the burner cover plate into position. Attach the burner cover plate first with 9 screws and then attach the burner with 2 screws. (Figure 3)
25. Replace the electrode gasket. (Figure 8)
26. Make sure that the black gasket (Figure 9) is intact on the gas control assembly. Make sure that the ribbed side faces toward the manifold and that the flat side faces toward the gas valve. Replace the lower and upper gaskets (included in kit) for the manifold plate removing any residue. (Figure 10)
27. Attach the electrical connector to the ignitor on the manifold and attach the gas manifold with 2 machine screws at the gas control assembly. (Figure 2)
28. Attach the gas manifold with 5 screws at heat exchanger. (Figure 2)
29. Connect wire harness attachments.
30. Attach the ignition line at the burner cover plate.
31. Attach the 3 electrical connectors to the solenoid valves.
32. Attach the wire harness to the fan assembly (white, yellow, black, red wires).
33. Attach the brackets to the water line connections. (Figure 2)
34. Install the front panel using 4 screws.
35. Turn on the water supply, power supply, and gas supply.
36. Check for gas leaks.

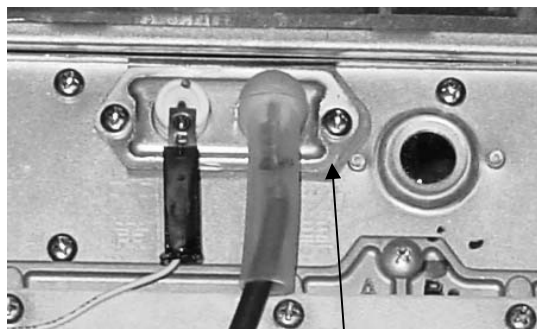


Figure 8 Electrode Gasket

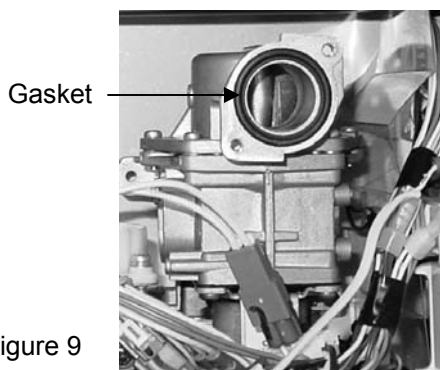


Figure 9 Gasket

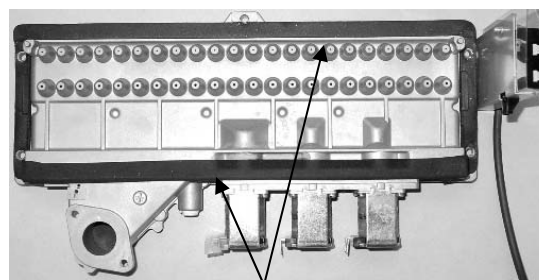


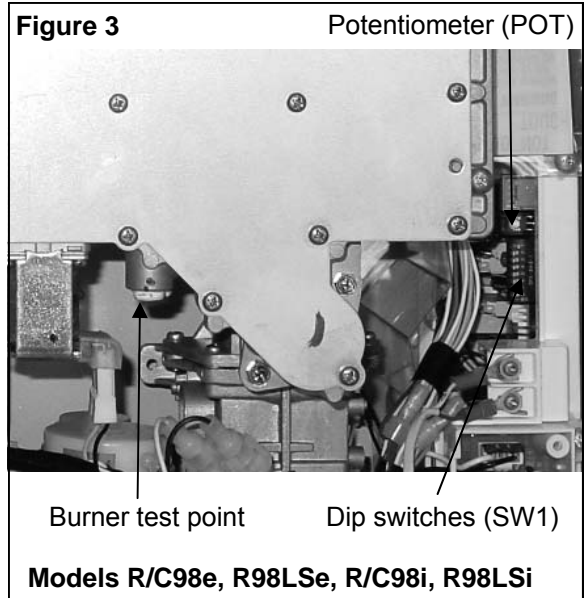
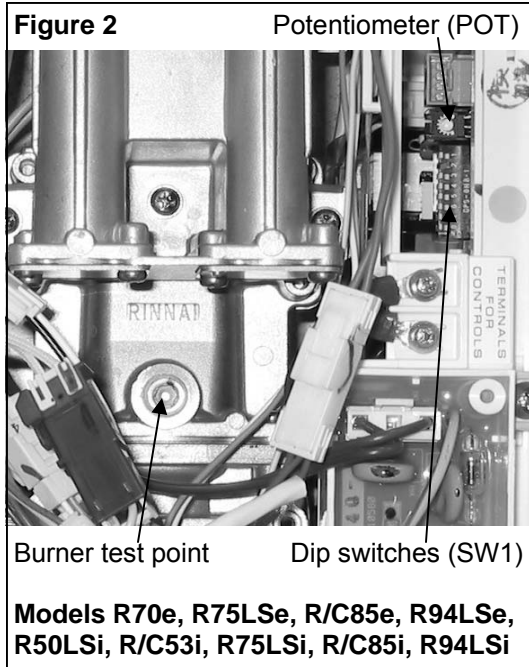
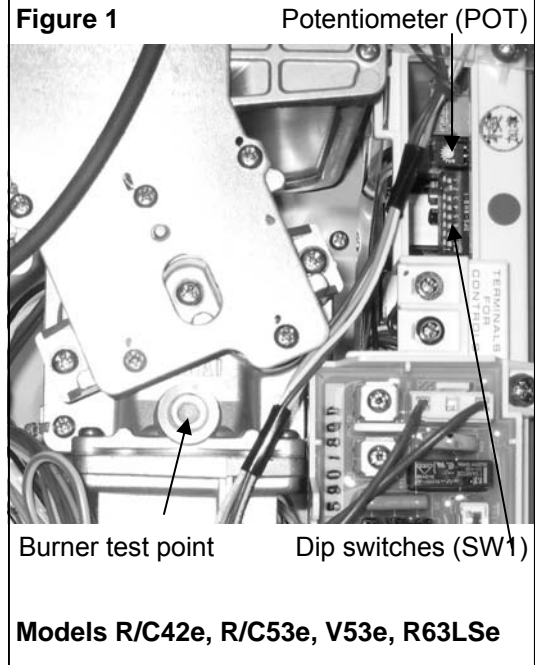
Figure 10 Gaskets

Gas Pressure Setting Procedure

CAUTION

Do not touch the areas at or near the heat exchanger or combustion chamber. These areas become very hot and could cause burns.

1. Remove the front panel (four screws).
2. Calibrate the low fire and high fire settings as follows:
 - A. Remove the allen head plug and attach the manometer to the burner test point located on the gas control. (Figure 1, 2, or 3)



Gas Pressure Setting Procedure

- B. Turn on the gas supply.
 - C. Turn on the power supply.
 - D. Flow water through the water heater at the maximum flow rate obtainable. (At least 3 gallons per minute is recommended.)
 - E. Move No. 7 dip switch of the SW1 bank to the ON position to calibrate "Forced Low" combustion. (Figure 5)
 - F. Check the burner test point pressure.
 - G. Remove the rubber access plug (Figure 4) and adjust the regulator screw on the modulating valve to obtain the correct low fire manifold pressure. Refer to the table for your gas type, model, and altitude. Install rubber access plug.
 - H. Move No. 7 and No. 8 dip switches of the SW1 bank to the ON position to calibrate "Forced High" combustion. (Figure 6)
 - I. Check the burner test point pressure.
 - J. Adjust the high pressure Potentiometer (POT) (Figure 1, 2, or 3) on the PC Board to obtain the correct high fire manifold pressure. Refer to the table for your gas type, model, and altitude.
 - K. Move No. 7 and No. 8 back to the OFF position to return the appliance to "Normal" combustion. (Figure 7)
 - L. Close hot water taps.
 - M. Turn off gas supply and 120 V power supply.
 - N. Remove manometer and re-install allen head plug.
 - O. Turn on the gas supply and 120 V power supply.
 - P. Operate the unit and check for gas leaks.
3. Install the front panel using four screws.

Figure 4

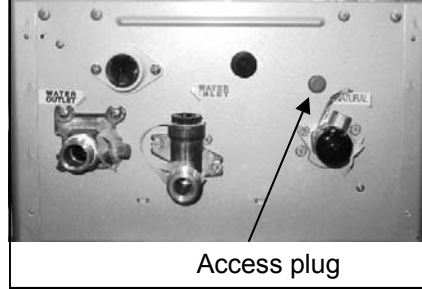


Figure 5

Forced Low

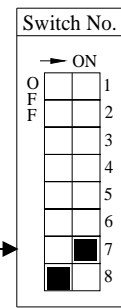


Figure 6

Forced High

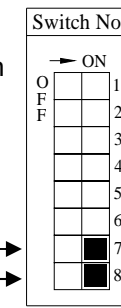
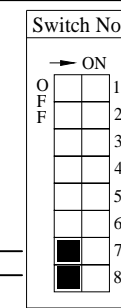


Figure 7

Normal



Manifold Gas Pressure Settings

V Series - Outdoor

Natural Gas

Propane Gas

R42e,C42e

Altitude	High Fire	Low Fire
less than 5000 ft (1524 m)	3.5	0.73
6000 ft (1829 m)	3.4	0.71
7000 ft (2134 m)	3.3	0.69
8000-10000 ft (2438 - 3048 m)	3.2	0.67

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	3.3	0.72
3000 ft (914 m)	3.0	0.65
4000 ft (1219 m)	2.7	0.58
5000 ft (1524 m)	2.3	0.50

R53e,C53e

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	3.7	0.74
3000 ft (914 m)	3.5	0.71
4000 ft (1219 m)	3.4	0.68
5000-10000 ft (1524 - 3048 m)	3.2	0.64

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	3.5	0.74

**R85e(PLUS),
C85e(PLUS)**

Altitude	High Fire	Low Fire
less than 10000 ft (3048 m)	3.4	0.56

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	5.1	0.88
3000 ft (914 m)	4.8	0.83
4000 ft (1219 m)	4.5	0.78
5000 ft (1524 m)	4.3	0.73
6000 ft (1829 m)	4.2	0.72
7000-10000 ft (2134 - 3048 m)	4.1	0.71

R70e

Altitude	High Fire	Low Fire
less than 10000 ft (3048 m)	3.4	0.56

Altitude	High Fire	Low Fire
less than 10000 ft (3048 m)	5.1	0.88

**R98e(ASME),
C98e(ASME)**

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	2.8	0.66
3000 ft (914 m)	2.7	0.63
4000 ft (1219 m)	2.6	0.60
5000 ft (1524 m)	2.4	0.57
6000 ft (1829 m)	2.3	0.54
7000 ft (2134 m)	2.2	0.52
8000-10000 ft (2438 - 3048 m)	2.1	0.50

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	3.8	0.80
3000 ft (914 m)	3.6	0.75
4000 ft (1219 m)	3.3	0.69
5000 ft (1524 m)	3.1	0.64
6000-10000 ft (1829 - 3048 m)	3.0	0.63

Manifold Gas Pressure Settings

V Series - Indoor

Natural Gas

**R53i(PLUS),
C53i(PLUS),
R85i(PLUS),
C85i(PLUS)**

Altitude	High Fire	Low Fire
less than 10000 ft (3048 m)	3.7	0.77

Propane Gas

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	4.2	0.93
3000 ft (914 m)	4.0	0.90
4000 ft (1219 m)	3.9	0.86
5000 ft (1524 m)	3.7	0.82
6000 ft (1829 m)	3.7	0.82
7000 ft (2134 m)	3.6	0.80
8000 ft (2438 m)	3.6	0.80
9000 ft (2743 m)	3.4	0.79
10000 ft (3048 m)	3.2	0.75

**R98i(ASME),
C98i(ASME)**

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	3.0	0.67
3000 ft (914 m)	2.8	0.64
4000 ft (1219 m)	2.7	0.60
5000-10000 ft (1524 - 3048 m)	2.5	0.56

Altitude	High Fire	Low Fire
less than 2000 ft (610 m)	3.7	0.83
3000 ft (914 m)	3.5	0.78
4000 ft (1219 m)	3.3	0.73
5000 ft (1524 m)	3.0	0.67

Manifold Gas Pressure Settings

VA Series

V53e (REU-VAM1620W) using NATURAL GAS

Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	2.5	0.73
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.4	0.7
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.4	0.7
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.4	0.9

V53e (REU-VAM1620W) using PROPANE GAS

Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	2.4	0.75
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.2	0.9
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.0	0.8
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.0	0.7

Manifold Gas Pressure Settings

VA Series

R63LSe (REU-VA2024W) using NATURAL GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	1.7	0.53
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	1.6	0.4
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	1.5	0.5
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	1.5	0.5

R63LSe (REU-VA2024W) using PROPANE GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	2.4	0.61
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.0	0.7
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.0	0.7
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	1.8	0.8

R63LSe2 - REU-VA2024W(A) using NATURAL GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	2.0	0.56
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	1.7	0.55
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	1.7	0.70
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	1.5	0.70

R63LSe2 - REU-VA2024W(A) using PROPANE GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	3.0	0.88
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.8	0.90
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.7	1.00
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.7	0.80

Manifold Gas Pressure Settings

VA Series

R50LSi (REU-VA2019FFU) using NATURAL GAS		MAX VENT (Dip Switch #1 is OFF)		MIN VENT (Dip Switch #1 is ON)	
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	2.0	0.52	2.0	0.52
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	1.7	0.7	1.8	0.7
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	1.7	0.7	1.7	0.7
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	1.8	0.9	1.8	0.9
R75LSi (REU-VA2528FFU), R94LSi (REU-VA2535FFU) using NATURAL GAS		MAX VENT (Dip Switch #1 is OFF)		MIN VENT (Dip Switch #1 is ON)	
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	3.3	0.52	3.3	0.52
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.8	0.5	2.8	0.6
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.4	0.5	2.4	0.5
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.1	0.5	2.1	0.5
R75LSi(A) (REU-VA2528FFU(A)) using NATURAL GAS		MAX VENT (Dip Switch #1 is OFF)		MIN VENT (Dip Switch #1 is ON)	
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	2.7	0.52	2.7	0.52
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.8	0.5	2.8	0.5
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.4	0.5	2.4	0.5
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.1	0.5	2.1	0.5

R75LSe (REU-VA2528W), R94LSe (REU-VA2535W) using NATURAL GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	3.3	0.56
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	3.3	0.7
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	3.3	0.9
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	3.1	0.7
R75LSe(A) (REU-VA2528W(A)) using NATURAL GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	2.9	0.56
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	3.3	0.7
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	3.3	0.9
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	3.1	0.7

Manifold Gas Pressure Settings

VA Series

R50LSi (REU-VA2019FFU) using PROPANE GAS		MAX VENT (Dip Switch #1 is OFF)		MIN VENT (Dip Switch #1 is ON)	
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	3.2	0.92	3.2	0.92
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	3.1	1.0	3.0	1.1
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.8	0.9	2.8	1.1
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.8	1.1	2.8	1.4
R75LSi (REU-VA2528FFU), R94LSi (REU-VA2535FFU) using PROPANE GAS		MAX VENT (Dip Switch #1 is OFF)		MIN VENT (Dip Switch #1 is ON)	
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	5.0	0.92	5.0	0.92
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	3.3	1.0	3.4	1.0
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	3.4	1.1	3.4	1.2
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	3.2	1.1	3.2	1.1
R75LSi(A) (REU-VA2528FFU(A)) using PROPANE GAS		MAX VENT (Dip Switch #1 is OFF)		MIN VENT (Dip Switch #1 is ON)	
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	4.4	0.92	4.4	0.92
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	3.3	1.0	3.4	1.0
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	3.4	1.1	3.4	1.2
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	3.2	1.1	3.2	1.1

R75LSe (REU-VA2528W), R94LSe (REU-VA2535W) using PROPANE GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	5.1	0.88
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	4.0	1.1
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	4.0	0.9
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	4.0	0.9
R75LSe(A) (REU-VA2528W(A)) using PROPANE GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	4.2	0.88
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	4.0	1.1
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	4.0	0.9
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	4.0	0.9

Manifold Gas Pressure Settings

VA Series

R98LSi (REU-VA3237FFU) using NATURAL GAS		MAX VENT (Dip Switch #1 is OFF)		MIN VENT (Dip Switch #1 is ON)	
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	3.0	0.67	3.0	0.67
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.7	0.7	2.7	0.7
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.7	0.8	2.7	0.8
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.5	1.7	2.5	1.2

R98LSe (REU-VA3237W) using NATURAL GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	2.8	0.65
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.5	0.7
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	2.5	0.7
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.5	0.7

R98LSi (REU-VA3237FFU) using PROPANE GAS		MAX VENT (Dip Switch #1 is OFF)		MIN VENT (Dip Switch #1 is ON)	
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	3.7	0.83	3.7	0.83
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	2.9	0.83	2.9	0.83
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	3.0	0.83	3.0	0.9
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	2.8	0.83	2.8	1.2

R98LSe (REU-VA3237W) using PROPANE GAS			
Dip Switch Setting	Altitude	Max Rate inches W.C.	Min Rate inches W.C.
#2 OFF, #3 OFF	0-2000 ft (0-610 m)	3.8	0.80
#2 OFF, #3 ON	2001-5200 ft (610-1585 m)	3.0	0.80
#2 ON, #3 OFF	5201-7700 ft (1585-2277 m)	3.0	0.80
#2 ON, #3 ON	7701-10200 ft (2277-3109 m)	3.0	0.80

Dip Switch Settings

V Series

SW1 Bank

1	OFF - "Long Flue" ON - "Short Flue" and Outdoor Models "Long flue" is defined as: 0 elbows and length is greater than 21 ft 1 elbow and length is greater than 15 ft 2 elbows and length is greater than 9 ft
2	ON position
3	OFF position
4	OFF position
5	OFF position
6	OFF position
7	OFF position - Used for low fire and high fire settings. Refer to the gas pressure setting procedure.
8	

SW2 Bank

1	OFF - Propane Gas ON - Natural Gas
2	OFF position for models prior to these serial numbers: (on these units, the front panel does not have an "R" or "C" trade name, unless the front panel has been replaced) V1616W, V1616WC 06.02-000001 V2020W, V2020WC 05.07-000001 V2532W, V2532WC 05.05-117257 V2532FFU, V2532FFUC 05.05-117257 V2520FFU, V2520FFUC 05.05-109539 V2526W 05.05-110434 ON position for other models, serial numbers
3	OFF position
4	OFF - Residential Models ON - Commercial Models

VA Series (for -UC models refer to the next page)

SW1 Bank

1	OFF - "Long Flue" ON - "Short Flue" and Outdoor Models "Long flue" is defined as: 0 elbows and length is greater than 21 ft 1 elbow and length is greater than 15 ft 2 elbows and length is greater than 9 ft												
2	Settings dependent on altitude												
3													
	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>0-2000 ft (0-610 m)</td> <td>2001-5200 ft (610-1585 m)</td> <td>5201-7700 ft (1585-2347 m)</td> <td>7701-10200 ft (2347-3109 m)</td> </tr> <tr> <td>#2: OFF</td> <td>#2: OFF</td> <td>#2: ON</td> <td>#2: ON</td> </tr> <tr> <td>#3: OFF</td> <td>#3: ON</td> <td>#3: OFF</td> <td>#3: ON</td> </tr> </table>	0-2000 ft (0-610 m)	2001-5200 ft (610-1585 m)	5201-7700 ft (1585-2347 m)	7701-10200 ft (2347-3109 m)	#2: OFF	#2: OFF	#2: ON	#2: ON	#3: OFF	#3: ON	#3: OFF	#3: ON
0-2000 ft (0-610 m)	2001-5200 ft (610-1585 m)	5201-7700 ft (1585-2347 m)	7701-10200 ft (2347-3109 m)										
#2: OFF	#2: OFF	#2: ON	#2: ON										
#3: OFF	#3: ON	#3: OFF	#3: ON										
4	OFF - if using MC-91 controller ON - if using MC-45 controller												
5	OFF - 120°F default temperature without a controller ON - 140°F default temperature without a controller												
6	OFF position												
7	OFF position - Used for low fire and high fire settings. Refer to the gas pressure setting procedure.												
8													

SW2 Bank (present on replacement PC boards only)

1	OFF - Propane Gas ON - Natural Gas
2	OFF - Outdoor model ON - Indoor model
3	OFF - R63LSe, R75LSe, R75LSi, R94LSe, R94LSi, R98LSe(ASME), R98LSi(ASME) ON - R50LSi, V53e
4	OFF - V53e, R63LSe, R94LSe, R94LSi, R98LSe(ASME), R98LSi(ASME) ON - R50LSi, R75LSe, R75LSi
5	OFF - V53e, R63LSe, R75LSe, R75LSi, R94LSe, R94LSi, R98LSe(ASME), R98LSi(ASME) ON - R50LSi
6	OFF position

Dip Switch Settings

VA Series (-UC Models)

If the model name on the side of the water heater ends with “-UC” (ex. “REU-VA2535FFUD-UC”), then these units have a default maximum temperature of 120° F (49° C) and an option to increase the maximum temperature to 140 °F (60 °C). Temperature settings from 125-140 °F (52-60 °C) are available by setting dip switch 6 to ON in the SW1 bank of 8 dip switches. Other dip switch positions may be defined differently than for the non -UC models.

SW1 Bank

1	OFF - “Long Flue” ON - “Short Flue” and Outdoor Models “Long flue” is defined as: 0 elbows and length is greater than 21 ft 1 elbow and length is greater than 15 ft 2 elbows and length is greater than 9 ft			
2	Settings dependent on altitude			
3				
	0-2000 ft (0-610 m)	2001-5200 ft (610-1585 m)	5201-7700 ft (1585-2347 m)	7701-10200 ft (2347-3109 m)
	#2: OFF	#2: OFF	#2: ON	#2: ON
	#3: OFF	#3: ON	#3: OFF	#3: ON
4	OFF - if using MC-91 controller ON - if using MC-45 controller			
5	OFF - 120°F default temperature without a controller ON - 140°F default temperature without a controller			
6	OFF - 120°F maximum temperature without an MCC-91 controller ON - 140°F maximum temperature without an MCC-91 controller			
7	OFF position - Used for low fire and high fire settings. Refer to the gas pressure setting procedure.			
8				

SW2 Bank (present on replacement PC boards only)

1	OFF - Propane Gas ON - Natural Gas
2	OFF - Outdoor model ON - Indoor model
3	OFF - R63LSe, R75LSe, R75LSi, R94LSe, R94LSi, R98LSe(ASME), R98LSi(ASME) ON - R50LSi, V53e
4	OFF position
5	OFF position
6	OFF position

Notes

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