

# Rinnai

## SERVICEMAN TROUBLESHOOTING INFORMATION

### RINNAI ENERGYSAVER RHFE-1004FA

#### IMPORTANT SAFETY NOTES:

There are a number of (live) tests that are required to be done in fault finding. Extreme care should be used at all times. You **must** be a qualified service person before proceeding with these test instructions.

Before checking resistance readings, turn off power switch and then isolate items to be checked from circuit (unplug it).

#### (ACIN)Connector

Black – White	120 VAC		1 – 2 pin #
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#### (TR2) Transformer: (Connector CN2 AC Out)

Read voltage across:		Read resistance	Pin #’s
Grey - Grey	98 – 125 VAC	4-6 $\Omega$	1 – 7
White - White	98 - 125 VAC	4–6 $\Omega$	2 – 3
Red - Red	35 VAC	1–2 $\Omega$	4 – 10
Black – Yellow	200-220 VAC	250–300 $\Omega$	5-8
Black – Blue	17 VAC	1–2 $\Omega$	8-9

#### (SP) Sparker: (Connector CN4)

Red -----	85 - 95 VAC	105K ~ 115K $\Omega$	3 ~ 6
Blue -----			

#### (SV1, SV2, SV3 & POV) Gas solenoids: (Connector CN4)

SV1 – Yellow ~Black (Hold)	85 - 90 VDC	1,400 ~ 1,800 $\Omega$	1 – 4
SV2 – Yellow ~ Black (assist)	85 - 90 VDC	1,200 ~ 1,600 $\Omega$	1 – 4
SV3 – Black ~ Pink	85 - 90 VDC	1200 ~ 2000 $\Omega$	2 – 5
POV Grey ~ Grey	6 – 16 VDC	80 – 90 $\Omega$	2 – 6

#### (BL) Combustion fan motor: (Connector CN8) (DC Motor 37 VDC 8 Watts)

White ~ Black	7 - 12 VDC	8 – 10K $\Omega$	7 – 8
White~ Yellow	4.0 – 5.0 VDC	4 – 6K $\Omega$	4 – 8
White ~ Red	10 – 30 VDC	N/A	3-8

#### (FM)Convection fan motor: (Connector CN3) (AC Motor 60 Hz, 100 Volts)

Black to White	40 – 105 VAC Firing	25 - -50 $\Omega$	1-2
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(PS) Pressure switch: CN13

The Pressure switch is an Electronic Switch	125 VAC, 0.1A @ 8.0mm WC" ON	125 VAC, 0.1A @ 2.8mm WC" OFF	
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Note: Ensure clear plastic lines from rear of blower housing are not clamped or blocked in any way, including spider webs.

(TH) Thermistor:

Check thermistor by inserting meter leads into each end of thermistor plug. Set your meter to the 200k scale and read resistance. You should be able to apply heat to the thermistor bulb and see resistance decrease. Then apply some ice to the thermistor and the resistance should increase.

Examples: 41DegF = 91k ohms  
50DegF = 65k ohms  
68DegF = 39k ohms  
86DegF = 23k ohms

(FR1, FR2, and FR3) Flame Rods:

FR1 and FR2 are high fire flame rods = the left hand rod (FR1) is a blue wire and the right hand rod (FR2) is a red wire. Flame current through these rods should range from 4 to 8 micro amps depending on gas type being used. FR3 fire flame rod = yellow wire located on the front center of unit next to the electrode. Low fire flame current should be 1.2 to 2.0 micro amps. The micro symbol on your meter will look like this  $\mu$ .

Improperly setup and /or converted units can soot and cause hard lockouts. If carbon is found on any one flame rod, remove all three rods and clean carbon from them. Then you need to confirm your manifold gas pressure and air rod settings. Also, check to ensure proper orifices were placed in the unit.

#### IMPORTANT INFORMATION CONCERNING HARD LOCKOUTS:

Other items that can cause hard lockouts are: improper sized gas lines, low gas pressures or pressure drops due to other appliances on the gas system, spider webs in the burner and air intake of vent system, improper ground or no ground at receptacle, supply regulators freezing up or defective, voltage drops or bad receptacles, winds in excess of 40 mph causing turbulence inside the vent terminal, etc.

(OHS1, OHS2, TF1, TF2) Safety Circuit Check: CN8

Check for continuity reading from pin #1 white wire to pin #5 blue wire. If you do not read continuity through this circuit, locate defective switch and replace that component. Insure combustion specs, ie gas pressures, etc. if open.

(MS) Main Switch: CN11

Disconnect CN11 from PCB, being careful not to break wires. Read Blue to Blue, pin #9 and 10 on 40K $\Omega$ . When ON/OFF is in the ON position, you should read 10-18K $\Omega$ . When released, you should read open or 0 $\Omega$ .

Always check wiring harness for loose connections, broken connectors, or blown fuses.