

Rinnai

SERVICEMAN TROUBLESHOOTING INFORMATION

RCE229A/329A/429A

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 power switch off, and isolate item to be checked from circuit (unplug it).

(TR) Transformer:

Wire colors	Voltage readings	Resistance readings	Pin #'s
Brown ~ Brown	21.5 ~ 23 VAC	1.1 ~ 1.8 ohms	39 ~ 42
Blue ~ Blue	09.5 ~ 11 VAC	10.1 - 10.8 ohms	40 ~ 43
Black ~ White	100 ~ 110 VAC	79.5 ~ 81 ohms	41 ~ 44

(IG) Ignitor:

Red ~ White	100 ~ 110 VAC	n/a	47 ~ 49
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(SV1, SV2, and POV) Gas valve solenoids:

SV1 = Blue ~ Blue	85 ~ 95 VDC	1,400 ~ 2,000 ohms	48 ~ 50
SV2 = Yellow ~ Yellow	85 ~ 95 VDC	1,400 ~ 2,000 ohms	48 ~ 50
POV = Red ~ White	Low-fire 1.8 ~ 2.5 VDC Hi.-fire 9.4 ~ 12 VDC	80 ~ 100 Ohms	32 ~ 33

(FM) Convection Fan Motor:

Blue ~ Yellow (329A/429A)	Lo. fire 48.5 VAC	138 ~ 142 ohms	45 ~ 46
Brown ~ Brown (229A)	Hi. fire 72.5 VAC		

Convection fan motor RPM's are as follows. The RCE229A Natural gas unit on high fire should be set at 950 rpm's, low fire 730 rpm's. The RCE229A Propane gas unit on high fire should be set at 950 rpm's, low fire 680 rpm's. The RCE329A Natural gas unit on high fire should be set at 850 rpm's, low fire 570 rpm's. The RCE329A Propane gas unit on high fire should be set at 870 rpm's, low fire 520 rpm's. This data is for reference only, you can not adjust RPM's.

(TF) Thermal Fuse/OHS:

White ~ black	24 ~ 30 VDC	0 ohms (as if meter leads were touching)	34 ~ 36
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(TH) Thermistor:

Check thermistor by inserting meter leads into each end of the thermistor plug, pins 30 - 31 yellow to yellow wires. Set your meter to the 200k ohm scale and read resistance across the thermistor bulb. You should be able to apply some ice to the thermistor bulb and the resistance should increase. When heat is applied to the bulb the resistance decreases. See example resistance readings and temperature readings for several different temperatures below.

Example:

41 degrees = 91 k ohms
50 degrees = 65 k ohms
68 degrees = 39 k ohms
86 degrees = 23 k ohms

Sub P.C. Board:

Black ~ Grey	118 ~ 125 VAC	n/a	41 ~ 44
Black ~ White	118 ~ 125 VAC	n/a	Electrical Supply

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(TC) Thermocouple or ODS device:

Connect your meter leads to the thermocouple output terminals at the back of the appliance or pin numbers 28 and 29. This terminal is on the right side of the unit directly above the air filter. The round plug slot is the negative lead and the square slot is for the positive lead. Normal milli-voltage output on low fire is above 18 milli-volts. High fire is normally above 16 milli-volts. Minimal output is 16 milli-volts, maximum is 35 milli-volts. If the milli-voltage output remains below 16 milli-volts for 60 seconds, the unit will shut down on safety. If this occurs check for a defective thermocouple, improper alignment, or carbon build up on thermocouple.

(OH. TH.) Overheat thermistor:

The overheat thermistor is located just under the front panel attached to the burner housing. This unit connects to the P.C. board at pins 37 and 38 yellow and blue wires. About six inches out from the board, there is a plug in this harness. The wires on this harness turn white at that point. See example below for resistance and temperature readings.

Example:

61 degrees = 114 k ohms
64 degrees = 105 k ohms
68 degrees = 98 k ohms
72 degrees = 91 k ohms
75 degrees = 84 k ohms
79 degrees = 79 k ohms

ON/OFF Switch for the RCE229/329A/429A:

On the RCE229A, read resistance across the red wire at pin #14, and white wire at pin #16 on the P.C.Board. In order to check the on/off switch operation you must unplug this terminal. Then connect your meter to the terminals as indicated above. There should be no reading until you press the on/off button, then you should read continuity through this circuit.

INFORMATION CONCERNING LOCKOUTS:

There are several factors that can cause units to shut off for no reason, that are not a fault of the appliance. Check for improper line sizing, supply regulators freezing up or defective, low pressure or pressure drops due to other appliances on the system, improper or no ground at the receptacle, voltage drops or bad receptacles, high altitude applications, etc. The best way to eliminate any of these items as the source, is to remove the appliance and take it back to your shop where it can be connected to a known gas and electrical source. If you do this and the problem goes away, you know then the problem is in the gas or electrical supply at the customer's home.

Items to check for in odor complaints:

New carpet, drapes, furniture, paint, chemical treatments of any kind, spraying of aerosols, pets, smoking, burning of candles and potpourri, excessive dust/lint inside the casing, contaminated ambient air, etc.

(dB) Decibels Level:

429-High fire 38 329-High fire 38 and 229-38
429-Low fire 28 329-Low fire 28 and 229-28

Wattage:

429-Low fire=21 329-Low fire=21 and 229=29
429-High fire=27 329-High fire=27 and 229=33

Fan CFM's:

429=Low fire=64 329=Low fire=60 and 229=46
429=High fire=106 329=High fire=92 and 229=64