

Rinnai

TDM - VF 2004 VENT FREE HEATERS

WARNING: THIS MANUAL IS FOR QUALIFIED GAS SERVICE TECHNICIANS ONLY. IF THE INFORMATION IN THIS MANUAL IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE. FOR YOUR SAFETY, THIS MANUAL MUST BE READ IN ITS ENTIRETY BEFORE OPERATING OR PERFORMING MAINTENANCE ON THIS EQUIPMENT.

TECHNICAL DATA MANUAL FOR:

Equators
Bantams
Tropics
Azure
Glo-Rays
Cosypanel
Silent Servants

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

WHAT TO DO IF YOU SMELL GAS

- DO NOT TRY TO LIGHT ANY APPLIANCE.
- DO NOT TOUCH ANY ELECTRICAL SWITCH.
- DO NOT USE ANY PHONE IN YOUR BUILDING. IMMEDIATELY CALL YOUR GAS SUPPLIER FROM A NEIGHBOR'S PHONE. FOLLOW THE GAS SUPPLIER'S INSTRUCTIONS.
- IF YOU CANNOT REACH YOUR GAS SUPPLIER, CALL THE FIRE DEPARTMENT.

INSTALLATION AND SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER

Rinnai

WARNING

IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE. REFER TO THE OWNER'S INFORMATION MANUAL PROVIDED WITH THE APPLIANCE FOR INSTALLATION INSTRUCTIONS. INSTALLATION AND SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.

CONTENTS

RINNAI CONTACTS	PAGE 03
SPECIAL NEW YORK STATE MEMO ON SIZING	PAGE 04
RINNAI HOME OWNER PILOT CLEANING	PAGE 05
TECHNICIAN PILOT CLEANING RINNAI PILOT	PAGE 06
COPRECI PILOT CLEANING	PAGE 07
HOW AN ODS WORKS	PAGE 08
PROPER BURNER CLEANING ON RADIANTS	PAGE 09
HOW TO CHECK A THERMOCOUPLE AND MAG UNIT	PAGE 10
MANIFOLD & PILOT GAS PRESSURE CHECKING	PAGE 11
ODS CLIP INSTALLATION ON LP RADIANTS	PAGE 12
SILENT SERVANT MODELS EXPLAINED	PAGE 13
RCE 606A & RCE 606TRA-II COMPARISON	PAGE 14
RCE 229A/RCE 329A/RCE429A TROUBLESHOOTING	PAGE 16
RCE 229 A WIRING DIAGRAM	PAGE 18
RCE 329A/RCE 429A WIRING DIAGRAM	PAGE 19
ERROR CODES FOR RCE 229A/RCE 329A/RCE429A	PAGE 20
GAS PRESSURE SETTING PROCEDURE RCE 229A	PAGE 21
GAS PRESSURE SETTING PROCEDURE RCE 329A/RCE429A	PAGE 22
RCE 506 A TROUBLESHOOTING & GAS PRESSURE	PAGE 23
RCE 506 A WIRING DIAGRAM	PAGE 25
GAS PRESSURE SETTING PROCEDURE RCE 506A	PAGE 26
RCE 590 A TROUBLESHOOTING	PAGE 27
RCE 590 A WIRING DIAGRAM	PAGE 29
GAS PRESSURE SETTING PROCEDURE RCE 590A	PAGE 30
RCE 606 A TROUBLESHOOTING	PAGE 32
RCE 606 A WIRING DIAGRAM	PAGE 34
GAS PRESSURE SETTING PROCEDURE FOR RCE 606A	PAGE 35
RCE 606TRA AND RCE 606TRA-II TROUBLESHOOTING	PAGE 36
RCE 606 TRA WIRING DIAGRAM	PAGE 38
RCE 606 TRAII WIRING DIAGRAM	PAGE 39
GAS PRESSURE SETTING PROCEDURE RCE 606TRA ONLY	PAGE 40
GAS PRESSURE SETTING PROCEDURE RCE 606TRA II (NOTE)	PAGE 41
ERROR CODES RCE 590 A, 606TRA AND 606TRA II FAULT FINDING INFO	PAGE 42

Rinnai

Rinnai Contacts

1-800-621-9419

FAX 678-364-8643

REGIONAL SALES MANAGERS

Midwest Region Manager	Ext.	246
Southeastern Region Manager Ext.		239
Southeastern Territory Manager	Ext.	242
Northeast Region Manager	Ext.	241
Western Region Manager	Ext.	240

CUSTOMER SUPPORT -- SALES

Customer Support Manager	Ext.	203
Customer Support Assistant	Ext.	208
Customer Support Assistant	Ext.	213

TECHNICAL SUPPORT

Northeast Region Technical Support	Ext.	501
Western Region Technical Support	Ext.	502
Southeast Region Technical Support	Ext.	217
Southeast Region Technical Support	Ext.	207
Southeast Region Technical Support	Ext.	285

PARTS SUPPORT

Parts Department	Ext.	214
------------------------	------	-----

Rinnai

VENT-FREE INSTALLATION IN NEW YORK *NEW YORK STATE SIZING CHARTS*

To: ALL DISTRIBUTORS
From: PAUL BRIMLOW
NATIONAL SERVICE MANAGER
HEATER DIVISION
CC: ALL REPS, SALES FORCE
Date: 3/6/2002
Re: NEW YORK STATE SIZING CHARTS

IT IS IMPERATIVE THAT ALL DEALERS USE THE NEW YORK SIZING CHART WHEN VENT FREE HEATERS ARE SOLD. A SUPPLY OF THE SIZING CHARTS WAS SHIPPED TO THE DISTRIBUTORS WHEN THE STATE APPROVED SALES OF VENT FREE HEATERS. IF YOU NEED MORE, PLEASE ORDER THEM AND WE WILL SHIP THEM AS SOON AS YOUR REQUEST IS RECEIVED.

VENT FREE HEATER SALES ARE BEING MONITORED BY THE STATE ENFORCEMENT AGENCY. NEW YORK STATE REQUIRES THE SIZING CHART BE USED FOR SIZING ON EVERY SALE. PLEASE INFORM YOUR DEALERS OF THIS REQUIREMENT AGAIN.

THE CHART WILL HELP YOUR DEALERS SIZE THE UNIT CORRECTLY AND RESULT IN IMPROVED SATISFACTION FOR THE CUSTOMER.

IF WE CAN ASSIST YOU IN THIS ENDEAVOR, PLEASE DO NOT HESITATE TO CALL:

1-800-621-9419 BETWEEN 8:00 A.M. AND 5:00 P.M. EST.

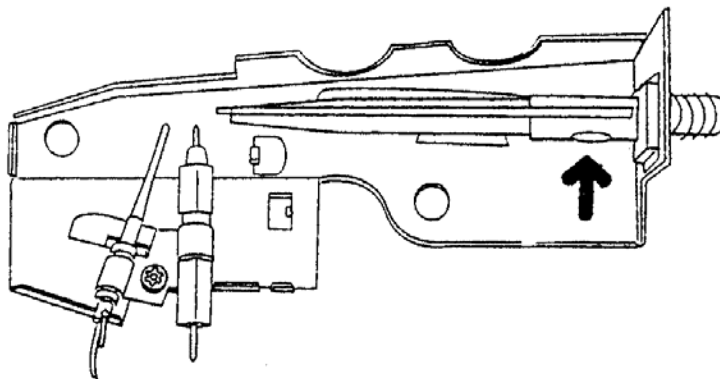
THANK YOU FOR YOUR ATTENTION TO THIS MATTER.

Rinnai

PILOT CLEANING PROCEDURE *FOR HOMEOWNERS*

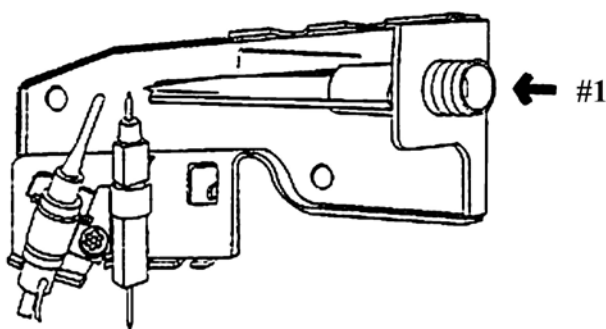
NOTE: if the pilot assembly on your appliance is not a Rinnai pilot you must contact the manufacturer of that pilot assembly for cleaning instructions. Failure to follow the manufacturer's instructions could cause damage to the appliance and/or serious injury to the person performing this task.

In order to properly clean the Rinnai pilot assembly shown below, you will need 120 psi of compressed air. In the drawing below, please find the venturi on your pilot assembly, indicated by the arrow. When this venturi becomes clogged with dust/lint, you can blow through the venturi using high-pressure air (120 psi) to dislodge any foreign matter. A good indicator for a dirty pilot is a yellow tip in the pilot flame. The most common statements we hear associated with dirty pilot are; my heater is getting harder and harder to light, the heater is shutting off for no reason, and I need a thermocouple. The above three items are very good indicators that you have a dirty pilot. Remember, cleaning of dust/lint is not a warranty issue. In over 98% of all pilot problems, it's a dirty pilot. Vacuum cleaners, furnace blowers and hair dryers do not provide enough air or suction to clean your pilot properly. If you follow this procedure using high-pressure air (120 psi), your appliance will deliver many years of trouble free service.



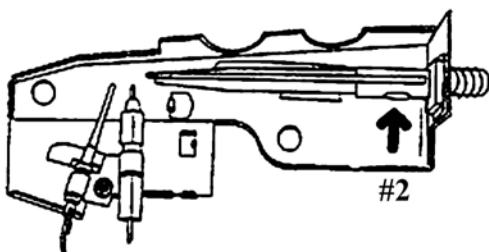
Rinnai

PILOT CLEANING PROCEDURE *FOR TECHNICIANS*



In order to properly clean the pilot orifice and air venturi:

First, remove pilot burner gas tube, then blow through the pilot orifice with 100 psi compressed air in the same direction the gas flows through the orifice. See arrow #1 for location as to where air nozzle should be placed.



Second, to ensure venturi on bottom side of pilot burner is clear, use 100 psi compressed air to blow out venturi at location indicated by arrow #2.

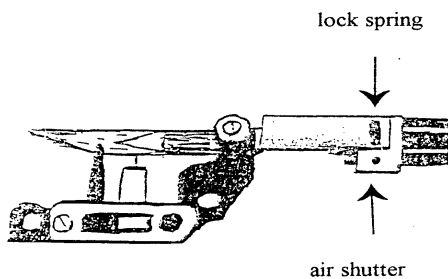
Note: This procedure is recommended only for Rinnai heaters. Contact manufacturer for other brand units.

Rinnai

COPRECI O.D.S. PILOT CLEANING PROCEDURE FOR TECHNICIANS

CLEANING INSTRUCTION OF COPRECI (O.D.S.) PILOT ASSEMBLY

In order to properly clean the pilot assembly and air venture – turn the heater to the off position and shut off the gas supply. Then proceed as follows.



First, grip the spring lock for the air shutter with a pair of pliers. Press down with pliers to allow lock spring to release. Use caution, do not bend the bi-metal strip when removing and re-installing the lock spring. The lock spring should come out without any restriction. When the lock spring is removed, the brass air shutter will drop down. This will allow you to see up inside the pilot assembly where the gas and air mix. Usually, you will note a big ball of dust/lint just behind the shutter.

Second, to ensure all dust/lint is removed from this location, take 100 psi compressed air and hold the nozzle back about six inches from the shutter gap and blow out all debris. Reassemble air shutter in reverse order of disassembly. Be careful not to drop lock spring in carpeting and lose it.

Rinnai

How to Clean an Oxygen Depletion Sensor (ODS) to Maximize Heater Performance

By GARY WILLIAMS
Rinnai America Corp.

In 1980, oxygen depletion sensor (ODS) pilots were adapted for use on vent-free space heaters. This technology has been used in Europe for more than 35 years with an excellent safety record.

With the advent of so many vent-free products, many questions arise regarding proper pilot operation and cleaning. As cool weather approaches and vent-free products are turned on, questions on proper pilot operation and correct cleaning procedures come up daily.

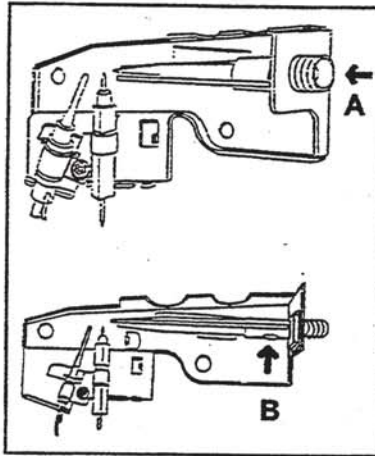
Experience indicates that about 90% of the problems are associated with dirty pilot assemblies. Manufacturers and retailers receive calls such as: "My heater is hard to light," "For no reason at all it keeps shutting off," or "I have a bad thermocouple."

The customer thinks his heater is defective when, in fact, the heater is doing exactly what it was designed to do. If the pilot's air intake venturi becomes clogged or blocked, the pilot flame shortens. This causes the pilot flame to lift up off of the thermocouple. When the thermocouple cools, it sends a signal back to the gas control valve. That signal tells the valve to shut off the gas supply to both the pilot and the main burner, thus shutting off the heater.

One important way to tell when a pilot assembly is beginning to get dirty is to visually inspect the pilot flame. The pilot flame will begin to turn yellow at the tip when the pilot venturi starts to clog. The dirtier the venturi becomes, the more yellow you will see in the pilot flame.

To properly clean any pilot assembly, first turn the heater off and shut off the gas supply. To clean the pilot orifice and air venturi on Rinnai products, first remove the pilot burner gas tube. Then place an air nozzle at "A" (see drawings) and blow through the pilot orifice with 100 psi of compressed air in the same direction the gas flows through the orifice.

To ensure that the venturi on the bot-



Points on Rinnai pilot assemblies that should be blown clean with compressed air.

tom side of the pilot burner is clear, next place the air nozzle at "B" and use 100 psi of compressed air to blow out the venturi.

The above instructions are for Rinnai products only. Other manufacturers' cleaning instructions may vary. You should always contact the original equipment manufacturer for proper cleaning instructions.

In general, however, cleaning the pilot assembly and venturi on most models begins with removing the spring lock for the air shutter with a

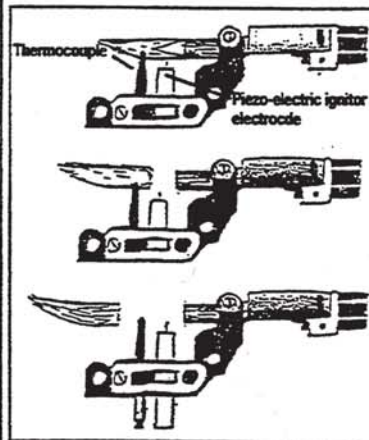
pair of pliers. Press down with the pliers to allow the lock spring to release. Use caution, however, to avoid bending the bi-metal strip while removing and re-installing the lock spring. It should come out without any restriction.

After removing the lock spring, the brass air shutter will drop down. This will allow you to see up inside the pilot assembly, where the gas and air mix. Often you will find a big ball of dust or lint just behind the shutter.

To ensure that all the dust or lint is removed from this location, hold the air nozzle back about six inches from the shutter gap and use 100 psi to blow out all of the debris. Reassemble the air shutter in reverse order of disassembly. Be careful not to drop the lock spring in carpeting, where it can be difficult to retrieve.

These are procedures unlikely to be within the capabilities of the average consumer. Federal Consumer Products Safety Commission (CPSC) regulations require that ODS units be reasonably tamperproof and not subject to ready access or adjustment by the user.

How An Oxygen Depletion Sensor (ODS) Works



The drawing at top shows normal combustion, with room oxygen at 20.9% or slightly below. Note that the

pilot flame engulfs the thermocouple. The center drawing shows what happens when room oxygen decreases to around 18.5% to 19%. The pilot flame speed slows, begins to move away from the gas source, and the thermocouple begins to cool. In the drawing at the bottom, the room oxygen level approaches 18%. The flame becomes unstable, and moves off the thermocouple. That collapses the electric field for the attached electromagnet, and a spring-loaded flap or valve (not shown) automatically shuts off the gas supply, extinguishing the unit.

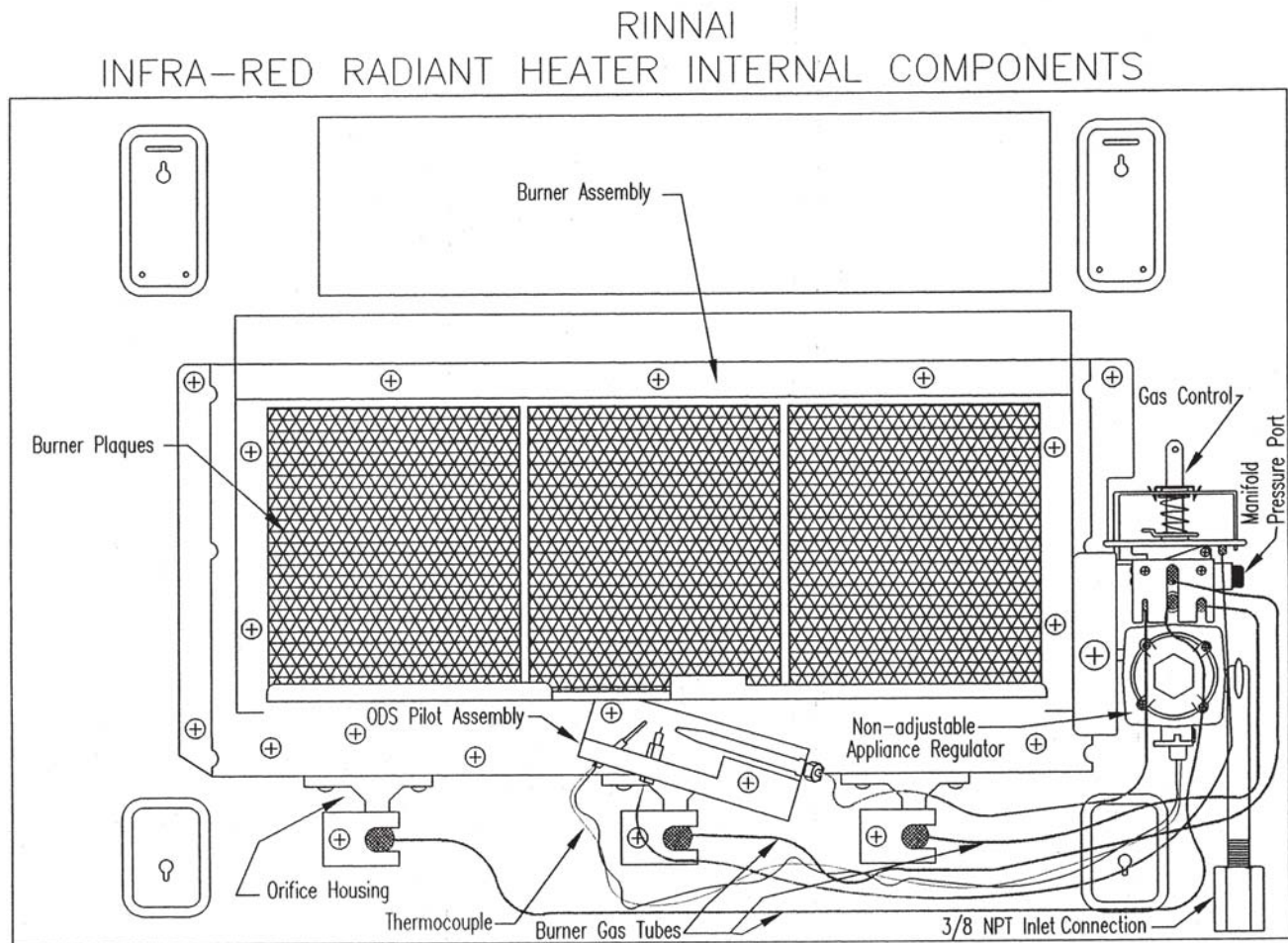
Although an ODS is a safeguard against CO poisoning, it does not measure CO directly, but inferentially, based on the fact that a greater percentage of CO is generated more rapidly in an oxygen-depleted environment rich in CO₂.

Rinnai

PROPER BURNER CLEANING INSTRUCTIONS

NOTE: Service must be performed by a qualified installer, service agency or gas technician.

Remove the unit from the structure before performing this cleaning due to the dust created by this cleaning procedure. In order to properly clean the burner on a Rinnai Vent Free radiant heater, you will need an air compressor capable of delivering 120 psi of compressed air. Using an air gun or nozzle, blow directly into the burner plaques from about four inches away. Take time to blow through each of the holes in the plaques. This will take about three minutes if done properly. After blowing the burner out fire the unit and let it operate for two minutes. Cut the unit off and repeat the above procedure three additional times: Some problems caused by dirty burners are; humming and/or air noises, dull plaques, and over-burning at the top of the plaques. Units cleaned annually as stated in the owner's manual, normally do not encounter these problems. Burners are replaced as an assembly. Plaques or bricks are not available individually.



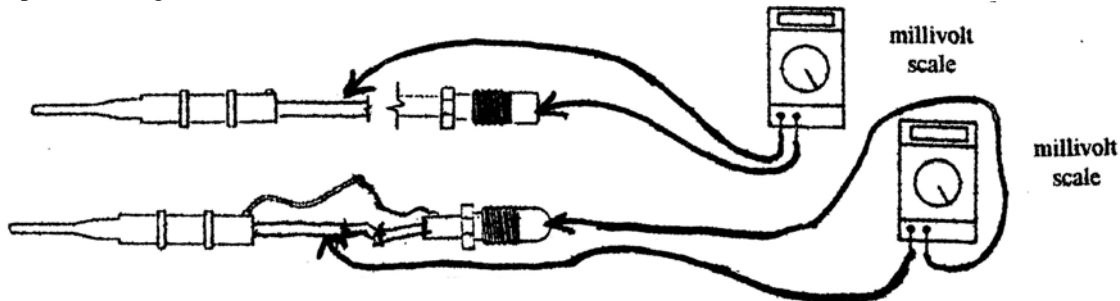
Rinnai

HOW TO CHECK A THERMOCOUPLE AND MAG UNIT

WARNING: 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).

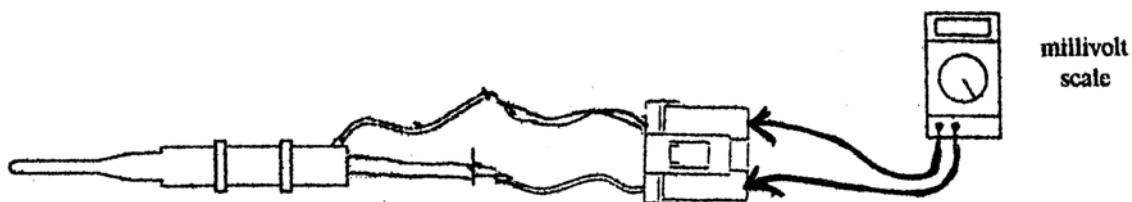
Thermocouple checking procedure (Screw in type):

Set your voltage meter to a DC milli-volt scale. This scale should be able to read above 35 milli-volts. Place the red lead of your meter to the copper lead and the black lead to the dome of the thermocouple. The dome is the portion of the thermocouple that goes up into the gas valve. See drawing below for location to place meter leads. The above procedure is for screw in type thermocouples. Now apply heat to the thermocouple. If the thermocouple is good, you will see the milli-volt output on the voltage meter start to increase. Maximum output will be somewhere between 24 to 30 milli-volt. After you have eliminated the thermocouple as the source of the problem, proceed with the pilot cleaning instructions.



Thermocouple checking procedure (Plug in type):

Set your voltage meter to a DC milli-volt scale. This scale should be able to read above 35 milli-volts. Place one lead of your meter into each receptacle of the plug as shown below in the drawing. Now apply heat to the thermocouple. If the thermocouple is good, you will see the milli-volt output on the voltage meter start to increase. Maximum output will be somewhere between 24 to 30 milli-volt. After you have eliminated the thermocouple as the source of the problem, proceed with the pilot cleaning instructions.



Proper procedure for checking the magnetic unit (Screw in and plug in types):

Remove the magnetic unit from the gas valve. Once it has been removed, reconnect the thermocouple to the magnetic unit. Then apply heat to the thermocouple while pressing down on the spring loaded plunger, (see drawing below). Hold the plunger down until it bottoms out for thirty seconds at the same time heat is being applied to the thermocouple. After thirty seconds, release the plunger. If the magnetic unit is good, it will stay in the bottomed out position by itself. After cooling for a brief period, it should release and spring back out to the relaxed state. If it doesn't stay down when released, the magnetic unit is defective and should be replaced.

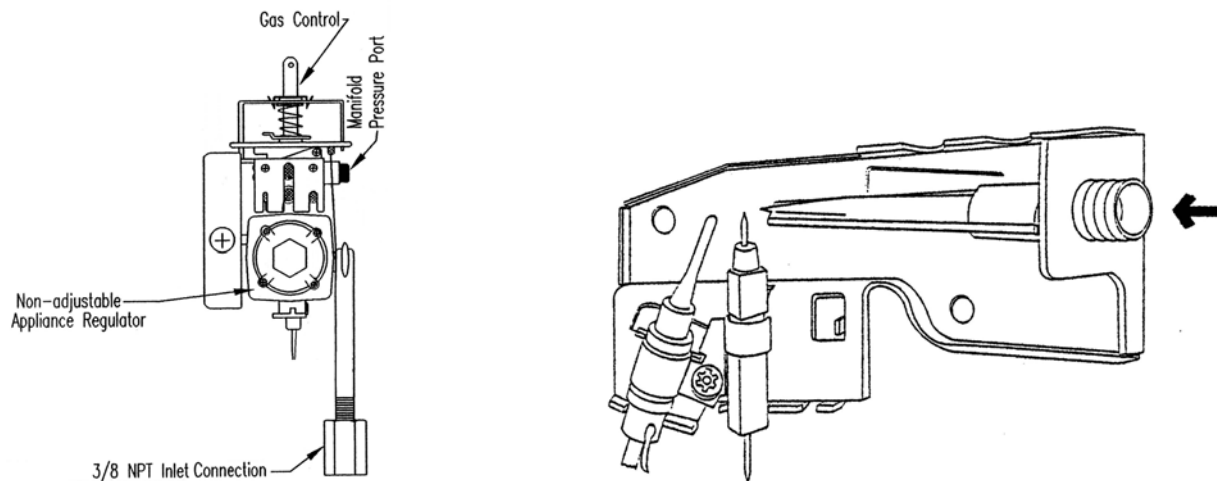


Rinnai

MANIFOLD & PILOT GAS PRESSURE CHECKING

Note: Service must be performed by a qualified installer, service agency, or gas technician.

Any time you are having problems with a gas appliance, one of the first things you should check is the operating manifold pressure. In the left hand drawing below, please find the manifold pressure test port on Rinnai Infra-Red Radiant Heater. This test port is plugged with an allen type plug with white pipe dope on it. This plug varies in location. You will need a 3/16" allen wrench to remove this plug. The plug threads are 1/8" NPT (national pipe taper). Connect your U-tube manometer up to this test port, fire the unit and record the manifold pressure. Proper manifold pressures can be found on the rating plate of each appliance or in the owner's manual. If the manifold pressure is found to be low, reinstall the pressure test port plug and check for proper inlet pressures. If the inlet pressure is found to be correct, then you know your problem is in the unit. It could be a bad appliance regulator or gas control. If the inlet pressure is low, then you know the problem is in the gas supply feeding the appliance.



CHECKING FOR PROPER GAS PRESSURE TO THE PILOT ASSEMBLY

Disconnect the pilot gas line from the ODS pilot assembly. (See picture above showing pilot assembly – disconnect gas line at the arrow in the right hand drawing.) Connect your U-tube manometer to the pilot assembly gas line. Turn the control knob to the pilot position and press down on the knob as you would when lighting the pilot. With the knob pressed down, check your manometer for any indication of gas pressure. Your manometer should indicate pressure at this point indicating proper gas feed to the pilot. If there IS PRESSURE found at this test point, this indicates that the pilot assembly is clogged and needs cleaning. If there is NO PRESSURE at this test point, it indicates that the gas control, pilot regulator, appliance regulator, or supply pressure could be the problem. Follow the steps in the manifold gas pressure check above to eliminate the gas supply as the problem.

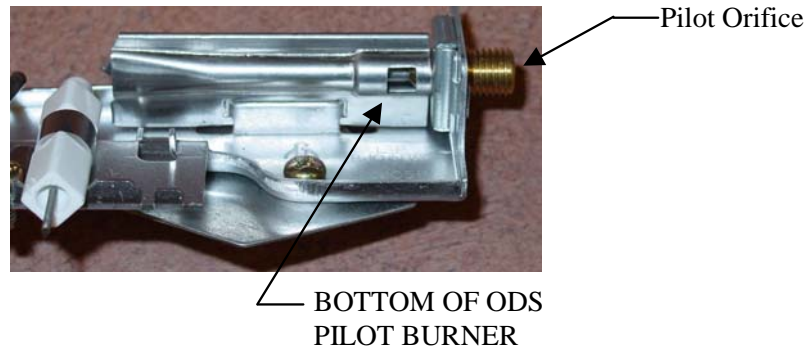
Rinnai

ODS CLIP INSTALLATION ON LP RADIANT HEATERS

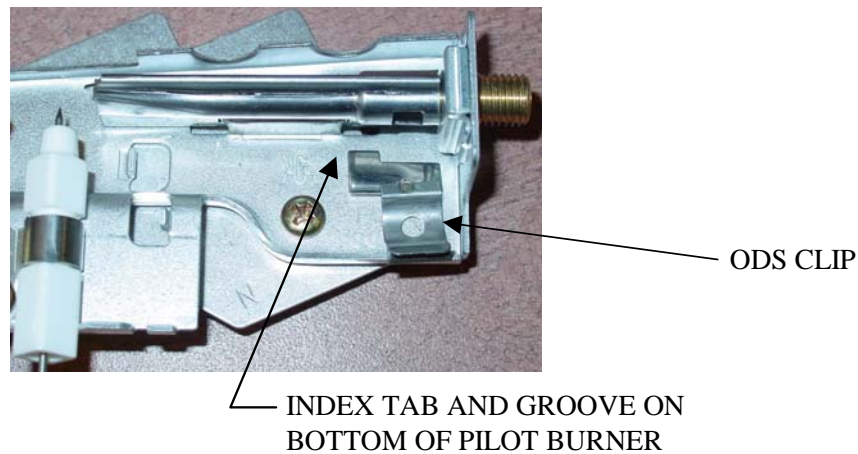
CAUTION: THE RINNAI ODS CLIP IS FOR THE FOLLOWING LP GAS MODEL HEATERS ONLY! 1) EQUATOR 2) BANTAM 3) TROPIC 4) GLO-RAY AND 5) COSYPANEL.

THIS CLIP IS NOT TO BE USED ON THE AZURE BFT!

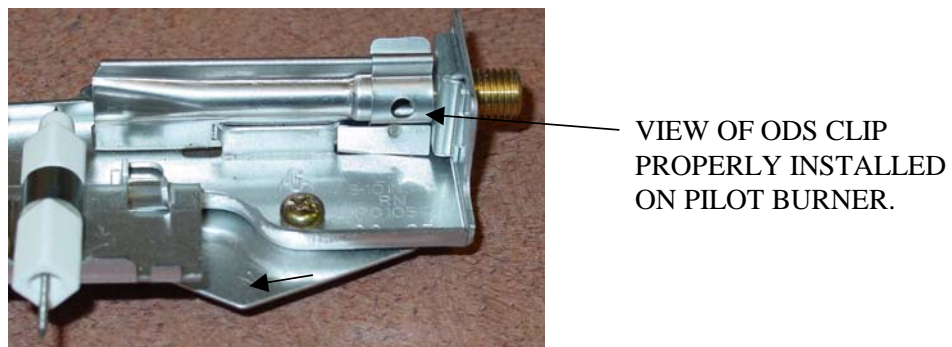
1. Confirm that the pilot orifice is not bent and is aligned straight into the pilot burner.



2. Place the index tab of the ODS Clip into the groove on the bottom of the Pilot Burner.



3. With index tab of the ODS Clip in the groove on the bottom of the Pilot Burner, rotate ODS Clip up around top edge of Pilot Burner and snap into place.



Rinnai

RINNAI SILENT SERVANT VENT FREE FAN CONVECTORS

THE VERY BEST SUPPLEMENTAL HEAT SOURCE ON THE MARKET TODAY IS THE RINNAI SILENT SERVANT VENT FREE FAN CONVECTORS. THE MODELS ARE LISTED BELOW.

1. RCE229A-6000 BTU HI FIRE TO 2000 BTU LO FIRE. SEVEN STAGE GAS CONTROL AND BLOWER SPEEDS. AUTO/OFF MODE =**TRUE T-STAT**_OPERATIONS.
2. RCE329A-10,000 BTU HI FIRE TO 3000 BTU LO FIRE SEVEN STAGE GAS CONTROL AND BLOWER SPEEDS AUTO/OFF MODE=**TRUE T-STAT**_OPERATIONS.
3. RCE429A-14,000 BTU HI FIRE TO 4000 BTU LO FIRE SEVEN STAGE GAS CONTROL AND BLOWER SPEEDS AUTO/OFF MODE=**TRUE T-STAT**_OPERATIONS.
4. RCE506A-**MANUAL ON/OFF HEATER**-21000 BTU HI TO 5000 BTU LO FIRE. THIS UNIT STAGES DOWN TO 5000 BTU AND CONTINUES TO RUN. IT IS A MANUAL ON/OFF HEATER. *NO LONGER IN PRODUCTION.*
5. RCE606TRA-**MANUAL ON/OFF HEATER**-24000 BTU HI TO 5000 BTU LO FIRE THIS UNIT STAGES DOWN TO 5000 BTU AND CONTINUES TO RUN. IT IS A MANUAL ON/OFF HEATER WITH CLOCKS, TIMERS, AND A REMOTE TO CUT THE UNIT ON AND OFF FROM YOUR RECLINER. *NO LONGER IN PRODUCTION.*
6. RCE606A-24,000 BTU TO 5000 BTU SEVEN STAGE GAS CONTROL AND BLOWER SPEEDS. **TRUE T-STAT** OPERATIONS WITH THE AUTO/OFF MODE. UNIT HAS ONE HOUR ON TIMER AND ONE HOUR RUN DELAY TIMER.
7. RCE606TRA-II-24,000 BTU TO 5000 BTU HEATER WITH REMOTE CONTROL DUAL TIMERS, **TRUE T-STAT** OPERATIONS WITH AUTO/OFF MODE SELECTED.

PRESENT PRODUCTION SILENT SERVANTS HAVE THE TRUE THERMOSTAT OPERATION FUNCTION WHEN THE AUTO/OFF LED IS SELECTED AND ON!!!

THE 506A AND THE 606TRA MODELS ARE MANUAL ON/OFF UNITS AND ARE NO LONGER IN PRODUCTION.

ALL UNITS REQUIRE ELECTRICITY TO OPERATE. IN THE EVENT OF A POWER FAILURE, AGA REQUIRES THE OPERATOR TO RE-START THE UNIT SINCE THEY ARE VENT FREE HEATERS.

ALL UNITS ARE AFTERMARKET MOBILE HOME APPROVED WHERE LOCAL CODES ALLOW. CHECK WITH YOUR LOCAL CODE ENFORCEMENT AUTHORITY.

PAINT, CARPET DYES, NEW FURNITURE DYES, HAIRSPRAY, FURNITURE OILS, SCENTED CANDLES, AROMATIC SMELLS, ETC. CAN CAUSE ODORS AFTER BEING RE-CIRCULATED THROUGH THESE HEATERS. THE UNITS DO NOT PRODUCE ODER, BUT CAN ACENTUATE AMBIENT SURROUNDING SMELLS.

Rinnai

RINNAI RCE 606A *SILENT SERVANT FAN CONVECTOR*

1. 24,000 BTU-NG 21,000 BTU-LP LOW FIRE 5000 BTUS
2. SEVEN STAGE GAS CONTROL AND BLOWER SPEEDS
3. **TRUE THERMOSTAT OPERATIONS**
4. ECONOMY FUNCTION
5. CHILD FUNCTION LOCK
6. DIRTY FILTER INDICATOR
7. SET TEMPERATURE LED
8. ROOM TEMPERATURE LED
9. OFF TIMER-ONE HOUR SLEEP TIMER
10. ON TIMER-DELAYS ONE HOUR RUN TIME UP TO 24 HRS. LATER
11. SAFETY DEVICES AS BELOW
 - Overheat switch
 - Fuse protected
 - Flame failure device
 - Oxygen Depletion Safety Device
 - Tilt Switch
 - Power failure (must be restarted by operator)
 - Self-diagnostic circuitry
 - Proofs flame and combustion specs every 15 minutes.
12. COOL TO THE TOUCH CABINET
13. SLEEK DESIGN AND NEUTRAL COLOR
14. AFTERMARKET MOBILE HOME APPROVED
15. AGA DESIGNED CERTIFIED
16. FULL 3 YEAR WARRANTY PARTS & LABOR 5 FOR \$5 AVAILABLE
17. NO COMPETITOR OFFERS THIS PRODUCT
18. FULL FACTORY SUPPORT 1-800-621-9419
19. FILTERS CLEAN THE AIR
20. COMFORT, EFFICIENCY, RELIABILITY
21. AVAILABLE PROPANE OR NATURAL GAS

Rinnai

RINNAI RCE 606TRA-II *SILENT SERVANT FAN CONVECTOR*

1. 24,000 BTU-NG 21,000 BTU-LP LOW FIRE 5000 BTUS
2. SEVEN STAGE GAS CONTROL AND BLOWER SPEEDS
3. **TRUE THERMOSTAT OPERATIONS**
4. ECONOMY FUNCTION
5. CHILD FUNCTION LOCK
6. DIRTY FILTER INDICATOR
7. SET TEMPERATURE LED
8. ROOM TEMPERATURE LED
9. DUAL TIMERS =2 START TIMES & 2 STOP TIMES
10. CLOCK
11. REMOTE CONTROL
12. SAFETY DEVICES AS BELOW
 - Overheat switch
 - Fuse protected
 - Flame failure device
 - Oxygen Depletion Safety Device
 - Tilt Switch
 - Power failure (must be restarted by operator)
 - Self-diagnostic circuitry
 - Proofs flame and combustion specs every 15 minutes.
13. COOL TO THE TOUCH CABINET
14. SLEEK DESIGN AND NEUTRAL COLOR
15. AFTERMARKET MOBILE HOME APPROVED
16. AGA DESIGNED CERTIFIED
17. FULL 3 YEAR WARRANTY PARTS & LABOR 5 FOR \$5 AVAILABLE
18. NO COMPETITOR OFFERS THIS PRODUCT
19. FULL FACTORY SUPPORT 1-800-621-9419
20. FILTERS CLEAN THE AIR
21. COMFORT, EFFICIENCY, RELIABILITY
22. AVAILABLE PROPANE OR NATURAL GAS

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
-------------	---------------	-----	---------

(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
---------------	-------------	--	---------

(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

Rinnai

(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:

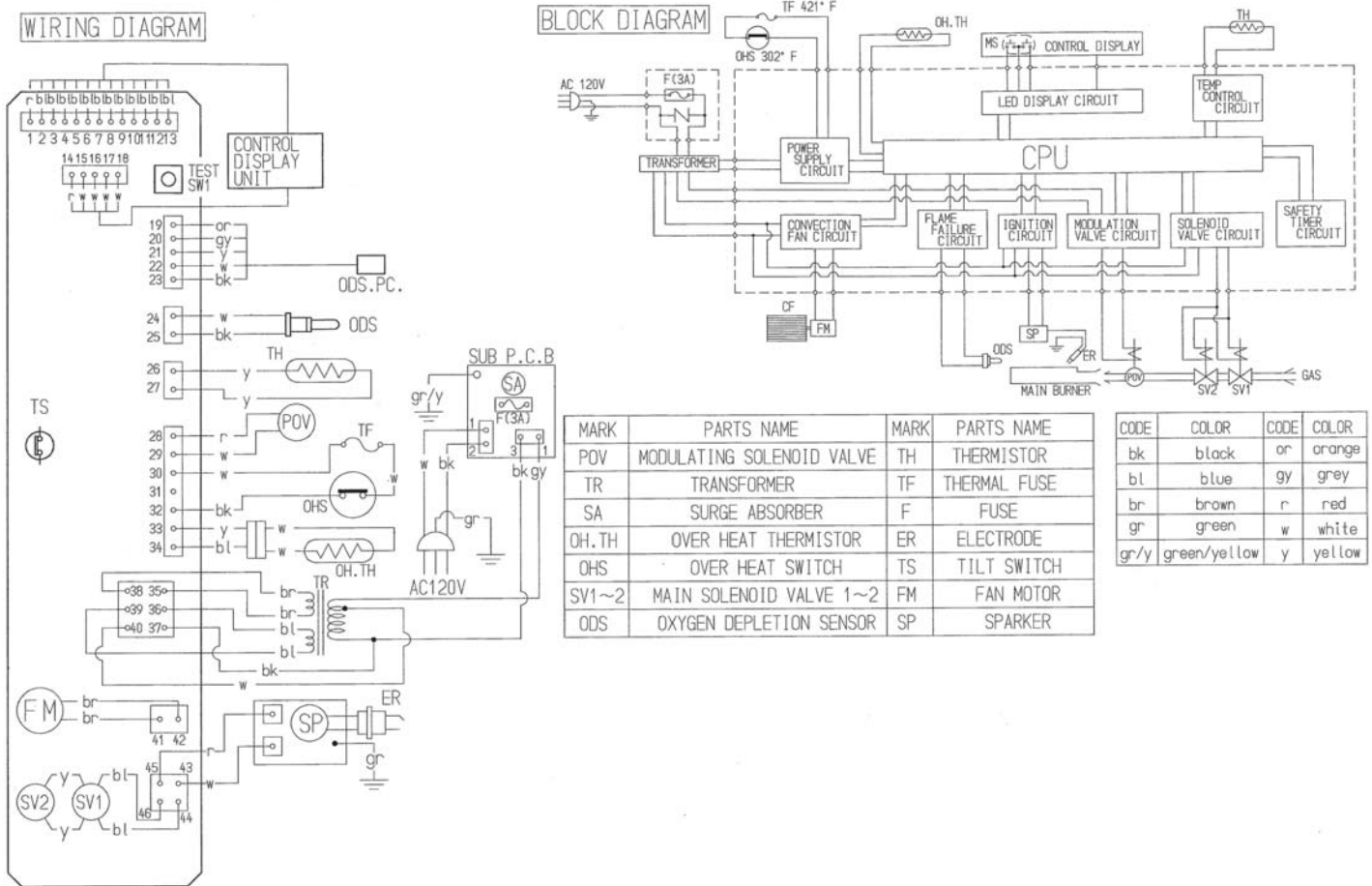
429-Low fire=21 329-Low fire=21 and 229=29
429-High fire=27 329-High fire=27 and 229=33

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

Rinnai

WIRING DIAGRAM RCE-229A

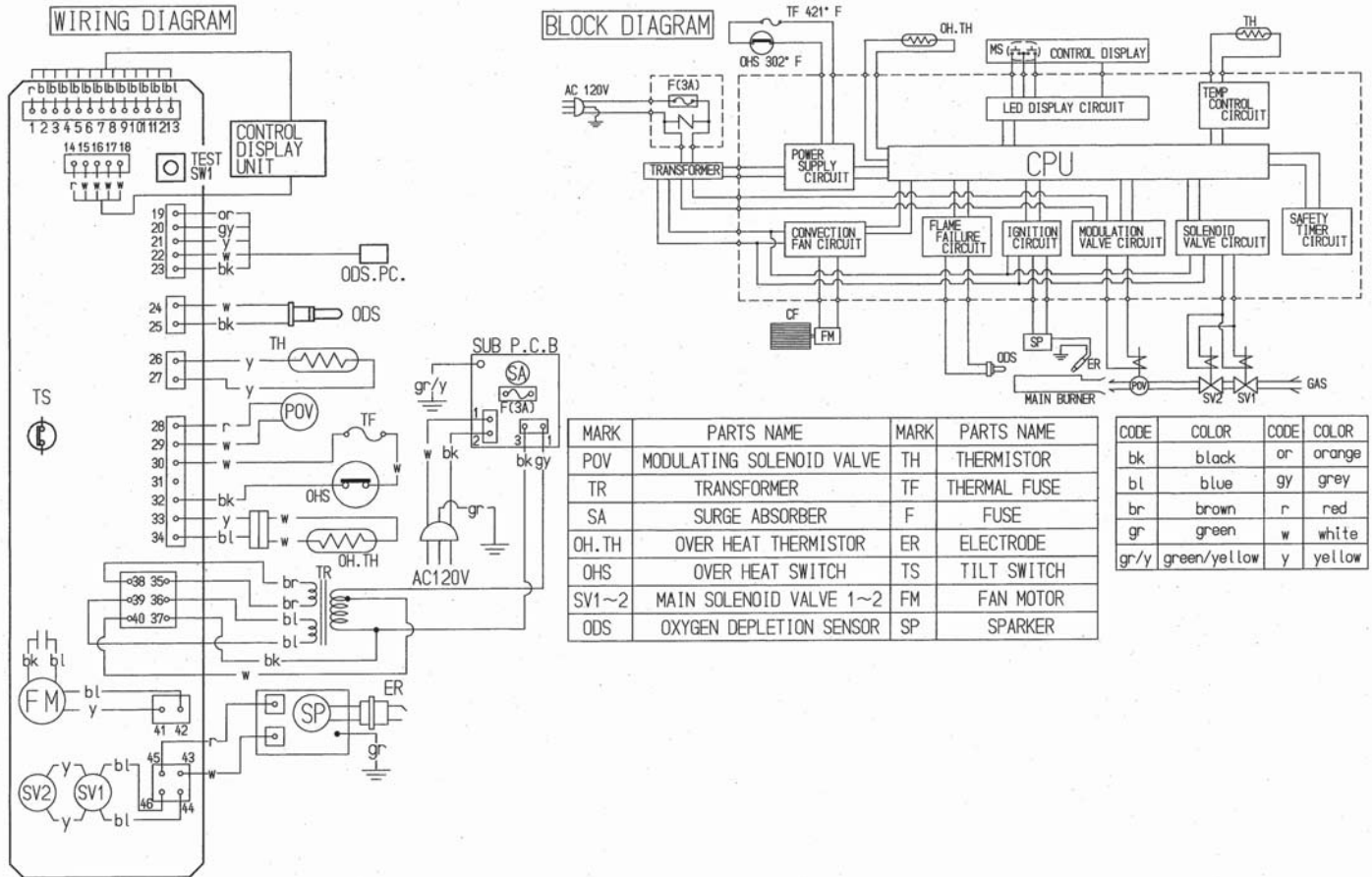


If any of the original wire as supplied with the appliance must be replaced, it must be replaced with a wire of a least a 194°F temperature rating and number 18AWG or its equivalent. “CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.” Verify operation after servicing.

Rinnai

WIRING DIAGRAM

RCE-329A/429A



If any of the original wire as supplied with the appliance must be replaced, it must be replaced with a wire of a least a 194°F temperature rating and number 18AWG or its equivalent. “CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.” Verify operation after servicing.

Rinnai

ERROR CODES MESSAGES & DIAGNOSTIC POINTS

RCE-229A, RCE-329A, and RCE-429A

CODE DISPLAYED	FAULT	DIAGNOSTIC CHECK POINT
00	Power reinstatement while ON/OFF switch on	
03	Tilt Switch Activated	Check Tilt Switch
11	Miss Ignition	Check Thermocouple output
12	Incomplete Combustion	Check Thermocouple output
14	Flashback Safety Device	Check Flashback Sensor
	Overheat Thermistor Activated	Check Overheat Thermistor
	Thermal Fuse Melted	Check Thermal Fuse
16	Unit cuts off (10 minutes at > 104°) From any heat source.	Check Room Temperature Thermistor
31	Room Temperature Thermistor broken circuit	Check Room Temperature Thermistor
32	Room Temperature Thermistor short circuit	Check Room Temperature Thermistor
33	Overheat Thermistor broken circuit	Check Overheat Thermistor
34	Overheat Thermistor short circuit	Check Overheat Thermistor
62	Fan Motor/appliance abnormal overheat	Check Convection Fan Motor
70	ON/OFF switch abnormal	Check Control PCB (ON/OFF Switch)
71	Solenoid circuit abnormal	Check Solenoid Valve
72	Thermocouple initial value abnormal	Check Thermocouple output
	Thermocouple high cut out	Check Thermocouple output >48 mV for 5 seconds
73	PCB E ² PROM Abnormal	

*Error history (No. 1 (most recent)-5), added combustion time (x100H), number of combustions are indicated when the room temperature control “▼” and “▲” buttons are pressed simultaneously for over 2.5 seconds.

Rinnai

GAS PRESSURE SETTING PROCEDURE

RCE-229A only

All settings/adjustments must be performed by a qualified Service Technician

NOTE: WITH THE UNIT IN THE OFF POSITION, PRESS THE BLUE TEST SWITCH ON THE TOP CORNER OF THE PCB BOARD. USING THE UP AND DOWN TEMPERATURE BUTTONS ON THE CONTROL, SELECT LP FOR PROPANE OR 13 FOR NATURAL GAS. PRESS THE TEST SWITCH AGAIN TO LOCK IN THE GAS TYPE.

THESE UNITS ARE PROGRAMMED FOR THE TYPE GAS ON THE RATING PLATE AND CAN NOT BE CONVERTED!!!

DO NOT make adjustments in any mode other than the “PL” and/or “PH” mode of operation. Follow the procedure below, if “PL” or “PH” does not appear in the display. **DO NOT** make any adjustments. If you do not understand the following procedures, contact Rinnai for assistance at 1(800) 621-9419. This unit is designed to operate only on the gas type shown on the rating plate attached to the unit.

1. Next start the unit by pressing the “**ON/OFF**” button. Once the unit has fired, press the “**TEST**” button on the P.C. board twice. The **LED** indicator will display “PL”, low fire mode. With your manometer connected to the manifold pressure test port, record low fire manifold pressure. If the low fire pressure is incorrect, adjust it by the screw on top of the modulation valve. Once the pressure has been set, lock the adjustment screw down with the lock nut and then reconfirm the low fire manifold pressure.

Low fire pressure should be 0.6” W.C. (14mm) on Natural gas.

Low fire pressure should be 1.0” W.C. (26mm) on Propane gas.

2. Next press the “**TEST**” button again. This will put you into the “PH” high fire mode. If the high fire pressure is incorrect, it can be adjusted by using the “▲” and “▼” buttons. Adjust high fire pressure to correct setting. After you have set unit to the correct manifold pressure, press the “**ON TIMER**” button to enter your setting into memory. Next press the “**ON/OFF**” button to exit the programming mode.

High fire pressure should be 3.5” W.C., (90mm) on Natural gas.

High fire pressure should be 4.4” W.C., (112mm) on Propane gas.

3. Remove the manometer, replace the test port plug, leak test the units and check operation of the unit..

Rinnai

GAS PRESSURE SETTING PROCEDURE

a

RCE-329A and RCE-429A Only

All settings/adjustments must be performed by a qualified Service Technician

NOTE: WITH THE UNIT IN THE OFF POSITION, PRESS THE BLUE TEST SWITCH ON THE TOP CORNER OF THE PCB BOARD. USING THE UP AND DOWN TEMPERATURE BUTTONS ON THE CONTROL, SELECT LP FOR PROPANE OR 13 FOR NATURAL GAS. PRESS THE TEST SWITCH AGAIN TO LOCK IN THE GAS TYPE.

THESE UNITS ARE PROGRAMMED FOR THE TYPE GAS ON THE RATING PLATE AND CAN NOT BE CONVERTED!!!

DO NOT make adjustments in any mode other than the “PL” and/or “PH” mode of operation. Follow the procedure below, if “PL” or “PH” does not appear in the display. **DO NOT** make any adjustments. If you do not understand the following procedures, contact Rinnai for assistance at 1(800) 621-9419. This unit is designed to operate only on the gas type shown on the rating plate attached to the unit.

1. Next start the unit by pressing the “**ON/OFF**” button. Once the unit has fired, press the “**TEST**” button on the P.C. board twice. The **LED** indicator will display “PL”, low fire mode. With your manometer connected to the manifold pressure test port, record low fire manifold pressure. If the low fire pressure is incorrect, adjust it by the screw on top of the modulation valve. Once the pressure has been set, lock the adjustment screw down with the lock nut and then reconfirm the low fire manifold pressure.

Low fire pressure should be 0.5”WC (329A) or 0.4”WC (429A) on Natural gas.
Low fire pressure should be 0.75”WC (329A) or 1.1”WC (429A) on Propane gas.

2. Next press the “**TEST**” button again. This will put you into the “PH” high fire mode. If the high fire pressure is incorrect, it can be adjusted by using the “▲” and “▼” buttons. Adjust high fire pressure to correct setting. After you have set unit to the correct manifold pressure, press the “**ON TIMER**” button to enter your setting into memory. Next press the “**ON/OFF**” button to exit the programming mode.

High fire pressure should be 3.9”WC (329A) or 3.9”WC (429A) on Natural gas.
High fire pressure should be 5.2”WC (329A) or 7.2”WC (429A) on Propane gas.

3. Disconnect your manometer, replace test port plug, leak test unit, and check operation of the unit.

Rinnai

SERVICEMAN TROUBLESHOOTING INFORMATION

RCE-506A

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	15 ~ 24 VAC	3.4 ~ 4.0 ohms	41 ~ 45
Purple ~ Purple	10 ~ 14 VAC	2.2 ~ 2.7 ohms	46 ~ 47
Blue ~ Blue	8 ~ 11 VAC	7 ~ 9 ohms	48 ~ 49
Red ~ Greg	100 ~ 106 VAC	35 ~ 41 ohms	52 ~ 53
Black ~ Black	110 ~ 120 VAC	39 ~ 42 ohms	52 ~ 53

(IG) Ignitor:

Red ~ White	100 ~ 106 VAC	6.4 ~ 6.9 mega ohms	58 ~ 60
-------------	---------------	---------------------	---------

(SV1, SV2, and POV) Gas valve solenoids:

SV1 = Yellow ~ Yellow	85 ~ 95 VDC	1,400 ~ 2,000 ohms	56 ~ 57
SV2 = Blue ~ Blue	85 ~ 95 VDC	1,400 ~ 2,000 ohms	56 ~ 57
POV = White ~ White	Lo. fire 2 ~ 3 VDC	80 ~ 100 Ohms	30 ~ 31
	Hi. fire 10 ~ 12 VDC		

(FM) Convection Fan Motor:

Blue ~ yellow	Lo. fire 58 ~ 62 VAC	110 ~ 180 ohms	54 ~ 55
	Hi. fire 95 ~ 100 VAC		

(TF) Thermal Fuse:

White ~ Ground	12 ~ 15 VAC	0 ohms (as if meter leads were touching)	32 ~ 33
----------------	-------------	--	---------

(TH) Thermistor:

Check thermistor by inserting meter leads into each end of the thermistor plug, pins 28 - 29 yellow to yellow wires. Set your meter to the 200 k 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. The thermistor is plugged into pins 31 and 32 on the P.C. board.

Example:

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

Rinnai

(TC) Thermocouple:

Connect your meter leads to the thermocouple output terminals at the back of the appliance. This terminal is on the right side of the unit directly under the electrical compartment 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.

(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 36 and 37 with two yellow 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 both the RCE506A:

On the RCE506A, read resistance across the red wire at pin #17, and white wire at pin #19 at terminal A on the P.C. In order to check the on/off switch operation you must unplug this terminal. Then connect your meter to the red and white wires in 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:

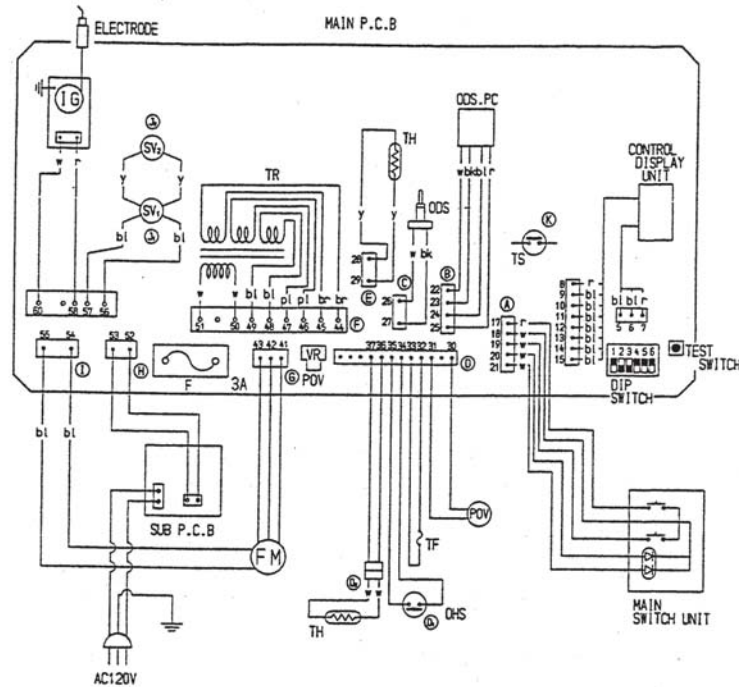
New carpet, drapes, furniture, paint, chemical treatments of any kind, spraying of aerosols, pets, smoking, burning of candles and potpourri, excessive dust/lint inside the casing, contaminated ambient air, etc.

Rinnai

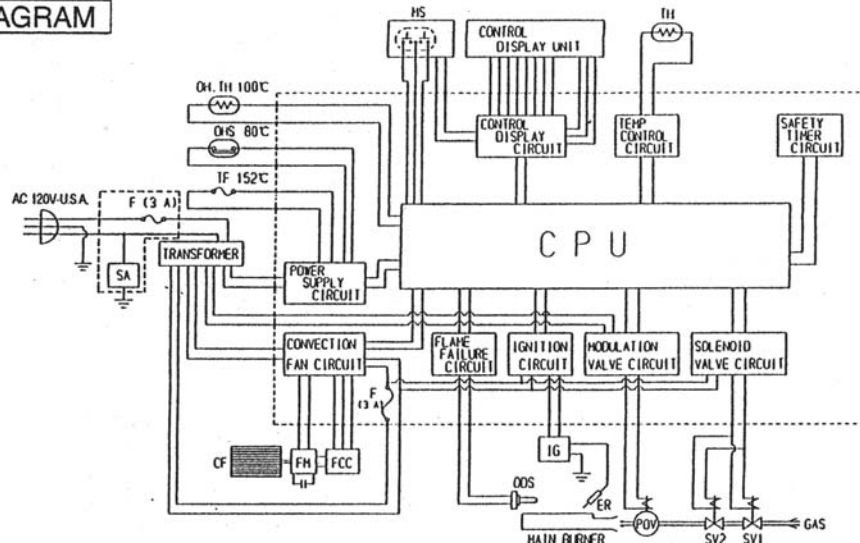
WIRING DIAGRAM

RCE-506A

WIRING DIAGRAM



BLOCK DIAGRAM



If any of the original wire as supplied with the appliance must be replaced, it must be replaced with a wire of a least a 194°F temperature rating and number 18AWG or its equivalent. “CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.” Verify operation after servicing.

Rinnai

GAS PRESSURE SETTING PROCEDURE

RCE-506A only

All settings/adjustments must be performed by a qualified Service Technician

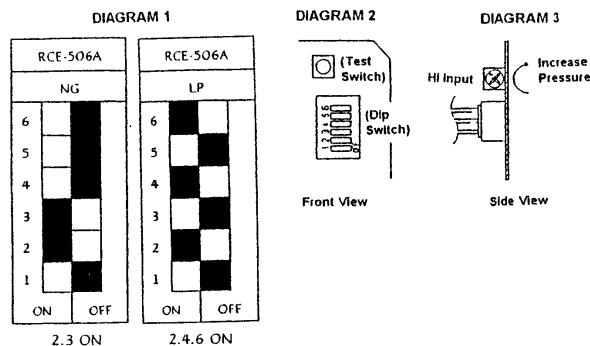
1. Turn the unit off, remove the gas pressure test port plug. Connect manometer to the 1/8" NPT test port.
2. Ensure all dip switches are set to the proper position. See diagram # 1 below. BLACK INDICATES SWITCH POSITION.
3. With the appliance operating, press the TEST button once. See diagram #2 below.
4. Set temperature control to "LOW" using the "▼" button on the control panel
5. Adjust the low pressure by the regulator screw. Below are proper gas pressures for gas type being used.

Natural	5,000 BTU/h	<u>.32" WC</u>
Propane	5,000 BTU/h	<u>.75" WC</u>

Lock regulator screw.

6. Re-set temperature control to the "HIGH" setting using the "▲" button.
7. Adjust high pressure by turning the POV port on the PC board. See diagram #3 below.

Natural	20000 BTU/H	<u>3.9" WC</u>
Propane	19000 BTU/H	<u>7.5" WC</u>
8. Press the TEST button again to enter your settings and to return the unit to normal operation.
9. Press the ON/OFF button to turn the appliance OFF. Remove test port connections and reinstall port plug.
10. Unit is now ready for operation.



Rinnai

SERVICEMAN TROUBLESHOOTING INFORMATION

RCE-590A only

IMPORTANT SAFETY NOTES:

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 unit. **Only trained and qualified service agencies should attempt to repair this product.** Remember, before checking for resistance readings, you should disconnect the power source to the unit and isolate the item to be checked from the circuit (unplug it).

(TR) Transformer:

Wire color	Voltage	Resistance	Connector #	Pin #'s
Red ~ Greg (Primary)	110 ~ 120 VAC	24 ~ 27 ohms	CN17	1 ~ 3
White ~ Black	100 ~ 120 VAC	24 ~ 27 ohms	CN2	8 ~ 9
Blue ~ Blue	8 ~ 10 VAC	2 ~ 3 ohms	CN2	6 ~ 7
Brown ~ Brown	17.5 ~ 19.5 VAC	0.8 ~ 1.2 ohms	CN2	3 ~ 4
Purple ~ Purple	11 ~ 13 VAC	0.4 ~ 0.6 ohms	CN2	1 ~ 2

(SV1, SV2, and POV) Gas valve and Modulating solenoids:

(SV1) Red ~ Red	80 ~ 100 VDC	1.7K ~ 2.1K ohms	CN3	3 ~ 4
(SV2) Red ~ Red	80 ~ 100 VDC	1.7K ~ 2.1K ohms	CN3	3 ~ 4
(POV) White ~ Red	4 ~ 12 VDC	72 ~ 76 ohms	CN7	7 ~ 8

(FM) Plasma Cluster Motor:

Blue ~ White	60 ~ 64 ohms	30 ~ 38 VAC	CN16	1 ~ 3
Blue ~ Yellow	39 ~ 44 ohms	70 ~ 100 VAC	CN16	1 ~ 5
Yellow ~ White	99 ~ 105 ohms	N/A	CN16	3 ~ 5

(PCM) Plasma Cluster Module:

Black ~ White	98 ~ 102 VAC	N/A	CN5	1 ~ 2
Red ~ Green	0.5 VAC	725 ~ 735 ohms	CN14	1 ~ 2

(IG) Ignition System:

White ~ White	95 ~ 105 VAC	N/A	CN3	1 ~ 2
---------------	--------------	-----	-----	-------

(FM) Combustion Fan Motor:

Blue ~ Yellow	144 ~ 150 ohms	Lo. 50 ~ 55 VAC Hi. 95 ~ 105 VAC	CN18	1 ~ 2
---------------	----------------	-------------------------------------	------	-------

(TF & OHS) Thermal Fuse & Overheat Switch:

White ~ White	Below 1 ohm	See below	CN7	4 ~ 6
---------------	-------------	-----------	-----	-------

You should have 12 VDC from terminal 4 to ground at connector CN7 and terminal 6 to ground.

Rinnai

(TF & OHS) Thermal Fuse & Overheat Switch:

White ~ White	Below 1 ohm	See below	CN7	4 ~ 6
---------------	-------------	-----------	-----	-------

You should have 12 VDC from terminal 4 to ground at connector CN7 and terminal 6 to ground.

(ODS) Thermocouple:

Yellow ~ Blue	N/A	16 ~ 35 milli volts DC	CN7	3 ~ 5
---------------	-----	------------------------	-----	-------

TH. Thermistor:

Black ~ Black	See example #1 below		CN6	
---------------	----------------------	--	-----	--

(OH. TH.) Overheat Thermistor:

Black ~ Black	See example #1 below	N/A	CN7	1 ~ 2
---------------	----------------------	-----	-----	-------

Example #1:

When checking the **TH. and OH. TH. Thermistors** insert your meter leads into each end of the thermistor plug at connector CN7, terminals 1 and 2. Set your meter to the 400K resistance scale. Apply a small amount of heat against the thermistor bulb. When the thermistor senses heat the resistance value will begin decreasing. Then, place the thermistor bulb in a glass of ice water, when the thermistor senses the temperature dropping the resistance value will increase. This indicates the thermistor is functioning properly.

If you do not get a reading when making the above checks the thermistor must be replaced. Thermistors usually do not fail unless the bulb is broken or the wire to the thermistor has been broken for some reason.

(3) Amp Fuses:

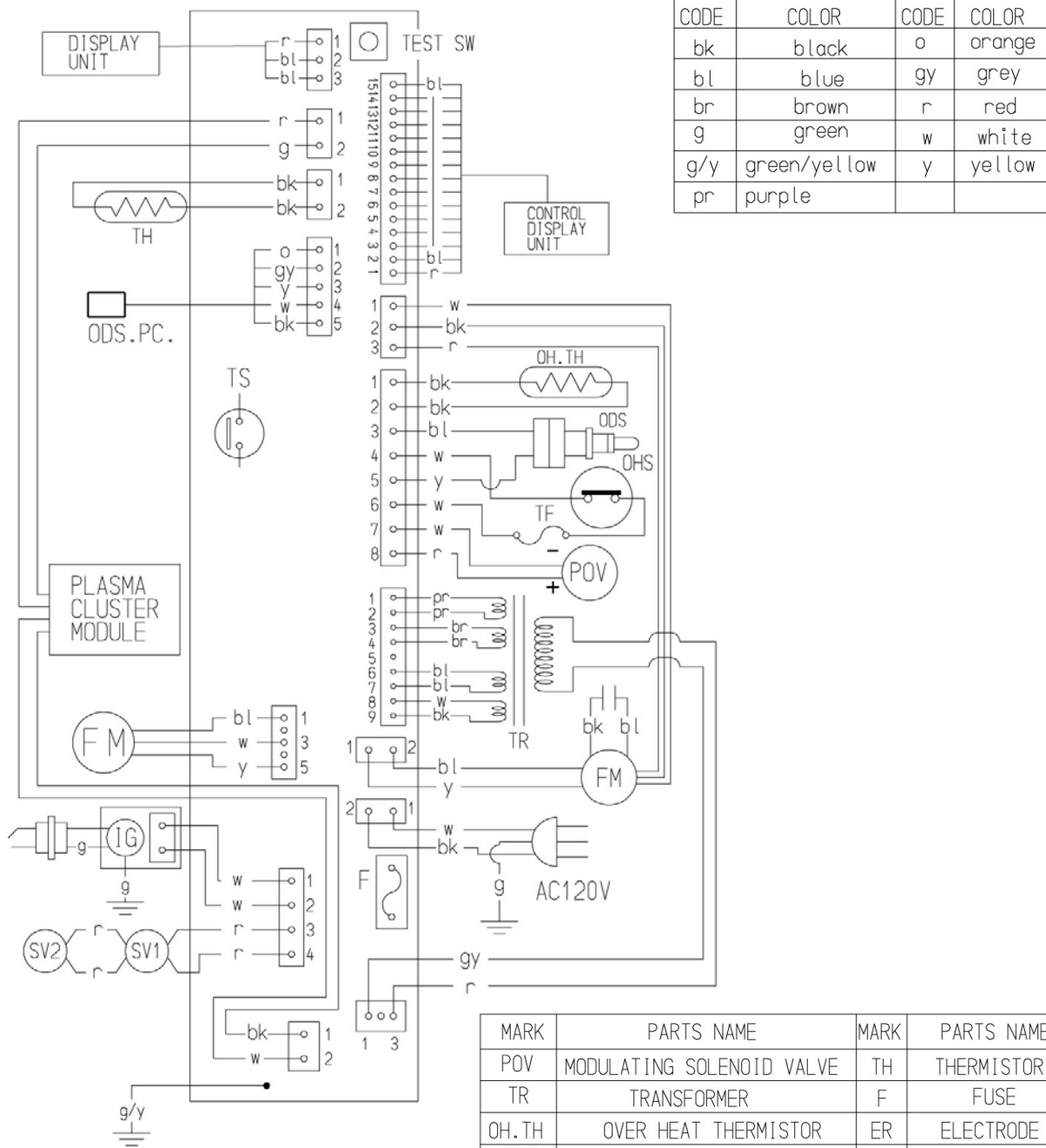
This unit has two inline (3) amp glass fuses. Remove fuse and check continuity through it. If you have continuity, the fuse is good. If you can not read continuity, the fuse is blown and must be replaced.

Rinnai

WIRING DIAGRAM

RCE-590A

Wiring Diagram:



CODE	COLOR	CODE	COLOR
bk	black	o	orange
bl	blue	gy	grey
br	brown	r	red
g	green	w	white
g/y	green/yellow	y	yellow
pr	purple		

MARK	PARTS NAME	MARK	PARTS NAME
POV	MODULATING SOLENOID VALVE	TH	THERMISTOR
TR	TRANSFORMER	F	FUSE
OH.TH	OVER HEAT THERMISTOR	ER	ELECTRODE
OHS	OVER HEAT SWITCH	TS	TILT SWITCH
SV1~2	MAIN SOLENOID VALVE 1~2	FM	FAN MOTOR
ODS	OXYGEN DEPLETION SENSOR	IG	IGNITER
TF	THERMAL FUSE		

Rinnai

Gas Pressure Setting Procedure

RCE-590-A only!

All Settings/adjustments MUST be performed by a qualified Service Technician.

1. Unplug the unit from the power supply, remove front panel. Locate the manometer gas pressure test port plug on the gas valve. Remove the Allen head test port plug from the gas valve. Connect your manometer to this test port. Then, plug the unit back into the wall receptacle.
2. With the unit in the off position, press the “SW2” button located on the upper right hand corner of the PC board. Using the up “▲” or down “▼” arrow button, select the gas type the unit will be operating on. The number “13” indicates natural gas; “LP” indicates propane gas. Select the appropriate gas type. After selecting the gas type press the “SW2” twice to enter the appropriate settings in the unit’s memory.
2. Press the “On/Off” button to allow the unit to cycle on, meaning combustion starts.
3. Press the “SW2” button on the PC board twice, the display should change to “PL” indicating the unit has been placed into a force low fire mode.
4. To adjust the low fire gas pressure, press the down arrow button “▼” on the control panel to lower the gas pressure, or the up arrow button “▲” to increase the gas pressure. Set the low fire gas pressure to the appropriate gas pressure setting as indicated below for the gas type the heater is operating on.

Low fire gas pressure setting for Propane Gas is 0.79" WC

Low fire gas pressure setting for Natural Gas is 0.39" WC

5. After setting the low fire gas pressure to the appropriate pressure, press the “On Timer” button once to enter your set pressure into the unit memory.
6. Next, press the “SW2” button on your PC board twice. This places the unit into forced high fire. The display should indicate “PH”.

Rinnai

7. To adjust the high fire gas pressure, press the down arrow button “▼” on the control panel to lower the high fire gas pressure, or the up arrow button “▲” to increase the high fire gas pressure. Set the high fire gas pressure to the appropriate gas pressure as listed below for the gas type the heater is operating on.

High fire gas pressure setting for Propane Gas is 6.9" WC
High fire gas pressure setting for Natural Gas is 5.1" WC

8. After setting the high fire gas pressure to the appropriate pressure, press the “**On Timer**” button once to enter your set pressure into the unit memory.
9. To reconfirm your gas pressures were properly set repeat steps 3 – 9 and recheck the pressure settings. If the pressures are set properly proceed to step eleven below.
10. Next, press the “**On/Off**” button to shut the unit off, this allows you to exit the programming mode.
11. Then, turn the gas supply off to the unit. Disconnect your manometer from the unit and reinstall the Allen test port screw.
12. Then, turn the gas supply back on and fire the unit. Check around the Allen test port screw for gas leaks using a gas leak solution or tester. If no leaks are found turn the unit off and unplug it.
13. Next, re-install the front panel on your unit.
14. After installing the front panel, plug the unit back into the wall receptacle. You are now finished with setting the gas pressures on the unit. Start the unit by pressing the “**On/Off**” button to start the unit.

Rinnai

SERVICEMAN TROUBLESHOOTING INFORMATION

RCE-606A only

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	15 ~ 24 VAC	1.5 ~ 2.0 ohms	39 ~ 42
Blue ~ Blue	8 ~ 11 VAC	11 ~ 12 ohms	40 ~ 43
Black ~ Black	105 ~ 120 VAC	82 ~ 87 ohms	41 ~ 44

(IG) Ignitor:

Red ~ White	100 ~ 106 VAC		47 ~ 49
-------------	---------------	--	---------

(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 = White ~ Red	Lo. fire 2 ~ 3 VDC Hi. fire 13 ~15 VDC	80 ~ 100 Ohms	28 ~ 29

(FM) Convection Fan Motor:

Blue ~ Yellow	Lo. fire 58 ~ 62 VAC Hi. fire 95 ~ 100 VAC	99 ~ 110 ohms	45 ~ 46
---------------	---	---------------	---------

(TF) Thermal Fuse:

White ~ Ground	24 ~ 28 VDC	0 ohms (as if meter leads were touching)	30 ~ 32
----------------	-------------	--	---------

(TH) Thermistor:

Check thermistor by inserting meter leads into each end of the thermistor plug (yellow to yellow). Set your meter to the 200 k 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. The thermistor on the **RCE606A** is plugged into pins 30 and 31 on the P.C. board.

Example:

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

(TC) Thermocouple:

Connect your meter leads to the thermocouple output terminals at the back of the appliance. This terminal is on the right side of the unit directly under the electrical compartment 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.

Rinnai

(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 33 and 34 with (1) yellow and (1) blue wire. 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:

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 connect your meter to the above terminals, as indicated for each model unit you are servicing. There should be no reading until you press the on/off button, then you should read continuity through this part of the circuit.

IMPORTANT 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:

Low fire 26

High fire 42

Wattage:

Low fire 28

High fire 40

Fan CFM's:

Low fire 99

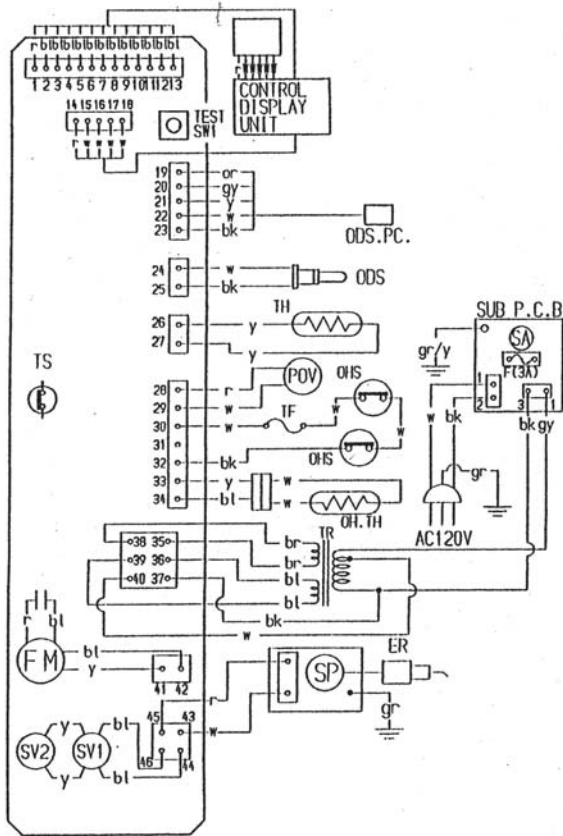
High fire 198

Rinnai

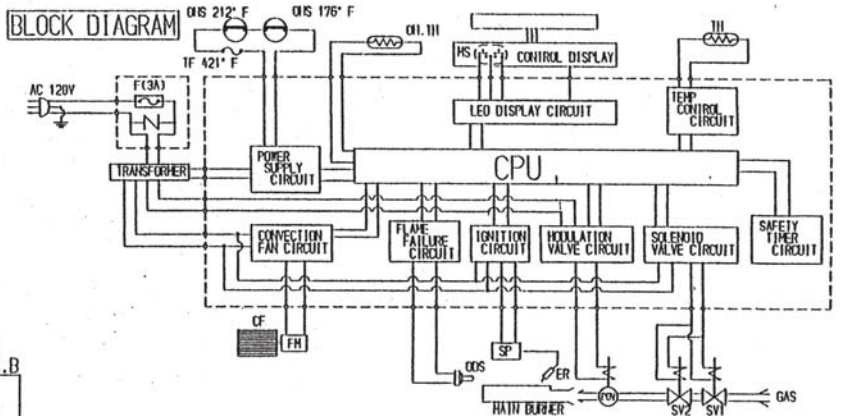
WIRING DIAGRAM

RCE-606A

WIRING DIAGRAM



BLOCK DIAGRAM



MARK	PARTS NAME	MARK	PARTS NAME
POV	MODULATING SOLENOID VALVE	TH	THERMISTOR
TR	TRANSFORMER	TF	THERMAL FUSE
SA	SURGE ABSORBER	F	FUSE
OH, TH	OVER HEAT THERMISTOR	ER	ELECTRODE
OHS	OVER HEAT SWITCH	TS	TILT SWITCH
SV1~2	MAIN SOLENOID VALVE 1~2	FM	FAN MOTOR
ODS	OXYGEN DEPLETION SENSOR	SP	SPARKER

CODE	COLOR	CODE	COLOR
bk	black	or	orange
bl	blue	gy	grey
br	brown	r	red
gr	green	w	white
gr/y	green/yellow	y	yellow

If any of the original wire as supplied with the appliance must be replaced, it must be replaced with a wire of a least a 194°F temperature rating and number 18AWG or its equivalent. "CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation." Verify operation after servicing.

Rinnai

GAS PRESSURE SETTING PROCEDURE

RCE-606A only

All settings/adjustments must be performed by a qualified Service Technician

NOTE: WITH THE UNIT IN THE OFF POSITION, PRESS THE BLUE TEST SWITCH ON THE TOP CORNER OF THE PCB BOARD. USING THE UP AND DOWN TEMPERATURE BUTTONS ON THE CONTROL, SELECT LP FOR PROPANE OR 13 FOR NATURAL GAS. PRESS THE TEST SWITCH AGAIN TO LOCK IN THE GAS TYPE.

THESE UNITS ARE PROGRAMMED FOR THE TYPE GAS ON THE RATING PLATE AND CAN NOT BE CONVERTED!!!

DO NOT make adjustments in any mode other than the “PL” and/or “PH” mode of operation. Follow the procedure below; if “PL” or “PH” does not appear in the display **DO NOT** make any adjustments. If you do not understand the following procedures contact Rinnai America for assistance at 1(800) 621-9419. This unit is designed to operate only on the gas type shown on the rating plate attached to the unit.

1. Next start the unit by pressing the “ON/FF” button. Once the unit has fired, press the “TEST” button on the P.C. board twice. The LED indicator will display “PL”, low fire mode. With your manometer connected to the manifold pressure test port record low fire manifold pressure. If the low fire pressure is incorrect, adjust it by the screw on top of the modulation valve. Once the pressure has been set, lock the adjustment screw down with the lock nut and then reconfirm the low fire manifold pressure.

Low fire pressure should be 0.24” W.C., (6 mm) on Natural gas.

Low fire pressure should be 0.75” W.C., (19 mm) on Propane gas.

2. Next press the “TEST” button again, this will put you into the “PH” high fire mode. If the high fire pressure is incorrect, it can be adjusted by using the “▲” and “▼” buttons. Adjust high fire pressure to correct setting. After you have set unit to the correct manifold pressure, press the “ON TIMER” button to enter your setting into memory. Next press the “ON/OFF” button to exit the programming mode.
3. High fire pressure should be 4.2” W.C., (106 mm) on Natural gas.
High fire pressure should be 9.1” W.C., (230 mm) on Propane gas.

Rinnai

SERVICEMAN TROUBLESHOOTING INFORMATION

RCE-606TRA & RCE-606TRA-II

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	RCE606 Pin #'s	606- II Pin #s
Brown ~ Brown	15 ~ 24 VAC	3.4 ~ 4.0 ohms	43 ~ 47	43 ~ 47
Purple ~ Purple	10 ~ 14 VAC	2.2 ~ 2.7 ohms	44 ~ 48	44 ~ 48
Blue ~ Blue	8 ~ 11 VAC	7 ~ 9 ohms	45 ~ 49	45 ~ 49
Red ~ Red	100 ~ 106 VAC	35 ~ 41 ohms	46 ~ 50	46 ~ 50
Black ~ Black	110 ~ 120 VAC	39 ~ 42 ohms	53 ~ 54	58 ~ 59

(IG) Igniter:

Red ~ White	100 ~ 106 VAC		55 ~ 57	
56 ~ 57				

(SV1, SV2, and POV) Gas valve solenoids:

SV1 = Yellow ~ Yellow	85 ~ 95 VDC	1,400 ~ 2,000 ohms	58 ~ 59	53 ~ 54
SV2 = Blue ~ Blue	85 ~ 95 VDC	1,400 ~ 2,000 ohms	58 ~ 59	53 ~ 54
POV = White ~ White	Lo. fire 2 ~ 3 VDC	80 ~ 100 Ohms	35 ~ 36	35 ~ 36
	Hi. fire 10 ~ 12 VDC			

(FM) Convection Fan Motor:

Blue ~ Yellow	Lo. fire 58 ~ 62 VAC	110 ~ 180 ohms	51 ~ 52	60 ~ 61
	Hi. fire 95 ~ 100 VAC			

(TF) Thermal Fuse:

White ~ Ground	12 ~ 15 VAC	0 ohms (as if meter leads were touching)	38 ~ 39	37 ~ 38
----------------	-------------	--	---------	---------

(TH) Thermistor:

Check thermistor by inserting meter leads into each end of the thermistor plug (yellow to yellow). Set your meter to the 200-k 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. The thermistor on the RCE606TRA is plugged into pins 28 and 29 on the P.C. board. The RCE606TRA-II it is on terminals 31 and 32.

Example:

41 degrees = 91 k ohms

50 degrees = 65 k ohms

68 degrees = 39 k ohms

86 degrees = 23 k ohms

(TC) Thermocouple:

Connect your meter leads to the thermocouple output terminals at the back of the appliance. This terminal is on the right side of the unit directly under the electrical compartment 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.

Rinnai

(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 41 and 42 with two yellow 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 both the RCE606TRA and the RCE606TRA-II:

Read resistance across the red wire at pin # 6, and white wire at pin # 4 on the P.C. board. In order to check the on/off switch operation you must connect your meter to the above terminals, as indicated for each model unit you are servicing. There should be no reading until you press the on/off button, then you should read continuity through this part of the circuit.

IMPORTANT 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.

DECIBELS

HIGH FIRE=40
LOW FIRE=28

CFMS

HIGH FIRE=198
LOW FIRE=98

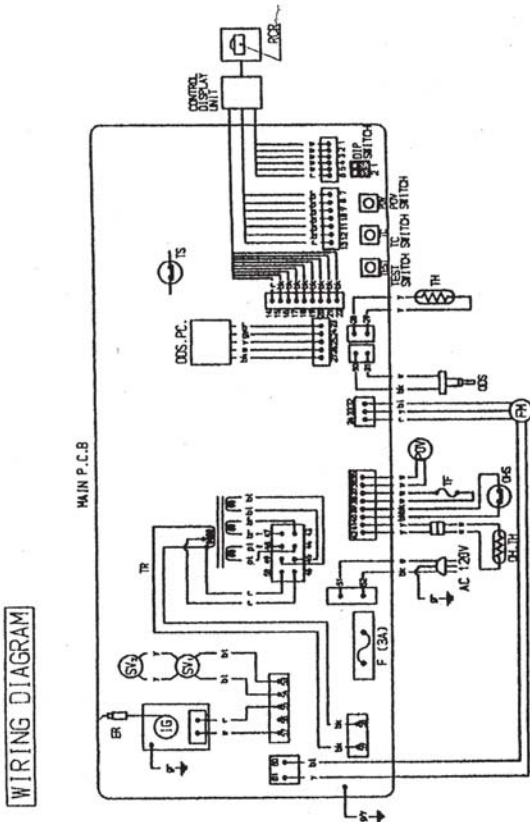
WATTAGE

HIGH FIRE=45
LOW FIRE=29

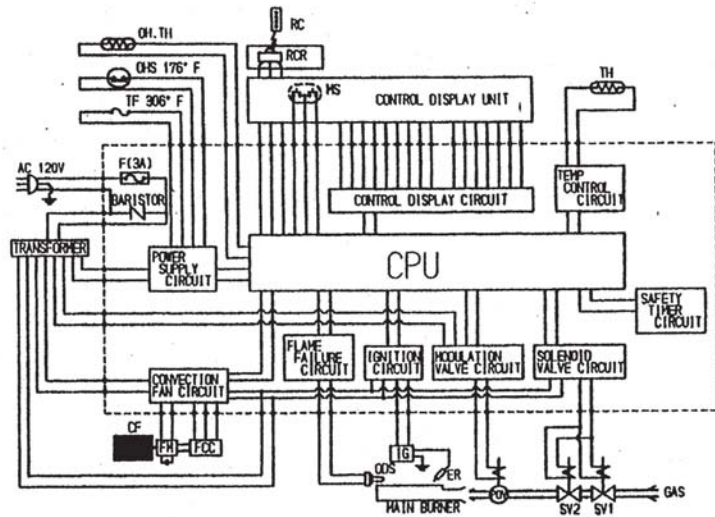
Rinnai

WIRING DIAGRAM

RCE-606TRA



BLOCK DIAGRAM



CODE	COLOR	CODE	COLOR
bk	black	or	orange
bl	blue	pl	purple
br	brown	r	red
g	green	w	white
gr/y	green/yellow	y	yellow
gy	grey		

MARK	PARTS NAME	MARK	PARTS NAME
HS	MAIN SWITCH	OH, TH	OVER HEAT THERMISTOR
TH	THERMISTOR	OHS	OVER HEAT SWITCH
TF	THERMAL FUSE	FH	FAN MOTOR
F	FUSE	IG	IGNITER
CF	CONVECTION FAN	SV1-2	MAIN SOLENOID VALVE 1-2
FCC	FAN CONTROL CIRCUIT	CPU	CENTRAL PROCESSING UNIT
ER	ELECTRODE	ODS	OXYGEN DEPLETION SENSOR
POV	MODULATING SOLENOID VALVE	TS	TILT SWITCH
TR	TRANSFORMER	RC	REMOTE CONTROL
		RCR	REMOTE CONTROL RECEIVER

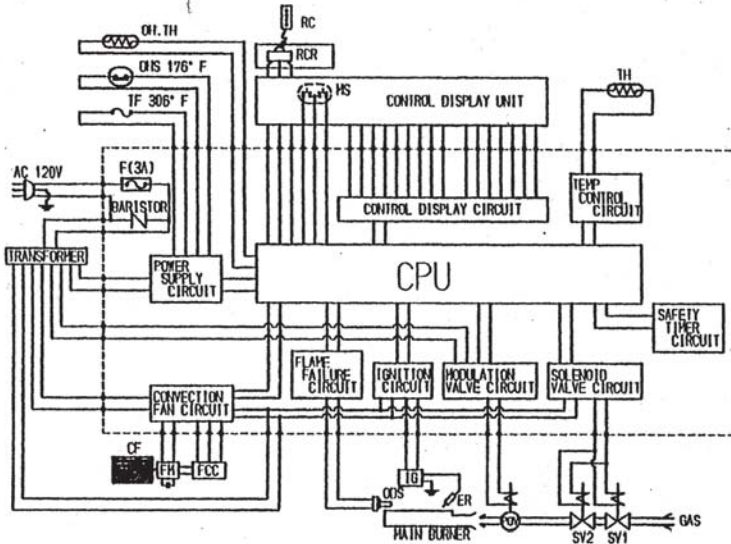
If any of the original wire as supplied with the appliance must be replaced, it must be replaced with a wire of a least a 194°F temperature rating and number 18AWG or its equivalent. “CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.” Verify operation after servicing.

Rinnai

WIRING DIAGRAM

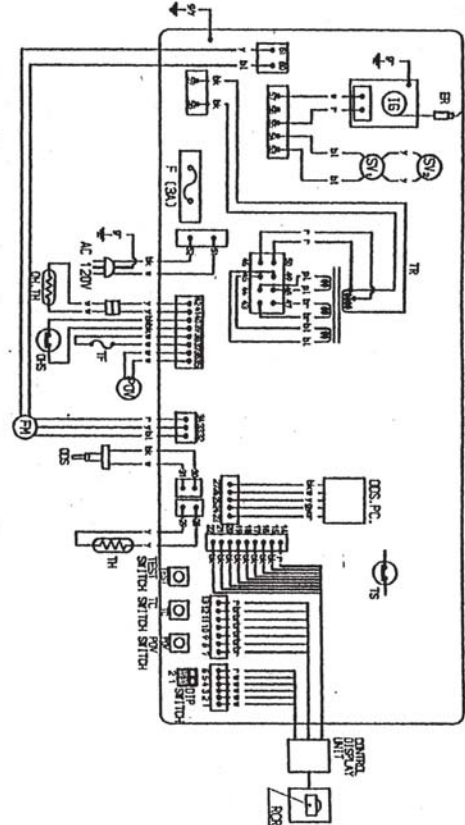
RCE-606TRAI

BLOCK DIAGRAM



CODE	COLOR	CODE	COLOR
bk	black	or	orange
bl	blue	pl	purple
br	brown	r	red
g	green	w	white
gr/y	green/yellow	y	yellow
gy	gray		

MARK	PARTS NAME	MARK	PARTS NAME
HS	MAIN SWITCH	OH.TH	OVER HEAT THERMISTOR
TH	THERMISTOR	OHS	OVER HEAT SWITCH
TF	THERMAL FUSE	FH	FAN MOTOR
F	FUSE	IG	IGNITER
CF	CONVECTION FAN	SV1~2	MAIN SOLENOID VALVE 1~2
FCC	FAN CONTROL CIRCUIT	CPU	CENTRAL PROCESSING UNIT
ER	ELECTRODE	ODS	OXYGEN DEPLETION SENSOR
POV	MODULATING SOLENOID VALVE	TS	TILT SWITCH
TR	TRANSFORMER	RC	REMOTE CONTROL
		RCR	REMOTE CONTROL RECEIVER



WIRING DIAGRAM

If any of the original wire as supplied with the appliance must be replaced, it must be replaced with a wire of a least a 194°F temperature rating and number 18AWG or its equivalent. "CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation." Verify operation after servicing.

Rinnai

GAS PRESSURE SETTING PROCEDURE

RCE-606TRA only

All settings/adjustments must be performed by a qualified Service Technician

1. Set dip switches to the proper position. Dip switches are located on the upper right corner of the PC board. Please set switches for the type of gas to be used as listed below:

PROPANE: Switch #1 ON Switch #2 ON
NATURAL: Switch #1 ON Switch #2 OFF

* Connect manometer up to gas test port at the POV valve.

2. Turn operation switch to the ON position. (Combustion starts)
3. Press the [TEST] button on the PCB once. You are in the program mode now. The left side of the display shows 01-07 to indicate combustion status.
4. Press [▼] button on the control panel until the display shows [01].
5. To adjust the low combustion gas pressure, adjust the screw on the modulation valve to the proper setting for the gas type being used. After adjusting the pressure lock regulator screw.

Low pressure setting for Propane Gas is 0.75" WC
Low pressure setting for Natural Gas is 0.24" WC

6. Press the [POV] button on the PCB. Display shows P. Now you can set the high combustion gas pressure for the proper gas type being used. The [▼] button reduces gas pressure and the [▲] increases the pressure.

High pressure setting on Propane Gas is 9.1" WC
High pressure setting on Natural Gas is 4.2" WC

7. Press the [POV] button on the PCB again to enter all *previous* settings. Display will show [07] a short while later. Data has now been stored in memory.
8. Press the [TC] level button on the PCB. Set the TC level to the correct setting for gas type being used. Display will show a 4 digit number when the TC button is pressed. Left 2 digits indicate high, and right 2 digits indicate low. The low combustion TC level is adjusted by using the [▼] button, and the high TC level is adjusted with the [▲] button. Below find the correct setting for your gas type.

Natural Gas TC level High 14 Low 14
Propane Gas TC level High 12 Low 14

9. Press the [TC] level button again to enter your settings.
10. Press the [TEST] button to return the unit to its normal operation mode. Display will show temperatures.

Rinnai

GAS PRESSURE SETTING PROCEDURE

RCE-606TRA-II

These units are not field convertible.

All settings/adjustments must be performed by a qualified service technician.

1. Turn the unit off, remove the gas pressure test port plug using a 3/16" allen wrench. Insert a 1/8" NPT test port and connect your manometer.
2. With the unit in the "Off" position and when it has completely stopped operating, press the "SW1" switch at the top of the PCB panel for approximately 0.3 seconds. Read the LED display. Natural gas models will display the number **13**. Propane gas models will display **LP**.
3. Select the correct gas type by using the "UP" (▲) and "DOWN" (▼) buttons.
4. To enter the gas type into memory, press the "SW1" switch again. The LED display turns blank and the unit returns to the normal "Off" mode.

Note: After changing the PCB or gas type, the pressures must be set.

5. To set the pressures, press the On/Off button to ignite the appliance with the manometer still connected.
6. Press the "SW1" switch. The unit will operate in a test mode. A number "01^U₀ - 07^U₀" will appear on the LED display.
7. Press the "▲" or "▼" button on the control panel until the LED displays 01:¹_c (Low combustion).
8. Check your manometer for the pressure reading. The low pressure setting is listed in the box below. Low pressure is adjusted by the regulator screw.

Natural Gas	0.24" W.C.
LP Gas	0.75" W. C.

9. Press the "SW1" switch at the top of the PCB to operate unit on High Pressure Setting Mode. The LED will display **P---**.
10. Adjust the High Pressure using the "▲" and "▼" buttons. The pressure setting on High are:

Natural Gas	4.2" W. C.
LP Gas	9.1" W. C.

11. To enter all settings in memory, push the Child Lock button on the control panel. The LED will display 07:¹_c indicating settings are in memory.
12. Press the On/Off button. This completes the pressure setting procedure, locking in **ALL** selections. The unit will stop. The unit must be placed in the On/Off position before it will return to normal operations and to save the settings.
13. Remove the test port connection and reinstate port plug and leak test.
14. Unit is now ready for operation.

Rinnai

ERROR CODED MESSAGES

* The latest error message will appear when Room Temperature Control Switches "▲", "▼" and "Economy" switch are pressed at the same time.

RCE-606 Series RCE-590 Series	RCE-506 Error Code F°	Description	Diagnostic Point
03	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Tilt Switch is activated	Check tilt switch
10	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Flash back device is activated	Check flash back sensing switch
11	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Ignition failure	Check thermocouple output and gas supply
12	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Incomplete combustion device is activated	Check thermocouple output
14	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Overheat Switch is activated	Check Overheat Switch and obstruction to air flow
14	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Thermal fuse melted (activated)	Check Thermal Fuse
16	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	OFF function activated	Check Room Temperature Thermistor
31	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Room Temperature Thermistor short circuit	Check Room Temperature Thermistor
32	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Room Temperature Thermistor short circuit	Check Room Temperature Thermistor
33	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Overheat Thermistor open circuit	Check Overheat Switch
34	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Overheat Thermistor short circuit	Check Overheat Switch
62	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Fan Motor open circuit	Check Convection Fan Motor
70	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Operation Switch failure	Check Operation Switch
71	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Modulating Valve circuit faulty	Check Modulating and/or Solenoid Valves
	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	TC high cut	Check thermocouple output for 5 seconds (above 48 mV)
00	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Power failure All indicator lamps off	Turn heater OFF and then ON again
73	 ◀ 'LO' '60' '64' '68' '72' '76' '80' 'HI' ▶	Communication Error All indicator lamps on	Restart unit, if unit does not recycle, contact Rinnai.

Rinnai

FAULT FINDING PROCEDURE

RCE-506A & RCE-606TRA

Flashing indicators are for the RCE-506A. Numbers in the [] are error codes for the RCE-606TRA.

1. Initial Checks

Service Call Symptom	Check Points (See information in following sections)		
Appliance does not operate after having pressed ON/OFF Switch.	<ul style="list-style-type: none"> • Check electrical cord is connected to the power point. • Confirm power supply. • Check Child Proof Lock. 		
Ignition does not occur. (Red Combustion Indicator does not illuminate.) (Room Temp '60' & Combustion Indicator flash) [11]	<ul style="list-style-type: none"> • Check gas type. • Check inlet pressure. • Air in gas supply. 11
Room does not warm up.	<ul style="list-style-type: none"> • Check preset temperature. • Blocked air-filter. • Warm air outlet obstruction. • Inadequate gas supply. 2341
Flame failure. (Room Temp '68' & Combustion Indicator flash) [14] (Room Temp 'LO' & Combustion Indicator flash) (Room Temp '72' & Combustion Indicator flash) [10] (All Room Temp 'LO' - 'H' flash*) * When power is restored within 0.5 seconds after power failure.	<ul style="list-style-type: none"> • Insufficient ventilation • Blocked air filter • Power failure • Warm air outlet obstruction • Check gas type • Strong draught is blown into appliance • Inadequate gas supply • Flash back 53417
There is a smell of gas.	<ul style="list-style-type: none"> • Leaking gas supply pipe connection • Safety device operating • Smell of combustion by-product 16

Rinnai

2. Failure conditions

- causes and remedy

1. Gas Supply

< Ignition Does Not Occur >,
< Room Does Not Warm Up >,
< Smell of Gas >

- Is the gas supply fully opened?
- Is the gas supply bent?
- Is the gas supply squashed?
- Is the gas supply incorrect size?
- Is the gas supply connected correctly?
- Ensure gas supply is fully open.
- Ignition doesn't occur when the gas supply is poor or if there is air in the supply line.

2. Pre-set Temperature

<Room Does Not Warm Up >

- Is the Pre-set Temperature lower than the current room temperature? (Appliance switches to 'LO' approximately 1 minute after ignition.)
- Reset the pre-set temperature to be higher than the current room temperature.
- Adjust Temperature Control Switches to desired temperature.

3. Blocked Air Filter

<Room Does Not Warm Up>,
<Flame Failure >

- Is the air filter blocked with dust, or curtain touching the air filter?
- Is the safety device operating due to blocked air filter? (Room Temperature Indicator '68' and Combustion Indicator flash) [14]
- Air filter should be cleaned approximately once a month.

4. Warm Air Outlet Obstruction

<Room Does Not Warm Up>,
<Flame Failure >

- Is there any object placed in front of the louvre? (Room Temperature Indicator '68' and Combustion Indicator flash) [14]
- Ensure the louvre is not blocked, or any large object placed in front (within 30") of the appliance.

5. Insufficient Ventilation

< Flame Failure >

- Is the ventilation in the room sufficient? (Room Temperature Indicator 'LO' and Combustion Indicator flash)
- Ensure that ventilation complies with local requirements.

6. Smell of Combustion By-product

< There is A Smell of Gas >

- There may be a slight smell of gas at ignition and/or extinction.
- Possibly caused by aerosol spray.

7. Flash Back

< Flame Failure >

- Is the air filter blocked with dust?
- Is the burner or restrictor blocked?
- Is the combustion chamber blocked, or foreign matter inside?
- Are combustion specifications and gas pressure settings correct? (Room Temperature Indicator '72' and Combustion Indicator flash) [10]

Rinnai

3. Conditions that are not faults

Condition	Cause and Explanation
Ignition is slow and cold air is blown from appliance.	When the ON/OFF switch is pressed, ignition occurs however, ignition could be delayed due to air in the gas supply line. Combustion Indicator (red) will not illuminate until the thermocouple has heated up, there will be few seconds delay after ignition.
Warm air continues to blow after switching appliance OFF.	The fan stops after releasing all heat residual from within the appliance. (approx. 150 sec)
A clicking sound when the burner ignites.	Normal ignition sound. The extent of the sound will depend on gas pressure and burner temperature; the sound may be loud.
Resonant sound after ignition.	Movement of the flame as it travels across the burner.
After ignition there is a ticking or clicking noise.	This is the expansion of the combustion chamber metal.
The heater does not ignite upon initial use.	There may be air in the gas supply, preventing the appliance igniting immediately. After 30 seconds the spark will stop and the heater will lockout. The ON/OFF switch must be reset to re-attempt ignition.
There is smoke or an unusual smell upon initial use.	This is caused by grease, oil or dust in or on the combustion chamber. This will stop after a short period. Increase the ventilation when using the appliance.

A sk about Rinnai's other fine products:



The Silent Servant

- North America's only vent-free convection heater
- 99% efficient
- whisper quiet
- perfect for hard to heat areas

The Energy Savers

- Direct Vent Heating with style and performance
- whisper quiet
- available with multi-step set back thermostats



The Infra-reds

- Vent free radiant heaters
- 99.9% efficient
- Heat like the sun

Portable Cooking Products

- One, two and two burner with broiler models.
- Perfect for camping, a picnic or a tailgate party.



Continuum

- Endless hot water for the whole house
- Digital Temperature Selection

Rinnai

www.rinnaiamerica.com
800-621-9419

TDM 2002
Printed 2002.3