

**HOME OWNER / INSTALLER  
FOR YOUR SAFETY  
THIS MANUAL MUST BE READ IN ITS  
ENTIRETY BEFORE OPERATING HEATER**



## **RHFE-431FA III**



### **ENERGYSAVER GAS DIRECT VENT WALL FURNACE**

Owner's Operation and Installation Manual

**WARNING:** If the information in these instructions are not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- 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.

This appliance may be installed in an aftermarket, permanently located, manufactured home (USA) or mobile home, where not prohibited by local codes.

This appliance is only for use with the type of gas indicated on the rating plate. This appliance is not convertible for use with other gases, unless a certified kit is used.

**INSTALLER:** Leave this manual with the appliance.  
**CONSUMER:** Retain this manual for future reference.

Register your product at [www.rinnairregistration.com](http://www.rinnairregistration.com) or call 1-866-RINNAI1 (746-6241)

# **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 THIS APPLIANCE. INSTALLATION AND SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.

### ENERGYSAVER RHFE-431FA III Operation Manual

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# FEATURES OF THE RHFE-431FA III UNITS

- ◆ Clean Heating Forced Flue Type
- ◆ Easy Operation One-Touch Ignition
- ◆ Sensible Temperature Control Feature
- ◆ Comfortable Room Temperature Control and Display
- ◆ Warm Air Outlet at Floor Level (Keeps Your Feet Warm)
- ◆ Child Safety Lock
- ◆ Room Temperature Setting Memory
- ◆ Dirty Air Filter Indicator Lamp
- ◆ Energy-Saving Economy Setting
- ◆ Humidifier Tray
- ◆ Air Flow Directional Louvers
- ◆ Direct Vent Easily Installed
- ◆ Proportional Heating Variable Capacity
- ◆ Hush! Quiet Operation
- ◆ Modern Design Minimizes Floor Space Requirements
- ◆ Failure Message Display

## SAFETY DEVICES

**Spark Safety Device:** Automatically shuts unit down when there is an abnormal spark at time of ignition. Display lamps “LOW”, “60”, and “64” will activate if this happens.

**Flame Failure Device:** Activated when burner flame fails, indicator lamp “ON” flashes. If burner fails to ignite, indicator lamp “60” flashes. This prevents raw gas from being released.

**Overheat Switch:** This device automatically cuts the gas off if the heater exceeds a predetermined temperature. This is normally caused by an obstruction in front of the louvers, or a blocked fan filter. Indicator lamp “68” “ON” and the “FILTER” indicator lamp flash when overheat switch is activated.

**Two Fusible Links:** Backs up the overheat switch. If the fusible link cuts the unit off, a service call by an authorized person is required to replace the link. Indicator lamps “68”, “FILTER” and “ON” will flash.

**Overcurrent Prevention Device:** This is a 3 amp. glass fuse found on P.C. board. Design to shut unit down in case of overcurrent. If fuse blows all indicator lamps will be "OFF".

**Power Outage Safety Device:** This safety device cuts off gas passage and stops operation.

Local and state codes must be adhered to prior to installation.

Rinnai is continually updating and improving products therefore specifications are subject to change without prior notice.

	NG	LPG
Minimum supply gas pressure	3.5" (89mmH <sub>2</sub> O)	8" (203mmH <sub>2</sub> O)
Maximum supply gas pressure	10.5" (267mmH <sub>2</sub> O)	13.0" (330mmH <sub>2</sub> O)
Manifold test pressure	Factory set	Factory set

※See conversion for setting gas pressures.

\*There are two 1/8" NPT test points for measuring differential pressure, one is located on the modulating gas valve, the other is located on the burner manifold. The minimum inlet gas supply pressure is for the purposes of input adjustment.

### **GENERAL INFORMATION**



THIS SERIES HEATER IS DESIGN CERTIFIED BY CSA INTERNATIONAL AS A DIRECT VENT WALL FURNACE AND MUST BE INSTALLED ACCORDING TO THESE INSTRUCTIONS. ALTERATION OF THE ORIGINAL DESIGN INSTALLED OTHER THAN AS SHOWN IN THESE INSTRUCTIONS OR USED WITH A TYPE OF GAS NOT SHOWN ON THE RATING PLATE, IS THE RESPONSIBILITY OF THE PERSON AND COMPANY MARKING THE CHANGE.

*Thank you for purchasing Rinnai gas forced flue heater.*

Before using this product, please read this manual carefully to insure proper use of the product.

Please read the attached warranty thoroughly and keep it in a safe place.

# IMPORTANT POINTS / USAGE AND INSTALLATION MUSTS

Unpack heater and check for damage. (DO NOT INSTALL DAMAGED HEATER.) If heater is damaged, contact your supplier for advise. Before installing a heater, check the label for the correct gas type (see label on heater). Refer to local gas authority for confirmation of gas type if you are in doubt.

## Included in Carton:

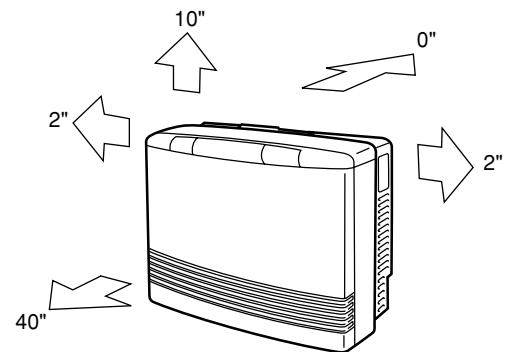
Customers Operating Information

## IMPORTANT

**Before using this product, please read this manual carefully to insure proper use of product.**

1. The installation must conform with local codes or, in absence of local codes, the National Fuel Gas Code, ANSI Z223.1 or the Canadian Installation Code, CAN/CGA-B149.
2. For information on gas type, see data plate on the appliance.
3. This heater must not be installed where curtains or other combustible materials could come into contact with it. In some cases curtains may need restraining.
4. This appliance is not designed to be built in.
5. If you move, check the gas type in the area where you are moving to. The local gas authority will be able to advise on local regulations.
6. This heater discharges a large volume of warm air at low level to provide even heat distribution. If the air in the room contains cooking vapor or cigarette smoke, and the heater is used on a carpet, the surface of the carpet may become discolored. In addition, some nylon carpets contain dyes which may be affected by the warm air flow. Some soft vinyl surfaces are also subject to distortion, or discoloration by warm air. To prevent discoloration of carpets, etc., a mat should be placed under the appliance, extending about 30" (750mm) in front of it.

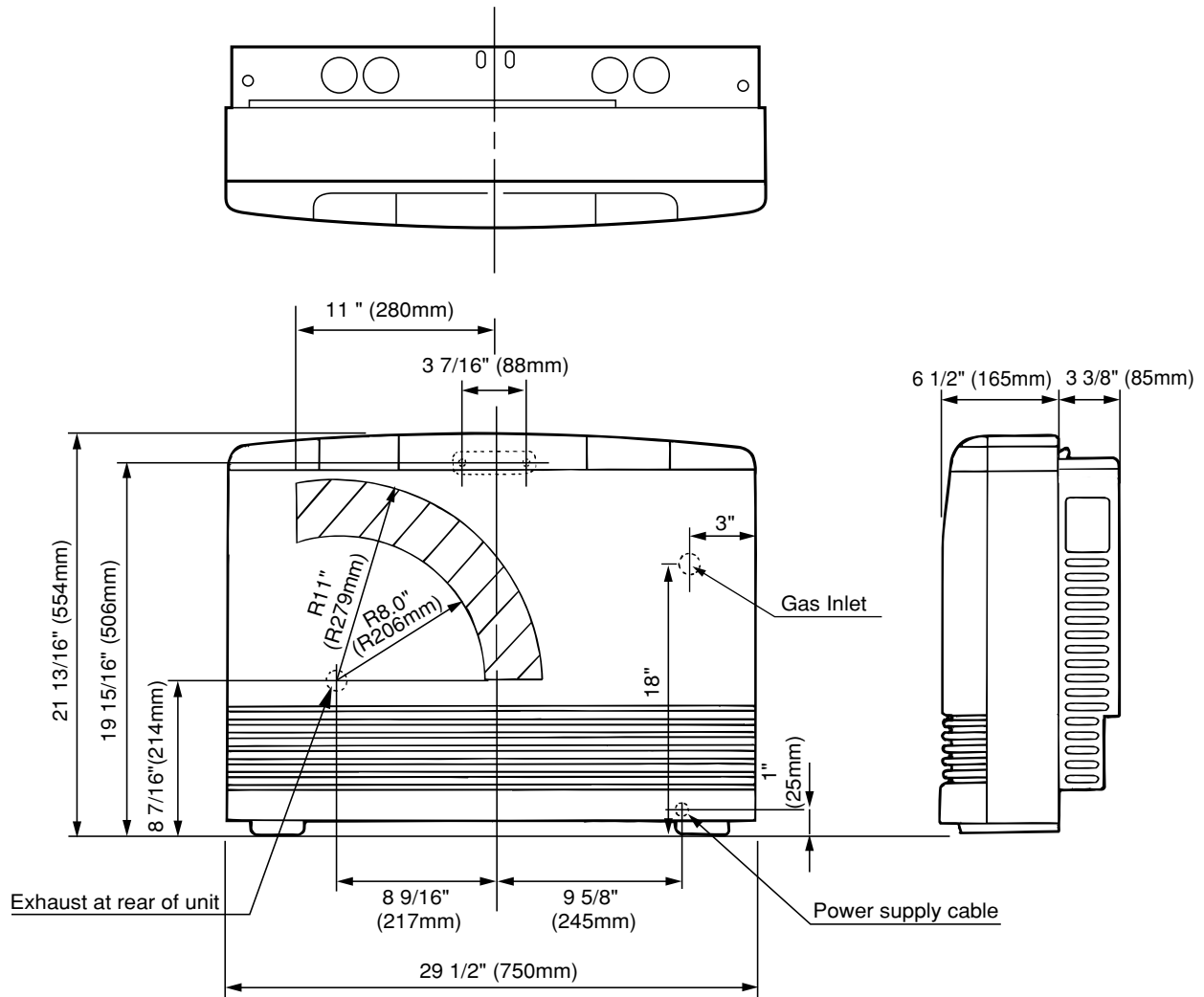
Diagram shows minimum clearances from combustible materials.



7. Read these rules and the instructions carefully. Check all local codes. Failure to follow these could cause a malfunction of the heater resulting in death, serious bodily injury and/or property damage.
8. This appliance is only for use with the type of gas indicated on the rating plate. This appliance is not convertible for use with other gases, unless a certified kit is used.  
If a conversion of the unit is needed, conversions must be performed at Rinnai America or authorized agent at owner's expense.
9. **WARNING:** Any change to this heater or its controls can be dangerous.
10. If a gas leak is suspected, turn heater off, turn gas supply valve off at appliance connector valve.  
Open windows to ventilate area immediately and contact your dealer or gas company.
11. **DO NOT PLACE CLOTHING OR FLAMMABLE MATERIALS, GASOLINE AND OTHER FLAMMABLE VAPORS AND LIQUIDS, ON OR NEAR THE HEATER.**

12. YOUNG CHILDREN SHOULD BE CAREFULLY SUPERVISED WHEN THEY ARE IN THE SAME ROOM WITH THE HEATER.
13. LPG containers must not be installed indoors.
14. Do not use this room heater if any part has been under water. Immediately call a qualified service technician to inspect the room heater and to replace any part of the control system and any gas control which has been under water.
15. Adequate clearances for accessibility for purposes of servicing and proper operation should be provided.
16. Adequate clearances around air openings should be provided.
17. Do not install in areas where curtains, drapes, clothing, or other moving flammables are within 12 inches of this unit.
18. Periodic examination of the venting system is required.
19. The flow of combustion and ventilation air should not be obstructed.
20. A manufactured home (USA only) or mobile home OEM installation must conform with the Manufactured Home Construction and Safety Standard, Title 24CFR, Part 3280, or, when such a standard is not applicable, the Standard for Manufactured Home Installations, ANSI Z225.1 or Standard for Gas Equipped Recreational Vehicles and Mobile Housing, CSA Z240.4.
21. "This appliance must be installed in accordance with the current standard CSA Z240.4 GAS EQUIPPED RECREATIONAL VEHICLES AND MOBILE HOUSING. Cet appareil doit être installé conformément aux exigences de la norme Z240.4 en vigueur de l'ACNOR, Installations de gaz dans les constructions mobiles et véhicules récréatifs."
22. If a blockage occurs at vent terminal due to snow, leaves or other type of obstruction the unit will stop working. The unit will not function until blockage has been removed then if unit fails to operate, contact a qualified service agency.
23. For a manufactured home (USA only) or mobile home OEM or residential or light commercial installation, this unit has been designed and certified to be converted from natural gas to propane or vice-versa. When provisions are being made to convert this unit, a certified conversion kit must be used. You must also readjust manifold gas pressure to specifications indicated in the conversion manual. If in doubt, contact Rinnai America for assistance.

# DIMENSIONS



# SPECIFICATIONS

MODEL #	BTU/h		MIN. CLEARANCES			FAN CFM OUTPUT
	INPUT	OUTPUT	SIDE	TOP	FRONT	
RHFE-431FA III-N  NATURAL	Low 8,200	Low 6,640	2" (50mm)	10" (250mm)	40" (1m)	LO:110.5
	High 16,700	High 13,530				HI:141.3
RHFE-431FA III-P  PROPANE	Low 8,200	Low 6,640	2" (50mm)	10" (250mm)	40" (1m)	LO:110.5
	High 16,700	High 13,530				HI:141.3

## SPECIFICATIONS

Type of Appliance	Fan forced flued gas furnace
Model	RHFE-431FA III ENERGYSAVER
Dimensions	Width— (750mm) 29 1/2" Depth—(250mm with back spacer)9 13/16" (with back spacer) Height—(554mm) 21 13/16"
Weight	Approx. 51 lbs.
Connections	Electrical—AC 120V 60Hz 40 watts Gas—1/2" female NPT
Combustion System	Stainless steel bunsen burner
Ignition System	Continuous spark
Operation	Finger touch control buttons (non-lock)
Temperature Control	Electronic thermostat HI-LOW/OFF Up/down switch
Temperature Range	Modulates Continuous LOW=55°F 60°F~80°F HI=High Combustion
Warm Air Outlet	Bottom front louver
Indicators/Lamps	Burner ON, child lock, filter, economy, temperature display (8)
Operating Buttons	On, Up/down, child-lock, economy
Economy Mode	Energy saving feature
Humidifier Tray	Capacity—3 pints (1300cc)



Safety Devices	Flame failure – Flame rod Over heat – Bi-metal switch, thermal fuse, thermistor Power failure – PCB Power surge – 3 Amp. fuse Fan delay – Micro computer timer Pre-purge – Combustion fan, pre-purge timer, spark sensor Room over heat – Automatic cut off at 104°F after 10 minutes	
Noise Level Range	HI~LOW=38~32dB(A)	
TYPE	Combustion Method	Forced combustion
	Air Supply Exhaust	Closed Type
	Radiation Method	Forced convection
AIR SUPPLY/ EXHAUST PIPE	Wall Penetration Hole	(80mm) 3 1/8"
	Max. Extended	(4m, 2 bends)=13ft., 2 bends

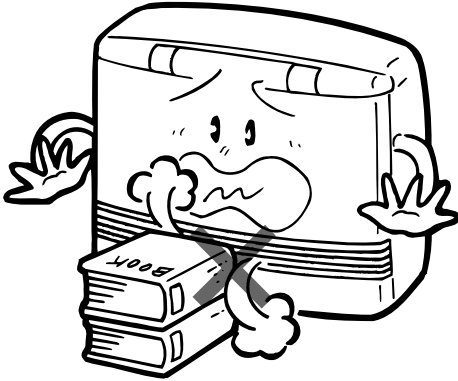
SPECIFICATIONS FOR VENT SIZES		
S	3"—4 1/2" (75—115)mm	Thin Walls Mobile Home
A	4 1/2"—9 1/2" (115—240 )mm	Wood Walls
B	9 1/2"—15 3/4" (240—400 )mm	Wood/Brick
C	15 3/4"—23 5/8" (400—600 )mm	Brick/Block
D	23 5/8"—31 1/2" (600—800 )mm	Special

\*\* BTU - Efficiency increase with vent size. Clearances from combustibles see pages 3 and 19.

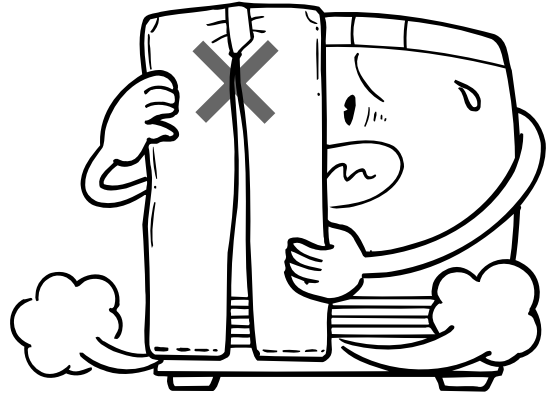
\*\* Thermal efficiency rating determined under continuous operating conditions, and was determined independently of any installed system.

# SAFETY POINTS

Do not restrict the warm air discharge by placing articles in front of the heater.



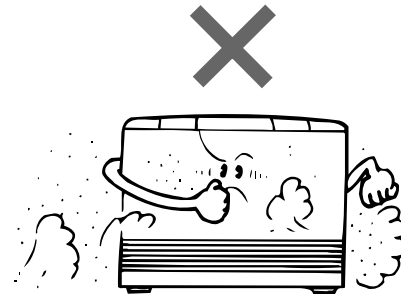
This appliance must not be used for any purpose other than heating.



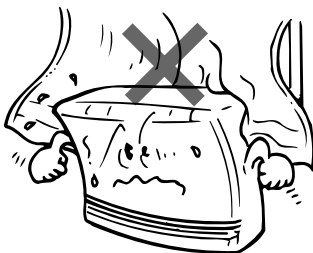
Do not spray aerosols while the heater is operating. Most aerosols contain butane gas, and can be a fire hazard if used near this heater when it is in use.



Do not install the heater in an unusually dusty area.



Do not allow curtains or other flammable or combustible materials to come into contact with the heater.



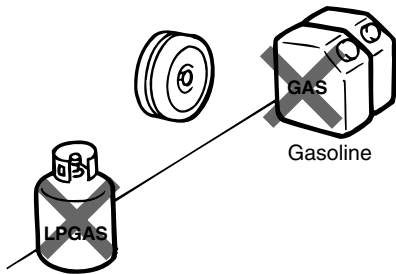
Combustible materials must not be placed where the heater could ignite them.

Do not allow anyone to sit on or lean against the appliance.

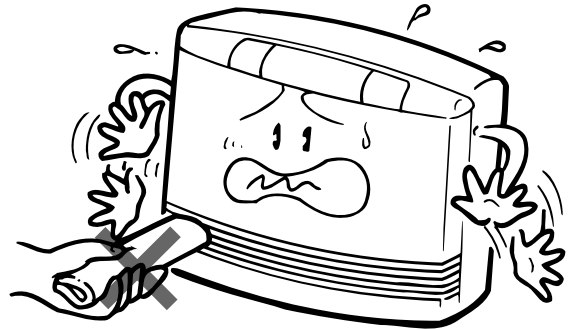


# SAFETY POINTS

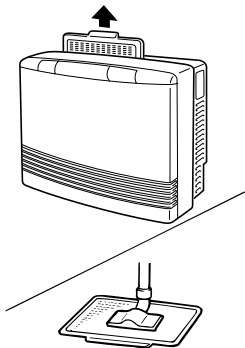
Keep flammable materials, trees, shrubs, etc., away from the flue terminal.



Do not allow anyone to poke articles through the louvers.

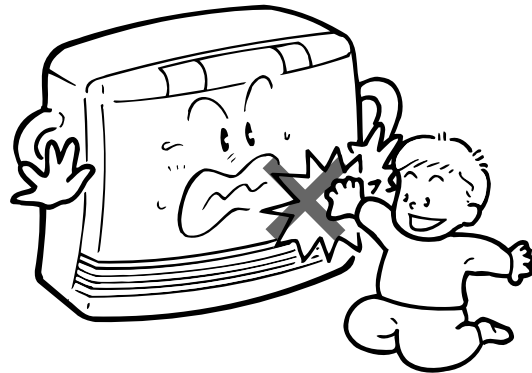


Filter should be cleaned at regular intervals. See page 30.

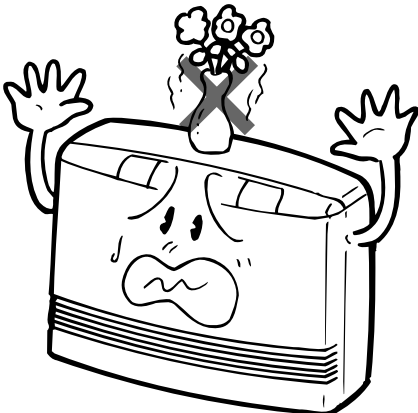


Clean with vacuum cleaner, weekly.

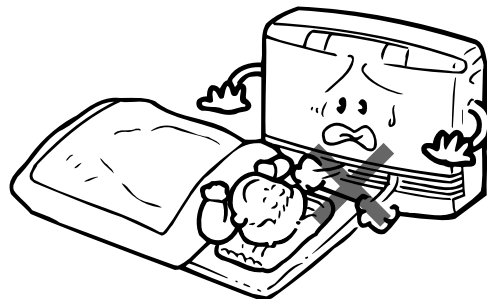
Young children should be supervised at all times. Hand or body contact with the louvers should be avoided.



Do not place articles containing liquids on top of the heater. Liquids spilled on the controls may cause extensive damage.



Do not allow young children or an infant to sleep directly in front of the heater.

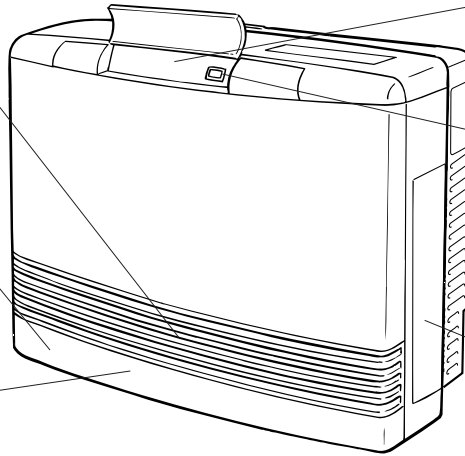


# GETTING TO KNOW YOUR NEW RHFE-431FA III

WARM AIR OUTLET

HUMIDIFIER  
REMOVE BOTTOM  
COVER AND PULL  
OUT TO REFILL

BOTTOM COVER  
HOLD BOTH SIDES  
AND PULL TOWARD  
YOU



DISPLAY  
TEMPERATURE  
SETTING CONTROLS

ON/OFF SWITCH  
TURNS MAIN POWER  
ON/OFF

RATING PLATE  
MODEL NUMBER,  
SERIAL NUMBER,  
GAS TYPE, ETC.

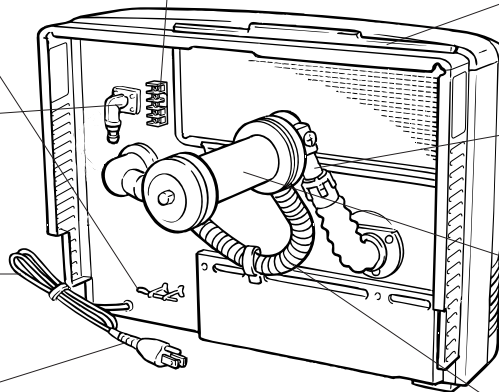
TERMINAL BLOCK  
FOR COMBUSTION FAN

THERMISTOR

GAS CONNECTIONS  
1/2" NPT

POWER CORD

PLUG 120V AC



AIR FILTER

EXHAUST PIPE

VENT TERMINAL  
COMBUSTION/  
EXHAUST

COMBUSTION AIR  
INTAKE HOSE

# CONTROL PANEL

ALL BUTTONS BEEP WHEN OPERATED.

## CHILD SAFETY LOCK

Lamp is "green" when this feature is on.

## TEMPERATURE DISPLAY

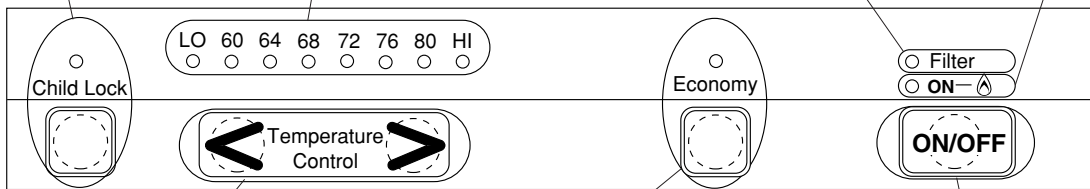
Set temperature lamp stays on. Current room temperature flashes.

## FILTER LAMP

Flashes when filter is dirty.

## OPERATION LAMP

This lamp turns "green" when power is on. Lamp will change to "red" when burner is on.



## TEMPERATURE BUTTONS

"<" adjust temp. to lower setting.  
">" adjust temp. to a higher setting.

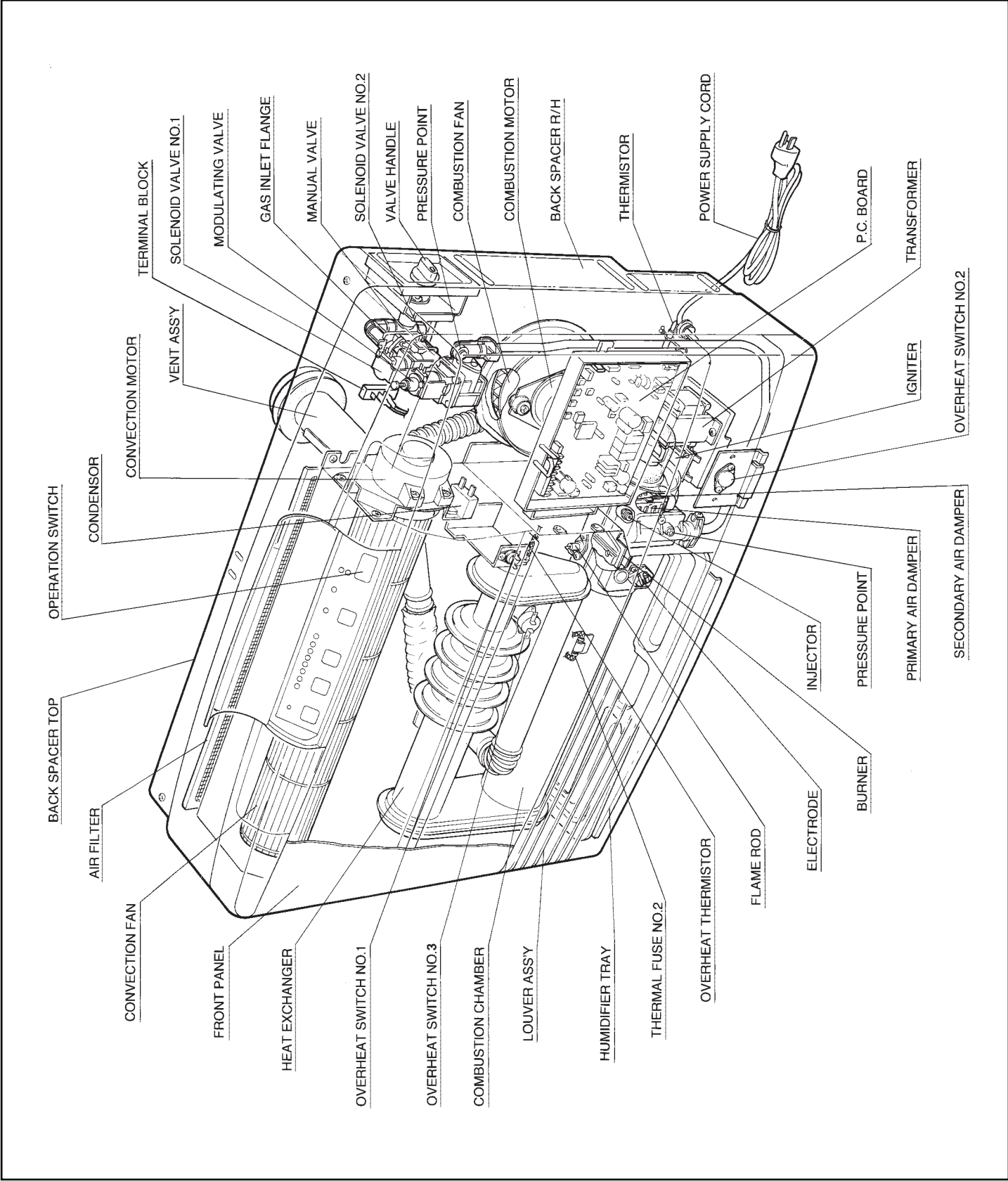
## ENERGY SAVING BUTTON

Lamp is "green" when this feature is activated.

## ON/OFF BUTTON

Easy operation  
One touch ignition

# CUT-AWAY DIAGRAM



# NOTICE BEFORE INSTALLATION

The heater must be installed by a qualified service person according to this installation instruction.

Check your local building codes for the proper method of installation. In the case of absence of local codes, this heater should be installed in accordance with the National Fuel Gas Code ANSI Z223 —1.

Check local codes or, in the absence of local codes, the current CAN/CGA —B149 INSTALLATION CODE.

DUE TO HIGH TEMPERATURES, THE APPLIANCE SHOULD BE LOCATED OUT OF TRAFFIC AND AWAY FROM FURNITURE AND DRAPERIES.

CHILDREN AND ADULTS SHOULD BE ALERTED TO THE HAZARDS OF HIGH SURFACE TEMPERATURES AND SHOULD STAY AWAY TO AVOID BURNS OR CLOTHING IGNITION.

**“WARNING”** Do not operate appliance with the panel(s) removed, cracked or broken. Replacement of the panel(s) should be done by a licensed or qualified service person.

INSTALLATION AND REPAIR SHOULD BE DONE BY A QUALIFIED SERVICE PERSON. THE APPLIANCE SHOULD BE INSPECTED BEFORE USE AND AT LEAST ANNUALLY BY A QUALIFIED SERVICE PERSON. MORE FREQUENT CLEANING MAY BE REQUIRED DUE TO EXCESSIVE LINT FROM CARPETING, BEDDING MATERIAL, ETC. IT IS IMPERATIVE THAT CONTROL COMPARTMENTS, BURNERS AND CIRCULATING AIR PASSAGEWAYS OF THE UNIT BE KEPT CLEAN.

The appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 or Canadian Electrical Code, CSA C22.1, if an external electrical source is utilized.

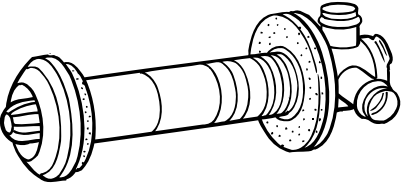

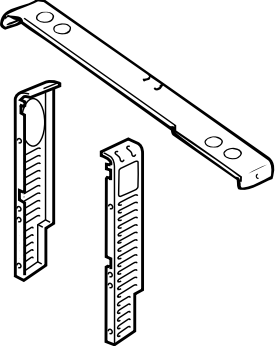





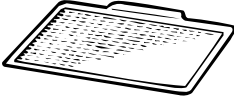




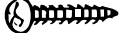


**WARNING:** THIS APPLIANCE IS EQUIPPED WITH A THREE-PRONG (GROUNDING) PLUG FOR YOUR PROTECTION AGAINST SHOCK HAZARD AND SHOULD BE PLUGGED DIRECTLY INTO A PROPERLY GROUNDED THREE-PRONG RECEPTACLE. Do not cut or remove the grounding prong from the plug.

This gas appliance must not be connected to a chimney flue serving a separate solid-fuel burning appliance. When the appliance is installed directly on carpeting, tile or other combustible material other than wood flooring, the appliance shall be installed on a metal or wood panel extending the full width and depth of the appliance.

Rinnai recommends a dedicated electrical circuit.

Appliance input ratings are based on sea level operation and need not be changed for operation up to 2,000 feet elevation. For operation at elevations above 2,000 feet, manufactured to specified deration conditions for Canada and the United States.

# INSTALLATION INSTRUCTIONS

Flue Manifold .....1		Spare rubber seal .....1 (‘A’ Flue units only)			
					
		(For weatherboard installations)			
Back Spacer Set		1	Flue Locking Clamp		1
			Flue Lock Stopper		1
			Insulation Clip		1
			Hose Clip		2
Customers operating information and Installation Instructions		1	Plastic tie for air inlet		1
Air Filter		1	(M4 X20)		1
(M4)	 For Back Spacer Set	6	(M4)		3
(M4)	 For Air Intake Clip	2	(M4.8 X32) Wood Screws		5
Wall Bracket		1	Spacer Bracket		1

Check to ensure gas supply matches that of the appliance.  
Refer to local gas authority for confirmation of gas type if in doubt.  
Refer to data plate located inside of the front panel.  
Check for damage, if the unit is damaged contact your supplier or Rinnai.  
Do not install a damaged unit before checking with your supplier.  
Refer to an approved pipe sizing chart if in doubt about size of gas line.



# GAS CONNECTION

1. The gas supply line shall be gas-tight, sized and so installed as to provide a supply of gas sufficient to meet the maximum demand of the heater without loss of pressure.
2. A shut off valve (and appliance connector valve) should be installed in the upstream of the gas line to permit servicing.
3. Flexible pipe and any appliance connector valve used for gas piping shall be types approved by nationally recognized agencies.
4. Any compound used on the threaded joint of the gas piping shall be a type which resists the action of liquefied petroleum gas.
5. Supplied gas pressure must be within the limits shown in the specifications.
6. After completion of gas pipe connections, all joints including the heater must be checked for gas tightness by means of leak detector solution, soap and water, or an equivalent nonflammable solution, as applicable.

CAUTION: Since some leak test solutions, including soap and water, may cause corrosion or stress cracking, the piping shall be rinsed with water after testing, unless it has been determined that the leak test solution is noncorrosive.

7. The appliance and its appliance main gas valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 P.S.I (3.5kPa).

The appliance must be isolated from the gas supply piping system by closing its individual manual shut off valve during any pressure testing of the gas supply system at test pressures equal to or less than 1/2 psig.

8. Two 1/8" test plugs are provided for testing of manifold differential pressure. See schematic for location.

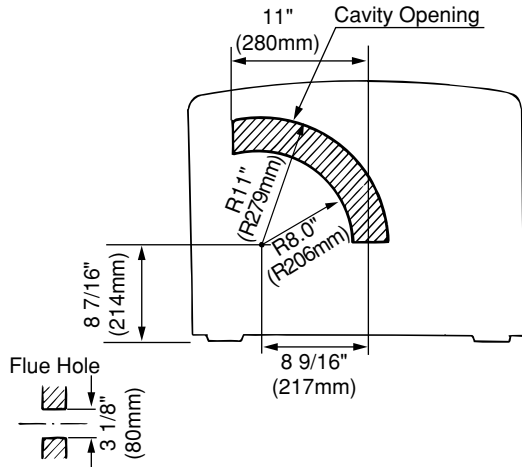
At time of installation installer must supply a 1/8" N.P.T. plugged tapping, accessible for test manometer connection, immediately up stream of the gas supply connection to the appliance.

## VENT LOCATION

### FLUE MANIFOLD POSITION

Center of hole for flue manifold can be drilled anywhere within the shaded area. (To avoid studs, etc.)

FOR WEATHERBOARD WALLS DRILL THROUGH CENTER OF WEATHER BOARD FROM OUTSIDE, THEN DRILL FROM INSIDE THROUGH PLASTER-BOARD.



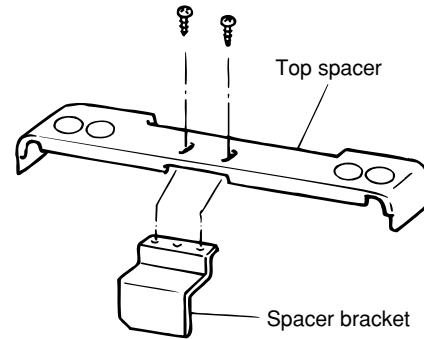
Before drilling the flue hole, check for water and gas pipes as well as electric cables. Use a 3 1/8" (80mm) drill for hole through wall.

### WALL MOUNTING BRACKETS

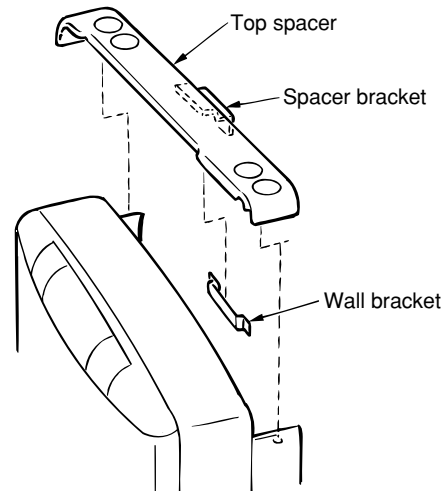
Place top back spacer in position. Mark the position of the top edge of the top spacer on the wall. Move the heater away from the wall. Mark center lines 1 1/8" (30mm) down from the top edge mark, and 1 9/16" (40mm) in front the left and right hand sides of the top spacer. Attach wall brackets at the marked position.

## FITTING TOP SPACER + WALL CLIP

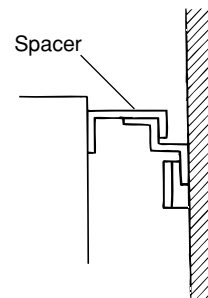
Tighten all screws.



### SECURE HEATER TO WALL

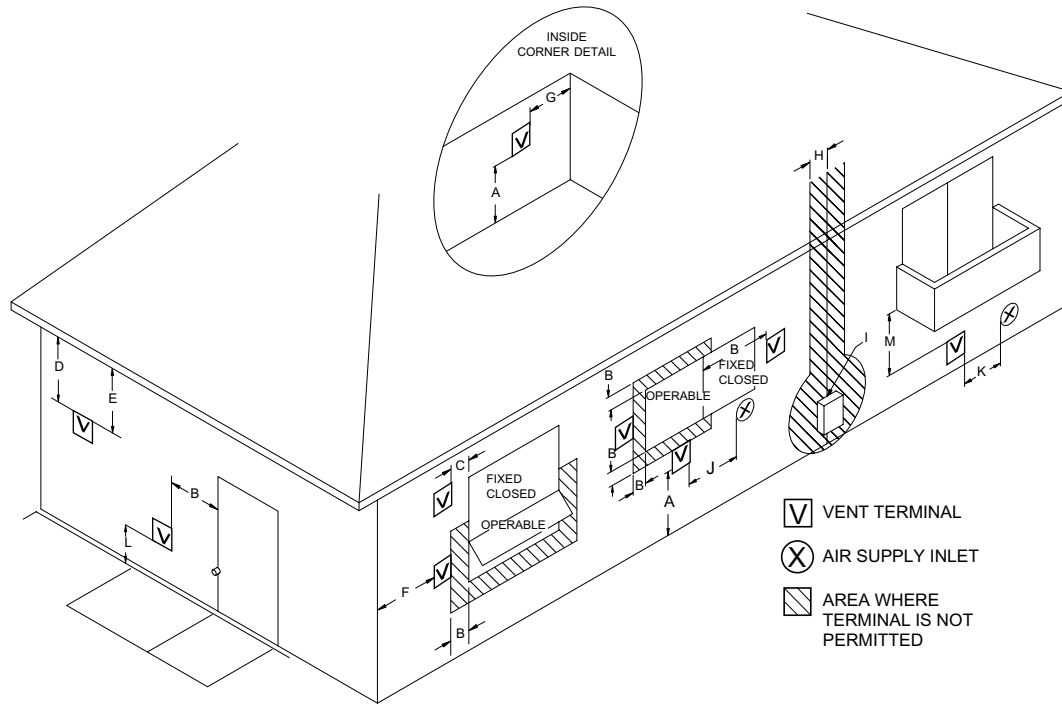


Replace top spacer, clipping the spacer into the wall brackets at the same time as attaching it to the heater. Secure top spacer with the screws provided. THE HEATER IS NOW SECURED TO THE WALL.



Replace fan filter.

# VENT TERMINATION CLEARANCES



REF	DESCRIPTION	U.S. Installations	Canadian Installations
A	Clearance above grade, veranda, porch, deck, or balcony	1 foot	1 foot
B	Clearance to window or door that may be opened	** 6 inches for appliances $\leq 10,000$ Btuh, 9 inches for appliances $> 10,000$ Btuh and $\leq 50,000$ Btuh, 12 inches for appliances $> 50,000$ Btuh	6 inches for appliances $\leq 10,000$ Btuh, 12 inches for appliances $> 10,000$ Btuh and $\leq 100,000$ Btuh, 36 inches for appliances $> 100,000$ Btuh
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit, eaves, or overhang	*	*
E	Clearance to unventilated soffit, eaves, or overhang	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	*	3 feet within a height 15 feet above the meter/regulator assembly
I	Clearance to service regulator vent outlet	*	3 feet
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	** 6 inches for appliances $\leq 10,000$ Btuh, 9 inches for appliances $> 10,000$ Btuh and $\leq 50,000$ Btuh, 12 inches for appliances $> 50,000$ Btuh	6 inches for appliances $\leq 10,000$ Btuh, 12 inches for appliances $> 10,000$ Btuh and $\leq 100,000$ Btuh, 36 inches for appliances $> 100,000$ Btuh
K	Clearance to a forced air inlet into a building	3 feet above if within 10 feet horizontally	6 feet
L	Clearance above paved sidewalk or paved driveway located on public property	*	† 7 feet
M	Clearance under deck, veranda, porch, or balcony (open on 3 sides)	*	‡ 1 foot

\* For clearances not specified in ANSI Z223.1 / NFPA 54 or CAN/CGA-B149, use clearances in accordance with local installation codes and the requirement of the gas supplier.

† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

‡ Permanent only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

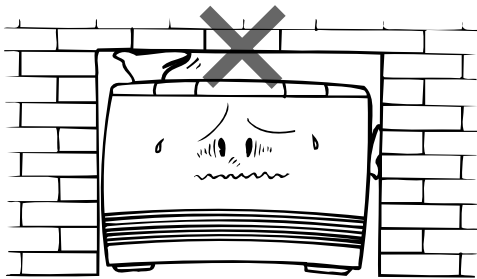
\*\* 4 feet for units other than Direct-Vent Appliance.

# LOCATION / CLEARANCES

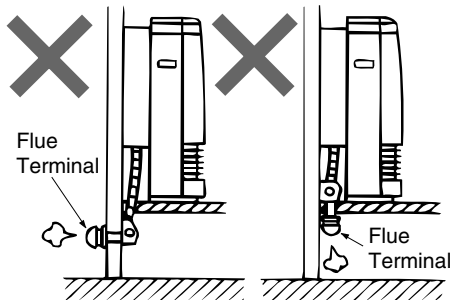
When positioning the heater the main points governing the location are:

1. Flueing
2. Warm air distribution

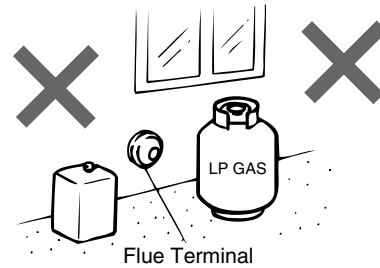
This heater is not designed to be build in.



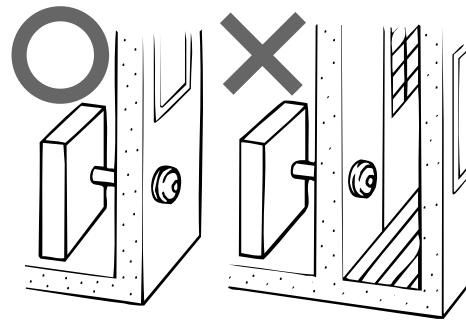
The flue is not designed to be positioned under floors, or below the level of the heater.



The flue terminal should be positioned away from flammable materials.



Do not flue into natural draught flues or fireplaces, this unit can only be used with one of the five types of Rinnai flue kits. Do not flue unit into other rooms. Flue terminal must be outside.



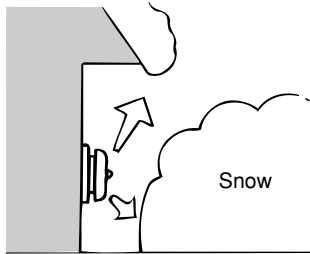
Flue may be positioned directly under opening windows, with a minimum clearance of 9" (230mm).

## FLUE SIZES:

5 Flue lengths are available.

- S flue walls 3"~4 1/2" (75~115mm)
- A flue walls 4 1/2"~9 1/2" (115~240mm)
- B flue walls 9 1/2"~15 3/4" (240~400mm)
- C flue walls 15 3/4"~23 5/8" (400~600mm)
- D flue walls 23 5/8"~31 1/2" (600~800mm)

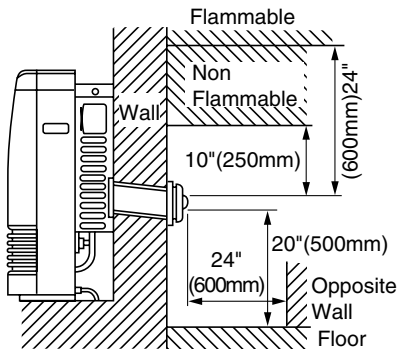
## SNOW AREAS



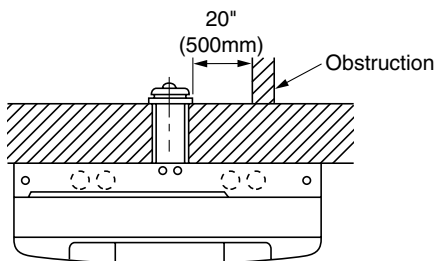
In areas subject to heavy snowfall, keep snow clear of flue terminal at all times.

## STANDARD INSTALLATION OF FLUE MANIFOLD.

Diagram below shows minimum clearances and distances from obstructions. Also check local regulations.

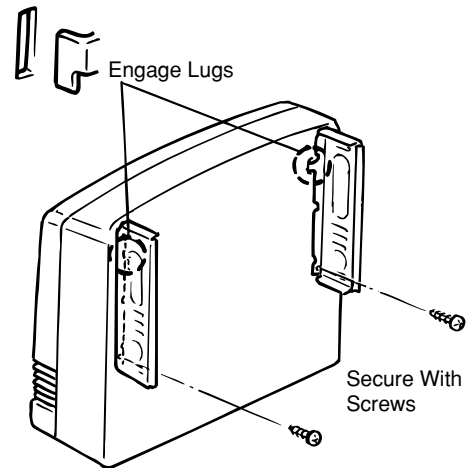


## Side Clearances



## FIT BACK COVERS (SIDES ONLY)

Fit back covers (sides only) as shown below.



Clearance in accordance with local installation codes and the requirements of the gas supplier.

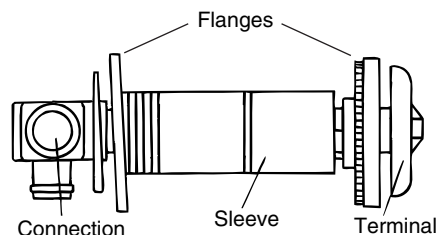
# SLEEVE AND MANIFOLD INSTALLATION

## METHOD FOR STANDARD WALLS

### 1. Disassemble Manifold from Sleeve.

The flue consists of 3 parts, sleeve, inside connectors and tube, outside terminal; (dis-assembly by pulling hard on outside terminal and inner connections, then pull sleeve off outer terminal.)

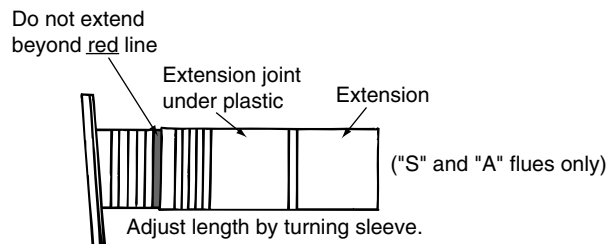
**NOTE:** Clearance to combustibles for terminal assembly sleeve and flanges is 0".



### 2. Adjustment of Sleeve Length.

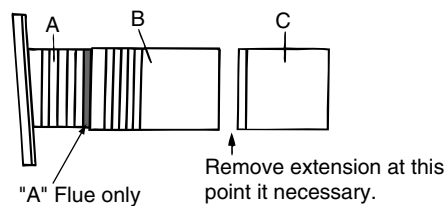
Measure wall thickness through previously drilled 3 1/8" (80mm) hole.

End of sleeve should protrude 3/16"~3/8" (5~10mm) from outside wall. Adjust sleeve length to wall thickness plus 3/16"~3/8" (5~10mm). (Sleeve is threaded for adjustment.) Do not extend beyond red line.



### 3. For S and A flue only.

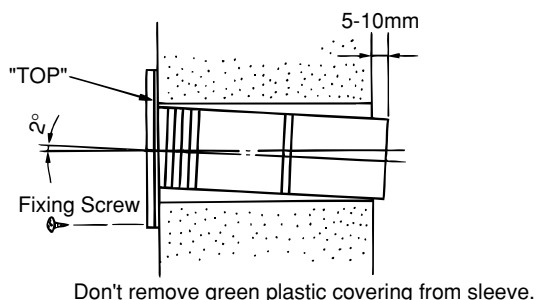
Depending on flue set and wall thickness extension piece "C" may need to be removed. Cut plastic, remove extension, then follow instruction 2. This applies to "S" and "A" flues only. There is no extension on other flues, they can be fully adjusted by turning the threaded section.



### 4. Fixing Sleeve.

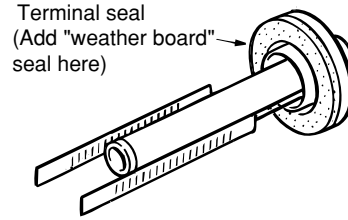
Fix to the wall, using the 3 screws provided.

**NOTE:** The flange is marked "TOP", sleeve must be fitted with this mark **Up**. Check sleeve protrudes 3/16"~3/8" (5~10mm) on the outside.



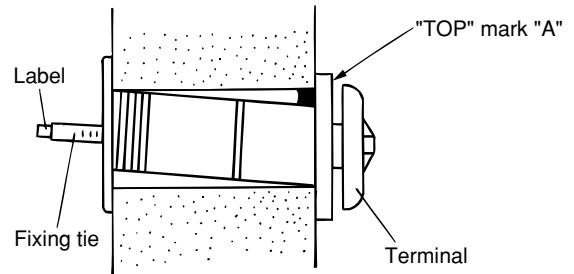
5. Check rubber seal is in place on terminal.

\*For weather board walls, add spare rubber seal provided to compensate for weather board angle.



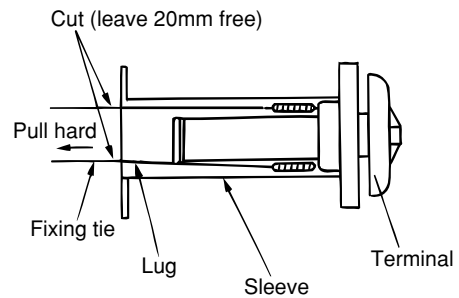
6. Installation of Terminal

From outside, insert terminal into sleeve with the "A" mark at the top. Left hand side fixing tie is marked "LEFT" (from inside).



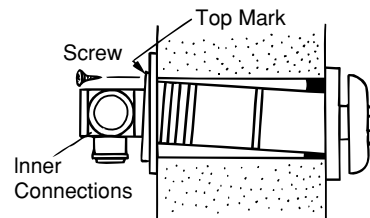
7. Attached Ties

Pull hard on left and right hand side ties, clip ties over lugs inside sleeve. You should be able to pull ties 2 or 3 slots past the starting point. Cut the ties, leaving about 3/4" (20mm) past the lugs. Bend ties so they are parallel with the wall.

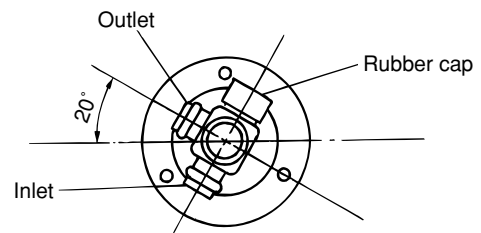


8. Insert Inner Connection Assembly.

Push assembly into the terminal tube, make sure "TOP" mark is uppermost. Fix with 3 screws provided.

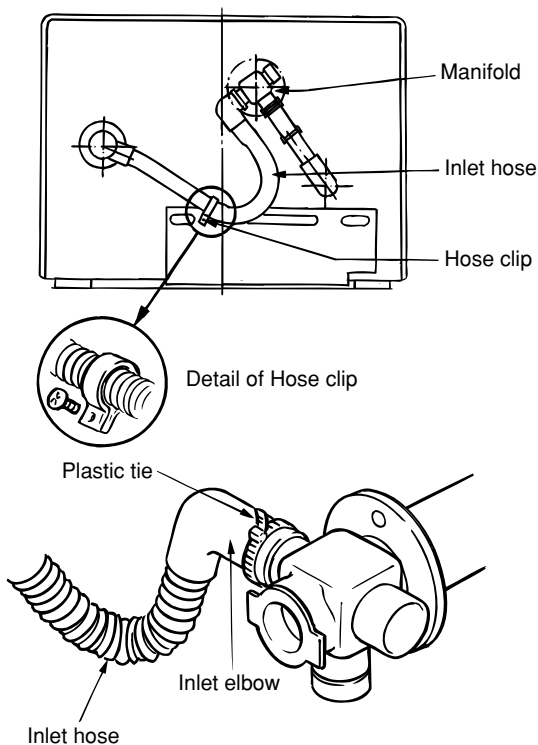


9. Manifold can still be turned after attaching.



# FITTING UNIT

## AIR INLET HOSE

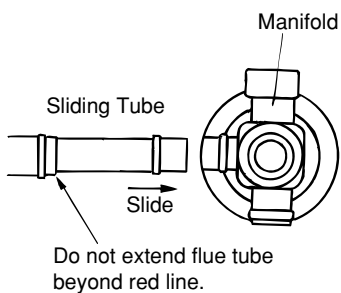


When servicing unit replace plastic tie with new one. (Available at local hardware store or contact local distributor.)

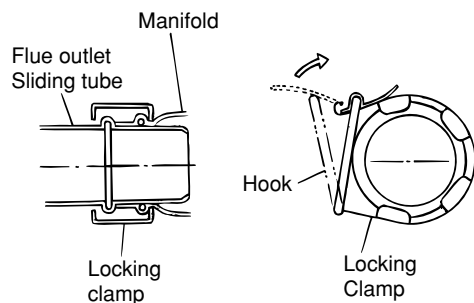
## LOCKING CLAMP SCREW CLAMP AND INSULATION.

The following components can be fitted by reaching down the rear of the appliance as it is positioned against the wall.

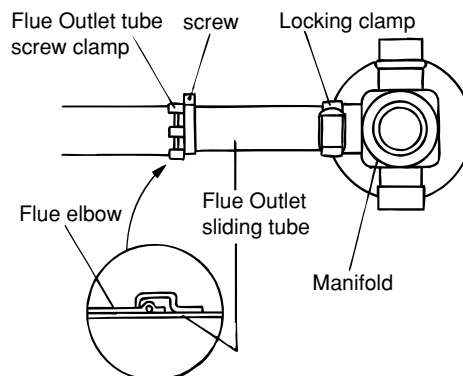
1. Connect the flue outlet to the manifold by extending the stainless steel sliding tube until it is fully inserted into the manifold.



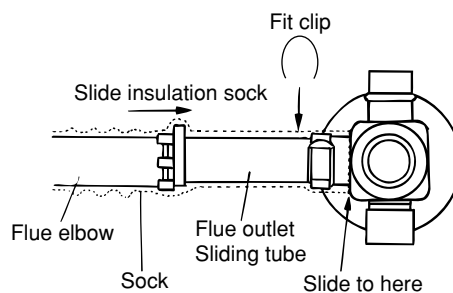
2. Fit the locking clamp over connection between sliding tube and manifold. Engage the hook and rotate it until it snaps against the body of the clamp.



3. Fit the screw clamp between the sliding tube and the flue elbow. Secure with the 4mm screws supplied. The flue outlet is now locked into position.

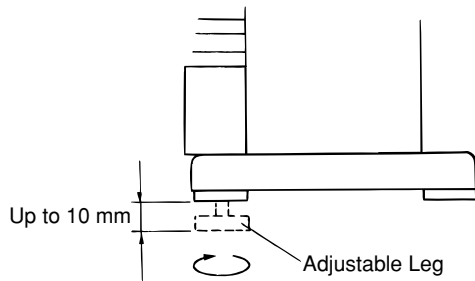


4. Slide the insulation sleeve up to the flue manifold, slip the securing clip over the sleeve as shown.





Levelling screws(Adjustable legs)



If necessary, the unit can be levelled using the adjustable legs under the front right and left hand side legs.

### ■ INSTRUCT CUSTOMER ON USE OF HEATER

When you are satisfied that the appliance is operating correctly, explain operation of heater to the customer.

#### Fault-Failure Procedure

If unable to get the heater to operating correctly, contact Rinnai directly or your Agent or Gas Utility.

Do not use electrical extension cords to connect unit to power supply. Keep the power cord away from the flue.

Some items are not covered under the unit's warranty. Example: annual maintenance carbon on flame rods/ignition, dust, spider webs, etc.


## OPERATING INSTRUCTION LABEL ENERGYSAVER RHFE-431FA III

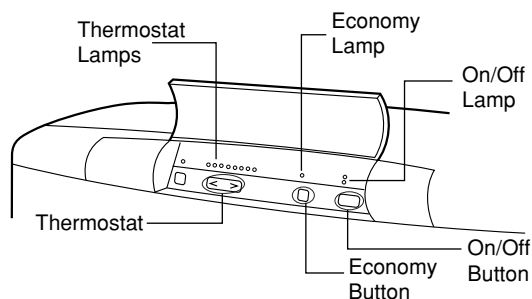
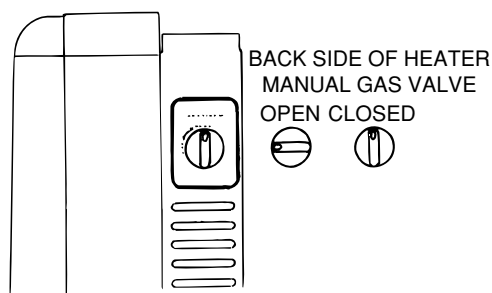
### FOR YOUR SAFETY READ BEFORE OPERATING

**WARNING:** If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
- WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance.
  - Do not touch any electric 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.
- C. Use only your hand push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

### OPERATING INSTRUCTIONS

- STOP! Read the safety information above on this label.
1. Set the thermostat to lowest setting.
  2. Turn off all electric power to the appliance via the ON/OFF button on the control panel. Locate manual gas valve to be found on back side of heater.
  3. Turn Manual valve clockwise  to the full OFF position.
  4. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas go to next step.
  5. Turn Manual gas valve to the full on position.
  6. Turn on all electric power to the appliance via ON/OFF button.
  7. Set the thermostat to desired setting.
  8. Burner is lit when indicator lamp "ON" turns red.
  9. "ON" indicator flashes when burner fails to ignite.
  10. If the appliance will not operate, follow the instruction "TO turn off gas to appliance" and call your service technician or gas supplier. See manual for additional information.



### TO TURN OFF GAS TO APPLIANCE

1. Turn off electric power to the appliance using the ON/OFF button located on the control panel.
2. Locate manual valve on back side of unit.
3. Turn manual valve clockwise to the full OFF position.

NOTE: The fan will continue to operate until the appliance is cool, do not turn the appliance off by unplugging it from the wall.

Keep burner and control compartment clean. See installation and operating instructions accompanying heater.

# ADDITIONAL CUSTOMER OPERATING INFORMATION

## IGNITION

Make certain the heater is connected into both the gas and the electric power.

Depress the ignition ON/OFF button slowly and firmly.

When you release the ignition ON/OFF button the 'Temperature Level' lamps will illuminate, the spark will ignite the main burner and the convection fan will begin to run. If the heater does not ignite within 15 seconds the spark will stop and the 'Temperature Level' lamps will flash. Turn off unit and repeat ignition operation.

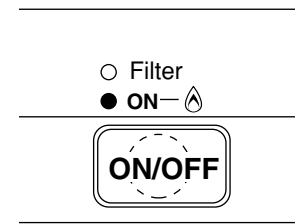
This heater has an automatic ignition system, when the main burner has lit, the ignition on lamp will glow red, and the spark will stop. There may be a smell of burning dust or oil the first time the heater is lit or when the heater has been out of operation for a long time, this is normal. You may need to repeat the ignition operation the first time the heater is plugged in, due to air in the gas line.

## TEMPERATURE CONTROL

The thermostat automatically modulates the burner and the fan to maintain the room temperature which you have selected.

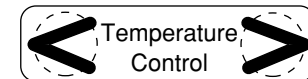
To change the room temperature, simply adjust the temperature control buttons until the desired setting is indicated.

The temperature range from LO to HI is about 54°F (12°C) to 97°F (36°C). Temperature control may be affected by the location of the heater.

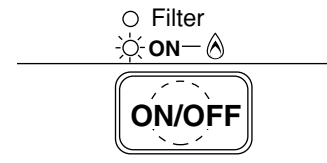


## TEMPERATURE LEVEL

LO 60 64 68 72 76 80 HI  
○ ○ ☀ ○ ○ ● ○ ○

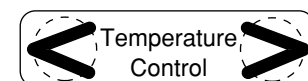


## COMBUSTION INDICATOR



## TEMPERATURE CONTROL

LO 60 64 68 72 76 80 HI  
● ● ● ● ● ● ● ●



## **ROOM TEMPERATURE DISPLAY**

Temperature is indicated by the L.E.D. display on the control panel. The room temperature is indicated by the flashing L.E.D., and the set temperature by the steady L.E.D. When the set temperature is reached, the flashing L.E.D. disappears and the temperature is indicated by the steady L.E.D. You will notice the fan speed changing as the heater modulates to match the room temperature.

## **TO TURN UNIT OFF**

Depress ignition ON/OFF button again. The switch will return to the off position. Do not turn off unplugging at the power outlet. Convection fan continues to run until heater is cool. The convection fan may start again after a few minutes to remove any residual heat.

## **ECONOMY BUTTON**

To select 'Economy Mode', push the 'Economy' button, the green lamp will glow. 30 minutes after the room temperature reaches the preset temperature (set by the thermostat), the 'Economy Mode', if set, reduces the temperature by 2°F, after another 30 minutes it reduces the temperature by a further 2°F, this is an energy saving feature. When the heater is running in lowest position on the thermostat, the 'Economy Mode' does not operate. It does not operate if the heater is under capacity for the room size.

## **FILTER LAMP**

If the filter lamp glows during operation, check air filter for dust. If there is dust present, clean filter. See section on care of heater. Turn heater off before cleaning filters.

## **OPERATING PRECAUTIONS**

Please read this section carefully, before using your Forced flue heater.

### **Gas Type, Power Source, and Manufactured Date**

- Type of gas, power source and manufactured date are displayed on the nameplate placed on the right side of the unit.
  - Do not use gas other than the type of gas (gas group) indicated on the nameplate.

## TEMPERATURE LEVEL

LO 60 64 68 72 76 80 HI  
○ ○ ☀ ○ ○ ● ○ ○



## IGNITION BUTTON

○ Filter  
○ ON—



## ECONOMY

☀  
Economy



☀ Filter  
● ON—



- This equipment is for 120 V AC (60Hz) only. Do not use power source other than what is listed.

### Caution

- Should the type of gas or power source be different, please contact your dealer. Using a different type of gas or power source may affect the performance or may be dangerous.
- If you are moving to another area, please check the types of gas and power source provided in the area. If the types of gas and power source are different, adjustment or modification is necessary. Please consult the gas provider in the new area.

### Usage

- Do not use for drying clothes!
  - Do not use for any other purposes other than heating (e.g., drying the laundry).
  - Draping clothes over the unit blocks the warm air outlet or the filter area and is very dangerous, as it causes heat to build up inside the unit.

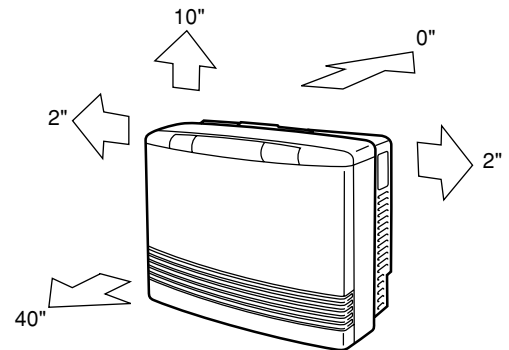
### Usage Location

- Do not use near flammable material !!!

Place the unit sufficiently away from flammable objects such as furniture, wall and curtains. Check carefully when installing the unit.

### REQUIRED DISTANCE FROM FLAMMABLES:

Top: At least 250mm or (10")      Right: At least 50mm or (2")  
Left: At least 50mm or (2")  
Front: At least 1m or (40")



- Watch for falling objects !!!

Do not place under a shelf or in other locations where there is a danger of an object falling on the unit.

- Avoid using in special purpose rooms !!!

This equipment is made for use as a heater for a residential building. Do not use in beauty salons, factories and other places where spray or chemicals are used or where a large amount of dust is present.

Do not use hair treatment products containing silicon in a room heated by the Forced flue heater, as they may cause ignition error, flame extinction or other malfunctions.

- Insert a board under the unit when placing on carpeted floor !!!

This heater may be installed on combustible flooring. When the heater is installed directly on carpeting, tile or other combustible material other than wood flooring, the heater shall be installed on a metal or wood panel extending the full width and depth of the heater.

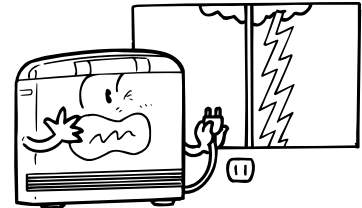
### Emergency Procedures:

Stay calm and turn the unit off !!!

In case of an emergency (e.g., abnormal overheating of the unit, loud noise), always stay calm, turn the unit off by pushing the ON/OFF button, close the gas valve and contact your dealer or the Rinnai office or store near you.

### During a Thunderstorm

When a thunderstorm is approaching, turn the unit off and unplug the power cord. Heavy thunderstorm may cause damage to the unit.

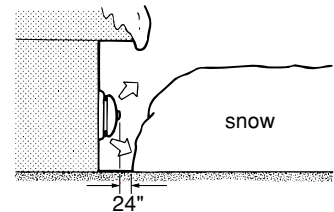


### Daily Inspection and Maintenance

- Be sure to perform daily inspection and maintenance procedures. (See page 29 and 35 for details.) In particular, check the gas connection, power connection and air supply/exhaust pipe connection.
- Do not use the unit if you suspect malfunctioning or damage. Incomplete repairs are dangerous. In case of malfunctioning, read the instructions on page 39 and contact your dealer or the nearest Rinnai office.

### During Snow Accumulation

If the air supply/exhaust vent is covered by snow or damaged by falling icicles, the exhaust may be blocked and cause malfunctioning of the unit. Keep the area around the air supply/exhaust vent free of snow and icicles. Minimum clearance from snow accumulations should be at least (24").



### Installation of Unit:

- Please ask your dealer to install the unit properly in a safe location:
- Refer to the installation manual to make sure the unit is installed properly.

### Customer's Operating Information

The following pages explain how to use the Forced flue heater. Also read "Operating Precautions" on pages 24—26.

### When Using for the First Time

- Check the power cord and power plug.
  - Firmly plug the unit into an electrical outlet, ensure outlet is properly grounded. An outlet that is not grounded properly can cause unit to operate erratically.
  - Make sure the power cord is not exposed to the heat from the exhaust pipe.
- Fully open the gas valve in the room.

### Before the Cold Season Begins

- Check the air supply/exhaust connection.
- Before using this heater, inspect the air supply/exhaust connection to make sure the pipe is not disconnected or bent.
- Check the main unit and the air supply/exhaust.
- Make sure there is no combustible or flammable material near the main unit or the air supply/exhaust.

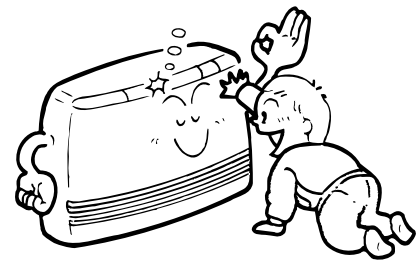
### CAUTION:

If you find a problem with the air supply/exhaust do not use the unit. Contact your dealer or the nearest Rinnai office.

### CHILD SAFETY LOCK

The child safety lock feature prevents accidents due to tampering by small children.

- Press the “Child Safety Lock” button.  
The “Child Safety Lock” lamp comes on and the lock engages.
- Cancelling the child safety lock.  
Press the child safety lock button again and hold for two (2) seconds.



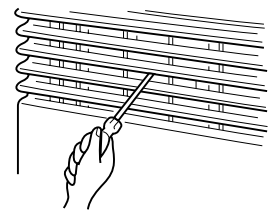
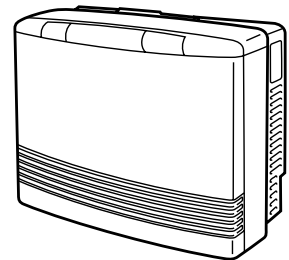
### Note:

If the child safety lock is engaged while the unit is operating, all operations by switches and buttons will be disabled except turning the unit off.

If the child safety lock is engaged while the unit is off, all operation will be disabled. When you turn the unit on and the child safety lock is engaged you must cancel the child safety lock before proceeding.

### AIR FLOW CONTROL:

- The direction of air flow may be changed to the left or right.  
Use a screwdriver or a similar object to change the direction of the vertical louver.



### CAUTION:

- Do not adjust repeatedly (more than 5-6 times), as it may cause the louver to break.
- The horizontal louver (which determines the vertical air flow direction) is fixed and cannot be adjusted.
- Do not adjust the air flow direction while warm air is flowing, as it may cause burn injury.

### Sensible Temperature Control:

The sensible temperature control feature enables comfortable heating which matches the conditions in the room.

- Based on the information collected by the room temperature thermistor when the heating starts, the heating capacity is automatically adjusted to achieve a comfortable heating effect and to reach the set room temperature quickly.

### Adding Water to Humidifier:

If the air gets dry, add water to the humidifier tray to add moisture to the air.

- (1) Remove the bottom cover.

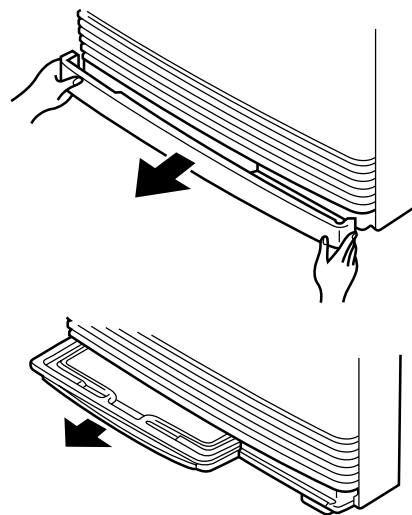
Hold both ends of the cover and pull toward you to remove the cover.

- (2) Pull out the humidifier tray and add water.

After adding water, gently push the plate back inside and replace the bottom cover. Be careful not to spill the water, as spilled water may cause staining, corrosion, or damage.

\*If the humidifier capacity is not sufficient, use a humidifier available on the market.

\*The humidifier tray holds approximately 3 pints (1300cc) of water. The time water lasts varies from 10 to 15 hours, so check the water level occasionally.



### Caution:

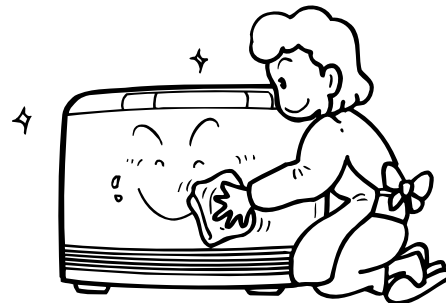
- The humidifier tray and the surrounding area are hot when the unit is on. To avoid burns, do not add water to the tray while unit is on.
- Avoid adding water when the room is susceptible to condensation.
- If the water overflows from the water level hole when adding water, do not add any more water.

### Care of Unit Exterior:

Dampen soft cloth with warm water, wring water out well and wipe the unit.

### Caution:

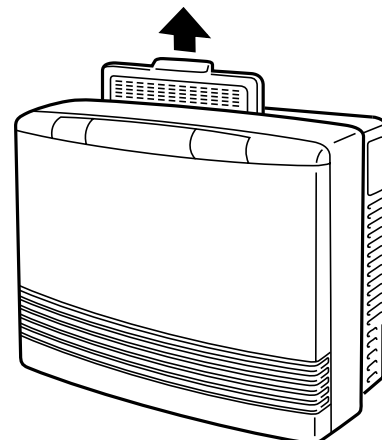
Never use volatile substances such as benzine or thinners, as they cause fading of paint or deformation of resin.



### Care of Air Filter:

Always clean the air filter when the filter indicator lamp starts blinking.

- The filter indicator lamp starts blinking when the dust accumulates on the air filter. In this event, turn the unit off immediately, wait until the unit cools off and clean the filter.
- Even if the lamp is not blinking, if you think the filter is dirty, clean the filter while you are cleaning the room (approx. once a week). This will ensure comfortable use.
- The air filter may be removed. Clean both sides of the filter with a vacuum cleaner or a duster.
- If the filter is greasy, wash quickly with detergent, shake water off and dry completely.
- After cleaning and drying, replace the filter securely.





**CAUTION:**

- If you continue to use the heater with the filter indicator lamp flashing, the sensor may detect trouble and turn the unit off automatically.
- When the unit is turned off automatically, the room temperature display lamp "68" and the "operation/combustion" lamp flashes, indicating that the safety device has been activated. (See page 30) In this event, clean the air filter immediately.

## TESTING

### Testing Unit

Purge air from gas line.

Refer to pipe sizing chart if in doubt about the size of the gas line.

Connection can easily be reached from the top, rear of the unit. Check for leaks, using soapy water after turning gas on.

Plug unit in and turn power on, (CAUTION - 120V inside unit).

Turn thermostat to "HI", turn control to "ON". Unit should ignite within 10 seconds.

(If unit does not ignite first time it will spark again after 10 seconds). If unit still does not ignite, there may be air in the gas line, turn control "OFF" then "ON" again.

Check pressure, regulator is factory set, if pressure is incorrect, check supply before altering regulator.

Turn control to "OFF" position, remove pressure manometer and replace test point screw.

Re-light unit, on "HI" setting. Slide thermostat control slowly towards the "LO" position, the heater will cut down, then cut out.

(Depending on the room temperature).

Turn the power off. Replace the casing.

Turn power on.

Re-check operation.

**WARNING: DO NOT OPERATE UNIT UNTIL PROPER INSTALLATION HAS BEEN COMPLETED.**

## CHECK

### Fault-Failure Procedure

If unable to get the unit to operate correctly, contact Rinnai Agent, or Gas Utility. Please read the fault finding charts before reporting faults.

Do not use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and to replace any part of the control system and any gas control which has been under water.

**"WARNING"** Do not operate appliance with the panel(s) removed, cracked or broken.

Installation and repair it should be done by a qualified service person. The appliance should be inspected before use and at least annually by a qualified service person.

More frequent cleaning may be required due to excessive lint from carpeting, bedding material, etc.. It is imperative that control compartments, burners and circulating air passageways of the appliance be kept clean. Ventilating system should be inspected and cleaned annually.

Rinnai's service assistance telephone number is 1/800/621—9419.

# PRE-SERVICE CHECK

Before asking for a service call please check the following points.  
These points are part of the normal operation of the unit.

## ■ At Ignition:

Heater does not operate.



Is the heater plugged in?  
Have the fuses or breaker blown at the switch board?  
Is there a power failure?  
Is the air filter blocked?  
Is anything blocking the outlet for the hot air?  
Is the flue blocked?

Warm air does not flow when the burner lights.



The fan is started automatically after a short delay.  
This is to allow the heat exchanger to warm up, helping to avoid cold draughts.

Smoke or strange smells are produced on the first trial light up after installation.



This is caused by grease or oil and dust on the heat exchanger and will stop after a short time.

Sharp clicking noises at ignition, or when unit cuts down on the thermostat, or goes out.



This is simply expansion noise from the heat exchanger.

## ■ During Combustion:

Clunking noise when the thermostat operates.



This is the sound of the solenoid gas valves opening and closing.

Unit is not heating room.



Is the air filter blocked?  
Is the set temperature high enough?  
Is the warm air outlet blocked by anything?  
Are the doors and windows of the room closed?

Air filter is blocked or the louvers are blocked or obstructed.



Allow heater to cool, clean air filter, operate again.

Heater will not re-ignite after overheating.



Even after unit has cooled down the heater does not ignite again. Repair is necessary.  
Contact your local agent or Rinnai for a Service call.

## ■ When the unit is turned off.

Convection fan continues to run after turning OFF.



This is to remove the residual heat from the heat exchanger, the fan will stop when the heater cools down.

## ■ Other Points:

Steam is discharged from the flue terminal.



High efficiency appliances tend to discharge water vapor on cold days, this is normal.

Unit cuts off without apparent reason.



Check whether filters are blocked, dirty filters will cause the heater of overheat.

Power Failure.



Switch OFF, then ON again when power is restored to re-set controls.

# TROUBLE SHOOTING

Your RHFE-431FA III requires very little maintenance, simply clean the rear fan filter once a week and wipe the outer case and louver section with a damp cloth.

Problem / Cause	No ON indicator	Burner doesn't ignite	Unusual combustion	Combustion stops during operation	Smell of gas	Noisy ignition	Takes too long to warm the room	Remedy
Not Plugged In	●	●						Plug In
Power Cut	●	●		●				Re-ignite manually after power is restored
(Initial Installation) Air In Gas Pipe		●						Purge air (Installer)
Gas Filter Blocked		●	●				●	Service Call
Miss Ignition	●	●						Service Call
Flue terminal obstructed			●	●		●		Clear obstruction
Flue manifold not connected						●		Service Call
Louver obstructed				●			●	Clear obstruction
Air filter blocked				●			●	Clean filter (weekly)
Gas Escape					●			Service Call
Child Proof Lock Set		●						Cancel Child Proof Lock
Gas turned off at meter	●	●						Turn gas on

General maintenance items are not covered under unit's warranty. Such as cleaning dust, debris and carbon from flame rod, and improper set up of unit.

# MAINTENANCE / SERVICE

## MAINTENANCE SUGGESTIONS

This heater has been designed and constructed for a long performance life when installed and operated properly under normal conditions. Regular inspections, as outlined in this section, are strongly recommended as means of keeping your heater operating efficiently throughout the season.

### 1. Cleaning

Heater must be cleaned annually. Keep heater clear of dust and debris especially in and around burner.

Cleaning procedures of heater are as follows:

- 1) Turn heater off. Allow to cool for one hour.
- 2) Remove the Front Panel by removing screws. See schematic page.
- 3) Use pressurized air to remove dust from around main burner.
- 4) Use soft dry cloth to wipe cabinet.

**DO NOT DAMAGE OR DISTORT ANY PARTS OF HEATER.**

**DO NOT USE WET CLOTH OR SPRAY CLEANERS ON BURNER.**

### 2. Visual check of main burner flames.

Flame pattern should be as shown in the following Figures.

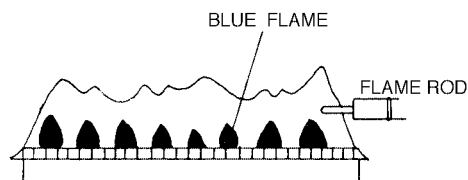
The burner must flame evenly over the entire surface when operating correctly. The flame must burn with a clear blue stable flame. See page for location of view ports. Any and all parts removed for inspection or service must be replaced before operating unit.

3. The appliance area must be kept clear and free from combustible materials, gasoline and other flammable vapors and liquids.
4. The flow of combustion and ventilation air should not be obstructed.
5. Verify proper operation after servicing.

## VISUAL CHECK

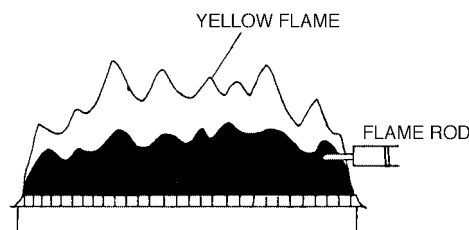
### SATISFACTORY

#### FRONT VIEW



### UNSATISFACTORY

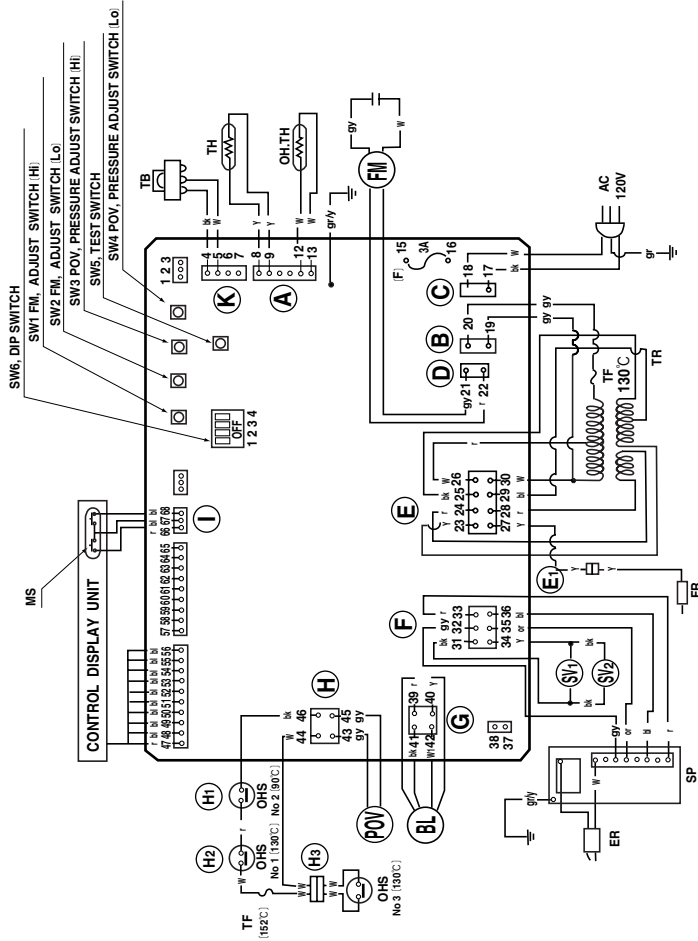
#### FRONT VIEW



- VENT MAINTENANCE
- VENT SYSTEM  
Must be checked annually for blockage or deterioration. See vent installation instructions.
- MAINTENANCE-ELECTRIC MOTORS  
Motors are permanently lubricated and need no lubrication. Keep fan and motor free of dust and dirt clean annually.

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

MARK	PART NAME
MS	MAIN SWITCH
TH	THERMISTOR
TF	THERMAL FUSE
F	FUSE
ER	ELECTRODE
POV	MODULATING SOLENOID VALVE
TR	TRANSFORMER
FR	FLAME ROD
OH, TH	OVER HEAT THERMISTOR
OHS1 ~3	OVER HEAT SWITCH
FM	CONVECTION FAN MOTOR
SP	SPARKER
SV1 ~2	MAIN SOLENOID VALVE 1~2
BL	COMBUSTION FAN MOTOR
TB	TERMINAL BLOCK



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

# CONSUMER SUPPORT

## Warranty Information

The installer is responsible for your heater's correct installation.

Please complete the information below to keep for your records:

Purchased from: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

\_\_\_\_\_

Date of Purchase: \_\_\_\_\_

Model No.: \_\_\_\_\_

Serial No.: \_\_\_\_\_

Installed by: \_\_\_\_\_ Installer's License No.: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Date of Installation: \_\_\_\_\_

## Limited Warranty

### **Gas Direct Vent Wall Furnace**

#### **What is covered?**

This Warranty covers any defects in materials or workmanship, subject to the terms stated below. This Warranty extends to the original purchaser and subsequent transferees, but only while the product remains at the site of the original installation. This Warranty only extends through the first installation of the product and terminates if the product is moved or reinstalled at a new location.

#### **How long does coverage last?**

<b>Item</b>	<b>Period of Coverage</b>
Heat Exchanger	10 years from date of purchase *
All Other Parts	5 years from date of purchase
Reasonable Labor	2 years from date of purchase

## Limited Warranty - continued

### **What will Rinnai do?**

Rinnai will repair any part or component that is defective in materials or workmanship as set forth as follows. All repair parts must be genuine Rinnai parts. All repairs or replacements must be performed by an individual or servicing company that has been authorized by Rinnai. Rinnai will pay reasonable labor charges associated with the repair or replacement of any part or component.

Replacement of the product may be authorized by Rinnai only. Rinnai does not authorize any person or company to assume for it any obligation or liability in connection with the replacement of a product. If Rinnai determines that repair of a product is not possible, Rinnai will replace the product with a comparable product, at Rinnai's discretion.

\* If the Heat Exchanger fails due to a defect in material or workmanship within the sixth (6) through the tenth (10) year from the date of purchase, Rinnai will make the following allowances toward the purchase of a replacement Heat Exchanger:

Heat Exchanger	
Year of Failure	Allowance
6	50%
7	40%
8	30%
9	20%
10	10%

### **How do I get service?**

You must contact a qualified/authorized service provider for the repair of a product under this Warranty. For the name of a qualified/authorized service provider please contact your place of purchase, visit the Rinnai website ([www.rinnai.us](http://www.rinnai.us)), call Rinnai at 1-800-621-9419 or write to Rinnai at 103 International Drive, Peachtree City, Georgia 30269.

Proof of purchase is required to obtain warranty service. You may show proof of purchase with a dated sales receipt, or by registering within 30 days of purchasing the product. To register your appliance, please visit [www.rinnairegistration.com](http://www.rinnairegistration.com). For those without internet access, please call 1-866-RINNAI1 (746-6241). Receipt of Registration by Rinnai will constitute proof-of-purchase for this product. However, Registration is not necessary in order to validate this Warranty.

### **What is not covered?**

This Warranty does not cover any failures or operating difficulties due to accident, abuse, misuse, alteration, misapplication, force majeure, improper installation, improper conversion\*, improper maintenance or service, or for any other causes other than defects in materials or workmanship. This Warranty does not apply to any product whose serial number or manufacture date has been defaced.

\* Improper conversion includes conversions for inventory adjustment.

Rinnai is not liable for any special, incidental, indirect or consequential damages that may arise, including damage to person or property, loss of use, or inconvenience. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

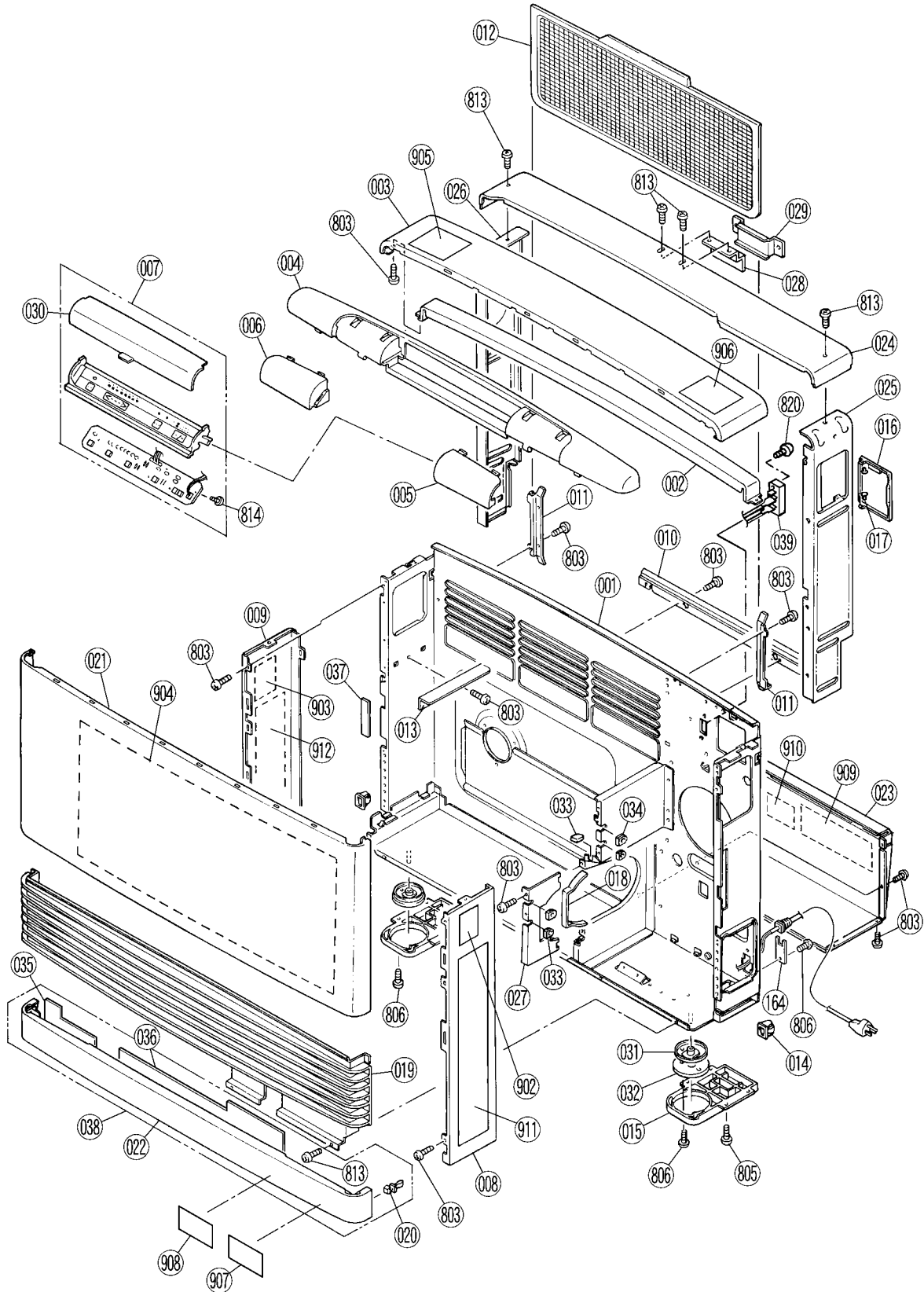
### **Limitation on implied warranties**

Any implied warranties of merchantability and fitness arising under state law are limited in duration to the period of coverage provided by this limited Warranty, unless the period provided by state law is less. Some states do not allow limitations on how long an implied Warranty lasts, so the above limitation may not apply to you.

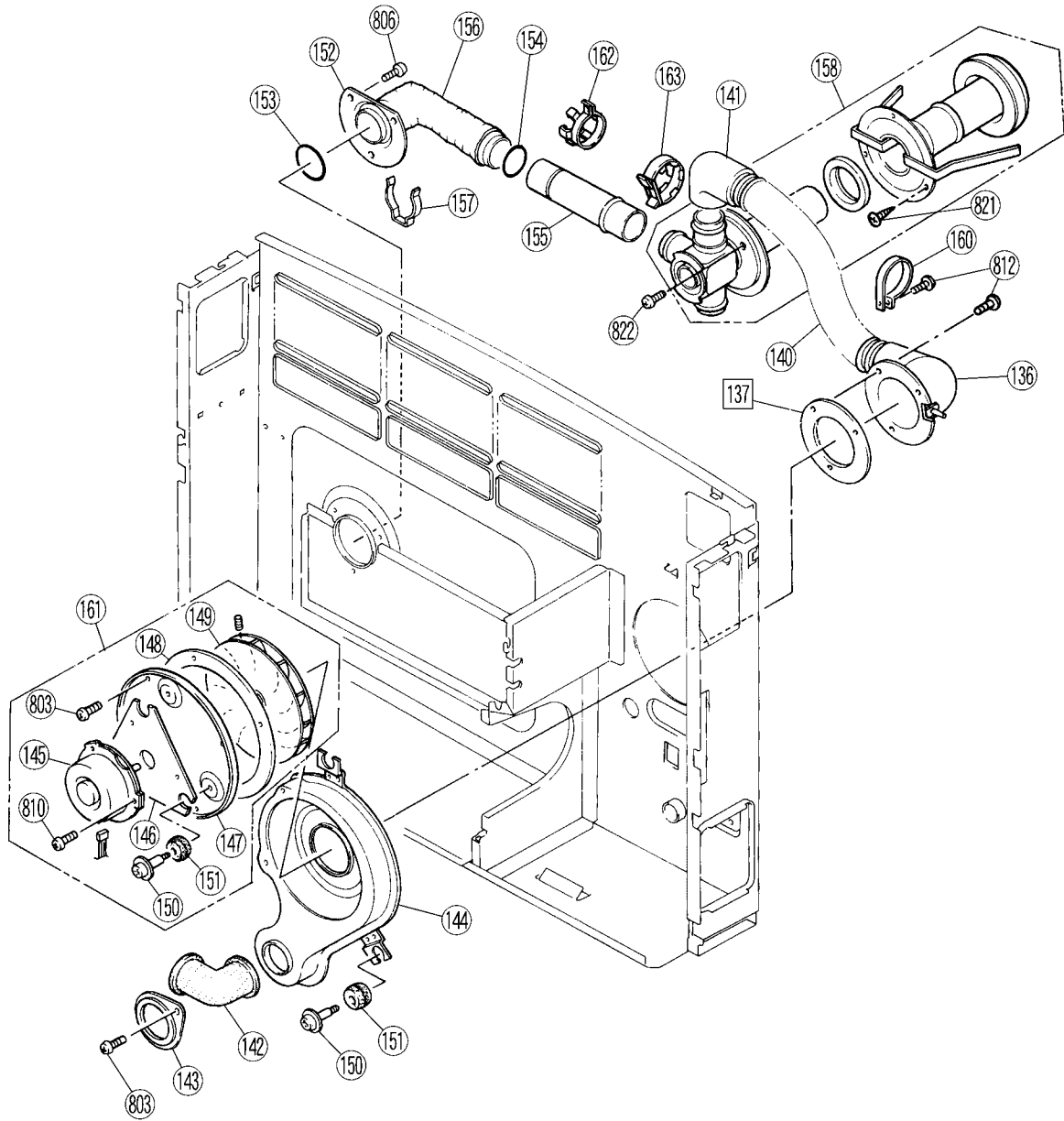
This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

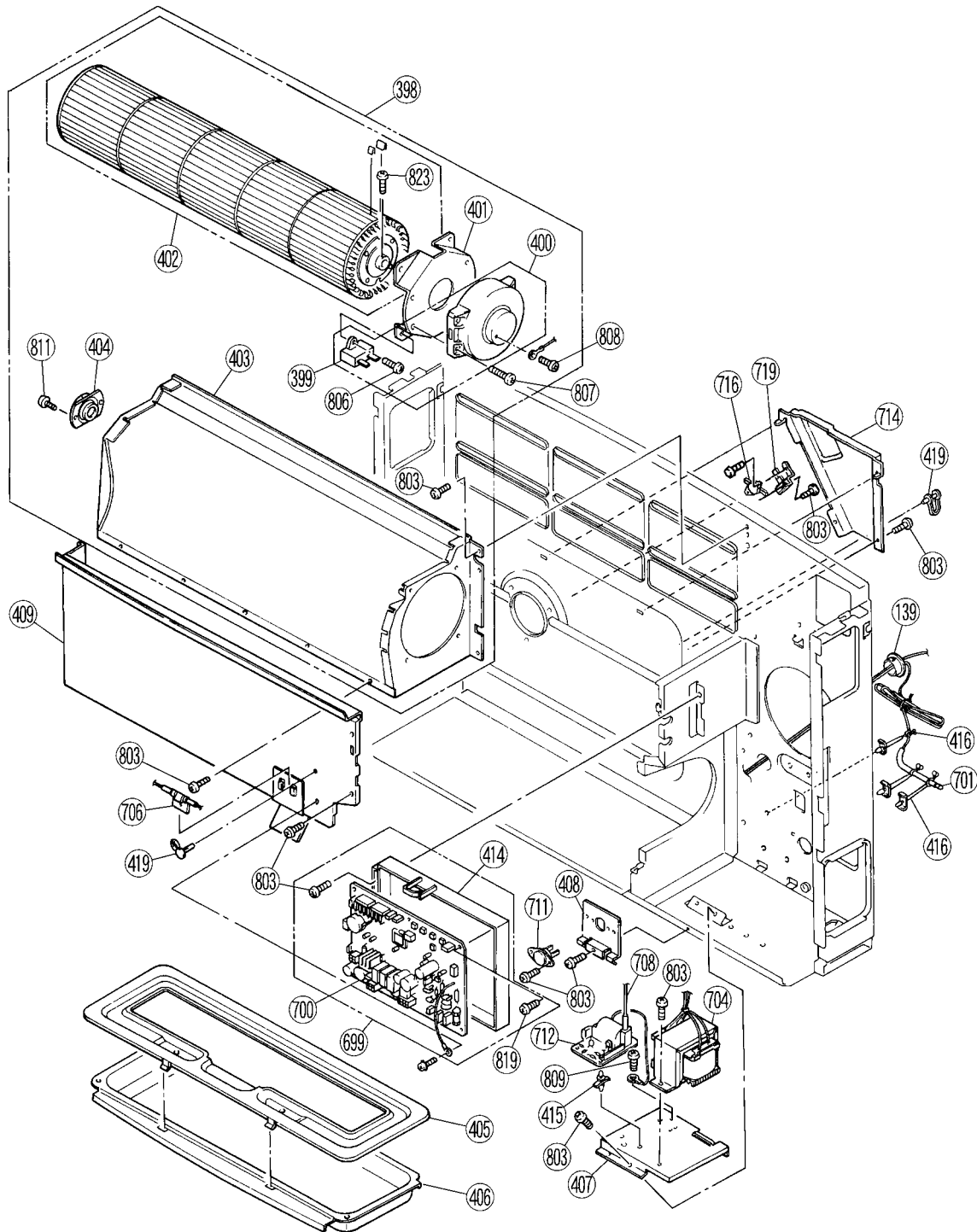


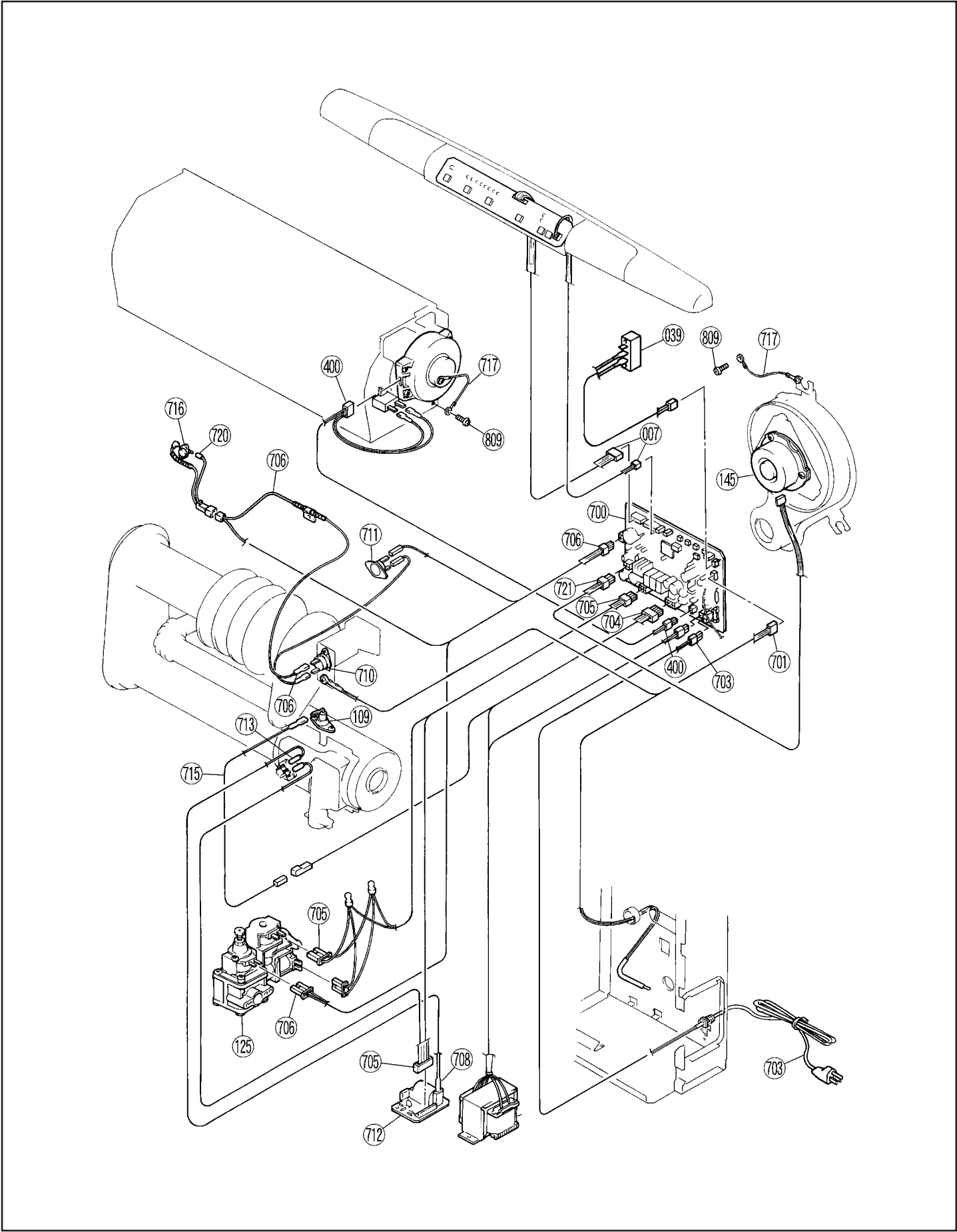
# SCHEMATIC DIAGRAM











# PARTS LIST

No.	PART NAME	PART No.	QTY.	REMARKS
001	REAR PANEL ASS'Y	556F-311-4	1	
002	TOP PLATE SUPPORTER	556F-480	1	
003	TOP PLATE	556F-469-2	1	
004	DECORATING FRONT PANEL	556F-467-2	1	
005	DECORATING FRONT PANEL (R)	556F-475-2	1	
006	DECORATING FRONT PANEL (L)	556F-476B-2	1	
007	CONTROL P.C.B ASS'Y	431F-1600	(1)	
008	SIDE PANEL (R)	556F-456-2-B	1	
009	SIDE PANEL (L)	556F-456-1-B	1	
010	AIR FILTER SUPPORTER	556F-312	1	
011	AIR FILTER SUPPORTER (SIDE)	556F-313	2	
012	AIR FILTER ASS'Y	556F-462-2	1	
013	SUPPORT BOARD TO FAN	556F-314	1	
014	LATCH	CP-90380	2	
015	LEG	556F-464	2	
016	CONTROL LID	431F-1320-1	1	
017	NYLON RIVET	550F-0418	2	
018	HEAT EXCHANGER PACKING	554F-421-2	1	
019	LOUVER ASS'Y	556F-472-2	1	
020	STRIKE	CP-90379	2	
021	FRONT PANEL	556F-470-3	1	
022	UNDER COVER ASS'Y	556F-479-2	1	
023	HEAT SHIELD PANEL	556F-321	1	
024	BACK SPACER TOP	556F-457-3	1	
025	BACK SPACER (R)	431F-1310	1	
026	BACK SPACER (L)	431F-1330-1	1	
027	WARM AIR SEAL PANEL	556F-305	1	
028	WALL BRACKET	304F-9077	1	
029	SPACER BRACKET	RHF300-152	1	
030	OPERATION BOX LID	556F-471	1	
031	LEG FIXING BOARD	550F-0220	2	
032	RUBBER LEG	550F-0225	2	
033	CORD PACKING B	AU131-236-b	3	
034	CORD PACKING A	AU131-236-a	2	
035	HEAT INSULATOR A	556F-477	1	
036	HEAT INSULATOR B	556F-478	1	
037	REAR PANEL PACKING	556F-325	1	

No.	PART NAME	PART No.	QTY.	REMARKS
038	UNDER COVER TOTAL ASS'Y	556F-479-2	1	
039	TERMINAL BLOCK	431F-1481	1	
090	MANUAL VALVE	1001F-1633	1	
091	KNOB ADAPTOR	431F-1080	1	
092	VALVE REINFORCEMENT BOARD	431F-1050	1	
093	PANEL FITTING PLATE	431F-1040	1	
094	VALVE PANEL	431F-1030	1	
095	VALVE KNOB	CP-40369-24	1	
100	HEAT EXCHANGER SET ALL ASS'Y	431F-1880-SP	1	
101	FIXING PLATE	556F-214	1	
102	COMBUSTION CHAMBER FIXER	556F-215	1	
103	OHS FIXER	556F-216	1	
105	BURNER BOX ASS'Y	431F-1094	1	
106	FLANGE B	556F-131-2	2	
107	SEAL PLATE	556F-2032	2	
108	ELECTRODE PLATE	RHF250-038	1	
109	FLAME ROD	1001F-1044	1	
110	FLAME ROD PACKING	554F-148	1	
111	BURNER ASS'Y C	431F-1091-2	(1)	NG, LPG
112	BURNER ASS'Y	B3A2-4	(3)	NG, LPG
113	BURNER SUPPORTER ASS'Y	556F-225	1	
114	BURNER BOX PACKING	556F-211	1	
115	BURNER BOX FITTING PLATE SET	556F-224-SP	1	
116(1)	DAMPER	556F-209-15	1	LPG
116(2)	DAMPER	556F-209-7	1	NG
117(1)	SECONDARY AIR DAMPER	556F-208-5	1	LPG
117(2)	SECONDARY AIR DAMPER	556F-208-7	1	NG
118	PACKING C	556F-2047	1	
119	MANIFOLD	556F-202-2	1	
120	INJECTOR	AU129-210 <sup>-0.85</sup> <sub>-1.13</sub>	4	LPG NG
121	MANIFOLD PACKING	556F-203	1	
122	ELECTRODE MOUNTING PLATE	554F-114	1	
123	ELECTRODE	556F-510	1	
124	ELECTRODE PACKING	554F-147	1	
125	GAS CONTROL TOTAL ASS'Y A	PC-111-A	1	LPG
125	GAS CONTROL TOTAL ASS'Y C	PC-111-C	1	NG

No.	PART NAME	PART No.	QTY.	REMARKS
126	GAS CONTROL ASS'Y	C36D-36-S	1	
127	INLET REINFORCEMENT BOARD	431F-1060	1	
128	INTER CONNECTION ASS'Y	431F-1150	1	
129	O RING	M10B-1-14	2	
130	BRIND SCREW	AU39-965	2	
131	PACKING	M10B-13-14	1	
132	PACKING	C311-7	1	
133	GAS FILTER	RCK-6808	1	
134	GAS INLET	431F-1110	1	
135	OUTLET D	554F-220-4	1	
136	AIR INLET	553F-340-3	1	
137	AIR INLET PACKING	RHF300F-79	1	
138	DRAIN PAN ASS'Y	556F-154	1	
139	BUSHING	CP-90326	1	
140	FLEXIBLE HOSE	RHF300-51-10	1	
141	AIR INLET ELBOW	RHF300-52	1	
142	CONNECTING TUBE	556F-404	1	
143	CONNECTING TUBE FIXER	556F-408	2	
144	COMBUSTION FAN CASING ASS'Y	556F-414-1	1	
145	COMBUSTION FAN MOTOR	308F-419	1	
146	MOTOR MOUNTING PANEL	554F-601	1	
147	LID	554F-604	1	
148	LID PACKING	554F-618	1	
149	COMBUSTION FAN	554F-608	1	
150	SCREW FOR MOTOR	CP-30310	6	
151	CUSHION RUBBER	308F-8273	6	
152	FLUE SLIDING TUBE ASS'Y	302F-1102	1	
153	O RING E	RHF300-200-e	1	
154	O RING D	FOT-001-016-3	1	
155	SLIDING TUBE	RHF250-148-2	1	
156	COVER	302F-1103	1	
157	RING	302F-1206	1	
158	VENT ASS'Y	431F-1900	1	
160	CLAMP	CP-90378	2	
161	COMBUSTION FAN TOTAL ASS'Y	431F-1200	1	
162	PIPE STOPPER F	305F-0013	1	
163	PIPE STOPPER C	305F-0017	1	
164	POWER SUPPLY CABLE BRACKET	RC-329-1033	1	BLACK



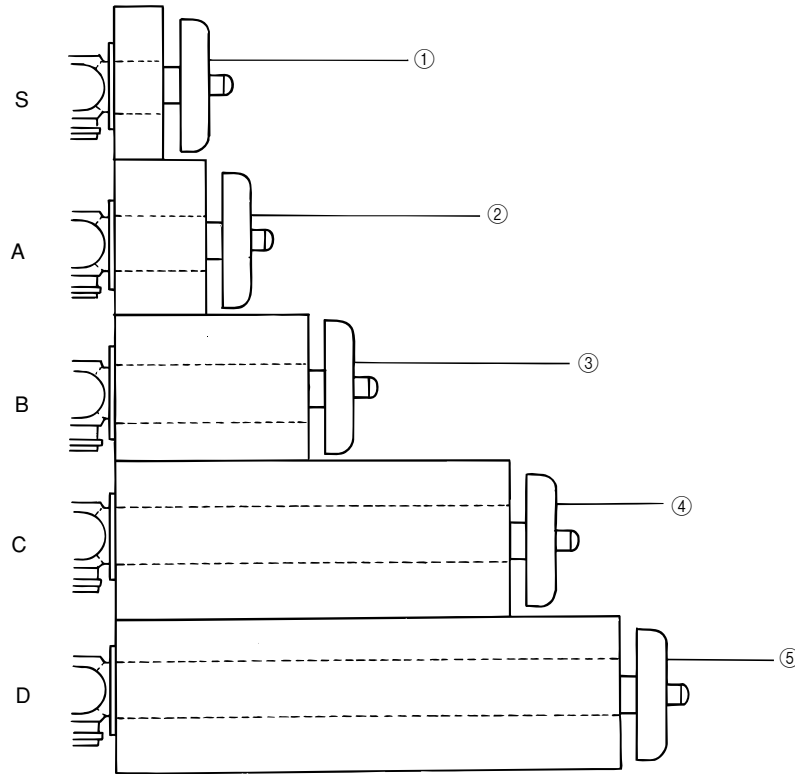
No.	PART NAME	PART No.	QTY.	REMARKS
398	CONVECTION FAN TOTAL ASS'Y	431F-1500	1	
399	CONDENSOR	431F-1260-2	1	2.6 $\mu$ F
400	CONVECTION MOTOR	431F-1260	1	
401	MOTOR BASE	556F-256	1	
402	CONVECTION FAN	556F-258	1	
403	FAN CASING ASS'Y	556F-257-2	1	
404	BEARING	RC-223-74	1	
405	HUMIDIFIER TRAY LID	556F-310	1	
406	HUMIDIFIER TRAY	556F-309	1	
407	IGNITER FIXER	556F-412	1	
408	OHS FITTING PLATE	556F-522	1	
409	HEAT SHIELD BOARD ASS'Y	556F-322	1	
414	P.C.B FITTING PLATE	556F-407	1	
415	CIRCUIT BOARD SPACER	CP-90436-3	4	
416	CABLE CLIP	CP-90125-2	3	
418	WIRE CLIP	CP-90107-2	3	
419	CLAMP	CP-90077-3	5	
699	P.C BOARD TOTAL ASS'Y	431F-1470-3	1	
700	P.C BOARD	ED-223	1	
701	THERMISTOR	556F-1021	1	
703	POWER SUPPLY CORD	CP-90466-2	1	
704	TRANSFORMER	ET-184	1	
705	MV HARNESS	431F-1400	1	
706	WIRE HARNESS	431F-1410	1	
708	HIGH TENSION CORD	431F-1460	1	
710	OVERHEAT SWITCH	ES-01171	1	266°F OFF
711	OVERHEAT SWITCH	ES-01170	1	194°F OFF
712	IGNITER	EI-161	1	
713	SLEEVE	3022-0344	1	

No.	PART NAME	PART No.	QTY.	REMARKS
714	TF COVER	556F-524	1	
715	FR LEAD	431F-1430	1	
716	OVERHEAT SWITCH	ES-01174	1	266° FOFF
717	EARTH LEAD	550F-0818	2	
719	OHS3 BRACKET	556F-570	1	
720	OHS3 LEAD	556F-571	1	
721	MOTOR LEAD	431F-1220	1	
801	SCREW	ZAA0420SZ		
802	SCREW	ZEAB0408UK		
803	SCREW	ZEAB0408SZ		
804	SCREW	ZEDB0412SZ		
805	SCREW	ZEAB0410SZ		
806	SCREW	ZEDB0408SZ		
807	SCREW	ZEDB0416SZ		
808	SCREW	ZHAE0306SZ		
809	SCREW	CP-30421-1		
810	SCREW	ZDAA0410SZ		
811	SCREW	ZEAB0406SZ		
812	SCREW	ZEDB0410SZ		
813	SCREW	ZEAB0408SC		
814	SCREW	ZDAA2.608SN		
815	SCREW	ZAA0422SZ		
816	SCREW	ZBA0410SZ		
817	SCREW	ZHAA0406SZ		
818	SCREW	ZEDB0408SC		
819	SCREW	CP-30486-2		
820	SCREW	ZEAB0414SZ		
821	SCREW	CP-30408		
822	SCREW	ZBB0410SC		
823	SCREW	ZAA0408SZ		
824	SCREW	ZHAA0410SZ		
900	CONVERSION KIT FOR L.R.G.	431F-1004-3	1	
901	CONVERSION KIT FOR N.G.	431F-1004-4	1	
902	RATING PLATE	CP-74167 <sup>7</sup> / <sub>8</sub>	1	LPG NG
903	RATING PLATE	CP-74168 <sup>7</sup> / <sub>8</sub>	1	LPG NG
904	OPERATION LABEL	431F-1810	1	
905	FILTER LABEL	1001F-1651	1	
906	CAUTION LABEL	431F-1830	1	
907	CAUTION LABEL D	1001F-1652	1	
908	CAUTION LABEL	1001F-1656	1	
909	STICKER	431F-1840 431F-1841	1 1	LPG NG
910	CAUTION LABEL	1001F-1654	1	
911	RATING PLATE SUPPORT LABEL	CP-74253 <sup>3</sup> / <sub>4</sub>	1	LPG NG
912	RATING PLATE SUPPORT LABEL	CP-74254 <sup>3</sup> / <sub>4</sub>	1	LPG NG

Vent sizes:

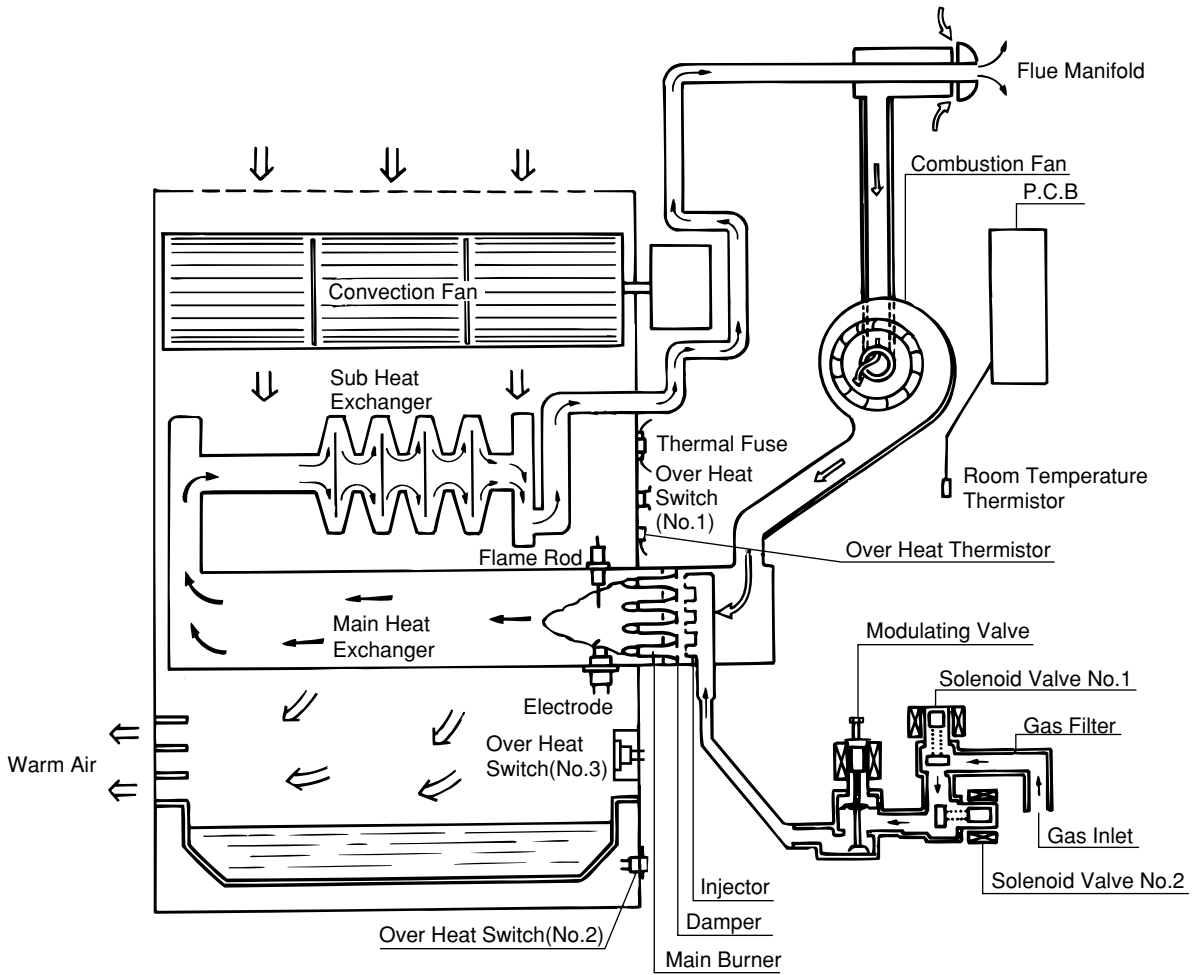
5 Vent lengths are available. inch (mm)

- S Vent suits walls 3"~4 1/2" (75~115)
- A Vent suits walls 4 1/2"~9 1/2" (115~240)
- B Vent suits walls 9 1/2"~15 3/4" (240~400)
- C Vent suits walls 15 3/4"~23 5/8" (400~600)
- D Vent suits walls 23 5/8"~31 1/2" (600~800)



NO.	RANK	PARTS NAME	PARTS NO.	QTY	REMARKS
1	M	VENT KIT - S	FOT-150	1	
2	M	VENT KIT - A	FOT-151	1	
3	M	VENT KIT - B	FOT-152	1	
4	M	VENT KIT - C	FOT-153	1	
5	M	VENT KIT - D	FOT-154	1	
6		RUBBER SEAL		1	SEE PAGE 14.

# RHFE-431FA III



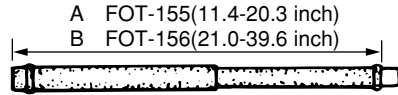
## EXTENSION SET PARTS AND INSTALLATION GUIDE

FOT-155	20"(0.5m)	EXTENSION SET
FOT-156	40"(1m)	EXTENSION SET
FOT-157	80"(2m)	EXTENSION SET
FOT-158		BENT ELBOW SET

# Rinnai

- This extension set is to be used for installations requiring extra distance.  
MAXIMUM VENT LENGTH 13' WITH 2 ELBOWS

## ■ NAMES AND NUMBERS OF PARTS



① EXHAUST PIPE



④ BENT ELBOW



⑦ PIPE STOPPER B



⑩ NUT



② EXHAUST PIPE (STRAIGHT) 40 inch



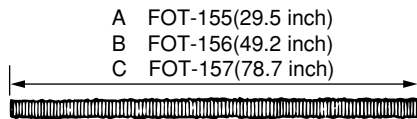
⑤ HOSE JOINT



⑧ PIPE CLAMP



⑪ SCREW A



③ AIR INTAKE HOSE



⑥ PIPE STOPPER A



⑨ WALL-FIXTURE

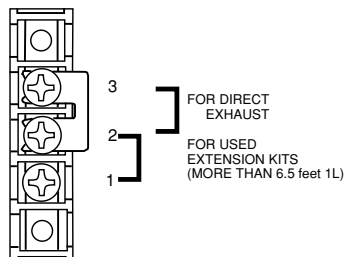


⑫ SCREW B

			FOT-155	FOT-156	FOT-157	FOT-158
①	A	EXHAUST PIPE	1			
	B	EXHAUST PIPE		1	1	
②		EXHAUST PIPE (STRAIGHT)			1	
③	A	AIR INTAKE HOSE	1			
	B	AIR INTAKE HOSE		1		
	C	AIR INTAKE HOSE			1	
④		BENT ELBOW				1
⑤		HOSE JOINT	1	1	1	
⑥		PIPE STOPPER A	1	1	2	1
⑦		PIPE STOPPER B	1	1	1	
⑧		PIPE CLAMP	2 SET	3 SET	4 SET	
⑨		WALL FIXTURE	2	3	4	
⑩		NUT	2	3	4	
⑪		SCREW A	2	3	4	
⑫		SCREW B	4	6	8	

- ※ When the appliance is installed using a vent extension that exceeds 6 feet you must change the jumper on the vent extension terminal block as shown.

Terminal is located at the rear of unit next to gas inlet.



## ■ TYPES COMPATIBLE WITH EXTENSION SET

### RHFE-431FA III

#### INSTALLING AN EXTENSION KIT

Installing an extension kit requires construction of an air line and the exhaust line. The air line is connected between the Air Supply Elbow at the rear of the heater and the air inlet port on the Flue pipe. Similarly, the exhaust line is connected between the joint pipe at the rear of the heater, and the exhaust port on the Flue pipe.

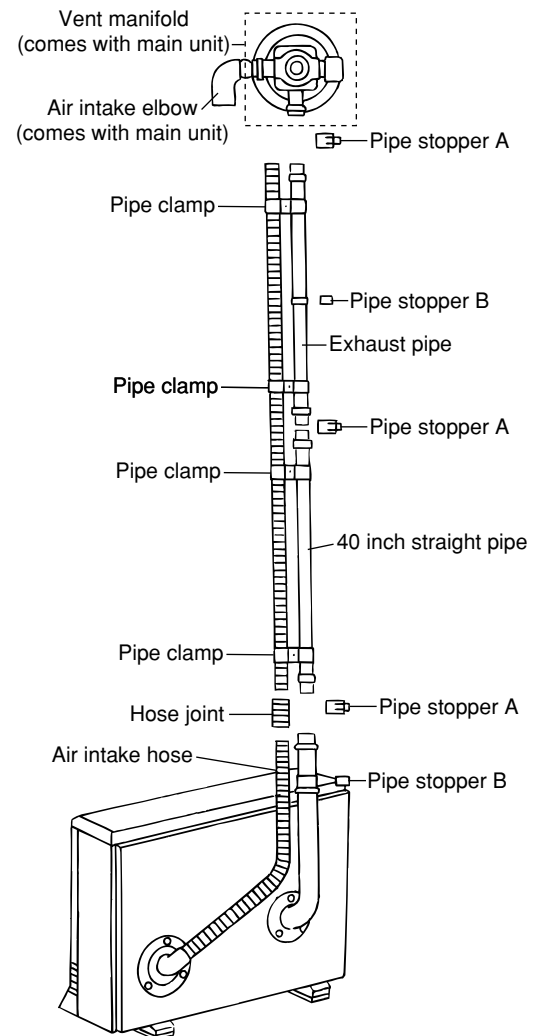
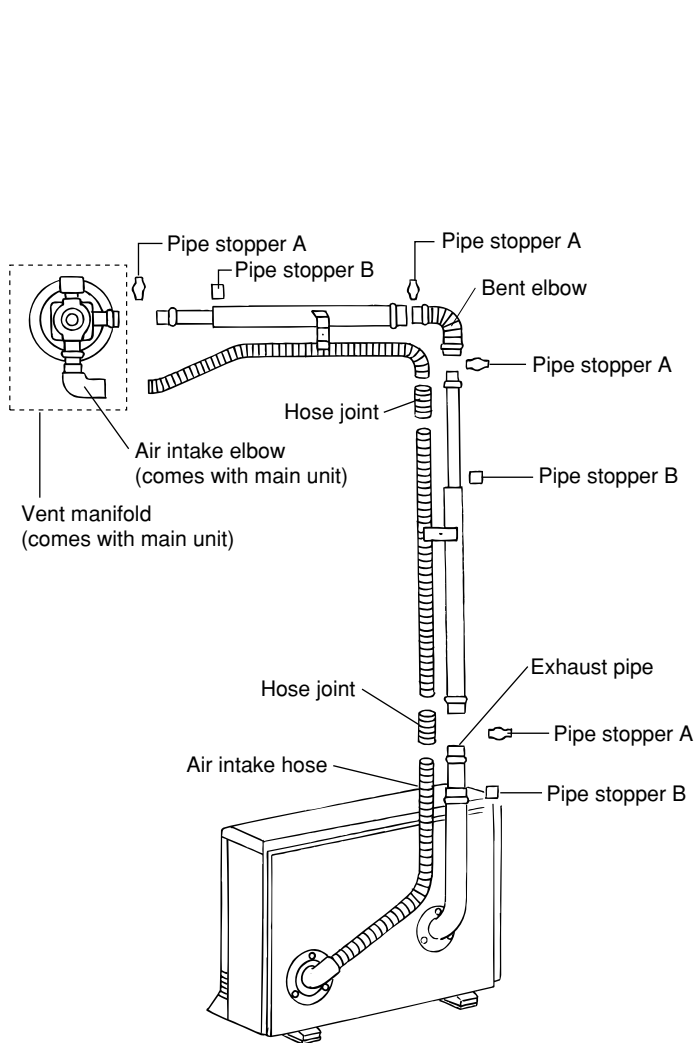
Caution: Check to see there is no debris in pipe or hose.

## ■ HOW TO INSTALL

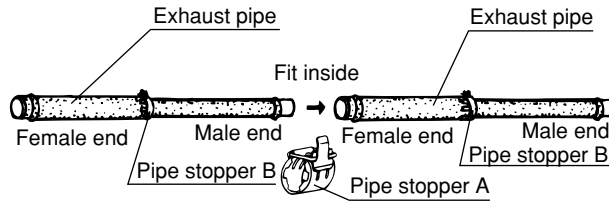
### MODEL: RHFE-431FA III

Example: Using 2 sets of extension set and 1 bent set.

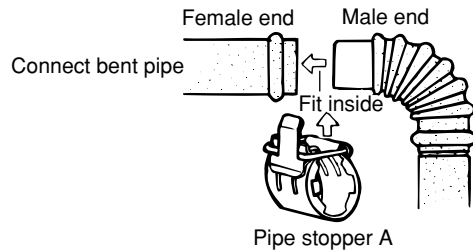
Example: Using 80 inches slide pipe set.



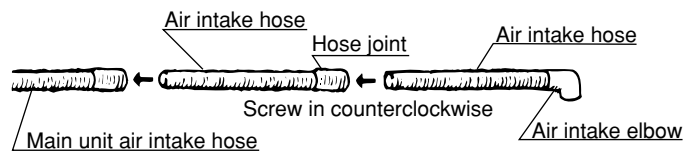
## 1. How to connect exhaust pipes



To connect the exhaust pipes, fit the male end into the female end and clamp with pipe stopper A to prevent slipping. The exhaust pipe can be telescoped to the required length; do not cut it.



## 2. How to connect air intake hose

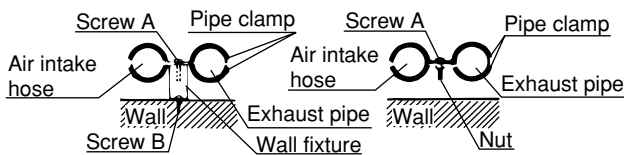


Screw hose joint half of its length onto the air intake hose, then screw another air intake hose into the joint. The hose can be cut to the required length.

**IMPORTANT: The PVC air line is longer than the exhaust line and may need to be cut to size. Be sure, however, to thoroughly deburr all rough edges.**

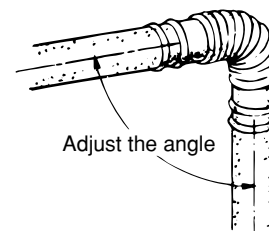
## 3. Affixing the air intake hose and exhaust pipe

**NOTE:** Maintain 1" clearance between exhaust pipe and combustible materials (0" clearance between exhaust pipe and non-combustible materials).



- Set the air intake hose and exhaust pipe into the pipe clamps, screw the clamp onto the wall fixture, and affix to the wall with screw B.
- The air intake hose and exhaust pipe can also be screwed onto the wall using the pipe clamp and the nut.

## 4. How to use the bent pipe

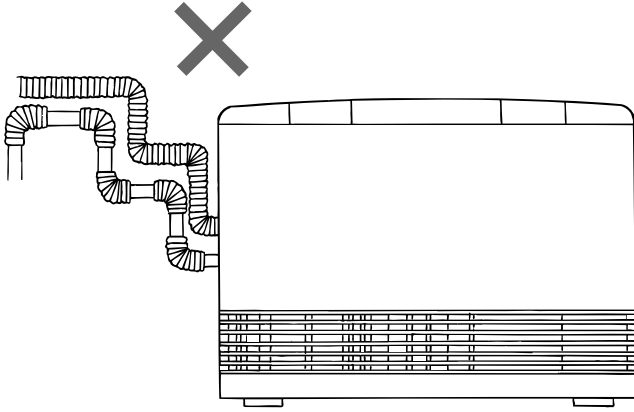


With the exhaust pipes inserted into the ends, bend the bent pipe to the angle required for installation. This part is mainly used for curves and for connection to vent terminal.

## ■ CAUTIONS

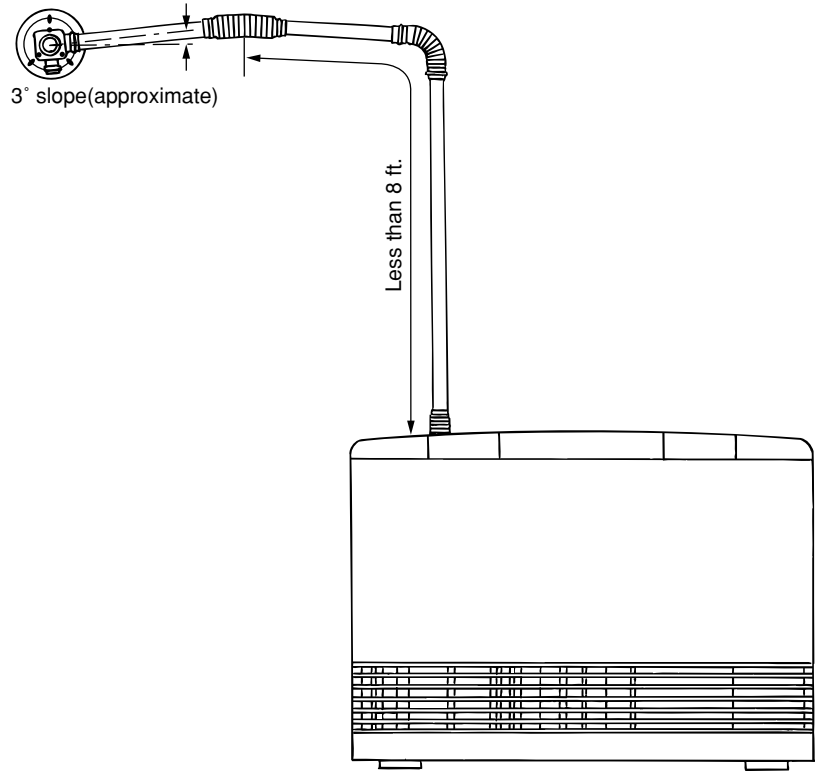
### 1. Maximum extendable length

FOR BEST ROOM AIR HUMIDITY, KEEP WATER IN THE HUMIDIFIER TRAY.

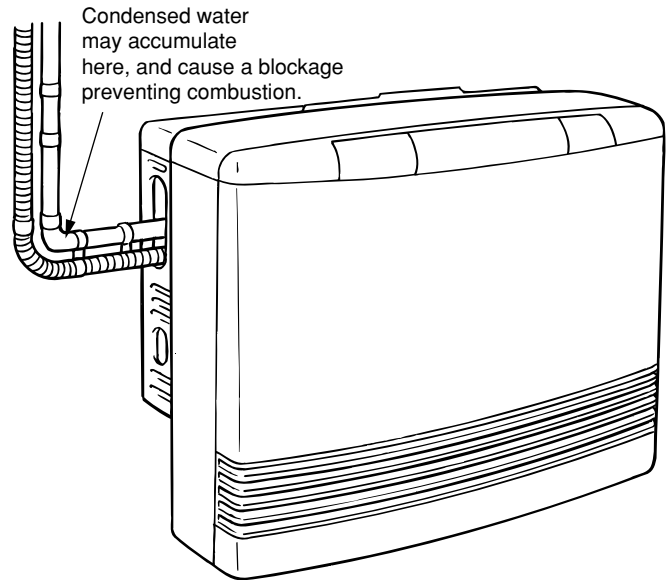


- 13 feet, 2 bends
- The bend where the hose and pipes leave the body is not counted.
- The air intake hose should run along the exhaust pipe.

3. Condensed water formed by combustion, will run back to the unit, and may overflow from the condensation pan if pipes are longer than 8 feet. Therefore, pipes exceeding these lengths should be made to drain to the outside by giving their horizontal portions 3° or more downward and outward slope.



### 2. To prevent water condensation

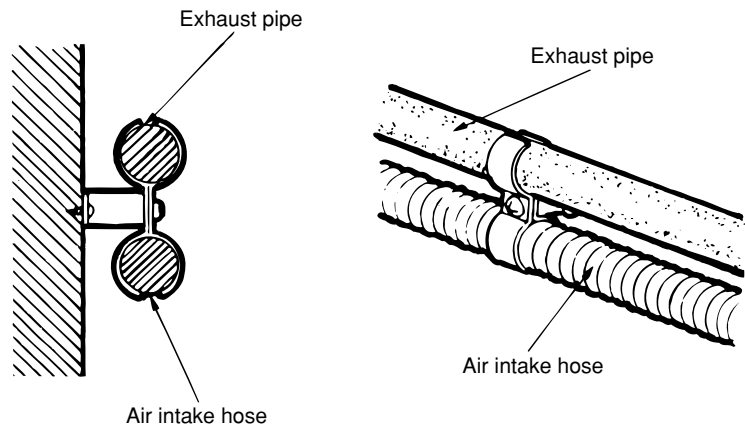


### CAUTION

**Never allow the exhaust pipe to sag, as condensed water may accumulate and cause incomplete combustion.**



4. Wherever the air intake hose and exhaust pipe run sideways, try to have the exhaust pipe on top (to prevent the air intake hose from sagging onto the exhaust pipe).



#### **QUALIFIED INSTALLING AGENCY**

The installation must conform to local codes, in the absence of local codes, the installation must conform with American National Standard (National Fuel Gas Code) known as NFPA 54 and ANSI Z223.1.1992.

Available from the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018 or from the National Fire Protection Association, 470 Atlantic Avenue, Boston, Mass. 02210.

# TECHNICAL DATA





WEIGHT	DIMENSIONS	GAS RATE (BTU/h)					
		INPUT			OUTPUT		
51 Lbs.	Width: 29 1/2" Height: 21 13/16" Depth: 9 13/16"		NG	LP		NG	LP
		LOW	8,200	8,200	LOW	6,640	6,640
		HIGH	16,700	16,700	HIGH	13,530	13,530

Burner Orifices:

RHFE-431FA III-P use: Orifice part #AU129-210×02-0.85(0.033")

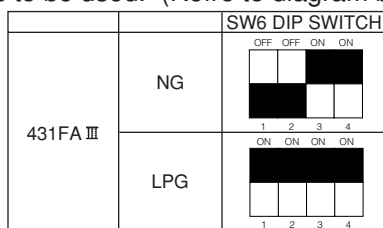
RHFE-431FA III-N use: Orifice part #AU129-210×02-1.13(0.044")

### GAS CONVERSION SPECIFICATIONS

MODEL	GAS TYPE	DIAMETER OF ORIFICE(mm)	PRIMARY DAMPER	SECONDARY DAMPER	MANIFOLD DIFFERENTIAL PRESSURE (W.C.)		DIP SWITCH POSITION
					HI	LO	
RHFE-431FA-III-P	LPG	φ 0.85	556F-209-15	556F-208-5 ( φ 2.5×15)	2.8"W.C.	0.8"W.C.	ON  OFF 
RHFE-431FA-III-N	NG	φ 1.13	556F-209-7	556F-208-7 (33×47hole)	2.4"W.C.	0.7"W.C.	ON  OFF 

### GAS PRESSURE SETTING PROCEDURE

1. Check and ensure SW6 Dip Switches are correct for the gas type for which the appliance is to be used. (Refer to diagram below.)



2. There are two test points, one on the manifold, one on the gas control assembly. Connect pressure gauge to both test points. Using an electronic manometer, connect the ⊖ side to the manifold test point. (Refer to data plate for pressure.)

#### GAS SUPPLY PRESSURE

	NATURAL	PROPANE
MINIMUM	3.5"W.C.	8"W.C.
MAXIMUM	10.5"W.C.	13"W.C.

3. Press the ON/OFF button to operate the appliance.
4. With appliance operating, press SW5 once.
5. Press SW4 to operate appliance on forced low. Adjust the setting to the correct pressure using the ">" and "<" buttons on the control panel.
6. Press SW4 again to lock in the selected setting.
7. Press SW3 to operate appliance on forced high. Adjust the setting to the correct pressure using the ">" and "<" buttons on the control panel.
8. Press SW3 again to lock in the selected setting.
9. Press SW5 once to return heater to normal operation.
10. Press the ON/OFF button to turn the appliance off.
11. Remove the gauge from the test points and replace the test point screws.
12. Test for gas escapes.

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