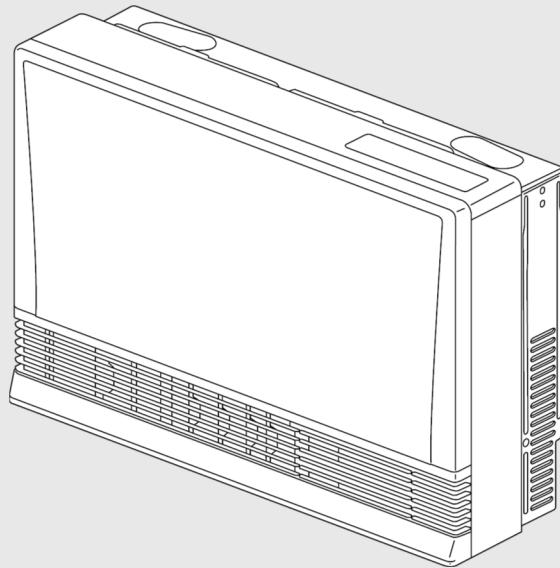


MODEL:  
EX38DT (RHFE-1006FTA)



# Direct Vent Wall Furnace

## Installation and Operation Manual

**Rinnai**<sup>®</sup>

RHF1006-1750(02)



108521

## **WARNING**

- If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.
- 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 licensed professional.

This appliance may be installed in an aftermarket, permanently located, manufactured home (USA only) 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.

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# 1. Welcome

Thank you for purchasing a Rinnai Direct Vent Furnace. Before installing and operating the direct vent furnace, be sure to read these instructions completely and carefully to familiarize yourself with the direct vent furnace's features and functionality.

## 1.1 To The Installer

- It is recommended that a trained and qualified professional who has attended a Rinnai training class complete the installation. The warranty may be voided due to any improper installation.
- A trained and qualified professional should have skills such as:
  - Gas sizing
  - Connecting gas lines, valves, and electricity
  - Knowledge of applicable national, state, and local codes
  - Installing venting through a wall
  - Training in installation of direct vent furnaces. Training on Rinnai Direct Vent Furnaces is accessible at [rinnai.pro.myabsorb.com](http://rinnai.pro.myabsorb.com).
- Read all instructions in this manual before installing the direct vent furnace. The direct vent furnace must be installed according to the exact instructions in this manual.
- Proper installation is the responsibility of the trained and qualified professional.
- When installation is complete, leave this manual with the direct vent furnace or give the manual directly to the consumer.

## 1.2 To The Consumer

- You must read the entire manual to properly operate the direct vent furnace.
- Refer to section "6. Maintenance" to stay up to date on regular maintenance for your direct vent furnace.
- As when using any appliance generating heat, there are certain safety precautions you should follow. See section "2. Safety" for detailed safety precautions.
- Be sure your direct vent furnace is installed by a trained and qualified professional.
- If installing in the state of Massachusetts, you must read section "9.1 Massachusetts State Gas Regulations" in this manual.
- Keep this manual for future reference.

## 1.3 Acronyms and Abbreviations

Table 1 below lists common acronyms and abbreviations used in this manual:

Table 1. Acronyms and Abbreviations

<b>ANSI</b>	American National Standards Institute
<b>BTU</b>	British Thermal Unit
<b>LPG</b>	Liquid Propane Gas
<b>NG</b>	Natural Gas
<b>NPT</b>	National Pipe Thread
<b>OEM</b>	Original Equipment Manufacturer
<b>PSI</b>	Pounds per Square Inch
<b>VAC</b>	Volts Alternating Current
<b>wc</b>	Inches of Water Column

# 2. Safety

## 2.1 Safety Symbols

This manual contains the following important safety symbols. Always read and obey all safety messages.



Safety alert symbol. Alerts you to potential hazards that can kill or hurt you and others.



### **DANGER**

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



### **WARNING**

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



### **CAUTION**

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

## 2.2 Safety Precautions



### **WARNING**

- Repairs should be performed by a trained and qualified professional.
- Keep the area around the furnace clear and free from combustible materials, gasoline, and other flammable vapors and liquids.
- Never store liquid propane containers indoors.
- Do not use this furnace if any part has been under water. Immediately call a trained and qualified professional to inspect the furnace and to replace any part of the control system and any gas control which has been under water.
- This furnace is equipped with a three-prong 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 ground prong from this plug.
- Any alteration to the furnace or its controls can be dangerous.
- Do not operate furnace with the panels removed, cracked or broken. Replacement of the panels should be performed by a trained and qualified professional.

## **WARNING**

When an existing Category I heater is removed or replaced, the original venting system may no longer be sized to properly vent the attached appliances. Instructions shall also indicate effects of an improperly sized venting system (formation of condensate, leakage, spillage, etc.) and shall specify the following test procedure.

### **WARNING: CARBON MONOXIDE POISONING HAZARD**

Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death.

The following steps shall be followed for each appliance connected to the venting system being placed into operation, while all other appliances connected to the venting system are not in operation:

1. Seal any unused openings in the venting system.
2. Inspect the venting system for proper size and horizontal pitch, as required in the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the Natural Gas and Propane Installation Code, CSA B149.1 and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
3. As far as practical, close all building doors and windows and all doors between the space in which the appliance(s) connected to the venting system are located and other spaces of the building.
4. Close fireplace dampers.
5. Turn on clothes dryers and any appliance not connected to the venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they are operating at maximum speed. Do not operate a summer exhaust fan.
6. Follow the lighting instructions. Place the appliance being inspected into operation. Adjust the thermostat so appliance is operating continuously.
7. Test for spillage from draft hood equipped appliances at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle.
8. If improper venting is observed during any of the above tests, the venting system must be corrected in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or Natural Gas and Propane Installation Code, CSA B149.1.
9. After it has been determined that each appliance connected to the venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-fired burning appliance to their previous conditions of use.

## **CAUTION**

- Do not block the warm air discharge. Do not allow anyone to sleep directly in front of the furnace.
- Due to high temperatures, the furnace should be located out of traffic and away from furniture and draperies.
- Children and adults should be alerted to the hazards of high surface temperature and should stay away to avoid burns or clothing ignition.
- Young children should be carefully supervised when they are in the same room as the furnace.
- Clothing or other flammable material should not be placed on or near the furnace.
- Any safety screen or guard removed for servicing must be replaced prior to operating the furnace.
- Do not insert items into the louvers.
- Do not spray aerosols near the furnace while it is operating. Most aerosols contain butane gas which is flammable.
- Do not unplug the furnace while it is operating or while the fans are on.
- Do not use bare hands to touch the front louvers due to high temperatures which may cause burns.
- Wear hand protection when touching the side back covers, front louver, and rear intake for the convection fan.
- Prevent dust from accumulating on the power cord, side covers, and parts behind the furnace.
- Do not sit on the furnace.
- Do not place containers of liquid on top of the furnace. Water spillage can cause extensive damage to the furnace and may result in electric shock.

# 3. About the Direct Vent Furnace

## Topics in this section

- Main Components
- Specifications
- Dimensions

## 3.1 Main Components

Front View

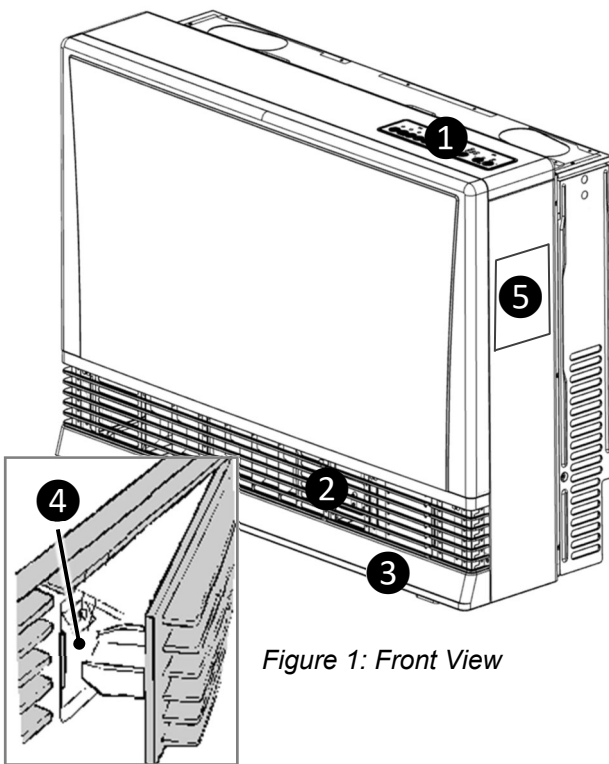


Figure 1: Front View

1	Control Panel
2	Warm Air Outlet
3	Bottom Cover
4	Humidifier (open panel to access)
5	Rating plate (includes model number, serial number, gas type, etc.). English is on the right side; French is on the left side.

Back View

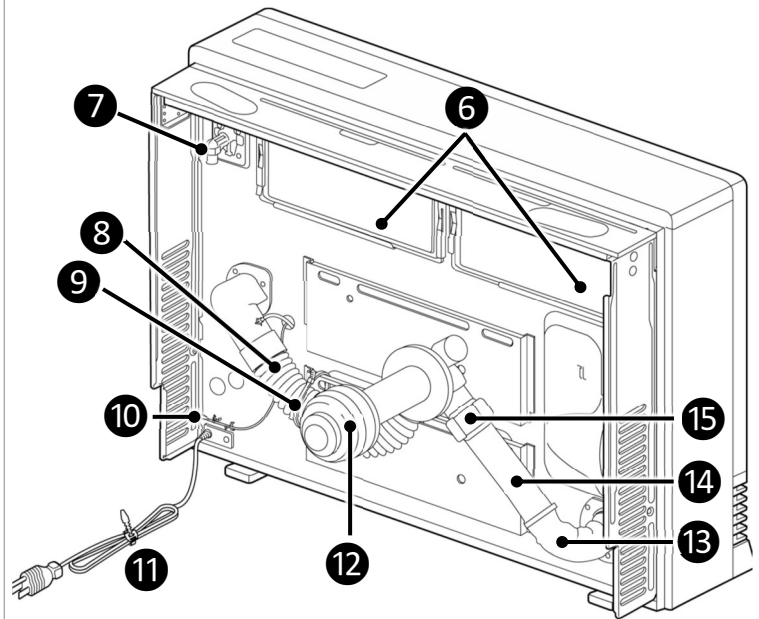


Figure 2: Back View

6	Air Filter
7	Gas Connection (1/2 in./13 mm Male NPT)
8	Combustion Air Intake Hose
9	Plastic Tie for Air Inlet
10	Room Temperature Sensor/Thermistor
11	Power Cord and Plug
12	Flue Manifold (Combustion/Exhaust)
13	Bent Elbow
14	Exhaust Pipe
15	Pipe Stopper

## 3.2 Specifications

Table 2: Specifications

	EX38DT	
<b>Application</b>	Approved for manufactured home (USA only) or mobile home or residential installation convertible for use with natural gas and liquefied petroleum gases (propane) when provision is made for the simple conversion from one gas to the other. Approved for commercial setting. Approved for installation at altitudes up to 10,200 feet (3,109 m).	
	<b>Natural Gas</b>	<b>Liquid Propane Gas</b>
<b>Min. Supply Gas Pressure</b>	3.5 in. (89 mm) wc	8.0 in. (203 mm) wc
<b>Max. Supply Gas Pressure</b>	10.5 in. (267 mm) wc	13.0 in. (330 mm) wc
<b>Btu/h Input</b>	Low 13,200 High 38,400	Low 13,200 High 36,500
<b>General Description</b>	Forced Combustion, Forced Convection, Flued Gas Furnace	
<b>Operation</b>	Push Button Electronic	
<b>Gas Connection</b>	1/2 in. (13 mm) Male NPT	
<b>Gas Control</b>	Electronic	
<b>Burners</b>	Stainless Steel Bunsen Burner	
<b>Temperature Control</b>	Electronic Thermostat, Low, 60-80°F (16-26°C) in 2°F (1°C) Increments, High	
<b>Ignition System</b>	Electronic Spark Ignition	
<b>Flue System</b>	The flue must be terminated to atmosphere with only flue components listed with the furnace's certification. Warranty will be voided if non-listed components are installed.	
<b>Humidifier Tray</b>	Capacity - 6.3 pints (3,000 cc)	
<b>Electrical Connections</b>	AC 120 Volts, 60 Hz, 58 watts	
<b>Standby Power</b>	0.7 watts	
<b>Weight</b>	86 lbs (39 kg)	
<b>Sound Level</b>	39-46 dB	
<b>Safety Features</b>	<ul style="list-style-type: none"> <li>• Overheat: The furnace will automatically shut down when exceeding a predetermined temperature.</li> <li>• Flame Failure: The furnace will automatically shut down if the burner flame is extinguished.</li> <li>• Power Failure: The furnace will shut off the gas if it loses electrical power.</li> <li>• Power Surge Fuse: A glass fuse on the PC board protects against overcurrent. If the fuse blows then all indicator lamps will be off.</li> <li>• Spark Detector: The furnace automatically shuts down if there is an abnormal spark at ignition.</li> <li>• Fusible Link: In case the overheat feature does not prevent an overheat, then the fusible link could break, shutting off the furnace.</li> </ul>	

The efficiency rating of this furnace is a product thermal efficiency rating determined under continuous operating conditions and was determined independently of any installed system.

Rinnai products are continually being updated and improved; therefore, specifications are subject to change without prior notice.



# 3.3 Dimensions

**IMPORTANT**

A full size wall template is provided on the furnace carton box. Do not discard until installation is complete.

Measurements: inches (mm)

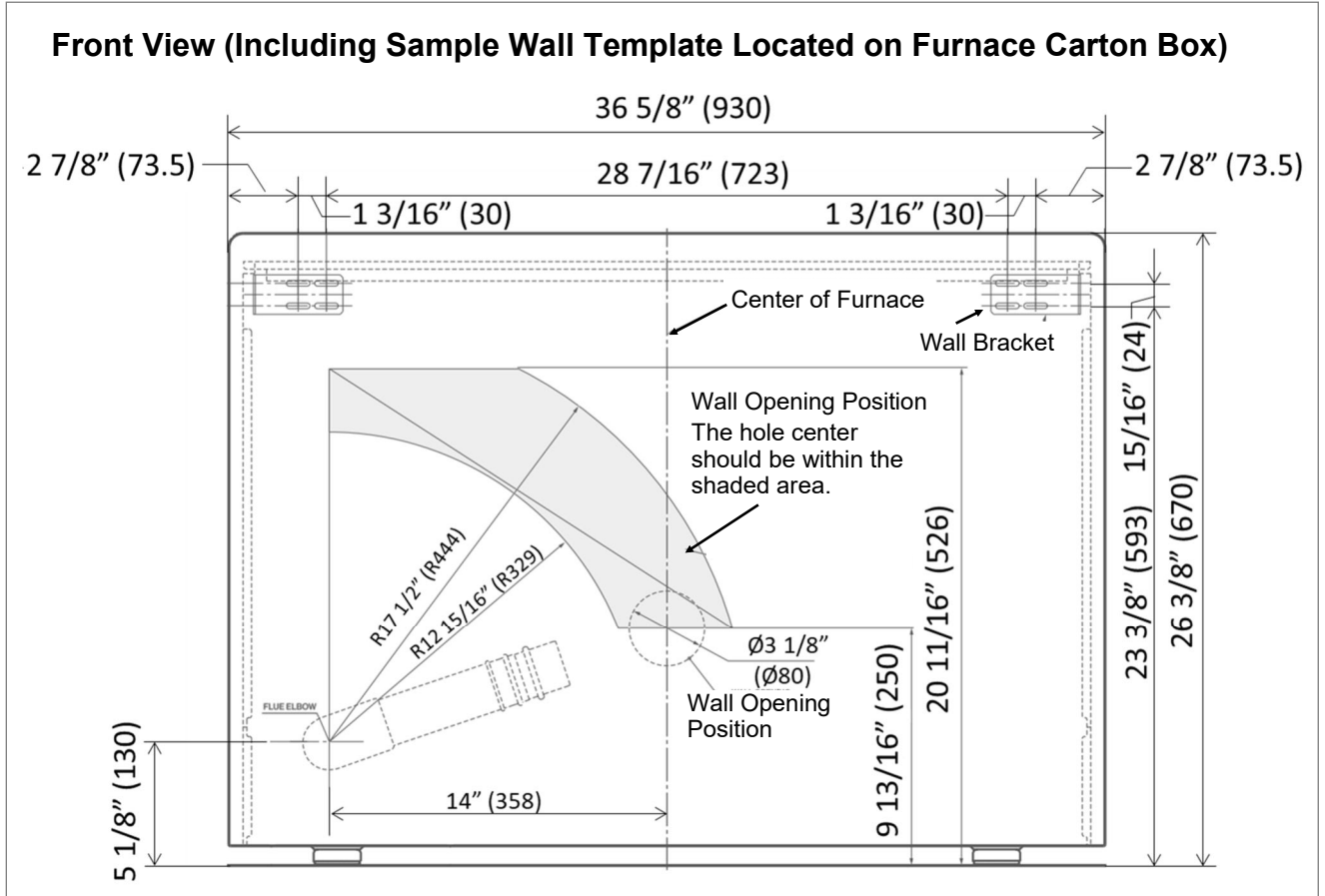


Figure 3: Front View

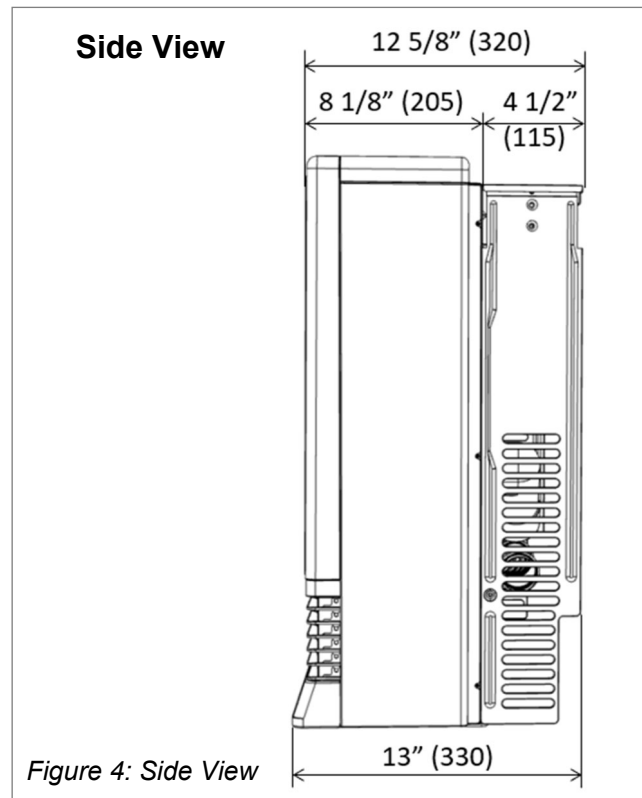


Figure 4: Side View

# 4. Installation

## Topics in this section

- Installation Guidelines
- What You Will Need
- Choose an Installation Location
- Installation Steps
- Post-Installation Checklist

### THIS SECTION IS INTENDED FOR THE INSTALLER

Installer qualifications: A trained and qualified professional must install the furnace, inspect it, and leak test the direct vent furnace before use. The warranty may be voided due to any improper installation. The trained and qualified professional should have skills such as: Gas sizing; Connecting gas lines, valves, and electricity; Knowledge of applicable national, state, and local codes; Installing venting through a wall; and training in installation of direct vent furnaces. Training for Rinnai Direct Vent Furnaces is accessible online at [rinnai.pro.myabsorb.com](http://rinnai.pro.myabsorb.com).

## 4.1 Installation Guidelines



**WARNING** Do not use substitute materials. Use only parts certified with the furnace.

When installing the direct vent furnace, follow these guidelines:

- This direct vent furnace is certified for installation in residential applications, commercial applications, and manufactured (mobile) homes.
- This furnace may be installed as an OEM installation in a manufactured home (USA only) or mobile home and must be installed in accordance with the manufacturer's instructions and the Manufactured Home construction and Safety Standard, Title 24 CFR, Part 3280, in the United States, or the Mobile Home Standard, CAN/CSA Z240 MH Series, in Canada.
- This furnace may be installed in an aftermarket, permanently located, manufactured home (USA only) or mobile home, where not prohibited by local codes.
- If installation is at a location above 2,001 ft (610 m), see section "4.4.8 Adjust the Gas Pressure Settings."
- Furnace input ratings are based on sea level operation and need not be changed for operation up to 2,000 ft (610 m) elevation.
- This furnace discharges a large volume of warm air next to the floor. Any particles in the air such as cigarette smoke could cause discoloration in nylon carpets containing dyes or vinyl surfaces.
- Rinnai suggests that a dedicated electrical circuit with a 120V AC, 60 Hz, 10 amp power source be used.
- A test plug is provided for testing of manifold differential pressure. It is located on the modulating gas valve.
- If you move to a different location, check the gas type in your new area. The local gas authority will be able to advise on local regulations.
- The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1.
- A manufactured home (USA only) or mobile home OEM installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280, or, when such a standard is not applicable, the standard for Manufactured Home Installations, ANSI Z225.1, or the standard for Gas Equipped Recreational Vehicles and Mobile Housing, CSA Z240.4.
- The furnace, 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 the Canadian Electrical Code, CSA C22.1.
- The furnace and its 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 psi (3.5 kPa).
- The furnace must be isolated from the gas supply piping system by closing its equipment shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psi (3.5 kPa).
- If the flooring is carpet or other combustible material other than wood, then the furnace must be installed on a metal or wood panel extending the full width and depth of the furnace.
- This furnace is only for use with the type of gas indicated on the rating plate. This furnace is not convertible for use with other gases unless a certified kit is used. If conversion of the unit is needed, conversions must be performed by a qualified service provider at the owner's expense.
- The furnace should be correctly sized for the space it is required to heat. It is recommended that an industry standard BTU Heat Loss Calculation be conducted to determine the proper sizing.
- Follow the installations instructions and those in section "6. Maintenance" for adequate combustion and ventilation air.
- This furnace is not designed to be built in.
- DO NOT connect this furnace to a chimney flue serving a separate solid-fuel burning appliance.
- DO NOT obstruct the flow of combustion and ventilation air.

## 4.2 What You Will Need

### 4.2.1 Items Included

Unpack the Rinnai Direct Vent Furnace package and verify the following contents are included. If any items are damaged or missing, contact your local dealer/distributor or call Rinnai Customer Care at 1-800-621-9419.



#### IMPORTANT

A full size wall template is provided on the furnace carton box. Do not discard until installation is complete.

Table 3: Items Included

Product	Qty	Image
Flue Manifold "A" Vent Kit (FOT-151)	1	
Spare Rubber Seal ("A" Flue Units Only)	1	 (For Weatherboard Installation)
Back Spacer Set <sup>1</sup>	1	
Pipe Stopper A&S	2	
Insulation Clip	1	
Manual Valve	1	
Plastic Tie for Air Inlet	1	
Screw (M5) (For Wall Brackets)	4	
Screw (M4) (For Flue Manifold)	3	
Screw (M4) (For Back Spacer Set)	7	

Product	Qty	Image
Wood Screw (M 4.8 x 32) (Wall Bracket Screws)	7	
Wall Brackets	2	
Flue Adapter (Attached to Unit)	1	
Rinnai Direct Vent Wall Furnace Installation and Operation	1	Image not shown

#### Additional Flue Manifolds

The following flue manifold sizes are available for different wall thicknesses:

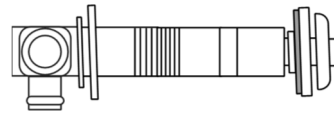


Table 4: Additional Flue Manifolds

Name	Kit No.	Fits Walls
S Vent Kit	FOT-150	3 - 4 1/2 in. (75 - 115 mm)
A Vent Kit	FOT-151	4 1/2 - 9 1/2 in. (115 - 240 mm)
B Vent Kit	FOT-152	9 1/2 - 15 3/4 in. (240 - 400 mm)
C Vent Kit	FOT-153	15 3/4 - 23 5/8 in. (400 - 600 mm)
D Vent Kit	FOT-154	23 5/8 - 31 1/2 in. (600 - 800 mm)

Vent Kit "A" is included with the furnace.

<sup>1</sup> The color of the back spacers is a slightly different shade than the color of the furnace.

## 4.2.2 Items Needed (Field-Supplied)

- Pipe Wrenches (x2)
- Adjustable Pliers
- Screwdrivers (x2)
- Wire Cutters
- Gloves
- Safety Glasses
- Level
- Soap or Gas Leak Detector Solution
- Approved Venting
- Teflon Tape (Recommended) or Pipe Compound

The following field-supplied items may be needed:

- Gas Manometer
- Hammer Drill with Concrete Bits
- Saw
- Threading Machine with Heads and Oiler
- Core Drill with Diamond Head
- Torch Set
- Steel Pipe Cutter
- Concrete Wall Anchors
- Optional Pipe Cover
- Single Gang Electrical Box
- Wire Nuts

## 4.3 Choose an Installation Location

When selecting an installation location, you must ensure that all direct vent furnace and venting clearances will be met and that the vent length will be within required limits. You must also consider the installation environment. Requirements for the gas line and electrical connection can be found in their respective installation sections in this manual.

### 4.3.1 Environment

Air surrounding the venting, and vent termination(s) is used for combustion and must be free of any compounds that cause corrosion of internal components. These include corrosive compounds that are found in aerosol sprays, detergents, bleaches, cleaning solvents, oil based paints/ varnishes, and refrigerants.

The furnace, venting, and vent termination(s) should not be installed in any areas where the air may contain these corrosive compounds. If it is necessary for a furnace to be located in areas that may contain corrosive compounds, the following instructions are strongly recommended.

#### **IMPORTANT CONSIDERATIONS:**

- **DO NOT** install in areas where air for combustion might be contaminated with chemicals.
- Before installation, consider where air has the ability to travel within the building to the furnace.
- Terminate the unit as far away as possible from any air inlet vents. Corrosive fumes may be released through these vents when air is not being brought in through them.
- Chemicals that are corrosive in nature should not be stored or used near the furnace or vent termination.
- Damage and repair due to corrosive compounds in the air is not covered by warranty.

## 4.3.2 Clearances

### Flue Terminal Clearances

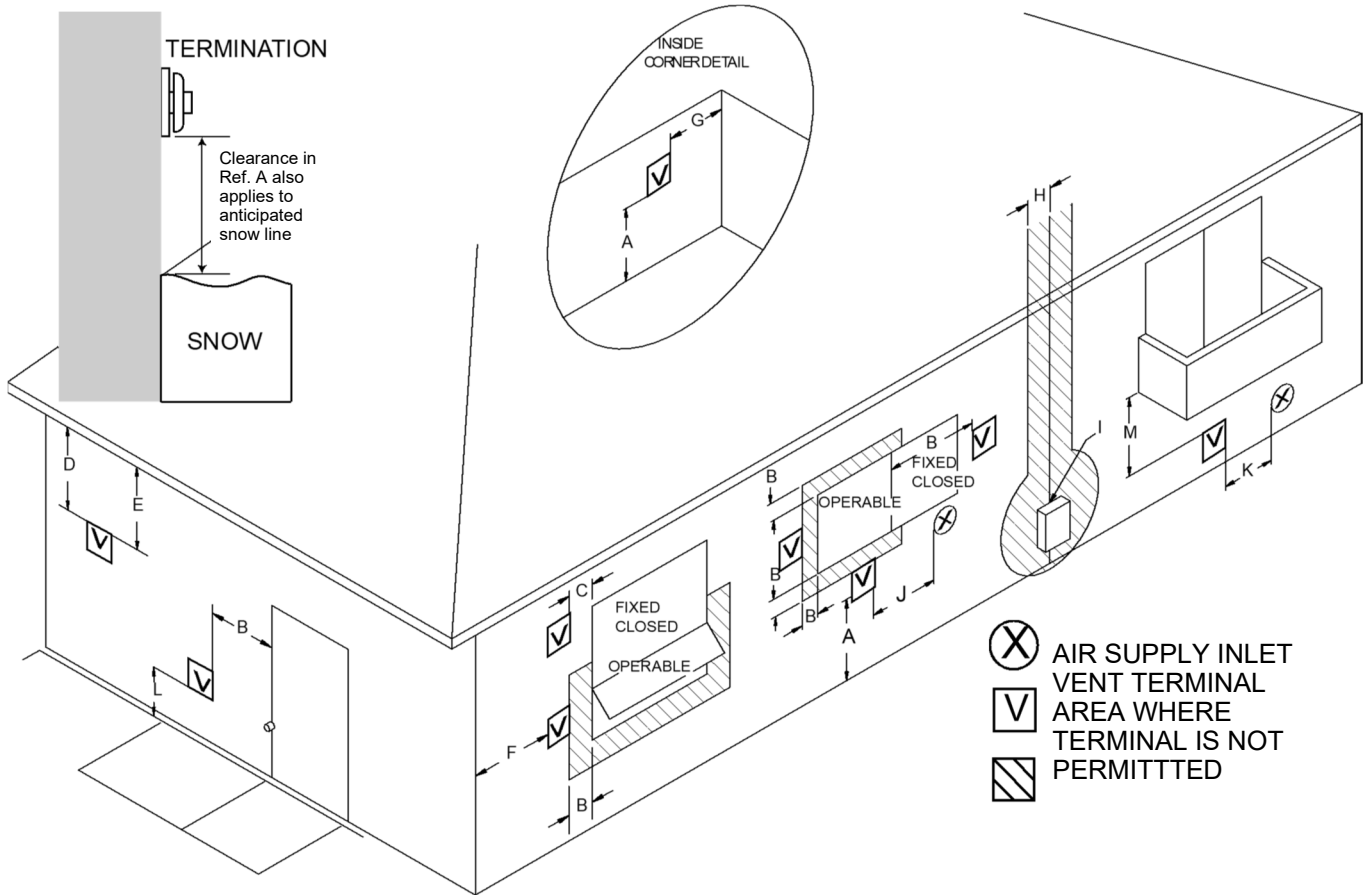


Figure 5: Flue Terminal Clearances

Table 5: Clearances

Ref	Description	Canadian Installations	US Installations
A	Clearance above grade, veranda, porch, deck, or balcony	12 inches (30 cm)	12 inches (30 cm)
B	Clearance to window or door that may be opened	12 inches (30 cm)	9 inches (23 cm)
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit, located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
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 (91 cm) within a height 15 feet (4.5 m) above the meter/regulator assembly	*
I	Clearance to service regulator vent outlet	36 inches (91 cm)	*
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	12 inches (30 cm)	9 inches (23 cm)
K	Clearance to a mechanical air supply inlet	6 feet (1.83 m)	3 feet (91 cm) above if within 10 feet (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 feet (2.13 m) [1]	*
M	Clearance under veranda, porch, deck, or balcony	12 inches (30 cm) [2]	*

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

[2] Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

\* For clearances not specified in *ANSI Z223.1/NFPA 54*, clearances are in accordance with local installation codes and the requirements of the gas supplier.

Clearance to opposite wall is 24 inches (60 cm).

## Clearances to Combustibles

When determining where to install the direct vent furnace, the clearances to combustibles shown in the figures below must be followed.

### **CAUTION**

If clearances are not met, damage to the property or direct vent furnace may occur.

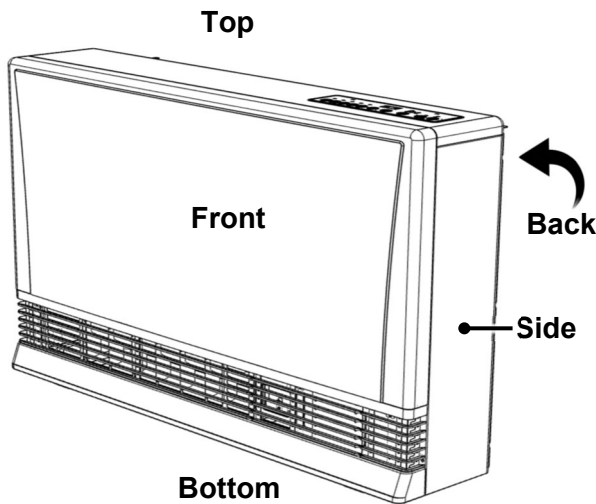


Table 6: Clearance to Combustibles

Location	Clearances to Combustibles
Top	0 in. (0 mm)
Bottom/Ground	0 in. (0 mm)
Front (Panel)	40 in. (1 m)* <i>*Does not include flooring material or carpeting less than 1.2 in. (30 mm) in height.</i>
Back (Including Back Spacer)	0 in. (0 mm)
Sides (Left and Right)	2 in. (50 mm)

Figure 6: Clearances

## Service Clearances

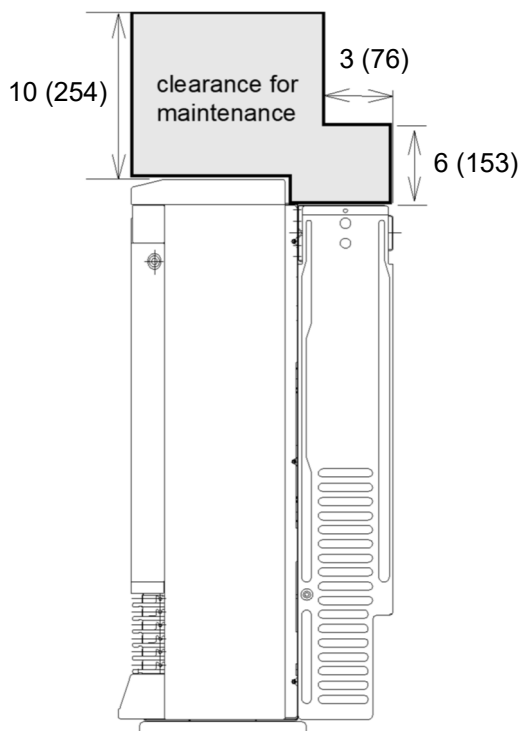


Figure 7: Service Clearances

Measurements: inches (mm)

Clearances to access the furnace during servicing are 10 in. (254 mm) from the sides, 40 in. (1 m) from the front, and the area shown above the furnace in the figure to the left.

Rinnai recommends 10 in. (254 mm) clearance from the top and on both sides for servicing.

### 4.3.3 Installation Location Checklist

Use this checklist to ensure you have selected the correct location for the direct vent furnace.

<input type="checkbox"/>	The furnace is not exposed to corrosive compounds in the air.
<input type="checkbox"/>	The furnace location complies with the required clearances.
<input type="checkbox"/>	The planned venting termination/air intake location meets the clearances.
<input type="checkbox"/>	Indoor air is not being used for combustion.
<input type="checkbox"/>	A standard 3 prong 120 VAC, 60 Hz properly grounded wall outlet is available.
<input type="checkbox"/>	The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1. If installed in a manufactured home, the installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280 and/or CAN/SCA Z240 MH Series, Mobile Homes.
<input type="checkbox"/>	Leave the entire manual taped to the furnace or give the manual directly to the consumer.

## 4.4 Installation Steps

### 4.4.1 Drill the Flue Hole

Ensure that there are no gas or water lines, or electrical circuits in the wall location where the flue hole is to be drilled.

Drill the flue hole using a  $\varnothing 3/8$  in. ( $\varnothing 80$  mm) drill. A template is provided on the furnace carton box. The center of the hole must be located anywhere within the shaded area, unless extension kits are used. See the dimensions diagram.

For weatherboard walls, drill through the center of the weatherboard from the outside first and then through the plasterboard.

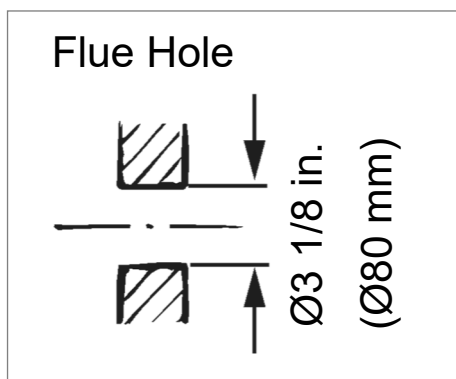


Figure 8

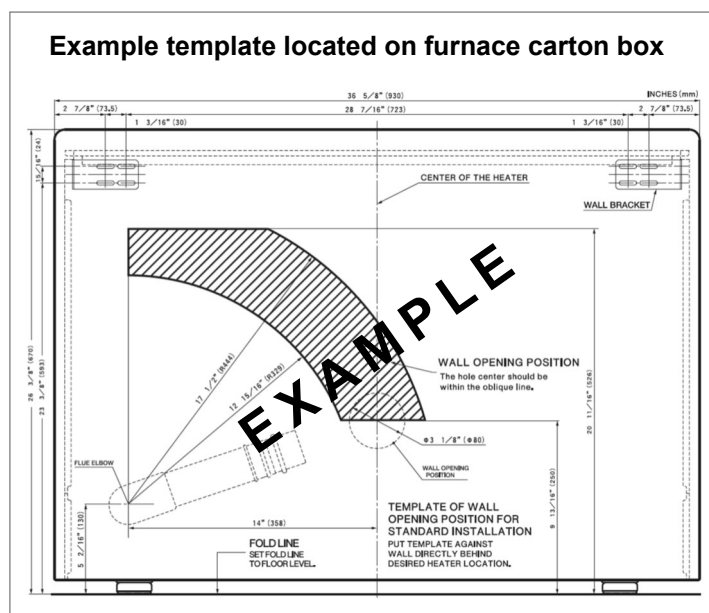


Figure 9

### 4.4.2 Attach Wall Brackets

Attach the wall brackets as shown. A template is provided.

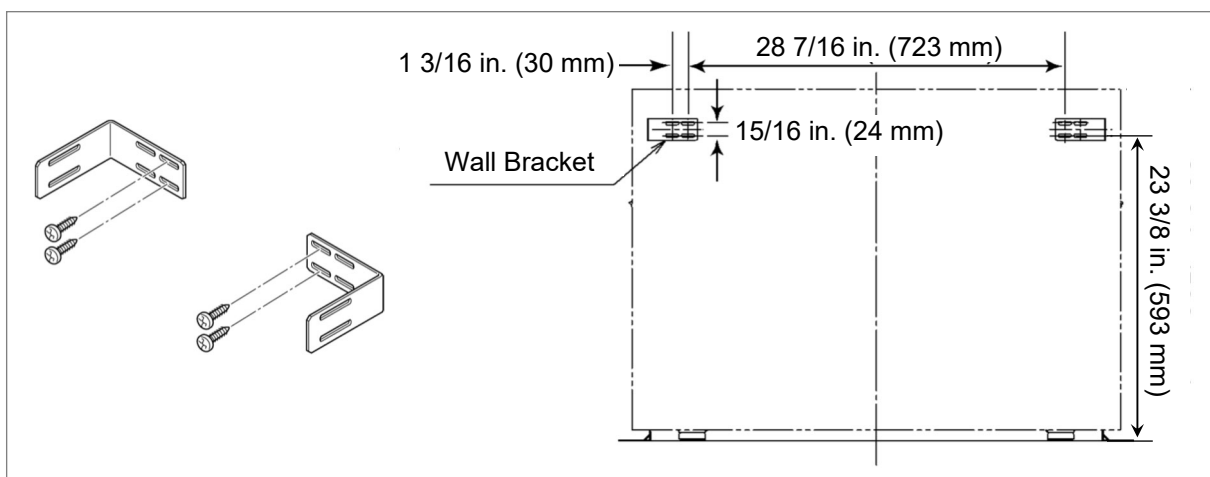


Figure 10



### 4.4.3 Attach Back Spacers

Attach side back spacers to both sides of the furnace with 2 screws each.

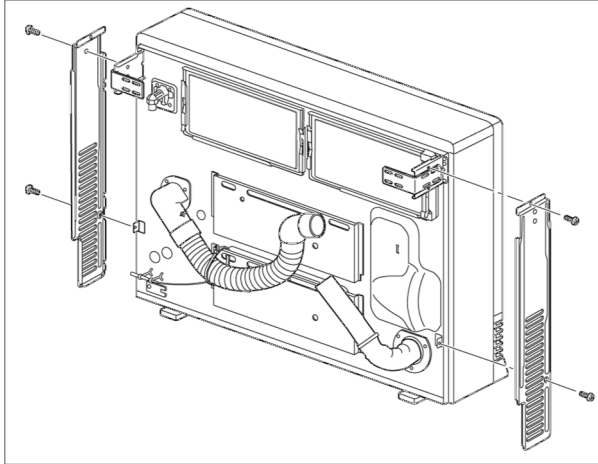


Figure 11

### 4.4.4 Install the Flue Manifold

#### Guidelines:

- The flue manifold must exhaust to the outside. Do not exhaust into other rooms.
- The flue manifold is not designed to be positioned under floors or below the furnace.
- The termination cannot be vertical.
- This furnace can only be used with one of the five types of Rinnai flue kits. The flue kits and their dimensions are listed in section “4.2.1 Items Included.”
- Refer to “Flue Terminal Clearances” in section “4.3.2 Clearances.”

#### Instructions:

1. Disassemble the flue manifold

The flue consists of 3 parts:

- sleeve
- inside connection
- outside terminal

Disassemble the flue manifold by first pulling out the inside connection. To remove the outer terminal pull and release the two internal ties and then pull out the outer terminal.

Clearance to combustibles for the sleeve and flanges is zero inches.

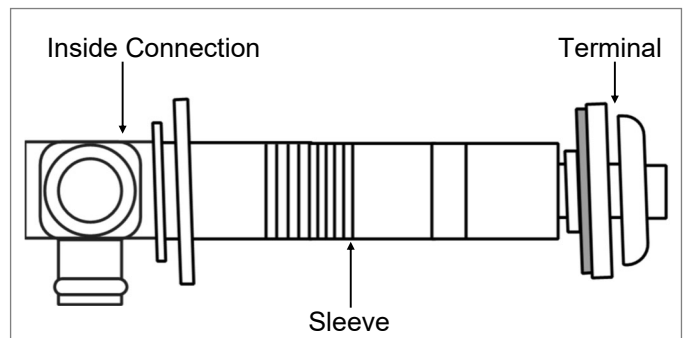


Figure 12

2. Adjust the sleeve length

Measure wall thickness through previously drilled  $\text{Ø}3 \frac{1}{8}$  inch ( $\text{Ø}80$  mm) hole.

The end of the sleeve should protrude  $\frac{3}{16}$  -  $\frac{3}{8}$  inch (5-10 mm) from the outside wall.

The sleeve is threaded for adjustment. Adjust the sleeve length to wall thickness plus  $\frac{3}{16}$  -  $\frac{3}{8}$  inch (5-10 mm).

NOTE: Do not extend beyond the red line.

For other than the “S” type flue manifold, if a shorter length is necessary an extension can be removed. Cut the outer plastic laminate (with a utility knife or similar) and remove the extension. The metal should not be cut.

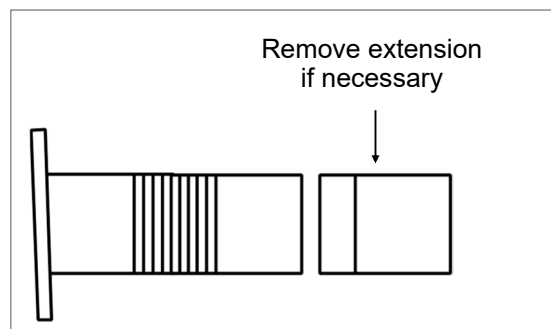


Figure 13

3. Install the Sleeve.

Attach the sleeve to the inside wall using 3 screws arranging the flange so that the marking "TOP" is at the top. The flange is offset 2° to allow the condensate drain to the outside.

Apply silicone sealing evenly around the perimeter of the outside sleeve to avoid water intrusion.

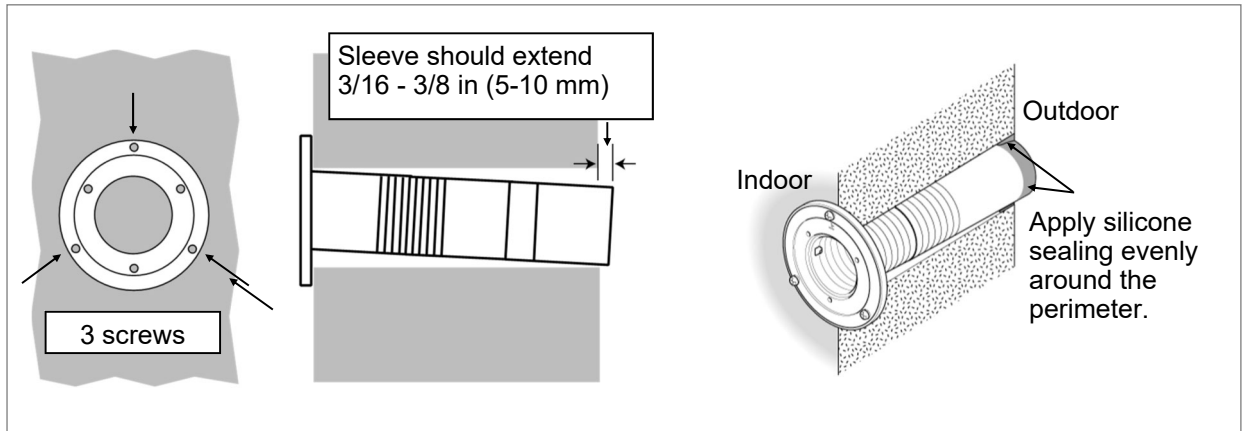


Figure 14

4. Install the Terminal.

Check that the terminal seal is in place. For weatherboard walls, add the second seal next to the terminal seal to compensate for weather board angle. Adjust the second seal to make sure "Top" marking of the second seal is located at the top or "Λ" marking is aligned with "V" marking on the terminal.

From the outside insert the terminal into the sleeve with the marking "TOP" at the top. The left hand side locking tie should be marked "LEFT".

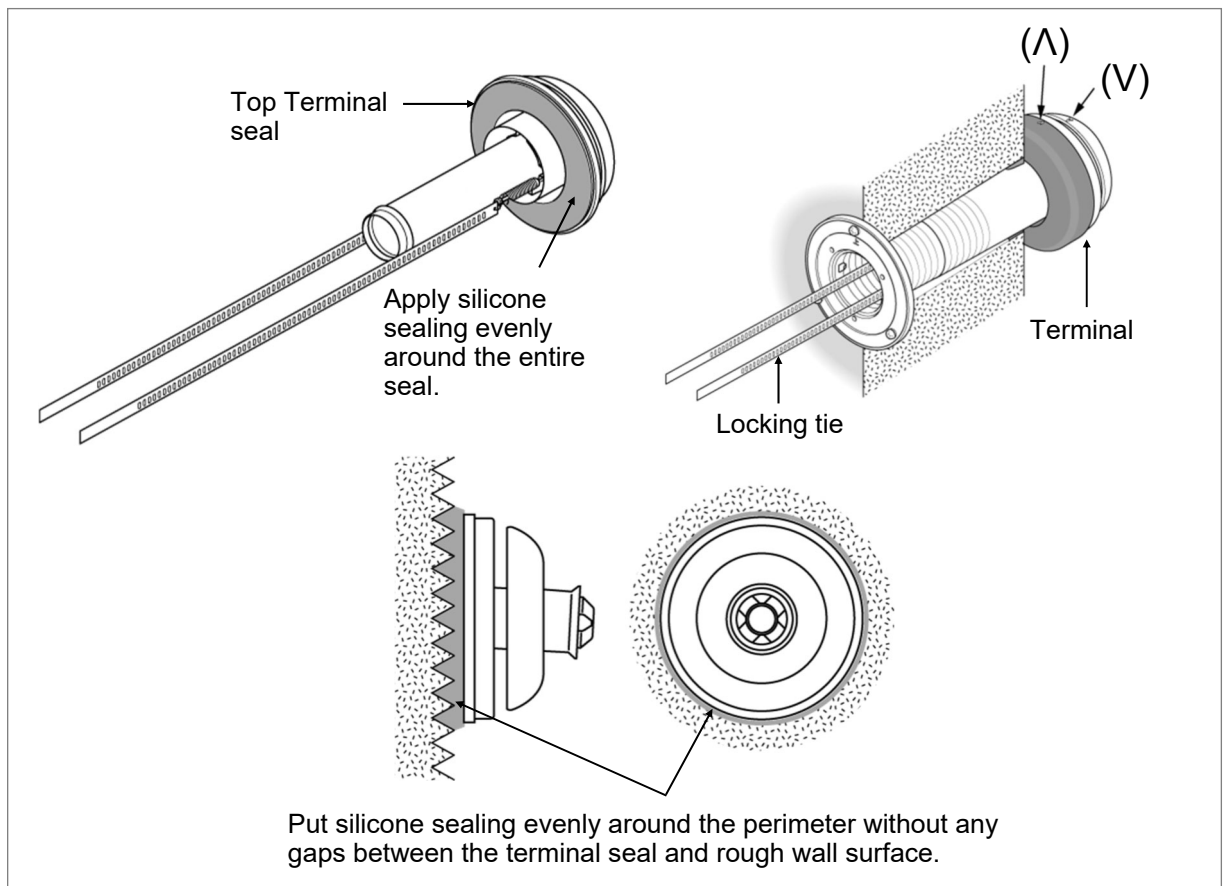


Figure 15

5. Lock the ties.

Pulling hard on the left and right hand ties, clip the ties over the notches inside the sleeve. You should be able to pull the ties 2 or 3 notches past the starting point. Cut the ties, leaving about 1 1/4 inch (30 mm) past the notch. Bend the ties back into the sleeve and parallel to the wall.

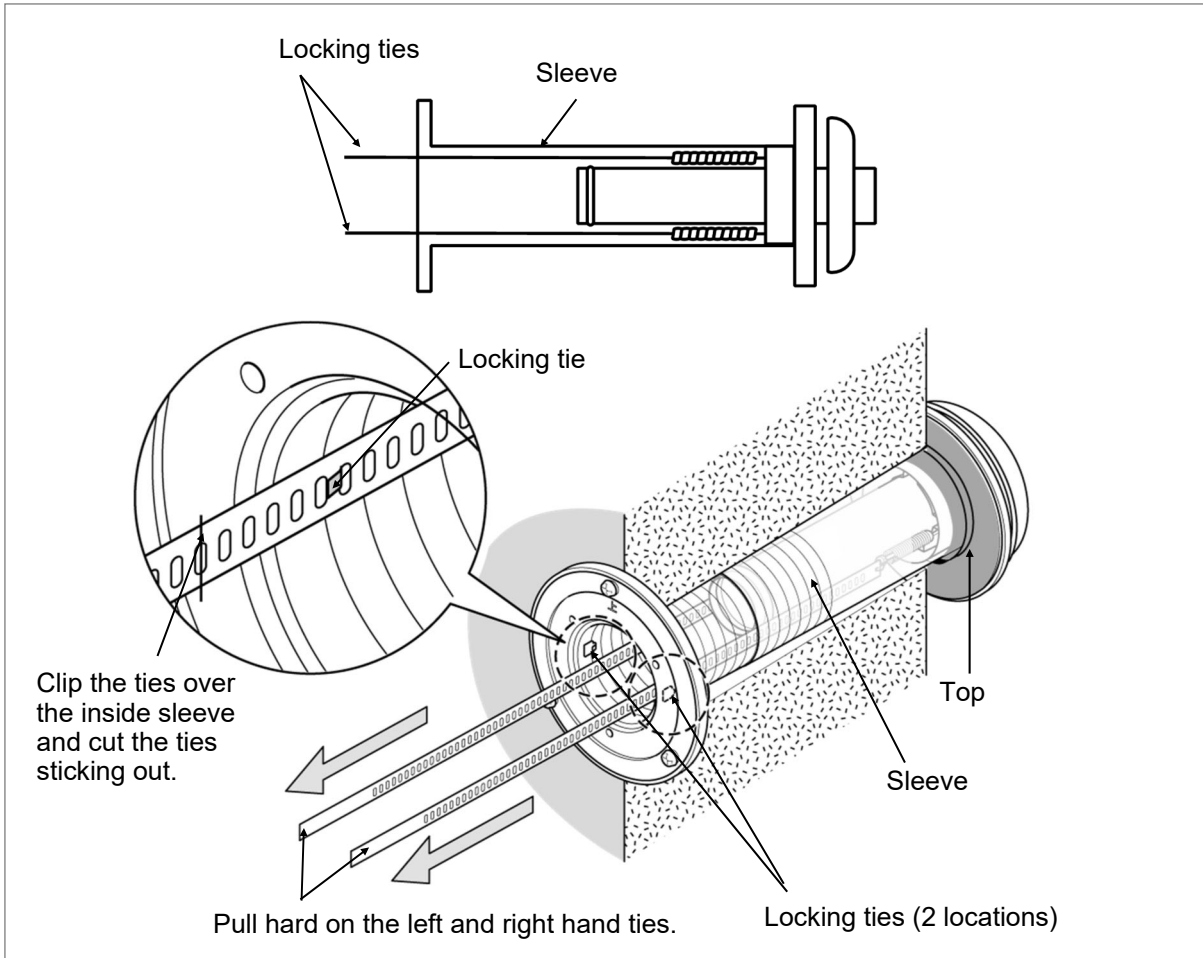


Figure 16

6. Insert Inside Connection Assembly.

Push the assembly into the terminal tube, ensuring that the seal is in place on the inner tube.

Attach the inside connection with 3 screws. The inner connection can still be turned to install the screws.

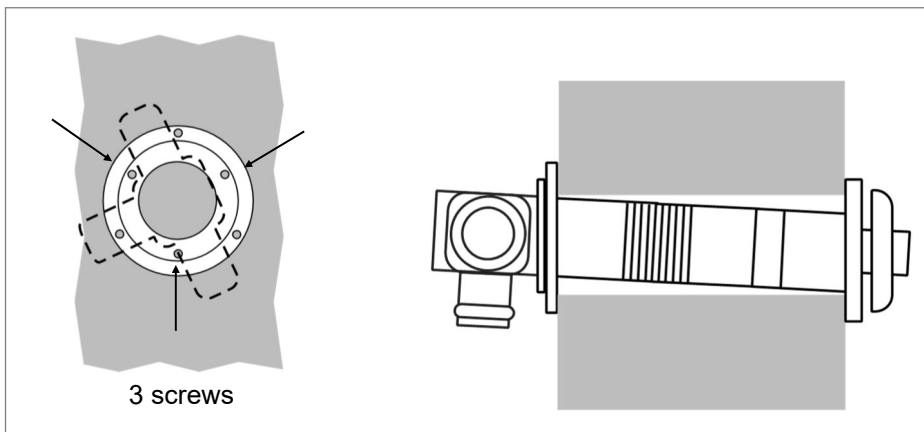


Figure 17

## 4.4.5 Install the Optional Extension Kit

Extension kits are available to extend the exhaust line and air intake hose between the manifold and direct vent furnace. Follow the steps in this section if the optional extension kit was purchased for your Direct Vent Furnace model.

### Extension Kit Contents

Verify the following contents are included in the extension kit:

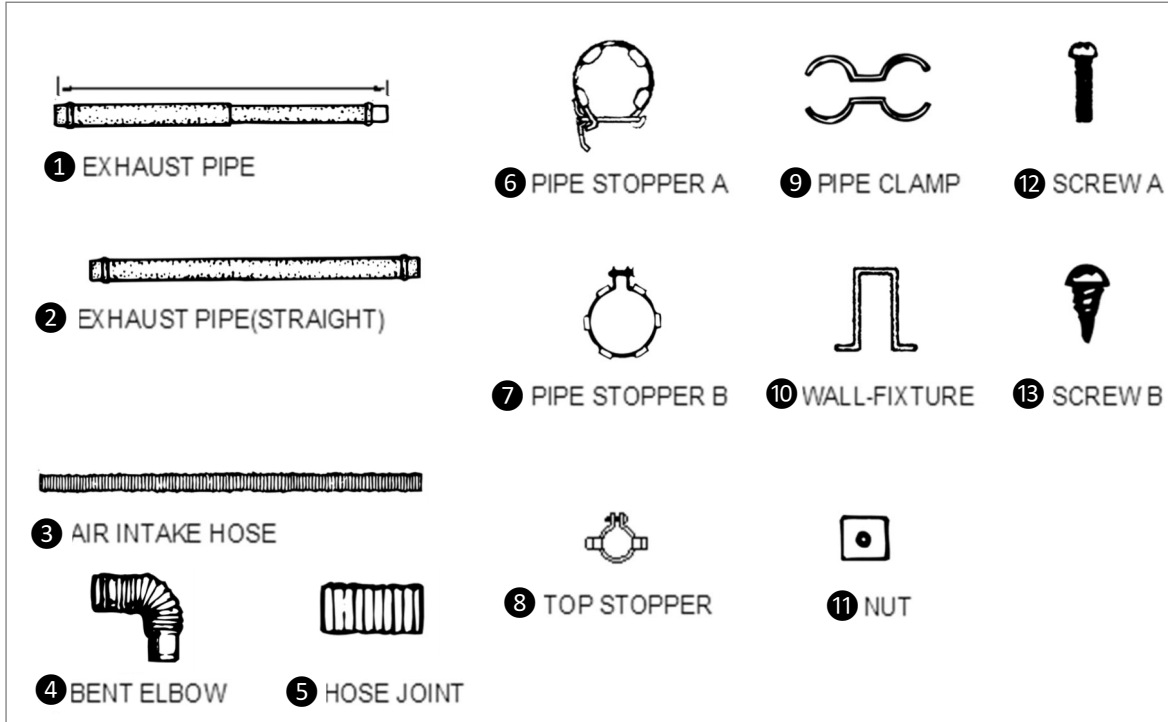


Figure 18

Table 7: Extension Kit Contents

Item	Description	Part Number	Extension Kit Part Number			
			FOT-102	FOT-103	FOT-114	FOT-115
1	Exhaust Pipe (adjustable) 12.2-21.1 in. (311-536 mm)	FOT 111-1	1			
1	Exhaust Pipe (adjustable) 21.9-40.4 in. (556-1,026 mm)	FOT 112-1		1	1	
2	Exhaust Pipe - 39.4 in. (1,000 mm)	FOT 114-3			1	
3	Air Intake Hose - 29.5 in. (750 mm)	RHF 1000-130-e	1			
3	Air Intake Hose - 51.2 in. (1.3 m)	RHF 1000-130-b		1		
3	Air Intake Hose - 90.6 in. (2.3 m)	RHF 1000-130-f			1	
4	Bent Elbow	FOT 025-4				1
5	Hose Joint	RFOT 226-001	1	1	1	
6	Pipe Stopper A	1001F-250	1	1	2	2
7	Pipe Stopper B	FOT 111-6	1	1	1	
8	Top Stopper	FOT 062-7	1	1	1	
9	Pipe Clamp	FOT 064-11	2 Sets	3 Sets	4 Sets	
10	Wall Fixture	FOT 064-12	2	3	4	
11	Nut	FOT 062-10	2	3	4	
12	Screw A	ZAA0420SC	2	3	4	
13	Screw B	CP-30408	4	6	8	

## Guidelines

1. The maximum vent length is 13 feet (4 m) with 3 bends. The bent pipe attached to the furnace does not count toward the max limit of 3 bends.
2. Horizontal sections should be sloped 3° to drain condensate. (3° equals 2/3 inch drop per foot of vent.) The direction should be to the outside (if local codes allow) or toward the furnace.
3. Do not allow any low points in the exhaust line where condensate will collect.
4. Vent extensions installed in unconditioned air space.
5. Clearances:
  - Exhaust pipe to combustibles: 1 in. (25.4 mm)
  - Exhaust pipe to non-combustibles: 0 in. (0 mm)

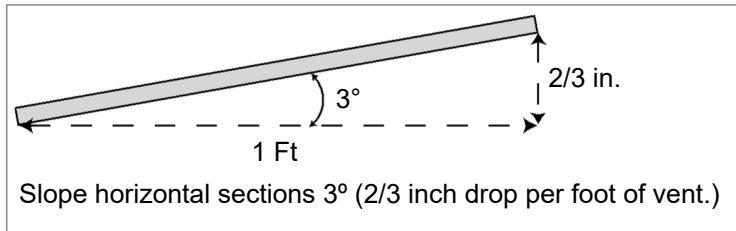


Figure 19

### NOTE

- The EX38DT is capable of two vent length settings:
- Short Vent: 0 - 7 ft + 1 elbow
  - Long Vent: 7 ft + 1 elbow - 13 ft + 3 elbows

## Configurations

### Correct Configurations

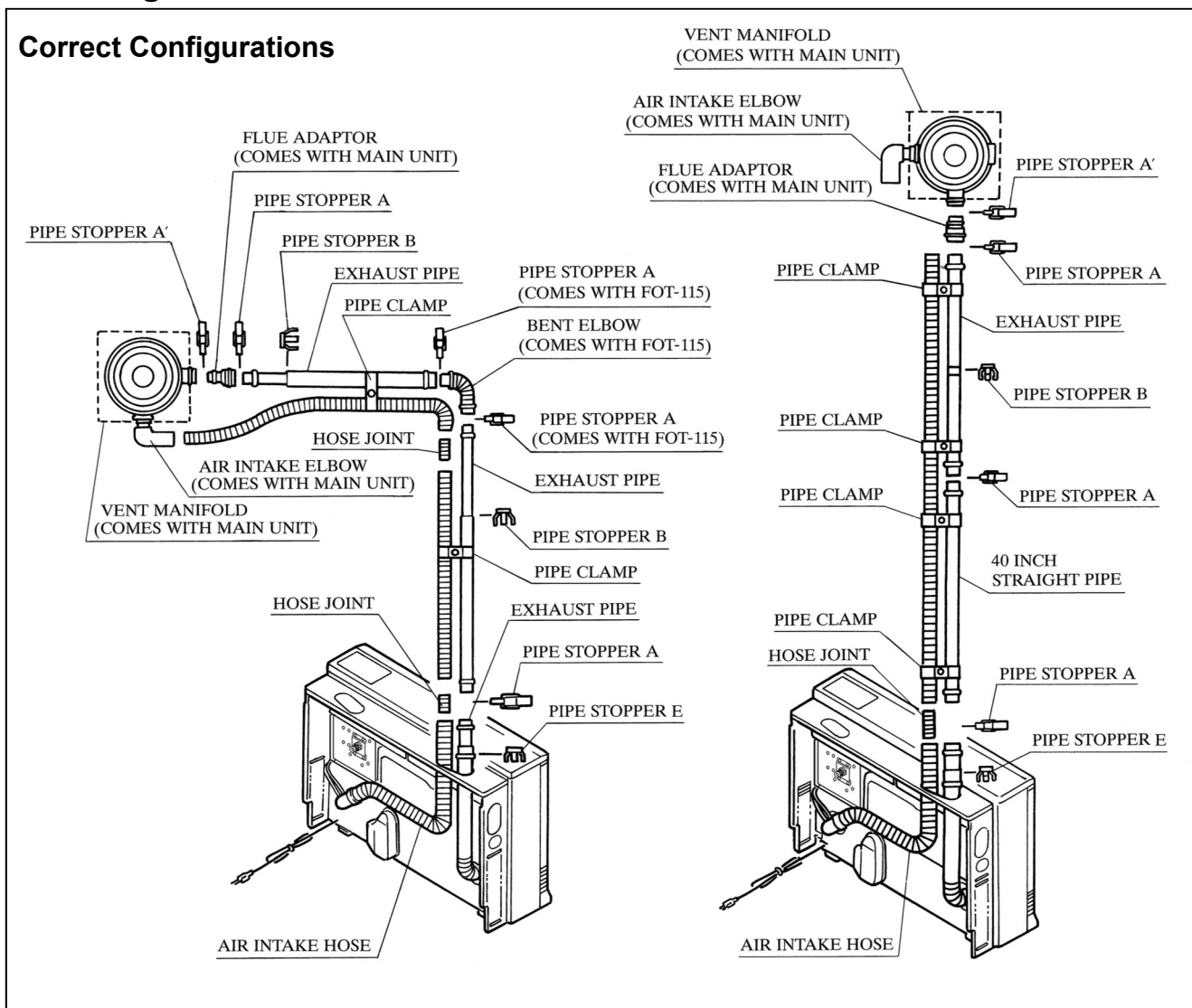


Figure 20

## Incorrect Configurations

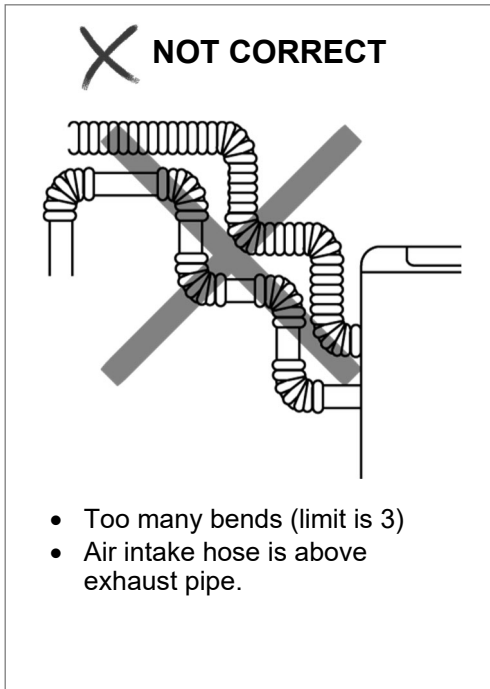


Figure 21

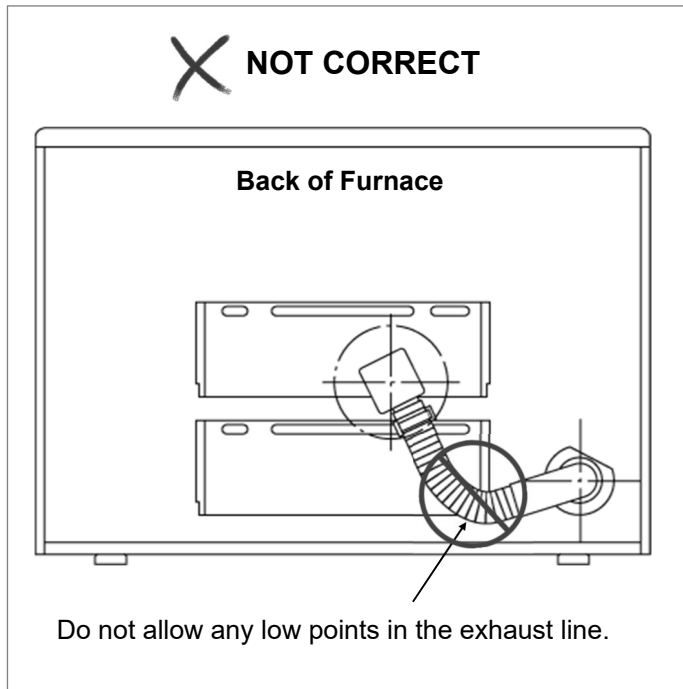


Figure 22

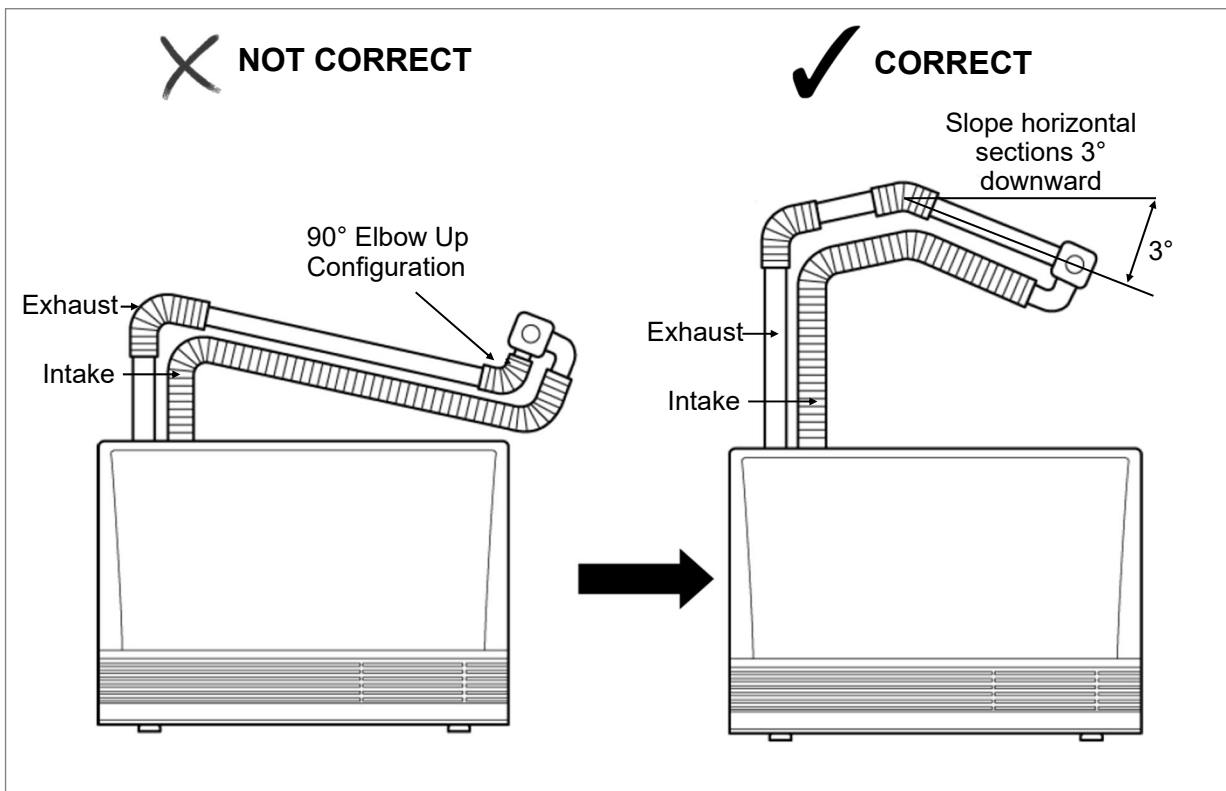


Figure 23

## Instructions:

### CAUTION

Use the pipe stoppers, connectors, clamps, and screws according to these instructions in order to ensure no leakage of exhaust gases.

#### 1. Install the Clamps:

Both the exhaust line and air intake hose are supported by clamps which are attached to the wall. A wall fixture can be used to offset the clamp from the wall. Use Screw B to attach the wall fixture to the wall. If the wall fixture is not used then use Screw A and the nut to attach the clamp to the wall.

The air intake hose should always be underneath the exhaust line so that in case the air line sags it will not come into contact with the exhaust line.

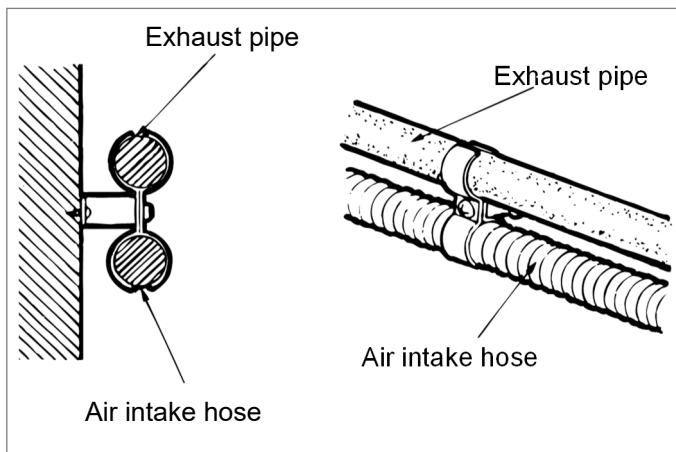


Figure 24

#### 2. Install the Exhaust Line:

The exhaust line is connected between the bent pipe at the rear of the furnace and the exhaust port on the flue manifold.

- To connect exhaust pipes with other straight pipes or bends, fit the male end into the female end. Use pipe stopper A to clamp the connection.
- Use pipe stopper B to fix the length on the adjustable exhaust pipes. Do not extend these pipes beyond the red line.
- Do not cut the exhaust pipe. Use the adjustable pipes if necessary.
- To bend the elbow, insert exhaust pipes into both ends for additional leverage. Bend to desired angle.
- Do not straighten the bent pipe attached to the furnace.

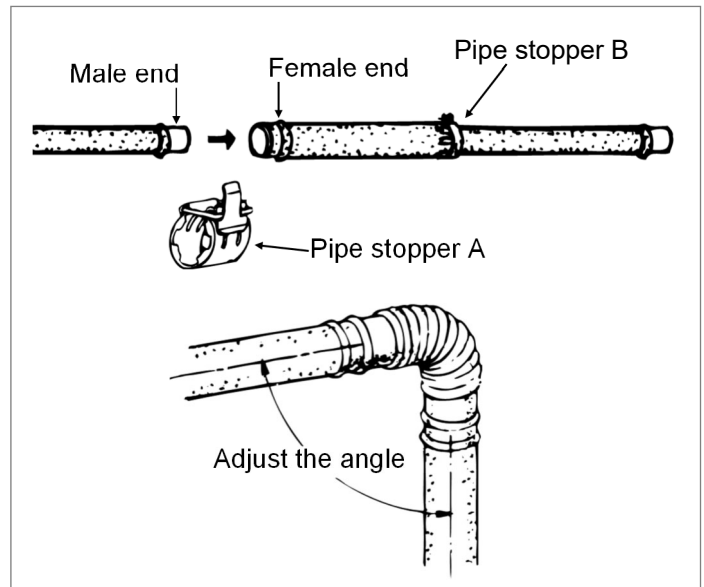


Figure 25

#### 3. Connect the Air Intake Hose:

The air intake hose is connected between the air connection at the rear of the furnace and the air intake port on the flue manifold.

Push the air intake hose onto the flue manifold and secure with the plastic cable tie.

Join air intake hoses by screwing the hose joint half of its length into the air intake hose and then screwing another air intake hose into the hose joint.

The lengths of the air intake hose and the exhaust pipe must be the same in order for the furnace to operate properly. The hose can be cut to the required length. Deburr all rough edges. Do not cut the hose attached to the furnace.

Support the air intake hose with pipe clamps.

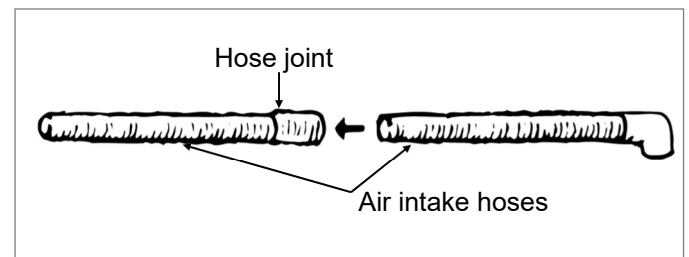


Figure 26

### NOTE

Do not cut the intake hose. Cutting the intake hose may result in noise.

## 4.4.6 Connect the Direct Vent Furnace

1. Attach flue adapter to the flue manifold with pipe stopper S.
2. Attach the air inlet hose to the flue manifold. Secure with plastic tie. The unused inlet is plugged with the rubber cap supplied on the manifold.

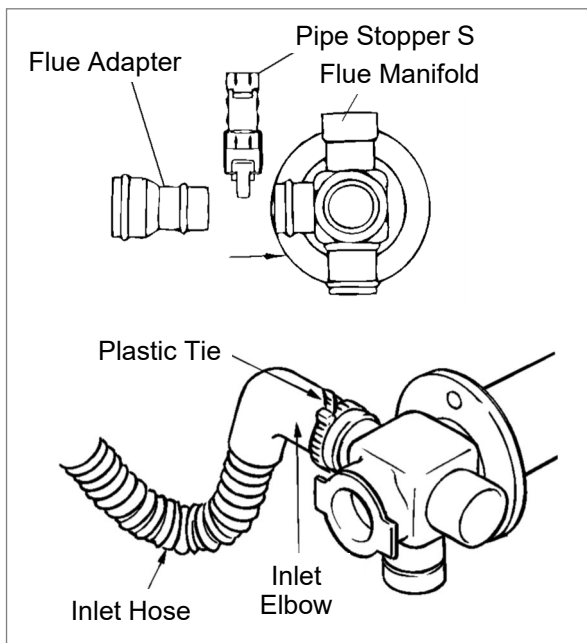


Figure 27

3. Connect the vent sliding tube with pipe stopper S and A.

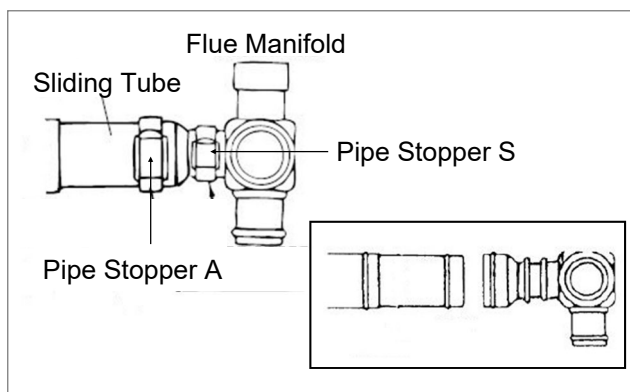


Figure 28

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

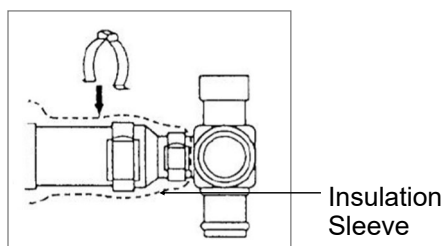


Figure 29

5. Attach the furnace to the wall brackets, using 2 screws at each bracket.

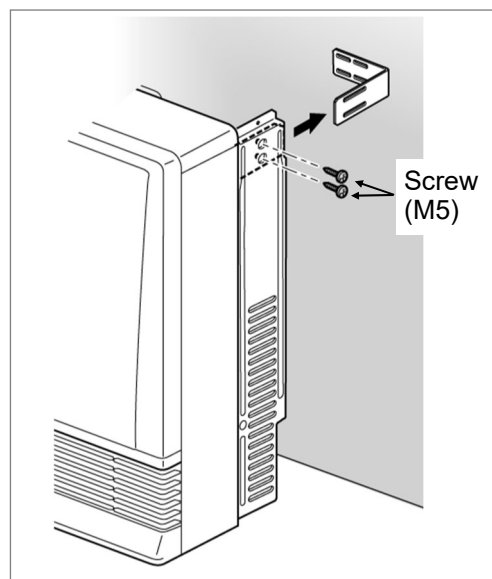


Figure 30

6. Attach the back spacer with 3 screws to the top of the furnace.

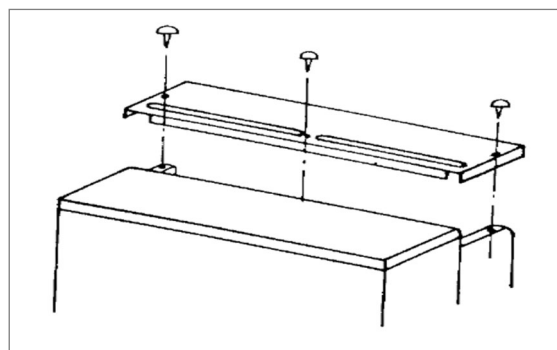


Figure 31

7. If necessary, the furnace can be leveled using the adjustable legs under the front right and left legs.

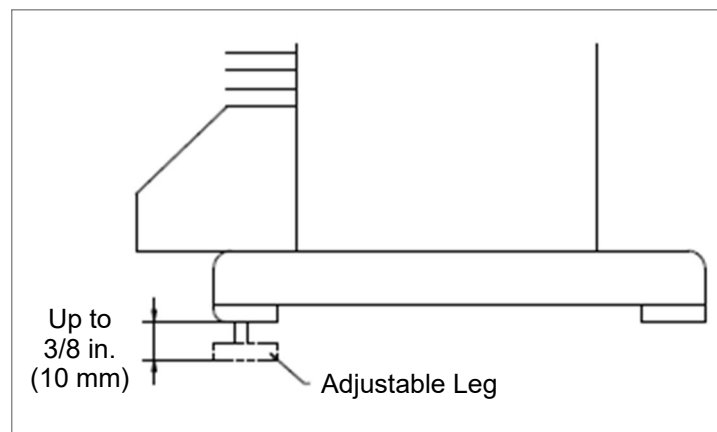


Figure 32



## 4.4.7 Connect the Gas

### WARNING

When connecting the gas valve or other gas components in the gas line, use a backup wrench to ensure the connection is gas tight.

- The gas supply line shall be gas tight, sized and so installed as to provide a supply of a gas sufficient to meet the maximum demand of the furnace without loss of pressure.
- A shut off valve and appliance connector valve should be installed in the upstream of the gas line to permit servicing.
- Flexible pipe and any appliance connector valve used for gas piping shall be types approved by nationally recognized agencies.
- Any compound used on the threaded joint of the gas piping shall be a type which resists the action of liquefied petroleum gas (propane).
- After completion of gas pipe connections all joints including the furnace must be checked for gas tightness by means of leak detector solution, soap and water, or an equivalent nonflammable solution, as applicable. (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 non-corrosive.)
- Check the gas supply pressure immediately upstream at a location provided by the gas company. Supplied gas pressure must be within the limits shown in section “3.2 Specifications.”
- Refer to an approved pipe sizing chart if in doubt about the size of the gas line.

## 4.4.8 Adjust the Gas Pressure Settings

Complete these instructions for altitude and vent length.

- Default altitude: 0 - 2,000 ft.
- Default vent length: 0 - 7 ft. + 1 Elbow
- For altitudes greater than 2,000 ft or installations with vent lengths longer than 7 ft, refer to Table 8: Gas Pressure on the next page.

For high altitude installations in Canada, the conversion shall be carried out by a manufacturer's authorized representative, in accordance with the requirements of the manufacturer, provincial or territorial authorities having jurisdiction and in accordance with the requirements of CAN/CGA-B149.1 or CAN/CGA-B149 installation codes.

### CAUTION

- Do not touch any other areas on the PC board besides the “SW” switches while power is supplied to the furnace. Parts of the PC board are supplied with 120 volts AC.
- Do not insert hands or objects into the circulation fans while they are running. Injury or mechanical malfunction may occur.
- Do not touch the areas at or near the exhaust. This area becomes very hot and could cause burns.

### IMPORTANT

The regulator has been factory pre-set. If the pressure is incorrect, contact Rinnai technical support.

## Instructions:

1. Turn off the gas and the power supply.
2. Remove the 3 screws that hold the front panel. Lift the panel straight up and then remove.
3. Remove test port screws (1/8 NPT tap) with 3/16 Allen wrench located at gas valve and burner cover. Install two 1/8 in. barb fittings (field-supplied). Attach dual port manometer to the test ports as shown. Ensure that the manometer is properly calibrated.
4. Turn on the gas and power supply to the furnace.
5. Ensure “Set Back” feature has been deactivated. (“Set Back” feature is active by default.)
6. With the unit in the Off position, press the Test Switch at the bottom, right of PC board until it beeps.
7. Select the correct code for gas type, altitude, and vent length on the LED display using ▲ and ▼ buttons. Refer to the table below.

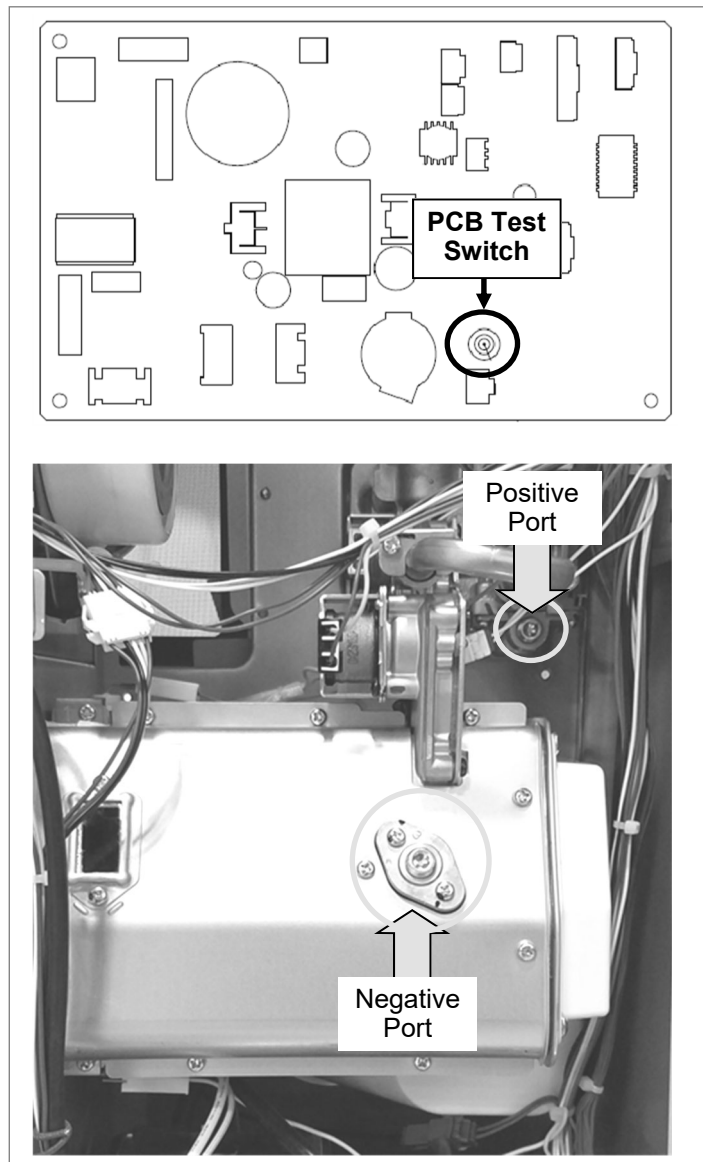


Figure 33

Table 8: Gas Pressure

Code	Natural Gas				Propane Gas			
	A1 / A5	A2 / A6	A3 / A7	A4 / A8	L1 / L5	L2 / L6	L3 / L7	L4 / L8
Altitude	0-2,000 ft 0-610 m	2,001-5,400 ft 611-1,646 m	5,401-7,800 ft 1,647-2,377 m	7,801-10,200 ft 2,378-3,109 m	0-2,000 ft 0-610 m	2,001-5,400 ft 611-1,646 m	5,401-7,800 ft 1,647-2,377 m	7,801-10,200 ft 2,378-3,109 m
Manifold test pressure - W.C. Low	1.69 in. (43 mm)	1.59 in. (40 mm)	1.49 in. (38 mm)	1.43 in. (36 mm)	3.21 in. (82 mm)	3.01 in. (76 mm)	2.85 in. (72 mm)	2.73 in. (69 mm)
Manifold test pressure - W.C. High	3.8 in. (96 mm)	3.0 in. (76 mm)	2.7 in. (68 mm)	2.5 in. (62 mm)	6.4 in. (162 mm)	5.6 in. (143 mm)	5.1 in. (129 mm)	4.6 in. (116 mm)

8. Press the Test Switch twice to enter the gas code into memory.

**The LED display turns blank and the unit returns to the normal off mode. You are now ready to program your correct low fire and high fire gas pressure setting. Follow the procedure below for setting the manifold gas pressure. Do not adjust gas pressure on this furnace using the screw on top of the gas valve.**

9. Press the ON/OFF button to operate the furnace.
10. Press the Test Switch twice to change to the low pressure mode. The LED will display "PL".
11. Compare the pressure reading on the manometer to the desired manifold test pressure (low) for your gas type, altitude and vent length. If necessary adjust the low fire pressure using the ▲ and ▼ buttons.
12. Press the Test Switch. The LED will display "PH" indicating high fire mode.
13. Compare the pressure reading on the manometer to the desired manifold test pressure (high) for your gas type, altitude and vent length. If necessary adjust the high fire pressure using the ▲ and ▼ buttons.
14. Press the ON/OFF button again. The LED display turns blank and the furnace returns to the normal OFF mode.
15. Remove manometer and two barb fittings, and install Allen head screws. Operate the unit and follow steps A, B, and C below.

**A. Check for Gas Leaks at the Test Points.**

**B. Check the Normal Operating Sequence:**

When you press the ON/OFF button, the LED display will illuminate, the combustion fan will begin to run, and the spark will ignite the main burner.

This furnace has an automatic ignition system. When the main burner has lit, the combustion lamp will glow red, and the spark will stop.

**C. Visually Inspect the Flame:**

Check that the burner flames are operating normally. The flame can be seen through the circular window.

When operating normally the burner flame should appear as long, clear, blue, stable, streaks. Yellow flames or an orange color is abnormal and maintenance is required.

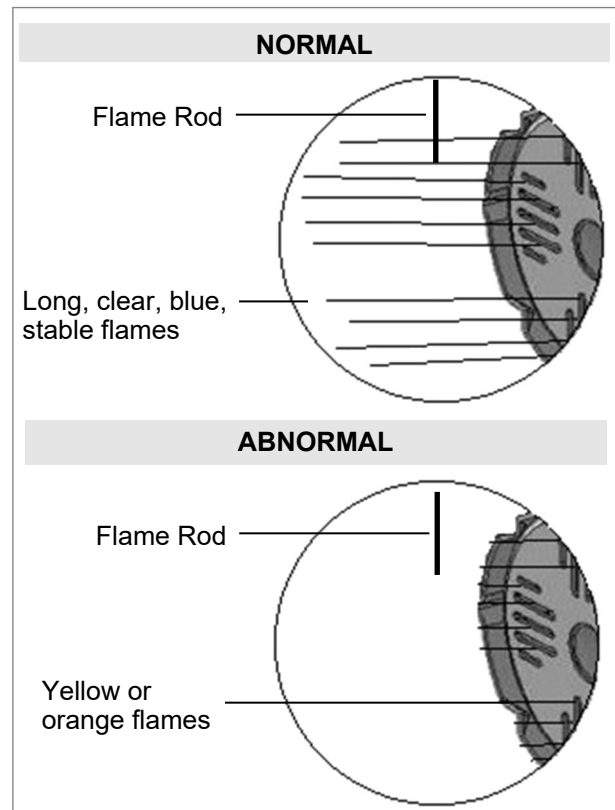


Figure 34: Normal and Abnormal Flames

16. Install the front panel.
17. If doing a gas type conversion, place the new conversion rating plate (label) on the front cover.

## 4.5 Post-Installation Checklist

Complete the following checklist when installation is complete. You should be able to answer YES to each question. If you answer NO to any question, installation is not complete. Refer to the applicable section in this manual for additional information. For assistance, contact your local dealer or distributor, or call Rinnai Customer Care at 1-800-621-9419.

<b>INSTALLATION LOCATION</b>	<b>YES</b>	<b>NO</b>
Have you verified the unit and vent termination meet the clearance requirements?	<input type="checkbox"/>	<input type="checkbox"/>
<b>COMBUSTION AIR AND VENTING</b>	<b>YES</b>	<b>NO</b>
Have all corrosive compounds been removed from around the direct vent furnace?	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct venting products for the installed model being utilized? Have you completely followed the installation instructions in this manual?	<input type="checkbox"/>	<input type="checkbox"/>
Have you verified the vent system does not exceed the maximum length for the number of elbows used?	<input type="checkbox"/>	<input type="checkbox"/>
<b>GAS SUPPLY</b>	<b>YES</b>	<b>NO</b>
Has a manual gas control valve been placed in the gas line to the furnace?	<input type="checkbox"/>	<input type="checkbox"/>
Have you checked the gas lines and connections for leaks?	<input type="checkbox"/>	<input type="checkbox"/>
Have you confirmed that the gas inlet pressure is within limits?	<input type="checkbox"/>	<input type="checkbox"/>
Did you confirm that the furnace is rated for the gas type supplied?	<input type="checkbox"/>	<input type="checkbox"/>
Have you verified the system is functioning correctly by connecting your manometer to the gas pressure test port on the furnace?	<input type="checkbox"/>	<input type="checkbox"/>
Did you operate all gas appliances in the home or facility at high fire?	<input type="checkbox"/>	<input type="checkbox"/>
Did you verify that the inlet gas pressure at the furnace did not drop below that listed on the rating plate?	<input type="checkbox"/>	<input type="checkbox"/>
<b>ELECTRICITY</b>	<b>YES</b>	<b>NO</b>
Did you confirm that the electricity is supplied from a 120 VAC, 60 Hz power source, is in a properly grounded circuit, and turned on?	<input type="checkbox"/>	<input type="checkbox"/>
Have you confirmed that an extension cord or an adapter plug has NOT been used with the furnace?	<input type="checkbox"/>	<input type="checkbox"/>
<b>FINAL ITEMS</b>	<b>YES</b>	<b>NO</b>
Did you install the front panel?	<input type="checkbox"/>	<input type="checkbox"/>
Have you explained to the customer the importance of not blocking the vent termination?	<input type="checkbox"/>	<input type="checkbox"/>
Have you explained to the customer the operation of the furnace, safety guidelines, maintenance, and warranty?	<input type="checkbox"/>	<input type="checkbox"/>
Did you leave the manual with the customer?	<input type="checkbox"/>	<input type="checkbox"/>
Does the installation conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1? If installed in a manufactured home, the installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280 and/or CAN/SCA Z240 MH Series, Mobile Homes.	<input type="checkbox"/>	<input type="checkbox"/>

# 5. Operation

## Topics in this section

- Safety Precautions
- Operating Instructions
- Control Panel
- Basic Operation Settings
- Add Water to the Humidifier
- Adjust Air Flow Direction
- Restart Function
- Diagnostic Codes

## 5.1 Safety Precautions

### **WARNING**

- **If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.**
- **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 licensed professional.**

### **WARNING**

- Keep the area around the furnace clear and free from combustible materials, gasoline, and other flammable vapors and liquids.
- Do not use this furnace if any part has been under water. Immediately call a trained and qualified professional to inspect the furnace and to replace any part of the control system and any gas control which has been under water.
- Do not operate furnace with the panels removed, cracked or broken.

### **CAUTION**

- Do not block the warm air discharge. Do not allow anyone to sleep directly in front of the furnace.
- Children and adults should be alerted to the hazards of high surface temperature and should stay away to avoid burns or clothing ignition.
- Young children should be carefully supervised when they are in the same room as the furnace.
- Clothing or other flammable material should not be placed on or near the furnace.
- Any safety screen or guard removed for servicing must be replaced prior to operating the furnace.
- Do not insert items into the louvers.
- Do not spray aerosols near the furnace while it is operating. Most aerosols contain butane gas which is flammable.
- Do not unplug the furnace while it is operating or while the fans are on.
- Do not use bare hands to touch the front louvers due to high temperatures which may cause burns.
- Wear hand protection when touching the side back covers, front louver, and rear intake for the convection fan.
- Prevent dust from accumulating on the power cord, side covers, and parts behind the furnace.
- Do not sit on the furnace.
- Do not place containers of liquid on top of the furnace. Water spillage can cause extensive damage to the furnace and may result in electric shock.



## 5.2 Operating Instructions

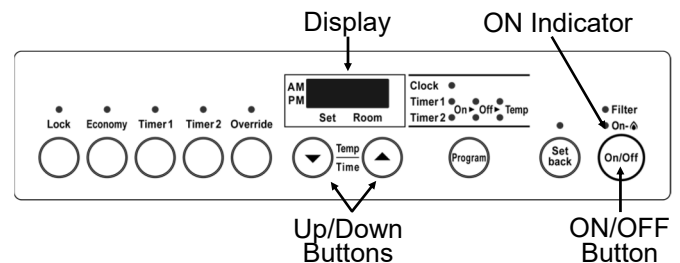
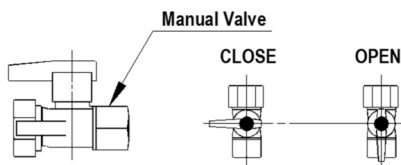
### FOR YOUR SAFETY READ BEFORE OPERATING

**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 to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, do not 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

1. **STOP!** Read the safety information above.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance using the ON/OFF button on the control panel.
4. 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.
5. Turn Manual valve clockwise  to the full OFF position.
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas go to the next step.
7. Turn the manual gas valve counterclockwise  to the full ON position.
8. Turn on all electric power to the appliance using the ON/OFF button.
9. Set the thermostat to desired setting.
10. Burner is lit when indicator lamp "ON" turns red.
11. "ON" indicator is lit and fault code 11 flashes when burner fails to ignite.
12. If the appliance will not operate, follow the instructions "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. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed (Using the ON/OFF button located on control panel.)
3. Locate the manual gas valve.
4. Turn the 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.

## 5.3 Control Panel

The direct vent furnace includes a controller integrated into the front cover. Each feature on the control panel is described in the following sections.

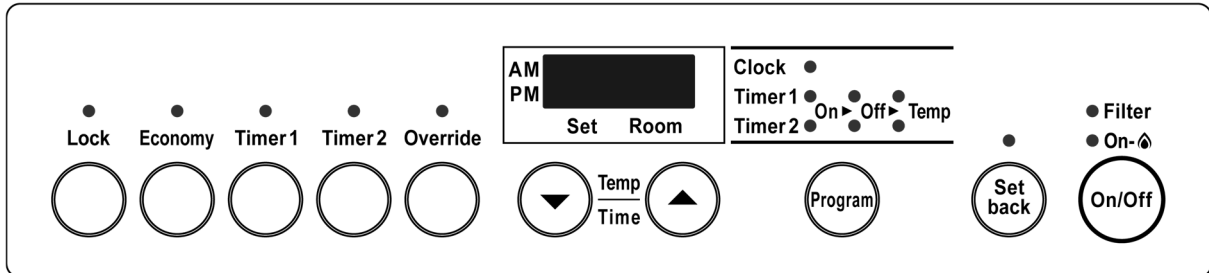


Figure 35: Control Panel

### Sensible Temperature Control

The sensible temperature control feature allows 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 temperature setting quickly.

Occasionally, the room temperature may briefly exceed the temperature setting due to the layout of the room or heating area.

### Display

After the furnace is turned on and begins operating, the display will dim. The display will turn off when the furnace is turned off. While programming the timers the display will turn off several seconds after a button is last pushed.

### Fahrenheit or Celsius

Note: The factory default is °F.

1. The furnace must be turned off.
2. Press the Timer 1 and Timer 2 button at the same time for about 5 seconds. The display will show "°C" or "°F".
3. Use the arrow keys to select the temperature scale.
4. Press the ON/OFF button.

## 5.4 Basic Operation Settings

### 5.4.1 On/Off

Press the ON/OFF button to operate the furnace. The ON indicator will glow green. Once the burner ignites the ON indicator will glow red. When the furnace warms up, the fan will automatically start.

To turn the furnace off, press the ON/OFF button. The ON indicator light will go out. The fan will continue to operate for several minutes after the burner has gone out in order to cool the furnace. Do not unplug the furnace while the fan is running.

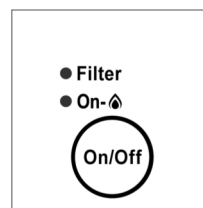


Figure 36

## 5.4.2 Lock

The Lock feature will help to prevent accidental operation of the furnace and to prevent children from operating the furnace.

To activate Lock, press the Lock button. The indicator will light and a beep will sound.

To deactivate Lock, press the Lock button and hold for about 2 seconds. The indicator light will go out and a beep will sound.

- The lock can be activated when the furnace is ON or OFF.
- If activated while the furnace is ON, all controls other than the OFF switch will be locked.
- If activated while the furnace is OFF, then all controls will be locked.
- If the furnace is turned off while the Lock is activated, it cannot be turned on again until the lock is deactivated.
- Deactivating the lock releases the control buttons.

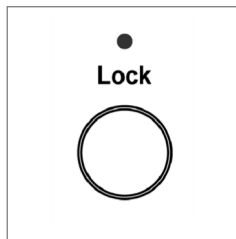


Figure 37

## 5.4.3 Set the Clock

1. Press the “Program” button.



Figure 38

2. The light next to “Clock” should be flashing. Press the up and down arrows to set the time. Holding down either of the arrow keys will change the time more quickly.

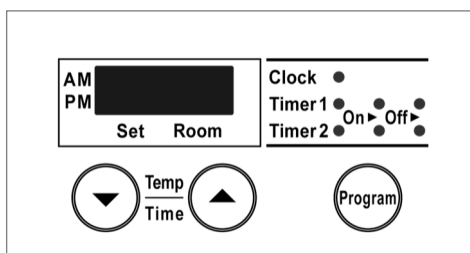


Figure 39

3. Press the “Program” button until none of the time options are flashing.



Figure 40

## 5.4.4 Operate the Furnace Manually

1. Turn the furnace on by pressing the “ON/OFF” button.
2. Press the up or down arrows to set the temperature. The left side of the display shows the temperature setting. The right side of the display shows the room temperature.

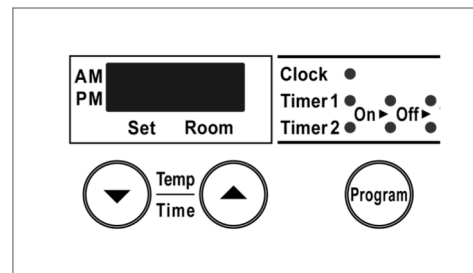


Figure 41

The thermostat automatically modulates the burner and the fan to maintain the temperature setting.

The temperature settings available are:

- L - burner is on minimum combustion
- 60-80°F (16-26°C) in 2°F (1°C) Increments
- H - burner is on maximum combustion



## 5.4.5 Remote Thermostat Mode (Optional Accessory)

A remote thermostat can be installed for the furnace with the Remote Thermostat Installation Kit (Part # 204000045 for US installations, Part # 204000048 for Canadian installations). Once installed, the furnace must be placed in Remote Thermostat mode by following the steps below:

1. Ensure the furnace is plugged in but is turned **OFF**.
2. Ensure the **Set back** feature is turned **OFF**.
3. Press and hold the **Economy + Up + Program** buttons for 2.5 seconds and then release (**00** appears in the display).
4. Press the **UP** button (**01** appears in the display).
5. Press the **ON/OFF** button; the display will go blank. The furnace is now in Remote Thermostat mode.

### ➔ IMPORTANT

Do not unplug the furnace within two hours of entering Remote Thermostat mode. This will cause the furnace to revert back to the Default Factory Setting.

**Note:** To return the furnace back to Control Panel mode, repeat steps 1-3. At step 4, press the **UP** button until **02** appears in the display. Next, press the **ON/OFF** button; the display will go blank. The furnace is now in Control Panel mode.

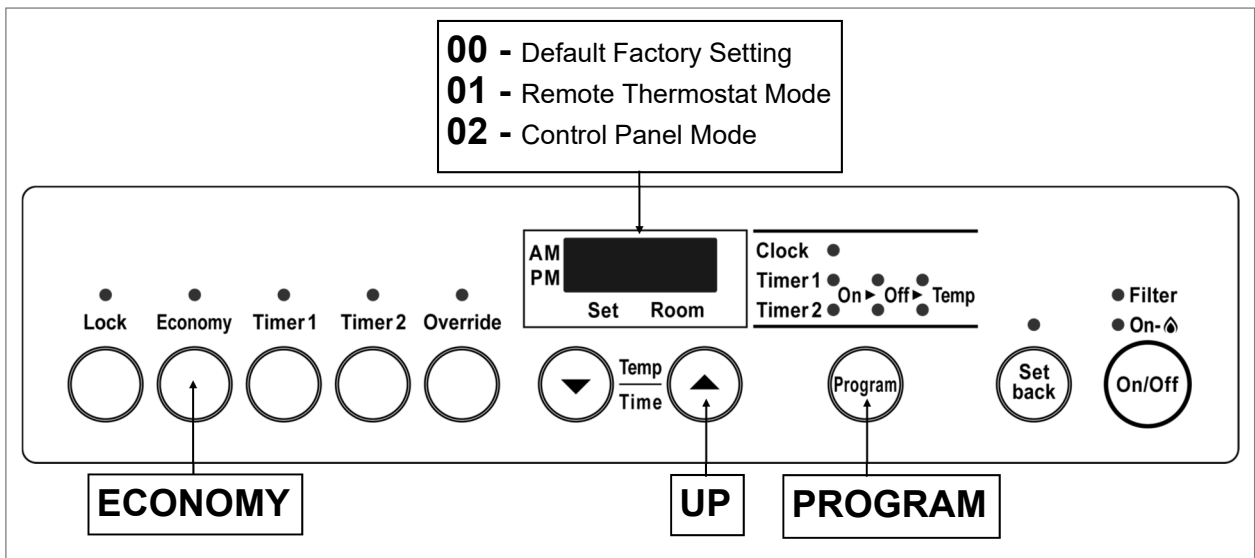


Figure 42

### ➔ IMPORTANT

**DO NOT** place furnace into **01 (Remote Thermostat Mode)** without wall thermostat connection components. Failure to do so may cause improper operation of the unit.

The following buttons/indicators on the control panel will remain functional in either mode:

- ON/OFF Button
- FILTER Indicator
- ON Indicator
- DISPLAY (The DISPLAY will be blank except in the event of an error code. All error codes will show on the DISPLAY in either mode. Error codes will not show on the remote thermostat even when in remote thermostat mode.)

### ➔ IMPORTANT

The remote thermostat will **NOT** control the furnace's ability to power on or power down. This must still be done by using the **ON/OFF** button of the furnace.

## 5.4.6 Setting and Operating the Timers

Confirm the clock is correct.

NOTE: The clock will have to be reset in case of a power failure. However the timers will retain their settings.

The furnace will start before the programmed starting time in order to heat the room by the programmed starting time.

The timers can be set while the furnace is on or off. To operate the timer, the furnace must be on.

### Setting the timers:

1. Press the “Program” button twice to set Timer 1.



Figure 43

2. The light next to “Timer 1 on” should be flashing. Press the up or down arrows to set the start time. Holding down either of the arrow keys will change the time more quickly.

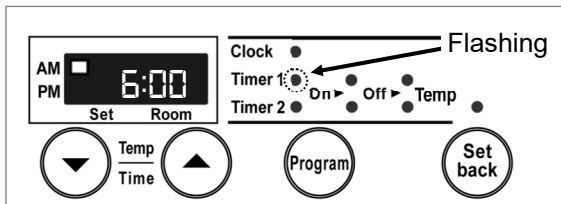


Figure 44

3. Press the “Program” button again so that the Timer 1 off position is flashing. Press the up or down arrows to set the end time. Holding down either of the arrow keys will change the time more quickly.

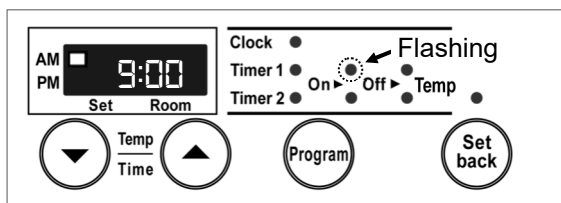


Figure 45

4. Press the “Program” button again so that the Timer 1 Temp Position is flashing. Press the up or down arrows to set the temperature.

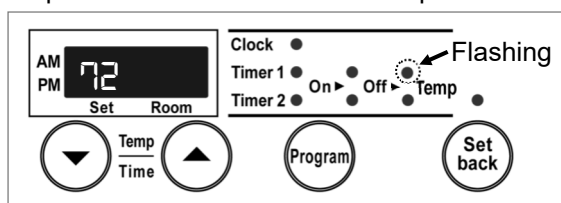


Figure 46

5. Press the “Program” button again to set the times for Timer 2. Follow the same steps above to set the start and end times.
6. Press the “Program” button until none of the time options are flashing up.

### Operating the timers:

To operate the furnace using a Timer, press the ON/OFF button and the appropriate Timer button. The furnace will operate from the start to end times you have entered for that Timer. It will operate at the temperature setting that has been set for the furnace. The timer can be set while the furnace is operating.

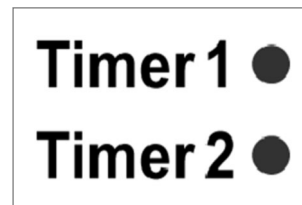


Figure 47

While in standby, the timer LED will be on with a solid light. When operating the LED will be flashing.

## 5.4.7 Override Function

This function is used only when the furnace is in Timer operation.

It allows you to “override” the reset timer setting until the beginning of the next Timer period.

For example, if the furnace is ON, pressing the “Override” button will turn the furnace OFF until the next period. If the furnace is OFF, pressing the “Override” button will turn the furnace ON, and allow you to select a temperature setting, until the next period. The furnace will remain on until the next timer period or until the Override function is turned off.

When in override function, pressing the “Override” button will return the furnace to the operation of the current timer period.

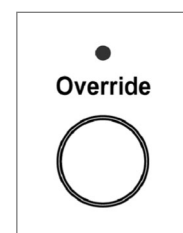


Figure 48

## 5.4.8 Economy (Energy Saving Mode)

The Economy mode can only be set while the furnace is operating (heating). Once it is set, it will remain in the system memory until deactivated.

1. To turn the Economy mode on, press the "Economy" button. The Economy indicator is lit.

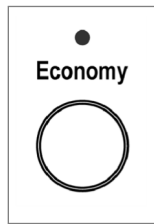


Figure 49

- The Economy mode now remains in the system memory.
  - If the furnace is turned off manually, or stops heating as a result of an OFF timer period, the "Economy" indicator will go out.
  - Whenever the furnace starts heating again, the "Economy" indicator will light.
2. To turn the Economy mode off, press the "Economy" button. The "Economy" indicator will go out.
    - The Economy mode can only be turned off while the furnace is operating (heating) and when the "Economy" indicator is lit.

### Economy Mode Information

After the room is heated initially, the air temperature may be dropped to a lower level without affecting comfort. The Economy Mode reduces the temperature by 2 °F, 30 minutes after the room temperature setting is reached. After another 30 minutes, it reduces the temperature setting by another 2 °F, effectively saving energy. The room temperature setting will drop up to a total of 4 °F.

The Economy Mode will not operate if the furnace is under capacity for the room size.

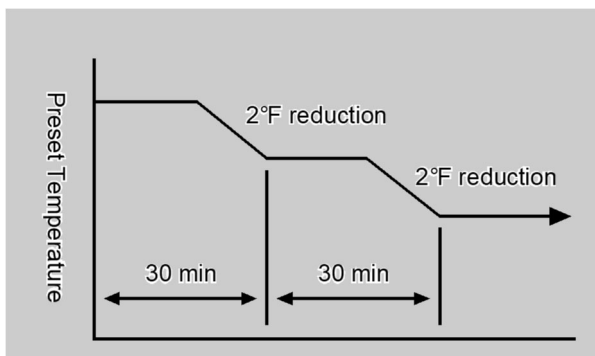


Figure 50: Economy Mode

## 5.4.9 Set Back

This function allows a minimum room temperature to be pre-set, between 38°F and 78°F (in 1°F increments) This temperature should be set below the room temperature setting. The default setting is 60°F. Once the Set back function is selected the furnace will start heating whenever the room temperature falls below the selected temperature, regardless of timer or manual settings.

Follow these steps to set and operate the Set back feature:

1. Make sure the furnace is turned OFF.

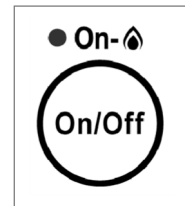


Figure 51

2. Press the "Set back" button. The light above the button will come on.

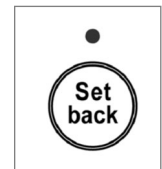


Figure 52

3. Press the up and down buttons to set the minimum temperature.

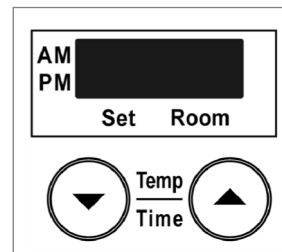


Figure 53

When the "Set back" indicator is on, frost protection is operating, and will always prevent the room temperature from falling below the pre-set minimum temperature (as long as electric power and gas is supplied).

To turn this feature off, press the "Set back" button.

The unit will retain its ON or OFF setting after a power failure. (Default setting at the factory is on.)

### IMPORTANT

The Set Back feature is intended to prevent the installation location from falling below a specified temperature. It is not intended as an alternate thermostat, but rather a preventative measure against freezing.

## 5.5 Add Water to the Humidifier

### CAUTION

Do not fill the tray while the furnace is in operation. Close the door after filling. The humidifier tray and surrounding area are hot when the furnace is on.

To fill the tray, open the door as shown in the illustration and pour water into the tray up to the Max Fill Line using the spout built into the door. The air will be humidified as it passes over the water in the tray.

During operation a small amount of condensation is produced in the flue system and drains into the humidifier tray.

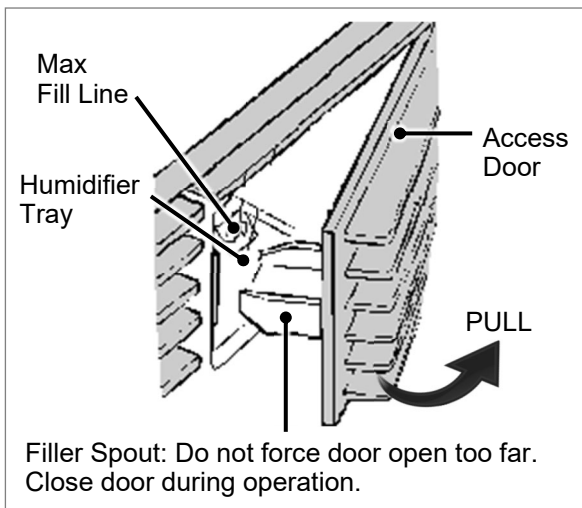


Figure 54

## 5.6 Adjust Air Flow Direction

### CAUTION

Do not adjust the air flow louvers while warm air is flowing.

The vertical louvers may be adjusted to move the air flow more to the right or to the left.

Use a screw driver or similar object to bend each louver to the desired position.

Do not bend repeatedly (no more than 5 times) or else the louver may break.

The horizontal louvers (which determines the vertical air flow direction) are fixed and cannot be adjusted.

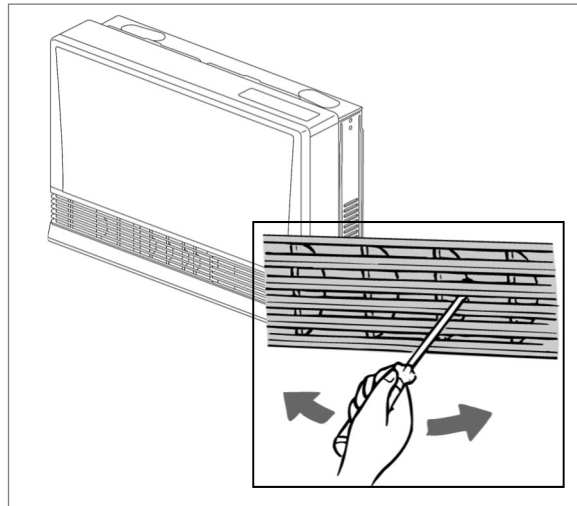


Figure 55

## 5.7 Restart Function

If there is a power failure while the furnace is on, then the furnace will start automatically when the power is restored.

If the furnace fails to ignite, the furnace will attempt ignition after 1 hour. The "Ignition Failure" fault code, 11, will appear during that hour and disappears after a successful ignition. If ignition fails again, then the fault code will remain and another attempt to ignite will occur in 1 hour. The fault code is not stored in the fault code history.

If the flame is extinguished during forced combustion then the furnace will attempt ignition after 1 hour. The "Ignition Failure" fault code, 11, will appear during that hour and disappears after a successful ignition. Forced combustion takes place for about 40-80 seconds after ignition. After this time, the temperature control logic controls the combustion.

If the flame is extinguished (burner combustion failure) while the temperature control logic is operating the furnace, then the furnace will immediately attempt ignition. No fault code will appear.

In summary, if the ignition fails or the flame is extinguished during forced combustion then the furnace will attempt to restart after 1 hour. If the flame is extinguished after this period then the furnace will immediately attempt ignition.

## 5.8 Diagnostic Codes

If there is a malfunction the furnace may shut down as a safety precaution and display a fault code to assist in diagnosing the problem. The fault code will flash in the display on the control panel. When making a service call, this code will assist with diagnosing the fault.

You may be able to clear the fault code by turning the furnace off and then on again. If the fault code remains or returns on the next operation, contact Rinnai or your nearest service agent and arrange for a service call.



### WARNING

Some of the checks below should be performed by a trained and qualified professional. Consumers should never attempt any action that they are not qualified to perform.

Table 9: Diagnostic Codes

CODE DISPLAYED	FAULT	REMEDY
11 [3]	No Ignition	Check that gas is turned ON. Check that the vent termination is not blocked. Refer to section "5.7 Restart Function." Service call if repeated.
14	Overheat	Clean filter. Service call if repeated. [1]
16	Room Overheat (More than 104°F/40°C)	Lower the room temperature.
30	Overheat Temperature Thermistor 2 Disconnection (open circuit)	Service Call
31	Room Temperature Thermistor Disconnection (Open Circuit)	
32	Room Temperature Thermistor Short Circuit	
33	Overheat Thermistor 1 Disconnection (Open Circuit)	
34	Overheat Thermistor 1 Short Circuit	
35	Overheat Temperature Thermistor 2 Short Circuit	
40	Pressure Sensor Sensing Tube Failure	
49	Pressure Sensor Breakdown	
53	Abnormal Spark Sensed	
61	Combustion Fan	
62	Convection Fan	
70	ON/OFF Switch or "Set Back" Switch	
71	Solenoid Valve Failure	
72	Flame Rod Failure	
73	Communication Error	
81	Solenoid Valve	
99	Flue Block	

[1] If the fusible link needs replacement, it must be done by a qualified service agency. In addition, the cause of the overheat needs to be determined. The fusible link is a one use safety device that breaks to shut off the furnace.

[2] Remove any obstructions. The flue needs to be kept clear to expel exhaust gases. If the furnace fails to operate contact a qualified service agency.

[3] The display of code 11 is dimly flashing.

# 6. Maintenance

- This direct vent furnace must be inspected annually by a trained and qualified professional. Repairs and maintenance must be performed by a trained and qualified professional. The trained and qualified professional must verify proper operation after servicing.
- 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 passage ways of the furnace be kept clean.
- Any screen or guard removed for servicing the furnace must be replaced prior to operating the furnace. Clean as follows:
  1. Turn heat off. Allow to cool for one hour.
  2. Remove the front panel by removing the five screws.
  3. Use pressurized air to remove dust from the main burner, heat exchanger, and fan blades.
  4. Use a soft, dry cloth to wipe the cabinet.
- Do not use wet cloth or spray cleaners on the burner.
- The flue should be inspected annually for blockages or damage.
- Motors are permanently lubricated and do not need periodic lubrication. Keep fan and motor free of dust and dirt by cleaning annually.
- Verify proper operation after servicing.
- When attaching the front panel, do not clip or pinch any electric cords to prevent electric shock.

## Exterior Care

- Dampen soft cloth with warm water. Wring water out well and wipe the unit.
- Do not use volatile substances such as benzene or thinners as they may cause fading of the paint and deformation of the resin.

## CAUTION

- Prevent dust from accumulating on the power cord, side covers, and parts behind the furnace.
- Keep the area around flue terminal free of snow and ice. The furnace will not function properly if the intake air or exhaust is impeded by obstructions.
- Refer to “Flue Terminal Clearances” in section “4.3.2 Clearances.” The clearance in Ref. A should be maintained from any snow accumulation.

## Filters

Dirty filters reduce the air flow and the furnace’s ability to produce heat. The filters should be cleaned frequently during the heating season.

If the filters become blocked, the filter indicator lamp will flash red and a beep will sound five times.

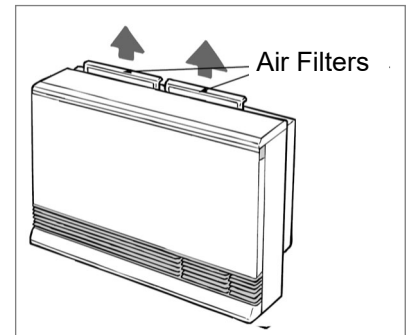


Figure 56

This beeping will repeat every five minutes. Eventually the furnace will turn off and display fault code 14 on the control panel display.

To clean the filters, the furnace should be OFF and cool. Remove the filter and clean it using a soft dry cloth or vacuum. If the filter is greasy wash with warm soapy water, rinse, and dry completely.

Do not use the furnace without the filters installed.

## Visual Inspection of Flame

Check that the burner flames are operating normally. The flame can be seen through the circular window.

When operating normally the burner flame should appear as long, clear, blue, stable, streaks. Yellow flames or an orange color is abnormal and maintenance is required.

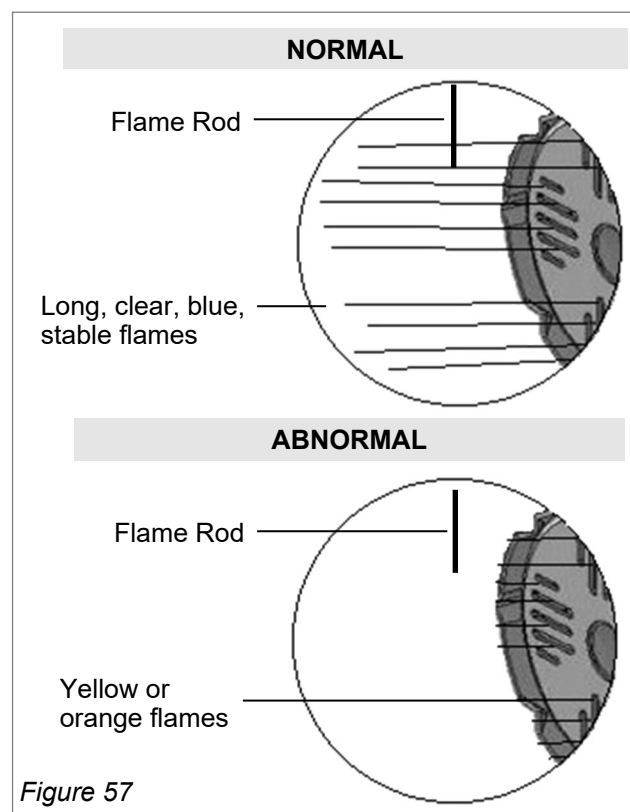


Figure 57

# 7. Troubleshooting

Before making a service call, please check the following:

<b>AT IGNITION:</b>		
Heater does not operate.	➔	Is the heater plugged in? Have the fuses or breaker blown at the fuse box / breaker panel? 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 drafts.
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.
<b>DURING COMBUSTION:</b>		
Low, rumbling 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? Was the appliance correctly sized for the space?
Air filter is blocked or the louvers are blocked or obstructed.	➔	Allow heater to cool, clean air filter or obstruction, 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 a qualified/ authorized service provider.
<b>WHEN THE UNIT IS TURNED OFF:</b>		
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.
<b>OTHER POINTS:</b>		
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 to overheat.

## Additional Troubleshooting Remedies

Table 10: Troubleshooting Remedies

Issue	No ON Indicator	No Burner Ignition	Abnormal Combustion	Loss of Combustion	Gas Smell	Noisy Ignition	Takes too Long to Warm Room	Remedy
Not Plugged in	✓	✓						Plug in
Power Failure	✓	✓		✓				Restart Unit
(Initial Installation) Air in Gas Pipe		✓						Purge Air (Installer)
Gas Filter Blocked		✓	✓				✓	Service Call
Missed Ignition	✓	✓						Service Call
Flue Terminal Obstructed			✓	✓		✓		Clear Obstruction
Flue Manifold Not Connected					✓	✓		Service Call
Louver Obstructed				✓			✓	Clear Obstruction
Air Filter Blocked				✓			✓	Clean Filter
Gas Escape					✓			Service Call
Lock Set		✓						Cancel Lock
Gas Off at Meter, Tank, or Valve		✓						Turn Gas On
ON Timer is set		✓						Cancel "ON" Timer



# 8. Parts

## Cut-Away Diagram

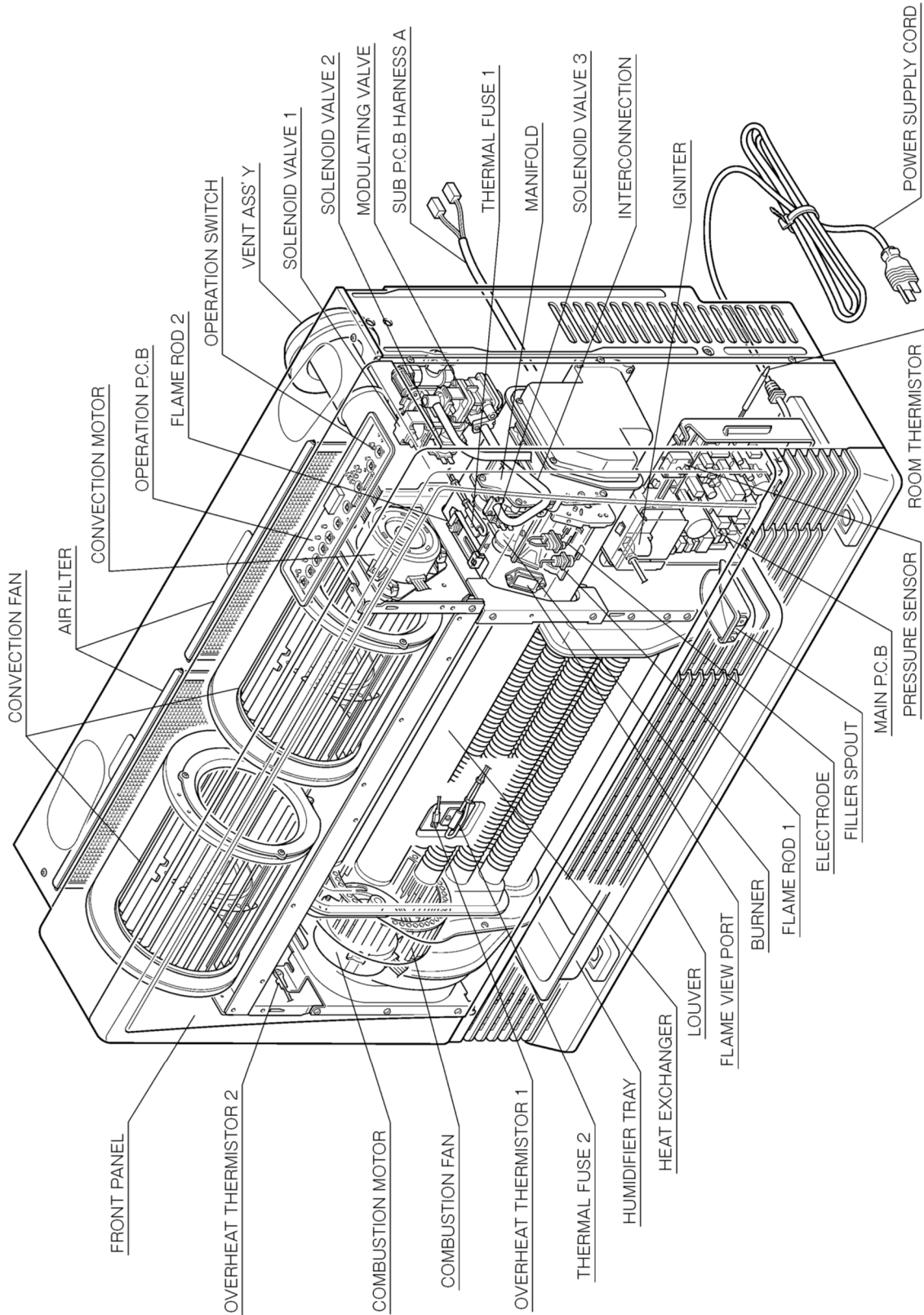


Figure 58

# Exploded View of Service Parts

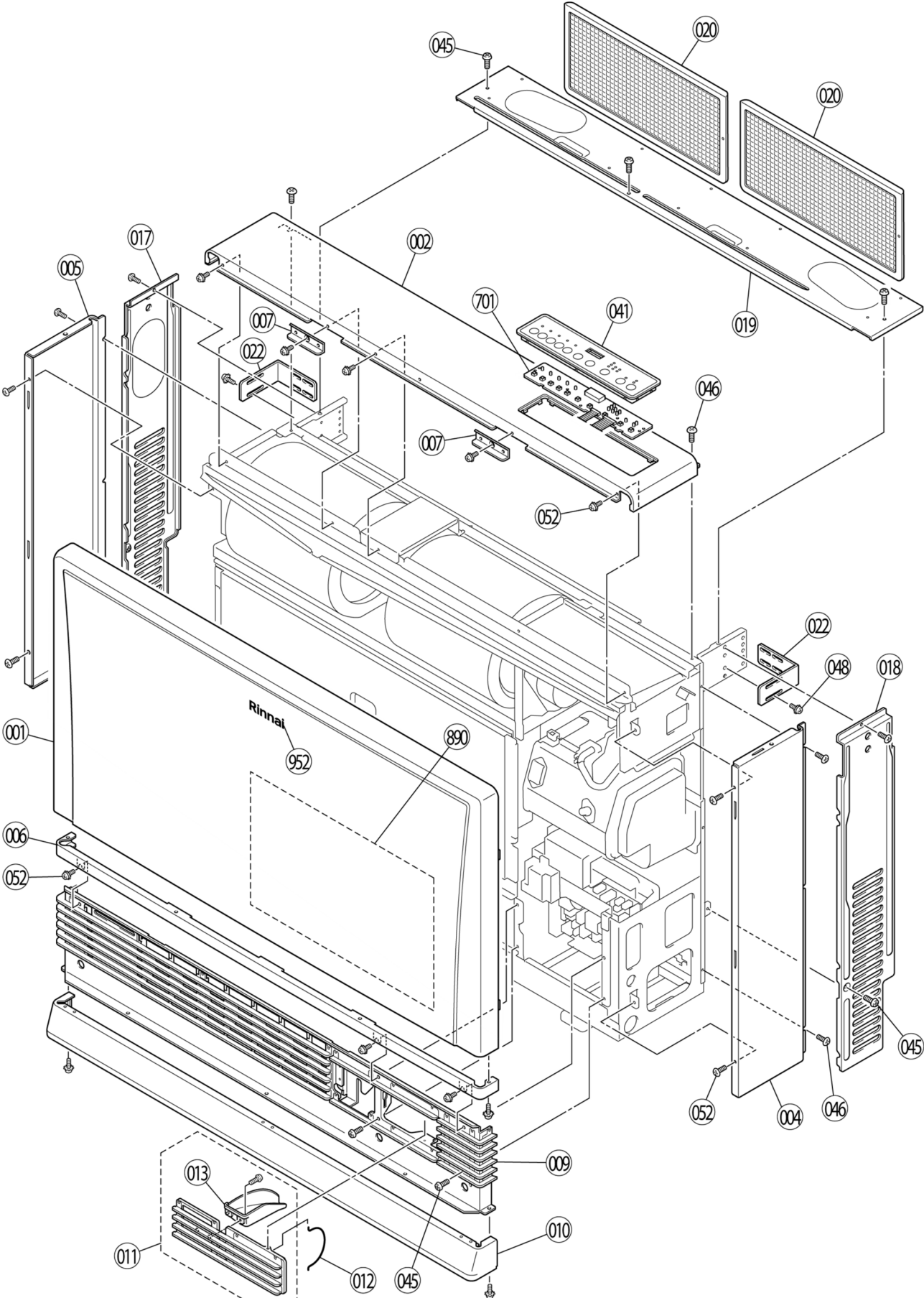


Figure 59

# Exploded View of Service Parts

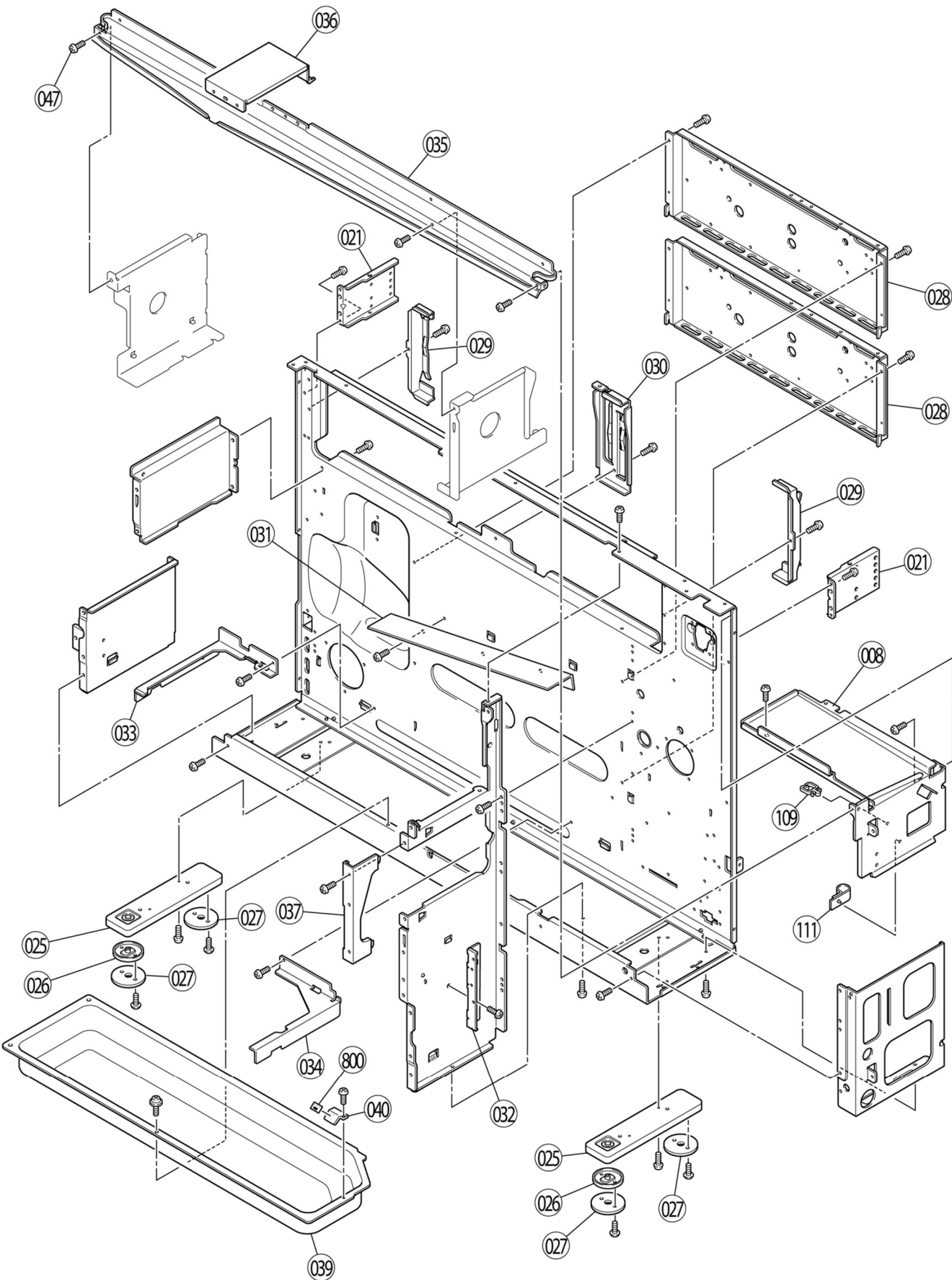


Figure 60

# Exploded View of Service Parts

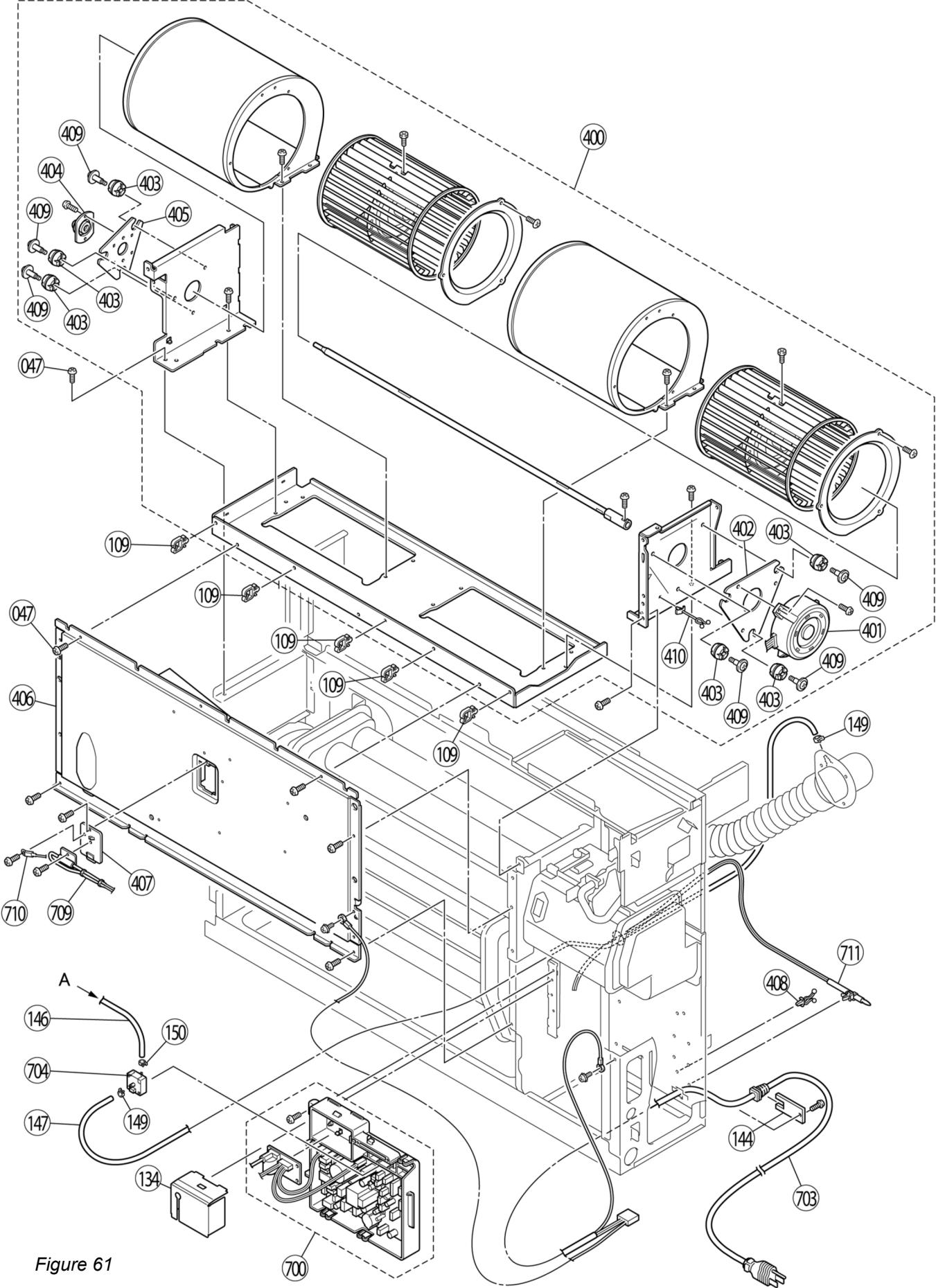


Figure 61

# Exploded View of Service Parts

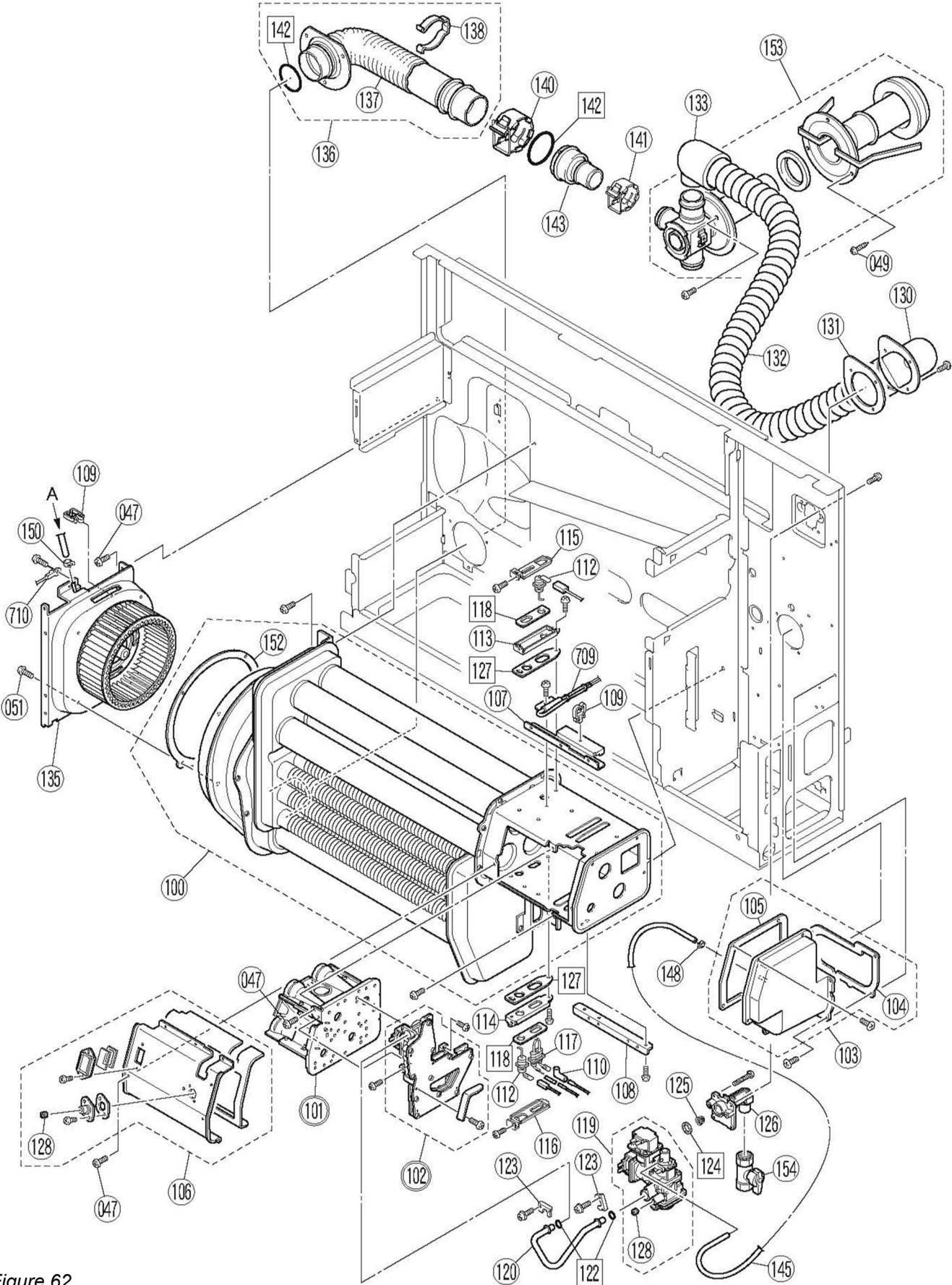


Figure 62

# Exploded View of Service Parts

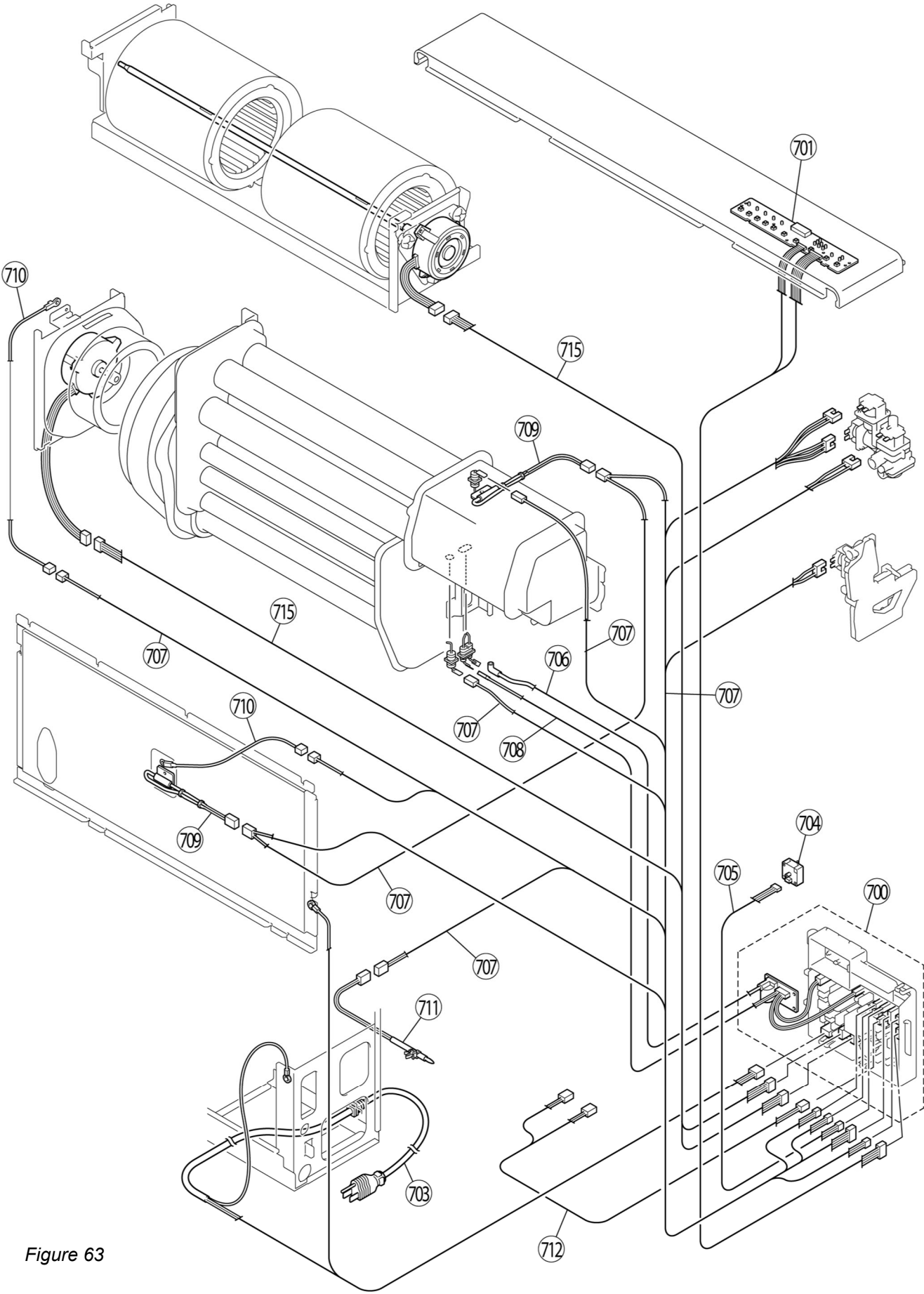


Figure 63

## Parts List

NO.	NAME	PART NUMBER	EX38DT (Beige)	EX38DT (White)
001	FRONT PANEL ASSY B	209000140	1	
001	FRONT PANEL ASSY A	209000139		1
002	TOP PLATE B	209000142	1	
002	TOP PLATE A	209000141		1
004	SIDE PANEL L	209000144	1	
004	SIDE PANEL J	209000143		1
005	SIDE PANEL M	209000187	1	
005	SIDE PANEL K	209000188		1
006	LOUVER SUPPORT TRIM B	208000051	1	
006	LOUVER SUPPORT TRIM C	209000189		1
007	FRONT PANEL HOLDER	209000147	2	2
008	FRAME CORNER UPPER	209000148	1	1
009	LOUVER ASSY B	208000053	1	
009	LOUVER ASSY C	209000190		1
010	BOTTOM TRIM ASSY G	209000029	1	
010	BOTTOM TRIM ASSY H	209000150		1
011	WATER FILLER TOTAL ASSY B	209000152	1	
011	WATER FILLER TOTAL ASSY C	209000191		1
012	WATER FILLER HINGE	209000192	1	1
013	WATER FILLER	209000153	1	1
017	BACK SPACER LEFT G	209000155	1	
017	BACK SPACER LEFT J	209000193		1
018	BACK SPACER RIGHT G	209000157	1	
018	BACK SPACER RIGHT J	209000194		1
019	BACK SPACER TOP ASSY B	209000159	1	
019	BACK SPACER TOP ASSY E	209000195		1
020	AIR FILTER ASSY	208000054	2	2
021	BACK SPACER SUPPORT	1001F-092X02	2	2
022	WALL BRACKET	209000196	2	2
025	LEG ASSY	209000160	2	2
026	RUBBER BRACKET ASSY	550F-0220X01	2	2
027	BASE SUPPORT RUBBER	550F-0225X01	4	4
028	HEAT SHIELD PANEL	209000108	2	2
029	FILTTER SIDE SUPPORT B	209000197	2	2
030	FILTTER CENTER SUPPORT B	209000198	1	1
031	STRAIGHTENING PLATE A	209000163	1	1
032	PCB UNIT MOUNTING ACCESSORY PLATE	209000165	1	1
033	HUMIDIFIER TRAY HOLD PLATE LEFT	208000057	1	1
034	HUMIDIFIER TRAY HOLD PLATE RIGHT	208000058	1	1
035	TOP PLATE SUPPORTER	209000168	1	1
036	TOP PLATE HOLDER	209000169	1	1
037	BURNER BOX SEAL PLATE	206000039	1	1

## Parts List (Continued)

NO.	NAME	PART NUMBER	EX38DT (Beige)	EX38DT (White)
039	HUMIDIFIER TRAY	1001F-037	1	1
040	WATER LEVEL INDICATOR	1001F-172	1	1
041	CONTROL BOX SP	209000199	1	
041	CONTROL BOX SP	209000200		1
045	SCREW	209000201	10	10
046	SCREW	209000202	9	9
047	SCREW	209000203	32	32
048	SCREW	209000204	4	4
049	SCREW	209000205	7	7
051	SCREW	209000206	4	4
052	SCREW	209000207	12	12
100	HEAT EXCHANGER TOTAL ASSY SP	206000040	1	1
101	BURNER TOTAL ASSY (LP)	206000041	1	1
101	BURNER TOTAL ASSY (NG)	206000042	1	1
102	MANIFOLD ASSY A (LP)	206000043	1	1
102	MANIFOLD ASSY B (NG)	206000044	1	1
103	COMBUSTION CHAMBER CONNECTION	206000045	1	1
104	COMBUSTION CHAMBER CONNECTION PACKING A	206000046	1	1
105	COMBUSTION CHAMBER CONNECTION PACKING B	206000047	1	1
106	BURNER LID ASSY B	206000048	1	1
107	BURNER LID MOUNTING PLATE A	206000049	1	1
108	BURNER LID MOUNTING PLATE B	206000050	1	1
109	WIRE CLIP	205000067	8	8
110	SLEEVE	3022-0344	1	1
111	CLAMP	209000177	1	1
112	FLAME ROD	205000068	2	2
113	ELECTRODE FIXING PLATE A	205000069	1	1
114	ELECTRODE FIXING PLATE B	205000070	1	1
115	ELECTRODE BRACKET A	205000071	1	1
116	ELECTRODE BRACKET B	205000072	1	1
117	ELECTRODE	205000073	1	1
118	ELECTRODE PACKING	205000074	2	2
119	GAS CONTROL ASSY	206000051	1	1
120	INTER CONNECTION	209000172	1	1
122	O RING	M10B-1-10	2	2
123	CONNECTING TUBE RETAINER	209000079	2	2
124	PACKING	C311-7	1	1
125	GAS FILTER	206000052	1	1
126	GAS INLET	431F-1110	1	1
127	ELECTRODE PACKING B	205000075	2	2
128	TEST PORT SCREW	AU39-965	1	1
130	AIR INLET D	208000059	1	1
131	AIR INLET PACKING	1004F-2033	1	1



## Parts List (Continued)

NO.	NAME	PART NUMBER	EX38DT (Beige)	EX38DT (White)
132	AIR INTAKE HOSE E	RHF1000-130-E	1	1
133	AIR INLET ELBOW	RHF1000-132	1	1
134	IGNITER COVER	209000208	1	1
135	COMBUSTION FAN TOTAL ASSY	208000075	1	1
136	EXHAUST ELBOW ASSY	208000065	1	1
137	COVER	1001F-111X03	1	1
138	ELBOW COVER STOPPER	RHF1000-145	1	1
140	EXHAUST PIPE STOPPER ASSY	1001F-250	1	1
141	EXHAUST PIPE STOPPER S ASSY	1001F-1730	1	1
142	O RING	209000173	2	2
143	EXHAUST ADAPTER B ASSY	1004F-530X01	1	1
144	POWER SUPPLY CORD BRACKET	RC-329-1033X01	1	1
145	TUBE D	208000017	1	1
146	SENSING TUBE A	205000078	1	1
147	SENSING TUBE J	208000066	1	1
148	Hose Band J	209000085	1	1
149	Hose Band O	209000087	2	2
150	Hose Band N	209000088	2	2
152	LID PACKING	209000209	1	1
153	FLUE ASSY	FOT-151	1	1
154	ON OFF VALVE ASSEMBLY	206000023	1	1
400	CONVECTION FAN TOTAL ASSY	208000067	1	1
401	CONVECTION FAN MOTOR	208000068	1	1
402	MOTOR MOUNTING PLATE	209000210	1	1
403	CUSHION RUBBER	308F-8273	6	6
404	FAN MOTOR BEARING FC824	908000009	1	1
405	BEARING MOUNTING PLATE	209000211	1	1
406	HEAT SHIELD BOARD ASSY	209000175	1	1
407	OHS BRACKET	209000176	1	1
408	CABLE CLIP	CP-90125-2	1	1
409	SCREW	209000212	6	6
410	Cable clip	809000183	1	1
700	PC BOARD ASSY	205000097	1	1
701	OPERATION PC BOARD ASSY	205000098	1	1
703	POWER SUPPLY CORD	205000082	1	1
704	PRESSURE SENSOR	208000069	1	1
705	PRESSURE SENSOR HARNESS	205000099	1	1
706	POWER SUPPLY CORD	205000100	1	1
707	SENSOR HARNESS	205000101	1	1
708	IG HARNESS	205000102	1	1
709	TF HARNESS	205000103	2	2
710	HILIMIT THERMISTOR	205000104	2	2
711	ROOM THERMISTOR	205000105	1	1

## Parts List (Continued)

NO.	NAME	PART NUMBER	EX38DT (Beige)	EX38DT (White)
712	DVF SUB PCB HARNESS A	205000092	1	1
715	MOTOR HARNESS	205000106	1	1
800	WATER LEVEL LINE LABEL B	209000213	1	1
888	OPERATION MANUAL	200000088	1	1
890	OPERATION LABEL	209000214	1	1
952	FRONT PANEL EMBLEM	209000215	1	
952	FRONT PANEL EMBLEM	209000216		1

## Conversion Kits (Optional)

Model	For Converting to Natural Gas	For Converting to Propane
EX38DT (RHFE-1006FTA)	203000011	203000012

# 9. Appendices

## Topics in this section

- Massachusetts State Gas Regulations
- Wiring Diagram
- Ladder Diagram

## 9.1 Massachusetts State Gas Regulations

### For Gas Models Sold in Massachusetts

#### NOTICE BEFORE INSTALLATION:

This direct-vent appliance must be installed by a state qualified or licensed contractor and a properly trained Rinnai Installer. If you are not properly trained, you must not install this unit.

#### **IMPORTANT: In the State of Massachusetts (248 CMR 4.00 and 5.00)**

For all side wall horizontally vented gas fueled equipment installed in every dwelling, building or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the side wall exhaust vent termination is less than seven (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied:

1. **INSTALLATION OF CARBON MONOXIDE DETECTORS.** At the time of installation of the side wall horizontal vented gas fueled equipment, the installing plumber or gasfitter shall observe that a hard wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter shall observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each

additional level of the dwelling, building or structure served by the side wall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard wired carbon monoxide detectors

- a. In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.
  - b. In the event that the requirements of this subdivision can not be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.
2. **APPROVED CARBON MONOXIDE DETECTORS.** Each carbon monoxide detector as required in accordance with the above provisions shall comply with NFPA 720 and be ANSI/UL 2034 listed and IAS certified.
  3. **SIGNAGE.** A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) inch in size, **"GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS"**.
  4. **INSPECTION.** The state or local gas inspector of the side wall horizontally vented gas fueled equipment shall not approve the installation unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08(2)(a)1 through 4.

# 9.2 Wiring Diagram



**CAUTION**

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

Mark	Parts Name
MS	Main Switch
R.TH	Room Thermistor
TF1,2	Thermal Fuse 1, 2
F	Fuse
ER	Electrode
POV	Modulating Solenoid Valve
PS	Pressure Sensor

Mark	Parts Name
W.TH	Wall Thermostat
OH.TH1,2	Over Heat Thermistor 1, 2
FM	Convection Fan Motor
SP	Sparker
SV1,2	Main Solenoid Valve 1,2
SV3	Solenoid Valve 3
BL	Combustion Fan Motor
FR1,2	Flame Rod 1, 2

Code	Color
bk	black
bl	blue
gr/y	green/yellow
r	red
gr	green
w	white
y	yellow
gy	gray
or	orange

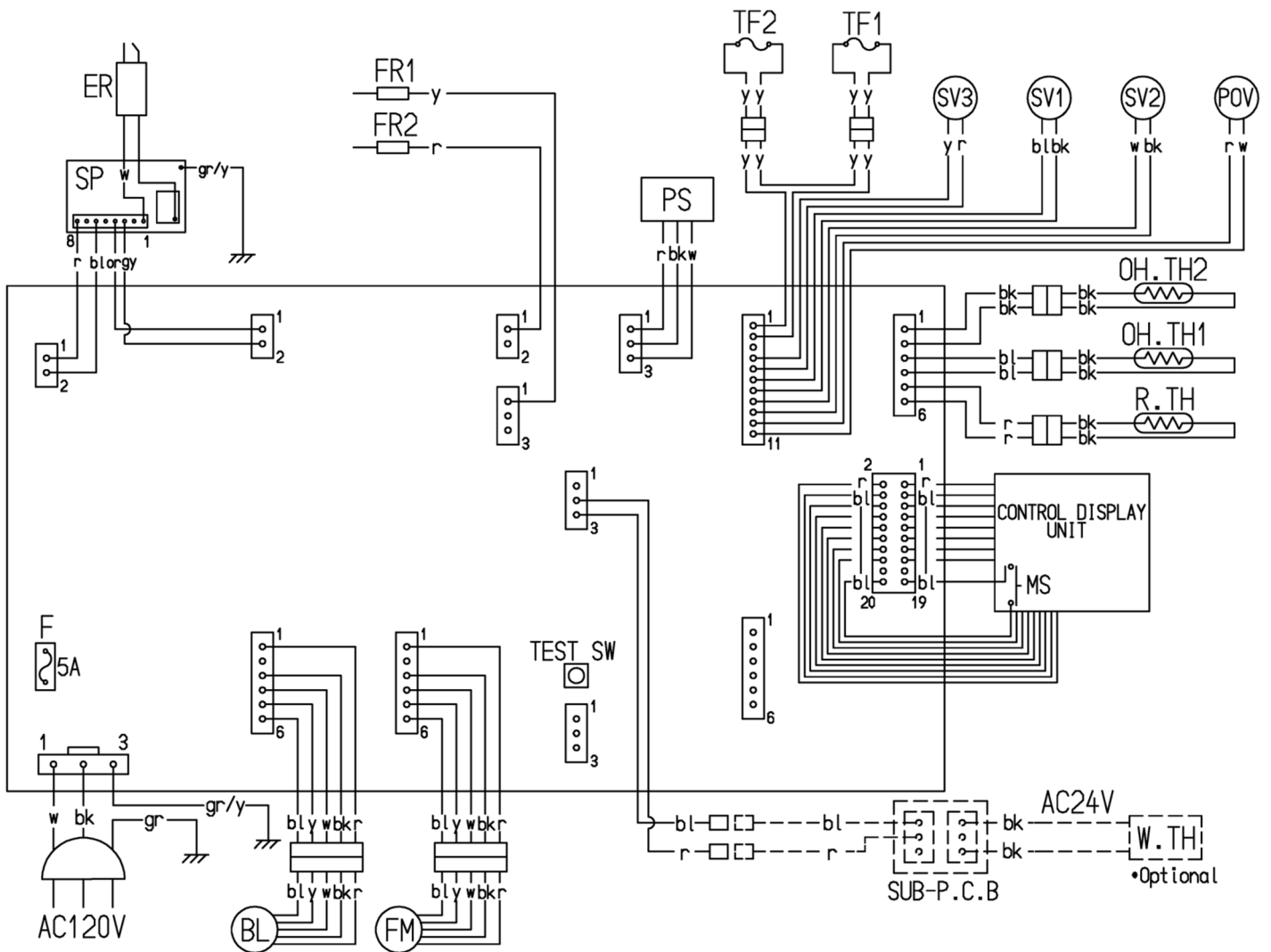


Figure 64: Wiring Diagram

# 9.3 Ladder Diagram

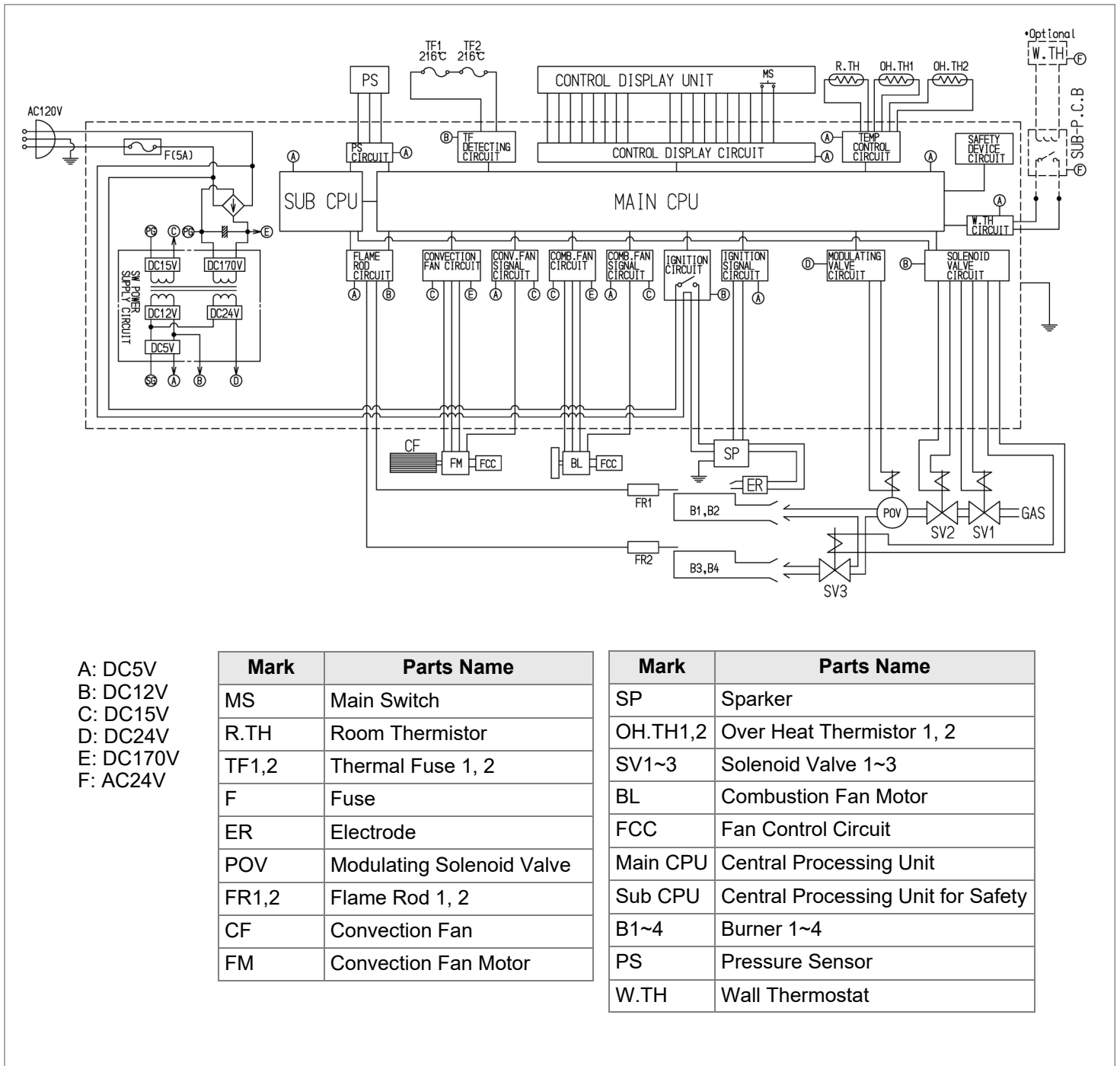


Figure 65: Ladder Diagram

# 10. Warranty

## Models

- EX08DT, EX11DT, EX17DT, EX22DT, EX38DT

## What is Covered?

The Rinnai Standard Limited Warranty covers any defects in materials or workmanship when the product is installed and operated according to Rinnai written installation instructions, subject to the terms within this Limited Warranty document. This Limited Warranty applies only to products that are installed correctly in the United States and Canada. Improper installation may void this Limited Warranty. It is recommended that a trained and qualified professional who has attended a Rinnai installation training class complete your installation. This Limited Warranty coverage, as set out in the table below, extends to the original purchaser and subsequent owners, but only while the product remains at the site of the original installation, and terminates if the product is moved or reinstalled at a new location.

Item	Period of Coverage (From Date of Purchase)
Heat Exchanger	10 Years
All Other Parts	5 Years
Reasonable Labor	2 Years

## What Will Rinnai Do?

Rinnai will repair or replace the covered product or any part or component that is defective in materials or workmanship as set forth in the above table. Rinnai will pay reasonable labor charges associated with the repair or replacement of any such part or component during the term of the labor warranty period. All repair parts must be genuine Rinnai parts. All repairs or replacements must be performed by a qualified professional who is properly trained to do the type of repair.

Replacement of the product may only be authorized by Rinnai at its sole discretion. Rinnai does not authorize any person or company to assume for it any obligation or liability in connection with the replacement of the product. If Rinnai determines that repair of a product is not possible, Rinnai may replace the product with a comparable product at Rinnai's sole discretion. The warranty claim for product parts and labor may be denied if a component or product returned to Rinnai is found to be free of defects in material or workmanship; damaged by improper installation, use or operation; or damaged during return shipping.

## How To Obtain Service

For the name of a trained and qualified professional, 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.rinnai.us](http://www.rinnai.us). For those without internet access, please call 1-800-621-9419. Receipt of registration by Rinnai will constitute proof-of-purchase for this product. However, registration is not necessary in order to validate this Limited Warranty.

## What Is Not Covered?

This Limited Warranty does not cover any failures or operating difficulties due to the following:

- Accident, abuse, or misuse
- Alteration of the product or any component part
- Misapplication of this product
- Force majeure
- Improper installation (such as but not limited to, condensate damage, improper venting, Incorrect gas type, or incorrect gas pressure)
- Improper conversion (including conversions for inventory adjustment)
- Improper maintenance (such as but not limited to vent blockage)
- Incorrect sizing
- Any other cause not due to defects in materials or workmanship

This Limited Warranty does not apply to any product whose serial number or manufacture date has been defaced.

## Limitation on Warranties

No one is authorized to make any other warranties on behalf of Rinnai America Corporation. Except as expressly provided herein, there are no other warranties, expressed or implied, including, but not limited to warranties of merchantability or fitness for a particular purpose, which extend beyond the description of the warranty herein.

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 Limited Warranty lasts, so the above limitation may not apply to you.

Rinnai shall not be liable for indirect, incidental, special, consequential or other similar damages that may arise, including lost profits, damage to person or property, loss of use, inconvenience, or liability arising from improper installation, service or use. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

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

[www.rinnai.us/warranty](http://www.rinnai.us/warranty)

# Rinnai America Corporation

103 International Drive  
Peachtree City, GA 30269

Tel: 1-800-621-9419  
Web: rinnai.us  
rinnai.ca

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