



OWNER'S MANUAL

INSTALLATION INSTRUCTION

DIRECT-VENT WALL FURNACE

MODEL: 1773512 natural gas only

MODEL: 1773511 propane gas only



SAVE THIS MANUAL FOR FUTURE REFERENCE.

WARNING: Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information, consult a qualified installer, service agency or the gas supplier.

WARNING: Installation and repair must be done by a qualified service person. The furnace should be inspected before use and at least annually by a professional service person.

WARNING: If not installed, operated and maintained in accordance with the manufacturer's instructions, this product could expose you to substances in fuel or from fuel combustion which can cause death or serious illness and which are known to cause cancer, birth defects or other reproductive harm.

WARNING: INSTALLATION IN MANUFACTURED HOMES

Williams Direct Vent Furnaces are allowed in manufactured homes when the following conditions are met:

- The manufactured home is permanently sited per local codes.
- The manufactured home is manufactured after 6/15/1976 and is HUD approved with a red certification label (US only).

This applies to aftermarket manufactured home installations where the home is sold, installed and permanently sited. Not for manufactured home manufacturing factory installation. These units may not be installed in trailers or recreational vehicles. These models are allowed both in the USA and Canada.

WARNING: If the information in this manual is not followed exactly; a fire or explosion may result, causing property damage, personal injury or loss of life.

- 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
 - Open all windows.
 - Do not try to light any appliance.
 - Do not touch any electrical switch.
 - Do not use any phone in your building.
 - Extinguish any open flame.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

WARNING: This product can expose you to chemicals including epichlorohydrin which is known to the State of California to cause cancer and birth defects and/or other reproductive harm. For more information go to www.p65warnings.ca.gov

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General Information and Technical Data

This furnace is design certified to ANSI Z21.86-2004 / CSA 2.32-2004 Gas-Fired Gravity and Fan-Type, Direct-Vent Wall Furnaces as a Fan-Type Direct-Vent Wall Furnace to be installed on an outside wall according to these instructions.

Any alteration of the original design, installed other than as shown in these instructions or used with a type of gas not shown on the rating plate is not permitted.

Instructions to Installer

Installation and repair should be done by a **QUALIFIED SERVICE TECHNICIAN**.

The installation must conform to local codes or in the absence of local codes; the installation must conform to the National Fuel Gas Code ANSI Z223.1/NFPA 54, Natural Gas and Propane Installation Code CSA B149.1.

Mobile (Manufactured) home installations 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 A 225.1 NFPA/501A, Mobile Home Standard, CAN/CSA Z240 MH Series, in Canada. Installer must leave this instruction manual with the home owner after installation. Installer should show the home owner how to start and operate furnace and thermostat. Installer must provide a 1/8-inch NPT plugged tapping for test gauge connection immediately upstream of the gas supply connection of the furnace.

During initial firing of the furnace, residual manufacturing grease will bake out and smoke will occur which is not a health danger. To prevent nuisance and operation of fire alarms, ventilate the room for the first two hours of operation.

WARNING: Any change to this furnace or its controls can be dangerous. This is a heating appliance and any panel, door or guard removed for servicing this furnace must be replaced prior to operating the furnace.

Safety Rules and General Warnings

DO NOT OPERATE THIS FURNACE WITHOUT FRONT PANEL INSTALLED

- Due to high temperatures, the furnace should be located out of traffic and away from any combustible materials such as furniture and draperies.
- Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burns or clothing ignition.
- 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 a furnace must be replaced prior to operating the furnace.
- Keep burner and control compartment clean.
- The outside vent cap is hot while furnace is in operation.
- Installation and repair should be done by a QUALIFIED SERVICE TECHNICIAN. The furnace should be inspected before use and at least annually by a qualified service technician.
- More frequent cleaning may be required due to excessive lint from carpeting, bedding materials, etc. It is imperative that control compartments, burners and circulating air passageways of the furnace be kept clean.
- DO NOT put anything around the furnace that will obstruct the flow of combustion and ventilation air.
- DO keep the furnace area clear and free from combustible materials, gasoline and other flammable vapours and liquids.
- DO examine venting system periodically and replace damaged parts.
- DO examine burner periodically. Clean and replace damaged parts.
- DO NOT use this furnace if any part has been under water. Immediately call a qualified service technician to inspect the furnace and to replace any part of the control system and any gas control which has been under water.

Safety Information for Users of LP Gas

Propane (LP Gas) is a flammable gas which can cause fires and explosions. In its natural state, propane is odourless and colourless. You may not know all the following safety precautions which can protect both you and your family from an accident. Read them carefully now, then review them point by point with the members of your household. Someday, when there may not be a minute to lose, everyone's safety will depend on knowing exactly what to do. If, after reading the following information, you feel you still need more information, please contact your gas supplier.

LP Gas Warning Odor

**If a gas leak happens, you should be able to smell the gas because of the odorant put in the LP Gas.
That's your signal to go into immediate action!**

- Do not operate electric switches, light matches or use your phone. Do not do anything that could ignite the gas.
- IMMEDIATELY get everyone out of the building, vehicle, trailer or area.
- Close all gas tank or cylinder supply valves.
- LP Gas is heavier than air and may settle in low areas such as basements. When you have reason to suspect a gas leak, keep out of basements and other low areas. Stay out until firefighters declare them to be safe.
- Use your neighbour's phone and call a trained LP Gas service technician and the fire department. Even though you may not continue to smell gas, do not turn on the gas again. Do not re-enter the building, vehicle, trailer or area.
- Have the service technician or fire department air out the area before you return. A properly trained LP Gas service technician must repair the leak, check and relight the gas furnace for you.
-

Some Points to Remember

- **Learn to recognize the odour of LP Gas.** Your local LP Gas dealer can give you a "Scratch and Sniff" pamphlet. Use it to find out what the propane odour smells like. If you suspect that your LP Gas has a weak or abnormal odour, call your LP Gas dealer.
- If you are not qualified, do not light pilot lights, perform service, or make adjustments to appliances on the LP Gas system. If you are qualified, consciously think about the odour of LP Gas prior to and while lighting pilot lights or performing service or making adjustments.
- Sometimes a basement or a closed-up house has a musty smell that can cover up the LP Gas odour. Do not try to light pilot lights, perform service or make adjustments in an area where the conditions are such that you may not detect the odour if there has been a leak of LP Gas.
- Odour fade, due to oxidation by rust or absorption on walls of new cylinders and tanks, is possible. Therefore, people should be particularly alert and careful when new tanks or cylinders are placed in service. Odour fade can occur in new tanks or reinstalled old tanks if they are filled and allowed to set too long before refilling. Cylinders and tanks which have been out of service for a time may develop internal rust which will cause odour fade. If such conditions are suspected to exist, a periodic sniff test of the gas is advisable. **If you have any question about the gas odour, call your LP Gas dealer. A periodic sniff test of the LP Gas is a good safety measure under any condition.**
- If, at any time, you do not smell the LP Gas odorant, and you should, assume you have a leak. Then take the same immediate action recommended when you do smell the odorized LP Gas.
- If you experience a complete "gas out" (the container is under no vapour pressure), turn the tank valve off immediately. If the container valve is left on, the container may draw in some air through openings such as pilot light orifices. If this occurs, some new internal rusting could occur. If the valve is left open, then treat the container as a new tank. Always be sure your container is under vapour pressure by turning it off at the container before it goes completely empty or having it refilled before it is completely empty.

Technical Data

OUTPUT HEATING CAPACITY	kW	3.96
	kBTU/hr.	13,500
INPUT RATING	kW	5.19
	kBTU/hr.	17,700
MINIMUM INPUT RATING (LO Input)	kW	3.84
	kBTU/hr.	13,100
THERMAL EFFICIENCY	%	76.27
LENGTH	mm	553
	in	21-3/4
HEIGHT	mm	715
	in	28-1/8
DEPTH	mm	208
	in	8-1/4
WEIGHT	kg	26
	lbs.	57
GAS CONNECTION	NPT	3/8 FEMALE
WALL HOLE DIAMETER	mm	50
	in	2
AIR INLET DIAMETER	mm	49
	in	1-7/8
EXHAUST PIPE DIAMETER	mm	35
	in	1-3/8
MAX WALL THICKNESS	mm	150
	in	5-7/8
MIN WALL THICKNESS	mm	500
	in	19-5/8

MANIFOLD PRESSURE	MAX	NATURAL GAS	mbar	7.7
			in w.c.	3.1
	MIN	LP	mbar	26.4
			in w.c.	10.6
GAS RATE	MAX	NATURAL GAS	m ³ /h	0.5
			ft ³ /h	17.8
	MIN	LP	m ³ /h	0.2
			ft ³ /h	6.9
MINIMUM INLET PRESSURE	MAX	NATURAL GAS	m ³ /h	0.4
			ft ³ /h	13.3
	MIN	LP	m ³ /h	0.1
			ft ³ /h	5.3
AIR FLOW	MAX	NATURAL GAS	mbar	17.4
			in w.c.	7.0
	MIN	LP	mbar	27.4
			in w.c.	11.0
TOTAL ELECTRICAL LOAD			m ³ /h	220
			cfm	129
MINIMUM AIR FLOW			m ³ /h	160
			cfm	94
			W	86

Installation

Installation should be done by a QUALIFIED SERVICE TECHNICIAN.

The furnace must be located on an outside wall.

Wall Installation

Minimum clearances from combustible materials:

- Unit to the top surface of carpeting, tile: 2-inches (50 mm)
- Unit to back wall (0" to spacers): 0-inch (0 mm).
- Vent to wall enclosure: 0-inch (0 mm)
- Unit to sidewalls: 3.15-inches (80 mm)
- Unit to ceiling: 10-inches (254 mm)

See Figure 1 showing clearance for installation of vent cap.

Leave at least three-feet in front of the wall furnace for servicing and proper operation. The wall furnace must be installed in such a way that the external casing can be completely removed for servicing.

If there is a shelf above the furnace, it must be non-combustible. A minimum clearance of 12-inches (300 mm) is recommended between the furnace and the non-combustible shelf above it.

Gas equipment installed in residential garages must be installed so that all burners and burner ignition devices are located not less than 18-inches (460 mm) above the floor. Such equipment must be located, or protected, so it is not subject to physical damage by a moving vehicle.

The vent terminal of this direct-vent furnace must be located at least 9-inches (230 mm) from any opening through which flue gases could enter a building. The bottom of the vent terminal and the air intake must be located at least 12-inches (300mm) above grade.

DO NOT cover the furnace.

Make sure that the correct gas supply is available.

The furnace requires a 120 V 60 Hz electrical supply.

The appliance, when installed, must be electrically grounded in accordance with local codes, or in the absence of local codes with the National Electrical Code ANSI/NFPA 70 (latest edition) or in Canada with CAN/CSA-C22.2 No. 3.

WARNING: For the installation of this furnace, the following items must be used as a vent air intake system:

External Vent Cap

(Part Number: WFR-TRM000)

Flanged Air Inlet Tube

(Part Number: WFR-TBO002)

Flue Outlet Tube

(Part Number: WFR-795)

O-Ring

(Part Number: WFN-RNG003)

(All the above items are supplied with the furnace)

WARNING: The nearest point of the vent cap should be a minimum horizontal distance of six (6) feet (1,830 mm) from any pressure regulator. In case of regulator malfunction, the six (6) feet (1,830 mm) distance will reduce the chance of gas entering the vent cap.

Installations in the State of Massachusetts

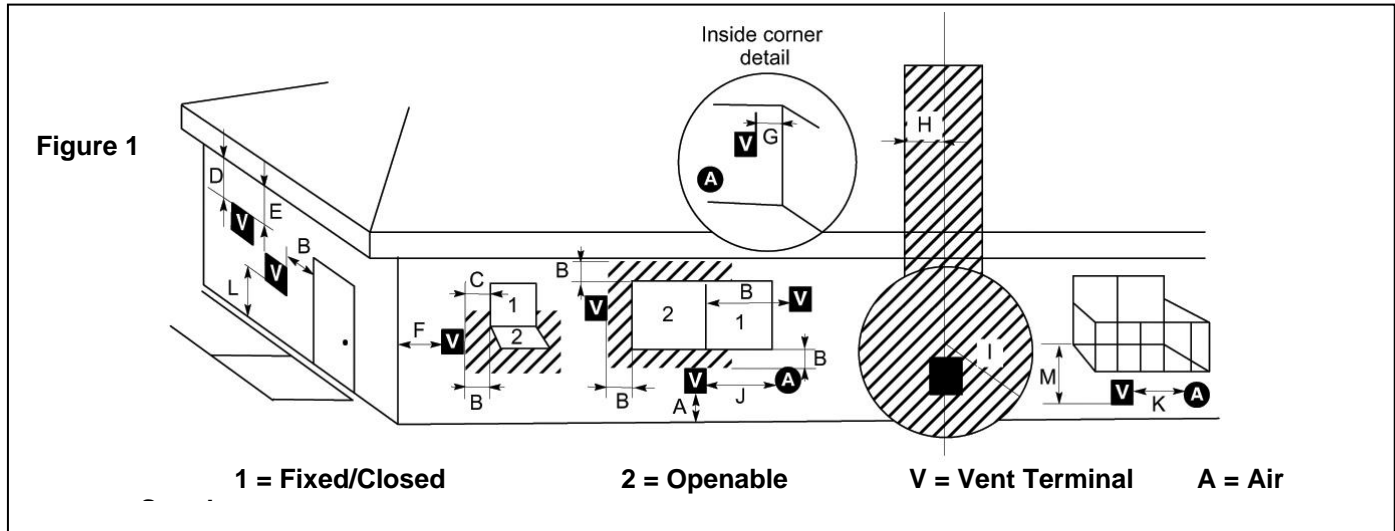
All installations in the State of Massachusetts must use the following requirements when installing, maintaining or operating direct-vent propane or natural gas-fired space heaters. For direct-vent appliances, mechanical-vent heating appliances or domestic hot water equipment, where the bottom of the vent terminal and the air intake is installed below four feet above grade the following requirements must be satisfied:

1. If there is not one already present, on each floor level where there are bedroom(s), a carbon monoxide detector and alarm shall be placed in the living area outside the bedroom(s). The carbon monoxide detector shall comply with NFPA 720 (2005 Edition).
2. A carbon monoxide detector shall be located in the room that houses the appliance or equipment and shall:
 - a. Be powered by the same electrical circuit as the appliance or equipment such that only one service switch services both the appliance and the carbon monoxide detector;
 - b. Have battery back-up power;
 - c. Meet ANSI/UL 2034 Standards and comply with NFPA 720 (2005 Edition); and
 - d. Have been approved and listed by a Nationally Recognized Testing Laboratory as recognized under 527 CMR.

A carbon monoxide detector shall:

- a. Be located in the room that houses the appliance or equipment;

- b. Be either hard-wired or battery powered or both; and
 - c. Shall comply with NFPA 720 (2005 Edition).
3. A product-approved vent terminal must be used, and if applicable, a product-approved air intake must be used. Installation shall be in the strict compliance with the manufacturer's instructions. A copy of the installation instructions shall remain with the appliance or equipment at the completion of the installation.
 4. A metal or plastic identification plate shall be mounted at the exterior of the building, four feet directly above the location of vent terminal. The plate shall be of sufficient size to be easily read from a distance of eight feet away, and read "Gas Vent Directly Below".

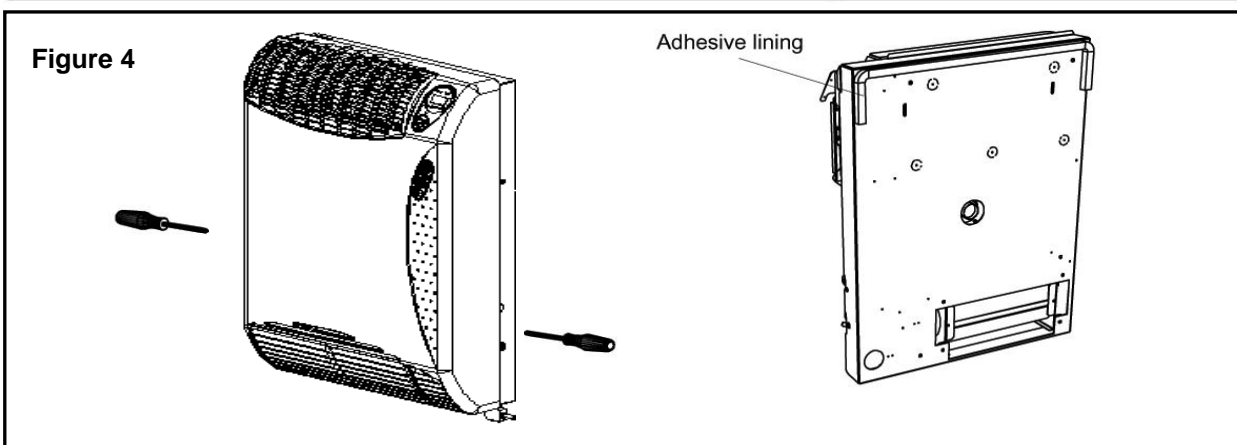
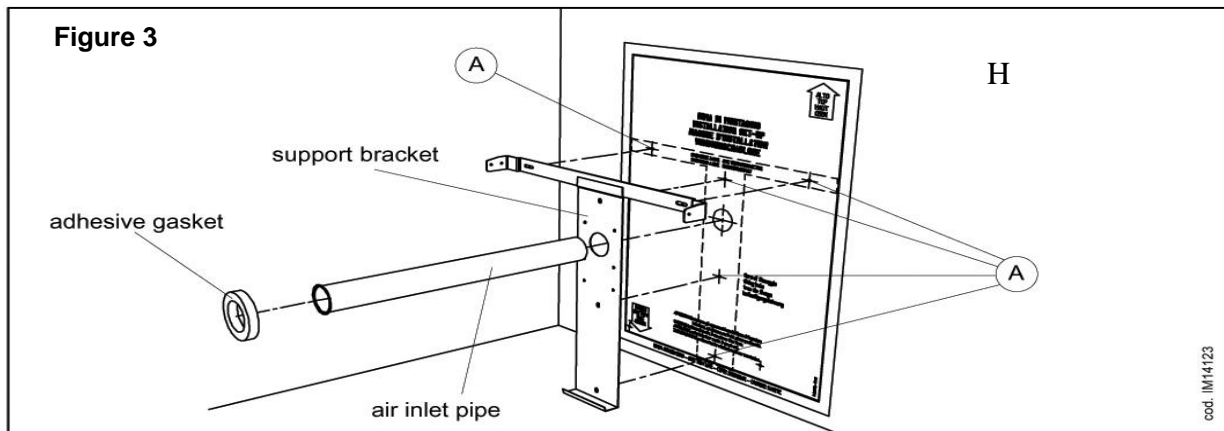
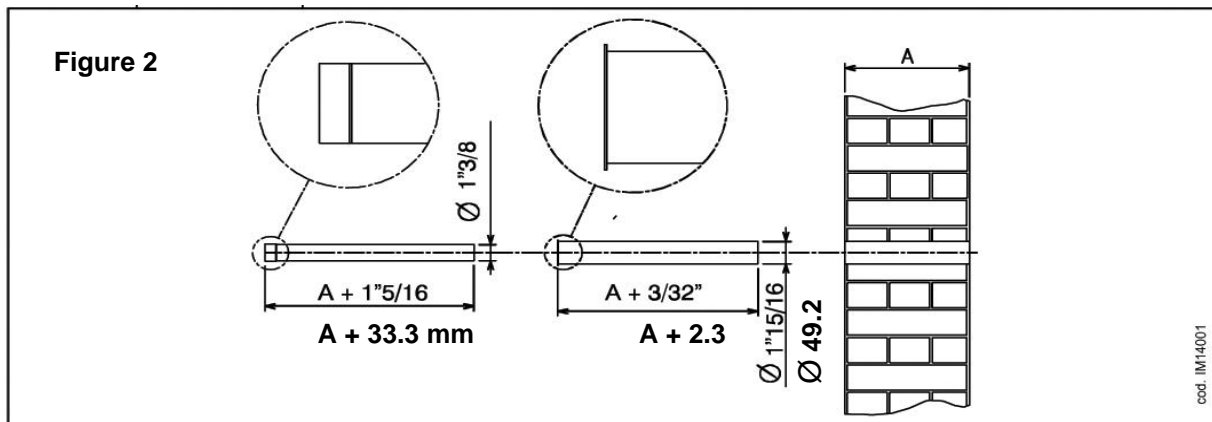


- A. Clearance above grade, veranda, porch, deck or balcony 12-inches (30 cm) minimum. ⁽³⁾
 - B. Clearance to window or door that may be opened 12-inches (30 cm) minimum. ⁽³⁾
 - C. Clearance to permanently closed window (minimum 12-inches (30 cm) recommended to prevent condensation on window.
 - D. Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (60 cm) from the centerline of the terminal 18-inches (46 cm) minimum.
 - E. Clearance to unventilated soffit 12-inches (30 cm) minimum clearance to vinyl soffit 36-inches (90 cm) minimum.
 - F. Clearance to outside corner 12-inches (30 cm) minimum.
 - G. Clearance to inside corner 18-inches (46 cm) minimum.
 - H. Not to be installed above a meter/regulator assembly within 3 feet (90 cm) horizontally from the centreline of the regulator. ⁽³⁾
 - I. Clearance to service regulator vent outlet 6 feet (1.8 m) minimum. ⁽³⁾
 - J. Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other furnace 12-inches (30 cm) minimum. ⁽³⁾
 - K. Clearance to a mechanical air supply inlet 6 feet (1.8 m) minimum. ⁽³⁾
 - L. Clearance ⁽¹⁾ above paved sidewalk or a paved driveway located on public property 7 feet (2.1 m) minimum. ⁽³⁾
 - M. Clearance under veranda, porch, deck or balcony 12-inches (30 cm) minimum. ^{(2), (3)}
- Notes:
- (1) A vent shall not terminate directly above a sidewalk or paved driveway which is located between two single family dwellings and serves both dwellings.
 - (2) Only permitted if veranda, porch, deck or balcony is fully open on a minimum of two sides beneath the floor.
 - (3) As specified in CGA B149 installation codes (1991).
- Note: Local codes or regulations may require different clearances.

Outside Location for Vent Terminal

Upon delivery, check to make sure the packaging has not been damaged.

1. Remove the furnace from box/packaging taking care not to damage the paper template to be used to mark the holes for mounting the furnace.
2. After marking where the appropriate holes will be, using the above mentioned template, make a 2-inch (50.8 mm) diameter hole.
3. Cut the combustion exhaust and fresh air inlet tubes according to the wall thickness (Figure 2):
Air inlet tube length = wall thickness + 3/32-inches (2.4 mm)
Flue outlet tube length = wall thickness + 1-5/16-inches (7.9 mm)
4. Drill the mounting holes "A" (5 holes) in the wall. If possible use self-tapping screws, drill 1/8-inch diameter holes. If self-tapping screws cannot be used, drill 1/4-inch diameter holes and use the plastic anchors provided.
5. Install the supporting bracket to the wall; insert the air pipe in the wall through the hole provided in the support bracket. Place the round adhesive gasket around the hole so that the air pipe remains in position. (Figure 3)
6. Attach the supporting bracket with the screws. If possible use self-tapping screws. If self-tapping screws cannot be used, use the plastic anchors provided.
7. Loosen the screws, remove the casing and disconnect the case grounding wire. (Figure 4)



8. Place the adhesive spongy lining behind the unit. (Figure 4)
9. Attach the flue exhaust pipe end (diameter 1-3/8") on the furnace male pipe connection (Figure 5). BE SURE THAT THE RUBBER SILICONE O-RING GASKET IS IN POSITION.
10. Install the unit to the wall leaning the bottom edge of panel "C" (where the fan is located) on the supporting frame. (Figure 6) Attach the furnace to the support bracket with the two screws.
11. When inside installation is complete, proceed to the location of the vent cap on the external wall. The vent cap should perfectly match the pipe end. Mark the location of the three holes for the screw anchors. (Figure 7) The flue grid must be vertical.
12. Remove the vent cap and drill all the necessary holes (diameter ¼ inch for the screw fittings provided with the furnace).
13. Relocate the vent cap and attach it with the screws. (Figure 7)
14. Attach the female end of the three-prong cord to the receptacle located near the bottom of the furnace.
15. Connect the gas supply line. A gas shutoff valve before the furnace must be installed.
16. Reconnect the grounding wire to the casing, attach the casing and tighten the screws.
17. Turn on gas supply and check for gas leaks with soapy water or other suitable means on all gas connections. Correct any gas leaks before operating the furnace.

Figure 5

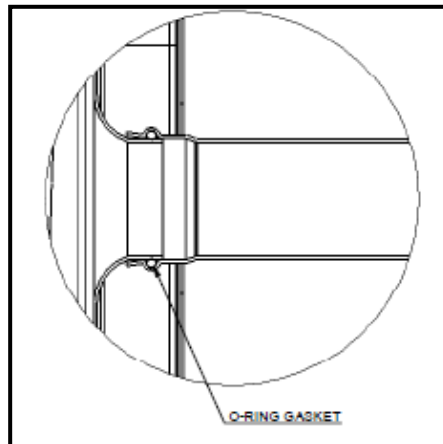
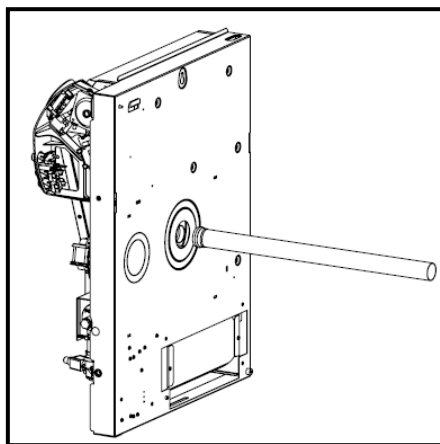
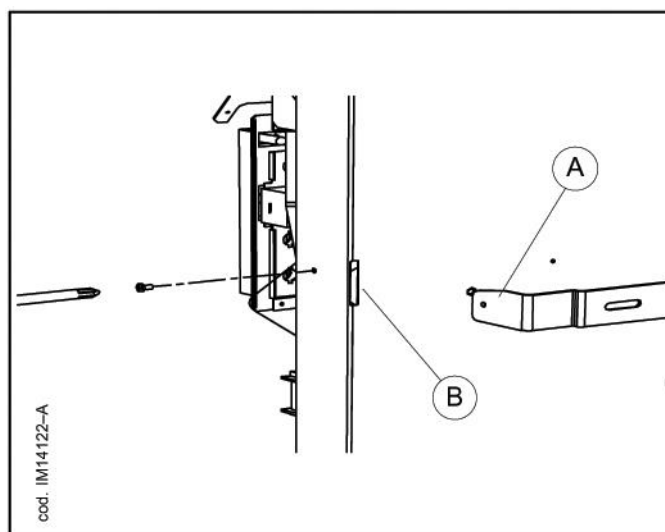
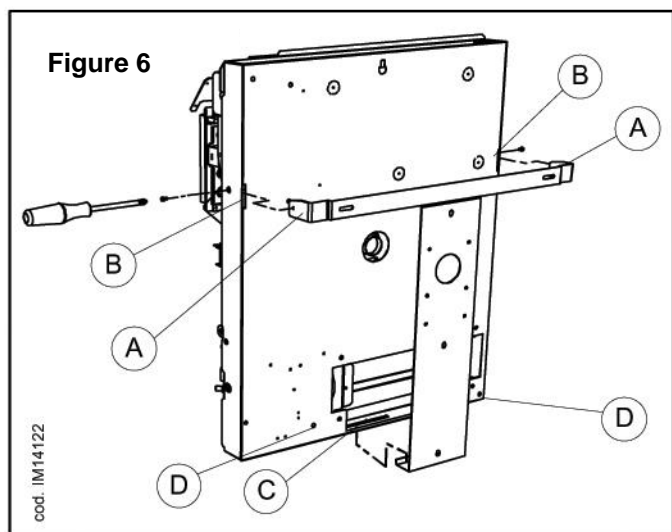
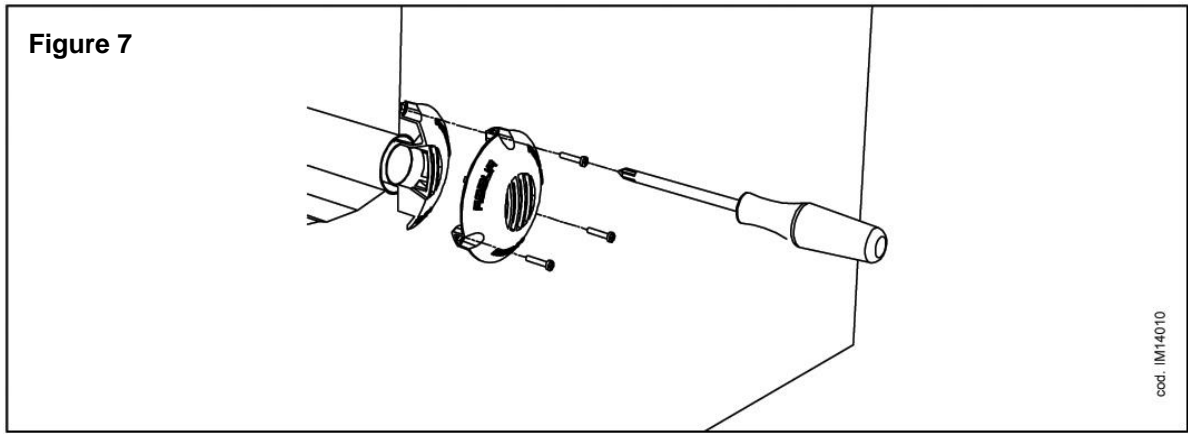


Figure 6



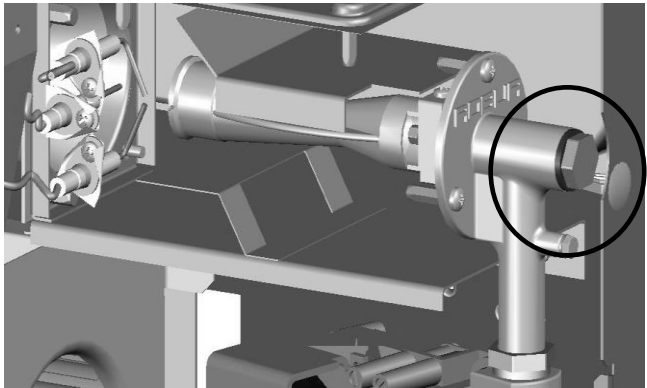


Gas Conversions

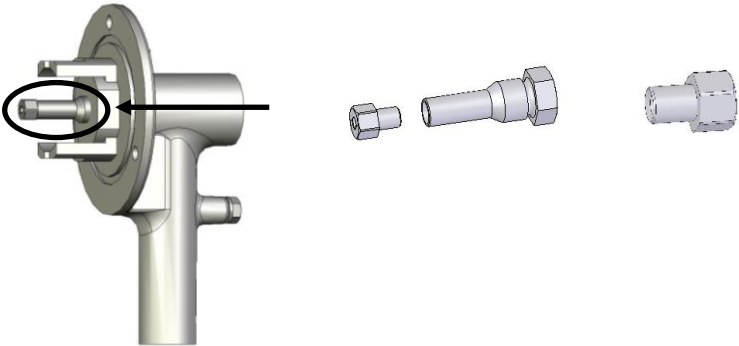
Converting to another gas type must be performed by a qualified service technician. If the type of the gas supplied to the dwelling is not the same type as your furnace (natural or LPG gas), it must be converted.

It will be necessary to do the following:

- 1. Change nozzle.
 - a. Remove the screw indicated to the right.



- 2. Remove the nozzle assembly from the burner inserting the screwdriver as indicated by the arrow.



- 3. Remove the nozzle from the support and replace it with the correct one. Reassemble the nozzle assembly and the screw indicated at point 1. Set the burner pressure as indicated in the table below:

Gas Type	Nozzle Part Number	Nozzle Diameter
Natural Gas	P332551	0.09 in.
LP Gas	P332552	0.05 in.

Gas Type	Minimum Inlet Line Gas Pressure	Maximum Manifold Gas Pressure	Minimum Manifold Gas Pressure
Natural Gas	7.0-inches w.c.	3.2-inches w.c.	1.8-inches w.c.
LP Gas	11.0-inches w.c.	10.6-inches w.c.	6.5-inches w.c.

4. Check the gas pressure and settings.

Minimum Burner Pressure Setting

- a. Set LOW burner capacity by pressing button Z2
- b. Connect a micro manometer to the test gauge B (Figure 8)
- c. Rotate the internal screw "D" (Figure 8) and set the pressure at the correct value

Maximum Burner Pressure Setting:

- a. Set HI burner capacity by pressing button Z2
- b. Connect a micro manometer to the test gauge B (Figure 8)
- c. Rotate the external screw "C" (Figure 8) and set the pressure at the correct value

Gas Supply

Check all local codes for requirements, especially for the size and type of gas supply line required. On natural gas lines less than 15" (380 mm) long, use 1/2" tube; on longer runs, use 3/4" iron tube or equal. On LP Gas lines please consult LP Gas supplier.

Installing a New Main Gas Shutoff Valve

Each furnace should have its own manual gas shutoff valve. A manual main gas shutoff valve should be located in the vicinity of the furnace. Where none exists, or where its size or location is not adequate, contact your local authorized installer for installation or relocation.

Compounds used on threaded joints of gas piping must be resistant to the action of LP Gas. The gas lines must be checked for leaks by the installer. This should be done with a soap solution watching for bubbles on all exposed connections, and if unexposed, a pressure test should be made. Correct all gas leaks before operating the furnace.

Never use an exposed flame to check for leaks. The furnace must be disconnected from piping at inlet of control valve and pipe capped or plugged for a pressure test. Never pressure test with furnace connected; the control valve will sustain damage!

A gas shutoff valve and ground joint union should be installed in the gas line upstream of the gas control valve to aid in servicing. It is required by the National Fuel Gas Code that a drip line be installed near the gas inlet. This should consist of a vertical length of pipe tee connected into the gas line that is capped on the bottom in which condensation and foreign particles may collect.

Use of the following gas connectors is recommended:

- ANSI Z21.24 Appliance Connectors of Corrugated Metal Tubing and Fittings. CGA 6.10.
- ANSI Z21.45 Assembled Flexible Appliance Connectors of Other Than All-Metal Construction.

The above connectors may be used if accepted by the authorities having jurisdiction.

Pressure Testing of the Gas Supply System

1. To check the inlet pressure to the gas valve, a plugged tapping, accessible for a test gauge connection, is provided on the gas valve. (Figure 8 - A).
2. The furnace and its individual shutoff 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 psig (3.5 kPa).
3. The furnace must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3.5 kPa).

Attention: If one of the above procedures results in pressures in excess of 1/2 psig (14" w.c.; 3.5 kPa) on the furnace gas valve, it will result in a hazardous condition.

High Altitudes (US Only)

For altitudes/elevations above 2,000 feet (610 m), ratings should be reduced at the rate of 4-percent for each 1,000 feet (305 m) above sea level by reducing the manifold pressure at 8% rate on the gas supply. Maximum altitude allowed for installation is 5,500 feet (1680 m).

High Altitudes (Canada Only)

The furnace is tested according to CGA 2.17 M91 for installation between 0 and 4,500 ft (0 and 1370 m) altitude. For altitudes/elevations above 2,000 feet (610 m), ratings should be reduced at the rate of 4-percent for each 1,000 feet (305 m) above sea level by reducing the manifold pressure at 8% rate on the gas supply. Maximum altitude allowed for installation is 5,500 feet (1680 m).

High Altitude Adjustment

Based on the altitude of the installation site, reduce the manifold pressure specified in the “Technical Data” chart and as shown in the table below:

Altitude	Manifold Pressure Reduction Rate
0-2,000 ft	0%
2,000-3,000 ft	8%
3,000-4,000 ft	16%
4,000-5,000 ft	24%
5,000-5500 ft	32%

First Firing the Furnace

Start the furnace following the instructions given in the “Operating Instructions”. The first lighting may be difficult because of the air trapped in the gas lines. During initial firing of the furnace, residual manufacturing grease will bake out and smoke will occur which is not a health danger. To prevent nuisance and operation of fire alarms, ventilate the room for the first two hours of operation.

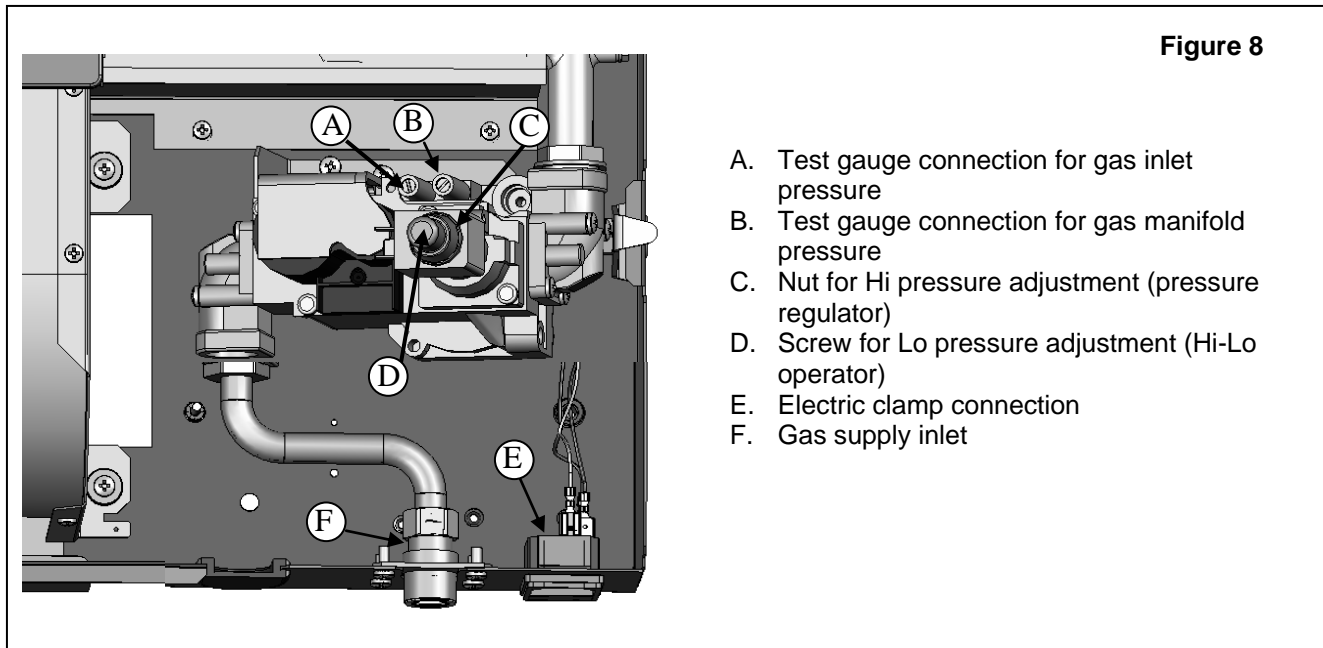
Checking the Gas Inlet Pressure

The gas inlet pressure can be measured by connecting a test gauge to the connection provided on the gas valve. (Figure 8 - A) Once installation is complete, the gas inlet pressure must be checked. The minimum gas inlet pressure must be as shown in “Technical Data”. After checking the gas inlet pressure, disconnect the test gauge and firmly tighten the screw of the gauge connection, then check for gas leaks. Correct any gas leaks before operating the furnace.

Checking the Gas Manifold Pressure

The gas manifold pressure can be measured by connecting a test gauge to the connection provided on the gas valve. (Figure 8 - B). The furnace comes set from the factory at the correct manifold gas pressure. After the installation is completed, the gas manifold pressure must be checked both in Hi and Lo input. Turn the control knob to switch the unit from Hi to Lo input. The position of the knob in which this occurs depends on the actual room temperature. The gas manifold pressure must be as shown in “Technical Data”. Differences of plus or minus 0.1 in. w.c. are acceptable. If the Hi or Lo gas manifold pressures are different from the values given in the “Technical Data” or are more than 0.1 in. w.c., shut off the furnace and contact a qualified service technician for correction.

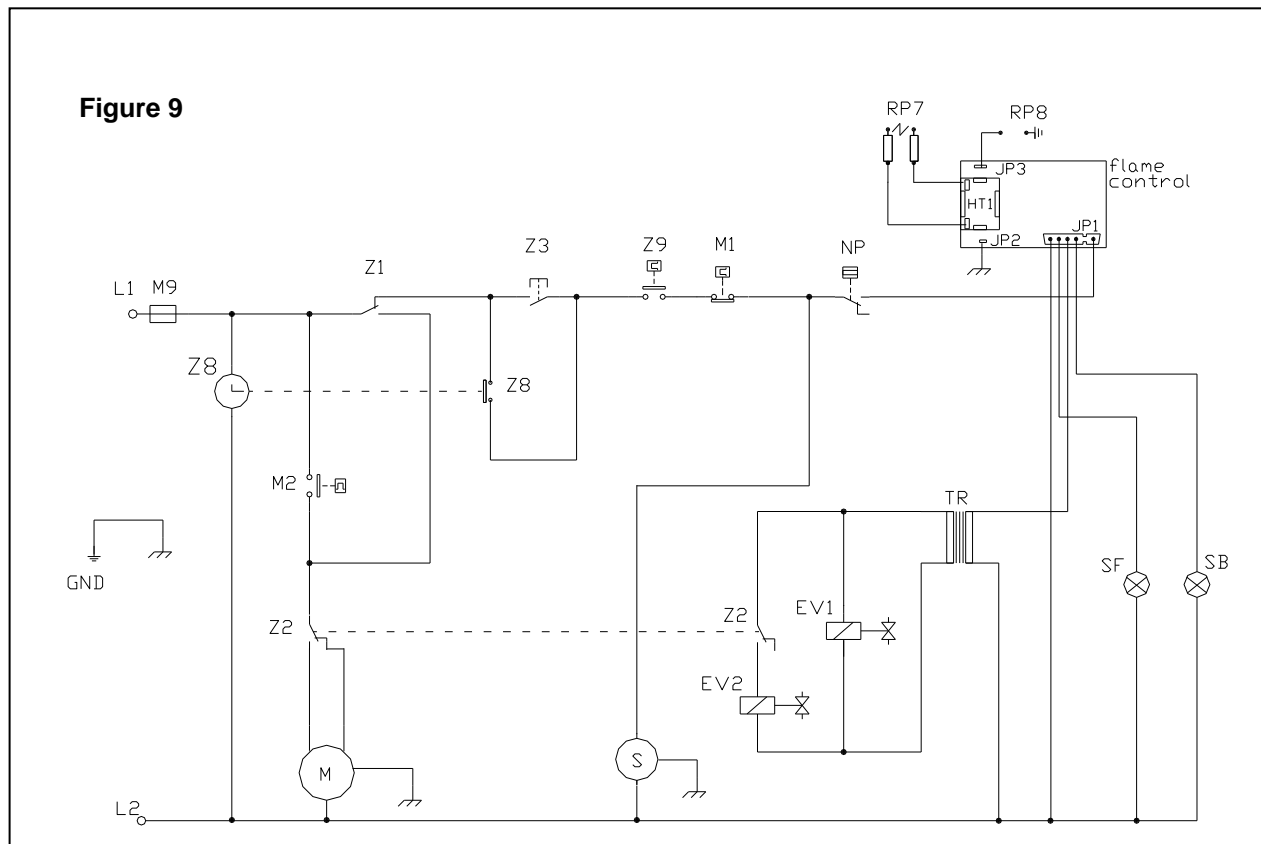
For instructions about adjustment of the manifold Hi and Lo pressures, see the “Servicing” section. After checking the gas manifold pressure, disconnect the test gauge and firmly tighten the screw of the gauge connection, then check for gas leaks from it. Correct any gas leaks before operating the furnace.



Electrical Wiring Diagram

Key:

EV, EV1	Gas Valve 1 (Safety Shutter)	Vanne Gas 1 (Securite')
EV2	Hi-Lo Flame Operator	Operateur Haute-Basse Flamme
M	Fan Motor	Moteur du Ventilateur
M1	Overheat Thermostat	Thermostat de Surchauffe
M2	Fan Thermostat	Thermostat de Ventilation
M9	Mains Fuse – 5x20 size – 4A	Pressostat de Circuit De Combustion
RP8	Flame Sensor	Electrode de Detection de Flamme
RP7	Spark Igniter (n. 2 pcs)	Electrode D'Allumage
S	Combustion Blower Motor	Moteur du Ventilateur de Combustion
SF	Flame View Lamp (green lamp)	Lampe de Presence de Flamme (Verte)
SB	Lock-Out Lamp (red lamp)	Lampe de Verrouillage (Rouge)
TR	Current Transformer 120-24 V	Transformateur 120-24 V
Z1	Reset and Summer – Winter Switch	Rearmement et Bouton Ete' - Hiver
Z2	Hi-Lo Flame and Fan Speed Switch	Bouton Haute-Basse Flamme – Vitesse Ventil.
Z3	Manual – Program Mode Switch	Bouton Manuel – Programme'
Z8	Programmable Timer	Interrupteur Horaire
Z9	Room Thermostat	Thermostat D'Ambiance
L1	Supply Line – Live Wire	Allimentation - Phase
L2	Supply Line – Neutral Wire	Alimentation - Neutre
GND	Supply Line – Ground Wire	Alimentation - Masse



Operating Instructions

Before operating the furnace, read carefully all warnings and safety information in this manual. Make sure the attached lighting instructions tag hangs outside the unit after lighting the pilot.

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 which must be lighted by means of the piezo igniter installed on the furnace. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.
- B. BEFORE LIGHTING, 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.
- C. 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.

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.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to the lowest setting by turning it counterclockwise completely. Do not force. 
3. Turn off all electric power to appliance.
4. This appliance is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand.
5. Turn off gas supply to the unit by turning off the gas shutoff valve.
6. Wait five minutes to clear out any gas. If you then smell gas, STOP! Follow the safety information in section "B" above. If you do not smell gas, go to the next step.
7. Turn on the gas supply to the unit.
8. Turn on electric power to the appliance.
9. Push the MIN/MAX button to MIN position (button down).
10. Switch the SUMMER/WINTER button to WINTER position (button up).
11. Set thermostat to desired setting.
12. The red lamp will be lit for 40 seconds, then the flame ignites. The red lamp will then shut off and the green lamp will be lit.
13. If the appliance will not operate, follow the instructions below "To Turn Off Gas Of Appliance" and call your service technician or gas supplier.
14. If you choose the high heat output setting, push the MIN/MAX button to MAX position (button up). If you prefer soft heating and silent operation, keep it on MIN position (button down).
15. This appliance has an automatic flame control system. When the flame is lit, the green lamp is lit also. In case of flame fault, the red lamp will light and the green lamp will turn off. If this occurs, set the SUMMER/WINTER button to the SUMMER position (button down) and wait ten (10) seconds; then turn the switch back to the WINTER position (button up). The appliance will attempt to relight after approximately 40 seconds. During these 40 seconds the red lamp will be lit. If the second attempt is unsuccessful, turn off the electric power to the appliance and call your Service Agency.



TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to the lowest setting by turning it counterclockwise  completely. Do not force.
2. Turn off all electric power to the appliance if service is to be performed.
3. Turn the gas tap installed on the gas supply to the CLOSED position.

WHAT TO DO IF THE RED LAMP IS LIT

This appliance has an electronic flame supervision device. If the flame disappears the gas flow will be automatically shut off and the red lamp will light instead of the green one. The appliance will attempt to relight if you do **ONE** of the following:

- A. Turn off the electric supply to the appliance for approximately 40 seconds and turn it on again; **OR**
- B. Turn the thermostat knob to the zero setting, then turn it back to a comfortable setting after approximately 40 seconds; **OR**
- C. Press the SUMMER/WINTER button to the SUMMER position (button down) for approximately 40 seconds and set it back (button up) to the WINTER position.

HOW TO SHUT OFF THE APPLIANCE

1. Turn the thermostat knob to the ZERO position.
2. Turn the I-O switch on the programmable clock to the ZERO position.
3. Turn off all electric supply to the appliance.
4. Turn the gas shutoff valve installed on the gas supply line upstream to the unit to the CLOSED position.

USING THE FEATURES OF YOUR FURNACE

GREEN LAMP: It is lit when the flame is ON.

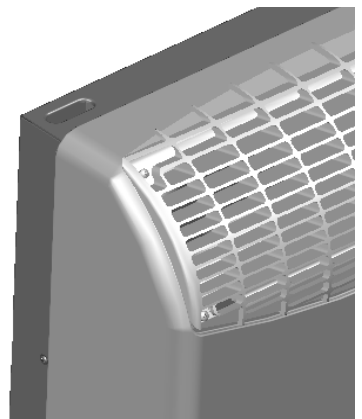
RED LAMP: In case the flame disappears, the gas flow will be shut off and the red lamp will be lit. The furnace is locked-out. To reset the furnace, follow the instructions above, "WHAT TO DO IF THE RED LAMP IS LIT."

MANUAL/PROGRAM BUTTON: When the button is down, the furnace keeps the temperature set by the thermostat according to the clock's program. When the button is up, the furnace thermostat maintains the temperature.

THERMOSTAT: Turn clockwise to increase the temperature, turn counterclockwise to decrease it.

SUMMER/WINTER: When the button is up, the furnace will operate in heating mode according to the thermostat and/or clock's program. When the button is down, the appliance will provide ventilation.

MIN/MAX BUTTON: For faster heating, keep this button up. For soft heating and silent operation, keep this button down.



Servicing

All servicing activities must be performed by a qualified service technician or a service agency. The home owner may not service the furnace. The home owner must read this section to be informed of the periodic maintenance and checks that are required. All servicing (except on vent system) must be performed with the external casing removed. After any servicing, the external casing must be reinstalled properly.

Checking and Adjusting the Gas Manifold Pressure

The furnace comes set from the factory at the correct HI and LO gas manifold pressures as shown in "Technical Data". It is recommended to check the pressures periodically (minimum once a year). If adjustment is required, this can be done by adjusting screws "C" and "D". (Figure 8) A test gauge must be connected as explained in "Checking the Gas Manifold Pressure".

Proceed as follows:

1. Place the unit in the HI mode.
2. Adjust the HI pressure by turning screw "C" (pressure regulator) to the value given in "Technical Data". Turn clockwise to increase the pressure, turn counterclockwise to decrease it.
3. Turn the control knob clockwise until the gas control switches to LO mode. The position in which this occurs depends on the actual room temperature.
4. Loosen screw "D" until the correct value for the LO pressure is achieved. Turn clockwise to decrease the pressure, turn counterclockwise to increase it.
5. Switch the unit from LO to HI mode to check that both the HI and LO pressures are correct. A tolerance of plus or minus 0.1-inches w.c. on the pressure value is acceptable. Readjust if needed.
6. Disconnect the test gauge and firmly tighten the screw of the gauge connection, then check for gas leaks from it.

The HI and LO pressures must be adjusted as instructed above. Never adjust them independently of each other.

Checking, Removing and Reassembling of the Vent Air Intake System

It is essential that the vent air intake system is examined periodically (minimum once a year) to verify it is clean from dust and deposits of solid materials such as leaves or nests. The vent air intake system is checked from outside. Proceed as follows:

1. Remove the vent cap by removing the three outer screws. (Figure 7)
2. Remove the inner flue pipe. **Do not use tools**; the pipe can be extracted by hand.
3. Remove dust and deposits from the vent cap and flue pipes. Deposits in the air pipe must be taken outside. **Do not push them inside the furnace**. The outer air pipe may not be removed from outside.
4. Reinstall the flue pipe from outside. Do not use glue or sealants.
5. Reinstall the vent cap on the flue pipe. Do not use glue or sealants. Tighten the three outer screws.

Lubrication of Moving Parts

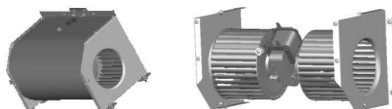
This furnace does not require lubrication. Do not try to lubricate any part of the furnace such as motors bearings, keys, knobs, screws, etc.

Flame Visual Check

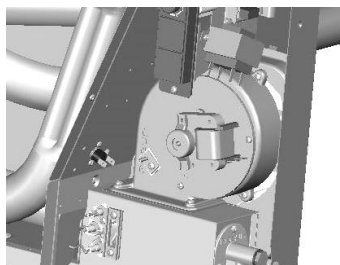
Correct and proper operation may be checked by examining the burner flame. The flame may be examined through the front flame viewer. The flame must be stable and have blue colour. Some small yellow tips are acceptable with propane gas. If the flame is yellow or has excessive turbulence, check the gas manifold pressure and the vent air intake system. If these are not acceptable, call a qualified service technician for a complete check of the furnace. Call also your gas supplier to check the composition of the gas in use.

Annual Maintenance Requirements

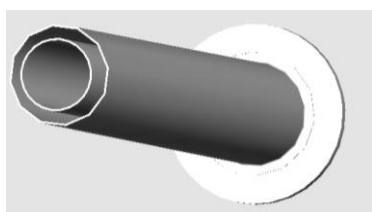
1. Clean fan blades.



2. Clean air blower.

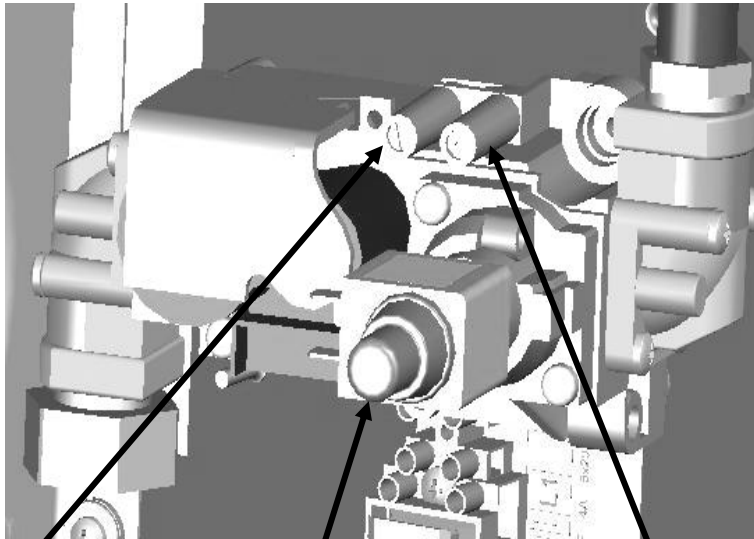


3. Check and clean silicone red pipes.
4. Check air flow switch.
5. Clean and check exhaust flue pipe and air intake pipe.



Check red O-Ring Gasket (P332612). If it is damaged, replace it.

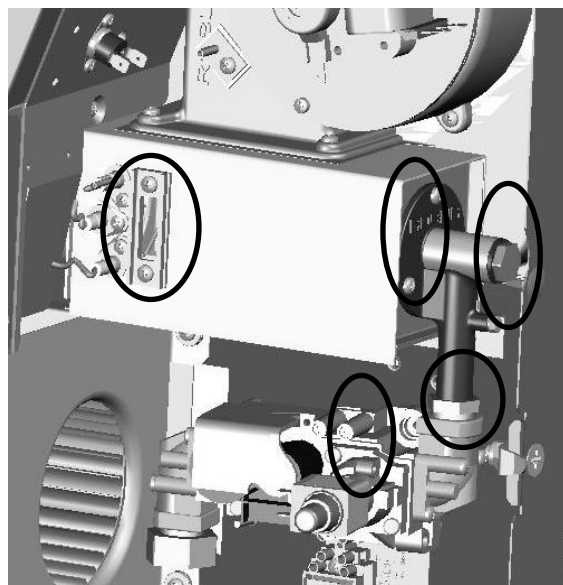
6. Check for gas leaks on all connections.
7. Check and adjust gas pressure.



Gas inlet pressure (pipeline)

Gas manifold pressure (burner)

Gas burner pressure adjustment



Programmable Timer

The programmable timer allows precise operating and timing control and is standard on this furnace. (Figure 10)

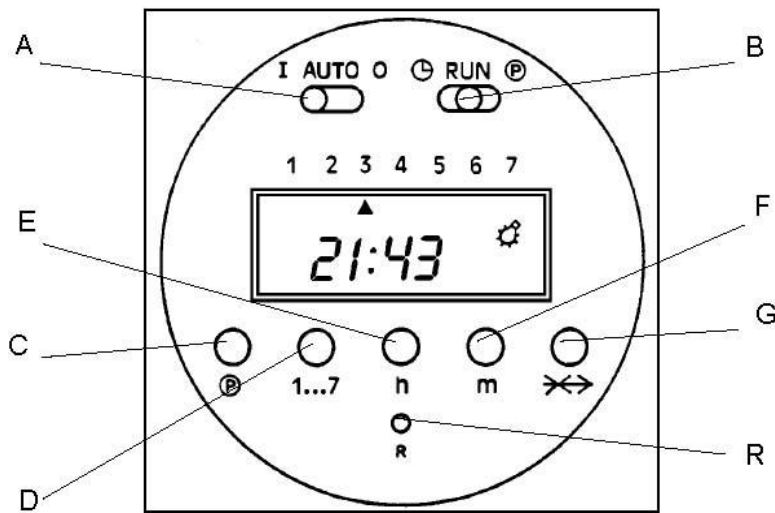
Overview

The programmable timer has the following features:

- Long life lithium battery
- Daily and weekly programs
- One minute minimum switching time
- Quick progression
- Sixteen programs (8 on and 8 off)
- Days of the week and hours of the day selection
- Programmable day blocks:

1-2-3-4-5	(Monday – Friday)
1-2-3-4-5-6	(Monday – Saturday)
1-2-3-4-5-6-7	(Monday – Sunday)
6-7	(Saturday – Sunday)

Figure 10



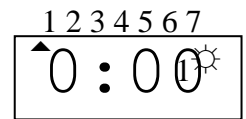
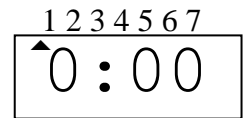
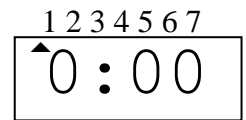
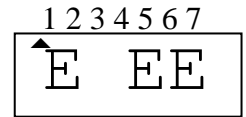
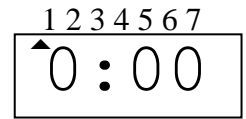
KEY

A	On/Off Switch	Pos. I	The appliance is controlled by the room thermostat
		Pos. AUTO	The appliance is controlled by both the timer and the room thermostat
		Pos. O	The appliance is turned off
B	Setting / Regulator Switch	Pos. ⊖	Time setting
		Pos. RUN	Normal operating mode (the display shows the current time)
		Pos. ⊕	Setting of programming
C	Program Selection		
D	Day Selection		
E	Hours Setting		
F	Minutes Setting		
G	SKIP Button		
R	Reset Button		

Setting and Adjustment

Initial Conditions

- A. Set the Setting/Regulator switch (Figure 10-B) in RUN position (centre). Press the Reset button R. The display will flash.
- B. With the Setting/Regulator switch selector in E position (right), press the Reset button, R, the display error EEE will appear. Move the Setting/Regulator switch, (Figure 10-B) to the RUN (centre) position. The display will disappear.
- C. If the Setting/Regulator switch, (Figure 10-B) is moved to \ominus position the display is frozen.
- D. If the Setting/Regulator switch, (Figure 10-B) is moved to RUN position the display is frozen with the colon flashing.
- E. If the Setting/Regulator switch, (Figure 10-B) is moved to E position (right), the display is flashing: $\text{☀}, 1, 1$.



Manual Operation

Move the On/Off switch, (Figure 10-A) to the I position (left).

- The symbol of a light (☀) will appear on the display. In this condition the heater is controlled by the furnace thermostat and is independent of the timer program.

Move the On/Off switch, (Figure 10-A) to the O position (right).

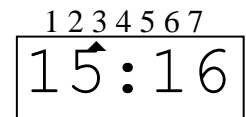
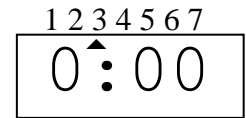
- The symbol of the light (☀) on the display will disappear. In this condition the furnace is turned off.

Move the On/Off switch, (Figure 10-A) to the AUTO position (centre).

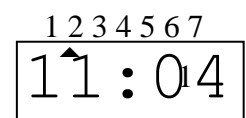
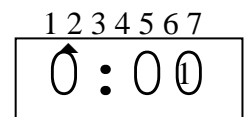
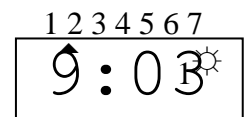
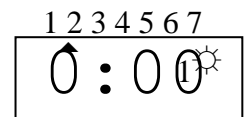
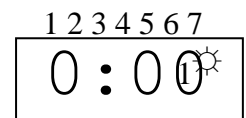
- The program function is activated. The furnace will operate according to the programs. The furnace is controlled both by the timer and by the furnace thermostat.

Day and Time Setting

- A. The Setting/Regulator switch, (Figure 10-B) is placed in the \ominus position (left).
- B. To set the day of the week, press the Day Selector button, (1...7, Figure 10-D), a triangular shaped indicator proceeds one day at a time. Number 1 stands for Monday, number 2 stands for Tuesday, etc.
- C. To set the time press the Hour Selector button (h, Figure 10-E) to set the hour and the Minutes Selector button (m, Figure 10-F) to set the minutes. The hours are set using military time.
- D. After setting the day and the time move the Setting/Regulator switch, B to the RUN position (centre). The display is frozen and the colon is flashing.



Example: Set Wednesday, 15:16 hours (military time).



Programming the Timer

Sixteen settings may be programmed on the timer. Eight odd numbers (1-3-5-7-9-11-13-15) for the ON position and eight even numbers (2-4-6-8-10-12-14-16) for the OFF position. Program numbers are to the left of the ☀ symbol on the display.

- A. Move the Setting/Regulator switch, (Figure 10-B) to the E position (right). On the right side of the display the number 1, 1, ☀ will appear. The ON time may now be set.
- B. Press the Day selection, (1.....7, Figure 10-D) button to the day or the block of days you want the furnace to turn ON. Number 1 stands for Monday, etc. To set the desired time, press the Hours Selection (h, Figure 10-E) button to set the hour and the Minute Selection (m, Figure 10-F) button to set the minutes (for example 09:03). The time is set using military time.
- C. Press the Program Selection (E , Figure 10-C). The right side of the display will show a number 2 without the light symbol. The OFF time may now be set.
- D. Press the Day Setting, (1.....7, Figure 11-D) button to program another day or block of days.

E. To set further programs repeat steps item B through D above.

NOTE: When the same ON and OFF times are desired for different days of the week, the setting procedure may be simplified.

- 1-2-3-4-5 (from Monday through Friday)
- 1-2-3-4-5-6 (from Monday through Saturday)
- 1-2-3-4-5-6-7 (from Monday through Sunday)
- 6-7 (Saturday and Sunday)

F. To avoid undesired operation verify that the programs do not overlap one another. You can check the settings by pressing the Program Selection button. (Ⓢ, Figure 10-C)

G. Move the Setting/Regulator switch to the RUN position (center). The display will show the current day and time.

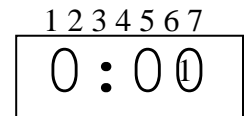
IMPORTANT: All the programs set will be activated ONLY the day after the setting has been carried out.

During operation, the ON status of the timer is shown on the display with the ☀ symbol on the right end. When the ☀ symbol does not appear, the timer is OFF.

Cancelling a Single Program

To cancel a single program:

- Move the Setting/Regulator switch (Figure 10-B) to the (Ⓢ, Figure 10-C) position (right). Press the Program Selector (Ⓢ, Figure 10-C) button and select the program to be cancelled.
- Simultaneously press the Program Selector (Ⓢ, Figure 10-C) and SKIP button (⌘→ Figure 10-G) for at least 2 seconds. The selected program will be cancelled.
- Verification that program has been cancelled is the continual blinking of 0:00.



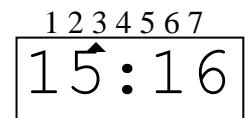
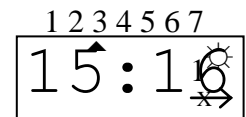
Cancelling of all Preset Programs

To cancel all the preset programs, press the Reset button, R, for at least 2 seconds. All the preset programs will be cancelled.

Using the Skip Function

To skip a program:

- Move the Setting/Regulator switch in the RUN position (center).
- Press the SKIP button (⌘→ Figure 10-G). The next program will be activated as programmed. The SKIP symbol (⌘→ Figure 10-G) is shown on display.
- The SKIP command may be stopped, by pressing the SKIP button. (⌘→ Figure 10-G) The preset program will restart and SKIP symbol (⌘→ Figure 10-G) will disappear from the display.



Skip Function Procedure During Operation

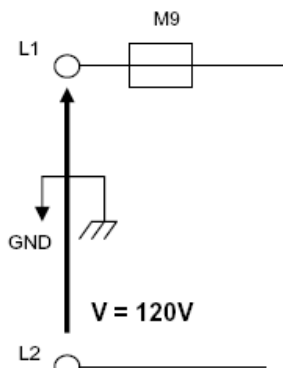
- The SKIP function can be activated only in RUN mode.
- The SKIP function starts immediately after the pressing the SKIP button, and disappears when next program starts.
- The SKIP function can be stopped manually by pressing the SKIP button and the preset program will be activated.

Troubleshooting

Starting Sequence (Electrical)

Step 1

1. Check L1 – L2 (Supply 120 V, 60 Hz)
2. Check M9 (Main fuse)



Troubleshooting Step 1

Point 1 (L1-L2)

No voltage (120 V).

Check the electrical supply line, wiring and connections.

Point 2 (M9)

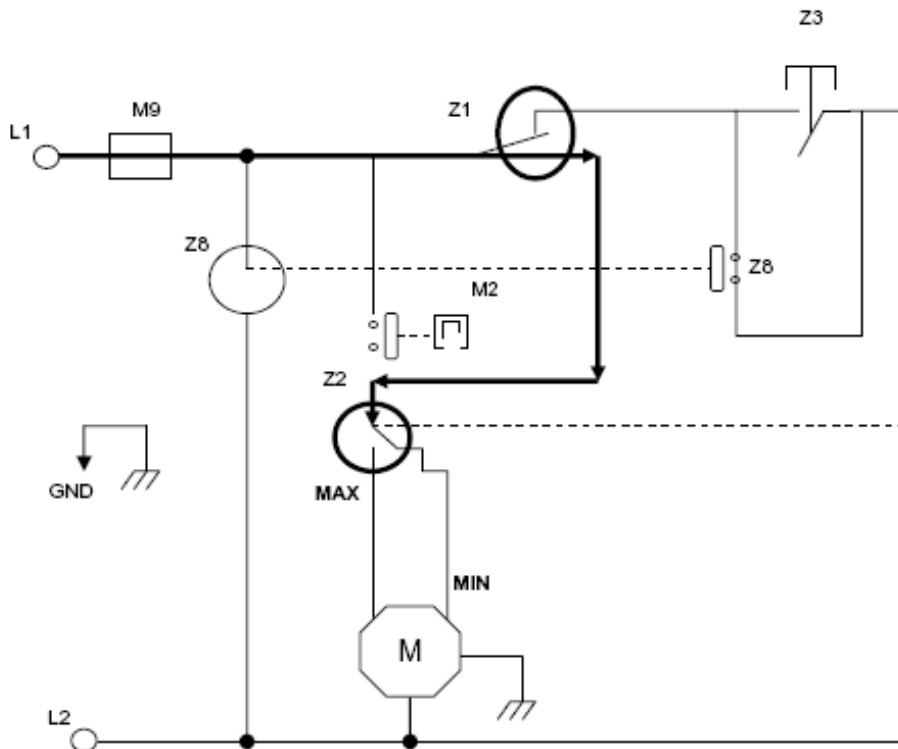
Fuse damaged.

Check the electrical supply line and replace the fuse.

Summer Mode

Step 2

3. Check Z1 (Reset summer/winter switch). Button down – summer mode.
4. Check Z2 (Hi-Lo flame and fan speed switch)
 - Button down - Minimum velocity
 - Button up – Maximum velocity



Troubleshooting Step 2

Point 3 (Z1)

Z1 is down (closed) but there is no voltage on the fan motor M.

Check wiring and connections. If everything is okay, replace the switch.

Point 4 (Z2)

Z2 is down but the fan motor runs at the maximum velocity (120 V)

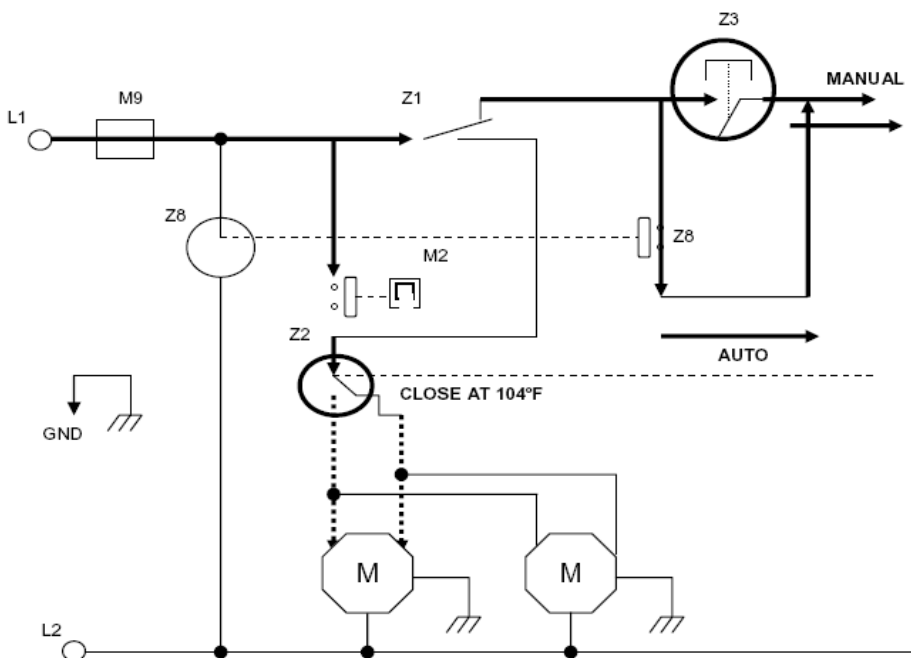
Z2 is up but the fan motor runs at the minimum velocity (lower than 120 V)

Check wiring and connections. If they are okay, replace the switch.

Winter Mode

Step 3

5. Check Z1 (Reset summer/winter switch). Button up – winter mode.
6. Check Z3 (Manual-program mode switch). Button up – manual mode. Button down – automatic mode.
7. Check M2 (Fan thermostat). The thermostat is closed only when its temperature is higher than 104 °F.



Troubleshooting Step 3

Point 5 (Z1)

Z1 is open and no ignition.

Check wiring and connections. If everything is okay, replace the switch.

Point 7 (M2)

M2 is closed and fan thermostat temperature is lower than 104 °F.

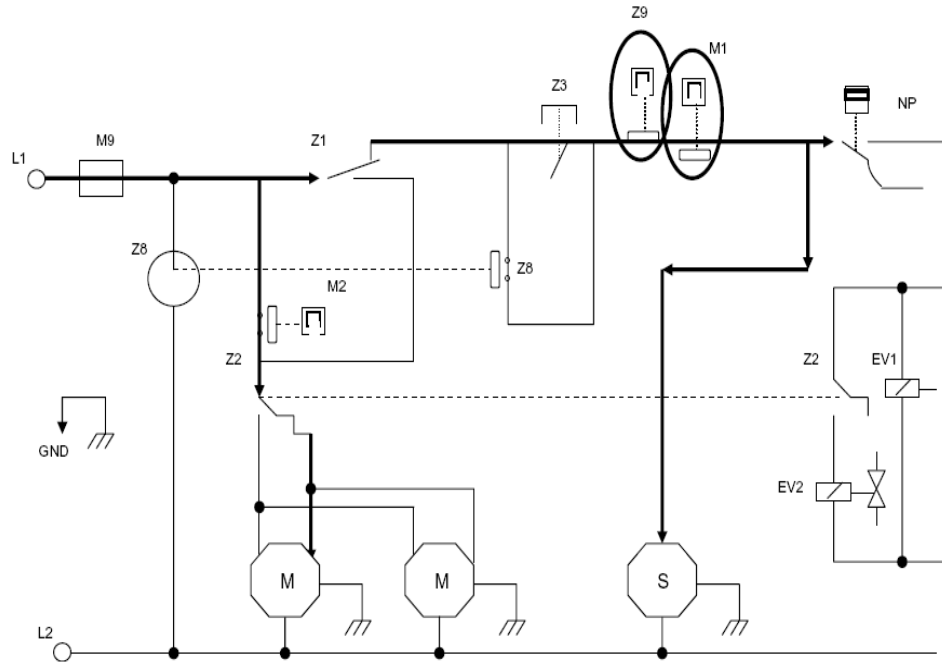
Check wiring and connections. If they are okay, replace the thermostat.

Step 4

8. Check Z9 (Room thermostat). Close the thermostat with a clockwise rotation.

9. Check M1 (Overheat thermostat, automatic reset). The thermostat is closed at a temperature lower than 140 °F.

10. Check S (Combustion blower motor).



Troubleshooting Step 4

Point 8 (Z9)

After a clockwise rotation, the contact is still open. Check wiring and connections. If they are okay, and the room temperature is cold, replace the switch.

Point 9 (M1)

M1 is open and fan thermostat temperature is lower than 140 °F. Check wiring, connections, gas pressure and fan motor. Clean fan blades and air grids. If everything is okay, replace the thermostat.

Point 10 (S)

S motor does not run. Check voltage, wiring and connections.

If everything is OK, replace the motor.

Step 5

11. Check NP (Pressure switch).

12. Check electrical supply to flame control box (120 V).

13. Check TR (electrical transformer). (120V/24V)

14. Check EV1 (Min gas valve, 24V).

15. Check RP7 (ignitions electrode)

16. Check RP8 (flame sensor)

17. Check EV2 (Max gas valve, 24 V).

Troubleshooting Step 5

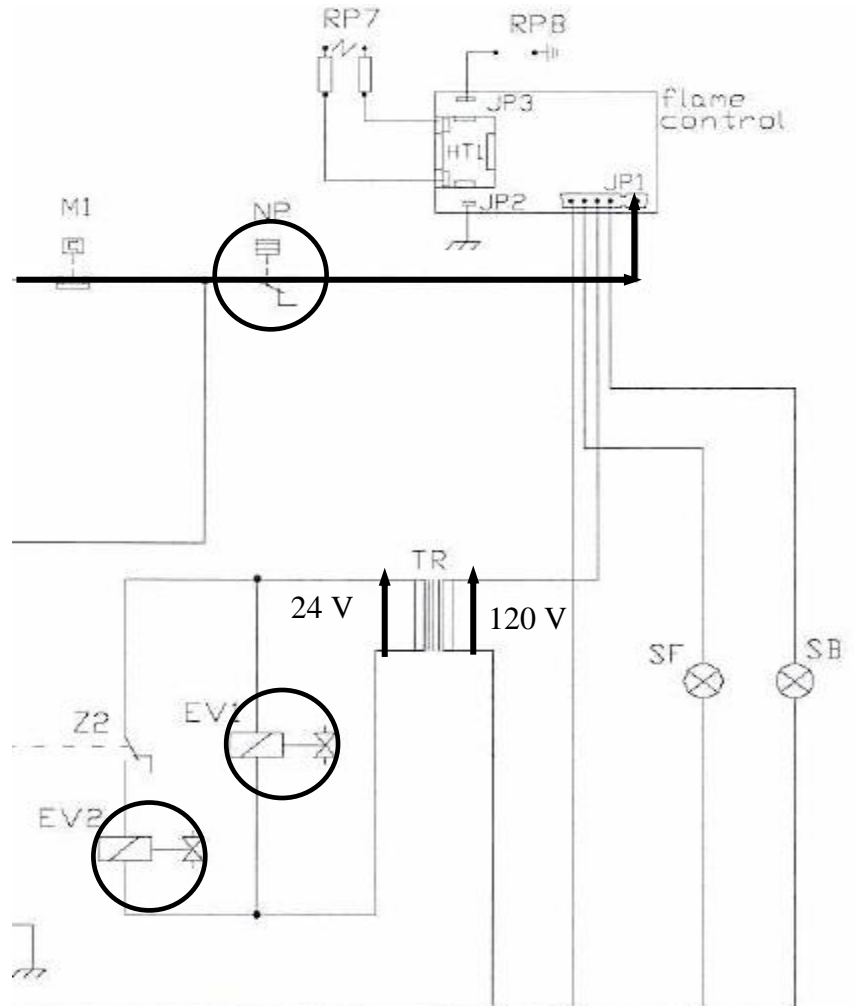
Point 11 (NP)

NP contact is open and air blower ON.

Check wiring and connections. Check and clean blower pipes.

Check and clean burner and flue gas pipe. Clean blower.

If everything is okay, replace the switch.



Point 13 (TR)

No inlet voltage (120 V).

Check 5 pole connector and control box.

If everything is okay, first replace the connector and then the control box if problem remains.

No outlet voltage (24 V) during ignition.

Check wiring and connections.

If everything is okay, replace the transformer.

Point 14 (EV1)

Valve closed during ignition.

Check wiring, connections and voltage.

If everything is okay, replace the gas valve.

Point 15 (RP7)

No spark during ignition.

Check electrode, wiring and connections.

If everything is okay, replace the flame control box.

Point 16 (RP8)

No flame sensing.

Check flame sensor, wiring and connections.

Check gas pressure and exhaust flue pipe.

If everything is okay, replace the flame control box.

Point 17 (EV2)

No voltage on EV2 with switch Z2 up.

Check wiring and connections.

If everything is okay, replace the switch.

Valve closed with voltage with Z2 up.

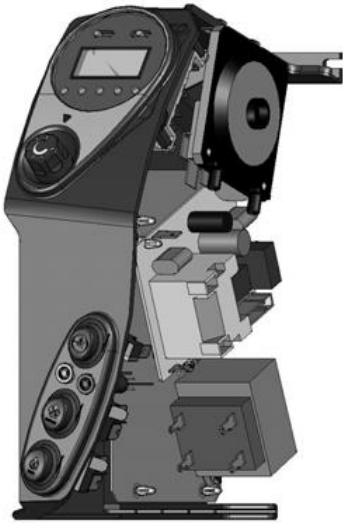
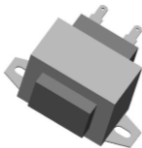
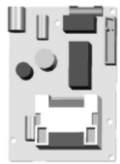

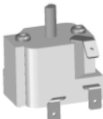






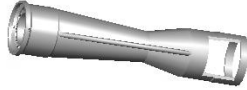


Check wiring, connections and voltage.

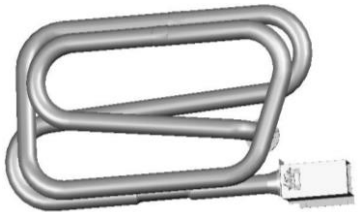



If everything is okay, replace the gas valve.

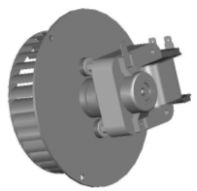
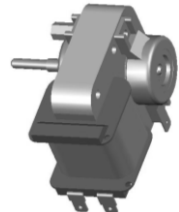
Starting Sequence (Gas)

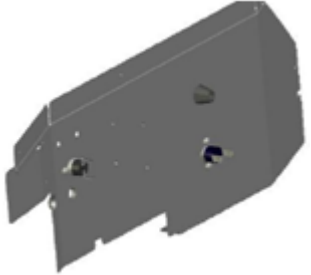


1. Check and clean exhaust flue pipes;
2. Check and clean air blower and fan motor;
3. Check and clean burner and combustion chamber;
4. Check and clean gas nozzle;
5. Check gas type;
6. Check supply gas line pressure (see the manual);
7. Check gas losses;
8. Set burner gas pressure (see the manual).


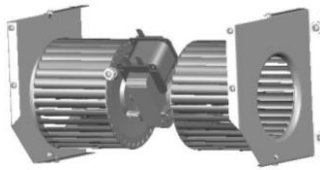

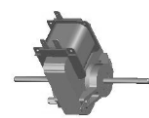
Replacement Parts

 <p>Electric Box</p>		TR – 120/24V Transformer	Part Number: P332523
		Ignition Control Box	Part Number: P332503
		NP – Pressure Switch	Part Number: P332516
		Z9 – Room Thermostat	Part Number: P332564
		Z1 – Reset and Summer/Winter Switch	Part Number: P332630
		Z8-Z3 – Timer and Manual-Program Mode Switch	Part Number: P332629
		Z2- Hi-Lo Flame and Fan Speed Switch	Part Number: P332631
		SF/SB – Green and Red Lamps	Part Number: P332538 P332633
		Z8 - Timer	Part Number: P332539
 <p>Gas Assembly</p>		Gas Burner and Gas Nozzle	Part Number: P332561
		Natural Gas Nozzle LP Gas Nozzle	Part Number: P332551 Part Number: P332552
		EV1/2 – Min/Max Gas Valve	Part Number: P332541

			RP8 : Flame Sensor	Part Number: P332511
			RP7: Spark Igniter (2 pieces)	Part Number: P332512

		S – Combustion Blower Motor Combustion Motor/Wheel Asy	Part Number: P332556 Part Number: P332558
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		M1 – Overheat Thermostat	Part Number: P332565
		M2 - Fan Thermostat	Part Number: P332496

			Fan Blades (2 pieces)	Part Number: P332572 (Left) P332638 (Right)
			M - Fan Motor	Part Number: P332513