Side Wall Vent Kit

This kit is to be used with 2” or 3” direct vent systems. The vent kit must terminate outside the structure and may be installed with the intake and exhaust pipes located side-by-side or with one pipe above the other. These kits are NOT intended for use with single pipe (non-direct vent) installations. ***Refer to the directions furnished with the Side Wall Vent Kit (p/n 0170K00000S or 0170K00001S) for installation specifications.***

CONDENSATE DRAIN LINES & DRAIN TRAP

A condensing gas furnace achieves its high level of efficiency by extracting heat from the products of combustion to the point where condensation takes place. The condensate must be collected in the furnace drain trap and routed to an appropriate drain location in compliance with local and national codes.

Follow the bullets listed below when installing the drain system. Refer to the following sections for specific details concerning furnace drain trap installation and drain hose hook ups.

- The drain trap supplied with the furnace must be used.
- The drain trap must be primed at time of installation.
- The drain line between furnace and drain location must meet local and nation codes.
- The drain line between furnace and drain location must maintain a 1/4 inch per foot downward slope toward the drain.
- Do not trap the drain line in any other location than at the drain trap supplied with the furnace.
- If the drain line is routed through an area which may see temperatures near or below freezing, precautions must be taken to prevent condensate from freezing within the drain line.
- If an air conditioning coil is installed with the furnace, a common drain may be used. An open tee must be installed in the drain line, near the cooling coil, to relieve positive air pressure from the coil’s plenum. This is necessary to prohibit any interference with the function of the furnace’s drain trap.

NOTE: In vertical installations, air conditioning coil condensate may drain into the furnace trap as long as there is a trap between the coil and the furnace trap and the drain pipe is not terminating below the water level of the furnace trap.

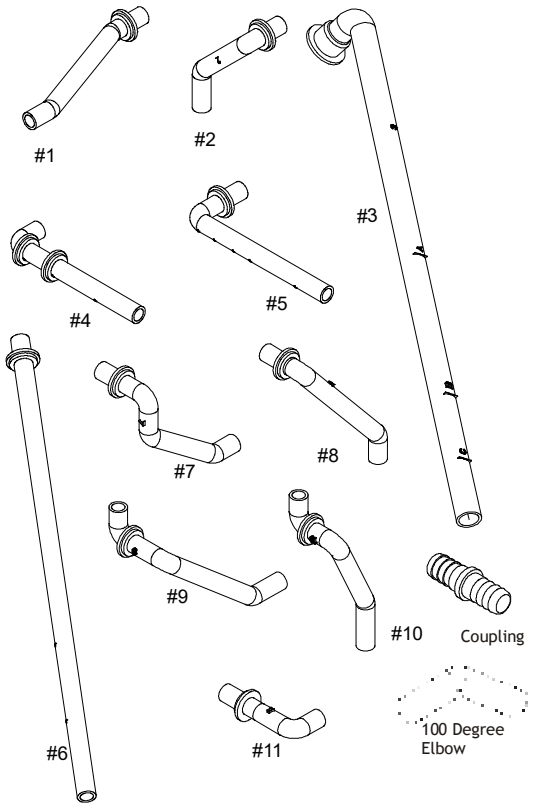


Figure 22

NOTE: Drain components shown for information purposes only. For horizontal installation, a Horizontal Drain Kit may be needed. Refer to the specifications sheet for kit part number.

General Drain Information

All furnace models come with a factory installed drain trap. For vertical installations, the trap will remain in the factory position except for a counterflow when the installer desires the drain to exit the right side. All furnace models installed horizontally require the trap to be relocated. Many drain hoses have a built–in grommet which will provide a cabinet seal when installed. See instructions below for your model and installation position.

NOTE: Both sides of the drain trap must be primed prior to initial furnace start up.

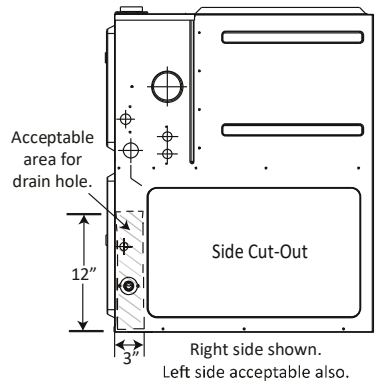


Figure 23

Field Supplied Drain

Drain the furnace and air conditioning coil if applicable, in compliance with code requirements. In horizontal or counterflow installations, a field installed rubber coupling will allow the drain trap to be removed for cleaning. The drain trap must be primed before initial furnace start up. When an air conditioning coil drain is connected to the field supplied furnace drain, it must be vented. An open tee must be installed at a height no higher than the bottom of the furnace collector box to prevent air conditioning condensate from backing up into the furnace, if the common drain was blocked.

Upflow Model Installed Vertically

The trap and factory installed hoses remain as shipped. The furnace drain may exit either the right or left side of the furnace cabinet. Both sides of the cabinet have two .875" diameter holes which can be used interchangeably for drain and low voltage wiring purposes. If a higher drain exit is needed, a .875" diameter hole may be added in the area shown in Figure 24. Any unused cabinet opening must be sealed. Do not allow drain hose to sag or trap water.

Drain Exiting Right Side

1. Locate and Install the 45º pipe / hose drain coupling from the outside of the cabinet (barbed end goes in the cabinet) through hole in the right side of the cabinet and secure with two field supplied #8 self-tapping screws (see Figure 24).
2. Locate the long drain hose #3 and cut at line "A" .
3. Install large end of hose #3 to trap outlet and secure with 1.25" clamp.
4. Install smaller end of hose #3 on 45º elbow and secure with 1" clamp.
5. Refer to Field Supplied Drain section for instructions on field supplied / installed drain on outlet of furnace trap.

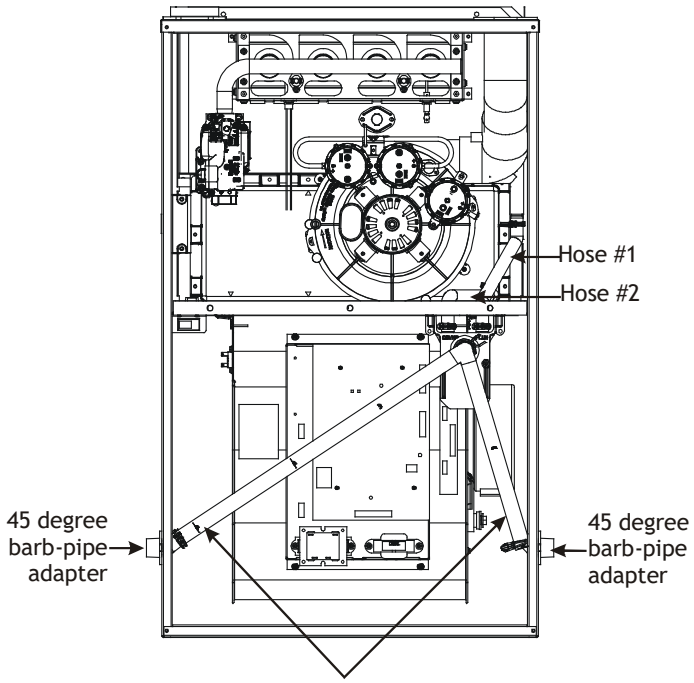


Figure 24

Drain Exiting Left Side

1. Install the 45 degree pipe / hose drain coupling from the outside of the cabinet (barbed end goes in the cabinet) through the hole in the left side of the cabinet and secure with two field supplied #8 self-tapping screws (see Figure 24).
2. Locate the long drain hose #3 and cut at "B" line for a 17.5" cabinet; cut at line "C" for a 21" cabinet; do not cut for a "D" width cabinet.
3. Install large end of hose #3 to trap outlet and secure with 1.25" clamp.
4. Install smaller end of hose #3 on 45º elbow and secure with 1" clamp.
5. Refer to Field Supplied Drain section for instructions on field supplied / installed drain on outlet of furnace trap.

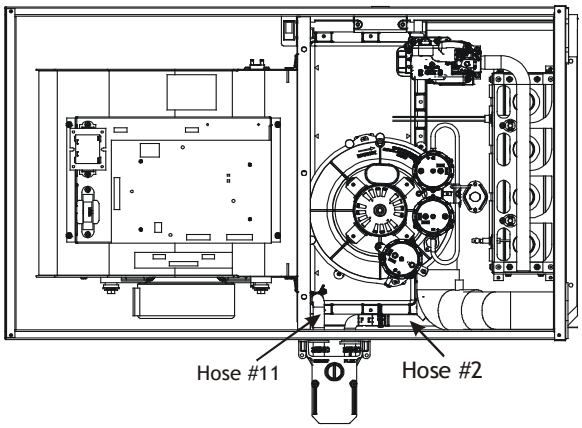


Figure 25

Upflow Model Installed Horizontally with Right Side Down

Minimum 5 ½" clearance is required for the drain trap beneath the furnace.

1. Remove the clamps from both ends of the drain hoses.
2. Remove the two screws holding the drain trap to the blower deck.
3. Remove the trap and two hoses from the blower deck
4. Remove the two plugs from the right side of the cabinet and install them in the blower deck.
5. (Draining the Vent Elbow) Locate hose #2 (factory installed) and cut 1" away from the 45 degree bend, discard the 45 degree section. Insert hose #2 from outside the cabinet through the cabinet drain hole nearest the top, secure it to the barbed fitting in the elbow with a red clamp.
6. (Draining the Collector Box) Install the non-grommet end of hose #11 from outside the cabinet in the bottom drain hole. Install on collector box and secure with a silver clamp.

7. Use two silver clamps and secure the hoses to drain trap. The trap outlet faces the front of the furnace. Secure the trap to the cabinet using two screws removed in step 2 by inserting the two screws through the large set of holes in the top mounting tabs of the trap into the two pre-drilled holes in the side of the cabinet.
8. Refer to Field Supplied Drain section for instructions on field supplied / installed drain on outlet of furnace trap.

Upflow Model Installed Horizontally with Left Side Down

Minimum 5 ½" clearance is required for the drain trap beneath the furnace.
**Also see Front Cover Pressure Switch Tube Location on page 10.*

1. Remove the clamps from the two drain tubes on the trap.
2. Remove the two screws holding the drain trap to the blower deck.
3. Remove the trap and hoses from the blower deck.

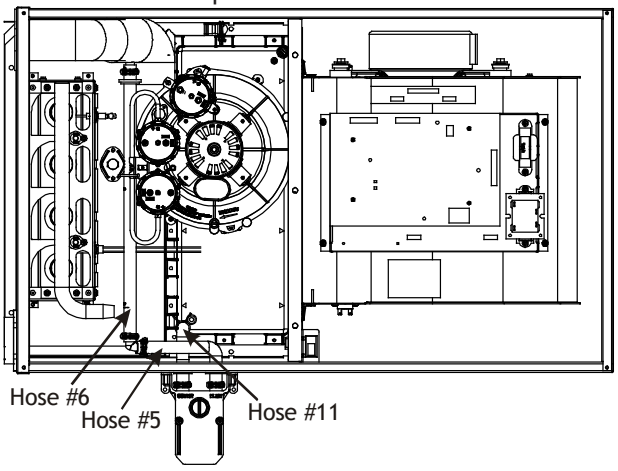


Figure 26

4. Remove the two plugs from the left side of the cabinet and install them in the blower deck.
5. (Draining the Vent Elbow) Locate hose #6. Measuring from the non-grommet end; cut off and discard 1 ½" for a "D" width cabinet, 5" for a "C" width cabinet, 8 ½" for a "B" width cabinet.
6. Remove the rubber plug from vent – drain elbow side port. Place hose #6 on the vent – drain elbow side port and secure with a silver clamp .
7. ***Unused vent-drain elbow drip leg port must be sealed to prevent flue gases from escaping. Insert the rubber plug removed in step 6 into the unused elbow drain port. Inserting a blunt tool such as a 3/16" Allen wrench into the center of the rubber plug will stretch the plug and allow complete insertion.***
8. Locate hose #5 and cut 3" from the non-grommet end. Discard the section without the grommet.
9. Insert the cut end of tube #5 through the lower cabinet drain hole.
10. Connect hose #6 & hose #5 using 100º elbow and secure with two red clamps
11. (Draining the Collector Box) Remove cap from left side collector box drain port (bottom in horizontal left position) and install it on right side (top) collector box drain port.
12. Install the non-grommet end of hose #11 from outside the cabinet in the upper drain hole. Install on collector box and secure with a silver clamp.
13. Use two silver clamps and secure the hoses to drain trap. The trap outlet faces the front of the furnace. Secure the trap to the cabinet using two screws removed in step 2 by inserting the two screws through the large set of holes in the top mounting tabs of the trap into the two pre-drilled holes in the side of the cabinet. [Removed: Place cap on vent...]
14. Refer to Field Supplied Drain section for instructions on field supplied / installed drain on outlet of furnace trap.

Upflow Model Installed Horizontally With Left Side Down - Alternate

**Also see Front Cover Pressure Switch Tube Location on Page 10.*

1. (Draining the RF000142 Coupling) Locate hose #2 (factory installed). Cut off and discard the 45° radius end.
2. Install 90°radius end of hose #2 on RF000142 drain outlet and secure with a red clamp.
3. Insert coupling in hose #2 and secure with a red clamp.
4. Locate hose #5 and cut 3" from the non-grommet end. Discard the section without the grommet.
5. Insert the cut end of tube #5 through the lower cabinet drain hole.
6. Insert 100 degree elbow in the cut end of hose #5.
7. Locate hose #6. Using red clamps, connect between the coupling and 100 degree elbow, cutting off excess tubing.
8. (Draining the Collector Box) Remove cap from left side collector box drain port (bottom in horizontal left position) and install it on right side (top) collector box drain port and secure with a red clamp.
9. Install the non-grommet end of hose #11 from outside the cabinet in the upper drain hole. Install on collector box and secure with a silver clamp.
10. Use two silver clamps and secure the hoses to drain trap. The trap outlet faces the front of the furnace. Secure the trap to the cabinet using two screws removed in step 2 by inserting the two screws through the large set of holes in the top mounting tabs of the trap.

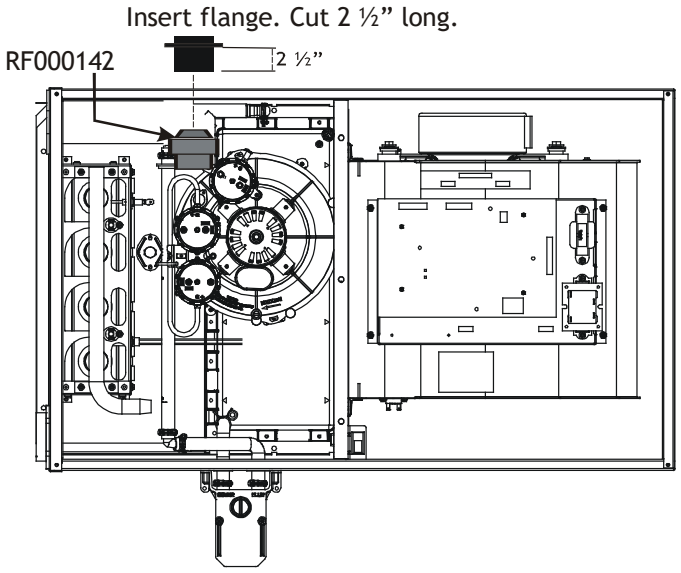


Figure 27

CounterFlow Model Installed Vertically

The furnace drain may exit the right or left side of the furnace cabinet (left side preferred) Trap and factory installed hoses remain as shipped if the drain will exit the left side of the cabinet. Draining from the right side requires relocation of the trap to outside the cabinet.

Drain Exiting Left Side (See Figure 28)

1. Install a field supplied rubber coupling secured with a 1 ¼" clamp to enable removing the trap for future cleaning. Alternately, a PVC fitting may be glued on the trap outlet.
2. Install drain per local and National codes.

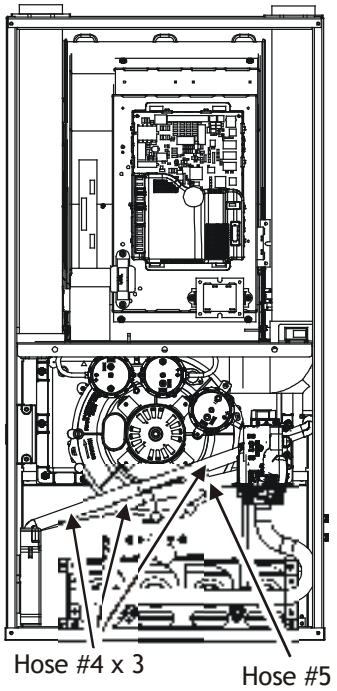


Figure 28

Drain Exiting Right Side (See Figure 29)

1. Removing the gas manifold assembly will provide better access when re-locating the trap. To remove the gas manifold, remove the four screws that fasten the gas manifold assembly to the bracket.
2. Remove hose clamps and hoses from trap.
3. Remove trap.
4. (Draining the Vent Elbow) Insert the non-grommet end hose #10 into the cabinet back drain hole. Insert a coupling into the drip leg of the vent-drain elbow and secure with a silver clamp. Secure hose #10 on vent - drain elbow barb fitting with a silver clamp.
5. (Draining the Collector Box) Insert non-grommet end of hose #9 into the cabinet front drain hole and secure on collector box drain port with a silver clamp.
6. Mate the drain trap inlets to the hoses and secure with silver clamps.
7. Line up the trap mounting holes with the pre-drilled holes in the furnace and secure with 2 screws removed in step 2.
8. Refer to Field Supplied Drain section for instructions on field supplied / installed drain on outlet of furnace trap.

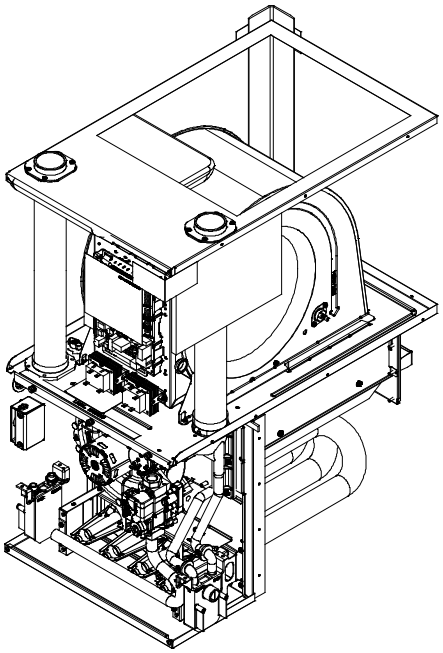


Figure 29

Counterflow Model Installed Horizontally with Right Side Down (See Figure 30)

Minimum 5 ½" clearance is required for the drain trap beneath the furnace.

NOTE: For horizontal installations, some of the required hoses are found in the factory-installed hose assemblies. Remove the hose clamps to obtain the respective hoses needed for installation, and install per the following directions.

1. Remove the drain trap and factory installed drain tube assemblies.
2. Remove two 1" plugs from right side of cabinet.

3. (Draining the Collector Box) From outside the cabinet, insert the non-grommet end hose #7 into the back drain hole and secure to collector box drain port using a silver clamp.
4. (Draining the Vent Elbow) Insert the straight barbed coupling into the vent - drain elbow drip leg and secure with a red clamp.

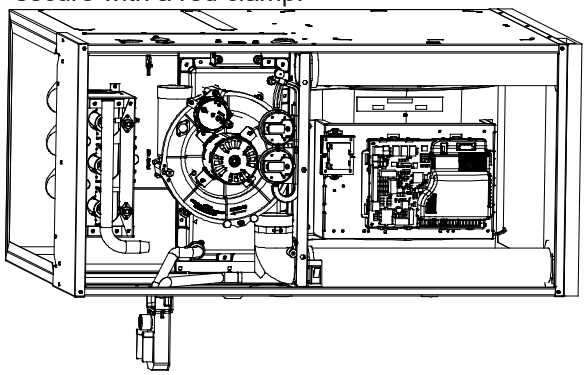


Figure 30

5. From outside the cabinet, insert the non-grommet end of hose #8 into the front cabinet drain hole and secure on the vent - drain elbow barb fitting using a red clamp.
6. Place the drain hoses on the trap inlets and secure with silver clamps. The outlet of the trap must face the original bottom of furnace.
7. Using the two sheet metal screws provided in the cabinet, secure the trap to the furnace.
8. Refer to Field Supplied Drain section for instructions on field supplied/installed drain on outlet of furnace trap.

Counterflow Model Installed Horizontally with Left Side Down (See Figure 31)

Minimum 5 ½" clearance is required for the drain trap beneath the furnace.
**Also see Front Cover Pressure Switch Tube Location on page 10.*

1. Remove the factory installed drain trap and hose assemblies. Leave the 100° elbow inserted and clamped in the vent-drain elbow.
2. Remove two 1"plugs from left side of cabinet.
3. (Draining the Collector Box) Remove the cap from the left side of the collector box drain port (bottom in horizontal left position) and install it on right side drain port.
4. Place radius end of hose #4 (factory installed) on the collector box drain port and secure with a silver clamp.
5. Insert hose #2 from outside the cabinet in the front drain hole.
6. Connect hose #4 & hose #2 together using a straight barbed coupling and two gold clamps (factory installed).
7. (Draining the Vent Elbow) Remove rubber plug from vent – drain elbow side port.
8. The unused vent-drain elbow drip leg port must be plugged to prevent flue gases from escaping. Insert rubber plug removed in step 7 into the 100° elbow. (Inserting a blunt tool such as a 3/16" Allen wrench into the center of the rubber plug will stretch the plug and allow complete insertion)

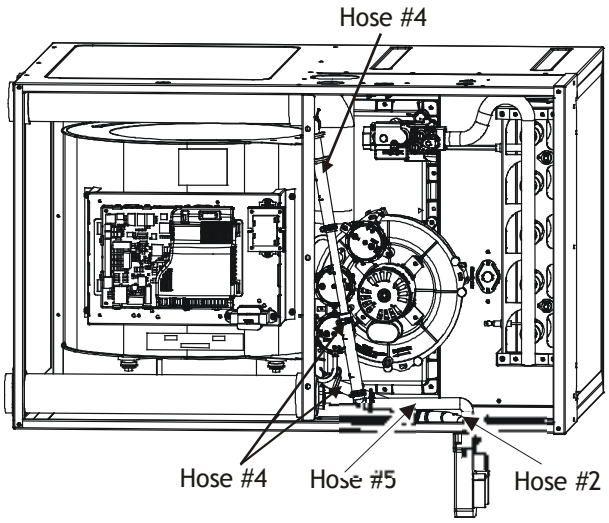


Figure 31

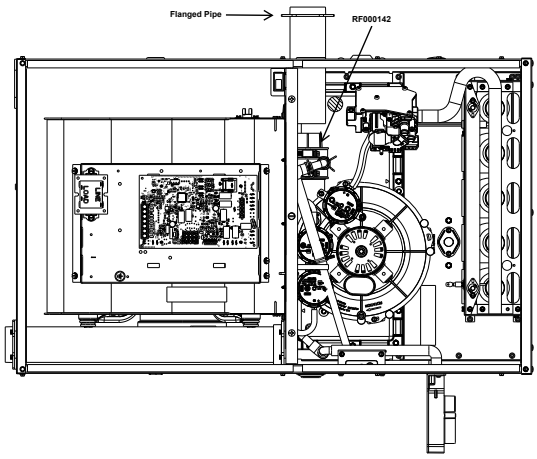
9. Place radius end of hose #4 on the side port of vent – drain elbow and secure with a gold clamp.
10. Insert a ½" diameter PVC pipe (factory installed) into hose #4 and secure with a gold clamp.
11. Insert the non-grommet end of hose #5 (factory installed) from outside the cabinet in the back drain hole.
12. Insert 100º elbow in hose #5 and secure with a red clamp.
13. Locate hose #4 and cut a cut off a 4" straight section and discard the radius end.
14. Connect the 4" straight section of hose #4 to the 100º elbow and the PVC pipe and secure with red clamps.
15. Connect the hoses to the trap inlets and secure with silver clamps, drain trap outlet must point to the original bottom of the furnace.
16. Using the two sheet metal screws provided in the cabinet, secure the trap to the furnace.
17. Refer to Field Supplied Drain section for instructions on field supplied / installed drain on outlet of furnace trap.

Counterflow Model Installed Horizontally with Left Side Down - Alternate

Minimum 5 ½" clearance is required for the drain trap beneath the furnace.
**Also see Front Cover Pressure Switch Tube Location on page 15.*

1. Remove the factory installed drain trap and hose assemblies.
2. Remove two 1"plugs from left side of cabinet.
3. (Draining the Collector Box) Remove the cap from the left side of the collector box drain port (bottom in horizontal left position) and install it on right side drain port.

4. Place radius end of hose #4 (factory installed) on the collector box drain port and secure with a silver clamp.
5. Insert hose #2 from outside the cabinet in the front drain hole.
6. Connect hose #4 & hose #2 together using a straight barbed coupling and two gold clamps (factory installed).
7. (Draining the RF000142 Coupling) Place radius end of hose #4 on the uncapped port of the coupling and secure with a gold clamp.
8. Insert a ½" diameter PVC pipe (factory installed) into hose #4 and secure with a gold clamp.
9. Insert the non-grommet end of hose #5 (factory installed) from outside the cabinet in the back drain hole.
10. Insert 100º elbow in hose #5 and secure with a red clamp.
11. Locate hose #4 and cut a cut off a 4" straight section and discard the radius end.
12. Connect the 4" straight section of hose #4 to the 100º elbow and the PVC pipe and secure with red clamps.
13. Connect the hoses to the trap inlets and secure with silver clamps, drain trap outlet must point to the original bottom of the furnace.
14. Using the two sheet metal screws provided in the cabinet, secure the trap to the furnace.
15. Refer to Field Supplied Drain section for instructions on field supplied / installed drain on outlet of furnace trap.



ELECTRICAL CONNECTIONS

Wiring Harness

The wiring harness is an integral part of this furnace. Wires are color coded for identification purposes. Refer to the wiring diagram for wire routings. If any of the original wire as supplied with the furnace must be replaced, it must be replaced with wiring material having a temperature rating of at least 105° C. Any replacement wiring must be a copper conductor.

115 Volt Line Connections

Before proceeding with electrical connections, ensure that the supply voltage, frequency, and phase correspond to that specified on the unit rating plate. Power supply to the furnace must be NEC Class 1, and must comply with all applicable codes. The furnace must be electrically grounded in accordance with local codes or, in their absence, with the latest edition of The National Electric Code, ANSI NFPA 70 and/or The Canadian Electric Code CSA C22.1.

WARNING

HIGH VOLTAGE
To avoid personal injury or death due to electrical shock, disconnect electrical power before servicing or changing any electrical wiring.



Humidifier	1.0 Amp maximum at 120 VAC
Electronic Air Cleaner	1.0 Amp maximum at 120 VAC

Use a separate fused branch electrical circuit containing properly sized wire, and fuse or circuit breaker. The fuse or circuit breaker must be sized in accordance with the maximum overcurrent protection specified on the unit rating plate. An electrical disconnect must be provided at the furnace location.

Connect hot, neutral, and ground wires as shown in the wiring diagram located on the unit's blower door. Metal conduit is not considered a substitute for an actual ground wire to the unit. For direct vent applications, the cabinet opening to the junction box must be sealed air tight using either a UL approved bushing such as Heyco Liquid Tight or by applying non-reactive UL approved sealant to bushing.

Line polarity must be observed when making field connections. Line voltage connections can be made through either the right or left side panel. The furnace is shipped configured for a left side (right side for counterflows) electrical connection with the junction box located inside the burner compartment. To make electrical connections through the opposite side of the furnace, the junction box must be relocated to the other side of the burner compartment prior to making electrical connections. To relocate the junction box, follow the steps shown in the Junction Box Relocation section.

WARNING

Edges of sheet metal holes may be sharp. Use gloves as a precaution when removing hole plugs.

WARNING

To prevent personal injury or death to electrical shock, disconnect electrical power before installing or servicing this unit.

WARNING

HIGH VOLTAGE

To avoid the risk of injury, electrical shock or death, the furnace must be electrically grounded in accordance with local codes or in their absence, with the latest edition of the National Electrical Code.



WARNING

All accessories that may become a potential ignition source if installed, such as electronic air cleaners, must only be powered through a Daikin accessory control board kit. If an electronic air cleaner is already installed in the duct work and not connected to the accessory control board, it will have to be disabled or removed. Ensure that any additional wiring from the indoor unit to the accessory control board is routed and protected from damage and wear, avoiding the flue pipe and any joints that may need brazed or disconnected for service. Refer to the product specification sheet for the accessory control board kit part number.

115 Volt Line Voltage Connection of Accessories (Humidifier and Electronic Air Cleaner)

The furnace integrated control module is equipped with line voltage accessory terminals for controlling power to an optional field-supplied humidifier and/or electronic air cleaner.

Turn OFF power to the furnace before installing any accessories. Follow the humidifier or air cleaner manufacturers' instructions for locating, mounting, grounding, and controlling these accessories. Accessory wiring connections are to be made through the ¼" quick connect terminals provided on the furnace integrated control module. The humidifier hot terminal is identified as 120V HUM-H, its neutral terminal is identified as 120V HUM-N. The electronic air cleaner hot terminal is identified as EAC-H, its neutral terminal is identified as 120V EAC-N. All field wiring must conform to applicable codes. Connections should be made as shown. (See Figure 32)

If it is necessary for the installer to supply additional line voltage wiring to the inside of the furnace, the wiring must conform to all local codes, and have a minimum temperature rating of 105°C. All line voltage wire splices must be made inside the furnace junction box.

The integrated control module humidifier terminal 120V HUM-H is energized with 115 volts whenever the induced draft blower is energized. This terminal can also be used to provide 115 volt power to a humidifier transformer. The remaining primary transformer wire would be connected to the Line N on the control board. The integrated control module electronic air cleaner terminals EAC-H is energized with 115 volts whenever the circulator blower is energized.

NOTE: Wire routing must not interfere with circulator blower operation, filter removal, or routine maintenance.

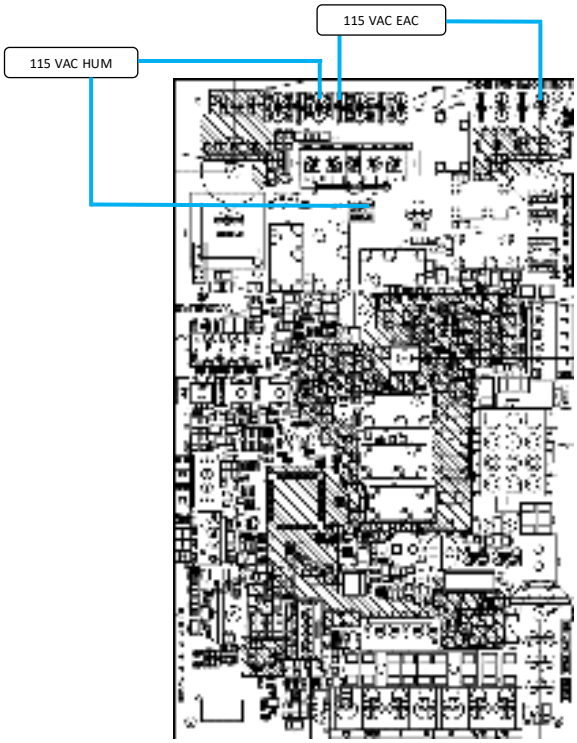


Figure 32

Connection of 24 Volt Humidifier

The integrated control module single humidifier terminal "24 V HUM" is energized with 24 volts whenever the induced draft blower is energized. Connect the common side of the 24 volt humidifier to the "C" terminal of the thermostat terminal strip on the control board.

Low Voltage Ventilation

The Ventilation connections provide a dry contact for field ventilator wiring connections. These connections are normally open and energize during the R-32 fault/alarm condition. VT IN and VT OUT connectors are provided on the control board and are shown in the image below.

Low Voltage A2L Alarm

The A2L alarm connection provides 24VAC for field alarm wiring connections. These connections are normally open and energize during the R-32 fault/alarm condition. An A2L Alarm connection is provided on the control board and is shown in the image below.

Field Installed Accessories

Additional accessories that do not have dedicated terminals on the furnace control board may require an additional daughter board to be installed. Please refer to service manual on your product for more information.

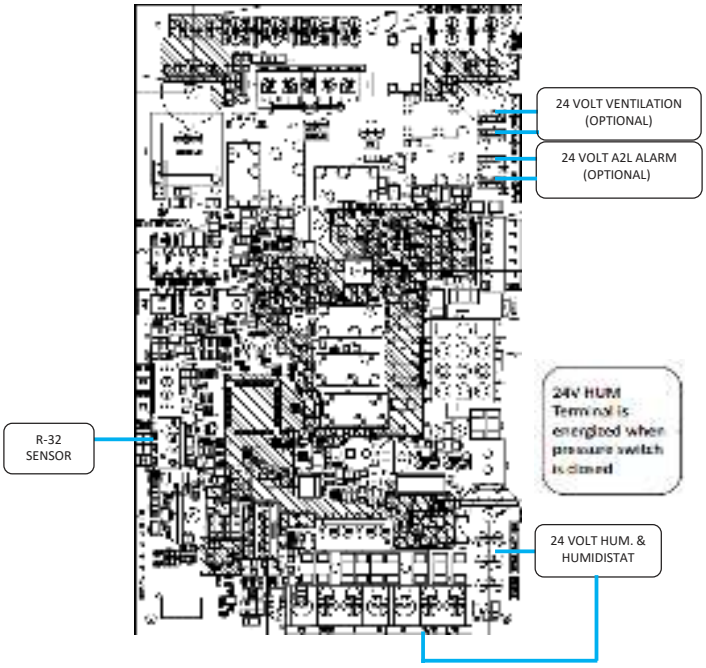


FIGURE 33

JUNCTION BOX RELOCATION

Line voltage connections can be made through either the right or left side panel. The furnace is shipped configured for a left side electrical connection. To make electrical connections through the opposite side of the furnace, the junction box must be relocated to the left side prior to making electrical connections. To relocate the junction box, perform the following steps.

1. Remove the burner compartment door.
2. Remove and save the two screws securing the junction box to the side panel.
3. Relocate junction box and associated plugs and grommets to opposite side panel. Secure with screws removed in step.

To ensure proper unit grounding, the ground wire should run from the furnace ground screw located inside the furnace junction box all the way back to the electrical panel.

NOTE: DO NOT USE GAS PIPING AS AN ELECTRICAL GROUND. TO CONFIRM PROPER UNIT GROUNDING, TURN OFF THE ELECTRICAL POWER AND PERFORM THE FOLLOWING CHECK.

1. Measure resistance between the neutral (white) connection and one of the burners. Resistance should measure 10 ohms or less.

This furnace is equipped with a blower door interlock switch which interrupts unit voltage when the blower door is opened for servicing. Do not defeat this switch.

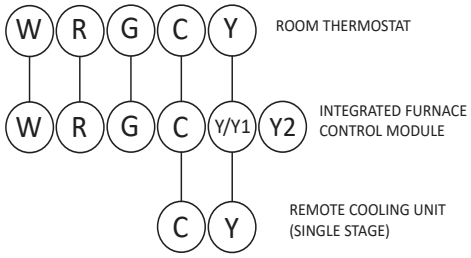
24 VOLT THERMOSTAT WIRING

IMPORTANT NOTE: WIRING ROUTING MUST NOT INTERFERE WITH CIRCULATOR BLOWER OPERATION, FILTER REMOVAL OR ROUTINE MAINTENANCE.

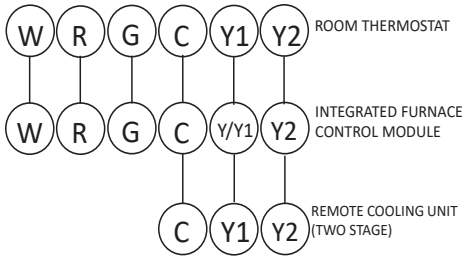
Low voltage connections can be made through either the right or left side panel. Thermostat wiring entrance holes are located in the blower compartment. The following figure shows connections for a “heat/cool system”.

This furnace is equipped with a 40 VA transformer to facilitate use with most cooling equipment. Consult the wiring diagram, located on the blower compartment door, for further details of 115 Volt and 24 Volt wiring.

THERMOSTAT WIRING DIAGRAMS



THERMOSTAT - SINGLE-STAGE HEATING WITH SINGLE-STAGE COOLING
FIGURE 34



THERMOSTAT - SINGLE-STAGE HEATING WITH TWO-STAGE COOLING
FIGURE 35

WARNING

HIGH VOLTAGE
TO AVOID PERSONAL INJURY OR DEATH DUE TO ELECTRICAL SHOCK, DISCONNECT ELECTRICAL POWER BEFORE SERVICING OR CHANGING ANY ELECTRICAL WIRING.

FOSSIL FUEL APPLICATIONS

This furnace can be used in conjunction with a heat pump in a fossil fuel application. A fossil fuel application refers to a combined gas furnace and heat pump installation which uses an outdoor temperature sensor to determine the most cost efficient means of heating (heat pump or gas furnace).

A heat pump thermostat is required to properly use a single-stage furnace in conjunction with a heat pump. Refer to the fossil fuel kit installation instructions for additional thermostat requirements.

Strictly follow the wiring guidelines in the fossil fuel kit installation instructions. All furnace connections must be made to the furnace two-stage integrated control module and the “FURNACE” terminal strip on the fossil fuel control board.

Twinning

For Furnace Twinning information, please refer to the Furnace Twinning installation manual IO-2001. Please scan the QR code below to open the document.

CAUTION

To prevent unreliable operation or equipment damage, the gas manifold pressure must be as specified on the unit rating plate. Only minor adjustments should be made by adjusting the gas valve pressure regulator.

WARNING

Possible property damage, personal injury or death may occur if the correct conversion kits are not installed. The appropriate kits must be applied to ensure safe and proper furnace operation. All conversions must be performed by a qualified installer or service agency.

GAS SUPPLY AND PIPING

INLET GAS SUPPLY PRESSURE		
Natural Gas	Minimum: 4.5" w.c.	Maximum: 10.0" w.c.
Propane Gas	Minimum: 11.0" w.c.	Maximum: 13.0" w.c.

The furnace rating plate includes the approved furnace gas input rating and gas types. The furnace must be equipped to operate on the type of gas applied. This includes any conversion kits required for alternate fuels and/or high altitude.

Inlet gas supply pressures must be maintained within the ranges specified in the following table. The supply pressure must be constant and available with all other household gas fired appliances operating. The minimum gas supply pressure must be maintained to prevent unreliable ignition. The maximum must not be exceeded to prevent unit overfiring.

WARNING

To avoid possible unsatisfactory operation of equipment or damage due to underfiring of equipment, use the proper size of natural/propane gas piping needed when running pipe from the meter/tank to the furnace.

HIGH ALTITUDE INSTALLATION

When this furnace is installed at high altitude, the appropriate High Altitude Kit including orifices and a pressure switch(s) must be installed. These changes are necessary to compensate for the natural reduction in the density of both the gas fuel and the combustion air at higher altitude.

Installation of this furnace at altitudes above 7000 ft (2134 m), shall be made in accordance with the Listed High Altitude Conversion Kit available with this furnace.

Do not derate the furnace by adjusting the manifold pressure to a lower pressure than specified on the furnace rating plate. The combination of the lower air density and a lower manifold pressure will prohibit the burner orifice from drawing the proper amount of air into the burner. This may cause incomplete combustion, flashback, and yellow tipping.

In some areas the gas supplier may artificially derate the gas in an effort to compensate for the effects of altitude. If the gas is artificially derated, the appropriate orifice size must be determined based upon the BTU/ft³ content of the derated gas and the altitude. Refer to the National Fuel Gas Code, NFPA 54/ANSI Z223.1, and information provided by the gas supplier to determine the proper orifice size. A different pressure switch may be required at high altitude regardless of the BTU/ft³ content of the fuel used. Consult the furnace Specification Sheet. All conversions must be performed by a qualified installer, or service agency.

Propane Gas Conversion

This furnace is shipped from the factory configured for natural gas at standard altitude. To operate this furnace on L.P. gas, a LPM-33 LP Conversion kit must be used. Propane gas installations require an orifice and spring change to compensate for the energy content difference between natural and propane gas.

If converting to LP gas, a low pressure switch should be installed per the LP kit. This low pressure switch will prevent the furnace from firing when the LP gas supply pressure is too low to support proper combustion.

All conversions must be performed by a qualified installer, or service agency.

WARNING

Possible property damage, personal injury or death may occur if the correct conversion kits are not installed. The appropriate kits must be applied to ensure safe and proper furnace operation. All conversions must be performed by a qualified installer or service agency.

Gas	Altitude	Kit	Orifice	Manifold Pressure	Pressure Switch Change
Natural	0-7000	None	#45	3.5" w.c.	None
Propane		LPM-33	1.25mm	10.0" w.c.	None

NOTE: In Canada, gas furnaces are only certified to 4500 feet.

Gas Valve

This unit is equipped with a 24 volt gas valve controlled during furnace operation by the integrated control module. As shipped, the valve is configured for natural gas. The valve is field convertible for use with propane gas by replacing the regulator spring with a propane gas spring from an appropriate manufacturer's propane gas conversion kit. Taps for measuring the gas supply pressure and manifold pressure are provided on the valve.

The gas valve has a manual ON/OFF control located on the valve itself. This control may be set only to the "ON" or "OFF" position. Refer to the lighting instructions label or Startup Procedure & Adjustment for use of this control during start up and shut down periods.

Gas Piping Connections

The gas piping supplying the furnace must be properly sized based on the gas flow required, specific gravity of the gas, and length of the run. The gas line installation must comply with local codes, or in their absence, with the latest edition of the National Fuel Gas Code, NFPA 54/ANSI Z223.1 or CAN/CSA B149.1-15 in Canada.

To connect the furnace to the building's gas piping, the installer must supply a ground joint union, drip leg, manual shutoff valve, and line and fittings to connect to gas valve. In some cases, the installer may also need to supply a transition piece from ½" pipe to a larger pipe size.

The following stipulations apply when connecting gas piping. Refer to *Gas Piping Connections* figure for typical gas line connections to the furnace.

- Gas piping must be supported external to the furnace cabinet so that the weight of the gas line does not distort the burner rack, manifold or gas valve.
- Use black iron or steel pipe and fittings for building piping. Where possible, use new pipe that is properly chamfered, reamed, and free of burrs and chips. If old pipe is used, be sure it is clean and free of rust, scale, burrs, chips, and old pipe joint compound.
- Use pipe joint compound on male threads ONLY. Always use pipe joint compound (pipe dope) that is APPROVED FOR ALL GASES. DO NOT apply compound to the first two threads.
- Use ground joint unions.
- Install a drip leg to trap dirt and moisture before it can enter the gas valve. The drip leg must be a minimum of three inches long.
- Install a ⅛" NPT pipe plug fitting, accessible for test gauge connection, immediately upstream of the gas supply connection to the furnace.
- Always use a back-up wrench when making the connection to the gas valve to keep it from turning. The orientation of the gas valve on the manifold must be maintained as shipped from the factory. Maximum torque for the gas valve connection is 375 in-lbs; excessive over-tightening may damage the gas valve.
- Install a manual shutoff valve between the gas meter and unit within six feet of the unit. If a union is installed, the union must be downstream of the manual shutoff valve, between the shutoff valve and the furnace.
- Tighten all joints securely.

Natural Gas Capacity of Pipe
In Cubic Feet of Gas Per Hour (CFH)

Length of Pipe in Feet	Nominal Black Pipe Size				
	1/2"	3/4"	1"	1 1/4"	1 1/2"
10	132	278	520	1050	1600
20	92	190	350	730	1100
30	73	152	285	590	980
40	63	130	245	500	760
50	56	115	215	440	670
60	50	105	195	400	610
70	46	96	180	370	560
80	43	90	170	350	530
90	40	84	160	320	490
100	38	79	150	305	460

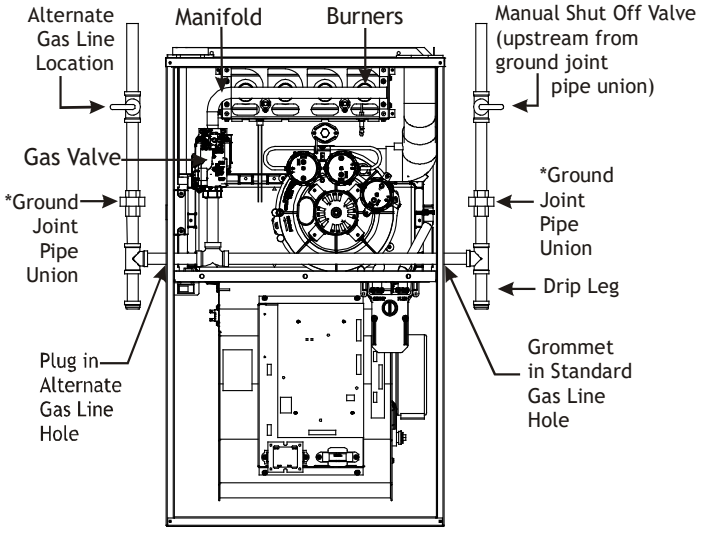
(Pressure 0.5 psig or less and pressure drop of 0.3" W.C.; Based on 0.60 Specific Gravity Gas)

$$CFH = \frac{\text{BTUH Furnace Input}}{\text{Heating Value of Gas (BTU/Cubic Foot)}}$$

- Connection method must be in compliance with all local and national codes. US: National Fuel Gas Code (NFGC) NFPA 54-2012/ANSI Z223.1-2012 and the Installation Standards, Warm Air Heating and Air Conditioning Systems ANSI/NFPA 90B.
  In Canada, CANADA: National Standard of Canada, Natural Gas and Propane Installation Code (NSCNGPIC) CSA B149.1-15.
  Connect the furnace to the building piping by one of the following methods:
  – Rigid metallic pipe and fittings.
  – Semi-rigid metallic tubing and metallic fittings. Aluminum alloy tubing must not be used in exterior locations. In order to seal the grommet cabinet penetration, rigid pipe must be used to reach the outside of the cabinet. A semi-rigid connector to the gas piping may be used from there.
- Use listed gas appliance connectors in accordance with their instructions. Connectors must be fully in the same room as the furnace.
- Protect connectors and semi-rigid tubing against physical and thermal damage when installed. Ensure aluminum-alloy tubing and connectors are coated to protect against external corrosion when in contact with masonry, plaster, or insulation, or subjected to repeated wetting by liquids such as water (except rain water), detergents, or sewage.

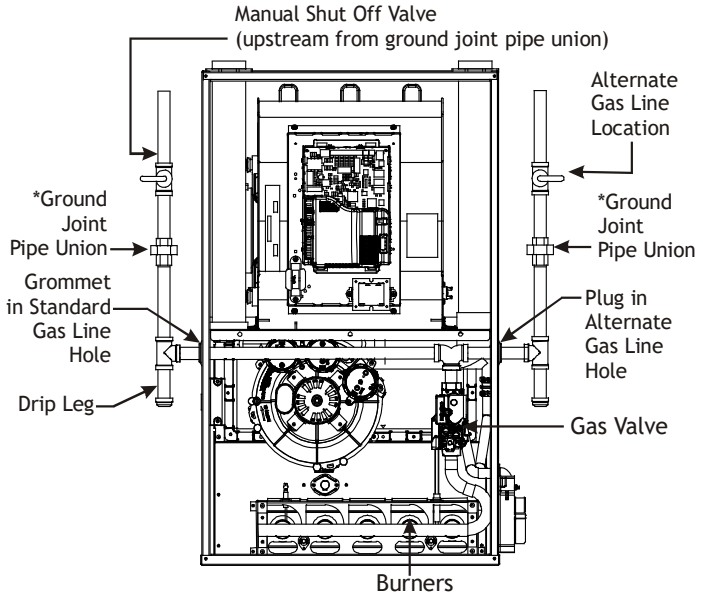
The gas piping may enter the left or right side of the furnace cabinet. The installer must supply rigid pipe long enough to reach the outside of the cabinet to seal the grommet cabinet penetration. A semi-rigid connector to the gas piping can be used outside the cabinet per local codes. ½" NPT pipe and fittings are required. For models with an "L" shaped manifold, a 4 ½" long nipple is required. For models with a hook shaped manifold, a 2" long nipple is required.

A semi-rigid connector to the gas piping can be used outside the cabinet per local codes. From the elbow, the length of pipe and the fittings required will vary by the side chosen, location of union and cabinet width. The union may be placed inside or outside of the cabinet.



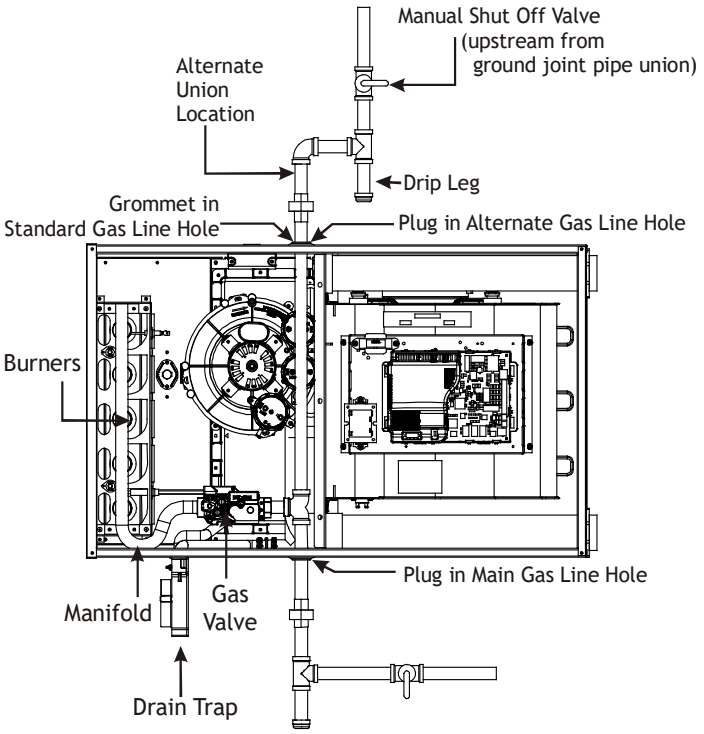
**NOTE: Union may be inside furnace cabinet where allowed by local codes.*

UPFLOW
FIGURE 37

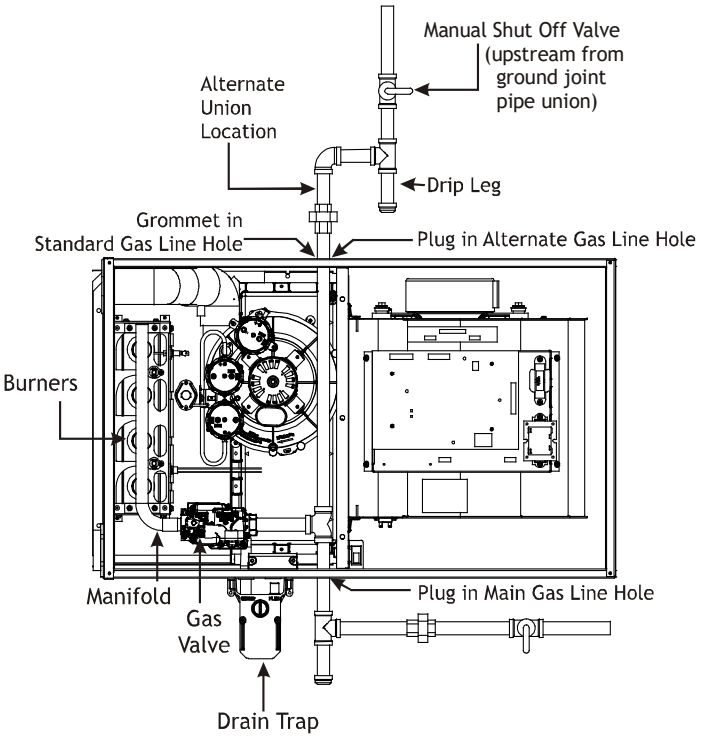


**NOTE: Union may be inside furnace cabinet where allowed by local codes.*

COUNTERFLOW
FIGURE 38



UPFLOW - HORIZONTAL LEFT
FIGURE 39



COUNTERFLOW - HORIZONTAL RIGHT
FIGURE 40

GAS PIPING CHECKS

Before placing unit in operation, leak test the unit and gas connections.

Check for leaks using an approved chloride-free soap and water solution, an electronic combustible gas detector, or other approved testing methods.

NOTE: Never exceed specified pressures for testing. Higher pressure may damage the gas valve and cause subsequent overfiring, resulting in heat exchanger failure.

Disconnect this unit and shutoff valve from the gas supply piping system before pressure testing the supply piping system with pressures in excess of ½ psig (3.48 kPa). Isolate this unit from the gas supply piping system by closing its external manual gas shutoff valve before pressure testing supply piping system with test pressures equal to or less than ½ psig (3.48 kPA).

WARNING

To avoid the possibility of explosion or fire, never use a match or open flame to test for leaks.

WARNING

If the gas furnace is installed in a basement, an excavated area or confined space, it is strongly recommended to contact a propane supplier to install a gas detecting warning device in case of a gas leak.

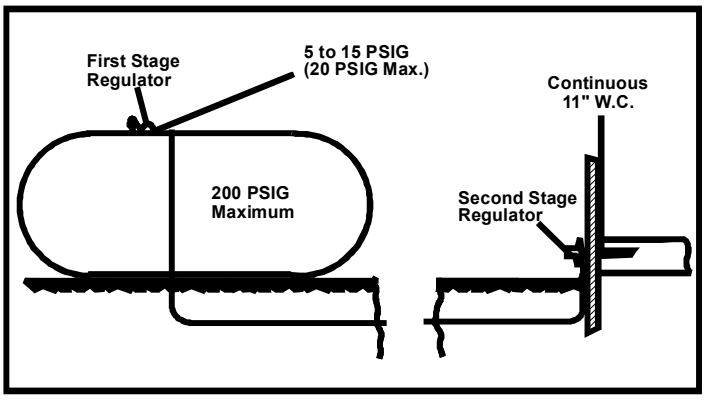
- Since propane gas is heavier than air, any leaking gas can settle in any low areas or confined spaces.
- Propane gas odorant may fade, making the gas undetectable except with a warning device.

Propane Gas Tanks and Piping

A gas detecting warning system is the only reliable way to detect a propane gas leak. Rust can reduce the level of odorant in propane gas. Do not rely on your sense of smell. Contact a local propane gas supplier about installing a gas detecting warning system. If the presence of gas is suspected, follow the instructions listed in the Safety Considerations section of this manual.

All propane gas equipment must conform to the safety standards of the National Fire Protection Association, NFPA 58

CANADA: National Standard of Canada, Natural Gas and Propane Installation Code (NSCNGPIC) CSA B149.1-15.



Propane Gas Installation (Typ.)
Figure 41

For satisfactory operation, propane gas pressure must be 10” WC at the furnace manifold with all gas appliances in operation. Maintaining proper gas pressure depends on three main factors:

1. Vaporization rate, depending on temperature of the liquid, and “wetted surface” area of the container or containers.
2. Proper pressure regulation (Two-stage regulation is recommended for both cost and efficiency).
3. Pressure drop in lines between regulators, and between second stage regulator and the appliance. Pipe size will depend on length of pipe run and total load of all appliances.

Complete information regarding tank sizing for vaporization, recommended regulator settings, and pipe sizing is available from most regulator manufacturers and propane gas suppliers.

Since propane gas will quickly dissolve white lead and most standard commercial compounds, special pipe dope must be used. Always use a pipe thread sealant approved for all gases.

Refer to the illustration for typical propane gas installations and piping.

WARNING

Never allow the products of combustion, including carbon monoxide, to enter the return ductwork or circulation air supply.

R-32 INFORMATION

R-32 Function

This furnace is equipped with a control board that is capable of shutting off the gas heat and turning on the blower fan in case of an R-32 refrigerant leak in the indoor evaporator coil. If the cooling unit that is paired with this furnace does not utilize R-32 as the refrigerant, the R-32 functionalities in the furnace control board will need to be turned off for the furnace to run properly.
R-32 function on the control board is ON by default. The R-32 function can be disabled through the furnace control by entering the A2L Function Enabled menu and selecting “no”. If A2L function is disabled, the furnace control will ignore all A2L functions. If A2L function is enabled, the control will monitor the R-32 sensor information.
To enter the A2L Function Enabled menu, press the left or right button until LED displays “A2E”. Press the center button and the LED will display the selected option (yes or no). Press the left or right switch to select one of the two options and press the center button twice to confirm the option.

R-32 Sensor Wire Routing

IMPORTANT NOTE: Wiring routing must not interfere with circulator blower operation, filter removal or routine maintenance. Wire should not be routed near hot surfaces and should be protected from sharp edges.

The R-32 Sensor wire coming from the indoor evaporator coil will need to be routed into the furnace and connected to the connection point on the furnace control board. This wire should be routed alongside the thermostat wires through the low voltage openings in the left or right side of the furnace blower compartment. Please see the electrical section for the location of the R-32 Sensor connection on the control board.

The R-32 function on the furnace control board may need to be enabled or disabled if any element of the installation changes from the original setup. The specific scenario will depend on each installation, so please refer to the evaporator coil’s installation manual to verify what is required for your setup. For example, if the furnace was initially installed with an evaporator coil that utilized R-410A refrigerant, and the coil is later replaced with one that uses R-32 refrigerant, then R-32 function mode on the furnace control board must be enabled, and the R-32 sensor wire must be connected to the furnace control board.

Furnace Start-Up

During furnace start up, the furnace control will identify the connected R-32 sensor and will start monitoring the sensor communication. A green LED located next to the sensor connection will indicate if there is communication between the furnace control and the R-32 sensor. The LED will be ON during the duration of the startup and then will either start blinking or turn OFF. The blinking LED signifies that communication with the R-32 sensor is present. The LED OFF signifies that there is no signal with the sensor.

If there are no alarms or faults, the furnace will go into regular run mode after a warm up period. The furnace control monitors the R-32 sensor once per second.

R-32 Refrigerant Leak

If the R-32 sensor on the indoor evaporator coil detects a specified concentration of R-32 refrigerant, the furnace will enter Mitigation Mode to dilute the refrigerant concentrations in case of a leak. In Mitigation Mode, the furnace will do the following:

1. Display the A2L Refrigerant Leakage error code (EAL)
2. Shut down the gas operation
3. Energize the optional ventilation and alarm outputs
4. Run the fan at max CFM airflow

Once the R-32 sensor stops detecting a leak, the fan will continue to run for 5 minutes. After the 5 minutes, if there are no other alarms or faults, the control will de-energize the optional ventilation and alarm outputs and then go back to the original operating mode per the thermostat.

A2L Verification

The A2L Function Verification menu allows the installer to verify if the R-32 function operates properly. This menu simulates the refrigerant leak process and is only able to be used when there are no active alarms or faults. To verify the R-32 functions, enter the A2L Function Verification menu and select “YES”. To enter the A2L Function Verification menu, press the left or right button until LED displays “A2u”. Press the center button and the LED will display the selected option (yes or no). Press the left or right button to select one of the two options and press the center button twice to confirm the option. Once “YES” is selected, the furnace will do the following:

1. Display the A2L Refrigerant Leakage code (EAL)
2. Shut down the gas operation
3. Energize the optional ventilation and alarm outputs
4. Run the fan at max CFM airflow

The control will exit the verification function if:

1. The 5 minute timeout expires or
2. An alarm or fault is detected or
3. The user turns OFF the A2L Function Verification.

NOTE: To verify gas heating operation shuts down, give furnace a call for heat before entering into A2L Function Verification.

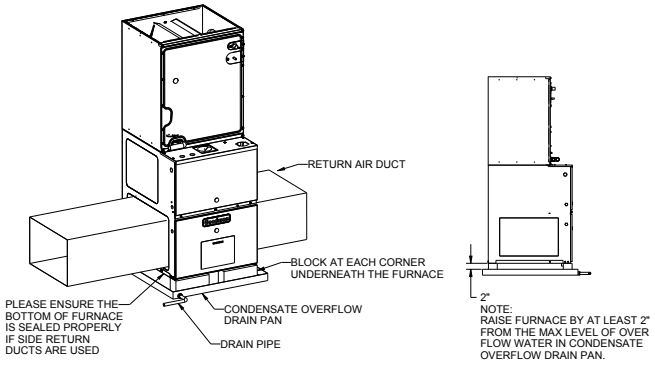
CIRCULATING AIR & FILTERS

Duct work - Air Flow

Duct systems and register sizes must be properly designed for the CFM and external static pressure rating of the furnace. Design the ductwork in accordance with the recommended methods of “Air Conditioning Contractors of America” Manual D.

Install the duct system in accordance with Standards of the National Fire Protection Association, NFPA 90A and 90B.

A closed return duct system must be used, with the return duct connected to the furnace. **NOTE:** Ductwork must never be attached to the back of the furnace. For upflow installations requiring 1600 CFM or more, use either two side returns or bottom return or a combination of side / bottom to help reduce noise and provide smoother airflow for heating. Flexible joints may be used for supply and return connections to reduce noise transmission. To prevent the blower from interfering with combustion air or draft when a central return is used, a connecting duct must be installed between the unit and the utility room wall. Never use a room, closet, or alcove as a return air chamber.



Checking Duct Static

Refer to your furnace rating plate for the maximum ESP (external duct static) rating.

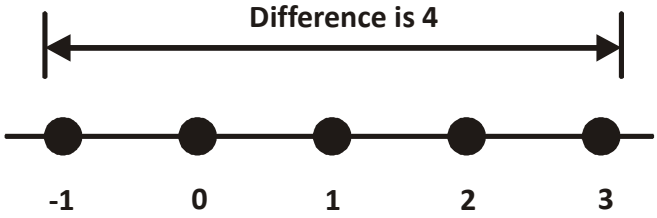
Total external static refers to everything external to the furnace cabinet. Cooling coils, filters, ducts, grilles, registers must all be considered when reading your total external static pressure. The supply duct pressure must be read between the furnace and the cooling coil. This reading is usually taken by removing the “A” shaped block off plate from the end on the coil; drilling a test hole in it and reinstalling the block off plate. Take a duct static reading at the test hole. Tape up the test hole after your test is complete. The negative pressure must be read between the filter and the furnace blower.

Too much external static pressure will result in insufficient air that can cause excessive temperature rise. This can cause limit switch tripping and heat exchanger failure.

To determine total external duct static pressure, proceed as follows:

1. With clean filters in the furnace, use a manometer to measure the static pressure of the return duct at the inlet of the furnace. (Negative Pressure)
2. Measure the static pressure of the supply duct. (Positive Pressure)
3. The difference between the two numbers is the total external static pressure.

EXAMPLE:



Static reading from return duct = -.1” w.c.

Static reading from supply duct = .3” w.c.

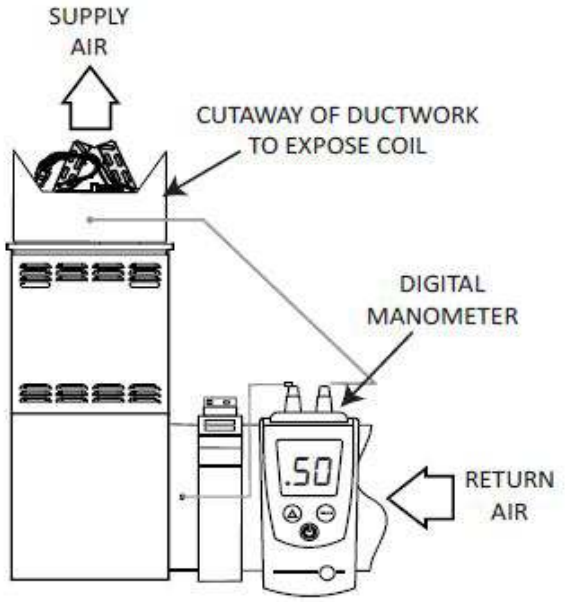
Total external static pressure on this system = .4” w.c.

NOTE: Both readings may be taken simultaneously and read directly on the manometer if so desired. If an air conditioner coil or Electronic Air Cleaner is used in conjunction with the furnace, the readings must also include theses components, as shown in the following drawing.

4. Consult proper tables for the quantity of air.

If the total external static pressure exceeds the maximum listed on the furnace rating plate, check for closed dampers, registers, undersized and/or oversized poorly laid out duct work.

The temperature rise of the furnace must be within the temperature rise range listed on the furnace rating plate.



Checking Static Pressure (80% Furnace Shown, 90% Similar)
Figure 42

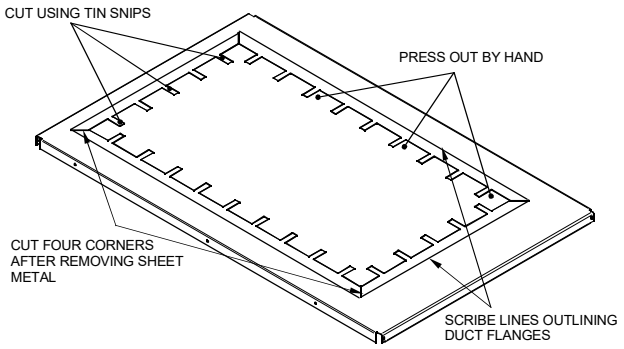
WARNING

Edges of sheet metal holes may be sharp. Use gloves as a precaution when removing sheet metal from return air openings.

Bottom Return Air Opening [Upflow Models]

The bottom return air opening on upflow models utilizes a “lance and cut” method to remove sheet metal from the duct opening in the base pan. To remove, simply press out the lanced sections by hand to expose the metal strips retaining the sheet metal over the duct opening. Using tin snips, cut the metal strips and remove the sheet metal covering the duct opening. In the corners of the opening, cut the sheet metal along the scribe lines to free the duct flanges. Using the scribe line along the duct flange as a guide, unfold the duct flanges around the perimeter of the opening using a pair of seamer pliers or seamer tongs.

NOTE: Airflow area will be reduced by approximately 18% if duct flanges are not unfolded. This could cause performance issues and noise issues.



Duct Flange Cut Outs
Figure 43

When the furnace is used in connection with a cooling unit, the furnace should be installed upstream of the cooling coil.

When the furnace is installed without a cooling coil, it is recommended that a removable access panel be provided in the outlet air duct. This opening shall be accessible when the furnace is installed and shall be of such a size that the heat exchanger can be viewed for visual light inspection or such that a sampling probe can be inserted into the air stream. The access panel must be made to prevent air leaks when the furnace is in operation.

When the furnace is heating, the temperature of the return air entering the furnace must be between 55°F and 100°F.

Filters - Read This Section Before Installing The Return Air Duct work

Filters must be used with this furnace. Discuss filter maintenance with the building owner. Filters do not ship with this furnace, but must be provided, sized and installed externally by the installer. Filters must comply with UL900 or CAN/ULCS111 standards. Damage or repairs due to the installation of the furnace without filters is not covered under the warranty.

On upflow units, guide dimples locate the side return cutout locations. Use a straight edge to scribe lines connecting the dimples. Cut out the opening on these lines. **NOTE:** An undersized opening will cause reduced airflow.

Refer to the Filter Sizing Chart to determine filter area requirements.

Filter Sizing Charts

Filter Sizing Chart	
Model	**Minimum Recommended Filter Size**
***R9S960403AN**	1 - 16 X 25 Side or 1 - 14 X 24 Bottom Return
***R9S960603BN**	1 - 16 X 25 Side or Bottom Return
***R9S960803BN**	1 - 16 X 25 Side or Bottom Return
***R9S960804CN**	1 - 16 X 25 Side or Bottom Return
***R9S960805CN**	2 - 16 X 25 Side or 1 - 20 X 25 Bottom Return
***R9S961005CN**	2 - 16 X 25 Side or 1 - 20 X 25 Bottom Return[1]
***R9S961205DN**	2 - 16 X 25 Side or 1 - 24 X 24 Bottom Return[1]
***D9S960403BN**	2 - 10 X 20 or 1 - 14 X 25 Top Return
***D9S960603BN**	2 - 10 X 20 or 1 - 14 X 25 Top Return
***D9S960804CN**	2 - 14 X 20 or 1 - 16 X 25 Top Return
***D9S961005CN**	2 - 14 X 20 or 1 - 20 X 25 Top Return
***D9S961205DN**	2 - 14 X 20 or 1 - 24 X 24 Top Return

Larger filters may be used, filters may also be centrally located.
[1] = use 2 - 16 X 25 filters and two side returns or 20 X 25 filter on bottom return or combination side & bottom if furnace is connected to a cooling unit over 4 tons nominal capacity

Filter Sizing Chart	
Model	**Minimum Recommended Filter Size**
***R9S920403AN**	1 - 16 X 25 Side or 1 - 14 X 24 Bottom Return
***R9S920603BN**	1 - 16 X 25 Side or Bottom Return
***R9S920803BN**	1 - 16 X 25 Side or Bottom Return
***R9S920804CN**	1 - 16 X 25 Side or Bottom Return
***R9S920805CN**	2 - 16 X 25 Side or 1 - 20 X 25 Bottom Return
***R9S921004CN**	1 - 16 X 25 Side or Bottom Return
***R9S921005CN**	2 - 16 X 25 Side or 1 - 20 X 25 Bottom Return[1]
***R9S921205DN**	2 - 16 X 25 Side or 1 - 24 X 24 Bottom Return[1]

Larger filters may be used, filters may also be centrally located.
[1] = use 2 - 16 X 25 filters and two side returns or 20 X 25 filter on bottom return or combination side & bottom if furnace is connected to a cooling unit over 4 tons nominal capacity

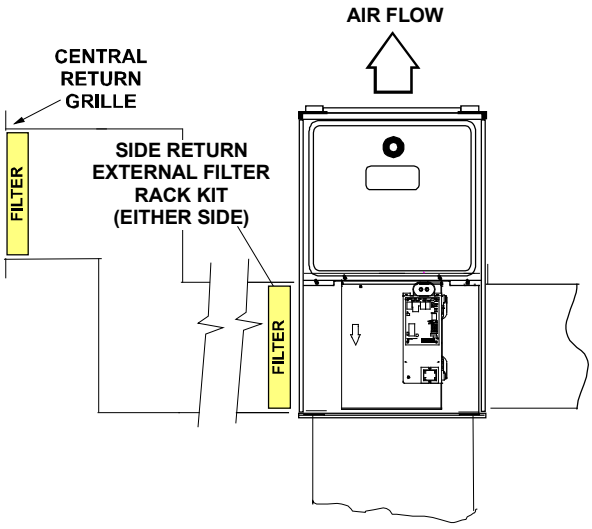
Change filters before occupants take ownership of a new home!

Consider installing an air cleaner with deep-pleated media filter at the time of furnace installation. A deep-pleated filter with a MERV rating of 8 (minimum) will often provide better filtration to protect equipment and the air distribution system than a standard 1” filter and often has lower static pressure loss than a 1” filter. Also a deep-pleated filter will typically require less frequent replacement intervals. Avoid using highly restrictive 1” filters which produce static pressure loss greater than .25” W.C. In some installations the minimum filter size required (consult filter sizing chart above) will not lend itself to a filter installation on the side of the furnace. The installation of a centrally installed air cleaner cabinet or a return duct filter installation may offer more practicality.

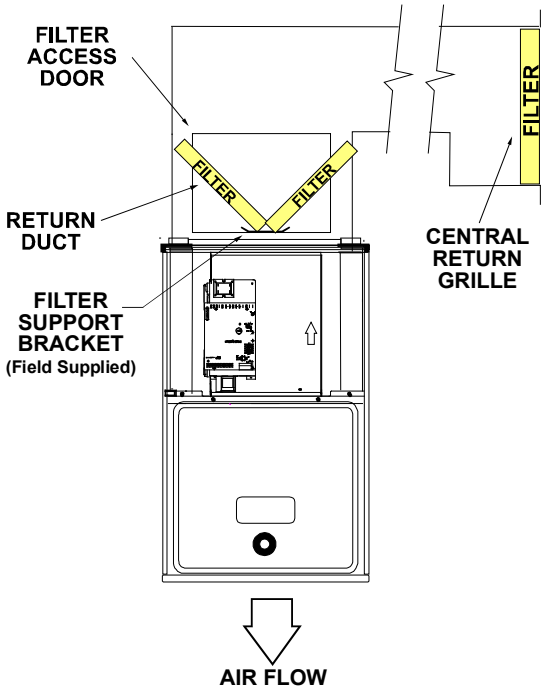
Clean Comfort™ brand MERV 11 air cleaners have 5¼" media filters and are available in the following configurations. Consult your distributor for information on our complete line of IAQ Clean Comfort™ products.

Depending on the installation and/or customer preference, differing filter arrangements can be applied. Filters can be installed in the central return register or a side panel external filter rack kit (upflows). As an alternative a media air filter or electronic air cleaner can be used as the requested filter.

The following figures show possible filter locations:



Possible Upright Upflow
Figure 44



Possible Upright Counterflow Filter Locations
Figure 45

Horizontal Installations

Filters must be installed in either the central return register or in the return air duct work.

STARTUP PROCEDURE & ADJUSTMENT

Furnace must have a 115 VAC power supply properly connected and grounded. Proper polarity must be maintained for correct operation. In addition to the following start-up and adjustment items, refer to further information in Operational Checks section.

Furnace Cabinet

Check that all furnace cabinet sealing components are in place (plugs, grommets, gaskets). **NOTE:** If the furnace bottom panel has not been removed for a return duct connection, all perforations must be sealed with duct sealant compound or other suitable method to prevent air leakage. For optimal performance verify that all do gaskets are properly in place and replace as needed to prevent air leakage.

Drain Trap Priming

The drain trap must be primed prior to furnace startup. To prime, fill both sides of the drain trap with water. This ensures proper furnace drainage upon startup and prohibits the possibility of flue gases escaping through the drain system.

Furnace Operation

Purge gas lines of air prior to startup. Be sure not purge lines into an enclosed burner compartment. Follow NFPA 54, National Fuel Gas Code 8.1 for proper purging methods. In Canada, follow approved purging methods in B149.1-15.
Check for leaks using an approved chloride-free soap and water solution, an electronic combustible gas detector, or other approved method. Verify that all required kits (propane gas, high altitude, etc.) have been appropriately installed.

NOTE: This furnace is equipped with a control board that is capable of monitoring for R-32 refrigerant leaks in the indoor evaporator coil. Please verify that the R-32 sensor wire is plugged in to the furnace control board before startup, if applicable. If furnace is not paired with an R-32 Refrigeration system, the default settings in the furnace control board will need to be changed. Please see the R-32 section for additional information.

Furnace Startup

1. Close the manual gas shutoff valve external to the furnace.
2. Turn off the electrical power to the furnace.
3. Set the room thermostat to the lowest possible setting.
4. Remove the burner compartment door.

NOTE: This furnace is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.

5. Move the furnace gas valve manual control to the OFF position.
6. Wait five minutes then smell for gas. Be sure check near the floor as some types of gas are heavier than air.
7. If you smell gas after five minutes, immediately follow the safety instructions in the *Safety Considerations* on page 2 of this manual. If you do not smell gas after five minutes, move the furnace gas valve manual control to the ON position.
8. Replace the burner compartment door.
9. Open the manual gas shutoff valve external to the furnace.
10. Turn on the electrical power to the furnace.
11. Adjust the thermostat to a setting above room temperature.
12. After the burners are lit, set the thermostat to desired temperature.

Gas Heat Sequence of Operation

Call for Heat

- On a call for heat, the thermostat contacts close & the control board receives 24 VAC on the W terminal.
- The control board microcomputer runs its self-check routine.
- The control verifies the limit switch is closed (24 VAC on Pin 8 of the 12 Pin connector).
- The control verifies that pressure switch circuit is open (0 VAC on Pin 5).
- The control module performs a gas valve circuitry check to verify gas valve relay state and presence of no voltage at the valve.
- The system will energize the Induced draft blower.
- The pre-purge period begins once the pressure switch is detected closed (24 VAC on Pin 5).
- After the completion of pre-purge, the control will energize the igniter.
- After completion of the ignitor warm-up period:
- The gas valve is energized.
- The ignitor is de-energized as soon as flame is sensed.
- After 30 seconds the indoor blower is energized on heating speed.
- When the thermostat is satisfied:
- The gas valve is de-energized.
- The inducer remains energized for the post purge period (15 seconds).
- The indoor blower runs for the selected off delay period (90 seconds by default, adjustable from 30 – 180 seconds).

Heating Mode Speed Selection

To change the main blower speed in HEATING mode, follow the following steps:

1. Press left or right button till LED displays “gA1” (for single stage HEATING). Press center button and LED will display the selected speed number as Fxx (xx: Blower speed number).
2. The control shall rotate available speed number every time Left/Right switches are pressed. Table below shows the available speeds for Low & High heat mode.
3. When the center switch is pressed, the current displayed speed shall be selected, and control shall apply the newly selected speed in next heating call.

NOTE: Always refer to the Heating Chart to choose from available heating speeds

THERMOSTAT CALL	AVAILABLE SPEEDS
W/W1	F01
	F02 (DEFAULT)
	F03
	F04

Heating Speed Table for 1 Stage IFC

Continuous Fan Mode Speed Selection

To change the main blower speed in circulation mode, follow the following steps:

1. Press the left or right switch until LED displays “FSd”. Press the center switch and LED will display the selected speed number as Fxx (xx: Blower speed number from 1 to 9). F01 is the default speed for circulation.
2. The control will rotate available speed number every time left/right switches are pressed. All 9 speeds are available for circulation.
3. When the center switch is pressed, the current displayed speed will be selected, and control will immediately apply that speed setting.

THERMOSTAT CALL	AVAILABLE SPEEDS
G	F01 (DEFAULT)
	F02
	F03
	F04
	F05
	F06
	F07
	F08
	F09

Circulation Speed Table

Cooling Mode Sequence of Operation

Low Stage Cooling Mode Sequence:

On a call for low stage cooling, the Y/Y1 or Y/Y1 and G thermostat contacts close signaling the furnace control board with 24 VAC on Y/Y1 or Y/Y1 and G terminals.

- The 7-Segment will display the cool mode: 1 A C
- The compressor and condenser fan are energized.
- The circulator fan is energized at low cool speed after a cool on delay. The electronic air cleaner will also be energized.
- After the thermostat is satisfied, the compressor and condenser fan are de-energized and the Cool Mode Fan Off Delay period begins.
- Following the Cool Mode Fan Off Delay period, the cool circulator and air cleaner relay are de-energized.

2nd Stage Cooling Mode Sequence:

On a call for 2nd stage cooling, the Y2 or Y2 and G thermostat contacts close signaling the furnace control board with 24 VAC on Y2 or Y2 and G terminals.

- The 7-Segment will display the cool mode: 2 A C
- The compressor and condenser fan are energized.
- The circulator fan is energized at cool speed after a cool on delay. The electronic air cleaner will also be energized.
- After the thermostat is satisfied, the compressor and condenser fan are de-energized and the Cool Mode Fan Off Delay period begins.
- Following the Cool Mode Fan Off Delay period, the cool circulator and air cleaner relay are de-energized

Cooling Mode Speed Selection

To change the main blower speed in COOLING mode, follow the following steps:

1. Press the left or right switch until LED displays “AC1” (for single stage COOLING) or “AC2” (for two-stage COOLING). Press the center switch and LED will display the selected speed number as Fxx (xx: Blower speed number from 1 to 9).
2. The control will rotate available speed number every time left/right switches are pressed. All 9 speeds are available for both Single and Two Stage cooling.
3. When the center switch is pressed, the current displayed speed will be selected, and control will apply the newly selected speed in next cooling call.

THERMOSTAT CALL	AVAILABLE SPEEDS
Y/Y1	F01
	F02
	F03
	F04 (DEFAULT)
	F05
	F06
	F07
	F08
	F09

Single-Stage Cooling Speed Table for 2 Stage IFC

THERMOSTAT CALL	AVAILABLE SPEEDS
Y2	F01
	F02
	F03
	F04
	F05 (DEFAULT)
	F06
	F07
	F08
	F09

Two-Stage Cooling Speed Table for 2 Stage IFC

Furnace Shutdown

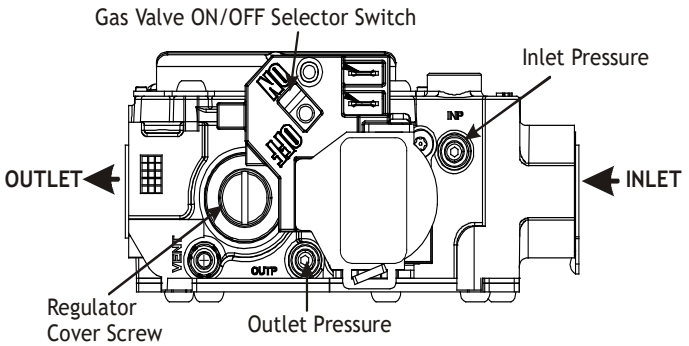
1. Set the thermostat to the lowest setting. The integrated control will close the gas valve and extinguish flame. Following a 15 second delay, the induced draft blower will be de-energized. After the blower off delay time expires, the blower de-energizes.
2. Remove the burner compartment door and move the furnace gas valve manual control to the OFF position.
3. Close the manual gas shutoff valve external to the furnace.
4. Replace the burner compartment door.

GAS SUPPLY PRESSURE MEASUREMENT

Gas Pressure Test

The line pressure supplied to the gas valve must be within the range specified below. The supply pressure can be measured at the gas valve inlet pressure tap or at a hose fitting installed in the gas piping drip leg. The supply pressure must be measured with the burners operating. To measure the gas supply pressure, use the following procedure.

1. Turn OFF gas to furnace at the manual gas shutoff valve external to the furnace.
2. Connect a calibrated manometer (or appropriate gas pressure gauge) at either the gas valve inlet pressure tap or the gas piping drip leg. See White-Rodgers 36J22 gas valve figure for location of inlet pressure tap.



White-Rodgers Model 36J22
Figure 48