INSTALLATION INSTRUCTIONS AND HOMEOWNER'S MANUAL: MODULATING GAS FIRED FURNACE

MODULATING GAS FURNACE MULTIPOSITION

Models:
C15-M-V & C15-M-S
C30-M-V & C30-M-S
C45-M-V & C45-M-S
C60-M-V
C75-M-V
C105-M-V
C120-M-V

⚠ CAUTION

Outdoor design temperature below 5°F(-15°C) could cause blockage of the exhaust.
Refer to section 7.2 for more details.

INSTALLER / SERVICE TECHNICIAN:

Use the information in this manual for the installation/servicing of the furnace and keep the document near the unit for future reference.

Caution:
Do not tamper with the unit or its controls. Call a qualified service technician.

HOMEOWNER: Please keep this manual near the furnace for future reference.

Manufactured by: **Dettson Industries Inc. Sherbrooke, Qc, Canada www.dettson.com**

Gas furnace manufactured on or after May 1, 2017 are not permitted to be used in Canada for heating of buildings or structures under construction

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1 SAFETY

1.1 SAFETY LABELING AND WARNING SIGNS

The words **DANGER, WARNING** and **CAUTION** are used to identify the levels of seriousness of certain hazards. It is important that you understand their meaning. You will notice these words in the manual as follows:

⚠ DANGER

Immediate hazards which WILL result in death or serious bodily and/or material damage.

⚠ WARNING

Hazards or unsafe practices which CAN result in death or serious bodily and /or material damage.

⚠ CAUTION

Hazards or unsafe practices which CAN result in minor bodily and /or material damage.

1.2 IMPORTANT INFORMATION

⚠ WARNING

Non-observance of the safety regulations outlined in this manual will potentially lead to consequences resulting in death, serious bodily injury and/or property damage.

⚠ WARNING

Installation and repairs performed by unqualified persons can result in hazards to them and to others. Installations must conform to local codes or, in the absence of such codes, to codes of the country having jurisdiction.
The information contained in this manual is intended for use by a qualified technician, familiar with safety procedures and who is equipped with the proper tools and test instruments.
Failure to carefully read and follow all instructions in this manual can result in death, bodily injury and/or property damage.

1. It is the homeowner's responsibility to engage a qualified technician for the installation and subsequent servicing of this furnace;
2. Do not use this furnace if any part of it was under water. Call a qualified service technician immediately to assess the damage and to replace all critical parts that were in contact with water;
3. Do not store gasoline or any other flammable substances, such as paper or carton, near the furnace;
4. Do not stack items or boxing within the required clearances to combustible materials specified in Table 2;
5. Never block or otherwise obstruct the filter and/or return air openings;
6. Ask the technician installing your furnace to show and explain to you the following items:
   - The main disconnect switch or circuit breaker;
   - The gas shut off valve;
   - The air filter and how to change it (at least twice a year);
7. Before calling for service, be sure to have the information of section 11 of your manual close by in order to be able to provide the contractor with the required information, such as the model and serial numbers of the furnace.

⚠ WARNING

Failure to follow this warning could result in dangerous operation, personal injury, death, or property dammage. Improper installation, adjustement, servicing or repair can cause carbon monoxide poisoning, explosion, fire, electrical shock, or other conditions which may cause personal injury or property damage. Consult a qualified service agency, local gas supplier, or your distributor for information or assistance. The qualified service agency must use only factory authorized and listed kits or accessories when modifying this product.

⚠ WARNING

INJURY HAZARD
Ignoring this warning could result in personal injury.
Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts, and servicing furnaces

1.3 SAFETY CONSIDERATION

Untrained personnel can perform basic maintenance functions such as cleaning and replacing air filters. All

other operations must be performed by trained service personnel. When working on heating equipement, observe precautions in literature, on tags, and on labels attached to or shipped with the furnace. Other safety precautions may apply.

These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances, these instructions exceed certain local codes and ordinances, especially those that may not have kept up with changing residential construction practices. We require these instructions as a minimum for a safe installation.

Follow all safety codes. Wear safety glasses, protective clothing and work gloves. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in the literature and attached to the unit.

1. Use only with type of gas approved for this furnace. Refer to the furnace rating plate and section 5 : GAS SUPPLY AND PIPING.
2. Install this furnace only in a location and position as specified in section 3 : INSTALLATION.
3. Provide adequate combustion and ventilation air to the furnace as specified in section 7 : VENTING AND COMBUSTION AIR PIPING.
4. Combustion products must be discharged outdoors. Connect this furnace to an approved vent system only, as specified in section 7 : VENTING AND COMBUSTION AIR PIPING.
5. Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections, as specified in section 5 : GAS SUPPLY AND PIPING.
6. Always install furnace to operate within the furnace's intended temperature-rise range with a duct system which has an external static pressure within the allowable range, as specified in section 4 : DUCT INSTALLATION of these instructions. See furnace rating plate.
7. When a furnace is installed so that supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by duct(s) sealed to the furnace casing and terminating outside the space containing the furnace. See section 4 : DUCT INSTALLATION.
   This furnace may be installed, with a two pipe sealed combustion configuration, in a space utilized as part of the return air supply. A filter must be installed at the return opening of the furnace and a grill should be installed in the space to allow proper circulation of air.
8. Gas furnace manufactured on or after May 1, 2017 are not permitted to be used in Canada for heating of buildings or structures under construction.
9. A gas-fired furnace for installation in a residential garage must be installed as specified in the WARNING box below:

⚠ WARNING

FIRE, INJURY OR DEATH HAZARD

Failure to follow this warning could result in personal injury, death and/or property damage.

When the furnace is installed in a residential garage, the burners and ignitions sources must be located at least 18 in. (457 mm) above the floor. The furnace must be located or protected to avoid damage by vehicles. When the furnace is installed in a public garage, airplane hangar, or other building having a hazardous atmosphere, the furnace must be installed in accordance with the NFPA 54/ANSI Z223.1-2009 or CAN/CSA B149.2-2010.

Do not install the furnace on its back or hang furnace with control compartment facing downward. Safety control operation will be adversely affected. Never connect return air duct to the back of the furnace.

⚠ WARNING

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

Improper servicing could result in dangerous operation, serious injury, death or property damage.

-Before servicing, disconnect all electrical power to furnace.

-When servicing controls, label all wires prior to disconneting. Reconnect wires correctly.

-Verify proper operation after servicing.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow this warning could result in personal injury or death. The operation of exhaust fans, kitchen ventilation fans, clothes dryers, attic exhaust fans or fireplaces could create a NEGATIVE PRESSURE CONDITION at the furnace. Make-up air MUST be provided for the ventilation devices, in addition to that required by the furnace.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD
Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death. The following steps shall be followed for each appliance connected to the venting system being placed into operation, while all other appliances connected to the venting system are not in operation:

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

1.4 DETECTION SYSTEMS

It is recommended that carbon monoxide detectors be installed wherever oil or gas fired heaters are used. Carbon monoxide can cause bodily harm or death. For this reason, agency approved carbon monoxide detectors should be installed in your residence and properly maintained to warn of dangerously high carbon monoxide levels.
Also, the house should be equipped with approved and properly maintained fire extinguishers.
Your unit is equipped with safety devices that can prevent it from functioning when anomalies are detected such as a blocked venting system.

1.5 DANGER OF FREEZING

⚠ CAUTION

FROZEN AND BURST WATER PIPE HAZARD
Failure to protect against the risk of freezing may result in property damage. Special precautions MUST be made if installing furnace in an area which may drop below freezing. This can cause improper operation or damage to equipment. If furnace environment has the potential of freezing, the drain trap and drain line must be protected.

⚠ CAUTION

PROPERTY DAMAGE HAZARD
Failure to follow this caution may result in burst water pipes and/or property damage. If a condensate pump is installed, a clogged condensate drain or a failed pump may cause the furnace to shut down. Do not leave the home unattended during freezing weather without turning off water supply and draining water pipes or otherwise protecting against the risk of frozen pipes.
Ensure all condensate drain connections are secured and liquid tight. Use the furnished tube clamps and verify tightness

2 INTRODUCTION

This multiposition Category IV condensing furnace is CSA design certified direct vent (2 pipes) or non-direct vent (1 pipe). The furnace is factory shipped for use with natural gas. The furnace can be converted in the field for use with propane gas when a factory supplied conversion kit is used. Refer to the furnace rating plate for conversion kit information and table 24

This furnace is designed for minimum continuous return air temperature of 60 °F (16 °C) or intermittent operation down to 55 °F (13 °C) such as when used with a night setback thermostat. Return air temperature must not exceed 80 °F (27 °C). Failure to follow these return air temperature limits may affect reliability of heat exchangers, motors, and controls.

The furnace should be sized to provide at least 100 % of the design heating load requirement. Heating load estimates can be made using approved methods available from Air Conditioning Contractors of America (Manual J); American Society of Heating, Refrigerating, and Air Conditioning Engineers; or other approved engineering methods. Excessive over sizing of the furnace could cause the furnace and/or vent to fail prematurely.

2.1 CODES AND STANDARDS

Follow all national and local codes and standards in addition to these instructions. The installation must comply with regulations of the serving gas supplier, local building, heating, plumbing, and other codes. In absence of local codes, the installation must comply with the national codes listed below and all authorities having jurisdiction. In the United States and Canada, follow all codes and standards for the following:

Table 1: Codes and Standards

TOPIC	USA	CANADA
Safety	National Fuel Gas Code (NFGC) NFPA 54-2009/ANSI Z223.1 and the Installation Standards, Warm Air Heating and Air Conditioning Systems ANSI/NFPA 90B	National Standard of Canada, Natural Gas and Propane Installation Code (NSCNGPIC) CAN/CSA B149.1
General installation	NFGC and the NFPA 90B. For copies, contact the National Fire Protection Association Inc., Battery march Park, Quincy, MA 02269; or for only the NFGC contact the American Gas Association, 400 N. Capitol, N.W.,Washington DC 20001	NSCNGPIC. For a copy, contact Standard Sales, CSA International, 178 Rexdale Boulevard, Etobicoke (Toronto), Ontario, M9W 1R3, Canada
Combustion and and air ventilation	Section 9.3 of the NFPA54/ANSI Z223.1 Air for Combustion and Ventilation	Part 8 of the CAN/CSA B149.1, Venting Systems and Air Supply for Appliances
Duct systems	Air Conditioning Contractors Association (ACCA) (Manual D), Sheet Metal and Air Conditioning Contractors National Association (SMACNA), or American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE).	
Acoustical lining and fibrous glass duct	current edition of SMACNA, NFPA 90B as tested by UL Standard 181 for Class I Rigid Air Ducts.	
Gas piping and pipe pressure testing	NFPA 54/ANSI Z223.1 NFGC; Chapters 5, 6, 7, and 8 and national plumbing codes.	CAN/CSA-B149.1, Part 6
Manufactured Mobile housing	Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280 or The Standard for Manufactured Home Installations ANSI/NCS A225.1	Canadian Standard for Series M92 Mobile Homes, CAN/CSA Z240MH
Electrical connections	National Electrical Code (NEC) ANSI/NFPA 70	Canadian Electrical Code CSA C22.1
Venting	Part 7, Venting of equipment, latest edition of the National Fuel Gas Code NPFA 54, 90A and 90B ANSI Z223.1-	CAN/CSA-B149.1-05 latest edition

IN THE STATE OF MASSACHUSETTS:

- This product must be installed by a licensed plumber of gas fitter;
- When flexible connectors are used, the maximum length shall not exceed 36 in. (914 mm);
- When lever type gas shutoffs are used they shall be ”T” handle type;
- The use of copper tubing for gas piping is not approved by the state of Massachusetts;

2.2 ELECTROSTATIC DISCHARGE

⚠ CAUTION

FURNACE RELIABILITY HAZARD
Failure to follow this caution may result in unit component damage. Electrostatic discharge can affect electronic components. Take precautions during furnace installation and servicing to protect the furnace electronic control. These precautions will help to avoid exposing the control to electrostatic discharge by putting the furnace, the controls, and the technician at the same electrostatic potential.

2.3 LOCATION

This furnace must :

- Be installed so the electrical components are protected from water;
- Not be installed directly on any combustible material other than wood flooring;
- Be located close to the chimney or vent and attached to an air distribution system. Refer to section 7

Place the unit so that proper venting can be achieved, with a minimum number of elbows, in accordance with the instructions in this manual. The furnace should be located as close to the chimney (vertical venting) or to the outside vent wall (horizontal venting) as possible.
When installing the furnace, provisions must be made to ensure the supply of adequate combustion and ventilation air in accordance with the “air for combustion and ventilation” section of the National Fuel Gas Code, NFPA 5/ANSI Z223 or applicable provisions of the local building code.

2.3.1 Clearance and accessibility

Installations must provide ample space for servicing and cleaning. Always comply with minimum fire protection clearances shown in table 2. Clearances must also accomodate an installation’s gas connection (to the left of the furnace), electrical connection, drain trap and venting/combustion air piping. If the combustion air is installed to the side of the furnace, additionnal clearance must be provided.

2.3.2 Location relative to cooling equipement

The cooling coil can either be installed in the supply air duct or in the return air duct. If the coil is installed in the supply air duct, it must be at a minimum of 6" over the furnace’s primary heat exchanger. This will avoid potential error codes due to heated refrigerant when the gas furnace is on. It also allows for a more laminar airflow through the coil. The cooling coil base can be purchased through your local distributor. See table 24 for the appropriate item number.

Table 2: Minimum clearance

Position	Clearance in (mm)
Rear	0
Front[1]	24 (610)
All sides of supply plenum [2]	1 (25)
Sides[3]	0
Vent	0
Top of furnace	1 (25)

1- For servicing or cleaning, a 24" front clearance is required.
2- For at least the first 3 ft of plenum from furnace
3-Unit connections (electrical, drain trap and combustion air) may necessitate greater clearances than the minimum clearances listed above.

3 INSTALLATION

To ensure proper drainage of the condensate when installed in position other than upflow, the furnace MUST be tilted. Refer to figures corresponding to the position of the furnace in the following sections.

⚠ CAUTION

PROPERTY DAMAGE HAZARD
Failure to follow this caution may result in water spillage and/or property damage.
For any position other than upflow, the multiposition pressure switch must be connected pneumatically to the condensate box and electrically to the control to allow the furnace to stop in the event of drain blockage.

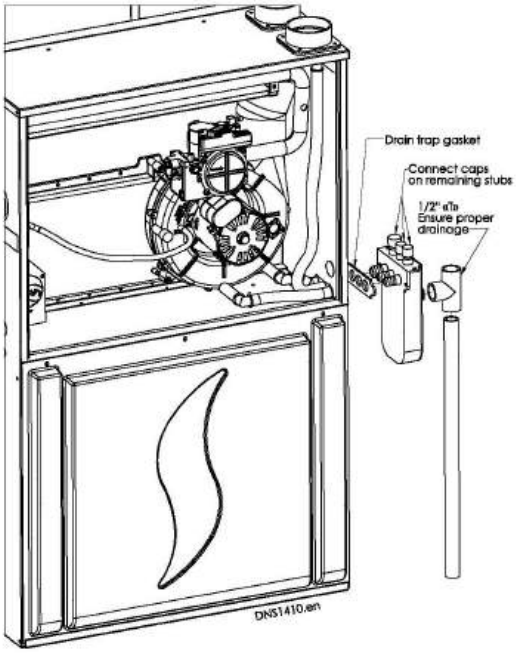
3.1 UPFLOW

The furnace is factory built for upflow position. In this position, the drain trap can be installed on the right or left side depending on air return duct. When installing the furnace in the upflow position, make sure it is leveled or tilted foward.

In the upflow orientation, the drain trap can be installed to the right or to the left of the furnace. The location of the drain trap is dependent of the return duct connection. The furnace must be perfectly leveled or slightly leaned forward to help drain condensate.

3.1.1 Right side condensate drain trap connection

Figure 1: Right side connection



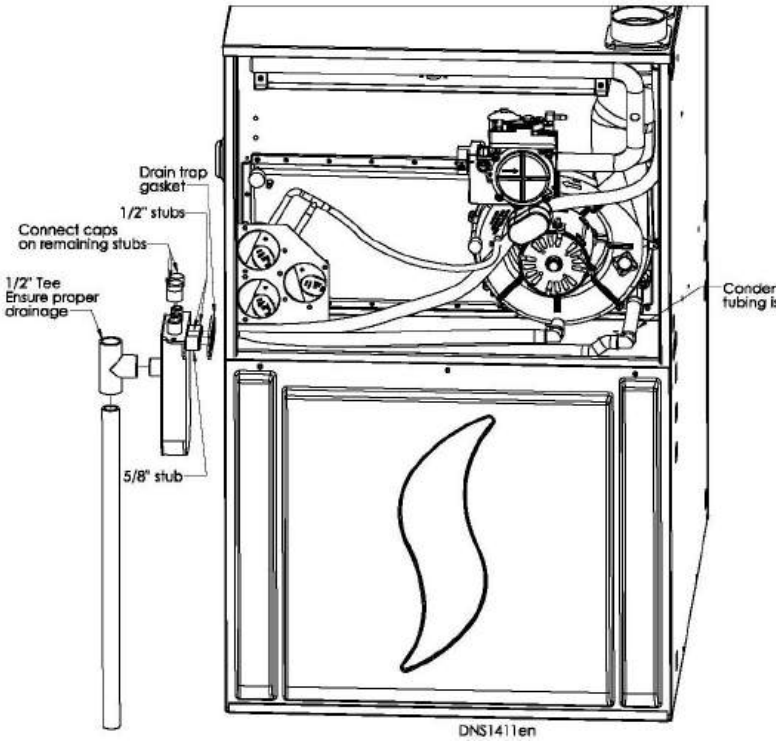
See figure 1 and read the following instructions:

1. Remove the oblong knock-out from the right side of the casing.
2. Place the drain trap gasket on drain trap.
3. Install the drain trap on the right side. See figure 1.
4. Screw in place the drain trap with two head tapping screws on the right side of the furnace.
5. Connect the three stubs to the condensate tubings already in place in the furnace.
6. Connect the outlet drain from the drain trap to an additional condensate tubing using a ½" tee for an adequate drainage of the condensate. DO NOT vent using the remaining 3 outlet stubs.
7. Prime the drain trap with water. This will ensure proper furnace drainage at startup and will avoid any recirculation of flue gas.
8. On the remaining 3 outlet stub, connect caps (1x5/8" and 2x1/2"). Those caps are furnished in the parts bag.
9. If a condensate pump needs to be use, make sure it is suited for acidic condensate.

3.1.2 Left side condensate drain trap connection

See figure 2 and read the following instructions:

Figure 2: Left side connection



1. Remove the oblong knock-out from the left side of the casing.
2. Place the drain trap gasket on the drain trap.
3. Install the drain trap on the left side, the three outlet stub of the drain trap toward the interior of the furnace.
4. Connect each condensate tubing to a stub. Use the furnished ½" and 5/8" tubing to cut the appropriate length to reach the drain trap. The condensate tubing from the condensate box is 5/8" and it must be connected to the 5/8" stub of the drain trap. The condensate tubing from the ID blower and the vent flange are ½" and are connected to the ½" stubs of the drain trap.
5. Ensure the tubings are adequately connected to the stubs and are correctly sloped to the drain trap. Left side connection requires special attention to the slope of condensate tubing through the furnace.
6. Screw the drain trap in place with two head tapping screws on the furnace side.
7. Connect the outlet drain from the drain trap to an additional condensate tubing using a ½" tee for an adequate drainage of the condensate. DO NOT vent using the remaining three outlet stubs. If a condensate pump is used, make sure it is approved for acidic condensate.
8. Prime the drain trap with water. This will ensure proper furnace drainage at startup and will avoid any recirculation of flue gas.

9. On the remaining 3 outlet stub, connect caps (1x5/8” and 2x1/2”). These caps are provided in the parts bag.

3.2 DOWNFLOW

SEE FIGURE 3 FOR INSTALLATION DETAILS

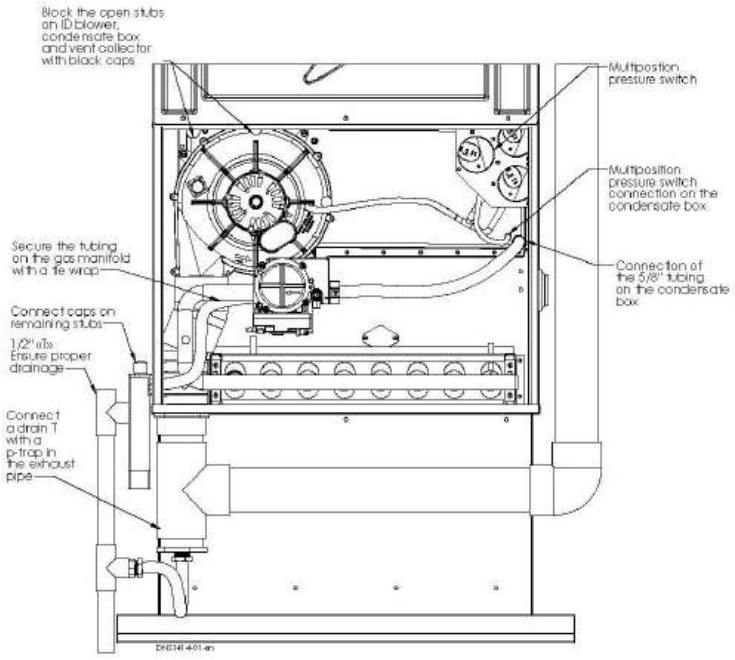
⚠ CAUTION

It is STRONGLY RECOMMENDED to use the optional downflow base to ensure the 1” clearance around the supply duct going through the floor and the proper slope of the furnace for condensate drainage. Also, the base allows sufficient spacing for the venting and the drain trap.

When installing the furnace in downflow position, make sure the furnace is tilted foward to make it drain properly.

Plan your installation to have at least 1.0 ft. of clearance under the installed furnace to put the exhaust pipe drainage and drain trap.

Figure 3: Downflow position



3.2.1 Downflow condensate drain trap connection

1. Remove all condensate tubing from the inducer blower, condensate box and vent collector. Block the openings with the provided 5/8” and 1/2” black caps. In the downflow position, the only connection to the drain trap comes from the condensate box. The inducer blower will be drained through the exhaust pipe.
2. Remove the downflow drain trap knock-out.
3. Place the drain trap gasket on the drain trap.
4. Install the drain trap.
5. Screw the drain trap in place with two head tapping screws on the side of the furnace.
6. Install two 1/2” black plastic caps on the unused 1/2” inlets of the drain trap inside the furnace.
7. Cut the required length of 5/8” tubing and connect one end on the downflow port of the condensate box. See figure 3 for port location.
8. Connect the other end to the 5/8” inlet of the drain trap and secure the tubing on the gas manifold with a tie wrap.
9. Connect the outlet of the drain trap to the condensate drain piping with a tee. DO NOT vent using the remaining 3 inlet of the drain trap. If a condensate pump is used, make sure it is approved for acidic condensate.
10. Make sure the 5 unused inlets of the drain trap are plugged with provided plastic caps.

3.2.2 Downflow multiposition pressure switch connection

The 3/16" stub just beside the drain of the condensate box must be drilled or cut open. Use the supplied black squared PVC tubing to connect the pressure switch (-0.2 in. w.c.) to this stub. (see figure 5)

The pressure switch must also be electrically connected in series with the low fire pressure switch (top) using the brown jumper provided in the parts bag. Refer to figure 4 for more details.

Figure 4: Downflow position pressure switch assembly

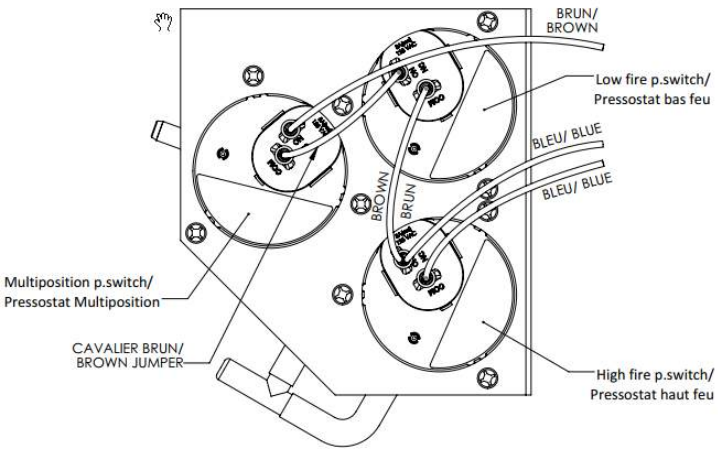
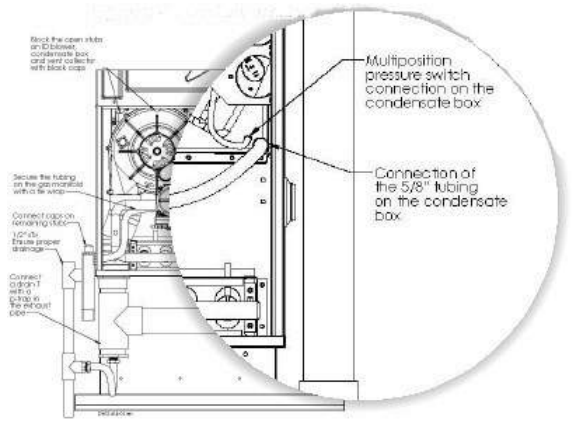


Figure 5: Connecting pressure switch in downflow position



3.3 HORIZONTAL RIGHT

⚠ CAUTION

C15-MV/MS, C30-M/S and C45-MV/MS can't be installed in this position

Figure 6: Horizontal right position

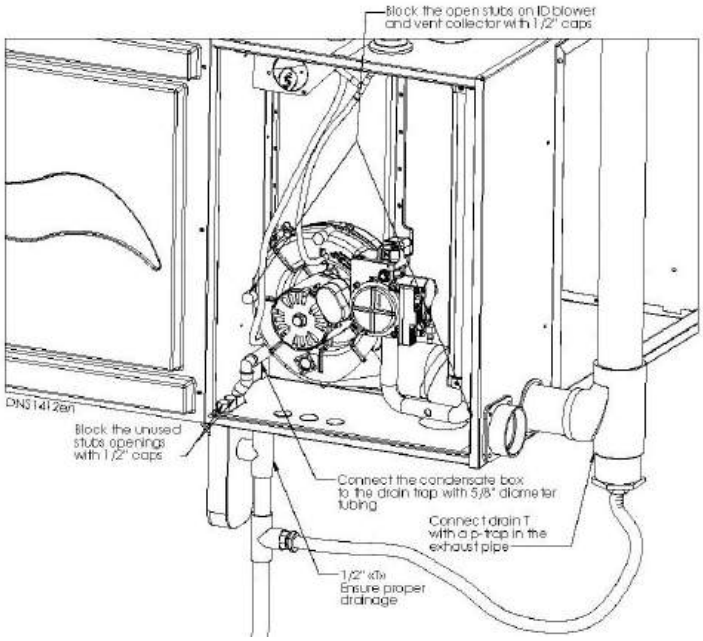
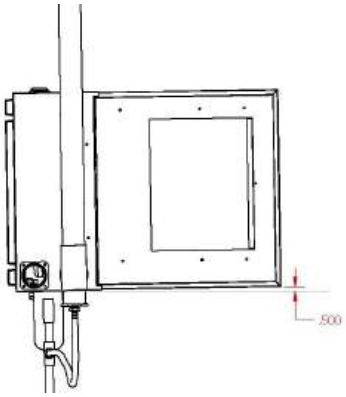


Figure 7: Horizontal right slope



When installing the furnace in horizontal right position, make sure the furnace is tilted foward to make it drain properly. Refer to figure 7.

Plan your installation and make sure you have sufficient space for the drain trap and exhaust pipe drainage. Drain trap will add approximately 6.50" to the furnace width. Refer to figure 6.

3.3.1 Horizontal right condensate drain trap connection

REFER TO FIGURE 6 FOR INSTALLATION DETAILS

1. Remove all condensate tubings from the inducer blower and vent collector. Block the openings with provided 5/8" and 1/2" black caps.

2. Remove the horizontal right drain trap knock-out.

3. Place the gasket on the drain trap.

4. Screw the drain trap in place with 2 self-tapping screws to the side of the furnace.

5. Install two 1/2" black caps on the unused inlets of the drain trap inside the furnace.

6. Connect a small length of 5/8" condensate tubing to the condensate box and route with an elbow to the drain trap. Make sure it can drain properly.

7. Connect the outlet of the drain trap to the condensate drain piping with a tee. DO NOT vent using the remaining 3 inlets. If a condensate pump is used, make sure it is approved for acidic condensate.

8. Prime the drain trap with water. This will ensure proper furnace drainage at startup and will avoid any recirculation of flue gas.

9. On the remaining 5 inlets, connect black caps (1x5/8" and 2x1/2"). These caps are provided in the parts bag.

3.3.2 Horizontal right multiposition pressure switch connection

Figure 8: Horizontal right pressure switch connection

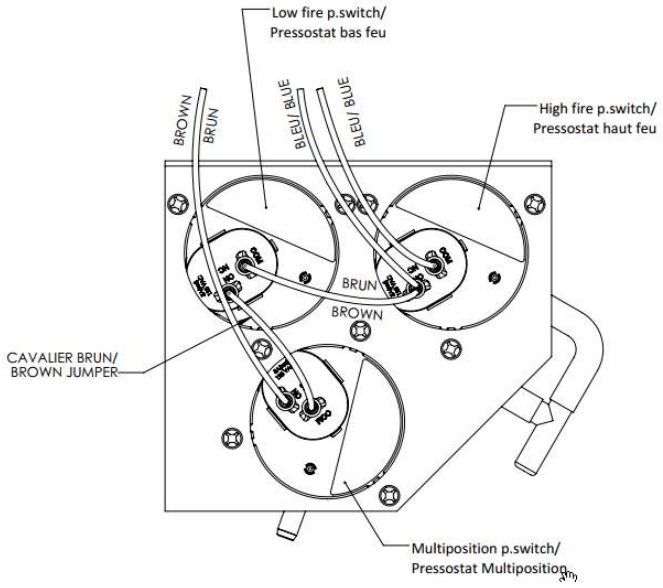
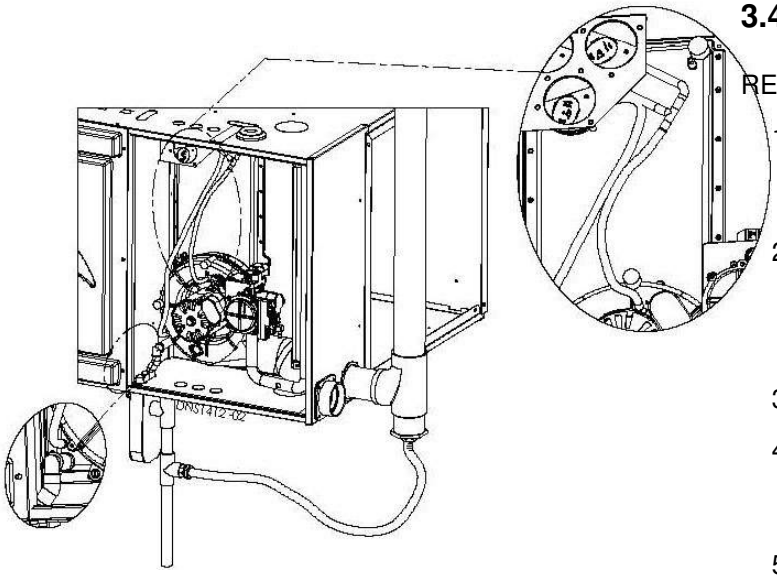


Figure 9: Horizontal right pressure switch tubing

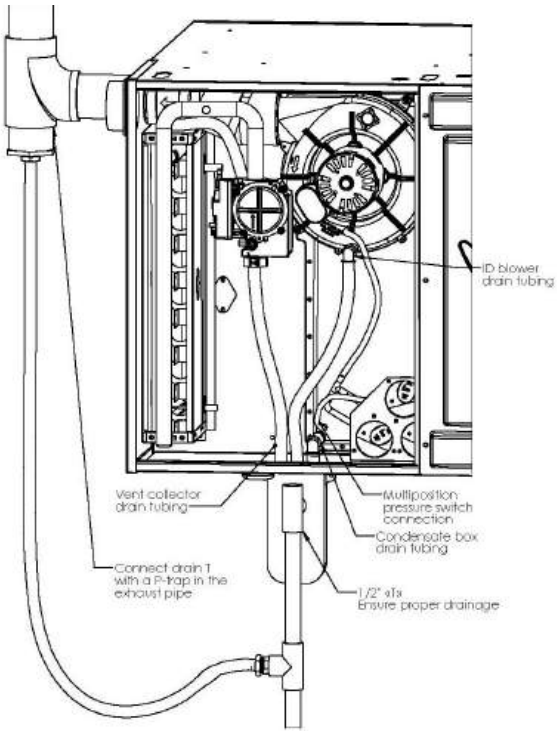


The 3/16" stub just beside the drain of the condensate box must be drilled or cut open. The black squared PVC tubing must connect the pressure switch (-0.2 in w.c.) to this stub. This tubing is provided with the furnace. Refer to figure 6 to see which port is associated to the horizontal right position.

The pressure switch must also be electrically connected in series with the low fire pressure switch (top) using the brown jumper provided in the parts bag. Refer to figure8 (Horizontal right pressure switch connection) for more details.

3.4 HORIZONTAL LEFT

Figure 10: Horizontal left position



3.4.1 Horizontal left condensate drain trap connection

REFER TO FIGURE 10 FOR INSTALLATION DETAILS.

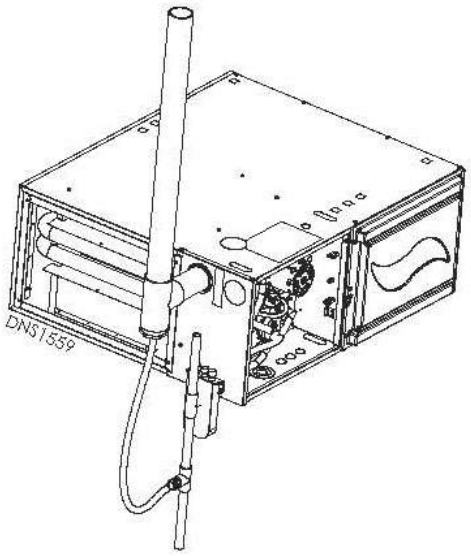
1. Remove all tubing from the ID blower, condensate box and vent collector and block the stub openings with furnished 5/8” and 1/2” black caps.
2. Remove the oblong knock-out from the bottom middle side of the casing. (An alternate knock-out is available on the furnace top panel if space is constraint)
3. Place gasket on the drain trap.
4. Screw in place the drain trap with 2 self-tapping screws to the side of the furnace. The drain trap must be vertical.
5. Drill open the new bottom stub of the ID blower (if not already open). Be sure to remove all debris.
6. Reroute the ID blower drain tube from the bottom of the ID blower casing to one of the 1/2” stub of the drain trap. Cut the provided 1/2" tubing at the appropriate length to reach the drain trap.
7. Reroute the condensate box drain tubing from the bottom of the condensate box to the 5/8” stub of the drain trap. Cut the provided 5/8" tubing at appropriate length to reach the drain trap.
8. Reroute the vent collector drain tube to one of the 1/2” stubs of the drain trap. Cut the provided 1/2"

tubing at the appropriate length to reach the drain trap.

9. Connect the outlet from the drain trap to the condensate drain piping using a ½" PVC tee. If a condensate pump is used, make sure it is approved for acidic condensate.
10. Prime the drain trap with water. This will ensure proper furnace drainage at startup and will avoid any recirculation of flue gas.
11. On the remaining 3 outlet stub, connect caps (1x5/8" and 2x1/2"). These caps are provided in the parts bag.

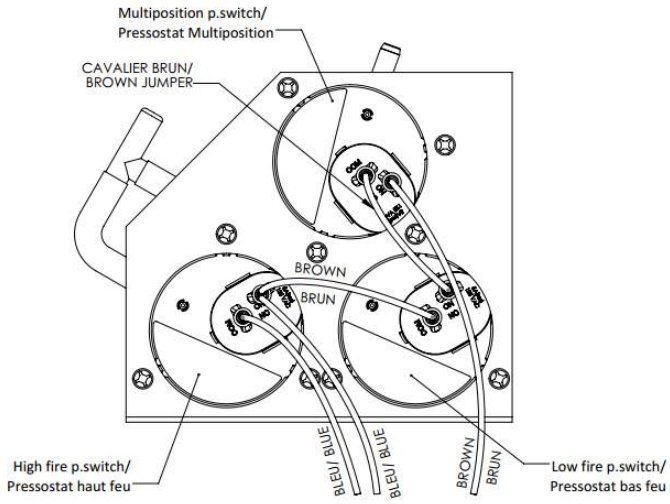
3.4.2 Alternate drain trap location in horizontal left position

Figure 11: Drain trap alternate position



3.4.3 Horizontal left multiposition pressure switch connection

Figure 12: Horizontal left pressure switch connection



The 3/16" stub just beside the drain of the condensate box must be drilled or cut open. Use the supplied black squared PVC tubing to connect the pressure switch (-0.2 in. w.c.) to this stub. (see figure 10)

The pressure switch must also be electrically connected in series with the low fire pressure switch (top) using the brown jumper furnished in the parts bag. Refer to figure 12 for more details.

3.5 MULTIPOSITION VENTING DRAINAGE

All furnaces with horizontal exhaust vent piping must have drain tee assembly and trap installed in the exhaust pipe as close to the furnace as possible. See Figures 3, 6 and 10.

4 DUCT INSTALLATION

4.1 GENERAL REQUIREMENTS

The duct system should be designed and sized according to accepted national standards such as those published by: Air Conditioning Contractors Association (ACCA), Sheet Metal and Air Conditioning Contractors National Association (SMACNA) or American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE). Consult The Air Systems Design Guidelines reference tables available at your local distributor.

The duct system should be sized to handle the required system design aiflow at the design external static pressure. When a furnace is installed so that the supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by duct(s) sealed to the furnace casing and terminating outside the space containing the furnace. This furnace may be installed, with a two pipe sealed combustion configuration (direct vent), in a space utilized as part of the return air supply. A filter must be installed in the return opening of the furnace and a grill should be installed in the space to allow proper circulation of air.

Secure ductwork with proper fasteners for type of ductwork used. Seal supply and return duct connections to the furnace with code approved tape or duct sealer.

Ductwork passing through an unconditioned space should be insulated to enhance system performance. When air conditioning is used, a vapour barrier is recommended.

Maintain a 1 in. (25 mm) clearance from combustible materials to supply air ductwork for a distance of 36 in. (914 mm) horizontally from the furnace.

Flexible connections can be used between ductwork and furnace to prevent transmission of vibration.

Many states, provinces and localities are considering or have implemented standards and/or restrictions on duct sizing practices, ductwork leakage, and/or ductwork thermal, airflow and electrical efficiencies. CONSULT

LOCAL CODE OFFICIALS for ductwork design and performance requirement in your area.

4.2 DUCT EXTERNAL STATIC PRESSURE

Higher than prescripted static pressure will decrease the air flow, causing excessive temperature rise, opening of the thermodisk, failure of the heat exchanger and / or poor performance of the heat pump / air conditioning.

To measure total external static pressure, proceed as follow:

1. Run the furnace at the system maximum airflow. This is usually acheive in cooling with a call on Y2. If you have a communicating system, unplug your thermostat, make the appropriate dipswitch setting using table 21 and jump either Y2 or Y1, depending on the airflow needed.
2. Return duct : Make sure the furnace filter is clean and measure the static pressure between the filter and the inlet of the furnace (negative pressure reading)
3. Supply duct : Measure the static pressure between the furnace and the cooling coil (positive static pressure). Tape up the hole when test is complete.
4. Substract the inlet pressure from the supply pressure. For exemple, if you measured 0.3"w.c. in the supply and -0.2" in the return:

   0.3"w.c. - (-0.2"w.c.) = 0.5"w.c.

If the total external static pressure exceeds the maximum listed on the furnace rating plate, check for closed dampers, register, unproperly size duct work or incorrect dipswitch settings. Make sure the temperature rise is coherent with the furnace rating plate.

4.3 SMART DUCT SYSTEM

Dettson Industries also offers the Smart Duct System. Please refer to the Smart Duct Manual (X40240) for proper installation of this system.
Please note Smart Duct system can only be used with approuved Smart Duct furnaces.

4.4 RETURN AIR CONNECTIONS

The return air duct must be connected to the bottom, left side or right side. If necessary (depending on your filter restriction), provision should be made for a double return.

In downflow configuration, side return air is not permitted, it must be connected to the bottom of the furnace.

Connection to the back of the furnace is prohibited.

Static pressure in the return air duct should be -0.2"w.c. at system maximum airflow.

At least two 90° elbows and 10 ft of straight duct should be installed before the first return branch to trunk connections to avoid noise or before return grill.

4.4.1 Bottom return

Cut a rectangular opening on the bottom plate of the furnace using the knock-outs.

In Upflow orientation when using the bottom inlet, return air base can be used. This base allows the connection of the duct on the side with a bottom inlet. See table 24 for the part number corresponding to your furnace.

4.4.2 Side return

Remove 4 knock-outs on the side of the furnace of the 8 knock-outs available. Use table 3 for suggested return size. Install the return air inlet as per local codes.

Table 3: Suggested Return size

Model	Return size
C15-M-V/C15-M-S	16" x 24.00" or 16" x 20.00"
C30-M-V/C30-M-S	16" x 24.00" or 16" x 20.00"
C45-M-V/C45-M-S	16" x 24.00" or 16" x 20.00"
C60-M-V/C60-M-S	16" x 24.00"
C75-M-V	16" x 24.00"
C105-M-V	16" x 24.00"
C120-M-V	16" x 24.00"

4.5 SUPPLY AIR DUCTS

The supply air duct must be connected to the furnace supply outlet air duct flanges. DO NOT cut furnace casing to attach supply air duct, humidifier, or other accessories. All accessories must be connected to the supply or return ductwork, external to furnace's casing. It is recommend that the outlet duct be provided with a removable access panel. This opening shall be accessible when the furnace is installed and shall be sized to allow the heat exchanger to be viewed or a probe to be inserted for sampling the air stream. The cover attachement should prevent leaks.

4.5.1 Ductwork acoutiscal treatment

Metal duct systems that do not have a 90 degree elbow and 10 ft. (3 M) of main duct to the first branch take-off may require internal acoustical lining. As an alternative, fibrous ductwork may be used if constructed and installed in accordance with the latest edition of SMACNA construction standard on fibrous glass ducts. Both acoustical lining and fibrous ductwork shall comply with NFPA 90B as tested by UL Standard 181 for Class 1

Rigid air ducts.

5 GAS SUPPLY AND PIPING

5.1 GENERAL

⚠ WARNING

FIRE OR EXPLOSION HAZARD
Failure to follow the safety warnings exactly could result in serious injury, death or property damage. Never test for gas leaks with an open flame. A fire or explosion may result causing property damage, personal injury or loss of life. Use a commercially available soap solution made specifically for the detection of leaks to check all connections.

Installations must be made in accordance with all authorities having jurisdiction.

Use a back-up wrench on the inlet of the gas valve when connecting the gas line to the gas valve.

Report to Table 6 for recommended gas pipe sizing. Support all gas piping with appropriate straps and hangers. Use a minimum of 1 hanger every 6 ft (1.8 m). Joint compound (pipe dope) should be applied sparingly and only to male threads of joints. Pipe dope must be resistant to the action of propane gas.

An accessible manual equipment shut off valve MUST be installed external to furnace casing.

Install a sediment trap in riser leading to furnace. Connect a capped nipple into lower end of tee. Capped nipple should extend below level of furnace gas controls.

Install a union between the manual shut off gas and the gas valve in order to remove it easily.

Install a union between the manual shut off gas and the gas valve in order to remove it easily.

Leak test the unit and gas connections.

The gas supply pressure shall be within the maximum and minimum inlet supply pressures marked on the rating plate and in Table 4.

The furnace gas valve inlet pressure tap connection is suitable to use as a test gauge port providing test pressure.

5.2 PROPANE CONVERSION

To convert from natural to L.P. gas, installer should use the appropriate conversion kit. Please refer to Tables 24 and 25.

The conversion kit consist of orifices, jumper and stickers to clearly identify conversion on the gas valve.

Follow the steps bellow to convert the gas valve to propane :

1. Move the switch located on the valve to the «off» position.
2. Remove the «NAT. GAS» label from the top of the gas valve.
3. Using a pair of tweezers or needle nose pliers, place the jumper (supplied) on the receptacle located beneath the label that was removed in step 2. Use care to make sure that both prongs of receptacle engage the jumper.
4. Place the «LP» label (supplied with the kit) on the gas valve over the opening to the jumper.
5. Attach the “WARNING” label (supplied with this kit) to the gas valve where it can readily be seen.
6. Move the switch located on gas valve back to the “ON” position.
7. Unscrew the manifold.
8. Replace the natural gas burner orifices with the LP orifice (# 56) supplied with the kit.
9. Replace the manifold and make sure it’s properly aligned with the burners.
10. Make sure the gas valve outlet pressure (measured on the outlet pressure tap) is compliant with the outlet pressure. Outlet pressure is specified on the nameplate of the furnace.

5.3 GAS PIPE GROMMET

For direct vent applications, the hole for the gas pipe on the cabinet must be sealed to prevent air leakage. Install the grommet in the hole, then insert the gas pipe.

5.4 SETTING GAS PRESSURE

Gas valve is very sensible to outlet pressure adjustment. Thus, it should be done slowly and only allows for slight adjustment. Follow those steps to properly adjust the servo gas valve :

1. With the gas to the unit shut off at the manual gas valve, remove the outlet pressure tap plug in the gas valve.
2. Connect the pressure hose from a manometer to this pressure tap. Turn on the manual gas valve.
3. Make sure the unit is operating at its maximum capacity and note the pressure. Should be 3.2” w.c. +/- 0.3 for Natural gas and 8.6” w.c. +/- 0.5 for LP gas.
4. Insert a small slotted screwdriver into the opening at the top of the valve. **Allow up to 10 seconds for each change in pressure**
5. Turn clockwise to increase pressure or counterclockwise to decrease pressure.
6. Shut off gas to the unit and place the regulator cap and the manifold pressure tap.
7. Check unit for leaks

Table 4: Inlet Gas Pressure

	Gas Pressure in.w.c. (psig)	
	Minimum	Maximum
Natural Gas	4.5	10.5
Propane	11.0	13.0

Table 5: Outlet gas pressure

	Gas Pressure in. w.c.	
Input	Natural Gas	Propane
High fire (100%)	3.2 +/- 0.3	8.6 +/- 0.5
Low fire (40%)	0.8 +/- 0.3	2.1 +/- 0.3

Table 6: Maximum capacity of pipe Cu.ft./Hr for pipe length ft (m)

Nominal Iron pipe size in. (mm)	Internal dia. in. (mm)	10 (3.0)	20 (6.0)	30 (9.1)	40 (12.1)	50 (15.2)
1/2 (13)	0.622 (158)	175	120	97	82	73
3/4(19)	0.824 (20.9)	360	250	200	170	151
1 (25)	1.049 (26.6)	680	465	375	320	285
1-1/4 (32)	1.380 (35.0)	1400	950	770	660	580
1-1/2 (39)	1.610 (40.9)	2100	1460	1180	990	900

6 ELECTRICAL CONNECTION

6.1 120V WIRING

Furnace must have a 120 V power supply properly connected and grounded. Proper polarity must be maintained for 120 V wiring. If polarity is incorrect, furnace will NOT operate. Verify that the voltage, frequency, and phase correspond to that specified on unit rating plate. Also, check to be sure that service provided by utility is sufficient to handle load imposed by this equipment. Use a separate fused branch electrical circuit with a properly sized fuse or circuit breaker for this furnace. A readily accessible means of electrical disconnect must be located within sight of the furnace.Refer to rating plate or Table 10.

6.2 24V WIRING

Make field 24 V connections at the 24 V terminal strip. Connect terminal Y/Y2 for proper cooling operation. Use AWG No. 18, color-coded, copper thermostat wire. For wire lengths over 100 ft., use AWG No 16 wire.

6.3 THERMOSTAT

To know exactly which thermostat should be used with your system (cooling, ERV/HRV), please refer to the table 11.

6.3.1 Non-communicating modulating, one-stage or two-stage thermostat

NOTE: Do not use 24 volt control wire smaller than No. 18 AWG.

Wire all non-communicating thermostats to the 24V connections on the integrated furnace control. See figure 14

NOTE: A larger wire gage may be required for longer lengths of thermostat wire.

Operations with a modulating non-communicating or communicating thermostat are fully modulating between 40% and 100% of furnace capacity. The firing rate is first determined by the thermostat and then sent to the furnace. This is the optimum mode of operation and will give the best temperature control with minimal temperature variation from the desired set point.

Operation with a 2-stage thermostat will proceed as follow : call on W1 will result in a 40% input, call on W2 will resulat in 60% input for 6 minutes followed by 100% input until thermostat demand is satisfied.

Operation with a single stage thermostat will require dispwitch configuration and will operate in three phase, as describe in table 7 below. See table 8 for configuration details.

Figure 13: Wiring Diagram Modulating t-stat

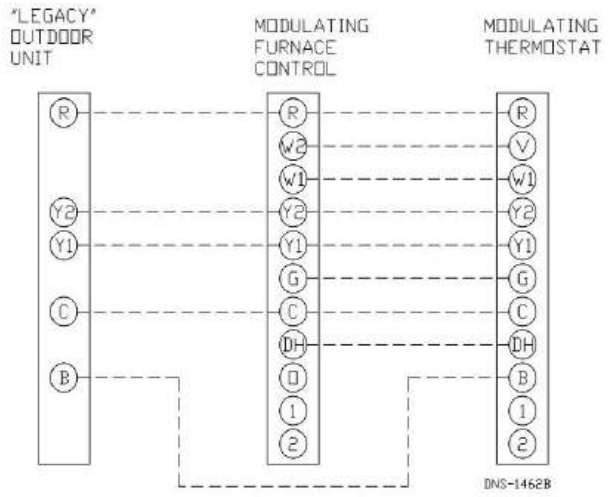


Table 7: OPERATION WITH SINGLE STAGE T-STAT

PHASE	TIME	INPUT
PHASE 1	0-5 minutes	40%
PHASE 2	5-12 minutes	60%
PHASE 3	12 +	100%

Table 8: THERMOSTAT TYPE SELECTION

S4-2	S4-3	DESCRIPTION
OFF	OFF	Modulating, communicating or 1-stage t-stat
ON	OFF	40% TEST MODE
OFF	ON	100% TEST MODE
ON	ON	2-STAGE T-STAT

6.3.2 Thermostat input

These connections are used with any traditional 24 V AC modulating non-communicating, thermostat specified for this modulating furnace. W1, Y1, Y2, G, C and R are the traditional thermostat inputs used in nearly all HVAC equipment. Installation of the thermostat to these connections is straight- forward and simple.

HUM STAT – This terminal is used to connect the output of a humidistat to the furnace control to control humidification and/or dehumidification. Optional equipment is required for these features.

Table 9: Dehumidification

S5-1	DESCRIPTION
OFF	No On Demand dehumidification
ON	On demand dehum based on HUM STAT terminal

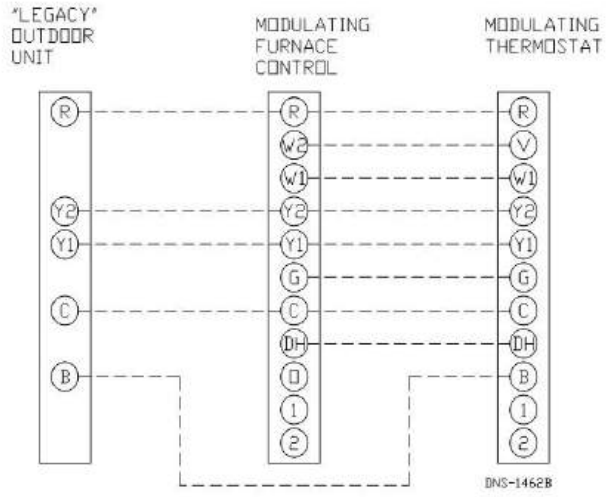
V/W2 – This terminal is used to connect the modulating signal (V) from a non-communicating, fully modulating thermostat specified for use with this furnace. It is used

to transmit the firing rate (determined by the thermostat) to the furnace control.

NOTE: Do not apply 24 VAC to the V/W2 terminal (as with a jumper to R for diagnostic purposes) with a non-communicating, modulating thermostat.

B - This terminal is used to pass a reversing valve signal to a condenser. It is only a holding place for connecting a wire from the thermostat and a wire from the condenser. It does not change the airflow of the cool/heat commands.

Figure 14: Wiring Diagram Modulating t-stat



6.4 ALTERNATE POWER SUPPLY

Dettson doesn't recommend to operate the furnace on a generator or other alternate power supply. If so it must produce a smooth sinusoidal waveform for compatibility with the furnace electronics. The alternate power supply must generate the same voltage, phase, and frequency (Hz) as shown on the furnace rating plate.

Power from an alternate power supply that is non-sinusoidal may damage the furnace electronics or cause erratic operation.

Contact the alternate power supply manufacturer for specifications and details.

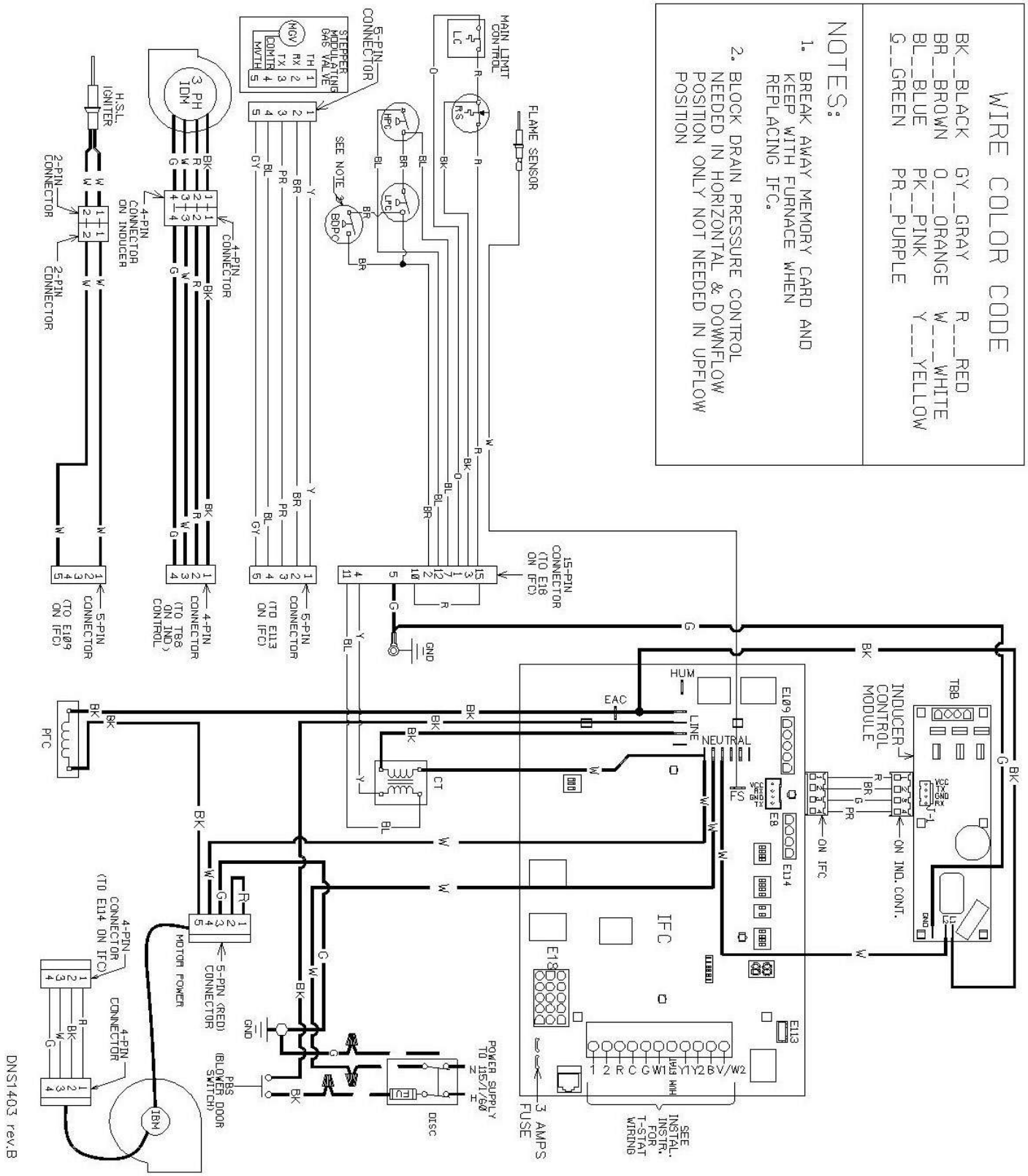
Table 10: Electrical Data

Unit size	Volts-Hertz-Phase	Operating range Min	Operating range Max	Maximum unit amp	Unit ampacity	Maximum fuse CKT BRK amp
15,000	120-60-1	127	104	10.7	12.6	15
30,000	120-60-1	127	104	10.7	12.6	15
45,000	120-60-1	127	104	10.7	12.6	15
60,000	120-60-1	127	104	13.1	15.6	20
75,000	120-60-1	127	104	13.1	15.6	20
105,000	120-60-1	127	104	15.8	19	20
120,000	120-60-1	127	104	15.8	19	20

Table 11: Thermostat Choice VS System

Heating system	Cooling system	Thermostat	HRV interlock at low CFM	Interface board needed	Smart Duct compliant
Modulating chinook	Alizé	R02P032	Yes	Yes	Yes
Modulating chinook	1 stage Non-Alizé Cooling unit	R02P032	Yes	Yes	No
Modulating chinook	1&2 stage Non-Alizé Cooling unit/Heat pump	2-Stage R02P032	No	No	No

Figure 15: Wiring Diagram



7 VENTING AND COMBUSTION AIR PIPING

⚠ WARNING

CARBON-MONOXIDE POISONING HAZARD Failure to follow instruction could result in severe personal injury or death due to carbon-monoxide poisoning, if combustion products infiltrate into the building.Check that all openings in the outside wall around the vent (and air intake) pipe(s) are sealed to prevent infiltration of combustion products into the building.Check that furnace vent (and air intake) terminals are not obstructed in any way during all seasons.

⚠ WARNING

Corrosive or contaminated air may cause failure of parts containing flue gas, which could leak into the living space. Air for combustion must not be contaminated by halogen compounds, which include fluoride, chloride, bromide and iodide. These elements can corrode the heat exchanger and burner cabinet component. This conditions would shorten the furnace life. Air contaminants are found in aerosol sprays, detergents, bleaches, cleaning solvents, salts, air fresheners, and other household products. Do not install the furnace in a corrosive or contaminated atmosphere. Make sure all combustion and circulating air requirements are met, in addition to all local codes and ordinances.

7.1 GENERAL

If this furnace replaces a furnace that was connected to a vent system or chimney, the vent or vent connectors of other remaining appliances may need to be re-sized. Vent systems or vent connectors of other appliance must be sized to the minimum size allowable.

An abandoned masonry chimney may be used as a raceway for properly insulated and supported combustion-air (when applicable) and vent pipes. Each furnace must have its own set of combustion air and vent pipes.

A furnace shall not be connected to a chimney flue serving a separate appliance designed to burn solid fuel.

Other gas appliances with their own venting system may also use the abandoned chimney as a raceway providing it is permitted by local code, the current edition of the National Fuel Gas Code, and the vent or liner manufacturer's installation instructions. Care must be taken to prevent the exhaust gases from one appliance from contaminating the combustion air of other gas appliances.

- The vent pipe and combustion air pipe must be the same diameter.
- Slope horizontal vent piping upward a minimum of 1/4" per foot of run so that condensate drains toward the furnace.
- Support horizontal vent piping at least every five feet. No sags or dips are permitted
- The vent pipe and combustion air pipe must terminate on the same building side.
- Installation of self regulating 5 or 7 watt heating cable at the termination of venting could be a necessity if ice build up is expected. See section 7.2.

7.2 VENT/EXHAUST BLOCKAGE DUE TO ICE BUILD UP

⚠ WARNING

If outdoor design conditions are 5°F (-15°C) or colder, there is a significant risk of ice blockage at the vent termination. To mitigate this risk, provision should be made for a heating cable at the exhaust. Additionally, ensure the exhaust termination is easily accessible to allow for manual deicing if the heating cable proves insufficient.

If design outdoor conditions are 5°F (-15°C) or less, this section should be thoroughly considered before final installation of the furnace.

Dettson is proud to offer one of the most efficient furnaces (+97% AFUE) on the market as well as being the only supplier of perfectly sized furnace in terms of footprint and input. The energy supplied to the furnace is delivered throughout the home for the comfort of the occupant rather than outside.

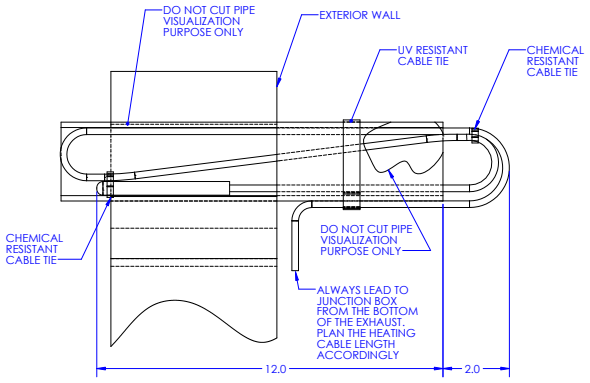
In these installations, residual energy in the chimney/vent are minimized and flue gases are expelled at low velocity. In some weather conditions, it leads to condensate freeze up at the termination and the furnace shuts down because of the ice blockage.

To prevent this phenomenon, Dettson highly suggests installing 5-watt/ft or 7-watt/ft self-regulating heating cable at the termination, inside of the pipe. Heating cable must be UL listed. Dettson recommends installing cable as per figure 16. While the figure depicts a straight vent termination, the insertion pattern applies to any permitted termination type.

The exhaust termination should be easily accessible in case the heating cable is insufficient, allowing for easy

removal of any ice blockage.

Figure 16: Suggested heating cable insertion in vent termination



7.3 DIRECT VENT

When this furnace is installed as a direct vent (2 pipes) furnace, no special provisions for combustion air are required.

Direct vent installations require a dedicated combustion air and exhaust vent piping. The system is only using outside air for combution.

The vent and combustion air pipe can terminate vertically, through the roof or horizontaly through and outside wall. Refer to figures for approved termination.

Penetration throught a roof requires appropriate sealing and proper flashing.

In Canada, refer to manufacturer's instructions for supporting ULC S636 venting. ABS can be used for the combustion air pipe.

7.4 NON DIRECT VENT

All air for combustion comes directly to the furnace from a space that is well ventilated with outdoor air (such as an attic or crawlspace). In addition, other gas appliances installed in the space with the furnace may require outside air for combustion. The combustion air pipe cannot be terminated in attics or crawlspaces that uses ventilation fans designed to operate during the heating season. If ventilation fans are present in these areas, the combustion pipe must terminate outdoors as a direct vent (2 pipe) system.

7.5 SPECIAL VENTING REQUIREMENTS FOR INSTALLATION IN CANADA

In Canada, S636 certified primers and cements must be used and be of the same manufacturer of the S636 venting system. Do not mix primers and cements from one manufacturer with a vent system from a different manufacturer. Follow the manufacturer's instructions for the use of primer and cement and never use primer or cement beyond its expiration date.

All fire stop and roof flashing used with this system must be UL listed material.

Acceptability under Canadian standard CAN/CSA B149 requires full compliance with all installation instructions.

The authority having jurisdiction (gas inspection authority, municipal building department, fire department, etc.) should be consulted before installation to determine the need to obtain a permit.

7.6 MATERIAL

USA:

Combustion air and vent pipe, fittings, primers and solvents must conform to American National Standard Institute (ANSI) and American Society for Testing and Material (ASTM) and be of the same manufacturer. See table 12

Table 12: Approved Vent and Combustion air pipe material USA installation

Material	Standards
PVC - DWV	ANSI/ASTM D2265
PVC schedule 40	ANSI/ASTM D1785
CPVC Schedule 40	ANSI/ASTM F441
SDR-21, SDR-26-26 PVC	ANSI/ASTM D2241
ABS-DWV Schedule 40	ANSI/ASTM D2661
Stainless steel (SS)	UL-1738
Polypropylene (PP)	UL-1738 and ULC-S636

All vent piping and combustion air piping MUST conform to local and national codes.

Pipe cement must be PVC (ANSI/ASTM D2564) or CPVC (ANSI/ASTM F493).

Primers must be PVC/CPVC (ANSI/ASTM F656).

CANADA:

Vent pipe installations in Canada must conform to the requirements of CAN/CSA B149 code. PVC and CPVC vent systems must be composed of pipe, fittings, cements, and primers listed to ULC S636 and must be of the same manufacturer.

Combustion air pipe can use ABS material meeting the ASTM standard D2661 / CSA B181.1.

All vent piping and combustion air piping MUST conform to local and national codes.

7.7 SIZE THE VENT AND COMBUSTION AIR PIPES

Furnace combustion air and vent pipe connections are sized for 2" pipe. Any pipe diameter change should be made outside furnace casing in a vertical section of the

pipe. Any change in diameter to the pipe must be made as close to the furnace as reasonably possible.

The maximum allowable vent length for the vent and combustion air pipe (when used) is listed in table 13 and depends on the furnace input. The maximum length must include straight pipe and any fitting and termination. Equivalent length of various fitting is list in table 14.

A minimum linear length of 5 ft must be respected.

To properly measure the Equivalent Vent Length :

1. Measure the linear pipe distance from the furnace to the termination for each pipe.
2. Count the number of elbows for each pipe.
3. For each pipe, multiply the number of elbows by the equivalent length for the type of elbow used (see table 14). Record the equivalent length of all the elbows for each pipe.
4. Record the equivalent length of the termination used (see table 14).
5. Add the equivalent length of the elbows and termination to the linear distance measured.
6. If the calculated vent length is greater than the maximum allowed vent length, consider modifying the termination location or use a greater pipe diameter.

Table 13: Maximum equivalent vent length (ft) for modulating units and altitude up to 4500 ft

Unit size	Vent pipe dia.	
BTU/hr	2"	3"
15,000	300	N/A
30,000	180	N/A
45,000	70	90
60,000	70	90
75,000	70	90
105,000	15	80
120,000	10	40

Table 14: Deduction for fittings

Type of elbow	Equivalent Length (ft)
45° standard	5
45° long sweap	2.5
90° standard	10
90° long sweap	5
Tee	1.5

7.8 EXHAUST PIPE CONNECTION TO FURNACE

Never common vent with any other appliance. Do not install in the same chase or chimney as a metal or high temperature plastic pipe from another gas or fuel-burning appliance unless the required minimum clearances to combustibles are maintained between the approved PVC pipe and the other pipes. Clean and deburr all pipe cuts.

In the included parts bag, an exhaust venting gasket is supplied and needs to be installed on the exhaust of the top panel. (See figure 27)

When 3" pipe is used, connect a 2" to 3" coupling to the 2" pipe.

For proper installation of venting/exhaust pipe:

1. Position the supplied venting gasket on the top panel exhaust.
2. Slowly slide a 2" diameter pipe throught the venting gasket. This step will be easier if pipe is chamfered.
3. Position this venting pipe length on the rubber vent collector and tighten the collar.
4. Install the remaining vent pipes. It is recommended that all pipes be cut, prepared, and preassembled before permanently cementing any joint.
5. Working from furnace to outside, cut the pipe to the required length(s).
6. Deburr the inside and outside of the pipe.
7. Chamfer the outside edge of pipe for better distribution of primer and cement.
8. Clean and dry all surfaces to be joined.
9. Check dry fit of the pipe and mark insertion depth on the pipe.
10. After the pipes have been cut and preassembled, apply a generous layer of cement primer to the pipe fitting socket and end of the pipe to insertion mark. Quickly apply approved cement to end of the pipe and fitting socket (over primer). Apply cement in a

light, uniform coat on the inside of socket to prevent build-up of excess cement. Apply second coat.

11. While cement is still wet, twist pipe into the socket with 1/4" turn. Be sure the pipe is fully inserted into the fitting socket.

12. Wipe excess cement from the joint. A continuous bead of cement will be visible around perimeter of a properly made joint.

13. Handle pipe joints carefully until cement sets.

14. Horizontal portions of the venting system shall be supported to prevent sagging. Support any piping at a minimum of every 5 ft. using perforated metal hanging strap or commercially available hangars designed to support plastic pipe.

15. Prevent condensate from accumulating in the pipes by sloping the combustion air piping and vent piping downward toward furnace a minimum of 1/4" per linear ft. with no sags between hangers.

16. Complete the vent installation by installing the required termination. See figures 22 to 26 for allowed termination.

17. Use appropriate methods to seal the openings where combustion air pipe and vent pipe pass through roof or sidewall.

7.9 COMBUSTION AIR PIPE CONNECTION

Chinook gas furnaces have three possible locations for the combustion air connection : top panel, right side panel or left side panel. Choose which configuration is best suited for your application. See figures 18 and 19.

To connect the combustion air pipe, use the venting flange with the gasket and screw it to the chosen location. Secure the combustion air pipe to the flange using glue.

At the combustion air termination, use a 90° elbow or two medium-radius sweep elbows to keep the inlet downward and prevent the entry of rain. The inlet opening of the combustion air termination must be a minimum of 12" above the anticipated level of snow accumulation.

The furnace may have a drain tee assembly and trap installed in the combustion air pipe as close to the furnace as possible (see figure 17). This is to drain any water that may enter the combustion air pipe, preventing entry in the furnace vestibule area.

Note that with horizontal combustion air pipe there is a risk of excessive moisture entering the combustion air pipe and consequently, furnace cabinet. A moiture trap should be added to the combustion air pipe as shown in figure 17.

Figure 17: Combustion air moisture trap

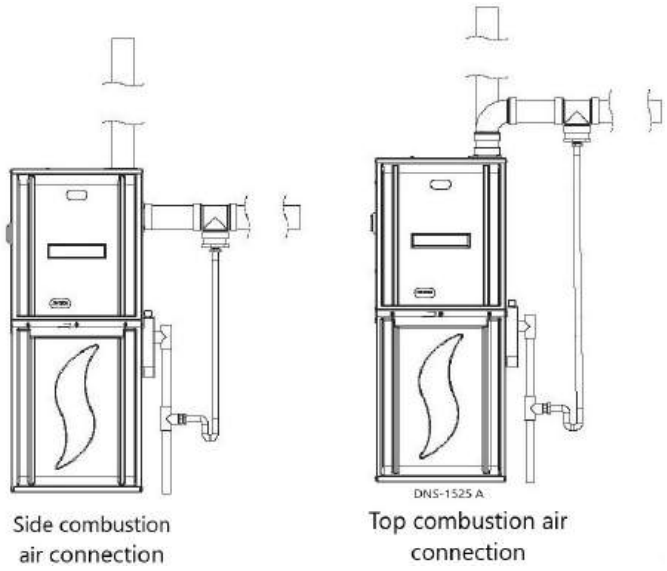


Figure 18: Top panel combustion air

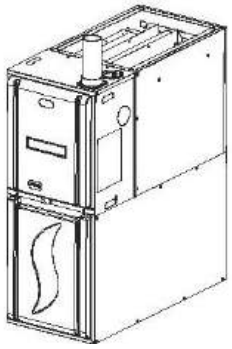
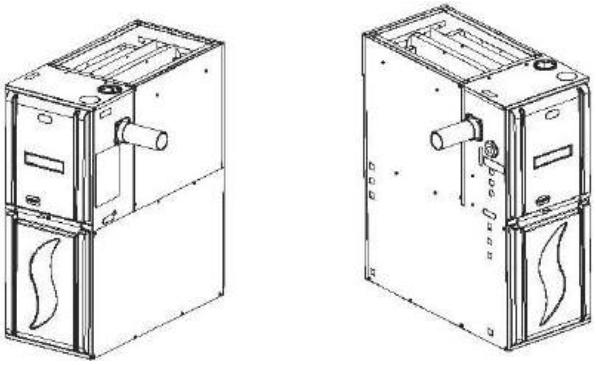


Figure 19: side panel combustion air



7.10 VENT TERMINATION

All clearance specified in this manual are in accordance with the current CSA B149.1, Natural and Propane Installation Code and the current ANSI Z223.1/NFPA 54, National Fuel Gas Code. For clearance not specified in these codes, clearance should be in accordance with local installation codes and the requirements of the gas supplier and the instructions in this manual.

A vent for this appliance shall not terminate:

-over public walkways;

-near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard;

-near regulators, relief valves, or other equipment where condensate or vapor could be detrimental to their operation;

See figures 28 and 29 for venting clearance.

7.10.1 Concentric vent

For multiple concentric installation, spacing of minimum 12" between each concentric is required. Figures 20 and 21 show the required clearance for concentric installation.

For installation through the roof or side wall, cut one 4” (102 mm) diameter hole for 2” (51 mm) kit, or one 5” (127 mm) diameter hole for 3” (76 mm) kit in the desired location. Loosely assemble concentric vent/combustion air termination components together following the kit instructions. Slide the assembled kit with rain shield REMOVED through the hole in the wall or roof flashing.

NOTE: Do not allow insulation or other materials to accumulate inside the pipe assembly when installing it through the hole. Disassemble loose pipe fittings. Clean and cement using the same procedures as used for system piping.

Figure 20: Roof concentric termination

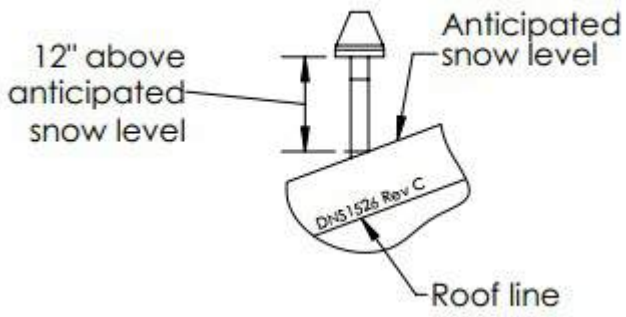
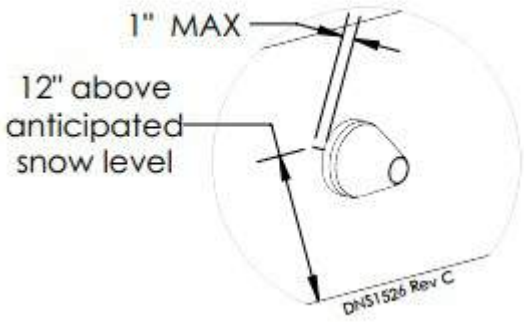


Figure 21: Sidewall concentric termination



7.10.2 Two pipe termination

Maintain the required distance between vents or pairs of vents. Cut the required number of holes in the roof or sidewall for vent and combustion air pipes. Sidewall holes for two pipes vent terminations should be side-by-side, allowing space between the pipes for the elbows to fit on the pipes. Holes in the roof for two pipe terminations should be spaced no more than 18” (457 mm) apart. Termination elbows will be installed after the vent and combustion air pipe are installed.

Combustion air intake can be snorkeled to acheive 12" min distance from expected level of snow and/or ground.

Figure 22: Roof termination

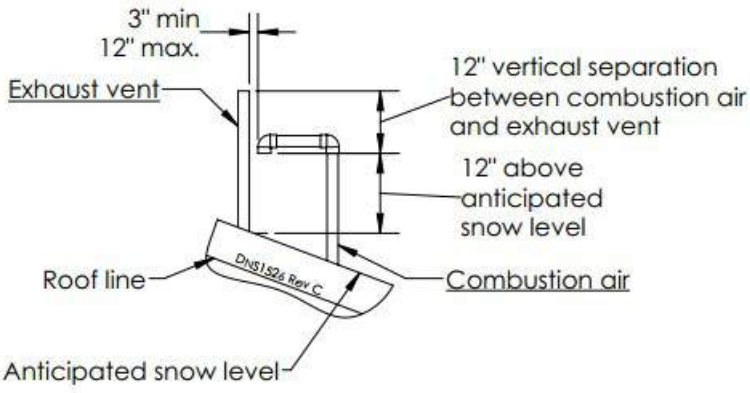


Figure 23: Straight termination with a Tee

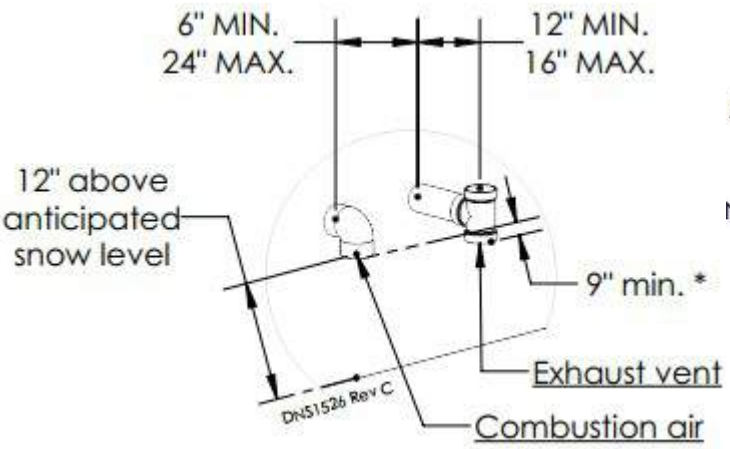


Figure 24: Straight termination

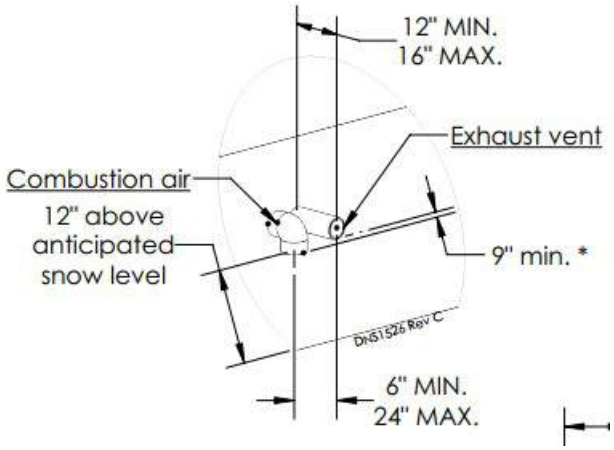


Figure 25: Snorkel termination

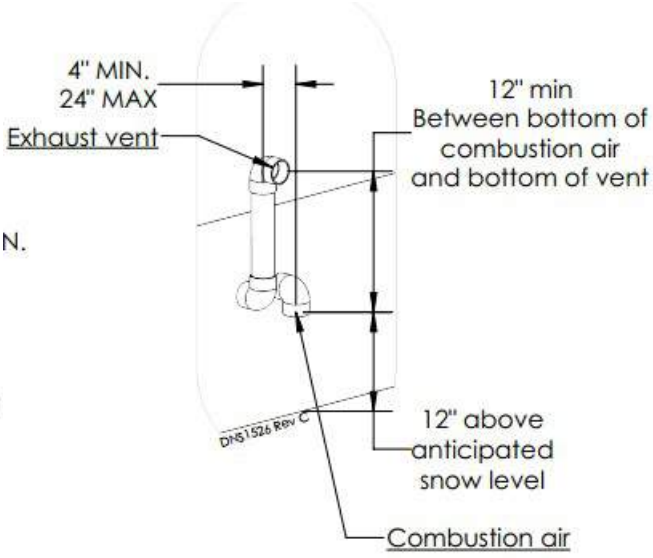


Figure 26: Sorkel termination with a Tee

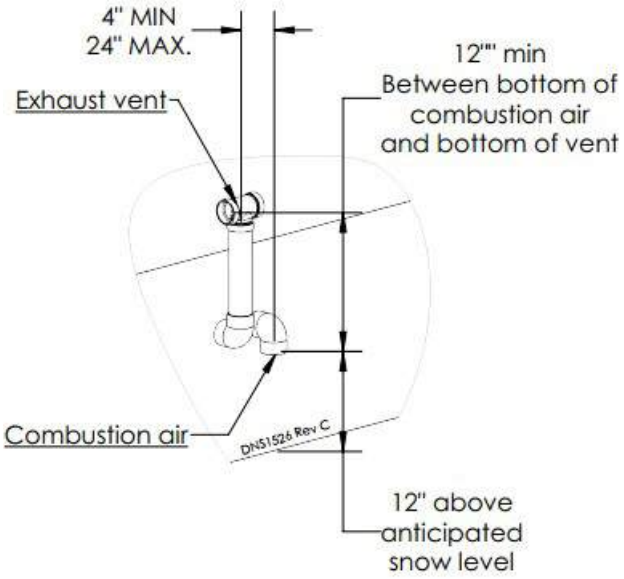


Figure 27: Venting gasket

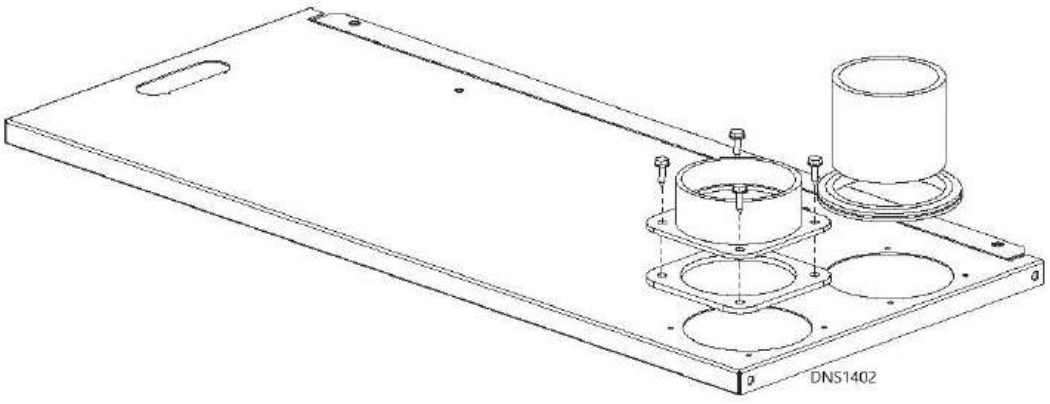
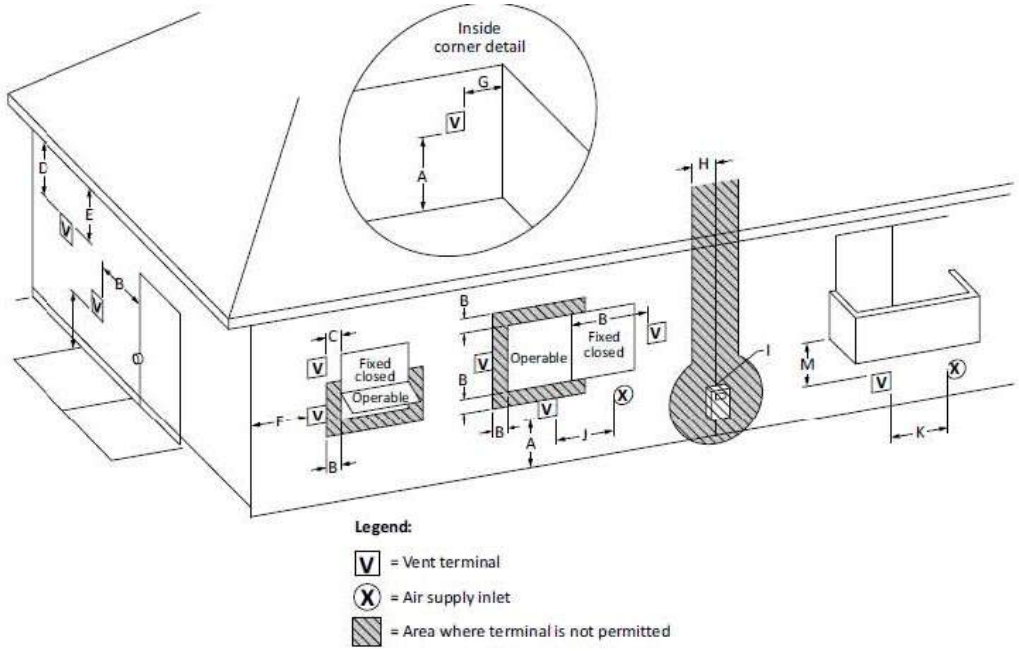


Figure 28: Direct vent clearance



		Canadian Installations	US Installations
A	Clearance above grae, veranda, porch, deck or balcony	12 inches (30 cm)	12 inches (30 cm)
B	Clearance to window or door that may be opened	6 inches (15 cm) for appliances 10,000 Btuh (3kW), 12 inches (30 cm) for appliances > 10,000 Btuh(3kW) and 100,000 Btuh(30kW), 36 inches (91 cm) for appliances > 100,000BTUh (30kW)	6 inches (15 cm) for appliances 10,000 Btuh (3kW), 9 inches (23 cm) for appliances > 10,000 Btuh(3kW) and 50,000 Btuh(15kW), 12 inches (30 cm) for appliances > 50,000BTUh (15kW)
C	Clearance to permanently closed window	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
E	Clearance to unventilated soffit	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
F	Clearance to outside corner	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
G	Clearance to inside corner	36 inches	36 inches
H	Clearance to each side of center line extended above meter/regulator assembly	3 feet (91 cm) within a height 15 feet (4.5 m) above the meter/regulator assembly	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
I	Clearance to service regulator vent outlet	3 feet (91 cm)	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 inches (15 cm) for appliances 10,000 Btuh (3kW), 12 inches (30 cm) for appliances > 10,000 Btuh(3kW) and 100,000 Btuh(30kW), 36 inches (91 cm) for appliances > 100,000BTUh (30kW)	6 inches (15 cm) for appliances 10,000 Btuh (3kW), 9 inches (23 cm) for appliances > 10,000 Btuh(3kW) and 50,000 Btuh(15kW), 12 inches (30 cm) for appliances > 50,000BTUh (15kW)
K	Clearance to a mechanical air supply inlet	6 feet (1.83 m)	3 feet (91 cm) above if within 10 feet (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 feet (2.13 m)'	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
M	Clearance under veranda, porch deck or balcony	12 inches (30 cm)"	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.

Notes :

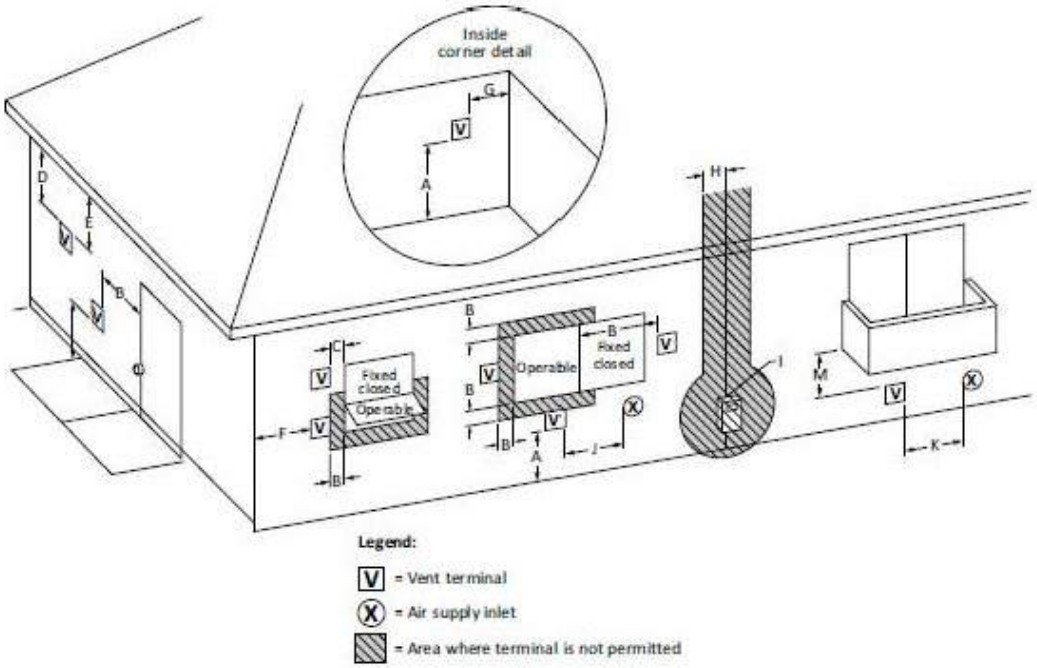
1) In accordance with the current CSA B149.1, Natural Gas and Propane Installation code

2) In accordance with the current ANI Z223.1/NFPA 54, National Fuel Gas Code

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

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

Figure 29: Other than Direct vent clearance



		Canadian Installations	US Installations
A	Clearance above grae, veranda, porch, deck or balcony	12 inches (30 cm)	12 inches (30 cm)
B	Clearance to window or door that may be opened	6 inches (15 cm) for appliances 10,000 Btuh (3kW), 12 inches (30 cm) for appliances > 10,000 Btuh(3kW) and 100,000 Btuh(30kW), 36 inches (91 cm) for appliances > 100,000 BTUh (30 kW)	4 feet (1.2 m) below or to side of openings; 1 foot (300 m) above opening
C	Clearance to permanently closed window	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
E	Clearance to unventilated soffit	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
F	Clearance to outside corner	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
G	Clearance to inside corner	36 inches	36 inches
H	Clearance to each side of center line extended above meter/regulator assembly	3 feet (91 cm) within a height 15 feet (4.5 m) above the meter/regulator assembly	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
I	Clearance to service regulator vent outlet	3 feet (91 cm)	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 inches (15 cm) for appliances 10,000 Btuh (3kW), 12 inches (30 cm) for appliances > 10,000 Btuh(3kW) and 100,000 Btuh(30kW), 36 inches (91 cm) for appliances > 100,000 BTUh (30 kW)	4 feet (1.2 m) below or to side of openings; 1 foot (300 m) above opening
K	Clearance to a mechanical air supply inlet	6 feet (1.83 m)	3 feet (91 cm) above if within 10 feet (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 feet (2.13 m)	7 feet (2.13 m)
M	Clearance under veranda, porch deck or balcony	12 inches (30 cm)	Clearance in accordance with local installation codes and the requirements of the gas supplier and this manual.

Notes :

1) In accordance with the current CSA B149.1, Natural Gas and Propane Installation code

2) In accordance with the current ANI Z223.1/NFPA 54, National Fuel Gas Code

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

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

8 START UP, ADJUSTEMENT AND SAFETY CHECK

8.1 TO START FURNACE

- Furnace must have a 120 V power supply properly connected and grounded (**NOTE**: Proper polarity must be maintained for 120 V wiring. Control status indicator light flashes rapidly and furnace does not operate if polarity is incorrect.)
- If the modulating thermostat is used, thermostat wire connections at terminals R, W/W1, G, Y/Y2, etc. must be made at 24 V terminal block on furnace control.
- Natural gas service pressure must not exceed 0.38 psig (10.5 in. w.c.), but must be no less than 0.16 psig (4.5-in. w.c.). Propane service pressure must not exceed 0.47 psig (13 in. w.c.) but must be no less than 0.40 psig (11 in. w.c.).
- Blower door must be in place to complete 120 V electrical circuit to furnace.
- EAC-1 terminal is energized whenever blower operates.
- HUM terminal is only energized when blower is energized in HEATING.

8.1.1 Lighting instruction

This appliance is equipped with a hot surface ignition device. This device lights the main burners each time the room thermostat calls for heat.
During initial start-up, it is not unusual for odour or smoke to come out of any room registers. To ensure proper ventilation, it is recommended to open windows and doors before initial firing.
The furnace has negative pressure switches that are a safety during a call for heat. The induced draft blower must pull a negative pressure on the heat exchanger to close the negative pressure switch. The induced draft blower must maintain at least the negative pressure switch set point for the furnace to operate. If the induced draft blower fails to close or maintain the closing of the negative pressure switch, an error code would result.

1. Set the room thermostat to its lowest setting and turn of furnace electrical power.
2. Remove the burner compartment control access door.
3. **IMPORTANT**: Be sure that the manual gas control has been in the “OFF” position for at least five minutes. Do not attempt to manually light the main burners.
4. Turn the gas control knob on the «on» position.
5. Replace de burner compartement control access door.

⚠ WARNING

Failure to replace the burner door can cause products of combustion to be released into the conditioned area resulting in personal injury or death

6. Turn on the manual gas control.
7. Turn on the furnace electrical power.
8. Put the thermostat to «Heat» mode and set the room thermostat at least 10°F above room temperature to light the main burners.
9. After the burners are lit, set the room thermostat to the desired temperature.

8.2 UNIT OPERATION HAZARD

These furnaces are equipped with a manual reset limit switch in burner assembly. This switch opens and shuts off power to the gas valve if an overheat condition (flame rollout) occurs in burner assembly. Correct inadequate combustion-air supply or improper venting condition before resetting switch. DO NOT jumper this switch.
Before operating furnace, check flame rollout manual reset switch for continuity. If necessary, press the button to reset switch.

8.3 NORMAL OPERATION

The control will display codes under normal operation. Please refer to table 20. The number displayed after the codes represent the heat demand or CFM demand. The number displayed with no letter before represent the CFM. For exemple, «H4» followed by «3» means heating at 40% with 300 CFM. Or code «F5» means Fan on at 500 CFM.

8.4 FAULT CODE RESET

To clear the fault code memory, push and hold the Fault Recall Button for more than 5 seconds and less than 10 seconds. The display will energize horizontal upper and lower segments for four seconds. This will clear faults in the buffer displayed at power-up.

8.5 DIAGNOSTIC FEATURES

The control continuously monitors its own operation and the operation of the system. If the failure is internal to the control, the entire control should be replaced, as the control is not field repairable.
If the sensed failure is in the system (external to control), the control will show error codes. Refer to table 20 for diagnostic.

8.6 SEQUENCE OF OPERATION

The heating cycle is always initiated by a 24 volt signal on W of the thermostat. When the controller senses 24 volts on W or the communicated message for heat call,

the following sequence occurs:

- High and low pressure switches are checked to insure contacts are open.
- Pre-purge.

There are two different types of pre-purge; a normal pre-purge and a learning-sequence pre-purge. During a learning-sequence pre-purge, the inducer motor will incrementally increase in RPM (stepping) until the low and high pressure switches are both closed. After both switches are sensed to be closed, the inducer motor will continue to run for an additional 30 seconds before the ignition trial.
A learning sequence pre-purge will be initiated under the following conditions:

- First heat call after power reset.
- Every 25th heat call.
- Next heat attempt after a failed pre-purge (pressure switch (es) does not close).
- Next heat attempt after a pressure switch has opened unexpectedly during normal heating operation.

A normal pre-purge will not go through the incremental stepping process of the inducer motor and should be much quicker. The inducer will start at a pre-determined RPM (determined during learning-sequence pre-purge) and this should close both pressure switches quickly. Once both pressure switches are sensed to be closed, the inducer will run for 25 seconds before the ignition trial starts.

- Hot-surface igniter is energized during the pre-purge period.
- The modulating gas valve is set to the highest possible rate (no flow yet).
- The main solenoids on the gas valve are energized allowing gas to flow to the burners.
- When flame is proven, the ignition control is de-energized - 8 second maximum trial times.
- The gas valve maintains 90% rate through the warm-up period - 20 seconds (aka «Blower On Delay»).

8.7 SETTING INPUT RATE

Checking furnace input is important to prevent over firing beyond its design-rated input. Prior to checking the furnace input, make certain that all other gas appliances are shut off, with the exception of pilot burners. Refer to section 5 and table 5
The furnace is shipped from the factory with #48 orifices. They are sized for natural gas having a heating value of 1030 BTU/cu. ft. and a specific gravity of .64.
Since heating values vary geographically, the manifold pressure may need to be changed. Consult the local gas utility to obtain the yearly average heating value.

9 CONTROLS

⚠ WARNING

Do not apply 24Vac to V/W2 at the furnace control (this is sometimes done during setup, troubleshooting and/or while diagnosing problems). Doing so will damage the thermostat.

9.1 FUSE

A three-amp automotive-style (ATC blade type) fuse is supplied on the furnace control board. This fuse should provide protection from short-circuits on the control board and associated 24 VAC wiring.
Any direct shorts during installation, service, or maintenance could cause this fuse to blow. If fuse replacement is required, use ONLY a 3 amp. It is located on the control board. Refer to Figure 15.

9.2 120 VAC TERMINALS

These terminals supply 120 VAC to the furnace control. Spare terminals are provided for use with electronic air cleaners and other accessories as needed (Check the voltage rating of your equipment.)

9.2.1 Electronic air cleaner EAC (E103)

This output is used to energize an electronic air cleaner. The output will provide 1.0 amp at 120 VAC. This output is energized any time the blower motor is above 500 CFM. Airflow below this value is not considered to be enough for a typical electronic air cleaner to perform properly.

9.2.2 HUM terminal

HUM terminal is only energized when blower is energized in heating.

It is engaged when 24 VAC is present on the t-stat therminal of the IFC labeled "HUM STAT" or a communicating t-stat with humidification and dehumidification capability is installed with call for humidification present.

An optional 24VAC humidistat can be installed as shown in figure 30. With the optional humidistat, two separate conditions must be met before humidification can begin. 1- There must be a call for heat and the blower must be engaged and 2- the humidistat must determine that there is a need for humidification.

Dipswitch S5-1 enables (ON) or desables (OFF) dehum operation. However it has no affect on humidification operation. If this switch is set to "ON" and no humidistat is installed, the cooling airflow will be permanently reduced by approximately 15% giving less than optimal performance and possibly causing problems. It is not recommended to leave this switch in the “ON” position without a humidistat installed

See both wiring methods in figure 31 and figure 30.

9.3 STEPPER GAS VALVE CONTROL

The furnaces is equipped with a stepper modulating gas valve. A five-pin connector is used to control and sense the gas valve. The valve uses a PWM (Pulse Width Modulated) signal to control the firing rate. The duty cycle of this signal is five percent less than the expected firing rate. For example, if the firing rate is 90%, the PWM to (and from) the valve will be 85% duty cycle. The connector also provides the 24 VAC signal to energize the main valve solenoid.

9.4 CONNECTOR 15-PINS

The 15-pin connector provides connections for a variety of inputs and outputs to the furnace control. The flame sense, pressure switches sense and limits sense (Main Limit, MRLC and HALC) are connected to the I.F.C. through this connector. Reference the wiring diagram for the furnace printed in this document or on the inside of the furnace blower door for pin assignments for troubleshooting.

9.5 ECM MOTOR CONNECTION

This connector sends and receives messages to and from the blower motor through a single peer-to-peer network. The blower motor does not communicate on the same communications buss as the furnace, condenser and thermostat. Further, a different communications protocol is used.
For troubleshooting purposes, follow the wiring diagram supplied in this manual and on the inside of the furnace blower door.

9.6 COMMUNICATIONS L.E.D.

“RX” (Green) L.E.D. – This L.E.D. indicates that communications is being sensed to or from (i.e.: something on the network is trying to communicate) other components (e.g. a condenser) on the network. This L.E.D. will blink randomly any time a message is received by the furnace control. If no blinking is seen within five minutes, it can be assumed that there is not valid communications established. Check wiring to make sure that all points are connected properly.
Further, if this L.E.D. is on continuously, it is an indication that mis-wiring has occurred. **“STAT” (STATUS) (Red) L.E.D.** – This L.E.D. blinks twice slowly (¼ second ON, ¾ second OFF) upon power-up.
Pressing the learn button for two seconds will cause the green “RX” L.E.D. to blink rapidly (for a short period) to indicate an attempt at communications. If the L.E.D. does not blink, communications cannot be established.

9.7 MEMORY CARD

⚠ WARNING

Do not replace the furnace control or memory card of the furnace with a furnace control or memory card of another furnace or another component (e.g. a memory card from a condenser or air handler). The wrong furnace control or memory card may specify parameters which will make the furnace run at undesired conditions including (but not limited to) reduced airflow during heating causing excessive undesired operation of the main limit control. Further, the memory card is specific to the model number and BTU input rating for a specific furnace and this information should not be transported from one furnace (or component) to another.

Furnace shared data is defined as data specific to a given furnace that is critical for proper furnace operation. More specifically, it is data which defines the operation of the furnace and is unique to a given furnace platform and model. The most critical of these data are the coefficients that control the blower operation (i.e. define the blower speed-torque operation). Because of this, each furnace control is programmed with furnace shared data for that model furnace only. The furnace shared data from any given furnace can NOT be transferred to another furnace for any reason. Doing so can adversely affect operation of the furnace. Further, if no furnace shared data is present, the furnace will not operate in any mode and a fault will be displayed.

9.8 REPLACING FURNACE CONTROL

In the event that the furnace control must be replaced, the memory card must be detached from the original furnace control and retained with the furnace. Failure to save and connect the memory card properly to the replacement control may result in no operation or undesired operation of the furnace.

When replacing the furnace control, be sure to match the DIP switch settings of the original control on the replacement.

9.9 DIP SWITCH

The integrated furnace control MAY not recognize switch setting changes while energized.

DIP switches are ignored on communicating system, except for test mode. In communicating system, all configurations can be made through the thermostat. Refer to thermostat manual for details.

9.9.1 Heat adjust

DIP switch bank S1 is used to fine-tune the airflow in the heating mode. The switches of bank S1 can be set to adjust either the minimum heat rate airflow or the maximum heat rate airflow or both. Also, every firing rate in between these points will be adjusted accordingly.

NOTE: All DIP switches on S1 will be shipped in the "OFF" position. See Table 15.

Table 15: Air Flow Adjustement - S1

	S1-1	S1-2	S1-3	S1-4	DESCRIPTION
FACTORY DEFAULT	OFF	OFF	OFF	OFF	NO ADJUSTMENT
LOW HEAT ADJUSTMENT ONLY (40%)	OFF	ON	OFF	OFF	-7.5%
	OFF	ON	OFF	ON	-15%
	OFF	ON	ON	OFF	+7.5%
	OFF	ON	ON	ON	+15%
HIGH HEAT ADJUSTMENT ONLY (100%)	ON	OFF	OFF	OFF	-7.5%
	ON	OFF	OFF	ON	-15%
	ON	OFF	ON	OFF	+7.5%
	ON	OFF	ON	ON	+15%
ADJUSTMENT TO ALL RISE RATE	ON	ON	OFF	OFF	-7.5%
	ON	ON	OFF	ON	-15%
	ON	ON	ON	OFF	+7.5%
	ON	ON	ON	ON	+15%

9.9.2 Cooling airflow select

Cooling airflow selection can't be done on communicating system. However, if you are installing a communicating system and you wish to test a specific CFM to mesure your duct system efficiency, you can use 24v connection and tables 21.

These DIP switches are used to select the appropriate cooling airflow based on the amount required. The switch settings do not affect cooling airflow when installed in fully communicating system. In that case, the condenser supplies the information for cooling airflow which is pre-set at the factory and not adjustable.

The target cooling airflow will be determined by the adjustments of S3-1 and S3-2. The airflow achieved may be less than the target depending of the static pressure in the supply air duct. Refert to table 21.

The adjustment of the cooling can also be made with S3-3 and S3-4. Those switches will increase of decrease CFM by 10%. Refer to table 16.

Table 16: Cooling Airflow Adjust

S3-3	S3-4	DESCRIPTION
OFF	OFF	0%
ON	OFF	+10%
OFF	ON	-10%
ON	ON	0%

9.9.3 Heat rise adjust

S4-1 HEAT RISE ADJUST – This DIP switch is used to select desired temperature rise in the heating mode. Refer to table 17.

Table 17: Heat Rise

	S4-1	DESCRIPTION
HEAT RISE	OFF	55°F
	ON	60-65°F

9.9.4 Continuous fan speed

S4-4 FAN SPEED SELECT – This DIP switch is used to select the continuous fan speed. **This switch is ignored on a communicating system.** Refer to table 18

Table 18: Continuous Fan Selection

	S4-4	DESCRIPTION
CONTINUOUS FAN	OFF	NORMAL CFM
	ON	HIGHER CFM

9.9.5 Furnace test mode

S4-2 and S4-3 - The Test Switches will place the furnace into a test mode, operating the furnace at continuous input rates of either 100% of full rate (maximum fire) or 40% of full rate (minimum fire). This is accomplished by setting the Test Switches. See table 19.

To enter the furnace test mode, proceed as follows:

1. Switch the 120 volt power to the furnace OFF. Do not change settings with control energized.
2. Position Test Switches for the desired test mode.
3. Switch the 120 volt power to the furnace ON.
4. Set the thermostat mode to HEAT; adjust the set point at least 4°F above room temperature to demand a call for heating.

The furnace will operate at the fixed test mode until one of the following conditions :

- The thermostat is satisfied and the call for heat is removed.
- The furnace has been in test mode continuously for sixty minutes, at which time the furnace control will exit the test mode and proceed to normal heating operation as configured. Test mode cannot be activated again unless line voltage power to the furnace is cycled off and back on. This is true even if the DIP switches remain configured to the test settings

Table 19: Test mode

S4-2	S4-3	DESCRIPTION
ON	OFF	40% TEST MODE
OFF	ON	100% TEST MODE

Figure 30: Dehum connection with humidistat

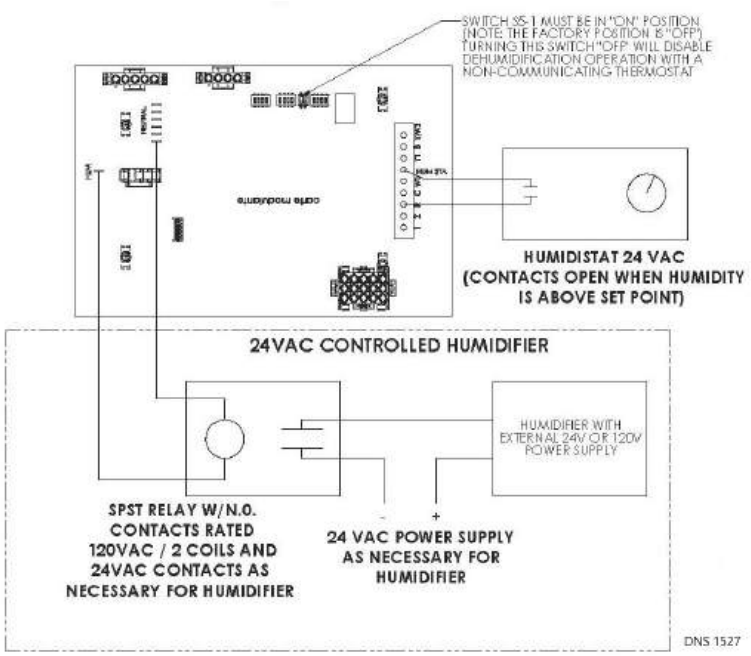
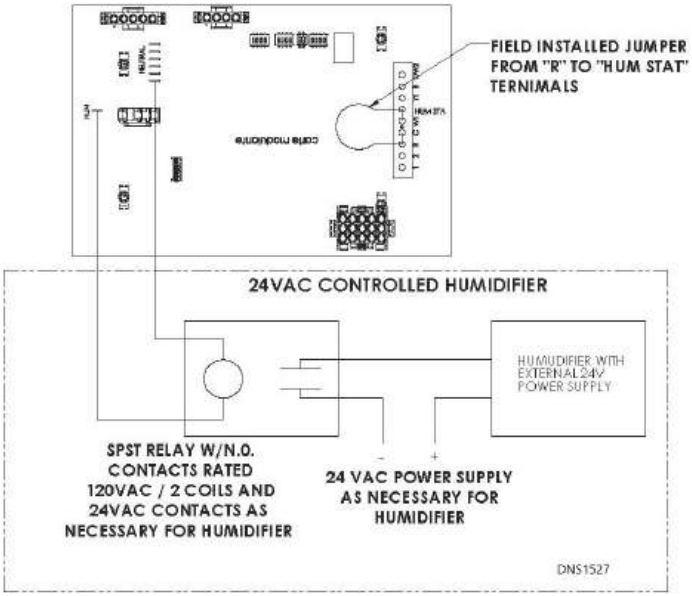


Figure 31: Dehum connection without humidistat



10 USER'S INFORMATION MANUAL

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Installation and service must be performed by a qualified installer, service agency, or the gas supplier.
Read all instructions in this manual and retain this and all additional instructions for future reference.
To keep your operating costs low and to eliminate unnecessary service calls, we have provided a few guidelines. These guidelines will help you understand how your gas furnace operates and how to maintain it so you can get years of safe and dependable service. Read all the instructions in this manual, and keep all manuals for future reference.
For your safety, read the following before operating your furnace:

1. The furnace area must be kept clear and free of combustible materials, gasoline, and other flammable vapors and liquids.
2. Insulating materials may be combustible. A furnace installed in an attic or other insulated space must be kept free and clear of insulating materials. Examine the furnace when it is installed and also any time insulation is added.
3. For proper safe operation, the furnace needs air for combustion and ventilation. Do not block or obstruct air openings to the area in which the furnace is installed, and the spacing around the furnace.
4. This furnace is equipped with an ignition device which automatically lights the burners.
5. Should the gas supply fail to shut off or if overheating occurs, shut off the gas valve to the furnace before shutting off the electrical supply.
6. Do not use the furnace if any part has been under water. A flood damaged furnace is extremely dangerous. Attempts to use the furnace can result in fire or explosion. A qualified service agency should be contacted to inspect the furnace and to replace all gas controls, control system parts, electrical parts that have been wet, or the entire furnace if deemed necessary.
7. Examine the furnace installation to determine that:
   - All flue gas carrying areas external to the furnace, such as the chimney and vent connector, are clear and free of obstructions.
   - Vent connector is in place, slopes upward, and is physically sound without holes or excessive corrosion.
   - Return air duct connection(s) is physically sound, sealed to the furnace casing, and terminates outside the space containing the furnace.
   - Physical support of the furnace is sound without sagging, cracks, gaps, etc. around the base as to provide a seal between the support and the base.
   - There are no obvious signs of deterioration of the furnace.
   - Burner flames are in good adjustment.
8. It is important that you conduct a physical inspection of the furnace at least twice a year. It is also recommended that the furnace should be inspected by a qualified service agent at least once per year.

10.1 WHAT TO DO IF YOU SMELL GAS

Follow those step if you can smell gas :

1. Do not try to light any appliance
2. Do not touch any electrical switch; do not use any phone in your building
3. Leave the building immediately
4. Immediately call your gas supplier. Follow the gas supplier's instructions.
5. If you cannot reach the gas supplier, call the fire department.

10.2 OPERATING YOUR FURNACE

These furnaces are equipped with an ignition device which automatically lights the burners. Do not try to light the burners by hand.
Before operating, smell around furnace area for gas. Be sure to smell near floor because some gas is heavier than air and will settle to the lowest point. See section 10 if the odour of gas is present. Use only your hand to turn the gas control knob; never use tools. If the knob will not turn by hand, don't try to repair it. Call a qualified service technician. Attempted repair may result in a fire or explosion.

10.3 LIGHTING INSTRUCTION

1. STOP! Read the previous safety information.
2. Set the thermostat to the lowest setting.
3. Turn off all electric power to the furnace.
4. Remove the burner compartment access panel.
5. Move the gas control switch to "OFF"
6. Wait 5 minutes to clear out any gas, then smell for gas (including at the bottom of the unit near the ground). If you smell gas, stop and follow the

directions in section 10. If you don't smell gas, continue to next step.

7. Move the gas control knob or switch to "ON".
8. Replace the burner compartment access panel.
9. Turn on all electric power to the furnace.
10. Set the thermostat to the desired setting.
11. If the furnace will not operate, call you service technician or gas spplier.

Table 20: Fault Code

CODE	DESCRIPTION	SOLUTION
0	Stand-by	No fault
H"0"	Gas Heating mode.The furnace is in heating mode. The digit displayed after in the input of the furnace. For example, H0 means the furnace is heating at 100%. H5 means the furnace is heating at approximately 50%.	
C	Indicates the furnace is in cooling mode (any stage) for communicating system and high stage for legacy system	
HP	This code indicates the furnace is in heat pump heating mode (any stage)	
F	Fan Mode : The furnace is in continuous fan mode	
dF	Defrost mode : Indicate the heat pump is in defrost mode and gives supplemental heat	
d4	The memory card is corrupt, invalid or there is no memory card installed. This is a none critical fault and the furnace may operate if it finds shared data on the network (t-stat and control). d4 will only be display when furnace is in standy mode	Replace the memory card
d1	No shared data : displayed when no shared data is available. The furnace cannot function.	Replace the memory card
10	Displayed after four failed ignition attempts. The furnace will goes inot a lockout mode and will not attempt to ignite again for 1 hour.	It all depends on what caused the 4 failed ignition. The error codes prior to 10 shall be retreive on the communicating thermostat or by pushing the fault recall button for 3 sec. Usually, clean the flame sensor, check your gas pressure, check the ignitor. If some burners seems to have difficulties to stay on, replace the burner box.
11	Failed ignition.	(1) Make sure the gas valve is on (2)Clean or replace de flame sensor (3) Make sure the furnace is grounded (4) Make sure gas outlet pressure is fine (5) Replace gas valve if it is not functionning
12	The flame sense current is weak or weird	(1) Clean or replace de flame sensor (2) Check gas outlet pressure (3) Take a combustion analysis. A dirty flamme sensor needs to be investigate.
13	Flame lost	(1) Clean or replace de flame sensor (2) Check gas outlet pressure (3) Check the burner box assembly
14	This fault indicate flame is present when it should not be	(1) Wire properly (2) Check gas valve (3) Check furnace control
16	Igniter fail : could be the ignitor itself or the control relay.	(1) Change ignitor (2) Change control
22	The main limit has opened or sensed opened. Temperature in the heat exchanger has gone above prescribe temperatures	(1) Check for blower operation. Change motor if needed (2) Check ductwork an filters (3) Check for temperature rise and furnace gas valve pressure
26	Indicates that line voltage and neutral are reversed to the furnace control.	Check voltage with meter and reverse if necessary
30	3 amps fuse open	Replace the 3 amp fuse on the furnace control
33	The rollout limit switch on the burner box is open	(1) Check gas pressure (2) Check for proper venting and venting length (3) Check pressure switch operation and connection (4) Check for proper ID blower operation
44	The low pressure switch is close when it should not be	(1) Check for venting length, less than 5ft is not enough, adding 90° elbow could be a solution (2) Check for wind draft at the venting termination, if necessary, relocate termination (3) Check pressure switch et replace if necessary (4) Check for ID blower function
45	Indicates the low pressure switch is open when the inducer is energized at high speed	Check pressure switch and its wiring
46	Indicates the low pressure switch is open when the inducer is energized at low speed	(1) Check the vent system for blockage (2) Check the vent length , remove excessive vent (3) Faulty or disconnected ID blower (4) Faulty control board (5) Wind gust (6) Faulty pressure switch

CODE	DESCRIPTION	SOLUTION
55	The high pressure control (or switch) should not be closed when the inducer is not running. If it is, this is a sign of a serious condition. The switch may be welded closed or purposely bypassed in the field. Before any heat cycle can begin, the pressure switch is tested to make sure that it is opened.	(1) Replace high pressure control (switch). (2) Remove bypass and restore correct operation. Determine reason for bypass (e.g. vent length too long) and correct issue. Notify homeowner and proper authorities of illegal tampering if necessary. (3) Check wiring and connections. Replace and/or repair as necessary. (4) Check for proper venting and terminations as defined in the furnace installation instructions.
57	This fault indicates that the high pressure switch is open when the inducer is energized at high speed. This fault can be displayed any time during the heat call except during low heat call and only after the pre-purge and blower on delays are complete.	(1)Check the vent system for blockage and proper termination and repair as necessary. (2) Check the specification sheets and/or installation instructions. Remove excess venting. (3) Repair or replace inducer and/or inducer wiring and/or electrical connections. (4) Replace control board. (5) Check wiring and connections. Replace and/or repair as necessary. (6) Replace hoses as necessary. (7) Insure proper termination. (8) Replace the pressure switch.
68	If the furnace was in heating operation when this fault occurred, the gas valve will immediately close (flame will be lost), blower motor operation will immediately stop and the furnace will shut down normally with Inducer post-purge at the correct speed. After the post purge (or immediately if no heat call was present), no other operation (including thermostat calls) will occur until this fault is cleared.	(1) Check wiring, connectors and terminals – repair or replace as necessary. (2) Check line voltage wiring, connectors and terminals to the inductance and ECM motor. Repair and replace as necessary. (3) Replace the furnace memory card with the correct replacement part. (4) Replace the motor.
71	When attempting to communicate with the inducer controller module (electronic control to the back of the main board), communications cannot be established or response from the inducer controller module is not as expected.	Check the wiring between the furnace controller (I.F.C.) and the inducer controller module. Check wiring between the inducer controller module and the inducer. Check line voltage to the inducer controller module. If these are ok, replace the inducer controller module and/or inducer.
77	The furnace control has lost communications with the gas valve.	(1) Check the wires, connectors or terminals between the gas valve and furnace control (or I.F.C.). Replace or repair as necessary. (2) Replace the gas valve. (3) Replace the furnace control.
93	This is a severe fault that should rarely (if ever) be discovered in the field. It is an indicator of an internal microprocessor fault on the furnace control (or I.F.C.) or voltage applied to the main gas valve solenoid when there should be none.	(1) Check for miswiring in the furnace. (2) Replace the furnace control (or I.F.C.).

11 UNIT COMMISSIONING AND STARTUP CHECKLIST

Furnace model: .....
Serial number: .....
Furnace orientation: .....
Fuel (N.gas/propane): .....
Conversion kit number: .....
Inlet gas pressure: .....
Outlet gas pressure high fire (100%): .....
Temperature rise at 100%: .....
Combustion analysis at 100%:
O2 [%]: .....
CO2 [%]: .....
CO undiluted [%]: .....
Outlet gas pressure low fire (40%): .....
Temperature rise at 40%: .....
Combustion analysis at 40%:
O2 [%]: .....
CO2 [%]: .....
CO undiluted [%]: .....
Static pressure in return at system maximum CFM: .....
Static pressure in supply at system maximum CFM: .....
Is drain trap filled with water?: .....
Is drain trap outlet vented with a Tee?: .....
Are condensate tubing properly slopped towards drain trap?: .....
Furnace leveled or slopped?: .....
Venting pipe diameter: .....
Venting length: .....
Venting termination: .....

Table 21: Legacy Cooling airflow

MODEL	A S3-1:OFF S3-2:OFF		B S3-1:ON S3-2:OFF		C S3-1:OFF S3-2:ON		D S3-1:ON S3-2:ON	
	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1
C15-M-V	1200	900	1000	750	800	600	600	450
C30-M-V	1200	900	1000	750	800	600	600	450
C45-M-V	1200	900	1000	750	800	600	600	450
C60-M-V	1600	1250	1400	1100	1200	900	800	600
C75-M-V	1600	1200	1200	900	1000	800	800	600
C105-M-V	2000	1500	1600	1200	1400	1000	1200	900
C120-M-V	2300	1700	1800	1400	1600	1200	1400	1000
C15-M-S	1200	900	1000	750	800	600	400	300
C30-M-S	1200	900	1000	750	800	600	400	300
C45-M-S	1200	900	1000	800	800	600	600	450
C60-M-S	1600	1250	1400	1100	1200	900	800	600

Table 22: Specifications

MODELS		C15-M-V	C30-M-V	C45-M-V	C60-M-V	C75-M-V	C105-M-V	C120-M-V
INPUT (BTU/h)	HIGH	15,000	30,000	45,000	60,000	75,000	105,000	120,000
	LOW	6,000	12,000	18,000	24,000	30,000	42,000	48,000
OUTPUT (BTU/h)	HIGH	14,595	28,860	43,515	58,080	72,000	101,430	116,400
	LOW	5,840	11,545	17,405	23,230	28,800	40,570	46,560
EFFICIENCY (%)		97.3	96.2	96.7	96.8	96.0	96.6	97.0
TEMPERATURE RISE		20-55 °F (11-30 °C)	40 - 70°F (22 - 39°C)					
AIRFLOW (CFM)	HEATING HIGH	310	480	720	1,025	1,200	1,680	1,920
	HEATING LOW	310	310	330	430	480	670	770
	MAX*	1,200	1,200	1,200	1,600	1,600	2,000	2,000
	MAX**	800	800	800	1,200	1,200	N/A	N/A
MAX COOLING CAPACITY (TONS)	TRADITIONAL DUCTS	3.0	3.0	3.0	4.0	4.0	5.0	5.0
	SMART DUCTS	2.0	2.0	2.0	3.0	3.0	N/A	N/A
MOTOR HP		1/2	1/2	1/2	3/4	3/4	1	1
SHIP WEIGHT (LB/KG)		115 / 52.2	116 / 52.6	119 / 54.0	136 / 61.7	138 / 62.6	161 / 73.0	171 / 77.6

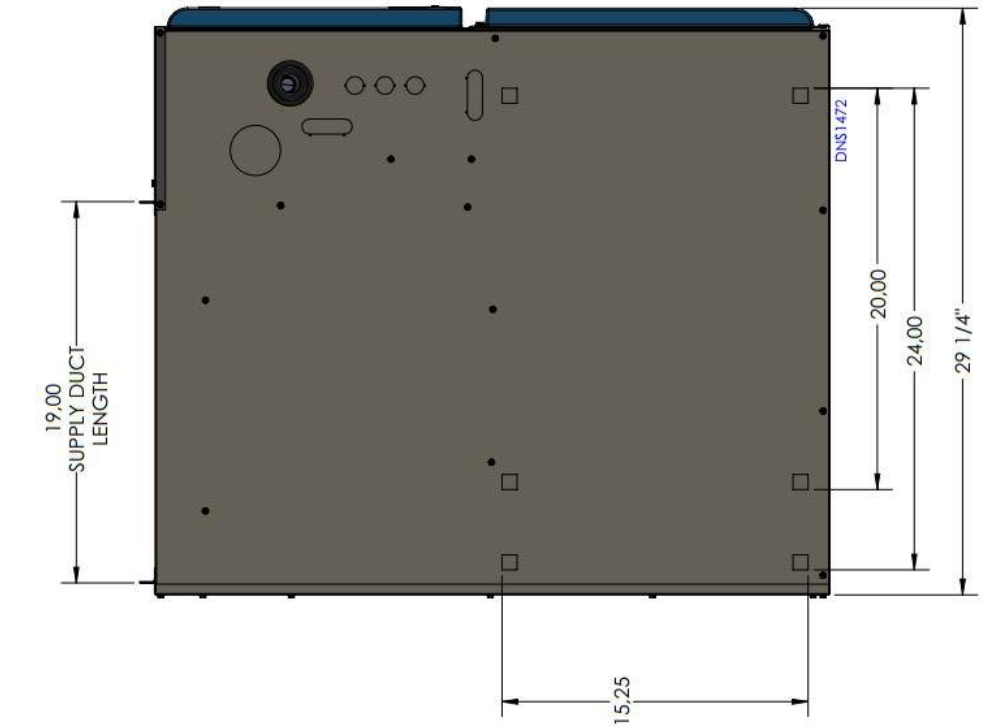
1- Maximum CFM in Regular ductwork
2- Maximum CFM using SmartDuct System

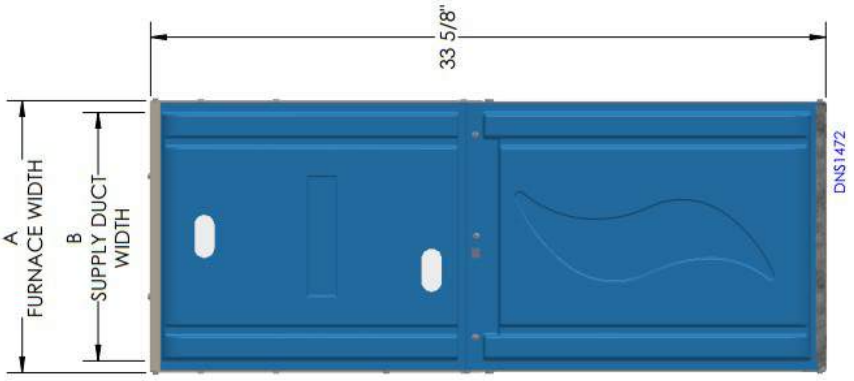
Table 23: Specifications for -MS

MODELS		C15-M-S	C30-M-S	C45-M-S	C60-M-S
INPUT	HIGH	15,000	30,000	45,000	60,000
(BTU/h)	LOW	6,000	12,000	18,000	24,000
OUTPUT	HIGH	14,595	28,860	43,515	58,080
(BTU/h)	LOW	5,840	11,545	17,405	23,232
EFFICIENCY (%)		97.3	96.2	96.7	96.7
TEMPERATURE RISE		20-55 °F (11-30 °C)	40 - 70°F (22 - 39°C)		
AIRFLOW (CFM)	HEATING HIGH	310	480	720	1050
	HEATING LOW	310	385	330	450
	MAX*	1,200	1,200	1,200	2,000
	MAX**	1,000	1,200	1,200	1,400
MAX COOLING CAPACITY (TONS)	TRADITIONAL DUCTS	3.0	3.0	3.0	5.0
	SMART DUCTS	2.5	3.0	3.0	3.5
MOTOR HP		3/4	3/4	3/4	1
SHIP WEIGHT (LB/KG)		115 / 52.2	116 / 52.6	119 / 54.0	136/61.7

1- Maximum CFM in Regular ductwork
2- Maximum CFM using SmartDuct System

Figure 32: Dimensional Drawing





UNIT INPUT (K BTU)	"A" (inch)	"B" (inch)	DIMENSIONS SUPPLY DUCT
15	13.50	12.50	12.50 X 19.00
30			
45			
60	15.75	14.75	14.75 X 19.00
75			
105	21.00	20.00	20.00 X 19.00
120			

12 PART LIST

Figure 33: Exploded view 1

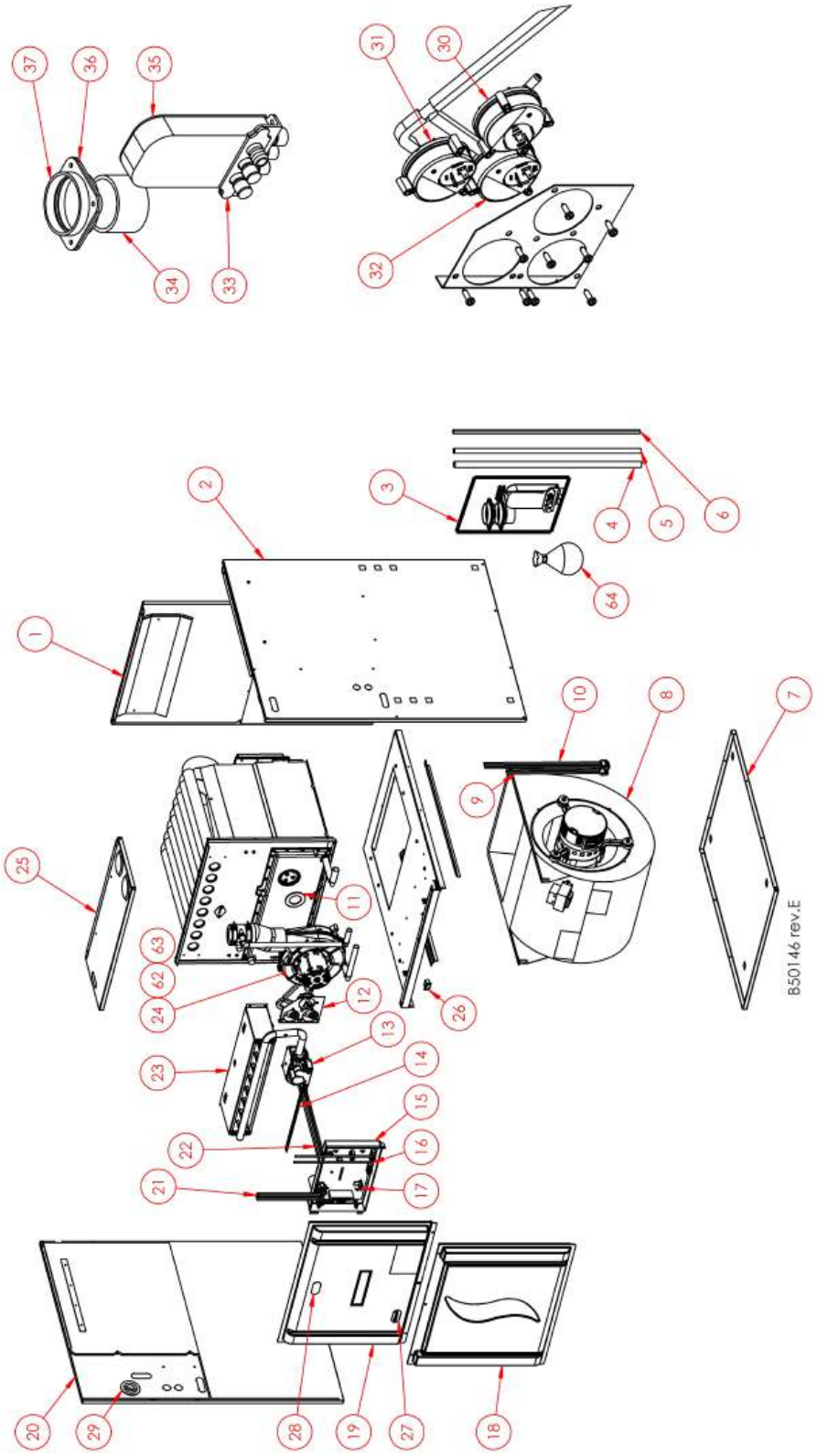


Figure 34: Exploded view 2

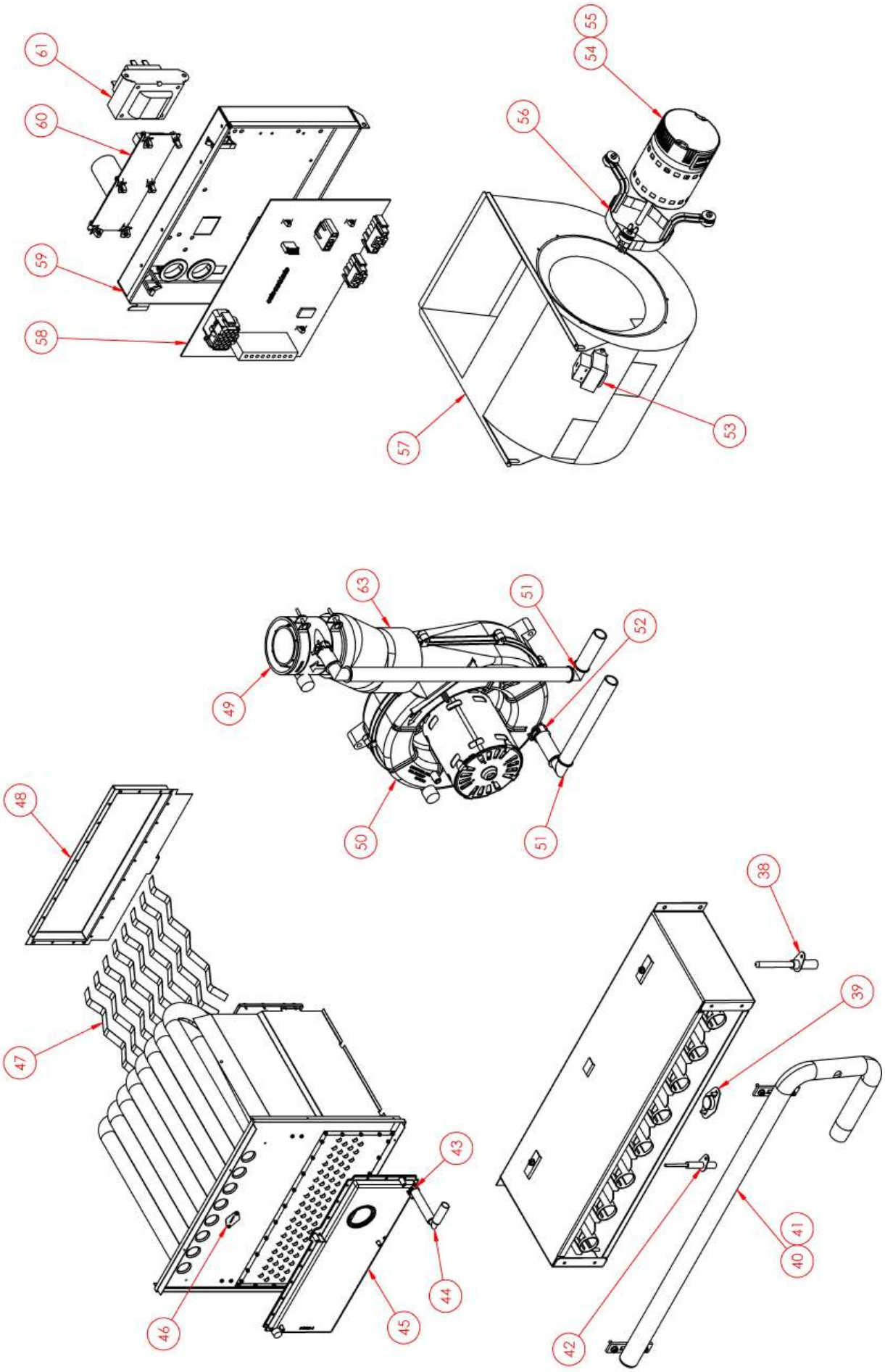


Table 24: Part List CXX-M-V

#	DESCRIPTION	C15-M-V	C30-M-V	C45-M-V	C60-M-V	C75-M-V	C105-M-V	C120-M-V
1	Back panel ass.	B40511-01	B40511-01	B40511-01	B40511-02	B40511-02	B40511-03	B40511-03
2	Right panel ass.	B40510-33	B40510-33	B40510-33	B40510-33	B40510-33	B40510-33	B40510-33
3	Part bag	B40569-01	B40569-01	B40569-01	B40569-01	B40569-01	B40569-01	B40569-01
4	5/8" flexible pvc hose	B30157-34	B30157-34	B30157-34	B30157-34	B30157-34	B30157-34	B30157-34
5	1/2" flexible pvc hose	B30157-38	B30157-38	B30157-38	B30157-38	B30157-38	B30157-38	B30157-38
6	3/16" square pvc hose	B30157-40	B30157-40	B30157-40	B30157-40	B30157-40	B30157-40	B30157-40
7	Floor	B40546-01	B40546-01	B40546-01	B40546-02	B40546-02	B40546-03	B40546-03
8	Blower assembly	B40603-01	B40603-01	B40603-01	B40603-02	B40603-03	B40603-04	B40603-04
9	Blower electrical kit (120V)	B40581-04	B40581-04	B40581-04	B40581-04	B40581-04	B40581-04	B40581-04
10	Blower wire (comm.)	B40587-01	B40587-01	B40587-01	B40587-01	B40587-01	B40587-02	B40587-02
11	ID blower restrictor	B40563-01	B40699	B40699	B40563-04	B40698	B40563-06	B40563-06
12	Pressure switch ass.	B40675-25	B40675-26	B40675-27	B40675-28	B40675-29	B40675-31	B40675-32
13	Gas Valve	R01K005K	R01K005K	R01K005	R01K005K	R01K005K	R01K005K	R01K005K
14	Wire gas valve / IFC	B40582-01	B40582-01	B40582-01	B40582-01	B40582-01	B40582-02	B40582-02
15	Control board ass.	B40516	B40516	B40516	B40516	B40516	B40516	B40516
16	Ignitor electrical kit	B40586-01	B40586-01	B40586-01	B40586-01	B40586-01	B40586-02	B40586-02
17	Memory card (programmed)	B40634-01	B40634-02	B40634-03	B40634-04	B40634-05	B40634-07	B40634-08
18	Lower door ass.	B40570-10	B40570-10	B40570-10	B40570-11	B40570-11	B40570-12	B40570-12
19	Upper door ass.	B40571-01	B40571-01	B40571-01	B40571-02	B40571-02	B40571-03	B40571-03
20	Left panel ass.	B40509-01	B40509-01	B40509-01	B40509-01	B40509-01	B40509-01	B40509-01
21	Electrical kit main harness	B40588-01	B40588-01	B40588-01	B40588-01	B40588-01	B40588-02	B40588-02
22	Elect. Kit inducer board/inducer	B40585-01	B40585-01	B40585-01	B40585-01	B40585-01	B40585-02	B40585-02
23	Gas manifold ass.	B40514-01	B40514-02	B40514-03	B40514-04	B40514-05	B40514-07	B40514-08
24	ID blower ass.	B40578-06	B40578-06	B40578-06	B40578-09	B40578-09	B40578-09	B40578-09
25	Top panel ass.	B40512-01	B40512-01	B40512-01	B40512-02	B40512-02	B40512-03	B40512-03
26	Door switch	L07H001	L07H001	L07H001	L07H001	L07H001	L07H001	L07H001
27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	Observation port	L04Z022	L04Z022	L04Z022	L04Z022	L04Z022	L04Z022	L04Z022
29	Grommet	G14F017	G14F017	G14F017	G14F017	G14F017	G14F017	G14F017
30	Pressure switch (multi po.)	R99F035	R99F035	R99F035	R99F035	R99F035	R99F035	R99F035
31	Pressure switch (high fire)	R99F055	R99F048	R99F044	R99F042	R99F049	R99F041	R99F048
32	Pressure switch (low fire)	R99F050	R99F036	R99F050	R99F037	R99F036	R99F036	R99F036
33	Drain trap gasket	B40568	B40568	B40568	B40568	B40568	B40568	B40568
34	PVC pipe	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35	Drain trap	B40760	B40760	B40760	B40760	B40760	B40760	B40760
36	Vent flange gasket	B40567	B40567	B40567	B40567	B40567	B40567	B40567
37	Vent flange	B40533	B40533	B40533	B40533	B40533	B40533	B40533
38	Ignitor (120V)	R03K005	R03K005	R03K005	R03K005	R03K005	R03K005	R03K005
39	Burner box high limit	R02N022	R02N022	R02N022	R02N022	R02N022	R02N022	R02N022
40	Manifold	B40576	B40577	B40527	B40528	B40529	B40531	B40532
41	Nat. gas orifice (#48)	R04I001	R04I001	R04I001	R04I001	R04I001	R04I001	R04I001
42	Flame sensor	R03J005	R03J005	R03J005	R03J005	R03J005	R03J005	R03J005
43	Hose clamp 5/8"	G99Z035	G99Z035	G99Z035	G99Z035	G99Z035	G99Z035	G99Z035
44	Elbow 5/8"	G07J007	G07J007	G07J007	G07J007	G07J007	G07J007	G07J007
45	Condensate box	B40526-01	B40526-01	B40526-01	B40526-02	B40526-02	B40526-03	B40526-04
46	High limit	R02N027	R02N024	R02N026	R02N024	R02N023	R02N024	R02N024
47	Heat exchanger baffle	B40572	B40572	B40572	B40572	B40572	B40572	B40572
48	Smoke box	B40539-01	B40539-01	B40539-01	B40539-02	B40539-02	B40539-03	B40539-04
49	Rubber vent coupling	B40580	B40580	B40580	N/A	N/A	N/A	N/A
50	ID blower	Z01K005K	Z01K005K	Z01K005K	Z01K005K	Z01K005K	Z01K005K	Z01K005K
51	Elbow 1/2"	G07J006	G07J006	G07J006	G07J006	G07J006	G07J006	G07J006
52	Hose clamp 1/2"	G99Z034	G99Z034	G99Z034	G99Z034	G99Z034	G99Z034	G99Z034
53	Inductor	B03141-02	B03141-02	B03141-02	B03141-01	B03141-01	B03141	B03141
54	Motor and support	B03240-13	B03240-13	B03240-13	B03716-04	B03716-04	B03241-11	B03241-11
55	Motor ECM 3.0	L06H020	L06H020	L06H020	L06I014	L06I014	L06K008	L06K008
56	Motor support	B01889	B01889	B01889	B01889	B01889	B01889	B01889
57	Blower	Z01I033	Z01I033	Z01I033	Z01I035	Z01I036	Z01I038	Z01I038
58	Control board	R99G014	R99G014	R99G014	R99G014	R99G014	R99G014	R99G014
59	Control board support	B40559	B40559	B40559	B40559	B40559	B40559	B40559
60	ID blower control	R99G017	R99G017	R99G017	R99G017	R99G017	R99G017	R99G017
61	Transformer	L01F009	L01F009	L01F009	L01F009	L01F009	L01F009	L01F009
63	Sleeve drain	N/A	N/A	N/A	B40913	B40913	B40913	B40913
	ACCESSORIES							
	Bottom return base	B40691-01	B40691-01	B40691-01	B40691-02	B40691-02	B40691-03	B40691-03
	Downflow base	B40632-01	B40632-01	B40632-01	B40632-02	B40632-02	B40632-03	B40632-03
	Propane conversion kit	B40574-03	B40574-06	B40574-09	B40574-12	B40574-15	B40574-21	B40574-24
	Propane orifice #56	R04I002	R04I002	R04I002	R04I002	R04I002	R04I002	R04I002

Table 25: Part List CXX-M-S

#	DESCRIPTION	C15-M-S	C30-M-S	C45-M-S	C60-M-S
1	Back panel ass.	B40511-01	B40511-01	B40511-01	B40511-02
2	Right panel ass.	B40510-33	B40510-33	B40510-33	B40510-33
3	Part bag	B40569-01	B40569-01	B40569-01	B40569-01
4	5/8" flexible pvc hose	B30157-34	B30157-34	B30157-34	B30157-34
5	1/2" flexible pvc hose	B30157-38	B30157-38	B30157-38	B30157-38
6	3/16" square pvc hose	B30157-40	B30157-40	B30157-40	B30157-40
7	Floor	B40546-01	B40546-01	B40546-01	B40546-02
8	Blower assembly	B40758	B40758	B40758	B40605-05
9	Blower electrical kit (120V)	B40581-04	B40581-04	B40581-04	B40581-04
10	Blower wire (comm.)	B40587-01	B40587-01	B40587-01	B40587-01
11	ID blower restrictor	B40563-01	B40699	B40699	B40563-04
12	Pressure switch ass.	B40675-25	B40675-26	B40675-27	B40675-28
13	Gas Valve	R01K005K	R01K005K	R01K005K	R01K005K
14	Wire gas valve / IFC	B40582-01	B40582-01	B40582-01	B40582-01
15	Control board ass.	B40516	B40516	B40516	B40516
16	Ignitor electrical kit	B40586-01	B40586-01	B40586-01	B40586-01
17	Memory card (programmed)	B40634-09	B40634-10	B40634-11	B40634-12
18	Lower door ass.	B40570-10	B40570-10	B40570-10	B40570-11
19	Upper door ass.	B40571-01	B40571-01	B40571-01	B40571-02
20	Left panel ass.	B40509-01	B40509-01	B40509-01	B40509-01
21	Electrical kit main harness	B40588-01	B40588-01	B40588-01	B40588-01
22	Elect. Kit inducer board/inducer	B40585-01	B40585-01	B40585-01	B40585-01
23	Gas manifold ass.	B40514-01	B40514-02	B40514-03	B40514-04
24	ID blower ass.	B40578-06	B40578-06	B40578-06	B40578-09
25	Top panel ass.	B40512-01	B40512-01	B40512-01	B40512-02
26	Door switch	L07H001	L07H001	L07H001	L07H001
27	N/A	N/A	N/A	N/A	N/A
28	Observation port	L04Z022	L04Z022	L04Z022	L04Z022
29	Grommet	G14F017	G14F017	G14F017	G14F017
30	Pressure switch (multi po.)	R99F035	R99F035	R99F035	R99F035
31	Pressure switch (high fire)	R99F055	R99F048	R99F044	R99F042
32	Pressure switch (low fire)	R99F050	R99F036	R99F050	R99F037
33	Drain trap gasket	B40568	B40568	B40568	B40568
34	PVC pipe	N/A	N/A	N/A	N/A
35	Drain trap	B40760	B40760	B40760	B40760
36	Vent flange gasket	B40567	B40567	B40567	B40567
37	Vent flange	B40533	B40533	B40533	B40533
38	Ignitor (120V)	R03K005	R03K005	R03K005	R03K005
39	Burner box high limit	R02N022	R02N022	R02N022	R02N022
40	Manifold	B40576	B40577	B40527	B40528
41	Nat. gas orifice (#48)	R04I001	R04I001	R04I001	R04I001
42	Flame sensor	R03J005	R03J005	R03J005	R03J005
43	Hose clamp 5/8"	G99Z035	G99Z035	G99Z035	G99Z035
44	Elbow 5/8"	G07J007	G07J007	G07J007	G07J007
45	Condensate box	B40526-01	B40526-01	B40526-01	B40526-02
46	High limit	R02N027	R02N024	R02N026	R02N024
47	Heat exchanger baffle	B40572	B40572	B40572	B40572
48	Smoke box	B40539-01	B40539-01	B40539-01	B40539-02
49	Rubber vent coupling	B40580	B40580	B40580	N/A
50	ID blower	Z01K005K	Z01K005K	Z01K005K	Z01K005K
51	Elbow 1/2"	G07J006	G07J006	G07J006	G07J006
52	Hose clamp 1/2"	G99Z034	G99Z034	G99Z034	G99Z034
53	Inductor	B03141-01	B03141-01	B03141-01	B03141
54	Motor and support	B03716-05	B03716-05	B03716-05	B03241-14
55	Motor ECM 3.0	L06I014	L06I014	L06I014	L06K008
56	Motor support	B01889	B01889	B01889	B01889
57	Blower	Z01I033	Z01I033	Z01I033	Z01I035
58	Control board	R99G014	R99G014	R99G014	R99G014
59	Control board support	B40559	B40559	B40559	B40559
60	ID blower control	R99G017	R99G017	R99G017	R99G017
61	Transformer	L01F009	L01F009	L01F009	L01F009
63	Sleeve drain	N/A	N/A	N/A	B40913
	ACCESSORIES				
	Bottom return base	B40691-01	B40691-01	B40691-01	B40691-02
	Downflow base	B40632-01	B40632-01	B40632-01	B40632-02
	Propane conversion kit	B40574-03	B40574-06	B40574-09	B40574-12
	Propane orifice #56	R04I002	R04I002	R04I002	R04I002