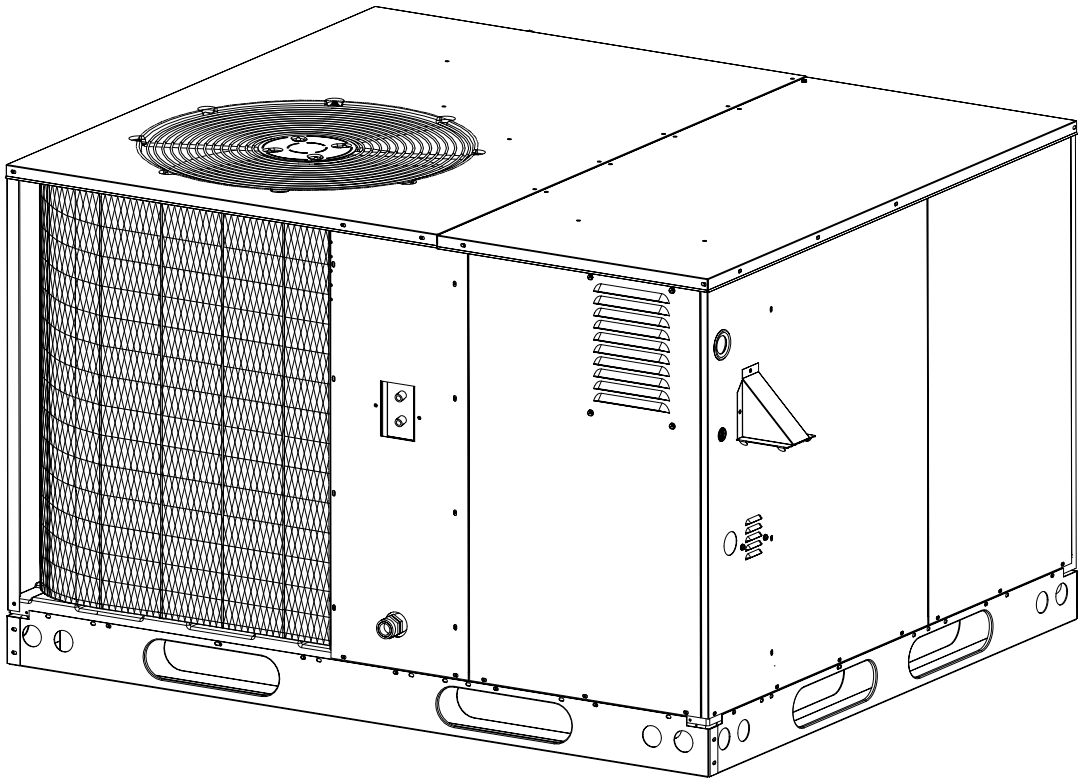
14/15 SEER iHybrid Dual Fuel Heating and Cooling Packaged System

Installation Instructions



⚠ WARNING:	FOR YOUR SAFETY	FOR YOUR SAFETY WHAT TO DO IF YOU SMELL GAS
Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual, for assistance or additional information consult a qualified installer, service agency, or the gas supplier.	**Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Do not use this 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 furnace if deemed necessary.**	• **Do not try to light any appliance.** • **Do not touch any electrical switch; do not use any phone in your building.** • **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.** • **If you cannot reach your gas supplier, call the fire department.** • **Extinguish any open flame.**

DO NOT DESTROY. PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

These instructions are primarily intended to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/service personnel for this type of equipment. Read all instructions carefully before starting the installation.

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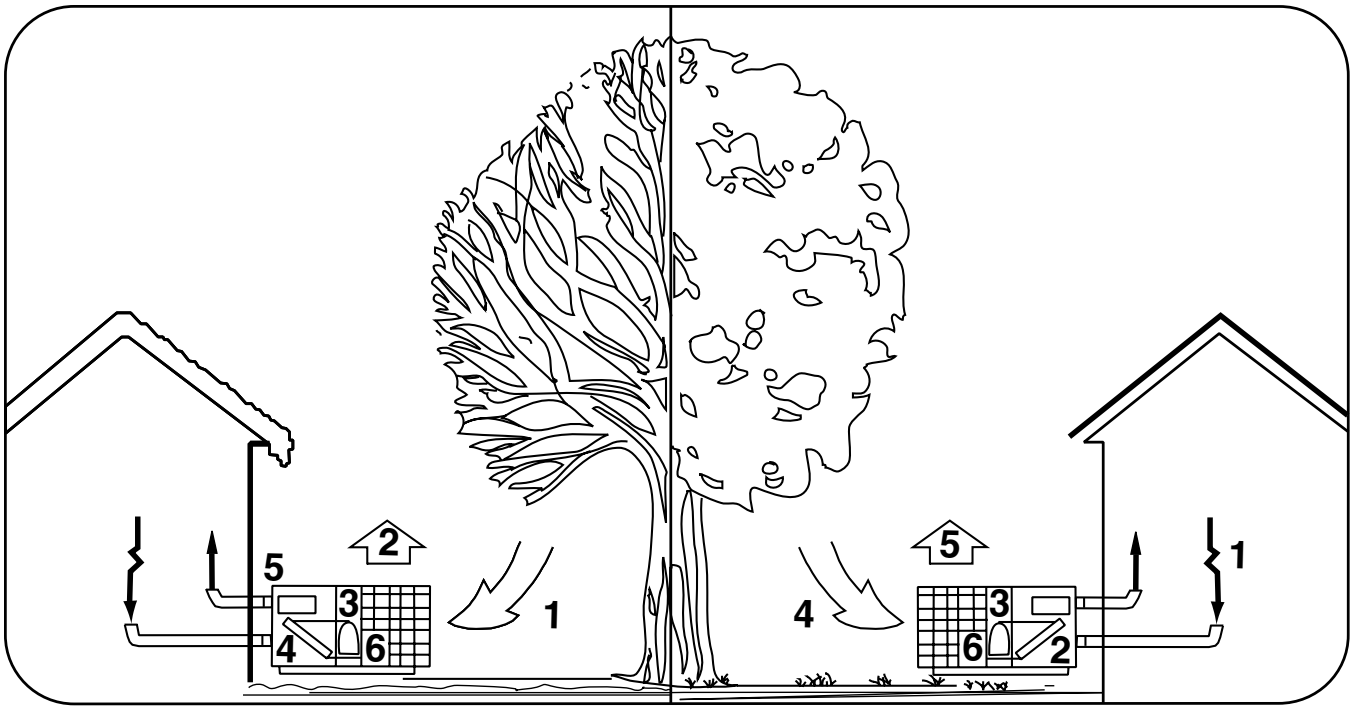
SECTION 1. OWNER INFORMATION



Heat Pump Operation

WINTER HEATING

1. Outdoor air enters the heat pump.
2. The cold, heat-transfer section (outdoor coil) extracts the heat from the air as the refrigerant evaporates from a liquid to a cold gas.
3. The refrigerant, compressed to a hot gas by the heat pump, carries the heat to the heat-transfer section (indoor coil).
4. The hot, heat-transfer section (indoor coil) releases the heat as the refrigerant condenses from a gas to a liquid.
5. The blower circulates the heat throughout the home via the supply duct.
6. The refrigerant returns to the outdoor coil and evaporates once again to absorb more heat.

SUMMER COOLING

1. Indoor air enters the return air duct.
2. The cold, heat-transfer section (indoor coil) extracts the heat from the air as the refrigerant evaporates from a liquid to a cold gas.
3. The refrigerant, drawn to the heat pump and compressed to a hot gas, carries the heat outdoors.
4. The hot, heat-transfer section (outdoor coil) releases the heat as the refrigerant condenses from a gas to a liquid.
5. The heat pump (outdoor fan) discharges the heat to the outside air.
6. The refrigerant returns to the indoor coil and evaporates once again to absorb more heat.

It is the sole responsibility of the homeowner to make certain that heat pump has been correctly set up and adjusted to operate properly.

The Manufacturer warranty on the heat pump covers defects in material or workmanship for the warranty period. The manufacturer is not responsible for any costs resulting from problems due to improper setup, improper installation, adjustments, improper operating procedure on the part of the user, etc.

Some specific examples of service calls which are not included in the limited warranty are:

1. Correcting wiring problems in the electrical circuit supplying the heat pump.
2. Resetting circuit breakers or other switches.
3. Adjusting or calibrating of thermostat.

To avoid misunderstandings at a later date, carefully review these responsibilities with your dealer or service company.

The heat pump system will heat and cool your home and save your energy dollars.

During the summer, a heat pump cools a house by absorbing heat from within the house and exhausting it outdoors. During the winter, a heat pump heats a house by absorbing heat outdoors and exhausting it indoors. This is an efficient heating means because you pay for “moving” heat from outdoors to indoors, but do not pay to generate the heat.

OPERATING INSTRUCTIONS

NOTE: A thermostat with fossil fuel back-up heat capability is required to operate the Dual Fuel iHybrid™ heat pump system.

To Operate Your Heat Pump For Cooling —

1. Set the thermostat system mode to COOL and the thermostat fan mode to AUTO. **See Figure 1.**

2. Set the thermostat temperature selector to the desired cooling temperature. The outdoor unit fan, the indoor blower, and the compressor will all cycle on and off to maintain the indoor temperature at the desired cooling level.

To Operate Your Heat Pump For Heating —

1. Set the thermostat system mode for HEAT and the thermostat fan mode to AUTO. **See Figure 1.**

2. Set the thermostat temperature selector to the desired heating temperature. The outdoor unit fan, the indoor blower, and the compressor will all cycle on and off to maintain the indoor temperature at the desired heating level.

Emergency Heat — Your thermostat will include a system switch position termed EM HT or AUX HT, etc. With the system mode set to EM HT, etc., the compressor and outdoor fan will be locked off and the secondary gas furnace will be used as a source of heat. Sustained use of gas heat in place of the heat pump will result in an increase in electric utility costs.

Defrost — During cold weather heating operation, the outdoor until will develop a coating of snow and ice on the heat transfer coil. This is normal and the unit will periodically defrost itself. During the defrost cycle, the outdoor fan will stop, while the compressor continues to run and heat the outdoor coil, causing the snow and ice to melt. During defrost, there may be some steam rise from the outdoor unit as the warm coil causes some melted frost to evaporate.

SPECIFICATIONS

Single Package Dual Fuel iHybrid™ Heating and Cooling Systems are designed for outdoor rooftop or ground level slab installations. The units are shipped ready for horizontal duct connections and are easily converted for down flow applications.

All models are shipped from the factory with the following:

1. Variable speed direct-drive blower.
2. 2-Stage compressor.
3. Demand defrost board.
4. Horizontal or Down flow duct connections.

The unit dimensions are shown in Figure 2.

The Dual Fuel iHybrid™ package heat pump comes with a factory installed gas furnace for secondary heat. A thermostat with fossil fuel back-up heat capability is required with this system. This feature insures that the compressor is off before the secondary heat is initiated.

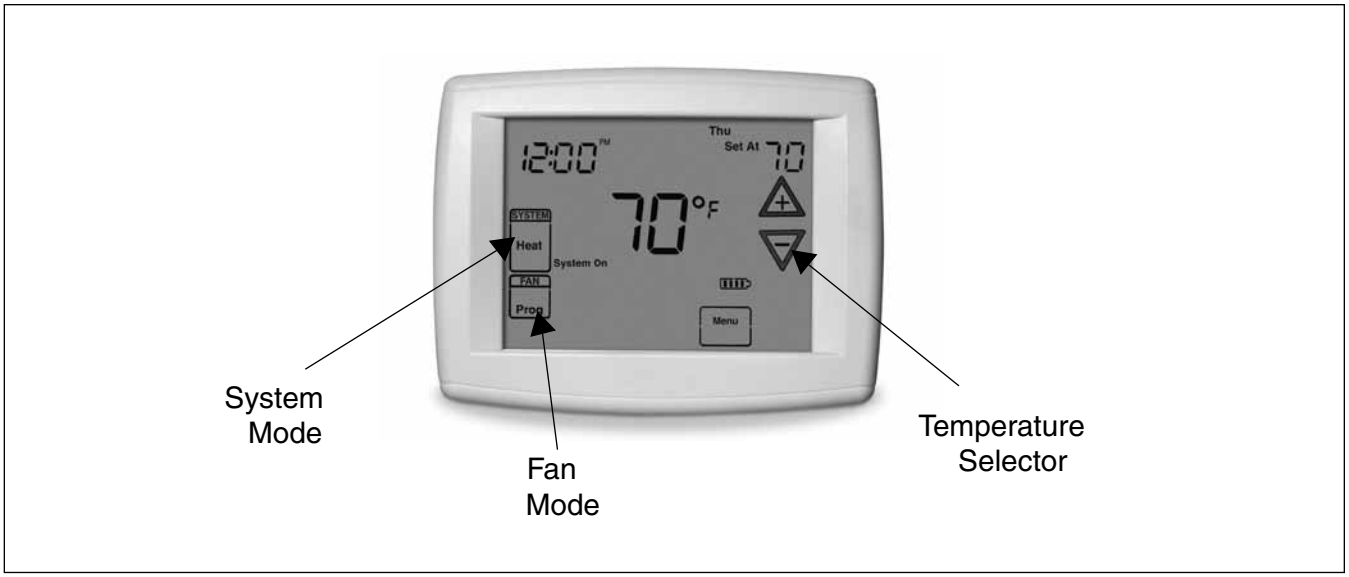


Figure 1. Typical Thermostat

SAFETY CONSIDERATIONS

It is the responsibility of the installer to ensure that the installation is made in accordance with all applicable local and national codes.

⚠ WARNING:

Improper installation, service, adjustment, or maintenance may cause explosion, fire, electrical shock or other hazardous conditions which may result in personal injury or property damage. Unless otherwise noted in these instructions, only factory authorized kits or accessories may be used with this product. Noncompliance may void the unit's warranty.

Labels, Tags — When working with this equipment, follow all precautions in the literature, on tags, and on labels provided with the unit and/or approved field installed kits. The type of hazard and severity are described on each label or tag.

Pressures Within The System — This equipment contains liquid and gaseous refrigerant under high pressure. Installation or servicing should only be performed by qualified trained personnel thoroughly familiar with this type equipment.

⚠ CAUTION:

This unit uses refrigerant R-410A. DO NOT under any circumstances use any other refrigerant besides R-410A in this unit. Use of another refrigerant will damage this unit.

INSTALLATION REQUIREMENTS

Equipment Check — Before beginning the installation, verify that the unit model is correct for the job. The unit model number is printed on the data label. This furnace is **NOT** to be used for temporary heating of buildings or structures under construction. All units have been securely packaged at the point of shipment. After unpacking the unit, carefully inspect it for apparent and concealed damage. Claims for damage should be filed with the carrier by the consignee.

Requirements and Codes — The installer must comply with all local codes and regulations which govern this type of equipment. Local codes and regulations take precedence over any recommendations contained in these instructions. In the absence of local codes, the installation must conform with the National Fuel Gas Code (ANSI 2223.1, NFPA-54), or Canadian installations must conform with CAN/CGA-B149 installation codes. All electrical wiring must be made in accordance with codes and regulations and with the National Electric Code (ANSI/NFPA 70) or in Canada the Canadian Electric Code Part 1 CSA C.22.1. Air Ducts must be installed in accordance with the standards of the National Fire Protection Association "Standards for Installation of Air Conditioning and Ventilation Systems" (NFPA 90A), "Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems" (NFPA 90B), these instructions, and all applicable local codes.

The National Fuel Gas Code is available by writing:

American National Standards Institute, Inc.
1430 Broadway
New York, NY 10018

NFPA publications are available by writing:

National Fire Protection Association
Batterymarch Park
Quincy, ME 02269

Unit Location — This Dual Fuel iHybrid™ heat pump is designed only for outdoor installations. Choosing the location of the unit should be based on minimizing the length of the supply and return ducts. Consideration should also be given to availability of electric power, service access, noise, and shade. Sufficient clearance for unobstructed airflow through the outdoor coil must be maintained in order to achieve rated performance **See Figure 4** for minimum clearances to obstructions.

Venting Requirements — This unit has been equipped with an integral venting system and designed to operate only with this venting system. No additional venting shall be used. This unit must be vented to the outdoors.

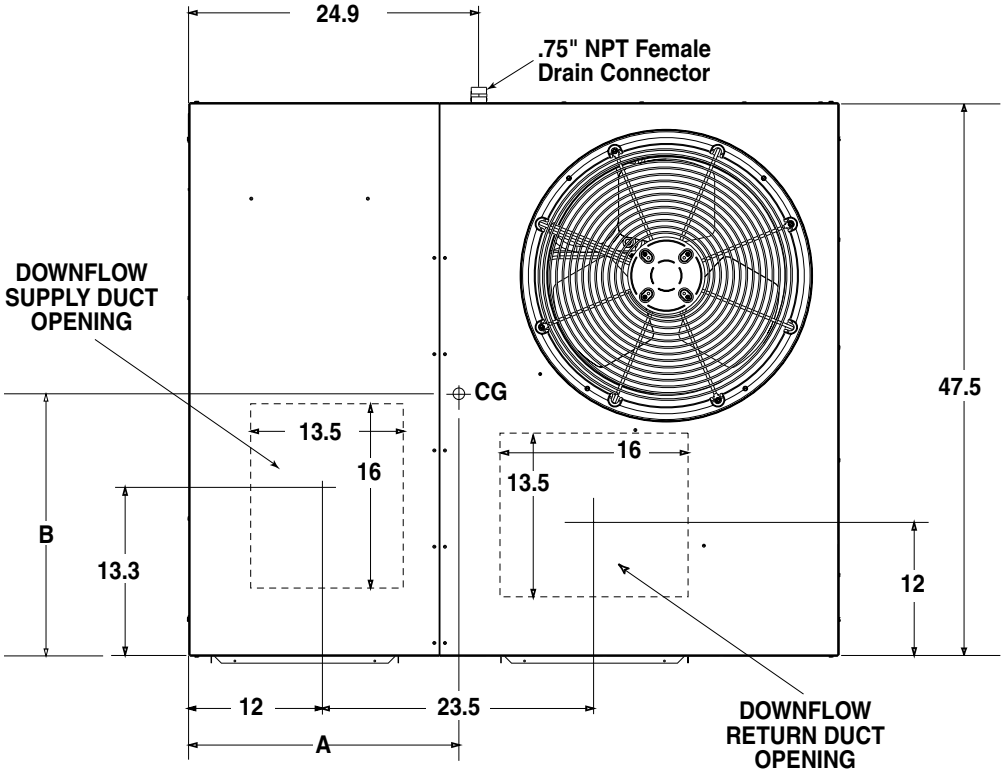
⚠ WARNING:

Do not vent furnace through a conventional venting system.

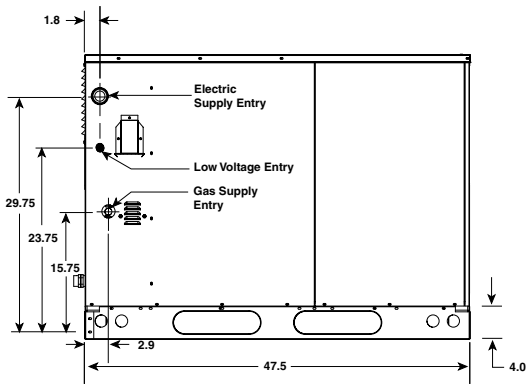
A vent cover assembly has been supplied with the unit. It can be found secured to the gas controls within the control area of this unit. **Figure 3** shows the proper installation of the vent cover assembly over the vent outlet on the exterior of the corner panel. The fasteners used to secure the vent cover assembly have been included in the homeowner's package.

⚠ WARNING:

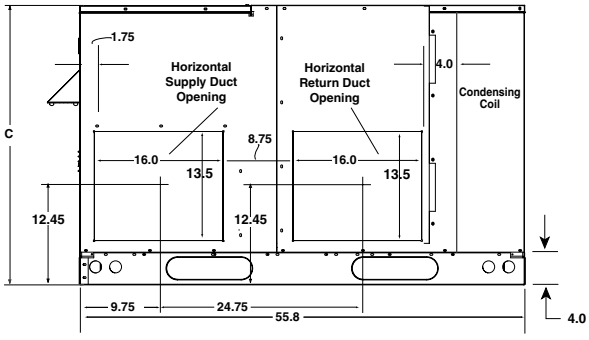
The vent cover assembly must be installed to assure proper operation of the unit.



Top View



Side View



Back View

Model Number	Unit Weight	Center of Gravity		Height (in inches) C	
		A	B	with base rails	without base rails
DF6SF-X24	480	26.0	27.0	39.0	35.3
DF6SE-X36	480	26.0	27.0	39.0	35.3
DF6SE-X48	570	27.0	26.5	43.0	39.3
DF6SE-X60	580	27.0	26.5	43.0	39.3

Figure 2. Dimensions

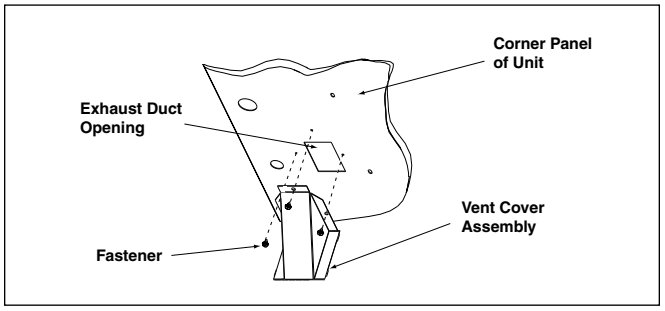


Figure 3. Vent Assembly

The following list is a summary of the requirements for the location of the termination of the venting system:

1. The location of the vent termination must be consistent with the National Fuel Gas Code (ANSI Z223.1) or CAN/CGA-B149 Installation Codes.
2. The vent termination must be located at least four (4) feet horizontally from any electric meters, gas meters, regulators, and relief equipment.
3. The vent termination must be located at least three (3) feet above any forced air inlet located within ten (10) feet.
4. The vent termination must be located at least four (4) feet below, four (4) feet horizontally from, or one (1) foot above any door, window, or gravity air inlet into any building.
5. The vent termination must be located at least one (1) foot above grade.
6. The unit should be installed in such a manner as to prevent snow accumulation from obstructing the vent termination.
7. The unit installation shall avoid areas where condensate drainage may cause problems by dropping on planters or patios, etc. Furthermore, ensure that the exhaust gases will not impinge on windows or building surfaces, which may be compromised or damaged by condensation. Do not install the unit such that exhaust from the vent termination is directed into window wells, stairwells, under decks, or in alcoves or similarly recessed areas. The vent termination must not be located above any public walkways.

Clearances to Combustible Materials — See **Figure 4** for required clearances to combustible materials. Refer to the unit data label for the model number. The Dual Fuel iHybrid™ unit is suitable for installation on combustible flooring or class A, B, or C roofing materials. A clearance of at least 36 inches from the blower access panel and from the louvered control access panel is recommended to allow for servicing and maintenance. **Where accessibility to combustibles clearances are greater than minimum clearances, accessibility clearances must take preference.** Sufficient clearance for unobstructed airflow through the louvered control access panel and through the outdoor coil must be maintained in order to achieve rated performance. See **Figure 4** for minimum clearances to obstructions.

Thermostat — The 14/15 SEER Dual Fuel iHybrid™ Heat Pump unit uses a special two speed compressor to achieve a high level of efficiency in a compact frame. A two stage cooling/two stage heating 24VAC thermostat can be used with these units. For the highest efficiency the use of a two-stage cooling thermostat is recommended.

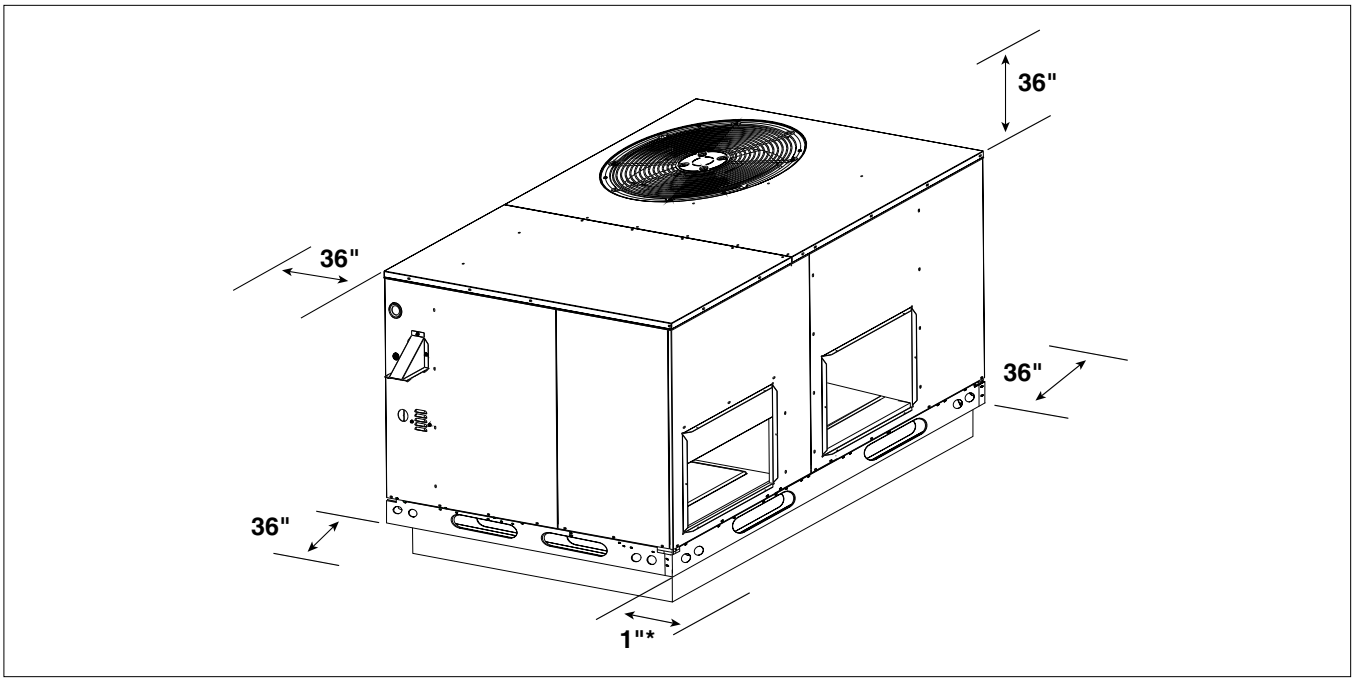


Figure 4. Minimum Clearances

IMPORTANT NOTICE TO INSTALLER: After installing or replacing the filtration system for this unit, add the following marking on the filter service panel or reasonably adjacent thereto: **"Replace filter(s) installed in your system only with the same dimensional size filters that are being replaced."**

NOTE: A thermostat with fossil fuel back-up heat capability is required with this unit.

Air Filter Requirements — A suitable air filter system must be installed in the unit or in the return air system upstream of the evaporator coil. Refer to **Table 1** for recommended filter sizes. Air filter pressure drop must not exceed 0.08 inches WC. This unit is not supplied with air filter(s) and

⚠ WARNING:

Never operate unit without a filter. Failure to follow this warning could result in a fire, personal injury, or death.

has no factory equipped means for accommodating internal air filter(s). For downflow installations only, an internal filter accessory kit can be ordered. For horizontal installations, the air filter system must be installed in the return air ductwork. All return air to this unit must pass through the filter(s) before entering the evaporator coil.

Ambient Sensor Mounting — For optimum performance of your Dual Fuel iHybrid™ heat pump package system, the ambient sensor must be mounted outside of the unit. To mount the ambient sensor:

1. Remove the mounting bracket wire tied to the gas manifold pipe and all hardware included in the homeowners packet.
2. Remove star bushing from 7/8" hole in corner panel of the unit.
3. Feed the ambient sensor through the 7/8" hole in the corner panel of the unit, and then through the 7/8" hole in the mounting bracket.
4. Feed the sensor through the star bushing. Use the star bushing to secure the mounting bracket to the unit. (see figure 5)
5. Secure the ambient sensor inside the plastic clip and secure it to the mounting bracket with the screw and nut provided **NOTE:** Install one spacer next between the plastic clip and mounting bracket as shown in figure 5.
6. Bend the mounting bracket into position. Install the vent cover screw to the mounting bracket as shown in figure 6.

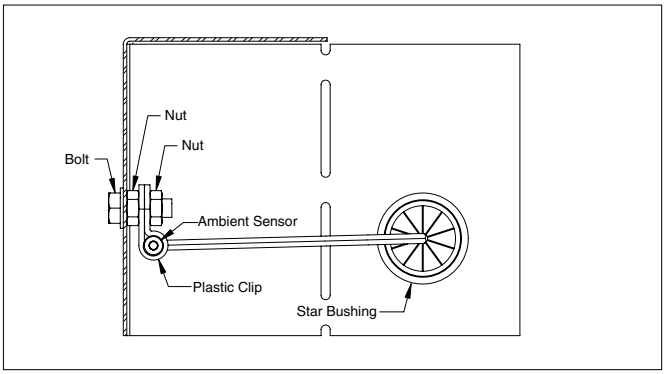


Figure 5. Ambient Sensor Mounting

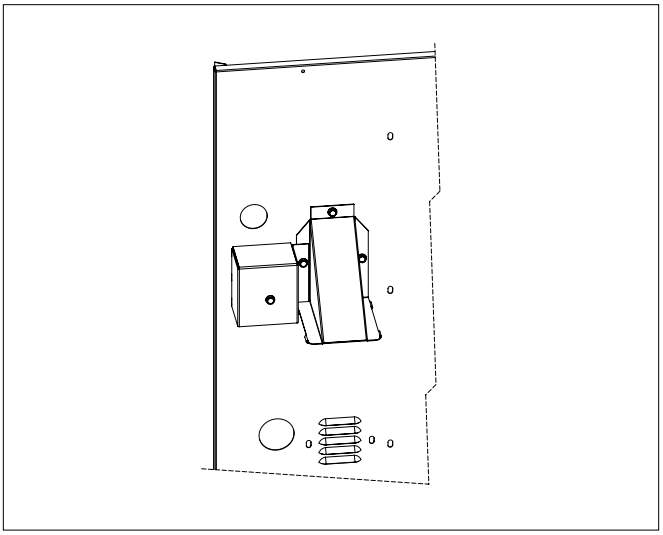


Figure 6. Ambient Sensor Mounting

Nominal Cooling Tonnage (Ton)	Approximate Air Flow Range (CFM)	Approximate Filter Area (Sq. In.)*		Recommended Filter Size (In. x In.)	
		Disposable	High Velocity	Disposable	High Velocity
2.0	700-900	450	280	18 x 25	14 x 20
3.0	1000-1300	625	400	25 x 25	20 x 20
4.0	1400-1800	900	550	18 x 25 (2 required)	22 x 25
5.0	1700-2150	1100	625	22 x 25 (2 required)	25 x 25

* Based on velocity of 300 ft/min for disposable filters and 500 ft/min for high velocity (cleanable) Filters.

Table 1. Air Filter Requirements

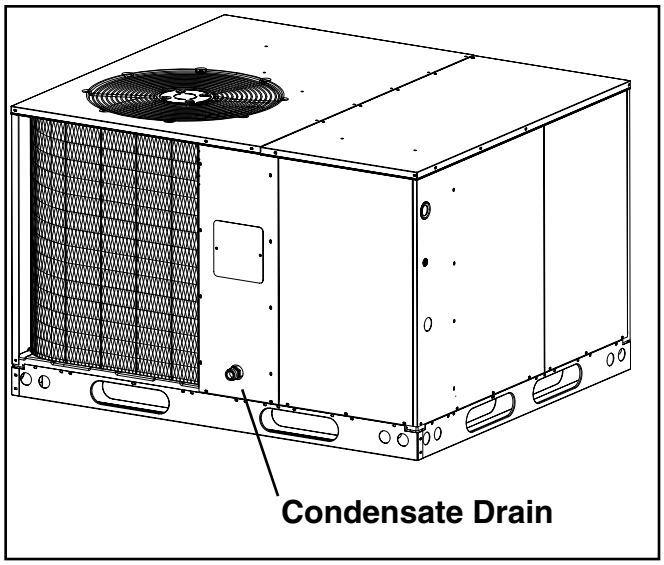


Figure 7. Condensate Drain

Condensate Drain — Condensate is removed from the unit through the 3/4" female pipe fitting located on the front side of the unit. See Figure 7. Install a 2 inch condensate trap in the drain line of the same size and prime with water. When connecting rigid drain line, hold the female fitting with a wrench to prevent twisting. Do not over tighten! Refer to local codes and restrictions for proper condensate disposal requirements.

UNIT INSTALLATION

Ground Level — When installing the unit at ground level, provide a concrete mounting pad separate from the building foundation. The pad must be level to insure proper condensate disposal and strong enough to support the unit's weight. See Figure 2. Make sure the slab is a minimum of 2" above the grade and in an area that drains well. See Figure 8.

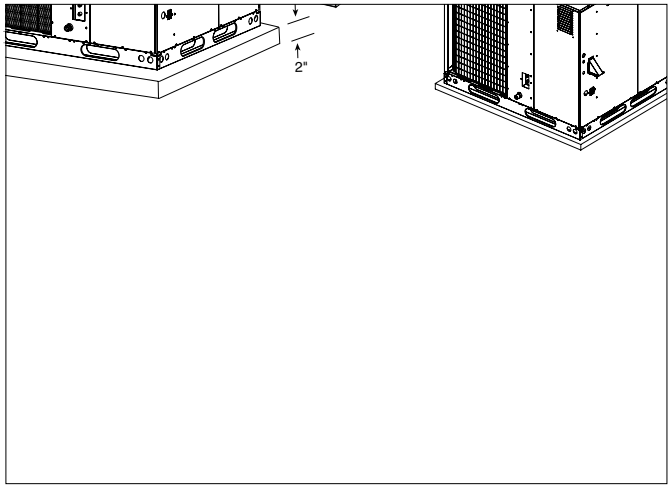


Figure 8. Ground Level Installation

Rigging and Hoisting — The unit should be lifted using slings and spreader bars. The spreader bars are necessary to prevent damaging the top of the unit's cabinet. Make sure that the lifting equipment is adequate for the load. Refer to Figure 2 for unit weights. Keep the unit in an upright position at all times. **For rooftop installations, remove and discard the two supports attached beneath the unit.**

⚠ WARNING:

To avoid the risk of property damage or personal injury; it is the rigger's responsibility to insure that whatever means are used to hoist the unit are safe and adequate.

⚠ CAUTION:

All panels must be securely in place when rigging and hoisting.

The rigging must be located outside the unit's center of gravity. Refer to Figure 3 for center of gravity locations.

Rooftop — For rooftop installations use the appropriate accessory roof curb and follow all instructions included with it. Make sure the two supports beneath the unit have been removed. Locate the unit according to local building codes and ordinances. The curb must be level to insure proper condensate drainage. See Figure 9.

The roof must be capable of handling the weight of the unit. See Figure 2 for unit weights. Reinforce the roof if required.

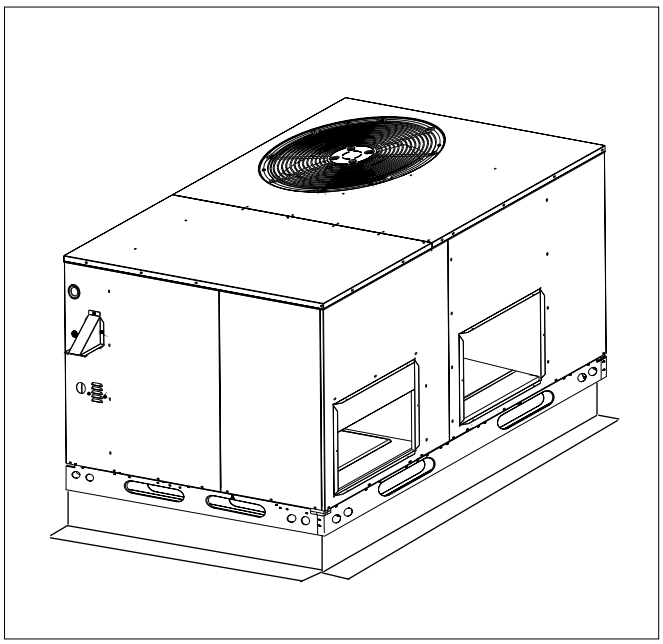


Figure 9. Roof Top Installation

⚠ WARNING:

Do not place combustible material on or against the unit cabinet. Do not place combustible materials, including gasoline and any other flammable vapors and liquids, in the vicinity of the unit.

AIR SUPPLY FOR COMBUSTION AND VENTILATION

Provisions must be made in the installation of this unit to provide an adequate supply of air for combustion. Detailed instructions for determining the adequacy of an installation can be found in the current revision of the National Fuel Gas Code (ANSI Z223.1) and NFPA 54, or in Canadian installation codes (CAN/CGA-B149), or in applicable local building codes. Consult local codes for special requirements.

⚠ WARNING:

Installation using methods other than those described in the following sections must comply with the National Fuel Gas Code and all applicable local codes to provide sufficient combustion air for the furnace.

If the unit is operated with inadequate combustion air supply the flame roll-out control located above the burners will open, turning off the gas supply to the burners. The flame roll-out control is a manually re-setable device. DO NOT install a jumper wire across this control to defeat its function. DO NOT reset the control without identifying and correcting the fault condition which caused the control to trip. If this control must be replaced, use only the replacement part specified in the Replacement Parts List.

Air Openings in the door of the unit, warm air registers, and return air grilles must not be restricted.

To maximize heat exchanger life, the combustion air must be free of chemical contaminants which form corrosive acidic compounds when combusted. Some examples of these chemical contaminants are chlorine, fluorine, and sulphur. Some common sources of these chemical contaminants are detergents, bleaches, aerosol sprays, cleaning solvents, and a wide variety of commercial and household products.

⚠ WARNING:

Combustible air must not be drawn from a contaminated atmosphere. Excessive exposure to contaminated combustion air will result in safety and performance related problems.

CIRCULATING AIR SUPPLY

⚠ WARNING:

Products of combustion must not be allowed to enter the return air ductwork or the circulating air supply. Failure to prevent products of combustion from being circulated into the living space can create potentially hazardous conditions including carbon monoxide poisoning that could result in personal injury or death.

All return ductwork must be adequately sealed, all joints must be taped, and the ductwork must be secured to the unit with sheet metal screws. When return air is provided through the bottom of the unit, the joint between the unit and the return air plenum must be air tight.

The roof curb or cement pad on which the unit is mounted must provide sound physical support of the unit with no gaps, cracks, or sagging between the unit and the curb or pad.

Return air and circulating air ductwork must not be connected to any other heat producing device such as a fireplace insert, stove, etc. Doing so may result in fire, explosion, carbon monoxide poisoning, personal injury, or property damage.

AIR DUCTS

This unit is designed only for use with a supply and return duct. Air ducts should be installed in accordance with the standards of the National Fire Protection Association “Standard for Installation of Air Conditioning Systems” (NFPA 90A), “Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems” (NFPA 90B), and all applicable local codes.

Design the duct work according to methods described by the Air Conditioning Contractors of America (ACCA). The ducts must be properly sized not to exceed .2” w.c. pressure drop at 400 scfm per nominal ton of cooling capacity.

Duct work should be attached directly to the unit flanges for horizontal applications. On roof curb installations the ducts must be attached to the curb hangers, not the unit.

CAPACITY OF BLACK IRON GAS PIPE (CU. FT. PER HOUR) FOR NATURAL GAS (SPECIFIC GRAVITY - 0.60)								
NOMINAL BLACK IRON PIPE DIAMETER (in.)	LENGTH OF PIPE RUN (feet)							
	10	20	30	40	50	60	70	80
1/2	130	90	75	65	55	50	45	40
3/4	280	190	150	130	115	105	95	90
1	520	350	285	245	215	195	180	170
1 1/4	1050	730	590	500	440	400	370	350
1 1/2	1600	1100	890	760	670	610	560	530

The cubic feet per hour listed in the table above must be greater than the cubic feet per hour of gas flow required by the unit.

To determine the cubic feet per hour of gas flow required by the unit, divide the input rate of the unit by the heating value of the gas:

$$\text{Cubic Feet Per Hour Required} = \frac{\text{Input To Unit (Btu/hr)}}{\text{Heating Value of Gas (Btu/Cu. Ft.)}}$$

Table 2. Capacity of Black Iron Gas Pipe (cubic feet per hour) for Natural Gas (specific gravity = .60).

It is recommended that the outlet duct be provided with a removable access panel. This opening should be accessible when the unit is installed in service and shall be of a size such that the smoke or reflected light may be observed inside the casing to indicate the presence of leaks in the heat exchanger. The cover for the opening shall be attached in such a manner as to prevent leaks.

If outside air is utilized as return air to the unit for ventilation or to improve indoor air quality, the system must be designed so that the return air to the unit is not less than 50°F (10°C) during heating operation. If a combination of indoor and outdoor air is used, the ducts and damper system must be designed so that the return air supply to the furnace is equal to the return air supply under normal, indoor return air applications.

Unconditioned Spaces — All duct work passing through unconditioned space must be properly insulated to minimize duct losses and prevent condensation. Use insulation with an outer vapor barrier. Refer to local codes for insulation material requirements.

Acoustical Duct Work — Certain installations may require the use of acoustical lining inside the supply duct work. Acoustical insulation must be in accordance with the current revision of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) application standard for duct liners. Duct lining must be UL classified batts or blankets with a fire hazard classification of FHC-25/50 or less. Fiber duct work may be used in place of internal duct liners if the fiber duct work is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts. Fibrous duct work and internal acoustical lining must be NFPA Class 1 air ducts when tested per UL Standard 181 for Class 1 ducts.

Horizontal to Down flow Conversion — The unit is shipped ready for horizontal duct connections. If down flow ducts are required, the unit must be converted following the steps below for both the supply and return ducts.

1) Remove the horizontal duct cap.
2) Locate the duct cap inside the duct openings and remove the screw holding it in place.
3) Lift the cap out of the unit. (The cap can be pushed up from the bottom by reaching through the fork slot).
4) Cover the horizontal duct opening with the horizontal duct cap. The insulation will be on the indoor side.
5) Fasten the cover with screws to seal.

GAS SUPPLY AND PIPING

This unit has right side gas entry. A typical gas service hookup is shown in **Figure 10.** When making the gas connection, provide clearance between the gas supply line and the entry hole in the unit's casing to avoid unwanted noise and/or damage to the unit.

All gas piping must be installed in compliance with local codes and utility regulations. Some local regulations require the installation of a manual main shut-off valve

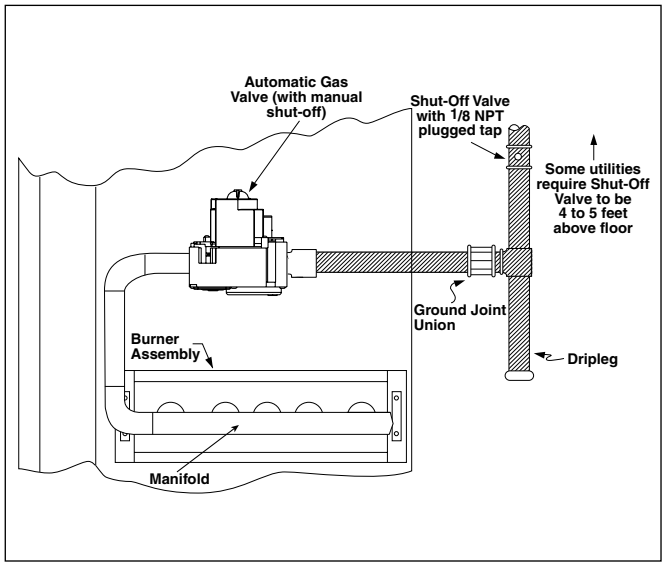


Figure 10. Typical Right Side Entry Gas Service Connection.

For a Natural Gas Sea Level Heating Value of 800 to 899 Btu/cu.ft.					
	Elevation (feet above sea level)				
	zero to 1999	2000 to 4999	5000 to 5999	6000 to 7999	8000 to 10000
Manifold Pressure Setting (in WC)	3.5	3.5	3.5	3.5	3.0

For a Natural Gas Sea Level Heating Value of 900 to 999 Btu/cu.ft.					
	Elevation (feet above sea level)				
	zero to 1999	2000 to 4999	5000 to 5999	6000 to 7999	8000 to 10000
Manifold Pressure Setting (in WC)	3.5	3.5	3.5	3.2	2.8

For a Natural Gas Sea Level Heating Value of 1,000 to 1,100 Btu/cu.ft.					
	Elevation (feet above sea level)				
	zero to 1999	2000 to 4999	5000 to 5999	6000 to 7999	8000 to 10000
Manifold Pressure Setting (in WC)	3.5	3.5	3.0	2.8	2.5

Table 3. Manifold Pressure (in WC) for Natural Gas at Various Altitudes and Heating Values

	Elevation, (feet above sea level)				
	0 to 1,999	**2,000 to 4,999**	**5,000 to 5,999**	**6,000 to 7,999**	**8,000 to 10,000**
Manifold Pressure in (WC) Based on Sea Level LP Heating Value of 2,500 Btu/ft.[3]	10.0	8.5	10.0	9.0	8.5
Orifice Size	54	54	55	55	55

Table 4. Manifold Pressure (in WC) for LP/Propane Gas at Various Altitudes

and ground joint union external to the unit. The shut-off valve should be readily accessible for service and/or emergency use. Consult the local utility or gas supplier for additional requirements regarding placement of the manual main gas shut-off. In the absence of local codes the gas line installation must comply with the latest edition of the National Fuel Gas Code ANSI Z223.1 or CAN/CGA B149 Installation Codes.

⚠ CAUTION:

Do not use matches, lighters, candles or other sources of open flame to check for gas leaks.

A 1/8 inch NPT plugged tap must be installed in the gas line immediately upstream of the gas supply connection to the furnace for use when measuring the gas supply pressure. The plug should be readily accessible for service use. A drip leg should be installed in the pipe run to the unit. **Table 2** lists gas flow capacities for standard pipe sizes as a function of length in typical applications based on nominal pressure drop in the line.

IMPORTANT NOTES:

1. Gas piping must not be run in or through air ducts, chimneys, gas vents, elevator shafts, etc.
2. Compounds used on threaded joints of gas piping must be resistant to the actions of liquefied petroleum gases.
3. The main manual gas valve and main power disconnect to the furnace must be properly labeled by the installer in case emergency shutdown is required.

Leak Check — After the gas piping to the unit is complete, all connections must be tested for gas leaks. To check for leaks in gas piping systems, use only a soap and water solution or other approved method.

IMPORTANT NOTE: When pressure testing the gas supply lines at pressures greater than 1/2 psig (14 inches WC), the unit must be disconnected from the gas supply piping system to prevent damage to the gas control valve.

If the test pressure is less than or equal to 1/2 psig (14 inches WC), the unit must be isolated from the gas supply line by closing the manual shut-off valve.

⚠ WARNING:

This unit was equipped at the factory for use with natural gas only. A special kit, supplied by the manufacturer, is required to convert the unit to operate on LP/propane gas. Failure to use the proper conversion kit can cause fire, explosion, property damage, carbon monoxide poisoning, personal injury, or death.

GAS AND HIGH ALTITUDE CONVERSIONS

Conversion: conversion of this unit must be performed by qualified service personnel, using only approved parts.

High Altitude Application

High altitude application with this furnace can be field performed by a simple adjustment of manifold pressure and if necessary, a change of the orifices. The changes required depend on the installation altitude and the heating value of the gas. The gas heating value based on sea level can be obtained from your local gas utility. The heating value of gas at high altitude is always lower than the sea level heating value. The heating values used in the **Tables 3 & 4** are based on sea level values.

Natural Gas High Altitude Conversion

All factory shipped furnaces are ready to operate between zero and 4999 ft. above sea level. For higher altitudes (between 5000 and 10,000 ft. above sea level), conversion can be achieved simply by adjusting the furnace manifold pressure as shown in **Table 3**.

LP/Propane Gas Conversion

Conversion of this furnace to utilize LP/Propane gas must be made by qualified service personnel, using approved parts. Conversion for the LP/Propane gas can be accomplished by adjusting the manifold pressure, after replacing the natural gas orifices with the appropriate LP/Propane orifices shown in **Table 4**. Note: that for installations between zero and 5000 ft. above sea level, a #54 drill size orifice should be used. However for installations above 5000 ft. over sea level, a # 55 drill size orifice should be used. Then use **Table 4** to determine the appropriate manifold pressure for your altitude installation. Conversion to LP/Propane (sea level and high altitude) is detailed in the installation instructions provided with the conversion kit. Approved conversion kits are:

United States LP/Propane Gas Sea Level and High Altitude Conversion Kit - P/N 904404
This kit is for LP/propane conversion in the United States at altitudes between zero and 10,000 ft. above sea level. Follow the installation instructions supplied with the kit for proper installation.
Canadian LP/Propane Gas Sea Level and High Altitude Conversion Kit - P/N 904405
This kit is for LP/propane conversions in Canada at altitudes between zero and 4500 ft. above sea level. Follow the installation instructions supplied with the kit for proper installation.

ELECTRICAL WIRING

General — Electrical power wiring must be made in accordance with all applicable local codes and ordinances, and with the current revision of the National Electric Code NFPA 70 or in Canada CSA C.22.1 - Canadian Electrical Code Part 1. If any of the original wire as supplied with the unit must be replaced, it must be replaced with material of the same gage and temperature rating.

⚠ WARNING:

To avoid the risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical power supply. When Servicing controls, label all wires prior to disconnecting and reconnect wires correctly. Verify proper operations after any servicing.

ELECTRICAL DATA

Model Number	Max. Heating Input	Nominal Electrical Supply	Voltage Range		Compressor		Fan Motor FLA	Indoor Blower FLA	Single Circuit	
			Min	Max	RLA	LRA			MCA	MOP
DF6SF-X24K045C	45,000	208-230/60/1	187	253	11.4	52.0	0.91	4.3	20.8	30.0
DF6SF-X24K072C	72,000	208-230/60/1	187	253	11.4	52.0	0.91	4.3	20.8	30.0
DF6SE-X36K072C	72,000	208-230/60/1	187	253	19.0	82.0	1.2	6.8	33.1	50.0
DF6SE-X36K096C	96,000	208-230/60/1	187	253	19.0	82.0	1.2	6.8	33.1	50.0
DF6SE-X48K096C	96,000	208-230/60/1	187	253	24.0	96.0	1.5	9.1	42.0	60.0
DF6SE-X48K120C	120,000	208-230/60/1	187	253	24.0	96.0	1.5	9.1	42.0	60.0
DF6SE-X60K096C	96,000	208-230/60/1	187	253	26.0	118.0	1.5	9.1	44.5	60.0
DF6SE-X60K120C	120,000	208-230/60/1	187	253	26.0	118.0	1.5	9.1	44.5	60.0

Notes: FLA = Full Load Amps; LRA = Lock Rotor amps; RLA = Rated Load Amps.

Table 5. Electrical Data.

Line Voltage — Before proceeding with the electrical connections, make certain that the voltage, frequency, and phase of the supply source are the same as those specified on the unit rating plate. Also verify that the service provided by the utility is sufficient to handle the additional load imposed by this equipment.

⚠ WARNING:

The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. This ground may consist of electrical wire or approved conduit when installed in accordance with existing national or local codes.

See the unit wiring label for proper high and low voltage wiring. Make all electrical connections in accordance with all applicable codes and ordinances.

This unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code (ANSI/NFPA 70) or the CSA C22.1 Electrical Code.

Use a separate branch electrical circuit for this unit. A means of electrical disconnect must be located within sight of and readily accessibility to the unit. Internally mounted circuit breakers are available as field installed options. These circuit breakers can be used as an electrical disconnect.

The unit is shipped from the factory wired for 240 volt transformer operation. For 208 volt operation, remove the lead from the transformer terminal marked 240V and connect it to the terminal marked 208V. For maximum ampacity and over current protection, see the unit rating plate or Table 5.

Provide power supply (or supplies) for the unit in accordance with the unit wiring diagram, and the unit rating plate. Connect the line-voltage leads to the corresponding terminals on the contactor (or the circuit breaker when the field installed circuit breaker kits are used) inside the control compartment. Use only copper wire for the line voltage power supply to this unit. Use proper code agency listed conduit and a conduit connector for connecting the supply wires to the unit and for obtaining proper grounding. Grounding may also be accomplished by using the grounding lug provided in the control box.

LOW VOLTAGE WIRING

Heating Configurations

The back-up furnace in this heat pump is factory configured to operate on high fire only, but can be field converted to operate as two-stage furnaces.

1. *Two stage heating thermostat configuration* – For this installation a two stage heat pump thermostat is used. **NOTE:** To configure this unit for two stage gas heating. Remove the jumper wire between W1 and W2 on the terminal block and move the brown wire on the low side of the gas valve to W2 on the terminal block. Connect W1 and W2 to the thermostat. On a call for first stage heat, the furnace will operate at low fire and the blower will run at a lower speed. On a call for second stage heat, the furnace will operate at high fire and the blower will run at a higher speed. The furnace will stage between low fire, high fire, and off depending on the thermostat signal.
2. *High fire only configuration* – As shipped from the factory, the W1 and W2 terminals on the terminal block jumpered together. This defeats the staging feature and the furnace operates on high fire only. All of the burners will operate on a call for heat and the variable speed blower will operate at a higher speed.
3. *Timed staging configuration* – For this installation, remove the jumper between W1 and W2 on the terminal block and replace with a delay on make timer (two wire style). Move the brown wire from the low side of the gas valve to W2 on the terminal block. **CAUTION:** DO NOT CONNECT W2 from thermostat to the furnace wiring when using timed stage configuration. When the low fire on the gas valve is energized, the furnace operates in the low fire mode at a lower blower speed and the timer begins its delay function. If the room thermostat is not satisfied before the timer activates, the furnace will stage to high fire and the blower will operate at a higher speed until the room thermostat is satisfied.
4. *Two Stage Cooling* – Connect Y2 from the thermostat to Y2 on the terminal block.

Install the thermostat per the manufacturer's instructions. The low voltage (24 volt) connections from the thermostat are made at the terminal block in the gas furnace side of the unit.

The thermostat must not be installed on an outside wall or any other location where its operation may be adversely affected. Adverse affects include radiant loading from fireplaces, sunlight, or lighting fixtures, and convective loading from warm air registers or electrical appliances.

To check the heat anticipator setting either:

1. Add the current draw of the system components; or
2. Measure the current flow on the thermostat R-W circuit after the circulating blower motor has started. Set the heat anticipator according to the thermostat manufacturer's instructions for heat anticipator settings.

⚠ CAUTION:

To avoid personal injury or property damage, make certain that the motor leads cannot come into contact with any uninsulated metal components of the unit.

⚠ WARNING:

The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. This ground may consist of electrical wire or approved conduit when installed in accordance with existing national or local codes.

VARIABLE SPEED BLOWER

Configuring the Blower—The variable speed blower is equipped with a microprocessor-controlled variable speed motor that is pre-programmed to deliver optimum airflow in a variety of conditions and system configurations. Before operation, the variable speed blower must be configured to match the unit with the system, system options, and climatic conditions. With the variable speed blower installed and configured properly, the furnace will respond directly to gradually change speed in response to changes in system variables such as the thermostat settings, duct static, filter, etc. The variable speed blower is configured by setting the 6 switches located on the motor control board as described below.

⚠ IMPORTANT:

The variable speed blower has been designed to give the installer maximum flexibility to optimize system performance, efficiency, and comfort. Because there are so many ways to configure, it is important to read and follow these instructions carefully.

Selecting the Basic Cooling/Heat Pump Airflow— The basic cooling/heat-pump airflow is selected by setting switches 1 through 4 on the variable speed input board. All airflows for other modes of operation (except secondary gas heat) are determined by this basic setting.

Table 6 shows the basic airflow values versus the airflow selector switch settings. Table 6 also shows the range of basic air flow settings recommended for each nominal system capacity.

SWITCH NUMBER				RECOMMENDED A/C AIRFLOW RATE (CFM)		SWITCH NUMBER				RECOMMENDED A/C AIRFLOW RATE (CFM)		SWITCH NUMBER				RECOMMENDED A/C AIRFLOW RATE (CFM)		
1	2	3	4	2 TON		1	2	3	4	3 TON		1	2	3	4	4-5 TON		
0	0	0	1		630	0	0	0	1		720	0	0	0	1			1440
0	**0**	**0**	**0**		700	0	0	0	0		800	1	0	0	1	4		1575
0	0	1	0	2	770	1	0	0	1		855	0	0	0	0			1600
1	0	0	1		783	0	0	1	0		880	0	1	0	1	T		1620
1	**0**	**0**	**0**	T	**870**	1	0	0	0		950	**1**	**0**	**0**	**0**	O		1750
0	1	0	1	O	918	0	1	0	1		990	1	1	0	1	N		1755
1	0	1	0	N	957	1	0	1	0		1045	0	0	1	0		5	1760
0	1	0	0		1020	0	1	0	0	3	1100	0	1	0	0			1800
1	1	0	1		1053	1	1	0	1	T	1170	**1**	**0**	**1**	**0**		T	1925
0	1	1	0		1122	0	1	1	0	O	1210	1	1	0	0		O	1950
1	1	0	0		1170	**1**	**1**	**0**	**0**	N	1300	0	1	1	0		N	1980
1	1	1	0		1287	1	1	1	0		1430	1	1	1	0			2145

NOTE: 0=OFF; 1=ON
*Factory settings are in bold.

Table 6. Air Flow Selection for Variable Speed Motors

NOTE: The CFM values listed in the tables are not dependent on duct static pressure. The motor automatically compensates for changes in duct static pressure (within the limits of the motor).

NOTE: If coil icing is observed, the basic cooling/heat-pump airflow selected may be too low. Double-check to be sure the setting selected is within the range shown in Table 6. Also check to be sure the system is properly charged. If icing continues to occur, raise the selected airflow one or two steps.

Selecting the Basic Gas Heating — The gas heating airflow is selected by setting switches 5 and 6, refer to Table 7 and select a nominal rise based on the furnace nominal efficiency and input. Follow the table column up to find the switch setting and nominal air-flow. Be sure that the selected rise is within the specification of the furnace as shown on the furnace rating label.

The Dual Fuel iHybrid™ heat pump is equipped with a two stage furnace. The units are shipped from the factory configured for high fire only. If configured for two-stage operation, the furnace will run at low fire during a call for emergency heat.

Delay Profile — The delay profile controls the start-up and shut-down characteristics of the packaged heat pump unit. By varying the start-up and shut-down characteristics of the packaged heat pump unit the system can be optimized for energy efficiency, humidity control, and comfort.

The delay profile has a two-step “on” delay. The blower will begin operation at 31% airflow for 30 seconds. The second step operation is 75% airflow for 30 seconds. After the two-step “on” delay has been completed, the blower operation will be 100% until the thermostat has been satisfied. There is also a 60 second “off” delay at 50% airflow.

OPTIONAL HUMIDISTAT

The optional humidistat may be installed in the return air duct to provide excellent humidity control when needed and maximum system capacity and energy efficiency when humidity levels are normal. The humidistat senses when humidity in the return air stream is above a preset level (field adjustable) and sends a signal to the motor to reduce the airflow so that more moisture may be removed until the humidity level drops. The packaged heat pump unit is pre-programmed for humidistat operation. Remove jumper connector installed between the two terminals marked “HUM” on the variable speed board.

Nominal Airflow Rates (CFM) and Temperature Rises (°F)													
Switches					DF6S(E,F) & PDF2S(E,F)								
					Low Fire Input		High Fire Input		Low Fire Input		High Fire Input		
5	6	7	8	9	29,250		45,000		46,800		72,000		
0	0	#	#	#	550	38	732	44	550	63	732	73	
1	0	#	#	#	650	33	865	38	650	53	865	62	
0	1	#	#	#	750	28	998	33	750	46	998	53	
1	1	#	#	#	900	24	1062	31	900	39	1062	50	

Nominal Airflow Rates (CFM) and Temperature Rises (°F)													
Switches					DF6S(E,F) & PDF2S(E,F)								
					Low Fire Input		High Fire Input		Low Fire Input		High Fire Input		
5	6	7	8	9	46,800		72,000		62,400		96,000		
0	0	#	#	#	700	50	1170	46	700	66	1170	61	
1	0	#	#	#	800	43	1240	43	800	58	1240	57	
0	1	#	#	#	1000	35	1640	33	1000	46	1640	43	
1	1	#	#	#	1200	29	2005	27	1200	39	2005	36	

Nominal Airflow Rates (CFM) and Temperature Rises (°F)													
Switches					DF6S(E,F) & PDF2S(E,F)								
					Low Fire Input		High Fire Input		Low Fire Input		High Fire Input		
5	6	7	8	9	62,400		96,000		78,000		120,000		
0	0	#	#	#	750	62	1253	57	750	77	1255	71	
1	0	#	#	#	900	52	1395	51	900	64	1395	64	
0	1	#	#	#	1050	44	1720	41	1050	55	1720	52	
1	1	#	#	#	1200	39	2005	36	1200	48	2005	44	

NOTE: 0 = OFF 1 = ON
Switch is not used — Can be 0 or 1
1. Recommended temperature rises are highlighted in **bold**. Use of any other setting may result in nuisance trips.
2. Temperature rises in the table are approximate. Actual temperature rises may vary.

Table 7. Heating Airflow Settings

Installation— Install the humidistat in the return air duct as directed in the installation instructions included with the kit. Wire the humidistat through the low-voltage wire entrance in the packaged heat pump unit to the quick-connect terminals marked “HUM”. Wire the humidistat to open on rise in humidity..

⚠ CAUTION:

To avoid personal injury or property damage, make certain that the motor leads cannot come into contact with any uninsulated metal components of the unit.

Check all factory wiring per the unit wiring diagram and inspect the factory wiring connections to be sure none loosened during shipping or installation.

Low Voltage Connections

Room Thermostat — Several options are available for a room thermostat depending on the application. Back-up fossil fuel heat capability is required with the Dual Fuel iHybrid™ heat pump packaged system. This system is capable of providing two stages of cooling, two stages of heating in heat pump mode, and an additional two stages of secondary gas heating. Select a thermostat which operates in conjunction with the desired operation of the system. The thermostat should be mounted about five feet above the ground on an inside wall. The thermostat should be kept away from drafts, slamming doors, lamps, direct sunlight, or in line with the supply air flow.

To install the thermostat:

1. Position the sub base on an inside wall and mark the mounting holes and thermostat cable openings.
2. Cut out the cable opening and route the thermostat cable from the unit’s low voltage compartment to the thermostat location. The thermostat cable is supplied by the installer.
3. Connect the cable leads to the sub base or thermostat terminals and to the unit’s low voltage terminal block. A system wiring diagram is also provided on the inside of the control panel cover.
4. Secure sub base or thermostat to the wall using screws provided with the thermostat.
5. If sub base is used, install the correct thermostat housing to sub base.
6. Refer to thermostat instruction sheet for complete detailed mounting and set-up information.

Demand Defrost Control — The demand defrost board controls the defrost cycle in response to ambient temperature, outdoor coil temperature and accumulated compressor run time. The heat pump is allowed to operate in the heating mode until the combination of outdoor ambient and outdoor coil temperatures indicate that defrosting is necessary, based on the programmed defrost curve. There are three preprogrammed defrost curves on the board. A jumper pin is used to switch between the different curves. The factory default setting is program two. This is the recommended setting for most standard applications.

The standard defrost cycle will terminate after 13 minutes and 39 seconds or when the coil temperature reaches its terminate temperature, whichever comes first. The defrost board is equipped with a 5 minute Anti-Short Cycle Delay (ASCD). The compressor will not turn on until the minimum 5 minute off time is reached.

The control contains a forced - defrost feature, which puts the system into defrost mode every 6 hours and 4 minutes, unless the coil temperature is above 40° F. The system can be manually put into a forced defrost mode at any time by shorting the “TEST” terminals on the demand defrost board together for more than 9 seconds. The coil temperature sensor does not need to be cold when the unit is forced into defrost. After the “TEST” input is removed, the defrost mode will terminate in 13.7 minutes or when the coil temperature is above the terminate set-point or when the “Y” input is removed, whichever occurs first.

START UP AND SYSTEM CHECK

Pre-Start Check List

- Verify that the unit is level to allow proper condensate drainage.
- Verify that there is free airflow to and from the outdoor coil and that all clearance requirements are met.
- Verify that the duct work is sealed to prevent air leakage.
- Verify that the line voltage power leads are securely connected and the unit is properly grounded.
- Verify that the low voltage wires are securely connected to the correct leads on the low voltage terminal strip.
- Verify that the gas line service pressure does not exceed 10.0 inches WC (0.36 psig), and is not less than 4.5 inches WC (0.16 psig) for natural gas. For LP gas the line service pressure must not exceed 14 inches WC (0.51 psig) and must not be less than 11.0 inches WC (0.40 psig).
- Verify that the flame roll-out control is closed. If necessary, press the red button to reset the control. DO NOT install a jumper wire across the control to defeat its function. If the control reopens upon start-

up, DO NOT reset the control without identifying and correcting the fault condition which caused the control to trip.

- Verify that the gas line has been purged and all connections are leak tight.
- Verify that all exterior panels are replaced and securely fastened.
- Verify that the outdoor fan turns freely.
- Verify that the power supply branch circuit overcurrent protection is sized properly.
- Verify that the thermostat is wired correctly. The thermostat function switch should be set to "Off' and the thermostat fan switch should be set to "Auto."

Start-Up Procedure

Close all electrical disconnects to energize the system.

Air Circulation — Leave the thermostat system switch set to "Off" and set the thermostat fan switch to "On." The blower motor should run continuously. Check for air delivery at the register(s). Ensure that there are no obstructions at the registers or in the duct work. Set thermostat fan switch to "Auto."

Short Cycle Protection — With the system operating in cooling mode, note the temperature setting of the thermostat and gradually raise the set-point temperature until the unit de-energizes. Immediately lower the set point temperature of the thermostat to its original setting and verify that the indoor blower is energized. Verify that after approximately 5 minutes the compressor and fan energize and that the temperature of the discharge air is cooler than the room temperature. This is available only for the single phase models.

System Cooling

1. Set the thermostat system switch to "Cool" and the thermostat fan switch to "Auto". Gradually lower the thermostat temperature switch below room temperature and observe that the blower, compressor, and fan energize. Check that air cooler than room temperature is being discharged at the register. Listen for any unusual noises.
2. After allowing the unit to run for several minutes, set the temperature selector above room temperature.
   - The fan and compressor cycles off with the thermostat.
   - The blower should also stop unless fan switch is set to "ON" position.

Secondary Heating

1. Switch the thermostat setting to emergency heat.
2. Verify that the compressor and fan de-energize. The indoor fan will continue to run and the inducer motor will energize. The furnace will run at high fire as wired from the factory. If the furnace has been wired for two-stage operation, the furnace will run at low fire.
3. Verify that the furnace is operating and that warm air is coming out of the registers.
4. Follow the procedures given on the operating instruction label, in this installation instructions or attached inside the louvered control access panel.
5. After the unit has run for approximately five minutes, set the thermostat below room temperature and verify the shutdown sequence. (See Operating Sequence)

Verifying and Adjusting Firing Rate — The firing rate must be verified for each installation to prevent over-firing of the furnace.

⚠ CAUTION:

Do not re-drill the burner orifices. If the orifice size must be changed, use only new orifices.

IMPORTANT NOTE: The firing rate must not exceed the rate shown on the unit data label. At altitudes above 2,000 ft. it must not exceed that on the data label less 4% for each 1,000 ft.

Follow the procedure below to determine the firing rate:

1. Shut off all other gas fired appliances.
2 Start the unit in heating mode and allow it to run for at least three minutes.
3. Measure the time (in seconds) required for the gas meter to complete one revolution.
4. Convert the time per revolution to cubic feet of gas per hour using **Table 8**.
5. Multiply the gas flow rate in cubic feet per hour by the heating value of the gas in Btu per cubic foot to obtain the firing rate in Btu per hour. Example:
   a. Time for one revolution of a gas meter with a one cubic foot dial = 40 seconds.
   b. From **Table 8** read 90 cubic feet per hour of gas.
   c. Heating value of the gas (obtained from gas supplier) = 1040 Btu per cubic foot.
   d. Firing rate = 1040 x 90 = 93,600 Btuh.
6. Adjustments to the firing rate can be made by adjusting the gas manifold pressure. See the High Altitude Application section for additional information of firing rate at elevations above 2000 ft.

FOR YOUR SAFETY READ BEFORE OPERATING

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

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.

B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or move by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

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

POUR VOTRE SÉCURITÉ. À LIRE AVANT L'EMPLOI

ATTENTION! L'inobservation de ces instructions peut entraîner un incendie ou une explosion pouvant causer des dammages à votre propriété à votre personne, ou la mort.

A. Cet appareil ménager n'a pas de veilleuse. Il est doté d'un système d'allumage automatique. Ne pas essayer d'allumer le brûleur manuellement.

B. AVANT L'USAGE. Attention à une possible odeur de gaz surtout au niveau du plancher où les gaz les plus lourds ont la tendance de se concentrer.

EN CAS D'ODEUR DE GAZ.

- Ne mettre en marche aucun appareil électrique.
- Ne toucher à aucun commutateur électrique, ne pas employer le téléphone.
- Quitter le bâtiment immédiatement et avertir la compagnie du gaz en utili sant le téléphone d'un voisin.
- A défaut de la compagnie du gaz, avertir le service des pompiers.

C. Enfoncer ou faire tourner le robinet à gaz à la main seulement. Ne jamais utiliser d'outils. S'il n'est pas possible de faire tourner ou d'enfoncer le robinet à la main, ne pas essayer de le réparer. Faire appel à un spécialiste. Forcer ou tenter de réparer le robinet pourrait être à l'origine d'une explosion ou d'un incendie.

D. Il est déconseillé d'utiliser cet appareil en contact prolongé avec l'eau. Faire inspecter ou remplacer toute commande par un technicien qualifié si un des systèmes de contrôle du gaz s'est trouvé sous l'eau.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to the lowest setting.
3. Turn off all electrical power to the appliance.
4. The appliance's ignition device automatically lights the burner. Do not try to light burner by hand.
5. Remove the control access door/panel (upper door if two-door model).
6. Move the gas control knob clockwise ↷ to "OFF". (See Figure 11)
7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in above information. If you don't smell gas, go to the next step.
8. Move the gas control knob counterclockwise ↶ to "ON". (See Figure 11)
9. Replace the control access door/panel (upper door if two-door model).
10. Turn on all electrical power to the appliance.
11. Turn the thermostat to a desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

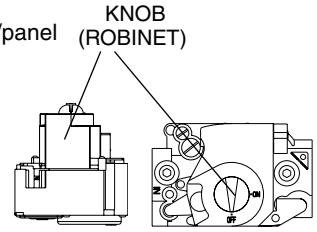


Figure 11

MODE D'EMPLOI

1. **ATTENTION!** Lire d'abord la liste des mesures de sécurité ci-dessus.
2. Mettre le thermostat à la position minimale.
3. Couper le courant électrique qui mène à l'appareil.
4. Cet appareil ménager étant doté d'un système d'allumage automatique, ne pas essayer d'allumer le brûleur manuellement.
5. Retirer le panneau/volet d'accès de commande (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
6. Faire tourner le robinet à gaz dans le sens des aiguilles d'une montre ↷ pour l'amener sur la position OFF (Arrêt) (Voir Figure 11).
7. Attendre cinq (5) minutes pour s'assurer de la dissipation du gaz En cas d'odeur, ARRÊTER LE PROCÉDÉ. Suivre les instructions ci-dessus (Section B). En l'absence de toute odeur de gaz, avancer à l'étape suivante.
8. Faire tourner le robinet à gaz dans le sens inverse des aiguilles d'une montre ↶ pour l'amener sur la position ON (Marche) (Voir Figure 11).
9. Remettre le panneau/volet d'accès de commande en place (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
10. Rebrancher l'appareil sur le réseau électrique.
11. Ajuster le thermostat à la position désirée.
12. Si l'appareil ne fonctionne pas, suivre les "Directives d'arrêt" cidessous et appeler le technicien de service.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to the lowest setting.
2. Turn off all electrical power to the appliance if service is to be performed.
3. Remove the control access door/panel (upper door if two-door model).
4. Move the gas control knob clockwise ↷ to "OFF". Do not use force. (See Figure 11)
5. Replace the control access door/panel (upper door if two-door model).

DIRECTIVES D'ARRÊT

1. Mettre le thermostat à la position minimale.
2. Débrancher l'appareil en prévision de la réparation.
3. Retirer le panneau/volet d'accès de commande (panneau supérieur s'il s'agit d'un modèle à deux panneaux).
4. Faire tourner le robinet à gaz dans le sens des aiguilles d'une montre ↷ pour l'amener sur la position OFF (Arrêt) Ne pas forcer (Voir Figure 11).
5. Remettre le panneau/volet d'accès de commande en place (panneau supérieur s'il s'agit d'un modèle à deux panneaux).

GAS FLOW RATE (CUBIC FEET PER HOUR)							
TIME FOR ONE REVOLUTION (SECONDS)	CUBIC FEET PER REVOLUTION OF METER			TIME FOR ONE REVOLUTION (SECONDS)	CUBIC FEET PER REVOLUTION OF METER		
	1	5	10		1	5	10
10	360	1800	3600	66	55	273	545
12	300	1500	3000	68	53	265	529
14	257	1286	2571	70	51	257	514
16	225	1125	2250	72	50	250	500
18	200	1000	2000	74	49	243	486
20	180	900	1800	76	47	237	474
22	164	818	1636	78	46	231	462
24	150	750	1500	80	45	225	450
26	138	692	1385	82	44	220	439
28	129	643	1286	84	43	214	429
30	120	600	1200	86	42	209	419
32	113	563	1125	88	41	205	409
34	106	529	1059	90	40	200	400
36	100	500	1000	92	39	196	391
38	95	474	947	94	38	191	383
40	90	450	900	96	38	188	375
42	86	429	857	98	37	184	367
44	82	409	818	100	36	180	360
46	78	391	783	102	35	176	353
48	75	375	750	104	35	173	346
50	72	360	720	106	34	170	340
52	69	346	692	108	33	167	333
54	67	333	667	110	33	164	327
56	64	321	643	112	32	161	321
58	62	310	621	114	32	158	316
60	60	300	600	116	31	155	310
62	58	290	581	118	31	153	305
64	56	281	563	120	30	150	300

Table 8. Gas Flow Rate (Cubic Feet Per Hour).

The manifold pressure for high fire must be set to the appropriate value for your installation. Refer to either **Table 3** for natural gas or **Table 4** for LP/propane gas to verify the manifold pressure setting required for your particular installation. To adjust the manifold pressure, remove the regulator cap and turn the high fire adjusting screw clockwise to increase pressure or counterclockwise to reduce pressure. Replace the regulator cap after adjustments are complete.

Verifying and Adjusting Temperature Rise — Verify that the temperature rise through the unit is within the range specified on the unit data label. Temperature rises outside the specified range could result in premature heat exchanger failure.

Place thermometers in the return and supply air stream as close to the duct connections as possible. The thermometer on the supply air side must be shielded from direct radiation from the heat exchanger to avoid false readings. Adjust all registers and duct dampers to the desired position and run the unit for ten to fifteen minutes before taking any temperature readings. The temperature rise is the difference between the supply and return air temperatures.

For typical duct systems, the temperature rise will fall within the range specified on the data label with the blower speed at the factory recommended setting **(see Table 7)**. If the temperature rise measured is outside the range specified, it may be necessary to change the blower speed. Lower blower speeds will increase the temperature rise and higher blower speeds will decrease the temperature rise.

The unit is equipped with a variable speed motor. Heating and cooling speed selection is made by changing the switch settings on the integrated control located in the unit control box. Refer to the Variable Speed Blower Section of this installation instruction for more details.

The VSB is designed with built in delay profiles for start up and shut down of the system. See the Sequence of Operation section on page 24 for more details.

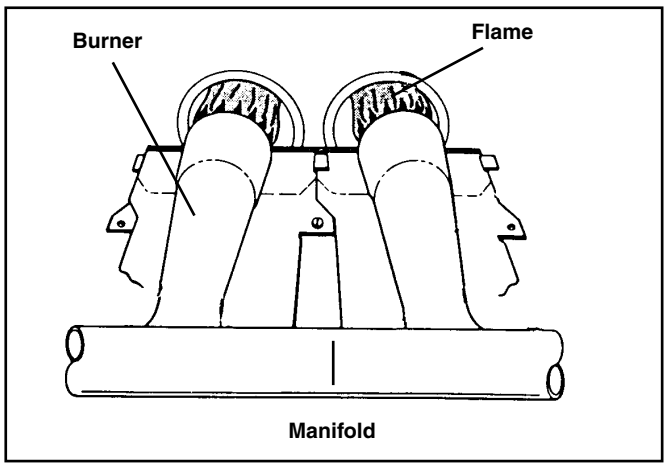


Figure 11. Burner Inspection

Verifying Burner Operation — To verify operation of the burners remove the louvered control access panel to ensure there is power to the unit. Set the thermostat to a temperature above room temperature and observe the ignition sequence. The burner flame should carry over immediately between all burners. The flames should be blue, without yellow tips. Flames should extend from each burner without lifting off, curling, or floating. Make sure the flame is drawn into the center of the heat exchanger tube (**See Figure 11**). In a properly adjusted burner assembly, the flame bends down and to the right at the end of the heat exchanger tube. The end of the flame will be out of sight around the bend. After verifying satisfactory flame characteristics, set the thermostat to a temperature below room temperature and verify that the burner flame extinguishes completely.

⚠ WARNING:

Uninsulated live components are exposed when louvered control access panel is removed.

Verify Operation of Over-Temperature Limit Control – To verify operation of the over-temperature limit control, make sure that the louvered control access panel is in place and that there is power to the unit. Block the return airflow to the unit by installing a close-off plate in place of or upstream of the filter. Set the thermostat to a temperature above room temperature and verify the unit operates with the correct sequence of operation (see page 24). The over-temperature limit control should function to turn off the gas valve within approximately four minutes (the exact time depending on the efficiency of the close-off in blocking the return air to the unit). The circulating air and combustion blowers should continue to run when the over-temperature limit control switch opens. Remove the close-off immediately after the over-temperature limit control opens. If the unit operates for more than four minutes with no return air, set the thermostat to a temperature below room temperature, shut off the power to the unit, and replace the over-temperature limit control.

COMPONENT FUNCTIONS

Flame Sensor — The flame sensor acts to prove that flame has carried over from the ignitor to the right-most burner. If no flame is sensed, the unit will be shut down automatically.

Flame Roll-Out Control — The flame roll-out control acts to verify that the burner flame is being drawn into the heat exchanger tubes. If the burner flame is not being drawn into the heat exchanger tubes, the roll-out control will open within several seconds and the integrated control diagnostic light will flash one time. The circulating air blower and combustion blower will continue to operate if the flame roll-out control opens.

Gas Valve — The gas valve acts to control the flow of gas to the burners in both low and high fire. When the gas valve is energized it automatically opens and regulates the gas pressure in the manifold.

Pressure Switch — The pressure switch acts to verify that the inducer motor is drawing the combustion gases through the heat exchanger tubes and venting the gases through the vent system.

Over-Temperature Limit Control — The over-temperature limit control acts to prevent the air temperature leaving the unit from exceeding the maximum outlet air temperature. If the limit opens, the integrated control diagnostic will flash one time. The circulating air blower and combustion blower will continue to operate if the over-temperature limit control opens.

Comfort Alert™ Diagnostics (Optional) – Faster Service And Improved Accuracy — The Comfort Alert diagnostics module is a breakthrough innovation for troubleshooting
heat pump and air conditioning system failures. By monitoring and analyzing data from the Copeland Scroll® compressor and the thermostat demand, the module can accurately detect the cause of electrical and system related failures without any sensors. A flashing LED indicator communicates the ALERT code and guides the service technician more quickly and accurately to the root cause of a problem.

NOTE: This module does not provide safety protection! The Comfort Alert module is a monitoring device and cannot shut down the compressor directly.

LED Description (Figure 12)
POWER LED (Green): indicates voltage is present at the power connection of the module.

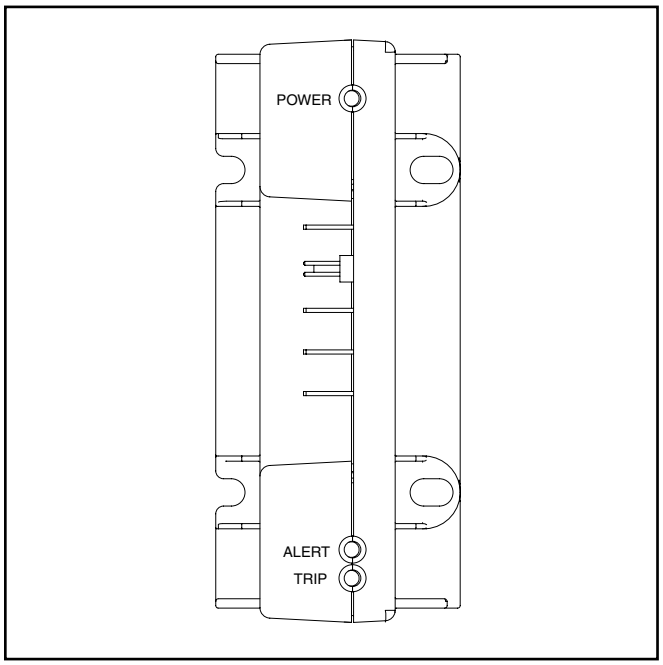


Figure 12. Comfort Alert Module

ALERT LED (Yellow): communicates an abnormal system condition through a unique flash code. The ALERT LED will flash a number of times consecutively, pause and then repeat the process. The number of consecutive flashes, defined as the Flash Code, correlates to a particular abnormal condition. Detailed descriptions of specific ALERT Flash Codes are shown in two tables on pages 8 and 9 of this manual.

TRIP LED (Red): indicates there is a demand signal from the thermostat but no current to the compressor is detected by the module. The TRIP LED typically indicates the compressor protector is open or may indicate missing supply power to the compressor.

UNIT MAINTENANCE

⚠ WARNING:

To avoid risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical supply.

Refrigerant Charging — Packaged heat pumps are fully charged with R-410A refrigerant at the factory. The system refrigerant charge can be checked and adjusted through the service ports provided at the front panel. Use only gauge lines which have a “Schrader” depression device present to actuate the valve. Draw a vacuum on gauge lines to remove air before attaching them to the service ports on the unit. Refrigerant charging must be done by qualified personnel familiar with safe and environmentally responsible refrigerant handling procedures.

⚠ WARNING:

Single Package Dual Fuel iHybrid™ Heat Pumps are shipped fully charged with R-410A refrigerant and ready for installation. When a system is installed according to these instructions, no refrigerant charging is required. If repairs make it necessary for evacuation and charging, it should only be done by qualified, trained personnel thoroughly familiar with this equipment. Some local codes require licensed installation/service personnel to service this type of equipment. Under no circumstances should the owner attempt to install and/or service this equipment. Failure to comply with this warning could result in property damage, personal injury, or death.

⚠ CAUTION:

Use care when removing parts from this unit. Personal injury can result from sharp metal edges present in all equipment of sheet metal construction.

Routine Maintenance — Proper maintenance is important to achieve optimum performance from the heat pump. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these skills, contact your dealer for maintenance. Consult your local dealer about the availability of maintenance contracts. At a minimum, routine maintenance should include the following:

1. Inspect and clean or replace air filters at the beginning of each heating and cooling season, or more frequently if required.
2. Inspect the condensate drain and outdoor coil at the beginning of each cooling season. Remove any debris. Clean the outdoor coil and louvers as necessary using a mild detergent and water. Rinse thoroughly with water.
3. Inspect the electrical connections for tightness at the beginning of each heating and cooling season. Service as necessary.

⚠ CAUTION:

The unit should never be operated without a filter in the return air system. Replace disposable filters with the same type and size.

4. The motors for the circulating air blower and the outdoor fan are pre-lubricated at the factory. No further oiling is required for the life of this product.
5. Inspect and clean the screen of the vent cover assembly at the beginning of each heating and cooling season.
6. The blower compartment should be cleaned monthly during the heating and cooling seasons to remove any dirt and lint that may have accumulated in the compartment or on the blower and motor. Buildup of dirt and lint on the blower and motor can create excessive loads on the motor resulting in higher than normal operating temperatures and possible shortened service life.
7. Maintain heat exchanger and burners. The unit should operate for many years without excessive scale buildup in the heat exchanger, however, the heat exchanger, the vent system, and the burners should be inspected and cleaned (if required) by a qualified serviceman annually to ensure continued safe operation. Particular attention must be given to identify deterioration from corrosion or other sources.

⚠ WARNING:

Holes in the heat exchanger can cause products of combustion to enter the home. Replace the heat exchanger if leaks are found. Failure to prevent products of combustion from being circulated into the living space can create potentially hazardous conditions including carbon monoxide poisoning that could result in personal injury or death.

Cleaning of Heat Exchanger — If the heat exchanger must be cleaned due to soot or scale build up, follow the steps below.

1. Shut off the gas supply to the unit either at the meter or at the manual valve in the gas supply piping.
2. Turn off all power to the unit and set the thermostat to the lowest temperature setting.
3. Remove the louvered control access panel from the unit.
4. Turn the gas control knob on the gas valve to the "OFF" position.
5. Disconnect the wires from the gas valve, ignitor, flame sensor, combustion air motor, flame roll-out control, over-temperature limit switch, and pressure switch.
6. Remove the silicone rubber tube from the collector pan to the pressure switch.
7. Remove the four nuts that hold the combustion blower to the collector pan and remove the complete combustion blower.
8. Remove the screws that hold the collector pan in place, and remove the collector pan from the unit.
9. Using wrenches, separate the ground-joint union in the gas supply piping at the unit.
10. Remove the piping between the gas valve and the ground-joint union, if necessary.
11. Remove the screws that hold the burner assembly in place and remove the burner assembly. **BE EXTREMELY CAREFUL NOT TO DAMAGE THE IGNITOR WHILE REMOVING THE BURNER ASSEMBLY.**
12. The unit heat exchanger tubes can now be cleaned by the use of a round wire brush attached to a length of high grade stainless steel cable, such as drain cleanout cable. Attach variable speed reversible drill to the other end of the spring cable. Slowly rotate the cable with the drill and insert it into the top portion of the heat exchanger. While reversing the drill, work the cable in and out several times to obtain sufficient cleaning. Repeat this sequence for each heat exchanger tube.
13. When all heat exchanger tubes have been cleaned, any debris inside the tubes can be removed with the nozzle of a vacuum cleaner.
14. With a light, check the condition of the upper and lower sections of the heat exchanger tube.
15. Inspect the burners and clean them (if necessary) with a soft wire brush and/or the nozzle of a vacuum cleaner. **BE EXTREMELY CAREFUL NOT TO DAMAGE THE IGNITOR WHILE CLEANING THE BURNER.**
16. Replace all the parts in reverse order from which they were removed.
17. Follow the operating instructions found on the right side door and the User's Information Manual to return the unit to operation.

Cleaning of Burners — If the burners must be cleaned, follow the steps below.

1. Shut off the gas supply to the unit either at the meter or at a manual valve in the supply piping.
2. Turn off all power to the unit and set the thermostat to the lowest temperature setting.
3. Remove the louvered control access panel from the unit.
4. Turn the gas control knob to the "OFF" position.
5. Disconnect the wires from the gas valve, ignitor, and flame sensor.
6. Using wrenches, separate the ground-joint union in the gas supply piping at the unit.
7. Remove the piping between the gas valve and the ground-joint union, if necessary.
8. Remove the screws that hold the burner assembly in place and remove the burner assembly. **BE EXTREMELY CAREFUL NOT TO DAMAGE THE IGNITOR WHILE REMOVING THE BURNER ASSEMBLY.**

9. Inspect the burners and clean them (if necessary) with a soft wire brush and/or the nozzle of a vacuum cleaner. **BE EXTREMELY CAREFUL NOT TO DAMAGE THE IGNITOR WHILE CLEANING THE BURNER.**
10. Replace all the parts in reverse order from which they were removed.
11. Follow the lighting instructions found on the lower unit door to return the unit to operation.

⚠ CAUTION:

Verify proper operation after servicing.

SEQUENCE OF OPERATION

The operating sequences for the heating, cooling, and fan modes are described below. Refer to the field and furnace wiring diagrams; Figures 12 and 12a.

Heating Mode 2-Stage (Heat Pump):

1. On an initial call for heating the thermostat closes applying 24 VAC to G and Y1 terminals. This closes the compressor contactor and the compressor operates on first stage. NOTE: The reversing valve is not energized in heating mode.
2. The control energizes the circulating blower at first stage for the selected air flow.
3. If the thermostat is not satisfied in the required time, based on the operation of the two-stage cooling thermostat, Y2 will energize and the compressor will run at second stage. Refer to the thermostat installation instructions for the heating profile.
4. When the thermostat is satisfied, G and Y terminals on the control board are de-energized, opening the compressor contactor.
5. If the thermostat does not satisfy on second stage heat pump mode, the thermostat or outdoor sensor will call for the back-up gas heat. NOTE: if the unit is switching from heat pump to gas heat the outdoor fan and compressor will continue to run until flame ignition is detected in the furnace. The indoor blower will continue to run.

Gas Heating / Emergency Heat Mode:

1. On a call for heat the thermostat closes, applying 24 VAC to the W terminal on the terminal block.
2. The control board checks for continuity on the 24 VAC limit control circuit (over-temperature limit switch, flame rollout switches and blocked vent switch in series). If an open limit is detected the control board will energize the inducer blower. All other system functions will be inoperable until the limit circuit closes. While the limit is open, the red LED will pulse at a rate of 1 blink per unit time.
3. The furnace control checks for continuity across the pressure switch (24 VAC). If the pressure switch is closed the heat mode sequence will not continue. If it remains closed for 10 seconds the red LED will blink 3 times repetitively until the fault condition clears.
4. The inducer is energized.
5. The pressure switch will close. If the pressure switch does not close after 10 seconds the fault LED will blink 2 times repetitively and the inducer will continue to run until the switch is closed.
6. The inducer will pre-purge for 30 seconds and then the igniter will start its warm-up as follows:
   Initial Power up: After 30 seconds of igniter warm-up the gas valves (24 VAC) will then open. The igniter circuit will stay energized for 3 seconds after the gas valve opens.

   After Initial Power up: The control has a programmed adaptive ignition feature which varies the warm-up period as follows: If ignition is successful the warm-up is *reduced* by 3-seconds on each subsequent call for heat until ignition failure occurs. Upon ignition failure, the warm-up is *increased* by 3-seconds on the next try. If successful, the timing remains fixed at this level. In general, whenever ignition failure occurs the warm-up interval is increased by 3-seconds on the next try. And if successful, it remains there. Minimum and maximum warm-up time limits are set at 6 and 54 seconds, respectively.
7. The furnace control must prove flame via the flame sensor 5 seconds after the gas valves open. If flame is sensed, burners are on and the igniter cools off. If no flame is sensed, the gas valve closes immediately and the inducer continues to run. A second trial for ignition (step 6) begins. If no flame is sensed on the fifth try for ignition, the furnace control is locked and the red LED will blink 4 times repetitively. The thermostat must be opened for at least ten seconds to reset the furnace control after a lock out. Otherwise, the furnace will attempt another ignition sequence in 1 hour.
8. The furnace control energizes the circulating air blower at a very low speed. After 30 seconds, the blower will ramp to the airflow selected for heating.
9. If the unit is wired for two stage operation, only the low-fire burners will be fired. If the need for stage 2 occurs, the gas valve will open further, firing the remaining burners. At this time the circulating air blower will ramp up to the high-fire airflow.
10. When the thermostat has been satisfied, gas valve is de-energized.
11. The inducer is de-energized after a 30 second postpurge.
12. The circulating air blower remains on for 120 seconds.
13. Abnormal conditions: If a limit opens during operation, the inducer blower continues to operate. The gas valve is de-energized immediately. The inducer blower continues to operate until the limit closes, then is de-energized.

Cooling Mode 2-Stage:

1. On a call for cooling the thermostat closes, applying 24 VAC to the G,O and Y1 terminals on the control. This closes the compressor contactor, energizes the reversing valve, and the compressor operates on 1st stage.
2. The control energizes the circulating blower to 1/3 of the selected airflow for approximately 30 seconds.
3. The circulating blower will then ramp to approximately 3/4 of the selected airflow for another 30 seconds before adjusting to full airflow until the thermostat is satisfied.
4. If the thermostat is not satisfied in the required time, based on the operation of the two-stage cooling thermostat, Y2 will energize and the compressor will run at second stage. Refer to the thermostat installation instructions for the cooling profile.
5. When the thermostat is satisfied, the G,O and Y terminals on the control board are de-energized opening the compressor contactor, and de-energizing the reversing valve.
6. The circulating air blower will operate at 1/2 of the selected speed for 60 seconds, and de-energize.

Fan Mode:

1. On a call for fan operation, the thermostat applies 24 VAC to the G terminal on the furnace control board.
2. The circulating air blower ramps to 1/2 of the selected airflow.

Unit Fails to Operate

If the unit does not operate in the cooling mode, be certain to check the following:

1. The thermostat is operating properly.
2. Electrical power to the unit is turned on.
3. The filters are not dirty.
4. The service doors are in place.
5. The 3 amp fuse is operational.
6. The anti-short cycle timer's 5-minute cycle has finished for single phase units.

If the unit does not operate in the heating mode, be certain to check the following:

1. The thermostat is operating properly.
2. Electrical power to the unit is turned on.
3. The filters are not dirty.
4. The gas is turned on.
5. The manual shut-off valve is open.
6. The service doors are in place.
7. The flame roll-out control is closed.
8. Refer to the diagnostic code table on the wiring diagram or see **Table 9**.
9. The 5 amp fuse is operational.

FAULT CONDITION	STATUS LIGHT (RED)
Power On	On
Limit Circuit Open	1 Flash
Pressure Switch Stuck Open	2 Flash
Pressure Switch Stuck Closed	3 Flash
Ignition Failure (Check Ground)	4 Flash
230 VAC & Neutral Reversed or No Ground	5 Flash
False Flame or Gas Relay Shorted	Continuous Flash
Power Off	Off
FAULT CONDITION	**STATUS LIGHT (YELLOW)**
Low Flame Sensor Signal	Continuous Flash
Flame Present	On

Table 9. Diagnostic Codes

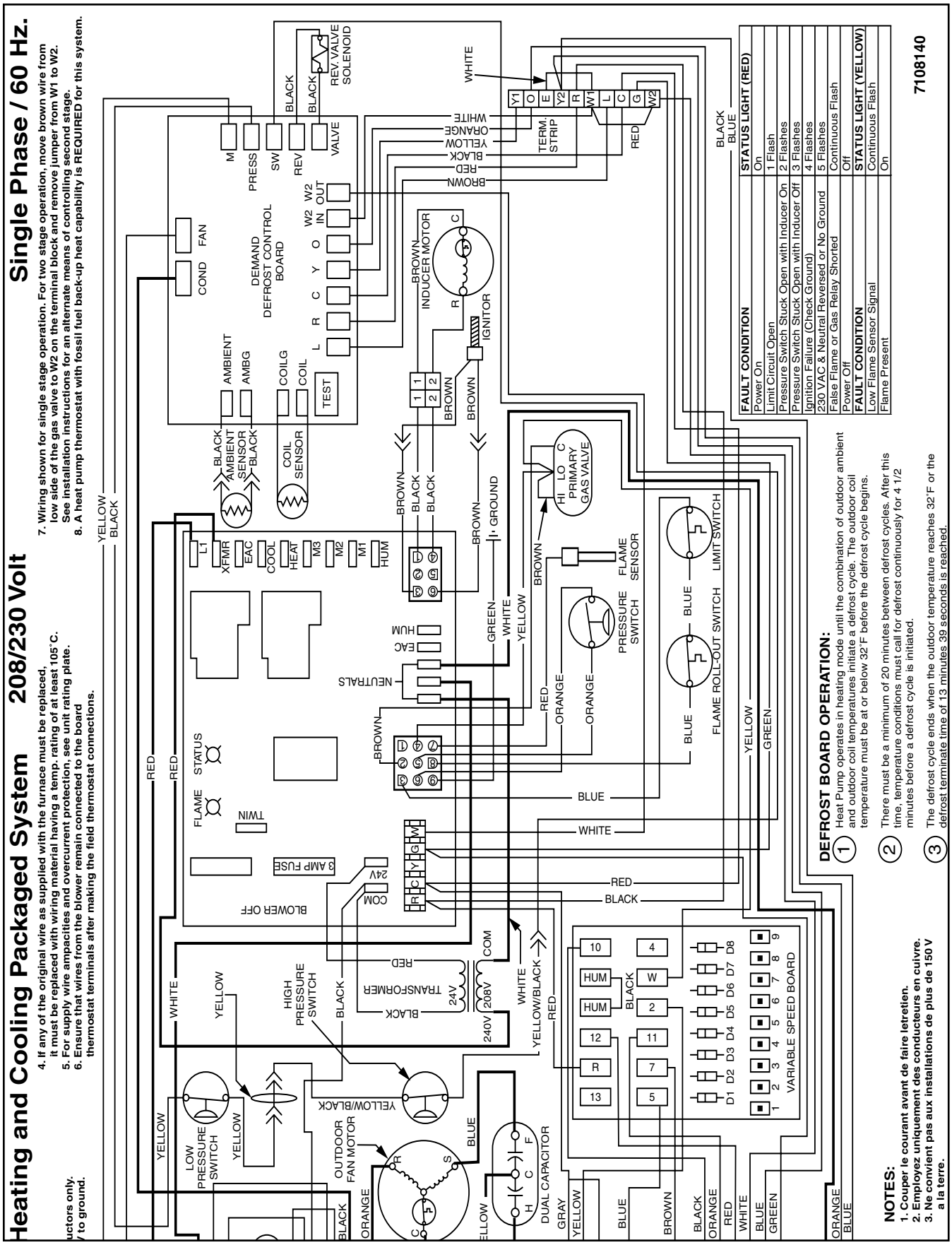


Figure 13. Two Stage Cool, Two Stage Heat (Heat Pump)
High Fire Only-Gas Heating

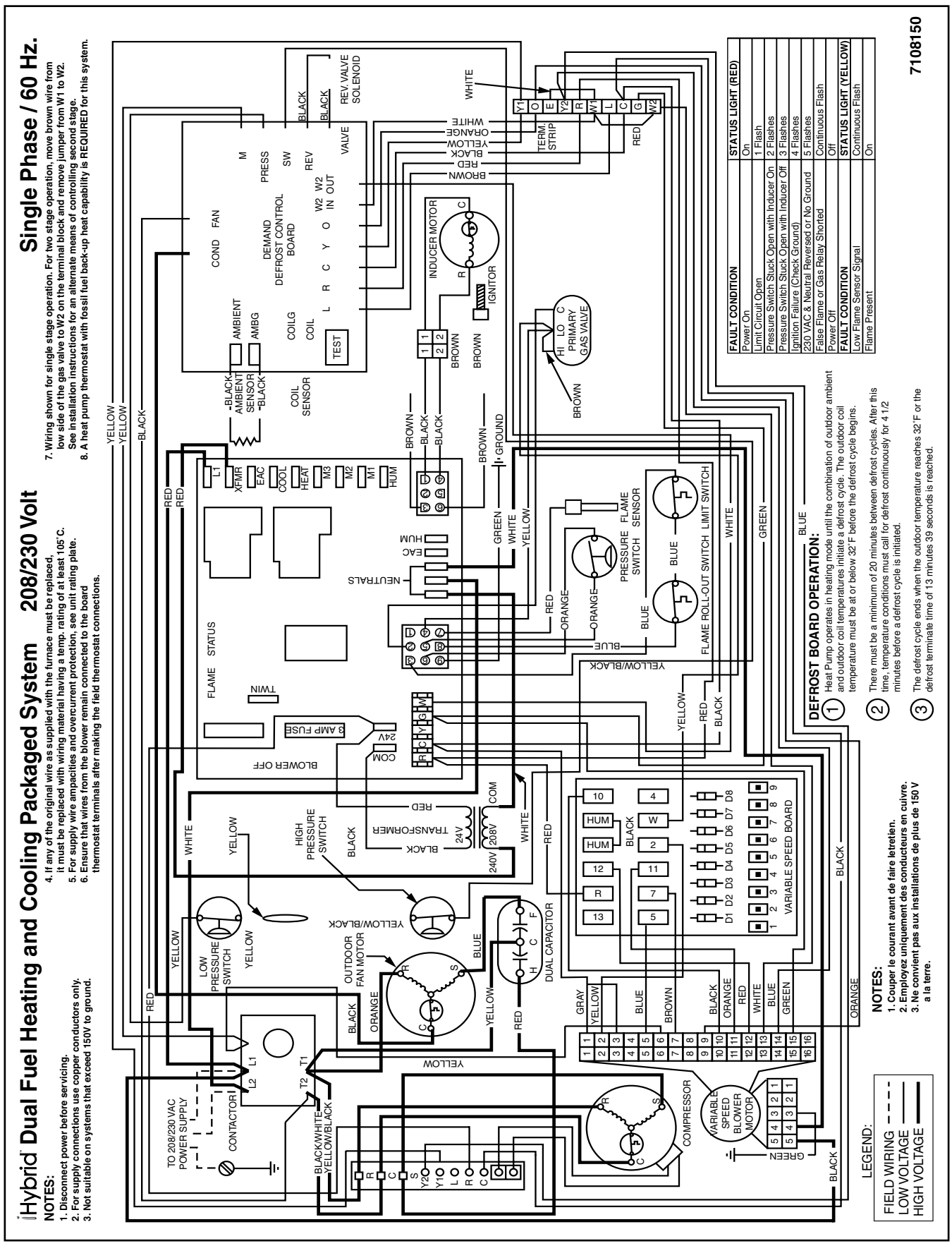
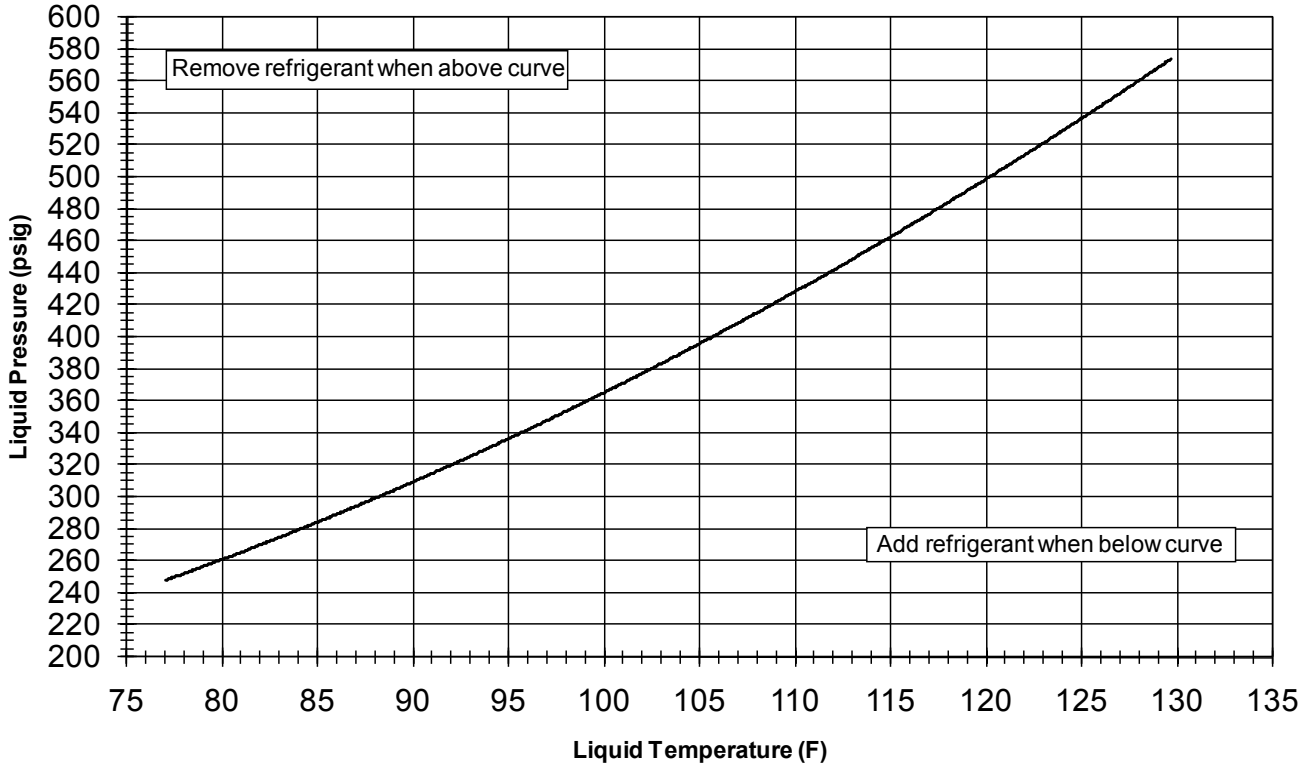


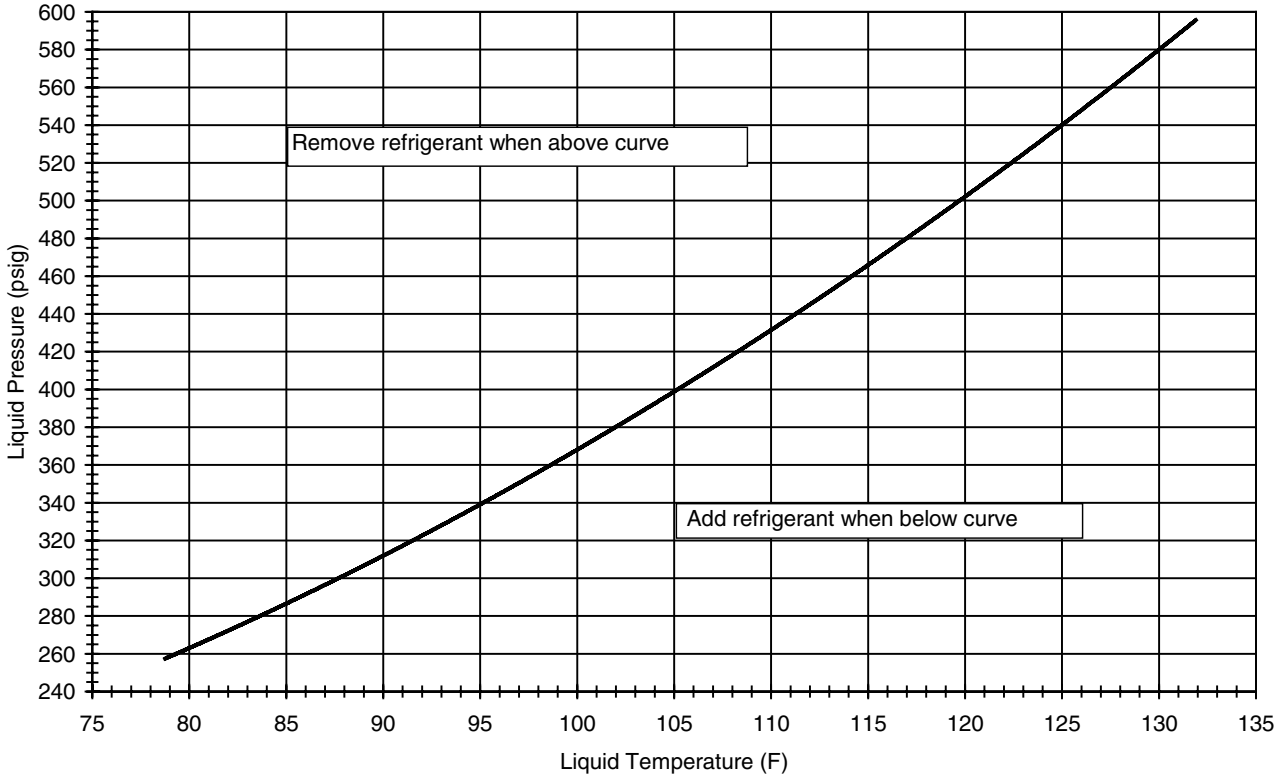
Figure 13a. Two Stage Cool, Two Stage Heat (Heat Pump)
High Fire Only-Gas Heating "With Optional Comfort Alert"

Charging Chart Cooling

DF6SF-X24K(A) Charging Chart

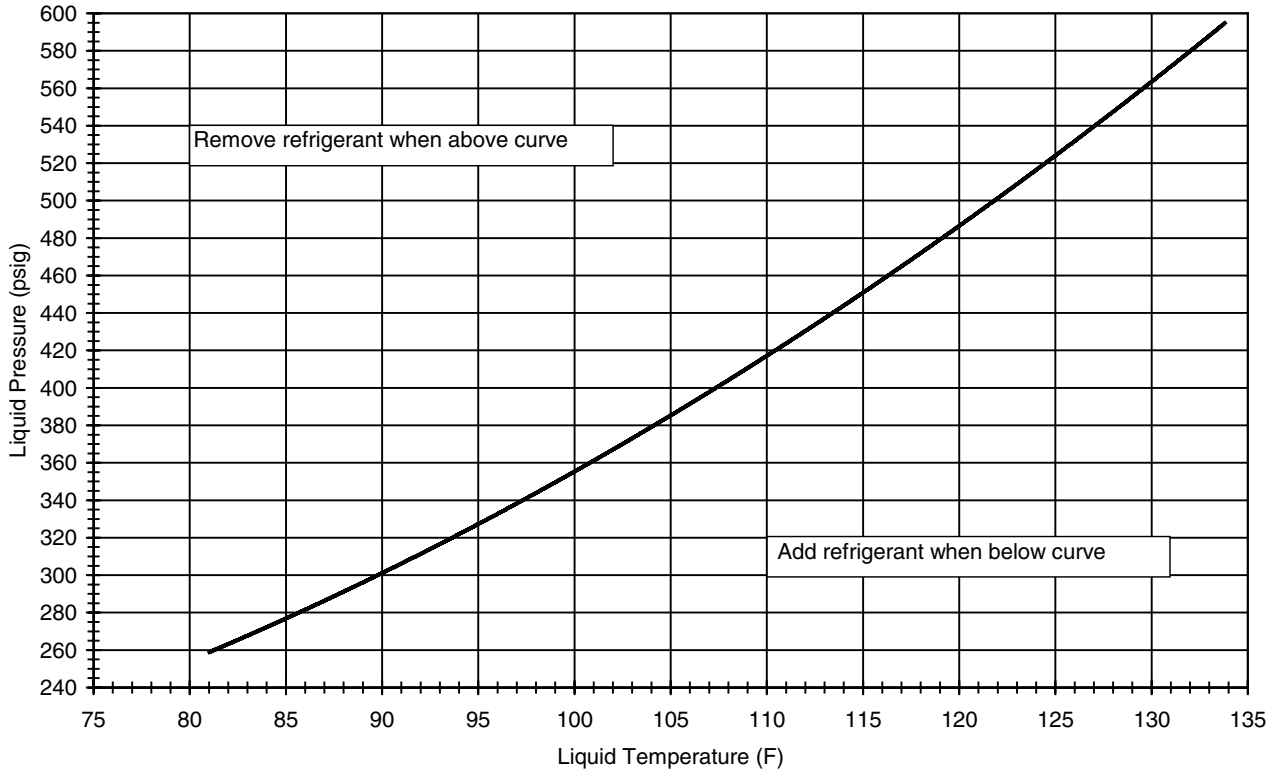


DF6SE-X36 Charging Chart

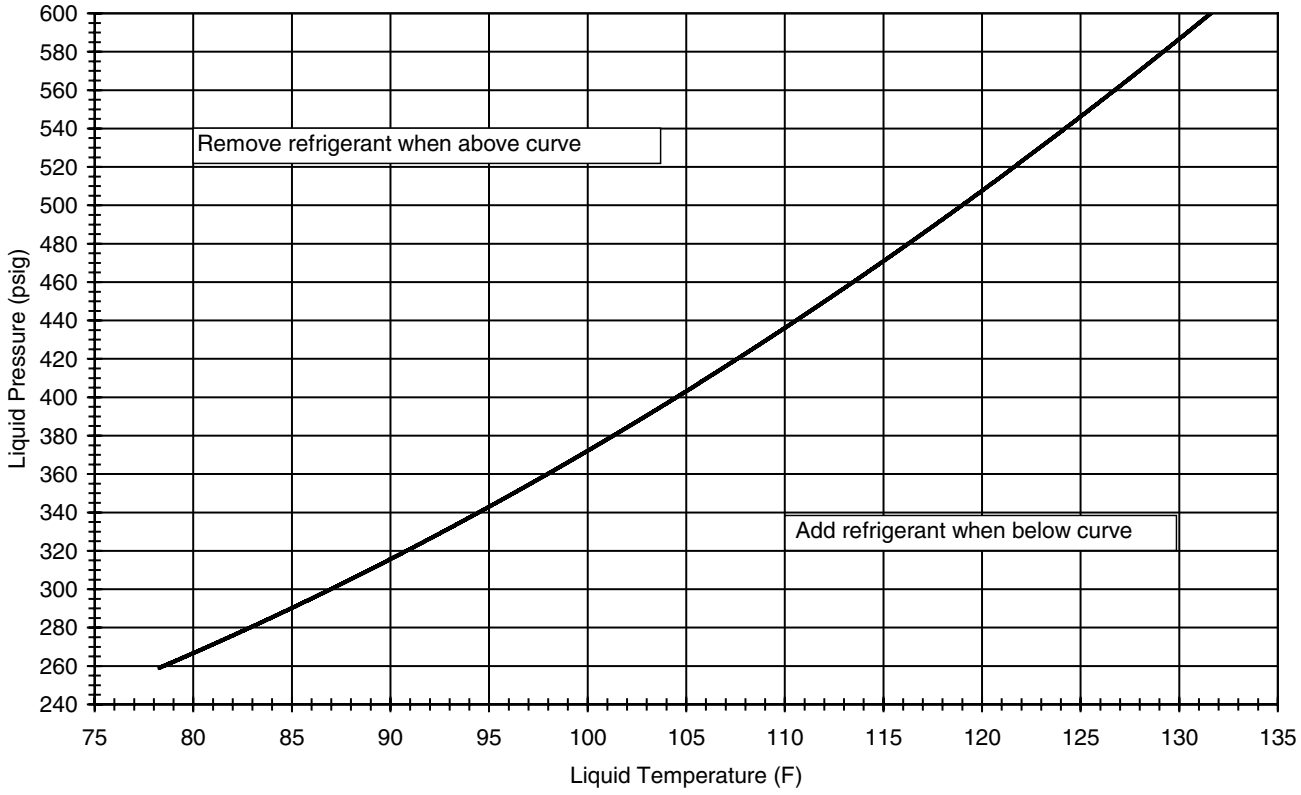


Charging Chart Cooling

DF6SE-X48 Charging Chart



DF6SE-X60 Charging Chart



INSTALLATION/PERFORMANCE CHECK LIST

LOCATION_____ CITY_____ STATE_____

INSTALLER _____ CITY_____ STATE_____

UNIT MODEL NUMBER _____ UNIT SERIAL NUMBER _____

Minimum Clearances per Table 1? _____

Electrical Connections tight? _____

Supply Voltage: _____ Volts

Blower Motor H.P.: _____

FUEL TYPE:

Natural Gas _____ LP/Propane _____

Gas Piping Connections leak-tested? _____

Gas Line Pressure: _____

(in. water column, with furnace operating)

Manifold Pressure: _____

(in. water column, with furnace operating)

Is there adequate fresh air supply for combustion and ventilation? _____

Furnace Input: _____ (Btu/hr)

Supply Air Temperature: _____ (°F)

Return Air Temperature: _____ (°F)

Temperature Rise: _____ (°F)

Is the vent hood installed? _____

Is there Proper Draft? _____

Is vent hood free from restrictions? _____

Is the Filter(s) clean? _____

Has the Thermostat been calibrated? _____

Is the Thermostat level? _____

Is the Heat Anticipator Setting correct? _____

Has the Owner's Information been reviewed with the homeowner? _____

Has the Literature Package been left with the homeowner? _____

INSTALLER: PLEASE LEAVE THESE INSTALLATION INSTRUCTIONS WITH THE HOMEOWNER.

Specifications & illustrations subject to change without notice or incurring obligations (05/15).
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