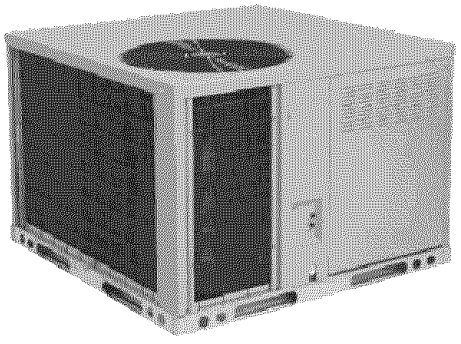
Packaged Dual Fuel Units



Owner's Guide to Operating and Maintaining Your Dual Fuel Unit

⚠ WARNING

ELECTRICAL SHOCK HAZARD.

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

Disconnect power at fuse box or service panel before performing recommended maintenance.

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK HAZARD.

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

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

⚠ WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in serious injury, death, and/or property damage.

- Information in this manual MUST be followed exactly.
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- WHAT TO DO IF YOU SMELL GAS
  - Leave the building immediately.
  - Do not try to light any appliance.
  - Do touch any electrical switch; do not use any phone in the building.
  - Immediately call your gas supplier from a neighbors phone. Follow the gas suppliers instructions.
  - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

This manual should be left with the owner.

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SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags, and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguisher available for all brazing operations.

⚠ WARNING

FIRE AND ELECTRICAL SHOCK HAZARD

Improper installation, adjustment, alteration, service, maintenance, or use can cause fire or an explosion which could result in personal injury or unit damage. Consult a qualified installer, service agency, or gas supplier for information or assistance. The qualified installer or agency must use only factory-authorized kits or accessories when modifying this product.

⚠ WARNING

FIRE, AND ELECTRICAL SHOCK HAZARD

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

Before performing service or maintenance operations on unit, turn off gas supply to unit. *Then* turn off unit main power switch and install lockout tag.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE**. These words are used with the safety-alert symbol. **DANGER** identifies the most serious hazards which **will** result in serious injury or death. **WARNING** signifies a hazard which **could** result in serious injury or death. **CAUTION** is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. **NOTE** is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

It is the personal responsibility and obligation of the customer to contact a qualified installer to ensure that the installation is adequate and conforms to governing codes and ordinances.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in the shorten life of unit components.

Do NOT operate unit in a corrosive atmosphere containing chlorine, fluorine, or any other corrosive chemicals.

TO LIGHT UNIT

Your combination heating/cooling unit is equipped with an automatic direct spark ignition and power combustion blower.

⚠ WARNING

FIRE AND/OR EXPLOSION HAZARD

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

Do NOT attempt to light the pilot or burner with a match or flame of any kind.

⚠ WARNING

FIRE AND/OR EXPLOSION HAZARD

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

Do not turn off the electrical power to unit without first turning off the gas supply.
Before attempting to start the gas heating section, familiarize yourself with all the procedures that must be followed.

Refer to Figure 1 for gas valve location.

1. Set the temperature selector on room thermostat to the lowest temperature setting and set system switch to **EMERGENCY HEAT** or **AUXILIARY HEAT**.
2. Close the external manual shutoff valve.
3. Turn off the electrical supply to the unit.
4. Remove the front access panel with a 5/16 -in. nut driver.
5. Move the selector switch on the internal gas valve to the OFF position and wait 5 minutes.
6. Move the selector switch on the internal gas valve to the ON position.
7. Replace the front access panel.
8. Turn on the electrical supply to unit.
9. Open the external manual shutoff valve.
10. Set the temperature selector on room thermostat slightly above room temperature to start unit. The induced-draft combustion-air fan will start. Main gas valve will open and burners should ignite the gas within 25 seconds. If burners do not light within 25 seconds, the ignition control will go into a Retry Mode that will take another 25 seconds. If the burners fail to ignite the gas in 4 consecutive attempts, the unit will lockout for 3 hours.
11. Set the temperature selector on room thermostat to desired setting.
12. Return thermostat system switch to **HEAT**.

⚠ WARNING

FIRE AND/OR EXPLOSION HAZARD

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

1. If the main burners fail to light, or the blower fails to start, shut down gas heating section and call your dealer for service.
2. Never attempt to manually light the main burners on unit with a match, lighter, or any other flame. If the electric sparking device fails to light the main burners, refer to the following shutdown procedures, then call your dealer as soon as possible.

TO SHUT UNIT OFF

⚠ WARNING

FIRE AND/OR EXPLOSION HAZARD

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

Do not turn off the electrical power to unit without first turning off the gas supply.

NOTE: If unit is being shut down because the heating season has ended, make sure to turn on power to cooling system.

If unit is being shut down because of a malfunction, call your dealer as soon as possible.

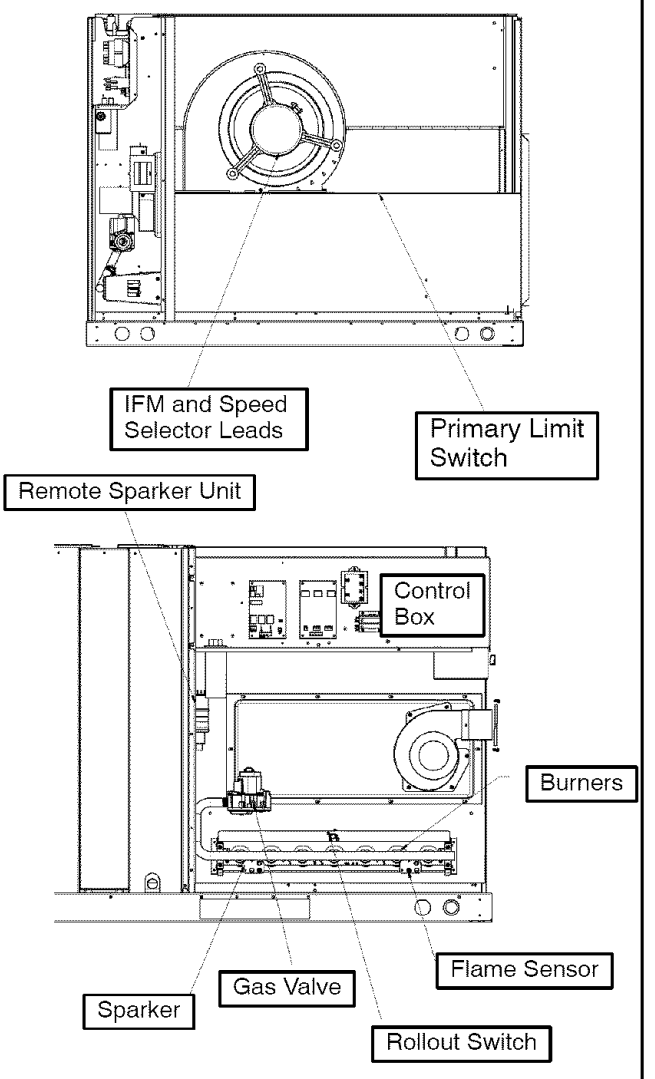
Should the gas supply fail to shut off or if overheating occurs, shut off the manual gas valve to the unit before shutting off the electrical supply.

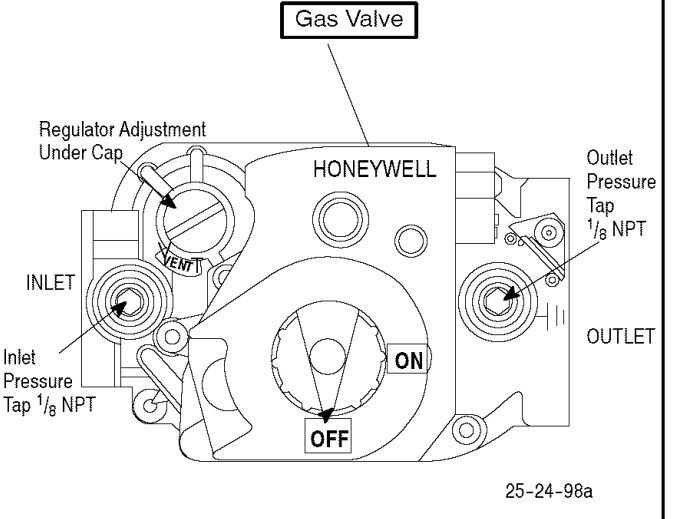
Do not use this furnace if any part has been under water. A flood-damaged furnace is extremely dangerous. Attempts to use the furnace can result in fire or explosion. A qualified service agency should be contacted to inspect the furnace and to replace all gas controls, control system parts, electrical parts that have been wet or the furnace if deemed necessary.

Refer to Fig. 1 while proceeding with the following steps.

1. Set the temperature selector on room thermostat to lowest temperature setting and set system switch to OFF.
2. Close the external manual shutoff valve.
3. Turn off the electrical power supply to the unit.
4. Remove the front access panel.
5. Move the selector switch on the internal gas valve to the OFF position.
6. Replace the burner access panel.
7. Restore electrical power to the unit and set system switch to COOL to ensure operation of the cooling system during the cooling season.

Figure 1 Access to Gas Valve



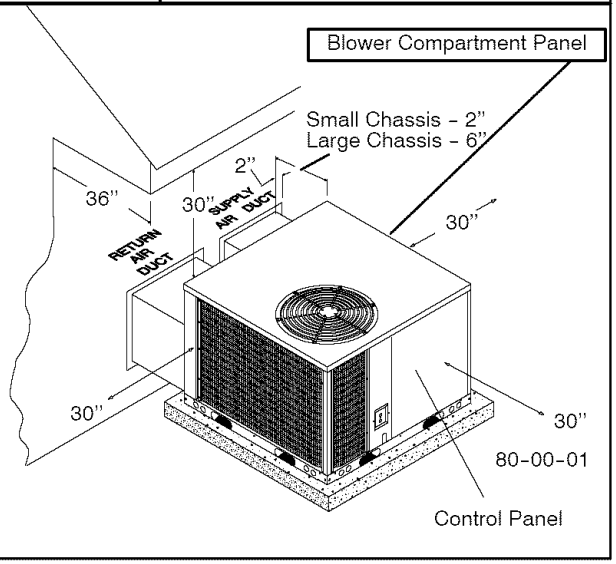


EFFICIENT HEATING and COOLING

Your new unit is among the most energy-efficient and reliable dual fuel products available today. To assure its dependability, spend just a few minutes with this booklet now. Learn about the operation of your dual fuel system and the small amount of maintenance it takes to keep it operating at its peak efficiency.

With minimal care, your dual fuel unit will provide you and your family with satisfying home comfort - both now and for years to come.

Figure 2 Minimum Clearances and Access Panels (Small Chassis Shown)



IMPORTANT FACTS

To better protect your investment and to eliminate unnecessary service calls, familiarize yourself with the following facts:

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK HAZARD

Improper installation, adjustment, alteration, service, maintenance or use could cause fire, electrical shock or other conditions which may cause personal injury, death or property damage.

Refer to this manual. For assistance or additional information consult a qualified installer, service agency, distributor, or branch. The qualified installer or agency must use only factory authorized kits or accessories when modifying this product.

- Your unit should never be operated without a clean air filter properly installed. Plan to inspect the filter periodically. A clogged air filter will increase operating costs and shorten the life of the unit.
- Supply-air and return-air registers should not be blocked. Drapes, furniture, and toys are some of the items commonly found obstructing grilles. Restricted airflow lessens the unit's efficiency and life span.
- Outdoor units must have unrestricted airflow. Do not cover the unit, lean anything against it, or stand upon it. Do not allow grass clippings, leaves, or other debris to accumulate around or on top of the unit. Maintain a 10-in. minimum clearance between the outdoor unit and tall grass, vines, shrubs, etc.
- Your multi-purpose indoor thermostat is the control center for your dual fuel system. You should familiarize yourself with its proper operation. Attempting to control the system by other means - for instance, switching the electrical supply power ON and OFF - may cause damage to the unit.
- Thermostat "jiggling" causes rapid-cycling, which is potentially damaging to the compressor. Do not move the temperature selector on the thermostat for any reason for at least 5 minutes after the compressor has shut off.
- You may find that you can maintain greater personal comfort by running the fan continuously. Air pockets can form due to the structure of the building, placement of registers, etc. These air pockets may be too cool or warm for your liking. Continuous fan operation minimizes any temperature differences. Also, systems equipped with electronic air cleaners and/or humidifiers offer the added benefits of having the air continuously cleaned year-round, and humidified during the winter season.
- Your dual fuel system will remove humidity from your home during the cooling season. After a few minutes of operation, you should be able to see water trickle from the condensate drain of the cooling coil. Check this occasionally to be sure the drain system is not clogged. Of course, don't expect to see much drainage if you live in a very dry environment.

OPERATING YOUR UNIT

THERMOSTAT

The operation of your dual fuel system is controlled by the indoor thermostat. You simply adjust the thermostat and it maintains the indoor temperature at the level you select. Most thermostats for dual fuel systems include temperature control selector, FAN switch, and SYSTEM switch. EMERGENCY HEAT control is usually provided with the SYSTEM switch.

The temperature control selector is a dial or button(s) that allows you to establish the degree of temperature that you wish to maintain for your personal comfort. Some thermostats possess two temperature control selectors: one for setting the temperature desired during the cooling cycle, and one to set the heating operation temperature.

The FAN switch offers two options for controlling the blower: AUTO and ON. When set to AUTO, the blower will run only during the time the dual fuel system is operating. When the FAN switch is set at the ON position, the blower will run continuously.

Typically, the SYSTEM switch on your thermostat offers the following selections: COOL, OFF, and HEAT. Your thermostat may also have another selection, AUTO. The unit will not operate when the SYSTEM switch is set at the OFF position. With the SYSTEM switch set at COOL, your unit will operate in its cooling mode when the indoor temperature rises above the level that you wish to maintain. With the SYSTEM switch set at the HEAT position, your unit will provide warmth whenever the indoor temperature falls below the level that you have selected.

The AUTO selection found on some thermostats provides for automatic changeover between cooling and heating

cycles. With the SYSTEM switch set in the AUTO position, the cooling mode is activated when the indoor temperature rises above the thermostat cooling temperature setting, or the heating mode will be activated when the indoor temperature drops below the thermostat setting for the heating cycle.

Depending on your winter heating needs, your dual fuel unit includes supplementary gas heating. Your system will turn on the gas heat to meet your heating needs when outdoor temperatures are very low or when heating is needed while the heat pump system goes through a defrost cycle. In the event of a heat pump system malfunction, you can use the Emergency Heat setting on your thermostat to deactivate the heat pump system and activate the gas heating system. If it becomes necessary to use the Emergency Heat setting, call your dealer for service as soon as it is practical.

Your dual fuel unit allows you to adjust the balance point temperature. The balance point temperature is the outdoor temperature where gas heat is used instead of heat pump heat. Refer to the installation instructions for proper balance point selection.

See your thermostat owner's manual for additional information.

SEQUENCE OF OPERATION

Cooling Mode:

(1)On a call for cooling

The compressor, condenser fan, and evaporator blower motor will energize.

The air conditioner has 2 stages of cooling, and will automatically pick the correct cooling stage based on the difference between the actual temperature and the set point temperature on the thermostat. For maximum efficiency, avoid frequent changes to the set point temperature.

(2)When the cooling setpoint has been satisfied

The compressor and condenser fan will de-energize immediately. Evaporator blower motor will have a delay off of 90 seconds.

Cooling Cycle - When operating in the cooling cycle, your air conditioner will run until the indoor temperature is lowered to the level you have selected. On extremely hot days, your air conditioner will run for longer periods at a time and have shorter "off" periods than on moderate days.

The following are typical conditions that add extra heat and/or humidity to your home. Your air conditioner will work longer to keep your home comfortable under these conditions:

- Entrance doors are frequently opened and closed
- Laundry appliances are being operated
- A shower is running
- More than the usual number of people are present in the home
- More than the normal number of electric lights are in use
- Drapes are open on the sunny side of the home

Heating Mode:

Depending on the outdoor temperature, the indoor temperature, and the set point temperature on the thermostat, the dual fuel unit will choose among 3 different heating modes to operate. The heating modes are as follows:

(1) First stage heat pump mode

If the outdoor temperature is above the balance point temperature (programmed into the thermostat by homeowner or installer) and the difference between the actual indoor temperature and desired indoor temperature is small, the dual fuel unit will run in 1st stage heat pump mode.

(2) Second stage heat pump mode

If the outdoor temperature is above the balance point temperature and the difference between the actual indoor temperature and desired indoor temperature is larger, the dual fuel unit will run in 2nd stage heat pump mode.

(3) Gas heat mode

There are 4 cases where gas heat is used:

1. If the outdoor temperature is below the balance point temperature (programmed into the thermostat by homeowner or installer) and heat is needed to raise the indoor temperature.

2. If the outdoor temperature is above the balance point temperature and the difference between the actual indoor temperature and desired indoor temperature becomes very large, the dual fuel unit will turn off the heat pump and turn on the gas heat.

3. If the heat pump mode is not operational, the dual fuel unit can be put into Emergency Heat mode on the thermostat. Emergency Heat mode will run gas heat for all heating requirements until the heat pump system can be repaired.

4. If the heat pump system requires a defrost cycle to clear frost from the outdoor coil, the system will turn on the gas heat.

Note: The dual fuel unit can NEVER operate in heat pump mode and gas heat mode at the same time.

Note: To set the balance point temperature on the thermostat, refer to the installation instructions to determine the best balance point temperature to use.

Defrost Cycle - When your heat pump is providing heat to your home and the outdoor temperature drops below 45 degrees Fahrenheit, moisture may begin to freeze on the surface of the outdoor coil. If allowed to build up, this ice would impede airflow across the coil and reduce the amount of heat absorbed from the outside air. So, to maintain energy-efficient operation, your heat pump has an automatic defrost cycle.

The defrost cycle starts at a preset time interval of 30, 60, 90 or 120 minutes. Defrost will start at the preset time only if the ice is sufficient to interfere with normal heating operation.

After the ice is melted from the outdoor coil, or after a maximum of 10 minutes in the Defrost mode, the unit will automatically switch back to normal heating operation.

Do not be alarmed if steam or fog appears at the outdoor unit during the defrost cycle. Water vapor from the melting ice may condense into a mist in the cold outside air.

GAS HEATING START-UP PROCEDURE

1. Adjust thermostat setting several degrees above room temperature and set thermostat selector to **EMERGENCY HEAT** or **AUXILIARY HEAT**. The combustion air blower should come **ON**.
2. The combustion air blower will run for 15 seconds to purge the combustion chamber.
3. After the 15 second purge, the combustion air blower will remain on. The sparker will turn on to ignite the gas. Make sure the gas valve is in the "ON" position. (Refer to the instructions label located on Burner Access Panel of unit.

NOTE: On a call for heat the sparker will remain energized for 7 seconds or until a flame is detected by the flame sensor. It may take several ignition attempts to purge the air out of the gas lines at initial start-up of the unit.

4. 30 seconds after the burners light, the circulating blower will begin to run.
5. Return thermostat system switch to **HEAT**.

⚠ WARNING

FIRE AND/OR EXPLOSION HAZARD

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

Do NOT attempt to light the pilot or burner with a match or flame of any kind.

ROUTINE MAINTENANCE

All routine maintenance should be handled by skilled, experienced personnel. Your dealer can help you establish a standard procedure.

For your safety, keep the unit area clear and free of combustible materials, gasoline, and other flammable liquids and vapors.

To assure proper functioning of the unit, flow of combustion and ventilating air must not be obstructed from reaching the unit. Clearance of at least 30 in. is required on all sides except the duct side.

MAINTENANCE AND CARE BY THE EQUIPMENT OWNER

Before proceeding with those things you might want to maintain yourself, please carefully consider the following:

- TURN OFF GAS SUPPLY AND ELECTRICAL POWER TO YOUR UNIT BEFORE SERVICING OR PERFORMING MAINTENANCE.
- Do not turn off electrical power to this unit without first turning off the gas supply.
- When removing access panels or performing maintenance functions inside your unit, be aware of sharp sheet metal parts and screws. Although special care is taken to reduce sharp edges to a minimum, be extremely careful when handling parts or reaching into the unit.

AIR FILTERS - Air filter(s) should be checked at least every 3 or 4 weeks and changed or cleaned whenever it becomes dirty. Dirty filters produce excessive stress on the blower motor and can cause the motor to overheat and shut down. Table 1 indicates the correct filter size for your unit.

When installing the new filter(s), note the direction of the airflow arrows on the filter frame.

If you have difficulty in locating your air filter(s), or if you have questions concerning proper filter maintenance, contact your dealer for instructions. When replacing filters, always use the same size and type of filter that was supplied originally by the installer. **NEVER OPERATE THE UNIT WITHOUT FILTERS IN PLACE. FAILURE TO OPERATE WITHOUT FILTERS COULD RESULT IN DAMAGE TO THE BLOWER MOTOR AND/OR COMPRESSOR.**

TABLE 1 Filter Data

	Disposable Filters		Washable Filters[1]	
	Nominal Size (qty x w x d)	Minimum Area (sq. inches)	Nominal Size (qty x w x d)	Minimum Area (sq. inches)
PDX324040K****	1 x 20" x 20"	384	1 x 10" x 20"	192
PDX330060K****	1 x 20" x 24"	480	1 x 12" x 20"	240
PDX336080K****	2 x 15" x 20"	576	1 x 15" x 20"	288
PDX342080K****	2 x 18" x 20"	672	1 x 18" x 20"	336
PDX348120K****	2 x 20" x 24"	854	1 x 20" x 24"	427
PDX360120K****	2 x 20" x 24"	960	1 x 20" x 24"	480

[1] Washable filter size based on an allowable face velocity of 600 ft/min. Refer to filter manufacturer's specifications for allowable face velocity and required filter area.

HEAT EXCHANGER - To ensure dependable and efficient heating operation, the heat exchanger should be checked by a qualified maintenance person before each heating season, and cleaned when necessary. This checkout should not be attempted by anyone not having the required expertise and equipment to properly do the job. Checking and/or cleaning the heat exchanger involves removing the gas controls assembly and the flue collector box cover and, when completed, reinstalling the gas controls assembly for proper operation. Also, the flue collector box cover must be replaced correctly so that a proper seal is maintained. Contact your dealer for the required periodic maintenance.

FANS AND FAN MOTOR - Periodically check the condition of fan wheels and housings and fan-motor shaft bearings. No lubrication of condenser- or evaporator-fan bearings or motors is required or recommended.

EVAPORATOR AND CONDENSER COILS - Cleaning of the coils should only be done by qualified service personnel. Contact your dealer for the required annual maintenance.

CONDENSATE DRAIN - The drain pan and condensate drain line should be checked and cleaned at the same time the cooling coils are checked by your dealer.

COMPRESSOR - All compressors are factory-shipped with a normal charge of the correct type refrigeration grade oil in them and should rarely require additional oil. The service person must be certain the proper oil level is maintained in the compressor when it is installed and running.

CONDENSER FAN -The fan must be kept free of all obstructions to ensure proper cooling. Contact your dealer for any required service.

ELECTRICAL CONTROLS and WIRING - Electrical controls are difficult to check without proper instrumentation; therefore, if there are any discrepancies in the operating cycle, contact your dealer and request service.

REFRIGERATION CIRCUIT - The refrigerant circuit is difficult to check for leaks without the proper equipment; therefore, if inadequate cooling is suspected, contact your local dealer for service.

COMBUSTION AREA and VENT SYSTEM - The combustion area and vent system should be inspected visually before each heating season. The normal accumulation of dirt, soot, rust, and scale can result in loss of efficiency and improper performance if allowed to build up.

UNIT PANELS - After performing any maintenance or service on the unit, be sure all panels are fastened securely in place to prevent rain from entering unit cabinet and to prevent disruption of the correct unit airflow pattern. for a general view of unit and location of access panels.

REGULAR DEALER MAINTENANCE

In addition to the type of routine maintenance you might be willing to perform, your unit should be inspected regularly by a properly trained service technician. An inspection (preferably each year, but at least every other year) should include the following:

1. Inspection of all flue product passages - including the burners, heat exchanger, and flue collector box.
2. Inspection of all combustion and ventilation air passages and openings.
3. Close inspection of all gas pipes leading to and inside of your unit.
4. Inspection and, if required, cleaning of the condenser and evaporator coils.
5. Inspection and, if required, cleaning of the evaporator drain pan.
6. Inspection and cleaning of blower wheel housing and motor.
7. Inspection of all supply-air and return-air ducts for leaks, obstructions, and insulation integrity. Any problems found should be resolved at this time.
8. Inspection of the unit base to ensure that no cracks, gaps, etc., exist which may cause a hazardous condition.
9. Inspection of the unit casing for signs of deterioration.
10. Inspection of all electrical wiring and components to assure proper connection.
11. Inspection for leaks in the refrigerant circuit. Pressure-check to determine appropriate refrigerant charge.
12. Inspection of compressor oil level.
13. Operational check of the unit to determine working conditions. Repair or adjustment should be made at this time.

Your servicing dealer may offer an economical service contract that covers seasonal inspections. Ask for further details.

Complete service instructions can be found in the unit Installation, Start-Up and Service Instructions.

BEFORE YOU CALL FOR SERVICE, CHECK FOR THESE EASILY SOLVED PROBLEMS

Check the indoor and outdoor disconnect switches. Verify that circuit breakers are ON.

Check for sufficient airflow. Check the air filter(s) for any accumulations of dirt. Check for blocked return-air or supply-air grilles. Be sure grilles are open and unobstructed.

Check the settings on your indoor thermostat. If you desire cooling, see that the temperature control selector is set below room temperature and the SYSTEM switch is on the COOL or AUTO position. If you require warmth, be sure the temperature control selector is set above room temperature and the SYSTEM switch is at HEAT or AUTO. The FAN switch should be set at ON for continuous blower operation or AUTO if you wish the blower to function only while the unit is operating.

If your comfort system still fails to operate, contact your servicing dealer for troubleshooting and repairs. Specify your apparent problem, and state the model and serial numbers of your equipment. (Record information below.) With this information, your dealer may be able to offer helpful suggestions over the phone, or save valuable time through knowledgeable preparation for the service call.

INSTALLATION DATA

Date Installed _____

Dealer Name _____

Address _____

City _____

State _____ Zip _____

Telephone _____

UNIT DATA

Model No. _____

MFR. No. _____

Serial No. _____