



Heating and Air Conditioning

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# **USER'S, MAINTENANCE and SERVICE INFORMATION MANUAL**

## **15 THRU 25 TON SINGLE PACKAGE AIR CONDITIONER GAS/ELECTRIC & ELECTRIC/ELECTRIC**

The manufacturer recommends that the "User" read all sections of this manual and keep the manual for future reference.

### **▲WARNING**

#### **FIRE OR EXPLOSION HAZARD**

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

- 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:

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

- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

## SAFETY INFORMATION

### FOR YOUR SAFETY

- Make sure that the furnace area is clear and free of combustible materials, gasoline and other flammable vapors and liquids.
- Be sure the furnace is free and clear of insulating material. Examine the furnace area after installation of the furnace or the installation of additional insulation. Some types of insulation are combustible.
- For proper operation of this furnace, air for combustion and ventilation is required. Make sure that these openings are not obstructed.
- For lighting or shutting down this furnace, refer to the lighting instructions provided adjacent to the burners and also located in this manual.
- A blocked vent roll-out switch is provided in the burner compartment. This switch is a manual reset. If the furnace fails to operate, contact a qualified service technician.
- Should the gas supply fail to shut off or if overheating occurs, shut off the gas valve to the furnace before shutting off the electrical supply. Then call a qualified service technician.
- 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 technician 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.
- Determine the integrity of the installation regarding the flue gas vent, the return and supply air duct. Confirm the equipment is well supported and there are no signs of deterioration. The manufacturer recommends that main burner, ignition device and controls are inspected by a qualified service technician before each heating season.

## SYSTEM OPERATION

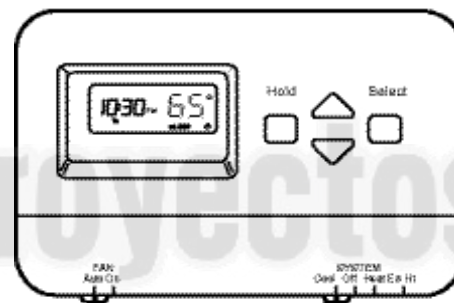
### THERMOSTATS

Set your thermostat for either heating or cooling then set it for the desired temperature. **DO NOT MOVE THE THERMOSTAT RAPIDLY ON AND OFF, OR BACK AND FORTH FROM HEAT TO COOL. THIS COULD DAMAGE YOUR EQUIPMENT.**

Always allow at least 5 minutes between changes. Find the temperature that is most comfortable to you, and then **LEAVE YOUR THERMOSTAT ALONE.** (Exception is for night or vacation "set back" to conserve energy).

Manually moving the thermostat up or down will not speed up temperature changes in your rooms. This only causes the thermostat switch to function at your command rather than responding to room temperature.

Heat generated by devices other than the furnace may interfere with thermostat performance. Therefore, lamps, radios, television sets, etc. should not be placed near the thermostat.



**FIGURE 1 - TYPICAL THERMOSTAT**

### INTERMITTENT IGNITION DEVICE

Your unit is equipped with a cycling pilot burner. It has a Pilot Relight control designed to automatically light the pilot burner each time the thermostat "calls" for heat.

### **CAUTION**

This furnace is equipped with an intermittent pilot and automatic re-ignition system. **Do Not** attempt to manually relight the pilot. Personal injury could result.

When the thermostat calls for heat, pilot gas is supplied and at the same time, sparking occurs to light the pilot gas. With the pilot lit, the flame sensor rod closes a circuit to the ignitor control which then opens the gas valve to admit main burner gas.

When the room thermostat is satisfied, the electrical circuit to the gas valve is opened, closing off both main burner and pilot gas simultaneously. If the pilot burner should fail to light, contact your heating contractor or gas utility for service to insure that proper operating conditions are restored.

## INPUT

The correct heat capacity of the furnace is regulated by the burner orifices and the gas pressure. The proper orifices are furnished but the gas pressure regulator must be adjusted by the installer or gas utility service technician.

## OPERATING INSTRUCTIONS

### TO SHUT DOWN THE FURNACE:

1. Close the main gas shutoff valve(s).
2. Turn off the electric power supply.

### TO LIGHT THE FURNACE:

1. Do not attempt to light manually.
2. Open the main gas shutoff valve(s).
3. Adjust the set point of the room thermostat above the temperature in the space.
4. Turn on the electric power supply.

5. The draft fan will operate. After an adequate purge time, the electric spark igniter will light the burners.
6. The burners will extinguish and relight automatically upon the demand of the room thermostat.

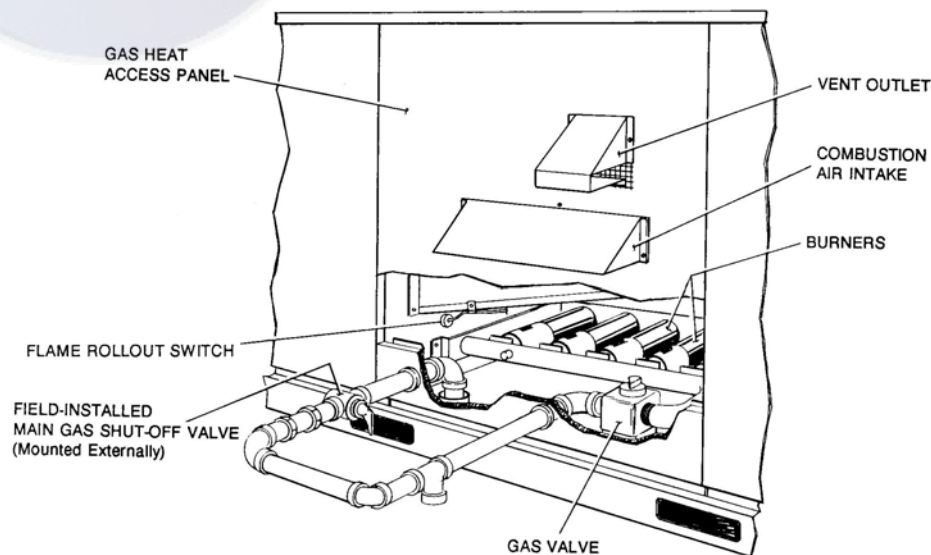
### VENT SAFETY SYSTEM:

This gas furnace is equipped with an automatic reset high temperature sensor or rollout switch which in the unlikely event of a sustained main burner flame rollout will shut off the flow of gas by closing the main gas valve. The ignition modules will also be disabled, preventing the flow of gas to the valves. The switch is located inside the gas heat access panel above the burner inlet. Flame rollout can be caused by blockage of the power vent system, improper gas pressure or adjustment. If this event occurs the furnace will not operate properly, gas supply to the furnace should be shut off and no attempt should be made to place the furnace in operation. The system should be inspected by a qualified service technician. Refer to Figure 2 for a typical installation.

### 100% SHUT OFF:

The ignition modules are designed for 100% shut-off. If the furnace fails to ignite within 85 seconds after a call for heat, the flow of gas (including pilot) will be shut off and the ignition module will lock out. The module can be reset by:

- A. Turning the system switch on the room thermostat to the "OFF" position and back to the "HEAT" position.
- B. Decreasing the set point of the room thermostat below the temperature in the conditioned space and returning it to its original setting.
- C. Opening and closing the unit's main disconnect switch.



**FIGURE 2 - TYPICAL INSTALLATION**

If the furnace continues to lock out, a qualified service technician should be called to determine the cause of the problem.

## ⚠ WARNING

### ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

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

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

- Before servicing, disconnect all electrical power to furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

## ⚠ WARNING

Prior to any of the following maintenance procedures, shut off all power to the unit, to avoid personal injury.

## EXPLAIN UNIT FUNCTION

When the system is functioning properly, show the owner the location of all disconnect switches and the thermostat. Explain how to start and stop the unit and how to adjust temperature settings within the limitations of the system. Advise that the flue exhaust hood surface and the immediate area will experience high temperatures during the heating cycle, and that all unauthorized personnel and debris must be kept away from this area.

## GENERAL MAINTENANCE

In order to insure long and trouble free service from your system, we recommend periodic inspection, cleaning, lubrication and adjustment by your installing Dealer/Contractor. Be sure to ask about this service. For those who prefer to do-it-yourself, please follow the instructions listed below to care for your system.

Snow or debris should not be allowed to accumulate in or around the unit. Do not permit overhanging structures or shrubs to obstruct outdoor air discharge, combustion air inlets or vent outlets on your unit. These provide air for com-

bustion and ventilation. Adequate air is important to the safe and proper operation of the unit.

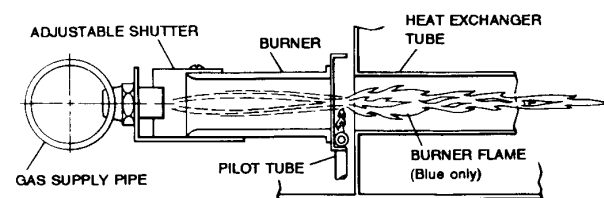
## HEATING SYSTEM INSPECTION

It is the owner's responsibility to insure that an annual inspection of the entire heating portion of the unit is made by a qualified service technician. This should include inspection of the burner, heating element and flue for any corrosion or soot accumulation which may require cleaning and also checking of burner and controls for proper operation.

In addition, at least once during the heating season, the owner shall make a visual inspection of the flue outlet for evidence of black soot or blockage of flue outlet by leaves or other debris. If any soot is found, it is recommended a qualified service technician be called immediately. If any blockage is found, it must be cleared immediately.

Check for obvious signs of deterioration of the unit. Check that the return and supply ducts attached to the unit are sound and air tight. Check that the unit's physical support, concrete slab or roof curb, is sound and not in need of repair. Make sure there are no gaps between the roof curb and the unit where rain could leak into the building.

Start the furnace. The vent motor should start, the igniter will start to spark and ignite the pilot flame. After a short delay the main burner should ignite. If it does not, contact a qualified service technician for assistance. Check the appearance of the main burner flame. Adjust burner shutters so no yellow flame is observed in the heat exchanger tubes. (See Figure 3.) If flame adjustment cannot be made, obtain the assistance of a qualified service technician and refer to the PILOT CHECKOUT and BURNER AIR SHUTTER ADJUSTMENT sections in the UNIT INSTALLATION INSTRUCTION.



**FIGURE 3 - TYPICAL FLAME APPEARANCE**

## BURNER AND PILOT CHECK

Periodically (at least annually at the beginning of each heating season) make a visual check of the pilot and main burner flame. If necessary, adjust main burner primary air shutters to give a distinct, sharp blue flame as explained under BURNER AIR SHUTTER ADJUSTMENT. If it is not possible to adjust for the proper flame, the burners may need cleaning.

## CLEANING BURNERS

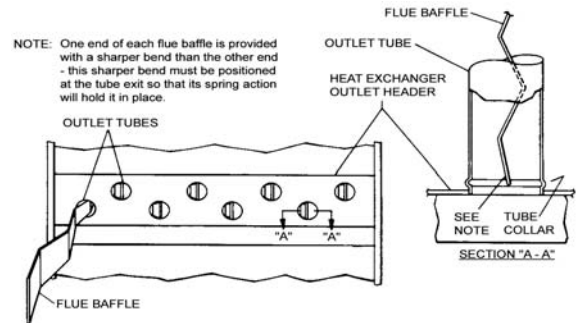
Remove them from the furnace as explained in BURNER INSTRUCTIONS section in the Unit Installation Instructions. Clean burners with wire brush and vacuum as needed.

## CLEANING FLUE PASSAGES AND HEATING ELEMENTS

With proper combustion adjustment, the heating element of a gas fired furnace will seldom need cleaning. If the element should become sooted, it can be cleaned as follows:

1. Remove the burner assembly as outlined in "BURNER INSTRUCTIONS" of the unit installation instructions.
2. Remove the unit roof from over the gas heat section.
3. Remove the top plate and the top draft blower wheel from the upper draft blower housing.
4. Remove the screws holding the top of the flue collector box. Carefully remove the top of the flue collector box without ripping the adjacent insulation. Then remove the center divider plate separating the upper and lower flue boxes.
5. On the inside of the flue collector box, remove the flue baffles from the tube interiors. Note the last bend of the baffle fits tightly against the tube forcing the end of the baffle to lock into the tube collar. This collar is formed when the tube is expanded into the end sheet. To remove, move the end of the baffle toward the center of the tube releasing the end of the baffle from the tube collar, then pull straight out of the tube. Refer to Figure 4.
6. Using a wire brush on a flexible wand, brush out the inside of each heat exchanger from the burner inlet and flue outlet ends.
7. Brush out the inside of the flue collector box and the flue baffles.
8. Run the wire brush down the vent hoods from the flue collector end.
9. If soot build-up is particularly bad, remove the vent motor and clean the wheel and housings. Run the wire brush down the flue extensions at the outlet of the vent housings.
10. After brushing is complete, blow all brushed areas with air or nitrogen. Vacuum as needed.
11. Replace parts in the order they were removed in Steps 1 thru 5.

12. When replacing the center and top of the flue collector box, be careful not to tear the adjoining insulation.
13. Ensure that all seams on the vent side of the combustion system are air tight. Apply a high temperature (+500°F) sealing compound where needed.



**FIGURE 4 - TYPICAL FLUE BAFFLE INSTALLATION**

## AIR FILTERS

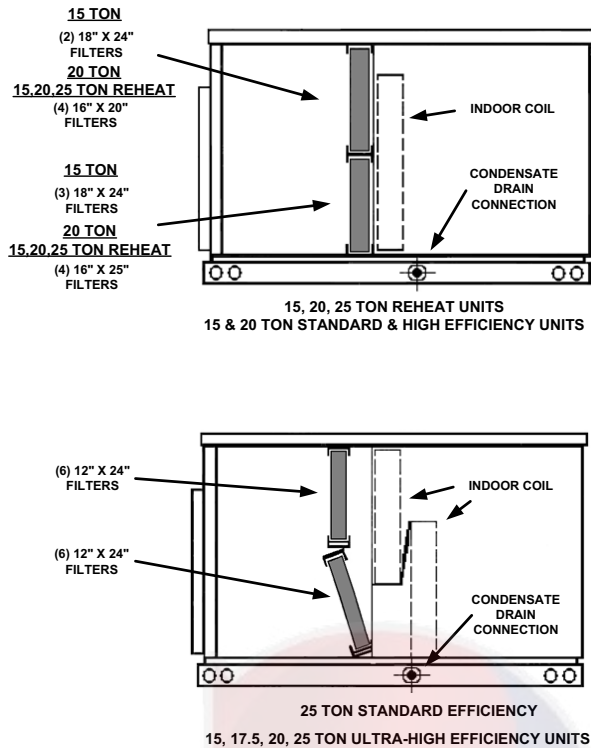
All units contain 2" filters. Filters can be installed in the building at a suitable return air location if an economizer or outside air accessory is not used. Filters must always be used. They should be inspected once a month and thoroughly cleaned or replaced if it appears they are beginning to accumulate excessive dirt. Filter sizes and quantities are shown in the following table.

THROWAWAY FILTER SIZES (Inches)	QUANTITY PER UNIT (Nom, Tons)			
	15 TON STD & HIGH EFF.	15, 20, 25 TON REHEAT 20 TON STD & HIGH EFF.	25 TON STD EFF.	15 - 25 TON ULTRA HIGH EFF.
12 x 24	-	-	12	12
16x 20	-	4	-	-
16 x 25	-	4	-	-
18 x 24	5	-	-	-

To install the filters, remove the filter access panel located to the left of the condensate drain connection as shown in Figure 5.

**NOTE:** Filters must be installed with "Air Flow" arrows pointing inward -- toward the indoor coil. In the event the spacers in the filter section are removed, they must be reinstalled in their original position.

Slide filters all the way into the filter racks provided. When more than one filter in a filter rack is required, they must butt each other when sliding into position. Replace the filter access panel.



**FIGURE 5 - END VIEW LESS FILTER ACCESS PANEL**

### ECONOMIZER

Even with good filters properly in place, the economizer assembly will become dust laden after many months of use. The entire assembly should be inspected annually. If the assembly is heavily coated with dust, it can be brushed and cleaned with a vacuum. A common aerosol contact cleaner will help remove excess accumulation.

After the dust and debris is removed, a silicon based spray lubricant should be applied to each of the gears used to connect and ensure proper alignment of the damper blades.

### **WARNING**

Perform all maintenance operations on the damper assembly with power disconnected. Do not clean or lubricate with the unit in operation.

### **CAUTION**

Excessive lubrication may accelerate the accumulation of dust.

### BLOWER ASSEMBLY

Even with good filters properly in place, blower wheels and motors will become dust laden after many months of operation. The entire blower assembly should be inspected annually. If the motor and wheel are heavily coated with dust, they can be brushed and cleaned with a vacuum cleaner.

### BLOWER SHAFT BEARING

Blower shaft bearings should be inspected on a monthly basis. At a minimum, the bearings should be relubricated every 6 months using a lithium-based grease (NLGI grade 2) recommended for ball bearing service.

### **WARNING**

Perform all maintenance operations on the blower motor with electric power disconnected from the unit. Do not attempt to lubricate bearings with the unit in operation.

### **CAUTION**

Damage can occur if the bearings are overlubricated. Use grease sparingly.

### MOTORS

Outdoor fan motors are permanently lubricated and require no maintenance.

Ventor motor is factory lubricated for an estimated 10 year life.

Indoor Blower Motor and Drive - The indoor blower motor features ball bearings that do not require periodic lubrication. Periodic lubrication of the motor and bearings can extend the life of components but is optional.

If desired, every three years, using a low pressure grease gun, pump grease into the bearing grease fitting until grease just begins to show at the seals. Do not over lubricate. Use any lithium base grease recommended for ball bearing service.

## CONDENSER COIL

An annual check and cleaning, if necessary, of the outdoor coil should be done. Cleaning should be as often as necessary to keep the coil clean. Clean any debris and dirt from the outside coil face with a brush being careful not to damage the fins. If extremely dirty, a hose can be used to wash the coil from the inside out while brushing a soapy solution on the outside.

## REGISTERS

Supply and return air registers must be open when the unit is in operation. Obstructions must not be allowed to block air-flow in or out of the registers.

## TROUBLESHOOTING

### BEFORE CALLING A SERVICE PERSON:

- A. Check thermostat setting and insure thermostat is calling for heat or cooling.
- B. Check thermostat for lint, etc.
- C. Check fuses or circuit breakers.
- D. Check filters for excessive dust accumulation.

OWNER please have your installer fill in the following information immediately after unit has been installed and is properly operating.

Installed by \_\_\_\_\_

Installer's Address \_\_\_\_\_

Installation Date \_\_\_\_\_

Owner's Name \_\_\_\_\_

Owner's Address \_\_\_\_\_

Equipment installed at (address) \_\_\_\_\_

Model Number \_\_\_\_\_ Serial Number \_\_\_\_\_

Distributor from whom the equipment was purchased \_\_\_\_\_

*The owner should keep this information in a place where it can be found if needed for warranty purposes.*

