

USER'S MANUAL

*SA ULTRA-LOW NOX SERIES, SINGLE STAGE, NON-CONDENSING GAS FURNACE

80+ AFUE



UPFLOW / HORIZONTAL FURNACE

This product complies with SJVAPCD 4905 and SCAQMD 1111 with NO_x levels below 14 ng/J when operated on natural gas.

⚠ 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 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.

DO NOT DESTROY THIS MANUAL. READ ALL INSTRUCTIONS IN THIS MANUAL AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

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IMPORTANT SAFETY INFORMATION

Safety markings are used frequently throughout this manual to designate a degree or level of seriousness and should not be ignored. **WARNING** indicates a potentially hazardous situation that if not avoided, could result in personal injury or death. **CAUTION** indicates a potentially hazardous situation that if not avoided, may result in minor or moderate injury or property damage.

WARNING:

The safety information listed below must be followed during the installation, service, and operation of this furnace. Failure to follow safety recommendations could result in possible damage to the equipment, serious personal injury, or death.

WARNING:

PROPOSITION 65 WARNING: This product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

WARNING:

This furnace is not approved for installation in mobile homes. Installing this furnace in a mobile home could cause fire, property damage, and/or personal injury.

- Use caution when handling this appliance or removing components. Personal injury can occur from sharp metal edges present in all sheet metal constructed equipment.

WARNING:

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in 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.

GAS SUPPLY & PIPING

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 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.

INSTALLATION AND SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.

This furnace does not have a pilot. It is equipped with an ignition device which automatically lights the burner. **DO NOT** light the burner by hand.

IMPORTANT NOTE

IF THE GAS SUPPLY FAILS TO SHUT OFF OR IF OVERHEATING OCCURS, SHUT OFF THE GAS VALVE TO THE FURNACE BEFORE SHUTTING OFF THE ELECTRICAL SUPPLY!

WARNING:

This furnace was shipped from the factory equipped to operate on natural gas only. Converting this furnace to LP/propane gas is prohibited. Converting this furnace for use on LP/propane gas can cause fire, explosion, property damage, carbon monoxide poisoning, personal injury, or death.

WARNING:

All gas piping and shutoff valves must be installed in compliance with local codes and utility regulations by licensed installers. **DO NOT** attempt to modify, or tap into existing gas lines yourself. Fire or explosion may result causing property damage, personal injury or loss of life. Failure to follow the safety warnings exactly could result in serious injury, death or property damage.

FILTER

WARNING:

Never operate the furnace without a filter in place. Accumulating dust in the return air can build up on internal components, resulting in loss of efficiency, equipment damage, and possible fire.

Keep air filters cleaned. Clean or replace filter to maintain proper airflow and achieve maximum efficiency. Refer to page 11 for Maintenance & Inspection information.

FLOOD DAMAGE

WARNING:

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.

VENTING SYSTEM

WARNING:

It is imperative to maintain proper operation of the venting system, including the masonry chimney (if applicable). Insufficient venting could create the production of excessive amounts of Carbon Monoxide (CO) - a colorless, odorless gas that is produced during incomplete combustion of any fuel. It can cause death without warning. Carbon monoxide poisoning can cause flu- like symptoms and also dizziness, fatigue, headaches, nausea, and irregular breathing.

If you suspect that you are experiencing CO poisoning, get fresh air immediately. Leave the home and call for assistance from a neighbor's home.

WARNING:

CARBON-MONOXIDE POISONING HAZARD

Failure to follow instructions could result in severe personal injury or death due to carbon-monoxide poisoning if combustion products infiltrate into the building.

Check that all openings in the outside wall around the vent (and air intake) pipe(s) are sealed to prevent infiltration of combustion products into the building.

Check that furnace vent (and air intake) terminal(s) are not obstructed in any way during all seasons.

- The U.S. Consumer Product Safety Commission (CPSC) recommends every home have a Carbon Monoxide detector in hallways near the bedrooms in each sleeping area. CO detectors should be certified to the most recent requirements of the UL, IAS OR CSA Standard and should be installed, operated, and maintained in accordance with the detector manufacturers instructions.

CLEARANCES TO COMBUSTIBLES

WARNING:

Do not place combustible materials on or against the furnace cabinet or within 6 inches of the vent pipe. Furnace area must be kept clear and free of combustible materials, gasoline and other flammable vapors and liquids. A fire or explosion may result causing property damage, personal injury or loss of life. Failure to follow the safety warnings exactly could result in serious injury, death or property damage.

The furnace is designed to have certain clearances to combustible items such as wood, paper, etc. Some types of insulation are combustible. If your furnace is installed in an attic, near unfinished walls, or in other insulated space, keep area surrounding the furnace free of insulating material.

FLAME ROLL-OUT LIMIT SWITCH

Verifies the inducer motor is drawing combustion gases through the heat exchanger properly. The temperature switch prevents furnace operation in the event of flue or combustion air passageway blockage, or improper inducer motor operation. If blower is running and control board is showing Open Limit flash code, check the following:

1. Set the thermostat to OFF or lowest setting.
2. Turn OFF all electrical power to the furnace.
3. Allow the furnace to cool if recently operating.
4. Carefully reach in and re-set the roll-out limit switch located on the gas burner head by depressing button on top of limit. Note: If limit doesn't re-set it may require more time to cool.
5. Check flue passageway for any blockage and clean as required.
6. Restore electrical power to the furnace.
7. Set thermostat to initiate a call for heat.
8. Monitor the furnace and inducer motor for any unusual operation or noise. Allow the unit to operate for 15-20 minutes to ensure proper operation.
9. If flame roll-out limit trips consult a licensed HVAC technician for service.

SOURCES OF CORROSION

It is known that certain common household chemicals can cause heat exchanger corrosion if the vapors are pulled into the furnace's burners. The following is a list of chemicals that should not be used or stored near the furnace.

Do not store these chemicals near the furnace:

- Permanent wave solutions
- Chlorinated waxes and cleaners
- Chlorine based swimming pool chemicals
- Water softening chemicals
- De-icing salts or chemicals
- Carbon tetrachloride
- Halogen type refrigerants
- Cleaning solvents (perchloroethylene)
- Printing inks, paint removers, varnishes, etc.
- Hydrochloric acid
- Cements and glues
- Antistatic fabric softeners
- Masonry acid washing materials

⚠ CAUTION:

This furnace requires unrestricted airflow for combustion and ventilation. For proper and safe operation, it is extremely important that the furnace receives an unobstructed flow of clean, fresh air to properly burn the fuel gas. If this flow of air is restricted, the partially burned combustion gases may create dangerous amounts of carbon monoxide that can cause personal injury or death.

- Do not block or obstruct air openings on the furnace, air openings or spacings around the furnace area or the room or closet the furnace is in. Furniture and drapery should be arranged so that the supply air registers and return grilles are not obstructed.
- If your furnace obtains its air through a pipe to the outdoors, do not allow the inlet of the pipe to become blocked. If the furnace is operated without adequate air for combustion, it may cause unit safety devices to activate. This indicates that a serious problem with the unit has occurred and must be corrected immediately.
- Before remodeling near the furnace, consult with a local code official or the National Fuel Gas Code to make sure you will be in compliance with supplying adequate air for combustion. By erecting new walls, it is sometimes possible to inadvertently restrict the furnace's air supply. You can find more information about supplying combustion air in the NFGC, which is available at many libraries.

ABOUT THE FURNACE

INTRODUCTION

Congratulations on the purchase on your new furnace! With our dedication to quality, superior reliability, and outstanding warranty, we know you will be pleased with this new appliance. This furnace has been designed and built to provide many years of safe and dependable home comfort, providing it is properly installed and regular maintenance has been performed. Improper use or insufficient maintenance can shorten the life of the furnace and result in serious personal injury or property damage. Please read this manual thoroughly and familiarize yourself with the safety, operation and maintenance procedures for this furnace. **DO NOT DESTROY THIS MANUAL. KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.**

Your furnace is designed to fulfill the requirements of being classified as a Category I furnace. This classification is related to the furnace's Annual Fuel Utilization Efficiency (AFUE) rating, the percentage of fuel that is converted into usable heating energy. Category I furnaces typically have an AFUE rating of about 80% and may be vented through a properly designed metal vent or masonry chimney. This venting system needs to be primarily vertical, so that the hot combustion products will develop a natural upwards draft action.

The furnace components shown in Figure 1 will help to identify and locate various parts of the furnace. The component you need to familiarize yourself with is the gas valve. You will use this to turn the furnace on and off. **There are no user serviceable parts. All repairs must be performed by a licensed HVAC technician.**

FILTER

⚠ WARNING:

Never operate the furnace without a filter in place. Accumulating dust in the return air can build up on internal components, resulting in loss of efficiency, equipment damage, and possible fire.

- Air filter(s) are not supplied with the furnace as shipped from the factory. The installer must provide a high velocity filter and rack for a filter in the return air duct adjacent to the furnace, or in a return air grill to the furnace.
- The furnace should always have a clean filter located either at the air return on the furnace or in an air return register. If the filter becomes dirty, it should be cleaned or replaced.
- New or newly renovated homes may require more frequent changing until the construction dust has minimized. Filters designed to remove smaller particles such as pollen, may require additional maintenance.
- Always reinstall the doors on the furnace after servicing or cleaning/changing the filters. **Do not operate the furnace without all doors and covers in place.**

THERMOSTAT

- This single stage furnace should be controlled by a conventional single stage thermostat.

FURNACE LOCATION

If a furnace is installed in relatively small utility room or closet, the installation needs openings in the walls or door to let combustion air in. Make sure that these openings remain unobstructed. Do not modify these openings in any way without consulting a licensed HVAC technician.

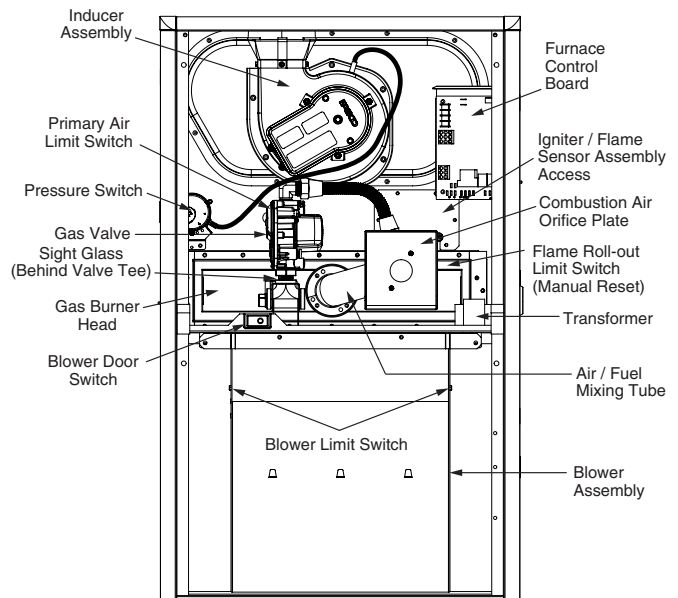


Figure 1. Furnace Components

STARTUP & SHUTDOWN

STARTING THE FURNACE

1. Make sure the filter is clean and in place.
2. Make sure the vent system is properly installed.
3. Set the thermostat to the lowest setting.
4. Close the manual gas valve outside the furnace.
5. Turn off all electric to the furnace.
6. Remove the door from the burner compartment.
7. Set the gas valve switch or knob to the OFF position. See Figure 1 for gas valve switch or knob location.
8. Wait 5 minutes. If there is any smell of gas, see "WHAT TO DO IF YOU SMELL GAS" on page 4.
9. Set the gas valve switch or knob to the ON position.
10. Turn on all electric to the furnace.
11. Open the manual gas valve.
12. Turn the thermostat back up to force ignition.
13. Observe furnace operation, including glow through burner sightglass which should produce a continuous glow once the ignitor is deenergized. If burner fails to ignite, call a licensed HVAC technician.
14. Replace the door on the burner compartment.

NOTE TO HOMEOWNER: Upon ignition you may occasionally hear a slight rumble or light-off noise which isn't unsafe or harmful to the homeowner or unit operation.

SHUTTING DOWN THE FURNACE

IMPORTANT! IF YOU NEED TO SHUT DOWN YOUR FURNACE FOR SERVICE OR MAINTENANCE, SHUT OFF THE GAS VALVE TO THE FURNACE BEFORE TURNING OFF THE ELECTRICAL SERVICE.

NOTE: Your furnace may be equipped with one of three types of gas valves. Remove the door panel from the front of the furnace and determine which valve type matches your installation in Figure 1. Move the switch to the OFF Position.

If your installation has a manual gas shutoff valve on the gas supply pipe, shut this off, then shut off the electric to the furnace.

1. Set the thermostat to the lowest setting.
2. Close the manual gas valve outside the furnace.
3. Turn electric to the furnace off.
4. Open the door to the burner compartment.
5. Set the gas valve switch or knob to the OFF position.
6. Replace the door on the burner Compartment.

ON / OFF SWITCH

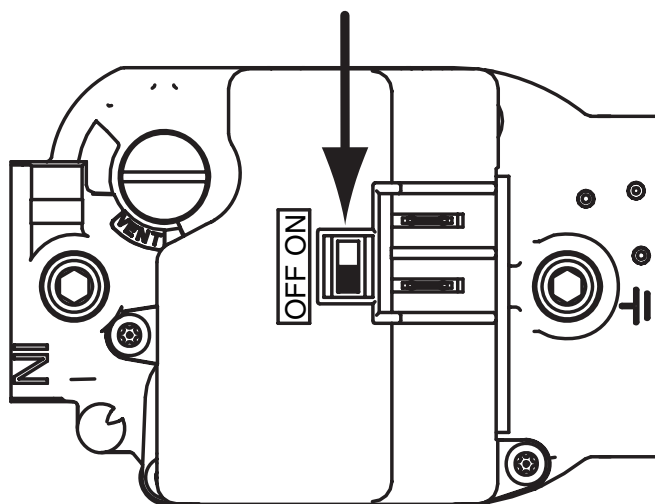


Figure 2. Single Stage Gas Valve

TROUBLESHOOTING

IF THE FURNACE FAILS TO OPERATE CHECK THE FOLLOWING:

1. Is the thermostat setting correct?
2. Are the blower compartment door(s) in place?
3. Has the circuit breaker tripped or the control board fuse burned open?
4. Is the gas turned on at the manual shutoff?
5. Is the filter dirty or clogged?
6. Is the manual reset roll-out limit switch tripped? See maintenance and inspection section page 7.

If the furnace still doesn't operate, contact a licensed HVAC technician

MAINTENANCE & INSPECTION

FURNACE & AIR DUCTS

- The furnace should be inspected annually by a licensed HVAC technician. Table 1 below contains suggested inspections and frequency of maintenance.
- Homeowners should perform frequent visual inspections of the furnace for obvious signs of deterioration. The furnace should be secure without sagging, cracks gaps, etc around the base. The return air duct connection(s) is secured and sealed to the furnace cabinet and terminates outside the area containing the furnace. Any signs of damage or loose connections should be repaired by a qualified HVAC technician.

VENTING SYSTEM

- For proper and safe operation, this furnace requires unrestricted airflow for combustion and ventilation. Inspect for blocked or obstructed air openings on or around the furnace (at the terminations outside the house), and the space around the furnace.
- The furnace venting system should be inspected annually by a licensed HVAC technician. Vent pipe must slope upwards and be physically secured without holes or corrosion. Any corroded section of vent pipe must be replaced, and any obstruction or blockage must be removed by the technician.
- Flue passageways and the vent system should be inspected and cleaned (if required) by a licensed HVAC technician annually to ensure continued safe operation.
- Existing masonry chimneys should be inspected and relined (if necessary) by a licensed HVAC technician.

BLOWER & FILTER

- It is recommended that the blower compartment be cleaned of dirt or lint that may have accumulated in the compartment or on the blower and motor as part of the annual inspection.
- Keep air filters cleaned. It is recommended that the furnace air filter be checked at least once a month. Clean or replace filter to maintain proper airflow and achieve maximum efficiency.
- Furniture and drapery should be arranged so that the supply air registers and return grilles are not obstructed.

FLAME ROLL-OUT LIMIT SWITCH

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5. Check flue passageway for any blockage and clean as required.
6. Restore electrical power to the furnace.
7. Set thermostat to initiate a call for heat.
8. Monitor the furnace and inducer motor for any unusual operation or noise. Allow the unit to operate for 15-20 minutes to ensure proper operation.
9. If flame roll-out limit trips consult a licensed HVAC technician for service.

BURNER OPERATION

Perform the startup instructions on page 6. The igniter should ignite the burner. The sightglass should produce a dull orange glow after the igniter is deenergized.

NEW CONSTRUCTION

Operating gas furnaces in construction environments can cause a variety of problems within the furnace and may significantly reduce the life or the performance of the furnace. Therefore operating the furnace during construction is not permitted and will void the warranty.

- Before occupancy, the furnace shall be inspected and approved by applicable local authority even if this results in redundant inspections.
- The duct work must be inspected and cleaned if found to contain any construction debris.
- The filter must be replaced or cleaned and the furnace must be inspected by a licensed HVAC technician. The furnace must be cleaned and/or repaired if found to be dirty, damaged, or malfunctioning in any way.

REPLACEMENT PARTS

Replacement parts are available through your distributor. Please have the complete model and serial number of the unit when ordering replacement parts.

ELECTRICAL:

- Gas Valves
- Ignition Controls
- Ignitors/Flame Sensors
- Pressure Switches
- Temperature Limit Switches
- Thermostats
- Transformers

MOTORS:

- Blower Motor
- Inducer Blower Motor

COMPONENTS:

- Blower Assembly
- Burners/Orifices
- Cabinet Panels
- Gaskets
- Heat Exchanger

MAINTENANCE ITEMS	FREQUENCY OF MAINTENANCE		
	BEGINNING OF EACH HEATING SEASON	END OF EACH HEATING SEASON	MONTHLY
Verify furnace area is free of combustible materials.	X	X	X
Verify combustion and ventilation air is not restricted.	X	X	X
Verify no signs of physical deterioration of the furnace.	X	X	X
Verify no obstructions or restrictions in vent or chimney.	X	X	
Verify no holes or cracks in vent pipe.	X	X	
Verify no corrosion in vent pipe.	X	X	
Verify the horizontal vent pipes slope upwards away from furnace.	X	X	
Verify burner ignition through sightglass.	X		
Clean or replace filter(s).			X
Clean blower compartment.	X		

Table 1. Maintenance Table

