80% GAS FURNACE INSTALLATION INSTRUCTIONS

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GAS FURNACE SAFETY

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.

This is the safety alert symbol.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

You can be killed or seriously injured if you don’t immediately follow instructions.

You can be killed or seriously injured if you don’t follow instructions.

Your safety and the safety of others are very important.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

This symbol alerts you to potential hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol and either the word “DANGER” or “WARNING.” These words mean:

DANGER

WARNING

You can be killed or seriously injured if you don’t immediately follow instructions.

You can be killed or seriously injured if you don’t follow instructions.
IMPORTANT SAFETY INSTRUCTIONS

- Use only with type of gas approved for this furnace. Refer to the furnace rating plate.
- Install this furnace only in a location and position as specified in the Location Requirements section of these instructions.
- Provide adequate combustion and ventilation air to the furnace space as specified in the “Venting Requirements” section of these instructions.
- Combustion products must be discharged outdoors. Connect this furnace to an approved vent system only, as specified in the “Venting Requirements” section of these instructions.
- Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections, as specified in the “Make Gas Connections” section of these instructions.
- Always install furnace to operate within the furnace’s intended temperature-rise range with a duct system which has an external static pressure within the allowable range, as specified in the “Complete Installation” section of these instructions. See furnace rating plate.
- When a furnace is installed so that supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by duct(s) sealed to the furnace casing and terminating outside the space containing the furnace.
- A gas-fired furnace for installation in a residential garage must be installed as specified in the “Location Requirements” section of these instructions.
- The furnace is not to be used for temporary heating of buildings or structures under construction.
- The furnace shall be installed so the electrical components are protected from water.
- Furnaces for indoor installation on combustible flooring shall not be installed directly on carpeting, tile or other combustible material other than wood flooring.

SAVE THESE INSTRUCTIONS

The California Safe Drinking Water and Toxic Enforcement Act requires the Governor of California to publish a list of substances known to the State of California to cause cancer, birth defects, or other reproductive harm, and requires businesses to warn of potential exposure to such substances.

WARNING: This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm.

This appliance can cause low-level exposure to some of the substances listed, including benzene, formaldehyde, carbon monoxide, toluene, and soot.

ADDITIONAL SAFETY INFORMATION

In the State of Massachusetts, the following installation instructions apply:
- Installations and repairs must be performed by a qualified or licensed contractor, plumber, or gasfitter qualified or licensed by the State of Massachusetts.
- If using a ball valve, it shall be a T-handle type.
- A flexible gas connector, when used, must not exceed 3 feet.
INSTALLATION REQUIREMENTS

These instructions are intended as a general guide only for use by qualified persons and do not supersede any national or local codes in any way. Compliance with all local, state, or national codes pertaining to this type of equipment should be determined prior to installation.

Read this entire instruction manual, as well as the instructions supplied in separate equipment, before starting the installation.

The installation of the furnace, wiring, warm air ducts, venting, etc. must conform to the requirements of the National Fire Protection Association; the National Fuel Gas Code, ANSI Z223.1/NFPA No. 54 (latest edition) and the National Electrical Code, ANSI/NFPA No. 70 (latest edition) in the United States, and any state laws, local ordinances (including plumbing or wastewater codes), or local gas utility requirements. Local authorities having jurisdiction should be consulted before installation is made. Such applicable regulations or requirements take precedence over the general instructions in this manual.

This furnace is design certified by CSA International as a Category I furnace using air from inside the structure for combustion. The combustion system is fan-assisted, which means it is equipped with an integral mechanical means to draw products of combustion through the heat exchanger.

Tools and Parts

Assemble the required tools before starting installation. Read and follow the instructions provided with any tools listed here.

Tools Needed:
- Pipe wrench
- Screwdriver
- Tape measure
- Non-corrosive leak check solution
- Test gauge with ¹⁄₈ in. NPT connection (for measuring gas supply pressure)
- Thread sealant

Parts Needed:
Check local codes and with gas supplier. Check existing gas supply, electrical supply, and venting, and read “Duct Work Requirements,” “Electrical Requirements,” “Gas Supply Requirements” and “Venting Requirements” before purchasing parts.

Location Requirements

WARNING

Explosion Hazard
Keep flammable materials and vapors, such as gasoline, away from furnace.
Place furnace so that burners are at least 18 inches (46 cm) above the floor for a garage installation.
Failure to follow these instructions can result in death, explosion, or fire.

WARNING

Explosion Hazard
Do not install this furnace in a mobile home.
Doing so can result in death, explosion, fire, or carbon monoxide poisoning.

IMPORTANT: Do not use the furnace as a heater in a building under construction. The furnace can be severely damaged due to the abnormal environment caused by construction. Chlorides from sources such as paint, stain, or varnish; tile and counter cements; adhesives; and foam insulation are abundant in a structure under construction and can be highly corrosive. Low return air temperature can cause condensation in the furnace and other damage that can shorten the life of the furnace.

- The furnace is suitable for installation in buildings constructed on site. The furnace should be centralized in respect to the heat distribution system as much as practicable.
- All models are suitable for closet or utility room installation. Utility room installation requires:
  A door opening large enough for the widest part of the furnace.
  A door opening large enough to remove/replace any other appliance located in the utility room, such as a water heater.
  Any other appliances arranged so that each appliance can be removed/replaced without disturbing the furnace.
In a residential garage, a gas-fired furnace must be installed so the burner(s) and the ignition source are located not less than 18 in. above the floor. The furnace is to be located or protected to avoid physical damage by vehicles.

WFAR, WFLR, WFAT, and WFLT models may be installed as suspended units in the horizontal position. These furnaces are not designed for direct attachment of suspension rods to the furnace casing. See the “Installation Configurations” section.

If the furnace is to be installed in an attic or other insulated space, it must be kept free and clear of insulating materials.

### Installation Clearances

- A 2 in. minimum clearance is required in front for air openings into the combustion chamber.
- All servicing and cleaning of the furnace can be performed from the front. If installed in a closet or utility room, provide 24 in. clearance in front for service if the door to the room is not in line with the front of the furnace. Where servicing clearances are greater than clearances to combustibles, servicing clearances take precedence.

#### Minimum Clearance to Combustibles Chart (all measurements in inches)

<table>
<thead>
<tr>
<th>Upflow and Counterflow Installations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cabinet Width</strong></td>
<td><strong>Front</strong></td>
</tr>
<tr>
<td>14.5</td>
<td>4</td>
</tr>
<tr>
<td>17.5</td>
<td>4</td>
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<tr>
<td>21.0</td>
<td>4</td>
</tr>
<tr>
<td>24.5</td>
<td>4</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Horizontal Installations (Models WFAT and WFLT only)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cabinet Width</strong></td>
<td><strong>Front</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>14.5</td>
<td>4</td>
</tr>
<tr>
<td>17.5</td>
<td>4</td>
</tr>
<tr>
<td>21.0</td>
<td>4</td>
</tr>
<tr>
<td>24.5</td>
<td>4</td>
</tr>
</tbody>
</table>

1 May be 2" when Type B-1 vent pipe is used.
2 May be 1" when Type B-1 vent pipe is used.
3 Where values greater than 0 are shown, may be 0" when Type B-1 vent pipe is used.

### High Altitude Installations

- This furnace is approved for operation at altitudes from 0 to 4,500 feet above sea level without any required modifications.
- From 4,500 to 7,500 ft, the gas manifold pressure needs to be adjusted according to the information shown in the Manifold Pressure vs. Altitude charts.

**IMPORTANT:**
For installations above 7,500 ft, the furnace input rate is to be reduced per the requirements of the National Fuel Gas Code (ANSI Z223.1/NFPA 54, latest edition), at the rate of 4 percent for each 1,000 feet above sea level.

The furnace is not recommended for installation above 10,000 ft.

### Installation Configurations

Models WFAU and WFLU must be installed only as an upflow furnace. Models WFAT and WFLT may be installed as an upflow or horizontal furnace. Models WFAR and WFLR may be installed as either a counterflow or a horizontal furnace.

Models WFAR, WFLR, WFAT and WFLT furnaces can be horizontally installed for airflow right to left or left to right.

### Upflow Installations

WFAU, WFLU, WFAT and WFLT model furnaces can be installed with either a side or bottom air return. For bottom air return the bottom air return knockout plate must be removed. For units that do not include a side or bottom return filter rack, kit no. AFILT524-1 (side return) or kit no. AFILT529-1 (bottom return) can be used.

To provide sufficient filter area for installations requiring more than 1600 CFM nominal air delivery, return air will have to be brought through both sides of the furnace, or through one side and the bottom, or an optional filter rack WAFILTHA7 may be used.
Horizontal Installations

WFAR, WFLR, WFAT and WFLT model furnaces can be horizontally installed for airflow right to left or left to right. To ensure access to parts for servicing, install upflow and counterflow furnaces so that the burner and blower access panels are readily accessible.

NOTE: When installed horizontally, the installer must install a sheet metal screw to retain the upper door as shown following, in either Position 1 or 2, depending on installation configuration.

Horizontal Installation (WFAR and WFLR models)

Horizontal Installation (WFAT and WFLT models)

Horizontal Installation - Suspended

WFAR, WFLR, WFAT and WFLT model furnaces may be installed as suspended units in the horizontal position. These furnaces are not designed for direct attachment of suspension rods to the furnace casing.

- The suspending means must be field fabricated, and should consist of two "cradles" made by attaching two rods to a length of angle iron or suitable gauge steel.
- Locate the cradles so that they are as close as possible to the ends of the furnace (this will provide access for removal of major components such as the blower assembly).
- Provide enough clearance between the suspension rods and the furnace to allow removal of access panels.

Installation for Counterflow (Downflow) Models

WARNING

Fire Hazard

Before installing counterflow (downflow) furnace on combustible surface, such as wood, install one of the following kits:

- WABASE 511 (14.5" cabinets)
- WABASE 512 (17.5" cabinets)
- WABASE 568 (21" cabinets)
- WABASE 569 (24.5" cabinets)

Contact your local dealer.

Failure to do so can result in death or fire.

IMPORTANT:

- The furnace may be installed directly on the supply plenum or coil cabinet if the furnace is installed on a non-combustible floor.
- For installations on combustible flooring, a special base must be ordered and used. See the "Accessories" section.

1. Cut, size and frame opening in floor to fit the Combustible floor base and provide a minimum 1in. clearance between the Supply Duct and combustible materials. The 4 legs on the base assembly should recess into the floor, and the base should rest on all 4 outside flanges.

2. Construct duct connections with 1in. to 1¾ in. right angle flanges, and long enough to extend below the floor joists.

3. Drop the duct connections through the top of the base assembly with the right angle flanges in good contact with the glass tape on top of the base assembly.

4. Carefully position the furnace over the right angle duct flanges.
Combustible Floor Installation (Counterflow Models only)

Duct Work Requirements
Install the conditioned air plenum, ducts and air filters (if not provided on the furnace) in accordance with NFPA 90B Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (latest edition).

The furnace is provided with flanges for the connection of the plenum and ducts.

All air filters must be listed as Class 2 furnace air filters.

Electrical Requirements

1. Furnace
2. Woven glass tape (between flanges of outlet duct and base assembly)
3. Base assembly
4. Combustible flooring
5. Leg
6. Supply plenum or coil cabinet (not provided - accessory)

Electrical Shock Hazard
Electrically ground furnace.
Connect ground wire to green ground screw.
Failure to do so can result in death or electrical shock.

Gas Supply Requirements
This furnace is equipped for use with natural gas. A conversion kit is required for use with propane. To order the correct conversion kit, see “Accessories.”

Gas supply piping should be installed in accordance with local codes and the regulations of the utility. Piping must be of adequate size to prevent undue pressure drop. Consult the local utility or gas supplier for complete details on special requirements for sizing gas piping.

If local codes allow the use of a flexible gas appliance connector, always use a new listed connector. Do not use a connector which has previously serviced another gas appliance.

Venting Requirements
Adequate provisions for combustion air and ventilation of furnace must be made. Refer to Section 5.3, “Air for Combustion and Ventilation,” of the National Fuel Gas Code, ANSI Z223.1/NFPA 54 (latest edition), or applicable provisions of the local building codes. For Category 1 furnaces, vent installations shall be in accordance with parts 7 and 11 of the National Fuel Gas Code, ANSI Z223.1/NFPA 54, the local building codes, and the furnace and vent manufacturer’s instructions.

Unconfined Space
An unconfined space is defined as “a space whose volume is more than 50 cu ft per 1000 BTU per hour of the combined input rating of all appliances installed in that space.”

When a furnace is installed in an unconfined space in a building, it can be assumed that the infiltration will be sufficient to supply the required air.

If the furnace is installed in a ventilated attic or crawl space, it is assumed that the air infiltration is sufficient to supply the required combustion air. However, in a building of unusually tight construction, additional outdoor air should be provided.

Confined Space
A confined space is defined as “a space whose volume is less than 50 cu ft per 1000 BTU per hour of the combined input rating of all appliances installed in that space.”

Confined Space Installation/Air from Inside Structure
If the furnace is installed in a confined space within the building and combustion air is taken from a heated space, the combustion air and ventilating air must enter and leave the space through two permanent openings of equal area. One opening shall be located within 12 in. of the ceiling and the other within 12 in. of the floor.

NOTE: Each opening must have a free area of at least 1 square inch per 1000 BTU/HR of total input rating of all equipment in the enclosure, and not less than 100 square inches each.
Confined Space Installation/Air from Outside Structure

If air from outside is brought in for combustion, the confined space shall be provided with two permanent openings. One opening shall be within 12 in. of the ceiling and one opening within 12 in. of the floor. Several methods can be used to bring the outside air in through these openings. The openings must open directly or by ducts to the outdoors, through spaces (crawl space or attic) that freely open to the outdoors, or indirectly through vertical ducts.

**NOTE:** If any of these methods are used, the inlet and outlet air openings must each have a free area of 1 square inch per 4000 BTU per hour of the total input rating of all equipment within the enclosure.

**Equipment in Confined Space - All Air from Outside**

*Inlet air from crawl space and outlet air to ventilated attic*

**Equipment in Confined Space - All Air from Outside**

*(All air through ventilated attic)*

**Equipment in Confined Space - All Air from Outside**

*(All Air from Horizontal Ducts)*

**Contaminated Combustion Air**

Excessive exposure to contaminated combustion air will result in performance-related problems. The recommended source of combustion air is outdoor air.

**Outdoor air as the source of combustion air**

If the furnace is installed in a confined space, it is recommended that the necessary combustion air come from the outdoors by way of an attic, crawl space, air duct, or direct opening. Outdoor air is required as the source of combustion air when the indoor air is contaminated with chemical substances and in the following types of installations:

- Furnaces installed in commercial buildings
- Furnaces installed in buildings with indoor pools
- Furnaces installed in hobby or craft rooms
- Furnaces installed near chemical storage areas
- Furnaces installed in laundry rooms
- Furnaces installed in hair salons
Indoor air as the source of combustion air is acceptable in most applications if the following guidelines are met:

- All provisions for indoor combustion air must meet the requirements for combustion air indicated in the National Fuel Gas Code, ANSI Z223.1/NFPA 54 (latest edition), and/or any applicable local codes.

- If indoor combustion air is used, the air supply to the furnace should not be exposed to the following substances:
  - Permanent wave solutions
  - Chlorinated waxes and cleaners
  - Chlorine-based swimming pool chemicals
  - Water softening chemicals
  - Deicing salts or chemicals
  - Carbon tetrachloride
  - Halogen-type refrigerants
  - Cleaning solvents (such as perchloroethylene)
  - Printing inks, paint removers, varnishes, etc.
  - Cements and glues
  - Antistatic fabric softeners for clothes dryers
  - Masonry acid washing materials
  - Chlorinated laundry products
  - Hydrochloric acid

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**INSTALLATION INSTRUCTIONS**

**WARNING**

**Explosion Hazard**

Furnace must be installed and serviced by a qualified person.

Examples of a qualified person include:

- licensed heating personnel,
- authorized gas company personnel.

Read and follow all instructions provided for installation, adjustment, service, alteration, or maintenance.

Failure to follow these instructions can result in death, explosion, fire, or carbon monoxide poisoning.

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**Plan Vent System**

**Vertical Venting**

Category I furnaces must be vented vertically or nearly vertically. Common venting and multistory venting are permitted when done in accordance with applicable codes, such as local and national codes.

The venting system should be designed in accordance with the “FAN” columns in the venting tables in the latest editions of the National Fuel Gas Code, ANSI Z223.1/ NFPA 54.

- Consult local building codes for installation requirements.
- The vent connector should be as short as possible with the least number of elbows and angles to do the job.
- It is recommended that a minimum of 26 gauge galvanized flue pipe be used. Use of single-wall vent pipe for the vent connector is permissible only in conditioned space. The vent material used should be in accordance with the National Fuel Gas Code, ANSI Z223.1/ NFPA 54 (latest edition) and local codes. Fan-assisted combustion system Category I furnaces shall not be vented into single wall metal vents.

**NOTE:** Use Doublewall Type B vent pipe through unconditioned space such as attics and crawl spaces.

- The vent connector must have an upward slope toward the chimney on all horizontal runs of at least ¼ in. per foot of horizontal run and should be supported by a sheet metal strap. The vent pipe connection must be secured to the induced draft blower outlet.
- A factory-built chimney must extend 3 ft above the highest point where it passes through a roof of a building and at least 2 ft higher than any portion of a building within a horizontal distance of 10 ft as shown.

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**Inspect Shipment**

**WARNING**

**Excessive Weight Hazard**

Use two or more people to move and install furnace.

Failure to do so can result in back or other injury.

This furnace is shipped in one package, completely assembled and wired. The thermostat is shipped in a separate carton when ordered.

- Check the unit rating plate to confirm specifications are as ordered.
- Upon receipt of equipment, carefully inspect it for possible shipping damage. Take special care to examine the unit inside the carton if the carton is damaged.
- If damage is found, it should be noted on the carrier’s freight bill. Damage claims should be filed with the carrier immediately. Claims of shortages should be filed with the seller within 5 days.

**NOTE:** If any damages are discovered and reported to the carrier, do not install the unit as your claim may be denied.
Vent Option - Vent Through Roof

- All vents passing through floors, ceilings, and walls must be fire stopped according to the requirements of the National Fuel Gas Code. See "Vent Options."

Sidewall Venting

This furnace can be sidewall (horizontally) vented with a listed sidewall venter such as Field Controls Model SWG-4HD with CK-43 Control Kit, or Tjernlund Model GPAK-JT. See the Sidewall Venter Limitations Chart following.

Category I venting classification is maintained when vented in this manner. The furnace, power venter and control kit (where applicable) must be installed in accordance with their installation instructions and all applicable codes.

For horizontal runs of vent pipe, supports are required at 5 ft intervals.

Sidewall Venter Limitations Chart

<table>
<thead>
<tr>
<th>Vent pipe diameter</th>
<th>4 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum vent pipe length</td>
<td>4 ft</td>
</tr>
<tr>
<td>Maximum vent pipe length</td>
<td>25 ft *</td>
</tr>
<tr>
<td>Maximum number of 90° elbows</td>
<td>4</td>
</tr>
</tbody>
</table>

* When fewer than 4 elbows are used, maximum vent pipe length can be increased by 5 ft per unused elbow.

Vent Through Wall

Chimney Options

The furnace must be connected to a factory-built chimney or vent complying with a recognized standard, or a masonry or concrete chimney lined with a lining material acceptable to the authority with jurisdiction.

NOTE: Venting into an unlined masonry chimney or a single wall metal vent is prohibited in all cases. A lined masonry chimney may be used.

Lined (Masonry) Chimney Venting

1. Cleanout
2. Liner
3. (Lined) Masonry chimney
NOTE: All vent pipe run outside shall be constructed of factory-built chimney sections.

- Extend the vent connector into the chimney so that it is flush with the inside of the flue liner. Seal the joint between the pipe and the liner.
- Masonry chimneys serving fireplaces cannot be used for venting purposes unless the fireplace opening is permanently sealed.
- A vent connector serving this appliance must not be connected into any portion of mechanical draft systems operating under positive pressure.
- The vent pipe must not be connected to a chimney flue serving a solid fuel appliance.
- A manual damper, barometric draft regulator, or flue restrictor must not be installed between the furnace and the chimney.
- Where local experience indicates that condensate may be a problem, the vent shall be constructed to prevent condensation from entering the combustion blower. Provision shall be made to drain off the condensate.
- All unused chimney openings should be closed.
- Multistory venting is allowed as permitted by the National Fuel Gas Code or local codes.
- Install all vents in accordance with the vent manufacturer’s instructions. For unlisted material, install in accordance with the National Fuel Gas Code.
- Vent terminals must be installed in accordance with the vent terminals listing or in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 (latest edition), and local codes.

Factory-Built Chimney Venting

1. Factory built chimney
2. Cleanout

Existing Venting Systems

When an existing furnace is removed or replaced, the original venting system may no longer be sized to properly vent the attached appliances. An improperly sized venting system can result in spillage of flue products into the living space, the formation of condensate, leakage, etc. See the “Carbon Monoxide Poisoning Hazard” for proper test procedure.

WARNING:
CARBON MONOXIDE POISONING HAZARD

Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death.

The following steps shall be followed for each appliance connected to the venting system being placed into operation, while all other appliances connected to the venting system are not in operation:

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

1. Using a \( \frac{1}{4} \) in. sheet metal screw, secure the vent pipe to the inducer blower outlet.
2. Make sure all vent connections do not leak.
3. Check that the venting is open, and that it is the correct size.
4. Check that the vent pipe terminates outside the building.

Install Duct Work

IMPORTANT:
- Install duct work in accordance with NFPA 90B and any local codes.
- If there is no complete return air duct system, the return air connection must be sealed to the furnace casing and run full size to a location outside the utility room or space housing the furnace to prevent a negative pressure on the venting system.

Installation with Return Ducts

A return air duct system is recommended. If the unit is installed in a confined space or closet, a return connection must be run, full size, to a location outside the closet. The air duct in the closet must be tight to prevent any entrance of air from the closet into the circulating air.

Installation with an Evaporator Coil

When a condensing unit is used in conjunction with the furnace, the evaporator coil must be installed in the discharge (supply) air. Do not install an evaporator coil in the return air; excessive condensation will occur within the furnace.

When installing a WME coil in a horizontal position with a horizontal gas furnace, always keep the open end of the A-coil facing the supply air outlet of the furnace (blow into the open end of the A-coil). The A-coil should point away from the supply air outlet of the furnace as shown.

Installation without an Evaporator Coil

If a cooling coil is not installed with the furnace, then a removable access panel should be provided in the supply plenum for purposes of inspecting the heat exchanger. This opening must be accessible when the furnace is installed. It must be large enough that the heat exchanger can be viewed for possible openings using light assistance or so that a probe can be inserted for sampling the airstream. The cover for the opening must be leak tight.

Filter Specifications

Filters are not supplied with these furnaces. It is the furnace installer's responsibility to install properly sized filters in accordance with the Minimum Filter Requirements chart.

- The Airflow Descriptor is the 2 digits immediately preceding the hyphen (-) in the furnace model number. Example: 16 is the Airflow Descriptor for furnace model WFA7075B16-1A. The model number is located on the rating plate inside the access panel.

- Areas and dimensions shown for cleanable filters are based on filters rated at 600 ft per minute face velocity.

- Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

<table>
<thead>
<tr>
<th>Airflow Descriptor</th>
<th>Disposable Filters</th>
<th>Cleanable Filters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min. Area (sq. in.)</td>
<td>Size (in.)</td>
</tr>
<tr>
<td>09</td>
<td>480</td>
<td>20 x 25</td>
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<tr>
<td>10</td>
<td>480</td>
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<tr>
<td>12</td>
<td>576</td>
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<td>14</td>
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<tr>
<td>16</td>
<td>768</td>
<td>20 x 20</td>
</tr>
<tr>
<td>20, 22</td>
<td>960</td>
<td>20 x 25</td>
</tr>
</tbody>
</table>

If a central return air filter-grille is used, the furnace does not require a filter.

To install a filter at the furnace only, use the following kits:
- AFIL524 for side return on upflow installations.
- AFIL529 for bottom return on upflow furnace installations.
- WAFILTHA7 for single side return in installations requiring more than 1600 CFM nominal air delivery.
Make Electrical Connections

**WARNING**

Electrical Shock Hazard
Disconnect power before servicing.
Replace all parts and panels before operating.
Failure to do so can result in death or electrical shock.

Thermostat
Install a room thermostat according to the instructions furnished with it. Select a location on an inside wall that is not subject to drafts, direct sunshine, or other heat sources.

Make the low voltage thermostat connections to the blower control board as indicated on the Wiring Connection Diagram.

**Continuous Low Speed Blower**
If continuous blower operation on low speed is desired, connect the low speed motor tap to the CONT (constant) air terminal on the blower control board. See the Wiring Connection Diagram. The blower will operate on low speed whenever the main power is connected to the furnace, except when it operates on heating or cooling speed during thermostat call for heat or cooling.

**NOTE:** The constant air terminal is to be connected to the low speed motor tap only. If a motor is wired for a higher speed, the increased amp draw could cause the board control to fail and void the warranty.

1. Disconnect power.
2. Remove the screw from the furnace electrical connection box.
3. Remove the cover from the furnace electrical connection box.
4. Route the field supply wires to the furnace electrical connection box.
5. Using UL listed wire nuts, connect the field supply wires to the furnace (black to black and white to white).

**WARNING**

Electrical Shock Hazard
Electrically ground furnace.
Connect ground wire to green ground screw.
Failure to do so can result in death or electrical shock.

6. Connect ground wire to green ground screw.

7. Replace the furnace electrical connection box cover and screw.
Make Gas Connections

**IMPORTANT:** This furnace requires conversion for use with propane. To order the correct conversion kit, see “Accessories.”

1. Install the field gas supply as shown.
2. Provide a sediment trap on the outside of the furnace.
3. Install a manual gas shut-off valve in the gas line, outside the unit, 5 ft above the floor, or in accordance with any local codes.
4. Install a test gauge connection with a ¹⁄₈ in. NPT plugged tapping immediately upstream of the shut-off valve as shown.
5. Connect the gas pipe to the furnace controls providing a ground joint union as close to the controls as possible to facilitate removal of controls and manifold.

Pipe-joint compounds suitable for use with natural and LP gas must be used. Do not use Teflon® tape.

6. Turn off the gas supply at the manual gas shut-off valve.
7. Remove the inlet pressure tap plug on the gas control valve and connect pressure gauge to the ¹⁄₈ in. NPT inlet pressure tap.
8. Turn on the gas supply at the manual gas shut-off valve.
9. Observe the inlet pressure.

The minimum inlet gas supply pressure is 5 in. W.C. for natural gas and 11 in. W.C. for propane gas.

The maximum inlet gas supply pressure is 10.5 in. W.C. for natural gas and 13 in. W.C. for propane gas.
10. Turn off the gas supply at the manual gas shut-off valve.

**IMPORTANT:** If the inlet gas supply pressure is not within the minimum and maximum range as shown on the rating plate, contact your gas supplier.
11. Disconnect the pressure gauge from the ¹⁄₈ in. NPT inlet pressure tap.
12. Replace the inlet pressure tap plug on the gas control valve.
13. Turn on the gas supply at the manual gas shut-off valve.
14. Test all connections by brushing on an approved non-corrosive leak-detection solution. Bubbles will show a leak. Correct any leak found.

- At test pressures greater than ½ psig (3.5 kPa), the furnace and the manual gas shut-off valve must be disconnected from the gas supply piping system.
- At test pressures less than or equal to ½ psig (3.5 kPa), the furnace must be isolated from the gas supply piping system by closing the manual gas shut-off valve.
15. Replace the burner access door.

---

**Check the Furnace Input Rate (if required)**

**IMPORTANT:**

- The furnace input rate must not exceed the input rating on the furnace rating plate.
- At altitudes from 2,000 to 7,500 ft the furnace input rate must not exceed that on the rating plate multiplied by the Input Factor in the Manifold Pressure vs. Altitude chart.
- This furnace is equipped for rated input at manifold pressures of 3.5 in. W.C. for natural gas and 10.0 in. W.C. for propane gas.

1. For natural gas, check the furnace rate by observing the gas meter, making sure all other gas appliances are turned off. The test hand on the meter should be timed for at least one revolution.

\[ \text{BTU/HR} = \text{Cubic feet per Revolution} \times 3600 \times \text{Heating Value} \]

2. The actual heating value of your gas can be obtained from your local utility company.

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Adjust the Furnace Input Rate (if required)

For altitudes 4,500 to 7,500 feet above sea level.

1. Remove the burner access door.
2. Move the gas control switch to the OFF position. Use only your hand to move the gas control switch; tools are not required.
3. Remove the outlet pressure tap plug on the gas control valve and connect pressure gauge to the \( \frac{1}{8} \) in. NPT outlet pressure tap.

Gas Control Valve

4. Be sure the gas control switch has been in the OFF position for at least 5 minutes before starting the unit.
5. Move the gas control switch to the ON position.
   **NOTE:** This furnace is equipped with an ignition device which automatically lights the burner. This furnace cannot be lighted manually. Do not try to light the burner by hand.
6. Turn on the electrical power to the furnace.
7. Set the room thermostat to a point above room temperature to light the main burners.
8. Observe the pressure reading on the pressure gauge.
9. Refer to the Manifold Pressure vs. Altitude chart for the correct manifold pressure. If necessary, remove the regulator adjusting cap on the gas valve and turn the regulator adjusting screw clockwise to increase pressure and input, or counterclockwise to decrease pressure and input.
   **IMPORTANT:** If the manifold pressure cannot be adjusted to the correct value, contact your gas supplier.
10. Move the gas control switch to the OFF position.
11. Disconnect the pressure gauge from the \( \frac{1}{8} \) in. NPT outlet pressure tap.
12. Replace outlet pressure tap plug and the regulator adjusting cap on the gas valve.
13. Move the gas control switch to the ON position.
14. Replace the burner access door.
15. Set the room thermostat to the desired temperature necessary to achieve optimum temperature rise.

Manifold Pressure vs. Altitude Chart (Most Models)

<table>
<thead>
<tr>
<th>Altitude (ft)</th>
<th>Heating Value (BTU/ft³)</th>
<th>Manifold Pressure (in. W.C.)</th>
<th>Input Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>948</td>
<td>3.50</td>
<td>0.9666</td>
</tr>
<tr>
<td>3000</td>
<td>914</td>
<td>3.50</td>
<td>0.9499</td>
</tr>
<tr>
<td>4000</td>
<td>881</td>
<td>3.50</td>
<td>0.9332</td>
</tr>
<tr>
<td>4500</td>
<td>865</td>
<td>3.50</td>
<td>0.9249</td>
</tr>
<tr>
<td>5000</td>
<td>849</td>
<td>3.29</td>
<td>0.8900</td>
</tr>
<tr>
<td>5500</td>
<td>833</td>
<td>3.27</td>
<td>0.8790</td>
</tr>
<tr>
<td>6000</td>
<td>818</td>
<td>3.25</td>
<td>0.8680</td>
</tr>
<tr>
<td>6500</td>
<td>802</td>
<td>3.23</td>
<td>0.8570</td>
</tr>
<tr>
<td>7000</td>
<td>787</td>
<td>3.21</td>
<td>0.8460</td>
</tr>
<tr>
<td>7500</td>
<td>771</td>
<td>3.19</td>
<td>0.8350</td>
</tr>
</tbody>
</table>

Manifold Pressure vs. Altitude Chart (Model WFAU 150 only)

<table>
<thead>
<tr>
<th>Altitude (ft)</th>
<th>Heating Value (BTU/ft³)</th>
<th>Manifold Pressure (in. W.C.)</th>
<th>Input Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>948</td>
<td>3.41</td>
<td>0.9666</td>
</tr>
<tr>
<td>3000</td>
<td>914</td>
<td>3.41</td>
<td>0.9499</td>
</tr>
<tr>
<td>4000</td>
<td>881</td>
<td>3.41</td>
<td>0.9332</td>
</tr>
<tr>
<td>4500</td>
<td>865</td>
<td>3.41</td>
<td>0.9249</td>
</tr>
<tr>
<td>5000</td>
<td>849</td>
<td>3.20</td>
<td>0.8900</td>
</tr>
<tr>
<td>5500</td>
<td>833</td>
<td>3.18</td>
<td>0.8790</td>
</tr>
<tr>
<td>6000</td>
<td>818</td>
<td>3.16</td>
<td>0.8680</td>
</tr>
<tr>
<td>6500</td>
<td>802</td>
<td>3.14</td>
<td>0.8570</td>
</tr>
<tr>
<td>7000</td>
<td>787</td>
<td>3.12</td>
<td>0.8460</td>
</tr>
<tr>
<td>7500</td>
<td>771</td>
<td>3.11</td>
<td>0.8350</td>
</tr>
</tbody>
</table>

For Altitudes 7,500 to 10,000 feet above sea level.
Do not adjust manifold pressure. An orifice change is required.
For the correct orifice size, see Table F.4 in Appendix F of the National Fuel Gas Code (ANSI Z223.1/NFPA 54, latest edition).
Complete Installation

**IMPORTANT:** Do not use this furnace if any part has been under water. Immediately call a qualified person to inspect the furnace and to replace any part of the control system and gas control which has been under water.

1. Check to be sure you have all of your tools.
2. Dispose of all packaging materials.
3. Check the furnace in its final location. Be sure the vent is not blocked.

**Measure Temperature Rise**

1. After 20 minutes of heating operation, measure the furnace temperature rise. Take air temperature readings in both the return air ducts and the heated air ducts (about 6 ft from the furnace where they will not be affected by radiant heat) as shown.

   **NOTE:** If more than one run of return or heated air ducts is used, air temperature measurements should be taken in each duct. These measurements can be converted to an average to obtain the temperature rise of the whole system.

2. If furnace doesn’t maintain temperature rise within the range shown on the furnace rating plate, adjust the blower speed.

**Adjust Blower Speed**

**WARNING**

**Electrical Shock Hazard**

Disconnect power before servicing. Replace all parts and panels before operating. Failure to do so can result in death or electrical shock.

**NOTE:** See the Wiring Connection Diagram while performing the following procedure.

1. Disconnect power.
2. For heating speed, check the temperature rise and make the necessary adjustments to the blower speed tap. See Wiring Diagram.
3. Reconnect power.
4. Recheck the temperature rise. Repeat the procedure as necessary to achieve optimum temperature rise.

**Shut Down the Furnace**

1. Set the room thermostat to the lowest setting.
2. Disconnect power.
3. Remove burner access door.
4. Shut off the gas by moving the gas control switch to the OFF position.
5. Replace the burner access door.
Sequence of Operation

Heating

A call for heat from the thermostat closes R to W on the blower control board, which begins the ignition sequence. The induced draft blower output energizes. The pressure switch senses normal combustion airflow, and closes. After a 15-second pre-purge, the control energizes the hot surface igniter. After an igniter warm-up period, the main gas valve energizes. Upon main burner ignition, the circulating air blower energizes following a 30-second delay.

When the call for heat is satisfied, R to W opens and the gas to the burners shuts off. The control turns off the inducer after a 5-second post-purge delay and the heating speed blower output turns off following the blower “off” delay.

**NOTE:** There is a fixed blower “off” delay of 90 seconds which is one-time adjustable to 150 seconds. See the Wiring Connection Diagram in the “Troubleshooting” section.

In the event the limit control senses an abnormally high temperature and opens, the ignition control de-energizes, and the combustion blower and circulating air blower heating speed continue to energize.

**Fan On**

A call for fan from the thermostat closes R to G on the control board. The control waits for a 1-second thermostat debounce delay before responding by energizing the heat speed blower. When the call for fan is turned off, the control de-energizes the heating speed blower after a 60-second delay.

**Cooling**

A call for cooling from the thermostat closes R to Y and R to G on the blower control board. The control waits for a 1-second thermostat debounce delay before energizing the cool speed blower. When the call for cooling is satisfied, the control de-energizes the cooling speed blower after a 60-second delay.

**Controls**

**Pressure Switch**

The pressure switch is a normally open switch that monitors combustion airflow. If there is adequate airflow, the pressure switch closes. Inadequate airflow resulting from excessive venting system restriction or a failed combustion blower will cause the switch to remain open.

**Rollout Switch(es)**

The rollout switch(es) are normally closed switch(es) that open when abnormal temperatures exist in the burner area. This can be caused by a restricted heat exchanger causing main burner flame to “roll out” into the vestibule area or burner box. The rollout switch(es) must be manually reset by pushing the button on top to restore furnace operation.

**Primary Limit Control**

This is a normally closed control that opens if abnormally high circulating air temperatures occur. It is an automatic reset control.

**Safety Interlock Switch**

When the blower door is removed, the safety interlock switch breaks the power supply to the burner controls and blower motor.

**Blower Control Board**

**WARNING**

Electrical Shock Hazard

Disconnect power before servicing.
Replace all parts and panels before operating.
Failure to do so can result in death or electrical shock.

The blower control board operates the circulating air blower, the combustion blower and any accessories connected to it. There is a fixed blower “off” delay of 90 seconds, which is one-time adjustable to 150 seconds. See Wiring Connection Diagram.

**Gas Control Valve**

The gas control valve contains control logic to sense proper operating conditions and provides gas flow and ignition only when all conditions are properly met. The gas control valve also regulates the manifold gas pressure.
Furnace Fails to Operate Properly

Review “Sequence of Operation” and visually inspect the following before troubleshooting:

Is the power to the furnace on?
Is the blower compartment door securely closed?
Are the manual shutoff valves in the gas line to the furnace open?

Failure Codes

The system has a built-in, self-diagnostic capability. The control continuously monitors its own operation and the operation of the system. If a system problem occurs, a failure code is indicated by the LED on the gas control valve. See the Failure Codes chart for a description of the flash codes.

IMPORTANT: Do not remove the blower compartment door or turn off the power to the furnace because either action will clear the control’s memory of the failure.

1. Start the system by setting the thermostat above the room temperature.
2. Observe the system’s response.
3. Use the information provided in this section to check the system’s operation.

---

### Failure Codes

<table>
<thead>
<tr>
<th>LED Status (Flash Codes)</th>
<th>Fault Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No Power to the System Control</td>
</tr>
<tr>
<td>Steady Flash*</td>
<td>Normal Operation (Standby or call for heat)</td>
</tr>
<tr>
<td>2 Flashes</td>
<td>Pressure switch closed when it should be open</td>
</tr>
<tr>
<td>3 Flashes</td>
<td>Pressure switch stuck open 30 seconds or longer after call for heat (system in 5-minute delay mode before next call for heat). On/off switch in OFF position during a call for heat will generate this code.</td>
</tr>
<tr>
<td>4 Flashes</td>
<td>Open Limit Switch or Limit Switch Circuit</td>
</tr>
<tr>
<td>5 Flashes</td>
<td>Flame Sense Signal sensed out of proper sequence</td>
</tr>
</tbody>
</table>

* 11 or more flashes with no pause
Wiring Connection Diagram - Honeywell® SmartValve II® Ignition System

NOTES:
1. If any of the original wire as supplied with the furnace must be replaced, it must be replaced with wiring material having a temperature rating of at least 90°C.
2. Not used on all models
3. For a fixed blower off delay of 90 seconds see “Blower Control Board” section. Jumper can be cut for a 150 second off delay.

WARNING
Electrical Shock Hazard
Disconnect power before servicing.
Replace all parts and panels before operating.
Failure to do so can result in death or electrical shock.

Check codes for proper wiring and circuit protection before installation.
ASSISTANCE OR SERVICE

If you need further assistance, you can write to the below address with any questions or concerns:

Whirlpool® Home Cooling and Heating
7901 S.W. 6th Court
Plantation, Florida 33324

Please include a daytime phone number in your correspondence.

Accessories

To order accessories ask for the appropriate part number listed below or contact your Whirlpool® Home Cooling and Heating dealer.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALPKT572-2</td>
<td>Natural Gas to Propane Conversion Kit</td>
</tr>
<tr>
<td>WAFILTHA7-2</td>
<td>Filter Frame Kit</td>
</tr>
<tr>
<td>AFILT524-1</td>
<td>Side Return Filter Kit</td>
</tr>
<tr>
<td>AFILT529-1</td>
<td>Bottom Return Filter Kit</td>
</tr>
<tr>
<td>WABASE511</td>
<td>Combustible Floor Base (14.5&quot; cabinets)</td>
</tr>
<tr>
<td>WABASE512</td>
<td>Combustible Floor Base (17.5&quot; cabinets)</td>
</tr>
<tr>
<td>WABASE568</td>
<td>Combustible Floor Base (21.0&quot; cabinets)</td>
</tr>
<tr>
<td>WABASE569</td>
<td>Combustible Floor Base (24.5&quot; cabinets)</td>
</tr>
</tbody>
</table>