

USER'S INFORMATION MANUAL

Gas-Fired Furnace

Congratulations...

...you have one of the most modern gas furnaces made. Your unit has been carefully selected to keep you warm and comfortable during the winter months. It will deliver superb performance with only minimal help from you.

To keep your operating costs low and to eliminate unnecessary service calls, we have provided a few guidelines. These guidelines will help you understand how your gas furnace operates and how to maintain it so you can get years of safe and dependable service. Read all the instructions in this manual, and keep all manuals for future reference.

GAMA Certified

The Gas Appliance Manufacturers Association (GAMA) symbol verifies that Annual Fuel Utilization Efficiency (AFUE) ratings for our gas furnaces have been derived from U.S. Government standard tests.



CSA International Design Certified

The CSA International symbols on each nameplate is your assurance that your furnace design meets nationally recognized standards for safety and performance.



Manufactured By
A.A.C.
A **Lennox International Company**
421 Monroe Street
Bellevue, OH 44811



WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow the 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 the gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency, or the gas supplier.

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IMPORTANT SAFETY INFORMATION

WARNING

ELECTRICAL SHOCK, FIRE, OR EXPLOSION HAZARD

Failure to follow the 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.

For your safety, read the following before operating your furnace:

1. The furnace area must be kept clear and free of combustible materials, gasoline, and other flammable vapors and liquids.
2. Insulating materials may be combustible. A furnace installed in an attic or other insulated space must be kept free and clear of insulating materials. Examine the furnace when it is installed and also any time insulation is added.
3. For proper and safe operation, the furnace needs air for combustion and ventilation. Do not block or obstruct air openings on the furnace, air openings to the area in which the furnace is installed, and the spacings around the furnace.
4. This furnace is equipped with an ignition device which automatically lights the burners. See **OPER-**

ATING YOUR FURNACE on this page for information on lighting and shutting down the furnace.

5. 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.
6. Do not use the 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.
7. Examine the furnace installation to determine that:
 - A. All flue gas carrying areas external to the furnace, such as the chimney and vent connector, are clear and free of obstructions.
 - B. Vent connector is in place, slopes upward, and is physically sound without holes or excessive corrosion.
 - C. Return air duct connection(s) is physically sound, sealed to the furnace casing, and terminates outside the space containing the furnace.
 - D. Physical support of the furnace is sound without sagging, cracks, gaps, etc. around the base as to provide a seal between the support and the base.
 - E. There are no obvious signs of deterioration of the furnace.
 - F. Burner flames are in good adjustment (see **Burner Flame** beginning on page 7).
8. It is important that you conduct a physical inspection of the furnace at least twice a year. It is also recommended that the furnace should be inspected by a qualified service agent at least once per year.

OPERATING YOUR FURNACE

These furnaces are equipped with an ignition device which automatically lights the burners. **Do not try to light the burners by hand.**

Before operating, smell around furnace area for gas. Be sure to smell near floor because some gas is heavier than

air and will settle to the lowest point. See **WHAT TO DO IF YOU SMELL GAS** on page 1 if the odor of gas is present.

Use only your hand to turn the gas control knob; **never use tools**. If the knob will not turn by hand, don't try to repair it. Call a qualified service technician. **Force or attempted repair may result in a fire or explosion.**

Lighting Instructions

1. **STOP!** Read the previous safety information.
2. Set the thermostat to the lowest setting.
3. Turn off all electric power to the furnace.
4. Remove the burner compartment access panel.
5. This appliance is equipped with an automatic ignition device. **Do not try to light the burners by hand.**
6. Turn the gas control knob to “OFF” (see Figure 1).

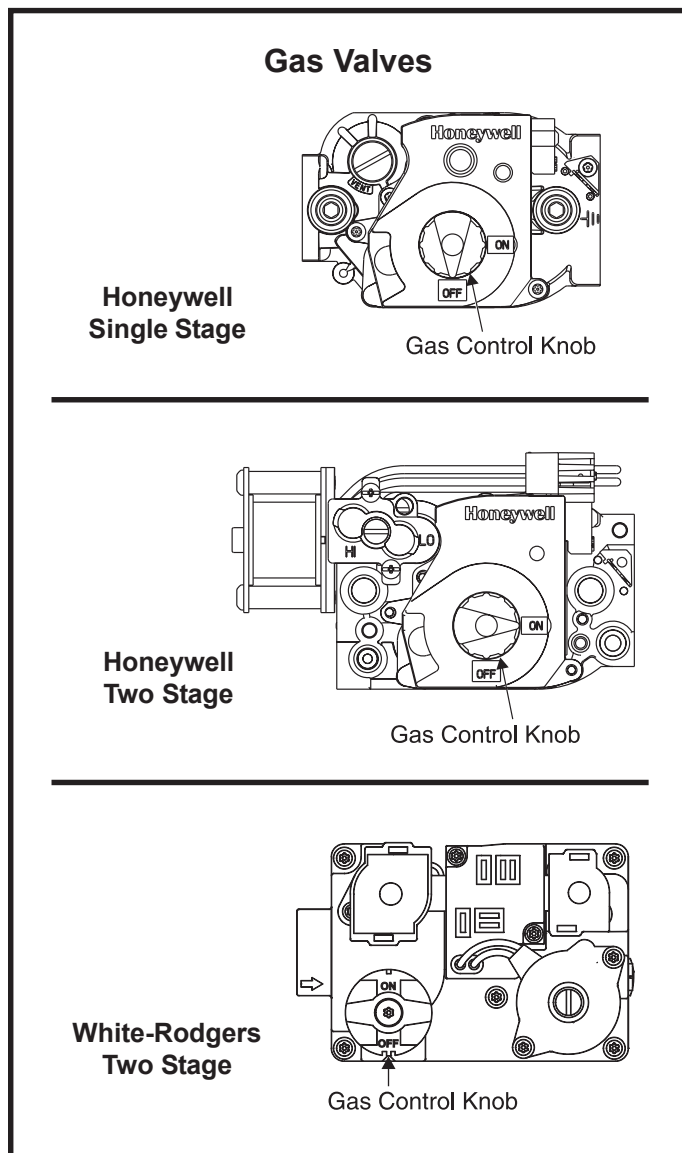


Figure 1

7. Wait 5 minutes to clear out any gas, then smell for gas (including at the bottom of the unit near the ground). If you smell gas, **stop** and follow the directions in **WHAT TO DO IF YOU SMELL GAS** on page 1. If you don't smell gas, continue to next step.

8. Turn the gas control knob to “ON”.
9. Replace the burner compartment access panel.
10. Turn on all electric power to the furnace.
11. Set the thermostat to the desired setting.
12. If the furnace will not operate, follow the instructions found below in **To Turn Off Gas to Furnace** and call your service technician or gas supplier.

Shutting Down the Furnace

To shut down the furnace, set the thermostat to the “OFF” position.

To Turn Off Gas to Furnace

1. Set the thermostat to the lowest setting.
2. Turn off all electric power to the furnace if service is to be performed.
3. Remove the burner compartment access panel.
4. Turn the gas control knob counterclockwise to “OFF” (see Figure 1). Do not force.
5. Replace the burner compartment access panel.

Temperature Control

There are many types and styles of thermostats. Yours may look different from the one shown in Figure 2 on page 4, depending on the type of thermostat and whether cooling was installed with the system. However, almost all thermostats perform the same basic functions described in the following section.

Thermostat Operation

There are two switches located on the thermostat (see Figure 2 on page 4). One switch controls the heating and cooling (if applicable) functions. The other switch is for “FAN” operation, either continuous or automatic. On the thermostat is the temperature range for the heating temperature and the cooling temperature desired.

To put the system into operation, push the switch to either “HEAT” or “COOL” position. After choosing the type of operation, move the thermostat dial or lever to select the temperature you would like the system to maintain.

Fan Operation

You may wish to increase your comfort by setting your system for continuous air circulation of the indoor air. The fan switch on the thermostat permits you to do this (see Figure 2 on page 4).

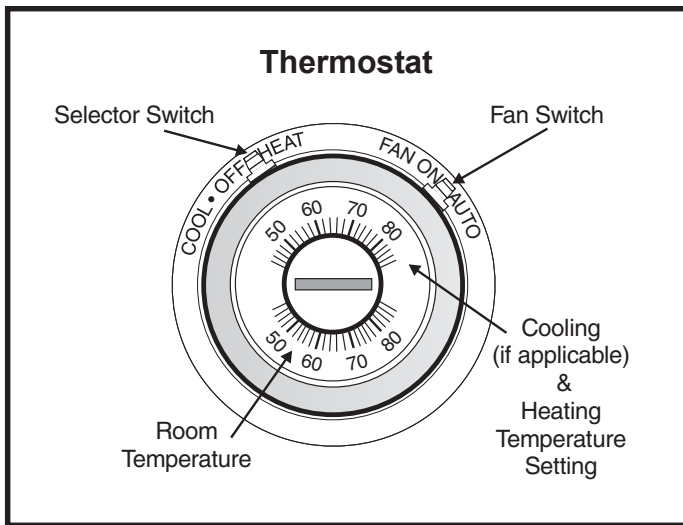


Figure 2

With the switch in the “ON” position the fan will operate continuously. “AUTO” position gives fan operation only when the unit is in either heating or cooling.

Furnace Operation

If your furnace is operating but fails to provide complete comfort, check the following before calling for service:

1. Be sure the thermostat setting is correct.
2. Check to see if the filter is clean.
3. Be sure air can circulate freely throughout your home. Do not block supply registers or return grilles with furniture or rugs.

And if you also have cooling...

4. Keep surface of the outdoor coil free from dirt, lint, paper, or leaves.
5. Check and clean indoor coil, if necessary. (This check should be made at the start of each cooling season by a qualified service technician.)

If your furnace fails to operate, check the following:

1. Be sure the main switch that supplies power to the furnace is in the “ON” position.
2. Replace any burned-out fuses or reset circuit breakers.
3. Be sure the thermostat is properly set.

If the furnace still does not start, call a qualified service technician.

MAINTENANCE OF YOUR FURNACE

⚠ WARNING

Always shut off all power to the unit before attempting any of the following maintenance procedures. Failure to do so may result in personal injury.

There are routine maintenance steps you should take to keep your furnace operating efficiently. This maintenance will assure longer life, lower operating costs, and fewer service calls. In addition to the maintenance procedures listed in this manual, there are also other service and maintenance procedures that require the skills of a service person who has specialized tools and training. **Personal injury can result if you are not qualified to do this work.** Please call your dealer when service is needed.

Your gas furnace is designed to give many years of efficient, satisfactory service. However, the varied air pollutants commonly found in most areas can affect longevity and safety. Chemicals contained in everyday household items such as laundry detergents, cleaning sprays, hair sprays, deodorizers, and other products which produce airborne residuals may have an adverse affect upon the metals used to construct your appliance.

The cabinet of the furnace can be cleaned with soap and water. Grease spots can be removed with a household cleaning agent.

It is important that you conduct periodic physical inspections of your appliance, paying special attention to the gas burner and the flue outlet from the furnace. These components are located at the front of the unit. A flashlight will be useful for these inspections. Make one inspection prior to the beginning of the heating season and another during the middle.

Should you observe unusual amounts of any of the following conditions, it is important that you call your authorized dealer at once to obtain a qualified service inspection:

- Rust, flakes, or other deposits
- Coatings
- Corrosion

Even if no unusual rust or other conditions are observed, **it is recommended that the furnace be inspected and serviced at least once per year by a qualified service technician.** Regular inspections and planned maintenance will assure many years of economical performance from your gas furnace.

Combustion and Ventilation Air

Adequate air supply must be provided to furnaces located in a closet, alcove, or utility room by means of upper and lower

grilles in the door, or by the introduction of outside air, or both, in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 (latest edition) or the CSA B149.1, Natural Gas and Propane Installation Codes, and local codes.

⚠ WARNING

Adequate combustion and ventilation air must reach the furnace to provide for proper and safe operation. Air openings in front of furnace must be kept free of obstructions. Any obstruction may cause improper operation that can result in a fire hazard or carbon monoxide injury.

Venting and Furnace Support

Venting of this furnace must comply with the unit Installation Instructions. Be sure the installer has followed these requirements. If not, you should request the installer to comply as soon as possible.

For your safety, please note the following:

1. 90% plus condensing furnaces must not be vented with any other appliance. The flue (vent) system is under positive pressure from the power venter. Connection of any other appliance to the furnace flue may create a hazardous condition that could cause either appliance to malfunction.
2. 80% furnaces may be common vented with another appliance in certain circumstances. Refer to the installation instructions and Category I Venting Tables, National Fuel Gas Code, ANSI Z223.1/NFPA 54 (latest edition) or the CSA B149.1, Natural Gas and Propane Installation Codes, and local codes for proper installation guidelines.
3. This furnace is not designed for use with a vent damper. Use of such a device will not improve the efficiency of this furnace.

The vent from your furnace may rise vertically and terminate above the roof. The vent from a 90% plus furnace may be run horizontally through an exterior wall. When horizontal venting an 80% furnace, an approved sidewall venter must be used. Refer to the Installation Instructions for further information on horizontal venting of an 80% furnace.

Make sure all flue product materials external to the furnace are clear and free of any obstruction, slope upward, and have no holes or leaks. For proper venting terminations, see the Installation Instructions furnished with the furnace. These furnaces are installed either as direct vent or non-direct vent units, depending on the furnace model. A direct vent (two pipe) installation requires that all the air necessary

for combustion be supplied from outside the dwelling through an air intake pipe. A non-direct vent (one pipe) installation uses air from inside the dwelling for combustion. If your furnace is direct vented, you should inspect the air intake and flue product carrying areas external to the furnace to determine they are clear and free of obstructions. You should also check to see that the vent-air intake system is in place, physically sound, sealed to the furnace casing, and terminating outside the space containing the furnace.

Check to see that the furnace cabinet is sound and firmly supported, without sagging. There should be no cracks or gaps between the furnace and the base or floor, which would permit entry of unfiltered air.

It is important that the outside area where the vent terminates is kept clear of any obstructions which might block or impede the venting of the furnace. Screens in vent terminals should be cleaned periodically. Should venting become blocked at anytime, your furnace is equipped with a special safety control to prevent operation of the furnace until the condition has been corrected. Contact your dealer if you desire more information about this important safety feature.

Should any unusual conditions be observed during your inspections, call an authorized service dealer immediately.

Return Air

All return air duct connections must be tight and sealed to furnace cabinet and all return air grilles or registers must be located outside the space containing the furnace.

Cleaning/Replacing the Filter

It is very important to clean or replace the air filter regularly. Dirty filters are the most common cause of inadequate heating or cooling performance and can sharply increase the operational costs of your unit. In some cases, they can double the cost. **The air filter should be inspected at least every 6 weeks and cleaned or replaced as required.**

Your furnace may use either a disposable filter or a cleanable filter. The type of filter may be indicated on a label attached to the filter. If a disposable filter is used, replace with the same type and size. To remove excess dirt from a cleanable filter, shake filter and/or use a vacuum cleaner. Wash filter in soap or detergent water and replace after filter is dry. Cleanable filters do not need to be oiled after washing.

Cleanable filters may be replaced with disposable filters. Refer to Table 1 on page 6 when selecting the proper size and quantity of disposable filter.

If your air distribution system has a central return air filter-grille, the furnace does not need a filter. Filter-grilles can be maintained the same way as cleanable filters (see above). Table 2 on page 6 lists the filters that are used by furnace

type. The installer may have changed the filter size, so always measure the original filter and replace with the same size and type.

Filter Location

The filter on your furnace will be located in one of several places on the unit, depending on which furnace style you own. Filters are not supplied by the manufacturer with counterflow furnaces. (Refer to the following paragraph for information concerning counterflow furnace filters.)

Figure 3 shows the different filter locations by furnace style (except counterflow). Filters are not supplied with counterflow (downflow) furnaces but their use is required. An optional counterflow filter kit accessory is available from the manufacturer (see Table 2). The filters in counterflow furnaces are typically placed by the installer into the return plenum at the top of the furnace. Filters are also not supplied with several upflow and upflow/horizontal models. It is the installer's responsibility to install properly sized filters in accordance with Table 1. **When changing any furnace filter, it is important to measure the filter being replaced and to replace it with the same size filter.**

Minimum Filter Requirements						
Airflow Descriptor	Disposable Filters			Cleanable Filters		
	Min. Area (sq. in.)	Size (in.)	Qty.	Min. Area (sq. in.)	Size (in.)	Qty.
09	480	20 x 25	1	240	16 x 20	1
10	480	20 x 25	1	240	16 x 20	1
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20, 22	960	20 x 25	2	480	20 x 25	1

- The Airflow Descriptor is the two digits following the "D" in the model number.
- Areas and dimensions shown for permanent filters are based on filters rated at 600 feet 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 1

Lubrication

Lubrication of the bearings in the circulating air blower motor and the combustion blower motor is not recommended.

Burner Flame

While the furnace is in operation, observe the main burner flames. Compare these observations to Figure 4 to

Filters Used (all filters listed are cleanable type)	
Furnace Type	Filter Size
Upflow - Side Return	16" x 25" x 1/2"
Upflow/Multi-Position Bottom Return* (Filter included in optional accessory kit)	26" x 24" x 1/2"
Counterflow (Filters included in optional accessory kit)	10" x 30" x 1/2" (two filters are used)

* Filter from bottom return accessory kit is cut to size by installer for bottom return applications. Always measure filter to determine exact size.

Table 2

determine if proper flame adjustment is present. If your observations indicate improper flame adjustment, call your authorized service dealer for service. **Do not attempt to adjust flame!** Your service representative will perform this adjustment correctly.

Condensate Collection and Disposal System (if applicable)

⚠ CAUTION

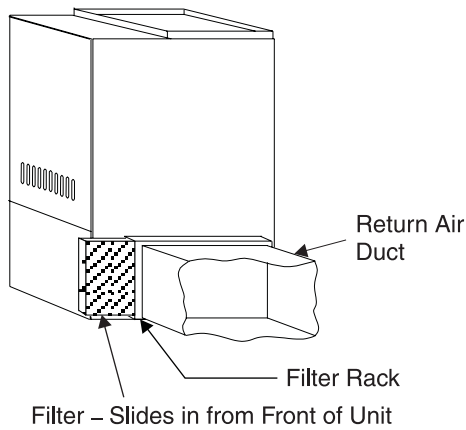
If the furnace has a condensate drain, it is incorporated within the furnace and is self-priming. **The condensate system must not be exposed to temperatures under 32°F.** Use of heat tape is permissible provided the rate temperature of tape **does not exceed 155°F.**

Make sure the condensate drain line does not become blocked or plugged. Visual inspection of condensate flow can easily be made while the furnace is operating. Use a flashlight to illuminate discharge end of the condensate drain that is placed in the sewer opening. The furnace will not operate properly if condensate drain line becomes blocked or plugged. If this event occurs, have the furnace inspected by a qualified service technician.

Rollout Switch

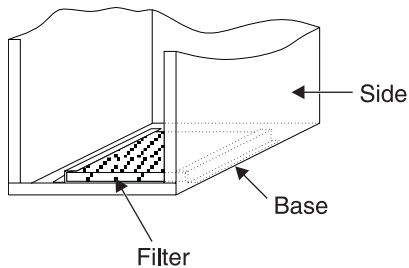
This unit is equipped with a manual reset high temperature sensor or rollout switch. In the unlikely event of a sustained main burner flame rollout, the rollout switch will shut off the flow of gas by closing the main gas valve. The switch is located inside the gas burner area. Flame rollout can be

Filter Location (Upflow/Multi-Position Models)



Side Return – Upflow Installations

If filter is located in an external filter rack or cabinet on either side of the furnace cabinet, it may be easily removed, cleaned, or changed, and reinserted in its proper location.



Bottom Return – Upflow/Horizontal Installations

If the furnace has a bottom return air, remove the lower front panel by lifting up and pulling out. The filter(s) may be removed by sliding toward the front. Replace in a reverse procedure.

Figure 3

caused by blockage of the power vent system, a blocked heat exchanger, or improper gas pressure or adjustment. If this event occurs, the unit will not operate properly. The gas supply to the unit should be shut off and **no attempt should be made to place it in operation**. The system should be inspected by a qualified service technician.

Safety Interlock Switch

The blower compartment door on your high efficiency gas furnace is equipped with a safety interlock switch that will automatically shut off your complete system (including blower) once the door is removed. This is for your personal safety. Be sure to check your furnace for proper operation once the door or panel has been replaced. If the

Typical Flame Appearance

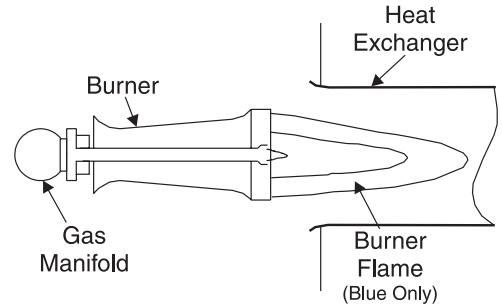


Figure 4

system does not operate once the panel has been replaced, try removing and replacing it once again. If the furnace still does not operate, call your dealer for service.

REPAIR PARTS

The following repair parts are available from your local distributor. When ordering parts, include the complete furnace model number and serial number which are printed on the rating plate located on the furnace.

Gas Control Group

Manifold	Orifice
Manifold retention plate	Ignition wire
Burner	Gas valve

Heat Exchanger Group

Primary heat exchanger	Transfer tube
Flue box	Burner inlet plate
Burner box	

Blower Group

Blower assembly	Capacitor
Blower housing	Blower cutoff
Blower motor	Blower support
Blower wheel	

Inducer Group

Pressure switch	Inducer blower and motor
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Electrical Group

Control box	Ignition control
Limit switch	Transformer
Fan timer control board	Rollout switch

Limited Warranty

August 1, 1997

This warranty gives you specific legal rights and you may have other rights which vary from state/province to state/province.

Warrantor: Armstrong Air Conditioning Inc., 421 Monroe St., Bellevue, OH 44811

Armstrong Air Conditioning Inc. products are available under the following names: Air Ease, Armstrong Air, American Aire, Concord

Subject to the limitations stated in this warranty, we warrant to the first buyer for use the residential heating, cooling or heat pump unit, when installed, operated and maintained as required by this warranty, to be free of defects in workmanship or material for a period of 5 years (1 year for commercial use) from the time of installation. We will replace any defective component without cost or expense to you except for the costs of delivery and labor for removal and replacement of the defective component.

Two-stage 80% furnaces installed as direct vent systems carry a limited lifetime warranty on the heat exchanger. All other 80% furnaces carry a 20-year limited warranty on the heat exchanger. All 90%+ series furnaces carry a limited lifetime warranty on the primary and secondary heat exchangers, except CG90 units installed as non-direct vent systems, which carry a 20-year limited warranty on the primary and secondary heat exchangers. Limited lifetime warranty applies to the original owner in private owner-occupied residences. All other applications or when the residence is sold carry a 20-year limited warranty from date of installation, subject to proof of purchase.

Warranty Begins

The warranty period begins when the installation is complete and the product is ready to operate. You must be able to verify this date whenever a warranty claim is made. Original bill of sale, installer's invoice or other similar document will suffice. If the beginning date cannot be verified, we will consider warranty coverage to begin 6 months after the date the product was shipped from our factory.

Limitations on Implied Warranties

Implied warranties of merchantability or, to the extent applicable, fitness for a particular purpose are limited to 5 years, the same duration as the basic limited written warranty provided herein. Some states/provinces do not allow limitations on how long an implied warranty of merchantability or fitness lasts, so the above limitations or exclusions may not apply to you.

Only Warranty

This written Limited Warranty is the only warranty made by the warrantor; this warranty is in lieu of and excludes all other warranties, express or implied. The warrantor does not authorize any person to provide any other warranty or to assume for it any further obligation in connection with the warranted product.

What is NOT Covered

1. Cabinets or cabinet pieces.
2. Normal maintenance items such as filters, fan belts, fuses or other consumable items.
3. Damage caused by misuse, failure to maintain properly, accidents or acts of God.
4. External wiring, piping, venting or attachment of accessory products not integral to our product, including without limitation, humidifier, air cleaner, vent damper, thermostat or other mechanical devices not manufactured by the warrantor.
5. Products that have been operated in a corrosive atmosphere where a concentration of acids, halogenated hydrocarbons or other corrosive elements causes deterioration to metal surfaces or integral components. NOTE: Operation in a corrosive atmosphere is considered abuse and voids this warranty.
6. Products that have NOT been installed in accordance with our published installation instructions, applicable local, state/provincial or national codes, ACCA published standards.
7. Products that have NOT been installed by competent, qualified installers.
8. Products that have been moved from their original place of installation.

Warranty on Replacement Components

Any replacement component furnished by us will assume the remaining (unused) portion of the Limited Warranty.

Consequential Damages

The warrantor shall not be responsible for any consequential damages caused by any defect in the product. Some state/provinces do not allow the exclusion or limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

NOTE: After the first year, in the event that a gas heat exchanger is no longer being manufactured by the warrantor, the warrantor will allow a credit equal to the then current wholesale price of an equivalent heat exchanger towards the purchase of a new Armstrong gas furnace.

This product must be installed, used, and cared for in accordance with the instruction manual. You are responsible for required periodic maintenance or service, such as changing or cleaning of air filters and lubrication or cleaning of components. Failure to properly install, operate, or maintain your unit voids this warranty.

Owner Record

Model # _____ Serial # _____ Installation Date _____

INSTALLED BY:

Dealer _____

Address _____

Telephone # _____ License # _____