

# High Valley STOVES

## MODEL 1600 NON-CATALYTIC WOOD HEATER



MODEL 1600 REAR-VENT WITH PEDESTAL



MODEL 1600 TOP-VENT WITH CAST IRON LEGS

# Owner's Manual

## Safety, Installation, Operation, & Maintenance Guidelines

### DO NOT DISPOSE OF THIS MANUAL



**INSTALLER:** Leave this manual with the individual (s) responsible for operating this wood heater.

**OPERATOR:** The Owner's Manual contains important safety, operating, and maintenance information. Please read and understand the entire Owner's Manual before installing or operating this wood heater. If you have questions please contact your High Valley Dealer for assistance.


### SAVE THIS OWNER'S MANUAL FOR FUTURE REFERENCE

**WARNING**



**HOT GLASS WILL CAUSE BURNS.**  
**DO NOT TOUCH GLASS UNTIL COOLED.**  
**NEVER ALLOW CHILDREN TO TOUCH GLASS.**

**NATIONAL FIREPLACE INSTITUTE**



**CERTIFIED**  
[www.nficertified.org](http://www.nficertified.org)

We suggest that our woodburning hearth products be installed and serviced by professionals who are certified in the United States by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists.

### Safety Notice:

*If this wood heater is not properly installed, a house fire may result.*

For your safety, please carefully read and follow the installation directions. Contact the local Building Inspector, Fire Official, or other Authority Having Jurisdiction (AHJ) about code requirements, restrictions, and installation inspection in your area. The AHJ can advise you if you are required to obtain a permit before installation.

*Failure to follow these instructions can result in property damage, bodily injury, or even death.*

**High Valley Stoves by Stoll**  
185 Highway 201 | Abbeville, SC 29620



## MODEL 1600 NON-CATALYTIC WOOD HEATER



Safety Tested by:  
**CONAM Inspection, Inc. AGTL** | Auburn, Massachusetts  
Tested 3/1999 to ANSI/UL 1482 & HUD Specifications

Emissions & Efficiency Tested by:  
**MYREN Consulting, Inc** | Colville, Washington  
Report 04.12.1999 | Tested to July 1990 Particulate Emission Standards

### U.S. ENVIRONMENTAL PROTECTION AGENCY

Certified to comply with 2015 particulate emission standards.  
Not approved for sale after May 15, 2020.

Under specific test conditions this non-catalytic wood heater has been shown to deliver heat at rates ranging from 11,796 to 40,431 Btu/hr. Emissions were determined to be 2.7 g/hr. The Overall HHV Efficiency\* was determined to be 73.8% and the Overall LHV\* Efficiency was determined to be 79.7% using the CSA B415.1-10 method. Results of CO (carbon monoxide) testing were not required nor recorded at that time. EPA validated CO and efficiency values will be published in future revisions of this manual, and on the High Valley website, as they become available.

This non-catalytic wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with the operating instructions provided in the owner's manual.

This non-catalytic wood heater needs periodic inspection and repair for proper operation. Consult the maintenance section of this owner's manual for further information.

This non-catalytic wood heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.

#### DO NOT BURN:

- Garbage;
- Lawn clippings or yard waste;
- Materials containing rubber, including tires;
- Materials containing plastic;
- Waste petroleum products, paints or paint thinners, or asphalt products;
- Materials containing asbestos;
- Construction or demolition debris;
- Railroad ties or pressure-treated wood;
- Manure or animal remains;
- Salt water driftwood or other previously salt water saturated materials;
- Unseasoned wood; or
- Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater.

Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.

Smoke Detectors should be installed on every floor of your home; in the living areas and especially near bedrooms. Many jurisdictions now require hard wired Smoke Detectors and/or Carbon Monoxide (CO) Detectors be installed in specific locations in single family homes. If you are not subject to such a requirement then, at a minimum, battery operated detectors should be installed. Test them regularly and install new batteries every six months. A smoke detector located in the same room as a wood heater should be installed as far away from the heater as possible to prevent accidental activation when lighting or refueling the fire. Smoke and CO detectors should be installed per the manufacturer's instructions and code requirements.

\* New EPA regulations require that the efficiency of a wood heater be determined by test under laboratory conditions and expressed as a percentage using the HHV (Higher Heating Value) and/or LHV (Lower Heating Value) of cord wood to provide consumers a benchmark to use when comparing various models of wood heaters. Under the EPA Regulations all Wood Heaters will be retested by the year 2020 using the CSA B415.1-10 standard which will use weighted average of efficiencies achieved at different burn rates and will determine a CO value as part of the testing. To learn more, please visit [www.highvalleystoves.com](http://www.highvalleystoves.com).

**HIGH VALLEY STOVES BY STOLL**  
185 Highway 201 | Abbeville, SC 29620  
[www.highvalleystoves.com](http://www.highvalleystoves.com)

This manual describes the installation, operation, and maintenance of High Valley Stoves Model 1600 non-catalytic wood heater. This heater is certified to comply with the U.S. Environmental Protection Agency’s crib wood emission limits for wood heaters sold after May 15, 2015.

Throughout this manual you will find important safety notices and information may be repeated a number of times. The repetition is intentional in an effort to reinforce safety instructions and to place them in context.

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## GENERAL SAFETY INFORMATION

Thank you for choosing a wood heater from High Valley Stoves. Safe and efficient operation of your wood heater depends greatly on proper installation as outlined in this owner's manual. If this wood heater is not properly installed, a house fire may result. To reduce the risk of fire follow all instructions, cautions, and safety notices contained herein. Installation must also meet all State and Local Code requirements and/or restrictions. Check with your local Building Official, Fire Official, or other Authority Having Jurisdiction (AHJ) regarding the need to obtain a permit prior to installing a wood heater; and whether an inspection of the installation is required upon completion. Understand that code requirements and follow-up inspection are not put in place to make the installation process more difficult. Rather they are designed to help ensure your safety. Don't take shortcuts, use or allow makeshift methods, or other compromises in the installation. Safety is paramount and the key to enjoying your new wood heater. Installation by an experienced professional installer who has the specialized knowledge, tools, and equipment to complete the installation safely is strongly recommended. Look for an installer who is certified by the The National Fireplace Institute (NFI) as a Woodstove Specialist or Master Hearth Professional (MHP) to have demonstrated their mastery of the knowledge required in all phases of safe woodstove installation, and of best current industry practices. Be sure to contact your insurance company to inquire whether they have additional requirements.

## SAFETY PRECAUTIONS

**BURN SOLID WOOD FUEL ONLY.** This wood heater is designed and approved for the burning of cord wood fuel only. Burning any type of fuel other than cord wood in this wood heater is against all safety testing and will void all warranties.

**DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.** Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in this wood heater. Keep all such liquids well away from the heater at all times. Storing these or other flammable liquids near a wood heater could cause a fire.

**DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA OR ENGINE OIL.** Cord wood is the only fuel approved for use in this wood heater.

**DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVICING ANOTHER APPLIANCE.**

**DO NOT CONNECT A WOOD HEATER TO, OR USE IN CONJUNCTION WITH, ANY AIR DISTRIBUTION DUCTWORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATIONS.**

**DO NOT OPERATE IN AN EXTREME MANNER AS TO OVER-FIRE THE WOOD HEATER.** If any part of the wood heater, the chimney, or the chimney connector glows, you are over-firing. If over-firing occurs, close all combustion air controls immediately. Over-firing can cause damage to the wood heater and may cause a fire.

**HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING, AND FURNITURE WELL AWAY. CONTACT MAY CAUSE SKIN BURNS.** Observe all minimum clearances as listed in this manual. Maintain a 36" area around the wood heater to be kept free of combustible materials including furniture and window treatments. **DO NOT** allow unattended children in the area of an operating wood heater.

**BURN DIRECTLY ON FIRE BRICKS.** Do not use grates, andirons, or other methods to support fuel.

**FUEL STORAGE.** Store bulk cord wood covered in a well ventilated area to ensure that the wood fuel is as dry as possible. Do not store wood fuel within wood heater minimum clearances or within the space needed for loading the heater or for ash removal.

**ASH DISPOSAL.** Ashes should be placed in a steel container with a tight-fitting lid and moved outdoors immediately. The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste shall not be placed in this container.

**CREOSOTE FORMATION & REMOVAL.** Inspect chimney connector and chimney twice monthly, and clean if necessary. Creosote accumulation in the connector pipe, chimney, or flue lining can create an extremely hot fire if ignited.

## INSTALLATION PLANNING

Your new High Valley Model 1600 has been designed to give you years of clean, efficient service. Take time to consider carefully where your new wood heater will be installed in your home. If you are planning to use an existing chimney and/or hearth, many of the decisions have been made for you. Consult with your High Valley dealer before committing to a final location and take full advantage of their experience. Consider how you plan to use your wood heater, your expectations, and the physical layout of your home. Once the wood heater has been installed it would require significant effort and expense to change its location. Perhaps, after considering all factors, you may come to the conclusion that the location of an existing chimney may not be the best place for your new wood heater. Evaluate all of your options fully before making a final decision.

**LOCATION:** The wood heater should be located in a place where it will be convenient to fuel and maintain the fire, but well away from human traffic flow, and clear of hallways and doors. It must be possible to maintain the minimum clearances to combustibles which were determined by safety testing. See **Page 9**. Ensure that furniture, window treatments (draperies, curtains, etc.), wood materials including wood fuel, and any other combustible materials will be no closer than 36" to the wood heater. If children reside in the home, or visit regularly, consider how the area immediately around the heater can be closed off to keep the children safely away from hot surfaces. Consult your High Valley dealer for advice on safety gates and other safety products.

**HEATING CONSIDERATIONS:** Ideally the wood heater will be centrally located in the area that you wish to heat. A wood heater is an excellent area heater or space heater. Properly sized and operated it will heat the area where it is located and heated air will naturally move throughout the home. Keep in mind that a wood heater does not have the advantage of a distribution system to deliver the heat around your home like a central heating boiler or furnace. Don't expect the type of even heat distribution that a central heating system can deliver. If your goal is to heat a family room, an addition, or a portion of the main house, the wood heater should be sized and operated to create a warm, comfortable space with the surplus heat allowed to travel around the home on natural convection (air) currents. A large wood heater with the capacity to heat a home will typically overheat the area where it is located unless the home is constructed with an open floor plan. If heating a typical partitioned home with wood as a primary heat source is truly the goal, then it would be wise to consider installing a number of smaller sized wood heaters throughout the space to be heated rather than a single large wood heater. The number would depend on the size and layout of the home. Installing your wood heater in an uninsulated basement is not recommended. Much of the heat produced will be lost to the uninsulated walls of the basement. Never cut holes or vents in a ceiling/floor in an attempt to get warm air to rise to the rooms above. You will be compromising a firebreak in your home and could, should a fire ensue, jeopardize your homeowner's insurance coverage. Contact your local Building Official, Fire Official, or other Authority Having Jurisdiction for guidance.

**CHIMNEY LOCATION:** Once the best physical location for your wood heater from a heating perspective is agreed upon, the feasibility of providing a safe and effective chimney in that location must be considered. If the chimney is to run up through the ceiling and/or the roof then the space above must be clear. The layout and location of floor joists and/or roof rafters must be ascertained. Most factory-built chimney components are designed to fit into standard construction without the need for cutting and boxing frame members. A factory-built chimney can also exit through the sidewall of the house and up the side of the home. Another alternative would be to construct a new masonry chimney specifically for the wood heater. In any case, the wood heater must not be vented into a chimney flue serving any other appliance. Once again, it is strongly recommended that the chimney installation be performed by a certified professional installer who is thoroughly familiar with the requirements of modern wood heaters.

Your High Valley Model 1600 is approved for installation into either a masonry chimney or a Type HT factory-built chimney listed to UL-103-HT or ULC-S629 standards. A masonry chimney is a permanent installation requiring a load bearing footing to support the mass of the chimney. Factory-built chimneys offer flexible installation options and use proprietary support systems for through-the-roof or sidewall installation. A properly constructed chimney that provides adequate draft is essential for the safe and efficient operation of your wood heater. More specific information about draft and various chimney installations and material will follow, but lets begin at the beginning. Look back to a time when fireplaces, woodstoves, and later, solid fuel central heating were relied on as the only source of heat in cold weather. Proper chimney construction and location could spell the difference between keeping warm in the winter and not. Those chimneys had to work. Life revolved around the fireplace and, later, the cook stove and parlor stove. The chimney was typically built in the center of the home where it helped warm the home and it, in turn, was kept warm by the home. The central location ensured that the chimney would exit near the peak of the roof and therefore be as tall as possible. Our ancestors knew from experience that a tall, warm chimney would draft better and was less likely to be affected by wind and weather. The same principals apply today.

## CHIMNEY PERFORMANCE

Chimneys that were constructed in homes built before the advent of oil and gas-fired central heating systems were invariably constructed within the walls of the home, typically centrally located, and exited the roof at or near the ridge. The principals that applied then apply today. A chimney is best located within the envelope of the home to keep it warm, and it should be installed as close to the peak of the roof as possible. If you have a modern fireplace that was constructed with the chimney outside the home, exposed to the cold, and with a relatively short chimney, it may not be your best choice for use with a modern, efficient wood heater. As central heating became prevalent, fireplaces and their chimneys were moved outside the walls of the home to conserve floor space. If they didn't draft well it was not considered a major problem because the central heating system kept the home warm.

**DRAFT:** The Environmental Protection Agency defines draft this way: "Draft is the force which moves air from the appliance up through the chimney." Simply stated, heated air (wood heater exhaust or any heated gas for that matter) becomes more buoyant and tends to rise. The hotter the gasses contained in a chimney flue are, compared to the temperature of the air outside, the greater the draft should be. There are many variables and the scientific explanation can become complicated. (There are books and scientific papers written for those who would like to know more.) Suffice to say that you need it. Without adequate draft your wood heater cannot burn efficiently nor vent smoke properly. The draft of the chimney provides the suction that pulls air into the wood heater to support combustion. A wood heater provided with adequate draft cannot leak smoke, as air is being drawn into the heater, connector pipe, and chimney. If a wood heater is leaking smoke or spills a lot of smoke during refueling, inadequate draft is most likely the culprit.

A complete explanation of all of the elements that may affect draft are beyond the scope of this manual but, briefly, some factors that contribute to a properly drafting chimney are these:

- **FLUE SIZE:** It is recommended that the flue size of the chimney be the same size as the flue outlet on the heater. Theoretically a larger chimney flue should have a greater flow capacity than a smaller flue. In practice however, the heated flue gases are diluted by the extra air in the larger flue and cool faster. Draft is decreased therefore and, if cooled too much, creosote may be deposited in the flue. The Model 1600 has a 6" flue collar and 6" factory-built HT chimney is readily available. With an existing masonry chimney it can be more challenging. A typical masonry flue tile is 8" square; considerably larger than the 6" flue recommended. Consider that the cross-sectional area of a 6" flue is @ 28¼ sq. in. ( $\text{Area} = \pi r^2$  or  $A = \pi 3^2$  or  $A = 3.14 \times 9$ ) where  $\text{Pi} = 3.14$  (enough for this purpose.) The cross sectional area of an 8" round flue is 50¼ sq. in.; the cross sectional area of an 8" square masonry flue tile is @ 64 sq. in. In addition, the masonry construction tends to cool more quickly with cold outside temperatures. If a new masonry chimney is being constructed, ask the mason to source round flue tiles. They are available and can be insulated with vermiculite or other approved chimney insulation materials. The performance of an existing masonry chimney may be improved significantly with the installation of an insulated chimney liner that is the same size as the flue outlet of the wood heater.
- **INSULATION:** A chimney flue that is kept warm is more likely to draft well than a cold chimney. Keeping the chimney within the walls of the home is the best solution if space allows. If the chimney must be constructed outside the home, then insulating the chimney is strongly recommended. Factory-built HT chimneys are packed with insulating material and can be further protected by installing them inside an insulated chimney chase (enclosure) outside the home. Masonry chimneys may require an insulated flue liner to provide adequate draft in all seasons. Consider that when it is cold (say 20 degrees for example) outside the home, the air inside the flue of an outdoor chimney will be essentially the same temperature. When lighting the fire it will be necessary to provide enough heat to overcome that column of cold air acting like a plug in the chimney flue. Even after the wood heater has been ignited and is burning, a cold chimney can still have a negative effect on draft. Hot flue gasses cool more quickly in a chimney exposed to the elements; perhaps to the point where the draft becomes inadequate to maintain an efficient fire.
- **HEIGHT:** A tall chimney is more likely to draft well than a short chimney. The taller column of heated gas creates a greater temperature and pressure differential with the outside atmosphere and better draft is the result. As above, the flue size and insulation also play significant roles in the process. A minimum chimney height of @ ten feet (10') and a maximum height of @ thirty feet (30'), measured from the top of the wood heater, is recommended. Locating the chimney where it will project above the ridge of the roof, rather than near the eaves of the home, will net the tallest chimney height practical for your home. External elements like tall trees, hills, tall buildings, and the like can affect draft when the wind is blowing from a particular direction. Locating a short chimney at the eaves of the home may result in draft problems when the wind blows across your own roof ridge. Height alone is not the only factor to consider when specifying a chimney but, in general, taller is better.

## CHIMNEY REQUIREMENTS

Your High Valley Model 1600 must be connected to either a factory-built Type HT chimney or to a masonry chimney with a flue liner of a construction that meets all current code requirements. If the wood heater is to be connected to an existing chimney, have the chimney inspected prior to installing the wood heater by an NFI certified hearth installer, a CSIA chimney sweep, or a qualified mason in the case of a masonry chimney. The chimney must prove to be sound and serviceable and to meet all applicable codes. An existing factory-built chimney must be Type HT with a minimum 6" (152mm) and maximum 8" (203mm) flue diameter. An existing masonry chimney must have a clay tile liner or approved stainless steel insulated liner. The wall thimble or pass-through construction should be inspected to ensure it conforms to current NFPA 211 guidelines. The flue size must not be less than the flue collar (6" or 152mm) or greater than three times (3X) the cross-section of the flue collar. NOTE: An oversized masonry chimney may not prove to provide adequate draft and may require the installation of an insulated liner approved to UL 1777 to function satisfactorily.

If a new chimney is to be constructed to vent the wood heater we strongly advise that the chimney be professionally installed. Factory-built chimney must be Type HT-2100°F tested to the UL 103 standard and/or ULC S629 standard. A six inch (6") diameter factory-built chimney is preferred. All components of the factory-built chimney must be from the same manufacturer and be of the same type to ensure proper connection of components. All chimney components needed for the installation including but not limited to wall pass-throughs, tees and tee supports, ceiling supports, insulation shields, fire stops, roof support packages, roof flashings, chimney caps, etc. must be installed exactly to the manufacturer's instructions. Installation specification and clearances may vary from manufacturer to manufacturer and must be carefully adhered to according to the individual manufacturer's instructions.

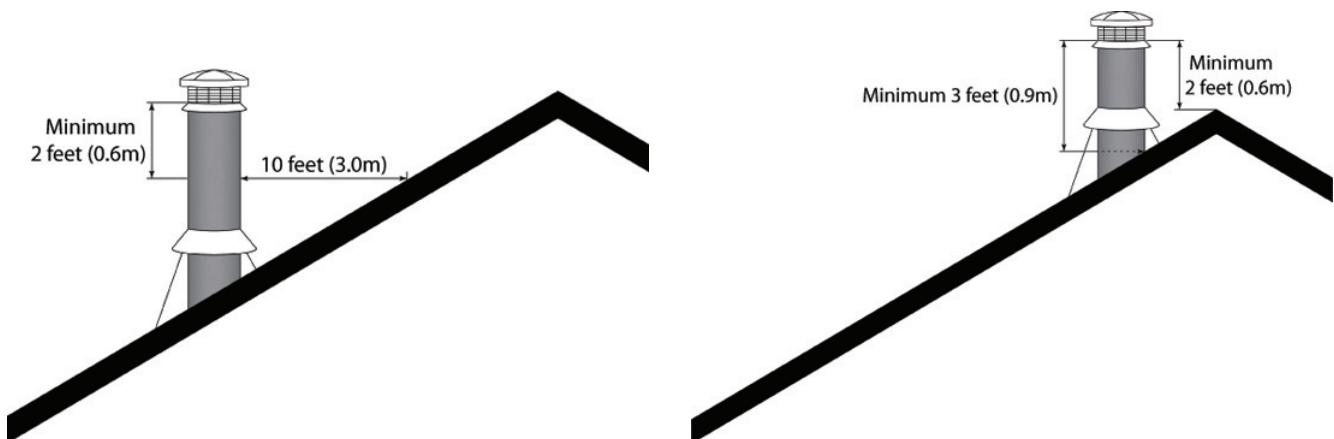
If a new masonry chimney is to be constructed, the use of a professional masonry contractor is strongly recommended. Specialized knowledge is needed to ensure proper construction and support for a masonry chimney. The chimney must be constructed in accordance with the latest edition of NFPA standard 211 and must conform to all applicable state and local codes. Wall thimble construction and clearances to combustibles must meet NFPA 211 guidelines. A permit and inspection may be required by the local Building Official, Fire Official, or other Authority Having Jurisdiction. A six inch (6") round or 8" x 8" square flue tile is required. The flue tiles must be mortared together with the approved material and provided with an air space as required by NFPA 211 and applicable codes. It is recommended that the masonry flue tiles be well insulated with a material approved for the purpose.

## CHIMNEY GUIDELINES

The following information about chimney construction and requirements is intended for reference only. The use of a professional installer is strongly recommended. Specific installation instructions and/or requirements must conform to the chimney manufacturer's instructions and/or applicable building codes. Seek the advice of your High Valley Dealer and/or the local Authority Having Jurisdiction as to local code, permitting, and inspection requirements.

### CHIMNEY HEIGHT

- The top of the chimney must be at least two feet (2' or 0.6m) taller than the highest point of the roof or any part of the roof or other structure within ten feet (10' or 3m) measured horizontally from the chimney termination.
- The chimney must be at least three feet (3' or 0.9m) taller than the high side of the roof penetration.



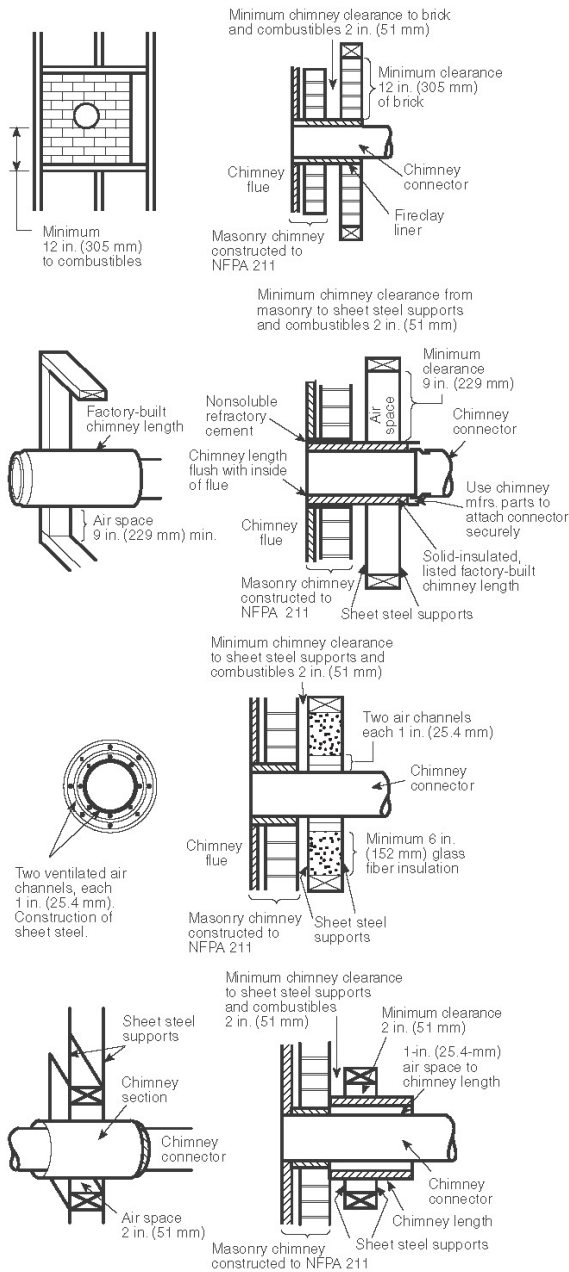
# CHIMNEY CLEARANCES & THIMBLE DETAILS

## CHIMNEY CLEARANCES

- Special care must be exercised to ensure that all chimney clearances to combustibles meet current standards.
- Existing chimneys should be inspected to ensure that clearances to combustibles are in compliance.
- Factory-built chimney clearances are defined in the manufacturer's installation instructions.
- Masonry chimney clearances to combustibles are described in the current NFPA standard 211.
- Clearances to combustibles may vary for indoor and outdoor installations.

## CHIMNEY THIMBLE DETAILS

- Special construction techniques are required to ensure safe connection to a chimney through a combustible wall.
- Refer to the current version of NFPA standard 211 and obtain the approval of the local Authority Having Jurisdiction.



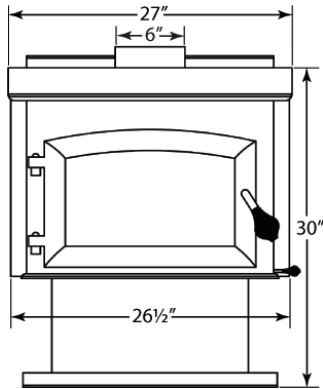
- Minimum 3.5 inch (90mm) thick brick masonry wall framed into combustible wall with a minimum of 12 inch (305mm) brick separation from clay liner to combustibles. Fireclay liner (ASTM C 315, Standard Specification for Clay Fire Linings, or equivalent), minimum  $\frac{5}{8}$  inch (16mm) wall thickness, shall run from outer surface of brick wall to, but not beyond, the inner surface of chimney flue liner and shall be firmly cemented in place.
- Solid-insulated, listed factory-built chimney length of the same inside diameter as the chimney connector and having 1 inch (25.4mm) or more of insulation with a minimum 9 inch (229mm) air space between the outer wall of the chimney length and combustibles. The inner end of the chimney length shall be flush with the inside of the masonry chimney flue and shall be sealed to the flue and to the brick masonry penetration with non-water-soluble refractory cement. Supports shall be securely fastened to wall surfaces on all sides. Fasteners between supports and the chimney length shall not penetrate the chimney liner.
- Sheet steel chimney connector, minimum 24 gauge [0.024 inch (0.61 mm)] in thickness, with a ventilated thimble, minimum 24 gauge [0.024 inch (0.61mm)] in thickness, having two 1 inch (25.4mm) air channels, separated from combustibles by a minimum of 6 inches (152mm) of glass fiber insulation. Opening shall be covered, and thimble supported with a sheet steel support, minimum 24 gauge [0.024 inch (0.61mm)] in thickness. Supports shall be securely fastened to wall surfaces on all sides and shall be sized to fit and hold chimney section. Fasteners used to secure chimney section shall not penetrate chimney flue liner.
- Solid-insulated, listed factory-built chimney length with an inside diameter 2 inches (51mm) larger than the chimney connector and having 1 inch (25.4mm) or more of insulation, serving as a pass-through for a single wall sheet steel chimney connector of minimum 24 gauge [0.024 inch (0.61mm)] thickness, with a minimum 2 inch (51mm) air space between the outer wall of chimney section and combustibles. Minimum length of chimney section shall be 12 inches (305mm). Chimney section concentric with and spaced 1 inch (25.4mm) away from connector by means of sheet steel support plates on both ends of chimney section. Opening shall be covered, and chimney section supported on both sides with sheet steel supports of minimum 24 gauge [0.024 inch (0.61mm)] thickness. Supports shall be securely fastened to wall surfaces on all sides and shall be sized to fit and hold chimney section. Fasteners used to secure chimney section shall not penetrate chimney flue liner.

## ADDITIONAL REQUIREMENTS:

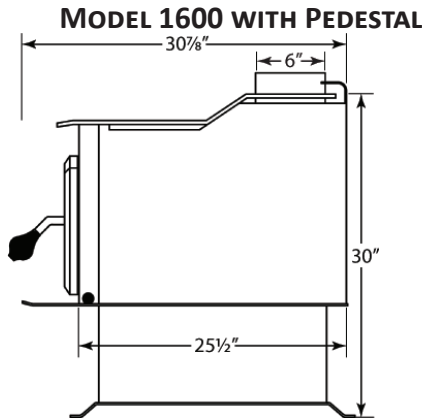
- Insulation material used as part of wall pass-through system shall be of noncombustible material and shall have a thermal conductivity of 1.0 Btu-in./hr-ft  $^{\circ}$ F (4.88 kg-cal/hr-m  $^{\circ}$ C) or less.
- All clearances and thicknesses are minimums; larger clearances and thicknesses shall be permitted.
- Any material used to close up an opening for the connector shall be of noncombustible material.
- A connector to a masonry chimney, except for System B, shall extend in one continuous piece through the wall pass-through system and the chimney wall to the inner face of the flue liner, but not beyond.



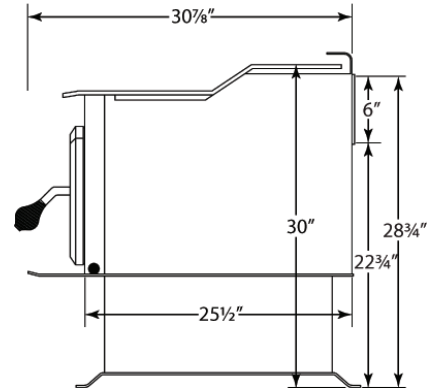
## MODEL 1600 SPECIFICATIONS & CLEARANCES



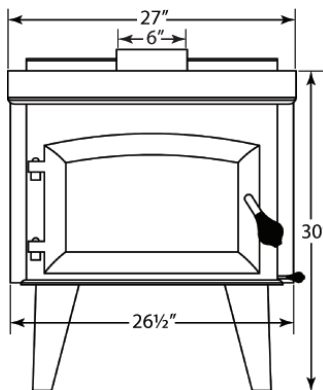
FRONT VIEW



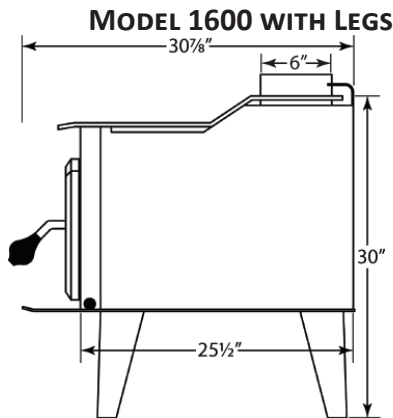
SIDE VIEW TOP-VENT



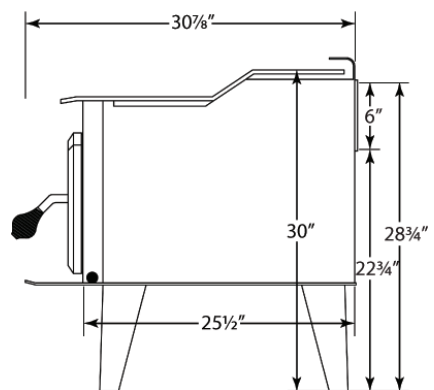
SIDE VIEW REAR-VENT



FRONT VIEW



SIDE VIEW TOP-VENT

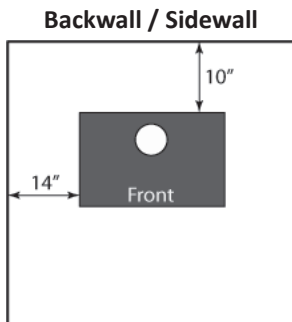


SIDE VIEW REAR-VENT

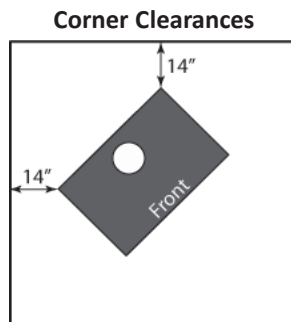
Model 1600 Over All Width: 27"  
 Model 1600 Over All Depth: 30 7/8"  
 Model 1600 Height with Pedestal: 30"  
 Weight: 514 lbs.

Flue Size: 6"  
 Firebox Volume: 2.7 cu. ft.  
 Firebox Dimensions: 21" wide x 22" deep  
 Maximum Log Length: 21"

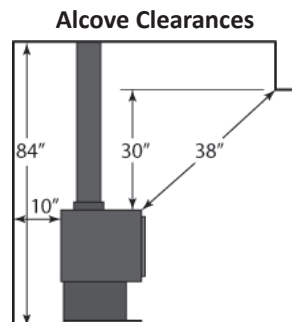
### MINIMUM CLEARANCES TO COMBUSTIBLES MEASURED FROM THE BODY OF THE WOOD HEATER



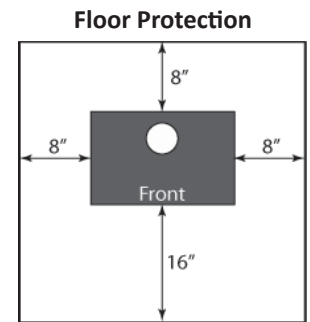
**With Single Wall Pipe**  
 Side = 14" (356mm)  
 Back = 10" (254mm)  
**With Double Wall Pipe**  
 Back = 5" (127mm)



**With Single Wall Pipe**  
 Corner = 14" (356mm)  
**With Double Wall Pipe**  
 Corner = 8" (203mm)



Minimum Alcove Width = 55"  
 Maximum Alcove Depth = 48"  
 Heater to Rear Wall = 10" (254mm)  
 Heater to Side Wall = 14" (356mm)  
 Clearance to Overhang as shown



Side = 8" (203mm)  
 Back = 8" (203mm)  
 Front = 16" (406mm) U.S.  
**Minimum Floor Protector Size**  
 43" w x 49" d U.S.

#### FLOOR PROTECTION:

**FLOOR PROTECTION:** Use UL 1618 Type 1 Ember Protection or continuous non-combustible material.

**NOTE:** Clearances to combustible materials may be reduced using shielding methods as described in the current edition of NFPA 211 Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances. Any reduction of clearances must be approved by the local Authority Having Jurisdiction.

## PRE-INSTALLATION ASSEMBLY

### CAUTION

- If this wood heater is not properly installed, a house fire may result. To reduce the risk of fire follow all instructions, cautions, and safety notices contained herein.
- Installation must also meet all State and Local Code requirements and/or restrictions. Check with your local Building Official, Fire Official, or other Authority Having Jurisdiction (AHJ) regarding the need to obtain a permit prior to installing a wood heater; and whether an inspection of the installation is required upon completion.
- Don't take shortcuts, use or allow makeshift methods, or other compromises in the installation. Safety is paramount and the key to enjoying your new wood heater.
- Installation by an experienced professional installer who has the specialized knowledge, tools, and equipment to complete the installation safely is strongly recommended. Look for an installer who is certified by the The National Fireplace Institute (NFI) as a Woodstove Specialist or Master Hearth Professional (MHP) to have demonstrated their mastery of the knowledge required in all phases of safe woodstove installation, and of best current industry practices.
- Be sure to contact your insurance company to inquire whether they have additional requirements.

### INSPECTION

Your High Valley Model 1600 was inspected before being packaged at the factory. Chances are that your High Valley Dealer has un-boxed and assembled your wood heater prior to delivery. Your dealer has the equipment and the experience to handle heavy appliances. If you have taken delivery of your Model 1600 in the box proceed as follows:

- Carefully remove the shipping materials. Use caution. The contents are heavy.
- Carefully inspect the Model 1600 and accessories, if any, for signs of damage.
- Check that the firebricks which line the sides and floor of the firebox are properly positioned and undamaged.
- Check that the baffle, firebricks, and ceramic fiber blanket are undamaged and properly positioned all the way to the back of the firebox. Ensure that the ceramic blanket lies flat on the baffle and does not block the flue opening.
- If any damage is noted or suspected please contact your High Valley Dealer for assistance.
- DO NOT proceed with installation until the wood heater has been inspected and replacement parts obtained.

### PEDESTAL OR LEG INSTALLATION

If your Model 1600 was not assembled before delivery, the pedestal base or legs must be fastened to the body. **USE EXTREME CAUTION.** The wood heater is very heavy. At least two strong individuals will be needed to lift the heater body for assembly. Personal injury and/or damage to the Model 1600 or personal property may result if the heater is handled improperly. If you have concerns about handling the heater please contact your dealer for assistance.

**MATERIALS INCLUDED:** Heater Body, Pedestal Base or Legs, four (4) each 3/8" - 16 x 1" bolts, Owner's Manual.

#### • PEDESTAL BASE INSTALLATION:

- Place the un-boxed pedestal on the floor close to where the wood heater will be installed. Place a piece or pieces of cardboard under the pedestal base to protect the floor while assembling the Model 1600.
- Carefully lift the Model 1600 body and set it down gently top of the pedestal; taking care that it is centered.
  - Do not drop the body onto the pedestal base. Damage to the floor or the floor protector may result.
- Align at least one of the holes in the pedestal with the corresponding threaded hole in the heater body.
  - Insert one of the 3/8 -16 x 1" bolts through the hole in the pedestal base and into the threaded hole in the bottom of the body. Tighten finger tight only at this stage. Pivot the heater body carefully on the pedestal base to align the remaining three bolt holes and fasten with the remaining bolts.
  - Tighten the four (4) bolts securely using a 9/16" or 14mm wrench, an adjustable wrench, or similar tool.

#### • LEG INSTALLATION:

**NOTE:** It is strongly recommended that Cast Iron or Steel Legs be installed by your High Valley dealer. The body of the Model 1600 must be lifted at least 12 inches (12") and supported in this position while the legs are attached. Your dealer has the material handling equipment and experience to handle the weight of the Model 1600. Laying the wood heater on its back to install the legs is not recommended as the bricks that line the firebox and the baffle may become dislodged. Leg breakage can occur as the assembled wood heater is being tipped upright.

- Carefully lift the Model 1600 body onto sturdy blocks or jacks capable of supporting the weight of the body.
- Assemble the four legs to the body using the 3/8 -16 x 1" bolts provided. Tighten each leg securely.
- Carefully lift the assembled heater, remove the blocking of jacks, and gently set the heater onto the legs.

**CAUTION:** Never slide the wood heater into position. It must be lifted or damage to the legs may result.

### CONVECTION BLOWER INSTALLATION

An optional Convection Blower Kit (BLO1600KIT) for the Model 1600 is available through your High Valley dealer. The Convection Blower Kit is pre-wired to a variable speed switch and power cord at the factory to simplify installation. Installation instructions and a wiring diagram are provided on **Page 17**.

# FREESTANDING WOOD HEATER INSTALLATION



We suggest that our woodburning hearth products be installed and serviced by professionals who are certified in the United States by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists.

*If this wood heater is not properly installed, a house fire may result. To reduce the risk of fire follow all instructions, cautions, and safety notices contained in this manual.*

*Do not take shortcuts. Do not use or allow makeshift methods or other compromises in the installation. Safety is the key to enjoying your wood heater responsibly.*

## FLOOR PROTECTOR INSTALLATION

- The Model 1600 requires UL 1618 Type 1 Ember Protection or a continuous non-combustible material that meets the dimensions listed on **Page 9**. Brick or tile must be mortared and grouted to present a continuous surface, not "loose laid." If a hearth or floor protector is to be site-built, or an existing hearth is to be utilized, the condition and thermal resistance must be determined to ensure the minimum requirements are met. See Appendix - C on **Page 21**.
- Minimum floor protection must be continuous under the wood heater and 8 inches (8") to the back and each side, and sixteen inches (16") in front of the loading door. The minimum size is 43"w x 49"d in the U.S.
- Floor protection must extend under any horizontal section of connector pipe and at least two inches (2") to each side.
- It is recommended that you use a floor protector that is larger than minimum size; large enough to cover the flooring to the wall in the rear, and to provide extra non-combustible working space for a metal ash container, tools, gloves, etc.

## WOOD HEATER INSTALLATION

- With the floor protection in place, carefully move the Model 1600 into position.
- Use extreme caution when lifting the Model 1600; it is **very heavy**. The use of lifting straps (furniture moving straps) by at least two, or more, strong individuals is recommended. Personal injury and/or damage to the wood heater or personal property may result if the wood heater is handled improperly. If you have concerns about handling the wood heater please contact your High Valley dealer for assistance.
  - Lift the wood heater and gently set it in place. Do not drop the wood heater onto the floor protector. Do not slide the wood heater into position. Damage to the floor protection may result. Setting the wood heater onto pieces of heavy cardboard will minimize the possibility of scratching the floor protection and allow final positioning of the wood heater. Remove the cardboard before lighting the first fire in the wood heater.
- The wood heater should be centered on the chimney if possible to allow for the shortest and most direct connection. The wood heater does not necessarily need to be centered on the floor protection as long as the minimum side protection requirement (8") is met. An asymmetrical installation may provide more usable space to one side.
- The wood heater and floor protector must be positioned to maintain at a minimum the clearances to combustibles as shown in the chart on **Page 9** of this manual and on the safety label affixed to the wood heater.
- Clearances to combustible materials may be reduced if needed by using shielding methods as described in the current edition of NFPA 211 Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances. Any reduction of tested clearances must be approved by the local Authority Having Jurisdiction (AHJ).

## CONNECTOR PIPE REQUIREMENTS

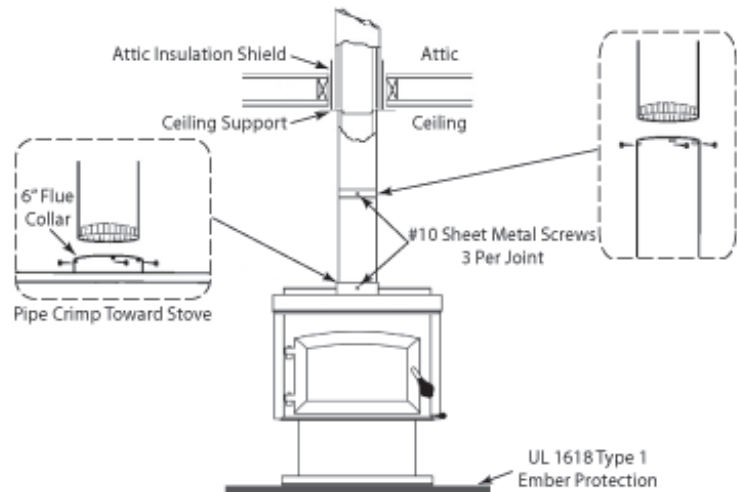
- Before connecting the wood heater to a factory-built or masonry chimney, have the chimney inspected to ensure that it is properly installed, clean, and in good repair. Have the chimney cleaned if necessary.
- Do not pass a chimney connector pipe through any combustible wall (s) or ceiling (s). Special methods are required when passing a chimney through any combustible wall, ceiling, or roof. Ensure that all chimney clearance requirements are met and all penetrations through combustible walls and/or ceilings meet manufacturer's installation requirements, NFPA 211, and/or applicable code requirements. See **Pages 8 & 12** for additional information.
- **DO NOT CONNECT THIS WOOD HEATER TO A CHIMNEY FLUE THAT IS SERVICING ANOTHER APPLIANCE.**
- Use six inch (6") (152mm) diameter minimum 24 MSG black steel connector pipe or pipe of a greater gauge.
- Use three (3) #10 sheet metal screws to fasten each section of connector pipe together and to secure the connector pipe to the flue collar of the wood heater. The length of the screws should be long enough to penetrate both sections of pipe (@ ¼") or the flue collar and pipe (@ ½") but not overly long.
- Crimped connector pipe ends should point away from the chimney and toward the wood heater flue collar.
- Connector pipe should be kept as short and straight as possible. Extra pipe and extra elbows can impede the flow of flue gasses and may cool the flue gasses to a point that negatively affects draft.

## FREESTANDING WOOD HEATER CONNECTION TO THE CHIMNEY

### VERTICAL CONNECTOR INSTALLATION

#### USING SINGLE WALL PIPE

- Center the wood heater flue collar directly under the chimney pipe if possible. All Clearances to combustibles must be maintained.
- Confirm that any ceiling support, roof support, fire-stops, insulation shields, etc. are installed correctly and match the brand of Type HT 2100° chimney being used.
- If the wood heater must be offset from the chimney opening, use 15° or 45° pipe elbows to make corrections for the offset.
- Crimped connector pipe ends must point downward toward the wood heater flue collar.
- Secure each pipe section to each other and the flue collar using three (3) #10 sheet metal screws. See **Page 11**.

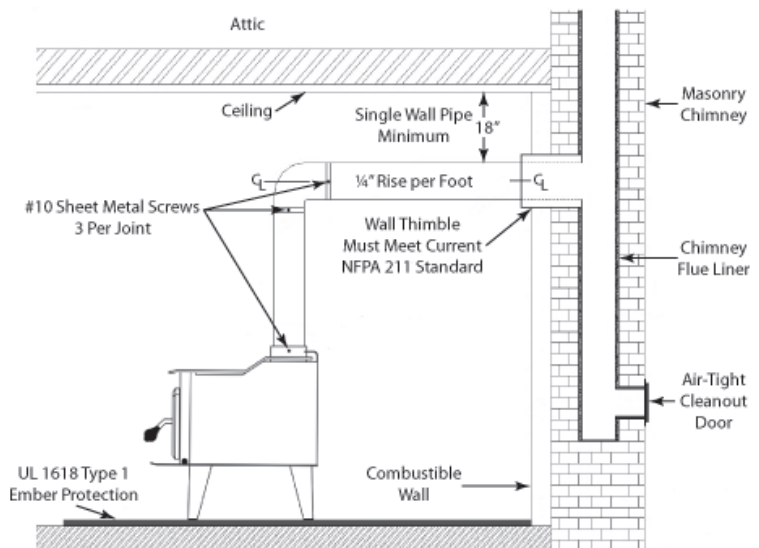


VERTICAL CONNECTOR PIPE INSTALLATION ILLUSTRATION \*

### HORIZONTAL INSTALLATION

#### USING SINGLE WALL PIPE

- Center the wood heater flue collar in line with the wall thimble if possible. All Clearances to combustibles must be maintained.
- Confirm that the factory-built wall pass through or masonry thimble meets manufacturer instructions and/or NFPA 211. See **Page 8**.
- Limit the 90° bends to one (1) elbow and the 90° bend where the thimble meets the flue.
- Maintain at least 18" clearance from single wall pipe connector to the ceiling.
- Floor protection must extend under horizontal section of connector pipe and at least two inches (2") to each side.
- Maintain 1/4" rise per foot in horizontal pipe.
- Crimped connector pipe ends must point toward the wood heater flue collar.
- Secure each pipe section to each other and the flue collar using three (3) #10 sheet metal screws. See **Page 11**.



HORIZONTAL CONNECTOR PIPE INSTALLATION ILLUSTRATION \*

### MASONRY FIREPLACE INSTALLATION:

The Model 1600 has not been specifically tested for installation into a fireplace. The rear vent configuration of the Model 1600 allows for installation into a masonry fireplace but top clearances to a mantel have not been determined.

## MOBILE HOME INSTALLATION - U.S. ONLY

### CAUTION: THE STRUCTURAL INTEGRITY OF MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

The installation must comply with all HUD Regulations.

Floor protector requirements and installation, minimum clearances, and installation precautions are the same as those on **Page 9** for conventional residential construction.

The wood heater must be anchored to the floor with bolts of sufficient size and length to penetrate the pedestal mount, floor protector, home floor, and subfloor.

The wood heater must be securely grounded to the mobile home chassis using #8 AWG copper wire or its equivalent.

### WARNING: DO NOT INSTALL IN A SLEEPING ROOM.

For mobile homes use 6 inch diameter Class "A" chimney listed to UL 103 HT and/or ULC629, suitable for use with solid fuels, installed from the flue collar to the termination point and fitted with a Spark Arrestor and Rain Cap. The chimney must be removable in case the mobile home is transported.

An outside air inlet must be provided for combustion and be unrestricted while the unit is in use. Use High Valley outside air kit (P/N: AIRKIT). See **Page 17**.

The front loading door of the wood heater must be kept closed at all times except for starting and refueling the fire.

\* **NOTE:** Installation Illustrations above are informational only. The drawings are not to scale and are not intended to accurately depict construction details nor minimum clearances to combustible materials. Refer to the latest edition of NFPA 211 for current requirements.

## PRE-OPERATION ADVISORY



### CAUTION: HOT WHILE IN OPERATION!

GLASS AND METAL SURFACES ARE VERY HOT WHILE THE WOOD HEATER IS BURNING.

CONTACT MAY CAUSE SKIN BURNS.

KEEP CHILDREN, CLOTHING, FURNITURE, AND FLAMMABLE MATERIALS WELL AWAY.

ENSURE THAT CHILDREN AND ADULTS ARE AWARE OF THE DANGER OF BURNS.

CHILDREN MUST BE CAREFULLY SUPERVISED AT ALL TIMES.

A SAFETY BARRIER SHOULD SURROUND THE WOOD HEATER TO KEEP CHILDREN AWAY.

### ALWAYS USE SAFE BURNING PRACTICES:

#### BURN SOLID WOOD FUEL ONLY.

This wood heater is designed and approved for the burning of cord wood fuel only. Never burn any type of coal in this heater. Burning any type of fuel other than cord wood in this wood heater is against all safety testing and will void all warranties.

#### DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.

Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in this wood heater. Keep all such liquids well away from the heater at all times. Storing these or other flammable liquids near a wood heater could cause a fire.

#### BURN DIRECTLY ON FIREBRICKS.

Do not use grates, andirons, or other methods to support or elevate fuel.

#### DO NOT OPERATE IN AN EXTREME MANNER AS TO OVER-FIRE THE WOOD HEATER.

If any part of the wood heater, the chimney, or the chimney connector glows, you are over-firing. If over-firing occurs, close all combustion air controls immediately. Over-firing can cause damage to the wood heater and may cause a fire.

**NOTICE:** Before lighting the wood heater for the first time ensure that any inspection required has been completed and passed by the local Building Inspector, Fire Official, or other Authority Having Jurisdiction (AHJ).

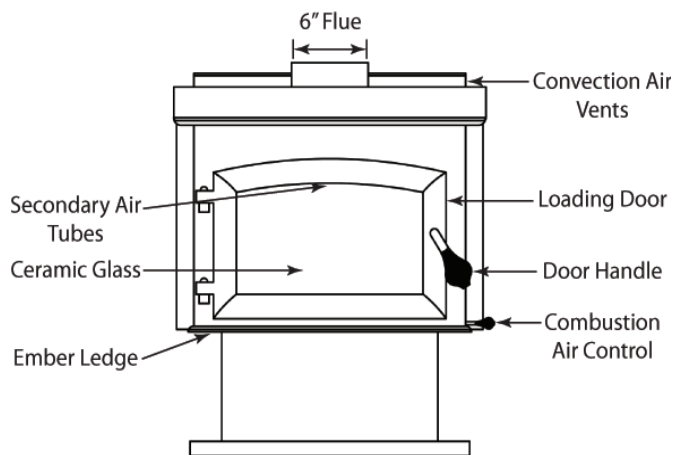
Smoke and CO detectors should be installed on every floor of your home. A smoke detector that is installed in the same room as the wood heater should be located as far away from the wood heater as possible. See **Page 2**. Many states have requirements mandating the installation of smoke and CO detectors. Those regulations must take precedence.

Be sure you have notified your homeowner's insurance company that a wood heater has been installed in your home. Inquire whether they require their own inspection.

It is recommended that a "Type A B C" fire extinguisher be kept in close proximity to the wood heater in the event that hot embers should escape the firebox during the loading of fuel and/or the removal of ashes. Please use all due care when loading or servicing the wood heater.

- **Never throw water on a burning wood heater.**
- Thermal shock could break the ceramic glass, exacerbating the problem.
- Hot steam could increase the risk of burns or scalding.

## MODEL 1600 FEATURES & COMPONENTS



**CONVECTION AIR VENTS:** To be used along with the optional convection blower to deliver heated air to the room.

**SECONDARY AIR TUBES:** Introduce fresh combustion air over the fire to re-burn gasses. No adjustment necessary.

**LOADING DOOR:** Allows access to the firebox for loading.

**CERAMIC GLASS:** Ceramic material withstands high temperatures and allows a view of the fire.

**DOOR HANDLE:** Rotate to latch/unlatch the loading door. Fitted with a spring handle for safer handling.

**EMBER LEDGE:** Designed to catch ash and embers.

**COMBUSTION AIR CONTROL:** Regulates the amount of air fed to the fire and thereby adjusts the burn rate. Pull out to open and push in to close using the spring handle.

**ATTENTION:** Your new wood heater has been painted with high temperature (1200°) stove paint. During the first few firings the heater may give off slight smoke, odors and/or vapors while the paint and oils used in manufacturing cure. These odors may be irritating to susceptible individuals. Open the windows in the room where the heater is installed while the paint cures.

**ATTENTION:** Any tags or stickers must be removed and optional plated loading doors and/or trim must be cleaned with ammonia free glass cleaner and a soft rag BEFORE lighting the wood heater for the first time. Failure to clean the glass or plated finish properly to remove any fingerprints or oils may permanently mar the finish. Never attempt to clean the door finish or door glass when hot.

## OPERATION GUIDELINES

**CAUTION:** Before lighting your wood heater please read and/or re-read the safety information on **Pages 2, 4 & 13**, and elsewhere throughout this manual. Ensure that the wood heater has been installed according to the instructions given in this manual, to all applicable codes, and has been inspected as required. Always use safe burning and operating practices, and exercise extreme caution when fueling and maintaining the wood heater. Wear heat resistant gloves when operating the wood heater. Failure to follow these precautions may result in burns or a fire.

**LIGHTING A FIRE:** Take time to test the draft conditions in the chimney before loading the firebox with kindling.

- Fully open (pull-out) the combustion Air Control.
- Carefully open the Loading Door.
- Crumple one or two pieces of newspaper into a ball, place them at the back of the firebox, ignite the paper, and close the loading door.
  - If smoke from the burning paper is drawn up the chimney then proceed with building the fire.
  - If smoke has filled the firebox but does not seem to be venting, the chimney may be cold. Warming the chimney may take a few attempts. Open the loading door very slightly and see if extra air helps. **NEVER** leave the room with the loading door open. Continued operation with the door ajar can cause dangerous overheating of the heater and combustibles.
    - In the fall or spring of the year the outside temperature may not be cold enough to establish adequate draft. Wait for a colder day and try again.

**NOTE:** In a well insulated home draft may be affected negatively. In extreme cases draft may be reversed and cold air pulled down the chimney. Try opening a window near the wood heater to see if draft improves. Conversely try turning on a vent hood or dryer to see if combustion stalls in the fire box. Introducing outside air, or make-up air, to the appliance may be the solution. Consult your dealer. See **Pages 16 & 17**.

- Once draft is established, begin building the fire.
  - Build the fire directly on the firebrick floor. Never use andirons, fire-dogs, grates, etc. to elevate the fire.
  - Traditionally tightly twisted sheets of newsprint are placed at the back of the firebox with dry softwood kindling (½ to 1" diameter) on top, followed by finely split (1½" to 2") dry wood, and then small logs.
  - The "top-down" lighting technique is recommended as an alternative. Simply invert the order of the kindling. Place the layer of small logs across the firebox with the finely split dry wood arranged in a grid on top of the logs and dry kindling wood as the next layer. Alternate the direction of each layer of wood and leave air spaces between the pieces of wood. Use twisted newsprint or clean burning firestarters to ignite the kindling. This method has been found to produce less smoke and emissions during startup.
  - Once the kindling has fully ignited; open (pull-out) the Air Control, open the Loading Door slowly, and add larger pieces of dry firewood.
  - Regulate the fire using the Combustion Air Control.

**FUEL:** Always burn dry, well seasoned wood; preferably hardwood. No other solid or liquid fuels may be used.

**STAGES OF COMBUSTION:** See **Page 20**.

**KINDLING STAGE:** During the first stage of combustion keep the Air Control fully, or nearly fully, open to help drive off moisture from the wood load. This stage may take up to an hour depending on the moisture in the wood.

**GAS VAPORIZATION & IGNITION STAGE:** During the second stage of combustion the secondary air tubes at the top of the firebox will light off with a clean flame. Keep the combustion Air Control open enough to support the secondary combustion. The actual Air Control opening will depend on the draft of the individual chimney but a medium to medium-high setting is usually optimal.

**CHARCOAL BURNING:** During the final stage of combustion the Air Control can be reduced to extend the burn time. Medium to medium-low is usually optimal. This non-catalytic wood heater has a manufacturer-set minimum low burn rate. **It is against federal regulations to alter this setting.**

**CONTINUOUS BURNING:** To maintain a continuous fire, fuel must be added while the charcoal bed is hot enough to kindle the fresh wood. Establish a regular routine and develop good habits for operating the wood heater.

- **Always wear heat resistant "woodstove" gloves.** Protect yourself from accidentally touching hot surfaces or ceramic glass when refueling and/or servicing your wood heater.
- **Open the Air Control before opening the Loading Door.** Opening the Air Control allows the air pressure in the firebox to equalize with room air pressure and helps drive off unburned volatile gasses.
- **Have fresh cord wood logs ready at hand.** Minimize the amount of time that the Loading Door remains open.
- **Unlatch the Loading Door and pause.** Opening the Loading Door too quickly allows oxygen-rich room air to combine with unburned volatile gasses in the firebox and may cause "back-puffing" or a flash-back.
- **Open the Loading Door slowly.** Pulling the Loading Door open aggressively can pull smoke into the room. In the Model 1600 smoke is brought forward under the baffle toward the Loading Door, past the secondary air tubes where gasses are ignited, before returning toward the flue.
- **Load fresh logs carefully.** Load wood into the wood heater with care. Don't slam or jam logs into the firebox. Damage to the Firebrick or the secondary air tubes may result.
- **Use cord wood of the correct size.** Cut and split cord wood logs to the proper length and diameter. Forcing oversized logs into the firebox can damage firebox components.
- **Close & Latch the Loading Door carefully.** Don't use the Loading Door as a battering ram to force unwieldy logs into the firebox. Damage to the ceramic glass can result.
- **Reset the Air Control.** If it is necessary to keep the Loading Door slightly ajar to freshen the fire, **never** leave the room while the door is unlatched.

**OVER-FIRING:** Never operate the wood heater in an extreme manner. If any part of the wood heater, the chimney, or the chimney connector glows, you are over-firing. A chimney with a very good draft may draw in too much combustion air, even with the Air Control in a fully closed position. If the fire seems uncontrollable, consult your dealer. A hand damper installed in the connector pipe will allow for manual control under high draft conditions.

## OPERATION GUIDELINES

**CERAMIC GLASS:** The Model 1600 is equipped with a clear window which allows monitoring the condition of the fire without the need to open the Loading Door. The transparent ceramic material has been safety tested for impact and thermal resistance, however it can be damaged if it is abused. Inspect the ceramic glass frequently for signs of damage. Never operate the wood heater with damaged, cracked, or broken ceramic glass. See **Page 18**.

Creosote deposits will build up on the window, especially when burning low fires. The deposits may burn off with a hot fire. **Never** use oven cleaners, harsh cleaners containing ammonia, or abrasive cleaners that may cause scratches that can develop into cracks. A simple and cost effective solution is to use damp (not wet) black & white newspaper to remove light staining. To remove heavier deposits, dip the newsprint (or a damp cloth) in a small amount of cold wood ash. Special glass cleaners for woodstoves, formulated to dissolve creosote, are also available through your dealer.

**ASH DISPOSAL:** Remove ashes once they get 2" to 3" deep, or deep enough to impede the air inlet located beneath the Loading Door opening. Remove ashes when the fire is extinguished or burned down to embers at the end of the charcoal stage of combustion. Use a steel rake to gather unburned charcoal or embers to one side and leave them in the firebox to be consumed as fuel. Remove spent ash only, leaving @ ½" to 1" of ash and hot coals in the firebox to insulate the ember bed and ignite fresh fuel. Again, try to avoid shoveling up hot coals or embers with the spent ash. Embers can stay hot for days insulated in ashes. Use a steel shovel to carefully remove the spent ashes into a steel container with a tight-fitting lid and move the container outdoors immediately. The closed container of ashes should be placed on a non-combustible surface or on bare ground, well away from any building and all combustible materials, pending final disposal. If the ashes are to be disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all embers have thoroughly cooled. No other waste of any kind shall be placed in this container.

Some ashes may spill while removing them from the firebox. Ashes can be vacuumed up once they are proved to be completely cool, but be advised that fine ash can pass through the vacuum and into the home. Special vacuums, equipped with heat resistant filters and designed for ash clean-up and removal, are available through your dealer.

**CONVECTION BLOWER OPERATION:** A Convection Blower is an optional feature of the Model 1600. The Convection Blower increases the delivery of heated air into the home. Room air is drawn in by the blower and circulated between the double walls of the Model 1600. The Convection Blower is equipped with a Variable Speed Control that allows you to adjust the blower speed to suit the current burn rate. If you have purchased an optional Convection Blower Kit additional instructions are found on **Page 17**.

- Rotate the Variable Speed Control clockwise to increase the blower speed and counterclockwise to reduce speed.
- Match the Convection Blower speed to the burn rate. Reduce the blower speed if cool air is coming from the vent.
- Rotate the control knob fully counterclockwise to the Off position when the Model 1600 is not in operation.

**SMOKE OPACITY:** The amount and density of smoke coming from the chimney is a visual indicator of how cleanly the wood heater is burning. Develop a habit of checking the smoke opacity regularly, and at various stages of combustion. With experience a quick glance can confirm proper operation or signal that something needs attention. Modern wood heaters can burn wood very cleanly and efficiently but, ultimately, they rely on the operator to adjust the combustion air properly. The correct combustion air setting is dependent on the draft of the chimney, the fuel being burned, and the stage of combustion. Ideally you will observe little or no smoke (0% opacity) if the fire is burning efficiently. Dense smoke indicates poor combustion. Be aware that in cold weather what looks like smoke could be moisture vapor condensing in cold air.

**CREOSOTE FORMATION & REMOVAL:** When wood is burned slowly, it produces tar and other organic vapors which combine with moisture to form creosote. Modern wood heaters, properly sized and operated, should not produce smoke or creosote to the degree that older stoves did, but the same elements are present. At one time it was popular to install a very large woodstove, load it full of wood, and reduce the combustion air; perfect conditions for producing creosote. Tars and vapors, combined with moisture, condense in the chimney at temperatures below @ 250°F. The resulting creosote can accumulate, clinging tightly to the flue liner and, if ignited, can create a very hot and dangerous chimney fire.

Creosote producing tars and vapors are burned at temperatures over 1100°F inside a modern wood heater producing the flames at the top of the firebox during the second stage of combustion. Ensure that there is always enough combustion air to support secondary combustion. Even still, a relatively cool chimney, especially an exterior masonry chimney, can cool the exhaust gasses before they exit the flue and some creosote will be produced. The chimney connector and chimney should be inspected at least once every two months during the heating season, or more frequently as needed, to determine if creosote build-up has occurred. Contact your High Valley dealer or local chimney sweep if you are uncertain how to inspect the venting system. Always have the chimney professionally cleaned at the end of the burning season or before resuming operation.

**IN CASE OF A CHIMNEY FIRE:** If your wood heater is operated properly to maintain clean, efficient combustion, connected to a good chimney, burning good, dry wood, and inspected regularly, a chimney fire should be an unlikely occurrence. If a chimney fire does occur it can be dangerous and frightening. Chimney fires are often accompanied by a loud rushing sound and, at times, banging noises within the chimney. **Should a chimney fire occur, alert everyone in the home and leave the building immediately.** Contact the fire department. If it appears safe to reenter the home close the Air Control and manual damper (if so equipped) wearing a heat resistant glove, to cut off air to the fire. Do not throw water on the wood heater. Thermal shock could break the ceramic glass causing smoke and/or ember spillage, or otherwise damage the wood heater. Have the chimney inspected and cleaned or repaired as necessary before resuming operation of the wood heater.

## TROUBLESHOOTING INFORMATION

Wood heater performance issues are most often related to poorly seasoned or wet fuel, poor chimney performance, and/or maintenance. Wood heaters are manually operated and, as such, depend on the operator to follow good burning practices and to use properly seasoned cord wood of the best quality available. With experience the operator will learn to quickly spot changes in performance that may indicate the need for chimney cleaning or other maintenance. Chronic draft or smoke leakage problems should be discussed with your High Valley dealer or a professional chimney sweep and resolved. (Refer to Chimney Performance on **Page 6**.) Use well seasoned hardwood and keep it dry and protected from rain and snow with an appropriate cover. Refer to Appendices A & B on **Pages 20 & 21**.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
THE FIRE IS SLOW TO IGNITE OR SMOULDERS.	Air Control is not full open	Open (pull-out) the Combustion Air Control fully for startup.
	The chimney is cold	Use extra paper or other to warm the chimney before lighting.
	The kindling is not dry	Use enough fully dry softwood kindling to establish a coal bed.
	Negative house pressure	Provide outside air directly to the wood heater.
	It is too warm outside	Wait for colder weather before lighting the fire.
	The hand damper is closed	Open the hand damper fully (if so equipped).
	The chimney is obstructed	Have the chimney, connector pipe, and cap cleaned.
THE FIRE IS LAZY, SMOKES EXCESSIVELY, IS SLOW TO IGNITE FULLY, OR DOESN'T HEAT AS EXPECTED.	See all of the above	Use enough kindling to establish a hot fire before loading logs.
	Green or wet wood	Use well seasoned wood that is not wet or covered with snow.
	No bed of coals	Establish a good bed of coals to ignite cord wood logs.
	The Air Control is closed	Allow the fire to become fully established before adjusting.
	Negative house pressure	Provide outside air directly to the wood heater.
SMOKE COMES OUT OF THE LOADING DOOR.	The Air Control is closed	Open the Air Control before unlatching the Loading Door.
	Door opened too quickly	Unlatch the Loading Door, pause, then open the door slowly.
	Baffle is obstructed	Check that the ceramic fiber blanket is properly positioned.
	The chimney is obstructed	Inspect the chimney & connector and have cleaned as needed.
TOO MUCH HEAT; THE FIRE CANNOT BE CONTROLLED PROPERLY.	Too much combustion air	Adjust the Combustion Air Control.
	Very dry softwood	Mix in some hardwood or less well-seasoned wood.
	Loading Door unlatched	Close and latch the Loading Door securely.
	Worn Loading Door gasket	Replace the Loading Door gasket.

**SMOKE IN THE HOME:** Always operate the wood heater according to the guidelines on **Page 14 & 15**. You must develop and use good wood burning habits; always open Air Control before opening the Loading Door, and always open the Loading Door slowly to avoid pulling smoke into the home. A modern wood heater, properly installed and connected to a good chimney which provides adequate draft, should not leak smoke into the home. Air is drawn *into* the wood heater, and *into* any small gaps in the connector pipe, by negative pressure (draft). If smoke is leaking into the home from the wood heater or the connector pipe there is inadequate draft or the chimney is blocked in some way. A smoke alarm or CO detector sounding will signal smoke leakage, and they should be installed throughout your home. See **Page 2**. A whiff of smoke will also alert you to the fact that there is inadequate draft. By-products of wood combustion contain carbon dioxide, carbon monoxide, tars, water vapor, etc., but the distinctive aroma of wood smoke always accompanies them. If you are smelling wood smoke on a regular basis, not associated with lighting or loading, or your CO detector is activated, **have the problem investigated and addressed**. Carbon Monoxide (CO) is particularly dangerous. Atmospheric conditions, tall structures, wind pressures, etc. can negatively affect draft on occasion, but a system that consistently leaks smoke into the home needs to be corrected. Draft is measured with a manometer, which accurately measures negative pressure in "inches of water column," to eliminate guesswork. The difference of a few hundredths of an inch of water column can spell the difference between poor performance and clean, efficient burning. Your High Valley dealer or a chimney professional, using experience and all of the tools available to them, should be able to diagnose the problem and recommend solutions.

Negative pressure in the home can overcome natural draft and cause smoke leakage. Today's homes are constructed to be much tighter and better insulated than older homes. Those older homes tended to "breathe" as fresh air was drawn in through myriad cracks to replace the air that rose up the chimney. Today well designed homes are equipped with "replacement air" systems to bring fresh air into the home. Without replacement air, tight homes can inhibit chimney draft and the flow of the chimney may be reversed when a vented appliance, such as a kitchen hood or a clothes dryer, is turned on. Tight homes and house pressures are complicated subjects, but they can be analyzed (also with manometers) and corrected. If there is smoke leakage, or the fire in the wood heater slows or "stalls" at times, outside air can be connected directly to the Model 1600. See **Page 17**.



## OPTIONAL CONVECTION BLOWER & OUTSIDE AIR INSTALLATION

### OPTIONAL CONVECTION BLOWER KIT CONTENTS:

- A. 75 CFM Blower with Mounting Brackets
- B. Variable Speed Switch with Bracket
- C. Hardware Pack: 2 ea. - 1/4"-20 Bolts; 2 ea. - 1/4" Washers; 2 ea. - Self-Tapping Screws

Inventory the kit to confirm that the kit is complete. If there are any missing parts contact your High Valley dealer for assistance.

- Locate the Convection Blower mounting holes in the heat shield on the back of the Model 1600.
- Attach the Convection Blower motor to the heat shield using two (2) 1/4"-20 bolts and washers. Use a 7/16" socket, nut driver, or wrench to tighten the bolts securely but do not over-tighten.
- Select a location for the Variable Speed Switch that will be easily accessible and, using the holes in Switch Bracket as a guide, mark the location of the mounting holes. The recommended location is near the bottom but the final location is an individual choice.
- Drill\* the top mounting hole first using the 9/64" drill bit provided. Use care to drill through the heat shield only.
- Attach the Variable Speed Switch using one of the self-tapping screws. Secure the green ground wire between the Switch Bracket and the heat shield. Do not fully tighten the screw.
- Confirm the location of the second hole and drill\* as above. Pivot the Switch out of the way if necessary to drill the hole. Insert and tighten both self-tapping screws. Do not over-tighten.
- Use the wiring diagram at right if the wires are disconnected.

**NOTE:** \*Center punch the hole location or use a piece of masking tape to keep the drill bit from skating on the heat shield.

### BLOWER MAINTENANCE:

The blower motor and bearings do not require lubrication. Adding additional lubricant will attract dust to the motor and may shorten the life of the motor.

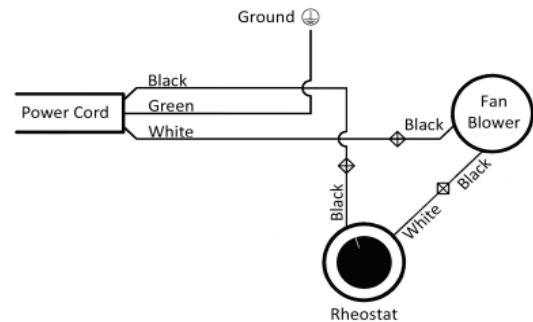
Check the blower impeller annually (more often as necessary) for any build-up of household dust, pet hair, or similar. **UNPLUG THE BLOWER** and vacuum the blower impeller using a brush attachment. It may be necessary to remove the blower from the heat shield and use a soft brush such as an old paint brush or toothbrush to reach dust buildup inside the impeller. Take care not to dislodge any balancing weights or tape from the impeller.



CONVECTION BLOWER MOUNTING



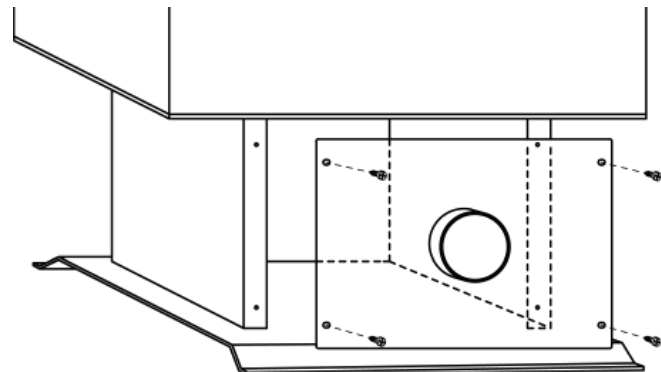
CONVECTION BLOWER SWITCH



CONVECTION BLOWER WIRING DIAGRAM

**OPTIONAL OUTSIDE AIR KIT:** Outside combustion air is required in mobile home installations, and may be helpful in tight homes to improve heater performance. The Outside Air Kit attaches to the Pedestal Base option only. The kit will not work with Cast Iron or Steel Legs. The optional Outside Air Kit is available through your High Valley dealer. Part Number: AIRKIT

The O/A kit mounts to the back of the pedestal, with the four (4) #8 x 1/2" self-tapping screws provided, into pre-punched holes. A 4" (102 mm) collar is provided for attachment of 4" diameter metal duct (supplied by others). Kits are available which include aluminum flexible duct, rain hood, and rodent screen as required by HUD regulations. Consult your dealer. The duct termination should be lower than the duct collar on the wood heater pedestal and in no case should the termination be higher than the wood heater itself. The maximum length of the 4 inch (102 mm) air intake duct should be no more than 12' (3.66 m).



Combustion air may be drawn from outside of the home or from a ventilated crawl space. Combustion air must not be drawn from an enclosed space such as a garage, or an unventilated crawl space. If the combustion air duct is to pass through the floor of the home, do not make a hole in any floor protection within the minimum floor protector dimensions of the wood heater. See **Page 9**. Seal any wall or floor penetrations with waterproof flexible sealer (not provided).

## LOADING DOOR MAINTENANCE & FIREBOX PARTS

**CERAMIC GLASS:** The Model 1600 Loading Door has a transparent 5mm ceramic window, sealed with a fiberglass gasket, which permits a view of the fire. The ceramic material has excellent heat resistance and strength characteristics, but it can be damaged and/or broken. Cleaning instructions are found on **Page 15**. Inspect the ceramic glass regularly for signs of damage. Monitor any scratches or defects in the ceramic glass as they can develop into cracks with exposure to heat. **Never** operate the wood heater with cracked, damaged, or broken ceramic glass. **Do not** substitute 3 mm ceramic glass, tempered glass, window glass, or similar, under any circumstances. OEM 5mm ceramic glass, cut to size and complete with a new gasket, is available through your High Valley dealer. Part Number: GLS1600.

**REPLACING CERAMIC GLASS:** Damaged ceramic must be replaced before the wood heater can be operated safely. Use care, broken ceramic is sharp! Failure to follow these instructions could result in a fire.

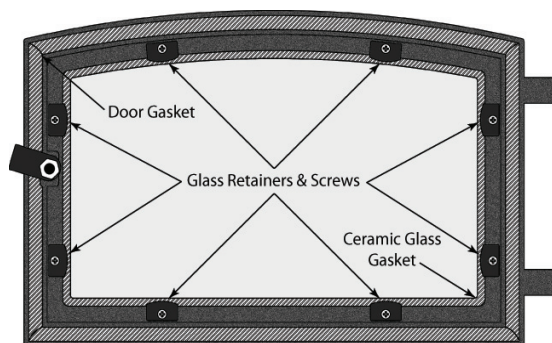
- Remove the Loading Door from the wood heater.
  - Open the Loading Door to @ 90 degrees and lift it straight up.
  - Remove the hinge pins and set them aside.
- Lay the Loading Door face down on a well padded work surface.
  - Allow the Door Handle to hang over the edge of the table.
  - Remove the eight (8) screws and retainer clips.
  - Wearing gloves, remove any remaining pieces of ceramic.
- Place the replacement ceramic glass on a clean section of the padded work area.
  - Remove a short section of the paper backing that covers the gasket adhesive.
  - Center the gasket material on the edge of the replacement ceramic glass and press the gasket onto the edge.
  - Continue around all four sides of the ceramic.
  - Trim off any excess gasket with sharp scissors.
- Carefully set the gasketed ceramic glass into the opening.
  - Replace all glass retainers leaving the screws loose.
  - Using a crossing pattern tighten the screws in small increments.
  - The goal is to have all of the screws tightened evenly.
  - The screws should be snug but not overly tight.
- Replace the Loading Door and hinge pins removed earlier.

**CAUTION:** Creating pressure points with one or more overly tight screws can pinch the ceramic glass and cause it to crack or shatter.

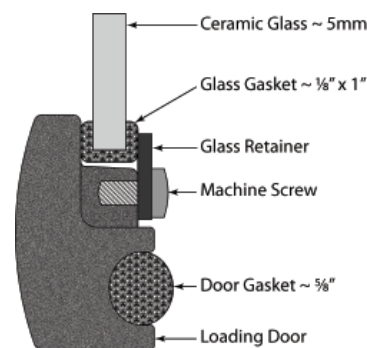
**DOOR GASKETING:** The Loading Door is equipped with  $\frac{5}{8}$ " fiberglass rope gasket. Check the condition of the gasket on a regular basis for signs of wear. Over time the gasket will compress and the door may not seal tightly. Replace as necessary. Use the "dollar bill test" to check the Loading Door seal. With the wood heater completely cooled, insert a dollar bill between the door gasket and the face of the wood heater. Leave half of the bill sticking out, close and latch the door, and tug on the bill. If the bill slips out easily the gasket needs to be replaced. Repeat the test around the perimeter of the Loading Door.

A gasket kit is available from your High Valley dealer and includes silicone adhesive. Part Number: GSKDOR. Thoroughly remove all of the old silicone from the Loading Door before installing the new gasket. Silicone will not adhere to old silicone.

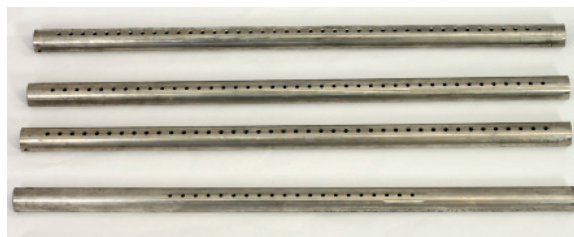
**SECONDARY AIR TUBES:** The Model 1600 is equipped with four stainless steel tubes which deliver secondary air below the baffle to promote secondary combustion. The tubes are durable material but they can degrade over time due to exposure to high temperatures or impact due to careless refueling. Damaged tubes must be replaced immediately. Remove the retainer clip that holds the tube in place and slide the tube side to side to remove it. Reverse the procedure to install the replacement tube. Replacement air tube sets are available from your High Valley dealer. Part Number: SSTU1600



Model 1600 Glass Retainer Locations



Model 1600 Loading Door Components



Model 1600 Secondary Air Tubes

**STOVE PAINT:** Your High Valley wood heater has been painted with high temperature stove paint at the factory. Over time the paint may lighten in color with heat exposure or need touch-up. Stove Bright brand #1900 Satin Black spray paint is compatible with the standard black OEM paint. If you chose an optional Burnished finish contact your dealer for touch-up paint. It is no doubt impractical to move the wood heater outside for painting. Open windows and doors for good ventilation before applying paint indoors. Protect all exposed surfaces and furnishings with drop cloths and/or plastic sheeting. Mask any areas not to be painted, including trim and ceramic glass. Apply light coats and follow all instructions and precautions on the spray can. Allow the stove paint to dry thoroughly before lighting a fire. The fresh high-temperature paint produces an acrid odor as it cures which may be irritating to susceptible individuals. Open windows and doors as needed for good ventilation during the curing process. If you are at all uncomfortable with painting indoors, contact your dealer for advice or assistance.

## MODEL 1600 MAINTENANCE & REPLACEMENT PARTS

**FIREBRICK:** The floor and sides of the firebox, and the baffle of the Model 1600 are lined with Firebrick for durability. If one or more of the Firebricks needs replacement, use the illustration at right as a guide to correct location and layout when reinstalling the Firebricks. **Never** burn the Model 1600 without a complete set of Firebrick installed.

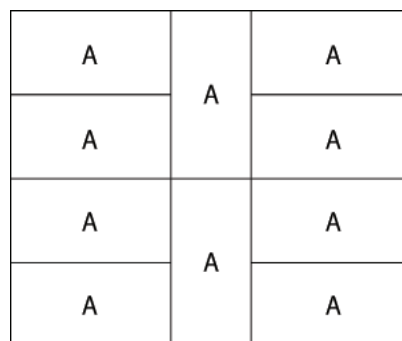
The Model 1600 uses the following standard and cut Firebrick sizes:

A: 4½" W x 9" L x 1" H      B: 2½" W x 9" L x 1" H

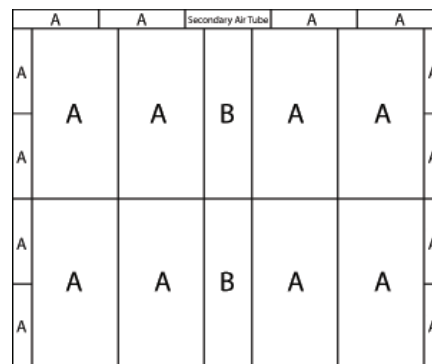
A complete set of replacement Firebricks is available through your High Valley dealer. Part Number: FIRBRK1600

If Firebrick (s) must be removed for any reason, handle them with care to avoid breakage. To remove one or more Firebrick from the firebox sides, first remove the Firebrick (s) on the floor that retain the sides. Draw the bottom of the side Firebrick toward the center to release it from the upper retainer. Note that a Firebrick on the firebox floor which has a simple crack does not necessarily need replacement. Before reinstalling the Firebricks clean the firebox thoroughly to ensure that the Firebricks lay flat and fit together properly. The firebox can be swept or vacuumed if it is completely cool. Be aware that fine ash can pass through the filter of a household vacuum or shop vacuum and into the home. Special vacuums, equipped with heat resistant filters designed to filter fine ash, are available through your dealer.

**FIREBRICK BAFFLE:** If a Firebrick in the baffle should need replacement for any reason it is necessary to remove some or all of the secondary air tubes to allow access to the baffle. Each tube is held in place with a clip and screw. With the tube (s) removed, lift one side of the Firebrick (s) and tilt to remove it. Reverse the process to replace the Firebrick (s) and tube (s). Take care not to damage the Ceramic Fiber Blanket when removing and replacing Firebricks.



Model 1600 Baffle Firebrick Layout



Model 1600 Firebox Firebrick Layout

**CERAMIC FIBER BLANKET:** A Ceramic Fiber Blanket is used to line the top of the Firebrick baffle of the Model 1600 to help maintain the high temperatures necessary for clean secondary combustion. The material is resistant to very high temperatures, but it is soft and flexible and can be damaged if handled unnecessarily. It is not necessary nor advisable to attempt to remove the Ceramic Fiber Blanket for routine service.

The extent of regular maintenance is to ensure that the Ceramic Fiber Blanket does not block the air passage over the top of the door opening. If the material is not lying flat, simply press it down onto the edge of the baffle. Wear rubber gloves and a good dust mask. If the connector pipe has been removed from the flue collar, check that debris from chimney cleaning has not accumulated on the Ceramic Fiber Blanket. Use a vacuum with a soft brush attachment to very gently remove debris if needed. Use care to not damage the material. Ensure that the ceramic material is pressed down flat on the baffle under the flue after servicing. In rare cases a very strong draft can pull a Ceramic Fiber Blanket up across the flue opening, effectively blocking off the draft.

If the Ceramic Fiber Blanket is damaged and needs replacement the new material must be inserted down through the flue opening. Do not attempt to remove or replace a Ceramic Fiber Blanket from the front of the baffle. Wear rubber gloves and a good dust mask when servicing the baffle blanket. The material contains no asbestos and is considered safe but fibers and dust will be released when it is handled. Remove the old Ceramic Fiber Blanket and dispose of it safely. The old material will likely be more rigid after exposure to high temperatures. The new Ceramic Fiber Blanket must be rolled and inserted through the flue collar. Unroll the material on top of the baffle and gently move it into position. Ensure that the Ceramic Fiber Blanket lies flat on the baffle before reinstalling the flue connector pipe.

Use only OEM replacement parts or approved supplies. A partial list of replacements parts is included below. Contact your High Valley dealer or High Valley Stoves customer service for additional information about replacement parts.

### MODEL 1600 REPLACEMENT PARTS LIST

Part Number	Nomenclature	Part Number	Nomenclature
AIRKIT	Outside Air Kit, Model 1600	GLS1600	Glass, Ceramic with Gasket, Model 1600
BLO1600	Blower, 75 CFM, Model 1600	GLSHAR	Retainer Clips & Screws for Ceramic Glass
BLO1600KIT	Blower Kit with Rheostat & Bracket, 1600	GSKGLS	Gasket, Fiberglass Tape, Glass, 1/8" x 1"
SWIRHEO	Switch, Rheostat, Blower Speed Control	GSKDOR	Gasket, Door, 5/8" with RTV Silicone
POWCOR	Power Cord, Blower, All Models	HANDOR	Door Handle ( <i>spring not included</i> )
SSTU1600	Secondary Air Tubes (set of 4) Model 1600	SPRDOR	Spring, Door Handle, Painted
STOBLA	Blanket, Baffle, Ceramic Fiber, Model 1600	SPRDMP	Spring, Air Control Damper, Painted
FIRBRK	Firebrick, Replacement (individual brick)	PAINTSTOVE	Paint, Spray Can, Hi-Temp, Black
FIRBRK1600	Firebrick Set, Complete, Model 1600		

## APPENDIX A ~ BASICS OF WOOD COMBUSTION

Before lighting the first fire in your new wood heater, please read the following information outlining the basic elements of clean wood combustion. Space is limited here, but much has been written on the subject and is available elsewhere.

**THE COMBUSTION TRIANGLE:** Air, Fuel, and Heat (Ignition) are required to establish and support combustion whether wood, coal, wood pellets, gas, oil, etc. is the fuel being burned. The correct proportion of air and fuel will vary, but the three basic ingredients are essentially the same.

**IGNITION:** Ignition in a wood heater is straightforward. Typically it involves a match, paper, and kindling wood. Enough heat must be generated and sustained to get the cord wood burning (@ 350°C to 500°C\*\*). For comparison matches are estimated to burn at 600°C to 800°C; a standard butane lighter is somewhat hotter at @ 800°C to 1100°C, paper will ignite at @225°C to 250°C and dry soft wood kindling at @350°C. You light the paper with a match to ignite the kindling and, finally, the cord wood.

**NOTE:** There are any number of "firestarters" on the market. They light easily with a match and eliminate the need for newspaper. We recommend the clean burning "food safe" firestarters. **Never use any type of flammable liquid to start or "freshen" the fire.**

**FUEL:** The Model 1600 is designed and approved for use with solid natural wood. Use of any other fuel may create excessive emissions and will void the warranty.

The cord wood that you will burn depends to a large degree on what species of trees are abundant where you live. Transporting hardwood from its source to an area where hardwood is scarce would be cost prohibitive. If you live where only softwood species are available, then that is what you will likely use for fuel. In fact all cord wood, regardless of species, has approximately the same potential BTU's\* in each pound of wood. A pound of softwood has the same potential @ 8600 BTU's (kiln dry) per pound as a pound of hardwood. "Hardwood" is denser than "softwood", varies in specific gravity, and is therefore heavier by volume; and, of course, wood is sold by volume, not by the pound. A cord of hardwood will take up the same space as a cord of softwood but it will be heavier and contain more potential BTU's.

**NOTE:** The common unit for the sale or purchase of firewood is the cord. One cord equals 128 cubic feet (4' high x 4' wide x 8' long). Because cord wood is irregularly shaped it would be impossible to achieve a solid 128 cu. ft. block of wood. Wood is supposed to be "well stacked" in a proper cord but that is a subjective measure. 85% wood and 15% air space is commonly accepted as the proper ratio but some sources cite 70% wood and 30% air space. That represents significant difference of @ 109 cu. ft. to @ 90 cu. ft. of usable wood.

Along with density, the other major variable in wood fuel is moisture content. Unseasoned or "Green" wood will contain 50% water or more. Good "air-dried" cord wood is about 20% moisture. At 20% moisture the available BTU's will be @ 6200 to 7000 per pound not 8600. At 50% moisture "green" wood will have only @ 4000 BTU's per pound or less. It follows that cord wood needs to be well seasoned. It may take 9 months for soft woods and up to 24 months for hard woods to air dry thoroughly.

**CONCLUSION:** Clean, efficient combustion in your wood heater depends on burning well seasoned, good quality fuel. Buying "seasoned" wood in the burning season is expensive and often disappointing. The best advice is to get "green" wood in early spring and air dry it yourself. If you don't cut your own wood, find a reputable, reliable wood seller. Well seasoned wood typically exhibits dark cut ends with radial cracks, but splitting a "dry" log and testing it with a meter eliminates speculation. Home moisture meters have become affordable and readily available. Follow the instructions that come with the meter. Stack your wood off the ground in a well ventilated area, preferably under cover or with a tarp over the top of the stack. More information on wood and wood species see Appendix - B on **Page 21**.

**AIR:** The other leg of the combustion triangle is air. The air needed to support combustion is drawn into the firebox by the draft of your chimney. See **Page 6**. Final air delivery and metering required much research and engineering to ensure clean combustion but, the good news is, you regulate the combustion air with a single Air Control. As long as your chimney drafts well, controlling combustion air is simplified. It is against federal regulations to alter the air control settings or controls in any way.

**STAGES OF COMBUSTION:** Put the three elements of the Combustion Triangle together in your wood heater and you will have started a fire. The chemical and physical processes taking place in that fire are complex, and scientific papers on the subject are lengthy and detailed. Three major stages are worth noting and will help the operator understand how to achieve the cleanest burning fire.

### **Stage One: Kindling & Moisture Evaporation:**

Kindling the fire has been covered above under Ignition. Provide enough heat to the wood for a long enough time and it will begin to burn. Before the fire can reach full heating potential moisture in the wood must be evaporated. This is why dry fuel is so important. More than 1000 BTU of potential heat will be needed to drive off each pound of water. Until the water present in the wood is boiled off the fire will be relatively cool, heat from the coal bed will be used up, and flue gas temperatures will be reduced. Burning green wood wastes a lot of energy.

### **Stage Two: Gas Vaporization & Ignition:**

After moisture is driven off, the temperature of the fire builds and various hydrocarbons and other elements begin to vaporize. At temperatures between 540°F and 1225°F these gasses will ignite if oxygen is introduced. The stainless steel tubes at the top of the firebox meter in air automatically to ignite those gasses. Temperatures approaching 2000°F are possible, providing more heat to the home. A blueish flame at the top of the firebox indicates the burning of flammable gasses. If the flames disappear prematurely increase the combustion Air Control setting.

### **Stage Three: Charcoal Burning:**

After flammable gasses have been burned off, only charcoal remains. Charcoal burns cleanly at @ 1100°F in the presence of oxygen. Adjust the Air Control as needed to extend the fire. If a continuous fire is desired, add fresh fuel while the charcoal bed is still hot enough to kindle the new wood.

\*A British Thermal Unit (BTU) is a measure of the amount of energy (heat) required to raise one pound of water by 1°F at sea level.

\*\*The temperatures are given in Celsius and the temperature ranges are approximate as the values vary from source to source.

## APPENDICES B & C

**APPENDIX B ~ HEATING VALUES OF WOOD:** Natural cord wood does not come with a specification sheet like the building materials described in Appendix C. Manufactured products can be made to strict, repeatable tolerances. Natural wood, on the other hand, varies considerably depending on where it grows, the climate, the mineral composition of the soil, and more. Even still, considerable research and scientific data is available on different varieties of wood. Added to the variations in the wood itself is the fact that fire wood is sold by volume; most typically by the cord. As discussed in Appendix A, a cord measures 4' wide X 4' high X 8' long or 128 cubic feet. Beyond those basic facts it gets less scientific.

The amount of burnable wood that will be available in a given cord can vary greatly on how it is cut, whether it is split, the sizes of the whole or split logs, and the skill (or perhaps the integrity) of the person stacking the wood. A bit of country wisdom avers that well stacked wood will have spaces large enough for a mouse to crawl through but not large enough for the cat chasing him. Well stacked wood should be @ 85% wood and 15% air space. The air spaces are necessary to ensure proper drying. There is some debate among experienced wood burners whether the bark side of split logs should be up (to shed water) or down (to promote evaporation). Bark up or down the wood must be well seasoned (@ 20% moisture) to be considered good firewood. Burning green wood is inefficient and disappointing; cutting the BTU values given below approximately in half.

Below is an abbreviated chart that gives some approximate weight and BTU values for various species of wood. More comprehensive lists are available on line, but a word or two of caution. The statistics can vary widely depending on the source or, more likely, on the point they are trying to make. The numbers can be easily manipulated by changing assumptions. If a cord of wood is assumed to have 30% air space then the estimated available BTU's will be considerably less. Likewise, assuming that a pound of wood at 20% moisture contains say 8000 available BTU will net an appealing, inaccurate number. In researching data we found the variations considerable.

Use the numbers below as a point of comparison between species available to you, not as a score card. The best advice is to find an honest wood vendor and rely on them to deliver a full cord of the best wood available. Buy your wood well ahead of the burning season, dry it well and keep it dry, and enjoy clean efficient wood heat.

WOOD SPECIES	LBS. PER CORD	BTU PER CORD
American Elm	@ 3000 lbs.	@ 20,000,000
Apple	@ 3800 lbs.	@ 27,000,000
Cherry	@ 2925 lbs.	@ 20,500,000
Hemlock	@ 2700 lbs.	@ 18,000,000
Hickory	@ 4200 lbs.	@ 27,000,000
Red Oak	@ 3500 lbs.	@ 24,500,000
Shagbark Hickory	@ 4325 lbs.	@ 27,500,000
Sugar Maple	@ 3750 lbs.	@ 24,000,000
Tamarack	@ 3250 lbs.	@ 21,000,000
White Ash	@ 3500 lbs.	@ 24,000,000
White Birch	@ 3200 lbs.	@ 20,000,000
White Cedar	@ 1915 lbs.	@ 12,500,000
White Oak	@ 4200 lbs.	@ 29,000,000
White Pine	@ 2250 lbs.	@ 15,000,000
Willow	@ 2100 lbs.	@ 14,500,000

All values are approximate and for comparison only.

**APPENDIX C ~ FLOOR & WALL PROTECTION:** UL Standard 1618; the Standard for Wall Protectors, Floor Protectors, and Hearth Extensions, was adopted as a standard in 2011. UL-1618 categorizes floor and wall protectors as Type 1 or Type 2 protection. A seemingly minor change in UL 1618 calls for the actual thermal properties of floor protection to be specified in R-value in place of k-value. In fact, that change makes it one step simpler to calculate thermal protection if it becomes necessary.

- Type 1: Ember Protection = No thermal value
- Type 2: Thermal Protection = R-value specified

Type 1 Ember Protection is deemed to be a continuous non-combustible material extending under the appliance and to the front, sides, and back in the size specified. Any thermal value a Type 1 protector may have is disregarded under UL-1618. Type 2 Thermal Protection provides thermal resistance in addition to ember protection. Thermal value is determined by laboratory test. UL-1618 calls for thermal requirements to be expressed as R-values rather than as k-values which were used in the past.

If a hearth or floor protection is to be built on-site, or there is an existing hearth already in place, then the thermal resistance must be calculated. This is where having thermal requirements expressed as an R-value vs. k-value simplifies calculations. R-values can be added together.

- R-value is a unit of measure of Thermal Resistance. It is commonly known as the measure of insulation value. As with insulation, the higher the number, the better.
- k-value is a unit of measure of Thermal Conductivity. k-value is the opposite (inverse) of R-value in that the smaller the k-value the greater the resistance.

Where R-values for different materials can be added together to determine the total R-value of composite layers of materials, k-values cannot. Converting k-value to R-value is relatively simple but it frequently causes confusion. (It should be noted that there are other units of measure, such as C-value, Thermal Conductance, but they are not as commonly used in hearth applications.) So, again, if only the k-value is given, then it must be converted to R-value. (Keep in mind that the k-value is given per inch of material.) To convert k-value to R-value divide 1 by the k-value of the material and *divide by the thickness of the material*. C-values can also be converted to R-values ( $1 \div C\text{-value}$ ) and R-values can also be converted to k-value ( $\text{inches} \div R$ ) but by staying with R-values materials can be added together.

Floor protection requirements were once commonly expressed as "3/8" of asbestos millboard  $k = 0.84$ " or similar. The conversion is:  $1 \div 0.84 = 1.19 \times 0.375" = 0.45$  R-value.

With the R-values known, consider this example:

A wood heater requires  $R = 1.19$ . If 4" common brick is the material of choice; their R-value is 0.80 (0.20 X 4"). Add 1/2" of Durock ( $R = 0.26$ ) and the protection is still not adequate ( $R = 1.06$ ). Add one more layer of 1/2" Durock and the floor protection is now acceptable ( $R = 1.32$ ). (Brick, tile, etc. must be mortared in place, not loose laid.)

MATERIAL	R-VALUE	k-VALUE
Common Brick	$R = 0.20$ per inch	$k = 5.00$ per inch
Durock	$R = 0.52$ per inch	$k = 1.92$ per inch
Hardibacker	$R = 0.51$ per inch	$k = 1.95$ per inch
Micore 160	$R = 2.86$ per inch	$k = 0.86$ per inch
Marble	$R = @0.09$ per "	$k = @11$ per inch

More complete lists of material specifications and more detailed explanations of calculations can be found online.

## WARRANTY COVERAGE

High Valley Stoves by Stoll warrants its High Valley brand wood heaters to be free from defects in material or workmanship, under normal use and conditions of service, to the original purchaser, for a period of seven (7) years from the date of purchase subject to the following limitations: Electrical Components (blowers, switches, etc.) are warranted against mechanical and electrical failures, under normal use and conditions of service, to the original purchaser for a period of one (1) year. High temperature ceramic glass is warranted to be free from defects in material, under normal use and conditions of service, to the original purchaser for a period of one (1) year. Damage to glass caused by impact is considered abuse and is not covered under this warranty. Catalytic Combustors are warranted by the manufacturer for a period of five (5) years. The warranty is administered by the manufacturer of catalytic combustors directly. The original purchaser should register the purchase of any High Valley wood heater equipped with a catalytic combustor with the manufacturer within 30 days of purchase using the warranty registration provided by the manufacturer of the catalytic combustor. Terms and exclusions of warranty on catalytic combustors are established by the manufacturer of the catalytic combustor and not by High Valley Stoves by Stoll. The following items are not covered under warranty: Gaskets, Paint, Damper, Damper Handles and Rod, Fireclay Bricks or castable lining, and all parts not permanently attached to the heating unit. Parts not permanently attached to the heating unit are defined as any part removable with common hand tools. If, after installation, assemblies and/or components covered under this warranty are found to be defective in materials or workmanship during the warranty period, High Valley Stoves by Stoll will, at its option, repair or replace the covered components, subject to the limitations set forth in this warranty.

**HIGH VALLEY STOVES LIMITED WARRANTY CONDITIONS:** This warranty is nontransferable and is extended exclusively for the benefit of the original purchaser, provided that the appliance purchase was made through an authorized High Valley dealer. The wood heater should be used within 30 days of purchase by having a fire started, the blower operated, and heat generated in the owner's home to confirm proper operation of all components. The product must be installed, operated, and maintained in compliance with the instructions set forth in the Owner's Manual supplied with the product at all times. Installation, setup, and start-up procedures are considered to be normal required activities not associated with warranty service. Issues such as adjustments or venting should be included in setup of the product. Such procedures are not covered by warranty. Any installation, construction, transportation, or other related costs or expenses arising from defective part(s), repair, replacement etc., will not be covered by this warranty, nor will High Valley Stoves by Stoll assume responsibility for them. Further, High Valley Stoves by Stoll will not be responsible for any incidental, indirect, or consequential damages. This warranty constitutes the entire warranty with respect to High Valley Stoves by Stoll and/or its products. High Valley Stoves by Stoll makes no other warranty, expressed or implied, including any warranty of merchantability, or warranty of fitness for a particular purpose.

**EXCLUSIONS AND LIMITATIONS:** This warranty does not cover the following: Damage caused by transportation and/or handling of the product; damage due to incorrect installation not in accordance with the Installation Instructions included with the product and any applicable national, state, and local building and fire codes, etc.; [High Valley appliances must be installed by a qualified (preferably NFI certified) installer. It is the installer's responsibility to ensure that the product is installed and operating correctly at the time of installation. Chimney components and/or other non-High Valley accessories used in conjunction with the installation of this product are not covered under this warranty.] Damage caused by improper use, which is not in accordance with the Instructions for Use and Maintenance included with the product (over firing, use of corrosive fuel, etc.); Damage caused by unauthorized modification, use, or repair; Damage caused by the use of non-High Valley spare parts or accessories; Damage caused by lack of regular maintenance and cleaning by the owner as outlined in the Operating Instructions, or due to negligence or carelessness; Damage caused by misuse, accident, neglect, or willful abuse of the product; Damage caused by the use of any type of coal in any High Valley wood heater. (The use of seasoned wood is required.); Damage due to accidental or uncontrollable environmental causes such as: intense cold, fire, lightning, voltage overload or drop, inadequate venting or ventilation, negative air pressures cause by mechanical systems such as furnaces, fans, clothes dryers, etc., and Damage due to wiring or mechanical systems not in accordance with applicable national, state, and local codes; Damage caused by rust or corrosion due to condensation, dampness, humidity, or incorrect installation; Calls for warranty service that are determined to be occasioned by lack of maintenance or factors not related to the High Valley appliance; Normal wear and tear such as paint discoloration, abrasion, worn gaskets, etc.; Repair or replacement of wear-parts which are subject to normal wear and tear during the warranty period, or parts that may require replacement in connection with normal maintenance; The installation of consumer replaceable items and installation of upgraded components; Noise resulting from the movement of motorized parts or minor expansion and contraction which is considered normal, not a defect.


**THIS WARRANTY IS VOID IF:** The appliance has been over-fired. Over-firing can be identified by, but not limited to, warped firebox components, discolored cast iron, discolored, bubbled, or cracked painted finishes; The appliance has been used to burn coal of any type; the appliance is subjected to prolonged periods of dampness or condensation; There is any damage to the appliance or other components due to water or weather damage which is the result of, but not limited to, improper chimney or venting installation.

**LIMITATIONS OF LIABILITY:** The exclusive remedy of the owner, and High Valley Stoves by Stoll's sole obligation under this warranty, and under any other warranty, express or implied, or in contract, tort or otherwise, shall be limited to repair or replacement as specified above. High Valley Stoves by Stoll assumes no liability for incidental damages or damages of any kind which may arise from the use of its products. In no event will High Valley Stoves by Stoll be held liable for any incidental, indirect, or consequential damages caused by defects in its products. The maximum amount recoverable under this warranty is limited to the purchase price of the product. This Warranty provides specific legal rights and the consumer may have other rights that vary from state to state. Some states do not allow exclusions or limitation of incidental or consequential damages, so these limitations may not apply to you. Except to the extent provided by law, High Valley Stoves by Stoll makes no express warranties on its High Valley Stoves other than the warranty specified herein. The duration of any implied warranty is limited to duration of the expressed warranty specified above.

**IF WARRANTY SERVICE IS REQUIRED:** If, during the warranty period, a High Valley wood heater is proved to be defective in material or workmanship, High Valley Stoves by Stoll will, at its own option, repair or replace the product as described below. Any claim for warranty service should be made to the dealer from whom this High Valley wood heater was purchased. Confer with your dealer in advance to determine any additional costs associated with a warranty service call. Service charges and/or mileage are not covered under warranty. These charges vary from retailer to retailer. Your authorized High Valley dealer will procure replacement parts and/or contact High Valley Stoves by Stoll to arrange for replacement should the appliance exhibit defects in material and workmanship which are beyond field repair. Extraordinary repairs which are deemed to require replacement must be approved by High Valley Stoves by Stoll prior to said repair or replacement. Any removal fees, transportation costs, reinstallation fees, construction costs, or any other related costs or expenses arising from replacement will not be covered by this warranty, nor will High Valley Stoves by Stoll assume responsibility for them.

# OWNER'S RECORD & SAFETY LABEL

High Valley Model: **1600** Serial Number: \_\_\_\_\_  
 High Valley Dealer: \_\_\_\_\_ Date of Purchase: \_\_\_\_\_  
 Installed by: \_\_\_\_\_ Installation Date: \_\_\_\_\_  
 Inspected by: \_\_\_\_\_ Date of Inspection: \_\_\_\_\_



## CAUTION

**HOT WHILE IN OPERATION. DO NOT TOUCH. CONTACT MAY CAUSE SKIN BURNS. KEEP CHILDREN AND CLOTHING AWAY. KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS FAR AWAY FROM THE APPLIANCE. SEE NAMEPLATE AND INSTRUCTION MANUAL.**

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**SAFETY WARNINGS**

**PREVENT CREOSOTE FIRE:** Inspect the chimney connector and chimney twice monthly and clean as necessary. Under certain conditions creosote buildup may occur rapidly.

**DO NOT OVER-FIRE:** If the wood heater or chimney connector glow, you are over-firing.

**OPERATE WITH DOOR CLOSED.** Immediately replace any damaged door glass with Ceramic Type Stove Glass only.

**DO NOT USE GRATE OR ELEVATE FIRE.** Build wood fire directly on firebox floor.

**DANGER!** Risk of Electrical Shock. Disconnect power before servicing unit. (Optional Blower: 115V | .62FLA | 3000RPM)

**U.S. ENVIRONMENTAL PROTECTION AGENCY**

Certified to comply with 2015 particulate emission standards.  
Not approved for sale after May 15, 2020.

**FOR USE WITH SOLID WOOD FUEL ONLY.**

**DO NOT** use any other solid or liquid fuel. Use of other fuels may damage the heater and create a dangerous condition. This non-catalytic wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with the operating instructions provided in the owner's manual.

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information.

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**PREVENT HOUSE FIRES**

Install and use only in accordance with the manufacturer's Installation and Operating Instructions. Contact your local Building or Fire Officials or other Authority Having Jurisdiction about code requirements, restrictions, and installation inspections in your area.

**CHIMNEY & CONNECTOR:** Use six inch (6 in.) (152 mm) diameter minimum 24 MSG black steel connector pipe with a UL 103 HT and/or ULC629 listed factory-built "Class A" chimney suitable for use with solid fuels or a masonry chimney. Special methods are required when passing a chimney through a combustible wall, ceiling, or roof. Do not pass chimney connector through a combustible wall or ceiling. See manufacturer's instructions and local building codes. Do not connect this solid fuel appliance to a chimney flue servicing another appliance.

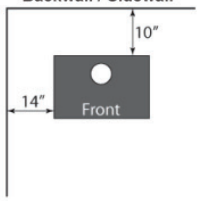
**ROOM HEATER, SOLID FUEL TYPE, ALSO FOR USE IN MOBILE HOMES (USA ONLY).** An outside air inlet must be provided for combustion and be unrestricted while the unit is in use. **DO NOT INSTALL STOVE IN A SLEEPING ROOM.** The structural integrity of the mobile home floor, walls and ceiling must be maintained. The stove needs to be properly grounded to the frame of the mobile home.

**APPROVED CHIMNEY SYSTEMS FOR MOBILE HOMES (USA ONLY):** 6 inch diameter Class "A" chimney listed to UL 103 HT and/or ULC629 suitable for use with solid fuels and with Spark Arrestor and Rain Cap. Install from the flue connector to the termination point.

To provide for combustion air in mobile home installation use High Valley outside air kit (P/N: AIRKIT).

**MINIMUM CLEARANCES TO COMBUSTIBLES MEASURED FROM THE WOOD HEATER BODY**

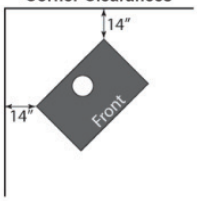
**Backwall / Sidewall**



With Single Wall Pipe  
Side = 14" (356mm)  
Back = 10" (254mm)

With Double Wall Pipe  
Back = 5" (127mm)

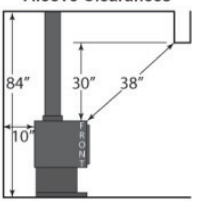
**Corner Clearances**



With Single Wall Pipe  
Corner = 14" (356mm)

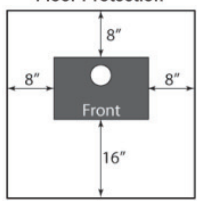
With Double Wall Pipe  
Corner = 8" (203mm)

**Alcove Clearances**



Minimum Alcove Width = 55"  
Maximum Alcove Depth = 48"  
Stove to Rear Wall = 10" (254mm)  
Stove to Side Wall = 14" (356mm)  
Clearance to Overhang as shown.

**Floor Protection**




Side = 8" (203mm)  
Back = 8" (203mm)  
Front = 16" (406mm) U.S.

Minimum Floor Protector Size:  
43"w x 49"d U.S.  
Not tested for use in Canada.

**FLOOR PROTECTION:** Use UL 1618 Type 1 Ember Protection or continuous non-combustible material.

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**High Valley**  
STOVES

MODEL: **1600**

FUEL: **WOOD**

SERIAL #:

Manufactured by:  
**HIGH VALLEY STOVES by STOLL**  
185 Highway 201, Abbeville, SC 29620

Tested by:  
**CONAM Inspection, Inc | Auburn, MA 01501**  
Tested 3/1999 to ANSI/UL 1482 & HUD Specifications

**DATE OF MANUFACTURE:**

2015	2016	2017	2018	2019	2020
○	○	○	○	○	○
○	○	○	○	○	○
○	○	○	○	○	○

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**DO NOT REMOVE THIS LABEL**

This facsimile of the Safety Label, which is attached to the back of your Model 1600, is provided for the convenience of the owner, the Authority Having Jurisdiction, or any other inspector, who wishes to verify the contents of the label. In some installations the label is not easily accessible. Please record the serial number off the original label for your records.

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