



RAIS INSERT 60 **USER'S MANUAL**

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Tested
& Listed by:



Beaverton
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Congratulations on your new RAIS wood burning stove. As a product of award winning design and superior quality, we wish you many years of warmth and pleasure.

INTRODUCTION

We are asking you to:

PLEASE READ THIS ENTIRE MANUAL BEFORE YOU INSTALL AND USE YOUR NEW RAIS STOVE. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY, OR EVEN DEATH. KEEP IT HANDY FOR EASY REFERRAL.

Safety and Environmental Testing

The RAIS 60 Insert stoves have been tested by OMNI-Test Laboratories, Inc. of Beaverton, Oregon and are listed to UL 1482 and ULC S628. They are also EPA certified.

Features and Items Included

Your RAIS has a built in convection system, so it creates air circulation in the room, to spread the heat faster and more evenly.

The stove is supplied with a "cool" handle cover, which enables you to operate the handle without the use of a glove (however, always use caution when touching areas where HOT surfaces are located).

Included with the RAIS stove (in the firebox) are:

- Flue collar with a 45° elbow (to connect to stove/pipe)
- An oven mitt and handle cover
- A box of RAIS starter matches
- A can of touch-up paint (**Remove from the stove!**)

Installation

Precautions and Specifications

IF THIS STOVE IS NOT INSTALLED PROPERLY, A HOME FIRE MAY RESULT. TO REDUCE THE RISK, PLEASE CAREFULLY FOLLOW THE DIRECTIONS FOR INSTALLATION.

Consult your local Building Inspector or Fire Marshall before installation to determine the need to obtain a permit. Also inquire about restrictions and installation inspection requirements in your area.

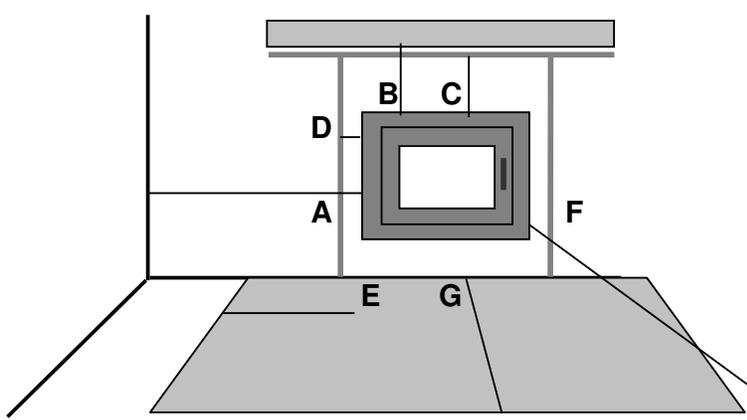
If utilizing an existing chimney, it is suggested that you have a professional mason or stove installer do a complete check-up of your chimney, liner, and flue.

In order for the stove to work and draw properly, sufficient air is important! Be especially aware of any mechanical fans (e.g. kitchen or bathroom) that may affect the proper draw.

In addition, make sure that the floor and sub-flooring is designed to carry the extra weight of the stove.

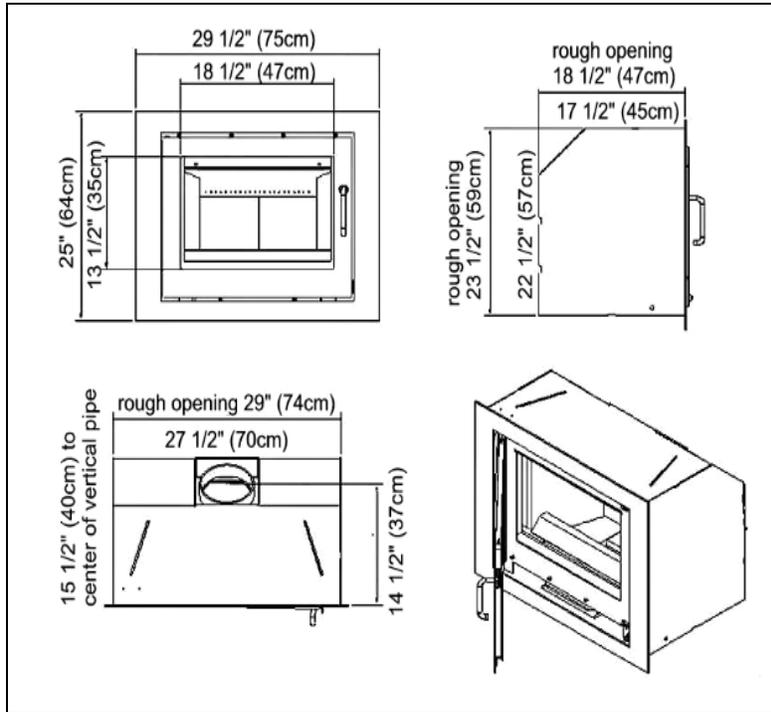
The floor in front of the insert (if placed lower than 5" above ground) must be thermal protected by a minimum of ½" (1cm) non-combustible material having a thermal conductivity of $k=0.84$, where $k=BTU\ in./hr.\ ft^2\ ^\circ F$ (based on 1" thickness). To substitute alternate material, you need to know the k value of that material. The formula to calculate thickness in inches is $(k\ of\ the\ alternate\ material / 0.84) \times \frac{1}{2}$ ".

When installing the insert, the heat distribution to other rooms should be taken into consideration. The RAIS 60 Inserts have a heating capacity of approximately 1,076 ft² (100m²) based on a standard ceiling height.

Specifications	
UL 1777 Listed 6" (15cm) diameter chimney liner up through the block off plate of an existing masonry chimney, a zero-clearance chimney, or Class A, UL-103 HT, 6" (15cm) diameter chimney. In Canada, a full length chimney liner is required.	
Optimal Thermal Output – 23,900 BTU (7 kW); range is 10,200 - 27,300 BTU (3 - 8 kW)	
Minimum stove draft pressure at above output – 0.06" WC (15 Pascals)	
Efficiency – 67% based on DS standard testing	
Tested EPA emission particulate rate – 7.23 grams/hour	
Minimum distances from edge of Insert Face Plate to combustible material – as shown:	
	<p>A = Distance to a combustable adjacent sidewall – 12" (30cm)</p> <p>B = Distance to a combustable mantel – 16" (41cm)</p> <p>C = Distance to ¾" protruding combustable top trim – 14" (36cm)</p> <p>D = Distance to ¾" protruding side trim – 2" (5cm)</p> <p>E = Side floor protection – 8" (20cm) from the fuel-loading door</p> <p>F = Distance to furniture – 36" (91cm)</p> <p>G = Front protection – 20" (51cm) to unprotected combustable floor</p>

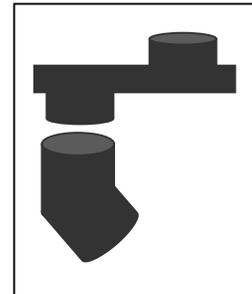
Assembly Instructions

The detailed dimensions of the RAIS 60 Insert are as shown:



Although the RAIS 60 Insert comes assembled, it has to be mounted into the fireplace or firebox.

1. First remove the baffle plate by lifting it up on
2. its side towards the top, and then pulling it out
3. the front (refer to "Cleaning the Smoke Box/Baffle System"). Included is a RAIS flue collar with a 45° elbow, which enables connection to the chimney or liner.
4. In some cases an offset box may also be needed for adjusting the position of the insert (as shown in the diagram). Attach the flue collar/offset box to the chimney/liner.
5. The insert (firebox) can then be placed and centered in the fireplace or built-in opening. To level the insert, use the 4 leveling screws situated at the bottom of the firebox (the stones will need to be removed to make the adjustments). Important! At least 1/2" (1cm) space should be left between insert and the opening.
6. Now the stovepipe (flexible or solid) can be attached to the offset box/collar on the insert. Reach up through the insert and pull the flue collar into the opening. Securely attach by bending the tabs on the collar over the insert's flange.



7. Finally, place the baffle plate back in reverse order. The baffle plate should be pushed all the way to the back of the firebox with it resting on both sides of the stones.
8. RAIS recommends that a sealer be used between the insert and the face of the opening.

Chimney

The RAIS inserts must be installed using a code-approved masonry chimney with a 6" (15cm) diameter flue liner, a zero-clearance chimney, or a Class A UL 103 HT approved factory-built chimney system.

The chimney must extend through the roof at least 3' (1m), and 2' (.6m) above any structure within 10' (3m). The condition of the chimney and height is very important. We suggest a total minimum height of 10' (3m). Consult your chimney expert if you have any questions.

Do not connect this stove to a chimney flue serving another appliance.

Important! Make sure that there is easy access to the chimney cleanout door.

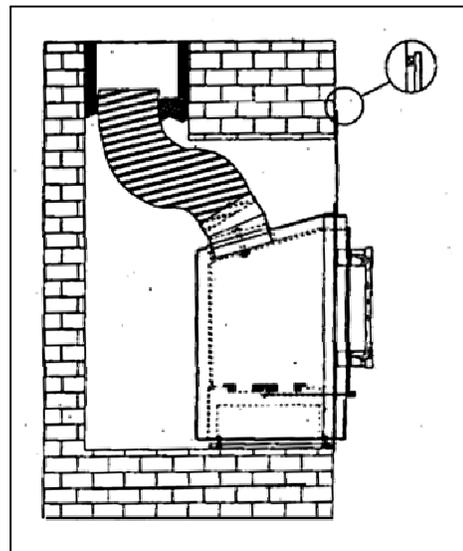
For venting directly into a masonry chimney (built to UBC Chapter 37 standards) with a clay liner, the installation should be in accordance with the NFPA 211 guidelines and methods.

Insure that there is a secure and airtight connection between the adapter pipe and the clay liner with a block off plate. See the illustrated diagram at left.

First, make sure to secure the fireplace damper in the open position (or remove the damper).

Then, have the chimney examined to insure that it is safe for use (e.g. not too large and no cracks), and some of the more critical requirements are:

- A minimum thickness of 4" (10cm) for brick or block and a 12" (30cm) for a natural or rubble stone wall.
- The 6" (15cm) chimney liner options include:
 - A full stainless steel chimney liner (meeting ULC S635 CLASS III standards) and securely attached to the insert and the chimney top is **required** for Canada. A UL 1777 liner is recommended in the United States for masonry and **required** for zero clearance.
 - A fire clay flue liner that is at least 5/8" thick and installed with refractory mortar.
 - An equivalent listed chimney liner system or other approved material.
- A chimney inside the house must have a 2" (5cm) clearance to combustibles, and an outside chimney must have at least a 1" (2.5cm) clearance to a combustible structure.



Fire stops must be installed at spaces where the chimney passes through floors and/or ceilings.

The RAIS 60 Insert is approved for installation in a masonry fireplace or a metal firebox (heat exchanger) within a masonry chimney (based on UL 907 listing) or for use in an approved factory-built zero-clearance fireplace (listed to UL 127).

When installing into a masonry opening, it is suggested that you wrap the insert with fiberglass or other non-combustible insulation for better heat retention.

There are several factory-built fireplaces that can be used with the RAIS 60 Insert. The clearance requirement is that there be a 2" (5cm) space between the insert and the back and sidewalls of the box.

To fit the insert into the zero-clearance firebox, the following items may be removed: damper, ember catches, fire grate, doors, and viewing screen or curtains. The smoke shelf or baffle can also be removed if done without cutting the material or permanently altering the fireplace structure.

Operating instructions

First Fire

Your new RAIS should be broken in gently for top performance and to prevent paint damage, cracks in the firebrick or firebox lining, and excessive wear and tear.

Start with a small fire (**never overload the firebox**) to allow the materials to get accustomed to the higher temperatures,

and then gradually increase the intensity. Use up to a maximum of 2 logs.

For the first few fires you may detect a strange smell that comes from "heat treating" the paint and materials. This is normal and will soon disappear. Just insure there is plenty of fresh air in the room!

Furthermore, during the initial heating up and cooling down, some "click-sounds" may occur from the metals being exposed to the large differences in temperature. This is normal.

For wood to burn correctly, the right amount of air has to be supplied at the right time and places.

Primary air is defined as combustion air for burning the "mass of wood" and stimulates production of volatile gases.

Secondary air is used to burn off the gases at high temperatures (above 1,000°F (540°C)) and to keep the glass free of soot.

Basically, the primary air is used to start the fire, and the secondary air is used to maintain the fire.

The RAIS 60 Insert stoves are equipped with an air control handle on the right of the door near the bottom. When the handle is pushed all the way up to **Position 1**, the primary air and secondary air are both fully open.

When the handle is pushed down about half way to **Position 2**, the stove gets only the full secondary air, and if the handle is pushed down further toward Position 0, the air supply is reduced. At **Position 0** (down all the way), the stove will shut down.

Firewood used should be seasoned, split wood with an adequate low degree of moisture (15 - 22%), and ideally about up to 20" (50cm) in length. In order to get "dry wood", it should be stored in a dry place under a roof with sufficient fresh airflow for at least one full year for softer woods and a minimum of two years for hardwoods.

Only use the wood fuel as described in the FIREWOOD Section of this manual!

Building the Fire

To start the fire lay a few pieces of kindling or dry twigs and paper at the back of the firebox (enough for a small fire). **Build the wood directly on the stove hearth, and do not use a grate or elevate the fire.**

Push the air control handle up to Position 1. Light the fire, and during start up you can leave the door slightly cracked (with supervision) until the kindling is burning well.

Add 1 or 2 split logs on the kindling fire and allow enough time for them to catch on fire (about 2 - 5 minutes). Now close the door completely, and push the air control handle down to Position 2. Use the door handle cover over the handle.

Further adjustments to the air control may be made later on if necessary.

Never reduce the air intake to Position 0 while logs are still burning. This will cause incomplete combustion (creosote), risk of explosion, and soot on the glass.

Once the door is closed and burning correctly, the stove does not require supervision.

The RAIS 60 Insert was developed to an optimal thermal output of 23,900 BTU/hr (7 kW) with a water content of 18%, which corresponds to **about 4½ lbs wood/hour**.

If the fire is fed more than recommended, there is a danger that the stove will be overloaded and might discolor. **Over firing is unnecessary and will void the warranty.**

Check for a Proper Burn

For a proper burn, the inside of the firebox and the glass panel should be free of soot, and the ashes in the bottom should be light gray (not black). To allow more air in to the heating chamber, move the air control handle up.

For normal operation the air control handle should be set at Position 2. However, if the wood is burning too quickly, you can adjust the air control handle down.

To ensure a proper and safe combustion, there should be bright and lasting flames/embers. Don't let the wood smolder. Do not close the air inlets completely during normal usage.

Firewood

Specifications

Only burn wood that has been seasoned for at least one full year (2 years is best!). If the wood has not been "dried", much of the energy of the fire will go into evaporating the water. Furthermore, condensation or creosote might occur in the stove and pipe if you burn moist wood.

The log size should be about 2" (5cm) less than the width of the firebox.

Burning value of wood

Air-dried wood has less moisture (15 - 20%) than freshly cut timber (40%+), and typically yields 20% more available heat. Wet wood burns at a lower temperature and causes incomplete combustion (soot and "creosote" formation, which in extreme cases, can lead to a chimney fire).

All types of wood heat up equally per pound (kilogram); however, the density of wood is not the same, as shown in the following table:

<i>Type of wood</i>	<i>Dry Wood - Lbs/ft³ (Kg/m³)</i>	<i>Compared to beech</i>
Beech and Oak	36.2 (580)	100%
Ash	35.6 (570)	98%
Maple	33.7 (540)	93%
Birch	31.8 (510)	88%
Mountain pine	30.0 (480)	83%
Fir	24.3 (390)	67%
Poplar	23.7 (380)	65%

A Few Reminders

- Store your wood cut and split (split logs dry faster).
- Keep the woodpile in a dry sunny place, protected from the rain. Don't cover the pile with plastic, because that will prevent the wood from drying out properly.
- Stack the wood with enough space between the rows to ensure good air circulation!

Fuel Caution

Do not burn trash (plastics and other trash emit harmful gases), driftwood, treated wood, artificial logs, or non-seasoned wood.

Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, naphtha, engine oil, or similar liquids to start or “freshen up” a fire in this heater. Keep all such liquids well away from the heater while in use.

CARE AND MAINTENANCE

Although your RAIS stove requires little day-to-day upkeep, it is important to maintain it for your safety and enjoyment.

IMPORTANT:

YOU SHOULD HAVE YOUR CHIMNEY AND STOVE CHECKED ONCE EVERY 2 MONTHS DURING THE HEATING SEASON OR AT LEAST ONCE A YEAR BY A PROFESSIONAL CHIMNEY SWEEP AND CLEANED AS NEEDED.

Creosote – Formation and Need for Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

The chimney connector and chimney should be inspected once every two months during the heating season to determine if a creosote buildup has occurred.

If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

Surfaces

The outer surfaces can be wiped with a dry soft rag, and if needed, a small amount of mild detergent, but try not to scrub!

Minor scratches and other surface damage can easily be touched up with the RAIS paint supplied with each stove. Remove any dirt, tar, and rust, and make sure repairs are made only when the stove is cool (room temperature).

Glass Doors

The glass can be easily cleaned by wiping with a damp rag dipped in some of the ashes. A good commercial glass cleaner can also be used.

If the glass should break, carefully lift off the door. Remove the 9 screws from the back, and remove the inner frame assembly. Then, remove all the loose pieces of glass and replace only with a 4mm ceramic new glass panel and gasket available from an authorized RAIS dealer. Assemble the inner frame, tighten screws evenly (star formation), and put the door back on.

Removing the Ashes

Clean out the ashes in the firebox through the opening door.

Remember to leave some of the ashes in the firebox (about a 1 1/2,5cm layer) for better insulation!.

DISPOSAL OF ASHES:

ASHES SHOULD BE PLACED IN A METAL CONTAINER WITH A TIGHT FITTING LID. THE CLOSED CONTAINER OF ASHES SHOULD BE PLACED ON A NONCOMBUSTIBLE 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.

Cleaning the Smoke Box/Baffle System

For best results the smoke box/baffle system should be cleaned about once a year. The following steps describe the cleaning process:

1. Remove the baffle plate as follows:
 - a. Push the baffle plate up towards the top of the stove and lift it off the side stones.
 - b. The baffle plate can now be turned at an angle and pulled out through the door opening. Note: The baffle plate is made out of vermiculite, which is a porous material and should be handled with care.
2. Brush the smoke box and vacuum if necessary.
3. The baffle plate can be put back in reverse order. Make sure the plate is correctly in place.

Firebox Lining

The firebox bottom lining is made out of firebrick and the side lining is made out of vermiculite slab insulation (skamol), which protects the outer steel plates from overheating. With time small cracks might appear, and this is normal. If it breaks however, it must be replaced. Vermiculite is a porous, high-insulating material and must therefore be handled with care.

Gaskets

It is recommended to replace the door gaskets about every 2 years. When replacing the door gasket, make sure the door glass is not pressed too hard against the gasket. The gasket around the ash drawer can also be replaced as needed. Gaskets can be obtained from an authorized RAIS dealer.

Trouble shooting

Problem	Possible Cause/Solution
Smoke coming out of the door	There may not be enough draft in the chimney (<0.06" WC (<16 Pascals)). Check for an obstruction.
Soot on the glass	Take care that the stove is warmed up sufficiently before closing the door.
The stove is burning too quickly	Check the door gaskets first and replace if needed. The chimney could also be too high and thus create too much draft (>0.09" WC (>22 Pascals)). A chimney cap reducer may help.
The stove is burning too slowly	It could be due to too little air getting to the stove. Check that you're not running exhaust fans (kitchen/bath), the chimney is not blocked, or there is a leak between the chimney, liner, stovepipe, and the stove.

If the problem continues or other conditions, we recommend that you contact your chimney sweep or your dealer.

If you should experience a chimney fire, quickly close all doors, dampers, vents, and call you local fire department. **Don't use water** to extinguish the fire.

Warranty

We offer a 5-year warranty on your RAIS stove, which covers any defect in material or workmanship. It does not cover damage from misuse or neglect. The glass, gaskets, firebrick and vermiculite stone liners are not covered.

ENJOY YOUR NEW RAIS!