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PLEASE KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE



PELLET STOVE

Bern

TECHNICAL MANUAL

CE₂₀₀₇



PLEASE READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS PELLET BURNING ROOM HEATER. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH

Contact your building or fire officials about restrictions and installation inspection requirements in your area.

50-1576

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SAFETY WARNINGS & RECOMMENDATIONS

* This manual is designed for the technician in conjunction with the owner's manual. *

Please read this entire Owner's Manual before installing or operating your ENVIRO Pellet Stove. Failure to follow these instructions may result in property damage, bodily injury or even death. Any unauthorized modification of the appliance or use of replacement parts not recommended by the manufacturer is prohibited. All national and local regulations and European Standards shall be complied with when installing this appliance.

Caution: Do not connect to any air distribution duct or system.

Warning: Parts of the appliance, especially the external surfaces, will be hot to touch when in operation so use due care and the fire gloves provided. Never place wood, paper, furniture, drapes or other combustible materials within 80cm (31½") of the front of the unit, 20cm (7⅞") from each side, and 10cm (4") from the back of the unit. Do not let children or pets touch it when it is hot.

To prevent the possibility of a fire, ensure that the appliance is properly installed by adhering to the installation instructions. An ENVIRO dealer will be happy to assist you in obtaining information with regards to your local building codes and installation restrictions.

FIRE EXTINGUISHER AND SMOKE DETECTION: All homes with a pellet burning stove should have at least one fire extinguisher in a central location known to all in the household. Smoke detectors should be installed and maintained in the room containing the stove when installing and operating a pellet burning appliance. If it sounds the alarm, correct the cause but do not deactivate. You may choose to relocate the smoke detection device within the room; **DO NOT REMOVE THE SMOKE DETECTOR FROM THE ROOM.**

CHIMNEY OR RUN AWAY FIRE: Call local fire department. Close the draft fully. Extinguish the fire in the burn pot liner with a cup of water and close the door. Examine the flue pipes, chimney, attic, and roof of the house, to see if any part has become hot enough to catch fire. If necessary, spray with fire extinguisher or water from the garden hose. **IMPORTANT:** Do not operate the stove again until you are certain the chimney and its lining have not been damaged.

FUEL: This pellet stove is designed and approved to only burn wood pellet fuel with up to 3% ash content. Dirty fuel will adversely affect the operation and performance of the unit and may void the warranty. Check with your dealer for fuel recommendations. **THE USE OF CORDWOOD IS PROHIBITED BY LAW. When filling fuel hopper,** open lid on top of unit, check hopper for foreign objects, empty the bag into the hopper, **DO NOT OVER FILL,** and ensure hopper lid closes completely. **DO NOT** use this appliance as an incinerator. **DO NOT** use unsuitable and non recommended fuels, including liquid fuels.

KEEP ASH PAN FREE OF RAW FUEL. **DO NOT PLACE UNBURNED OR NEW PELLETT FUEL IN ASH PAN.** A fire in the ash pan may occur.

SOOT: Operation of the stove with insufficient combustion air will result in the formation of soot which will collect on the glass, the heat exchanger, the exhaust vent system, and may stain the outside of the house. This is a dangerous situation and is inefficient. Frequently check your stove and adjust the slider/damper as needed to ensure proper combustion. **See: "SLIDER/DAMPER SETTING".**

SAFETY WARNINGS & RECOMMENDATIONS

CLEANING: There will be some build up of fly ash and small amounts of creosote in the exhaust. This will vary due to the ash content of the fuel used and the operation of the stove. It is advisable to inspect and clean the exhaust vent semi-annually or every two tons of pellets. The appliance, flue gas connector and the chimney flue require regular cleaning. Check them for blockage prior to re-lighting after a prolonged shut down period.

ASHES: Disposed ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be on a non-combustible surface, well away from all combustible materials pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispensed, they should be retained in the closed container until all cinders have been thoroughly cooled.

IMPORTANT: The door and ash drawer cover must be kept closed except during ignition, refueling and removal of residue material to prevent fume spillage.

GLASS: Do not abuse the glass by striking or slamming the door. Do not attempt to operate the stove with broken glass. The stove uses ceramic glass. Replacement glass must be purchased from an ENVIRO dealer. Do not attempt to open the door and clean the glass while the unit is in operation or if glass is hot. To clean the glass, use a soft cotton cloth and mild window cleaner, gas or wood stove glass cleaner, or take a damp paper towel and dip into the fly ash. This is a very mild abrasive and will not damage the glass.

ELECTRICAL: The use of a surge protected power bar is recommended. The unit must be grounded. The grounded electrical cord should be connected to a standard 220-240 volts (2.0-2.3 Amps), 50 hertz electrical outlet and also must be accessible. If this power cord should become damaged, a replacement power cord must be purchased from the manufacturer or a qualified ENVIRO dealer. Be careful that the electrical cord is not trapped under the appliance and that it is clear of any hot surfaces or sharp edges. This unit's maximum power requirement is 525 watts.

OPERATION: The door and ash drawer cover must be kept closed securely when the unit is in operation to prevent fume spillage and for proper and safe operation of the pellet stove. Also ensure all gaskets on the door are checked and replaced when necessary.

CAUTION: When operating during adverse weather, if the unit exhibits dramatic changes in combustion stop using the unit immediately.

INSTALLATION: Contact your local building or fire official to obtain a permit and any information on installation restrictions and inspection requirements for your area. All local regulations, including those referring to national and European Standards need to be complied with when installing this appliance.

Be sure to maintain the structural integrity of your home when passing a vent through walls, ceilings, or roofs. It is recommended that the unit be secured into its position in order to avoid any displacement. This appliance must be installed on a floor with an adequate load bearing capacity. If an existing construction doesn't meet these prerequisite, suitable measures (e.g. load distributing plate) shall be taken to achieve it.

DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS UNIT.

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

SAFETY WARNINGS & RECOMMENDATIONS

FRESH AIR: Outside Fresh Air connection is optional. Fresh Air must be connected to all units installed in "Air Tight Homes" or where required by local codes.

Consider all large air moving devices when installing your unit and provide room air accordingly. NOTE: Extractor fans when operating in the same room or space as the appliance, may cause problems. Limited air for combustion may result in poor performance, smoking and other side effects of poor combustion.

The stove's exhaust system works with negative combustion chamber pressure and a slightly positive chimney pressure. It is very important to ensure that the exhaust system be sealed and airtight. The ash pan and viewing door must be locked securely for proper and safe operation of the pellet stove.

Do not burn with insufficient combustion air. A periodic check is recommended to ensure proper combustion air is admitted to the combustion chamber. Setting the proper combustion air is achieved by adjusting the slider damper located on the left side of the stove.

Minor soot or creosote may accumulate when the stove is operated under incorrect conditions such as an extremely rich burn (black tipped, lazy orange flames).

If you have any questions with regards to your stove or the above-mentioned information, please feel free to contact your local dealer for further clarification and comments.

SINCE SHERWOOD INDUSTRIES LTD. HAS NO CONTROL OVER THE INSTALLATION OF YOUR STOVE, SHERWOOD INDUSTRIES LTD. GRANTS NO WARRANTY IMPLIED OR STATED FOR THE INSTALLATION OR MAINTENANCE OF YOUR STOVE. THEREFORE, SHERWOOD INDUSTRIES LTD. ASSUMES NO RESPONSIBILITY FOR ANY CONSEQUENTIAL DAMAGE(S).

SAVE THIS INSTRUCTION MANUAL FOR FUTURE REFERENCE

INSTALLATION

RATING LABEL LOCATION:

The rating label is located on the back of the unit.

DECIDING WHERE TO LOCATE YOUR PELLET APPLIANCE:

1. Check clearances to combustibles.
2. Do not obtain combustion air from an attic, garage or any unventilated space. Combustion air may be obtained from a ventilated crawlspace. NOTE: Extractor fans when operating in the same room or space as the appliance, may cause problems.
3. Do not install the stove in a bedroom.
4. You can vent the stove through an exterior wall behind the unit or connect it to an existing masonry or metal chimney (must be lined if the chimney is over 6" (15 cm) diameter, or over 28 inches² (180 cm²) cross sectional area). An interior vent can be used with approved pipe passing through the ceiling and roof.
5. Locate the stove in a large and open room that is centrally located in the house. This will optimize heat circulation.
6. The power cord is 8 feet (2.43 m) long and may require a grounded extension cord to reach the nearest electrical outlet.

REMOVING PELLET STOVE FROM PALLET:

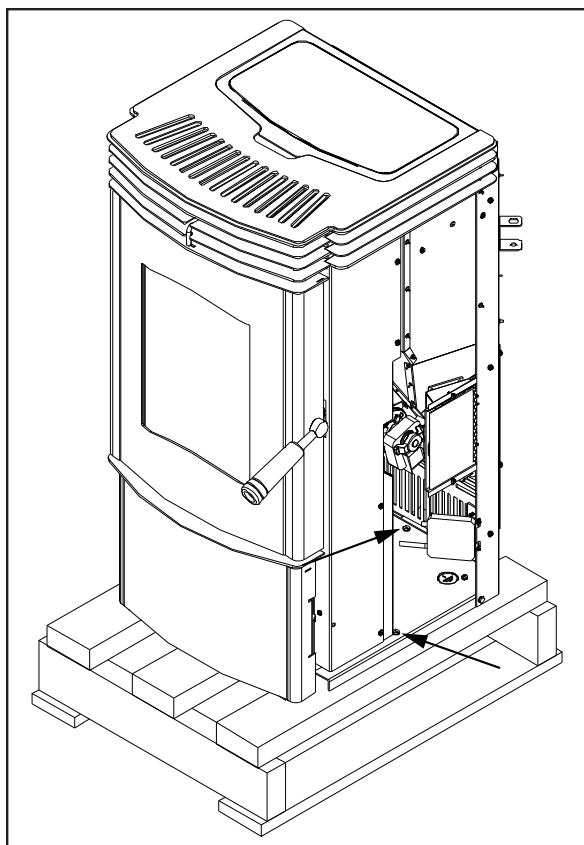


Figure 1: Screws to take out to remove stove from pallet.

1. Remove the right and left hand cabinet sides by loosening the three (3) T-20 Torx screws on the back of the each panel.
2. Remove the screw located on the front of the cabinet side, below the louvers and loosen the screw behind the ash door.
3. Using a $\frac{5}{16}$ " socket of flat head screwdriver, remove the three (3) wood screws that are holding the bottom of the stove to the pallet. There is one (1) screw behind each side panel and one (1) at the back behind the back grill.
4. Close the side panels.
5. Install the four (4) leveling legs into the nuts in the base.

INSTALLATION

DIMENSIONS & SPECIFICATIONS:

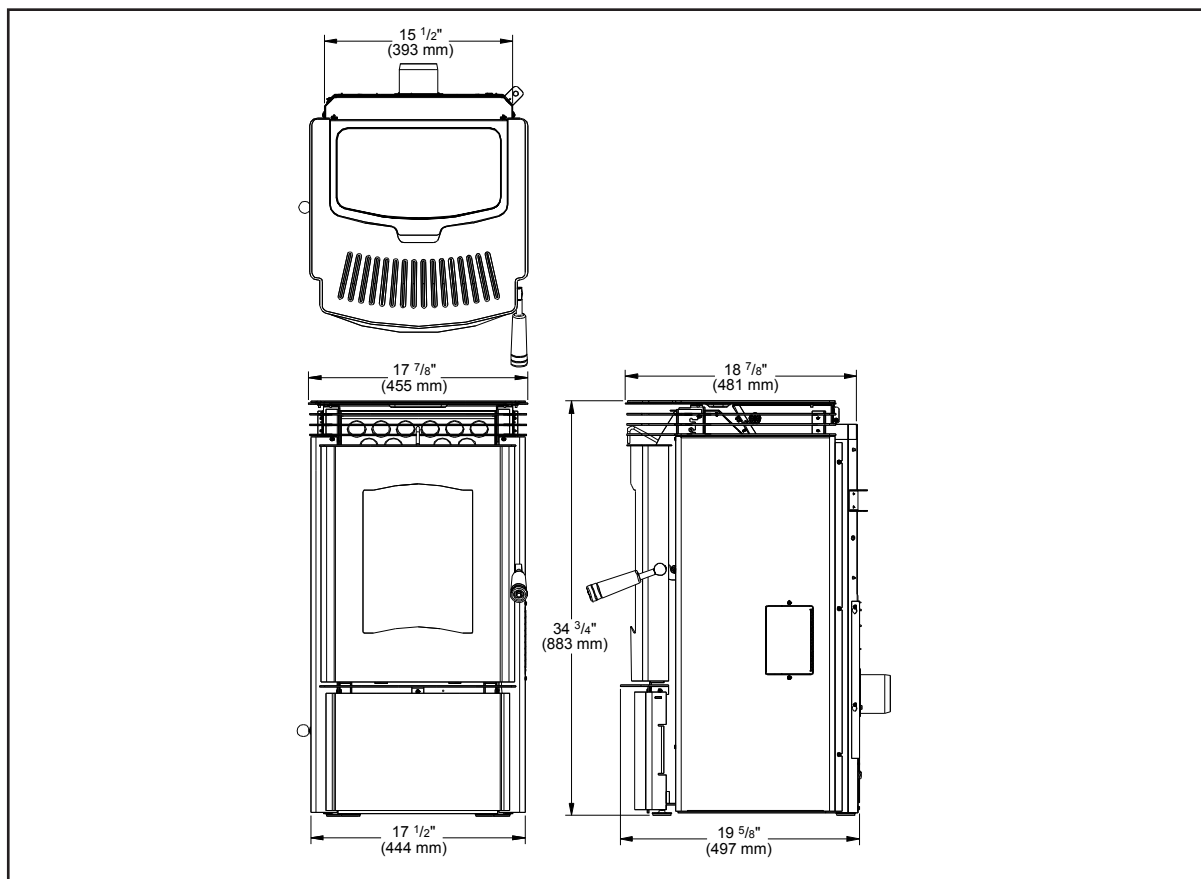


Figure 2: Dimensions of Bern.

Table 1: Bern Specifications.

Classification	Testing Standard	Description
Class I IP-20	EN14785:2006/EN13240:2001/A2:2004	Residential Wood Pellet Heater
Voltage	Current	Frequency
220 - 240 V	2.0 - 2.2 Amps	50 Hz
Maximum Power Requirement	Fuel type	Calorific value of Pellet used
500W (1708 BTU/hr)	wood pellets - 6mm (1/4") dia.	≥ 5.10 kWh/kg (≥ 8000 BTU/lb)
Maximum Flue Gas Temperature	Mean Flue Gas Temperature	Mean Flue Gas Temperature (Reduced)
160°C (320°F)	145°C (293°F)	95°C (203°F)
Nominal Heat Output	CO emissions from Combustion	Energy Efficiency
5.3 KWh (18084 BTU)	0.014%	87%
Reduced Heat Output	CO emissions from Combustion (Reduced Output)	Energy Efficiency (Reduced Output)
2.7 KWh (9213 BTU)	0.022%	91.8%
CO ₂ at Nominal Output	Nominal Fuel Consumption Rate	Unit with Full Hopper
7.15%	1.2 Kg/hr (3.22 lb/hr)*	~ 106.5kg (285lb)
CO ₂ at Reduced Output	Fuel Consumption Rate (Reduced Output)	Hopper Capacity
6.62%	0.58 Kg/hr (1.55 lb/hr)*	~ 23.6kg (52lb)

*Note: Consumption will vary with the type of fuel used.

INSTALLATION

CLEARANCES TO COMBUSTIBLES:

Use a hearth pad that extends 6 inches (15 cm) in front of the unit when installing on a combustible floor.

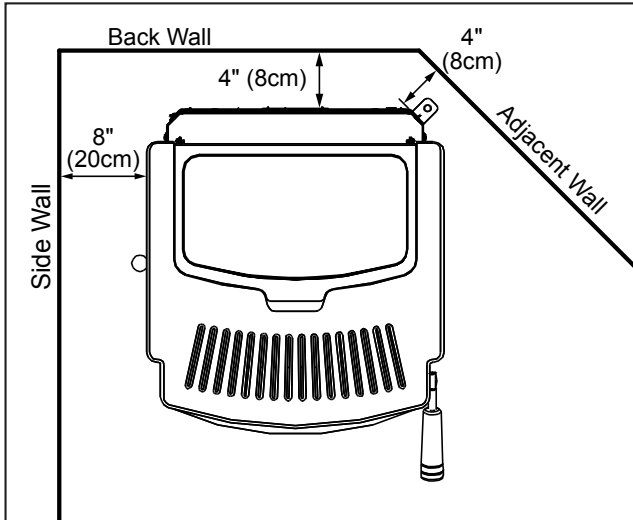


Figure 3: Bern Clearance to Combustibles.

These dimensions are minimum clearances but it is recommended that you ensure sufficient room for servicing, routine cleaning and maintenance.

Side wall to unit	200mm (7 ⁷ / ₈ inches)
Back wall to unit	100mm (4 inches)
Adjacent wall to corner of unit	100mm (4 inches)

Any combustible directly in front of the unit
800mm (31¹/₂ inches)

ALCOVE CLEARANCES:

This unit may be installed in an alcove. Maintain these clearances to combustibles.

Minimum Alcove width	1220mm (48 inches)
Minimum Alcove height	1220mm (48 inches)
Maximum Alcove depth	1220mm (48 inches)

Install vent at clearances specified by the vent manufacturer.

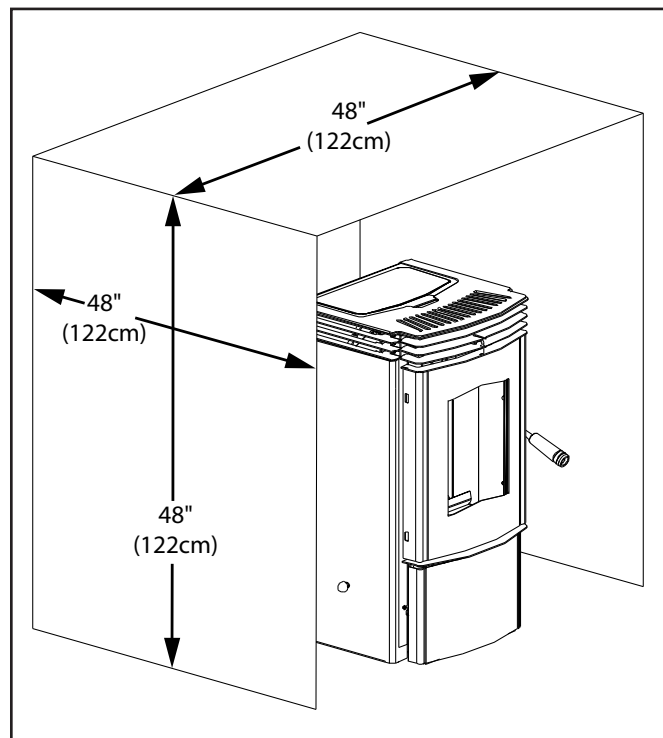


Figure 4: Bern Minimum Alcove Size.

INSTALLATION

VENT TERMINATION REQUIREMENTS:

IT IS RECOMMENDED THAT YOUR PELLET STOVE BE INSTALLED BY AN AUTHORIZED DEALER/INSTALLER.

Table 2: Use in conjunction with Figure 5 for allowable exterior vent termination locations.

Letter	Minimum Clearance	Description
A	61cm (24 in)	Above grass, top of plants, wood, or any other combustible materials.
B	122 cm (48 in)	Beside/below any door or window that may be opened. (46 cm (18") if outside fresh air install.)
C	30 cm (12 in)	Above any door or window that may be opened. (23 cm (9") if outside fresh air install.)
D	61cm (24 in)	To any adjacent building, fences and protruding parts of the structure.
E	61cm (24 in)	Below any eave or roof overhang
F	30 cm (12 in)	To outside corner.
G	30 cm (12 in)	To inside corner, combustible wall (vertical and horizontal terminations).
H	91 cm (3 ft) within a height of 4.5 m (15 ft) above the meter/regulator assembly	To each side of center line extended above natural gas or propane meter/regulator assembly or mechanical vent.
I	91 cm (3 ft)	From any forced air intake of other appliance
J	30 cm (12 in)	Clearance to non-mechanical air supply inlet to building, or the combustion air inlet to any appliance.
K	61cm (24 in)	Clearance above roof line for vertical terminations.
L	2.13 m (7 ft)	Clearance above paved sidewalk or paved driveway located on public property.

1. Do not terminate the vent in any enclosed or semi-enclosed areas such as a carport, garage, attic, crawlspace, narrow walkway, closely fenced area, under a sundeck or porch, or any location that can build up a concentration of fumes such as stairwells, covered breezeway, etc.

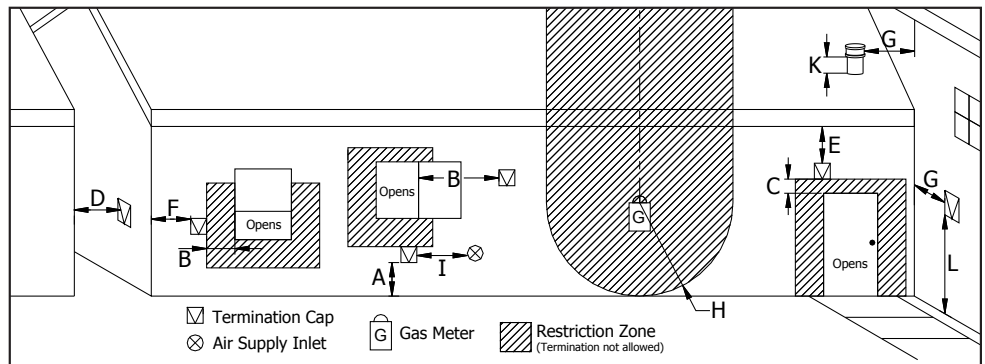


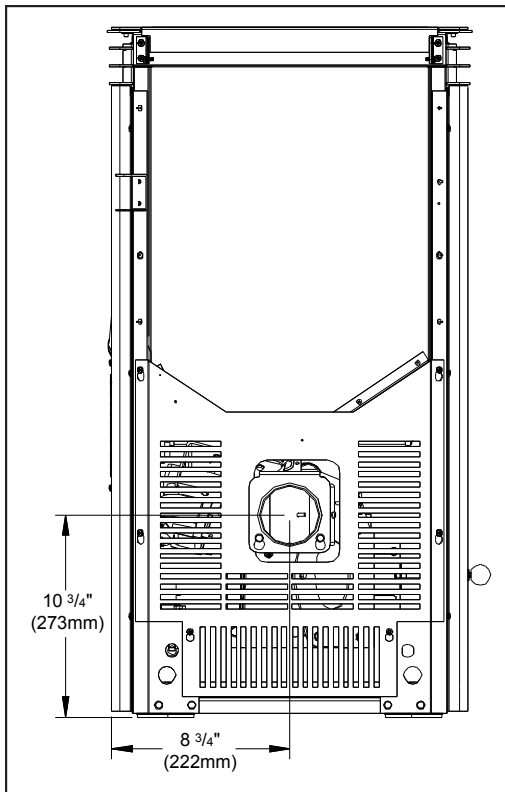
Figure 5: Use in conjunction with Table 2 for allowable exterior vent termination locations.

2. Vent surfaces can become hot enough to cause burns if touched by children. Non-combustible shielding or guards may be required.
3. Termination must exhaust above the inlet elevation. It is recommended that at least five feet of vertical pipe be installed outside when the appliance is vented directly through a wall, to create some natural draft to prevent the possibility of smoke or odor during appliance shut down or power failure. This will keep exhaust from causing a nuisance or hazard from exposing people or shrubs to high temperatures. In any case, the safest and preferred venting method is to extend the vent through the roof vertically.
4. Distance from the bottom of the termination and grade is 30 cm (12 in) minimum. This is conditional upon the plants and nature of grade surface. The exhaust gases are hot enough to ignite grass, plants and shrubs located in the vicinity of termination. The grade surface must not be lawn.
5. If the unit is incorrectly vented or the air to fuel mixture is out of balance, a slight discoloration of the exterior of the house might occur. Since these factors are beyond the control of Sherwood Industries Ltd, we grant no guarantee against such incidents.

NOTE: Venting terminals shall not be recessed into walls or siding.

INSTALLATION

EXHAUST LOCATION:



Base of unit to center of flue 10³/₄" (273 mm)

Side of unit to center of flue 8³/₄" (222 mm)
[at center of unit]

Figure 6: Bern Inlet and Outlet Location.

CORNER THROUGH WALL INSTALLATION:

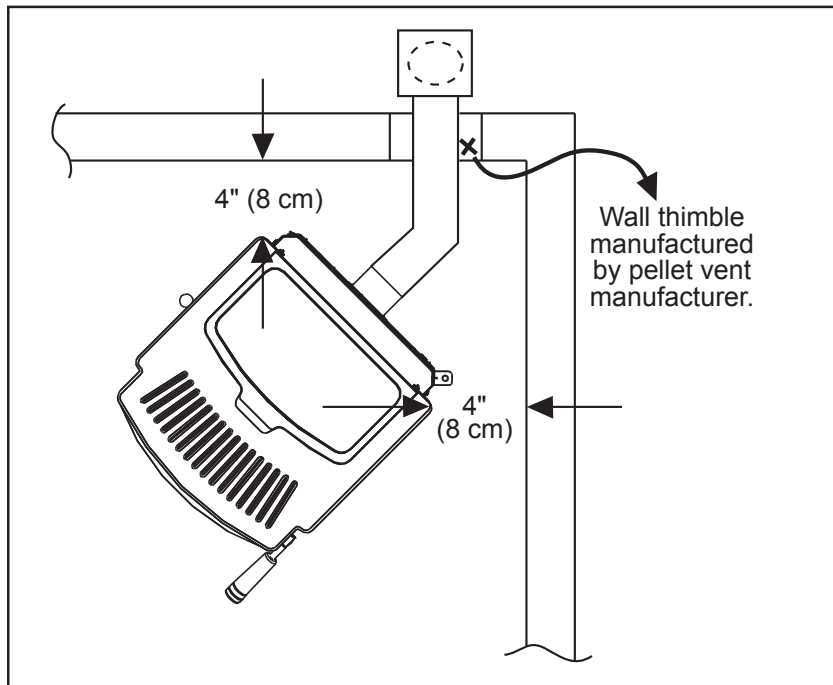


Figure 7: Corner Installation.

INSTALLATION

HORIZONTAL EXHAUST THROUGH WALL INSTALLATION:

Vent installation: install vent at clearances specified by the vent manufacturer.

A chimney connector shall not pass through an attic or roof space, closet or similar concealed spaces, or a floor, or ceiling. Where passage through a wall or partition of combustible construction is desired, the installation must conform with all local regulations, including those referring to regional, national or European Standards. Use 80mm stainless steel vent pipe to exhaust the unit to the outside.

1. Choose a location for your stove that meets the requirements stated in this manual and allows installation with the least amount of interference to house framing, plumbing, wiring, etc.

2. Install a non-combustible hearth pad (where necessary).

3. Place the appliance 375 mm (15") away from the wall. If the stove is to be set on a hearth pad, set the unit on it.

4. Locate the center of the exhaust pipe on the stove. Extend that line to the wall. Once you have located the center point on the wall, refer to pellet vent manufacturer installation instructions for correct hole size and clearance to combustibles.

5. Install the wall thimble as per the instructions written on the thimble. Maintain an effective vapour barrier in accordance with local building codes.

6. Install a length of 80mm (3") vent pipe into the wall thimble. The pipe should install easily into the thimble.

7. Install the fresh air intake (see OUTSIDE FRESH AIR CONNECTION).

8. Connect the exhaust vent pipe to the exhaust pipe on the stove. Seal the connection with high temperature silicone.

9. Push the stove straight back, leaving a minimum of 100mm (4") clearance from the back of the stove to the wall. Seal the vent pipe to the thimble with high temperature silicone.

10. The pipe must extend at least 30 cm (12") away from the building. If necessary, bring another length of pipe to the outside of the home to connect to the first section. Do not forget to place high temperature silicone around the pipe that passes through the thimble.

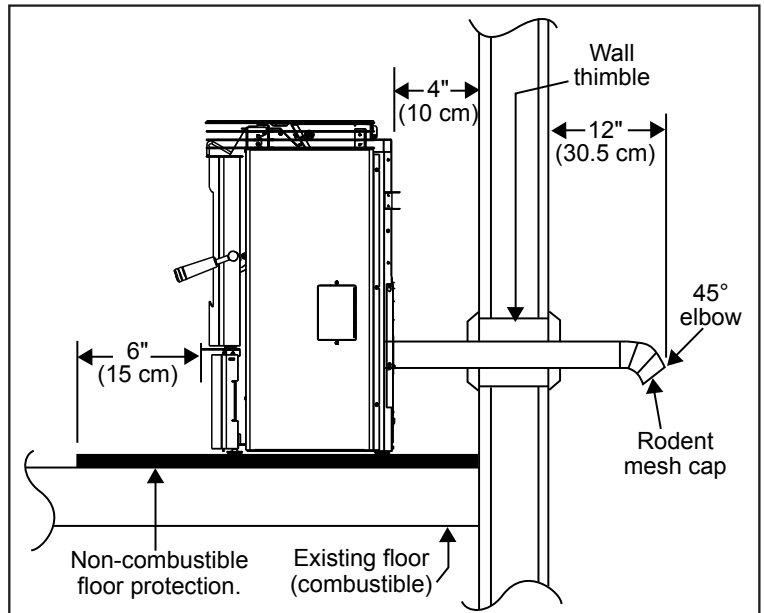


Figure 8: Straight through wall Installation.

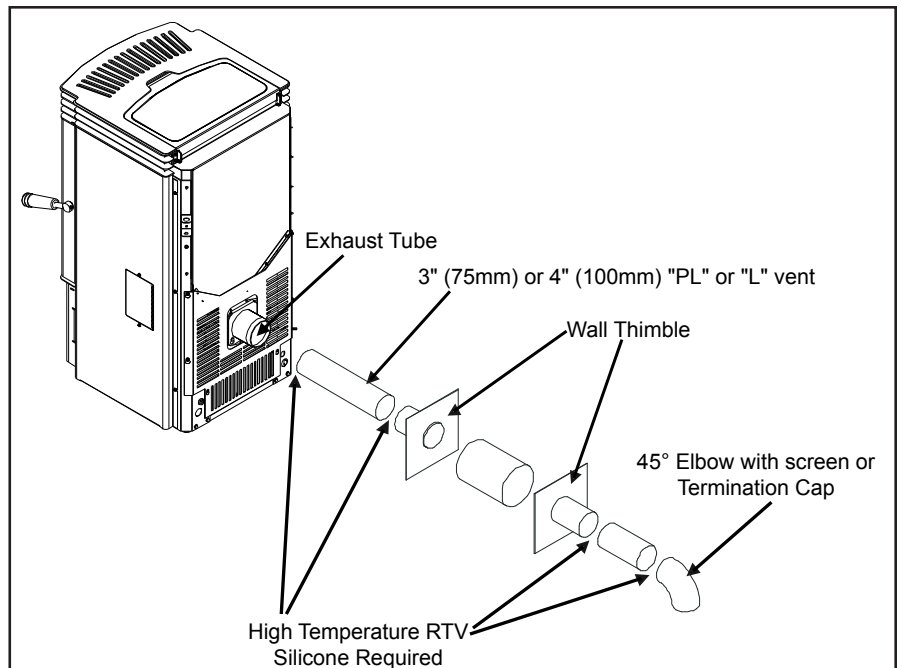


Figure 9: Venting to use with straight through wall Installation.

INSTALLATION

11. Install a vertical pipe, or if all requirements for direct venting are met, install vent termination. The stainless steel cap termination manufactured by the vent manufacturer is recommended. However, when the vent terminates several feet above ground level and there are no trees, plants, etc. within several feet, a 45° elbow can be used as termination. The elbow must be turned down to prevent rain from entering.

NOTE:

- It is recommended that horizontal through wall installations have 3 to 5 feet (91 to 152 cm) of vertical pipe in the system to help naturally draft the unit in the event of extreme weather or a power outage.
- Some horizontal through wall installations may require a "T" and 3 to 5 feet (91 to 152 cm) of vertical pipe outside the building to help draft the unit. This may be required if a proper burn cannot be maintained, after the stove has been tested and the airflow set. This is due to the back pressure in the exhaust caused by airflow around the structure.
- Follow vent manufacturer's guidelines for installation of venting. High temperature sealant must be used when connecting the vent pipe to the unit's starter pipe. Improper seals at the vent joints may cause combustion byproducts to leak into the room where installed - seal as required.

THROUGH WALL WITH VERTICAL RISE AND HORIZONTAL TERMINATION INSTALLATION - FREESTANDING:

A 45° down elbow with a rodent screen may be used in place of the termination cap (or stainless steel termination hood).

Figure 10 is the recommended installation set up.

Figure 11 is the installation to use if there is a concrete or retaining wall in line with exhaust vent on a pellet stove. The termination must be 305mm (12") from the outside wall and 305mm (12") above the ground.

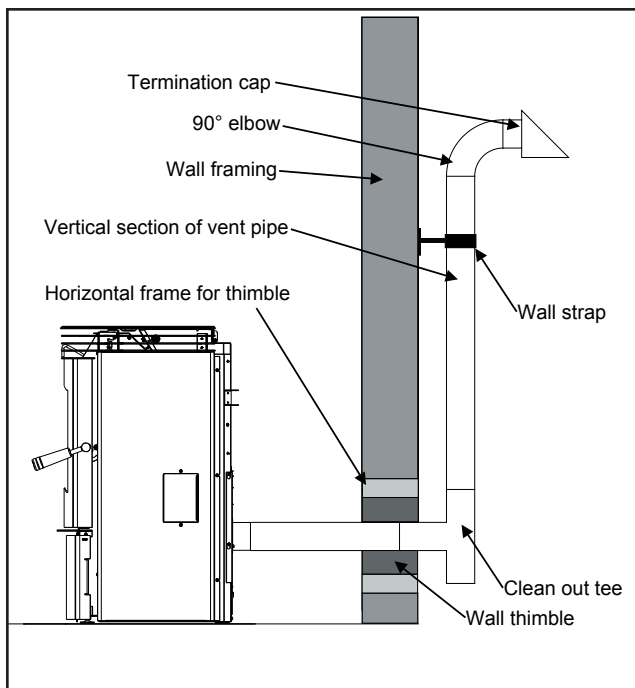


Figure 10: Venting horizontally with rise.

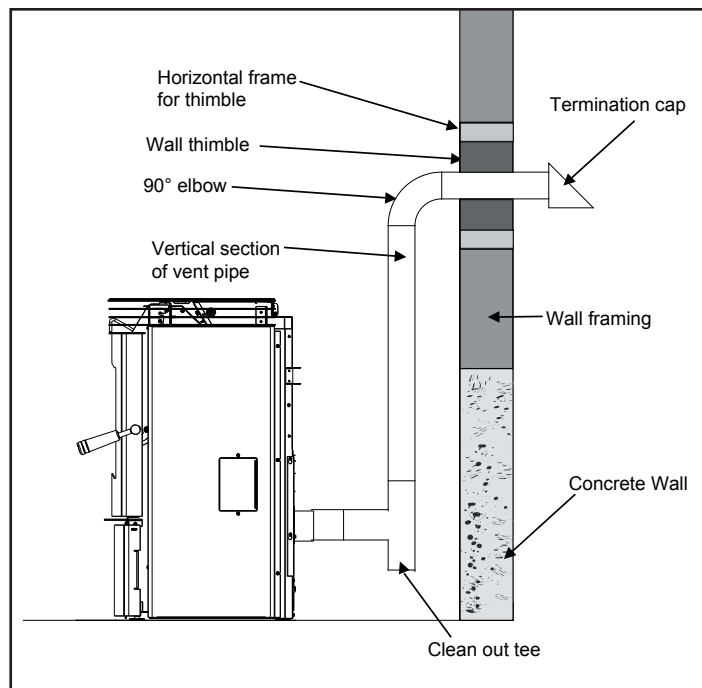


Figure 11: Venting with concrete wall behind unit .

INSTALLATION

INSIDE VERTICAL INSTALLATIONS:

1. Choose a stove location that is ideal. See the section "DECIDING WHERE TO LOCATE YOUR PELLET APPLIANCE."
2. Place a non-combustible hearth pad where necessary.
3. Place the unit on the hearth pad (if installed on a carpeted surface) and space the unit in a manner so when the pellet vent is installed vertically, it will be 100mm (4") away from a combustible wall.
4. Locate the center of the fresh air intake pipe on the unit. Match that center with the same point on the wall and cut a hole about 40mm (1 $\frac{5}{8}$ ") in diameter.
5. Install the fresh air intake pipe.
6. Install the tee with clean out.
7. Install the pellet vent upward from there. When you reach the ceiling, make sure that the vent goes through the ceiling fire stop. Maintain a 100mm (4") distance to combustibles and keep attic insulation away from the vent pipe. Maintain an effective vapor barrier.
8. Finally, extend the pellet vent to go through the roof flashing.
9. Ensure that the rain cap is approximately 900 mm (36") above the roof.

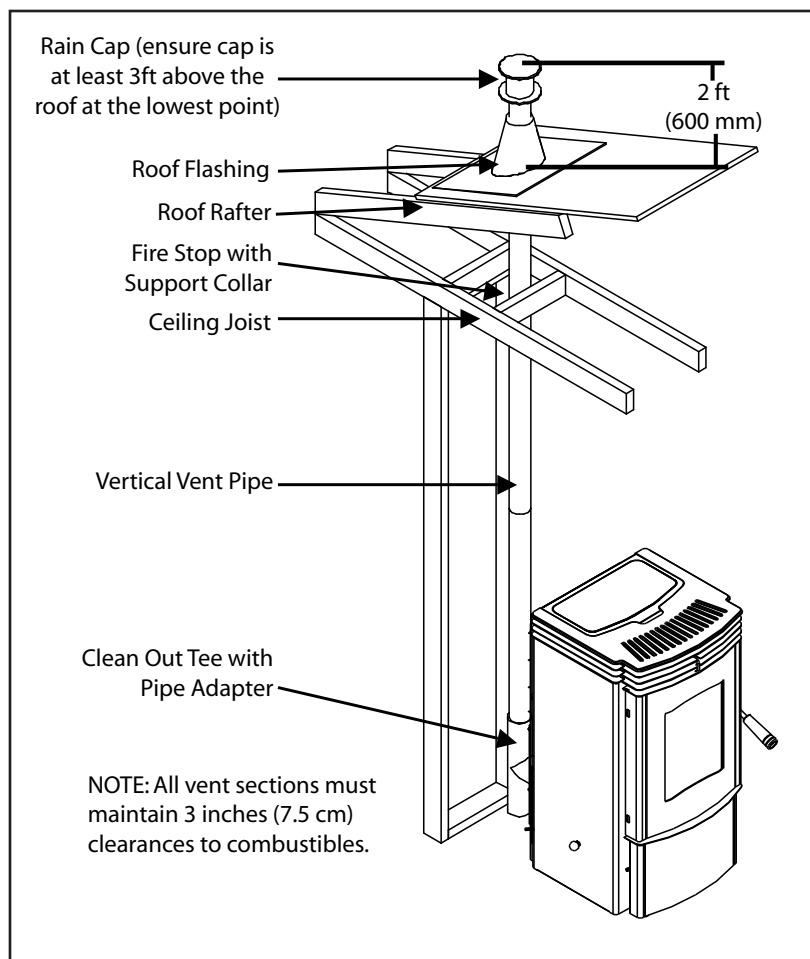


Figure 12: Inside Vertical Installation.

OUTSIDE VERTICAL INSTALLATIONS:

To accomplish a outside vertical pipe installation, follow steps 1 through 5 in the "INSIDE VERTICAL INSTALLATIONS - FREESTANDING" section and then finish it by performing the following (refer to Figure 13).

1. Install a tee with clean out on the outside of the house.
2. Install vent pipe upward from the tee. Make sure that you install support brackets to keep the vent straight and secure.
3. Install ceiling thimble and secure the flashing as you go through the roof.
4. Ensure that the rain cap is approximately 900 mm (36") above the roof.

INSTALLATION

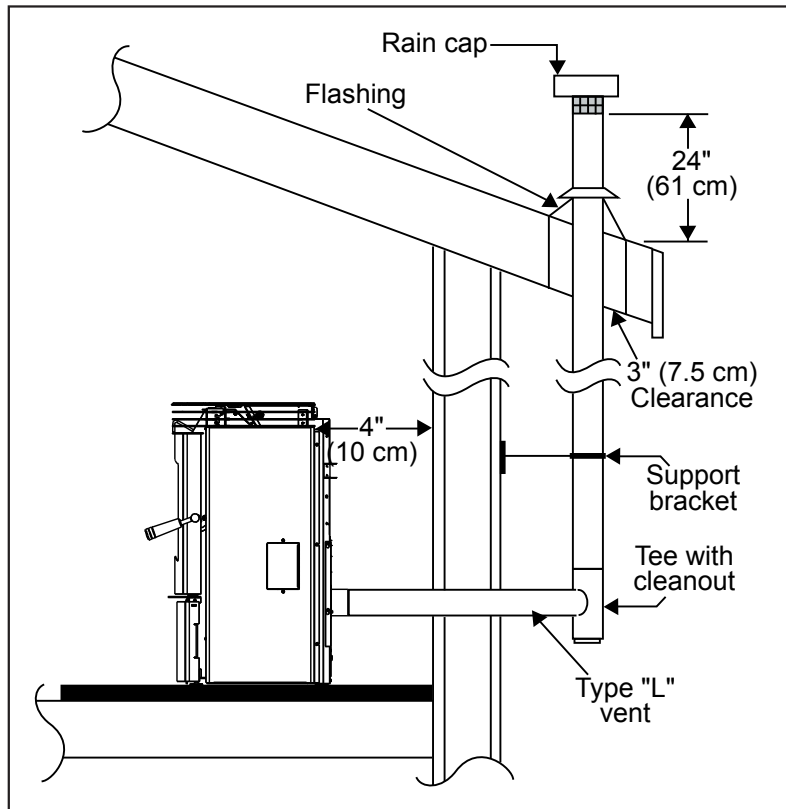


Figure 13: Outside Vertical Installation.

HEARTH MOUNT INSTALLATION:

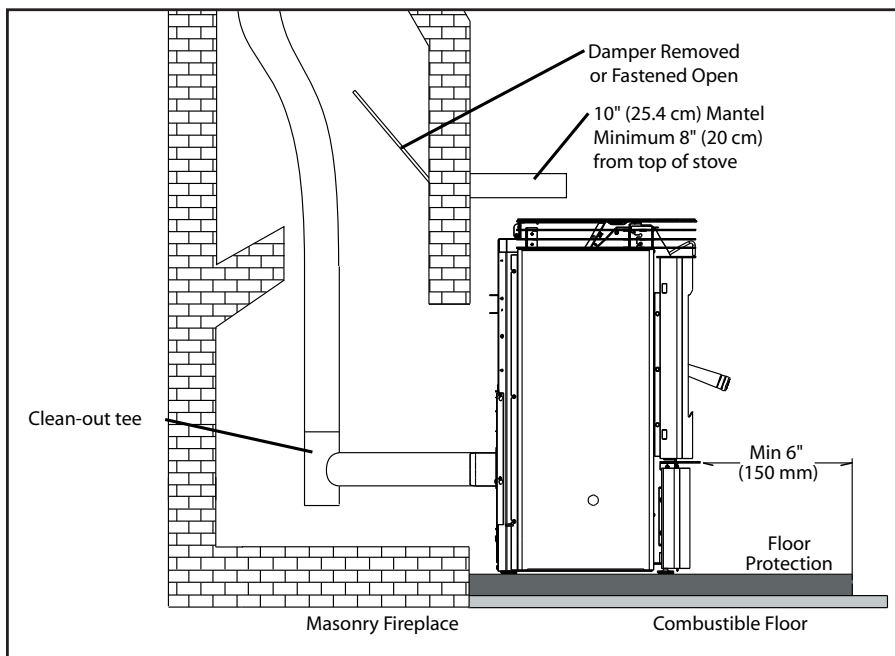


Figure 14: Freestanding hearth mount installation.

Refer to Figures 14 and 15.

1. Install the hearth pad.
2. Lock fireplace damper in the open position.
3. Install a positive flue connector at the fireplace dampers.
4. Connect a tee or a 90° elbow to the exhaust pipe.
5. Install flexible stainless steel liner or listed pellet vent to the top of the chimney.

INSTALLATION

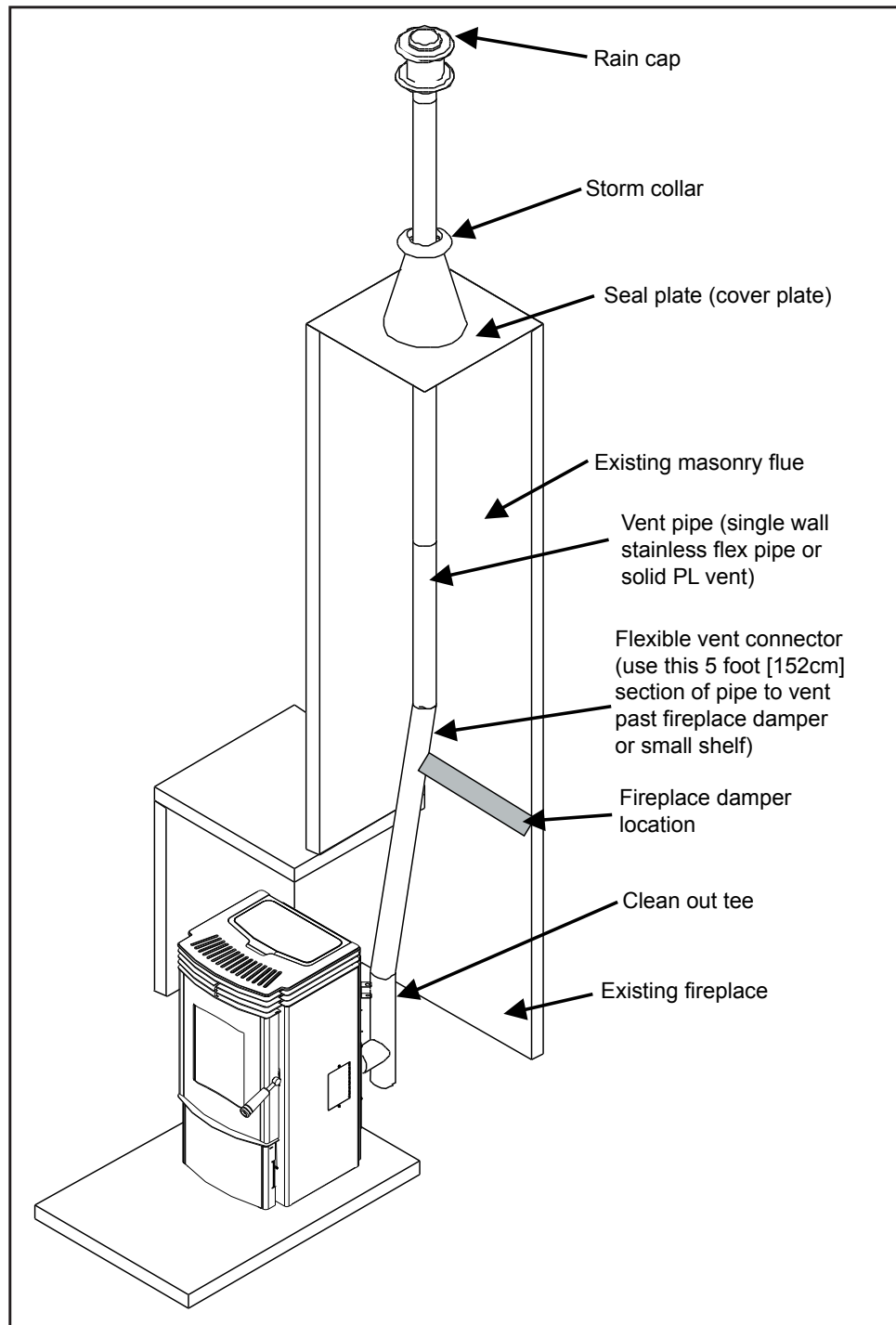


Figure 15: Freestanding hearth mount installation overview.

INSTALLATION

EXTERIOR MOUNTED EXHAUST BLOWER:

The Bern can be equipped with an externally mounted exhaust blower. This optional kit includes all components necessary to install the exhaust blower on any vertical wall surface.

Choose a location for your stove that meets the requirements stated in your manual and allows installation with the least amount of interference with house framing, plumbing, wiring, etc.

Included in the Exterior Mounted Exhaust Blower Kit are:

- 1 - Exhaust blower housing box.
- 1 - Blower cover plate.
- 1 - Hardware bag

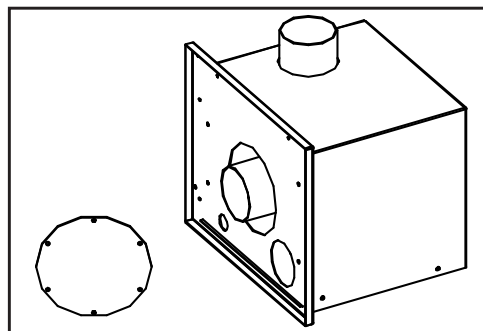


Figure 16: Exterior Blower Kit.

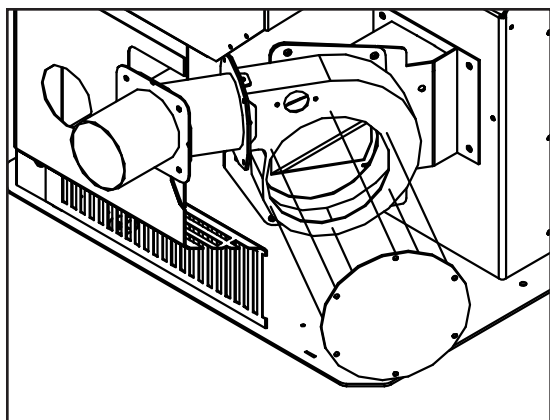


Figure 17: Exterior Blower Kit.

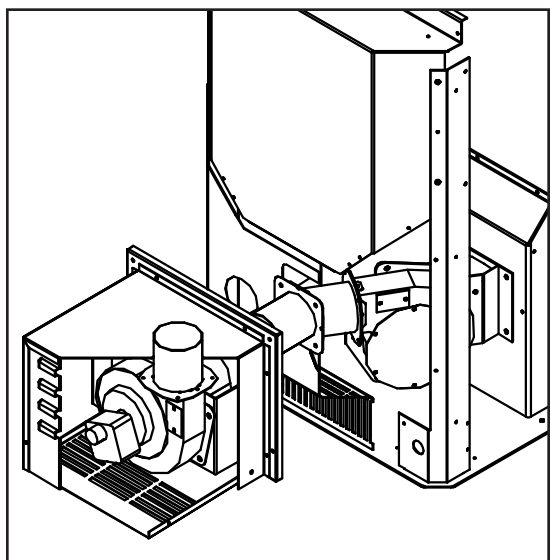


Figure 18: Exterior Blower Kit cut-through.

1. Remove the left hand cabinet side by removing the two (2) screws down the front. Loosen the three screws on the back of the cabinet side and remove panel.
2. Loosen the six (6) screws that hold the back grill in place. Lift the back grill off the screws.
3. Disconnect the Exhaust blower wires from the wire harness. Remove the exhaust blower motor from the housing; six (6) screws. Cover hole in housing with cover plate provided (see Figure 17).
4. Remove the cover from the exhaust blower housing box.
5. Install the exhaust blower housing box into the pipe placed through the wall thimble, seal with high temperature silicone. Fasten the box to the wall with (4) four screws, seal edges of box to wall with clear silicone.
6. Drill a hole through the wall thimble plate for the electrical wires. Pass the armored cable through the wall thimble. Use the strain relief provided. **Do not pass cable through vent hole.**
7. Install the Exhaust Blower motor into the external exhaust blower housing box. Make the electrical connections to the wire harness and exhaust blower.
8. Replace the cover on the Exhaust Box and the back grill of the stove and ensure the screws are tightened down.
9. Install vertical pipe as instructed in appropriate section.

INSTALLATION

TYPICAL THROUGH WALL WITH EXTERIOR BLOWER KIT INSTALLATION - HORIZONTAL TERMINATION:

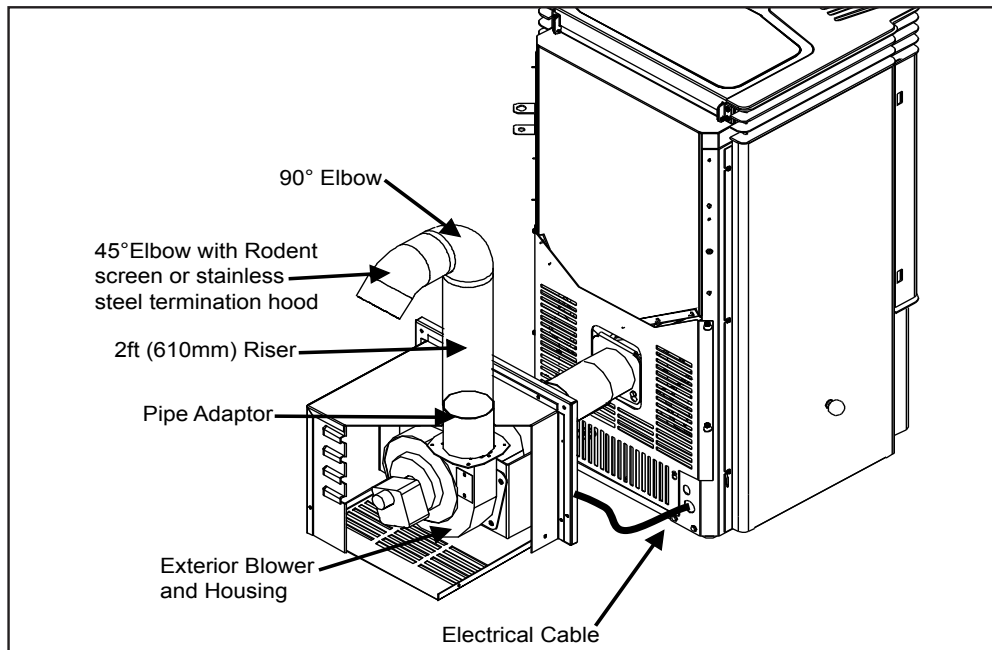


Figure 19: Through Wall Installation with Exterior Blower Kit.

NOTE:

Ensure that all interior vent connections are sealed by placing a small bead of high temperature silicone around each chimney connection.

Also ensure that all vertical vent sections are properly supported and that all clearances to combustibles are maintained in accordance with the vent manufacturer's specifications.

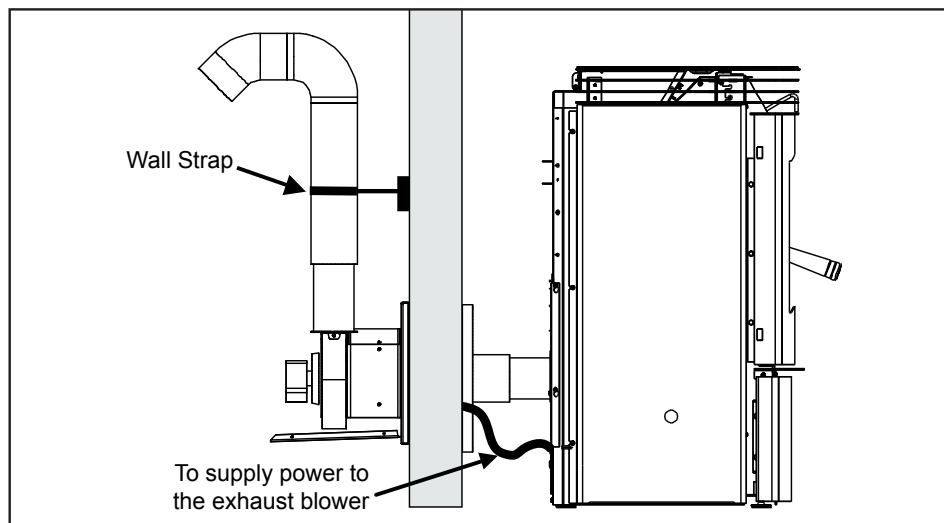


Figure 20: Through Wall Installation with Exterior Blower Kit; Side View.

Install an armour coated electrical cable from the exhaust blower housing, through the wall thimble plate and attach to the pre drilled hole in the left hand rear hopper pillar. Hook up to wires from the exhaust blower wiring harness.

All electrical connections must be in accordance to local code requirements

INSTALLATION

TYPICAL THROUGH WALL WITH EXTERIOR BLOWER KIT INSTALLATION - VERTICAL TERMINATION:

Follow the previous pages for through wall installations. Ensure that vent pipe is properly secured to wall using wall straps. Maintain clearances to combustibles on vent pipe as well as unit.

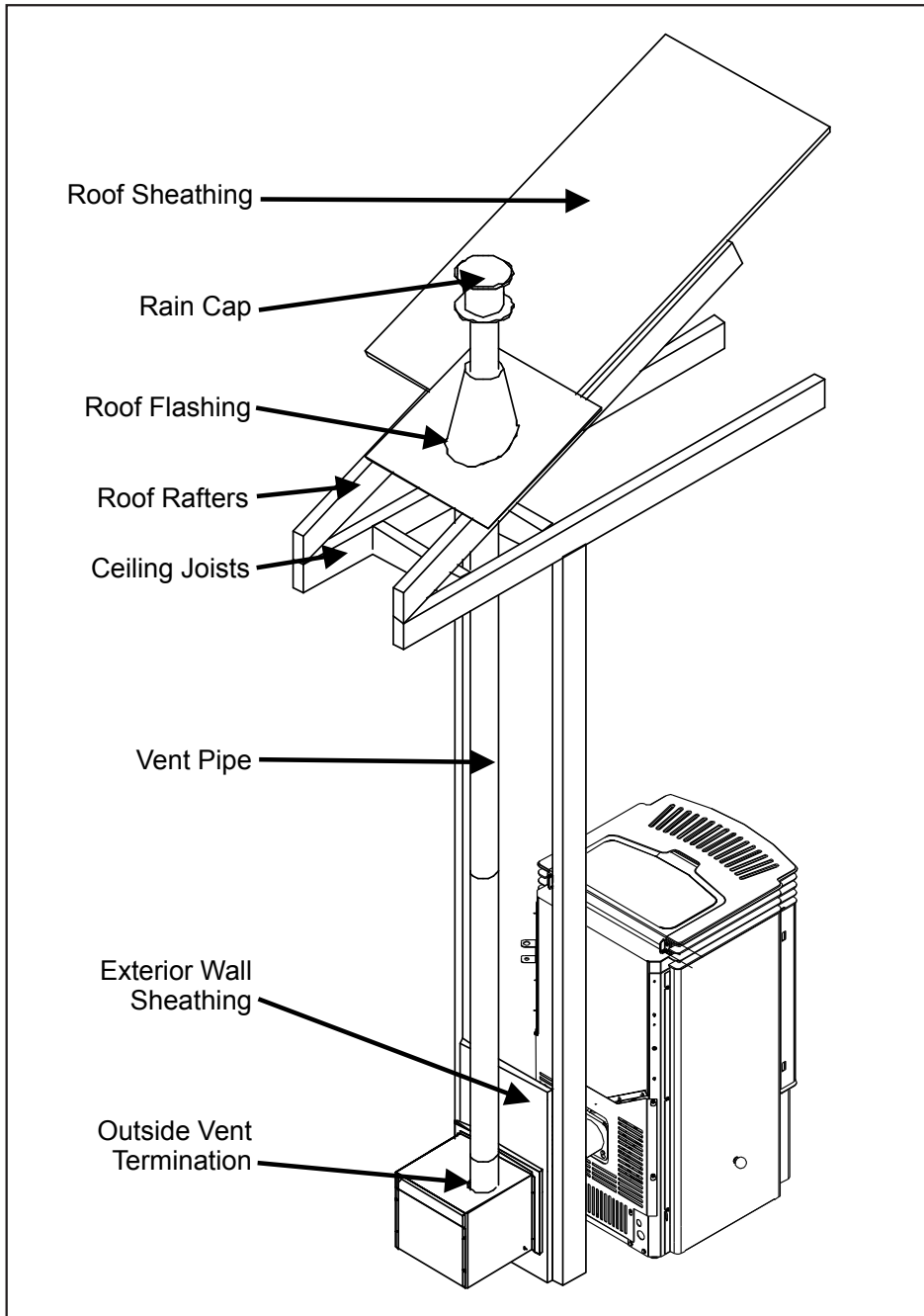


Figure 21: Through Wall Installation with Exterior Blower Kit; Vertical Termination.

INSTALLATION

THERMOSTAT INSTALLATION:

1. Install the wall thermostat (12 or 24 Volt rated) in a location that is not too close to the unit but will effectively heat the desired area.
2. Connect the Thermostat or Timer using an 2 x 18 gauge wire from the unit to the thermostat.

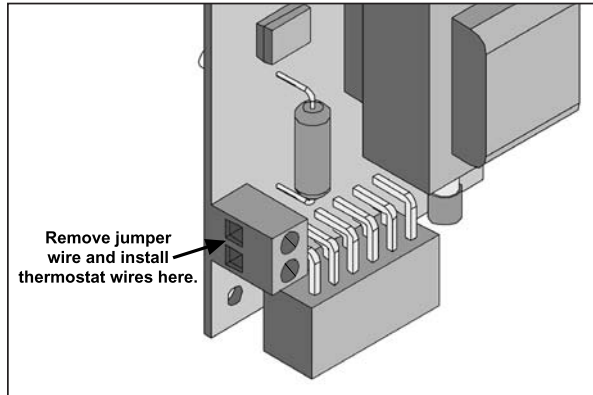


Figure 22: Thermostat wire placement.

If the unit has been placed in the HI / LOW mode, the unit will be taken to a low or idle setting when the thermostat is not calling for heat. When the thermostat calls for heat, the unit will go to the setting that is displayed on the control board Heat Indicator. If the heat in the room becomes too great, the high limit switch may turn the stove off and the switch will have to be manually reset. To reset the high limit switch, remove the right cabinet side. The switch is found behind the control panel. Avoid setting off the high limit switch.

OPTIONAL SLIDER/DAMPER INSTALLATION:

NOTE: NOT APPLICABLE FOR GERMANY AND NEW ZEALAND

If you wish to adjust the slider damper externally (NOT REQUIRED), please follow the instructions below.

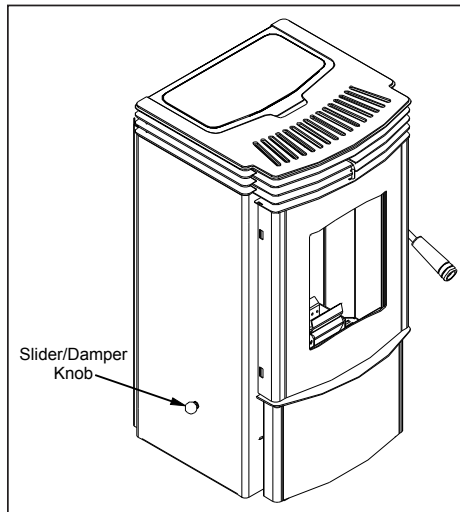


Figure 24: Slider/Damper Knob.

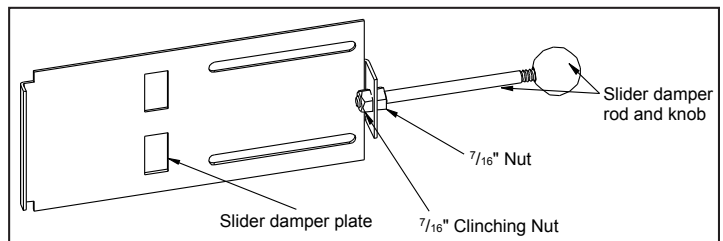


Figure 23: Slider/Damper Assembly.

1. To install the OPTIONAL slider damper rod, remove the left cabinet side and locate the slider damper plate. Install the $\frac{7}{16}$ " (11mm) inch nut onto the slider damper rod, thread all the way to the end of the threads on rod.
2. Slide rod through the hole in the slider damper plate and install the $\frac{7}{16}$ " (11mm) clinching nut onto the rod and tighten completely onto the slider damper plate.
3. Re-install the cabinet side. Install the black knob on the end of the rod. Check slider damper for smooth operation.

INSTALLATION

SLIDER/DAMPER SET-UP:

This is used to regulate the airflow through the pellet stove. The slider damper should be set by a trained technician using magnehelic.

The slider damper is located behind the left side panel. To open the left side panel, undo the one screw located in the upper front corner of the cabinet side between the louvers. Also loosen three screws down the back of the side panel.

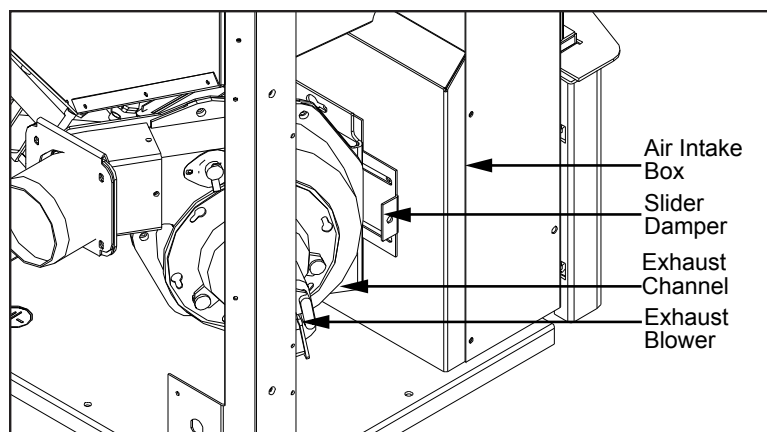


Figure 25: Slider/Damper Plate in Unit.

The combustion exhaust blower is a variable speed blower controlled by the heat output button. This blower will decrease the vacuum pressure inside the stove and as the heat output button is turned down. The vacuum pressure inside the firebox will increase as the combustion exhaust blower increases in speed (higher heat output setting).

If the fire should happen to go out and the heat output indicator has been set on the lowest setting, the Slider Damper should be pushed in slightly, decreasing the air in the firebox.

If, after long periods of burning, the fire builds up and overflows the burn pot or there is a build up of clinkers, this would be a sign that the pellet quality is poor, this requires more primary air, the slider damper must be pulled out to compensate. Pulling the slider damper out gives the fire more air.

The easiest way to make sure that an efficient flame is achieved is to understand the characteristics of the fire.

- A tall, lazy flame with dark orange tips requires more air – Open slider (pull out) slightly.
- A short, brisk flame, like a blowtorch, has too much air – Close slider (push in) slightly.
- If the flame is in the middle of these two characteristics with a bright yellow/orange, active flame with no black tips then the air is set for proper operation (see Figure 28).

SPECIAL NOTES:

Pellet quality is a major factor in how the Pellet stove will operate. If the pellets have a high moisture content or ash content the fire will be less efficient and has a higher possibility of the fire building up and creating clinkers (hard ash build-up).



Figure 26: Efficient Flame.

IMPORTANT: Taking a reading of vacuum pressure inside the firebox with a magnehelic gauge should be used to set the slider for best combustion. The slider damper should be set only on a hot stove (operating for thirty (30) minutes or more) by using a Magnahelic Pressure Gauge to measuring the pressure in the firebox. **The best settings are a reading of approximately 0.11 0.12 inches of water column (27.4 - 29.9 Pa) on the high fire setting. Some fuels may require higher or lower settings.** The reading can be taken from the 1/8" (3 mm) hole located on the front of the unit below the ash shelf.

INSTALLATION

OPTIONAL PANEL KIT:

This kit must be installed before the unit is started.

Tools Required:

- T-20 screwdriver

Kit Components:

Quantity	Description
1	Left Cab Panel
1	Right Cab Panel
1	Hopper Lid
20	#8 T-20 screws (3/8" long)
2	Hopper Bracket
2	Bushing 1/4" O.D. x 1/8" long

Please ensure that all components are supplied with this kit. If components are missing or have been damaged, contact your dealer, distributor or courier company before starting this installation.

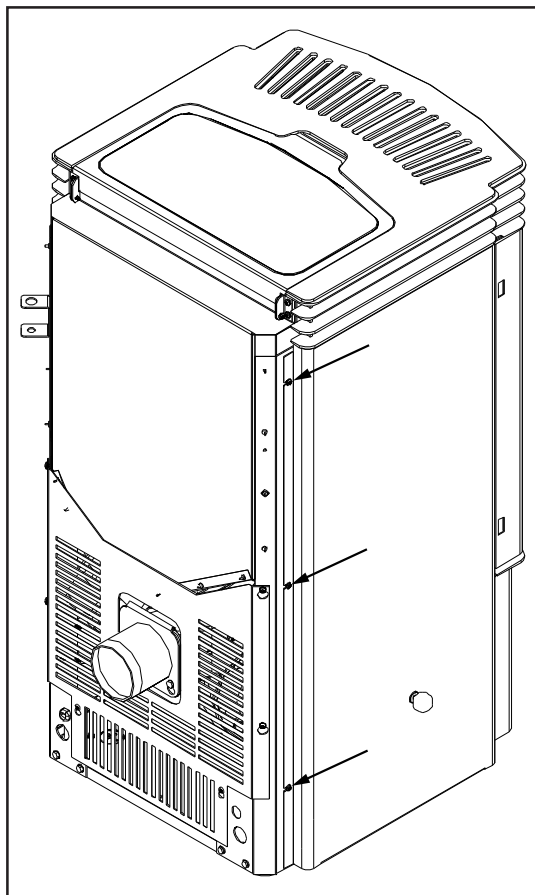


Figure 29: Screws at back of the cab side.

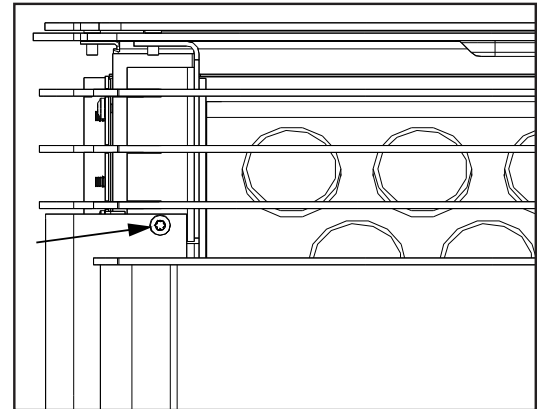


Figure 27: Screws above door top corner.

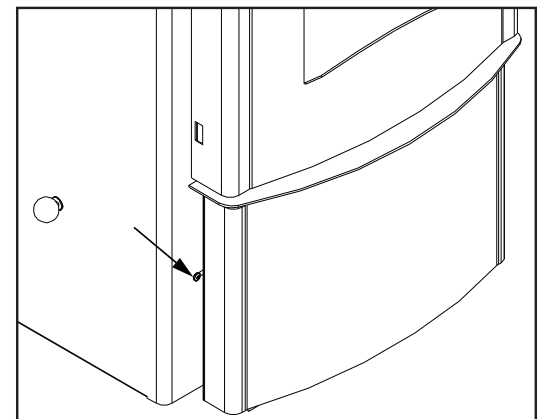


Figure 28: Screw behind ash box.

Installing the Panels:

1. Remove the screws above the door on both sides (Figure 27).
2. Ensure the screws behind the ash box, one on each side (Figure 28) and the three (3) on each side at the back (Figure 29) are loosened.
3. Slide the three (3) slots at the back of the cab panels under the three (3) screws at the back.
4. Optional for Left Side: Line up the slider rod with the hole in the cab panels, slide it through, and install the knob.
5. Slide the front of the cab panels over the screw behind the ash box.
6. Install the screw above the door and tighten all screws.

INSTALLATION

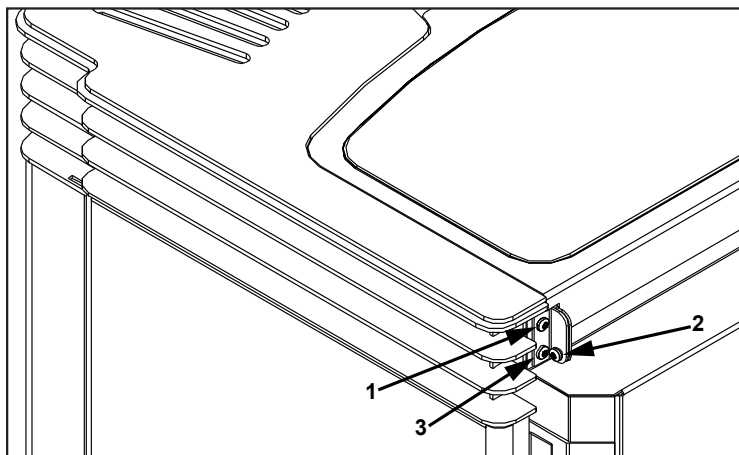


Figure 30: Installing Hopper Lid.

Installing Hopper Lid:

1. Attach the hopper brackets to the back of the unit with a screw in each top hole of the brackets (#1 in Figure 30). Do not tighten these screws until all six (6) screws are in place.
2. Lay the hopper lid in place, slide the bushing into the bracket, and attach the lid to the brackets (#2 in Figure 30). The screw must go through the bushing in the bracket then into the hopper cover.
3. Install the screw in the bottom hole on both brackets (#3 in Figure 30).
4. Let the hopper lid lay flat on the stove top then tighten the four (4) bracket screws.

OPTIONAL FAN KIT:

1. Please check your fan for damage, if it has been damaged, contact your dealer, distributor or courier company to have the fan replaced before starting this installation.
2. Remove both cab panels. Remove the screws above the door on both sides (Figure 27) and ensure the screws behind the ash box, one on each side (Figure 28) and the three (3) on each panels at the back (Figure 30) are loosened. Slide the front of the cab panels out then slide the back of the cab panels out from under the three (3) screws at the back (Figure 29). Note: The slider knob will need to be removed if installed.
3. Slide the fan into place between the bracket (see Figure 31 & 32).
4. Using a flat head screwdriver or a 1/4" (6mm) socket fasten the fan in place with two (2) screws on each side.
5. Plug the white and purple wires into the fan.
6. Close the cab panels by following the instructions in step 2 in reverse.

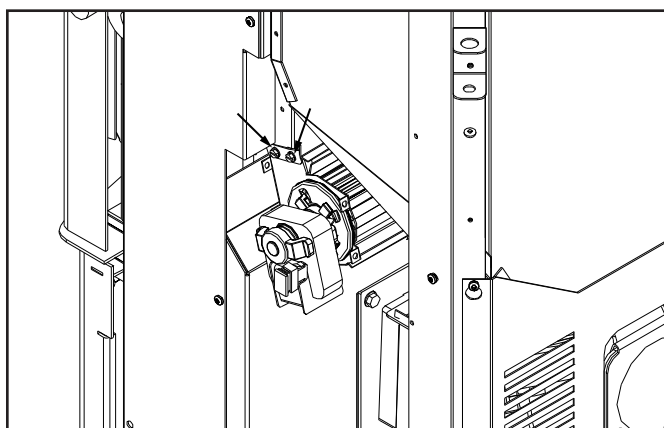


Figure 31: Behind the right cab panels.

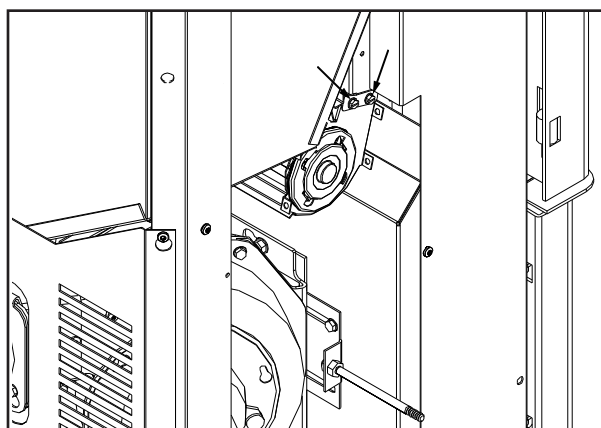


Figure 32: Behind the left cab panels.

TROUBLESHOOTING

DO NOT:

- Service the stove with wet hands. The stove is an electrical appliance, which may pose a shock hazard if handled improperly. Only qualified technicians should deal with possible internal electrical failures.
- Do not remove from the firebox any screws without penetrating oil lubrication.

WHAT TO DO IF:

1. The stove will not start.
2. The stove will not operate when hot.
3. The exhaust blower will not function normally.
4. Light # 2 on Heat output bar flashing.
5. Auger light flashes but auger motor does not turn at all
6. The 200 °F (93 °C) high limit temperature sensor has tripped.
7. The convection blower will not function normally.
8. Igniter- the pellets will not light.
9. Control settings (Heat Level) has no effect on the fire.
10. The stove keeps going out.

***NOTE: All troubleshooting procedures should be carried out by qualified technicians or installers.**

1. The stove will not start.

- ✓Make sure the stove is plugged in and the wall outlet is supplying power.
- ✓If the Control Board has been placed in the ON /OFF thermostat mode, then turn the thermostat up to call for heat.
- ✓Check the Heat Level Indicator. - If the # 2 light is flashing (see the # 2 light is flashing)
- ✓Check the fuse on the circuit board.
- ✓If the unit still does not start, contact your local service dealer for service.

2. The stove will not operate when hot.

- ✓Check the Heat Level Indicator if a fire is not detected, or if the fire has gone out **the #3 light will flash** because the Exhaust Temperature Sensor's contacts have opened.
- ✓Check the hopper for fuel.
- ✓Incorrect air damper setting. - Excessive air may consume the fire too quickly before the next drop of fuel, leaving completely unburned fuel in the burn pot liner. - Insufficient air will cause build up, further restricting the air flow through the Burn Pot Liner. This in turn will cause the fuel to burn cold and very slowly. Fuel may build up and smother the fire. In this case clean the burn pot. **(NOTE: unit may require a change to the vent system or installation of fresh air to correct Air to Fuel ratio problems).**
- ✓Combustion Blower failure. - The Combustion Blower is not turning fast enough to generate the proper vacuum in the fire box. Visual Check – is the blower motor turning.
- ✓Check the Exhaust Blower voltage across the blower wires ($\geq 220V$ on #5 setting and $\geq 150V$ on #1 setting). – Replace the Circuit Board if the Voltage reading is less than 150 V. with a line voltage $>220 V AC$.
- ✓Check Vacuum levels in the exhaust channel by bypassing the Vacuum Switch, then remove the Vacuum hose from Vacuum Switch. Check exhaust vacuum readings by placing the open end of the Vacuum Hose on a Magnahelic Gauge (readings must be above .10" W.C. on low fire).
If the motor fails to reach a 0.10" W.C. readings, then replace the Combustion Blower.

TROUBLESHOOTING

- ✓ Poor Quality Fuel – Insufficient energy in the fuel to produce enough heat to keep the stove burning or operational.
- ✓ Exhaust Temperature Sensor failure. – Bypass sensor located on Exhaust Blower if stove now operates properly, the unit may require cleaning or a new sensor. Contact your local dealer for service.
- ✓ Check the fuse on the circuit board.

3. The exhaust motor will not function normally.

- ✓ Open the left side access panel; check all connections against the wiring diagram.
- ✓ See "2. The stove will not operate when hot." section.

4. Light # 2 on Heat output bar flashing

(The Vacuum Switch contacts have opened for more than 15 sec.)

- ✓ Pinch, break or blockage in Vacuum Hose - Check hose for pinch points or damage, replace or re-route as required. Blow out Vacuum Hose
- ✓ Blocked Hose Barb on Exhaust Channel - Use a paper clip to clean out Hose Barb or remove the Vacuum Hose from the Vacuum Switch and blow into the hose to remove blockage.
- ✓ Blocked exhaust / venting system - Have stove and venting cleaned and inspected.
- ✓ Severe negative pressure in area where unit is installed - Check the operation by opening a window, does this solve the problem? If it does, install fresh air intake to unit or room. Venting system may require vertical section to move termination into a low pressure zone.
- ✓ Vacuum Switch failure - Bypass the vacuum switch, if this corrects the problem check for above problems before replacing the Vacuum Switch.
- ✓ Damage to gray wires between Circuit Board and Vacuum Switch - Inspect wires and connectors
- ✓ Combustion Blower failure - The Combustion Blower is not turning fast enough to generate the proper vacuum in the Exhaust Channel. Visual Check; is the blower motor turning? Check the Exhaust Blower voltage across the blower wires ($\geq 220V$ on #5 setting and $\geq 150V$ on #1 setting). – Replace the Circuit Board if the Voltage reading is less than 150 V. with a line voltage $>220 V AC$.
- ✓ Check Vacuum levels in the exhaust channel by bypassing the vacuum switch, then remove the Vacuum hose from Vacuum Switch. Check exhaust vacuum readings by placing the open end of the Vacuum Hose on a Magnahelic Gauge. (readings must be above .10" W.C. on low fire).

If the motor fails to reach a 0.10" W.C. readings, then replace the Combustion Blower

To reset Circuit Board after a trouble code - push the ON/OFF button

5. Auger light flashes but auger motor does not turn at all.

- ✓ If the Auger gear box does not turn but the motor's armature does try to spin then the auger is jammed.
 - Try to break apart jam by poking at the jam through the drop tube. If this fails then empty the hopper and remove the Auger Cover **Remember to re-seal the cover after installation**
- ✓ Check the fuse on the circuit board.

6. The 200 °F (93 °C) high limit temperature sensor has tripped.

- ✓ Reset sensor and determine cause – was it Convection Blower failure
- ✓ Check the fuse on the circuit board.

TROUBLESHOOTING

7. The convection blower will not function normally.

- ✓Clean all grill openings at the back and below unit .
- ✓Press the fan button; does the fan come on? Press again to verify that the blower turns on; if, not contact your local dealer for service.

8. Ignitor- the pellets will not light.

- ✓Everything else in the stove operates but the ignitor will not light the pellets.
- ✓Make sure the burn pot liner is up tight and square to the ignitor tube by pushing the burn pot back against the ignitor tube.
- ✓Check to see if the exhaust blower is operating. If not, contact your local dealer for service.
- ✓Check the fuse on the circuit board.

NOTE: The ignitor should be bright orange in color. If not replace the ignitor.

9. Control settings (Heat Level) has no effect on the fire.

- ✓NOTE: If the system light is flashing the Control Board has complete control of the unit. When the units system light becomes solid then control of the unit is given back to the operator.
- ✓If there is no control of the Heat Level button make sure the thermostat is calling for heat.
- ✓Call your local dealer for service.

10. The stove keeps going out.

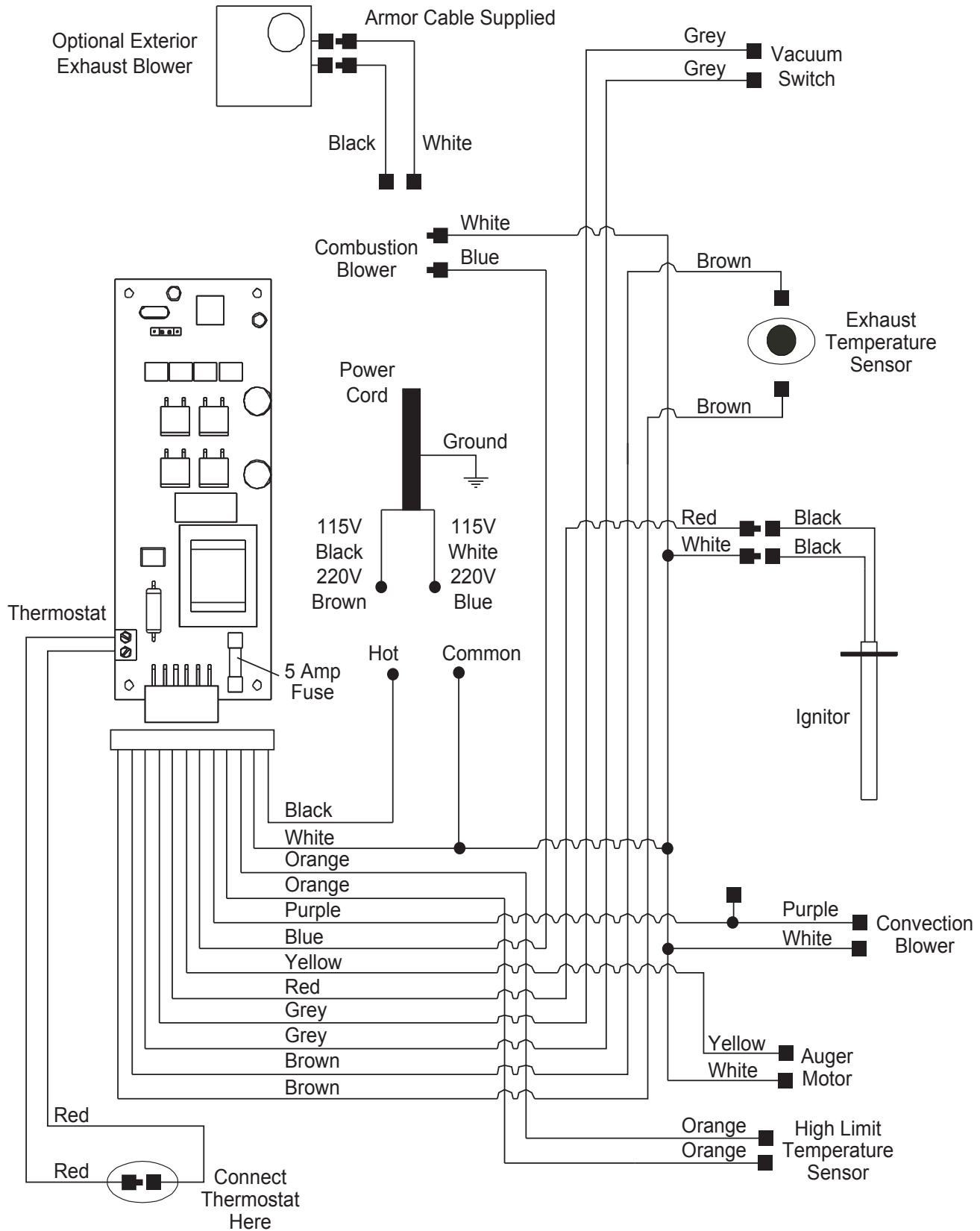
If the stove goes out and leaves fresh unburned pellets or cigarette-like ashes in the burn pot liner, the fire is going out before the stove shuts off.

- ✓Check to see that the Slider / Damper is in the correct position (set with a magnehelic gauge).
- ✓Turn the Heat Level up slightly (poor quality pellets will require slightly higher settings).
- ✓Set the auger trim till the #1 and #5 lights are illuminated.

If the stove goes out and there are partially burned pellets left in the burn pot liner, the stove has shut down due to a lack of air, exhaust temperature, or power failure.

- ✓Adjust the Slider / Damper.
- ✓Check to see if the stove needs a more complete cleaning.
- ✓Turn the Heat Level up slightly (poor quality pellets will require slightly higher settings).
- ✓Did the power go out?
- ✓Contact your local Dealer for service.

WIRING DIAGRAM



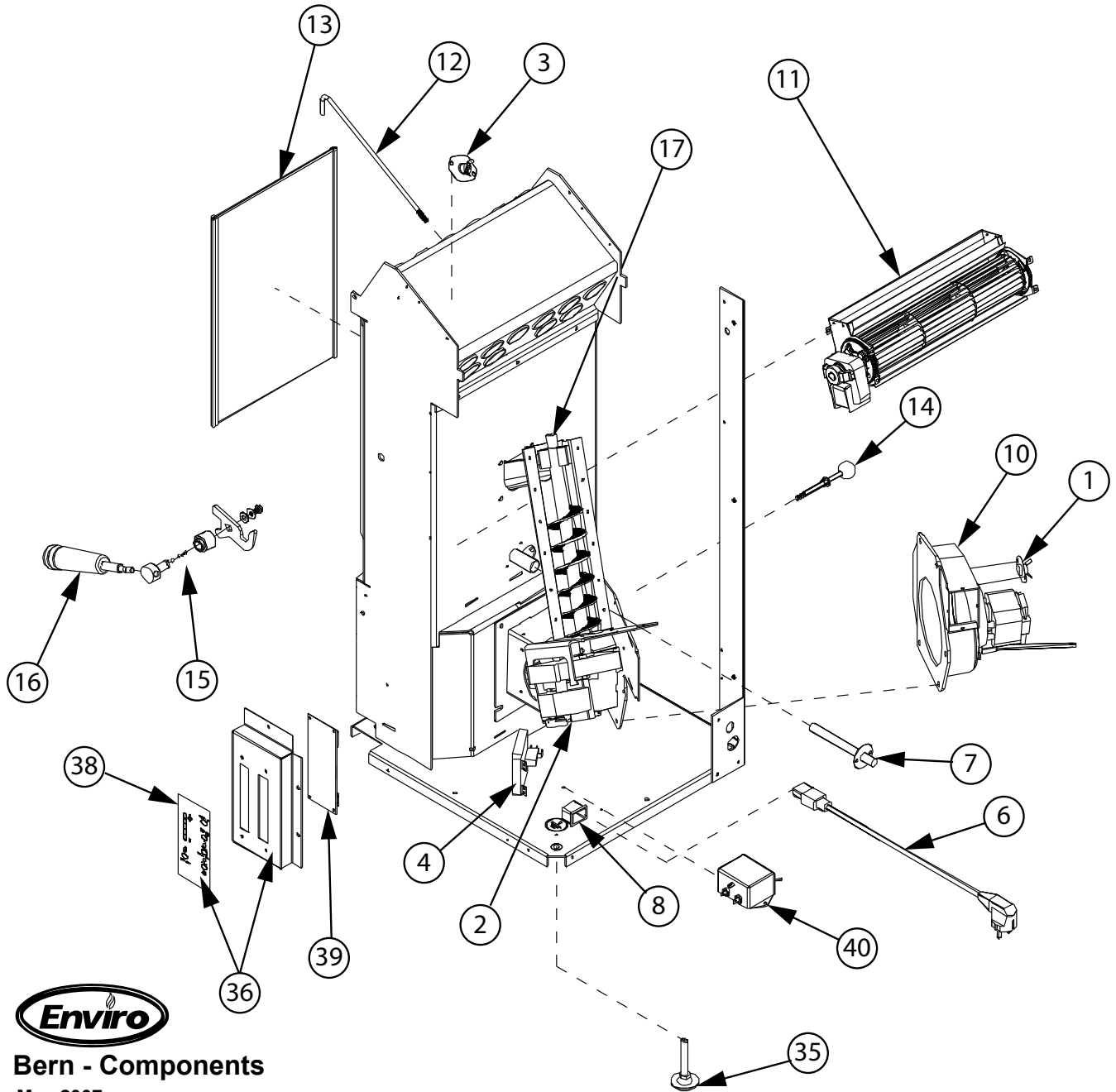
PARTS LIST

Reference #	Description	Part #
1	120°F (49°C) Ceramic Fan Temperature Sensor	EC-001
	Window Channel Tape - 1.8m (6ft)	EC-058
2	Auger Motor - 220V	EF-001-220V
3	High Limit Temp Sensor 200°F (93°C) Manual Reset	EF-016
4	Vacuum Switch - 220V	EF-017-220V
	Combustion Blower Mounting Gasket	EF-011
	Combustion Blower Housing Gasket	EF-012
	Silicone Hose	EF-018
	Aluminum Hose Barb	EF-019
	25mm (1") Knob	EF-068
	Shoulder Bolt, Hardened Bush & Nut (Set of 2)	EF-124
	Firebox Ceramic Wool Insulation	EF-126
	Pellet Stove Cleaning Brush	EF-156
	Auger Brass Bushings (Set of 2)	EF4i-065
5	Door Hinge Bracket	EF5-135
6	NZ Power Cord - 220V	20-011
6	IEC Power Cord - 220V	20-013
	Hardened Bushing	20-020
	16mm (5/8") Door Gasket - 2.1m (7ft)	50-088
7	400 Watt Ignitor - 220V	50-646
7	Ignitor Tube	50-1408
8	IEC Power Cord Inlet Socket	50-713
	Circuit Board 5 Amp Fuse - 220V (Pair)	50-834
9	Exhaust Starter Tube 80mm x 2.5" Long	50-898
10	Exhaust Blower Assembly - 220V	50-900
	5/8" ID Auger Collar with Screw	50-968
11	Fan Kit	50-1086
12	Heat Exchanger Rod	50-1154
13	Glass with Gasket (356mm x 244mm)	50-1155
14	Slider Damper Rod & Knob	50-1156
	Wire Harness	50-1157
15	Latch Assembly	50-1158
16	Door Handle	50-1159
17	Auger with Paddles	50-1161

PARTS LIST

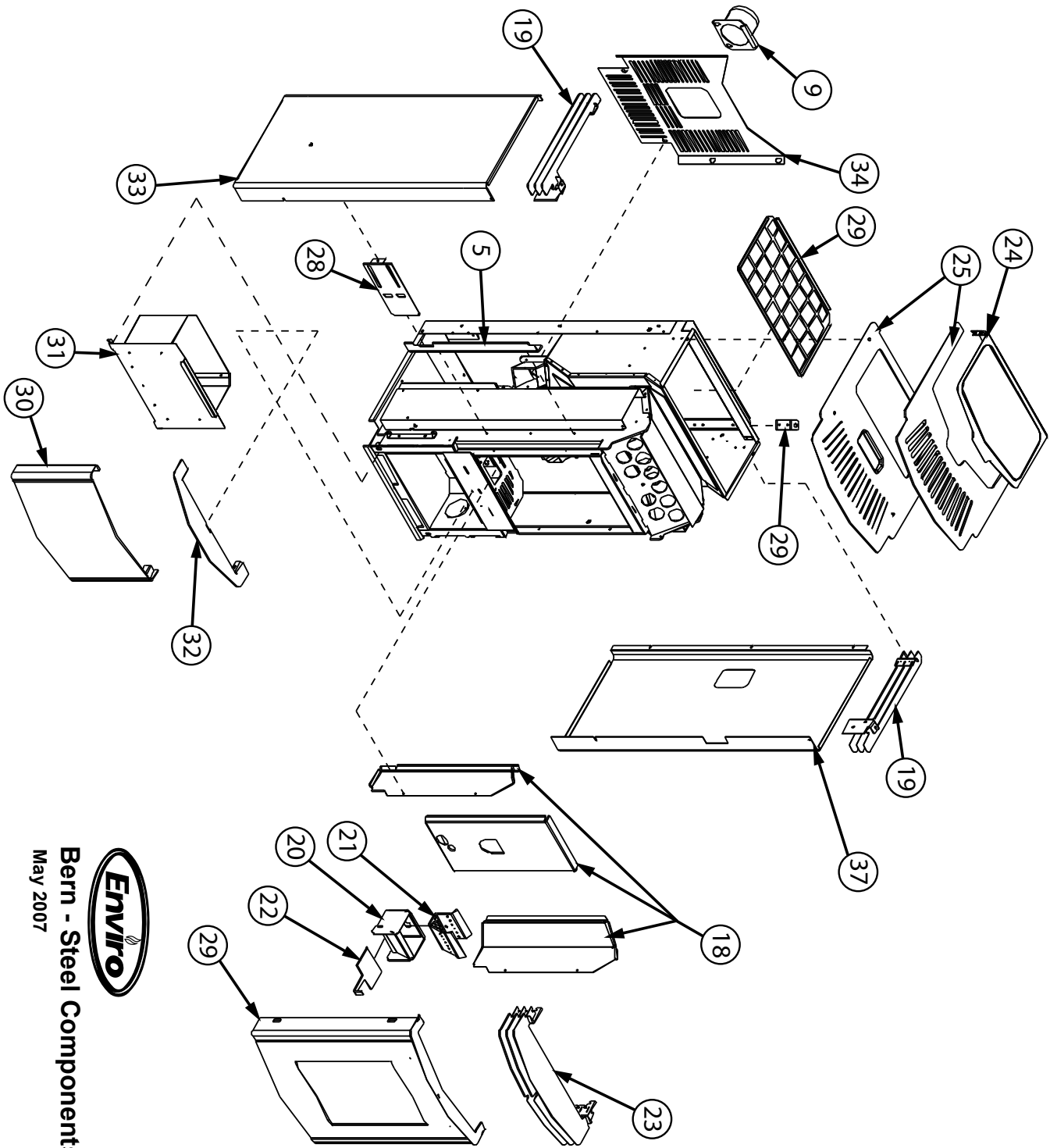
Reference #	Description	Part #
18	Brick Panel Set with Insulation	50-1162
19	Side Louver - Left or Right	50-1163
20	Burn Pot	50-1166
21	Burn Pot Liner	50-1167
22	Burn Pot Bottom	50-1168
23	Front Louvers	50-1169
24	Lid Set	50-1171
25	Stove Top Assembly	50-1172
26	Hopper Guard	50-1174
27	Handle Bracket	50-1177
28	Draft Slider	50-1178
29	Door Assembly Complete	50-1179
30	Ash Pan Cover	50-1180
31	Ash Pan	50-1181
32	Ash Shelf Louver	50-1182
33	Cabinet Side Left - Painted	50-1183
33	Cabinet Side Left - SS	50-1486
	Hearth Pad	50-1219
	Burner Scraper Tool	50-1254
34	Back Grill	50-1297
35	Leveling Legs (Set of 4)	50-1342
	Auger Tube Cover	50-1407
	Exhaust Starter Tube Gasket	50-1448
36	Control Panel and Decal	50-1478
37	Cabinet Side Right - Painted	50-1479
37	Cabinet Side Right - SS	50-1480
38	Control Panel Decal	50-1482
	Backdraft Flap Gasket	50-1520
39	Circuit Board with Thermostat Switch 2sec On Time 230V	50-1521
	Gloves	50-1525
	Ignitor Mounting Bracket	50-1542
	Bern International Owner's Manual	50-1575
	Bern International Technical Manual	50-1576
40	EMI Filter	50-1584

PARTS DIAGRAM - COMPONENTS



Bern - Components
May 2007

PARTS DIAGRAM - STEEL



Bern - Steel Components
May 2007

INSTALLATION DATA SHEET

The following information must be recorded by the installer for warranty purposes and future reference.

NAME OF OWNER: _____
ADDRESS: _____ _____ _____
PHONE: _____

NAME OF DEALER: _____
ADDRESS: _____ _____ _____
PHONE: _____

MODEL: _____
SERIAL NUMBER: _____
DATE OF PURCHASE: _____ (dd/mm/yyyy)
DATE OF INSTALLATION: _____ (dd/mm/yyyy)
MAGNEHELIC AT INSTALL: _____
INSTALLER'S SIGNATURE: _____

NAME OF INSTALLER: _____
ADDRESS: _____ _____ _____
PHONE: _____

WARRANTY: If you have any concerns with your unit please contact the dealer where you purchased the stove.

MANUFACTURED BY:
SHERWOOD INDUSTRIES LTD.
6782 OLDFIELD RD. SAANICHTON, BC, CANADA V8M 2A3
www.enviro.com
September 10, 2007
C-11439