

EngA®

ENGINEERED AIR®

**INSTALLATION, OPERATION
AND MAINTENANCE MANUAL
FOR
Power Venters**

**ENGINEERED AIR INDIRECT GAS FIRED HEATING UNITS
INDOOR MODELS ONLY**



UNIT MODEL NO. _____
UNIT SERIAL NO. _____
SERVICED BY: _____
TEL. NO: _____

**CANADIAN
HEAD OFFICE
AND FACTORY**

1401 HASTINGS CRES. SE
CALGARY, ALBERTA
T2G 4C8
Ph: (403) 287-4774
Fx: 888-364-2727

**USA
HEAD OFFICE
AND FACTORY**

32050 W. 83rd STREET
DESOTO, KANSAS
66018
Ph: (913) 583-3181
Fx: (913) 583-1406

**CANADIAN
EASTERN FACTORY**

1175 TWINNEY DRIVE
NEWMARKET, ONTARIO
L3Y 5V7
Ph: (905) 898-1114
Fx: (905) 898-7244

SALES OFFICES ACROSS CANADA AND USA

Retain instructions with unit and maintain in a legible condition.
Please give model number and serial number when contacting
factory for information and/or parts.

www.engineeredair.com

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WARNING

These instructions are intended as an aid to qualified, licensed installers and service personnel for proper installation, adjustment and operation of this unit. Read and understand these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, carbon monoxide poisoning, explosion, personal injury or property damage.

YOU HAVE RESPONSIBILITIES TOO


This installation, operation and maintenance manual cannot cover every possibility, situation or eventuality. Regular service, cleaning and maintaining the equipment is necessary. If you are not capable of performing these tasks, hire a qualified service specialist. **Failure to perform these duties can cause property damage and/or harm to the building occupants and will void the manufacturers' warranty.**



INTRODUCTION

Engineered Air units are high quality products designed and manufactured to provide many years of trouble-free operation. We recommend that this manual be read thoroughly to ensure proper installation, efficient operation and proper maintenance of this equipment. The submittal record is considered to be part of the Installation, Operation and Maintenance Manual. Please report any omissions to the national service manager.

SAFETY PRECAUTIONS

Read, understand and follow the complete manual before beginning the installation, including all safety precautions and warnings.

	Warning: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.
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	Warning: This unit is connected to high voltages. Electrical shock or death could occur if instructions are not followed. This equipment contains moving parts that can start unexpectedly. Injury or death could occur if instructions are not followed. All work should be performed by a qualified technician. Always disconnect and lock out power before servicing. DO NOT bypass any interlock or safety switches under any circumstances.
	

WARRANTY

LIMITED WARRANTY ENGINEERED AIR will furnish without charge, F.O.B. factory, freight collect, replacement parts for, or repairs to products covered herein which prove defective in material or workmanship under normal and proper use for a period of twelve (12) months from the initial start-up or eighteen (18) months from the date of shipment, whichever expires sooner, provided the customer gives ENGINEERED AIR written notice of such defects within such time periods and provided that inspection by ENGINEERED AIR establishes the validity of the claim and all pertinent invoices have been paid in full. The repairs or replacements will be made only when the complete product(s) or part(s) claimed to be defective are returned to ENGINEERED AIR or a depot designated by ENGINEERED AIR, transportation charges prepaid. Repairs or replacements as provided for by this paragraph shall constitute fulfillment of all ENGINEERED AIR's obligations with respect to this warranty. The refrigerant charge is not included in any part of this warranty. This warranty does not apply to any products or parts thereof that have been subject to accident, misuse or unauthorized alterations, or where ENGINEERED AIR's installation and service requirements have not been met.

The foregoing warranty is in lieu of all other warranties, express or implied. ENGINEERED AIR specifically disclaims any implied warranty of merchantability and/or fitness for purpose. Under no circumstances shall ENGINEERED AIR be liable to, nor be required to indemnify, Buyer or any third parties for any claims, losses, labour, expenses or damages (including special, indirect, incidental, or consequential damages) of any kind, resulting from the performance (or lack thereof) of this Agreement or the use of, or inability to use the goods sold hereunder, including, but not limited to, damages for delay, temporary heating/cooling costs, loss of goodwill, loss of profits or loss of use. Furthermore, the parties agree that the Buyer's sole remedy under this Agreement shall be limited to the limited warranty set forth in the preceding paragraph relating to the repair or replacement of any defective goods. Under no circumstances shall any claim or award against ENGINEERED AIR exceed the original contract price whether awarded through arbitration, litigation or otherwise.

ENGINEERED AIR Warranty is void if:

1. The unit is not installed in accordance with this manual.
2. The start-up and operation of the unit is not performed in accordance with this manual.
3. The unit is operated in an atmosphere containing corrosive substances.
4. The unit is allowed to operate during building construction.
5. The unit is allowed to operate in atmospheres where chlorine or chlorine compounds are present or which contain any contaminant (silicone, aluminum oxide etc.) that adheres to the spark ignition flame sensing probe.

PARTS

Contact the nearest Engineered Air sales office or factory. Be sure to include Model Number, Serial Number, date of installation and nature of failure along with the description of the parts required. Some parts may not be stocked items that must be made or ordered.

DESCRIPTION

Power Venters are designed to side wall vent Natural and LP Gas heaters or assist vertical discharge installations with where the length of horizontal vent is greater the vertical. The Venter features a safety system consisting of the Venter Proving Switch. This device monitors the Venter's performance and will interrupt the main burner if a venting malfunction is detected. After each burner cycle the Power Venter will continue to operate in post-purge mode to purge the heater or humidifier and to remove residual flue gases.

All Power Venter selection and sizing must be performed by Engineered Air. Engineered Air Power Venters shall only be used with Engineered Air heaters.

INSTALLATION RESTRICTIONS

1. The Power Venter may only be installed on Natural Gas or LP Gas heaters.
2. The Power Venter as described in this Installation Operation and Maintenance Manual is only suitable for Engineered Air appliances.
3. For Category I appliances the Power Venter shall only be installed on a heater or humidifier equipped with a barometric draft control or an Engineered Air draft hood.
4. For Category II appliances the Power Venter shall only be installed on a heater or humidifier equipped with a barometric draft control, an Engineered Air draft hood or with and Engineered Air modulating venter control.
5. The Power Venter must be mounted so that the shaft of the motor remains horizontal to prevent motor bearing wear.
6. The Venter Proving Switch must be mounted with its diaphragm in a vertical position. Do not mount the Venter Proving Switch on a heat source that exceeds 140°F (60°C). Examples of improper mounting surfaces include vent pipe, venter, top of heater or humidifier casing or any place where radiant or convective heat would exceed 140°F (60°C).
7. Ambient temperature surrounding Power Venter must not exceed 104°F (40°C). The minimum ambient temperature is 50°F (10°C).

Caution:

All wiring, piping and fuel line installation must be completed by qualified persons in accordance with all federal, state, provincial and/or local codes.

Note: Installation shall be in accordance with this manual and all other associated component and control Installation, Operation and Maintenance Manuals.

CODESIn Canada:

The installation of this unit shall be in accordance with the latest edition of the Canadian Electrical Code, Part 1 – C.S.A. Standard C22.1, Provincial and Local Codes, and in accordance with the local authorities having jurisdiction.

1. This unit shall be electrically grounded in accordance with the latest edition of the Canadian Electrical Code, Part 1 – C.S.A. Standard C22.1, Provincial and Local Codes, and in accordance with the local authorities having jurisdiction.
2. The installation of this unit shall be in accordance with the latest edition of the Canadian Natural Gas and Propane Installation Code, C.S.A. Standard B149.1, Provincial and Local Codes, and in accordance with the local authorities having jurisdiction.
3. In accordance with local authorities having jurisdiction or CSA. Standard B149.1 a readily accessible approved manual shut-off valve shall be installed in either the drop or riser as close as possible to the valve train (gas manifold).
4. The installation of this unit shall be in accordance with the latest edition of the National Plumbing Code of Canada, Provincial and Local Codes, and in accordance with the local authorities having jurisdiction.

The installation of this unit shall be in accordance with all other National, Provincial and Local Codes, and in accordance with the local authorities having jurisdiction.

5. In USA:
6. The installation of this unit shall be in accordance with the latest edition of the National Electrical Code (ANSI/NFPA 70), State and Local Codes and in accordance with the local authorities having jurisdiction.
7. This unit shall be electrically grounded in accordance with the latest edition of the National Electrical Code (ANSI/NFPA 70), State and Local Codes and in accordance with the local authorities having jurisdiction.
8. If the unit has not been provided with an electric disconnect switch, one of adequate ampacity shall be installed in accordance with Article 430 of the National Electrical Code (ANSI/NFPA 70).

9. The installation of this unit shall be in accordance with the latest edition of the National Fuel Gas Code ANSI/Z223.1/NFPA 54, State and Local Codes and in accordance with the local authorities having jurisdiction.
10. The installation of this unit shall be in accordance with the latest edition of the National Standard Plumbing Code (NSPC), State and Local Codes and in accordance with the local authorities having jurisdiction.
11. The installation of this unit shall be in accordance with all other National, State and Local Codes, and in accordance with the local authorities having jurisdiction.

SPECIFIC CODE REQUIREMENTS

Terminate the vent system so that proper minimum clearances are maintained as cited in the latest edition Canadian Natural Gas and Propane Installation Code, C.S.A. Standard B149.1, Provincial and Local Codes or the National Fuel Gas Code ANSI/Z223.1/NFPA 54, State and Local Codes and in accordance with the local authorities having jurisdiction or as follows:

- Not be less than 7 feet (2100 mm) above grade when located adjacent to public walk ways.
- At least 3 feet (900 mm) above any forced air inlet located within 10 feet (3000 mm).
- At least 4 feet (1200 mm) below, 4 feet (1200 mm) horizontally from or 1 foot (300 mm) above any window or gravity air inlet into any building.
- Do not mount above a door.
- At least 1 foot (300 mm) above grade.
- So that the flue gases are not directed so as to jeopardize people, overheat combustible structures or enter buildings, and
- Not less than 2 feet (600 mm) from an adjacent building.

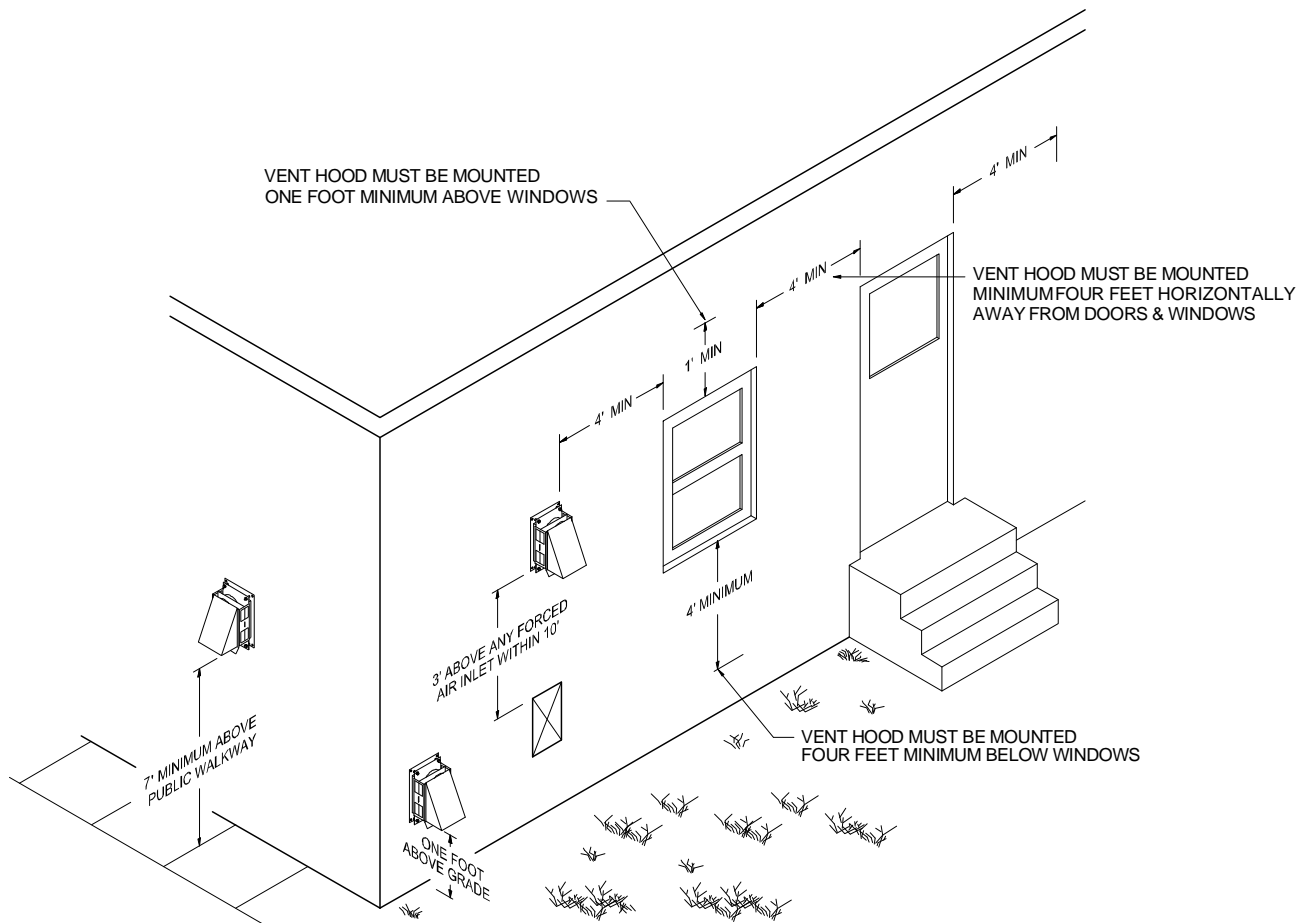
VERTICAL VENT TERMINATION

An approved vent cap (eg. Breidert), furnished by the customer, must be installed at the termination point of the vertical vent system. 'B' Vent is acceptable

VENT HOOD LOCATION

If possible, locate the Vent Hood on a wall that does not face the direction of prevailing winds. This will diminish the possibility of heater or humidifier interruption during periods of extreme winds.

Locate the Vent Hood no closer than 3 feet (900 mm) from an inside corner of an L-shaped structure.



INSTALLATION

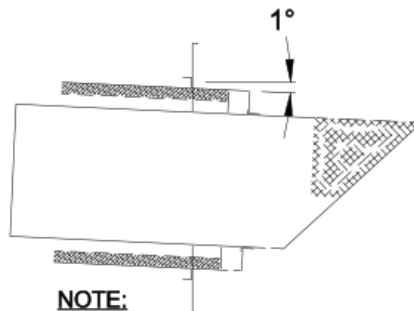
**Warning:**

The Power Venter must be installed by a qualified installer in accordance with these instructions. Improper installation can create a hazardous condition such as an explosion, fire, electrical shock or carbon monoxide poisoning resulting in property damage, personal injury or death.

**Warning:**

Failure to install, maintain and/or operate the Power Venter in accordance with manufacturer's instructions may result in conditions which can produce bodily injury and property damage.

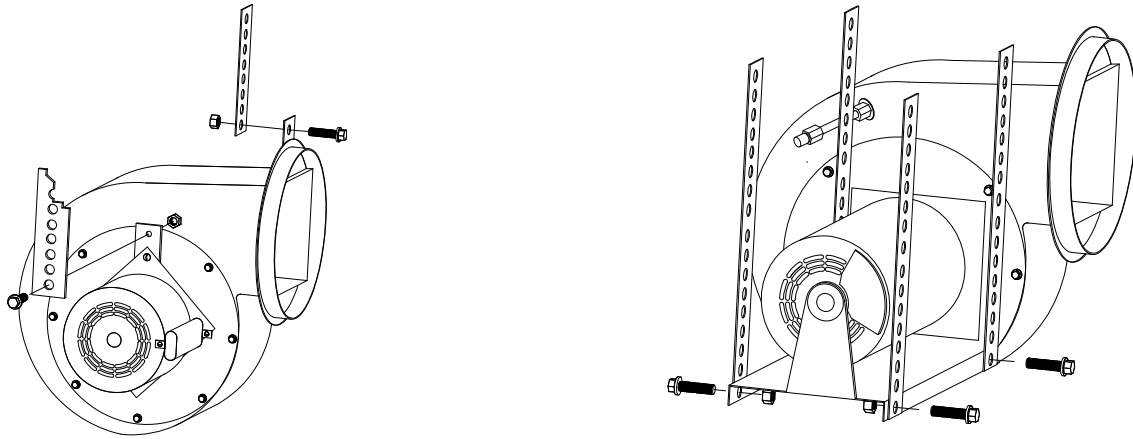
1. The Power Venter Proving Switch must be wired as per the field wiring diagram provided.
2. Install the venting system so that the code required clearances are maintained.
3. To prevent personal injury and equipment damage, disconnect power supply when working on Power Venter.
4. Install the power wiring and interlock wiring as per the field wiring diagram provided.
5. Normally the power supply for the Power Venter is wired to the Engineered Air heater. If this is not the case make certain the power supply is adequate for the Power Venter motor requirements. Do not add the Power Venter to a circuit where the total load is unknown.
6. Plan the vent system layout so that the Power Venter is as close to the point of termination as possible. "B" vent between the Power Venter and Vent Hood may be acceptable. All vent pipe connections after the Power Venter discharge will be under positive pressure during operation and must be sealed. Subject to the approval of the authority having jurisdiction, high-temperature caulk or high temperature aluminum vent pipe tape may be used to prevent flue gas leakage into the structure.

**NOTE:**

FLUE ASSEMBLY TILTED APPROXIMATELY 1° AGAINST WALL MTG PLATE

POWER VENTER MOUNTING

The Venter may be firmly mounted in any position as long as the shaft of the motor remains horizontal. The Venter housing is single wall and 12 inches (300 mm) must be maintained from all combustibile materials. The Venter shall be firmly mounted as close as possible to the point of termination. All joints downstream of the Power Venter fan must be sealed with high temperature sealant rated for 500°F minimum.



Typical small power venter installation.

VENT PIPE INSTALLATION

When installing the Power Venter a barometric draft control or the Engineered Air draft hood provided shall be installed. If used, the barometric draft control must be installed as close as possible to the heater. If used, the Engineered Air draft hood must be installed on the heater. After the barometric draft control or the Engineered Air draft hood, a tapered reducer should be installed to reduce the flue to the size as selected by Engineered Air. After the tapered reducer, install “B” vent to the inlet of the Power Venter.

The Power Venter inlet and outlet are designed to only accept single wall vent pipe. The installer must supply adapters to connect to the Power Venter for other vent types. The Power Venter shall be mounted at the point of termination. Subject to approval of the authority having jurisdiction it may be acceptable to install vent pipe between the outlet of the Power Venter and the point of termination. The installer must use a venting system suitable for pressure or seal all vent pipe connections after the Power Venter with high-temperature caulk or aluminum vent pipe tape to prevent flue gas leakage during operation. The size of the vent pipe between the Power Venter and point of termination shall be the size as selected by Engineered Air. Support the vent pipe as recommended by the vent pipe manufacturer.

Caution:



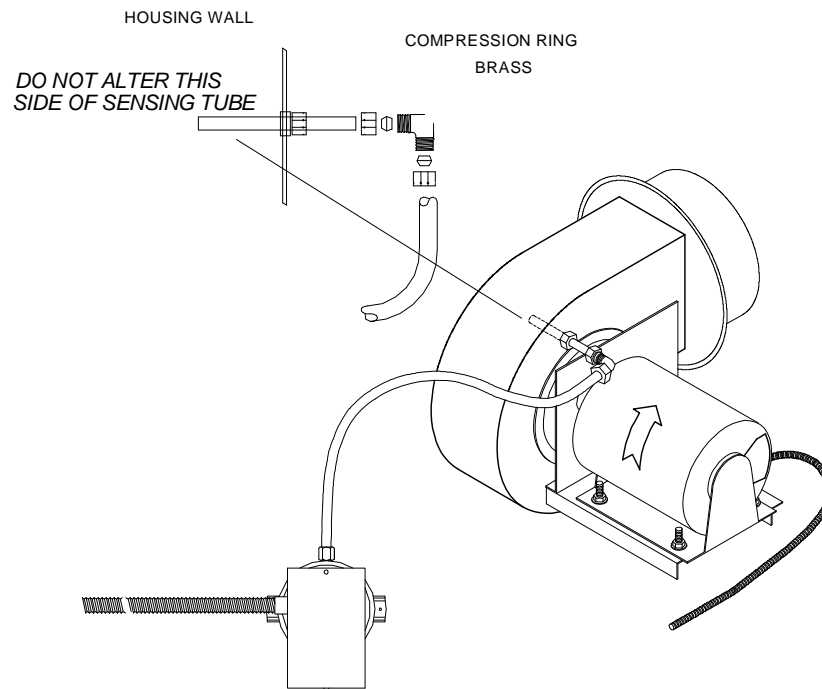
Elbows placed directly after discharge on Power Venter may cause erratic operation of Venter Proving Switch. If elbows are necessary on discharge, allow for a straight section of pipe 3 times the vent diameter being used before installing an elbow.

IMPORTANT: The Venter Proving Switch must be mounted so the diaphragm is in a vertical position.

1. Mount the Venter Proving Switch onto a stable, non-vibrating location, in the vertical position. Do not mount the Venter Proving Switch onto a heat source that could exceed 140°F (60°C). Examples of improper mounting surfaces include vent pipe, venter, top of heater or humidifier casing or any place where radiant or convective heat would exceed 140°F (60°C).
2. Connect the flexible tubing from the Venter Proving Switch to the Power Venter housing. The factory calibrated sensing tube length and compression fittings are critical for proper operation of the Venter Proving Switch. If it is necessary to alter the sensing tube length, **ONLY** trim sensing tube portion that is on the exterior of the housing.

IMPORTANT: DO NOT trim the sensing tube portion that will be mounted in the interior of the housing because Venter Proving Switch will not sense the proper pressure. Sensing tube assembly with factory calibrated length must be used for Venter Proving Switch to work properly.

DO NOT SUBSTITUTE SENSING TUBE MATERIALS



WIRING

Warning:

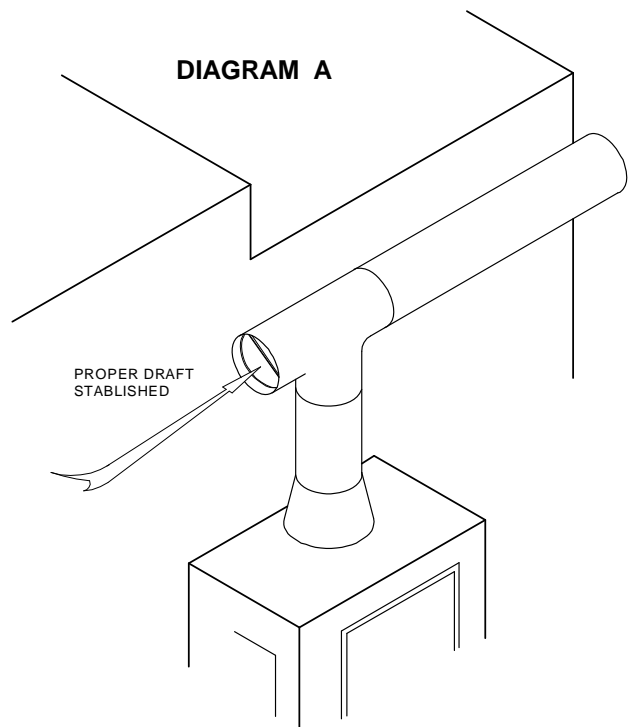
All wiring from the Venter to the unit shall be as shown on the wiring diagrams provided and shall be in accordance with the latest edition of the Canadian Electrical Code, Part 1 – C.S.A. Standard C22.1, Provincial and Local Codes or the latest edition of the National Electrical Code (ANSI/NFPA 70), State and Local Codes and in accordance with the local authorities having jurisdiction.

DRAFT ADJUSTMENT AND COMBUSTION AIR SET-UP

Caution:

The Power Venter Proving Switch is designed to disable the heat upon Power Venter failure only!

1. Close all doors and windows of the building. If the heater or humidifier is installed in a utility room or closet, close the entrance door to this room.
2. Turn on all exhaust and ventilation fans to maximum speeds.
3. Following the function, place the unit in operation, set the control for continuous operation.
4. Verify that Power Venter operates prior to burner ignition. Watch to make sure burner the lights.
5. Disconnect the Proving Switch tubing. Make sure the burner shuts off.
6. After allowing the unit to operate for 15 minutes, verify that the recommended draft is present. As an additional check, a smoke stick can be held adjacent to the barometric draft control or draft hood to verify smoke is being drawn into, and not rolling out of edge of the relief opening.
7. Next, turn on all other fuel-burning appliances within the same room so they will operate at their full input. Repeat Step 3 above, confirming the draft on each appliance.

**Warning:**

If exhaust gases are escaping from the barometric draft control or Engineered Air draft hood, the equipment must not be operated until proper adjustments or repairs are made to provide adequate draft levels.

COMBUSTION AIR

Adequate combustion air is vital for proper combustion, safe venting and for proper Power Venter performance. Many installers assume adequate combustion air is present, especially in older buildings. In some cases this is a false assumption, because many older buildings have been weatherized. Size the combustion air opening(s) as outlined in local or national codes. When installing a Power Venter it is not necessary to supply any more combustion air than normally required when using conventional venting. Common symptoms of inadequate combustion air include: Venter Proving Switch short cycling, odor present at end of burner cycle, outside air enters the structure through the Power Venter during off cycle.

MAINTENANCE

1. For fractional HP motors, oil every six months with 2 drops of S.A.E #20. The oil ports are located at both ends of the motor. For larger HP motors refer to the motor manufacturer for lubrication recommendations. Recommended motor lubrication operating less than 12 hours per day is every 5 years; motors operating greater than 12 hours per day should be lubricated every 2 years. On motors having grease drain plugs, remove the plugs and operate the motor for 15 minutes before replacing plugs. **DO NOT OVER GREASE.**
2. Semi-annually inspect the Vent Hood and vent pipe for blockage, corrosion and leaks.
3. A vent system inspection must be performed annually by qualified service personnel. The inspection should include an operational check, safety interlock test, combustion air test and a visual inspection of the complete vent system for corrosion, blockage or leaks. Any corrosion, blockage or leaks detected must be repaired or replaced immediately.