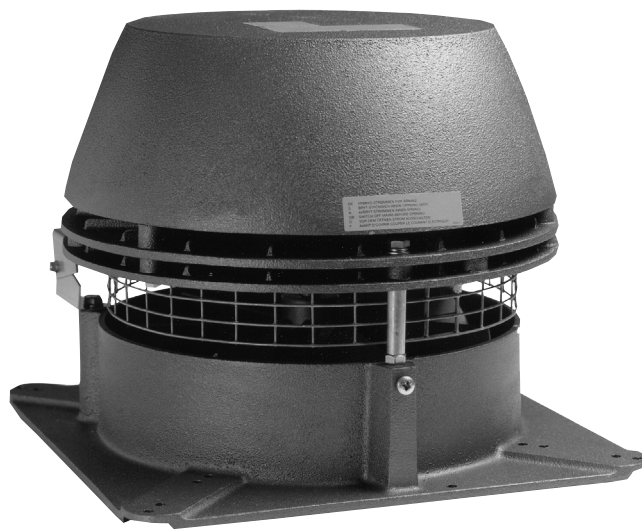




USA

CAN



RS Chimney Fan **For Gas & Oil Applications**

EXHAUSTO



Installation and adjustment instructions for **EXHAUSTO** Chimney Fan Type **RS**

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1. Introduction

1.1 System Design

EXHAUSTO model RS Chimney Fan is a chimney top mounted ventilator that is designed to provide large flue gas volume capacities. It is designed and intended for use with oil/gas fired central space heating systems, for volume water heating or for combination space heating/volume water heating.

This product is developed to prevent draft problems from occurring by creating a mechanical draft in venting systems and thereby also increasing the capacity and efficiency of a venting system.

The use of the EXHAUSTO Chimney Fan is not restricted to any type of chimney, because the fan creates a negative pressure (below atmospheric) in the chimney.

1.2 Code Compliance and Listings

Installations must conform to requirements of the authority having jurisdiction. Where required by the authority having jurisdiction, the installation must also conform to the Standard for Draft Equipment.

All electrical wiring must be in accordance with the requirements of authority having jurisdiction or, in absence of such requirements, with the National Electrical Code.

The EXHAUSTO Chimney Fan, Model RS, is tested by the ETL Testing Laboratories and is labeled and listed for use with non-solid fuel applications.

Caution: The chimney fan must be interlocked with the connected appliance(s) to insure proper combustion and to avoid flue gas spillage.

1.3 Warranty Information

Conditions available from EXHAUSTO, Inc.

1.4 Package Shipment

The packing list (attached to one of the packages) clearly lists all items in the shipment and each package has a label showing the contents. Check the list against all materials on the job site for completeness.

Symbol Legend:

The following terms are used throughout this manual to bring attention to the presence of potential hazards or to important information concerning the product.



Danger: Indicates an imminently hazardous situation which, if not avoided, will result in death, serious injury or substantial property damage.



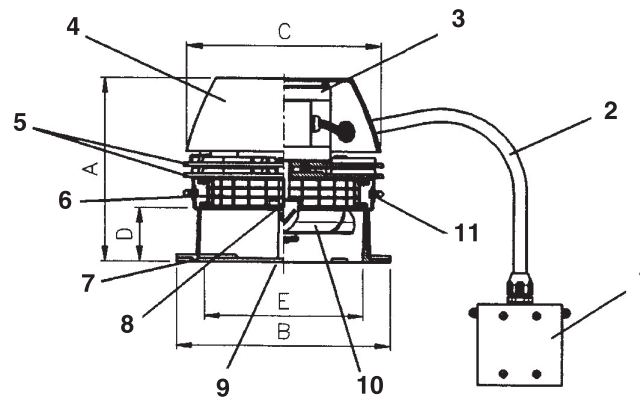
Caution: Indicates an imminently hazardous situation which, if not avoided, may result in personal injury or property damage.

Warning: Indicates an imminently hazardous situation which, if not avoided, will result in death, serious injury or substantial property damage.

Notice: Used to notify of special instructions on installation, operation or maintenance which are important to equipment but not related to personal injury hazards.

1.5 Dimensional Data

Fan Size	RS 9	RS 12	RS 14	RS 16
A	10	11	13	16
B	12	14	16	19
C	11 2/5	14	15 4/5	18
D	3	3 3/5	4	4
E	8 1/2	11 1/8	12 3/4	14 3/4
Weight (lbs)	28	36	46	60
Elec. Character	120/1/60			
Amps	0.4	1.2	1.4	3.9
Watts	20	80	100	250
RPM	1600			
Max. CFM	450	950	1400	2000



- | | | | |
|---|----------------|----|-------------|
| 1 | Junction Box | 7 | Base Plate |
| 2 | Conduit/cord | 8 | Locking Nut |
| 3 | Motor | 9 | Inlet |
| 4 | Motor Housing | 10 | Axial Vane |
| 5 | Cooling Plates | 11 | Hinges |
| 6 | Bird Screen | | |

1.6 Planning Ahead

Important to note:

1. Observe proper combustion air requirements.
2. Provide a firm support system for the chimney fan.
3. Determine the type of system involved.
4. Observe proper safety measures are taken to assure system will shut down in case of insufficient draft in vent system.

Combustion Air Requirements: Provisions for combustion air must be in accordance with applicable local codes.

If the heating system is installed in an unconfined space, adequate air will be available via normal infiltration.

If the heating system is installed in a confined space, (a space with a volume of less than 50 cubic feet per 1000 Btu/hr of input for all fuel burning equipment) or building construction is unusually tight, adequate air for combustion must be provided by two openings: one located about 6" below the ceiling, the other about 6" above the floor. **Each opening must have a minimum free area as follows:**

1. One square inch per 4000 Btu/hr of input when communicating directly with the outside or through a vertical duct.
2. One square inch per 2000 Btu/hr of input when communicating through horizontal ducts to outside.
3. One square inch per 1000 Btu/hr of input when ventilation air is provided by openings in doors, etc. to adjoining spaces having adequate infiltration.

Warning:

Adequate fresh air must be provided for combustion; otherwise, improper operation and inadequate venting of deadly flue gases may result.

Support system for the chimney fan: Prior to installation of the chimney fan, it must be assured the chimney can safely carry the weight of the chimney fan.

A steel chimney should be well supported at the roof penetration point. If the chimney extends more than 20' above the roof, the chimney and the fan should be secured by wires attached on the chimney and on the roof at 2 to 3 different points.

Brick chimneys usually do not need any kind of support to carry the weight of the chimney fan.

System Type

To determine the type of system is important in order to understand what to expect from the system.

Direct connect oil or gas appliances (no draft hood) normally do not require any mechanical draft adjustment. However, if there are long horizontal breechings and far between the appliances, it is a good idea to install mechanical vent-dampers, so adjustments of the draft can easily be made.

Draft hood systems should generally speaking have vent dampers installed. The vent dampers are used to balance the system and assure that only a minimum of dilution air is pulled through the draft hoods.

Safety Devices

Local codes usually require installation of safety devices, when mechanical draft is provided in an oil or gas fueled system.

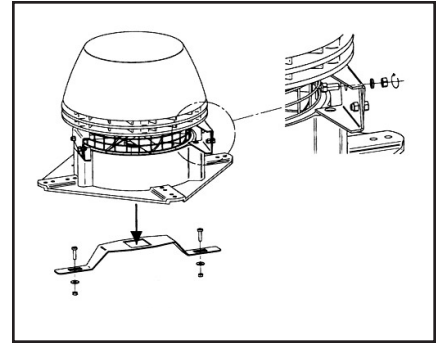
Make sure a differential pressure switch (fan proving switch) is installed to assure that no appliance will fire unless there is a proven draft.

2. Installing the Chimney Fan

Transport Safety Device

If a transport safety device is present, remove it from the vane and make sure that the vane can revolve without hindrance.

RS 14/16: Before mounting, the transport safety device on the hinges must be removed.



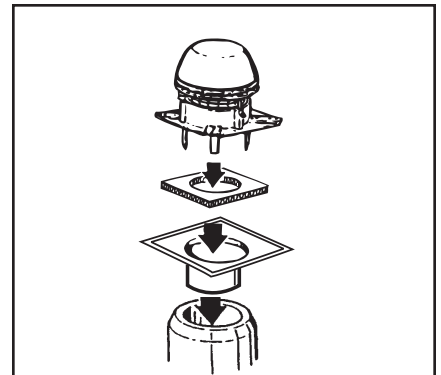
2.1 Single Fan on Steel Chimney

Step 1: Prepare fan location

If a stack cap is already installed, it must be removed. The steel adapter (FRS) slides right into the chimney, where the long collar engagement ensures safe anchoring. If necessary, the adaptor can be secured by means of long self-tapping stainless steel screws into the side of the collar through the chimney wall.

Measure the inside diameter of the flue and cut a corresponding hole in the center of the fiber mat. If the flue is so big that the throat in the adapter has been reduced to fit the throat of the fan, the hole in the fiber mat should correspond to the throat.

The aluminum foil on the fiber mat must face upward (against fan base).

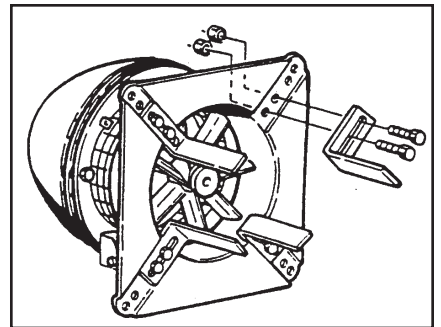


Step 2: Preparation of fan

Locate the installation brackets in the grooves on the under side of the fan base, using the bolts and nuts supplied to secure the brackets. Note that the bolts shall be installed from the bottom side in the two inner holes.

Adjust the final position of the installation brackets ensuring that there is a small gap between the brackets and the flue wall/adapter throat. Tighten the nuts.

If the brackets touch the flue wall, it is likely to create some vibration noise.

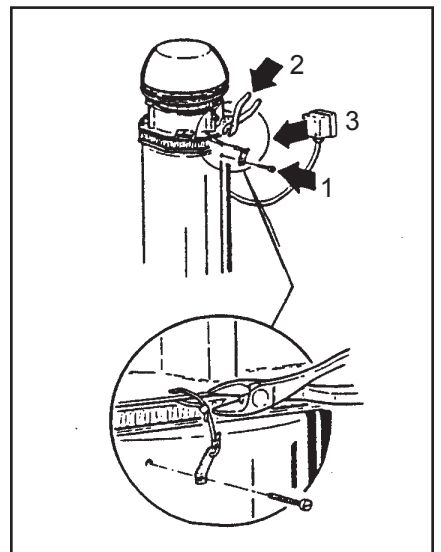


Step 3: Attaching the fan

The chimney fan is now ready for installation on the top of the chimney. Place the fiber mat with the aluminum foil facing upwards on the top of the adapter, and place the fan on top of the mat.

If extremely strong winds constantly surround the top of the chimney, the chimney fan must be secured by using two safety wires.

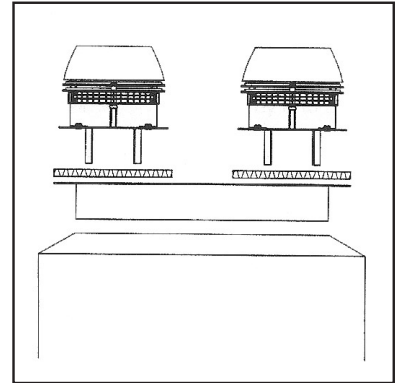
Caution: Under conditions with extremely strong winds constantly surrounding the top of the chimney, the chimney fan must be secured by steel wires or similar.



2.2 Multiple Fans on Steel Chimney

If two or more chimney fans are required to create sufficient draft, installation procedures are the same as for single fan installation on a steel chimney. The only difference is that the fans are sitting next to each other on the top of the chimney.

When installing multiple fans, it is extremely important that the fans are of the same model and size.



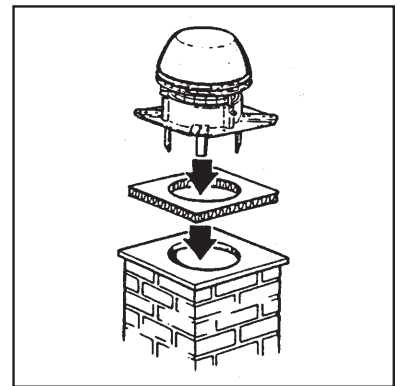
2.3 Single Fan on Brick Chimney

Step 1: Prepare fan location

The installation procedure is the same whether the flue is round or square. If a clay tile flue liner is installed, it might stick up a few inches. Cut it back so it is flush with the chimney crown.

Measure the inside diameter of the flue, cut a corresponding hole in the fiber mat leaving a minimum distance of 3/4" to any side of the fiber mat.

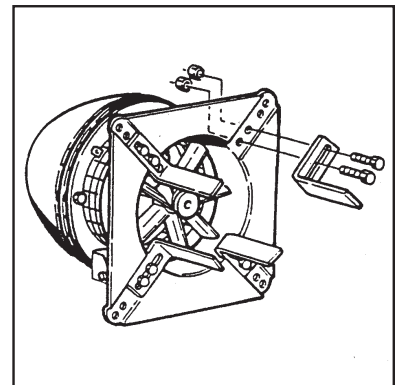
The aluminum foil on the fiber mat must face upwards (against fan base).



Step 2: Preparation of fan

Locate the installation brackets in the grooves on the underside of the fan base using the bolts and nuts supplied, to secure the brackets. Note that the bolts shall be installed from the bottom side in the two inner holes.

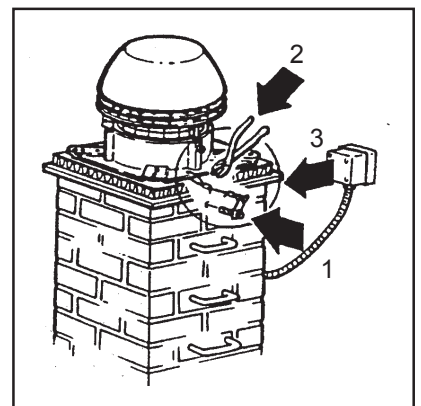
Adjust the final position of the brackets ensuring that there is clearance between the brackets and the flue wall. If the brackets touch the wall, it may generate some vibration noise.



Step 3: Attaching the fan

The chimney fan is now ready for installation on the top of the chimney. Place fiber mat with the aluminum foil facing upwards on the top of the chimney, and place the fan on top of the mat.

Caution: Under conditions with extremely strong winds constantly surrounding the top of the chimney, the chimney fan must be secured by steel wires or similar.

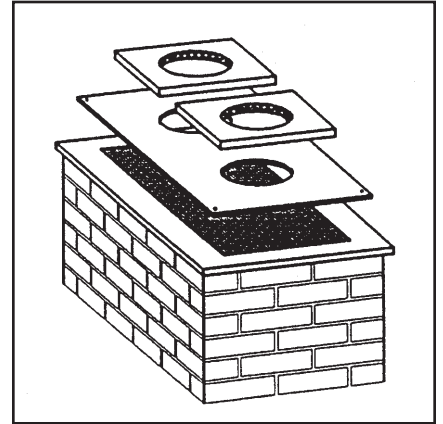


2.4 Multiple Fans on a Brick Chimney

If two or more fans are required to create sufficient draft, a special adapter plate is required. The adapter should be made of stainless steel (14 GA or thicker), depending on the size and the fan models used.

The two holes in the plate should match the throat diameter of the fan model used and the distance from center to center should be at least equal to the fan width (dimension "B" in 1.5. Dimensional Data).

The adapter should be sealed with silicone and bolted onto the top.

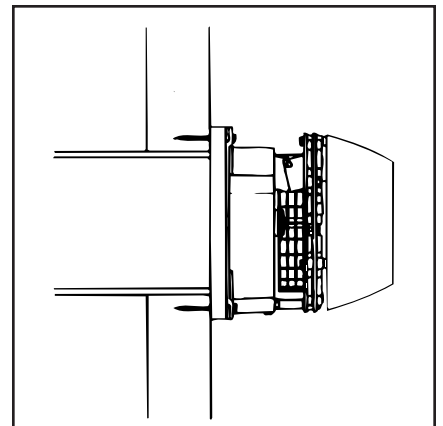


2.5 Wall Mounting of Chimney Fan

When mounting the chimney fan on a wall, the installation instructions for installation on a steel chimney should be followed. Use of the adapter FRS is not necessary.

To ease installation, detach the fan base by removing the bolts holding the hinges together. Center fan base over outlet and bolt the base onto the wall with the hinges pointing upwards.

After mounting the base securely, attach the fan motor housing by assembling the fan hinges again. Seal with silicone all around the fiber mat to prevent rain from entering the flue.



2.6 Installation for high temperatures

If the fan is used for applications where the flue gas temperatures exceed 400°F **at the flue exit**, and does not exceed 650°F, dilution bolts must be used.

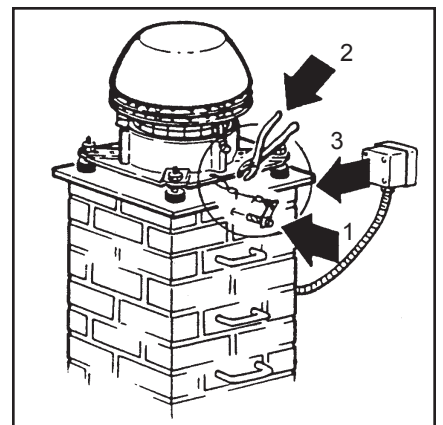
Dilution bolts will cause cool air to dilute the warm flue gas, by lifting the fan and leaving space so the cool air can get in under the fan base.

The dilution bolts should be installed in the outer holes in the fan base.

The dilution bolts are adjustable and should be adjusted so the flue gas temperature does not exceed 400°F when discharged through the fan.

When using dilution bolts the fan's actual capacity is reduced and a stronger model may be required.

The fiber mat is not required when using dilution bolts.

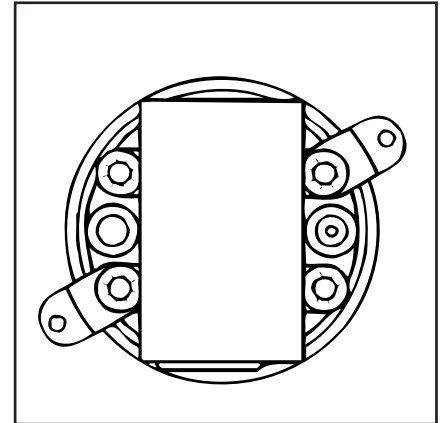


3. Installing Safety Systems

3.1 Installing Dwyer Pressure Switch

Step 1:

Select a location that is free from excessive vibration, corrosive atmosphere and where the ambient temperature is within the limits of the switch. The distance from the switch to the place where the probe is inserted in the pipe system should not exceed 5 feet.

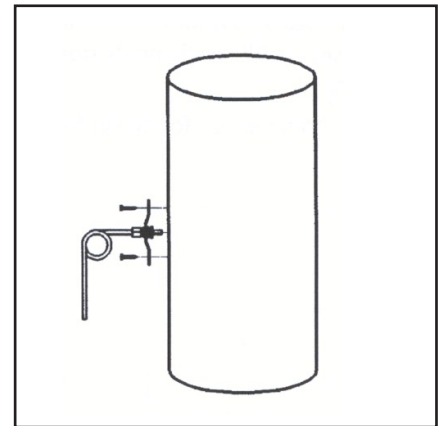


Step 2:

Mount the standard switch with the diaphragm in a vertical position. Some switches are position sensitive and may not reset properly unless they are mounted with the diaphragm vertical.

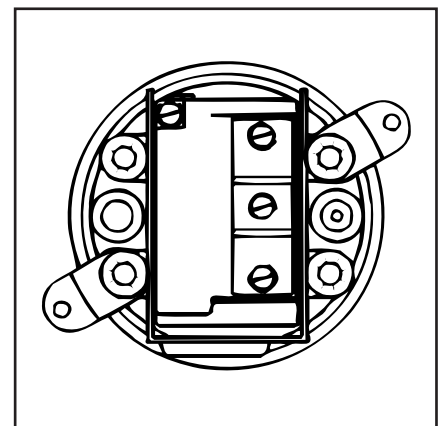
Step 3:

For installation of the probe in the piping, drill a hole with a diameter of 1/4" in the pipe. The length of the probe is approximately 2" and if necessary, it should be cut back so it is flush with the inner wall of the pipe.
Attach the probe to the outer pipe wall with the two metal screws.



Step 4:

Connect switch to the probe with the 1/4" metal tubing. Connect to the 1/8" NPT female pressure port. To measure negative pressure (below atmospheric pressure), connect the tube from the probe to low pressure port (marked: "LO") and leave the high pressure port (marked: "HI") open to atmosphere.



Step 5:

Electrical connections to the standard single pole, double throw snap switch are provided by means of screw terminals marked "common", "norm open", and "norm closed". The normally open contacts close and the normally closed contacts open when pressure increases beyond the set point.

4. Wiring the Chimney Fan

4.1 General



Danger: Turn off electrical power before servicing. Contact with live electric components can cause shock or death.

All electrical wiring must be in accordance with requirements of authority having jurisdiction or, in absence of such requirements, with National Electrical Code NFPA 70 — latest edition. If an external electrical source is utilized, system must be electrically grounded in accordance with requirements of the authority having jurisdiction or, in the absence of such requirements, with the National Electrical Code NFPA 70 — latest edition.

Safety devices, such as a Pressure Differential Switch (fan proving switch) must be wired so they shut down all appliances connected to the chimney.

Wiring diagrams can be found on the following pages.

Power requirements for the system depends on the fan size. Electrical requirements are:

RS 9	1 x 120 V/60Hz	0.4 Amps
RS 12	1 x 120 V/60Hz	1.2 Amps
RS 14	1 x 120 V/60Hz	1.4 Amps
RS 16	1 x 120 V/60Hz	3.9 Amps

The chimney fans have a split capacitor motor with infinitely variable speed.

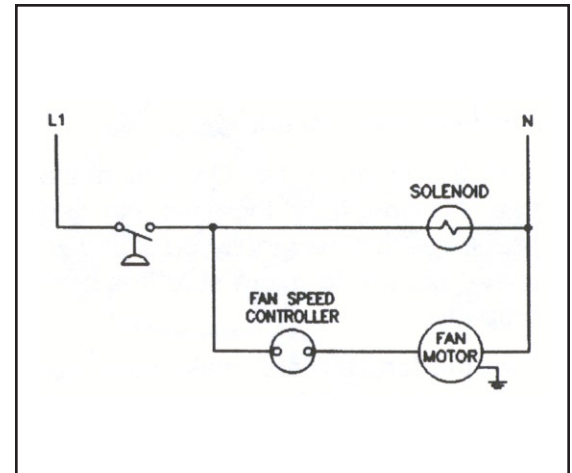
The fan speed control supplied is rated 1x120V/60 Hz and 5 Amps. It has an adjustable low voltage set point of min. 65 V +/- 5 V.

Notice: If any of the original wire supplied with the system must be replaced, use similar wire of the same temperature rating. Otherwise, insulation may melt or degrade, exposing bare wire.

4.2 Wiring diagram for solenoid operated gas valve with proven draft protection

Sequence of Operation

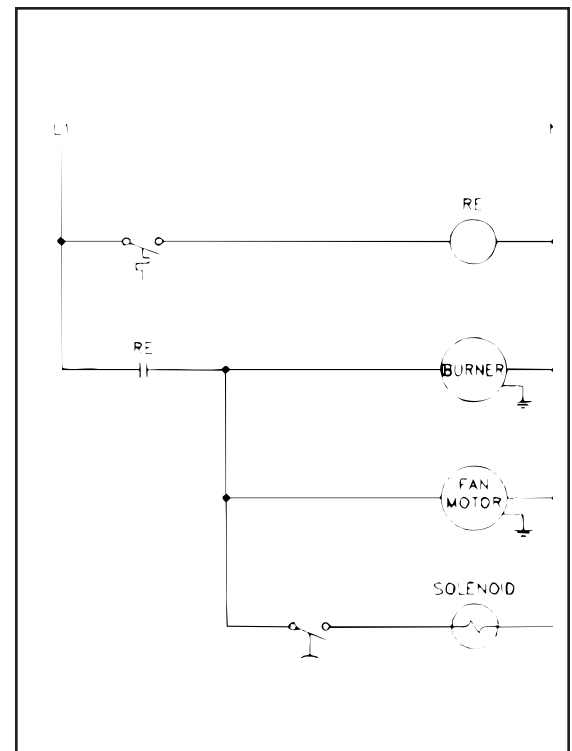
1. The chimney fan motor is in continuous operation.
2. Continuous operation keeps the pressure switch, PS, in the closed position.
3. The pressure switch, PS, activates the Solenoid Operated Gas Valve located between the Pilot Light and the Gas Valve.
4. Any interruption of the draft causing the draft to fall below the pressure switch set point will open the pressure switch and deactivate the Solenoid Operated Gas Valve.



4.3 Wiring diagram for burner control circuit with proven draft protection

Sequence of Operation

1. The thermostat closes the relay RE.
2. The RE relay contacts close activating the burner control and the chimney fan motor.
3. Operation will close the pressure switch, PS, and activate the Solenoid Operated Valve located between the oil tank and the burner.
4. Any interruption of the draft causing the draft to fall below the pressure switch set point will open the pressure switch and deactivate the Solenoid Operated Valve.



5. System Start-Up

5.1 System testing

Before any adjustments are made to the system, follow these procedures:

- Turn the chimney fan ON and make sure that it is operating. Increase and decrease the speed of the fan by adjusting the fan speed control to make sure it is operating properly.
- Turn the fan OFF and make sure the pressure switch opens, so the power to the circuit, it controls, is disconnected.

Notice: Do not blow air into the tube going to the pressure switch as this may damage the diaphragm.

5.2 Adjusting the Chimney Fan Speed

Start all appliances up. Use the fan speed control to set the speed of the chimney fan so no back pressure is experienced anywhere in the system. Check the system for flue gas spillage. Mark this setting on the fan speed control cover.

5.3 Adjusting the pressure switch setting

Remove the snap-on cover from the conduit enclosure by loosening its retaining screw. Turn the slotted Adjustment Screw clockwise to raise the set point pressure and counter clockwise to lower the set point.

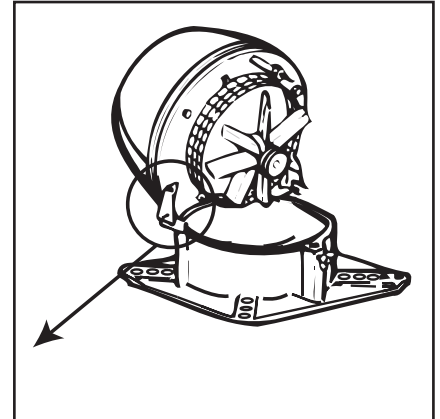
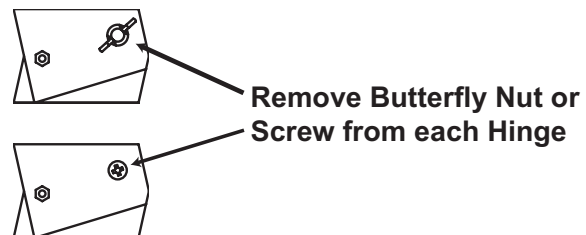
Set the adjustment to its lowest position. With all appliances operating, reduce the speed of the fan to the point, where the appliance(s) starts to spill flue gas. Increase the speed of the fan gradually to the point where there is no more spillage. Raise the switch's set point so it just opens. Return the fan speed to the original setting marked on the cover.

The system is now adjusted so flue gas spillage will disconnect the heating system.

6. Maintenance

6.1 Prior to Cleaning

Remove Butterfly Nut or Screw from each Hinge prior to cleaning.

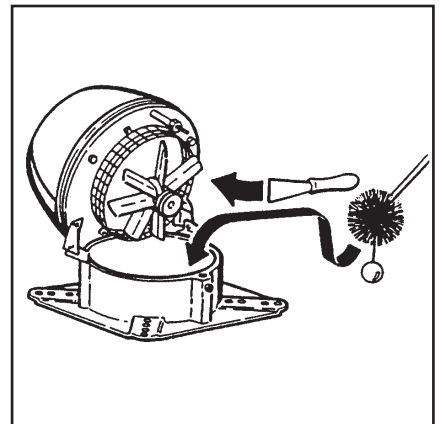


6.2 Care and cleaning

The EXHAUSTO Chimney Fan is designed for prolonged use. The fan should be inspected at least once a year when the chimney is inspected. Creosote and other deposits should be removed from the fan blades and the bottom of the motor housing.

The top of the fan is hinged and can be opened in order to ease the cleaning.

Warning: Do not open the motor housing unless power to the chimney fan has been disconnected.





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