

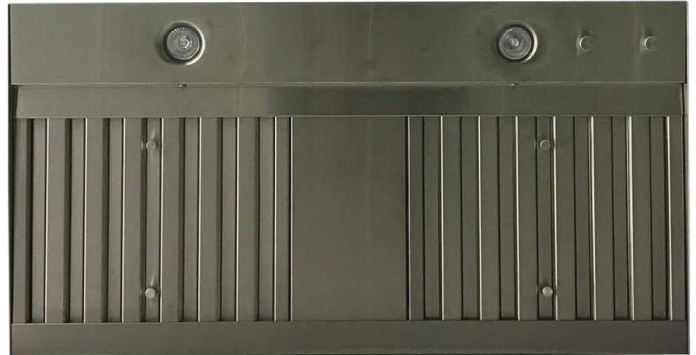


# INSTALLATION INSTRUCTIONS & USE & CARE GUIDE

Trade-Wind® VSL 400 Series Liners  
For Remote/In-Line Blowers

## VSL 400 Series Liner Models

Model	Width	CFM	Type of Motor & Blower
VSL430BF	28 <sup>3</sup> / <sub>8</sub> "	*	Remote
VSL436BF	34 <sup>3</sup> / <sub>8</sub> "	*	Remote
VSL442BF	40 <sup>3</sup> / <sub>8</sub> "	*	Remote
VSL448BF	46 <sup>3</sup> / <sub>8</sub> "	*	Remote
VSL454BF	52 <sup>3</sup> / <sub>8</sub> "	*	Remote
VSL460BF	58 <sup>3</sup> / <sub>8</sub> "	*	Remote
VSL472BF	70 <sup>3</sup> / <sub>8</sub> "	*	Remote



\*These models connect to an In-Line, Roof or Wall-Mounted Remote Blower. The blower used determines the CFM. The Trade-Wind In-Line blowers are either 836 CFM or 1266 CFM.

Before beginning installation, please thoroughly read and become familiar with these instructions. Installation and service must be completed by a qualified installer. Failure to properly install this product may void the warranty.

**Installer:** Please leave Installation Instructions with the range hood liner.

**Owner:** Please keep Installation Instructions for local electrical inspector's use and for future reference.



**WARNINGS:** Must be followed carefully to avoid personal injury.



**IMPORTANT:** Must be followed carefully to avoid damage or incorrect installation.



**TIPS:** Contain helpful information to facilitate installation.

## READ AND SAVE THESE INSTRUCTIONS



**WARNING! TO REDUCE THE RISK OF FIRE, ELECTRICAL SHOCK, OR INJURY TO PERSONS OBSERVE THE FOLLOWING:**

a) Use this unit only in the manner intended by the manufacturer. If you have any questions, please contact the manufacturer at the address or telephone number listed in the warranty.

b) Before servicing or cleaning unit, switch power off at service panel, lock service panel, and lock the service disconnection means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.



### **CAUTION**

-- For general ventilating use only. Do not use to exhaust hazardous or explosive materials and vapors.



### **WARNING – TO REDUCE THE RISK OF A RANGE TOP GREASE FIRE:**

a) Never leave surface units unattended at high settings. Boilovers cause smoking and greasy spillovers that may ignite. Heat oils slowly on low or medium settings.

- b) Always turn hood ON when cooking at high heat or when flambeing food (i.e. Crepes Suzette, Cherries Jubilee, Peppercorn Beef Flambe’).
- c) Clean ventilating fans frequently. Grease should not be allowed to accumulate on fan or filter.
- d) Use proper pan size. Always use cookware appropriate for the size of the surface element.



**WARNING! TO REDUCE THE RISK OF INJURY TO PERSONS IN THE EVENT OF A RANGE TOP GREASE FIRE, OBSERVE THE FOLLOWING:**

- a) SMOTHER FLAMES with a close-fitting lid, cookie sheet, or metal tray, then turn off the burner. BE CAREFUL TO PREVENT BURNS. If the flames do not go out immediately, EVACUATE AND CALL THE FIRE DEPARTMENT.
- b) NEVER PICK UP A FLAMING PAN—YOU MAY BE BURNED.
- c) DO NOT USE WATER, including wet dishcloths or towels. A violent steam explosion will result.
- d) Use an extinguisher ONLY if:
  - 1. You know you have a Class ABC extinguisher and you already know how to operate it.
  - 2. The fire is small and contained in the area where it started.
  - 3. The fire department is being called.
  - 4. You can fight the fire with your back to an exit.



**Recommendations:**

- 1. Consult a licensed ventilation contractor or qualified technician for proper installation of exhaust ducting. Locate the cooking area for minimum cross drafts—away from doors and windows, when possible.
- 2. Ducts must be of adequate size and duct runs should be as short as possible. Where turns are necessary, keep turning radius as large and as smooth as possible.
- 3. The ducting must be air tight. Use a minimum of 2 sheet metal screws at every duct joint. Then, seal the duct joints with high quality duct tape.
- 4. Do not use this unit with any solid-state speed control device.
- 5. This unit must be grounded.

**INSTALLATION INSTRUCTIONS**



**WARNING – TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:**

- a) Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction codes and standards.
- b) Sufficient air is needed for proper combustion and exhausting of gasses through the flue (chimney) of fuel burning equipment to prevent back drafting. Follow the heating equipment manufacturer's guidelines and safety standards such as those published by the National Fire Protection Association (NFPA) and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) and the local code authorities.
- c) When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
- d) Ducted fans must always be vented to the outdoor.



**WARNING -- TO REDUCE THE RISK OF FIRE, USE ONLY METAL DUCTWORK.**



**CAUTION –**To reduce the risk of fire and to properly exhaust air, be sure to duct air outside – Do not vent exhaust air into spaces within walls, ceilings, cabinets or into attics, crawl spaces, or garages.



**CAUTION** – To reduce the risk of fire and electric shock, install this (range hood) only with. Remote Blower models rated maximum 6 amps.

## **CONTENTS:**

Part 1 - Planning The Installation

Part 2 - Securing The Liner

Part 3 - Use & Care

Part 4 - Electrical Connection (Give copy of these 2 pages to electrician.)

## **PART 1 Planning the Installation**

Trade-Wind® Designer Series Liners are designed for installation inside custom hood canopies. Proper installation of the liner is directly related to the material from which the custom canopy is constructed. A qualified person must complete the installation of this unit. Because of the large size and weight of this hood / liner, two installers are recommended. Plan the installation so that all minimum clearances are met or exceeded. Dimensions shown provide minimum clearances, unless otherwise specified. **Important:** You must provide structural framing and tight backing in the areas in which you are securing the liner inside your custom canopy. Failure to do so could distort and damage the liner and void the warranty.

For best and quietest performance with In-Line Blower installations, the blower should be installed *in the attic*, near or slightly beyond the mid-point of the duct system. In installations requiring the blower be in a chase or wood-type hood over the range (e.g., no attic above the kitchen), the duct silencer will not be as effective in absorbing motor noise. In addition, there will likely be motor sound transmitted through the walls of the chase, bypassing the duct silencer.

**Given the high performance of Trade-Wind® In-Line Blowers, it is highly recommended that the blower NOT be attached directly to the liner or in a chase immediately above the liner unless a Trade-Wind® brand duct silencer is installed between the blower and liner and neoprene lined FC Clamps are used.** FC Clamps are available from Trade-Wind® through your Trade-Wind® supplier. Ask for model numbers FC6 (6”), FC8 (8”) or FC10 (10”), 2 per box.



### **In-Line & Remote Ventilators, Duct Silencers, Dampers and Ducting**

Trade-Wind® VSL Liners (non-internal motor models) are also designed for use with “in-line” and “remote-mount” ventilators. When planning for installations using these products, please refer to the Installation Instructions provided with the ventilator. Trade-Wind® Duct Silencers are available from your local Trade-Wind® dealer. When planning for installation using a duct silencer, please refer to the Installation Instructions provided with the duct silencer.

Given that most installations are different, a back-draft damper is not provided with this unit. Trade-Wind® back draft dampers are also available from your local Trade-Wind® dealer. Always install ventilation products with an approved wall or roof cap. Duct performance is improved by using round, smooth metal duct work instead of rectangular. Do not rely on duct tape alone to seal duct joints. Use sheet metal screws as required to support the duct.

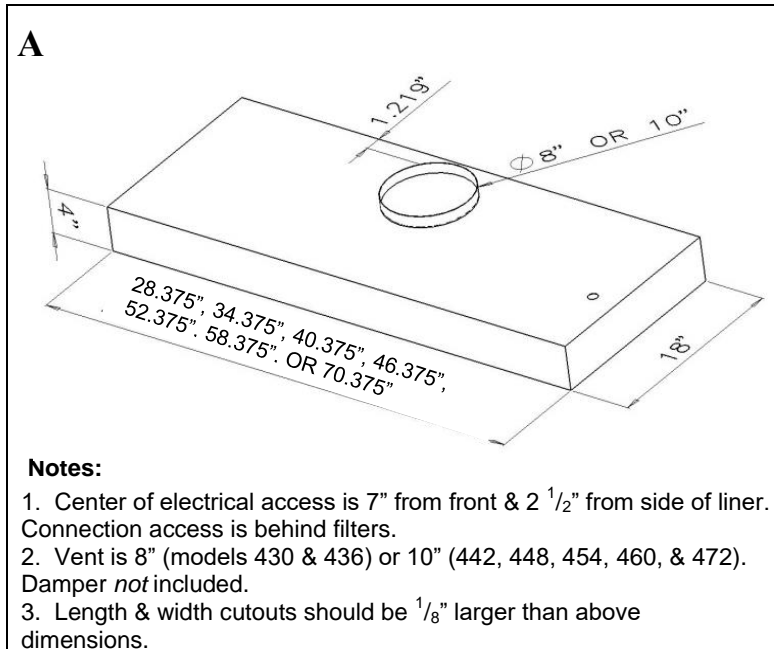


**WARNING!** For maximum ventilation performance, the bottom of the hood or liner should be 30 - 36 inches (76.2 - 91.4 cm) above the cooking surface (minimum is 24”). This would typically result in the bottom of the hood being 66 - 72 inches (167.6 - 182.9 cm) above the floor. These dimensions provide for safe and efficient operation of the hood. **Always observe local building codes.**

## Important Cut-out Information

Cabinet or hood cutouts should be at least  $\frac{1}{8}$ " larger than the following outside dimensions

Pic	CFM	Models Available (by Width)						70 $\frac{3}{8}$ "	Sones	Control	Blower
		28 $\frac{3}{8}$ "	34 $\frac{3}{8}$ "	40 $\frac{3}{8}$ "	46 $\frac{3}{8}$ "	52 $\frac{3}{8}$ "	58 $\frac{3}{8}$ "				
A	-	VSL430BF	VSL436BF	VSL442BF	VSL448BF	VSL454BF	VSL460BF	VSL472BF	N/A	Variable	In-Line or Remote Mount Blower



### PART 2 Securing the Liner



#### TILE BACKSPLASHES

**IMPORTANT:** Liners installed immediately above the top edge of tile backsplashes thicker than  $\frac{3}{4}$ " should be installed slightly forward—not flush with the back wall. The back filter bracket of the liner is 1" deep and tile installations thicker than this will prevent the filters from being removable.



#### MOUNTING HOLES

**NOTE: DRILLING THROUGH STAINLESS STEEL REQUIRES A TITANIUM BIT. BE CAREFUL NOT TO DRILL THROUGH FILTER BRACKETS, ELECTRICAL COMPONENTS OR UL LABEL.**

Because the Trade-Wind® Standard Series Liner was designed for various wood hood applications, no mounting holes have been pre-drilled. This allows the liner to be attached in most any area of the canopy that has a wood frame support, e.g., the back, sides or top. We recommend at least six equally spaced screws per liner—three screws along the back (top or back side panel) and three screws on the front top, immediately next to the light bar wall or behind the removable light bar. Where possible, the screw holes should be drilled into the top of the liner (instead of the sides or back). This will help prevent distorting the liner walls in situations where the wood frame is not properly sized to the liner. **Models with internal motors should also have at least one screw centered and securely in place on each end (side panel) of the liner because of the added weight.**

Neatly measure and mark (left to right and top to bottom) and drill screw holes through the liner as required to match the wood backing. It is easier to drill holes from the outside in, by setting the liner on its face (on cardboard) and drilling from the back side. Secure the liner by driving screws (by others) tightly into the wood frame. Use washers where necessary.

\*When removing the filters, be careful not to scratch the liner by placing the filters, screws, drill bits or drill on the liner's face. **For visual instructions on removing the filters for mounting and other liner questions, check out our YouTube Channel: [https://www.youtube.com/channel/UCwVlbi\\_9hbulATTYvz43oBA](https://www.youtube.com/channel/UCwVlbi_9hbulATTYvz43oBA).**



## CONNECTING TO THE VENT PIPE

The VSL liner comes with a metal start collar welded in place. Attach the Start Collar to the duct with at least three equally spaced screws. Also apply duct tape, preferably the metal type.

## PART 3 Use and Care



### WARNING!

Do NOT operate the blower / ventilator system without the filters in place, or with dirty, grease laden filters.



### OPERATING CONTROLS:

Always activate the ventilator when using cooking appliances. For best performance, turn on the blower a few minutes before starting to cook to establish an airflow pattern within the room. To use the electronic touch control, touch the button that corresponds to the desired speed. To turn off blower, touch the illuminated speed button again or the illuminated blower off control button. The electronic light control when touched comes on high; touch again for night light setting, touch again for light off. The inline and remote blower options come with knobs. To use these controls, adjust the fan speed by simply turning the knob. To turn off blower, turn knob to off position. For controlling the lighting, turn the corresponding knob; the light comes on high and adjusts to the night light setting.



### ENERGY SAVING TIPS:

Eliminate air currents in the liner vicinity by shutting nearby windows and doors, turning off ceiling fans and adjusting the adjacent heating and air conditioning outlets if necessary. Place your largest pans on the rear burners whenever possible. Clean filters and grease laden surfaces often to improve efficiency. Always use lids on cookware to retain heat and moisture. Minimize the amount of liquid used to cook food. Select cookware of proper size, material and construction for the cooking task being performed.



### CARE & CLEANING:

Proper cleaning is necessary to maintain performance and appearance, while also ensuring safe operation. The frequency of cleaning should be according to the type and amount of cooking. Best results will be achieved by cleaning soiled components as soon as possible. Filters must be cleaned regularly. Using the aluminum knob, lightly pull the filter toward the front of the liner while pulling the backside downwards. Replacing the filter is just as easy as taking it out. For visual instructions on how to remove the filters visit our YouTube page ([https://www.youtube.com/channel/UCwVIbi\\_9hbulATTYvz43oBA](https://www.youtube.com/channel/UCwVIbi_9hbulATTYvz43oBA)).

The filters may be cleaned by hand washing in hot water using a mild detergent solution, or by placing them in a dishwasher. Locate holes on the sides of the filter. Put filter in dishwasher with holes facing up so detergent can enter filters. Dry the filters completely before using again. Rinse and dry with a soft lint-free cloth. Always wipe stainless steel surfaces with the grain. Never wipe across the grain. After cleaning, reinstall the filters carefully.

>> **Most common scrubber type pads will scratch the hood.**



### CAUTION:

If a commercially available stainless steel cleaner is used, it is important to read the labels for chlorine compounds. Chlorine is a corrosive substance, DO NOT USE. Follow polish manufacturer's instructions.



### LED LIGHT BULBS:

Trade-Wind® liners are designed for MR16/GU10 LED flood light bulbs. They can be purchased at most home or grocery stores. The bulbs provided with the unit are 3.5 watt, 350 lumen, and 3000K (color temperature).

## PART 4 Electrical Connection

**IMPORTANT: Copy this page and the next 2 pages to your electrical installer.**



**WARNING!** Ensure that the power supply is disconnected before proceeding. Verify that the power supply matches the ratings found on the appliance data label before proceeding. The complete appliance must be properly grounded at all times when electrical power is applied. Do not ground the appliance with the neutral (white) house supply wire. A separate ground wire must be utilized. Failure to complete electrical connections properly may result in damaged or non-functional systems. Follow instructions carefully to ensure proper installation.

It is the owner's responsibility to ensure that a qualified person performs the electrical connection of this appliance. The electrical installation, including minimum supply wire size, must comply with the National Electric Code ANSI/NFPA 70-1990 (or latest revision) and local codes and ordinances. A copy of this standard may be obtained from: National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02269-9101

**INSTRUCTIONS:** A 15 to 20 amp electrical service is recommended for proper electrical supply. Before determining, calculate amp ratings based on the product label found on the liner and the ventilator. Always observe local building codes. Always use a dedicated circuit. Line load is calculated by adding the amperage of the halogen lights to the rated amperage of the ventilator (either in-line or roof top). If the ventilator is rated in watts rather than amps, divide the watts by 120 and this will give you the amperage rating. The Trade-Wind® liner, without the internal motor, is supplied with a 6.0 amp variable speed fan control. Make sure the rated amperage on the remote ventilator does not exceed 6.0 amps (or 700 watts).



**CAUTION:** The neutral wire (usually white) for the blower/motor must connect to the same neutral wire that comes from the electrical panel to the liner. It is recommended to run a white neutral wire from the liner's white neutral wire along the same path as the red wire from the liner's variable speed control to the blower/motor.

### Variable-Speed Control Wiring Details (for remote blowers, usually "in-line" blowers)

Black	120 volt AC from electrical panel (usually black) to liner
White	Neutral from electrical panel (white) to liner
Green	Ground from electrical panel (usually green) to liner
Red	120 volt AC variable control from liner to 120 volt AC of variable speed ventilator

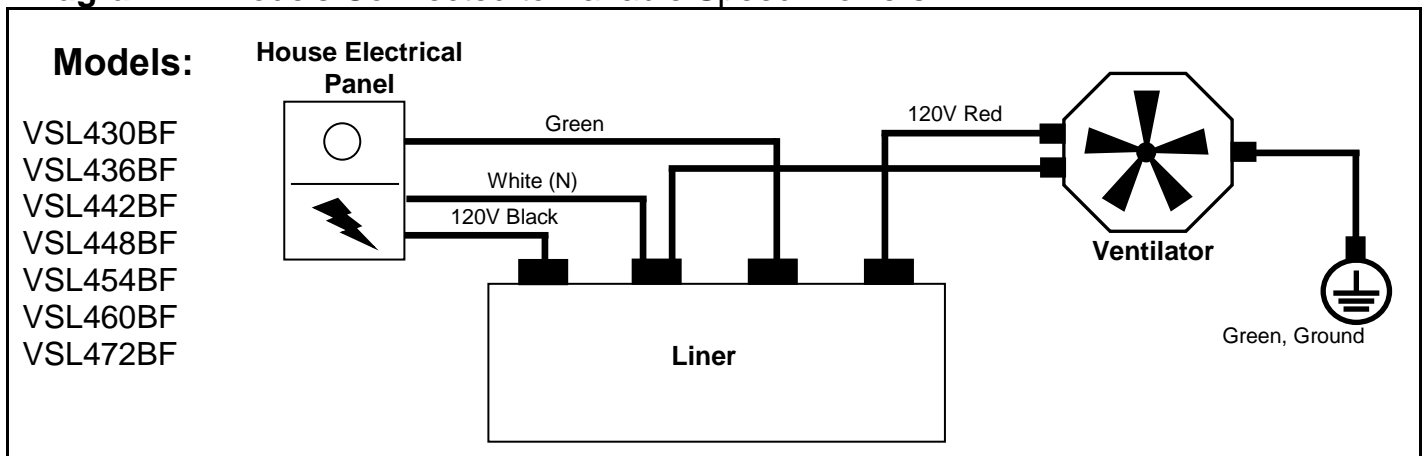
**CAUTION:** Do **NOT** connect this wire to a 3-speed blower.

**IMPORTANT:** Trade-Wind does not pay warranty claims for damage to liners or components connected to other brand blowers inconsistent with these Installation Instructions. Always consult the switch manufacturer's installation instructions when substituting control switches. The warranty may be voided if any unauthorized service, alterations or repairs are made to the product.

## Wiring Diagrams

**IMPORTANT: Copy this page and previous page to your electrical installer.**

**Diagram 1: Models Connected to Variable Speed Blowers**





# WARRANTY

## TRADE-WIND Kitchen Ventilation Products

### What IS Covered:

**Trade-Wind Manufacturing, LLC**<sup>®</sup> warrants its **Trade-Wind**<sup>®</sup> Kitchen Ventilation Products to the original user, to be free of defects in materials and workmanship for three (3) years from the date of purchase.

**Trade-Wind Manufacturing, LLC**<sup>®</sup> at its option, will repair or replace the complete unit or any defective component without charge. This warranty may be voided if any unauthorized service, alterations, or repairs are made to the product.

### What is NOT Covered:

- Normal maintenance and service of any product that has been subject to misuse, negligence, accident, or installation inconsistent with the recommended **Trade-Wind**<sup>®</sup> Installation Instructions and **Trade-Wind**<sup>®</sup> Best Practices Guidelines.
- Product used other than for normal in-home use or products used outside of the United States and Canada.
- Damage to the product caused by accident, fire, flood, or other acts of God.
- Service calls to educate the customer in the proper use and care of the product, change fuses, or to reset the circuit breakers.
- Service calls to correct faulty installation, such as, performance issues relating to improperly sized ducting or restrictive roof caps is not covered and will by default be charged back to the Homeowner.
- Light bulbs are not covered under warranty.

**Trade-Wind Manufacturing, LLC**<sup>®</sup> disclaims and excludes any liability for implied warranties or for incidental or consequential damages wherever permitted by law. There are no implied warranties of merchantability or fitness for a particular use or purpose. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.

For Service: If you need service on your **Trade-Wind**<sup>®</sup> Kitchen Ventilation Product, visit our website at: [www.t-wusa.com](http://www.t-wusa.com) and click on the warranty tab. Fill out the simple form providing the model number, serial number, date of purchase, and brief description of the problem. Proof of purchase will also be required.

Warranty Revised 6/11/18

**Trade-Wind Manufacturing, LLC**<sup>®</sup> has a policy of continuous improvements and reserves the right to modify (at any time and without notice) any or all of its products, features, designs, components and specifications. *For exact dimensions, see the Installation Instructions included with each product.* Some features may be slightly different than shown on product literature.



For more information, please contact your **Trade-Wind**<sup>®</sup> Representative



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[t-wusa.com](http://t-wusa.com)





## Best Practices

### Venting Installation Instructions for Range Hoods and Wood Hood Liners (All Models)

—Addendum to Installation Instructions—



**IMPORTANT:** Problems caused by improper installations are not covered by the manufacturer's warranty.



**IMPORTANT:** Undersized and improperly installed duct pipe and/or other ventilation components will cause excessive static pressure (air resistance), that may result in rattling, vibration and air buffeting noises, as well as inadequate ventilation.

#### 1. Building Codes

Kitchen Hood Ventilators should be installed by qualified technicians familiar with state and local building codes.

#### 2. Duct Pipe and Fittings (Elbows, Transitions, Roof & Wall Caps)

- a. Use round or rectangular rigid metal duct only. Where possible, use round duct as it creates the least amount of static pressure. DO NOT use flex duct.
- b. All duct sections and fittings (EXCEPT DAMPERS, per Section 4), should overlap and be connected with at least 3 – 4 equally spaced screws and wrapped tightly with 2 – 3 layers of Aluminum Foil Metal Duct Tape. This type of duct tape is more durable than traditional cloth duct tape. DO NOT use butt joints.
- c. For best air flow, elbows and pipe size transition fittings should not be directly connected to one another. Where possible, always include at least 15 inches of straight pipe between fittings.

#### 3. Duct Pipe and Fitting Sizes. (See **Duct Sizing Chart and Area Calculations** Section for more detail)



**IMPORTANT:** DO NOT use either of the following duct pipe sizes or fitting sizes for any kitchen hood ventilator installations:

- 6" round duct pipe
- 3.25" x 10" rectangular x 6" round transitions
- 6" x 7" linear transitions



**IMPORTANT:** No portion of any length of duct pipe or fitting should be smaller than the discharge port of the ventilator. This is very important because any type of restriction anywhere in the ventilation system will cause increased static pressure (air resistance), that may result in rattling, vibration and air buffeting noises, as well as inadequate ventilation.

Example: For ventilator models with 3.25" x 10" discharge ports, no part of the roof cap or wall cap's air path should be smaller than 3.25" x 10" (32.5 square inches) or 7" round (38.5 square inches). See **Roof Caps and Wall Caps** section for more detail.

Exception: For some short duct runs inside walls framed with 2 x 4 studs, it is a common industry practice to transition a 7" round duct to a 3.25" x 10" rectangular duct. If space allows, it is best to use a 3.25" x 14" rectangular duct with a 3.25" x 14" x 7" transition.

#### Duct Runs – Length

- a. Configure the ventilation duct run to be as short and as direct to the outside as possible. Minimize the number of elbows and transition fittings used. Complex or long runs should be reviewed by a



- qualified installer.
- b. No portion of the ducting should be run so that the exhaust air flows downward. Since exhaust heat rises, forcing the air to flow downward will cause increased static pressure. As previously mentioned, improperly installed duct pipe will cause excessive static pressure (air resistance), that may result in rattling, vibration and air buffeting noises, as well as inadequate ventilation.
  - c. Duct runs for 390 CFM ventilator models should not exceed 20 linear feet with two 90-degree elbows (or four 45-degree elbows), a damper and a roof or wall cap. Longer runs or additional elbows will result in decreased ventilation performance. Each 90-degree elbow is the equivalent of 8 linear feet of duct pipe; each 45-degree elbow is equivalent to 4 linear feet of duct pipe.
  - d. Duct runs for 600 – 1200 CFM ventilator models should not exceed 35 linear feet with two 90-degree elbows and two 45-degree elbows, a damper and a roof or wall cap. Longer runs or additional elbows will result in decreased ventilation performance. Each 90-degree elbow is the equivalent of 6 linear feet of duct pipe; each 45-degree elbow is equivalent to 3 linear feet of duct pipe.
  - e. Always run ventilator ducts to the outdoors. DO NOT terminate a duct into an attic, basement, garage, crawl space under a house, a chimney, other ducting or an enclosed room.

#### 4. Dampers



**IMPORTANT:** DO NOT USE SCREWS TO ATTACH ANY TYPE OF DAMPER AS THE SCREWS MAY BLOCK THE DAMPER BLADES.



**IMPORTANT:** DO NOT USE MORE THAN ONE DAMPER IN THE VENTILATION SYSTEM. **NOTE:** Many styles of roof caps and wall caps have built-in dampers. See **Roof Caps and Wall Caps** section for more detail. Always use carefully crafted, tightly wrapped Aluminum Foil Metal Duct Tape on all connections and physically view and test the damper blades to make certain they are opening and closing correctly. Make sure that the damper blades do not touch the duct walls and that there is no debris blocking the free movement of the damper mechanism. Common things to look for include screws protruding into the blade's path, overspray of paint, plaster and insulation. If using rectangular duct, be sure that all four sides of the duct are on the outside of the damper's start collar or frame.

##### a. **390 CFM Models**

390 CFM models have either a 3.25" x 10" rectangular metal damper attached directly to the ventilator or a 7" start collar that requires a 7" damper (sold separately). DO NOT USE SCREWS TO ATTACH THE DUCT TO THE DAMPER FRAME AS THE SCREWS MAY BLOCK THE DAMPER BLADE. ALWAYS use Aluminum Foil Metal Duct Tape on all connections and physically view the damper blade to make certain it is operating correctly. On ventilator installations designed to recirculate the exhaust air back into the kitchen, be sure to remove the aluminum damper blade before attaching the duct to the damper frame.

##### b. **600 – 1200 CFM Ventilator Models**

###### **Damper in Roof Cap or Wall Cap**

In ventilation systems utilizing a roof cap or wall cap ***with*** a built-in damper, do not install an additional in-line damper. Two dampers are unnecessary and will cause increased static pressure (air resistance), that may result in rattling, vibration and air buffeting noises, as well as inadequate ventilation.

**In-line Damper** (for ventilation systems utilizing a roof cap or wall cap ***without*** a built-in damper)

In cold weather areas, installing an "in-line" damper may be the preferred type of installation. This is because in-line dampers installed just above the perimeter of the heated space (the ceiling) will reduce the amount of cold air traveling down the duct into the heated space and into the kitchen

through the ventilator.

In-line dampers must be installed so that the exhaust air flow will open the butterfly blades.

For **horizontal duct runs**, the in-line damper must be installed so that the hinge between the two butterfly blades is **vertical**—the hinge pin must point up and down. Otherwise, because of gravity, the damper’s blades will not close and the damper will not prevent backdrafts.

For **vertical duct runs**, the in-line damper’s hinge will be **horizontal** (sideways), which is correct for vertical duct runs. Gravity will help close the damper blades after each use.

For **upward slanted duct runs**, the in-line damper’s hinge must point to the top and bottom sides of the duct. In his position, gravity will help close the damper blades after each use. Otherwise, because of gravity, the damper’s blades will not close and the damper will not prevent backdrafts.

## 5. Roof Caps and Wall Caps

The roof cap or wall cap is the termination point of the venting system that allows the exhaust air to exit to the outdoors. All sections of this fitting must have an equal or greater air path area than the ventilator’s discharge port. If any section of the roof cap or wall cap is smaller than the ventilator’s discharge port, the entire ventilation system will lose efficiency and the restriction will cause increased static pressure.



**IMPORTANT:** Even though the intake side of the roof cap or wall cap may be properly sized, roof caps or wall caps with built-in dampers must be made so that when the damper is fully open, the actual open area of the final air path is equal to or greater than the discharge port of the ventilator. Any undersized portion of a roof cap or wall cap will cause excessive static pressure that may result in rattling, vibration and air buffeting noises, as well as inadequate ventilation.

**\*\*\*Roof caps and wall caps must have an integral bird screen.**

## 6. Attaching Duct to House Framework

The ventilation system should be attached to the framework in such a manner that the weight of the duct and fittings is supported with no stress on the duct joints, fittings or on the ventilator. All ducting should be attached so as to avoid any possible duct vibration from being transferred to the house’s framework.

## 7. Duct Sizing Chart and Area Calculations

Ventilator Discharge Port Types & Sizes		Duct Type Required	Duct Size (in Square Inches)	Minimum Discharge Size of Roofcap or Wallcap Outside Opening
6" Diameter, Round	28.3"	6" Round Metal Duct	28.3"	28.3"
7" Diameter, Round	38.5"	7" Round Metal Duct	38.5"	38.5"
8" Diameter, Round	50.25"	8" Round Metal Duct	50.25"	50.25"
10" Diameter, Round	78.5"	10" Round Metal Duct	78.5"	78.5"
3.25" x 10" Rectangular	32.5"	3.25" x 10" Rectangular Metal Duct	32.5"	32.5"

### Calculating Square Inches of Various Duct Sizes & Types

ROUND DUCT					
Radius	x	Radius	x	3.1416	= Area (Sq. Inches)
	x		x		=
The "radius" is one-half the diameter of a round duct, e.g., ½ of a 10" round duct is 5". 3.1416 is "Pi", the "constant" used when calculating the area of a circle.					

RECTANGULAR DUCT or WALL/ROOF CAP				
Width	x	Depth	=	Area (Sq. Inches)
	x		=	