

# INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS

## CENTRIFUGAL FILTERED SUPPLY POWER ROOF VENTILATORS

### MODELS VS/VH - BELT DRIVE

CARNES COMPANY 448 S. Main St., P. O. Box 930040, Verona, WI 53593-0040 Phone: (608)845-6411 Fax: (608)845-6504 www.carnes.com

### **CAUTION!**

**DO NOT INSTALL, USE OR OPERATE THIS EQUIPMENT UNTIL THIS  
MANUAL HAS BEEN READ AND UNDERSTOOD. READ AND SAVE THESE INSTRUCTIONS FOR FUTURE USE**

#### RECEIVING, HANDLING AND STORAGE

1. Handle the fan with care. Avoid severe jarring or dropping of the unit.
2. Carefully inspect the unit for damage upon delivery. If the unit has been damaged in transit it is the responsibility of the recipient to make all claims against the carrier.
3. Provide adequate, protected storage prior to installation. Upon unpacking, inspect the unit for any damage that may have occurred in transit and check for loose or missing parts.

#### INSTALLATION

1. Upon unpacking, inspect the unit for any damage that may have occurred in transit. Check also for loose or missing parts.
2. When handling the fan, do not lift or move the fan by using the hood.
3. **CAUTION!** This fan contains rotating parts and requires electrical service. Appropriate safety precautions should be taken during installation, operation and maintenance.
4. **WARNING!** Do not install or operate this fan in environment or atmosphere where combustible or flammable materials, gasses or fumes are present, unless it has been specifically designed and manufactured for use in that environment. **Explosion** or **Fire** could result!
5. This ventilator is designed to be mounted on a curb. The curb should be securely installed prior to fan installation.
6. A damper, if used, should be securely mounted within the curb or ductwork in a manner which allows free and unobstructed operation. Provide service access through duct or curb extension.
7. **CAUTION!** All electrical work must be done in accordance with local and/or national electrical code as applicable. If you are unfamiliar with methods of installing electrical wiring, secure the services of a qualified electrician.
8. **WARNING!** This product must be grounded.
9. **DANGER!** Make sure power is turned off and locked in **OFF** position at the service entrance before installing, wiring or servicing fan.
10. **CAUTION!** Before wiring the motor, check the supply voltage against the motor nameplate voltage. High or low voltage can damage the motor and void the motor warranty.
11. Power should be routed through the conduit/conduit opening provided.
12. **WARNING!** Be sure to keep all wiring clear of rotating or moving parts.
13. **WARNING!** Before starting the fan, turn the wheel to assure it rotates freely. If needed, adjust the wheel/shaft/bearing/motor position as required to achieve necessary clearances.
14. **CAUTION!** On belt drive units assure belts are tensioned and aligned properly. (See Maintenance section.)
15. **WARNING!** Check all set screws and keys. Tighten as necessary prior to fan startup.
16. Anchor the fan securely to the curb. Anchoring thru the vertical portion of the curb cap flange is recommended. Use a minimum of four lag bolts or other suitable fasteners.

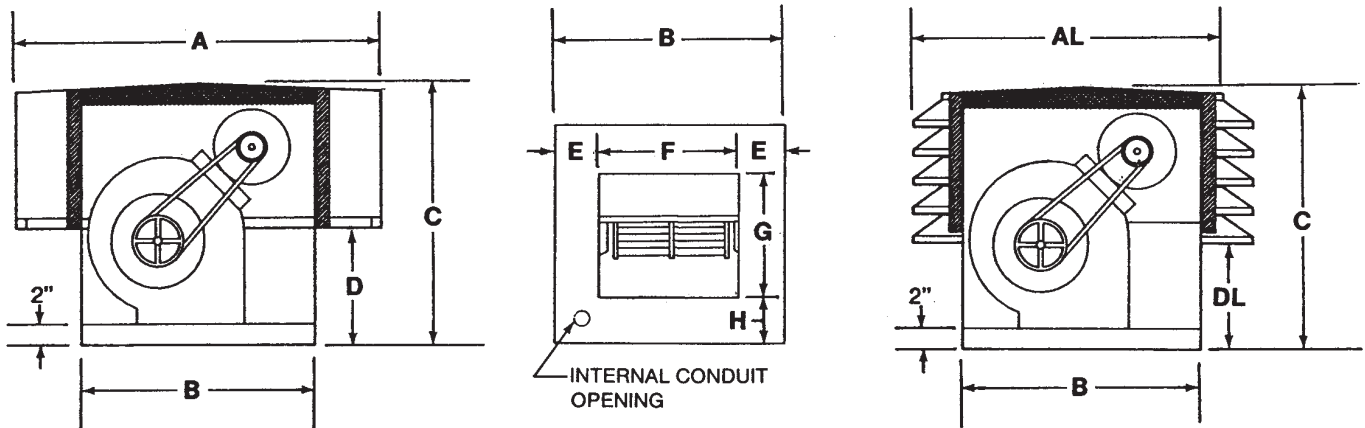
#### OPERATION

1. **CAUTION!** Assure the fan inlet and ductwork openings are clean and free of obstructions.
2. **WARNING!** This contains rotating parts. Appropriate safety precautions should be taken during operation.
3. Operate under power and check for correct rotation direction.
4. **CAUTION!** Incorrect rotation can damage fan motor.

## **MAINTENANCE**

1. **DANGER!** Before performing any maintenance on the fan, be sure power is turned off and locked in the **OFF** position at the service entrance before servicing the fan.
2. Ventilators should be carefully checked at least once a year. For critical or rugged applications, a routine check every two or three months is suggested.
3. All motors supplied with CARNES ventilators carry a one year warranty from date of shipment. For repairs within the warranty period, the motor must be taken to the motor manufacturer's authorized service dealer. Contact your CARNES representative for additional warranty details.
4. A periodic motor check should consist of spinning the motor shaft with the power off to be sure the motor turns freely and the bearings run smoothly. The belt on belt driven units should be removed from the motor sheave.
5. **CAUTION!** When removing or installing a belt, do not force the belt over the sheave. Loosen the motor mount so that the belt can be easily slipped over the sheave.
6. The belt on belt driven units should be removed and carefully checked for radial cracks, ply separation or irregular wear. A small irregularity in the contact surface of the belt will result in noisy operation. If any of these defects are apparent, the belt should be replaced. Check the sheave also for chipping, dents or rough surfaces which could damage the belt.
7. **CAUTION!** The correct belt tension is important. Too tight a belt will result in excess bearing pressure on the motor bearings and shaft pillow blocks, and may also overload the motor. Too loose a belt will result in slippage which will quickly "burn" out belts. A belt should feel "live" when thumped, approximately 1/4" belt deflection when subjected to finger pressure (3 to 5 lbs.) at midpoint between sheaves.
8. **CAUTION!** The belt alignment should also be checked to be sure the belt is running perpendicular to the rotating shafts. Motor and drive shafts must be parallel. Improper alignment will result in excessive belt wear.
9. **CAUTION!** Check sheave set screws to ensure tightness. Proper keys must be in keyways.
10. **CAUTION!** Do not readjust variable pitch sheave without checking motor amps. Do not readjust variable pitch sheaves above the maximum catalog RPM for unit and motor. If fixed sheaves are replaced, use only sheaves of identical size and type.
11. **CAUTION!** If adjustment of two groove variable pitch sheaves is required, each sheave must be opened or closed the same number of turns. Improper adjustment can cause excessive belt wear and premature failure.
12. If unit is to be left idle for an extended period (especially over summer months), it is recommended that belts be removed and stored in a cool, dry place to avoid premature belt failure.
13. The standard pillow block bearings on CARNES belt driven ventilators are permanently lubricated and are supplied with an oil base corrosion preventive compound. These should not require any service except that during the first few months of operation it is recommended the set screws holding the shaft be checked to be sure they are tight. (Proper tightness will permanently deform Allen wrench.)
14. The centrifugal fan wheel should not require maintenance except for removing foreign materials that may accumulate on the blades. The balance weights should not be disturbed. If a wheel has to be removed from the shaft, do not apply force that will damage the bearings or warp the wheel. Use a wheel puller.
15. **FILTERS** - Regular filter maintenance will assure proper filtration efficiency and fan performance. Remove the unit lid for inspection. Clean filter media with a mild solution of soap and water. Replace filters when necessary. (See Page 3 for proper sizes). Reinstall filters with air flow arrow toward blower.

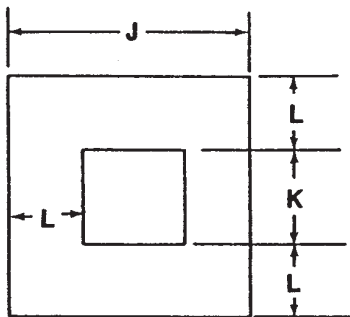
## DIMENSIONS



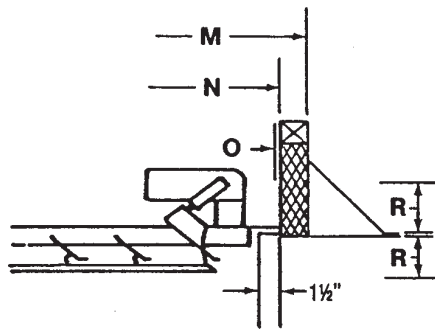
DIMENSIONS LISTED IN INCHES

Unit Size	A Sq. Hood O. D.	AL Sq. Hood O. D.	B Sq. Cap I. D.	C Height	D Stack	DL Stack	Qty Tiers VHBB	E	F	G	H	Weight		1" Filters Qty — Nominal Size
												VSBB	VHBB	
08	29	34	19 <sup>3</sup> / <sub>4</sub>	19	9	8	3	5	8 <sup>3</sup> / <sub>4</sub>	9 <sup>5</sup> / <sub>8</sub>	6 <sup>9</sup> / <sub>16</sub>	125	100	4 — 10 x 16
10	37	43	28 <sup>1</sup> / <sub>4</sub>	29	13	13	4	7 <sup>1</sup> / <sub>4</sub>	11 <sup>3</sup> / <sub>4</sub>	13 <sup>5</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>16</sub>	225	175	4 — 16 x 25
12	37	43	28 <sup>1</sup> / <sub>4</sub>	29	13	13	4	6	13 <sup>3</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>16</sub>	250	200	4 — 16 x 25
15	45	45	32 <sup>1</sup> / <sub>8</sub>	30	14	14	4	6 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>4</sub>	19	7 <sup>3</sup> / <sub>4</sub>	350	260	4 — 16 x 25
18	45	50	36 <sup>1</sup> / <sub>8</sub>	38	18	18	5	6 <sup>7</sup> / <sub>8</sub>	19 <sup>1</sup> / <sub>4</sub>	22 <sup>1</sup> / <sub>4</sub>	7	425	300	4 — 20 x 25
20	69	65	50 <sup>1</sup> / <sub>2</sub>	49	29	29	5	12 <sup>3</sup> / <sub>4</sub>	25 <sup>1</sup> / <sub>8</sub>	25 <sup>1</sup> / <sub>8</sub>	13 <sup>7</sup> / <sub>8</sub>	700	500	8 — 20 x 20

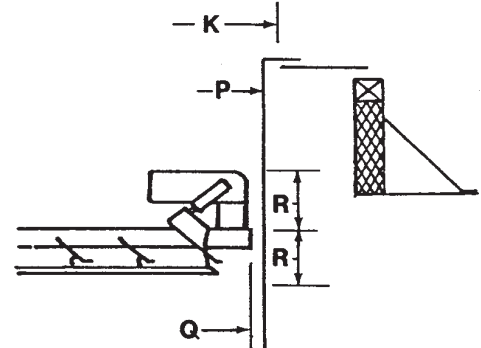
## ACCESSORIES



Duct Adapter



Model VXGA  
Curb Mounted Damper  
(Requires 1<sup>1</sup>/<sub>2</sub>" damper shelf)  
Shown with optional motor pack

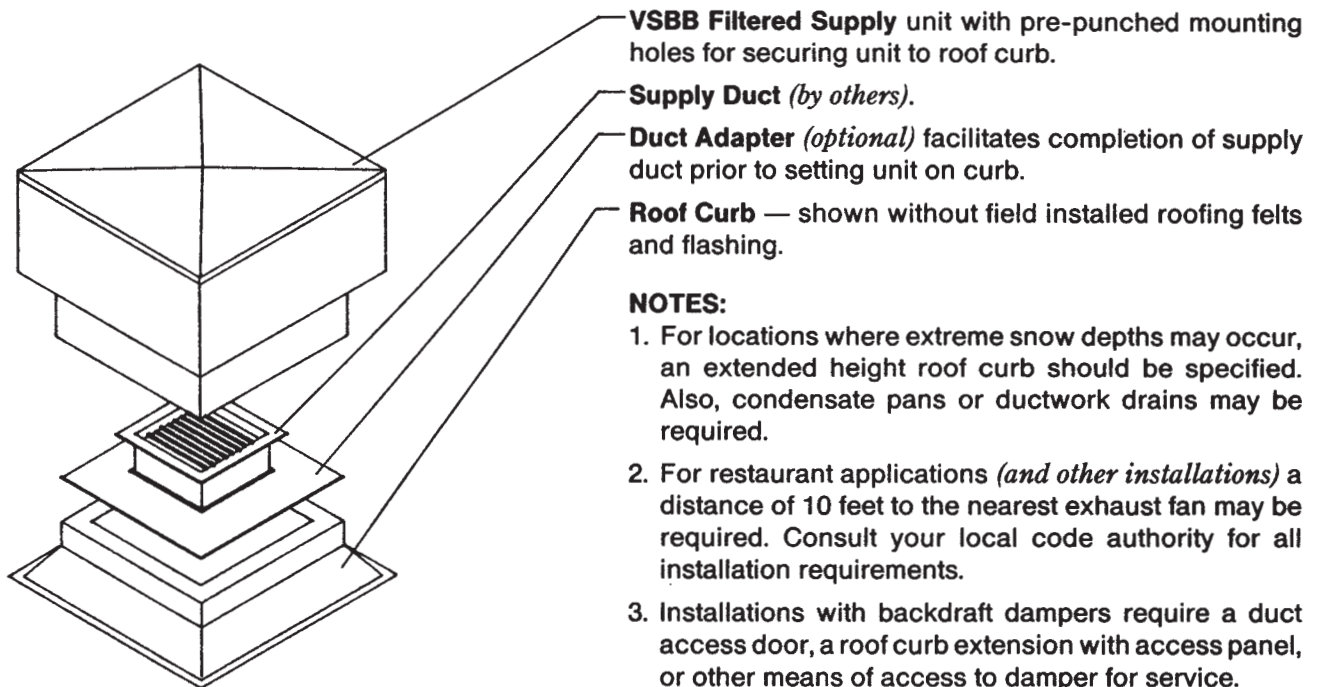


Model VXHA  
Duct Mounted Damper  
Shown with optional motor pack

DIMENSIONS LISTED IN INCHES

Unit Size	J Sq.	K Sq.	L	Roof Curb Sq.		VXGA Damper		P Duct Sq. I. D.	VXHA Damper		R Damper Clearance	1" Filters Qty — Nominal Size
				M O. D.	N I. D.	Size	O Sq. O. D.		Size	Q Sq. O. D.		
08	18	12 <sup>1</sup> / <sub>4</sub>	2 <sup>7</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>2</sub>	15 <sup>1</sup> / <sub>2</sub>	15	14 <sup>3</sup> / <sub>4</sub>	12	12	11 <sup>1</sup> / <sub>4</sub>	7	4 — 10 x 16
10	26 <sup>1</sup> / <sub>2</sub>	14 <sup>1</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>8</sub>	27	24	23	22 <sup>3</sup> / <sub>4</sub>	14	14	13 <sup>3</sup> / <sub>4</sub>	7	4 — 16 x 25
12	26 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>8</sub>	27	24	23	22 <sup>3</sup> / <sub>4</sub>	18	18	17 <sup>3</sup> / <sub>4</sub>	7	4 — 16 x 25
15	30	20 <sup>1</sup> / <sub>4</sub>	4 <sup>7</sup> / <sub>8</sub>	30 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	27	26 <sup>3</sup> / <sub>4</sub>	20	20	19 <sup>3</sup> / <sub>4</sub>	7	4 — 16 x 25
18	34	26 <sup>1</sup> / <sub>4</sub>	3 <sup>7</sup> / <sub>8</sub>	34 <sup>1</sup> / <sub>2</sub>	31 <sup>1</sup> / <sub>2</sub>	31	30 <sup>3</sup> / <sub>4</sub>	26	26	25 <sup>3</sup> / <sub>4</sub>	7	4 — 20 x 25
20	48 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>4</sub>	9 <sup>1</sup> / <sub>8</sub>	49	46	45	44 <sup>3</sup> / <sub>4</sub>	30	30	29 <sup>3</sup> / <sub>4</sub>	7	8 — 20 x 20

# TYPICAL INSTALLATION



## REPLACEMENT PARTS LIST MODELS VSBB and VHBB

Unit Size	1" Filter (Qty)	Blower Assembly*	Vibration Isolators (4 Required)
08	(4) 999-8899	999-2581	999-9748
10	(4) 999-8886	999-2582	999-9748
12	(4) 999-8886	999-2583	999-9748
15	(4) 999-8886	999-2584	999-9748
18	(4) 999-8898	999-2585	999-9748
20	(8) 999-8889	999-2586	999-9748

\*Blower assembly consists of the wheel, shaft, bearings and cushions.

Consult factory for replacement parts not listed.

**CARNES**<sup>®</sup>  
COMPANY

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