



INDUSTRIAL PROCESS AND  
COMMERCIAL VENTILATION SYSTEMS

# DOWNBLAST ROOF EXHAUSTERS

VC



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Model VC

Now Available with



see page 6



Model VC is cULus 705 listed for electrical, File No. E158680.



Twin City Fan & Blower certifies that the Model VC shown herein are licensed to bear the AMCA Seal. Certified performance data may be found in Twin City Fan & Blower's Fan Selector software.



Scan the QR code to search Twin City Fan & Blower's AMCA-certified products.



For complete product performance, drawings and available accessories, download our Fan Selector software at [tcf.com](http://tcf.com).

## Overview VC

Twin City Fan & Blower's line of quiet, efficient and economical centrifugal roof exhausters are designed to offer world-class performance and quality in a wide variety of commercial and industrial ventilating applications. Model VC features spun aluminum construction.

### Typical Applications Include

Schools, Office Buildings, Warehouse, Restaurants, General Exhaust

### Impeller Types

Backward Inclined or Backwardly Curved Centrifugal

### Optional Construction

Special Coatings, Spark Resistant, UL 705, Miami-Dade Hurricane Construction

### Certifications

AMCA Sound/Air and FEI, cULus Listed for Power Ventilators, Miami-Dade County Hurricane Rating per NOA No. 23-0918.01

### Performance Data

8.375" to 12" (215 mm to 305 mm) impeller diameters  
Airflow to 1,450 CFM (2,500 m<sup>3</sup>/hour)  
Static pressure to 1" w.g. (250 Pa)

## Energy Regulations

Twin City Fan & Blower supports energy efficiency regulations enacted by the Department of Energy (DOE) and energy commissions of specific states. The selection and application of fan products is a significant part of these regulations. Engineers and specifiers must understand how to apply Twin City Fan & Blower products to their specific applications to meet efficiency requirements. Twin City Fan & Blower has made significant investments in product testing to assure users will receive the most efficient products available. Developments in the Fan Selector software are in place to help aide in product selection to meet the efficiency requirements as stipulated in the regulations. Visit [tcf.com](http://tcf.com) for the latest on fan energy efficiency regulations.



General HVAC  
Roof & Wall Exhaust

**Housings** - VC housings feature heavy-gauge spun aluminum construction of the shroud and motor cover. Shrouds feature a rolled bead edge for rigidity. All housings provide complete protection of the motor, while allowing quick access to these components.

**Motors** - ODP and TEFC, single-phase motors are carefully matched to the fan load.

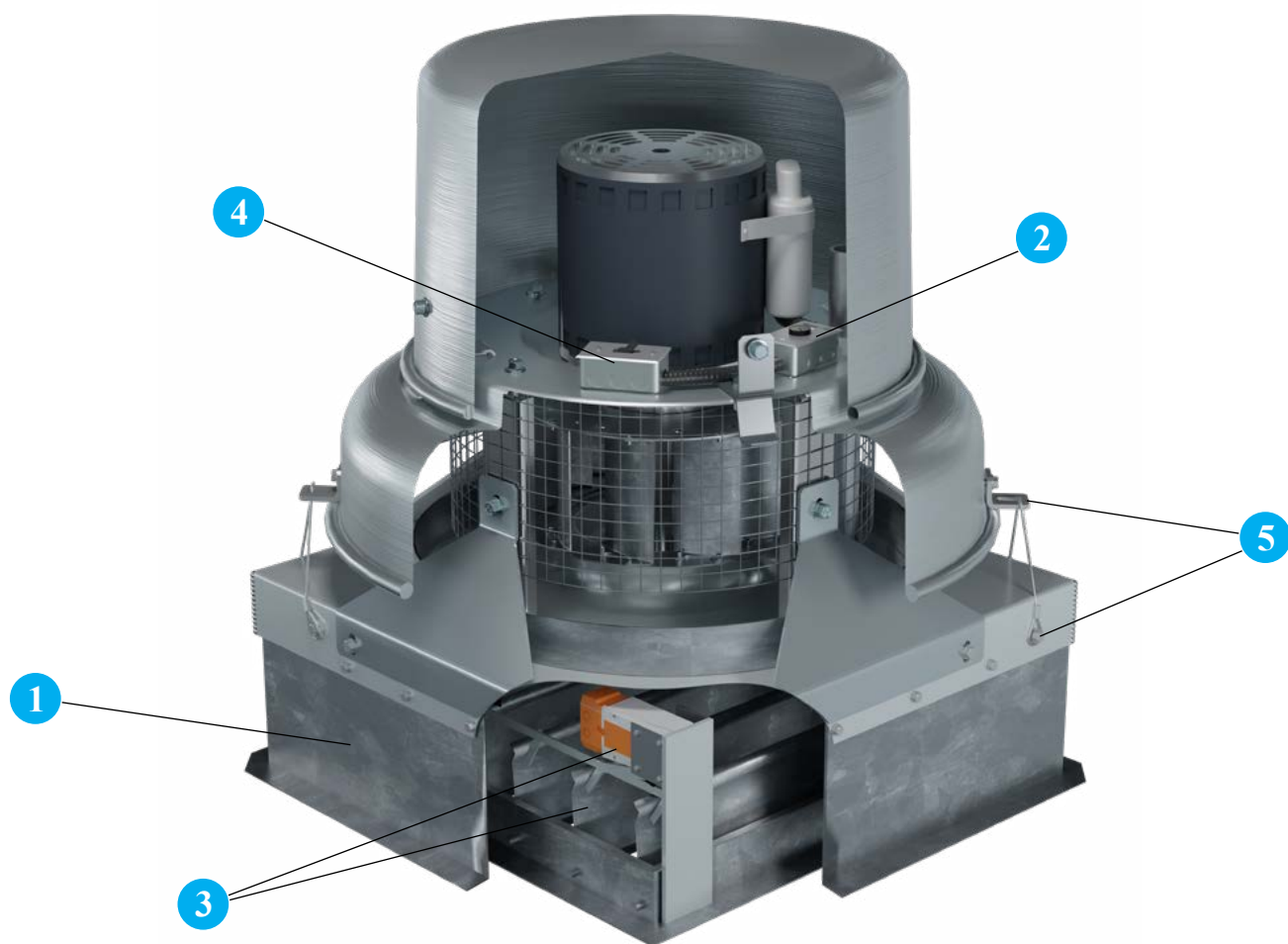
**Impeller** - Quiet and efficient non-overloading impellers with backward inclined or backwardly curved blades are precisely matched to a deep spun venturi. All impellers are statically and dynamically balanced to ensure smooth and quiet operation.

**Galvanized Bird Screen** - Protects the impeller, inlet and internal components from entry of birds.

**Curb Cap** - One-piece curb cap/inlet venturi assembly provides protection from weather. Prepunched mounting holes provide easy and accurate attachment to the roof curb.

**Conduit Tubing** - A conduit tube is furnished for running electrical wiring through the curb cap and into the motor compartment.

**Disconnect Switch** - Standard on all units. Fans are provided with a NEMA 1 type disconnect switch mounted in the motor compartment.



**1 Self-Flashing Roof Curb** Prefabricated roof curbs are available in heavy-duty galvanized steel or aluminum construction, in heights of 8", 12" or 18". The self-flashing curb is provided with a factory installed  $\frac{3}{16}$ " polystyrene gasket. Curbs are provided with 1.5" of insulation as standard and feature continuously-welded seams for added rigidity and moisture protection. Prefabricated curbs are also available in raised cant, pitched and peak models. Refer to Catalog 4910 for complete details on roof curb options. Minimum 12" high curbs are recommended for use with motorized dampers.

**2 Variable Speed Control** is an optional accessory on all VC models with 115 volt, open type motors, to allow the adjustment of airflow for system balancing. Variable speed controllers are solid-state (Tri-ac) design and are designed to start the motor on high speed for better startup characteristics. Variable speed controls can be shipped separately, factory installed or field installed on the unit at a later date. Motor must be ODP 115V, PSC type.

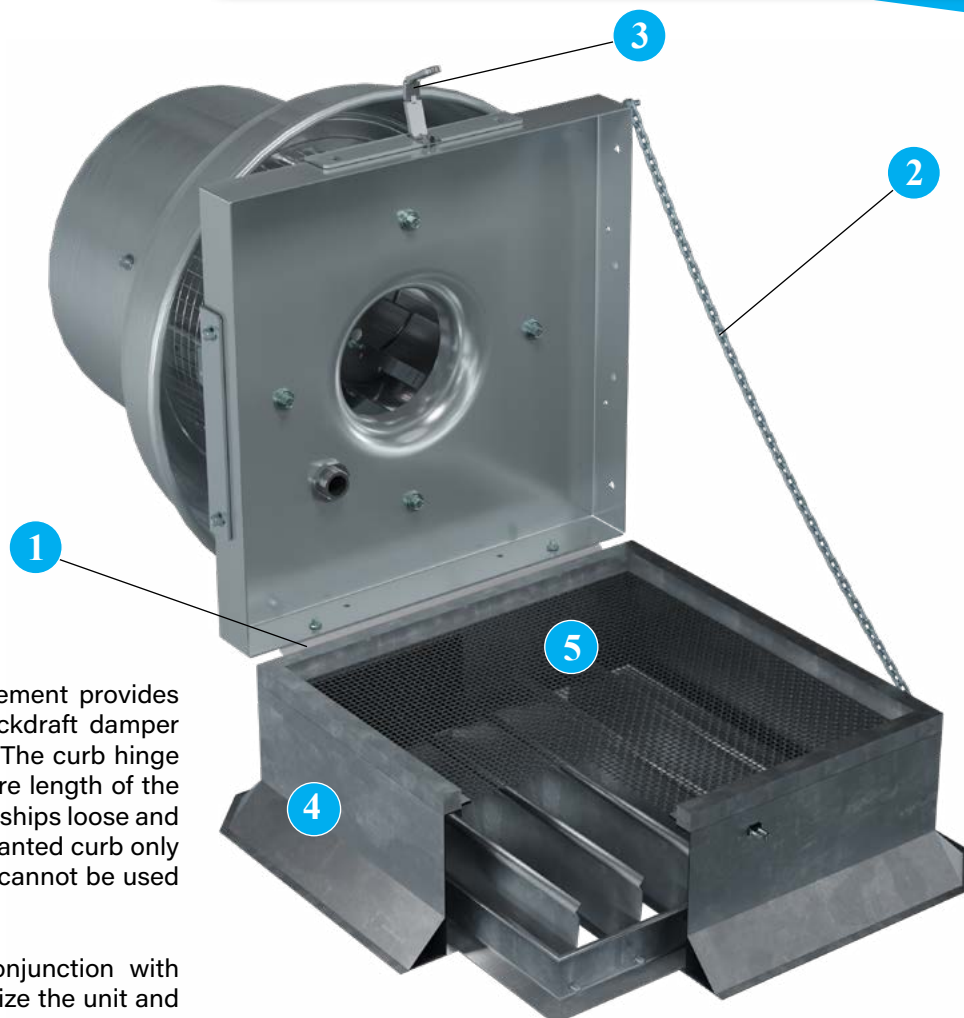
**3 Backdraft Damper**, with automatic or motorized operation, feature a felt seal on the edge of the damper blades for quiet operation. Damper frames are constructed of 19-gauge galvanized steel and blades are constructed of 26-gauge aluminum.

Motorized dampers are recommended for low CFM applications to assure unrestricted airflow. Motorized dampers are available with 115, 208, 230, 460, 575 or 24 volt service. End switches are available. When a motorized damper option is selected a 12" (or greater) high roof curb is required.

**4 NEMA 1 Disconnect Switch** provides positive electrical shutoff during fan cleaning or maintenance of fan. VC fans are provided with a NEMA 1 type disconnect switch in the motor compartment.

**5 Tie-Down Brackets** A quantity of four brackets are mounted to the fan shroud to allow the fan to be secured to the roof in areas where high winds are a concern. Guy wires are supplied and installed by others.





**1 Curb Hinge** The curb hinge arrangement provides easy access to the exhaust fan, backdraft damper and duct for servicing and cleaning. The curb hinge is of the piano type, running the entire length of the fan's curb cap. The curb hinge option ships loose and is designed for use with a standard canted curb only (1.5" less than fan base). This option cannot be used with self-flashing curbs.

**2 Retaining Chain** is available in conjunction with the curb hinge arrangement to stabilize the unit and to prevent damage from occurring to the unit while servicing and cleaning.

**3 Security Hasp** A security hasp is available in conjunction with the curb hinge arrangement to prevent removal of the unit from the unit curb cap and prevent entrance into the building through the roof's ductwork.

**4 Canted Roof Curb** Prefabricated roof curbs are available in heavy-duty galvanized steel or aluminum construction, in heights of 8", 12" or 18". The canted curb is provided with a factory installed wood nailer. Curbs are provided with 1.5" of insulation as standard and feature continuously-welded seams for added rigidity and moisture protection. Prefabricated curbs are also available in raised cant, pitched and peak models. Refer to Catalog 4910 for complete details on roof curb options. Minimum 12" high curbs are recommended for use with motorized dampers.

**5 Insect Screen** Provides protection from entry of insects into impeller, inlet and interior of building.

## OTHER ACCESSORIES/OPTIONS:

- **Special Coatings** for protective and decorative purposes.
- **Straight-Sided Roof Curb** See page 7 and refer to Catalog 4910 for complete details.
- **Firestat** Designed to shut down fan in the event of a fire to prevent spreading. For use with single-phase motors only. Available shipped loose for field mounting and wiring or factory mounted and wired.
- **AMCA Spark B** Includes a non-ferrous (aluminum) impeller and an aluminum rubbing plate around the opening through which the shaft passes.
- **Performance Baffle** Inlet plate with customized diameter to meet specific performance point. Ships loose for field mounting.
- **Miami-Dade Construction** Our high-performance fans are engineered to endure the formidable forces of a Category 4 hurricane. What sets us apart from the competition is our fan's exceptional durability, capable of withstanding not only hurricane winds but also large missile impacts per the Miami-Dade test. Choose resilience.

# ELECTRONICALLY COMMUTATED MOTORS



Model VC  
with GridSmart™ EC Motor

Twin City Fan & Blower offers its own line of custom engineered Electronically Commutated (EC) motors. Electronic commutation is the latest motor technology to be used in direct drive fans. Also known in the industry as Brush Free or Brushless DC, the EC motors utilize an electronic circuit board to control the functionality of the motor. The motor operates off of single-phase AC power, which is converted to DC power within the motor's circuitry. Twin City Fan & Blower has motor options available for 115V, 208V or 230V single-phase electrical power. The result is a highly efficient motor, even at part load, with an expanded speed control range and a variety of speed control options from which to choose. EC motors are available in ODP and TENV enclosures.



## Benefits

- Efficiencies up to 85%
- Constant efficiency as the motor speed is varied
- Up to 66% energy savings over traditional PSC motors
- Performance range comparable to a belt driven fan with reduced maintenance benefits of a direct drive fan
- 80% usable turndown range as compared with 40% maximum on PSC motors
- Soft start gives fans smooth, quiet start
- Lower operating temperatures result in longer life and reduces energy consumption
- Heavy-duty ball bearings are permanently lubricated
- Elimination of VFD results in lower initial cost

## EC Motor Options

### 1/8 HP to 1 HP

- 1/8 HP – 1 HP: 115V, 208V or 230V single-phase
- ODP or TENV enclosure
- 0-10VDC control leads as standard
- Available with remote mounted speed control dial or GridPoint controller, depending on the motor



1/8 HP to 1 HP  
GridSmart™ EC Motors



GridPoint Controller



## Canted Roof Curbs

- Constructed of 18-gauge galvanized steel with continuously-welded seams
- Large 3" built-in 45° cant to accommodate roofing material to top of curb. Cant is beveled at corners for better support of roofing material
- Wood nailer (1 1/2") secured to top ledge
- Lined with 1 1/2" fiberglass fire-resistant, sound-absorbing insulation
- Damper shelf standard
- Options: Aluminum (16-gauge) construction, burglar security bars, metal liner (galvanized or aluminum), special heights up to 24", single- or double-pitched curbs for sloping roofs



## Self-Flashing & Straight-Sided Roof Curbs

- Constructed of 18-gauge galvanized steel with continuously-welded seams
- Wide base plate (flashing) to ensure watertight seal to roof
- Top ledge covered with 3/16" polystyrene gasket (self-flashing) for weather seal and to reduce metal-to-metal conducted noise
- Wood nailer secured to top ledge (straight-sided)
- Lined with 1 1/2" fiberglass fire-resistant, sound-absorbing insulation
- Damper shelf standard
- Straight-sided roof curbs are constructed with the same features as the self-flashing curbs, but are one dimensional to allow for field supplied cants and roofing material to be brought up to the top of the curb
- Options: Aluminum (16-gauge) construction, burglar security bars, metal liner (galvanized or aluminum), special heights up to 24", single- or double-pitched curbs for sloping roofs



## Curb Adapters

- Constructed of heavy-gauge galvanized steel with continuously-welded seams
- Top ledge covered with 3/16" polystyrene gasket to reduce metal-to-metal conducted noise and act as a weather seal
- Available in enlarger or reducer (shown) models





NEMA 1 Disconnect Switch

## NEMA 1 Disconnect Switch

A NEMA 1 disconnect switch provides positive electrical shutoff during fan cleaning or maintenance of fan. VC fans are provided with a NEMA 1 type disconnect switch in the motor compartment.

## NEMA 3R Disconnect Switch

Model VC fans are available with a NEMA 3R rain-tight disconnect switch, externally mounted when ODP or TEFC motors are used. NEMA 3R, rain proof, disconnects are available shipped loose for field mounting and wiring or factory mounted and wired.



NEMA 3R Disconnect Switch

## NEMA 4 Disconnect Switch

A NEMA 4 disconnect switch (optional) is mounted externally and is water- and dust-tight. Switch is available shipped loose for field mounting and wiring or factory mounted and wired.

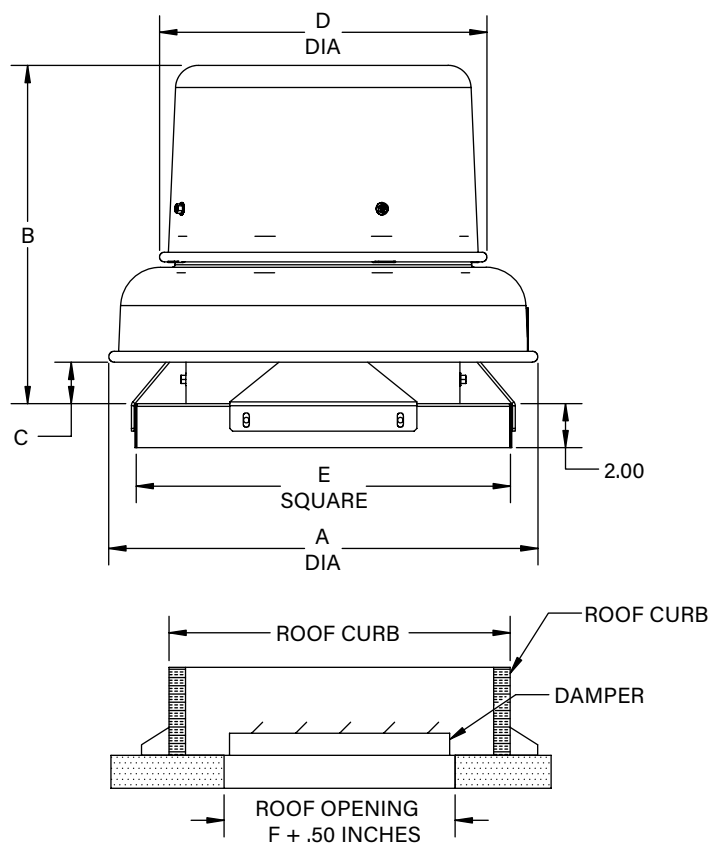


NEMA 4 Disconnect Switch





## Model VC



\* Damper not available on restaurant construction.

### Dimensional Data and Weights

SIZE	A	B	C	D	E INSIDE	DAMPER SIZE*	STANDARD CURB SIZE	AVG. UNIT WT. (LB.) <sup>o</sup>
077	19.50	15.36	1.88	14.87	17.00	10 X 10	15.5 X 15.5	40
083	19.50	15.36	1.88	14.87	17.00	10 X 10	15.5 X 15.5	36
085	19.50	15.36	1.88	14.87	17.00	10 X 10	15.5 X 15.5	36
089	22.00	17.30	2.67	17.44	17.00	10 X 10	15.5 X 15.5	41
098	22.00	17.30	2.67	17.44	17.00	10 X 10	15.5 X 15.5	41
112	22.00	17.30	2.67	17.44	17.00	10 X 10	15.5 X 15.5	43
120	22.00	17.30	2.67	17.44	17.00	10 X 10	15.5 X 15.5	43

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#### Notes:

1. All dimensions are in inches unless otherwise noted.
2. Dimensions are not to be used for construction.
3. Outside dimensions of dampers are nominal.
4. Outside dimensions of roof curb should be 1" to 1.50" less than inside curb cap dimension 'E', depending on thickness of flashing material used. If curb hinges are used, specify 1.50" difference.
5. Self-flashing roof curbs are 1" larger than canted curbs.

# TYPICAL SPECIFICATIONS



## Model VC

Roof exhaust fans shall be of the direct drive centrifugal type, Model VC, as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

**PERFORMANCE** — Performance ratings shall conform to AMCA Standard 211 (air performance) and 311 (sound performance). Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA accredited laboratory. Fans shall be licensed to bear the AMCA certified ratings seal for both sound and air. Model VC shall be cULus 705 listed.

**CONSTRUCTION** — Fans shall be constructed of aluminum for durability and appearance. Fan spinnings shall have a rolled bead edge for rigidity. Units shall have a deep venturi inlet to prevent snow and rain entry into the building. The curb cap shall include prepunched mounting holes for ease of installation. A conduit chase constructed of electrical metallic tubing shall be provided to the motor compartment. The motor cover shall overlap the shroud to prevent snow and rain entry into motor housing. Fans shall bear a permanently attached nameplate displaying model and serial number of the unit for future identification.

**MOTOR ASSEMBLY** — Motor assembly shall be mounted on a structurally designed shroud to minimize vibration and noise transmission into the ductwork. Motors shall be mounted out of the exhaust airstream.

**IMPELLER** — Fan impellers shall be of the centrifugal backward inclined or curved type, containing a matching inlet venturi for optimal unit performance. Impellers shall be statically and dynamically balanced in accordance with ANSI/AMCA 204-96 "Balance Quality and Vibration Levels for Fans" to Balance Quality Grade G6.3.

**MOTOR** — Motors shall be heavy-duty ball bearing type, closely matched to the fan load. All single-phase ODP motors shall contain thermal overload protection. All motors shall be UL and /or CSA recognized. Motors for use with speed control shall provide good speed controllability without any objectionable noise or thermal overloading.

**DISCONNECT SWITCH** — A NEMA 1 disconnect switch shall be supplied with wiring leading from the motor to the junction box (ODP and TEFC motors).

**FINISH AND COATING** — Fans shall be constructed of aluminum. The entire fan assembly, excluding the shaft, shall be properly washed and pretreated before application of a rust-preventative primer, if called out on the order. After the fan is completely assembled, a finish coat of paint shall be applied to the entire assembly, if called out on the order. The fan shaft shall be coated with a petroleum-based rust protectant.

**ACCESSORIES** — When specified, accessories such as backdraft damper, roof curb, curb hinge, retaining chain, security hasp, variable speed controller, NEMA 3R disconnect switch, NEMA 4 disconnect switch, firestat, aluminum bird screen, aluminum insect screen and special coatings shall be provided by Twin City Fan & Blower to maintain one source responsibility.

**FACTORY RUN TEST** — All fans prior to shipment shall be completely assembled and test run as a unit at operating speed or maximum RPM allowed for the particular construction type. Records shall be maintained and a written copy shall be available upon request.

**GUARANTEE** — The manufacturer shall guarantee the workmanship and materials for its roof and wall mounted centrifugal exhaust fans for at least one (1) year from startup or eighteen (18) months from shipment, whichever occurs first.





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