

## **SECTION 23 34 23**

### **POWER VENTILATORS**

#### **TAG: Centrifugal Downblast**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Fan shall be a spun aluminum, G90 Galvanized, roof or wall-mounted, direct drive, downblast centrifugal exhaust ventilator.

##### **1.2 SUBMITTALS**

- A. The manufacturer assumes no liability for the use or results of use of this document. This specification is to be reviewed by the engineer to confirm requirements of the project and building codes are met.
- B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

##### **1.3 QUALITY ASSURANCE**

- A. ETL Listed and complies with UL705 (electrical) Standards and CSA Std C22.2, No 113.
- B. Fan shall bear the AMCA certified rating seal for air performance.
- C. Wheels shall be balanced in two planes and done in accordance with AMCA standard 204-96, Balance Quality and Vibration Levels for Fans.
- D. Miami-Dade Certification – NOA 1 Aluminum Downblast.

##### **1.4 WARRANTY**

- A. All units are provided with the following 2-year standard warranty from date of shipment.
- B. 3-year Extended Warranty (motor only).
- C. This warranty shall not apply if:
  - 1. The equipment is not installed by a qualified installer per the manufacturer's installation instructions shipped with the product.
  - 2. The equipment is not installed in accordance with Federal, State, and Local codes and regulations.
  - 3. The equipment is misused, neglected, or not maintained per the manufacturer's maintenance instructions.
  - 4. The equipment is not operated within its published capacity.
  - 5. The invoice is not paid within the terms of the sales agreement.
- D. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by the manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization. All returned equipment shall be shipped by

the buyer, freight prepaid to a destination determined by the manufacturer.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL ASSEMBLY**

- A. The fan shall be factory assembled, tested, and shipped as a complete unit.
- B. The following specifications, delivering all capacities scheduled and conforming to the design indicated herein. Alternate layouts or dimensional changes will not be accepted.

### **2.2 CONSTRUCTION**

- A. The fan discharge apron shall be constructed of heavy gauge aluminum. It shall be spun on an automatic lathe to provide consistent dimensions.
- B. The discharge apron shall have a rolled bead for added strength.
- C. Base corners shall be welded to provide strength and support for hinging and cleaning and prevent leakage into the building.
- D. The fan shall bear a permanently attached nameplate displaying model and serial number of unit for future identification.
- E. The unit shall be factory tested after assembly.

### **2.3 CURB**

- A. The curb shall be constructed of galvanized steel.
- B. The heavy duty G90 galvanized curb cap shall have fully welded corners for added strength and leak protection.
- C. Hinged Base: None
- D. Hinged Base: Attached
- E. Hinged Base: Loose
- F. Hinged Base: Locking Attached
- G. Hinged Base: Locking Loose
- H. Paint Option: Not Painted
- I. Paint Option: Enamel
- J. Paint Option: Epoxy
- K. Insulated
- L. Burglar Bars
- M. Electrical Knock-Out
- N. Full Bottom Corners
- O. Welded Bottom Corners
- P. 16-gauge

### **2.4 WHEEL**

- A. The fan wheel shall be centrifugal backward inclined and non-overloading.
- B. The wheel blades shall be aerodynamically designed to minimize turbulence, increase

efficiency and reduce noise.

- C. The wheel blades shall be welded to the wheel inlet cone.
- D. If balancing weights are required, they shall be riveted to the blades or wheel.
- E. The wheel inlet shall overlap the fan base inlet for maximum performance and efficiency.
- F. The wheel shall be firmly attached to the motor shaft with two set screws.

## **2.5 MOTOR**

- A. Motor Type: Totally Enclosed Air Over Electronically Commutated Motor (TEAO-ECM).
- B. Motor Type: Open Drip Proof (ODP).
- C. Motor Type: Totally Enclosed Fan Cooled (TEFC) motor driven by a Variable Frequency Drive.
- D. Motor shall be permanently lubricated and rated for continuous duty.
- E. Furnished at the specified voltage, phase, and enclosure. Motor speed shall be variable, controlled using an integrated speed controller.
- F. Motors shall be mounted out of the airstream and furnished at the specified voltage, phase, and enclosure.
- G. Motor mounting plate shall be constructed of heavy gauge aluminum.
- H. The motor compartment shall be cooled by outside air through louvers in the motor cap.
- I. An integral electrical conduit running from the fan base to the motor compartment is provided for ease of installation.

## **2.6 ECM EXHAUST WIRING PACKAGES**

- A. ECM Wiring Package - Exhaust - Manual or 0-10VDC Reference Speed Control -MSC- (NIDEC)
- B. ECM Wiring Package - Exhaust - Manual or 0-10VDC Reference Speed Control -MSC- (TELCO), CCW Rotation
- C. ECM Wiring Package - Exhaust - MODBUS Control -MSC- (NIDEC)
- D. ECM Wiring Package - Exhaust - MODBUS Control -MSC- (TELCO), CCW Rotation
- E. ECM Wiring Package - Manual or 0-10VDC Reference Speed Control (TELCO Motor), CCW Rotation
- F. ECM Wiring Package - PWM Signal from ECPM03 Prewire (TELCO Motor), CCW Rotation
- G. ECM Wiring Package-Exhaust - Manual or 0-10VDC Reference Speed Control (NIDEC Motor)
- H. ECM Wiring Package-Exhaust - PWM Signal from ECPM03 Prewire (NIDEC Motor)

## **2.7 CONTROL OPTIONS**

- A. Current Sensor Mounted in Exhaust Fan for with with Prewire Proving.
- B. RTC 0-10V Settings: Changes "APP" is set to "PuLS". "LSPD" is set to "0", "re" is set to

"0-10" to use with 0-10V signal. (Nidec)

C. RTC 0-10V Settings: Changes "APP" is set to "PuLS". "LSPD" is set to "0", "re" is set to "0-10" to use with 0-10V signal. (TELCO)

## **2.8 OPTIONS AND ACCESSORIES**

A. Fan Back Draft Damper Motorized I BDD 120/240V.

B. Fan Back Draft Damper Motorized I BDD 24V.

C. Fan Back Draft Damper Motorized I BDD 460V.

D. Motor Grounding Kit – Shaft Grounding Ring. Epoxy mounted to face of motor.

E. Gravity Back Draft Damper I BDD.

F. 2" Wall Mount Brackets.

G. 5" Wall Mount Brackets.

H. Class B Spark Resistant construction for USBI, CASRE, and DU/DR fans.

I. Class C Spark Resistant construction for PRVs.

J. Exhaust Fan Heat Baffle.

K. Guy Line Eye Bolts – Used for 4 Guy Line Tie Off Points.

L. Hinge Kit – Ships Loose for curb supplied by others.

M. Hinge Kit Locking – Ships Loose for curb supplied by others.

N. Thermostat Control.

O. Painted Coatings: Tan enamel coating.

P. Through Wall Curb Mount Installation. Curb height must be minimum 9" taller than wall thickness for use with a hinge kit.

Q. Wall Mount Construction for Fan.

R. Wall Mount Construction (Isolators), 70lb Max for wall mounting.

S. Fan Occupancy Sensor.

## **2.9 VFD OPTIONS**

A. VAV Package with Manual Control (VFD included).

B. VAV Package with Static Pressure Control (VFD included).

C. VAV Package with Preset or Reference Speeds (VFD included).

D. Line Reactor Mounted in Fan.

E. Load Reactor Mounted in Fan.

F. VFD unit mounted.

G. VFD factory mounted and wired in exhaust fan.

H. Unit mounted VFD for use with ECPM03.

I. VFD Mounting Bracket.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine all areas and conditions under which package(s) are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

### **3.2 INSTALLATION**

- A. Install the package in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

### **3.3 CONNECTIONS**

- A. Electrical connections conform to applicable requirements in Division 26 Sections.

### **3.4 SYSTEM START-UP**

- A. System start-up is performed by a factory-trained Service Technician.