

PRODUCT SPECIFICATION GUIDE
MODEL CSP-A DIRECT DRIVE PREMIUM INLINE CABINET CENTRIFUGAL EXHAUST FAN
FACILITY SERVICES SUBGROUP: DIVISION 23 SECTION 23 34 23

Specifier Notes: This product specification guide is written in accordance to the Construction Specifications Institute (CSI) Format - 2004 Edition.

This section must be carefully reviewed and edited by the Engineer to meet the requirements of the project and local building code. Coordinate with other specification sections and the drawings.

Delete all unnecessary “**Specifier Notes**” when editing this section.

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1. GENERAL

1.1 SUMMARY

- A. Section Includes: HVAC Power Ventilators
- B. Related Sections:

Specifier Notes: Delete any sections below not relevant to this project; add others as required.

- 1. 01 00 00 General Requirements
- 2. 07 00 00 Thermal and Moisture Protection
- 3. 09 00 00 Finishes
- 4. 23 00 00 Heating, Ventilating, and Air-Conditioning (HVAC)
- 5. 26 00 00 Electrical

1.2 REFERENCES

Specifier Notes: Delete references from the list below that are not actually required by the text of the edited section.

- A. Air Movement and Control Association Inc. (AMCA):
 - 1. 99 - Standards Handbook
 - 2. 200 - Publication, Air Systems
 - 3. 201-90 - Publication, Fans and Systems
 - 4. 202-88 - Publication, Troubleshooting

5. 203-90 - Publication, Field Performance Measurement of Fan Systems
 6. 211-05 - Publication, Certified Ratings Program – Product Rating Manual for Fan Air Performance
 7. 300-96 - Standard Reverberant Room Method for Sound Testing of Fans
 8. 311-05 - Publication Certified Ratings Program – Product Rating Manual for Fan Sound Performance
 9. 99-0401-86 - Classification for Spark Resistant Construction
 10. 99-2408-69 - Operating Limits for Centrifugal Fans
- B. Air Movement and Control Association Inc. (AMCA), American National Standards Institute (ANSI):
1. 204-05 - Standard Balance Quality and Vibration Levels for Fans
 2. 210-99 - Standard Laboratory Methods of Testing Fans for Aerodynamic Performance Rating
- C. American National Standards Institute (ANSI):
1. 11-r1999 - Method of Evaluating Load Ratings of Bearings
- D. American Society of Civil Engineers (ASCE):
1. 7-02 - Minimum Design Loads for Building and Other Structures
- E. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE):
1. Chapter 45 - 2003 Handbook, HVAC Applications
 2. Chapter 7 - 2001 Fundamentals handbook, Sound-Vibration
 3. Chapter 32 - 2001 Fundamentals handbook, Duct Design
 4. Chapter 18 - 1992 HVAC System and Equipment handbook, Fans
- F. American Society for Testing and Materials (ASTM):
1. E330-02 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylight and Curtain Walls by Uniform Static Air Pressure Difference
- G. National Fire Protection Association (NFPA)
1. 70 - National Electrical Code
 2. 90A-02 - Standard for the Installation of Air-Conditioning and Ventilating Systems
 3. 92A-06 - Recommend Practice for Smoke-Control System
 4. 92B-05 - Standard for Smoke Management System in Malls, Atria, and Large Areas
 5. 96-04 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
- H. Occupational Safety and Health Administration (OSHA):
1. 1910.212 - General requirements for Machine Guarding
 2. 1910.219 - General requirements for guarding safe use of mechanical power transmission apparatus
 3. 1926.300 - General requirements for safe operation and maintenance of hand and power tools
- I. Underwriters Laboratories (UL):
1. 507 - Electric Fans
 2. 555 - Fire Dampers
 3. 555S - Smoke Dampers
 4. 705 - Standard Power Ventilators
 5. 762 - Standard Power Roof Ventilators for Restaurant Exhaust Appliances
 6. 793 - Snow Load

1.3 SUBMITTALS

- A. General: Submit in accordance with Section 01 33 00 Submittal Procedures
- B. Provide dimensional drawings and product data on each fan
- C. Provide fan curves for each fan at the specified operation point, with the flow, static pressure and horsepower clearly plotted
- D. Provide outlet velocity and fan's inlet sound power readings for the eight octave bands, decibels, and sones
- E. Strictly adhere to QUALITY ASSURANCE requirements as stated in section 1.04 of this specification
- F. Provide manufacturer's certification that exhaust fans are licensed to bear Air Movement and Control Association (AMCA), Certified Rating Seal for sound and air performance

- G. Installation, Operation, and Maintenance Manual (IOM): Provide manufacturer's installation, operations, and maintenance manual, including instructions on installation, operations, maintenance, pulley adjustment, receiving, handling, storage, safety information and cleaning. A troubleshooting guide, parts list, warranty and electrical wiring diagrams

1.4 QUALITY ASSURANCE

- A. Performance ratings: Conform to AMCA standard 211 and 311. Fans must be tested in accordance with ANSI/AMCA Standard 210-99 and AMCA Standard 300-96 in an AMCA accredited laboratory. Fans shall be certified to bear the AMCA label for air and sound performance seal
- B. Classification for Spark Resistant Construction, Levels A, B and C, conform to AMCA 99
- C. Each fan shall be given a balancing analysis which is applied to wheels at the outside radius. The maximum allowable static and dynamic imbalance is 0.05 ounces (Balance grade of G6.3)
- D. Comply with the National Electrical Manufacturers Association (NEMA), standards for motors and electrical accessories
- E. The High Wind models have been analyzed and stamped by a state license P.E. to the ASCE 7-02 Standard which meets the IBC, Florida and Miami-Dade codes
- F. Each High Wind model is subject to be certified by a third party to the ASTM E330 Static Pressure Difference Standard
- G. All High Wind models have been analyzed using Computational Fluid Dynamics (CFD). The CFD simulates the flow of high speed (150MPH) winds over the surface of objects
- H. The Finite Element Analysis (FEA) is the results from the CFD and it can accurately predict the stress, strain, and deflection resulting from high wind loads

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer, material, products included, and location of installation
- B. Storage: Store materials in a dry area indoor, protected from damage, and in accordance with manufacturer's instructions. For long term storage follow manufacturer's Installation, Operations, and Maintenance Manual
- C. Handling: Handle and lift fans in accordance with the manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage. Follow all safety warnings posted by the manufacturer

1.6 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents
 - 1. The warranty of this equipment is to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at the Manufacturers option when returned to Manufacturer, transportation prepaid
 - 2. Motor Warranty is warranted by the motor manufacturer for a period of one year. Should motors furnished by us prove defective during this period, they should be returned to the nearest authorized motor service station

1.7 MAINTENANCE

- A. Refer to Manufacturer's Installation, Operation and Maintenance Manual (IOM), to find maintenance procedures

2. PRODUCTS

2.1 MANUFACTURER

- A. Greenheck, PO Box 410, Schofield, Wisconsin 54476. Phone (715) 359-6171. Fax (715)355-2399. Website: www.greenheck.com

2.2 DIRECT DRIVE PREMIUM INLINE CABINET CENTRIFUGAL EXHAUST FANS - GREENHECK MODEL CSP-A

A. General Description:

1. Base fan performance at standard conditions (density 0.075 Lb/ft3)
2. Ceiling mounted applications
3. Performance capabilities up to 3,700 cubic feet per minute (cfm) and static pressure to 1 inches of water gauge
4. Fans are available in nineteen sizes (110 - 3600 unit sizes)
5. Maximum operating temperatures is 130 Fahrenheit (54.4 Celsius)
6. Sound levels as low as 0.8 AMCA sones
7. Fans are UL/cUL listed 507 - Electric Fans
8. Each fan shall bear a permanently affixed manufacture's nameplate containing the model number and individual serial number

B. Wheel:

1. Forward curved centrifugal wheel
2. Constructed of galvanized steel or calcium carbonate filled polypropylene
3. Statically and dynamically balanced in accordance to AMCA Standard 204-05

C. Motors:

1. Motor enclosures shall be open driproof (ODP), opening in the frame body and or end brackets
2. Motors are permanently lubricated sleeve bearing type to match with the fan load and furnished at the specific voltage and phase
3. Motor shall be mounted on vibration isolators and be accessible for maintenance
4. Compatible for use with speed controls
5. Thermal overload protection

D. Housing:

1. Constructed of heavy gauge galvanized steel
2. Interior shall be lined with 0.5 inches of acoustical insulation
3. Profile as low as 10 ½ inches

E. Spring Loaded Aluminum Backdraft Damper:

1. Prevents air from entering back into the building when fan is off
2. Eliminates rattling or unwanted backdrafts

F. Outlet:

Specifier Notes: Edit the following outlet connections. Round Duct Connection is standard on sizes A50, A70, and A90. Consult manufacturer for additional information

1. Type of outlet: [Square] [Round]
2. Field rotatable from horizontal to vertical discharge
3. Duct collar shall include an aluminum backdraft damper

G. Grille:

Specifier Notes: Edit the following grille to meet project requirements

1. Designer: Calcium-carbonate, Factory Standard
 2. Decorative: Calcium-carbonate, Lighted and non-lighted
 3. Aluminum: White enamel finish
 4. Stainless Steel: Polished stainless steel finish
- Consult manufacturer for additional information.

1. Types: [Designer] [Decorative] [Aluminum] [Stainless Steel]
2. Constructed of high impact polystyrene for sizes 50 thru 390, plastic shall be factory standard on unit under 390
3. Constructed of aluminum non-yellowing for sizes 410 thru 3600, aluminum shall be factory standard on units over 410.

H. External Electrical Access:

1. Eliminates removing the motor pack which saves time on installation

I. Mounting Brackets:

- 1. Fully adjustable for multiple installation conditions
- J. Access Panel:
 - 1. Once installed shall have easy access to internal components
- K. Options/Accessories:

Specifier Notes: Specify accessories 1 - 10 required for the exhaust fans. Delete accessories not required. Consult manufacturer for additional information.

1. Disconnect Switches:

Specifier Notes: Edit the following Disconnect Switches to meet project requirements: Factory Mounted and Shipped loose for field mounting, National Electrical Manufacturers Association (NEMA)

1. NEMA 1: indoor application no water. (Single pole rocker switch assembly)(two pole rocker switch assembly)

2. NEMA MS-16: Single pole rocker switch assembly with cover and pilot light

Consult manufacturer for additional information

- a. NEMA rated: [1] [MS-16]
- b. Positive electrical shut-off
- c. Wired from fan motor to junction box installed within motor compartment
- d. Access for wiring shall be external
- 2. Motion Detectors:
 - a. Mounted Location: Wall
 - b. Infrared motion detector shall automatically turn on the fan when there is a change in temperature
 - c. Viewing area of 180 degrees
 - d. Adjustable time delay shutoff setting of 1 to 20 minutes
- 3. Speed Controls:
 - a. Controls the fan's output
 - b. Fan can be adjusted to 60 percent of full speed
 - c. Can be used to operate more than on fan at a time
- 4. Time Delay Switch:
 - a. Save energy by automatically turning off the fan
 - b. On a delay of 1 to 60 minutes after the light on fan has been turned off.
- 5. Transformers:

Specifier Notes: Edit the following transformers to meet project requirements:

1. Model T-2.0, UL listed, Rated for 230/277v to 115, 2.0 amps max at 120 volts

1. Model T-4.3, UL listed, Rated for 230/277v to 115, 4.3 amps max at 120 volts

2. Model T- 6.5, UL listed, Rated for 230/277v to 115, 6.5 amps max at 120 volts

3. Model T-8.6, UL listed, Rated for 230/277v to 115, 8.6 amps max at 120 volts

Consult manufacturer for additional information.

- a. Type: [T-2.0] [T-4.3] [T-6.5] [T-8.6]
- b. Available for applications requiring voltage reduction
- c. All transformers are shipped loose
- 6. Wall Discharge:

Specifier Notes: Edit the following Wall Discharge Positions to meet the requirements of the project.

1. Round Connection, Hooded Wall Cap (Model WC), Aluminum Construction with aluminum finish, for outside wall applications, built in birdscreen and damper.

2. Square/Rectangular Connection, Hooded Wall Cap (Model WC), Steel construction with black enamel finish, for outside wall applications, built in birdscreen and damper

3. Wall Louvered Discharge (Model WL), Anodized aluminum grille, built in damper

4. Brick Vent (Model BE), Designed for installation in masonry walls, anodized aluminum construction, built in aluminum mesh insect screen

- 5. Round Duct Connector (Model RDC), replace the standard square discharge duct connector and damper, galvanized steel construction
- 6. Transition Duct Reducer (Model TR 6x4), Reduces duct from 6 to 4 inches, galvanized steel construction

Consult manufacturer for additional information

- a. Type: [Round Connection, hooded wall cap model WC] [Square/Rectangular Connection, hooded wall cap model WC] [Wall Louvered Discharge, model WL] [Brick Vent, Model BE] [Round Duct Connector, model RDC] [Transition Duct Reducer, Model TR 6x4]

7. Roof Discharge:

Specifier Notes: Edit the following Roof Discharge Position to meet the project requirements

- 1. Pitched Roof Cap (Model RJ), Steel construction with black enamel finish, integral flashing flange, built in birdscreen and damper
- 2. Elbow Discharge with Grille (Model EL), Designed for installation under roof eaves, painted steel louvered grille, built in damper

Consult manufacturer for additional information.

- a. Type: [Pitched Roof Cap, Model RJ] [Elbow Discharge with Grille, Model EL]

8. Flat Roof Caps:

Specifier Notes: Edit the following Flat Roof Caps to meet the requirement of the project.

- 1. Model RCC-7, Curb Cap: weathertight aluminum construction, integral birdscreen, built in curb cap which require roof curb.
- 2. Model GRS, Curb Cap: aluminum exterior construction, galvanized steel internal supports, integral birdscreen, built in curb cap which requires roof curb.
- 3. Model RFC-7, Flashing Flange: weathertight aluminum construction, integral birdscreen, built in flashing flange
- 4. Model GFSF, Flashing Flange: aluminum exterior construction, galvanized steel internal supports, integral birdscreen, built in flashing flange

Consult manufacturer for additional information.

- a. Type: [Model RCC-7] [Model GRS] [Model RFC-7] [Model GFSF]

9. Vibration Kit:

- a. Available for suspended installations
- b. Includes prepunched hole for ease of installation and shall have all hardware to mount one unit.

3. EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog installation instructions

3.2 EXAMINATION

- A. Examine areas to receive fans. Notify the Engineer of conditions that would adversely affect installation or subsequent utilization and maintenance of fans. Do not proceed with installation until unsatisfactory conditions are corrected

3.3 PREPARATION

- A. Ensure roof openings are square, accurately aligned, correctly located, and in tolerance
- B. Ensure duct is plumb, sized correctly, and to proper elevation above roof deck. Install duct as specified in Air Distribution (Division 23)

3.4 INSTALLATION

- A. Install fans system as indicated on the Installation, Operation and Maintenance Manual (IOM) and contract drawings
- B. Install fans in accordance with manufacturer's instructions

3.5 SYSTEM STARTUP

- A. Refer to Installation, Operation, and Maintenance Manual (IOM)

3.6 ADJUSTING

- A. Adjust exhaust fans to function properly
- B. Adjust Belt Tension
- C. Lubricate bearings
- D. Adjust drive for final system balancing
- E. Check wheel overlap

3.7 CLEANING

- A. Clean as recommended by manufacturer. Do not use material or methods which may damage finish surface or surrounding construction

3.8 PROTECTION

- A. Protect installed product and finished surfaces from damage during construction
- B. Protect installed exhaust fans to ensure that, except for normal weathering, fans will be without damage or deterioration at time of substantial completion

Section 1.01 END OF SECTION 23 34 23