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# JM Aerofoil Fans

Bulletin JMA60-05



## Introduction

### The high performance JM Aerofoil Fan

Benefits of the JM Aerofoil Fan include compactness, low cost, high efficiency and rugged design. Availability in numerous fan diameters, hub diameters, speeds and blade solidities assures a highly efficient selection for your application.



### Sound Levels

Extensive sound testing has proved that the JM Aerofoil axial fans have the lowest sound power levels currently available. Both inlet and outlet sound power levels are given for every fan size and speed at the design performance.

### Woods in North America

Woods fans have been sold in North America since 1957. The company's US marketing and manufacturing group is located at the Howden American Fan Company, Fairfield, Ohio.

### Installations

Woods fan can be found in thousands of offices, educational, medical, manufacturing and public buildings – from the Mall of America in Minneapolis and the new Boston Garden to the San Francisco Airport and McCormick Place Convention Center in Chicago.

### Service

Servicing Woods installations is a cooperative effort between the Woods engineering and field service staff. Field service groups are based in both Fairfield, Ohio (USA) and Colchester, England (UK).

### Sales Office

There are over 100 sales offices in over 50 major cities throughout North America.

### Ratings

Howden American Fan Company certifies that the model JM Aerofoil fans shown herein are licensed to bear the AMCA Seal. The ratings shown are based on test and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program.



The AMCA Certified Ratings Seal applies to air performance ratings only.

### Quality Assurance

Howden American Fan Company's Quality Management System is certified to ISO-9001: 2000 standards.



## JM Aerofoil Features

### Motors

Motors are cast iron, pad mounted design suitable for horizontal through vertical operation. Motors are 3 phase premium efficiency totally enclosed air over design with 1.15 service factor. Standard efficiency motors are also available.

All efficiency testing and labelling is done in accordance with NEMA MG1-12.53 standard. Class F insulation with Class B rise is standard. Bearings are anti-friction grease lubricated ball or roller with 30,000 hour L-10 life minimum.

### Electrical Supply and Starting

Standard motors are 3 phase/60 Hz/460V. Other voltages, 50 Hz, and 1 phase are also available.

Motors are available for across-the line, Wye-Delta, Part Winding, or Autotransformer starting.

### Impellers

JM Aerofoil impellers have a unique aerodynamic blade section to optimise efficiency and performance while minimizing the noise. The thin sections obtained by high pressure die cast technique promote efficiency, strength and lower weight.

Impellers are comprised of high pressure die cast aluminium blades, hub and clamp plate with fully adjustable pitch angle. All impeller components are X-ray examined to ASTM E-155 prior to machining to assure premium quality.

Impellers are precision balanced as a component and fan assembly is further balanced to minimise vibration levels.

### Casings

JM fan casings are heavy gauge steel with spun flanges and continuously welded seams. They are manufactured to stringent tolerances for roundness assuring proper blade tip clearances required for optimal performance.

### Non-Overloading

JM Aerofoil fans have a non-overloading characteristic. The peak power input occurs within normal operating range of pressures and is always exceeded by the motor rating.

### Reversal of Airflow

JM Aerofoil fans can be reversed for emergency use. Reversal is obtained by interchanging electrical connections. If frequent reversals are necessary, contact the factory. A 'truly reversible' impeller can be provided where equal volume in either airflow direction is required.

### Accessories

- Motor and Impeller side guards
- Mounting Feet
- Horizontal or vertical suspension clips
- Companion Flanges
- Flexible Connectors
- Back draft Dampers
- Inlet Bells
- Vibration Isolators
- Outlet Cones, Silencers and Acoustical Diffusers

### Finish

Parts are cleaned, primed and then finish painted with premium grade enamel. Hot dipped galvanized, epoxy and other coatings are also available.

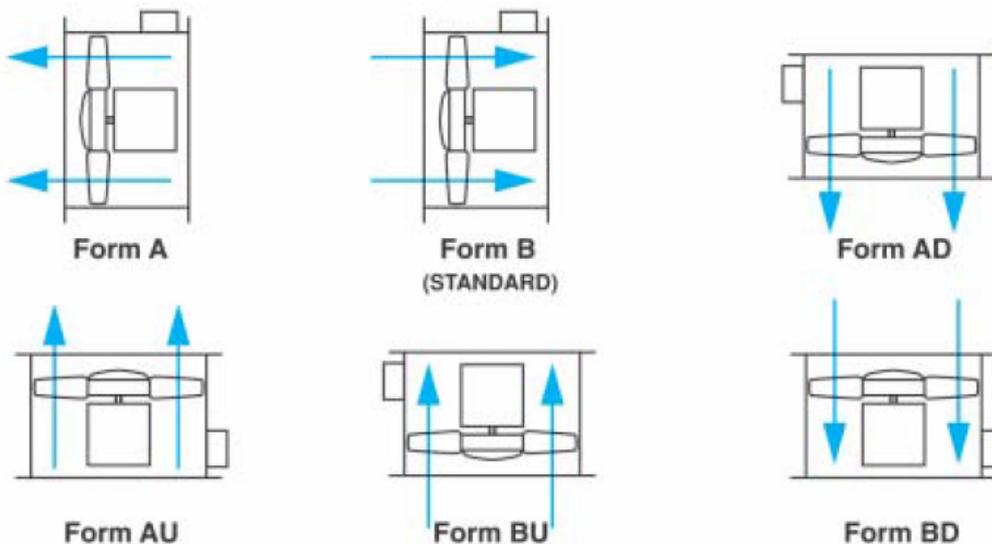
## Forms of running and mounting

The direction of airflow through the fan and the fan mounting position are defined as the 'Form of running'.

On each chart is shown the standard Form(s) of running for that particular fan, when mounted horizontally. For vertical operation add suffix "U" for airflow up, or suffix "D" for airflow down.

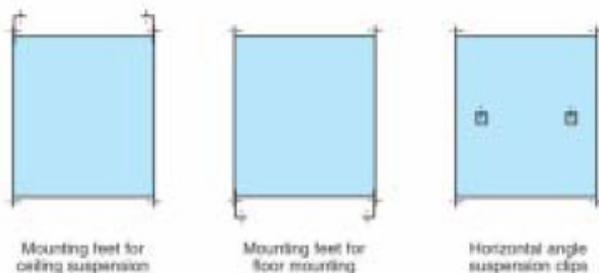
Arrows indicating correct rotation and direction of airflow are incorporated in the duct nameplate.

The standard Form of running offered will be Form B. When an alternative is available: see chart information, please request when the fan is ordered. Form of running is especially relevant when weatherproofed motors are required.

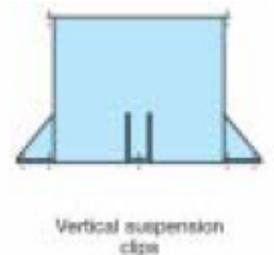


### Mounting

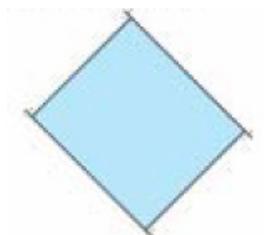
Horizontal – JM Aerofoil fans may be floor or ceiling mounted with optional mounting feet. They may also be ceiling suspended with optional horizontal suspension clips.



Vertical – JM Aerofoil fans may be mounted for vertical up or down airflow. Optional vertical mounting clips are available.



Angular – JM Aerofoil fans may be angular mounted at any position. For special mounting clip arrangement contact factory.



## Fan Specifications

1. Fans shall be manufactured by Howden American Fan/Woods USA. Fan casings shall be made of heavy gauge steel with spun flanges and continuously welded seams. They shall be manufactured to stringent tolerances for roundness to assure proper blade tip clearance for optimal performance.
2. Motors shall be cast iron frame, pad-mounted design suitable for horizontal through vertical operation. Motors shall be 3 phase premium efficiency (or 1 phase standard efficiency) totally enclosed air over design with 1.15 service factor. All motor efficiency testing and labelling shall be done in accordance with NEMA MG1-12.53 standard. Insulation shall be class F with class B rise. Bearings shall be grease lubricated anti-friction ball or roller type with 30,000 hours L-10 life minimum.
3. Impeller shall consist of high pressure die cast aluminium airfoil blades, hub, and clamp plate with fully adjustable blade pitch angle. All impeller components are to be X-ray examined to ASTM E-155 prior to machining to assure casting integrity and quality. Impellers shall be precision balanced as a component and then further balanced as a fan assembly to minimise vibration levels and assure smooth operation.
4. Motor supports shall be heavy gauge steel and bolted to the fan casing and the motor to assure the concentricity of the motor to the fan casing.
5. Finish of fan assembly shall consist of high-pressure cleaning, application of 1 coat of primer and 1 coat of enamel paint. Dry film thickness (DFT) shall be 2.5 mils minimum.
6. Fans shall be licensed to bear the AMCA Seal. Ratings shall be based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program.
7. Fan manufacturer shall be certified to ISO 9001 quality system standards.

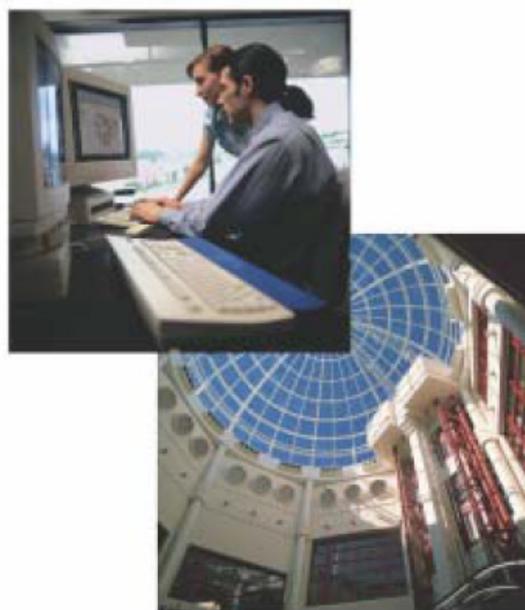
## Also Available...

### JM Aerofoil Fans for Building Fire Safety/Smoke Exhaust

In any building, fire smoke can be the major killer. In the event of a fire in densely populated buildings, such as schools, office buildings, department stores, shopping malls, sports arenas, and hotels, rapid, efficient smoke evacuation is vital to safe escape and minimisation of damage.

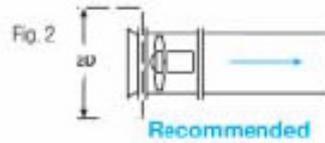
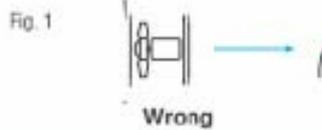
Howden American Fan/Woods USA has built and thoroughly tested JM Aerofoil fans specifically for this application. Fans are typically rated for 250 degrees C (482 degrees F) for one hour or 200 degrees C (392 degrees F) for two hours. Higher temperature ratings are available.

Fans for smoke exhaust can be provided for either duct mounting or as roof mounted exhaust fan. Contact your local Howden American Fan USA sales representative or the factory for more information.



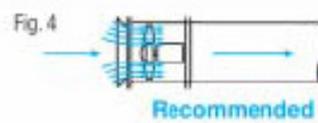
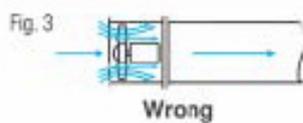
## Installation Recommendations

A sharp-edged fan inlet orifice reduces fan performance.



Fit a bell-mouth inlet to the fan.

A flanged fan inlet starves the impeller blade tips of air reducing performance and increasing noise.



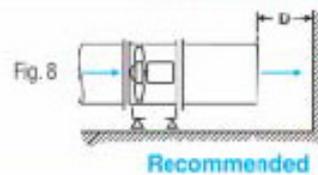
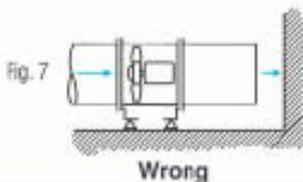
A bellmouth inlet guides air into the impeller blade tips.

Avoid obstructions close to fan inlets. Part of impeller is starved of air.



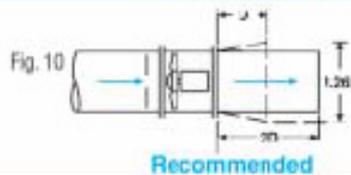
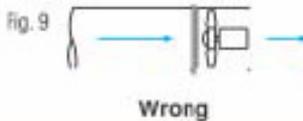
Allow a space of at least one diam. (D) at the fan inlet.

Avoid obstruction close to the fan outlet.



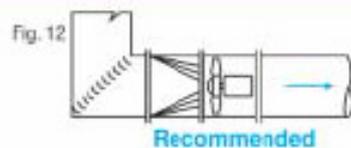
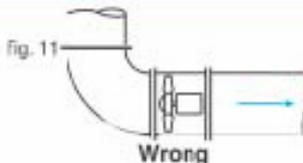
Allow a space of at least the fan diam. (D) at the fan outlet.

Avoid fan terminating the discharge end of a system.



Fit a duct length of 2D or an outlet expander D x 1.26 after the fan at the discharge end. Extra ducting after the expander helps even more. See charts.

Fan performance suffers and noise is increased if a 90° circular section bend of small radius is used.



Use a square bend with short chord turning vanes. This is also preferable when air flow is in the opposite direction.

Do not use an expander of 30° or more immediately before or after a fan.



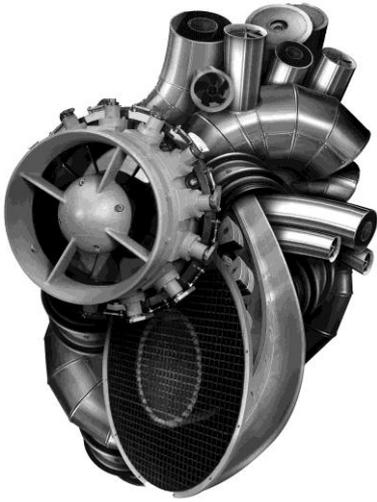
Ideally an expander immediately before a fan should not be more than 15°.

Flexible connectors should not be slack, as this will cause "necking", which will starve the impeller blade tips of air, reduce fan performance, and increase noise.



Flexible connectors should be just long enough for mechanical isolation and should be taut.

### Flex Connectors



## At the heart of your operations

Howden people live to improve our products and services and for over 160 years our world has revolved around our customers. This dedication means our air and gas handling equipment adds maximum value to your operations. We have innovation in our hearts and every day we focus on providing you with the best solutions for your vital operations.



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