



AX AXUS

High Pressure Ambient & High Temperature (300°C for 2hr, 400°C for 2 hr) Axial Flow Fans
Installation and Maintenance



1.0 Introduction

The AXUS high pressure range of axial flow fans are designed for 'in duct' applications. Manufactured from mild steel then galvanised, making the unit suitable for indoor and outdoor applications.

These units are available for selection in 3 variants. For temperature rating please refer to the product rating label.

- Ambient (day to day use).
- F300 (day to day use, with one off emergency smoke extraction 300°C for 120min).
- F400 (day to day use, with one off emergency smoke extraction 400°C for 120min).

Case diameters of 630mm to 900mm.
Unit codes AX63 to AX90.

Impellers have been selected at blade angle settings matched to various motor speeds to perform against the design criteria laid down in Nuaire's selection catalogue / software.

Any attempt to adjust or reset impeller blade angles will invalidate warranty.

For full unit description, dimensional, weight and performance details refer to the Nuaire product catalogue. A comprehensive range of ancillaries and silencers are also listed.

2.0 Lifting

The fan impeller is carefully balanced and centralised in the fan case, it is therefore essential that great care is exercised when handling the unit. Check the weight on the rating plate details before attempting any lift. Always use a spreader as shown (fig. 1), or a suitable forklift, if forklift access points are provided within the mounting feet. Never pass lifting slings through the impeller (fig. 2).

Figure 1. Correct method of lifting using a spreader.

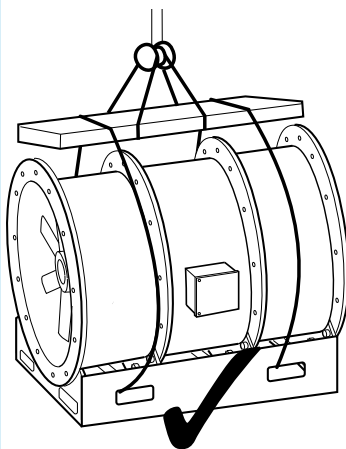
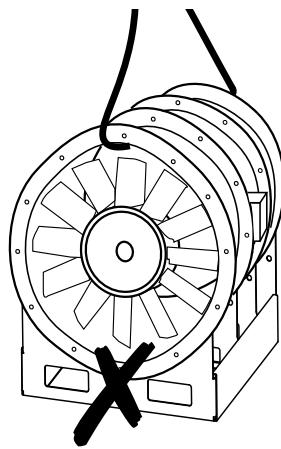


Figure 2. The wrong method of lifting with sling through impeller can cause case distortion.



3.0 Installation And General Advice

Installation must be carried out by competent personnel, in accordance with good industry practice, the appropriate authority and in conformance with all statutory and governing regulations e.g. IEE, CIBSE, HVCA, ATEX, BSI & EN standards etc.

Before commencing installation check that all materials, including optional ancillaries are available to complete the installation. Every unit is tested and serialised at works and a test certificate produced, the details recorded on the fan side rating plate should also be referred to before handling and installation.

Any damages or deviations should be immediately reported to the seller/supplier/agent quoting the order and product details from the product rating plate.

3.1 Mechanical Installation

Rotate the fan impeller by hand to ensure free and smooth rotation and that no transit or handling damage has occurred, observe the direction of flow/direction of rotation arrow and ensure that:

- All optional accessories such as support brackets, attenuators, inlet cones, guards, flexible connectors etc. are assembled to the fan.
- The mounting brackets are fitted for horizontal application. For other orientations please contact Nuaire for advice.
- External termination box is accessible to the electrician.
- When offering the fan to the ducted system that both inlet and outlet connections are perfectly aligned.

3.2 Horizontal on Floor

Optional resilient mountings should be attached to the unit mounting brackets at this stage (fig. 3). Position and align the unit with the ductwork in both horizontal and vertical planes and pack height under mounting feet if necessary.

Matching attenuators, if required, should be fitted to the fan with any other accessories before installation.

Matching flanges are fixed to the ductwork ends with rivets.

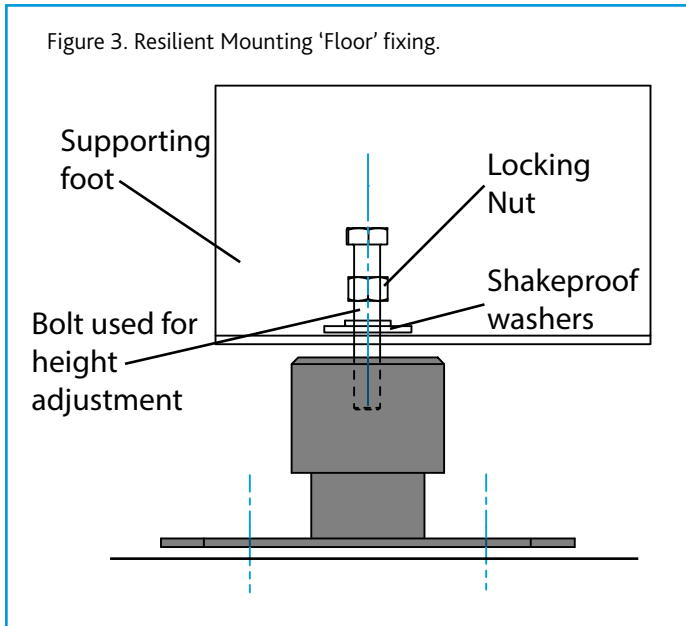
IMPORTANT

The units are designed to be supported by the mounting bracket, in a horizontal orientation. For any other mounting orientation please contact Nuaire.

IMPORTANT

AV mounts isolate the fan only. Silencers / backdraught dampers and other "significant mass" accessories should form part of the fixed ductwork after the flexible connection.

Figure 3. Resilient Mounting 'Floor' fixing.



3.3 Suspended Horizontally or Vertically

A.V. mountings must be arranged so that they are used in compression only.

A suspended steel underframe would be necessary to support the unit, (by others) standing on A.V. mountings.

IMPORTANT

To minimise the possibility of Electro Magnetic Interference:

- Always install screened cable between the control and the fan, maximum length 30 metres. Please consult Nuaire if a longer cable run is needed.
- This product must be earthed and always 'earth' the screened cable at both ends. Ensure that ALL earth connections are the same potential. Cable glands are provided.
- Always keep mains supply cables and motor supply cables separate and DO NOT install any data cable or low voltage cable within 50mm of other cables or on the same metal cable tray as other cables.

3.4 Electrical Installation - Motors

Motors are totally enclosed and protected to IP55 (Dust and low pressure water jets). Motors comply with BS5000, EN60034 and IEC34-1. The motors have sealed for life ball bearings in units up to 132mm frame size. Frame sizes 160mm and above are re-greaseable type.

Enclosures are to IP55 with class F/H insulation dependant on motor temperature rating.

N.B. Please note that the requirements for maintenance of the motor. Failure to comply with the recommendations will invalidate any warranty claim.

High Temperature unit motors are tested in accordance with EN12101-3.

3.5 Wiring

Electrical supply wiring connection is to an externally mounted terminal box on the case exterior. The terminal box is pre-wired to the motor. High Temperature units are pre-wired with heat resistant cable.

3.6 Connection details

Check that the voltage full load and starting current on the fan rating label is suitable for your supply.

Units for external use require weatherproof conduit and glands.

Single speed motors below 4kW

Single speed motors below 4kW are suitable for Direct On Line starting only.

Single speed motors 4kW and above

Single speed motors 4kW and above are supplied with Star/Delta capability but Direct On Line starting is recommended as the simplest means for emergency equipment operation.

Two speed motors

Two speed motors are supplied TAP or PAM single winding or Dual Wound. All two speed types are designed for Direct On-Line starting on both speeds only unless otherwise specified.

3.7 Start-up procedure

Ensure that the impeller rotation follows the label arrow indicator on the casing. Should the direction be incorrect on three phase units, reverse any two of the supply leads. Care should be taken to set correct rotation as incorrect rotation may result in damage to the motor. Equipment should be run for approximately 30 minutes to ensure correct operation.

If any fault occurs, the equipment should be switched off. Do not re-start until the fault has been rectified.

IMPORTANT

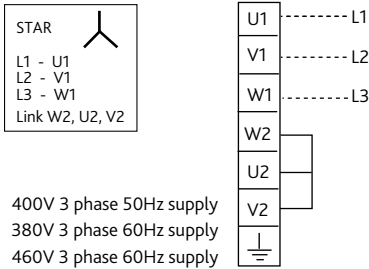
Inverter Control - High Temperature Applications

Under fire conditions the electrical supply must not run through the inverter - THE INVERTER MUST BE BYPASSED.

4.0 Electrical Wiring

4.1 Three Phase Units

D.O.L. Starting, 3 phase (3kW and below)



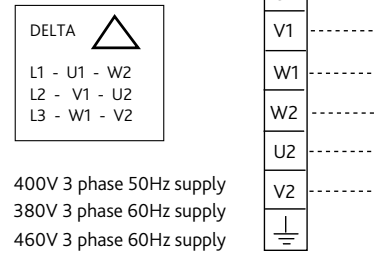
400V 3 phase 50Hz supply
380V 3 phase 60Hz supply
460V 3 phase 60Hz supply

IMPORTANT

For specialist connections not shown always refer to the wiring diagram supplied with the unit. In the event of query or uncertainty contact NUAIRE directly before any connection is made.

Star / Delta Starter, 3 phase (4kW and above)

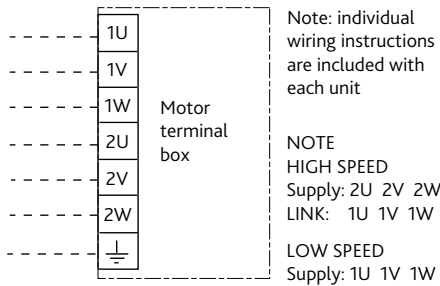
Note:
For all D.O.L. (Direct On Line) operation or Inverter type Speed Control wire in DELTA



400V 3 phase 50Hz supply
380V 3 phase 60Hz supply
460V 3 phase 60Hz supply

Two Speed - TAP/PAM WOUND MOTOR

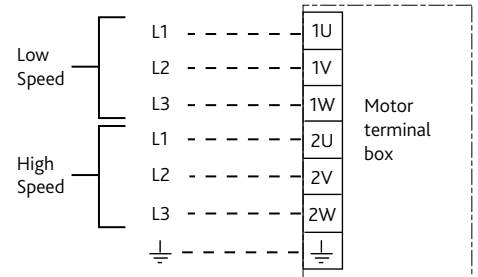
D.O.L. Starting (Both Speeds), 3 phase



400V 3 phase 50Hz supply
380V 3 phase 60Hz supply
460V 3 phase 60Hz supply

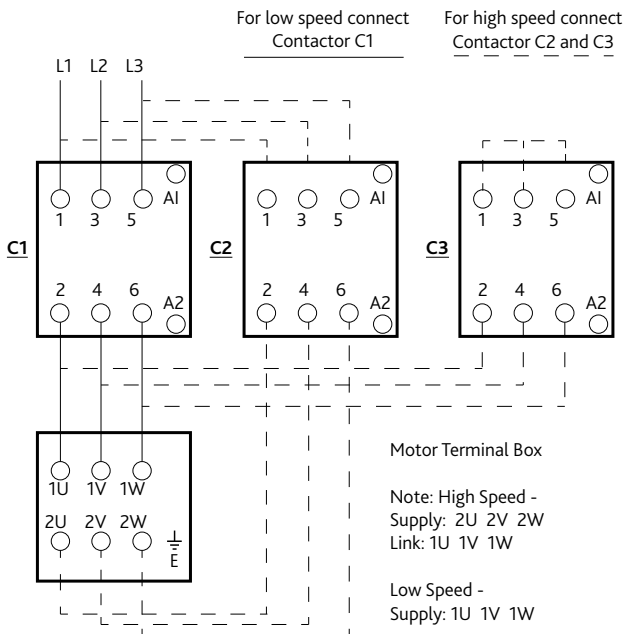
Two Speed - DUAL WOUND MOTOR

D.O.L. Starting (Both Speeds), 3 phase



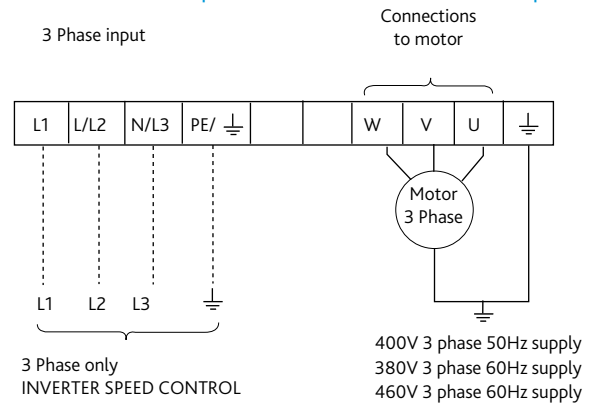
400V 3 phase 50Hz supply
380V 3 phase 60Hz supply
460V 3 phase 60Hz supply

Example Contactor control - Two Speed Motors, 3 phase



400V 3 phase 50Hz supply
380V 3 phase 60Hz supply
460V 3 phase 60Hz supply

Speed Control - ELECTRONIC, 3 phase



Notes:
Total Length of motor leads should not exceed 50 metres.

IMPORTANT

An inverter is used to provide speed control. When the fan is isolated, allow 5 minutes for the capacitors in the inverter to discharge before commencing any work on the unit.

5.0 Specific Commissioning And Servicing Requirements

300°C for 2 hours / 400°C for 2 hours Motors for Smoke Extract Fans

Motors for Smoke Extract Fans

These motors are used to provide a SAFETY FUNCTION for people in the event of fire in public premises or in the home: they are therefore subject to strict constraints concerning their operating and maintenance.

Operating Constraints

- i. Check on the nameplate that the selected motor corresponds to the maximum exposure temperature and duration.
- ii. Non ventilated motors MUST be placed in the airflow from the driven fan. Ventilated motors can be placed outside the flow.
- iii. AFTER THE MOTOR HAS BEEN SUBJECTED TO ONE EMERGENCY DUTY OPERATION, IT MUST BE REPLACED.
- iv. With variable speed control. Ensure that the maximum speed never exceeds the speed of the motor supplied by the mains and that the delivered power corresponds to the previous definitions. The motor should be equipped with PTC thermistors connected to the protection system during S1 duty and switched off during S2 duty (operation during an emergency).

These qualifications ensure the qualification of the driven fan by the manufacturer.

Maintenance Constraints

Regular service visits must be performed on the installation AT LEAST EVERY 6 MONTHS, incorporating the following checks:

i. Checking the insulation resistance (R>100 MOhms, 500V DC)

- If the drain holes are blocked, open them to eliminate any accumulated condensation.
- If R<100 MOhms, dry the stator in an oven and check the insulation resistance. If the fault persists, replace the stator.
- The stator must be replaced 5 years after installation or after 20,000 hours of operation.

ii. Cooling check

- Ensure there is no dust or grease in the entire ventilation circuit (housing fins, motor cover/fan if fitted driven fan).
- Ensure the motor runs normally when switched on for a few minutes.

iii. Bearing check (C3 or C4 play)

Run the motor during each maintenance visit. When the motor is cold, a high level of noise is caused by the texture of the grease. This does not indicate a bearing fault.

S2 duty only:

The bearings must be replaced by an identical type every 5 years. Ensure the motor runs normally when switched on for a few minutes.

S1 duty and Emergency in S2 duty:

a) Permanently greased bearings.

300°C / 400°C range; replace on 2 pole motors after 10,000 hours of operation and on motors with 4 poles or more after 20,000 hours.

b) Re-greaseable bearings

The information on the motor nameplates must be strictly respected (grease quantity, grease quality and re-greasing frequency). The bearings must be replaced after 20,000 hours of operation.

6.0 Maintenance

IMPORTANT

Isolation - Before commencing work, make sure that the unit, switched live and Nuaire controls are electrically isolated from the mains supply.

Only appropriately qualified personnel, familiar not only with the electrical aspect of the work but with the plant, area or application served by the unit, should carry out routine and preventative maintenance on this product.

Ensure all mechanical and electrical connections and fixings are secure and that inlet and outlet duct work is free of any obstruction or debris. Briefly switch the fan on/off to ascertain correct direction of rotation, compare the rotational label applied to the fan case and correct if necessary.

6.1 Maintenance Intervals

Maintenance should be carried out on a regular basis, Nuaire recommend three months from commissioning and at least annually thereafter as determined by the operating conditions and levels of airborne contamination to which the unit is exposed.

6.2 Maintenance Check List ✓

- | | |
|--------------------------|---|
| <input type="checkbox"/> | Check that bird guards/safety grilles are secure and free of obstruction. |
| <input type="checkbox"/> | Inspect all bolts, fixings and electrical terminals for security. |
| <input type="checkbox"/> | Check motor for undue wear, signs of overheating and apply winding insulation and continuity tests. |
| <input type="checkbox"/> | Remove all dust and dirt from impellers, be especially careful not to disturb balance weights. |
| <input type="checkbox"/> | Generally clean. |
| <input type="checkbox"/> | Check resilient mounts and replace any that show signs of wear or deterioration. |

6.3 Lubrication

Motors are fitted with sealed for life bearings and do not require any lubrication.

6.4 Impellers

Impellers are dynamically balanced during manufacture, no special treatment is required during maintenance, other to clean and remove all dust and dirt residue taking care not to disturb the balance weights. Remove stubborn dirt with warm soapy water – do not use caustic fluids.

The maintenance programme must conform to 'good custom and practice' and to the published recommendations of associations such as the HVCA, CIBSE etc. The HVCA's publication 'Standard Maintenance Specification for Mechanical Services in Buildings' Vol 2 Ventilating and Air Conditioning is a recommended reference.

7.0 Replacement of Parts

Should any component need replacing, Nuaire keep extensive stocks for quick delivery. Ensure that the unit is electrically isolated, before carrying out any work.

When ordering spare parts, please quote the serial number of the unit and the ARC number of the purchase; if possible **(This information will be available on the fan label)**.

8.0 Warranty

Axus AX units have a 3 year warranty. Units with Ecosmart control have a 5 year warranty. The warranty starts from the day of delivery and includes parts and labour for the first year. The remaining period covers replacement parts only.

This warranty is void if the equipment is modified without authorisation, is incorrectly applied, misused, disassembled, or not installed, commissioned and maintained in accordance with the details contained in this manual and general good practice.

The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.

9.0 After Sales

For technical assistance or further product information, including spare parts and replacement components, please contact the After Sales Department.

Telephone 02920 858 400
aftersales@nuaire.co.uk