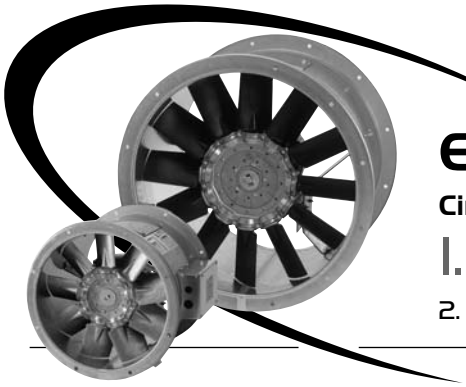

Ecosmart Axus AX Product Manual

Circular Long Cased Axial Flow Fans

1. Installation

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ecosmart energy saving control

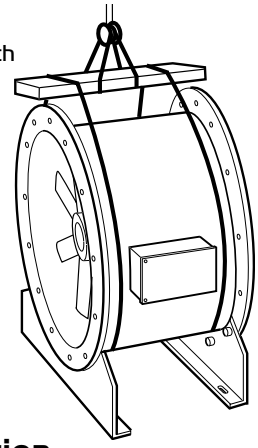
Important Notes to Installers

Installation must be carried out by competent personnel in accordance with the appropriate authority and conforming to all statutory and governing regulations e.g. I.E.E., CIBSE, COHSE etc.

Handling

Care must be taken on site when handling the unit not to damage or distort the blades which are carefully balanced, or alter the motor position. **Note: the weight of the unit from the rating plate and lift use a "spreader" as shown in (figure 1.)**

Figure 1. Shown with mounting feet.



Fan Installation

Units are suitable for internal and external use.

Prior to installation the impeller should be rotated by hand to check for smooth rotation and that no transit damage has occurred.

Optional supporting brackets can be located anywhere around the circumference of the flange, allowing installation in any mounting plane.

Motors are wired into an external case mounted terminal box through flexible conduit. Motors may incorporate condensation drain holes. It is essential that the holes are positioned at the lowest point of the fan motor when the unit is horizontally mounted.

NOTE: The Ecosmart Control Box is a seperate item, packed individually.

Horizontal on floor or supported from wall etc.

Optional resilient mountings should be attached to the unit mounting brackets at this stage. (See figure 2).

If the unit is supported from a wall, supporting brackets should be used. 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.

Figure 2.

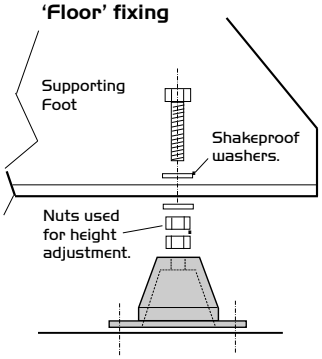
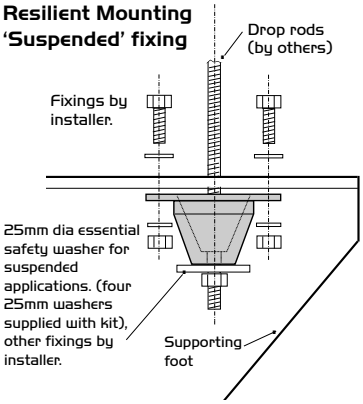


Figure 3.



Suspended horizontally or vertically

A.V. mountings must be arranged so that they are used in **compression** only. If Resilient Mountings NAVI to NAV5 are specified the rubber mountings must also remain in compression The large metal washers must be fitted under the studding nuts on each mounting. (See figure 3).

Other types of A.V. mounts - spring etc are also designed to be used in compression only.

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

Ecosmart Control Installation

The controller must be fitted indoors (an optional outdoor cover can be purchased) and away from moisture ingress. The operating range is - 10° to 35°C up to 85% relative humidity.

The controller must be fitted to a vertical vibration free wall with appropriate fastners and for ease of installation the cover should be removed and the casing separated from the base. If cooling fans are fitted they should be disconnected while installation takes place.

The cable connecting the Ecosmart control and the fan must be a screened power cable, max length 25m. It should be earthed at both ends using the special cable glands supplied.

(Details of wiring connections are on sheets 2 and 4).

Warning - Inverter Speed Control

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.

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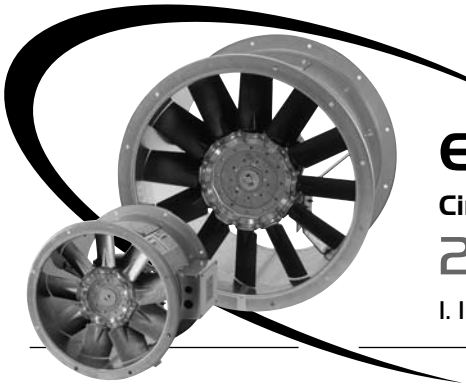

Ecosmart Axus AX Product Manual

Circular Long Cased Axial Flow Fans

2. Setting to Work

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ecosmart energy saving control

Getting Started

The Ecosmart Axus AX fan is designed for maximum control flexibility. The control should be supplied from a local isolation (by others) and the control connected to the fan by screened cable and suitable glands. (maximum length 50m).

Apart from the power supply an enabling signal is always required to set the fan running. This can be a switched time signal (connect to SL) or an enabling device plugged in the net connection. If an enabling signal is not available, connect a link wire from 'L' to 'SL'. **Note: the unit must be fused in line with the full load current on the fan rating label.**

Warning - Inverter Speed Control

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.

Ecosmart Compatible Devices

Enabling Devices	
ES-PIR:	PIR Sensor
ES-TC:	7 Day Timeclock
Sensors	
ES-TEMP:	Temperature Sensor ES-CO2
ES-RH:	Humidity Sensor
User Controls	
ES-UCF:	Fan Only Control
Others	
ES-JB:	Junction Box (to add extra sensors etc)
ES-AVI:	Audio Visual Fault Control

Note: these Ecosmart devices will affect all the fans linked using the SELV data cable. The switched live signal will only affect the fan to which it is connected.

Control Connections

Net - the 4 IDC plug-in connectors are provided for the connection of compatible sensors, manual controls and for linking the fans together under a common control. If more than 4 connections are required, the junction box (product code ES-JB) should be used (see 'data cable installation' below).

Switch Live (SL) terminal - A signal of 100-230V ac will activate the fan. **Note that a signal from an isolating transformer will produce unpredictable result and is not recommended.**

Volt Free Relay Controls

Note that the volt free contacts are not fused. If these are used to power any external equipment, the installer must provide adequate fusing or other protections.
These contacts are rated at 5A resistive, 0.5A inductive.
Run connections - These contacts are closed when the fan is running.
Fault connections - No fault = the contacts are closed. Fault = the contacts are opened (this includes no power supply at the unit)

Data Cable Installation

A 4-core SELV data cable is used to connect devices such as sensors to the fan and interconnecting multiple fan units. Do not run data cable in the same conduit as the mains cables and ensure there is a 50mm separation between the data cable and other cables. The maximum cable run between any two devices is 300m when it is installed in accordance with the instructions.
Please note that the total data cable length used in any system must be less than 1000m. Keep the number of cable joints to a minimum to ensure the best data transmission efficiency between devices.

Maximum number of devices

The maximum number of devices (including fans) that can be connected together via the cable is 32, irrespective of their functions. Any other low voltage/signal cable connection i.e. BMS follow the guidelines as given in '"Data Cable" and keep the cable length as short as possible - less than 50m.

Settings

Setting the maximum air flow

ii) Ensure the power supply is switched off and that a link wire is connected from the supply L to the SL terminal. Unplug all items connected to the 'Net' connectors.
ii) Switch on the power supply.
iii) Wait for the fan to complete its self-test operation. Measure the airflow using standard commissioning instruments at a suitable point in the ductwork.
If adjustment is required, rotate the pot marked 'MAX' to obtain the desired airflow.

Setting the minimum trickle airflow (nominal 40%)

i) Repeat the same procedure as for maximum airflow above but without the link wire between supply L and SL terminal. Ensure the trickle switch is in the 'ON' position. The adjustment must be made on the pot marked 'Min'
ii) Note that the minimum setting (nominally 40%) must be below the maximum setting, otherwise minimum setting will be automatically set to be the same as the maximum.

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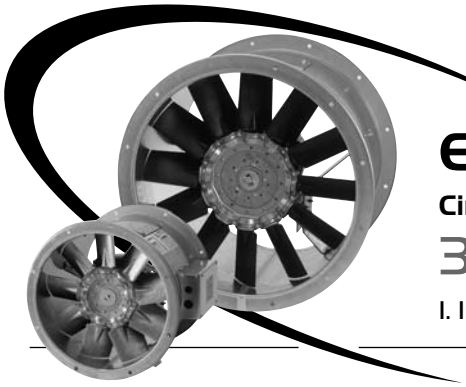


Ecosmart Axus AX Product Manual

Circular Long Cased Axial Flow Fans

3. Maintenance

1. Installation 2. Setting to Work 4. Wiring

ecosmart energy saving control

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

Warning - Inverter Speed Control

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.

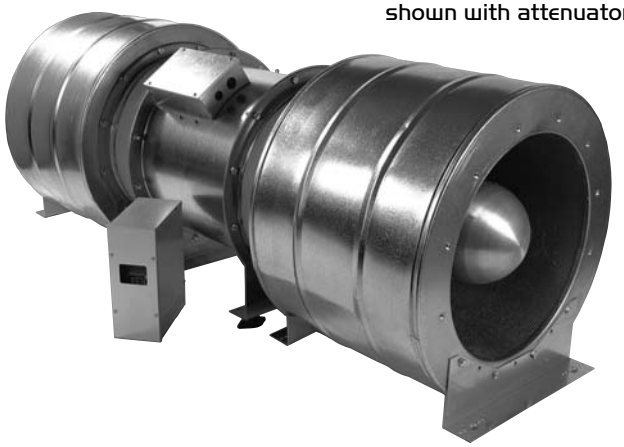
Maintenance Intervals

The first maintenance should be carried out three months after commissioning and thereafter at twelve monthly intervals. These intervals may need to be shortened if the unit is operating in adverse environmental conditions, or in heavily polluted air.

Lubrication

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

Figure 4. Axus Fan shown with attenuator.



General Cleaning and Inspection

Clean and inspect the exterior of the fan unit and associated controls etc. Expose the inlet and outlet side of the fan by removing the flexible connectors-if fitted). Inspect and, if necessary, clean the fan impeller and motor assemblies and the interior of the case. Check all parts for security and condition. Check that the impeller rotates freely. Ensure all control components are secure and clean, replace all access doors.

Cleaning Control Box and Sensors (if fitted)

Remove covers and carefully clean out interiors as necessary. Check for damage and security of components. Refit covers.

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).

3 Year Warranty

The 3 year warranty starts from the day of delivery and includes parts and labour for the first year.
The remaining 2 years covers replacement parts only.
This warranty is conditional on planned maintenance being undertaken.

Service Enquiries

Nuaire can assist you in all aspects of service. Our service department will be happy to provide any assistance required, initially by telephone and If necessary arrange for an engineer to call within 48 hours if possible.

Telephone 029 2085 8585
Fax 029 2085 8586

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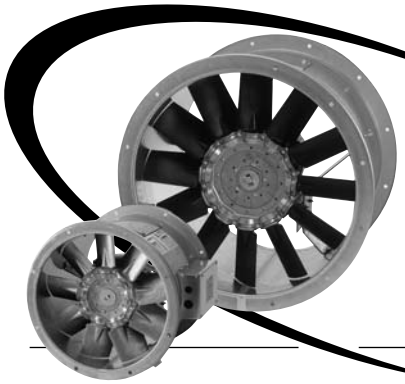

Ecosmart Axus AX Product Manual

Circular Long Cased Axial Flow Fans

4. Wiring

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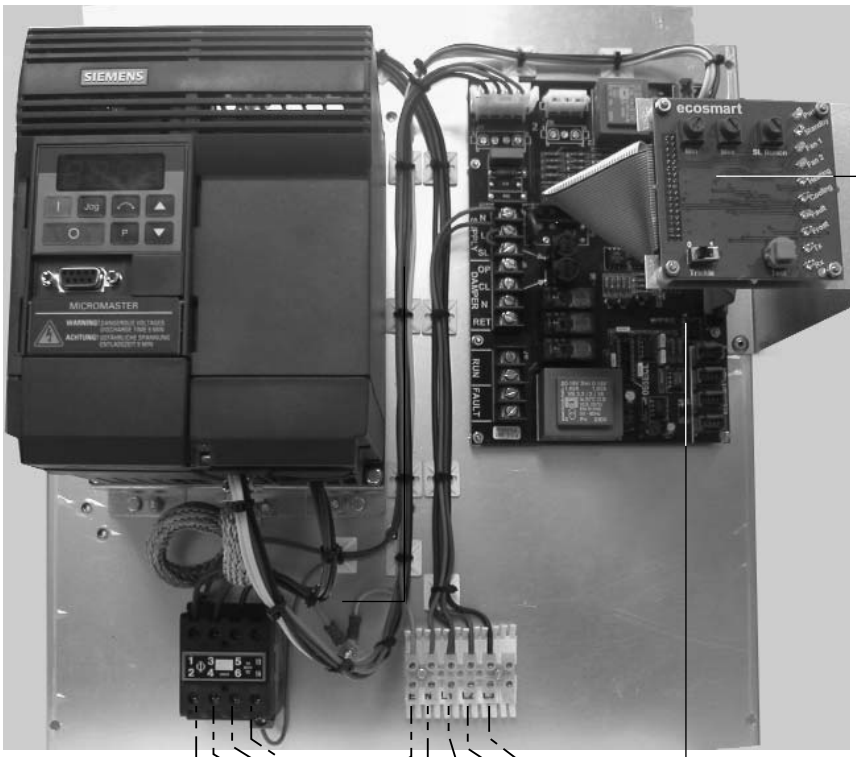
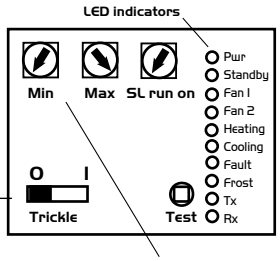




MIN = **Min speed adjustment**
MAX = **Max speed adjustment**
SL Run on = **Switched Live Run-On Timer adjustment**
TRICKLE = **Selects trickle running: O = off, I = selected**
TEST = **Test button**

Warning - When the fan is isolated, allow 5 minutes for the capacitors in the inverter to discharge before commencing work on the unit.

LED Indication

PWR	GREEN: Power on & OK.
Standby	LED on when fan is not running. (Not applicable)
Fan I	GREEN: Fan I is running, RED: Fan I faulty.
Fan 2	GREEN: Fan 2 is running, RED: Fan 2 faulty. (Not applicable)
Heating*	Not applicable. See note.
Cooling*	Not applicable. See note.
Fault	LED on when a fault is present on unit.
Frost*	Not applicable. See note.
Tx	LED on when the controller is transmitting data.
Rx	LED on when the controller is receiving data.

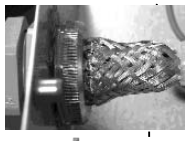
***Note: the control panel is common to all the Ecosmart products. Indicators for functions that are not available in this particular fan will not be illuminated.**

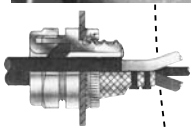
Connection to fan must use screened power cable, max length 50m. Screening must be earthed at both ends.

U V W E

E N L1 L2 L3

Main Supply 400V 3ph 50Hz

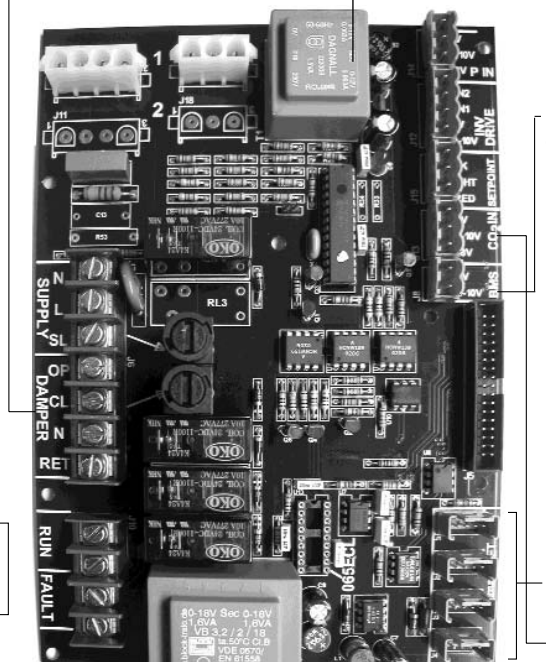




Glands supplied.

To Fan

U V W E



Important! This product must be earthed

Damper Connections (if required)

OP - 230V 50Hz 1A max supply to open the damper
CL - 230V 50Hz 1A max supply to close the damper
N - Neutral supply to damper
RET - 230V ac return signal from damper limit switch to indicate the damper has reached its operating position. If the return signal is not present, the fan will wait for 1 minute before starting.
Note: If a damper is not fitted, connect a link wire from OP to RET. This will cancel the delay.

BMS Signal

The system's response to a 0-10V dc BMS signal is given in the following table. Note the BMS signal will override any sensors and user control connected in the system. The voltage tolerance is +/_ 125mV and is measured at the fans terminal.

	Ventilation mode	Cooling mode*	Heating mode*
Local control	0.00	-	-
OFF / trickle	0.25	-	-
Speed 1	0.50	0.75	1.00
Speed 2	1.50	1.75	2.00
Speed 3	2.50	2.75	3.00
Speed 4	3.50	3.75	4.00
Speed 5	4.50	4.75	5.00
Speed 6	5.50	5.75	6.00
Speed 7	6.50	6.75	7.00
Speed 8	7.50	7.75	8.00
Speed 9	8.50	8.75	9.00
Speed 10	9.50	9.75	10.00

*** Only available on relevant unit**

Enabling
ES - PIR
ES - TC

Sensors
ES - TEMP
ES - RH
ES - CO2

User Control
ES - UCF

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DECLARATION OF INCORPORATION AND INFORMATION FOR SAFE INSTALLATION, OPERATION AND MAINTENANCE

We declare that the machinery named below is intended to be assembled with other components to constitute a system of machinery. The machinery shall not be put into service until the system has been declared to be in conformity with the provisions of the EC Council Machinery Directive.

Designation of machinery :-	ECOSMART AXUS FAN
Machinery Types :-	ESA
Relevant EC Council Directives :-	98/37/EC (Machinery Directive)
Applied Harmonised Standards :-	EN292-1, EN292-2, EN294
Applied National Standards :-	BS848 Parts One, Two and Five

Signature of manufacture representatives :-

Name:		Position:	Date:
1) C. Biggs		Technical Director	3. 11. 02
2) W. Glover		Manufacturing Director	3. 11. 02

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CE DECLARATION OF CONFORMITY

We declare that the machine named below conforms to the requirements of EC Council Directives relating to Electromagnetic Compatibility and Safety of Electrical Equipment.

Designation of machinery :-	ECOSMART AXUS FAN
Machinery Types :-	ESA
Relevant EC Council Directives :-	89/336/EEC, 92/31/EEC (EMC) 73/23/EEC, 93/68/EEC (Low Voltage Directive)
Applied Harmonised Standards :-	EN55011, CLASS A, GROUP 1, EN60204-1, EN60335-2-80
Basis of Self Attestation :-	Quality Assurance to BS EN ISO 9001 BSI Registered Firm Certificate No. FM 149

Signature of manufacture representatives :-

Name:		Position:	Date:
1) C. Biggs		Technical Director	3. 11. 02
2) W. Glover		Manufacturing Director	3. 11. 02

INFORMATION FOR SAFE INSTALLATION, OPERATION AND MAINTENANCE OF NUAIRE VENTILATION EQUIPMENT

To comply with EC Council Directives 98/37/EC Machinery Directive

To be read in conjunction with the relevant Product Documentation (see 2.1)

1.0 GENERAL

1.1 The equipment referred to in this **Declaration of Incorporation** is supplied by NuAire to be assembled into a ventilation system which may or may not include additional components.
The entire system must be considered for safety purposes and it is the responsibility of the installer to ensure that all of the equipment is installed in compliance with the manufacturers recommendations and with due regard to current legislation and codes of practice.

2.0 INFORMATION SUPPLIED WITH THE EQUIPMENT

2.1 Each item of equipment is supplied with a set of documentation which provides the information required for the safe installation and maintenance of the equipment. This may be in the form of a Data sheet and/or Installation and Maintenance instruction.

2.2 Each unit has a rating plate attached to its outer casing. The rating plate provides essential data relating to the equipment such as serial number, unit code and electrical data. Any further data that may be required will be found in the documentation.
If any item is unclear or more information is required, please contact NuAire.

2.3 Where warning labels or notices are attached to the unit the instructions given must be adhered to.

3.0 TRANSPORTATION, HANDLING AND STORAGE

3.1 Care must be taken at all times to prevent damage to the equipment. Note in particular that shock to the unit may result in the balance of the impeller being affected.

3.2 When handling the equipment, care should be taken with corners and edges and that the weight distribution within the unit is considered. Lifting gear such as slings or ropes must be arranged so as not to bear on the casing.

3.3 Equipment stored on site prior to installation should be protected from the weather and steps taken to prevent ingress of contaminants.

4.0 OPERATIONAL LIMITS

4.1 It is important that the specified operational limits for the equipment are adhered to e.g. operational air temperature, air borne contaminants and unit orientation.

4.2 Where installation accessories are supplied with the specified equipment eg. wall mounting brackets. They are to be used to support the equipment only. Other system components must have separate provision for support.

4.3 Flanges and connection spigots are provided for the purpose of joining to ductwork systems. They must not be used to support the ductwork.

5.0 INSTALLATION REQUIREMENTS

In addition to the particular requirements given for the individual product, the following general requirements should be noted.

5.1 Where access to any part of equipment which **moves**, or can become **electrically live** are not prevented by the equipment panels or by fixed installation detail (eg ducting), then guarding to the appropriate standard must be fitted.

5.2 The electrical installation of the equipment must comply with the requirements of the relevant local electrical safety regulations.

6.0 COMMISSIONING REQUIREMENTS

6.1 General pre-commissioning checks relevant to safe operation consist of the following -
Ensure that no foreign bodies are present within the fan or casing
Check electrical safety. e.g. Insulation and earthing.
Check guarding of system.
Check operation of Isolators/Controls.
Check fastenings for security.

6.2 Other commissioning requirements are given in the relevant product documentation.

7.0 OPERATIONAL REQUIREMENTS

7.1 Equipment access panels must be in place at all times during operation of the unit, and must be secured with the original fastenings.

7.2 If failure of the equipment occurs or is suspected then it should be taken out of service until a competent person can effect repair or examination. (Note that certain ranges of equipment are designed to detect and compensate for fan failure).

8.0 MAINTENANCE REQUIREMENTS

8.1 Specific maintenance requirements are given in the relevant product documentation.

8.2 It is important that the correct tools are used for the various tasks required.

8.3 If the access panels are to be removed for any reason the electrical supply to the unit must be isolated.

8.4 A minium period of two minutes should be allowed after electrical disconnection before access panels are removed. This will allow the impeller to come to rest.

NB: Care should still be taken however since airflow generated at some other point in the system can cause the impeller to "windmill" even when power is not present.

8.5 Care should be taken when removing and storing access panels in windy conditions.

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