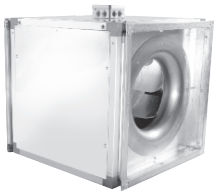


AM

Airmover Supply & Extract Fans Installation Manual

1.0 SAFETY INFORMATION

- The provision of the electrical supply and the connection of the unit to the mains must be carried out by a qualified electrician.
- Isolate from power supply before removing any covers. During installation / maintenance ensure all covers are fitted before switching on the mains supply.
- All-pole disconnection from the mains as shown in the wiring diagram must be incorporated within the fixed wiring and shall have a minimum contact separation of 3mm in accordance with latest edition of the wiring regulations.
- This unit must be earthed.
- Ducting must be securely fixed with screws to the spigot to prevent access to live parts. Duct runs terminating close to the fan must be adequately protected by suitable guards.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other fuel-burning appliances.
- This appliance should not be used by children or persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning the safe use of the appliance by a person responsible for their safety. Children shall not play with the appliance. Cleaning and user maintenance shall not be carried out by children.

1.1 Symbols

GENERAL WARNING

Signifies a general warning regarding hazard specified by supplementary information.

ELECTRIC SHOCK

This unit must be completely electrically isolated before any panels are removed. Check mains supply and control connections.

ROTATING PARTS

This unit contains fast moving rotational parts which may start automatically. It is the sole responsibility of the installer to adequately guard these components.

REFER TO INSTRUCTION MANUAL

Read and understand the installation and maintenance manual before installing, operating or maintaining this product.

1.2 Important Information

This manual contains important information on the safe and appropriate assembly, transport, commissioning, operation, maintenance, disassembly and simple troubleshooting of the product.

While the product has been manufactured according to the accepted rules of current technology, there is still a danger of personal injury or damage to equipment if the following general safety instructions and the warnings contained in these instructions are not complied with.

- **Read these instructions completely and thoroughly before working with the product.**
- **Keep these instructions in a location where they are accessible to all users at all times.**
- **Always include the operating instructions when you pass the product on to third parties.**

1.3 Personal Protective Equipment

The following minimum Personal Protective Equipment (PPE) is recommended when interacting with Nuaire product:

- **Protective Steel Toed Shoes -** when handling heavy objects.
- **Full Finger Gloves (Marigold PU800 or equivalent) -** when handling sheet metal components.
- **Semi Fingerless Gloves (Marigold PU3000 3DO or equivalent)** - when conducting light work on the unit requiring tactile dexterity.
- **Safety Glasses** - when conducting any cleaning/cutting operation or exchanging filters.
- **Reusable Half Mask Respirators** - when replacing filters which have been in contact with normal room or environmental air.

Nuaire would always recommend a site specific risk assessment by a competent person to determine if any additional PPE is required.

2.0 INTRODUCTION

The units shall be manufactured from a highly rigid pentapost framework with 25mm double skinned infill panels. The panels shall contain inert high-density infill. Panel materials are heavy gauge Aluzinc corrosion resistant steel. The units shall provide exceptional thermal and acoustic insertion. The very low breakout noise level through the unit casing must not be exceeded.

The general construction is to class A leakage.

The fan impeller and motor shall be selected to provide the most energy efficient solution conforming to part L regulations and shall be direct drive with EFF2 high efficiency motors to BS5000 as standard.

The fan impeller shall be a high efficiency backward curved centrifugal design, manufactured in galvanised steel. **Maximum ambient operating temperature 50°C.**

2.1 Code Description

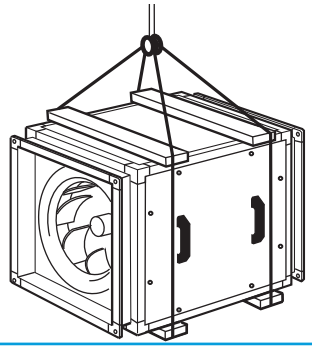
AM	4	3	ES
1	2	3	4

1. Range:	**AM** = Airmover
2. Motor Pole:	**2, 4 or 6**
3. Unit Size:	**1, 2, 3 or 4** (2 Pole Units) **1, 2, 3, 4, 5 or 6** (4 Pole Units) **1 or 2** (6 Pole Units)
4. Controls:	**ES** = Ecosmart Controls **No Suffix** = No Controls

3.0 HANDLING

Before commencement of lifting ensure that normal equipment safety checks have been carried out and the lift/deposit areas are clear of site personnel and traffic. **Obtain the weight of the unit from the rating plate and lift using "spreaders" as shown (Figure 1).**

1 Unit Lifting



4.0 MECHANICAL INSTALLATION

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.

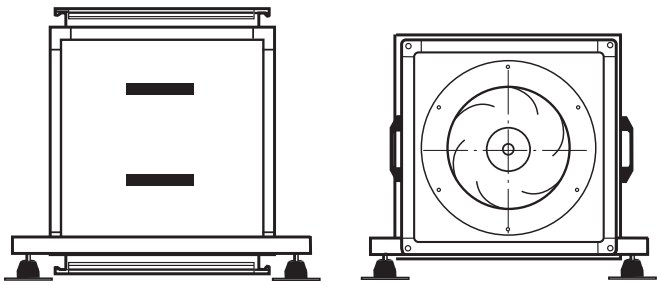
Units are suitable for internal use unless it has an optional outdoor cover (Section 5.0 for outdoor weather cover details).

Prior to installation the impeller should be rotated by hand to check for smooth rotation and that no transit damage has occurred. It is advisable to fit flexible connectors on either side of the fan unless there is an open-ended inlet or discharge, and the fans should be supported on A/V mounts (Figures 2 & 3).

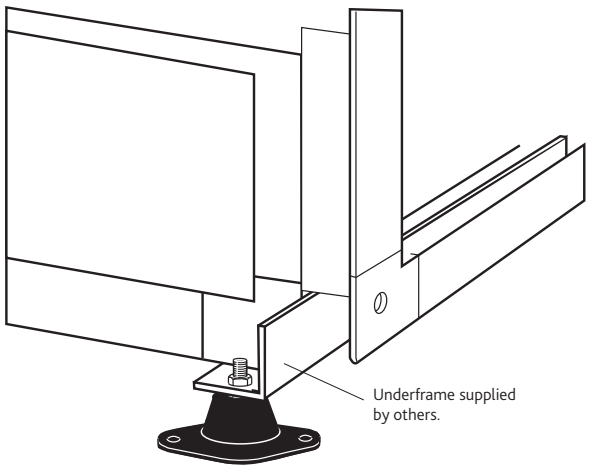
The A/V mounts should be "levelled off" for satisfactory running and the flexible connectors installed maintaining the line of the ductwork with minimal crimping.

A range of ancillaries including guards and silencers are available from Nuaire.

2 Vertical & Horizontal Orientation with AV Mounts



3 AV Mount Installation



5.0 ECOSMART CONTROL INSTALLATION (OPTIONAL)

The Ecosmart Control Box is a separate item, packed individually.

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 with up to 85% relative humidity.

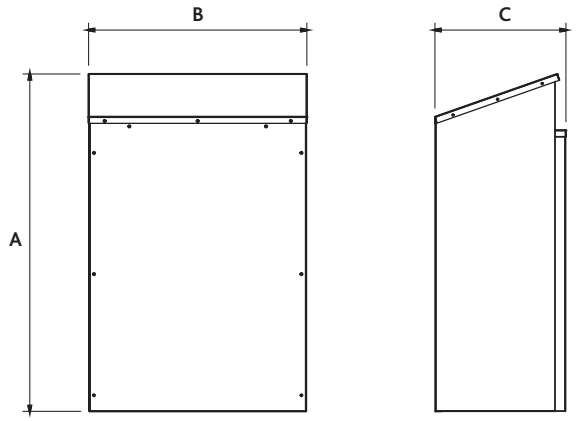
The controller must be fitted to a vertical vibration free wall with appropriate fasteners and for ease of installation the cover should be removed, and the casing separated from the base. If cooling fans are fitted, they should be disconnected while installation takes place.

The cable connecting the Ecosmart control to the fan must be a screened power cable, max length 30m. It should be earthed at both ends using the special cable glands supplied (Details of wiring connections are shown on pages 2 & 4).

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.

5.1 Ecosmart Weather Cover Codes & Dimensions

4 AV Mount Installation



Cover Code	Dimensions (mm)			Models	Compatible Airmover
	A	B	C		
ES-ISC-WPA	626.2	476.8	286.6	1.2-4.1	AM21, AM11, AM41, AM42, AM43
ES-ISC-WPB	687.5	559.3	343.1	5.6-23.1	AM23, AM24, AM44, AM45, AM61, AM62
ES-ISC-WPC	1069.1	691.3	415.3	26-Above	AM46

5.2 Ecosmart Compatible Devices

The below 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.

5.2.1 Enabling Devices

ES-PIR: Passive Infra-Red (PIR) Sensor
ES-TC: 7 Day Timeclock

5.2.2 Sensors

ES-TEMP: Temperature Sensors
ES-CO2: CO2 Sensor
ES-RH: Humidity Sensor

5.2.3 User Controls

ES-UCF: Fan Only Control

5.2.4 Others

ES-JB: Junction Box (to add extra sensors etc.)
ES-AVI: Audio Visual Fault Control

6.0 ELECTRICAL INSTALLATION

The electrical wiring must be carried out by competent persons, in accordance with good industry practice and should conform to all governing and statutory bodies i.e. IEE, CIBSE, COHSE etc.

6.1 Wiring

This product must be earthed.

6.1.2 Two Speed Motors DOL Starting Both Speeds

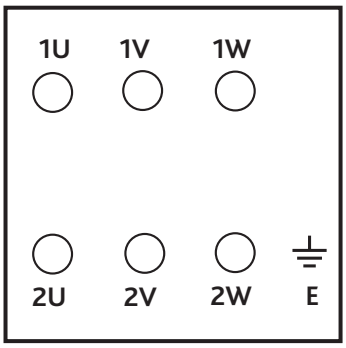
Observe the motor plate and connection details. 3 phase two speed tap/pam wound motors require a three-contactor control. 3 phase Dual wound motors require a two-contactor control.

5 Wiring - Two Speed Motors

Motor Terminal Box

HIGH SPEED
Supply 2U 2V 2W
Link 1U 1V 1W

LOW SPEED
Supply 1U 1V 1W

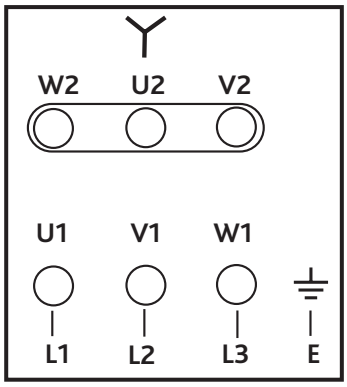


400V 3 phase 50Hz supply

6.1.2 Three Phase Units 3KW & Below

3 phase motors are connected directly to the Motor Terminal Box.

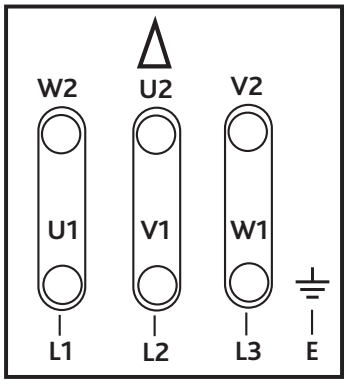
6 Wiring - 3 Phase Units 3KW & Below



6.1.3 Three Phase Units 4KW & Above

3 phase motors are connected directly to the Motor Terminal Box.

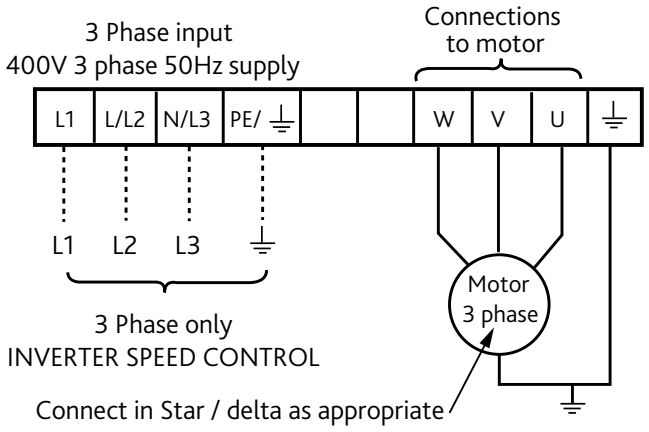
7 Wiring - 3 Phase Units 4KW & Above



6.1.4 Three Phase Units with Matched Frequency Inverter

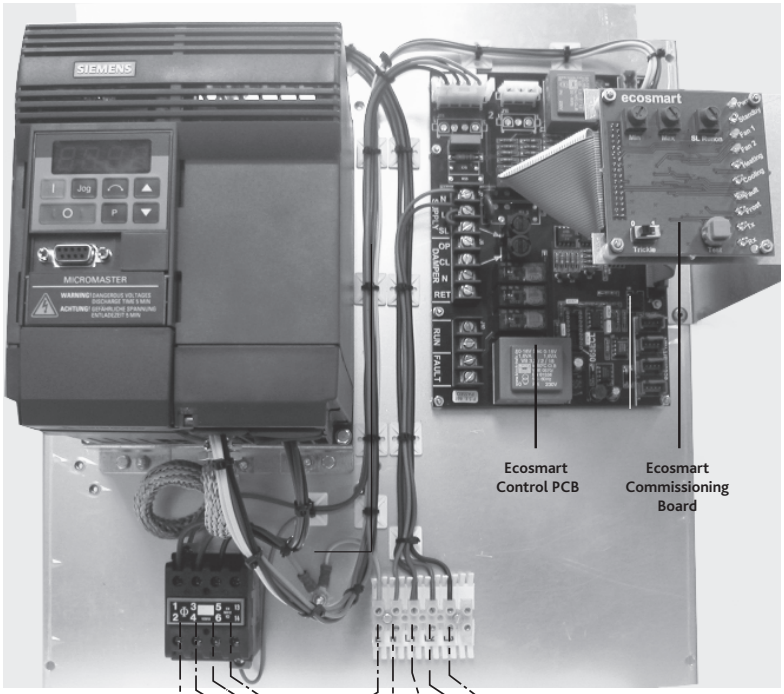
If screened motor cable is used, the maximum length should be 30m. Consult our Technical Department if you wish to use longer leads. Inverters are configured to suit specific fans and control applications as described on the customer order.

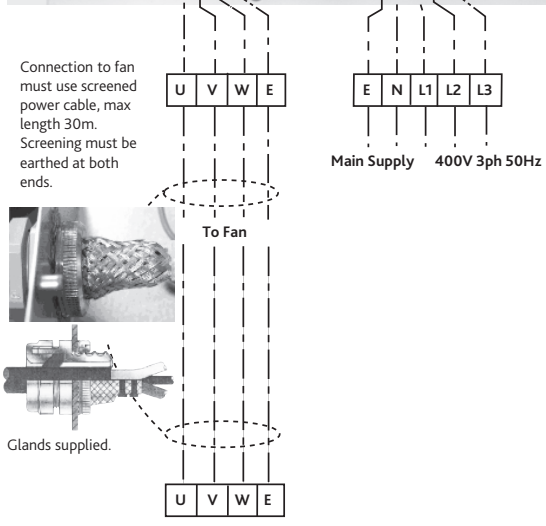
8 Wiring - 3 Phase Units with Matched Frequency Inverter



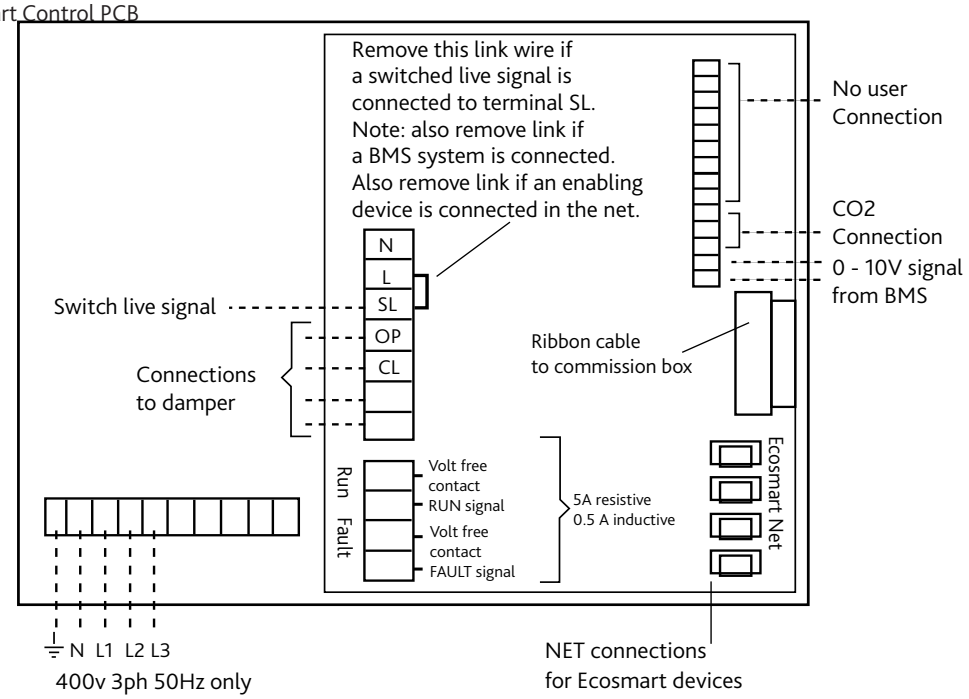
6.1.5 Three Phase with Ecosmart Control

9 Wiring Overview - 3 Phase Units with Ecosmart Control





10 Wiring - Ecosmart Control PCB



6.2 Ecosmart Control Connections

6.2.1 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).
Switch Live (SL) Terminal - A signal of 100-230V AC will activate the fan (required at each control).

A signal from an isolating transformer will produce an unpredictable result and is not recommended.

6.2.2 Damper Connections

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 the damper limit switch indicates the damper has reached its operating position. If the return signal is not present, the fan will wait for 1 minute before starting.

If a damper is not fitted, connect a link wire from OP to RET. This will cancel the delay.

Where units are supplied in modular sections, it will be necessary to install and connect mains wiring between controls and devices such as motorised dampers, it may also be necessary to install and connect mains wiring between sensors and actuators.

Depending on final damper location, extension of the cable looms may be required.

6.2.3 Volt Free Relay Contacts

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.

Volt free relay contacts are rated at 5A resistive, 0.5A inductive.

Run Connections - Contacts closed when the fan is running
Fault Connections - No Fault = Contacts are closed
Fault - Contacts are opened
Heat Demand - Contacts closed when heating is selected.

6.2.4 Data Cable Connection

A 4-core SELV data cable is used to connect devices.

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.

6.2.5 Maximum Number of Devices

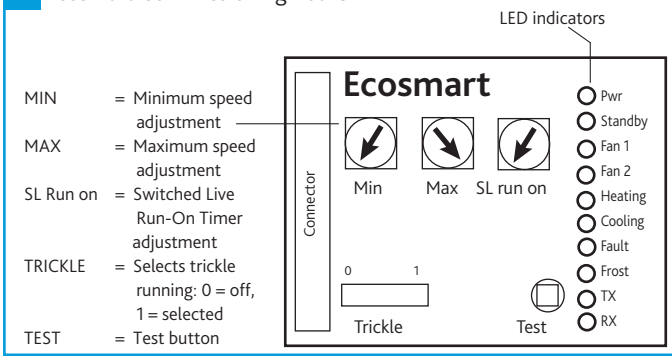
The maximum number of devices (including fans) that can be connected together via the cable is 32, irrespective of their functions.

6.2.6 Other Low Voltage Cables

Follow the basic principle in Section 6.2.4. Keep the cable run as short as possible, less than 50 metres. Use screened cable if cable length is more than 2m.

6.3 Ecomsart Commissioning Board

11 Ecosmart Commissioning Board



6.3.1 Using Test Button (ES Control Only)

The test button allows the individual blowers within the unit to be checked for its operation. If the fan is running already, press the button once to stop the fan, press again to switch on the fan. **The fan will return to normal operation after 30 seconds.**

6.3.2 LED Indication

PWR GREEN: Power on & OK.
Standby LED on when fan is not running.
Fan 1 GREEN: Fan 1 is running, RED: Fan 1 faulty.
Fan 2 GREEN: Fan 2 is running, RED: Fan 2 faulty.
Heating* GREEN: Heating selected RED: Heating faulty.
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.

***The control panel is common to all the Ecosmart products and will have indicators for functions that are not available in this particular fan. However these indicators will not be illuminated.**

6.3.3 Maximum Airflow

- 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.
- Switch on the power supply.
- 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.

6.3.4 Minimum Airflow (Trickle)

- 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. Adjustment must be made on the pot marked 'Min'.

The minimum setting (20% of maximum air flow) must be below the maximum setting; otherwise minimum setting will be automatically set to be the same as the maximum.

6.3.5 Trickle Ventilation

Slide the 'trickle' switch 0 = Off, 1 = On. With 'trickle' on and power to unit, the fan will run at minimum speed until the switch live signal activates it to boost.

6.3.6 Overrun Time

A switched live of 100-230V at terminal SL will activate the fan.

When the switched live signal is removed the fan will overrun for period set by the dial 'SL run on' - adjust the desired overrun time between 1-60 minutes by rotating clockwise.

6.4 BMS Input Signals

The system's response to a 0-10V DC BMS signal is given in the following table.

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

7.0 MAINTENANCE

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

It is important that maintenance checks are recorded and that the schedule is always adhered to, in all cases, the previous report should be referred to.

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

7.1 Routine Maintenance

- Clean all areas of unit and treat any areas of corrosion.
- Remove covers and carefully clean out interiors including fan impeller and motor assemblies as necessary. Check for damage and security of components. Refit covers.
- Check all access doors for leakage and if necessary locks should be adjusted and any replacement gasket materials should be replaced as required.

7.2 Annually

- Thoroughly inspect the unit and its components for corrosion, acting immediately to treat/restore any damaged areas.
- All electrical terminals within the unit should be tightened.
- Check all earth connections.
- Check control dampers blades.
- Check operation of damper actuators and linkages and adjust as necessary.

8.0 WARRANTY

The Airmover has a 3 year warranty and Ecosmart Airmover has a 5 year warranty.The warranty starts from the day of delivery and includes parts and labour for the first year. The remaining years 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. **Failure to maintain the unit as recommended will invalidate the warranty.**

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 END-OF-LIFE AND RECYCLING

Where possible Nuaire use components which can be largely recycled when the product reaches its end-of-life:

- Fans, motors, controls, actuators, cabling and other electrical components can be segregated into WEEE recycling streams.
- Sheet metal parts, aluminium extrusion, heating/cooling coils and other metallic items can be segregated and fully recycled.
- EPP, plastic ducting, nylon corner pieces, plastic heat exchangers, packaging material and other plastic components can be segregated into mixed plastic and widely recycled.
- Cardboard packaging, wood, used filters and other paper components can be largely recycled or fully processed in energy from waste centres.
- Remaining Items can be further segregated and processed in accordance with the zero waste hierarchy. Please call After Sales Support for further information on items not listed above.

Ensure that Nuaire product is made safe from any electrical / water / refrigerant supplies before dismantling commences. This work should only be undertaken by a qualified person in accordance with local authority regulations and guidelines, taking into account all site based risks.

10.0 AFTER SALES AND REPLACEMENT PARTS

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

If ordering spares please quote the serial number of the unit together with the part number, if the part number is not known please give a full description of the part required. The serial number will be found on the identification plate attached to the unit casing.

Telephone 02920 858 400
aftersales@nuaire.co.uk

Technical or commercial considerations may, from time to time, make it necessary to alter the design, performance and dimensions of equipment and the right is reserved to make such changes without prior notice.

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. All parts except for moving parts requiring the correct installation of safety guards comply with the essential requirements of the Machinery Directive. The machinery shall not be put into service until the system has been declared to be in conformity with the provisions of the EC Machinery Directive.

Designation of machinery:	ECOSMART AIRMOVER FAN
Machinery Types:	Supply and Extract Fan
Relevant EC Council Directives:	2006/42/EC (Machinery Directive)
Applied Harmonised Standards:	BS EN ISO 12100, BS EN ISO 13857 EN60204-1, BS EN ISO 9001
Applied National Standards:	BS848 Parts 1, 2.2 and 5

Note: All standards used were current and valid at the date of signature.

Signature of manufacture representatives:

Name:		Position:	Date:
1) C. Biggs		Technical Director	10. 12. 13
2) A. Jones		Manufacturing Director	10. 12. 13

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

To comply with EC Council Directives 2006/42/EC Machinery Directive and 2014/30/EU(EMC).

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, 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 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 duct work 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.

5.3 For EMC all control and sensor cables should not be placed within 50mm or on the same metal cable tray as 230V switched live, lighting or power cables and any cables not intended for use with this product.

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.