







## Sections 3.1, 3.2 & 4 are applicable to Ecosmart Control option only.

### 3.1 Electrical Wiring

The mains power supply to the controller must appropriately sized and installed via a local isolation switch (by others). The isolator must also accommodate the 230V switched live (if used).

The mains supply from the Ecosmart controller to the fan must be appropriately sized, not exceeding 30 metres and must be a screened power cable, earthed at both ends.

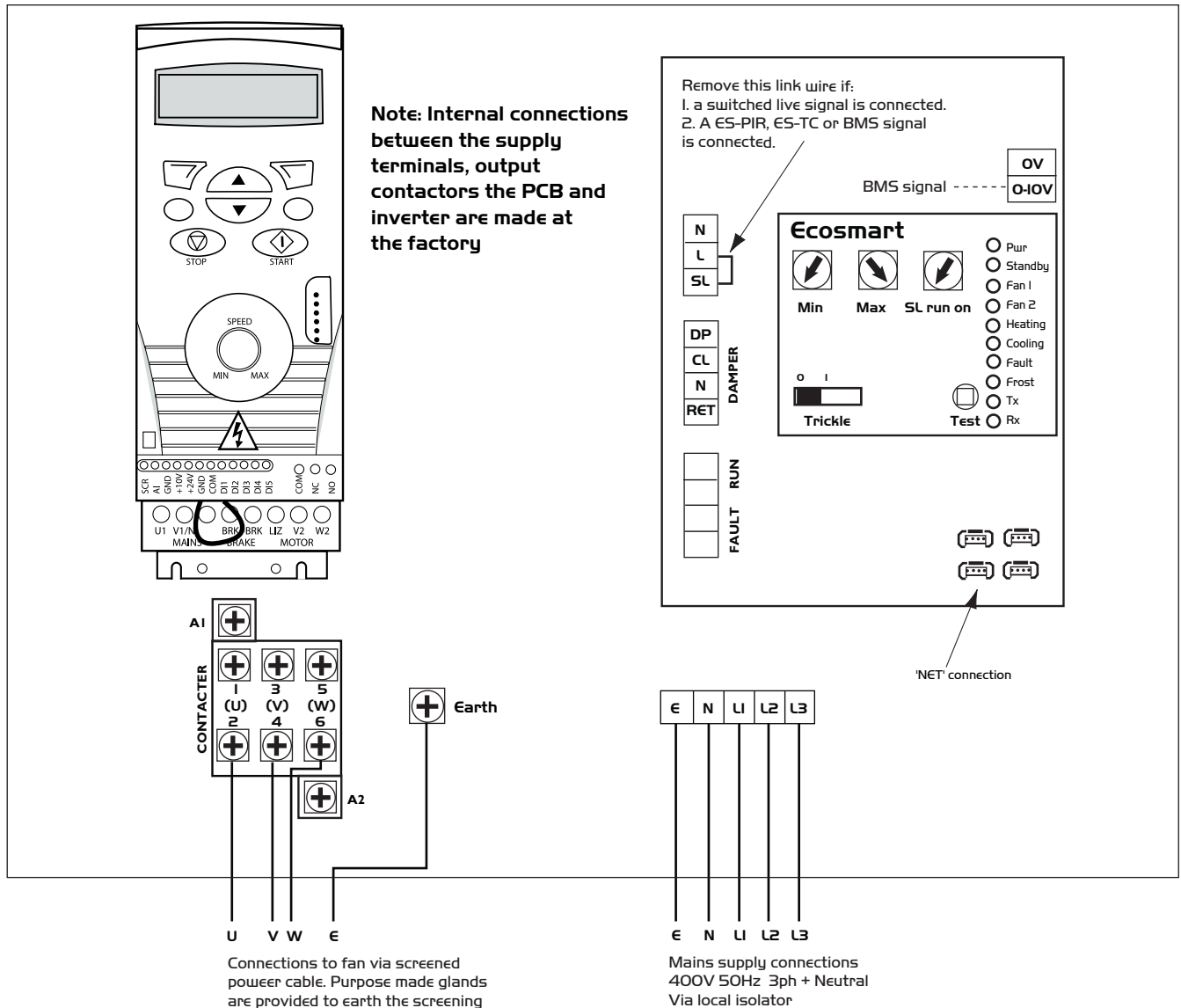
A four point glanding plate is formed from the base of the control and in order to maintain EMC compliance, an EMC glanding kit is supplied.

Ecosmart controls and sensors are supplied with 10 metres of data cable plugged at both ends, if used these can now be fitted and plugged in to the low voltage sockets on the Ecosmart control board. **All other low voltage connections i.e. BMS can also be completed.**

#### IMPORTANT

\* Motors of 4kW and above must be connected to Delta  $\Delta$

Figure 5.



#### IMPORTANT

The screening of the power cable must be continuous. Bridge any breaks (e.g. at local isolators) using braided earthing cable. Ensure the screening is earthed at both ends.

#### 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 Nuairc 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 in the same containment as mains carrying cables.

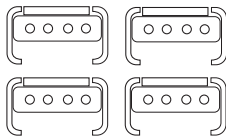
### 3.2 Control Connections

#### a) Mains connections

Mains cables should be suitably sized and terminated at terminals shown on the appropriate diagram.

#### b) Control Connections

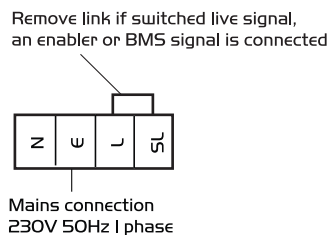
Figure 6. 'Net' connection for Ecosmart devices.



**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).

#### c) Switched Live (SL) terminal at the PCB

Figure 7.

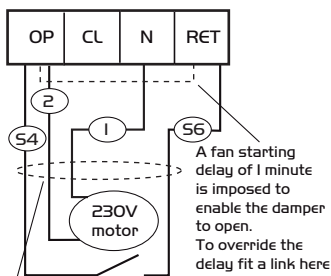


A signal of 100-230V a.c. will activate the fan from either its off state or trickle state (see setting to work-trickle switch). When the SL is disconnected the fan will over-run for 1 - 60 minutes. (see figure 11).

Do not take this signal from an isolating transformer.

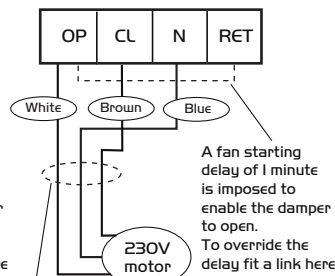
#### d) Damper connections

Figure 8a. Drive open/ Spring close.



All wiring is IPh 230V 50Hz

Figure 8b. Drive open/ Drive close.

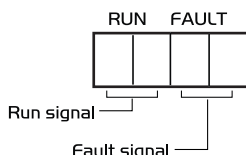


All wiring is IPh 230V 50Hz

- OP** - 230V 50Hz IA max supply to open the damper.
  - CL** - 230V 50Hz IA 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.
- Note: If a damper is not fitted, connect a link wire from OP to RET. This will cancel the delay.

#### e) Volt Free Relay Contacts

Figure 9.



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.

#### f) Data cable installation

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.

#### g) 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.

#### h) Other low voltage cables e.g. BMS signal

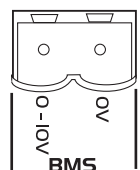
Follow the basic principle (as f). Keep the cable run as short as possible, less than 50 metres. If the cable is longer than 12m, we recommend using screened cable with the screening grounded at one end only (preferably at the inverter end).

#### j) BMS input signals

The BMS connection is made with a plug-in connector via the socket (See figure 10). To ensure the connection is made only by suitably qualified and authorised personnel the plug is not supplied.

It is available from R S Components, Part No. 403-875 or Farnell, Part No. 963-021.

Figure 10.



#### Reversal of the BMS connection will damage the control.

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

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.

## 4.0 Setting to Work

### IMPORTANT

**Isolation - Before commencing work make sure that the unit, switched live and Nuair 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.

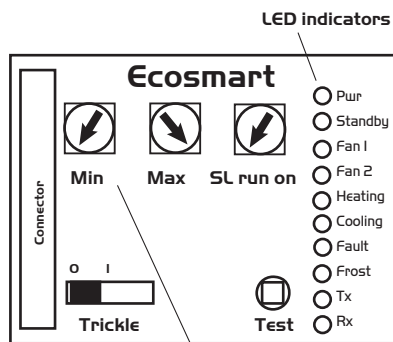
### a) Electrical

#### Using the Test button

The test button allows the blower 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.

**Note that the fan will return to normal operation after 30 seconds.**

Figure II.



- MIN = Minimum speed adjustment
- MAX = Maximum speed adjustment
- SL = Switched Live Run-On Timer adjustment
- TRICKLE = Selects trickle running: 0 = off, I = selected
- TEST = Test button

### b) 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:
- 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 that 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.**

### c) Settings

#### Setting the maximum air flow

- i) 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 reach steady condition.

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. Remove the link wire if not required - see "wiring (c)".

#### Setting the minimum/trickle airflow rate (nominal 20%)

- 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. Adjustment must be made on the pot marked 'Min'.
- ii) Note that the minimum setting (nominally 20%) must be below the maximum setting, otherwise minimum setting will be automatically set to be the same as the maximum.
- iii) The minimum speed set is the trickle speed at which the fan operates.

**Note: The working speed range of the user control and sensors is between the minimum and maximum set points.**

**IMPORTANT**

Isolation - Before removing panels make sure that the unit is electrically isolated from the mains supply.

**5.0 Maintenance**

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.

**5.1 Maintenance Intervals**

Maintenance should be carried out on a regular basis, we 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.

**5.2 Maintenance check list ✓**

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

**5.3 Lubrication**

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

**5.4 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.

**If ATEX compliant, observe the advice of guidance note document 671216.**

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.

**6.0 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).

**7.0 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.

**8.0 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**

**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 Machinery Directive.

Designation of machinery: AXUS AXIAL FAN  
 Machinery Types: AX  
 Relevant EC Council Directives: 2006/42/EC (Machinery Directive)  
 Applied Harmonised Standards: BS EN ISO 12100-1, BS EN ISO 12100-2, EN294, EN60204-1, BS EN ISO 9001  
 Applied National Standards: BS848 Parts One, Two and Five

**Signature of manufacture representatives:**

Name:	Position:	Date:
1) C. Biggs 	Technical Director	15. 04. 16.
2) A. Jones 	Manufacturing Director	15. 04. 16.

**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 Nuairé 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 Nuairé.  
 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 minimum 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.

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.