



# ES-ISC

## Ecosmart Speed Control

### Installation and Maintenance



## 1.0 INTRODUCTION

### ES-ISC Ecosmart Controls

The Ecosmart Energy Saving Speed Control is designed to control selected Nuaire fans and to match the range of integrated Ecosmart control systems.

The control is only available for three phase electrical supply.

The case material is of Aluzinc corrosion resistant steel, incorporates a frequency inverter, Ecosmart control board and is directly compatible with the Ecosmart range of user controls, time clocks, 'stats and sensors.

Figure 1. Ecosmart Speed Control



## 2.0 DELIVERY & RECEIPT OF EQUIPMENT

All equipment is inspected prior to despatch and leaves the factory in good condition. Upon receipt of the equipment an inspection should be made and any damage indicated on the delivery note.

Particulars of damage and/or incomplete delivery should be endorsed by the driver delivering the goods before offloading by the purchaser.

No responsibility will be accepted for damage sustained during the offloading from the vehicle or on the site thereafter.

All claims for damage and/or incomplete delivery must be reported to Nuaire within two days of receipt of the equipment.

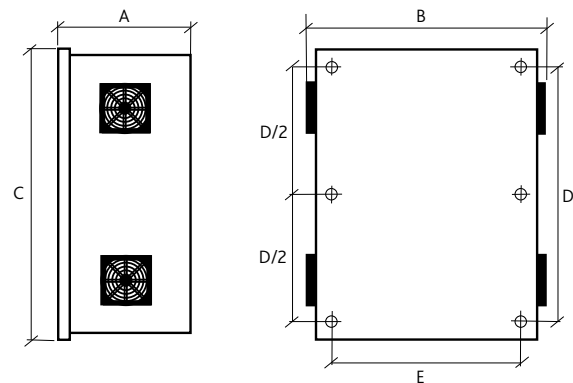
Always handle with care to avoid damage and distortion, and where lifting slings are employed use spreaders to ensure slings do not come into contact with the unit case, or control pack (see fig. 2).

### 2.2 Dimensions (mm) & Weights (Kg)

Control sizes are selected by matching the unit full load current with the control code i.e. control code ES-ISC3.3A is suitable for a fan with a maximum full load current of 3.3A.

The Inverter overload is pre-set at the rating plate value, if a lower setting is required fit an appropriately sized overload relay to the output contactor and adjust accordingly.

Figure 3. Dimensions and drill pattern.



Unit Code	A	B	C	Weight	Drill Pattern	
					D	E
ES-ISC1.2A	230	325	410	6	340	298
ES-ISC2.4A	230	325	410	6	340	298
ES-ISC3.3A	230	325	410	6	340	298
ES-ISC4.1A	230	325	410	6	340	298
ES-ISC5.6A	290	390	455	14	470	373
ES-ISC7.3A	290	390	455	14	470	373
ES-ISC8.8A	290	390	455	14	470	373
ES-ISC12.5A	290	390	455	20	470	373
ES-ISC15.6A	290	390	455	20	470	373
ES-ISC23.1A	290	390	455	20	470	373
ES-ISC38.0A	355	525	805	40	710	510

Figure 2. Typical lifting methods.

Slings via spreaders fitted to unit with base frame.

Please note that above images are examples of typical lifting methods. Actual unit lifting plan and risks must be assessed by competent personnel before moving the unit.

### 2.1 Offloading & Handling

The weight of the unit modules and palletised items are displayed on the packaging.

Some of the modules have an uneven weight distribution, and this will be indicated by labelling where appropriate.

Offloading and positioning of the equipment is the responsibility of the purchaser. Items should only be lifted by competent personnel following appropriate risk assessment.

## 3.0 INSTALLATION

The installation must be carried out by competent personnel in accordance with the appropriate authority and conforming to all statutory and governing regulations i.e. IEE, CIBSE, HVCA etc.

The Ecosmart control is designed to be installed indoors, away from any water spray or steam generating source. Fix or mount in upright position to a secure vibration free vertical surface (see fig. 1 & 3). Ensure the ventilation grilles are free of obstruction.

If the unit is installed outdoors, the matching size weathering cover ES-ISC-WP\* must be used to provide weather protection.

### IMPORTANT

The operating range is 0°C to 35°C, up to 85% relative humidity (non-condensing).  
Installation in unventilated loft is not recommended.

### 3.1 Mechanical Installation

For ease of installation, remove the front cover and disconnect any cooling fans fitted. Remove the control casing from the base, offer the base to the wall (or mark from the drill pattern).

Drill and fix the base to the wall using appropriate fasteners. It may be easier to connect the field wiring at this stage. Reassemble the case ensuring that cooling fans are reconnected.

### IMPORTANT

Isolation - Ensure that the unit is electrically isolated from the mains supply before commencing work.

Motors of 4kW and above must be connected to Delta Δ

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.

### 3.2 Electrical

The mains power supply to the controller must be 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.

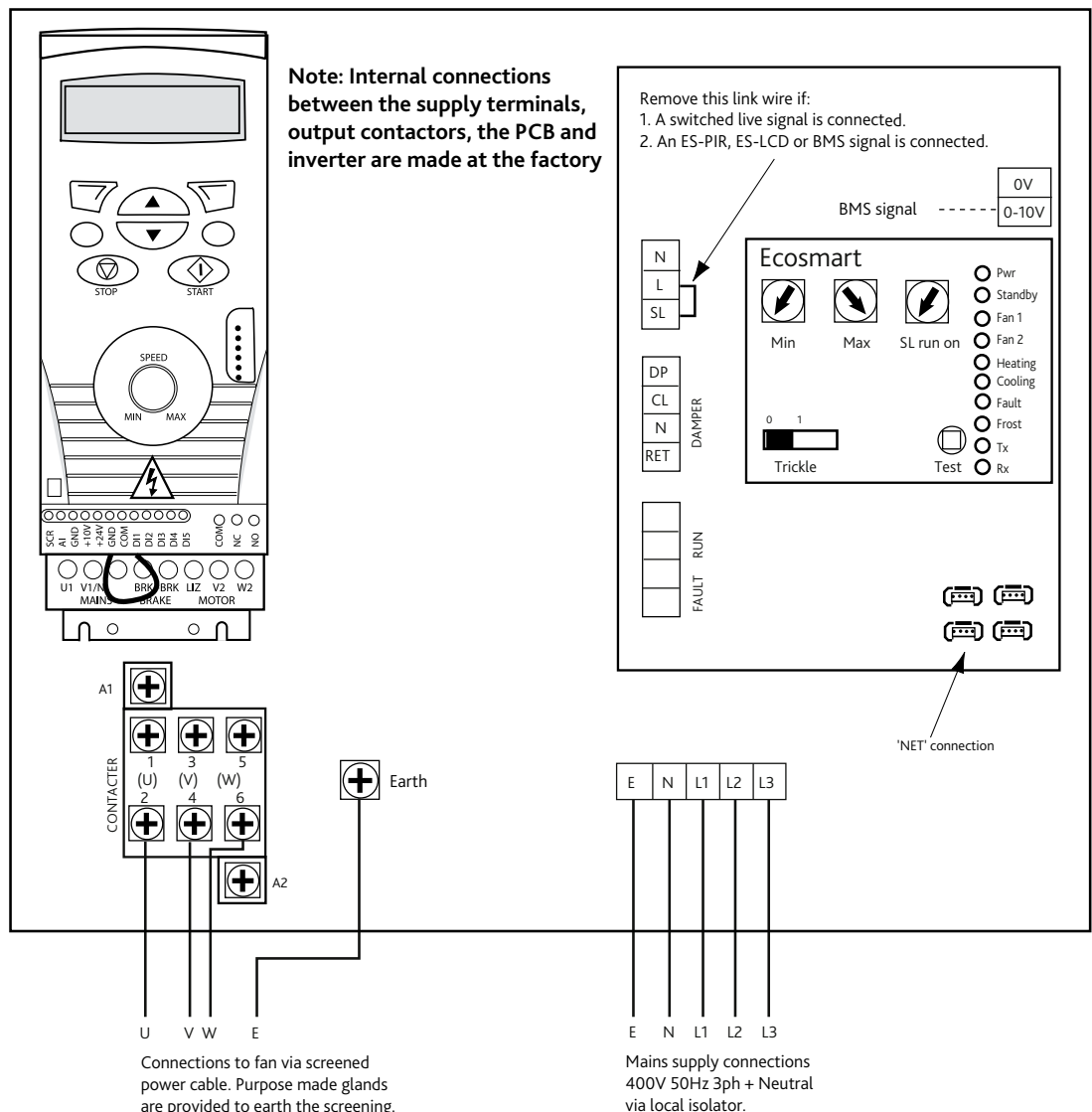
Ecosmart controls and sensors are supplied with 10 metres of data cable plugged at both ends, if used these can now be fitted and plugged in to the low voltage sockets on the Ecosmart control board. **All other low voltage connections i.e. BMS can also be completed.**

### IMPORTANT

To minimise the possibility of Electro Magnetic interference:

- Always install screened cable between the control and the fan, maximum length 30 metres. Consult Nuairé 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.

Figure 4. ES-ISC wiring diagram.



## 4.0 CONTROL CONNECTIONS

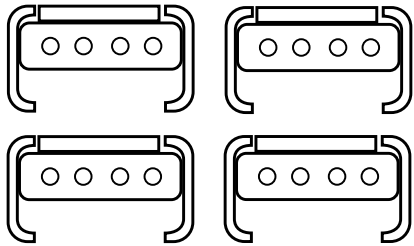
### 4.1 Mains Connections

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

### 4.2 Control Connections

4 IDC plug-in Net 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).

Figure 6. 'Net' connection for Ecosmart devices.



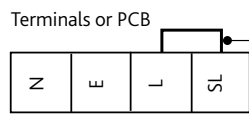
### 4.3 Switched Live (SL) Terminal

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 fig. 11).

Do not take this signal from an isolating transformer.

Figure 7. SL terminal.

Remove link if switched live signal, an enabler or BMS signal is connected.

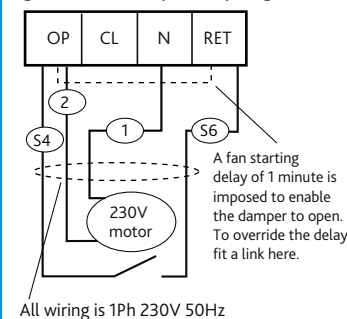


Mains connection pre-wired  
230V 50Hz 1ph / 220V 60Hz 1ph

### 4.4 Damper Connections

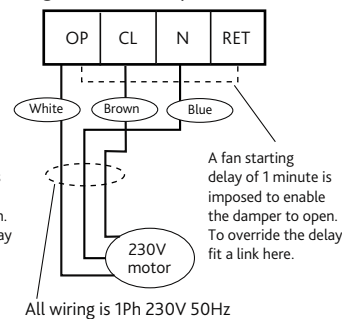
Volt free contacts are not fused, if these are used to power any external equipment, the installer must provide adequate fusing or other protection. These contacts are rated at 5A resistive, 0.5A inductive.

Figure 8. Drive open / spring close.



All wiring is 1Ph 230V 50Hz

Figure 9. Drive open / drive close.



All wiring is 1Ph 230V 50Hz

**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.

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

## IMPORTANT

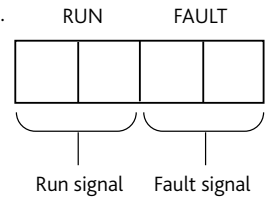
**Isolation** - Ensure that the unit, switched live and Nuaire control are electrically isolated from the mains supply before commencing work.

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

### 4.8 Volt Free Relay Contacts

Volt free contacts are not fused, if these are used to power any external equipment, the installer must provide adequate fusing or other protection. These contacts are rated at 5A resistive, 0.5A inductive.

Figure 5. Volt free relay contacts.



**Run Connections** = Contacts are closed when the fan is running.

**Fault Connections - No Fault** = Contacts are closed.

**Fault Connections - Fault** = Contacts are open.

### 4.5 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.**

### 4.6 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.

### 4.7 Other Low Voltage Cables e.g. BMS signal

Follow the basic principle (as f). Keep the cable run as short as possible but 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).

### 4.9 BMS input signals

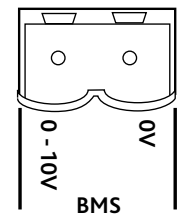
The BMS connection is made with a plug-in connector via the socket (see fig. 9). To ensure the connection is made only by suitably qualified and authorised personnel the plug is not supplied.

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

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.

Figure 10. BMS input signals



## IMPORTANT

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

	Ventilation	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

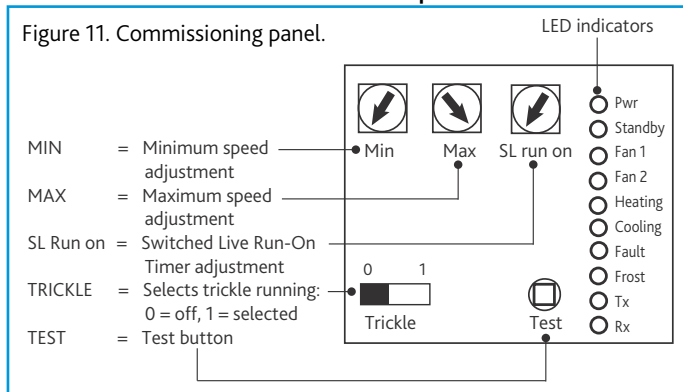
## 5.0 SETTING TO WORK

### 5.1 Electrical

#### 5.1.1 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.**



#### 5.1.2 LED Indication for Units with Ecosmart Control

- PWR** GREEN: Power on & OK.  
 RED: To much power is taken by peripherals or there is a short circuit in the net cable. Check the cable and use a junction box (ES-JB) to connect some of the peripherals.
- 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 (Twin fan only).
- Heating\*** Not applicable. See note.
- Cooling\*** Not applicable. See note.
- Fault** LED on when a fault is present on unit.
- Frost\*** Applicable with LPHW only. 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 classic products and will have indicators for functions that are not available in this particular fan. However these indicators will not be illuminated.

## 5.2 Settings

### 5.2.1 Setting the Maximum Air Flow Rate

- 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 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)".

### 5.2.2 Setting the Minimum / Trickle Air Flow Rate (Nomial 20%)

- 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'.

- 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.

- 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.**

## 6.0 MAINTENANCE

### 6.1 General Cleaning and Inspection

Clean and inspect the exterior of the unit, remove covers and carefully clean out any dust deposits. Check security of all components and terminals, remove fan filters and clean or replace as necessary. Refit covers.

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.

### 6.2 Replacement of Parts

Should any component need replacing, Nuair keep extensive stocks for quick delivery. 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

The 5 year warranty starts from the day of delivery and includes parts and labour for the first year. The remaining 4 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.

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 Nuair International Sales office for further details.

## 8.0 AFTER SALES ENQUIRIES

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