



# ES-ISC

## Ecosmart Speed Control Installation Manual



### 1.0 SAFETY INFORMATION

- The provision of the electrical supply and the connection of the unit to the electrical supply 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.
- 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.



##### 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 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.

## 3.0 DELIVERY & HANDLING

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.

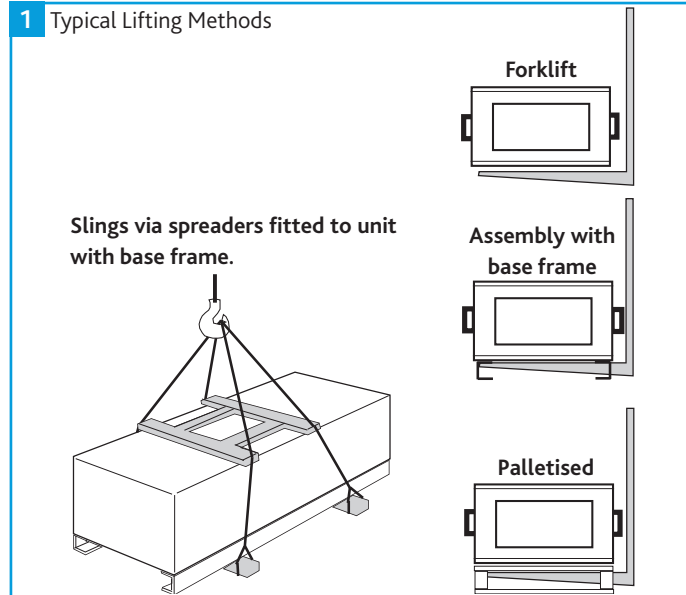
Particulars of damage and/or incomplete delivery should be endorsed by the driver delivering the goods before offloading by the purchaser. No responsibility will be accepted for damage sustained during the offloading from the vehicle or on the site thereafter. All claims for damage and/or incomplete delivery must be reported to Nuaire within two days of receipt of the equipment.

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.**

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.

### 1 Typical Lifting Methods

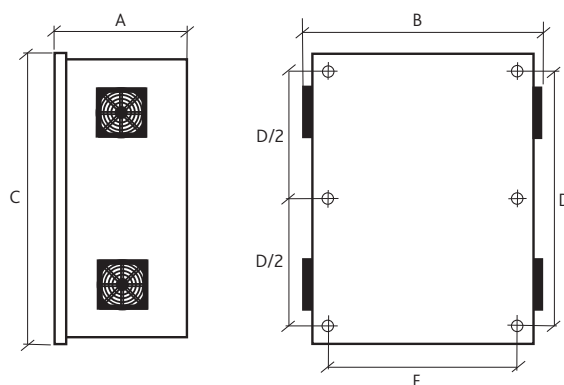


## 4.0 DIMENSIONS (mm) & WEIGHTS (kg)

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.

### 2 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

## 5.0 INSTALLATION

Installation must be completed by competent persons, in accordance with good industry practice and should conform to all governing and statutory bodies i.e. IEE, CIBSE, etc.

**The ES-ISC 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 (Figure 2). Ensure the ventilation grilles are free of obstruction. Minimum distance of 50mm between grilles and any side obstruction. Minimum distance of 100mm between grilles and any top obstruction. **If the unit is installed outdoors, the matching size weathering cover ES-ISC-WP(A-C) must be used to provide weather protection.**

The operating range is -10°C to 40°C, up to 85% relative humidity (non-condensing). Installation in unventilated loft is not recommended.

Ensure that the unit is electrically isolated from the mains supply before commencing work. When the fan is isolated, allow 5 minutes for the capacitors in the inverter to discharge before commencing any work on the unit.

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.

## 5.1 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.

## 5.2 Electrical Installation

To minimise the possibility of Electro Magnetic interference:

- Always install screened cable between the control and the fan, maximum length 30 metres. 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 in the same containment as mains carrying cables.

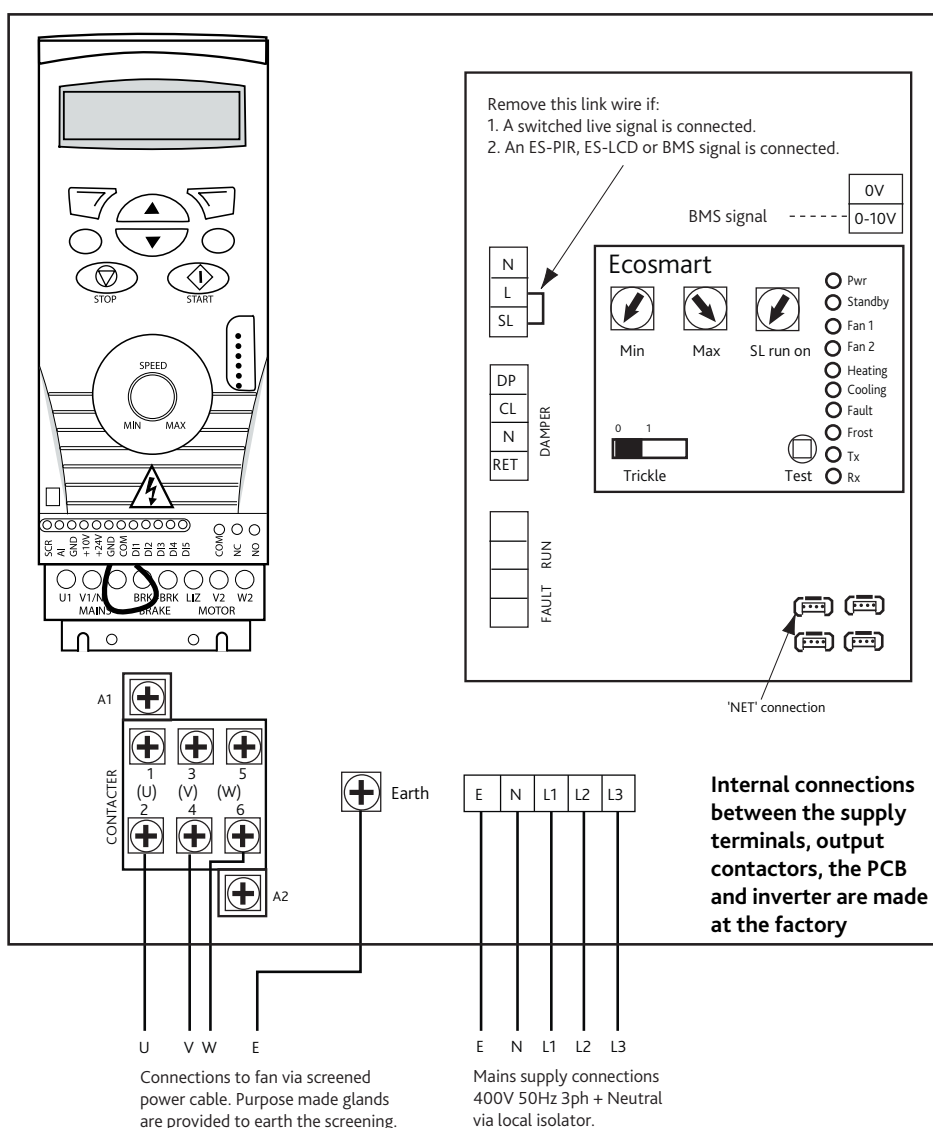
The mains power supply to the controller must be appropriately sized and installed via a local isolation switch (by others). The isolator must also accommodate the 230V switched live (if used).

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.**

### 5.2.1 Wiring Diagram

#### 9 Wiring



## 5.3 Control Connections

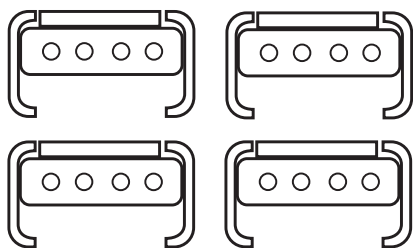
### 5.3.1 Mains Connections

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

### 5.3.2 Ecosmart 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).

#### 3 Ecosmart 'Net' Connections



### 5.3.3 Switched Live (SL) Terminal

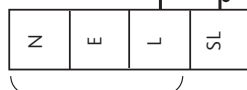
A signal of 100-230V a.c. will activate the fan from either its off state or trickle state (see setting to work-trickle switch). When the SL is disconnected the fan will over-run for 1 – 60 minutes (see fig. 11).

Do not take this signal from an isolating transformer.

#### 4 Switch Live Terminal Wiring

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

Terminals or PCB



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

### 5.3.4 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.

**OP** - 230V 50Hz 1A max supply to open the damper

**CL** - 230V 50Hz 1A max supply to close the damper

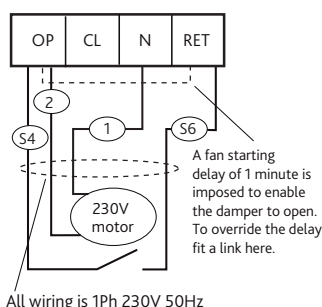
**N** - Neutral supply to damper

**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.**

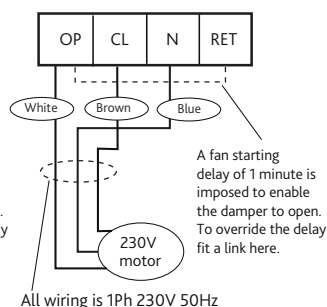
#### 5 Damper Wiring

##### Drive Open / Spring Close



All wiring is 1Ph 230V 50Hz

##### Drive Open / Drive Close



All wiring is 1Ph 230V 50Hz

### 5.3.5 Volt Free Contacts

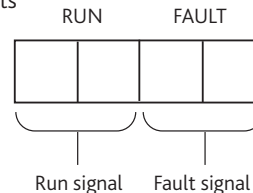
Volt free contacts are not fused, if these are used to power any external equipment, the installer must provide adequate fusing or other protection. These contacts are rated at 5A resistive, 0.5A inductive.

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

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

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

#### 6 Volt Free Contacts



### 5.3.6 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.

**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.**

### 5.3.7 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.

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

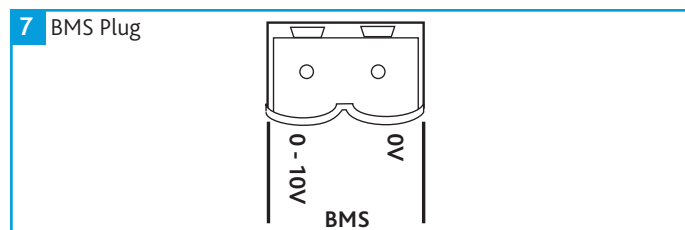
Follow the basic principle (as f). Keep the cable run as short as possible but less than 50 metres. If the cable is longer than 12m, we recommend using screened cable with the screening grounded at one end only (preferably at the inverter end).

### 5.3.9 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 (**available from R S Components, Part No. 176-7772**).

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

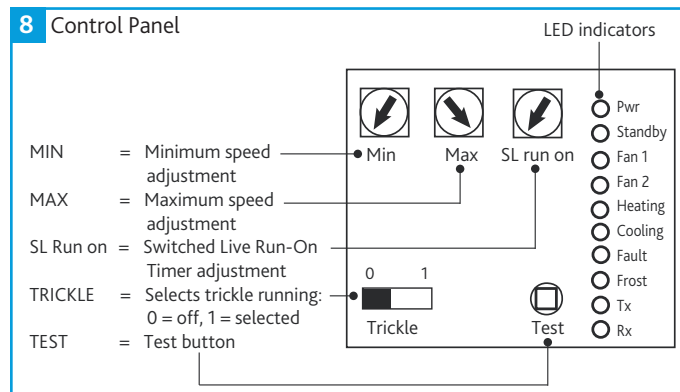
The system's response to a 0-10V dc BMS signal is given in the table below. **The BMS signal will override any sensors and user control connected in the system. The voltage tolerance is +/- 125mV and is measured at the fans terminal.**



System Response	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.

## 6.0 CONTROLS



### 6.1 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.

**The fan will return to normal operation after 30 seconds.**

### 6.2 LED Indication

- PWR** GREEN: Power on & OK.  
RED: Too 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.

**\*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.**

### 6.3 Settings

#### 6.3.1 Maximum Airflow 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)".

#### 6.3.2 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'.
- 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.

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

## 7.0 MAINTENANCE

**Ensure that the unit is electrically isolated from the mains supply before commencing work. When the fan is isolated, allow 5 minutes for the capacitors in the inverter to discharge before commencing any work on the unit.**

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.

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.

### 7.1 Routine Maintenance

- 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.

## 8.0 WARRANTY

The 5 year 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.

**Failure to maintain the unit as recommended will invalidate the warranty.**

## 9.0 END-OF-LIFE AND RECYCLING

**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.**

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.

## 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](mailto: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.

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