

ESBH

Ecosmart Boxer Air Handling Units Installation and Maintenance



1.0 INTRODUCTION

The information contained in this document provides details of installation, operation and maintenance for installers and users of the ESBH Ecosmart Boxer range of air handling units.

A standard system incorporates the following, as appropriate to fan type:

- Inlet section
- Filters
- Electric or LPHW heater
- Chilled Water or DX coil
- Belt or Direct Drive section
- Ecosmart control
- Fan failure circuit
- Integral temperature sensor

Optional extras may include:

- Silencers
- Dampers
- Heat Exchangers
- Inlet and Outlet Terminals
- Weathering Roof
- Sensors
- User controls

For systems which include supply fans with heating and/or cooling coils, other than where the BMS has control, the appropriate user control is required.

Code description: XBOXER XBC Ventilation Unit

ESBH S * - L C
 | | | | |
 1 2 3 4 5

1. Ecosmart Boxer Range (High Efficiency)
2. S = Supply Unit
E = Extract Unit
3. * = Unit Size (1-7)
4. N = No Heater
L = LPHW Coil
E = Electric Heater
5. C = CHW Coil
D = DX Coil

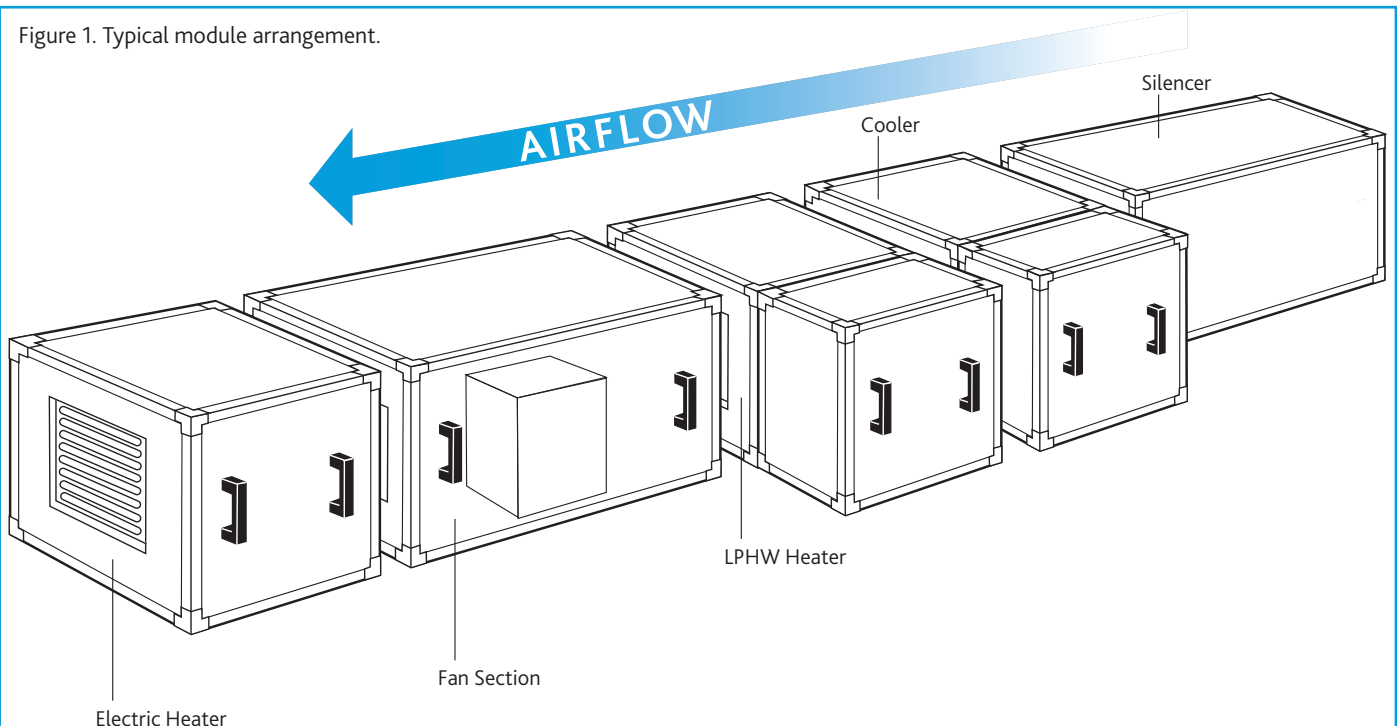
IMPORTANT

UNITS OF MODULAR CONSTRUCTION: Units sizes 3 and above will be supplied in modular sections, their assembly and wiring between controls, sensors and actuators located in each section is the responsibility of the installer and is discussed within this document.

IMPORTANT

ECOSMART CONTROL BOXES - Units sizes 3 and above, incorporate control boxes on external casing as shown in Figure 1.

Figure 1. Typical module arrangement.

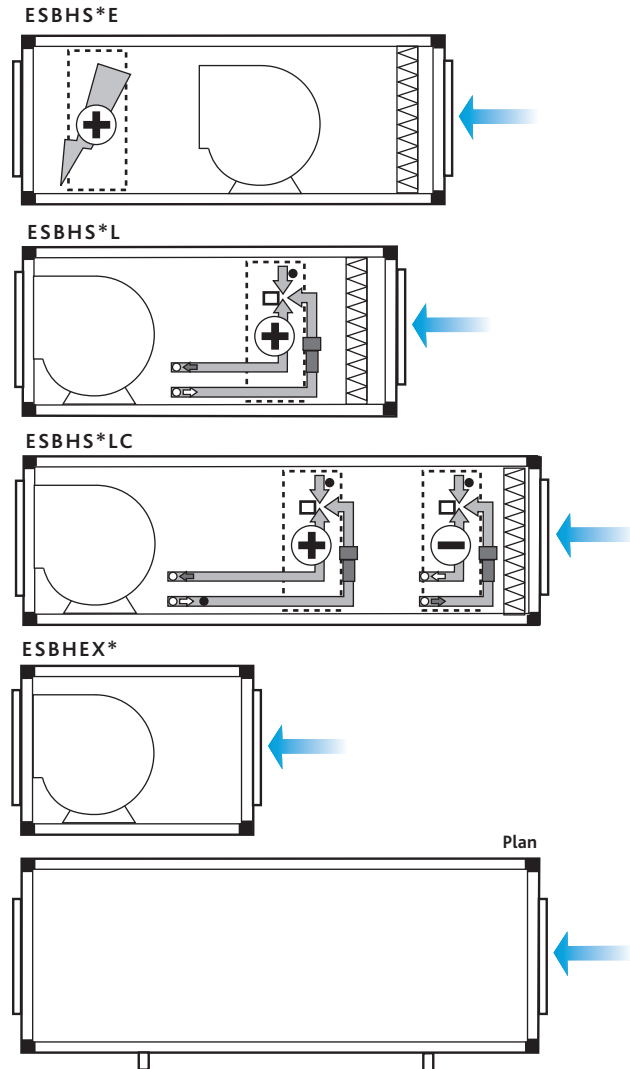


1.1 Typical Unit Arrangements

Unless otherwise stated i.e. RHT in unit code, all control packs are positioned on the left of the unit when viewed with direction of airflow. For any alternative control or pipework position, contact us on the number opposite.

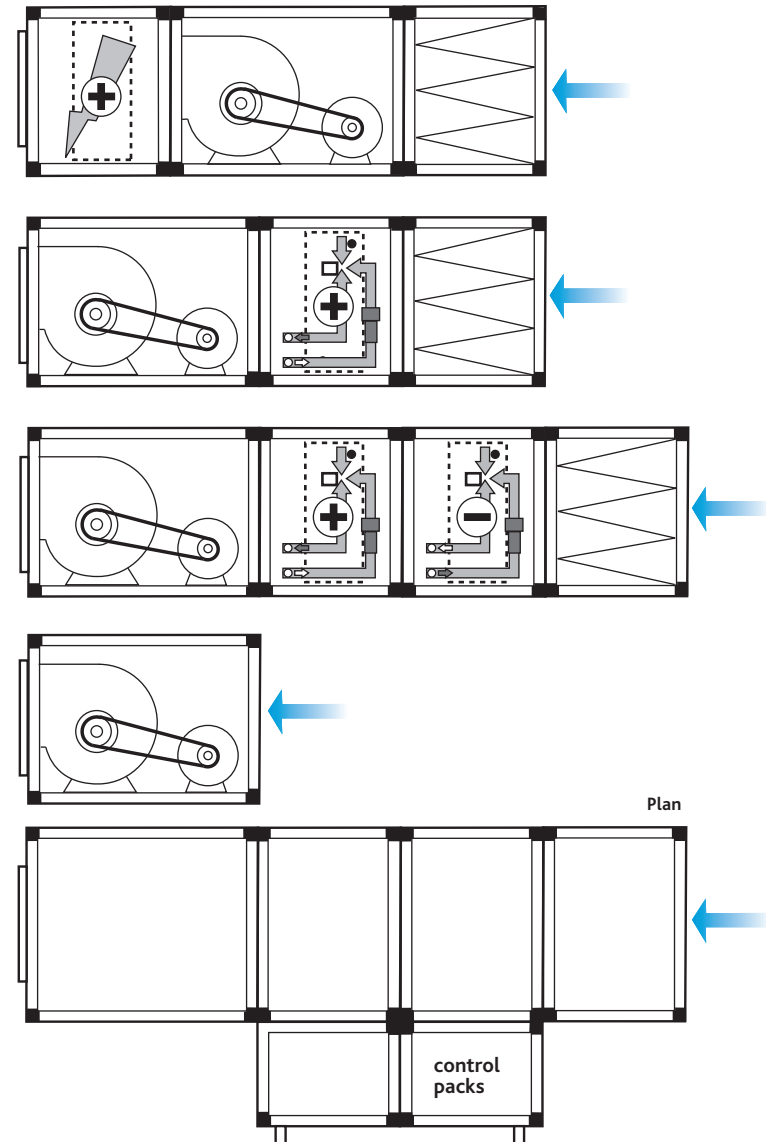
1.1.1 Direct Drive (Sizes 1 and 2)

Figure 2.



1.1.2 Belt Drive (Sizes 3 to 7)

Figure 3.



1.2 Dimensions & Weights

Full details, with project specific documents and drawings are available from the Nuair Technical Estimating Department.

2.0 HANDLING

Upon receipt of the equipment an inspection should be made, and before commencement of lifting ensure that normal equipment safety checks have been carried out.

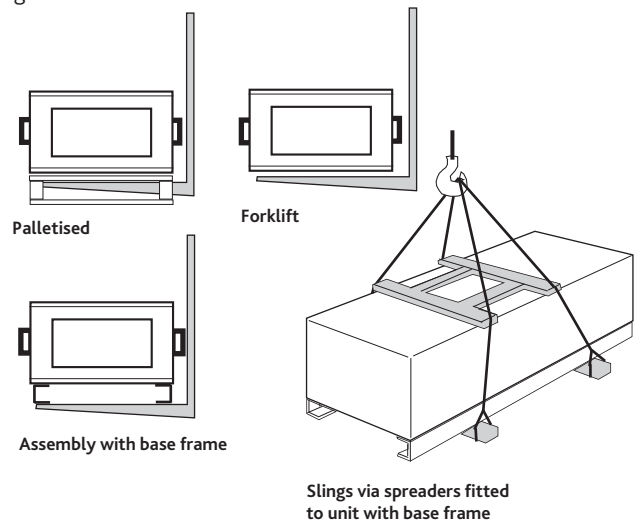
The unit/sections should be removed from the vehicle using a fork lift or crane. Always handle with care to avoid damage and distortion, and where lifting slings are employed use spreaders to ensure slings do not come into contact with the unit case, or control pack (Figure 4).

Correctly position slings to avoid twisting of the unit case and observe the centre of gravity before the final lift is made.

Note: The weight of the unit from the rating plate.

Dependent on model and size units may be supplied in single or multi-module sections. Handle each section individually **do not stack for lifting or storage.**

Figure 4.



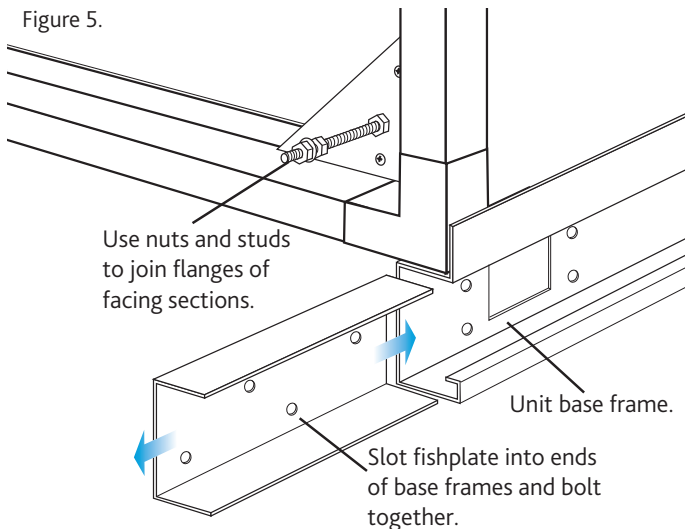
3.0 INSTALLATION

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

3.1 Erection

Unit sizes 1 and 2 are generally single section units and require no assembly.

Unit sizes 3 to 7 are multi-section units supplied on a base frame. The units and base frame will require bolting together using matched drilled flanges and the nuts and bolts provided. In addition fish-plates must be used to join two base frames together (Figure 5).

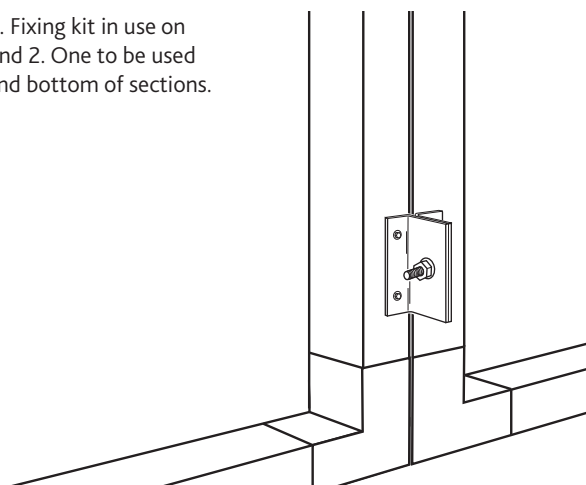


3.2 Assembly of Equipment

3.2.1 Mechanical

Ensure all components and sections are available to complete the work. The flanges of facing sections must be offered one to the other, and secured via the studs and nuts provided. Access to each securing point is by removal of the access doors on each section. Each joint must be appropriately sealed to ensure weathering and to prevent air leakage.

Figure 6. Fixing kit in use on sizes 1 and 2. One to be used at top and bottom of sections.



Where cooling coils and heat exchangers are in use condensate drainage points are provided. It is the installers' responsibility to ensure connection to the appropriate trap and drainage.

On sizes 1 and 2, where motorised dampers are coupled to a system, it will be necessary to remove the spigot section inlet/discharge to fix the damper into position. Where ancillaries such as silencers, bag filters, frost heaters etc. are to be fitted, each additional component is supplied with a fixing kit (Figure 6).

Note: It is the assembler's responsibility to seal all modular facing joints.

3.2.2 Electrical

On sizes 3 to 7 the various modular sections are delivered separately for assembly on site.

Ensure that all inter-connecting wiring looms are connected between the adjoining modules - refer to the appropriate wiring diagram in section 5.

When selecting the unit position, ensure adequate access for connection of external services, commissioning, future inspection and maintenance and the removal of component parts.

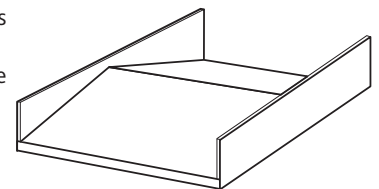
3.2.3 Indoor Installation

The standard fan is suitable for installation indoors only, away from heat sources, steam generation or water spray. Site the fan on a secure and level surface, using the base frame provided, suspend on a platform or support rails, alternatively hang using drop rods.

3.2.4 External Installation

Where an external installation is required, install on a secure and level surface, use the base frame and the weather roof tailored for each system. Connect ducting, inlet or extract cowls as appropriate.

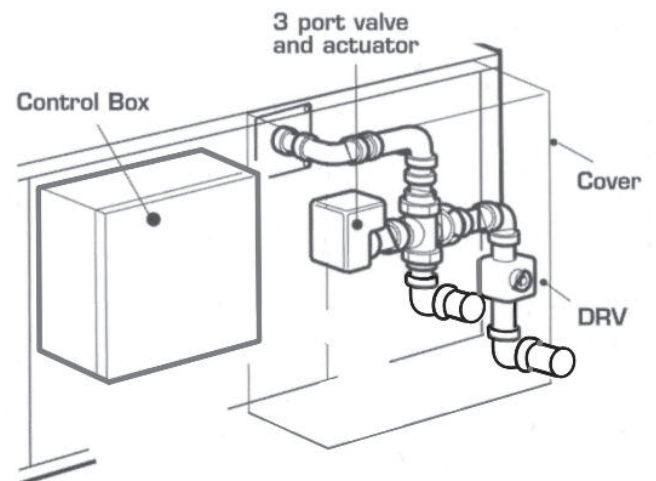
Figure 7. Weather Roof



3.2.5 Wet Pipe Connections

Unit Model	Frost Coils	CHW Coils	LPHW Coils
ESBHS1	0.75" BSP	1" BSP	1.25" BSP
ESBHS2	0.75" BSP	1.25" BSP	1.25" BSP
ESBHS3	1" BSP	1.25" BSP	1.25" BSP
ESBHS4	1" BSP	1.25" BSP	1.5" BSP
ESBHS5	1.25" BSP	1.5" BSP	2" BSP
ESBHS6	1.25" BSP	2" BSP	2" BSP
ESBHS7	1.5" BSP	2" BSP	2" BSP

Figure 8. Typical wet coil pipe termination arrangement.



NB: The flow valve is not factory set and should be adjusted by the commissioning engineer.

4.0 WIRING

IMPORTANT

This product must be earthed.

4.2.1 Power Requirements

Unit Model	FLC Fan Only	Electric Heater (Max Power)	FLC Heater
ESBHEX1, ESBHS1-L	4.8A	N/A	N/A
ESBHS1-E	4.8A	18kW	25A
ESBHEX2, ESBHS2-L	7.3A	N/A	N/A
ESBHS2-E	7.3A	24kW	33A
ESBHEX3, ESBHS3-L	11A	N/A	N/A
ESBHS3-E	11A	27kW	38A
ESBHEX4, ESBHS4-L	11A	N/A	N/A
ESBHS4-E	11A	36kW	50A
ESBHEX5, ESBHS5-L	16A	N/A	N/A
ESBHS5-E	16A	54kW	75A
ESBHEX6, ESBHS6-L	16A	N/A	N/A
ESBHS6-E	16A	54kW	75A
ESBHEX7, ESBHS7-L	16A	N/A	N/A
ESBHS7-E	16A	54kW	75A

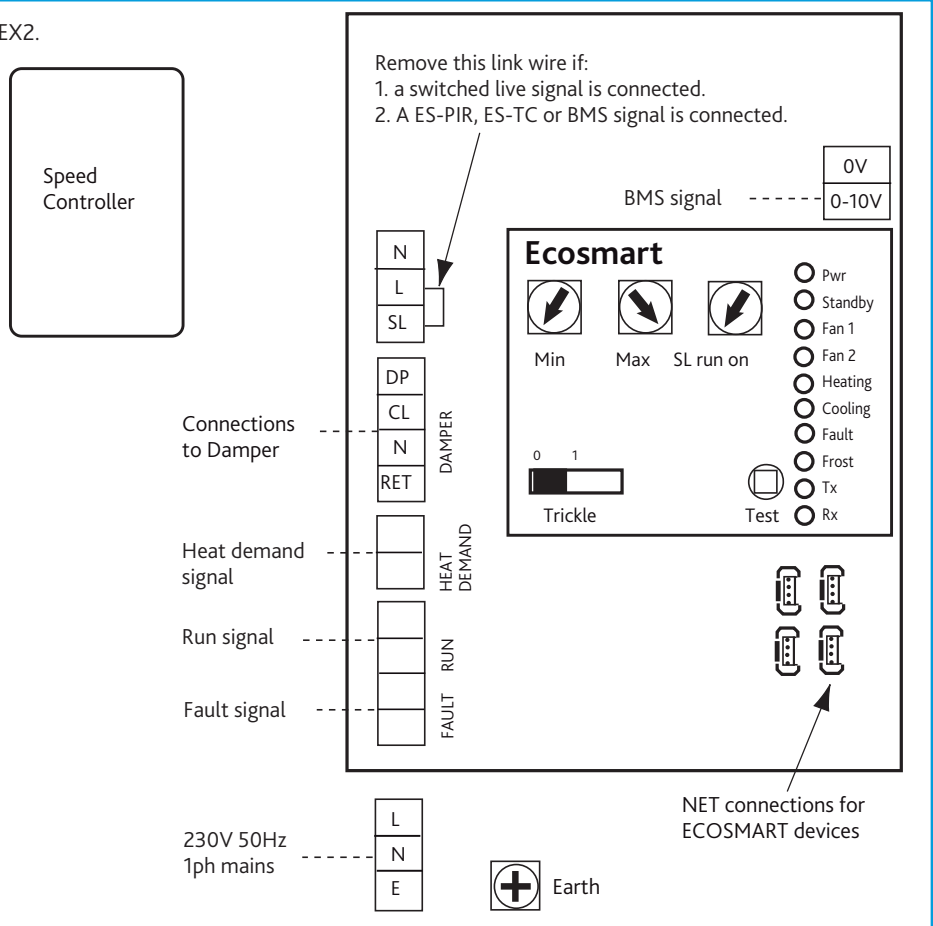
Cautionary Notes:

- Ecosmart controls use 'burst fire' control technology to manage the heater output. Due to the high absorbed currents on electric heaters there may be voltage drops experienced in the electrical system that may have an adverse effect on lighting etc.
- There are no inrush starting currents quoted because the Ecosmart control incorporates a soft starting speed control feature.
- The inverters are pre-set to match the fan heaters and control requirements. Under normal circumstances it should not be necessary to adjust them.
- Pay particular attention to the model type, recorded on the product rating plate and connect as follows.

The electrical wiring must be carried out by a competent person and the unit must be provided with means of local isolation (by others) for maintenance purposes. A suitable isolator is available from Nuair as a separate option.

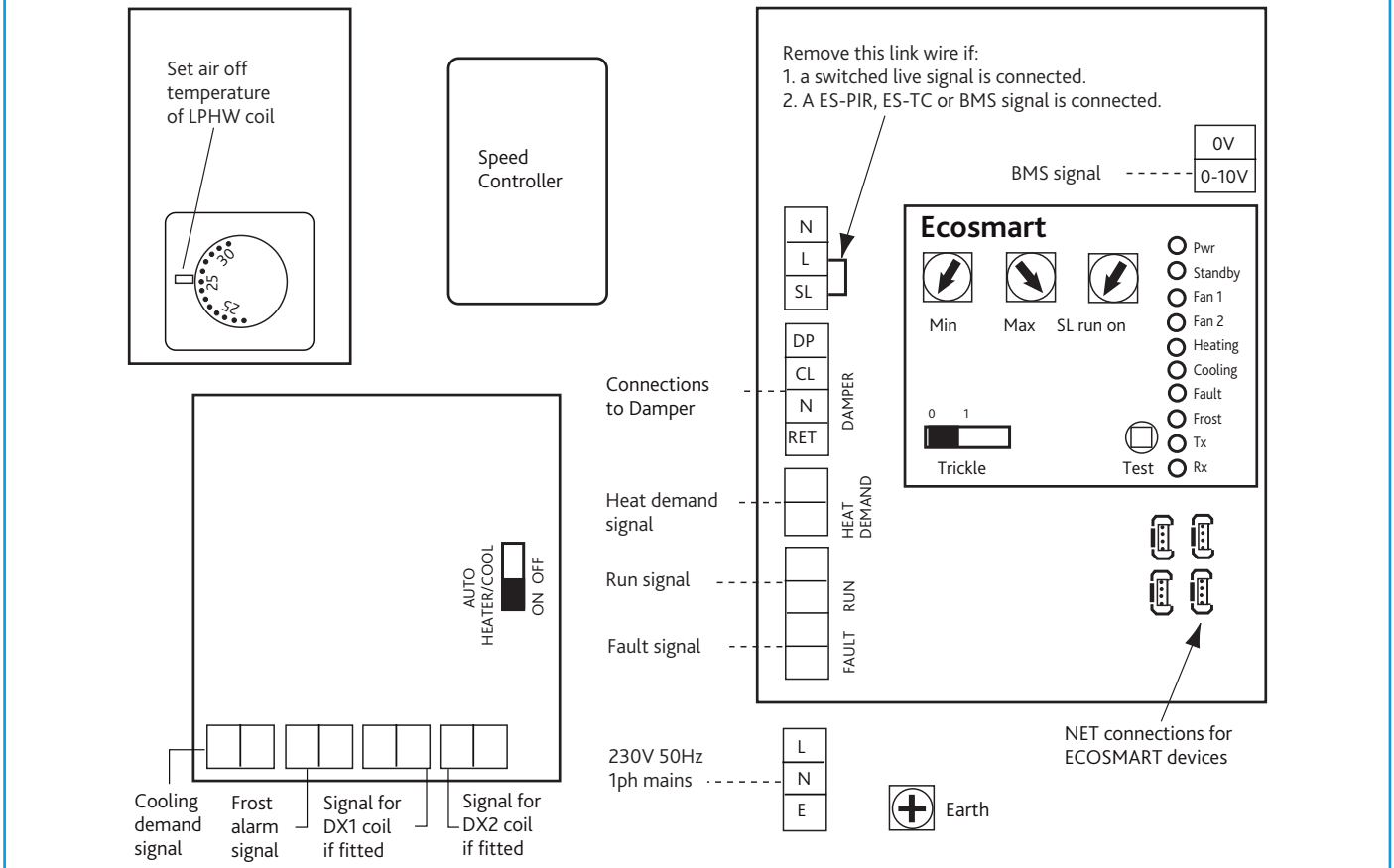
4.2.2 ESBHS1, ESBHS2, ESBHEX1 and ESBHEX2

Figure 9. ESBHS1, ESBHS2, ESBHEX1 and ESBHEX2.



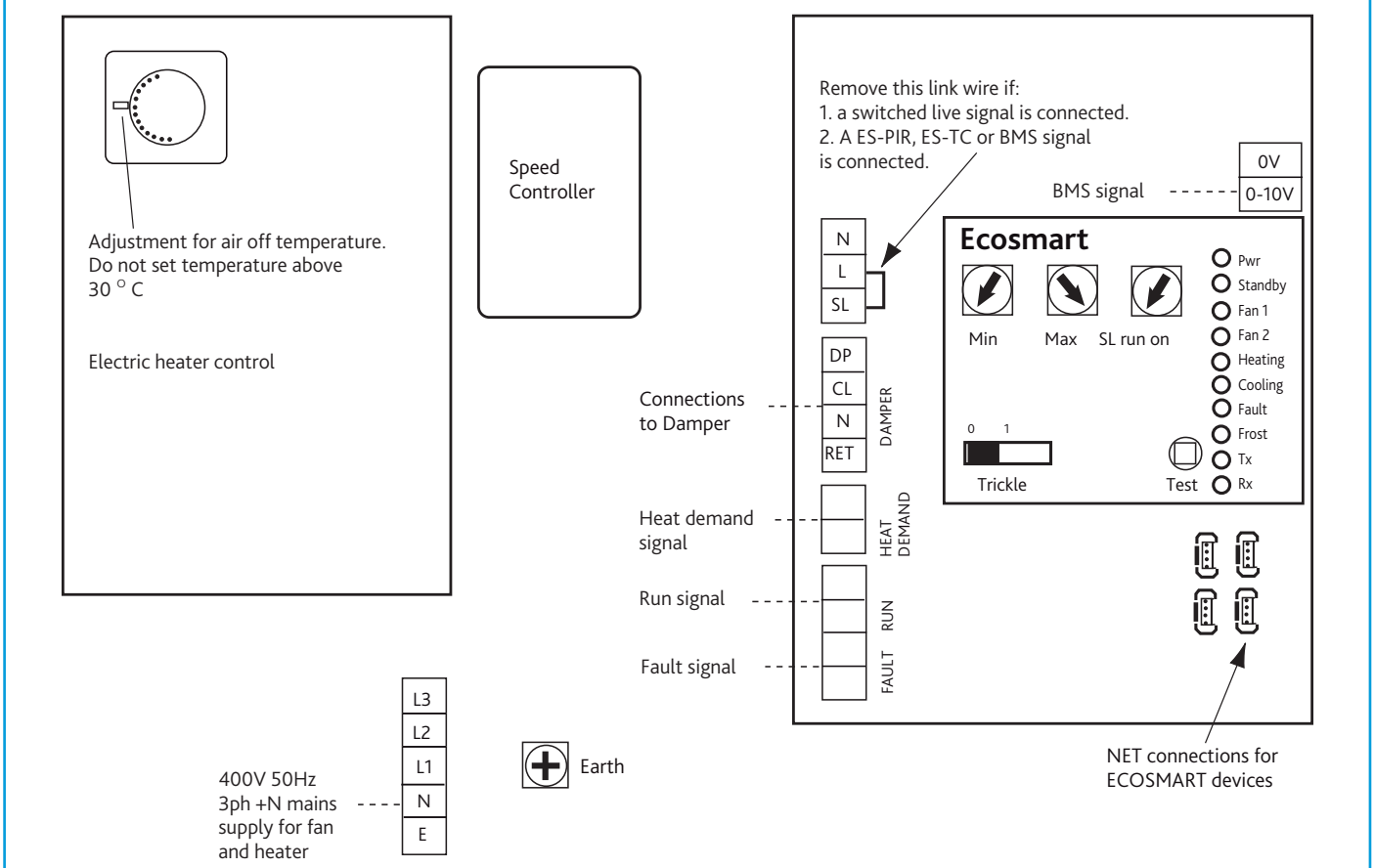
4.2.3 ESBHS1-L, ESBHS2-L, ESBHS1-LD and ESBHS-2LD

Figure 10. ESBHS1-L, ESBHS2-L, ESBHS1-LD and ESBHS-2LD.



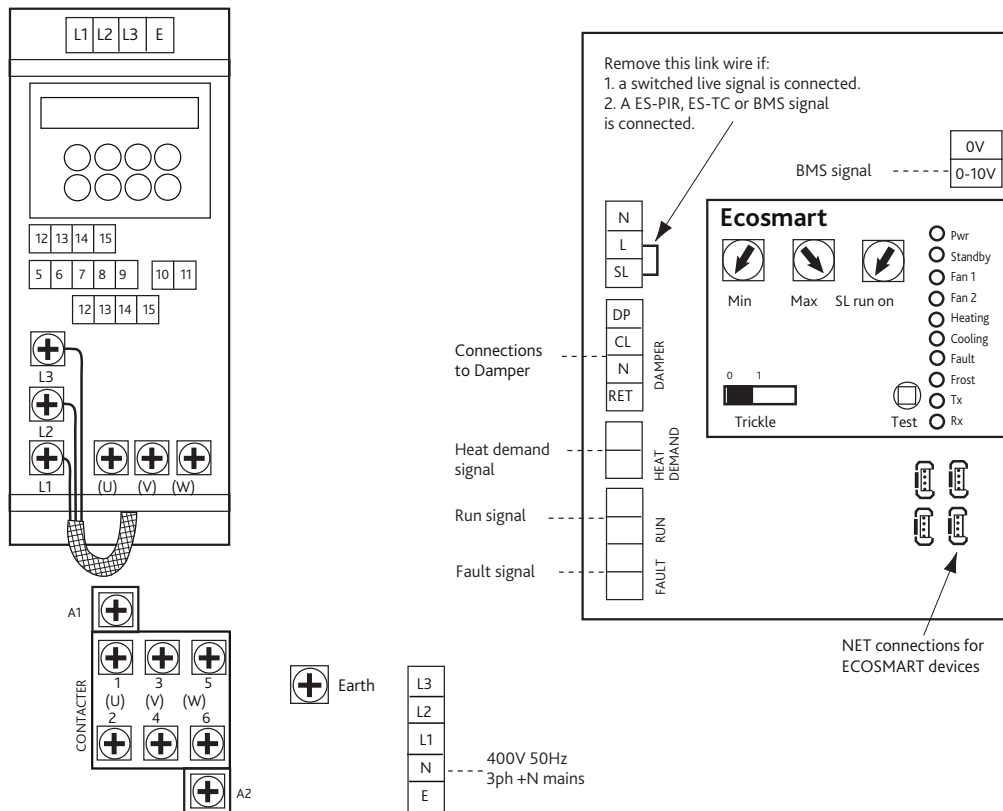
4.2.4 ESBHS1-E and ESBHS2-E

Figure 11. ESBHS1-E and ESBHS2-E.



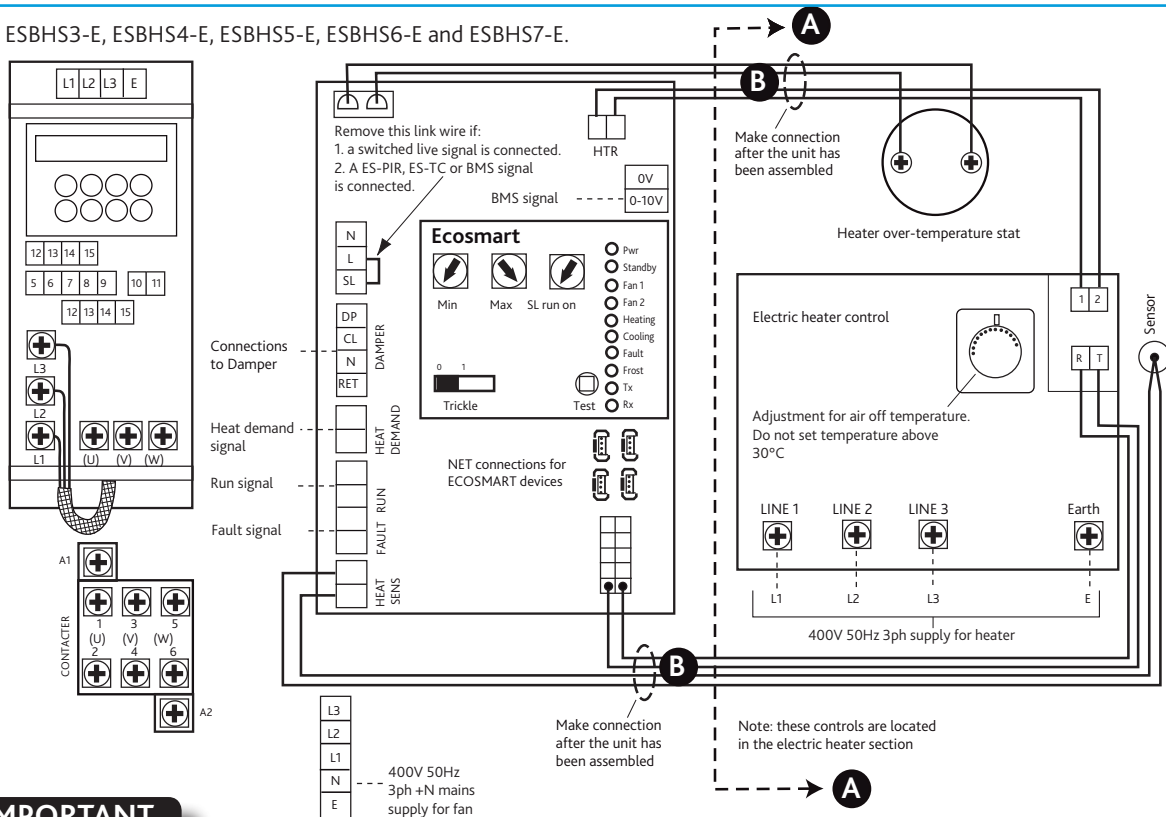
4.2.5 ESBHEX3, ESBHEX4, ESBHEX5, ESBHEX6 and ESBHEX7

Figure 12. ESBHEX3, ESBHEX4, ESBHEX5, ESBHEX6 and ESBHEX7.



4.2.6 ESBHS3-E, ESBHS4-E, ESBHS5-E, ESBHS6-E and ESBHS7-E

Figure 13. ESBHS3-E, ESBHS4-E, ESBHS5-E, ESBHS6-E and ESBHS7-E.

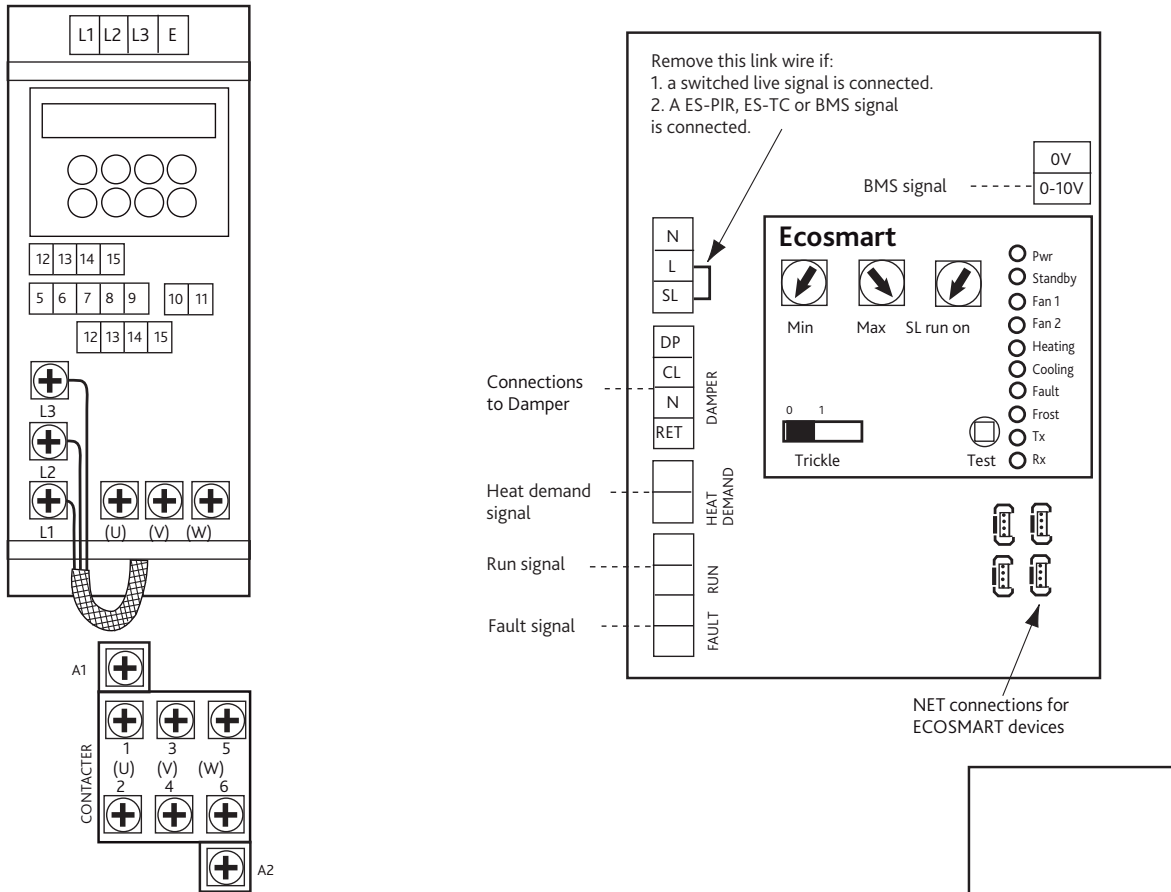


IMPORTANT

Section A is an adjacent module in which additional controls and sensors are installed. Ensure these devices are connected to the Ecosmart control by terminating at points B & C.

4.2.7 ESBHS3-L, ESBHS4-L, ESBHS5-L, ESBHS6-L, ESBHS7-L, ESBHS3-LD, ESBHS4-LD, ESBHS5-LD, ESBHS6-LD and ESBHS7-LD

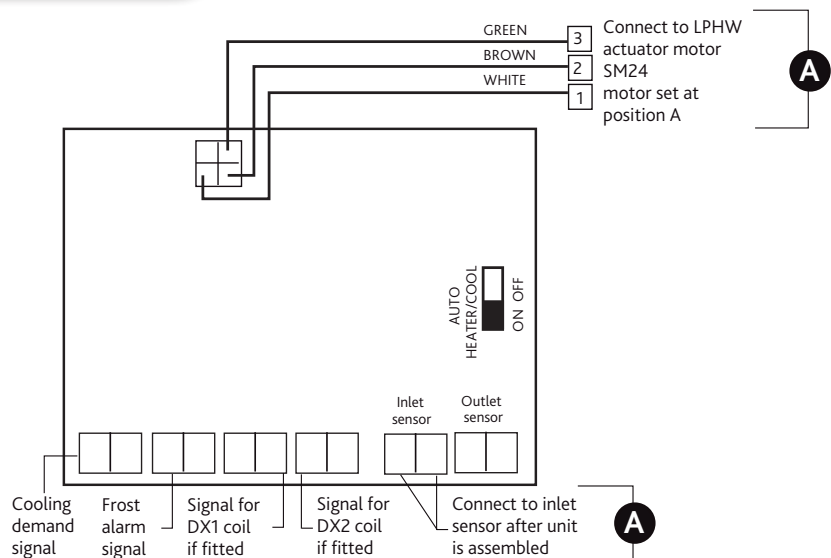
Figure 14. ESBHS3-L, ESBHS4-L, ESBHS5-L, ESBHS6-L, ESBHS7-L, ESBHS3-LD, ESBHS4-LD, ESBHS5-LD, ESBHS6-LD and ESBHS7-LD.



IMPORTANT

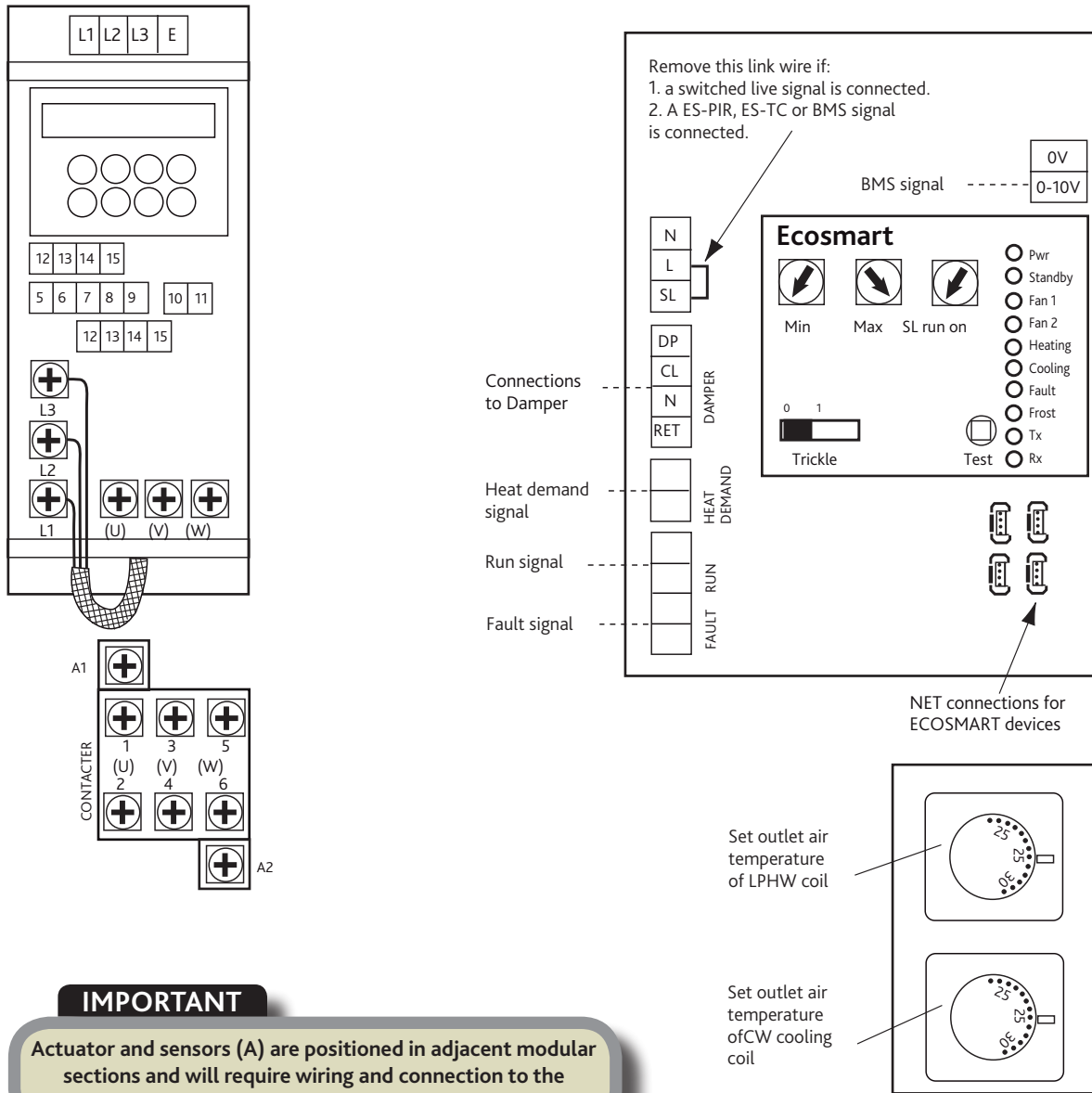
Actuator and sensors (A) are positioned in adjacent modular sections and will require wiring and connection to the Ecosmart control.

Set air off temperature of LPHW coil



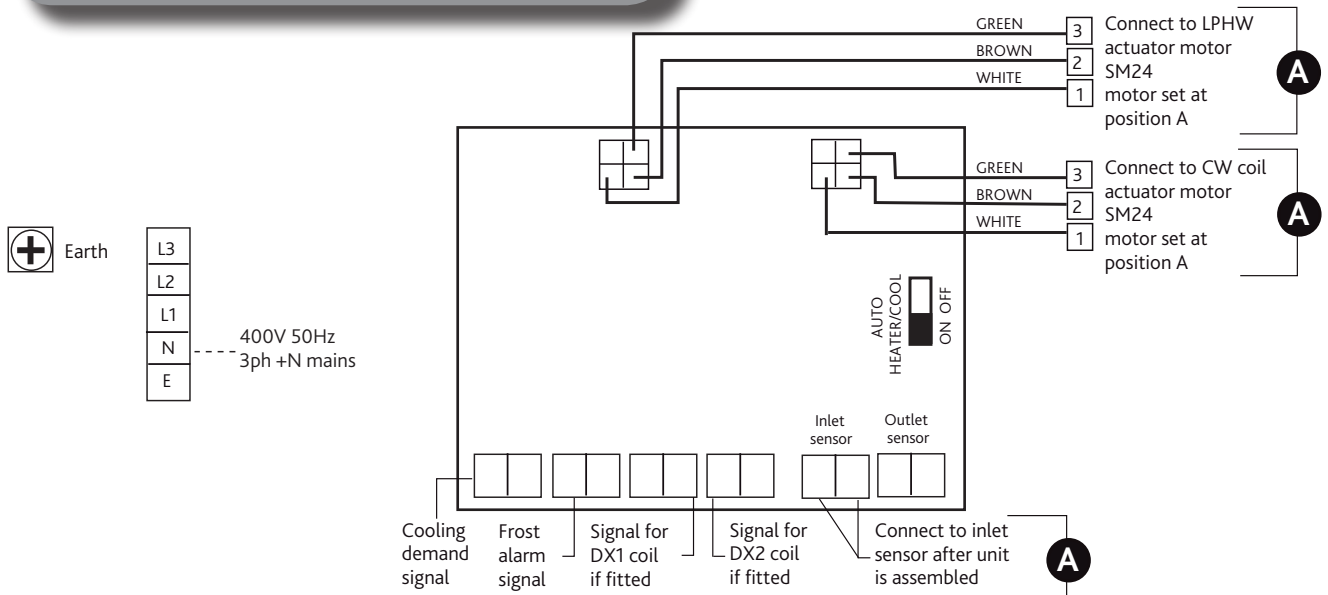
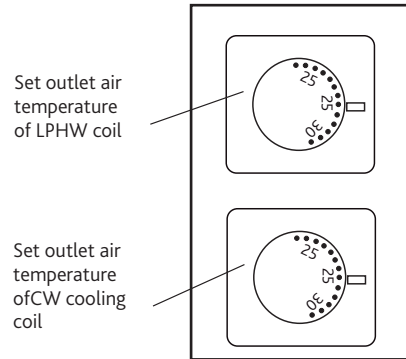
4.2.8 ESBHS3-LC, ESBHS4-LC, ESBHS5-LC, ESBHS6-LC and ESBHS7-LC

Figure 15. ESBHS3-LC, ESBHS4-LC, ESBHS5-LC, ESBHS6-LC and ESBHS7-LC.



IMPORTANT

Actuator and sensors (A) are positioned in adjacent modular sections and will require wiring and connection to the Ecosmart control.



4.1 Connections

4.1.1 Mains Connections

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

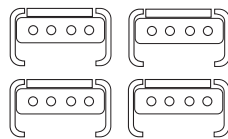
Where units form part of a system it will be necessary to install and connect mains wiring between controls and devices such as heat exchangers and motorised dampers - refer to the relevant section of this document.

Where units are supplied in modular sections, sizes 3 to 7, it will also be necessary to install and connect mains wiring between sensors and actuators. Extension of the cable looms may be required.

4.1.2 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).

Figure 16. 'Net' connection for Ecosmart devices.



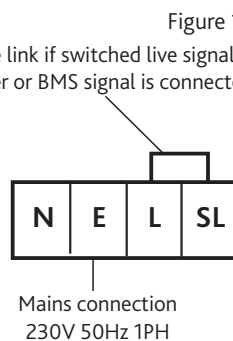
Where units are supplied in modular sections, sizes 3 to 7, or as part of a system it will also be necessary to install data cable (supplied) between Ecosmart controls and from Ecosmart sensors and heat exchanger etc.

4.1.3 Switched Live (SL) Terminal

A signal of 100 - 230V AC 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 (see setting to work-timer adjustment).

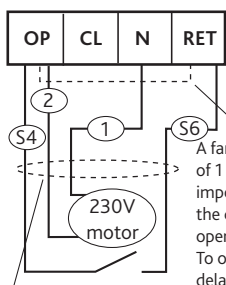
Do not take this signal from an isolating transformer.

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



4.1.4 Damper Connections

Figure 18. Drive Open/ Spring Close.



All wiring is 1PH 230V 50Hz

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

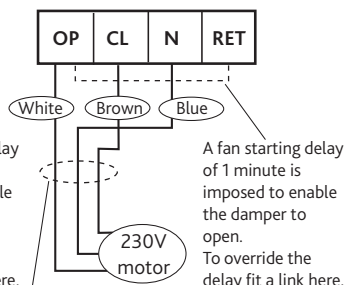
CL - 230V 50Hz 1A max supply to close the damper

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.

Figure 19. Drive Open/ Drive Close.



All wiring is 1PH 230V 50Hz

4.1.5 Volt Free Relay Contacts

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 = Contacts closed when fan is running.

Fault Connections: No fault = Contacts closed.

Fault = Contacts open.

Heat Demand = Contacts closed when heating selected.

Cooling Demand = Contacts closed when cooling selected.

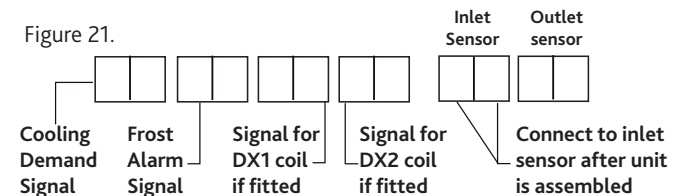
Do not use this contact to switch compressors directly.

Frost Alarm - Contacts closed when air off temperature is 4°C or below. Fan shuts down, valve opens and the heat demand contacts activated.

DX1 - contacts close when stage 1 of DX coil selected.

DX2 - contacts close when stage 2 of DX coil selected.

Figure 21.



4.1.6 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.

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.

4.1.7 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.

4.1.8 Other Low Voltage Cables

Follow the basic principle (as Data cable installation). Keep the cable run as short as possible and less than 50 metres.

4.1.9 BMS Input Signals

The BMS connection is made with a plug-in connector via the socket (Figure 22). 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 20.

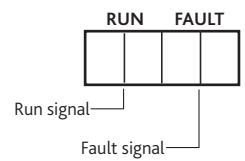
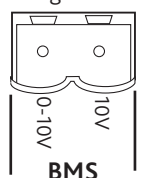


Figure 22.



IMPORTANT

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.

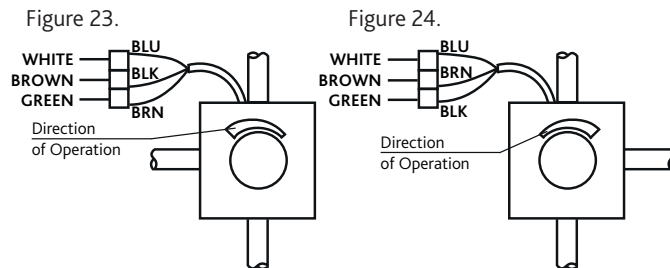
	Ventilation Mode	Cooling Mode*	Heating Mode*
Local Control	0.00	-	-
OFF/ Trickle	0.25	-	-
Speed 1	0.50	0.75	1.00
Speed 2	1.50	1.75	2.00
Speed 3	2.50	2.75	3.00
Speed 4	3.50	3.75	4.00
Speed 5	4.50	4.75	5.00
Speed 6	5.50	5.75	6.00
Speed 7	6.50	6.75	7.00
Speed 8	7.50	7.75	8.00
Speed 9	8.50	8.75	9.00
Speed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

*Only available on relevant unit.

4.1.10 LPHW Actuator Connections

LPHW actuator connection (unit sizes 3-7) must be made between the control and LPHW modules, using link wire provided.

Note: Actuator wiring can change dependent on direction of operation (Figure 23 & Figure 24).



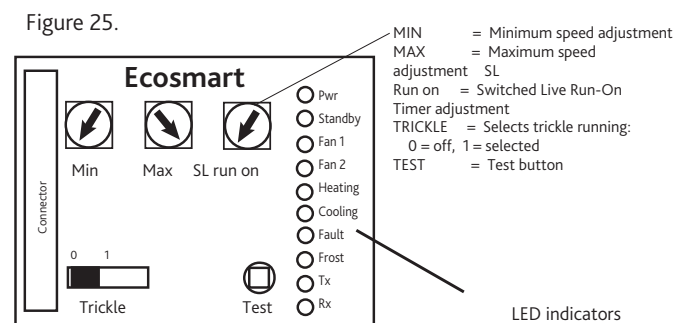
5.0 Setting to Work

5.1 Electrical

5.1.1 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.

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



5.1.2 LED Indication (Figure 25)

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
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.

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

5.1.4 Maximum/Trickle Airflow Rate (Nominal: 40% Sizes 1 & 2; 20% Sizes 3 to 7)

- 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 40%) must be below the maximum setting, or the 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.

5.2 Mechanical

- Wet systems require the setting of the flow valve. Set as general commissioning procedures - refer to the specified design flow duties and the documentation attached to each valve.
- Frost protection must be incorporated on shut down and fresh air conditions to avoid the coil and associated pipework freezing. Ideally, where the system is at risk of frost damage, the addition of a proprietary antifreeze solution to the water is recommended.
- DX coils have two separate cooling stages with independent condenser units, the coils are supplied with ends sealed. Connection, commissioning and setting to work is the responsibility of the condensing unit installer

6.0 MAINTENANCE

IMPORTANT

Before commencing work, make sure that the unit and Nuair control are electrically isolated from the mains supply.

IMPORTANT

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.

6.1 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.

6.2 Lubrication

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

6.3 General Cleaning and Inspection

Clean and inspect the exterior of the fan unit and associated controls etc. Remove the access panel from the fan unit. Inspect and, if necessary, clean the fan and motor assemblies and the interior of the case. If the unit is heavily soiled it may be more convenient to remove the fan / motor assemblies. If Nuair controls and or remote indicators are fitted, remove the covers and carefully clean out the interiors as necessary. Check for damage. Check security of components. Refit the access covers.

6.4 General

Check that all fixings are tight. Check sealing strips around the fan outlets are tight up against the bulkhead. Check that duct connections are not leaking.

6.5 Filters

Disposable filters should be changed when fully dust laden. Washable filters should be removed and washed in mild detergent, flushed with clean water and allowed to dry before refitting.

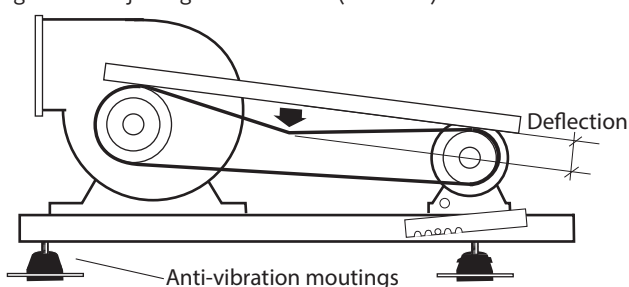
6.6 Cleaning Control Box and Sensors (if fitted)

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

6.7 Adjusting Drive Belt Tension (Sizes 3-6)

To check the correct tension of a drive belt, apply a force at right angles to the centre of the belt span sufficient to deflect the belt 16mm for every metre of span length (Figure 26). The force required to deflect the 'V' belt should be from 0.5kg to 0.8kg.

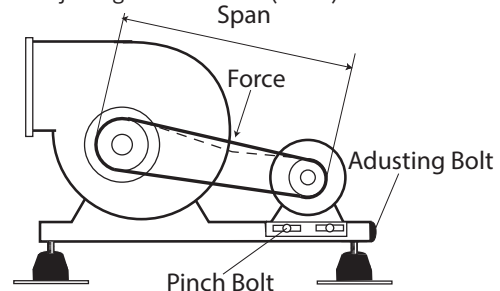
Figure 26. Adjusting the drive belts (Sizes 3-6).



6.8 Changing a Drive Belt

To replace a belt, remove the two bolts from the motor mounting furthest from the fan and slacken the remaining two bolts. Lift the motor plate and remove the belt. Replacing the belt is the reverse of this procedure.

Figure 27. Adjusting the drive belts (Size 7).



6.9 Adjusting Drive Belt Tension (Size 7)

All belt drive units incorporate belt tensioning devices. To adjust the belt tension, slacken the pinch bolt on the sides of the motor plate. Turn the adjusting bolt clockwise to tighten the belt and counter clockwise to loosen it. The drive should be tensioned until a slight bow appears in the slack side of the 'V' belt when running under load.

6.10 Checking Belt Tension

- Measure the span length (Figure 27).
- At the centre of the span, apply a force at right angles to the belt sufficient to deflect one belt 16mm for every metre of span length (Figure 27). The force required to deflect the 'V' belt should be from 0.5kg to 0.8kg.
- Tighten the pinch bolts.

6.11 Replacement of Parts

Should any component need replacing Nuair 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

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 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

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 BOXER FANS
Machinery Types: ESBS, ESBEX
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	20. 07. 07
2) A. Jones		Manufacturing Director	20. 07. 07

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

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. 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.

2.2 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 e.g. 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.

4.4 **Local Environment - Humidity.** Ambient humidity (the humidity at the unit's installed location) shall be within the range: 10 to 95% (for controls, non-condensing). Air humidity (the humidity of the air passing through the unit) shall be within the range: 10 to 95% (for controls, non-condensing).

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 (e.g. 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.

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