

SQRBO XBOX

(Pre-packaged heat recovery unit)

Installation, Operating and Maintenance Instructions

Code description example

S* (T) (NC) -XB*- * 2WP

1	2	3	4	5	6	7
			8			

- 1 = Unit size 2 to 10.
- 2 = T = Optional Twin (run & standby) extract fan; available as vertical stacked XB* for sizes S2 - 6T and S8T or horizontal XBH for size S8T.
- 3 = Ecosmart control as standard. NC = optional no control version, FC = optional fan speed control only.
- 4 = V = Vertically stacked unit, H = side-by-side unit (available for S6 to S10 only).
- 5 = L = Left hand, R = right hand (see illustrations).

- 6 = E = Electric heater (sizes 2 to 8 inclusive), L = LPHW coil, N = No heater fitted.
- 7 = 2 = 2 row heating coil.
- 8 = WP = Optional weatherproof cover.

Example: S2-XBV-LE is size 2, vertically stacked with electric heater and left hand access.

S6NC-XBH-RL is a size 6 with no controls, horizontal side-by-side unit, right hand access and LPHW heating coil.

AHU with Heat Recovery section and direct drive AC motor technology.

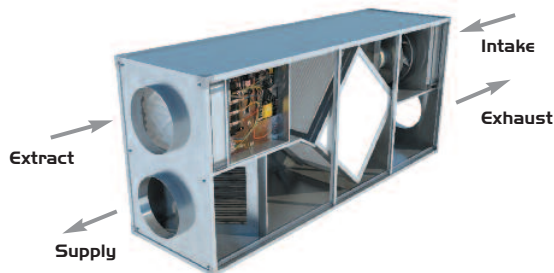


Figure 1: S2/5-XBV-LE (left hand with electric heater).

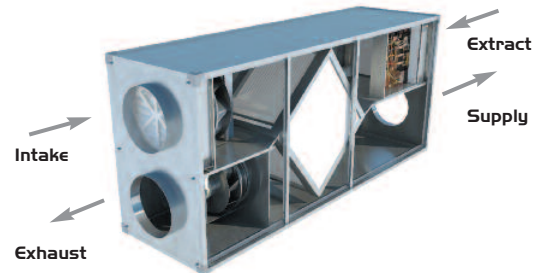


Figure 2: S2/5-XBV-RN (right hand with no heater).

AHU with Heat Recovery section and direct drive EC motor technology.

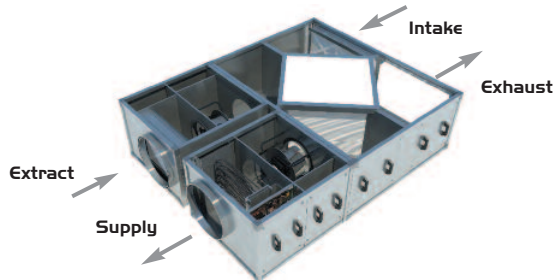


Figure 3: S6-XBH-RE (right hand with electric heater).

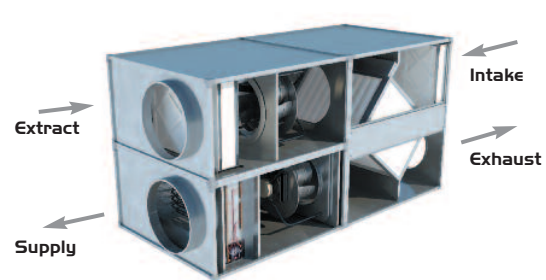


Figure 4: S6-XBV-LE (left hand with electric heater).

AHU with Heat Recovery section and direct drive AC motor/Inverter technology.

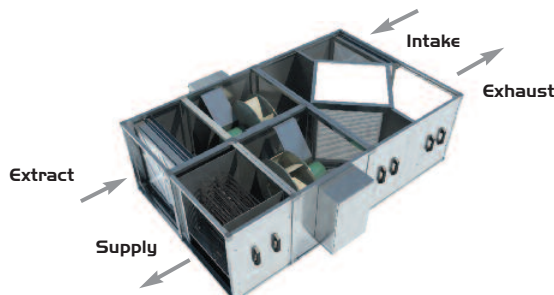


Figure 5: S7/8-XBH-RE (right hand with electric heater).

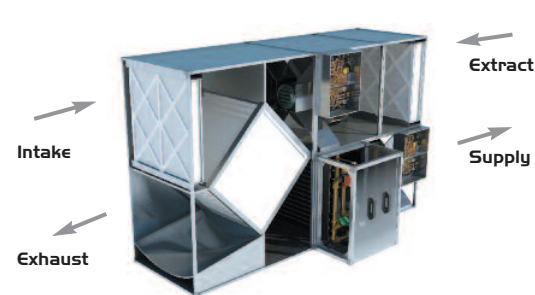


Figure 6: S7/8-XBV-RL (right hand with LPHW).

1.0 General

IMPORTANT

Safety first! – before commencing any work ensure:

- That all appropriate risk assessments have been carried out, and the required safety measures have been taken
- That you understand the work required
- That you are trained and competent to carry it out

The information contained in this document gives details of operation and maintenance for installers and users of Nuair SQRBO XBOX equipment.

These air handling units comprise a combination of modular sections assembled (at works or on site) to suit the application requirements as specified by the purchaser.

General information regarding performance and specifications for the equipment may be obtained from our Technical Literature, and / or project specific documentation.

2.0 Delivery of Equipment

2.1 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 Nuair within two days of receipt of the equipment.

2.2 Offloading and Handling from the delivery Vehicle

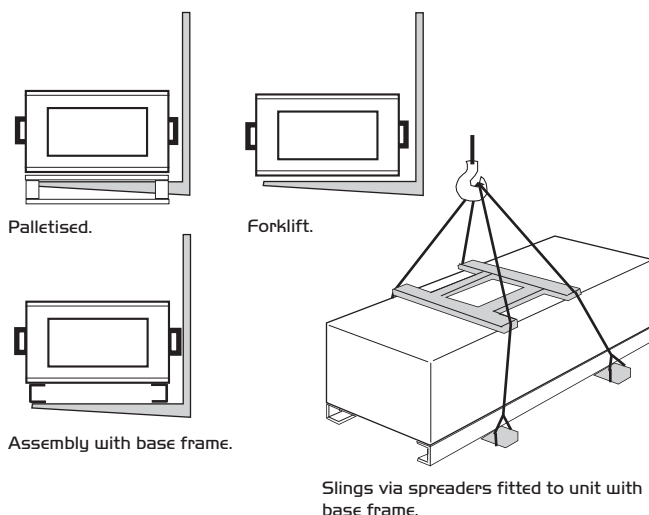
The weight of the unit modules and palletised items is displayed on the unit rating plate or on the packaging. Some of the modules have an uneven weight distribution, and this will be indicated by labelling where appropriate. Ensure that lifting and handling equipment is adequately rated.

Offloading and positioning of the equipment is the responsibility of the purchaser.

Spreaders should be used when lifting with slings to avoid damage to the casings. Care must be taken to ensure that slings are correctly positioned to avoid crushing and twisting of the unit castings.

Where channels and/or support frames are bolted to the underside of the unit casing, slings or fork-lift arms should be positioned to locate in the apertures in the channels. If Lifting Eyes have been supplied / fitted it is recommended that they are used.

Figure 7: Lifting.



2.3 Storage

The equipment must be stored in a dry, internal location. Ductwork connection apertures shall be sealed against the ingress of dust, water and vermin.

Note that units that are intended for external locations are generally not fully weatherproof until their installation, including ductwork connections is complete.

If the storage period is to exceed two months, contact Nuair for guidance on the appropriate "mothballing" procedures. Do not stack units, modules or components.

3.0 Erection and Assembly

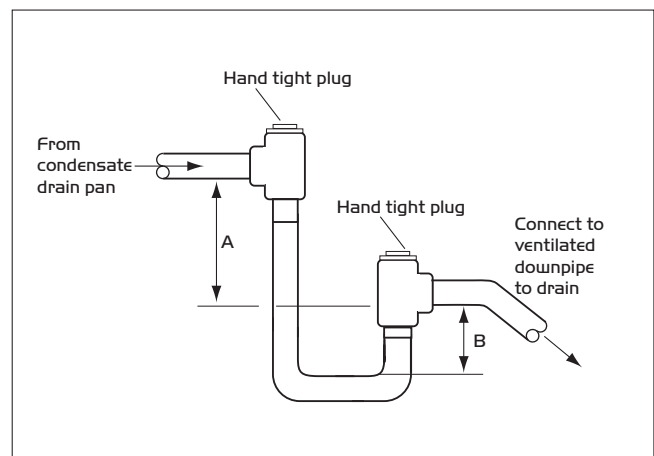
Units must be installed in accordance with good industry practice, upright and level on a prepared base (which may include a suitably designed suspended platform).

Support positions should be determined to provide a distributed support for the unit base, and should not obstruct access panels or air way connections.

Heat recovery modules and modules that incorporate cooling coils may produce condensation during use. An insulated drip tray and drain connection is provided, and should be connected to a suitable drainage point. (***Note that provision of a powered condensate pump is an option for this type of equipment. If such a pump is supplied, the main drip tray drainage point should be capped, and the pump discharge tube routed as required. Specific instructions for the pump type fitted will be attached to the unit.**)

Provision may be required, and if so, should be made, for the fitting of a correctly sized cleanable trap to each drain connection.

Figure 8: Condensate trap.



If the condensate tray is located at the inlet side of the fan (i.e. under negative pressure) then calculate the values of A & B as shown below. (and see fig. 5).

A = Fan inlet pressure (mm H2O) + 25mm (minimum).

Allow 100mm for these units if pressure is unknown.

B = A/2. (minimum).

(Note: 10Pa = 1mm H2O).

If the condensate tray is located at the outlet side of the fan (i.e. under positive pressure) then calculate the values of A & B as shown below.

A = 25mm (minimum).

B = Fan outlet pressure (mm H2O) + 25mm (minimum).

Allow 100mm for these units if pressure is unknown.

The installation, including all external services and controls should be installed in accordance with the appropriate authority and MUST conform to all governing regulations e.g. CDM, CIBSE, IEE, and in strict accordance with the applicable Building Regulations.

3.1 Equipment Access

Access for maintenance and inspection of the SOURBO XBOX units is generally from the sides of the unit.

Once assembled and in position, sufficient free space must be available adjacent to the unit for future inspection, maintenance, component service, repair and replacement and connection of services.

It is recommended that at least the unit width (vertically arranged units XBV); or half the overall unit width (horizontally arranged units XBH) + 100mm be allowed. (note – for units with a horizontal layout (types XB/XBH), access is typically required to both sides of the unit casing). Guidance may be found in Approved Document F 2010.

3.2 Assembly of Equipment

SOURBO XBOX unit sections will be delivered to site in the number of sections shown below.

Unit	No. of sections
S2 - S5 XBV	1
S6 and S7 XBV	1
S6 and S7 XBH	3
S8 / S9 / S10 XBV / XBH	3

For units with multiple sections, the sections consist of:

Supply fan (includes heater if included), extract fan and heat exchanger.

Each Section will be labelled with the direction of air flow. The direction convention must be observed during assembly. The units may only be operated in their intended installation plane.

Twin (run & standby) extract fan versions are supplied in the following arrangements;

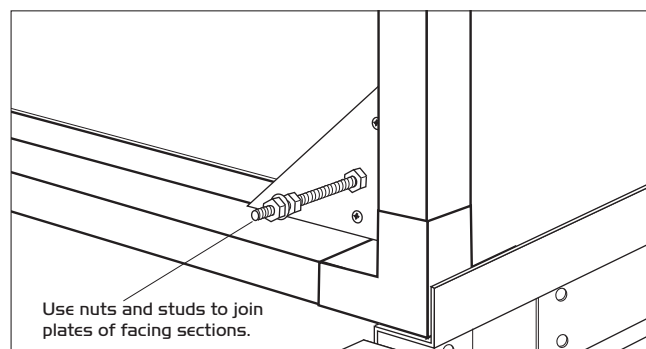
Sizes S2T to S6T, vertically stacked XBV range: all the fans are supplied within one single pre-assembled package as standard; the standby fan is pre-wired to the Ecosmart control if fitted.

Sizes S8T with Ecosmart control (both horizontal and vertically stacked): the standby fan is supplied bolted to the main fan and connected to the control as standard.

Sectional units are supplied with matching internal connection plates with a single bolt hole provided to each corner through which the sections are bolted together. Unit access panels must be removed to perform the assembly operation. Plates will either have clearance holes – or one face with a threaded insert and the other with a clearance hole.

A sealing gasket should be applied as necessary to the mating faces of the unit frames before bolting together.

Figure 9: Section assembly plate.



Pipe-work connections to heating and / or cooling coils shall be made to the appropriate standard, and the entire circuit tested for tightness. Care must be taken not to over-tighten and distort connections to coils.

2 Row LPHW Heating Coil Connection size (standard LPHW unit)

S2 - S5 XBV	= 15 mm plain
S6 / S7 XBH/XBV	= 1.25 in BSP
S8 / S9 / S10 XBH / XBV	= 2 in BSP

Connection sizes for other coil types are project specific.

Coils are tested during manufacture to 16 Bar (using dry compressed air). Operation of standard equipment is rated at PN6, if the intended system requires higher operating pressures; please contact the Nuaire Technical department for advice.

Electrical connections to the unit shall be made in accordance with the appropriate product (see below); and installation wiring diagrams, and shall use appropriately sized and rated cables. The unit rating label shows the maximum electrical load of the equipment.

Connections to the unit may include three phase and single phase supply connections, and a variety of control circuits.

Control circuit connections must be segregated (i.e. routed separately) from power connections.

Only the prepared apertures in the unit casing may be used for cable entry. Do not drill or cut the unit casing for this purpose.

The equipment must be earthed and earth-bonded.

Means of local isolation for maintenance purposes are generally required and are specified and installed by others.

Weatherproof units

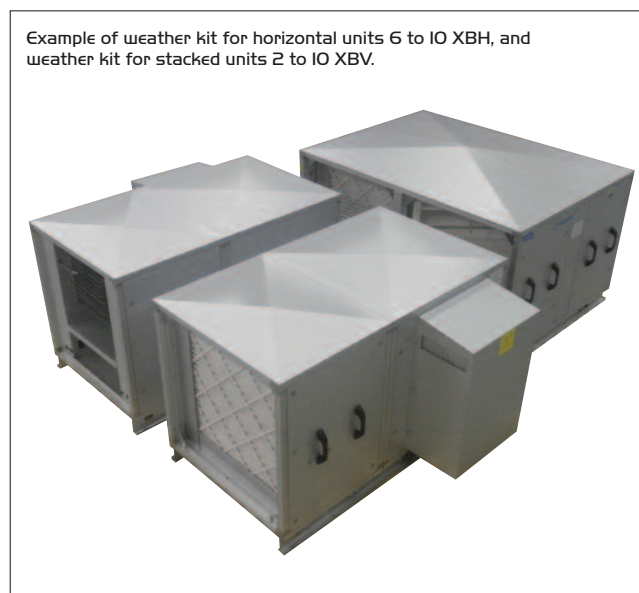
Weatherproof units in multiple sections will have sectional roof components that must be fitted and sealed after the unit sections are bolted together. (see figure 10). All necessary nuts, bolts, washers and sealant are supplied with each unit and are normally bagged and located within the fan section.

The equipment must not be exposed to the weather in an un-assembled or partially assembled state. All ductwork, sealing and assembly work must be completed before the unit can be considered weather-proof.

IMPORTANT

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

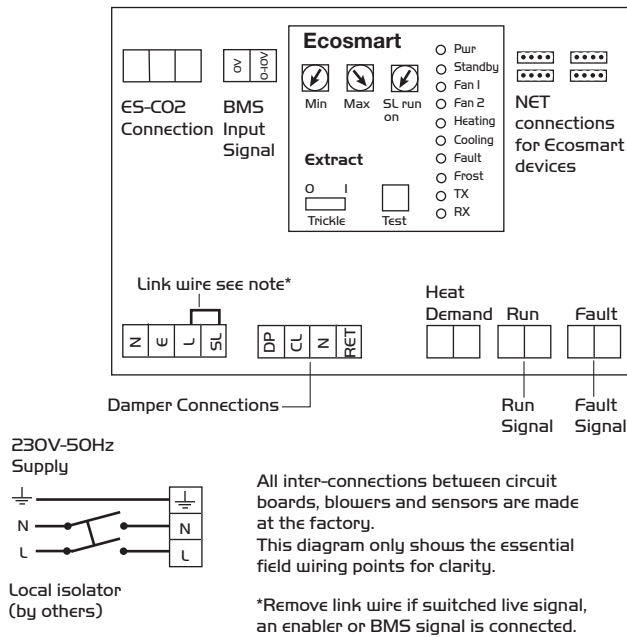
Figure 10: Weatherproof roof components.



4.0 Wiring - for units with Ecosmart control

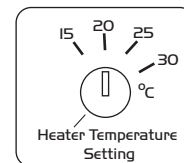
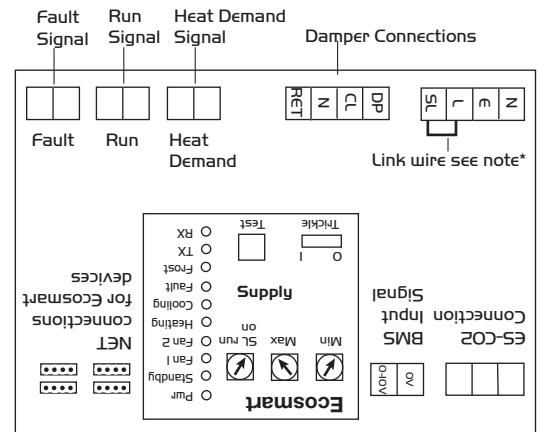
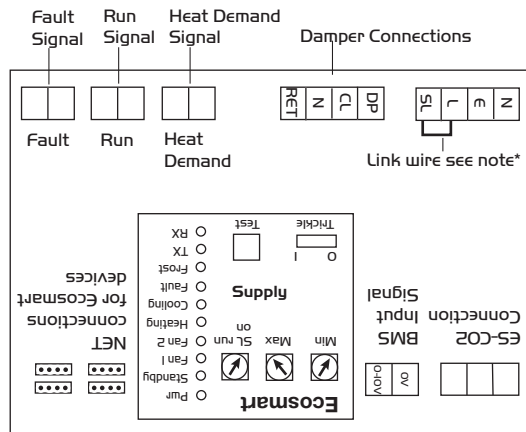
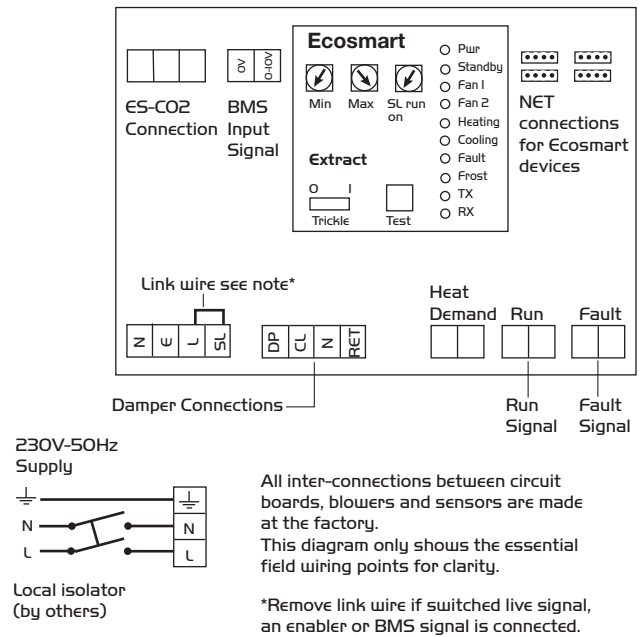
Unit sizes S2 - S5 with Ecosmart fan only control

Figure 11:



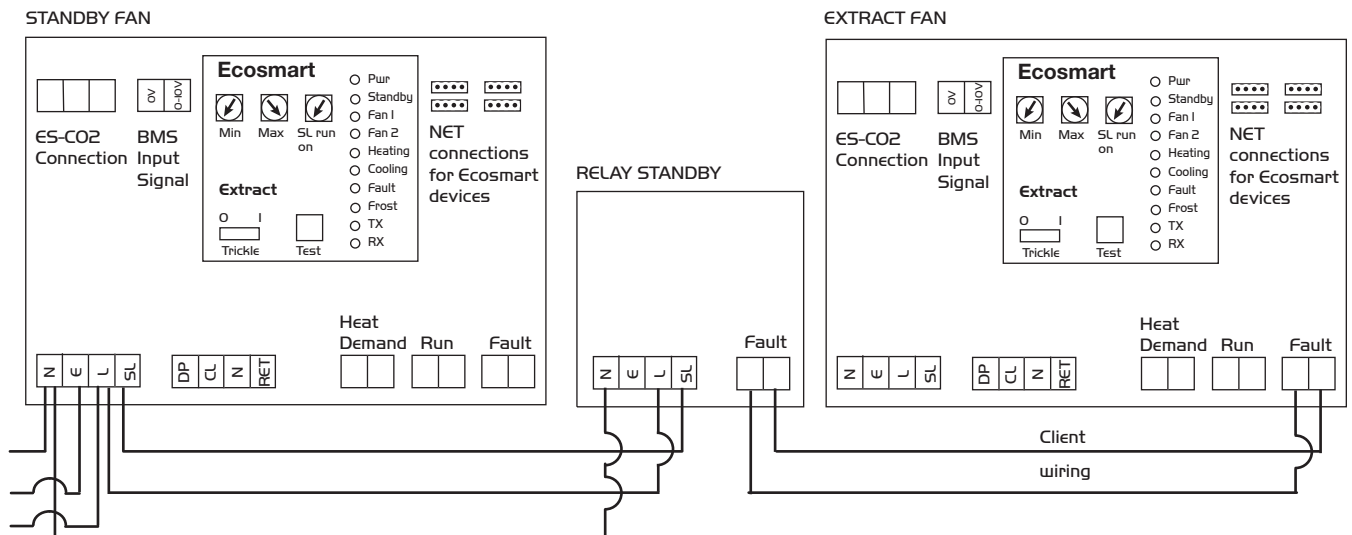
Unit sizes S2 - S5 with Ecosmart fan and electric heater control

Figure 12:

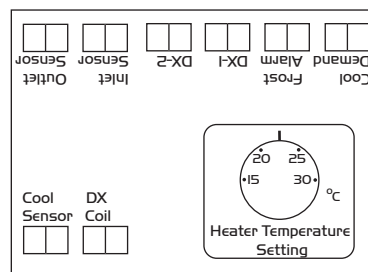


S2T to S5T Twinfans all variants

Figure 13:



Unit sizes S2 - S5 with Ecosmart fan and LPHW coil control Figure 14:



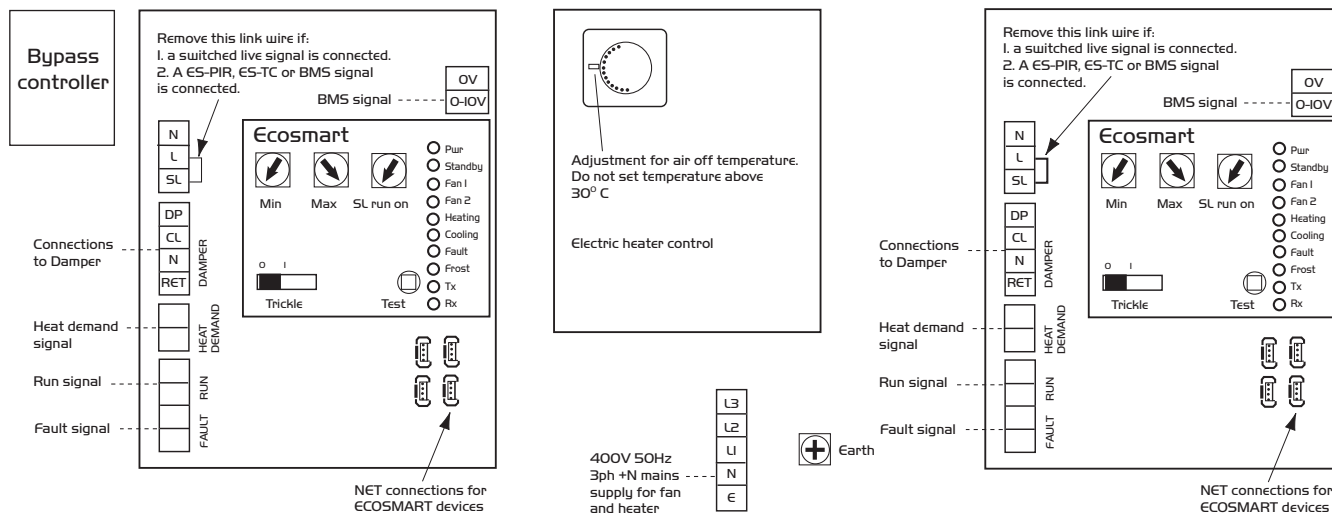
Fans without Electric Heater		Fans with Electric Heater	
Unit Code	fIc (amps)	Unit Code	fIc (amps)
S2-XB*~*N/L	1.7	S2-XB*~*E	22
S3-XB*~*N/L	1.9	S3-XB*~*E	22
S4-XB*~*N/L	2.8	S4-XB*~*E	23
S5-XB*~*N/L	3.3	S5-XB*~*E	24
S6-XB*~*N/L	6.0	S6-XB*~*E	33

Wiring - for units with Ecosmart control cont.

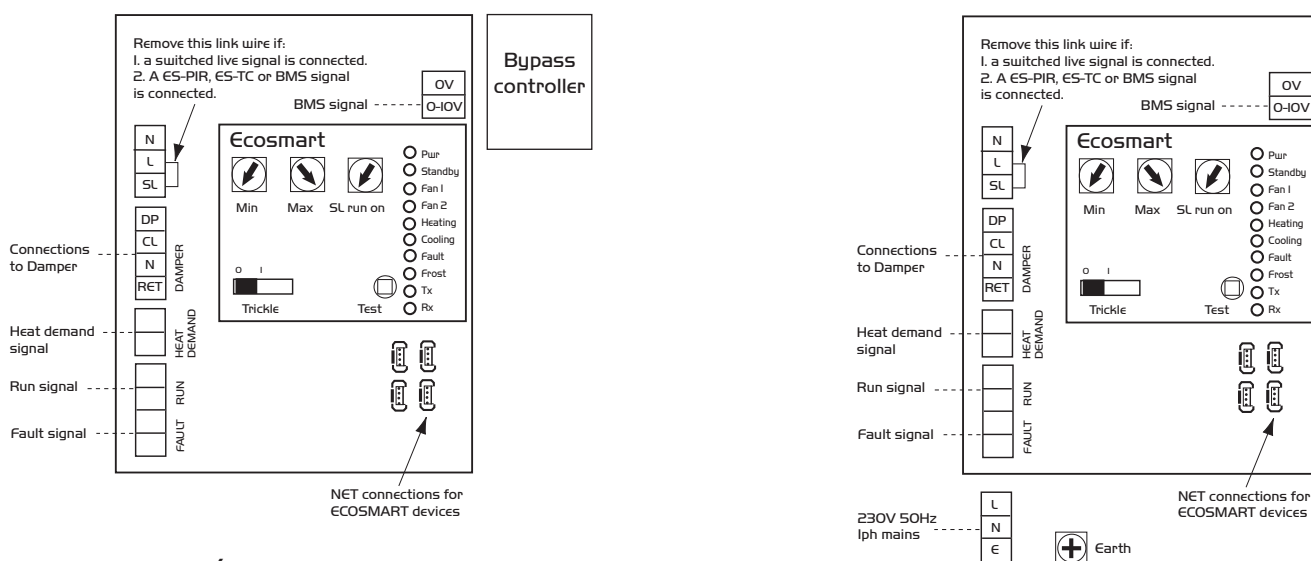
S6-XBV: this variant is supplied with all modules bolted together into a single unit. All wirings between the modules are pre-wired in our factory. Only one in-coming mains supply is needed.

S6-XBH: this variant is supplied as separate module for on site assembly. The connections between the modules are pre-wired into clearly identified plugs and sockets; these must be plugged together during on-site assembly. Note only one in-coming mains supply is needed.

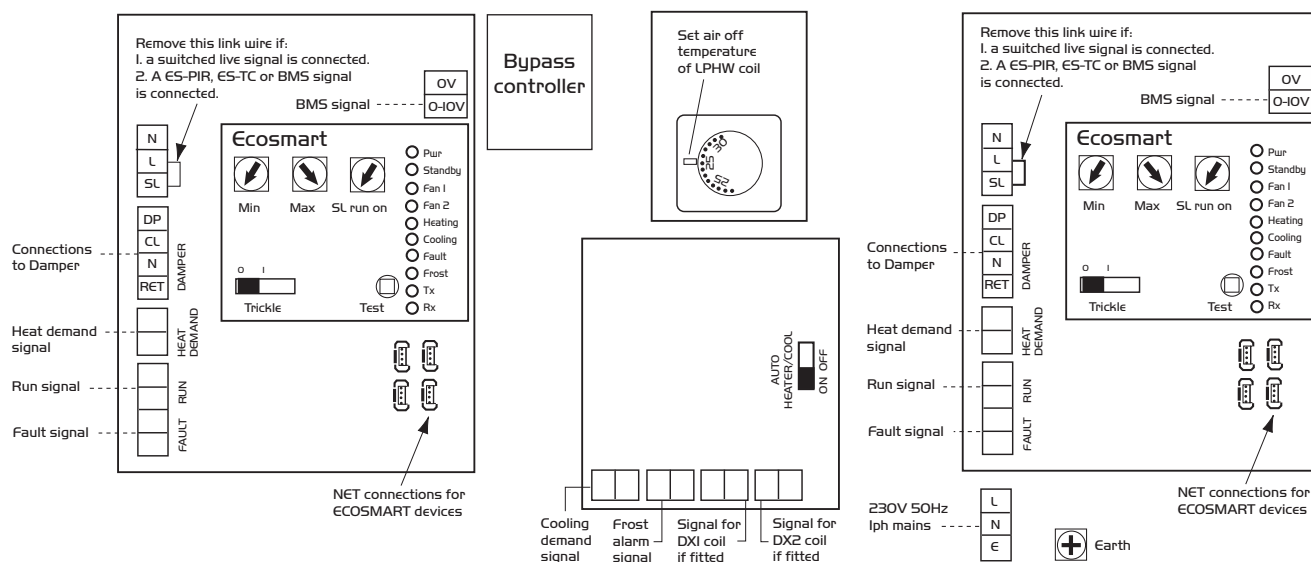
Unit size **S6-XB V/H with electric heater** Figure 15:



Unit size **S6-XB V/H without heater** Figure 16:



Unit size **S6-XB V/H with LPHW coil** Figure 17:



Wiring - for units with Ecosmart control cont.

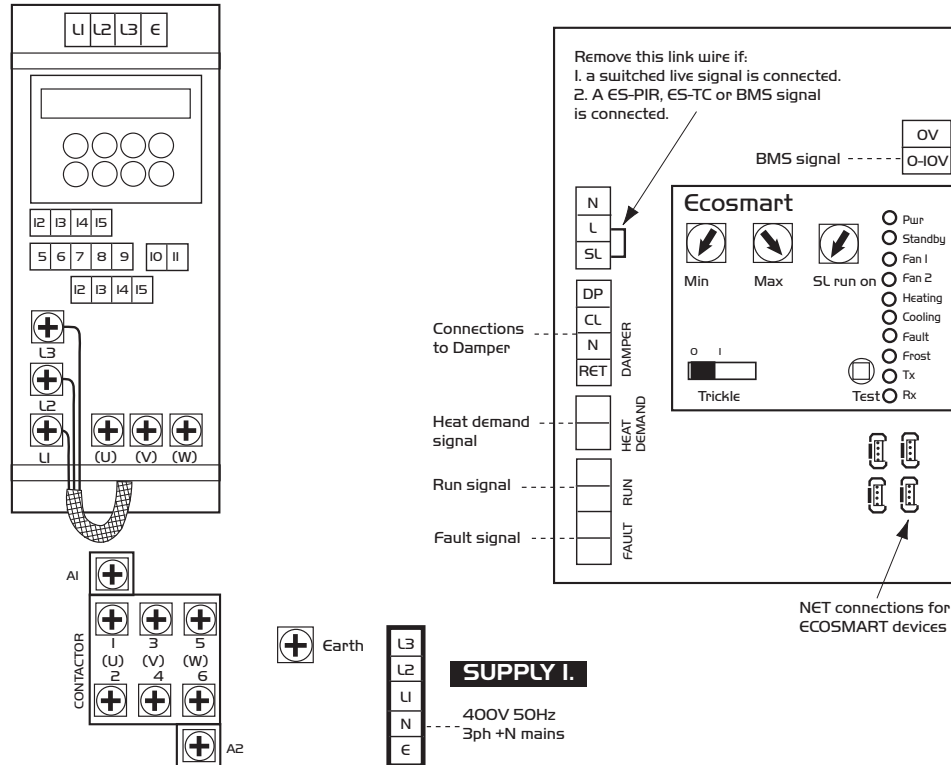
S7-XBV: this variant is supplied with all modules bolted together into a single unit. All wirings between the modules are pre-wired in our factory. **Please note separate mains supply must be connected to the extract and supply fan control.**

S8-IO XBV and S7-IO XBH: these variants are supplied as separate

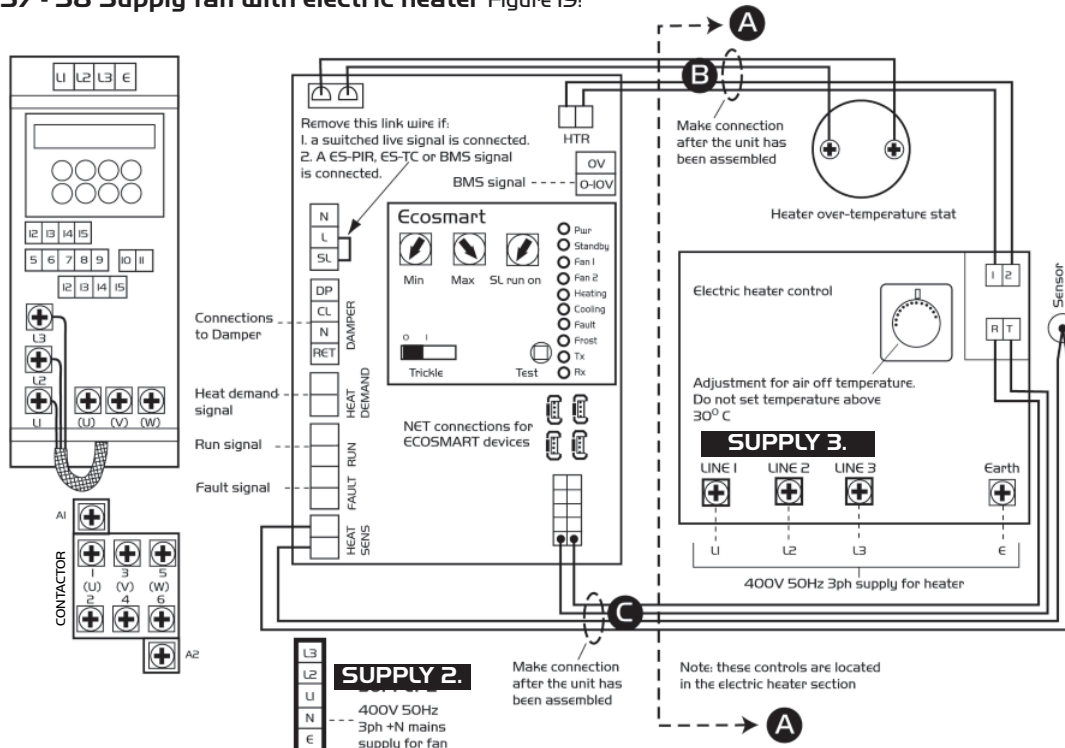
modules for on site assembly. The connections between the modules are pre-wired into clearly identified plugs and sockets; these must be plugged together during on-site assembly.

Please note separate mains supply must be connected to the extract and supply fan control.

Unit sizes S7 - S10 Extract fan - all versions and unit sizes S7 - S10 Supply fan without heater Figure I8:



Unit sizes S7 - S8 Supply fan with electric heater Figure I9:

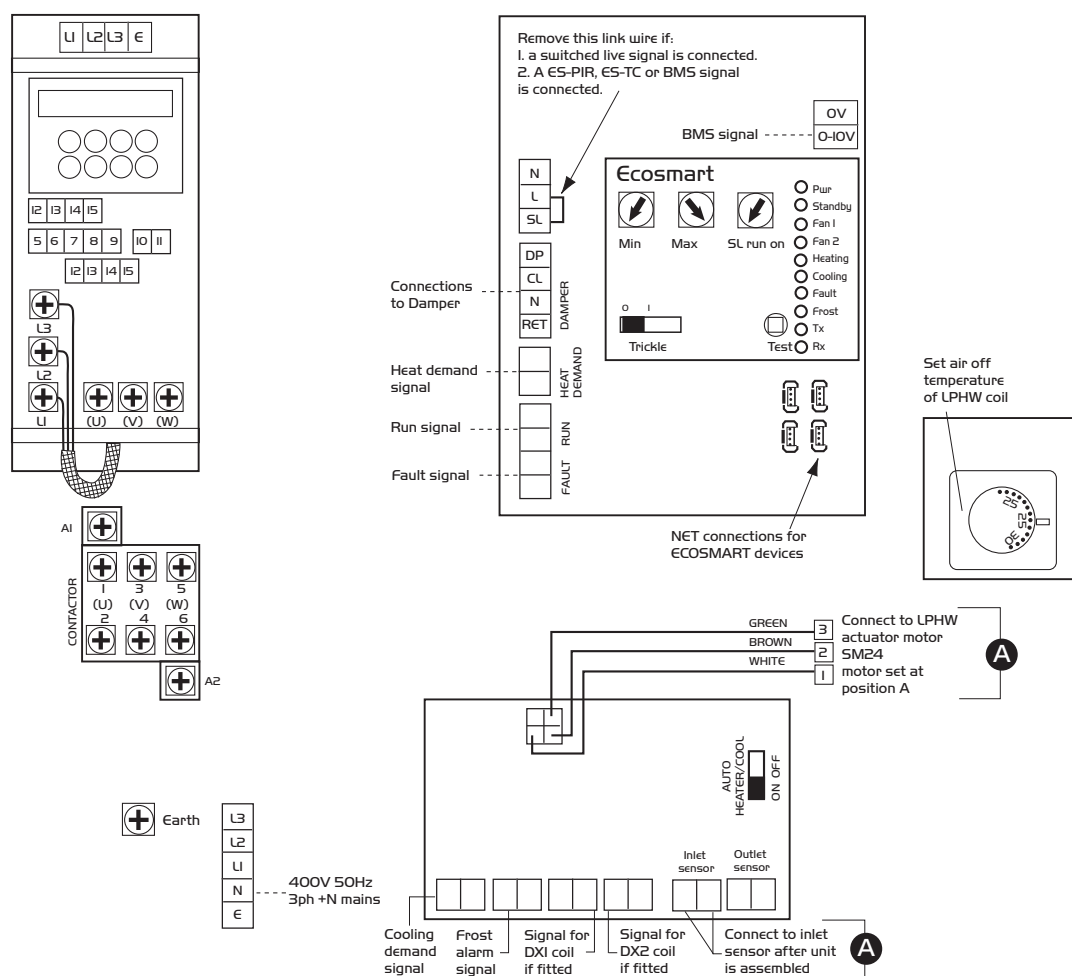


IMPORTANT

Section A is an adjacent module in which additional controls and sensors are installed. These are pre-wired to plugs and sockets.

Wiring - for units with Ecosmart control cont.

Unit sizes S7 - S10 Supply fan with LPHW coil Figure 20:

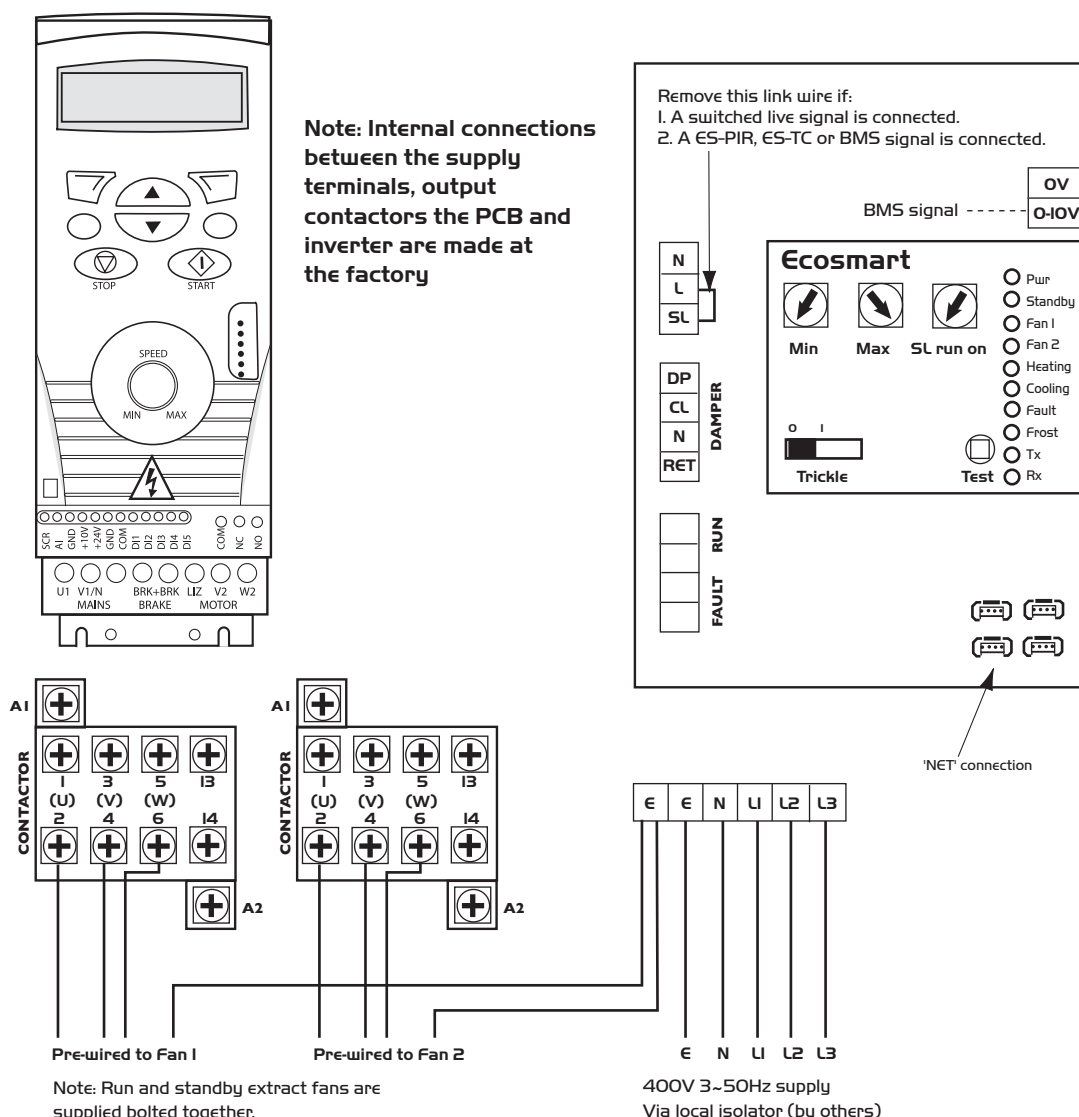


IMPORTANT

(A) Is pre-wired to plugs and sockets.

Wiring - for units with Ecosmart control cont.

Unit size S8T Run and standby extract fan Figure 21:



Wiring - for units (No control option)

Please note units supplied with no control will have motor wiring brought out to a wiring box; one each for the supply fan, extract fan and the by-pass damper. If the unit is supplied with electric heater, this must be connected to suitable control circuit with adequate safety interlock (to be designed and supplied by others).

All heating or cooling coils supplied under this option will be supplied without any control valve or actuator, it is the installer's responsibility to provide suitably sized valve and electric and water control circuit to produce the desired output.

Electrical Details

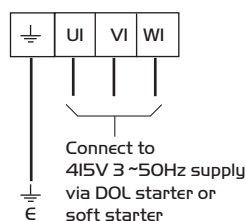
Fan motor ratings		Electric heater ratings (if fitted)	
Unit size	flc	sc	kW
S2-XB	2x 0.75A	2x 3A	4.5kW
S3-XB	2x 0.75A	2x 3A	4.5kW
S4-XB	2x 1.2A	2x 4.8A	4.5kW
S5-XB	2x 1.2A	2x 4.8A	4.5kW
S6-XB	2x 3A	2x 3A	12kW
S7-XB	2x 5A	2x 35A	27kW
S8-XB	2x 5A	2x 35A	54kW
S9-XB	2x 8.2A	2x 49A	-
S10-XB	2x 11.4A	2x 72A	-

Bypass damper rated at 3W, 13mA for all unit sizes.

Motor wiring for S7 - 9 NC - **

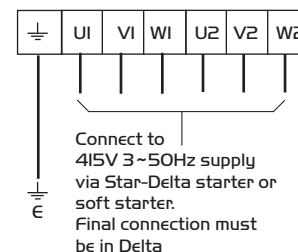
(All variants) Figure 22a:

Motor pre-wired for DOL starting



Motor wiring for S10 NC - **

(All variants) Figure 22b:

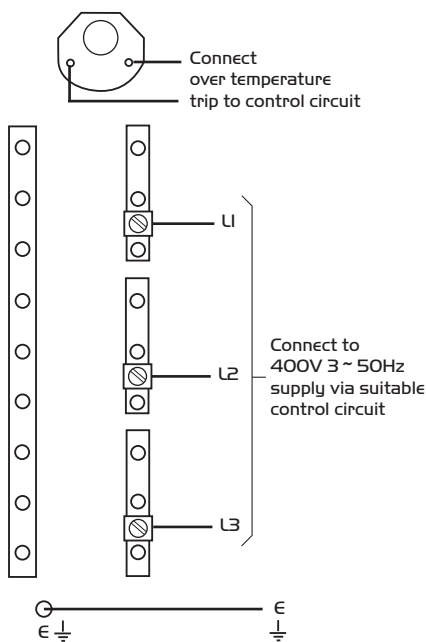


continued on page 10.

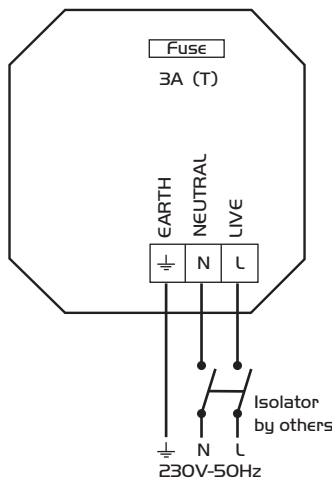
Wiring - for units (No control option) cont.

Typical electric heater wiring S6 12kW, S7 and S8 Figure 23:

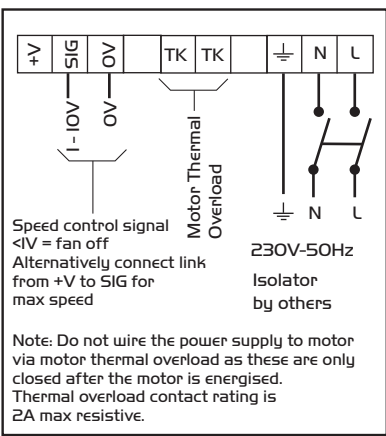
Remove the access panel on the heater section to gain access to the wiring point.



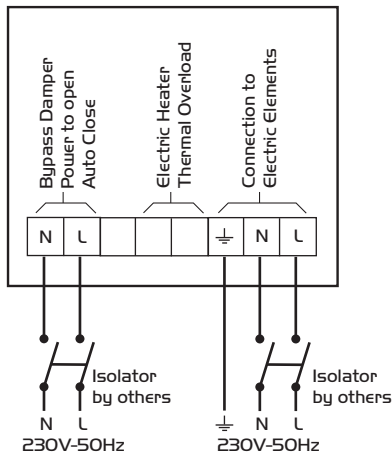
Fan wiring for S2 - 5-XB 2 per unit and one per blower Figure 24:



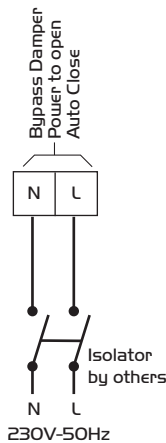
Fan wiring for S6-XB 2 per unit and one per blower Figure 25:



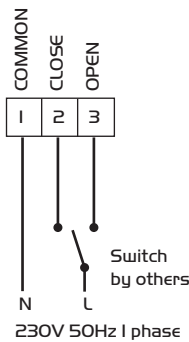
Fan wiring for S2 - 6-XB with electric heater, bypass damper and electric heater wiring Figure 26:



Fan wiring for S2 - 6-XB fan only or with LPHW coil bypass damper wiring Figure 27:



Wiring for S7 - 10-XB bypass damper Figure 28:



Wiring (continued)

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.

Connections

a) Mains connections

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

IMPORTANT

Where units form part of a larger 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.

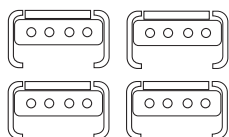
Where units are supplied in modular sections it will also be necessary to install and connect mains wiring between sensors and actuators and the main control location.

b) Control connections

The facilities described below are provided, but may not be relevant to your installation – refer to project documentation.

Figure 29:

'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).

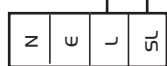
IMPORTANT

Where units are supplied in modular sections, sizes 6 to 10 it will also be necessary to install data cable (supplied) between Ecosmart controls and from Ecosmart sensors and heat exchanger etc. Some ancillary items (e.g. motorised dampers, Frost Coils) may also require mains rated and data cable connections.

c) Switched Live (SL) terminal

Figure 30:

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



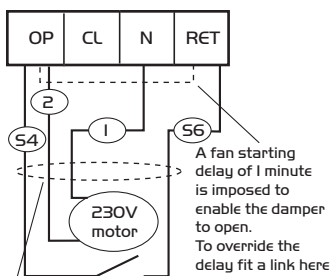
Mains connection
230V 50Hz 1 phase

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 (see setting to work-timer adjustment).

Do not take this signal from an isolating transformer.

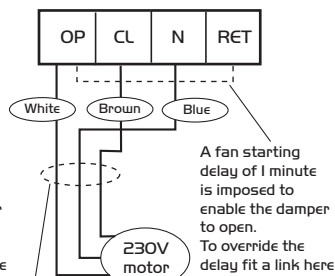
d) Damper connections

Figure 31a: Drive open/
Spring close.



All wiring is IPh 230V 50Hz

Figure 31b: Drive open/
Drive close.



All wiring is IPh 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

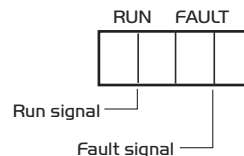
RET - 230V ac return signal from the damper limit switch indicates the damper has reached its operating position.

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.

e) Volt Free Relay Contacts

Figure 32:



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 protection.

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.

Heat demand - contacts closed when heating is selected.

Cooling demand - contacts close when cooling selected.

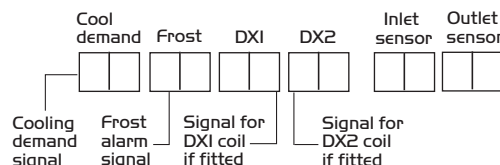
Do not use this contact to switch compressors directly.

Frost alarm - contacts close 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 33:



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

Keep the cable run as short as possible, less than 50 metres.

j) BMS input signals

The BMS connection is made with a plug-in connector via the socket (See figure 34). To ensure the connection is made only by suitably qualified and authorised personnel the plug is not supplied.

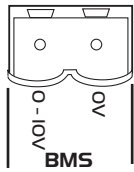
It is available from R S Components, Part No. 403-875 or Farnell, Part No. 963-021.

IMPORTANT

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

Wiring (continued)

Figure 34:



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 $\pm 125\text{mV}$ and is measured at the fan's 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.

5.0 Commissioning & Setting to work

(Note – not all of the components listed here are necessarily included with the equipment supplied).

5.1 Dampers (shut-off, isolation and face/bypass)

Check the free action of the damper blades before powered operation (the actuator has a gear release button). Check that the actuator operates freely and over the correct range.

5.2 Mixing Boxes

Mixing box dampers should be checked as in 4.1 and should be adjusted / set up to give the required airflows through each leg.

5.3 Filters

Remove filter access panels (observe and note airflow direction labels), inspect filters for contamination with construction debris, replace as necessary. Replace access panels.

Filter pressure drops will depend on actual flow rate and condition. Observe and record filter pressure drops after performance commissioning.

Typically, filter "dirty" condition occurs when the initial filter "clean" readings have been increased by 125Pa.

If filter manometers, pressure switches or indicators have been fitted, they should be set or adjusted to reflect the commissioned system operation.

5.4 Heating & Cooling Coils Water

Water coils should be connected to ensure that full counter flow exists i.e. – the entering airflow meets the return connection. All water coils should be connected with the flow at the bottom and the return at the top unless otherwise advised. Drain and bleed valves are located on the coil, others may be required in the system pipe-work depending on the installation.

Frost protection must be incorporated on shut down and fresh air conditions to avoid coil freezing. The Ecosmart control system if fitted, includes temperature sensing and frost protection strategies.

Ideally, where the system is at risk of frost damage, the addition of a proprietary anti-freeze solution to the water is recommended.

Where Ecosmart heating / cooling controls are provided, the coil is pre-fitted with a 3 / 4 port valve and actuator housed in the casing extension.

Pipe-work connections should be made to the unit using appropriate techniques, and must be independently supported. The connections should be pressure tested.

DX

Direct expansion coils must be fitted with a correctly sized thermostatic expansion valve with an external equalising connection. The expansion valve phial must be fitted between the suction header connection and the equalising line. The recommendations of the TE valve manufacturer should be referred to when locating the phial and adjusting the superheat. In all cases, settings should be in accordance with the recommendations of the manufacturer of the refrigeration equipment.

All cooling coil drains must be connected to the sloping drain with a correctly sized trap running to an open tundish or similar.

Note: ES-TC must be used in conjunction with DX.

5.5 Electric Heaters

Remove control access panel to permit site wiring to the Ecosmart heating controller, or directly to the heating elements.

Elements have threaded connection points for linking elements and site wiring. Elements should be linked with reference to the appropriate wiring diagram, and the maximum available element power combination may be decreased if required. Always maintain a balanced load on three phase systems.

Cable entry must be made through the apertures provided. Screwed glands with cable restraint devices should be used.

PVC or similar cables must not be used inside the heater unit – due to the temperatures that may be experienced.

Units with Ecosmart electric heating controls incorporate a fan run-on facility and overheat / fan failure protection.

In non-Ecosmart units, heaters are fitted with an over-heat cut-out that must be wired into the control system.

It is strongly recommended that an airflow switch is incorporated within the control system with a fan run on timer (15 minutes) and an interlock provided between the heater contactor and fan motor starter – to allow elements to cool on shutdown.

Nuaire will accept no liability for damage caused by an inadequate control system.

All heaters must be wired in accordance with IEE regulations and conform to local and national statutory requirements.

The element tray is a mains carrying component and must be earthed.

5.6 Recuperators (Plate heat exchangers)

All recuperator drains must be connected to the drain socket and sloping drain with a correctly sized trap running to an open tundish or similar. Note that more than one drain point may be fitted – drain trapping must ensure isolation.

5.7 Fan Sections

Access to the fan section is via lift off panels. Cable entry must be made through the apertures provided. Screwed glands with cable restraint devices should be used.

For units with Ecosmart controls, the fan motors and failure protection devices are pre-wired to the control assembly.

For non-Ecosmart units, wiring to the fan motor / unit terminal box should be mechanically protected and in made in accordance with the details on the motor name plate and diagram attached to the unit.

For star delta starting, all links should be removed from the motor terminal box and the motor wired as per the instructions supplied with starter.

With the unit electrically isolated, rotate the fan impeller / drive manually, checking that it spins freely. Check all fixings are secure.

Units must not be operated without all access panels in place – damage to equipment or injury to personnel may result.

Units must not be operated unless control interlocks are in place – damage to equipment may result.

Test run motor for condition and correct rotation.

Check that the correct current overloads are fitted and that the current being drawn does not exceed the motor nameplate value. Excessive current normally indicates that the ductwork system resistance is different to design.

5.8 Electrical – Ecosmart Units

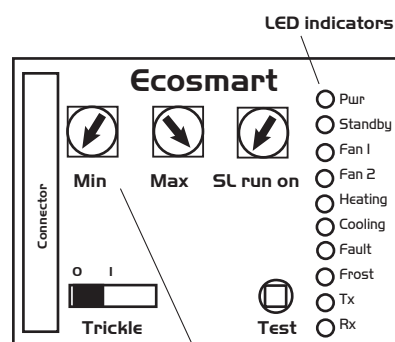
Commissioning panel - Using the Test button

The panel is located within the control enclosure – one for each fan.

The test button allows the fan within the unit to be checked for correct 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 35:



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

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

Cooling* GREEN: Cooling selected

Fault: LED on when a fault is present on unit.

Frost* RED: Frost condition exists

Tx LED on when the controller is transmitting data.

Rx LED on when the controller is receiving data.

*** Note that this control panel is common to all the Nuair Ecosmart products and may have indicators for functions that are not available in individual units – however, the unused indicators will not be illuminated.**

5.9 Settings

Setting the maximum airflow

i) Ensure the power supply is switched off and that a linkwire 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 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.

Setting the minimum/trickle airflow rate

(Nominally 40% for S6 units and 20% for all others as standard).

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 40%) must be below the maximum setting, otherwise the 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 adjustment of the fan speed by user control and sensors, ranges between the minimum and maximum set points.

Note - Where third party controls are specified and fitted, reference should be made to the control specification and operating instructions.

It is the installer's responsibility to ensure that such controls are suitable for operation with the Nuair equipment.

Nuair will accept no liability for equipment damage resulting from incompatible controls.

Mechanical

i) Wet systems require the setting of the coil bypass balancing valve, set using general commissioning procedures - refer to the specified design flow duties and any documentation attached to the valve.

6.0 Maintenance

It is recommended that PPE is always used during the maintenance of Air Handling Equipment – gloves, eye shields and respiratory mask.

IMPORTANT

Isolation - Before commencing work make sure that the unit 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.

In some Ecosmart units and in some third party controls, variable speed drives (inverters) are used to provide fan speed control. After the fan is isolated, allow at least 5 minutes for the capacitors in the inverter to discharge before commencing any work on the unit.

6.1 Dampers

At regular intervals check that the blades move freely.

6.2 Filters

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

Carbon filters should be replaced once carbon activation is exhausted.

Inclined gauge manometers, where fitted, should be checked for fluid level.

6.3 Heating and Cooling Coils

Coils should have their finned surface examined for accumulation of dirt, lint and biological contaminants or similar. If necessary, wash down affected areas with a mild detergent solution and a soft brush. Care should be taken not to damage the finned surface, and any cleaning fluids should be rinsed away with water. A compressed air line may be used to blow out any solids between

fins. Do not probe the coil fin block with metal objects as damage may cause leaks.

Drain lines should be checked to ensure that they are unobstructed and free draining. Traps should be checked that they are fully primed and functioning.

Drain pans should be flushed out periodically to remove contamination.

Note: The unit application may require particular attention to this item – Check with Building Management personnel for details.

6.4 Electric Heaters

Electric heaters should be checked at regular intervals for condition of elements, wiring and insulation.

6.5 Recuperator

The recuperator block is normally protected from dust and contamination by upstream pre-filters. It is possible to clean the unit with compressed air in the case of dust deposits or by spraying with a mild detergent solution for grease deposits.

Solvents, strong alkaline, acidic or any products that may be aggressive to aluminium should not be used. Do not use cleaning water over 50 deg C.

Drain lines should be checked to ensure that they are unobstructed and free draining. Traps should be checked that they are fully primed and functioning.

Drain pans should be flushed out periodically to remove contamination, and chemical treatments may be used to provide protection between service visits.

Note: The unit application may require particular attention to this item – Check with Building Management personnel for details.

6.6 Fans, Motors and Belt Drives

Fan bearings should be manually checked at regular intervals for condition. Standard fan bearings are supplied as ‘sealed for life’ and have an anticipated life of 40,000 hours.

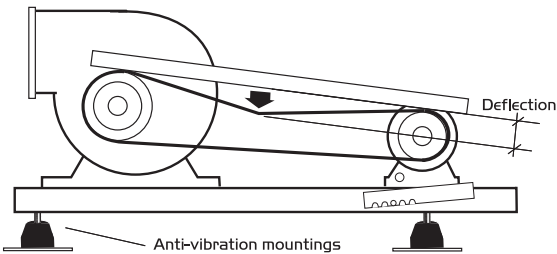
Motors have an enclosed bearing housing and are pre-greased for life. Belts should be checked for wear, tension and alignment. Check all fixings are secure.

Checking drive belt Tension (Sizes 9 & 10)

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.

The force required to deflect the ‘V’ belt should be from 0.5kg to 0.8kg.

Figure 36:



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.

Adjusting drive belt tension

All belt drive units incorporate a belt tensioning facility.

To adjust the belt tension, slacken the pinch bolts on the sides of

the motor plate. Use the motor platform pivot adjustment to tighten and loosen the belt.

Clean impellers with a soft brush only, and remove dust/deposits from all internal surfaces including the motor housing,

6.7 General

Inspect all internal and external surfaces to check for corrosion or peeling of painted surfaces.

Thoroughly clean affected areas with a wire brush, apply a coat of zinc rich primer or similar, and re-touch with suitable finishing paint. Ensure tightness of all nuts, bolts, and fixings. Check all components for general condition.

7.0 Maintenance Schedule

The first maintenance should be carried out three months after commissioning and thereafter at six to 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 MONTHS	12 MONTHS
FILTERS	✓ or	✓
DAMPERS		✓
DAMPER ACTUATORS		✓
BELT DRIVES		✓
FILTER MANOMETER FLUID	✓	
VENT WATER COILS		✓
COIL FINNED SURFACES		✓
CHECK DRAIN LINES + DRIP TRAY	✓	✓
CLEAN & FLUSH DRAIN PANS	Building Schedule ?	✓
NUTS, BOLTS, FIXINGS SECURE		✓
FAN BEARINGS		✓
ELECTRIC HEATERS		✓
ELECTRICAL WIRING		✓
FAN IMPELLER		✓
GENERAL		✓

8.0 Warranty

Ecosmart SOURBO XBOX units have a 5 year warranty. No control units have a 2 year warranty. The first year covers parts and labour and the remaining period covers 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.

9.0 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

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: SQRBO XBOX

Machinery Types: Supply & Extract Fans with Heat Recovery

Relevant EC Council Directives: 2006/42/EC (Machinery Directive)

Applied Harmonised Standards: BS EN ISO 12100-1, BS EN ISO 12100-2, EN60204-1, BS EN ISO 9001, BS EN ISO 13857

Applied National Standards: BS848 Parts 1, 2.2 and 5

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

Signature of manufacture representatives:

Name:

Position:

Date:

1) C. Biggs



Technical Director

26. 01. 11

2) A. Jones



Manufacturing Director

26. 01. 11

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

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

To be read in conjunction with the relevant Product Documentation (see 2.1)

1.0 GENERAL

- 1.1 The equipment referred to in this Declaration of Incorporation is supplied by Nuaire to be assembled into a ventilation system which may or may not include additional components.

The entire system must be considered for safety purposes and it is the responsibility of the installer to ensure that all of the equipment is installed in compliance with the manufacturers recommendations and with due regard to current legislation and codes of practice.

2.0 INFORMATION SUPPLIED WITH THE EQUIPMENT

- 2.1 Each item of equipment is supplied with a set of documentation which provides the information required for the safe installation and maintenance of the equipment. This may be in the form of a Data sheet and/or Installation and Maintenance instruction.
- 2.2 Each unit has a rating plate attached to its outer casing. The rating plate provides essential data relating to the equipment such as serial number, unit code and electrical data. Any further data that may be required will be found in the documentation. If any item is unclear or more information is required, contact Nuaire.
- 2.3 Where warning labels or notices are attached to the unit the instructions given must be adhered to.

3.0 TRANSPORTATION, HANDLING AND STORAGE

- 3.1 Care must be taken at all times to prevent damage to the equipment. Note that shock to the unit may result in the balance of the impeller being affected.
- 3.2 When handling the equipment, care should be taken with corners and edges and that the weight distribution within the unit is considered. Lifting gear such as slings or ropes must be arranged so as not to bear on the casing.
- 3.3 Equipment stored on site prior to installation should be protected from the weather and steps taken to prevent ingress of contaminants.

4.0 OPERATIONAL LIMITS

- 4.1 It is important that the specified operational limits for the equipment are adhered to e.g. operational air temperature, air borne contaminants and unit orientation.
- 4.2 Where installation accessories are supplied to 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.



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