

## DAVE Supply Fans (ES Models) 50/60Hz

### For Internal and External use

#### Installation & Maintenance Instructions

## DAVE Supply Fans

The Dave range of in-line backward curve fans consisting of 9 duty sizes with a maximum of 1.1m<sup>3</sup>/s (1100l/s).

Units are manufactured from aluzinc, rectangular in section and have circular rigid spigots at each end. All units are supplied with fixing brackets designed to simplify installation.

## 1.0 Fan Unit Coding Descriptions

### DS1A-NESH

|| | | || |  
1 2 3 4 5 6

1. DAVE Range
2. Supply fan
3. Case size (1-7)
4. L = LPHW Coil/valve  
E = Electric heater  
N = No heater
5. ES = Ecosmart control
6. No suffix = 50Hz  
H = 60Hz

#### IMPORTANT

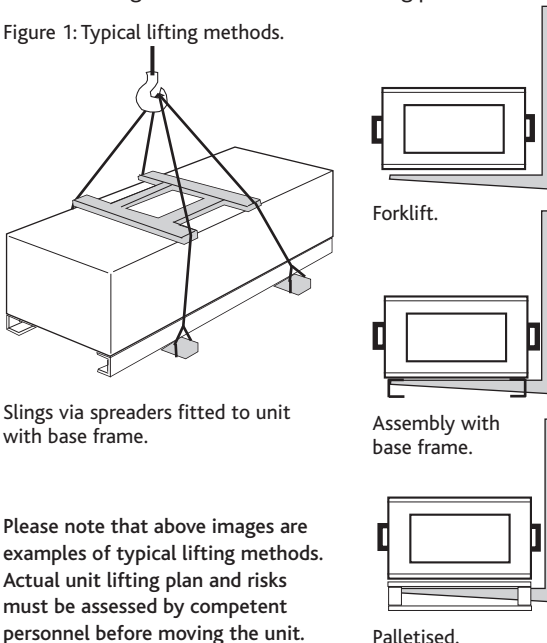
For systems which include supply fans with heating other than where the BMS (0-10V) has control, the appropriate user control is required (i.e. ES-LCD or ES-CI).

## 2.0 Handling

Always handle the units carefully to avoid damage and distortion. Care must be taken to ensure any slings used for hoisting do not damage the casing or the control module components.

Note: The weight of the unit is on the rating plate.

Figure 1: Typical lifting methods.



Slings via spreaders fitted to unit with base frame.

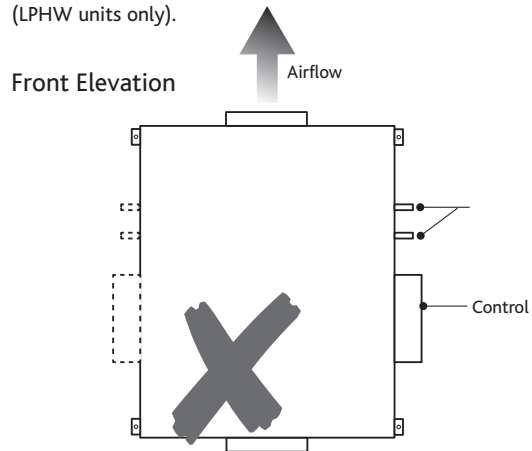
Please note that above images are examples of typical lifting methods. Actual unit lifting plan and risks must be assessed by competent personnel before moving the unit.

## 3.0 Installation

Installation must be carried out by competent personnel, in accordance with good industry practice, the appropriate authority and in conformance with all statutory and governing regulations.

Access to the unit for maintenance is via the top or bottom lid, therefore this should be taken into account before installation takes place (See important note below).

Figure 2: Mounting in the vertical orientation below is not advisable (LPHW units only).



#### IMPORTANT

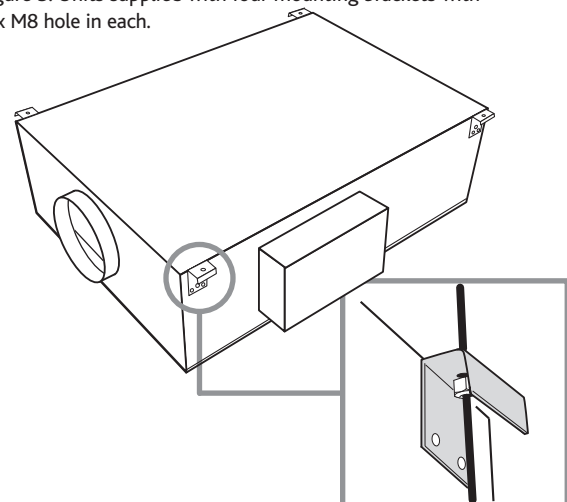
External units must not be installed at an angle over 5° from the horizontal.

Mounting in the vertical orientation shown above IS NOT ADVISABLE for LPHW units due to the actuator being below the valve.

Service/Maintenance Access – Unit must be installed with a minimum of unit depth as additional clearance i.e. DS1A-NES either allow 233mm above or below unit.

Units are supplied complete with four support mounting brackets for quick and easy installation, either surface mounted or suspended with drop rods.

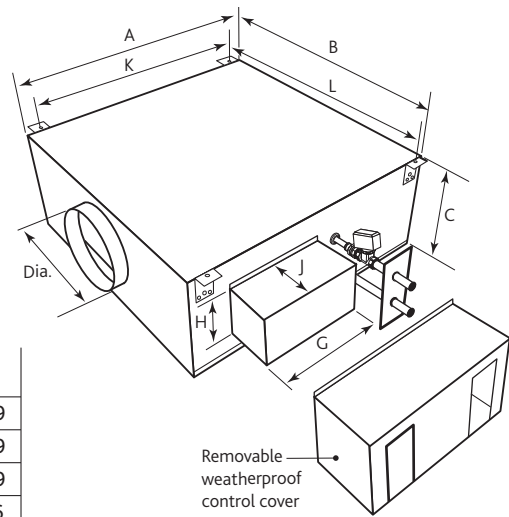
Figure 3: Units supplied with four mounting brackets with 1 x M8 hole in each.



### 3.0 Dimensions (mm) & Weights (ES) Supply fans

**IMPORTANT**

When weather cover is removed from control, always replace the removed fixings.



**Dimensions (mm) - Supply fans** Fig 4:

Unit Code (ES)	A	B	C	'D' Dia.	G	H	J	K	L
DS1A-NES/H	1005	559	233	150	370	150	100	960	609
DS1A-LES/H	1005	559	233	150	430	175	190	960	609
DS1A-EES/H	1005	559	233	150	430	155	155	960	609
DS2A-NES/H	1005	696	300	200	370	150	100	960	746
DS2A-LES/H	1005	696	300	200	430	175	190	960	746
DS2A-EES/H	1005	696	300	200	430	155	155	960	746
DS2HA-NES/H	1005	696	300	200	370	150	100	960	746
DS2HA-LES/H	1005	696	300	200	430	175	190	960	746
DS2HA-EES/H	1005	696	300	200	430	155	155	960	746
DS3A-NES/H	1005	780	345	200	370	150	100	960	830
DS3A-LES/H	1005	780	345	200	430	175	190	960	830
DS3A-EES/H	1005	780	345	200	430	155	155	960	830
DS4A-NES/H	1005	840	370	250	370	150	100	960	890
DS4A-LES/H	1005	840	370	250	430	175	190	960	890
DS4A-EES/H	1005	840	370	250	430	155	155	960	890
DS4HA-NES/H	1005	840	370	250	370	150	100	960	890
DS4HA-LES/H	1005	840	370	250	430	175	190	960	890
DS4HA-EES/H	1005	840	370	250	430	155	155	960	890
DS5A-NES/H	1155	984	410	315	370	150	100	1110	1034
DS5A-LES/H	1155	984	410	315	430	175	190	1110	1034
DS5A-EES/H	1155	984	410	315	430	155	155	1110	1034
DS6A-NES/H	1155	1092	455	400	370	150	100	1110	1142
DS6A-LES/H	1155	1092	455	400	430	175	190	1110	1142
DS6A-EES/H	1155	1092	455	400	430	155	155	1110	1142
DS7A-NES/H	1155	1200	500	400	370	150	100	1110	1250
DS7A-LES/H	1155	1200	500	400	430	175	190	1110	1250
DS7A-EES/H	1155	1200	500	400	430	155	155	1110	1250

**Dimensions - Removable weatherproof control cover**  
 DS1A/H to DS7A-NES/H 470mm wide x 173mm high x 120mm deep.  
 DS1A/H & DS2A-LES/H 649mm wide x 183mm high x 216mm deep.  
 DS3A-LES/H 649mm wide x 243mm high x 256mm deep.  
 DS4A-LES/H 649mm wide x 251mm high x 256mm deep.  
 DS5A/H to DS7A-LES/H 649mm wide x 323mm high x 281mm deep.  
 DS1A/H to DS7A-EES/H 530mm wide x 178mm high x 175mm deep.

### Weights (kg) Supply fans

Unit Code	Unit Weights (kg)	Unit Code	Unit Weights (kg)
DS1A-NES/H	30	DS4HA-NES/H	70
DS1A-LES/H	55	DS4HA-LES/H	70
DS1A-EES/H	50	DS4HA-EES/H	60
DS2A-NES/H	40	DS5A-NES/H	75
DS2A-LES/H	60	DS5A-LES/H	105
DS2A-EES/H	50	DS5A-EES/H	90
DS2HA-NES/H	40	DS6A-NES/H	80
DS2HA-LES/H	60	DS6A-LES/H	110
DS2HA-EES/H	50	DS6A-EES/H	90
DS3A-NES/H	45	DS7A-NES/H	95
DS3A-LES/H	65	DS7A-LES/H	120
DS3A-EES/H	55	DS7A-EES/H	105
DS4A-NES/H	50		
DS4A-LES/H	70		
DS4A-EES/H	60		

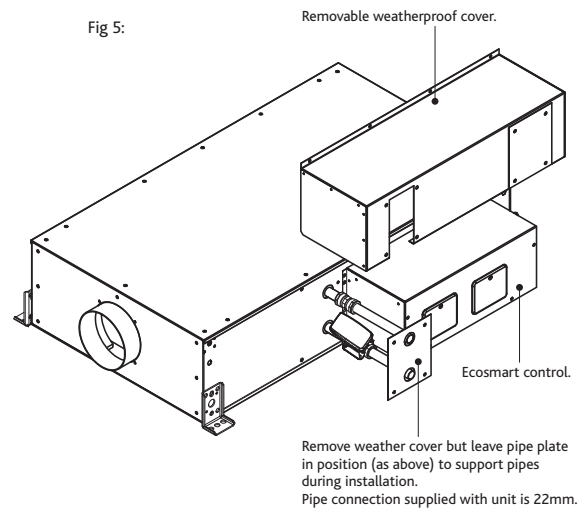
## 4.0 Installing the Water Circuit

It is recommended that all joints are checked for leaks when commissioning and a strainer and isolating valves are fitted (by others) for ease of maintenance.

The Low Pressure Hot Water heating coil shall be factory fitted with a 2-port pressure independent balancing and control valve complete with actuator. All components pre-piped, assembled and tested by the manufacturer.

Ecosmart frost protection is activated on any Ecosmart unit fitted with LPHW heating, when the outlet air temperature is 4°C or below.

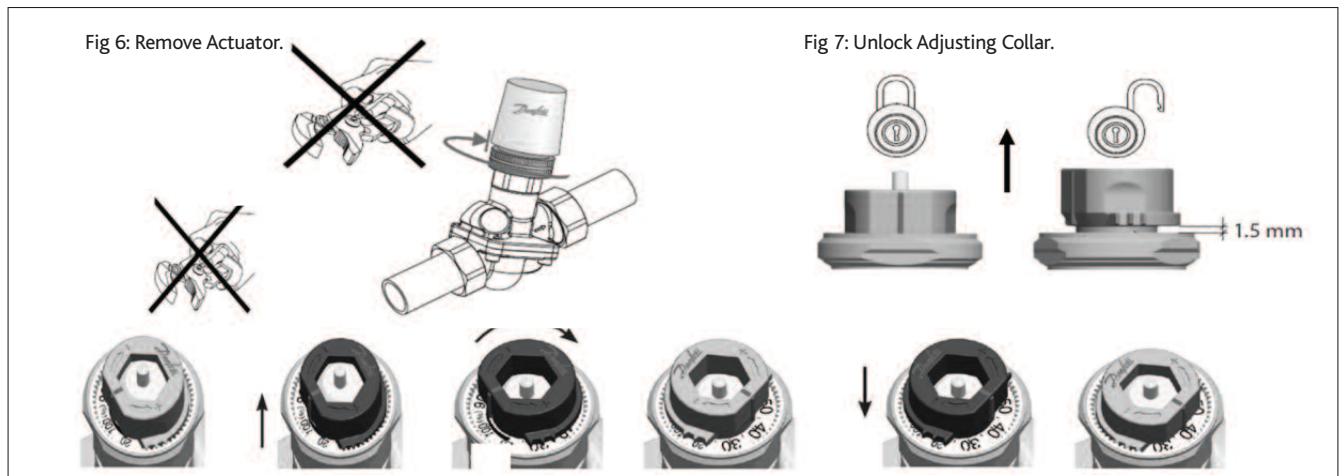
The unit reacts by shutting down the fan to prevent a 'wind chill' effect reducing the temperature to a point whereby the coil could freeze and burst. The unit will also drive open the LPHW valve to a fully open position to allow full water flow through the coil and the main PCB will close the 'Heat demand' contacts. These contacts could be used to send a signal to activate the boiler and/or valve to open to provide heat if not already doing so.



### IMPORTANT

NB: LPHW supply units have a 2 Port Pressure Independent control Valve (PICV) fitted. If the LPHW system is not run via a 'Constant Pressure Pump' then provision must be made to incorporate a 'Bypass' into the system to maintain a minimum level of flow through the pump when the 2 Port PICV is closed.

## 4.1 2 Port Pressure Independent Balancing Control Valve - Setting Instruction



### Valve settings for DAVE Supply Units (1 - 7)

#### Units 1, 2 & 2H

DN20	L/h	L/s	GPM
20%	180	0.050	0.80
25%	225	0.063	1.00
30%	270	0.075	1.20
35%	315	0.088	1.40
40%	360	0.100	1.60
45%	405	0.113	1.80
50%	450	0.125	2.00
55%	495	0.138	2.20
60%	540	0.150	2.40
65%	585	0.163	2.60
70%	630	0.175	2.80
75%	675	0.188	3.00
80%	720	0.200	3.20
85%	765	0.213	3.40
90%	810	0.225	3.60
95%	855	0.238	3.80
100%	900	0.250	4.0

#### Units 3, 4 & 4H

DN25	L/h	L/s	GPM
20%	340	0.094	1.50
25%	425	0.118	1.88
30%	510	0.142	2.25
35%	595	0.165	2.63
40%	680	0.189	3.00
45%	765	0.213	3.38
50%	850	0.236	3.75
55%	935	0.260	4.13
60%	1020	0.283	4.50
65%	1105	0.307	4.88
70%	1190	0.331	5.25
75%	1275	0.354	5.63
80%	1360	0.378	6.00
85%	1445	0.401	6.38
90%	1530	0.425	6.75
95%	1615	0.449	7.13
100%	1700	0.472	7.50

#### Units 5, 6 & 7

DN32	L/h	L/s	GPM
20%	640	0.178	2.80
25%	800	0.222	3.50
30%	960	0.267	4.20
35%	1120	0.311	4.90
40%	1280	0.356	5.60
45%	1440	0.400	6.30
50%	1600	0.444	7.00
55%	1760	0.489	7.70
60%	1920	0.533	8.40
65%	2080	0.578	9.10
70%	2240	0.622	9.80
75%	2400	0.667	10.50
80%	2560	0.711	11.20
85%	2720	0.756	11.90
90%	2880	0.800	12.60
95%	3040	0.844	13.30
100%	3200	0.889	14.00

## 5.0 Wiring

### Wiring Connections for units with Ecosmart Control

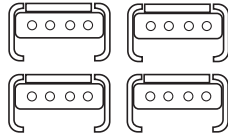
#### a) Mains connections.

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

#### b) Control Connections.

Below: 'Net' connection for Ecosmart devices.

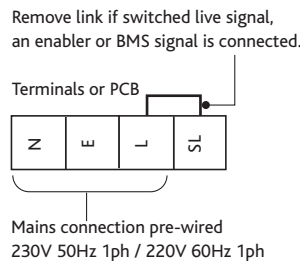
Fig 8:



Net - the 4 IDC plug-in connectors are provided for the connection of compatible sensors, manual controls and for linking the fans together under a common control. If more than 4 connections are required, the junction box (product code ES-JB) should be used (see data cable installation).

#### c) Switched Live (SL) terminal.

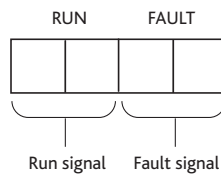
Fig 9:



A signal of 100-230V / 220V 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) Volt Free Relay Contacts.

Fig 10:



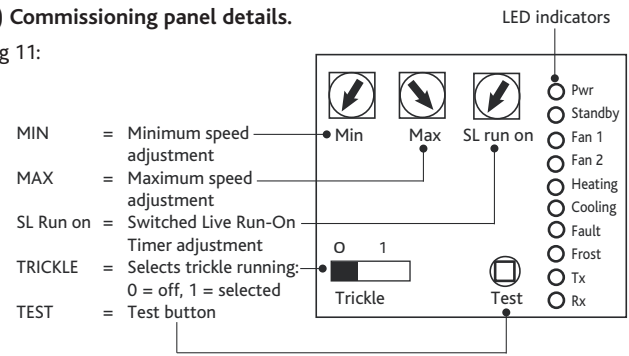
### LED indication for units with Ecosmart Control

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. (Twinfan only)
Heating*	Not applicable. See note.
Cooling*	Not applicable. See note.
Fault	LED on when a fault is present on unit.
Frost*	Applicable with LPHW only. See note.
Tx	LED on when the controller is transmitting data.
Rx	LED on when the controller is receiving data.

\* Note that the control panel is common to all the Ecosmart products and will have indicators for functions that are not available in this particular fan. However these indicators will not be illuminated.

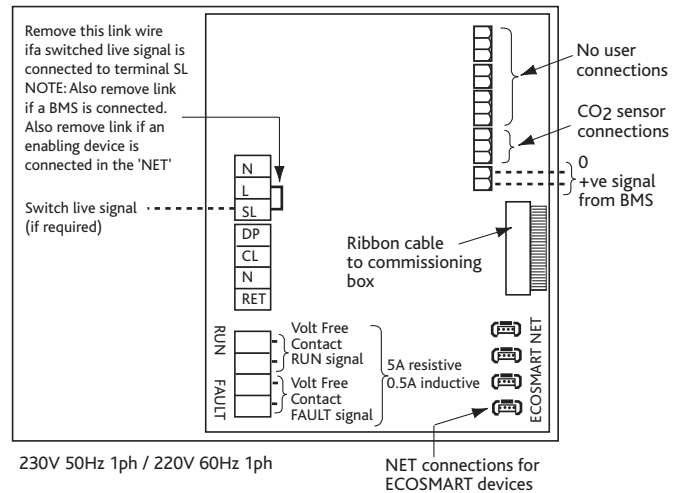
#### e) Commissioning panel details.

Fig 11:



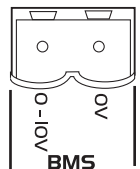
Note: A Commissioning Procedure document (leaflet No. 671153) is available on request from Nuair Tel: 029 2088 5911.

### The Control Module Fig 12:



The BMS connection is made with a plug-in connector via the socket (See figure 13). 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.

Fig 13:



### IMPORTANT

Reversal of the BMS connection will damage the control.

The system's response to a 0-10V dc BMS signal is given 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

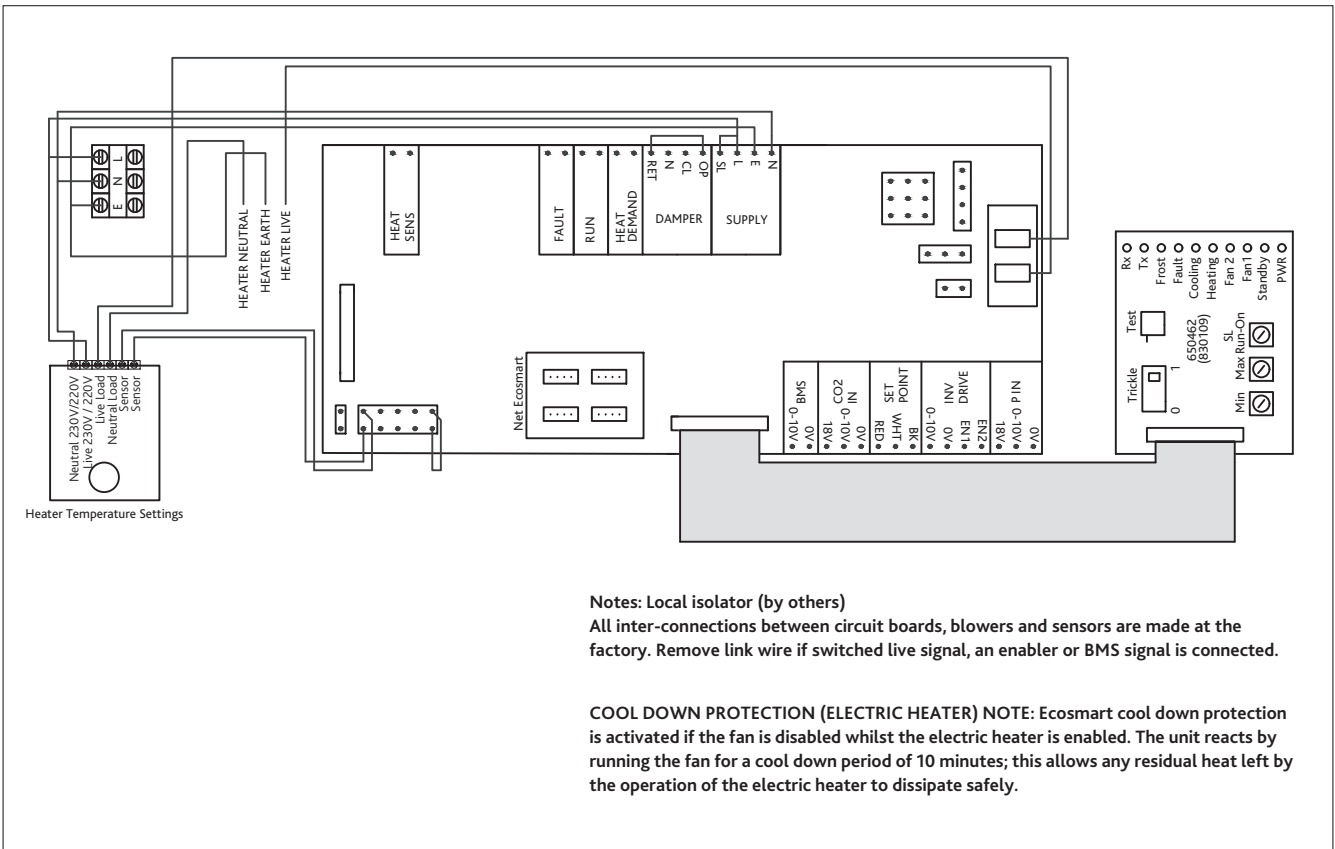
## 5.0 Wiring

### Wiring Connections for units with Ecosmart Control.

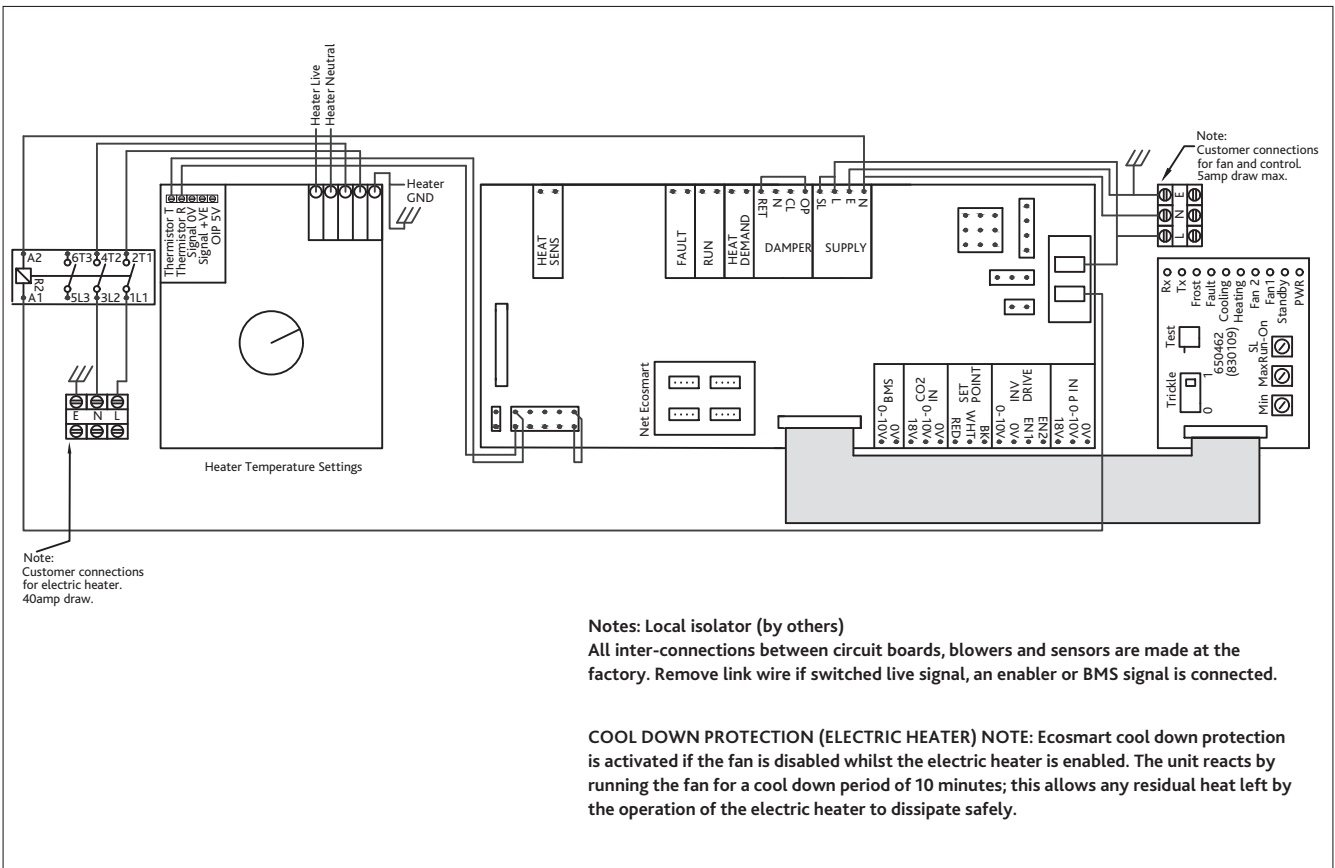
#### Wiring for units with Electric Heater 3Kw Fig 14:

**IMPORTANT**

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



#### Wiring for units with Electric Heater 4.5 – 9 Kw Fig 15:



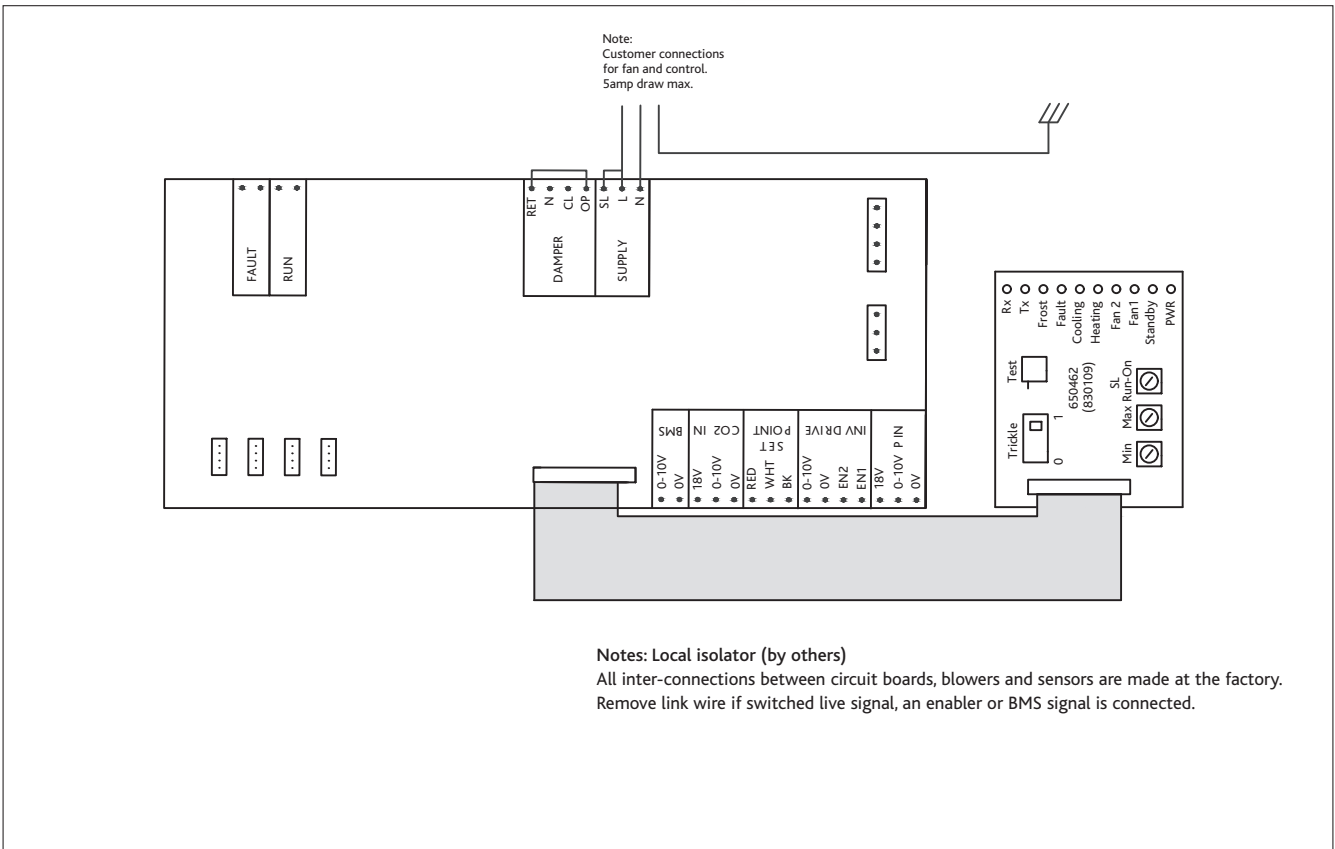
### 5.0 Wiring

#### Wiring Connections for units with Ecosmart Control.

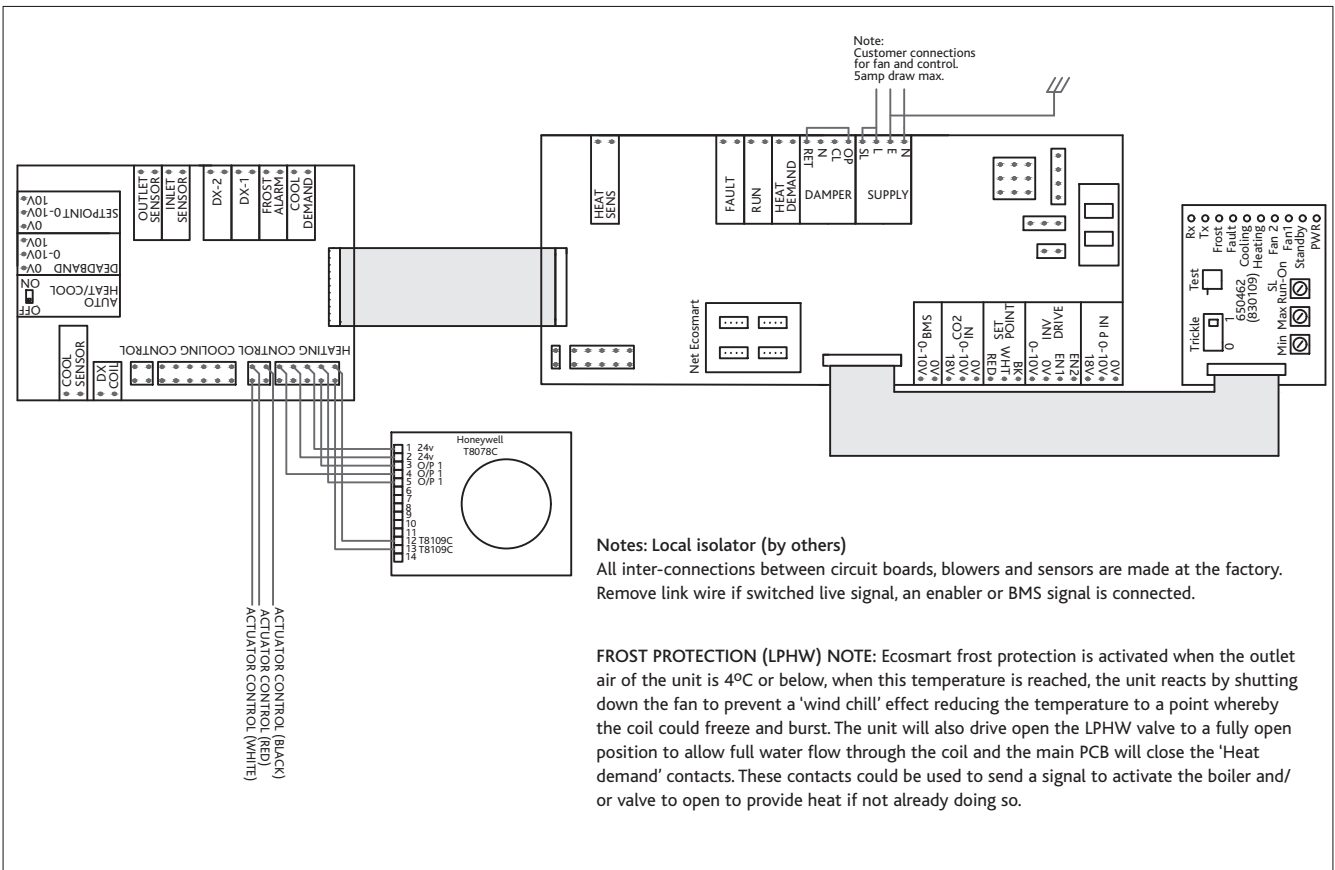
Wiring for units with No Heater Fig 16:

**IMPORTANT**

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



Wiring for units with LPHW Fig 17:



## 6.0 Maintenance

The first maintenance should be carried out three months after commissioning and thereafter at 12 monthly intervals.

**General Cleaning and inspection** - Electrically isolate before commencing work. Remove the top or the bottom cover and carefully clean out the interior as necessary. Check all parts for security and that the impeller rotates freely, taking care not to disturb the balance. Ensure all control components are secure and clean, refit the cover.

### IMPORTANT

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

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

**Filter care/replacement** -The filter (where applicable) will require cleaning on a regular basis. The frequency of the cleaning operation will depend on the site conditions.

## 7.0 Fan Components (see fig: 18)

### Key Components

A	Lid / Base
B	Attenuation Pods
C	Attenuation Pods Retaining Clips
D	G4 Filter, Optional F7 Filter (Site removal)
E	Weather Cover for control box for external installation (If required)
F	LPHW Coil / 2 Port PI valve (PICV)
G	Electric Heater

Fig 18a: Fan Components. (No Heater unit)

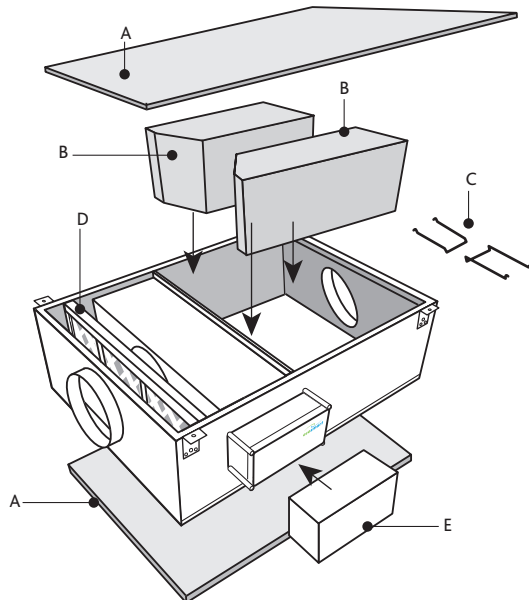


Fig 18b: Fan Components. (LPHW unit)

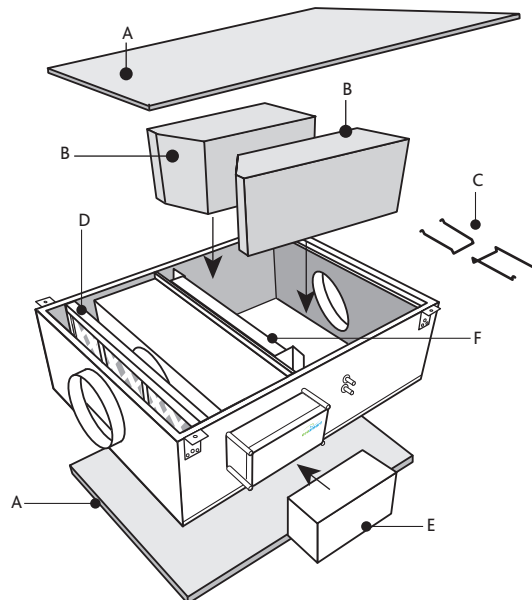
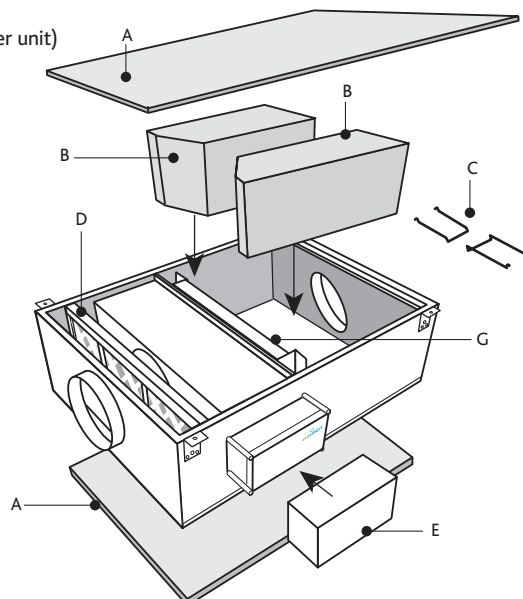


Fig 18c: Fan Components. (Electric Heater unit)



## 8.0 Warranty

5 year warranty on Ecosmart models for peace of mind. The warranty starts from the day of delivery and includes parts and labour for the first year. The remaining period covers replacement parts only.

This warranty is void if the equipment is modified without authorisation, is incorrectly applied, misused, disassembled, or not installed, commissioned and maintained in accordance with the details contained in this manual and general good practice.

The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.

## 9.0 Spares for Dave Supply fans

Spare parts and replacement components are available from Nuaire Ltd. Please contact us on the numbers below for further details.

### G4 Filter

Unit Size	Replacement Part No.
DS1A-*ES	D1A-G4FILTERKIT
DS2A-*ES	D2A-G4FILTERKIT
DS2HA-*ES	D2HA-G4FILTERKIT
DS3A-*ES	D3A-G4FILTERKIT
DS4A-*ES	D3A-G4FILTERKIT
DS4HA-*ES	D4HA-G4FILTERKIT
DS5A-*ES	D5A-G4FILTERKIT
DS6A-*ES	D6A-G4FILTERKIT
DS7A-*ES	D7A-G4FILTERKIT

### F7 Filter

Unit Size	Replacement Part No.
DS1A-*ES	D1A-F7FILTERKIT
DS2A-*ES	D2A-F7FILTERKIT
DS2HA-*ES	D2HA-F7FILTERKIT
DS3A-*ES	D3A-F7FILTERKIT
DS4A-*ES	D3A-F7FILTERKIT
DS4HA-*ES	D4HA-F7FILTERKIT
DS5A-*ES	D5A-F7FILTERKIT
DS6A-*ES	D6A-F7FILTERKIT
DS7A-*ES	D7A-F7FILTERKIT

## 11.0 After Sales

For technical assistance or further product information, including spare parts and replacement components, please contact the After Sales Department.

**Telephone 02920 858 400**





## DECLARATION OF INCORPORATION AND INFORMATION FOR SAFE INSTALLATION, OPERATION AND MAINTENANCE

We declare that the machinery named below is intended to be assembled with other components to constitute a system of machinery. 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: DAVE Ecosmart (ES) models  
 Machinery Types: Supply fans  
 Relevant EC Council Directives: 2006/42/EC (Machinery Directive)  
 Applied Harmonised Standards: BS EN ISO 12100, BS EN ISO 13857  
 EN60204-1, BS EN ISO 9001  
 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	28.01.15
2) A. Jones		Manufacturing Director	28.01.15

## 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/EC (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 Nuair 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 Nuair.

2.3 Where warning labels or notices are attached to the unit the instructions given must be adhered to.

### 3.0 TRANSPORTATION, HANDLING AND STORAGE

3.1 Care must be taken at all times to prevent damage to the equipment. Note that shock to the unit may result in the balance of the impeller being affected.

3.2 When handling the equipment, care should be taken with corners and edges and that the weight distribution within the unit is considered. Lifting gear such as slings or ropes must be arranged so as not to bear on the casing.

3.3 Equipment stored on site prior to installation should be protected from the weather and steps taken to prevent ingress of contaminants.

### 4.0 OPERATIONAL LIMITS

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

4.2 Where installation accessories are supplied with the specified equipment eg. wall mounting brackets. They are to be used to support the equipment only. Other system components must have separate provision for support.

4.3 Flanges and connection spigots are provided for the purpose of joining to duct work systems. They must not be used to support the ductwork.

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 (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.