

BOXER AHU's

(No Controls Fitted)

CE The EMC Directive
2014/30/EU
The Low Voltage
directive
2014/35/EU

Installation and Maintenance

I.O Introduction

This Direct and Belt Drive range of Boxer Air Handling Units is supplied without any controls and consists of the following:

- Units are Fan Control only
- BHSEX*NC Boxer Extract Fan.
- BHS*NC-E Boxer Supply fan with Electric Heater.
- BHS*NC-L Boxer Supply fan with LPHW Heater.
- BHS*NC-LC Boxer Supply fan with LPHW Heater and CW Cooling Coil.
- BHS*NC-LD Boxer Supply fan with LPHW Heater and DX Cooling Unit.
- BHS*NC-ED Boxer Supply fan with Electric Heater and DX Cooling Unit.

(*Denotes unit size in product code, 1-7).

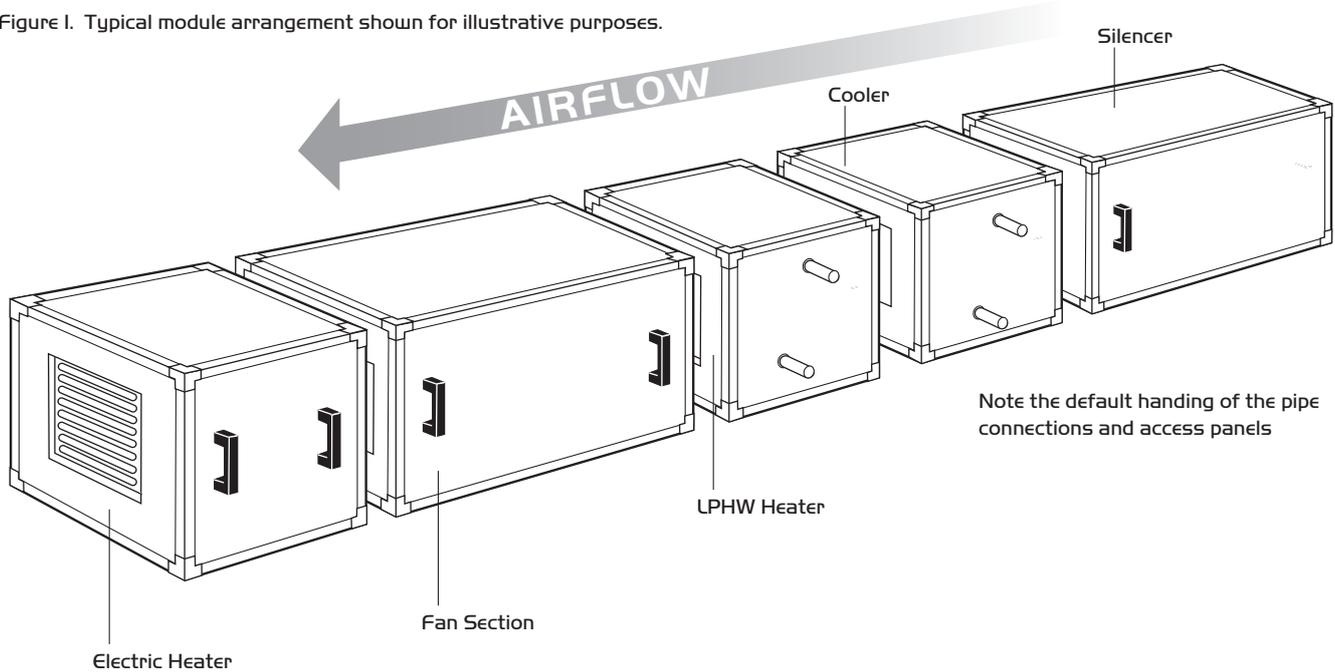
A typical unit will consist of an inlet filter, heating and/or cooling coil and a fan. Size 1 and 2 will typically be supplied in a single section. However ancillaries such as pre-heater and silencers will be supplied as separate modules. Size 3 and above will be supplied as separate modules. The modules must be assembled together on site in a workman like manner with inter-connections of wiring etc. between the modules.

IMPORTANT

Please note the air handling units described in this manual are supplied without any controls. It is the installer's responsibility to select and install suitable controller(s) and circuit(s) to produce the desired output from the units.

All heating/cooling coils are supplied as bare coils. It is the installer's responsibility to supply suitably sized valves, controls and pipework to produce the desired output conditions. Any electric heater fitted must be connected to suitable control circuit with adequate safety interlock.

Figure 1. Typical module arrangement shown for illustrative purposes.



IMPORTANT

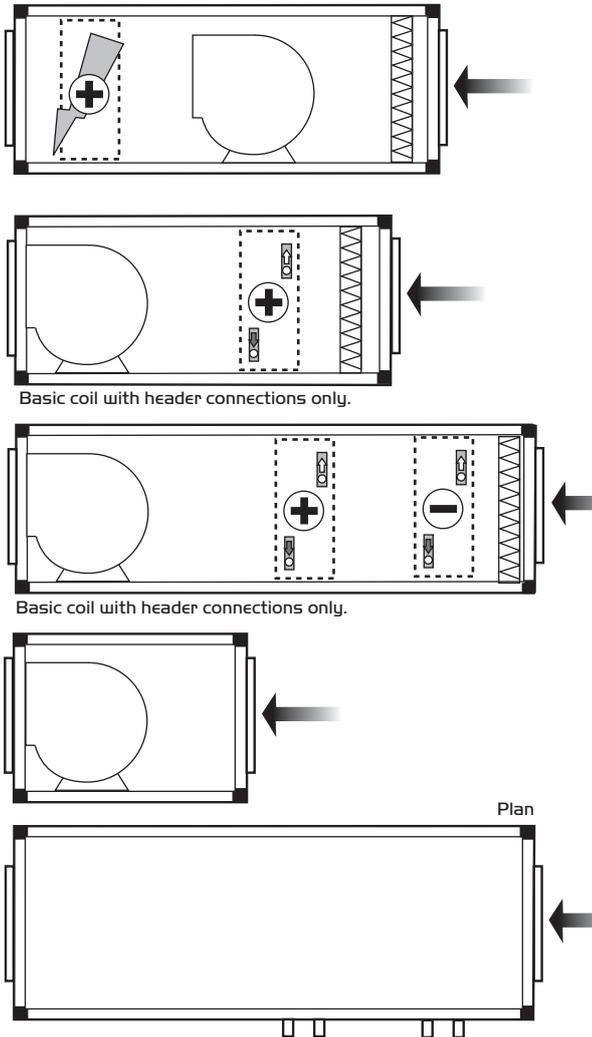
UNITS OF MODULAR CONSTRUCTION

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.

2.0 Typical unit arrangements

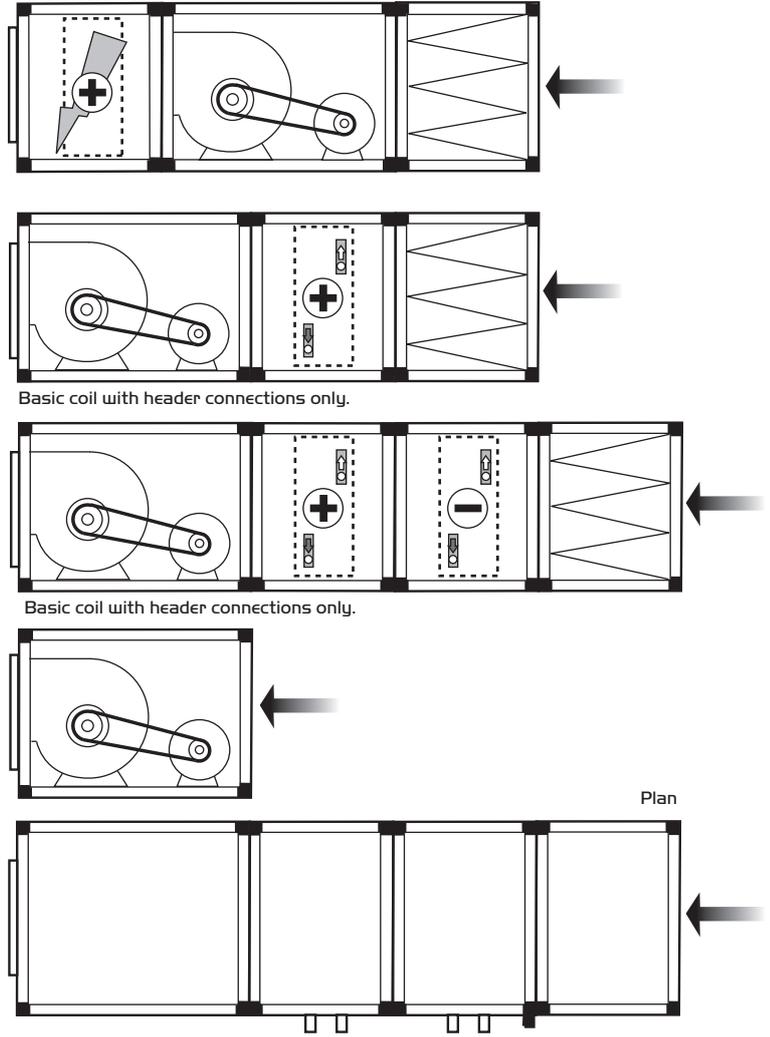
Direct Drive: (Sizes 1 and 2 in fan unit code)

Figure 2.



Belt Drive: (Sizes 3 to 7 in fan unit code)

Figure 3.



Dimensions and weights

Full details, with project specific documents and drawings are available from the Nuair Technical Estimating Department. Quote your project references when calling. Tel: 02920 858200.

Unless otherwise stated all control packs (where applicable) 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.

3.0 Handling

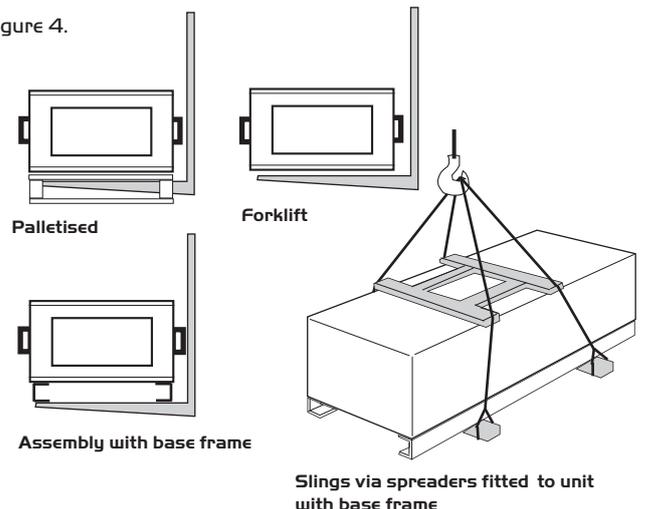
Upon receipt of the equipment an inspection should be made, and before commencement of lifting ensure that normal equipment safety checks have been carried out.

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. (See 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-modula sections. Handle each section individually- **do not stack for lifting or storage.**

Figure 4.



4.0 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. I.E.E., CIBSE, COHSE etc.

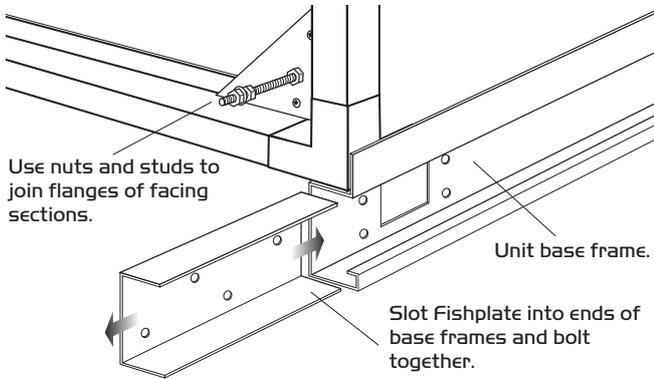
When selecting the unit position, ensure adequate access for connection of external services, commissioning, future inspection and maintenance and the removal of component parts.

Erection and Assembly

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 fishplates must be used to join two base frames together. (See figure 5).

Figure 5.



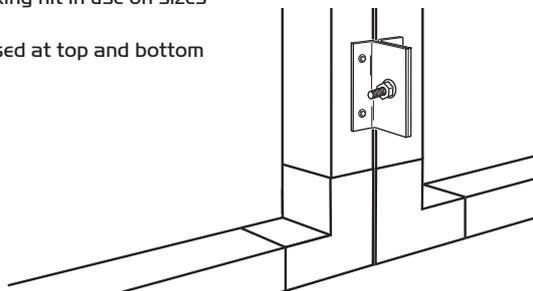
Assembly of Equipment

a). 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.

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. 7).

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

(Allow 125mm if the pressure is not known for this range of fans).

B = A/2. (Note: 10Pa = 1mm H2O).

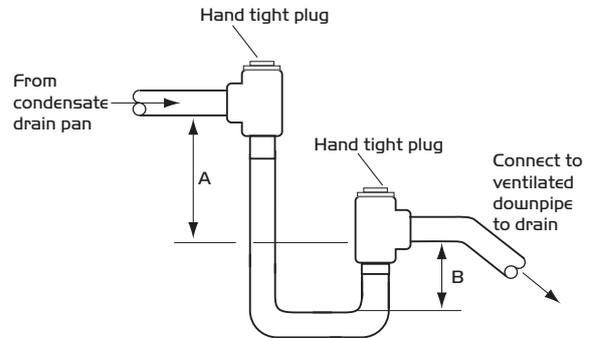
If the condensate tray is located at the outlet side of the fan (i.e. under positive pressure) then calculate the values of A & B as shown below.

A = 25mm

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

(Allow 125mm if the pressure is not known for this range of fans).

Figure 7. Condensate Trap.



On sizes 1 and 2, where motorised dampers are coupled to a system, it will be necessary to remove the spigotted 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. (See figure 6).

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

b). Electrical - see section 5.

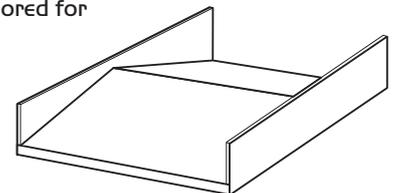
c) Indoor Installation

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.

d) 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 couls as appropriate.

Figure 8. Weather roof.



e) Wet pipe connections

	Frost Coils		Cooling Coils		Heating Coils	
	In	Out	In	Out	In	Out
BHS1FC	0.75BSP	0.75BSP	1 BSP	1 BSP	1.25BSP	1.25BSP
BHS2FC	0.75BSP	0.75BSP	1.25BSP	1.25BSP	1.25BSP	1.25BSP
BHS3FC	1 BSP	1 BSP	1.25BSP	1.25BSP	1.25BSP	1.25BSP
BHS4FC	1 BSP	1 BSP	1.25BSP	1.25BSP	1.5BSP	1.5BSP
BHS5FC	1.25BSP	1.25BSP	1.5BSP	1.5BSP	2 BSP	2 BSP
BHS6FC	1.25BSP	1.25BSP	2 BSP	2 BSP	2 BSP	2 BSP
BHS7FC	1.5BSP	1.5BSP	2 BSP	2 BSP	2 BSP	2 BSP

5.0 Wiring

IMPORTANT

Please note: this product must be earthed.

Power requirements

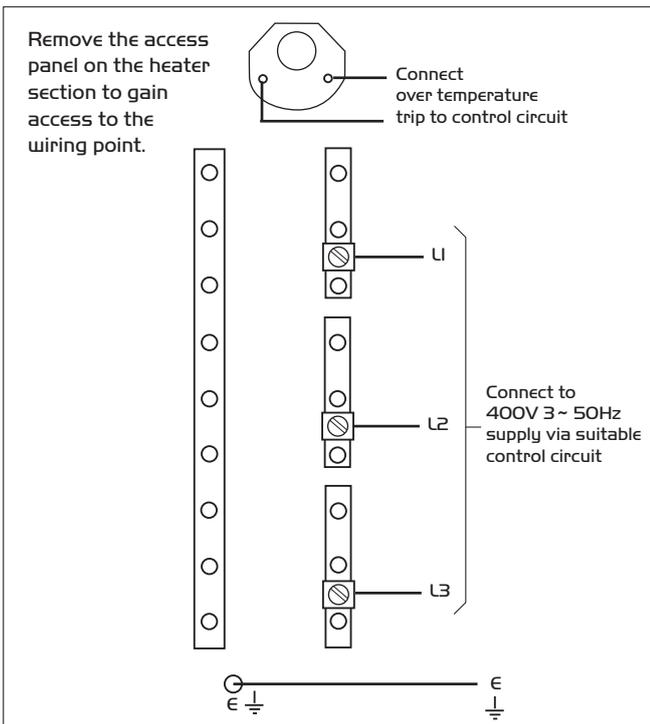
Model	Fan load		Electric heater (if fitted)	
	FLC (1)	SC (2)	Heater kW (4)	Heater FLC
BH5EX1NC, BHS1NC-L/C	4.8A	19A	-	-
BHS1NC-E	4.8A	19A	18	25A
BH5EX1HNC, BHS1HNC-L/C	7.2A	7.2A (3)	-	-
BHS1HNC-E	7.2A	7.2A (3)	18	25A
BH5EX2NC, BHS2NC-L/C	7.2A	28A	-	-
BHS2NC-E	7.2A	28A	24	33A
BH5EX2HNC, BHS2HNC-L/C	7.5A	7.5A (3)	-	-
BHS2HNC-E	7.5A	7.5A (3)	24	33A
BH5EX3NC, BHS3NC-L/C	4.6A	29A	-	-
BHS3NC-E	4.6A	29A	27	38A
BH5EX4NC, BHS4NC-L/C	6.1A	42A	-	-
BHS4NC-E	6.1A	42A	36	50A
BH5EX5NC, BHS5NC-L/C	7.8A	56A	-	-
BHS5NC-E	7.8A	56A	54	75A
BH5EX6NC, BHS6NC-L/C	8.2A	49A	-	-
BHS6NC-E	8.2A	49A	54	75A
BH5EX7NC, BHS7NC-L/C	11.4A	72A	-	-
BHS7NC-E	11.4A	72A	54	75A

Note:

- (1) Full load currents for sizes 1 & 2 are rated at 230V ~ 50Hz, all other sizes are rated at 400V 3 ~ 50Hz.
- (2) DOL starting current; except for size 7 which is star-delta.
- (3) Motor with built-in inverter.
- (4) Electric heater rated at 400V 3 ~ 50Hz.

Pay particular attention to the model type, recorded on the product rating plate and connect as follows.

Figure 9. Typical Electric Heater Wiring.



Please note the air handling units described in this manual are supplied without any controls. It is the installer's responsibility to select and install suitable controller(s) and circuit(s) to produce the desired output from the units. Any electric heater fitted must be connected to suitable control circuit with adequate safety interlock.

Please note that all motor wiring is brought out to a junction box on the specified access side of the unit.

Figure 10. Motor wiring for BHS (1 - 2) NC.

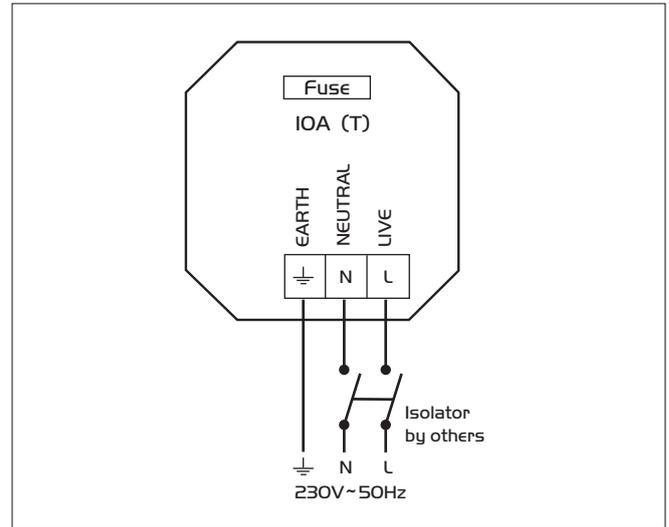


Figure 11. Motor wiring for BHS (1 - 2) HNC - ** (All variants).

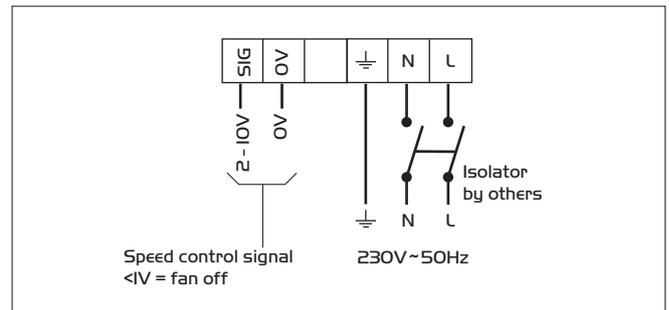


Figure 12. Motor wiring for BHS (3 - 6) NC - ** (All variants).

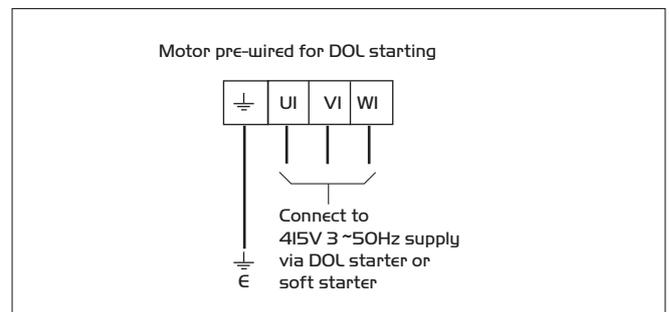
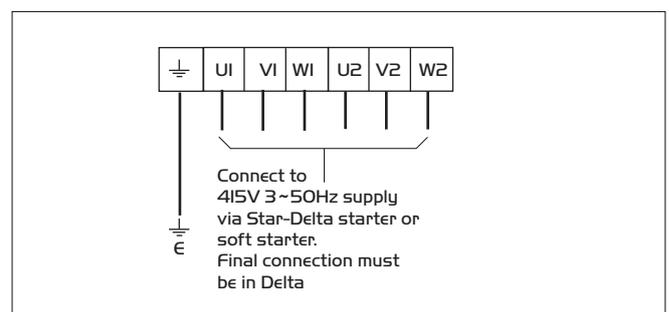


Figure 13. Motor wiring for BHS 7NC - ** (All variants).



7.0 Maintenance

IMPORTANT

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

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.

Lubrication

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

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.

General

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

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.

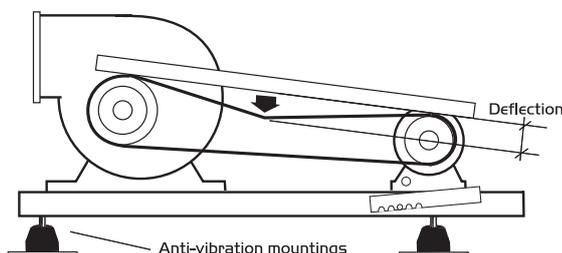
Cleaning Control Box and Sensors (if fitted)

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

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 (see fig. 14). The force required to deflect the 'V' belt should be from 0.5kg to 0.8kg.

Figure 14. Adjusting the drive belts (Sizes 3-6).



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 (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.

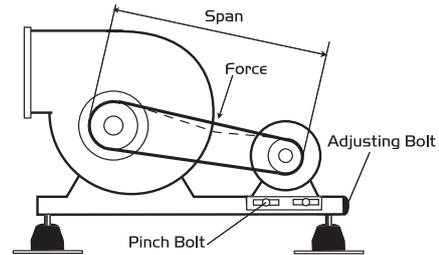


Figure 15. Adjusting the drive belts (Size 7).

To check for correct tension, proceed as follows:

1. Measure the span length (See fig. 15).
2. 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 (see fig. 15). The force required to deflect the 'V' belt should be from 0.5kg to 0.8kg.
3. Tighten the pinch bolts.

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).

Warranty

The 3 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.

After Sales

For technical assistance or further product information, 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. 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: BOXER FANS
Machinery Types: BHSNC, BHSEXNC
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	5. 11. 10
2) A. Jones 	Manufacturing Director	5. 11. 10

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.I)

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.

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.