

XBOXER

XBC 75 & 85 ECOSMART2 (NT) MODELS

INSTALLATION, CONTROL DETAILS,
OPERATING AND MAINTENANCE





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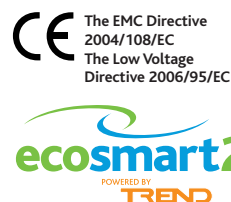
**INDEX - INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS
FOR XBOXER XBC 75 & 85 HORIZONTAL UNITS**

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XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

SUPPLY & EXTRACT VENTILATION UNIT WITH HEAT RECOVERY

INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS



INTRODUCTION - XBOXER XBC 75 & 85 HORIZONTAL ECOSMART2 (NT) MODELS

The information contained in this document provides details of installation, operation and maintenance for installers and users of the XBOXER XBC75 & 85 Supply and Extract Ventilation Units with Heat Recovery.

This supply and extract air handling unit range comprises a combination of high efficiency centrifugal fans with EC motors, a counterflow design plate heat exchanger, filters, optional heaters (LPHW and Electric) and a casing with high mass acoustic treatment.

The one-piece ventilation unit shall be constructed with double skinned aluzinc panels on an aluminium Pentapost frame with integral acoustic mineral fibre ensuring low breakout noise levels. The unit shall incorporate a high efficiency aluminium counterflow plate heat exchanger matrix with a thermal efficiency of up to 92%, fitted with a segmented 100% bypass facility and actuator (patent app.for) operating under automatic control.

A range of matched, side by side internal and external attenuators (horizontal units) and double deck internal and external attenuators (Vertical units) with a similar construction method to that of the unit is available.

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

Figure 1: Layout Overview of the XBC horizontal unit unit viewed from above with the lid removed.

CODE DESCRIPTION: XBOXER XBC 75 & 85 HORIZONTAL VENTILATION UNITS

XBC 75 - H - LNT - R - WP

1	2	3	4	5	6	7	8

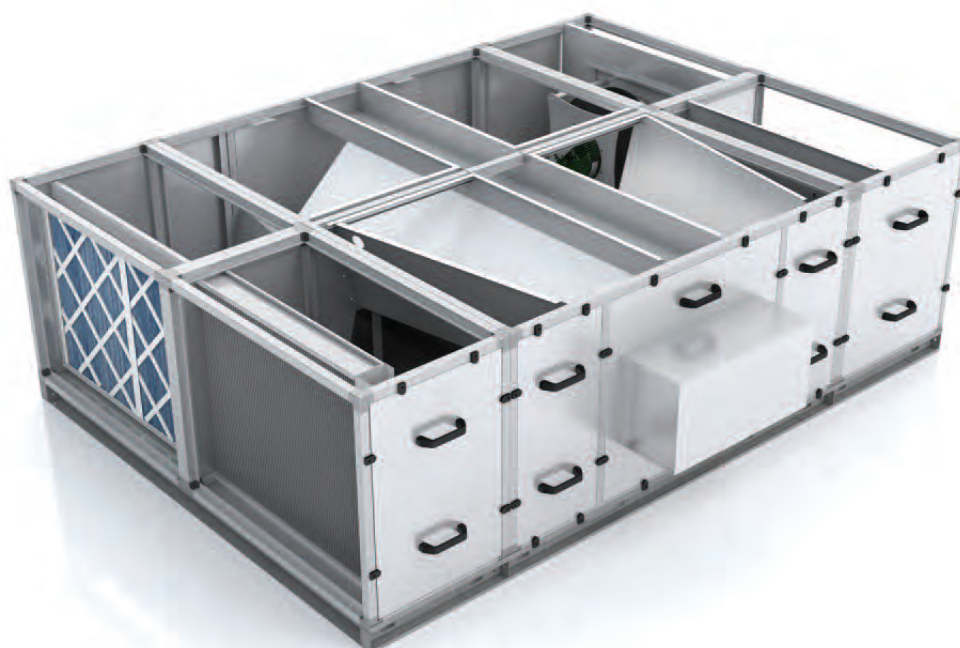
1. XBOXER XBC Range
2. Counterflow heat exchanger
3. Unit size 75 & 85
4. H = Horizontal
5. type of heater battery:
L = LPHW Heater, N = No Heater
E = Electric Heater
6. Control type:
NT = Ecosmart2 control
ES = Ecosmart control
BC = Basic control
7. R = Opposite configuration
8. WP = Weather roof factory fitted only

CODE DESCRIPTION: MATCHED SIDE BY SIDE ATTENUATOR

XBC 75 - H - SIL900

1	2	3	4

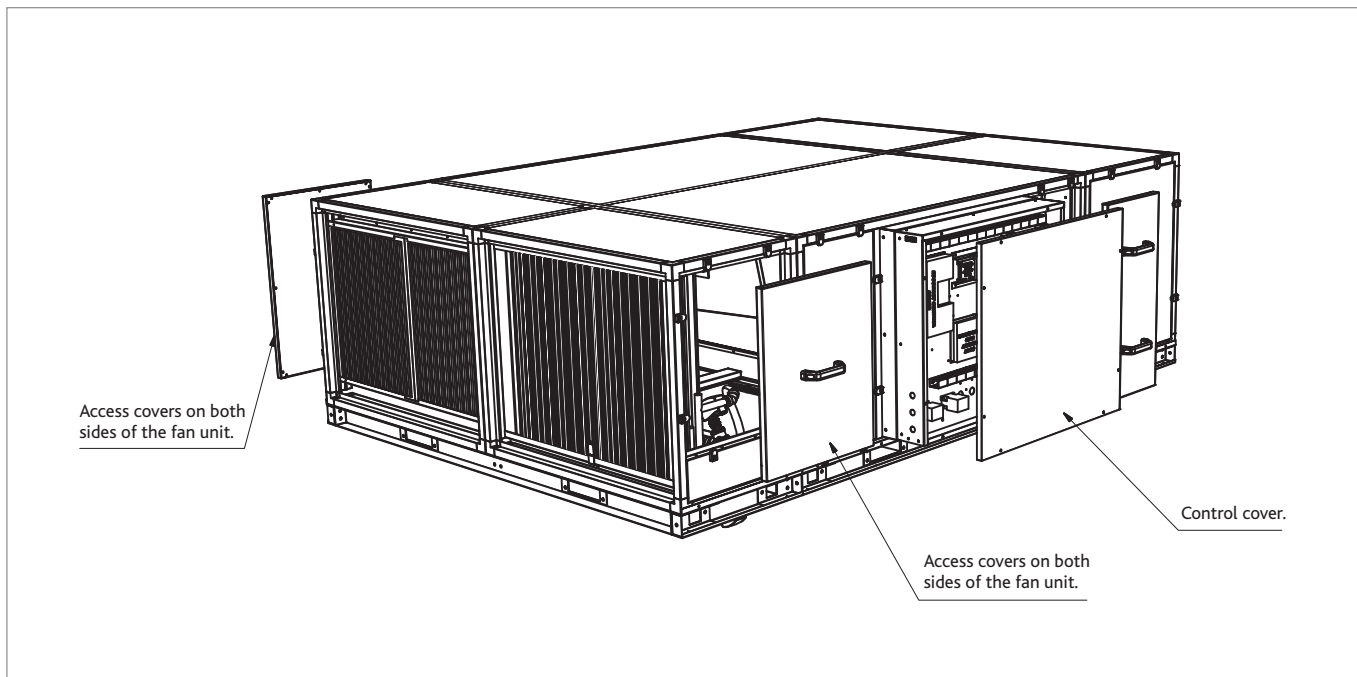
1. XBOXER XBC Range
2. Unit Size 75 & 85
3. H = Horizontal
4. Attenuator SIL900 = 900 mm length
Attenuator SIL900WP = 900 mm length with weather roof



XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

1.0 XBOXER XBC HORIZONTAL UNIT ACCESS

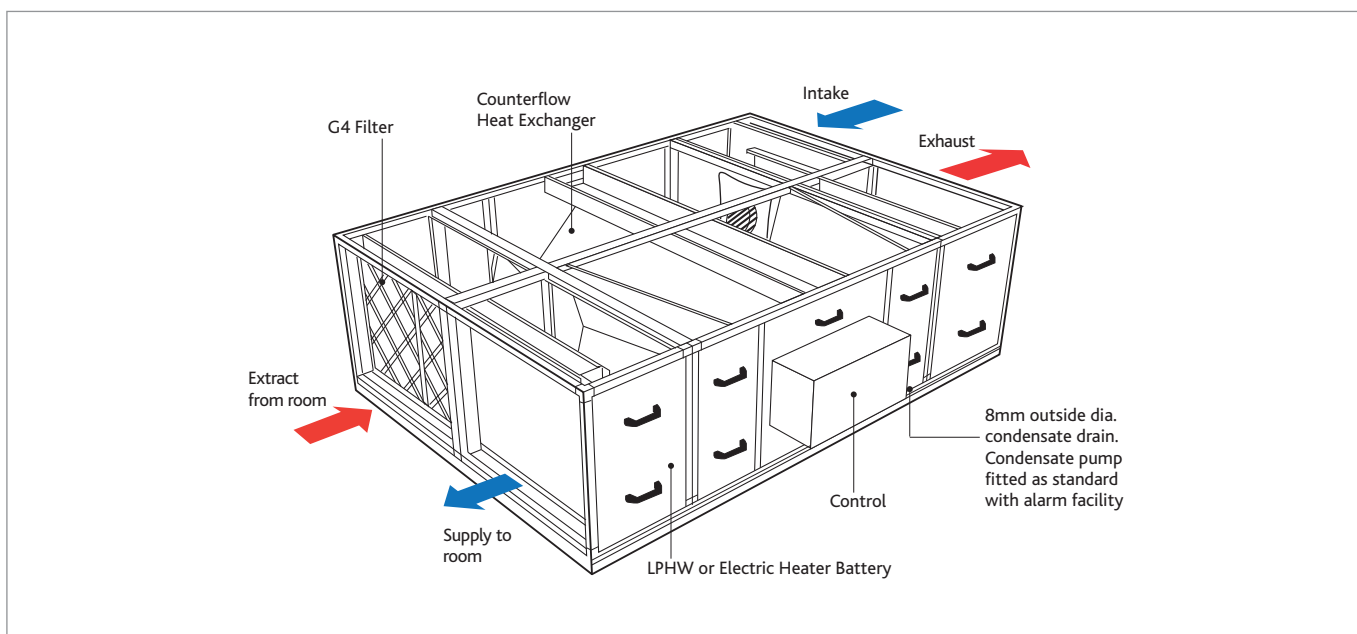
Figure 2: The unit must be installed with at least 650mm clearance from a wall / barrier to gain access from the side. Isolate before removing panels.



In this product range, several unique concepts have been implemented with a view to simplifying the installation design.

1. The unit must be installed with at least 650mm clearance from a wall / barrier. With this absolute minimum clearance, the unit may be connected to the power supply and control connection. 1000mm clearance is required to remove the LPHW coil and electric heater.
2. With this clearance, unit filters may be changed, and the fans coils, heat exchanger and condensate tray may be inspected and cleaned if necessary.
3. The LPHW and Electrical heater settings, coil bleed and drain, and all other control adjustments are similarly accessible.
4. Side access, where possible, is preferred in all cases in terms of safe working access to the equipment under the CDM regulations.
5. Note however, that access in the situation is difficult and additional time should be allocated. For convenience it is preferred that wherever possible, this minimum access provision is not adopted, and it is recommended that a minimum of around 600mm clearance (as stated in ADF 2010) is allowed.
6. Where these arrangements are not suitable, the Consultant's and Contractor's project specific requirements will always be accommodated where possible.

Figure 3: Horizontal unit access and configuration. Standard (left hand) unit shown.



XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

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

2.0 DELIVERY & 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 Nuaire within two days of receipt of the equipment.

2.1 OFF LOADING 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.

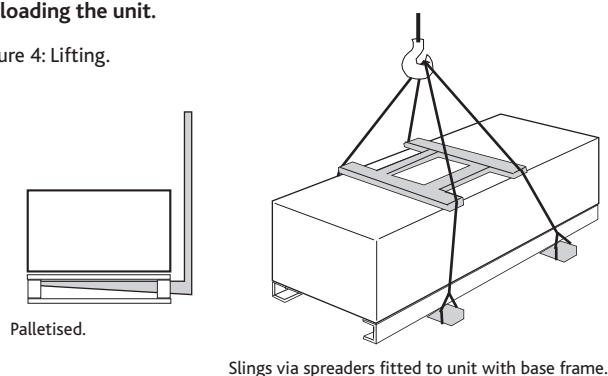
Offloading and positioning of the equipment is the responsibility of the purchaser.

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.

CAUTION: The XBC75 & 85 fan units have an uneven weight distribution, please refer to the unit labelling before Lifting/offloading the unit.

Figure 4: Lifting.



XBOXER XBC unit sections will be delivered to site in the number of sections shown below.

XBOXER XBC Central Ventilation Unit	No. of sections
1	1

The unit will be labelled with the direction of air flow.

The direction convention must be observed during assembly.

The unit may only be operated in its intended horizontal installation plane.

The unit must be fully levelled during installation (this is essential to ensure that condensate drains correctly).

See page 7. for dimensions and weights.

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. If the storage period is to exceed two months, contact Nuaire 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.

These units may only be mounted horizontally and must be fully levelled in the horizontal plane.

The units are heavy, and should be mounted using the fixing brackets supplied or other suitable methods of support.

The supporting structure must be assessed for structural suitability.

If these units are being fitted into a ceiling void a suitable support structure must be provided under each unit, the baseframe provided is 'NOT' suitable for this purpose.

Heat recovery components and modules that incorporate cooling coils may produce condensation during use.

An insulated drip tray and condensate pump is provided.

The drain connection must be connected to a suitable drainage point.

(See fig 9, page 9 for details).

CONDENSATE PUMP ALARM

The condensate pump incorporates an alarm function. If the water level in the condensate tray exceeds a maximum level (for example, as a result of the discharge tube becoming blocked or frozen), the alarm contact will open. This contact is internally connected to the heat exchanger bypass actuator, and the unit will automatically be placed into bypass mode, preventing further condensate production. Unit operation will otherwise be unaffected.

CONDENSATE PUMP SPECIFICATION

Maximum flow rate = 50 L/H

Maximum head = 20m Vertical, 100m Horizontal

Pipe Connection size (Low Pressure Condensate connection) XBOXER XBC = 8 mm

LPHW Coils, if fitted, are tested during manufacture to 16 Bar (using dry compressed air). Coil and valve assemblies are similarly tested to 10 Bar. 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.

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. Cable access points are provided at the ends of the control enclosure.

If the control is rotated to aid connection of cables, please ensure that sufficient flexibility is provided in the final connection run.

NB to avoid conflict with the unit access panels, it is recommended that electrical and plumbing service connections to the unit are run at 90 degrees to the main air flow axis.

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

The unit rating label shows the maximum electrical load of the equipment. Connections to the unit may include single phase supply connections, and a variety of control circuits.

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.

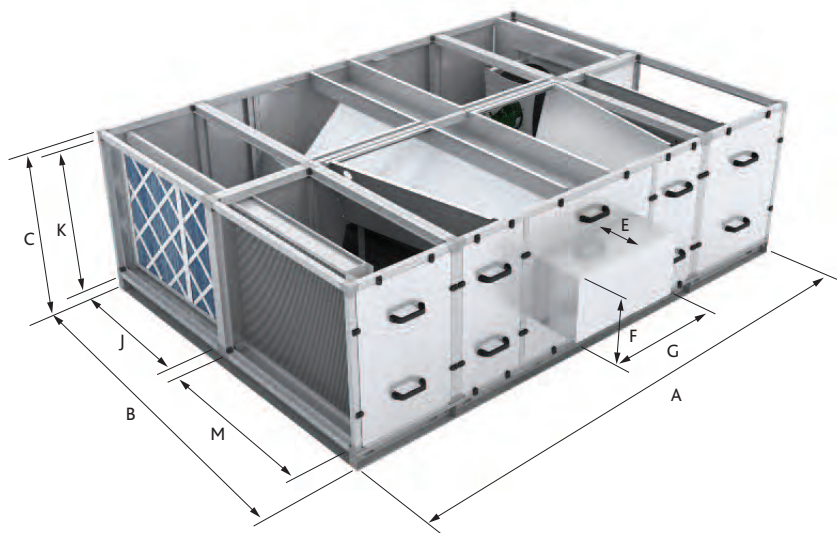
The equipment must be earthed and earth-bonded.

Means of local isolation for maintenance purposes are generally required (by others). Ensure that all mains connections are isolated.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

4.0 XBOXER XBC (NT) HORIZONTAL UNIT DIMENSIONS (MM) AND WEIGHTS (KG)

Figure 5: Horizontal unit dimensions (mm) and weights (kg).



Unit code	Unit Dimensions (mm)						Control dimensions			Unit weights	Packed weights
	A	B	C	J	K	M	E	F	G	(kg)	(kg)
XBC75-H-***	2800	2126	876	940	740	940	250	730	800	720	902
XBC85-H-***	2800	2126	876	940	740	940	250	730	800	760	942

The unit is designed for side access as standard and must be installed with a minimum of clearance of 650mm from a wall or barrier. This will provide access to filters, coil, fan, heat exchanger, condensate tray and pump.

All models - the weather roof is part of the unit code and is factory fitted only. Example: XBC85-H-LESWP.

*Includes unit and base rail.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

5.0 XBOXER XBC75 & 85 HORIZONTAL (NT) MOTORISED DAMPERS

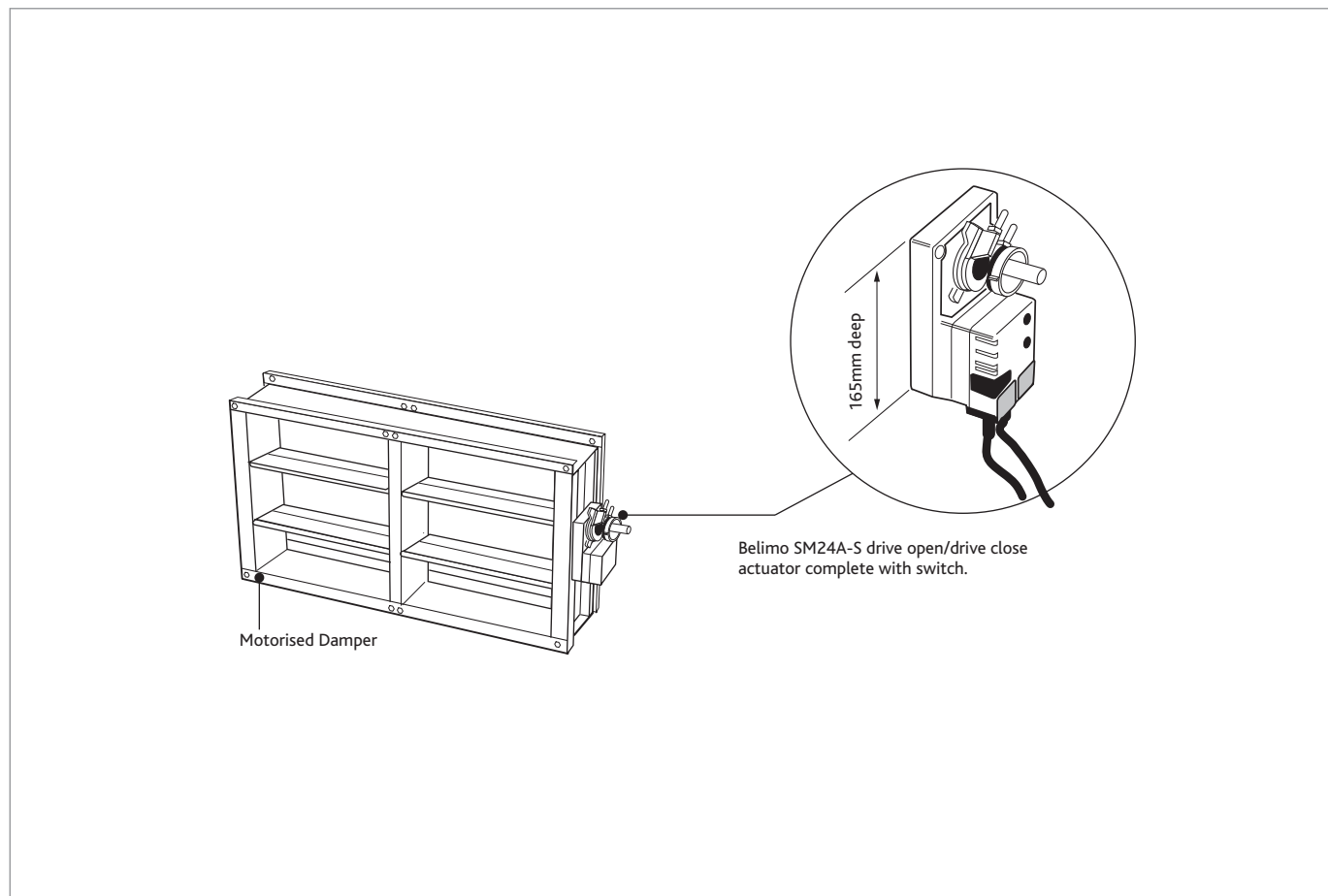
Internal version (example code: XBC75-H-MD24V).

If Nuaire matched silencers (example code XBC75-H-SIL900) are being fitted to the fan unit, the motorised damper (example code XBC75-H-MD24V) needs to be fitted after the silencers. This ensures that breakout noise levels are kept to a minimum.

The motorised damper units will be supplied loose and are designed to fit directly onto the flange connector (by others).

- Fully interlocking parallel blades, half inch diameter electroplated mild steel spindle.
- Nylatron bushes and external nylon/aluminium blade inter connection linkage.
- Fitted with Belimo SM24A-S drive open/drive close actuator complete with switch.

Figure 6: Installing the Motorised Damper.



XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

6.0 COMMISSIONING & SETTING TO WORK ON HORIZONTAL UNITS

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

6.1 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.

6.2 HEATING COILS LPHW

Observe the Flow and Return connection labels on the unit. Drain and bleed valves are located on the coil.

Other valves may be required in the system pipe-work depending on the installation (by others).

Where the wet system is at risk of frost damage, the addition of a proprietary anti-freeze solution to the water is recommended. Note that any frost protection offered by the unit's integral control system will not operate if the power supply to the unit is interrupted.

Piped connections should be made to the unit using appropriate techniques, and all pipework must be independently supported.

No hot work is permitted within one metre of the unit.

Ensure that installed pipework runs do not prevent or restrict access to the unit at any point.

The completed installation (including the connections within the unit, as these may be disturbed during installation) shall be pressure tested to the project engineer's specification. (A condition of the unit warranty).

6.3 ELECTRIC HEATERS

Heater Capacity: XBC75 – 3ph, 12Kw

XBC85 – 3ph, 18Kw

The Electric Heater requires a 3ph supply which is independent from the main unit supply. Connections to be made through the low level fixed panel. The Electric Heater may be withdrawn to allow access to the Heater Controller without the need for wiring to be disconnected (Ensure the mains supply is isolated before removing any access panels and any adjustments are made to the Heater Controller).

6.4 FAN SECTIONS

Access to the fan section is via lift off panels. (see fig 7).

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.

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.

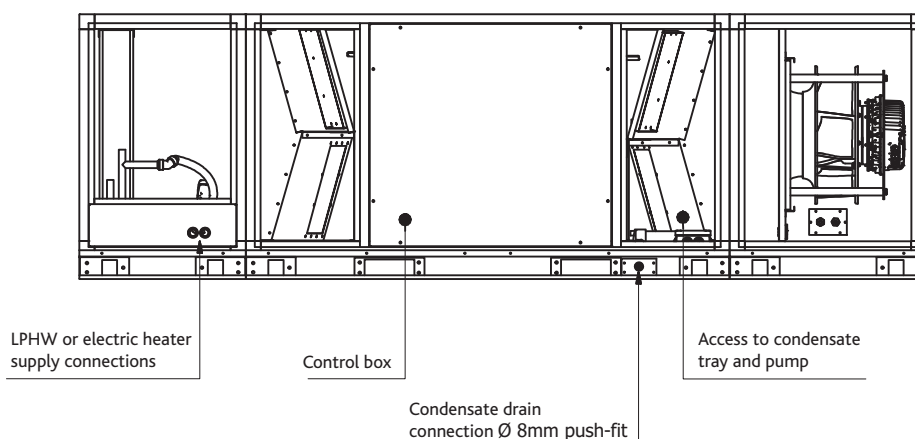
Test run motor for condition and correct rotation.

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.

IMPORTANT

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

Figure 7: Customers connections. Control side of horizontal unit showing coil and condensate connections.



CONDENSATE ALARM

The condensate pump incorporates an alarm function.

If the water level in the condensate tray exceeds a maximum level (for example, as a result of the discharge tube becoming blocked or frozen), the alarm contact will open. This contact is internally connected to the heat exchanger bypass actuator, and the unit will automatically be placed into bypass mode, preventing further condensate production. Unit operation will otherwise be unaffected.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

7.0 XBOXER XBC75 & 85 HORIZONTAL (NT) SPARE PARTS

Ensure correct model is selected:

XBC75 – HORIZONTAL

PART NO.	DESCRIPTION
XBC75-H-FILTERKIT	Replacement G4 panel filters x 4
776187	Replacement Blower assembly x 1

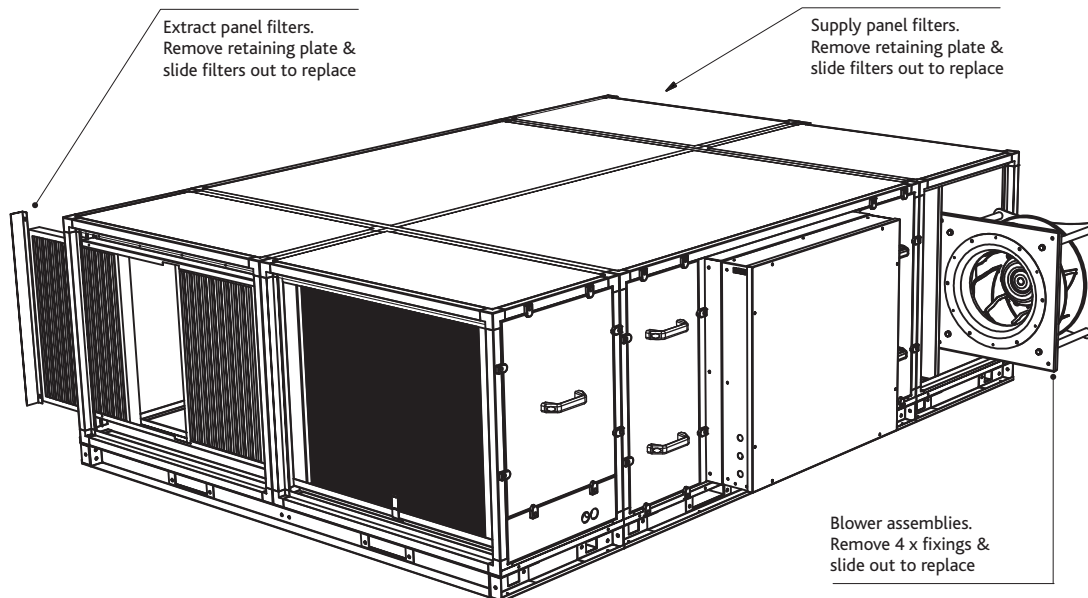
XBC85 – HORIZONTAL

PART NO.	DESCRIPTION
XBC85-H-FILTERKIT	Replacement G4 panel filters x 4
776199	Replacement Blower assembly x 1

IMPORTANT

Isolation - Before unit panels are removed make sure that the unit is isolated.

Figure 8: Replacing filters and blower assembly.



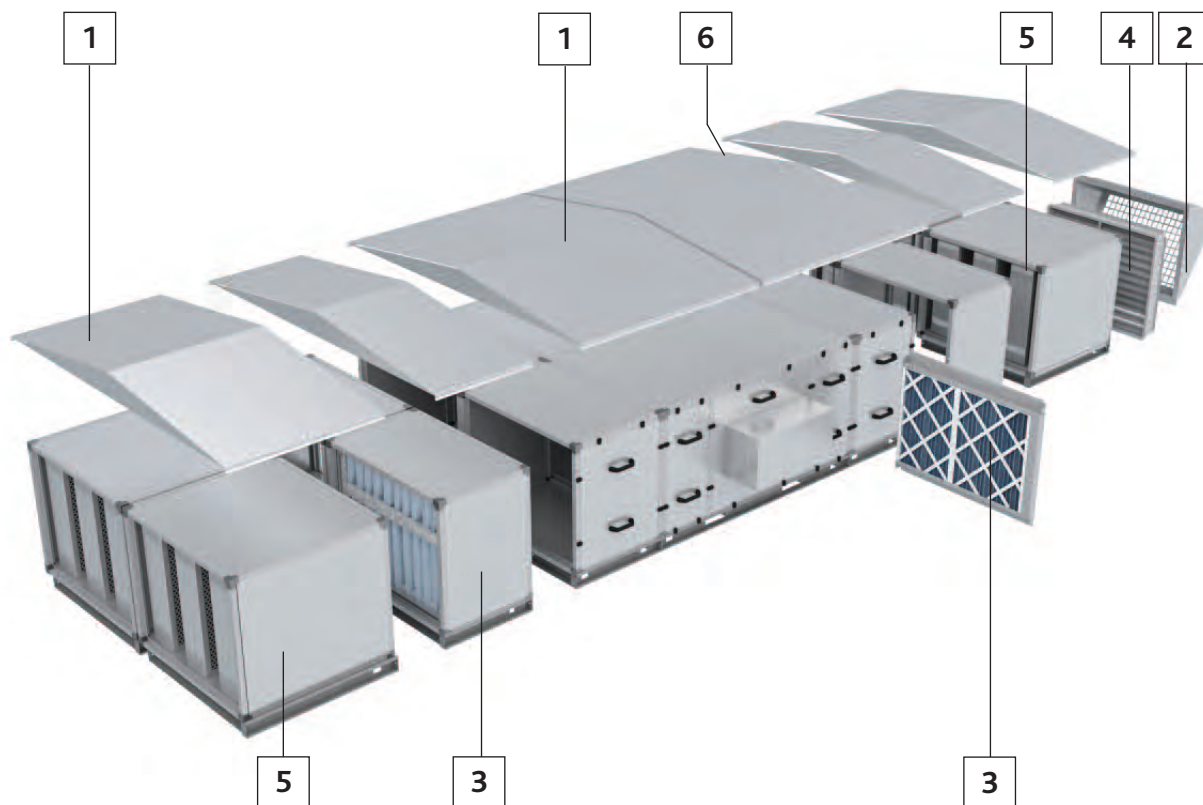
IMPORTANT

Caution - Blower Weight
XBC75 - 18kg and XBC85 - 37kg

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

8.0 XBOXER XBC75 & 85 HORIZONTAL (NT) ANCILLARY DIMENSIONS (MM) AND WEIGHTS

Figure 9: Horizontal Unit ancillary key.



WEATHER KIT

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
1	XBC75-H-***WP	Unit with weather roof	2000	1001	2800	720
	XBC75-H-***-RWP	Unit with weather roof	2000	1001	2800	720
	XBC85-H-***WP	Unit with weather roof	2000	1001	2800	760
	XBC85-H-***-RWP	Unit with weather roof	2000	1001	2800	760

WEATHER TERMINAL

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
2	XBC75-H-RT	Weather terminal	940	740	700	10
	XBC85-H-RT	Weather terminal	940	740	700	10

FILTER & MODULE OPTIONS (Side by side and supplied as one piece)

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
3	XBC75-F7B/G4P-H	F7 Bag/G4 Panel	2000	876	600	115
	XBC85-F7B/G4P-H	F7 Bag/G4 Panel	2000	876	600	115
	XBC75-F7B/G4P-HR	F7 Bag/G4 Panel	2000	876	600	115
	XBC85-F7B/G4P-HR	F7 Bag/G4 Panel	2000	876	600	115
	XBC75-G4B-H	G4 Bag	2000	1001	600	115
	XBC85-G4B-H	G4 Bag	2000	1001	600	115
	XBC75-G4B-HR	G4 Bag	2000	1001	600	115
	XBC85-G4B-HR	G4 Bag	2000	1001	600	115
	XBC75-F7B/G4P-HWP	F7 Bag/G4 Panel with weather roof	2000	876	600	117
	XBC85-F7B/G4P-HWP	F7 Bag/G4 Panel with weather roof	2000	876	600	117
	XBC75-F7B/G4P-HRWP	F7 Bag/G4 Panel with weather roof	2000	876	600	117
	XBC85-F7B/G4P-HRWP	F7 Bag/G4 Panel with weather roof	2000	876	600	117
	XBC75-G4B-HWP	G4 Bag with weather roof	2000	1001	600	117
	XBC85-G4B-HWP	G4 Bag with weather roof	2000	1001	600	117
	XBC75-G4B-HRWP	G4 Bag with weather roof	2000	1001	600	117
	XBC85-G4B-HRWP	G4 Bag with weather roof	2000	1001	600	117

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

8.0 XBOXER XBC75 & 85 HORIZONTAL (NT) ANCILLARY DIMENSIONS (MM) AND WEIGHTS

DAMPERS

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
4	XBC75-H-MD24V	Motorised dampers 24V for Ecosmart2 models (NT)	840	700	165	20
	XBC85-H-MD24V	Motorised dampers 24V for Ecosmart2 models (NT)	840	700	165	20
	XBC75-H-MD-NC	Damper no actuator with extended spindle	840	700	165	20
	XBC85-H-MD-NC	Damper no actuator with extended spindle	840	700	165	20

2 X MATCHING SILENCERS (Side by side and supplied as one piece)

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
5	XBC75-H-SIL900	Side by side silencer with base frame	2000	876	900	180
	XBC85-H-SIL900	Side by side silencer with base frame	2000	876	900	190
	XBC75-H-SIL900-WP	Side by side silencer with base frame and weather roof	2000	1001	900	180
	XBC85-H-SIL900-WP	Side by side silencer with base frame and weather roof	2000	1001	900	190

FROST COILS (Side by side and supplied as one piece)

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
6	XBC75-FCL-LNT-H	LPHW side by side module with base frame for Ecosmart2 control units (NT)	2000	876	600	113
	XBC85-FCL-LNT-H	LPHW side by side module with base frame for Ecosmart2 control units (NT)	2000	876	600	113
	XBC75-FCL-RNT-H	LPHW side by side module with base frame for Ecosmart2 control units (NT)	2000	876	600	113
	XBC85-FCL-RNT-H	LPHW side by side module with base frame for Ecosmart2 control units (NT)	2000	876	600	113
	XBC75-FCE-LNT-H	Electric side by side module with base frame for Ecosmart2 control units (NT)	2000	876	600	121
	XBC85-FCE-LNT-H	Electric side by side module with base frame for Ecosmart2 control units (NT)	2000	876	600	121

Above is an indicative list of XBC75 & 85 ancillaries, for further details please contact Nuair.

Note: Codes with 'R' i.e. (XBC75-G4B-HR) refer to right hand unit versions.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

SUPPLY & EXTRACT VENTILATION UNIT WITH HEAT RECOVERY

INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS



INTRODUCTION - XBOXER XBC 75 & 85 VERTICAL ECOSMART2 (NT) MODELS

The information contained in this document provides details of installation, operation and maintenance for installers and users of the XBOXER XBC75 & 85 Supply and Extract Ventilation Units with Heat Recovery.

This supply and extract air handling unit range comprises an combination of high efficiency centrifugal fans with EC motors, a counterflow design plate heat exchanger, filters, optional heaters (LPHW and Electric) and a casing with high mass acoustic treatment.

The one-piece ventilation unit shall be constructed with double skinned aluzinc panels on an aluminium Pentapost frame with integral acoustic mineral fibre ensuring low breakout noise levels. The unit shall incorporate a high efficiency aluminium counterflow plate heat exchanger matrix with a thermal efficiency of up to 92%, fitted with a segmented 100% bypass facility and actuator (patent app.for) operating under automatic control.

A range of matched, side by side internal and external attenuators (horizontal units) and double deck internal and external attenuators (Vertical units) with a similar construction method to that of the unit is available.

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

Figure 10: Layout Overview of the XBC vertical unit viewed with side panels removed removed.

CODE DESCRIPTION: XBOXER XBC 75 & 85 VERTICAL VENTILATION UNITS

XBC 75 - V - LNT - R - WP

1	2	3	4	5	6	7	8

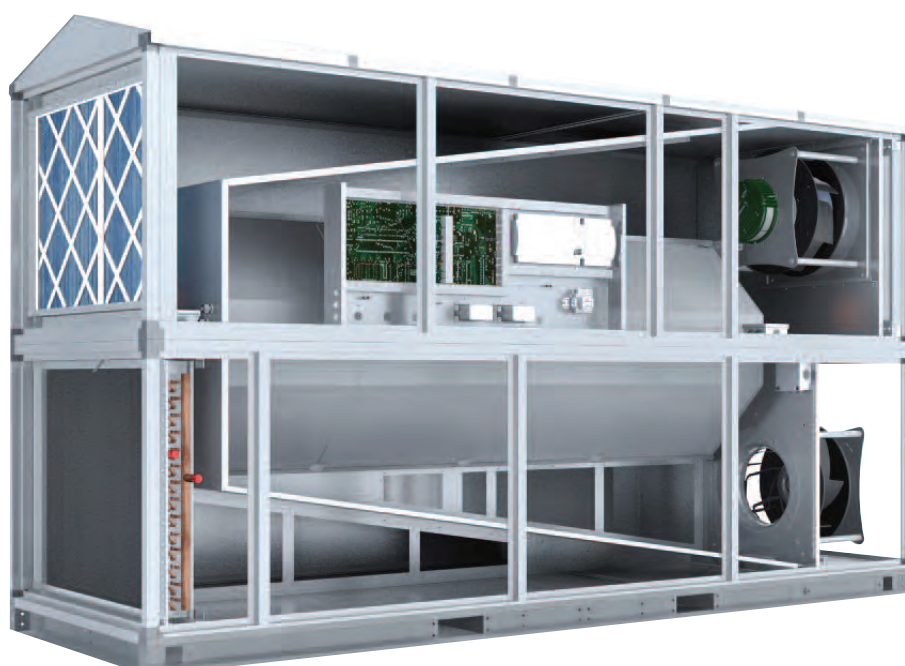
1. XBOXER XBC Range
2. Counterflow heat exchanger
3. Unit size 75 & 85
4. V = Vertical
5. type of heater battery:
L = LPHW Heater, N = No Heater
E = Electric Heater
6. Control type:
NT = Ecosmart2 control
ES = Ecosmart control
BC = Basic control
7. R = Opposite configuration
8. WP = Weather roof factory fitted only

CODE DESCRIPTION: MATCHED DOUBLE DECK ATTENUATOR

XBC 75 - V - SIL900

1	2	3	4

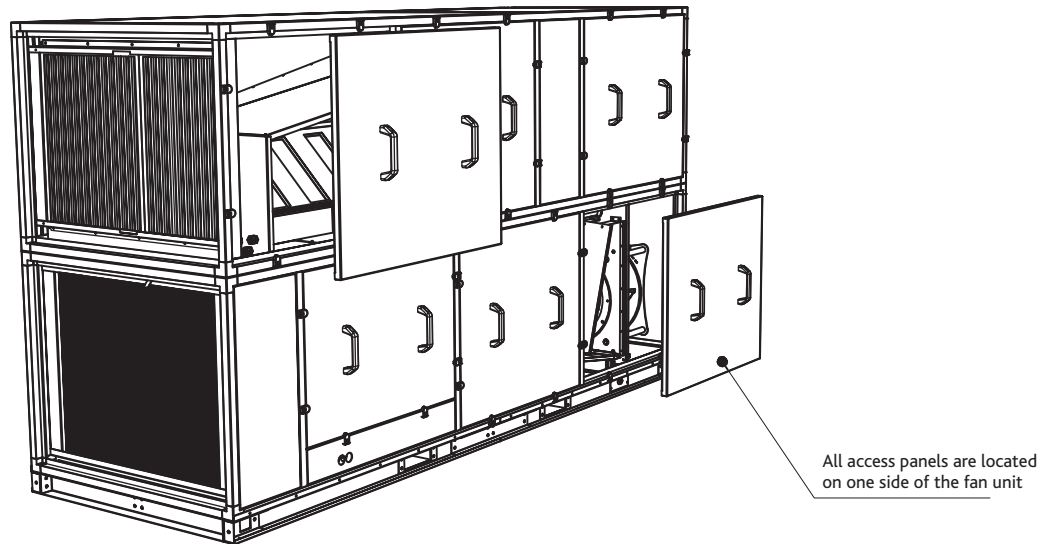
1. XBOXER XBC Range
2. Unit Size 75 & 85
3. V = Vertical
4. Attenuator SIL900 = 900 mm length
Attenuator SIL900WP = 900 mm length with weather roof



XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

9.0 XBOXER XBC (NT) VERTICAL UNIT ACCESS

Figure 11: The unit must be installed with at least 650mm clearance from a wall / barrier to gain access from the side. **Isolate before removing panels.**

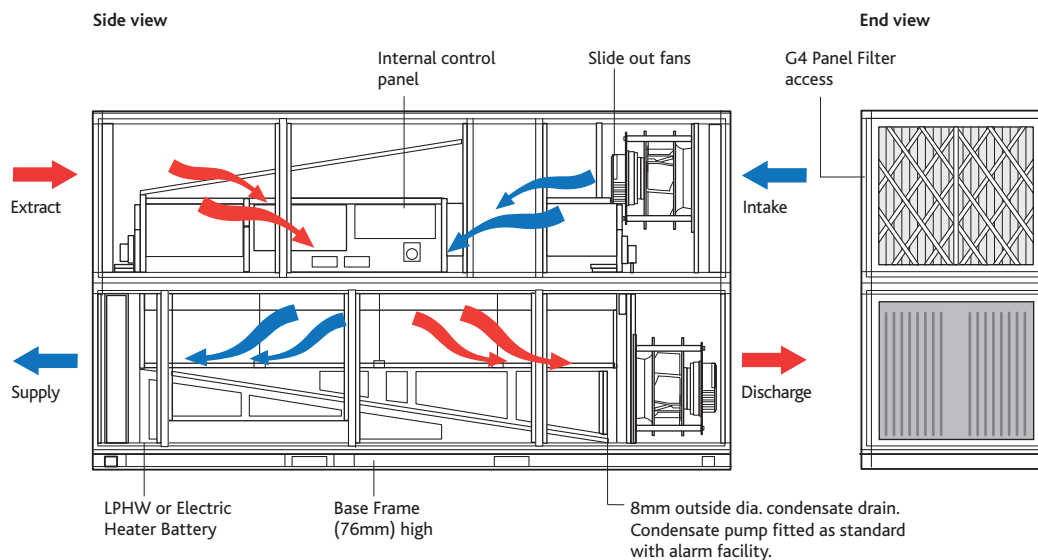


Note: Unit must be isolated before panels are removed.

In this product range, several unique concepts have been implemented with a view to simplifying the installation design.

1. The unit must be installed with at least 650mm clearance from a wall / barrier. With this absolute minimum clearance, the unit may be connected to the power supply and control connection. 1000mm clearance is required to remove the LPHW coil and electric heater.
2. With this clearance, unit filters may be changed, and the fans coils, heat exchanger and condensate tray may be inspected and cleaned if necessary.
3. The LPHW and Electrical heater settings, coil bleed and drain, and all other control adjustments are similarly accessible.
4. Side access, where possible, is preferred in all cases in terms of safe working access to the equipment under the CDM regulations.
5. Note however, that access in the situation is difficult and additional time should be allocated. For convenience it is preferred that wherever possible, this minimum access provision is not adopted, and it is recommended that a minimum of around 600mm clearance (as stated in ADF 2010) is allowed.
6. Where these arrangements are not suitable, the Consultant's and Contractor's project specific requirements will always be accommodated where possible.

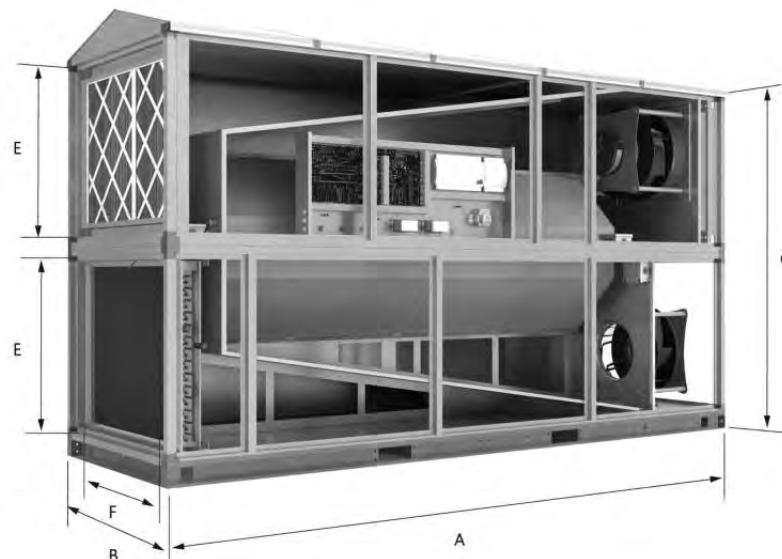
Figure 12: Vertical unit access and configuration. Standard (left hand) unit shown.



XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

10.0 XBOXER XBC (NT) VERTICAL UNIT DIMENSIONS (MM) AND WEIGHTS (KG)

Figure 13: Vertical unit dimensions (mm) and weights (kg).



Unit code	Unit Dimensions (mm)						Control dimensions			Unit weights	Packed weights
	A	B	C	J	K	M	E	F	G	(kg)	(kg)
XBC75-V-***	2500	954	1416*	610	894		60	954	2500	630	730
XBC85-V-***	3000	1000	1676*	940	740		65	1000	3000	780	880

The unit is designed for side access as standard and must be installed with a minimum of clearance of 650mm from a wall or barrier. This will provide access to filters, coil, fan, heat exchanger, condensate tray and pump.

All models - the weather roof is part of the unit code and is factory fitted only. Example: XBC85-V-LESWP.

*Includes unit and base rail.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

11.0 XBOXER XBC75 & 85 VERTICAL (NT) MOTORISED DAMPERS

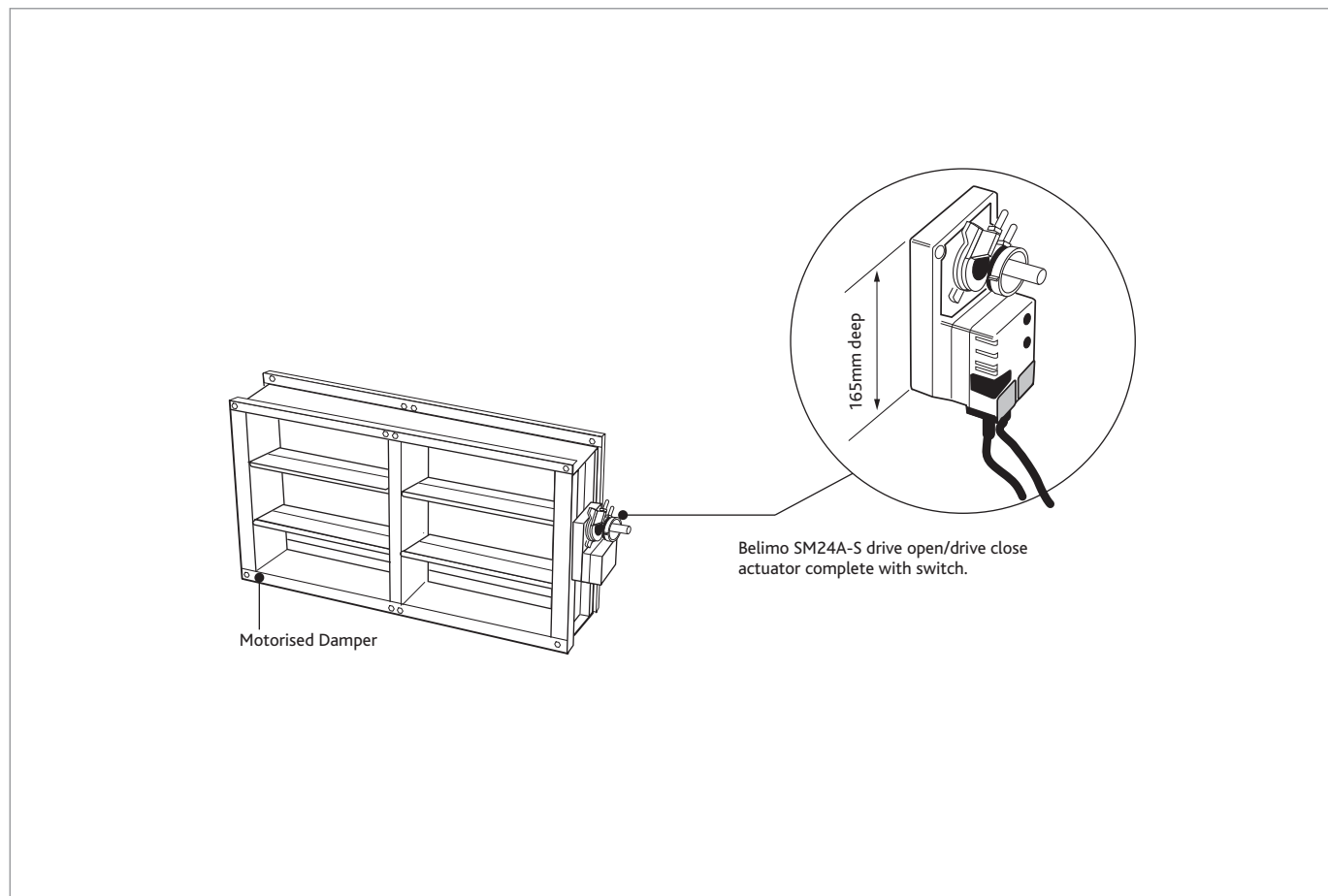
Internal version (example code: XBC75-V-MD24V).

If Nuaire matched silencers (example code XBC75-H-SIL900) are being fitted to the fan unit, the motorised damper (example code XBC75-V-MD24V) needs to be fitted after the silencers. This ensures that breakout noise levels are kept to a minimum.

The motorised damper units will be supplied loose and are designed to fit directly onto the flange connector (by others).

- Fully interlocking parallel blades, half inch diameter electroplated mild steel spindle.
- Nylatron bushes and external nylon/aluminium blade inter connection linkage.
- Fitted with Belimo SM24A-S drive open/drive close actuator complete with switch.

Figure 14: Installing the Motorised Damper.



XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

12.0 COMMISSIONING & SETTING TO WORK ON VERTICAL UNITS

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

12.1 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.

12.2 HEATING COILS LPHW

Observe the Flow and Return connection labels on the unit. Drain and bleed valves are located on the coil. Other valves may be required in the system pipe-work depending on the installation (by others).

Where the wet system is at risk of frost damage, the addition of a proprietary anti-freeze solution to the water is recommended. Note that any frost protection offered by the unit's integral control system will not operate if the power supply to the unit is interrupted.

Piped connections should be made to the unit using appropriate techniques, and all pipework must be independently supported.

No hot work is permitted within one metre of the unit.

Ensure that installed pipework runs do not prevent or restrict access to the unit at any point.

The completed installation (including the connections within the unit, as these may be disturbed during installation) shall be pressure tested to the project engineer's specification. (A condition of the unit warranty).

12.3 ELECTRIC HEATERS

Heater Capacity: XBC75 – 3ph, 12Kw

XBC85 – 3ph, 18Kw

The Electric Heater requires a 3ph supply which is independent from the main unit supply. Connections to be made through the low level fixed panel. The Electric Heater may be withdrawn to allow access to the Heater Controller without the need for wiring to be disconnected (Ensure the mains supply is isolated before removing any access panels and any adjustments are made to the Heater Controller).

12.4 FAN SECTIONS

Access to the fan section is via lift off panels. (see fig 15).

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.

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.

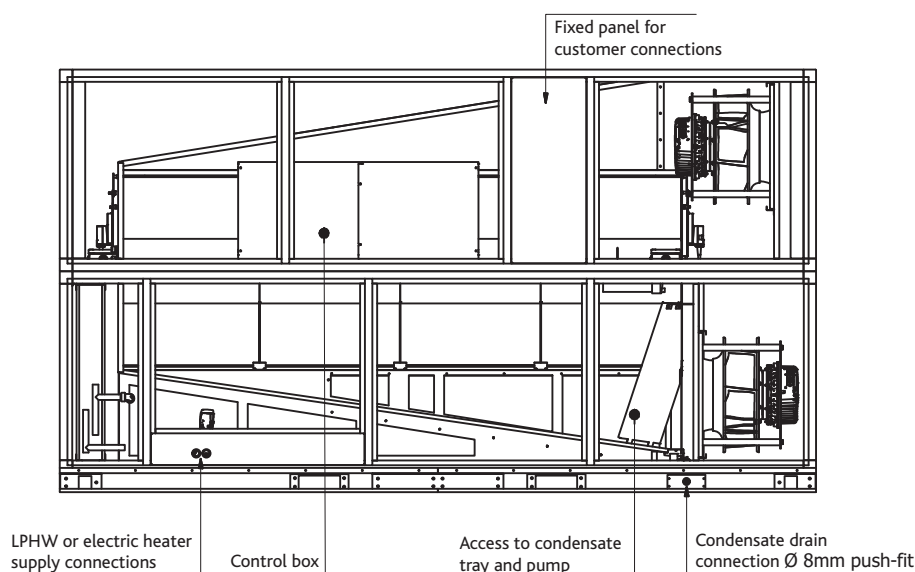
Test run motor for condition and correct rotation.

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.

IMPORTANT

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

Figure 15: Customers connections. Control side of horizontal unit showing coil and condensate connections.



CONDENSATE ALARM

The condensate pump incorporates an alarm function.

If the water level in the condensate tray exceeds a maximum level (for example, as a result of the discharge tube becoming blocked or frozen), the alarm contact will open. This contact is internally connected to the heat exchanger bypass actuator, and the unit will automatically be placed into bypass mode, preventing further condensate production. Unit operation will otherwise be unaffected.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

13.0 XBOXER XBC75 & 85 VERTICAL (NT) SPARE PARTS

Ensure correct model is selected:

XBC75 – VERTICAL

PART NO.	DESCRIPTION
XBC75-V-FILTERKIT	Replacement G4 panel filters x 4
776187	Replacement Blower assembly x 1

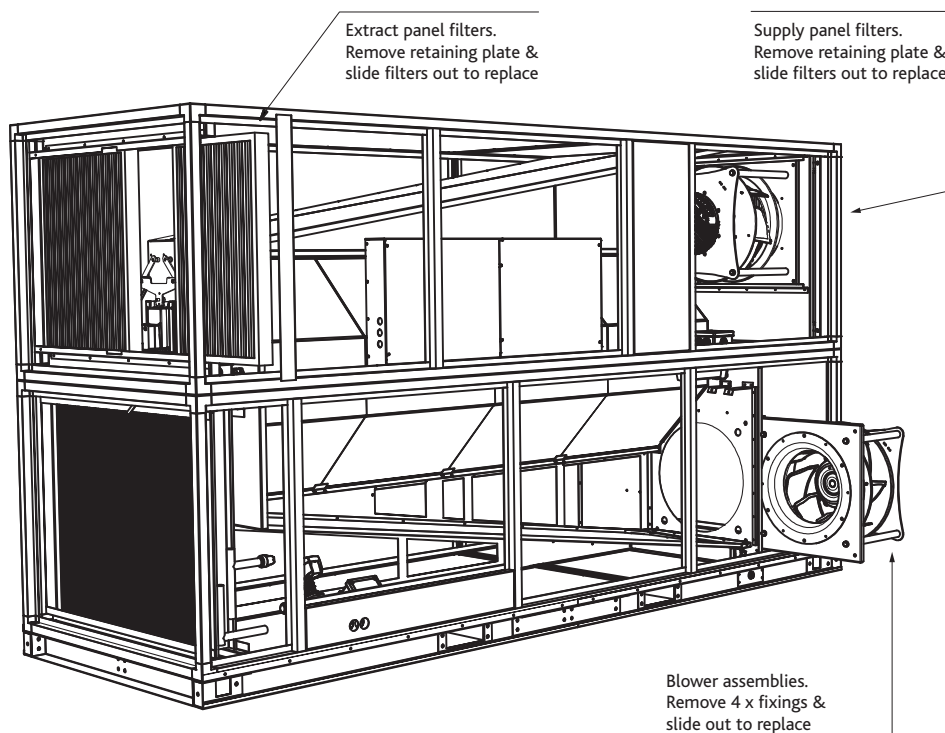
XBC85 – VERTICAL

PART NO.	DESCRIPTION
XBC85-V-FILTERKIT	Replacement G4 panel filters x 4
776188	Replacement Blower assembly x 1

IMPORTANT

Isolation - Before unit panels are removed make sure that the unit is isolated.

Figure 16: Replacing filters and blower assembly.



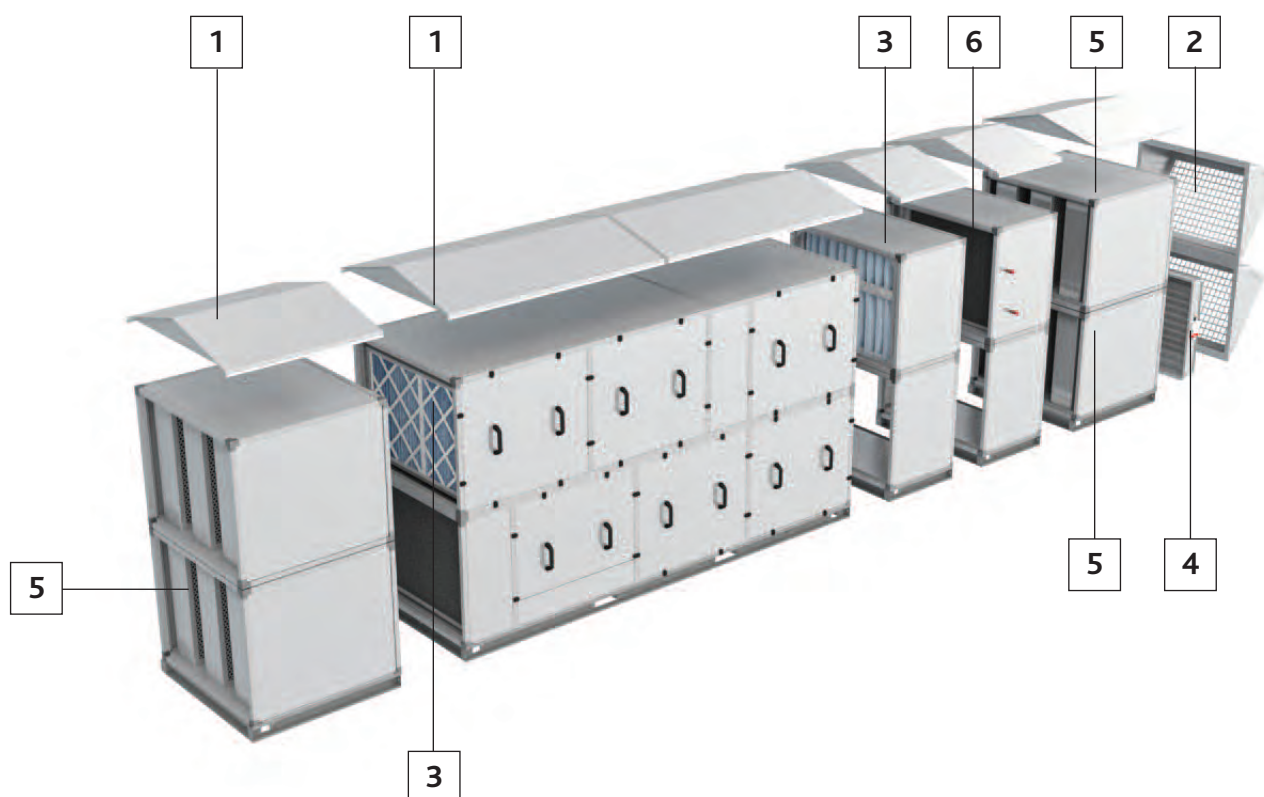
IMPORTANT

Caution - Blower Weight
XBC75 - 18kg and XBC85 - 37kg

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

14.0 XBOXER XBC75 & 85 VERTICAL (NT) ANCILLARY DIMENSIONS (MM) AND WEIGHTS

Figure 17: Vertical Unit ancillary key.



WEATHER KIT

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
1	XBC75-V-***WP	Unit with weather roof	954	1476	2500	630
	XBC75-V-***RWP	Unit with weather roof	954	1476	2500	630
	XBC85-V-***WP	Unit with weather roof	1000	1741	3000	780
	XBC85-V-***RWP	Unit with weather roof	1000	1741	3000	780

WEATHER TERMINAL

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
2	XBC75-RT	Weather terminal for vertical unit	842	570	610	8
	XBC85-RT	Weather terminal for vertical unit	940	740	700	10

FILTER & MODULE OPTIONS (Double deck and supplied as one piece)

Ref No.	Unit Code	Description	Dimensions			Weight (kg)
			Width	Height	Length	
3	XBC75-F7B/G4P	F7 Bag/G4 Panel	954	1416	600	90
	XBC85-F7B/G4P	F7 Bag/G4 Panel	1000	1676	600	105
	XBC75-F7B/G4P-R	F7 Bag/G4 Panel	954	1416	600	90
	XBC85-F7B/G4P-R	F7 Bag/G4 Panel	1000	1676	600	105
	XBC75-G4B	G4 Bag	954	1416	600	90
	XBC85-G4B	G4 Bag	1000	1676	600	105
	XBC75-G4B-R	G4 Bag	954	1416	600	90
	XBC85-G4B-R	G4 Bag	1000	1676	600	105
	XBC75-F7B/G4P-WP	F7 Bag/G4 Panel with weather roof	954	1476	600	92
	XBC85-F7B/G4P-WP	F7 Bag/G4 Panel with weather roof	1000	1741	600	107
	XBC75-F7B/G4P-RWP	F7 Bag/G4 Panel with weather roof	954	1476	600	92
	XBC85-F7B/G4P-RWP	F7 Bag/G4 Panel with weather roof	1000	1741	600	107
	XBC75-G4B-WP	G4 Bag with weather roof	954	1476	600	92
	XBC85-G4B-WP	G4 Bag with weather roof	1000	1741	600	107
	XBC75-G4B-RWP	G4 Bag with weather roof	954	1476	600	92
	XBC85-G4B-RWP	G4 Bag with weather roof	1000	1741	600	107

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

14.0 XBOXER XBC75 & 85 VERTICAL (NT) ANCILLARY DIMENSIONS (MM) AND WEIGHTS

DAMPERS

Ref No.	Unit Code	Description	Dimensions			Weight
4			Width	Height	Length	(kg)
	XBC75-V-MD24V	Motorised dampers 24V for Ecosmart2 models (NT)	620	560	165	14
	XBC85-V-MD24V	Motorised dampers 24V for Ecosmart2 models (NT)	840	700	165	20
	XBC75-V-MD-NC	Damper no actuator with extended spindle	620	560	165	14
	XBC85-V-MD-NC	Damper no actuator with extended spindle	840	700	165	20

2 X MATCHING SILENCERS (Double deck and supplied as one piece)

Ref No.	Unit Code	Description	Dimensions			Weight
5			Width	Height	Length	(kg)
	XBC75-V-SIL900	Double deck silencer with base frame	954	1416	900	180
	XBC85-V-SIL900	Double deck silencer with base frame	1000	1676	900	200
	XBC75-V-SIL900-WP	Double deck silencer with base frame and weather roof	954	1476	900	185
	XBC85-V-SIL900-WP	Double deck silencer with base frame and weather roof	1000	1741	900	205

FROST COILS (Double deck and supplied as one piece)

Ref No.	Unit Code	Description	Dimensions			Weight
6			Width	Height	Length	(kg)
	XBC75-FCL-LNT-V	LPHW double deck module with base frame for Ecosmart2 models (NT)	954	1416	600	100
	XBC85-FCL-RNT-V	LPHW double deck module with base frame for Ecosmart2 models (NT)	1000	1676	600	115
	XBC75-FCL-LNT-V	LPHW double deck module with base frame for Ecosmart2 models (NT)	954	1416	600	105
	XBC85-FCL-LNT-V	LPHW double deck module with base frame for Ecosmart2 models (NT)	1000	1676	600	120
	XBC75-FCE-LNT-V	Electric double deck module with base frame for Ecosmart2 models (NT)	954	1416	600	100
	XBC85-FCE-RNT-V	Electric double deck module with base frame for Ecosmart2 models (NT)	1000	1676	600	115
	XBC75-FCE-LNT-V	Electric double deck module with base frame for Ecosmart2 models (NT)	954	1416	600	105
	XBC85-FCE-LNT-V	Electric double deck module with base frame for Ecosmart2 models (NT)	1000	1676	600	120

Above is an indicative list of XBC75 & 85 ancillaries, for further details please contact Nuaire.

Note: Codes with 'R' i.e. (XBC75-G4B-R) refer to right hand unit versions.

INDEX - DESCRIPTION OF CONTROL

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15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

A comprehensive unit control specification - factory fitted and tested to provide guaranteed operation from a single supplier – one who will take responsibility.

GENERAL

The Nuaire unit contains the following controllable items:

- Inlet Damper (if fitted).
- Exhaust Damper (if fitted).
- Heat Recovery and Bypass Damper.
- Frost Heating coil (if fitted).
- Heating Coil.
- Cooling Coil.
- Supply Fan Speed.
- Extract Fan Speed.

All setpoints are user adjustable.

Heating and Cooling can be manually overridden off.

Software designed for ETHERNET connection to main head end.

RUN DEMANDS

The unit can be enabled in one of two ways, selectable via software switch:

- Local Control.
- Remotely enabled.

Should the emergency input not be healthy, the unit is disabled immediately.

LOCAL CONTROL (IQVIEW4 / SDU)

Under local control the unit will be enabled in the following conditions:

- Optimum Start Stop (OSS).
- Override Extension.
- Fabric Protection
- Night Cooling mode.
- Boost Mode.

In OSS the unit is enabled so that the space temperature should reach setpoint by the users defined time profile (Occupation times). The unit will continue to run until the end of these times.

Override Extension is selectable via software switch and will enable the plant as if in OSS for an hour.

In Fabric Protection should the space temperature drop below the Fabric Protection setpoint then the unit is also enabled until it rises 1° C above this setpoint.

Night Cooling mode is initiated when the following conditions are met:

- Average inlet temperature between 1pm and 6pm above space heating setpoint.
- Average daytime space temperature above the space cooling setpoint.
- The intake temperature is at least 2° C less than the space.
- The space temperature is above the heating setpoint.
- The inlet temperature is above the low limit supply setpoint.
- Outside of OSS times.

Boost Mode is selectable via software switch and will run the unit at maximum heating (with high limit trim) for 1 hour or until the space temperature is 3° C above the heating setpoint.

REMOTE CONTROL

Run demands sent from remote controllers via inter controller communications.

Boost mode and Override Extension are still available.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

The unit integrated Ecosmart2 system provides the facility for operational efficiency and energy saving by allowing a comprehensive range of unitary control functions and / or full BMS integration (by others) via standard BACnet configuration.

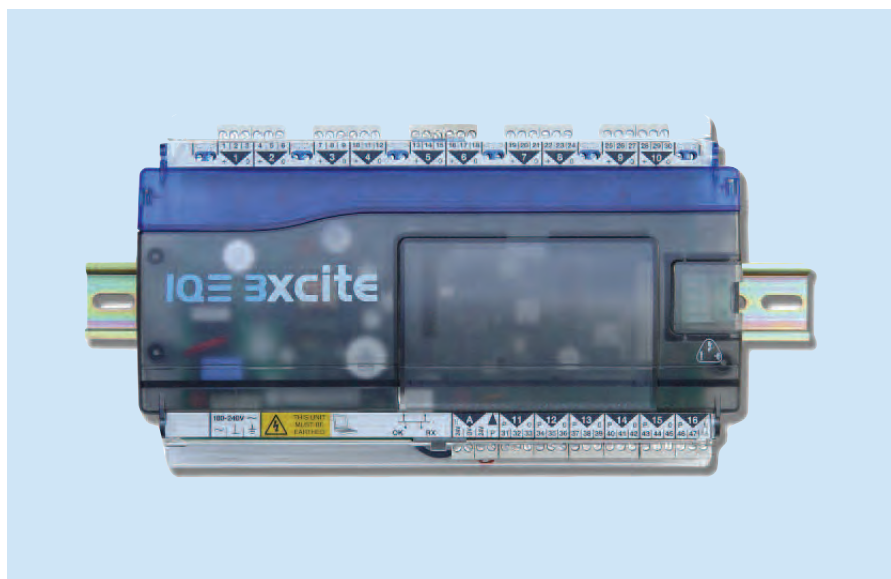
CONTROL

Once a run demand is received the Inlet and Exhaust Dampers, if fitted, are opened. When the open signals are received, the Supply and Extract Fans are enabled at minimum speed. Should either damper not open after a timed setpoint, an alarm is raised.

The alarm has to be reset via software switch.

Note: Hard re-set - airflow sensor fail = power down reset.

Should a Damper fail the associated Fan is held off but the other Fan can run at minimum speed. Once the Supply and Extract Fans give a flow signal then control is enabled (temperature and CO2 control).



TEMPERATURE CONTROL - GENERAL

The space temperature is controlled to setpoint via PI Loops. With increasing heating demand the following items are staged and modulated open:

- Heat Exchanger if heating mode available.
- Heating valve.

With increasing cooling demand the following items are staged and modulated open:

- Heat Exchanger if cooling mode available.
- Cooling valve.

A space heating and cooling demand cannot happen at the same time.

Should the supply temperature rise above or fall below the high or low temperature limits then the demands shall be backed off.

FROST VALVE

If fitted this is controlled whenever the unit is enabled to maintain the off coil temperature to setpoint by modulation of the valve.

The control is via a PI Loop.

If the off coil temperature drops below this setpoint by 1° C for 30 seconds then the unit is held off and an alarm is raised. This Low Intake Temperature Shutdown will require a software restart to enable the unit. When the unit is off the Frost Coil valve will be shut unless a 1st Stage Frost or Low Intake Temperature Shutdown condition exists when it is opened 80%.

15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

The system incorporates a web enabled Trend IQ3xcite/96/BAC/24 controller, and is augmented by application specific unit interface and diagnostic circuits. Controller software is optimised and pre-configured, and each unit / control assembly is fully functionally tested at works (refer to technical documentation for full controller functional specification).

HEAT EXCHANGER

Should the off frost coil temperature be above the extract temperature by 2° C or more and control is enabled, then the Exchanger is available in Cooling mode.

Should the off frost coil temperature be below the extract temperature by 2° C or more and control is enabled, then the Exchanger is available in Heating mode.

The Heat Exchanger dampers can be modulated between full bypass of the Exchanger to 100% Heat Recovery.

With increasing space heating demand (with high limit trim) the dampers will be modulated towards 100% heat exchange if the Heating mode is available. If not available then it will remain in full by pass mode.

With increasing space cooling demand (with low limit trim) the dampers will be modulated towards 100% heat exchange if the Cooling mode is available. If not available then it will remain in full by pass mode.

In Fabric Protection and when the unit is off, the Heat Exchanger will be in 100% Heat Recovery.

In Night Time Cooling Mode the Heat Exchanger will be in Full Bypass.

HEATING VALVE

The heating valve is modulated to meet the space demands providing the following conditions are met.

- Outside Air Temperature below the Hold Off Heating setpoint.
- The control has been enabled.
- The Heating manual override off switch is not selected.

If these are not met then the valve is shut unless the following conditions exist:

- 1st Stage Frost condition
- Low Intake Temperature Shutdown .
- Low Supply Temperature Shutdown.

When the valve will be opened 80%.

COOLING VALVE

The cooling valve is modulated to meet the space demands providing the following conditions are met.

- Outside Air Temperature above the Hold Off Cooling setpoint.
- The control has been enabled.
- The Cooling manual override off switch is not selected.

If these are not met then the valve is shut unless the following conditions exist:

- 1st Stage Frost condition
- Low Intake Temperature Shutdown .
- Low Supply Temperature Shutdown.

When the valve will be opened 50%.

CO2 CONTROL (NOT STANDARD)

Once control is enabled during OSS, Boost or Extension, with increasing CO2 levels the Supply Fan speed is modulated from the minimum speed up to its maximum speed setpoint.

The Extract Fan tracks the Supply Fan speed by a percentage setpoint.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

Units fitted with Ecosmart2 control (code example XBC45-H-LNT) have a 5 year warranty.

FANS

The Supply and Extract fans are enabled once a run demand is given and the dampers (if fitted) are open. They run at minimum speed setpoint until the flow signals are received when they are controlled as follows:

- During OSS, Heating Boost or Extension, the Supply Fan is modulated from minimum speed to maximum speed to maintain the CO2 Extract level to setpoint. The Extract Fan speed tracks the Supply Fan speed according to the percentage setpoint.
- In Fabric Protection the Fans remain at their minimum speed setpoints.
- In Night Time Cooling the Supply and Extract Fans run at a medium speed setpoint. Should either Fan flow fail the other will run on but at its minimum speed setpoint.

The failed Fan is latched off and has to be reset via software switch.

Note: Hard re-set - airflow sensor fail = power down reset.

SHUTDOWN

Should the following conditions arise the unit is shut down:

- Emergency condition.
- Supply temperature below the low limit supply temperature setpoint for 5 minutes.
- Off Frost Coil 1° C below the Off Frost Coil setpoint for 30 seconds.
- Both Dampers failed to open.
- Both Fans flow failed.

When the Emergency condition clears the unit will restart automatically. All other conditions require a software switch reset to resume.

FROST PROTECTION

Should the outside air temperature drop below the 1st Stage Frost setpoint then a 1st Stage Frost condition exists. If the unit is off the LTHW valves are driven to 80% open and the ChW valve to 50%. This is to give protection against freezing in the pipes.

ALARMS

Maintenance Alarms

There are the following:

Sensors out of limits or read failures.
Filter Dirty.
Supply Fan Service Interval.
Extract Fan Service Interval

Plant Alarms

There are the following:

Intake Damper Failed.
Exhaust Damper Failed.
Supply Fan Flow Failed.
Extract Fan Flow Failed.
Space Temperature High.
Space Temperature Low.

Critical Alarms

There are the following:

Supply Fan exceeded Service Life.
Extract Fan exceeded Service Life.
Low Intake temperature shutdown.
Low Supply temperature shutdown.
Both Dampers failed to open.
Both Fans flow failed.
Emergency Shutdown.

Setpoints

All the following are user adjustable within engineered limits:

Space @ 20° C.
Space deadband @ 2° C.
Space High Temperature @ 24° C.
Space Low Temperature @ 16° C.
Supply Duct Low Limit @ 12° C.
Supply Duct High Limit @ 34° C.
Off Frost Coil @ 3° C.
CO2 @ 500 ppm.
1st Stage Frost @ 3° C.
Fabric Protection @ 10° C.
Extract Fan % of Supply Fan speed @ 90%.
Supply Fan Minimum Speed @ 20%.
Extract Fan Minimum Speed @ 20%.
Supply Fan Medium Speed @ 50%.
Extract Fan Medium Speed @ 50%.
Damper Open Grace Time @ 90 seconds.
Heating Hold Off @ 18° C.
Cooling Hold Off @ 22° C.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

To help you select the appropriate control solution for your application, simply refer to one of the options below. For the full range and technical details, please visit www.nuairegroup.com



	(NT)
BMS compatible	Y
Commissioning control	Y
Run/fail signal (volt free)	Y
Dirty filter monitor	Y
Inverter control (3 phase)	Y
Speed control (single phase)	Y
Pre-piped coil (C/W DRV)	Y
Motorised control valve (cw actuators)	Y
Air off temp stat	Y
Frost protection	Y
Heat dissipation run on	Y
Plug in sensors	Y
Trickle & boost switch	Y
Automatic bypass	Y
Ethernet connection to Trend or BACnetIP	Y
Time control	Y
Web connectivity	Y
Energy monitoring	Participation via Trend network
Energy metering	Participation via Trend network

TOUCH SCREEN & MANUAL USER CONTROLS (LOCAL)



IQVIEW4 Touch screen display.
(6 x 4 inch).
FPK/Plate – Mounting plate.
IQVIEW4/SM BOX – Surface mount box for wall or panel.

Transformer for IQVIEW4 included.
ACC/24V - 230/24 VAC, 36 VA



IQVIEW8 Touch screen display.
(10 x 6 inch).
IQVIEW8/SM BOX – Surface mount box for flat surfaces.

Transformer for IQVIEW8 included.
ACC/24V - 230/24 VAC, 36 VA



SDU-xcite Display.
RD/SDU-IQ2COMMSCABLE/3m – RJ11 plug to RJ11 plug cable (3m) for SDU-xcite.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

Thermistor temperature sensors



Code: TB/T1/S – For duct or immersion use – short 150mm
TB/T1/L – For duct use only – long 400mm

DESCRIPTION

Low cost thermistor sensors comprising insertion, clamp-on, and outside air versions.

The insertion sensor may be used for duct or immersion purposes. It has a 6 mm diameter brass probe which is suitable for retrofit immersion applications and will fit most existing pockets (universal fitting kit option).

FEATURES

- Low cost
- High quality thermistors
- Brass probes
- M20 conduit entry with M16 cable gland
- IP67 housing
- Quarter turn quick release lid
- Easy to wire
- Universal fitting kit option for retrofit of immersion sensors
- Adjustable insertion depth flange option for duct sensors

Duct humidity and temperature sensors



Code: HT/D – Duct and thermistor sensor (+/-3%)

DESCRIPTION

Duct mounted relative humidity and temperature sensors for HVAC applications. The certified 2% high accuracy (1/2%) and standard 3% versions offer excellent linearity and stability over a wide humidity range (10 to 90 %RH).

FEATURES

- Pre-calibrated for ease of commissioning
- IP65
- Operates over 10 to 100 %RH non-condensing
- $\pm 3\%$ accuracy versions
- 2 part connectors for ease of installation
- Humidity sensor element protected by replaceable filter
- Capacitive humidity sensing element provides excellent long term stability
- Adjustable depth duct mounting flange option

CO2 sensors



Code: CO2/T/D – Duct sensor
CO2/T/S – Space carbon dioxide concentration and temperature sensor

DESCRIPTION

The CO2 duct and space sensors monitor the carbon dioxide concentration and temperature of the air.

The space sensors have additional options of humidity monitoring and a 4 digit display. The display will show the measured values in succession. The duct sensor has a quick-release lid to facilitate installation.

FEATURES

- Low cost, high quality thermistor temperature sensor
- Humidity monitoring option for space sensor
- Optional digital display for space sensor
- IP67 housing (duct sensor)
- Quarter turn quick release lid (duct sensor)
- Two part terminals to facilitate wiring
- 24 Vac/dc supply
- Adjustable depth duct mounting flange option

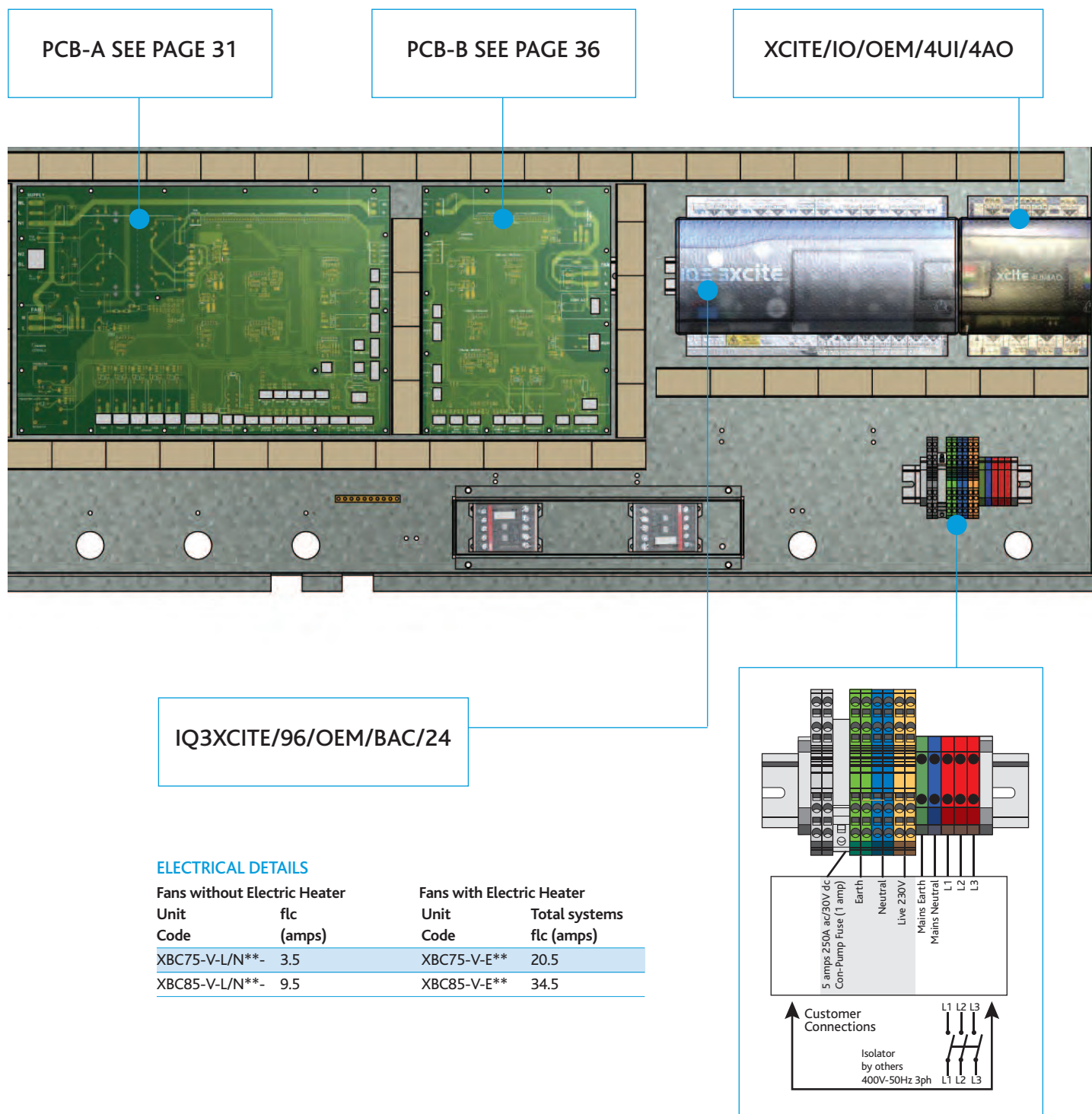
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XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

16.0 VERTICAL UNIT TREND CONTROL LAYOUT

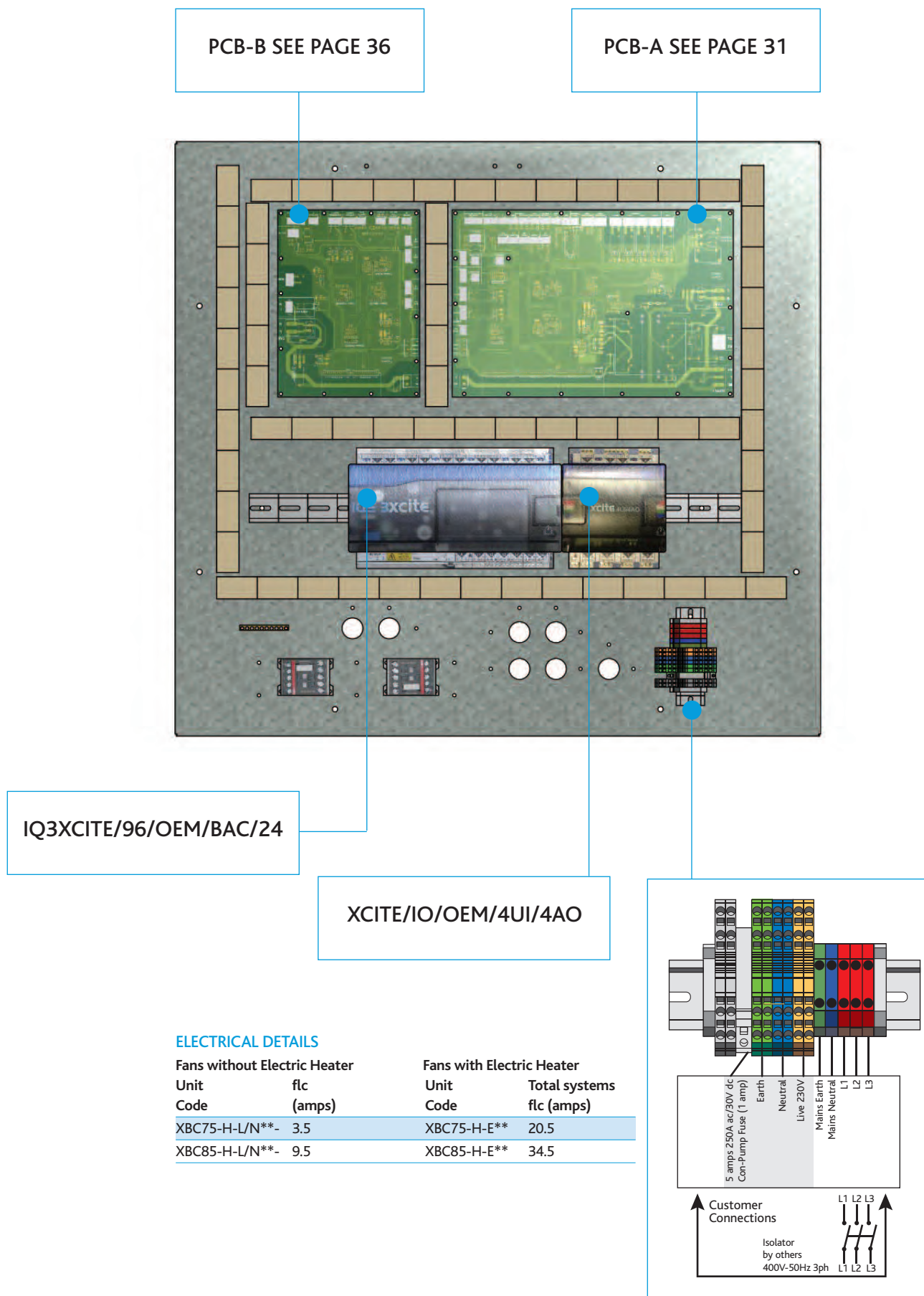
Figure 18.



XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

17.0 HORIZONTAL UNIT TREND CONTROL LAYOUT

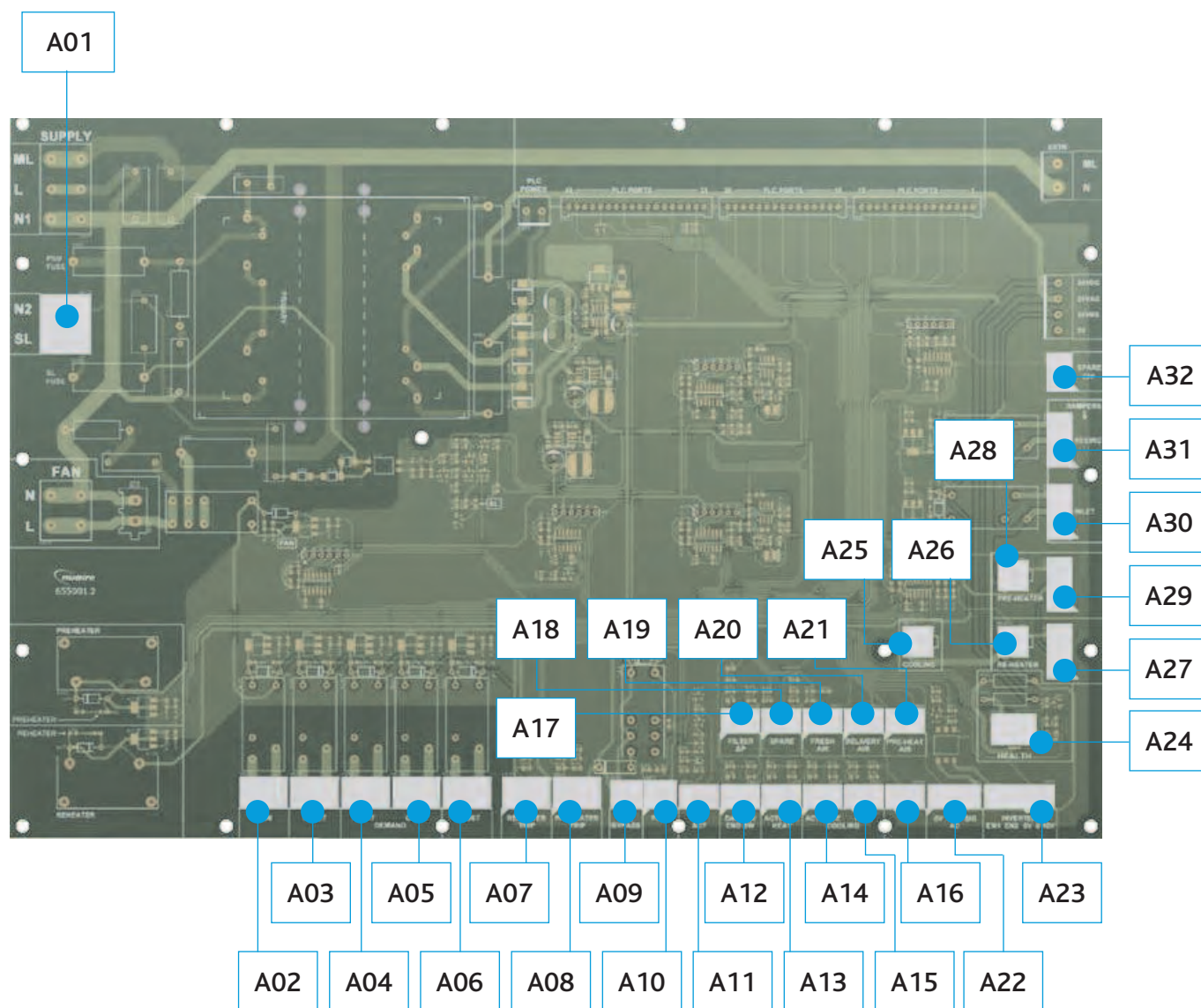
Figure 19.



XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

18.0 NUAIRE PCB-A (SUPPLY PCB)

Figure 20. PCB-A Terminal Positions.



TERMINAL DETAILS

A01 – Switched live input (Page 25)

A02 – Supply run relay (Page 24)

A03 – Fault condition relay (Page 26)

A04 – Heat demand relay (Page 27)

A05 – Cooling demand relay (Page 2)

A06 – Frost condition relay (Page 26)

A07 – Re-heater [main heater] trip (Page 25)

A08 – Pre-heater trip (Page 25)

A09 – Relay power (Page 24)

A10 – Shutdown (Page 24)

A11 – Activate signal (Page 25)

A12 – Inlet damper end switch (Page 25)

A13 – Activate heating signal (Page 25)

A14 – Activate cooling signal (Page 25)

A15 – Activate freecooling signal (Page 25)

A16 – Space temperature (Page 26)

A17 – Inlet filter dP switch (Page 25)

A18 – Spare analogue input (Page 27)

A19 – Fresh air temperature (Page 26)

A20 – Delivery air (Page 26)

A21 – Preheat air (Page 26)

A22 – Active sensor input (Page 26)

A23 – Supply fan drive (Page 24)

A24 – Supply fan health (Page 24)

A25 – CW cooling control output

A26 – LPHW re-heat control output (Page 2)

A27 – Electric re-heat control output (Page 27)

A28 – LPHW pre-heat control output (Page 27)

A29 – Electric pre-heat control output (Page 27)

A30 – Inlet damper drive (Page 26)

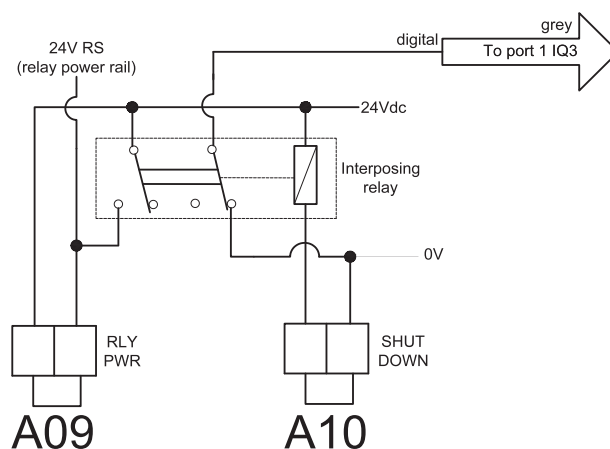
A31 – Recirc. damper drive (Page 26)

A32 – Spare analogue output (Page 27)

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

18.1 NUAIRE PCB-A (SUPPLY PCB) CONNECTION SCHEMATICS

Figure 21. Shutdown Circuit.

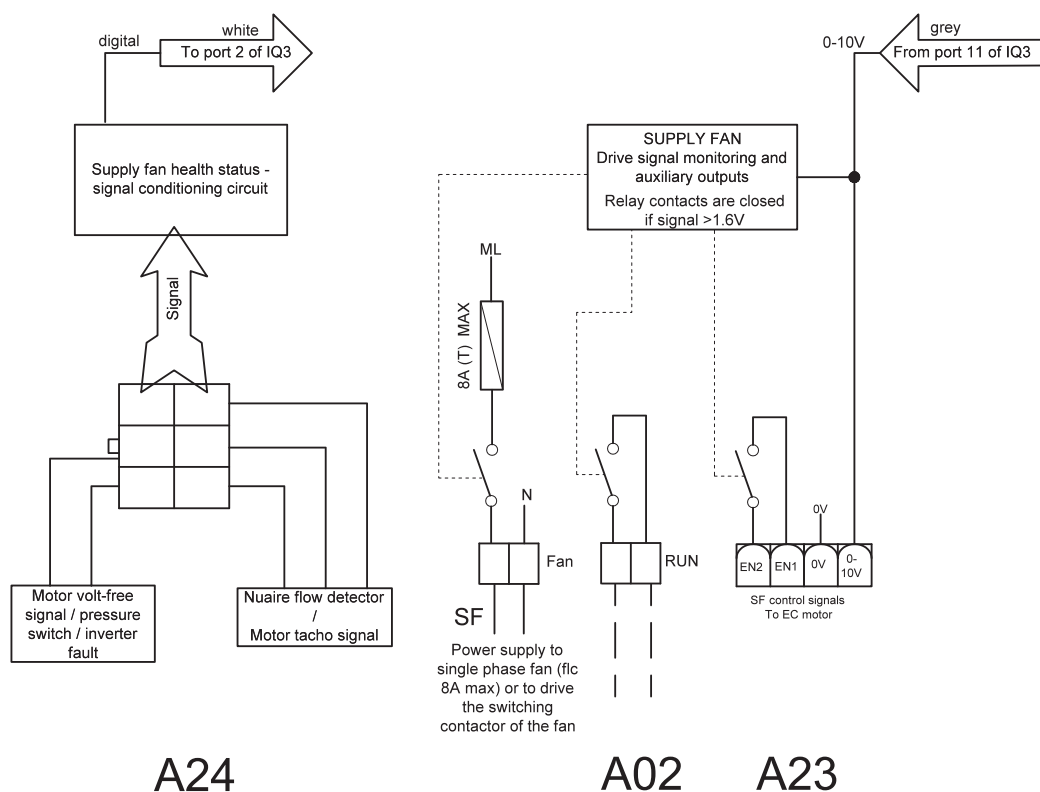


The links shown in Figure 14 can be replaced by external switches or volt-free relays.

A09 – Breaking the circuit will immediately remove power to all PCB relays. **NOT RECOMMENDED.**

A10 – Breaking the circuit will initiate software driven shutdown.

Figure 22. Supply Fan.



A24 – Only one of the possible monitoring signals shall be present.

A02 – Contacts closed when supply fan is running. See note 1 on page 30

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

18.2 NUAIRE PCB-A (SUPPLY PCB) CONNECTION SCHEMATICS

Figure 23. MUX Input 1.

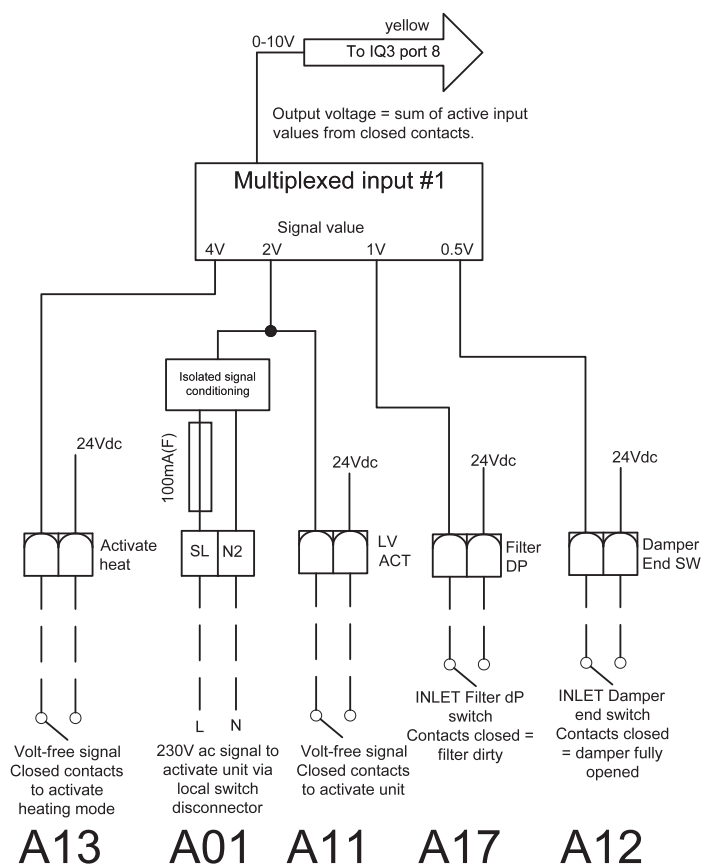
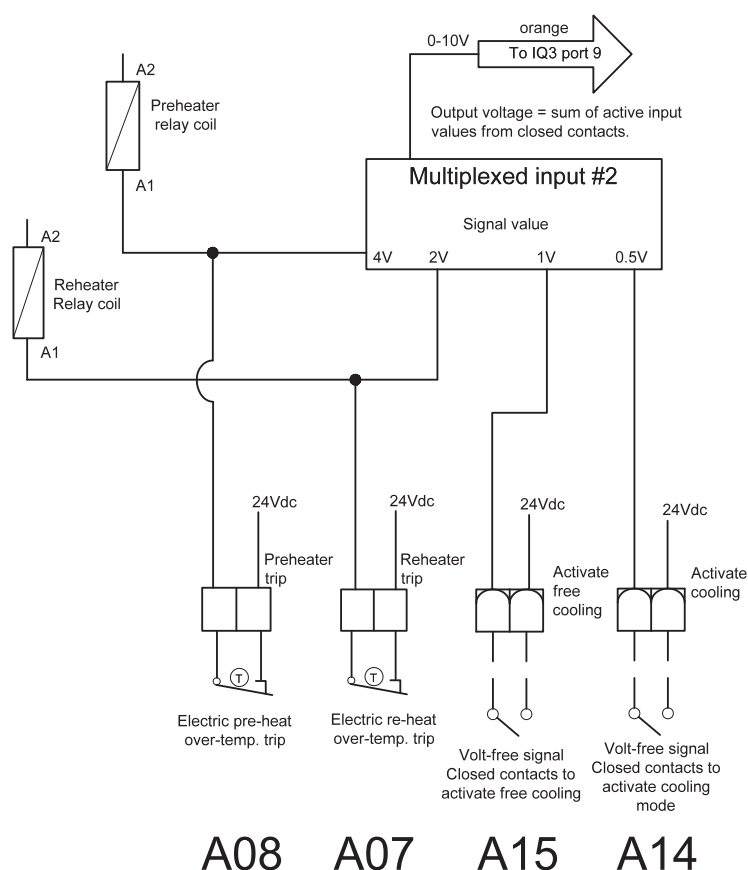


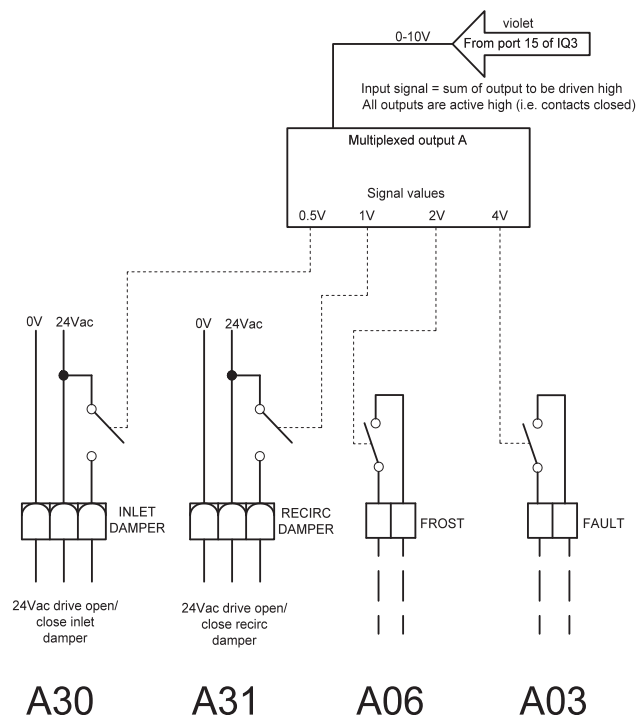
Figure 24. MUX Input 2.



08 / 07 – High temp. device shall open contacts when air temperature at heating element exceeds maximum operating limit. These devices must not be used for temperature regulation.

18.3 NUAIRE PCB-A (SUPPLY PCB) CONNECTION SCHEMATICS

Figure 25. MUX Output A.



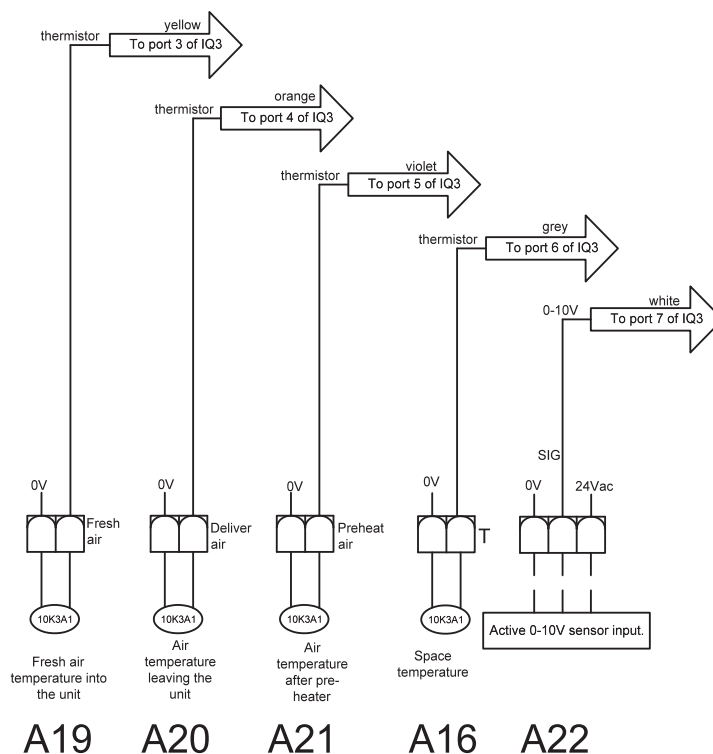
30 – 24VAC DODC actuator connection. See note 2 on page 30.

31 – 24VAC DODC actuator connection. See note 2 on page 30.

06 – Contacts closed in frost condition. See note 1 on page 30.

03 – Contacts closed in fault condition. See note 1 on page 30

Figure 26. Analogue Inputs.

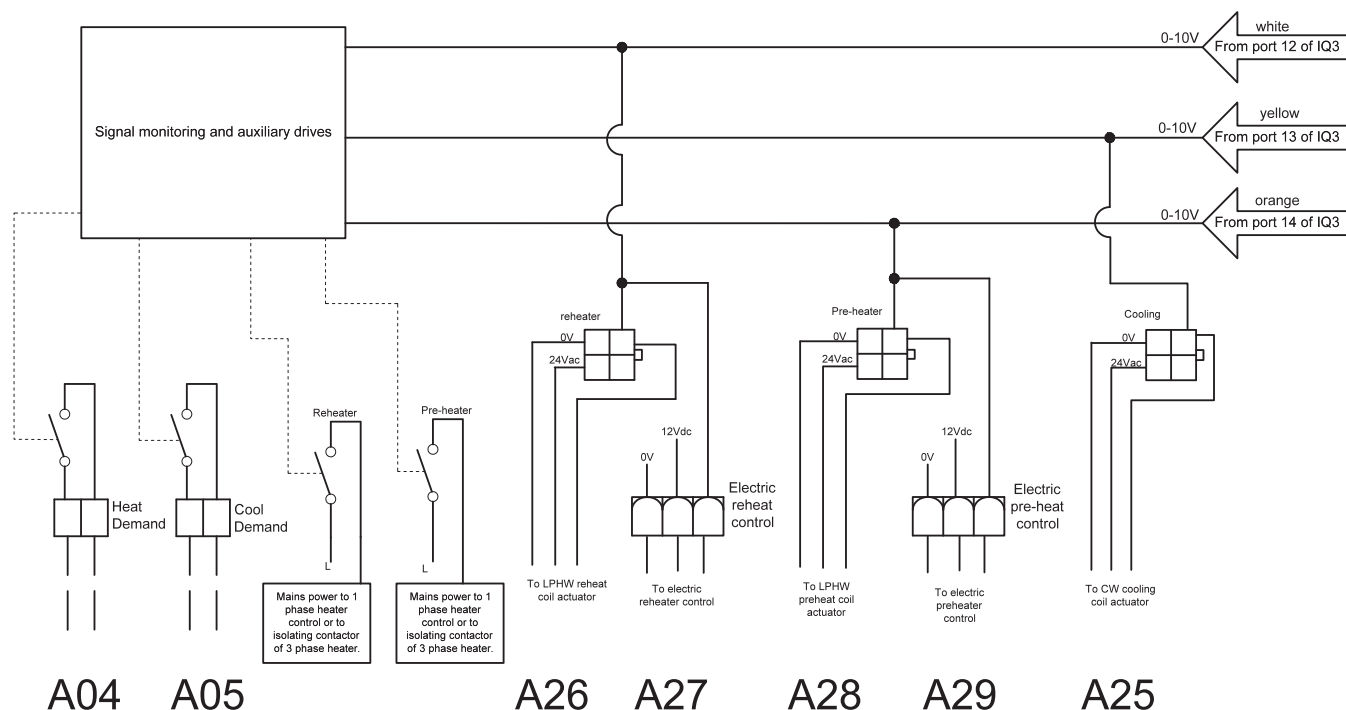


22 – Intended for connection to pressure sensor or CO2 sensor.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

18.4 NUAIRE PCB-A (SUPPLY PCB) CONNECTION SCHEMATICS

Figure 27. Analogue Outputs.



04 – Contacts closed when preheater and/or heater is active. See note 1 on page 30.

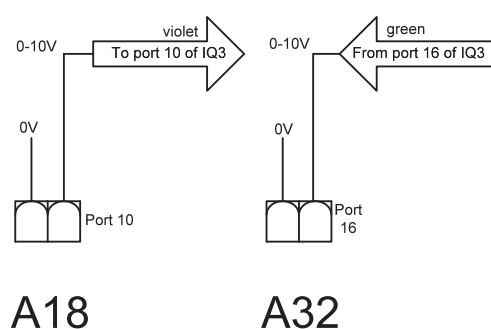
05 – Contacts closed when cooling is active. See note 1 on page 30.

26 – Modulating actuator connection. See notes 2 and 3 on page 30.

28 – Modulating actuator connection. See notes 2 and 3 on page 30.

25 – Modulating actuator connection. See notes 2 and 3 on page 30

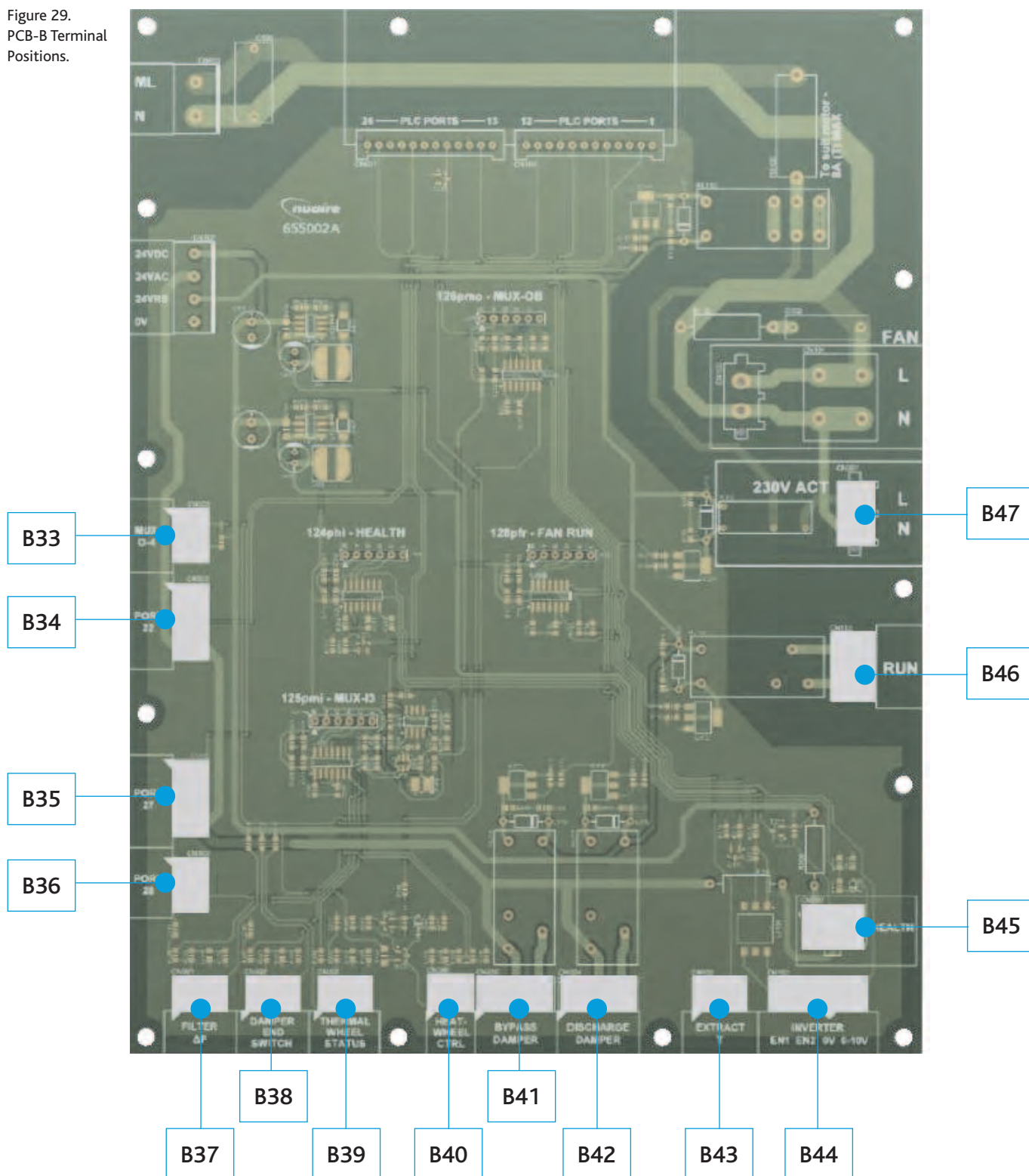
Figure 28. Spare Analogue I/O.



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19.0 NUAIRE PCB-B (EXTRACT PCB)

Figure 29.
PCB-B Terminal
Positions.



TERMINAL DETAILS

B33 – Condensate pump alarm (Page 29)

B34 – Spare universal input (Page 30)

B35 – Spare analogue output (Page 30)

B36 – Spare analogue output (Page 30)

B37 – Extract filter dP switch (Page 29)

B38 – Discharge damper end switch (Page 29)

B39 – Thermal wheel status (Page 29)

B40 – Heat wheel drive (Page 30)

B41 – Bypass damper drive (Page 30)

B42 – Discharge damper drive (Page 30)

B43 – Extract air temperature (Page 30)

B44 – Extract fan drive (Page 29)

B45 – Extract fan health (Page 29)

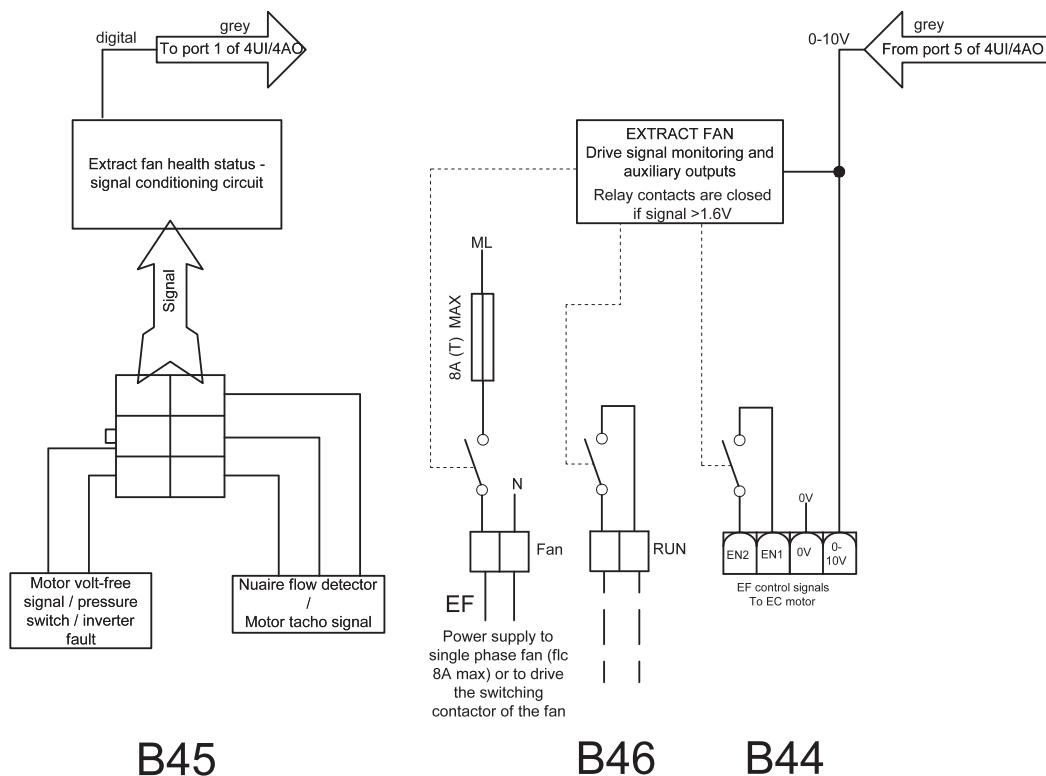
B46 – Extract run relay (Page 29)

B47 – 230V thermal actuator drive (Page 30)

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

19.1 NUAIRE PCB-B (EXTRACT PCB) CONNECTION SCHEMATICS

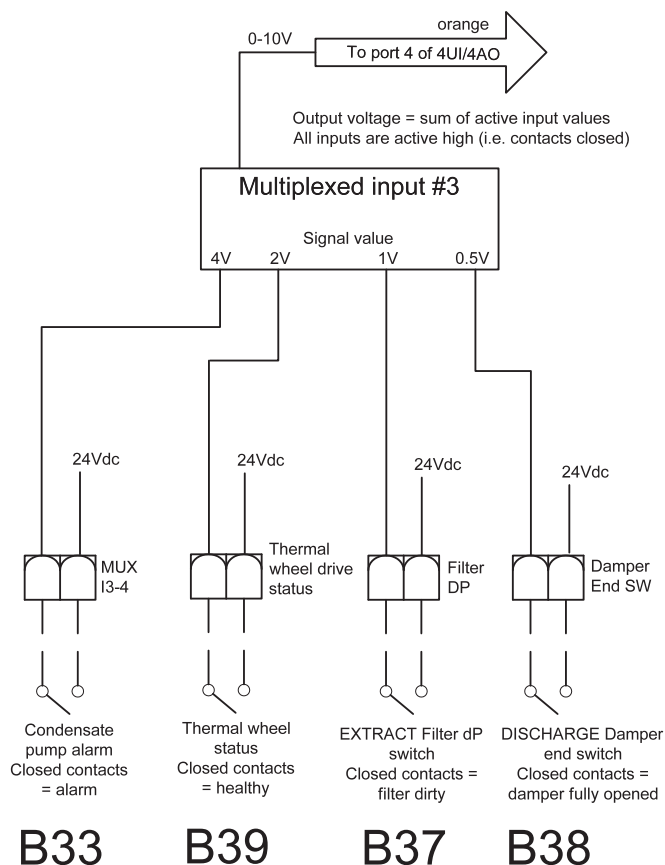
Figure 30. Extract Fan.



45 – Only one of the possible monitoring signals shall be present.

02 – Contacts closed when extract fan is running. See note 1 on page 30

Figure 31. MUX Input 3.

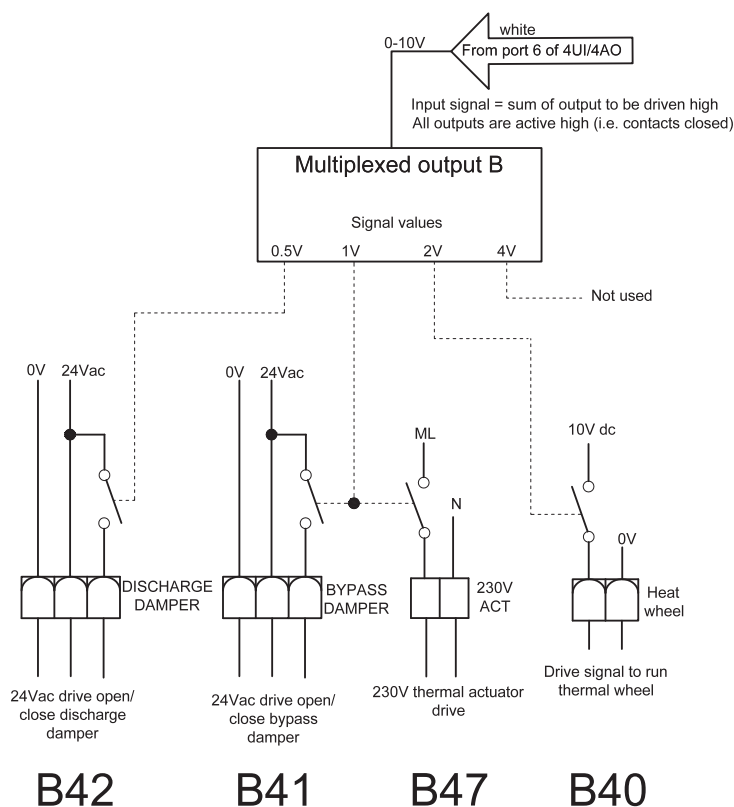


22 – Intended for connection to pressure sensor or CO2 sensor.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

19.2 NUAIRE PCB-B (EXTRACT PCB) CONNECTION SCHEMATICS

Figure 32. Mux Output B.

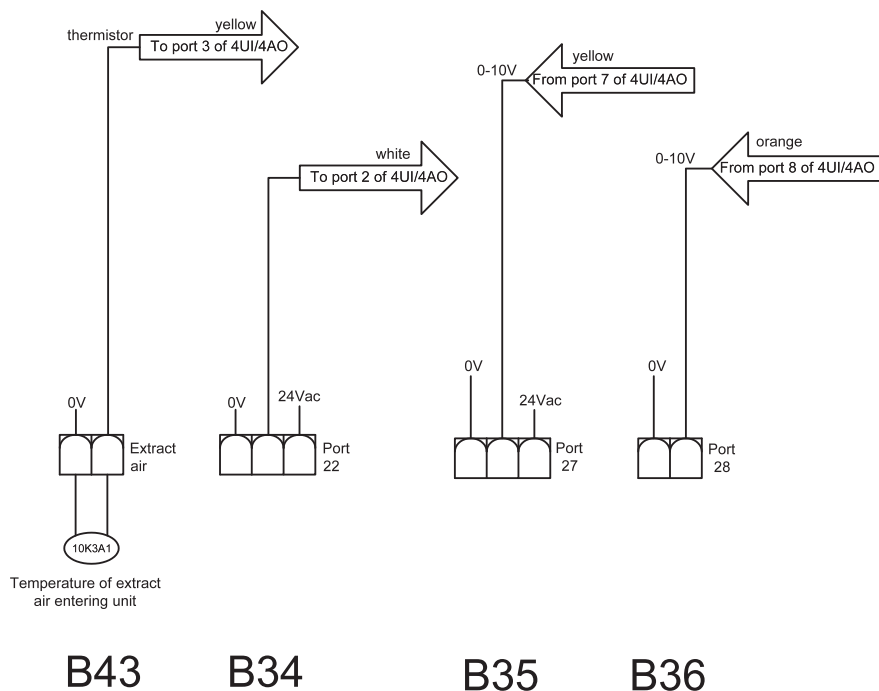


42 – 24VAC DODC actuator connection. See note 2 on page 30.

41 – 24VAC DODC actuator connection. See note 2 on page 30.

47 – 230V supply for thermally operated actuator. (0.2A max. Drive open, auto return)

Figure 33. Remaining I/O.



GENERAL NOTES

- 1) PCB relays are provided for volt-free control of external plant. Max switching load per circuit is 8A resistive, 3A inductive. A contact suppressor must be connected across the item being switched to minimise arcing across the relay contacts.
- 2) Total power consumed by all 24VAC actuators driven directly via the PCB must be 24VA or below.
- 3) Modulating valve actuators must be local to AHU/HRU and not remotely connected.
- 4) All signals are subject to the appropriate software conditions allowing switching to take place.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

20.0 CONNECTION CHARTS

Figure 34. PCB-A to IQ3 Connection Chart.

MUX		PCB-A		IQ3xcite/96/BAC/24			
Voltage	Description	Terminal No.	Port No.	DI	AI	DO	AO
MUX Input 1	Shutdown	A10	1	1			
	Supply Fan Health	A24	2	1			
	Fresh Air Temp	A19	3		1		
	Delivery Air Temp	A20	4		1		
	Preheat Air Temp	A21	5		1		
	Space Temp	A16	6		1		
	Active Sensor Input	A22	7		1		
	4V Heating Activate	A13	8		1		
	2V Switched Live	A01					
	Unit Activate	A11					
	1V Inlet Filter dP Switch	A17					
	0.5V Inlet Damper End Switch	A12					
	4V Pre-heater Trip	A08	9		1		
	2V Re-heater Trip	A07					
	1V Activate Freecooling	A15					
	0.5V Activate Cooling	A14					
MUX Input 2	Not In Use	A18	10		1		
	Supply Fan Drive	A23	11				1
	LPHW Re-Heat Drive	A26	12				1
	Electric Re-Heat Drive	A27					
	Cooling Drive	A25	13				1
	LPHW Pre-Heat Drive	A28	14				1
	Electric Pre-Heat Drive	A29					
	4V Fault Relay	A03	15				1
	2V Frost Relay	A06					
	1V Recirc. Damper Drive	A31					
MUX Output A	0.5V Inlet Damper Drive	A30					
	Not In Use	A32	16				1

Figure 35. PCB-B to 4UI/4AO Connection Chart.

MUX		PCB-B		4UI/4AO			
Voltage	Description	Terminal No.	Port No.	DI	AI	DO	AO
MUX Input 3	Extract Fan Health	B45	1	1			
	Not In Use	B34	2	1			
	Extract Air Temp	B43	3		1		
	4V Condensate Pump Alarm	B33	4		1		
	2V Thermal Wheel Status	B39					
	1V Extract Filter dP Switch	B37					
	0.5V Discharge Damper End Switch	B38					
MUX Output B	Extract Fan Drive	B44	5				1
	2V Heat Wheel Drive	B47	6				1
	1V 230V Thermal Op Damper	B40					
	1V Bypass Damper Drive	B41					
	0.5V Discharge Damper Drive	B42					
	Not In Use	B35	7				1
	Not In Use	B36	8				1

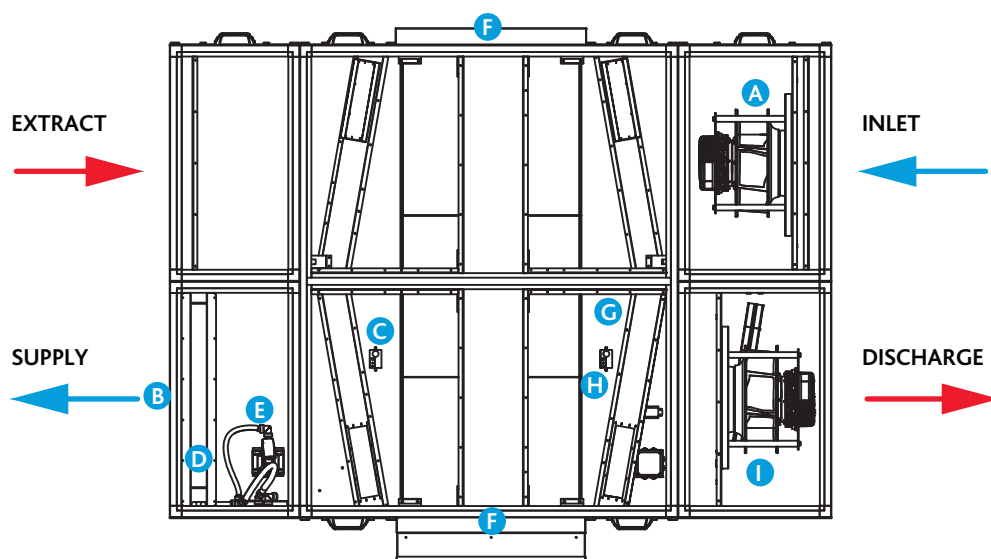
XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

21.0 NETWORK SETTINGS

IP address is 192.168.11.12
Subnet mask 255.255.255.0
Lan 011, node 012

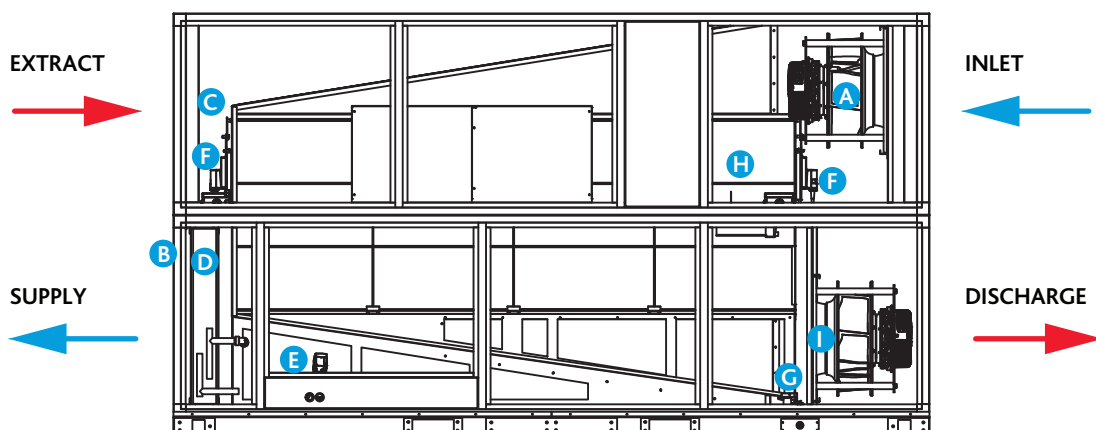
22.0 HARDWARE POSITIONS ON HORIZONTAL UNIT

Figure 36. XBC unit plan view.



22.1 HARDWARE POSITIONS ON VERTICAL UNIT

Figure 37. XBC unit plan view.



KEY TO HARDWARE POSITIONS

- | | |
|---|--|
| A) Supply fan (drive & health) | E) LPHW re-heat drive (LPHW models only) |
| B) Delivery air temperature sensor | F) Bypass damper drive |
| C) Extract air temperature sensor | G) Condensate pump alarm |
| D) Re-heater trip (electric heater models only) | H) Fresh air temperature |
| | I) Extract fan (drive & health) |

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

23.0 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 Nuaire control are electrically isolated from the mains supply.

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.

23.1 DAMPERS

At regular intervals check that the blades move freely.

23.2 FILTERS (4 X G4 FITTED AS STANDARD)

Disposable filters should be changed when an appropriate pressure drop is achieved.

23.3 HEATING 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. 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.

23.4 ELECTRIC HEATERS

Electric Heaters should have their elements examined periodically for accumulation of dirt, lint and biological contaminants or similar.

If necessary clean the affected Elements with a soft cloth or brush, under no circumstances should any type of liquid cleaning solution be used. A compressed air line may be used to blow out any solids. Care should be taken not to damage the Elements.

23.5 COUNTERFLOW PLATE HEAT EXCHANGER

The heat exchanger 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.

23.6 FANS AND MOTORS

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. **Check all fixings are secure.**

23.7 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.**

24.0 SERVICE SCHEDULE

Typical–will depend on site conditions.

	6 MONTHS	12 MONTHS
G4 FILTERS	✓ or	✓
F7 FILTERS	✓	
DAMPERS		✓
DAMPER ACTUATORS		✓
VENT WATER COILS		✓
COIL FINNED SURFACES		✓
CHECK DRAIN LINES + DRIP TRAY	✓	✓
CLEAN DRAIN PANS	Building Schedule ?	✓
NUTS, BOLTS, FIXINGS SECURE		✓
FAN BEARINGS	✓	
ELECTRIC HEATERS		✓
ELECTRICAL WIRING		✓
FAN IMPELLER	✓	
GENERAL		✓

25.0 WARRANTY

5 year warranty on Ecosmart2 (NT) 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 or not installed commissioned and maintained in accordance with the details contained in this manual and general good practice.

If control software is modified or removed

Nuaire will accept warranty on the hardware (unit) provided the replacement does not control the unit beyond its specified limits (refer to Nuaire testing standards and Application Guidance Notes document NA-QS-W029-3 which can be found on our website www.nuaire.co.uk)

26.0 SPARES

Spare parts and replacement components, and general advice are available from the Nuaire Ltd Service department.

TELEPHONE 029 2085 8400
FAX 029 2085 8444

27.0 CERTIFICATION

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: XBOXER XBC Ecosmart2 models (NT)
Machinery Types: Supply & Extract fans with Heat Recovery
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	29. 09. 13
2) A. Jones	Manufacturing Director	29. 09. 13

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

To comply with EC Council Directives 2006/42/EC Machinery Directive and 2004/108/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 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 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.

XBOXER XBC 75 & 85 ECOSMART2 (NT) MODELS

NOTES

[illegible]



FOR MORE INFORMATION

www.nuaire.co.uk

COMMERCIAL

www.nuaire.co.uk/commercial

AIR HANDLING UNITS

www.nuaire.co.uk/boxerahu



NUAIRE LIMITED

Western Industrial Estate | Caerphilly | CF83 1NA

t +44 (0)29 2085 8200 | **f** +44 (0)29 2085 8222 | **e** info@nuaire.co.uk

www.nuaire.co.uk

As part of our policy of continuous product development Nuaire reserves the right to alter specifications without prior notice.
Telephone calls may be recorded for quality and training purposes.