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CIBSE BUILDING PERFORMANCE AWARDS 2014 — Winner

# XBOXER

## XBC 10 - 65 ECOSMART2 (NT) MODELS

INSTALLATION, CONTROL DETAILS, OPERATING AND MAINTENANCE

ErP COMPLIANT 2015

ecosmart2 POWERED BY TREND

12. 01. 15. Leaflet Number 671622

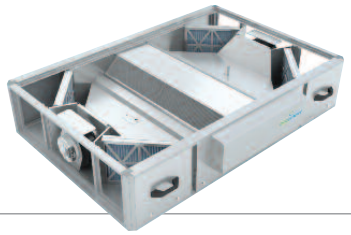
## GENERAL INDEX

## INDEX - INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

# XBOXER XBC ECOSMART2 (NT) MODELS

## SUPPLY & EXTRACT VENTILATION UNIT WITH HEAT RECOVERY

INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS



The EMC Directive 2004/108/EC
The Low Voltage Directive 2006/95/EC

ecosmart2 POWERED BY TREND

## INTRODUCTION - XBOXER XBC ECOSMART2 (NT) MODELS

**The information contained in this document provides details of installation, operation and maintenance for installers and users of the XBOXER XBC Supply and Extract Ventilation Unit 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.

A range of matched, close coupled attenuators with a similar construction method to that of the unit is available. The attenuators can be flipped for positioning on the left or right of the fan unit (see fig 1) allowing flexibilty for duct layout.
Attenuators are available in 1050, 1250 and 1600mm lengths and a matching attenuator flange is attached to the fan unit.

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

### CODE DESCRIPTION: XBOXER XBC VENTILATION UNIT

**XBC 45 - H - LNT - R - BA**
**1 2 3 4 5 6 7**

1. XBOXER XBC Range
2. Unit size 10, 15, 25, 45, 55 and 65
3. H = Horizontal Side by Side layout
4. E = Electric Heater; L = LPHW Heater, N = No Heater
5. NT = Ecosmart2 Control
6. R = Opposite arrangement, (refer to page 3)
7. BA = Bottom access (filters only, refer to page 3)

### CODE DESCRIPTION: MATCHED COMBINED ATTENUATOR

**XBC 25 - HS - MS10**
**1 2 3 4**

1. XBOXER XBC Range
2. Unit Size 10, 15, 25, 45, 55 and 65
3. HS = Horizontal Supply/Discharge unit
   or HE = Horozontal Extract/Intake unit
4. Attenuator MS10 = 1050 mm; MS12 = 1250 mm;
   MS16 = 1600 mm

### CODE DESCRIPTION: XBC UNITS WITH WEATHER ROOF

**XBC 15 - H - LNTWP**

Unit Size 10, 15, 25, 45, 55 and 65
WP = Fan Unit supplied with Weather Roof

Figure 1: Layout Overview of the XBC unit viewed from above and shown with matched room side and atmospheric side attenuators.
Access for maintenance and inspection of the standard XBOXER XBC units is from the side of the unit.

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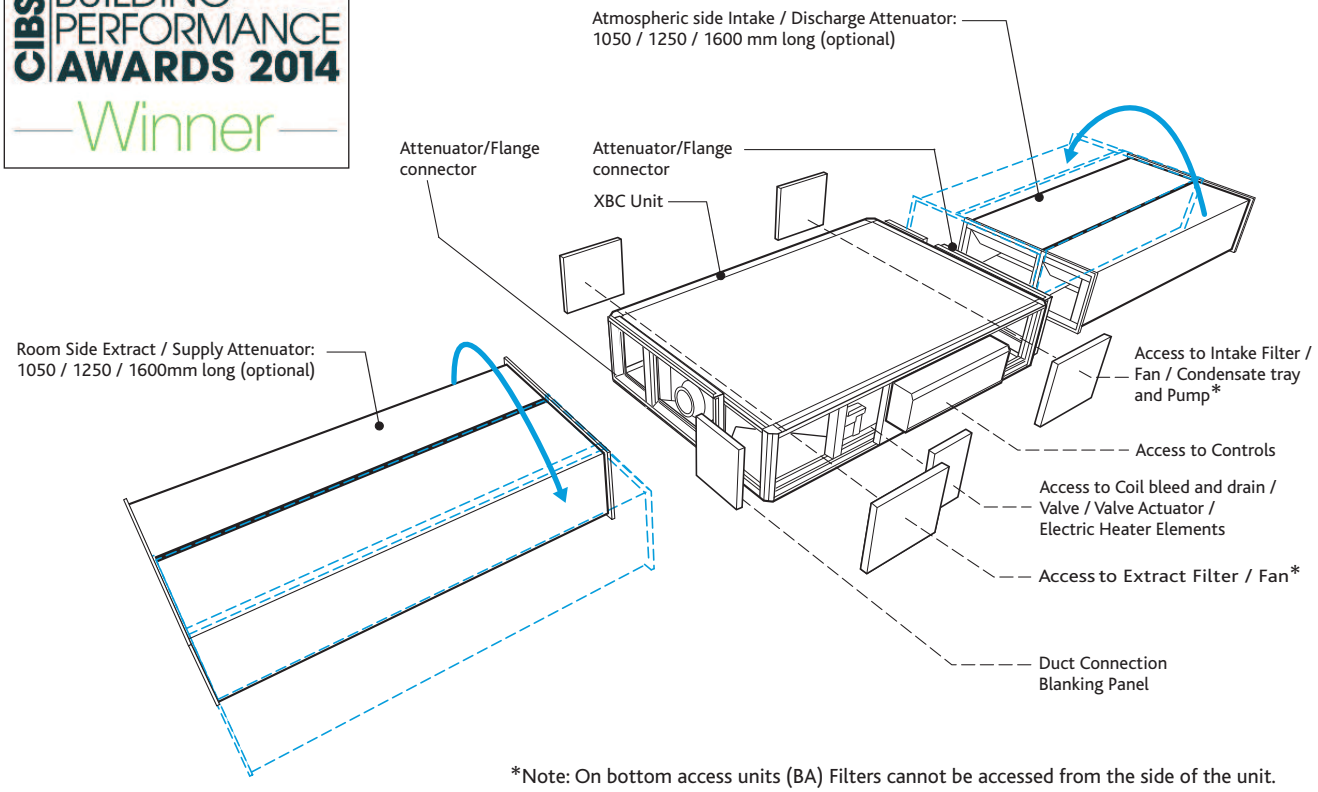



*Note: On bottom access units (BA) Filters cannot be accessed from the side of the unit.

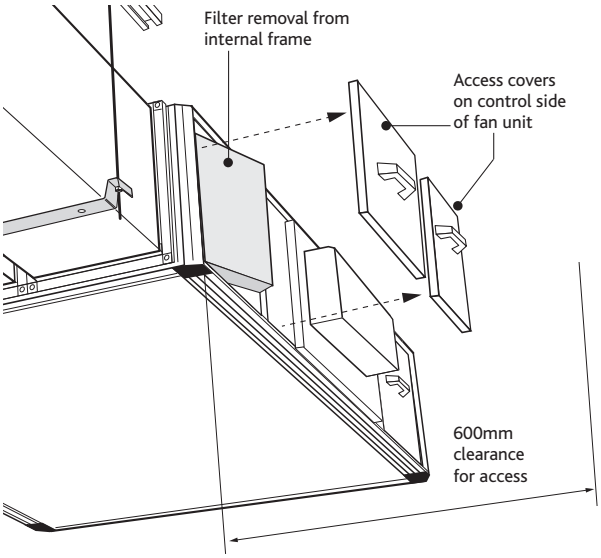
## 1.0 XBOXER XBC UNIT ACCESS CONCEPTS

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

1. The unit configuration is such that the supply and discharge connections are positioned on the unit centreline.

   The corresponding Intake and Extract connections may be positioned on either side of the unit, allowing greater flexibility in the layout of ductwork in the space. (see Fig 2a) with the blanking panel re-positioned to suit.
2. The standard Ecosmart XBC unit configuration is shown in Fig 2b. **Unit handing information will not be requested for this range,** and units will be supplied in this format as standard.
3. The unit must be installed with at least 600mm clearance from a wall / barrier on the control side of the unit. With this absolute minimum clearance, the unit may be connected to the power supply and control connections. (Note: - cable connections must allow for the relative movement when the control is re-positioned).
4. With this clearance, unit filters may be changed, and the fans coils, heat exchanger and condensate tray may be inspected and cleaned if necessary.
5. The LPHW and Electrical heater settings, coil bleed and drain, and all other control adjustments are similarly accessible (see Fig 1).
6. Side access, where possible, is preferred in all cases in terms of safe working access to the equipment under the CDM regulations.
7. 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.
8. Where these arrangements are not suitable, the Consultant's and Contractor's project specific requirements will always be accommodated where possible.

Figure 4: The control side of the unit must be installed with at least 600mm clearance from a wall / barrier to gain access from the side.




9. Bottom access only units. (Example code: XBC15-H-LNT BA). Provides access to filters only (see fig 4).
   **Filter removal is not available from the sides on these units.**
   Bottom access units must be installed with the following minimum clearance below the units.
   XBC15 = 225mm, XBC25 = 300mm XBC45 = 360mm.
   Note: Bottom access is not available on XBC55 or XBC65 units.

Figure 2a: Selectable Duct Connections (Top view).

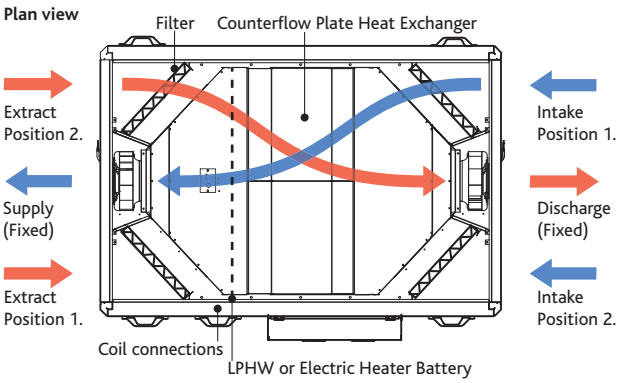
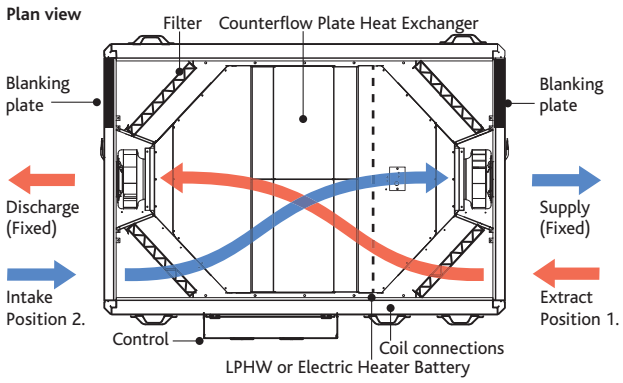



Figure 3: Opposite unit arrangement (R) side access (Top view).




**Note: The unit is shipped with four G4 filters in place, two of which are included as spares. For F7 filters contact Nuaire.**

Figure 2b: Standard Unit Format (Top view).

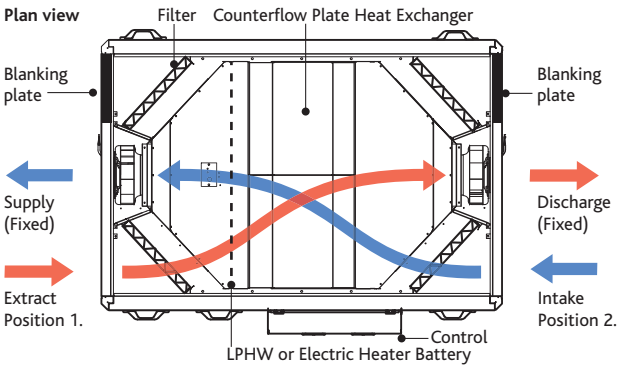
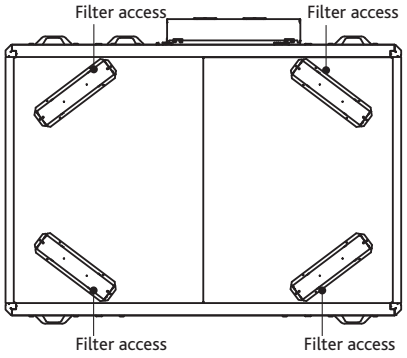



Figure 4: bottom access only unit. (Example code: XBC15-H-LNT BA).



**IMPORTANT**

**Safety first! – before commencing any work ensure:**

- **That all appropriate risk assesments 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 OF EQUIPMENT

### 1.1 Receipt of equipment

All equipment is inspected prior to despatch and leaves the factory in good condition. Upon receipt of the equipment an inspection should be made and any damage indicated on the delivery note.

Particulars of damage and/or incomplete delivery should be endorsed by the driver delivering the goods before offloading by the purchaser.

No responsibility will be accepted for damage sustained during the offloading from the vehicle or on the site thereafter.
All claims for damage and/or incomplete delivery must be reported to Nuaire within two days of receipt of the equipment.

## 2.2 OFF LOADING AND HANDLING FROM THE DELIVERY VEHICLE

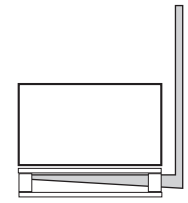
The weight of the unit modules and palletised items is displayed on the unit rating plate or on the packaging. Some of the modules have an uneven weight distribution, and this will be indicated by labelling where appropriate. Ensure that lifting and handling equipment is adequately rated.

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

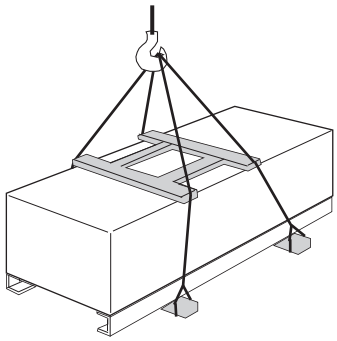
Spreaders should be used when lifting with slings to avoid damage to the casings. Care must be taken to ensure that slings are correctly positioned to avoid crushing and twisting of the unit castings.

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.

Figure 5: Lifting.



Palletised.



Slings via spreaders fitted to unit with base frame.

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

| Unit | No. of sections |
|---|---|
| XBOXER XBC Central Ventilation Unit | 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.

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 13, page 13 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 = 12 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.

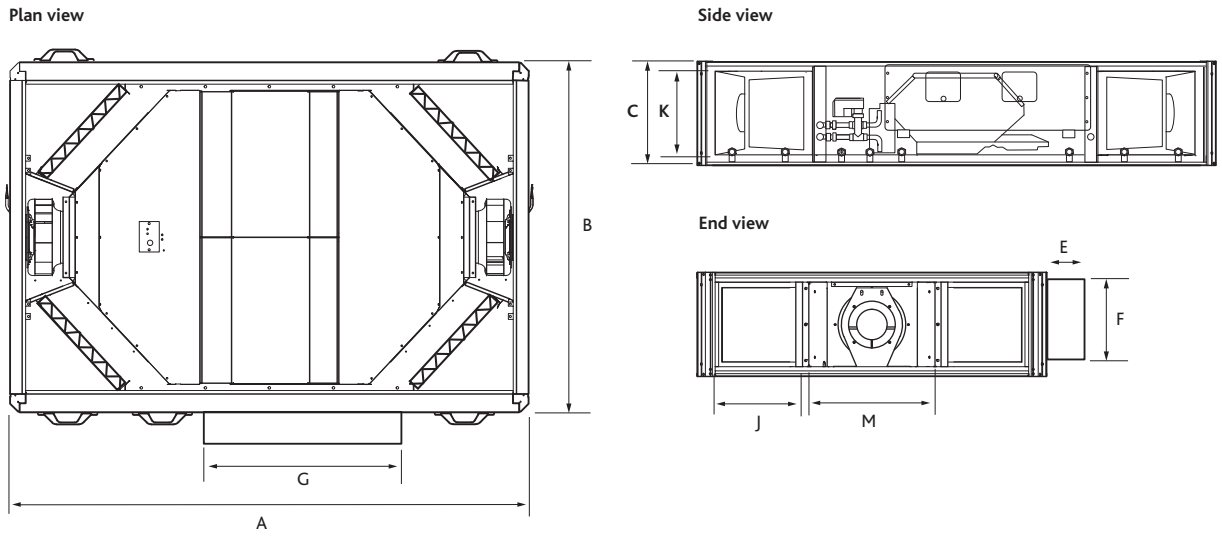
The unit rating label shows the maximum electrical load of the equipment. Connections to the unit may include single phase supply connections, and a variety of control circuits.

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.

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

Figure 6: Standard unit dimensions (mm) and weights (kg).



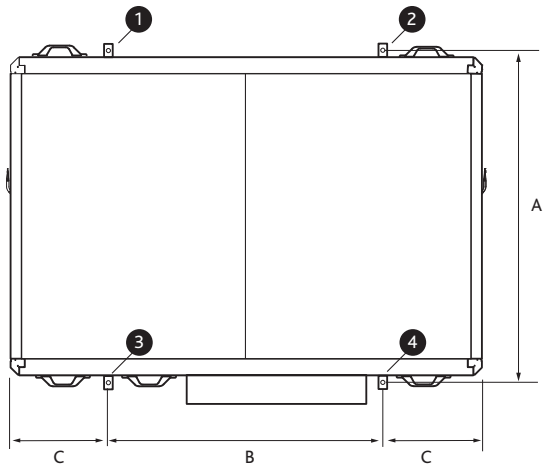

| Unit code | Dimensions (mm) | | | | | | Control dimensions | | | Unit weights | Packed weights |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | A | B | C | J | K | M | E | F | G | (kg) | (kg) |
| XBC10-*NT | 1600 | 1000 | 260 | 250 | 225 | 340 | 255 | 324 | 635 | 145 | 195 |
| XBC15-*NT | 1600 | 1000 | 260 | 250 | 225 | 340 | 255 | 324 | 635 | 195 | 245 |
| XBC25-*NT | 1700 | 1150 | 340 | 265 | 305 | 455 | 255 | 324 | 635 | 242 | 292 |
| XBC45-*NT | 1900 | 1250 | 400 | 280 | 365 | 525 | 255 | 324 | 635 | 298 | 398 |
| XBC55-*NT | 1900 | 1560 | 470 | 410 | 435 | 580 | 255 | 324 | 635 | 368 | 418 |
| XBC65-*NT | 1900 | 1560 | 620 | 410 | 585 | 580 | 255 | 324 | 635 | 476 | 626 |

2 attenuator flange connectors are attached to every unit. Add 50mm to dimension 'A' to include both flanges.

*Type of heater battery.

## 4.1 XBOXER XBC UNIT HANGING BRACKET POSITIONS

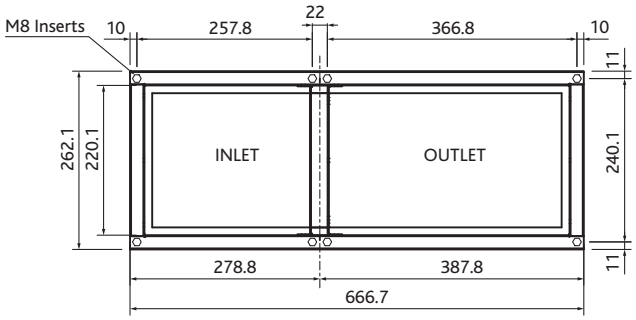
Figure 7: Plan view of unit with 4 hanging brackets attached (Two each side of the unit).



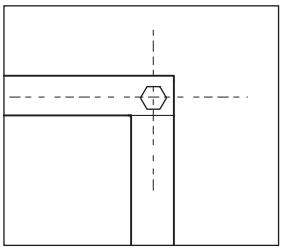

| Unit code | Dimensions to hole centres (mm) | | |
|---|---|---|---|
| | A | B | C |
| XBC10 | 1059 | 858 | 371 |
| XBC15 | 1059 | 858 | 371 |
| XBC25 | 1207 | 888 | 406 |
| XBC45 | 1309 | 1008 | 446 |
| XBC55 | 1619 | 1058 | 421 |
| XBC65 | 1619 | 1058 | 421 |

## 4.2 XBOXER XBC ATTENUATOR FLANGE CONNECTOR DIMENSIONS (MM) Figure 8.

### XBC10 & 15 FLANGE CONNECTOR

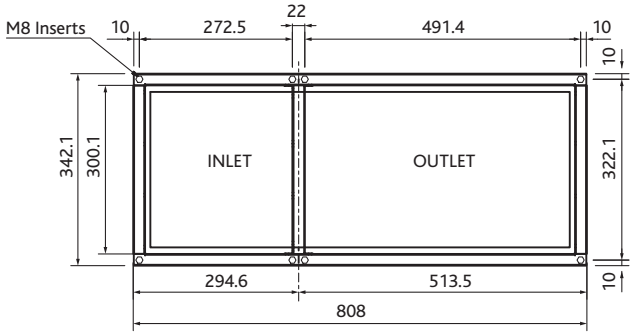



**Hole centres.**

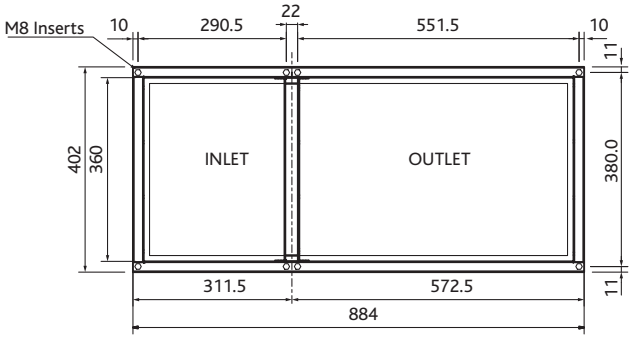


**Compatible with 20mm Mez.**

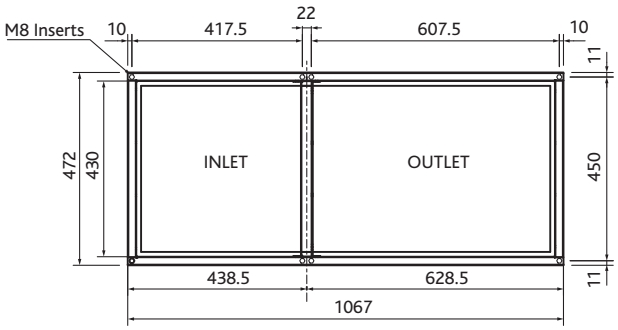
### XBC25 FLANGE CONNECTOR



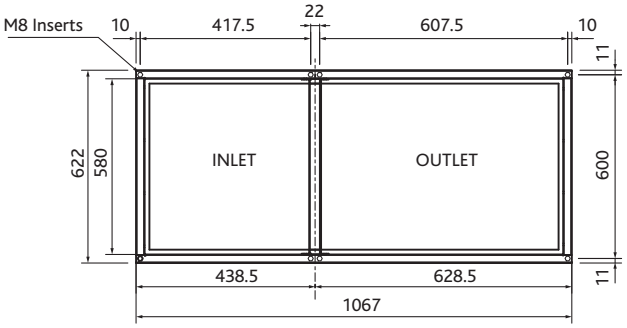

### XBC45 FLANGE CONNECTOR




### XBC55 FLANGE CONNECTOR



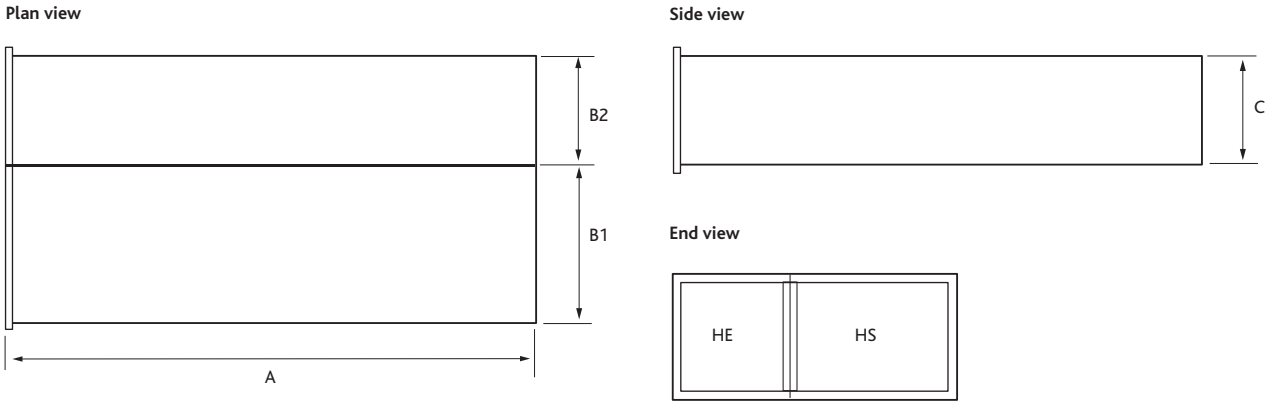

### XBC65 FLANGE CONNECTOR




**Note: The flange connector leaves factory attached to unit.**

## 4.3 XBOXER XBC ATTENUATOR DIMENSIONS (MM) AND WEIGHTS (KG)

Figure 9: Attenuator dimensions (mm).




| Unit Code | Dimensions (mm) | | | | Unit weights |
|---|---|---|---|---|---|
| | A | B1 | B2 | C | (kg) |
| XBC15-HS-MS10* | 1050 | 340 | | 225 | 49 |
| XBC15-HE-MS10* | 1050 | | 250 | 225 | 37 |
| XBC15-HS-MS12* | 1250 | 340 | | 225 | 63 |
| XBC15-HE-MS12* | 1250 | | 250 | 225 | 50 |
| XBC15-HS-MS16* | 1600 | 340 | | 225 | 81 |
| XBC15-HE-MS16* | 1600 | | 250 | 225 | 62 |
| XBC25-HS-MS10 | 1050 | 455 | | 305 | 59 |
| XBC25-HE-MS10 | 1050 | | 265 | 305 | 44 |
| XBC25-HS-MS12 | 1250 | 455 | | 305 | 76 |
| XBC25-HE-MS12 | 1250 | | 265 | 305 | 59 |
| XBC25-HS-MS16 | 1600 | 455 | | 305 | 99 |
| XBC25-HE-MS16 | 1600 | | 265 | 305 | 73 |
| XBC45-HS-MS10 | 1050 | 525 | | 365 | 69 |
| XBC45-HE-MS10 | 1050 | | 280 | 365 | 49 |
| XBC45-HS-MS12 | 1250 | 525 | | 365 | 88 |
| XBC45-HE-MS12 | 1250 | | 280 | 365 | 66 |
| XBC45-HS-MS16 | 1600 | 525 | | 365 | 114 |
| XBC45-HE-MS16 | 1600 | | 280 | 365 | 81 |
| XBC55-HS-MS10 | 1050 | 580 | | 435 | 79 |
| XBC55-HE-MS10 | 1050 | | 410 | 435 | 62 |
| XBC55-HS-MS12 | 1250 | 580 | | 435 | 101 |
| XBC55-HE-MS12 | 1250 | | 410 | 435 | 82 |
| XBC55-HS-MS16 | 1600 | 580 | | 435 | 131 |
| XBC55-HE-MS16 | 1600 | | 410 | 435 | 102 |
| XBC65-HS-MS10 | 1050 | 580 | | 585 | 87 |
| XBC65-HE-MS10 | 1050 | | 410 | 585 | 74 |
| XBC65-HS-MS12 | 1250 | 580 | | 585 | 112 |
| XBC65-HE-MS12 | 1250 | | 410 | 585 | 97 |
| XBC65-HS-MS16 | 1600 | 580 | | 585 | 145 |
| XBC65-HE-MS16 | 1600 | | 410 | 585 | 122 |

Coding: The 'HS' denotes the type of silencer required for the supply or discharge. The 'HE' denotes the type of silencer required for the extract or fresh air intake on the unit.

***Note: XBC15 silencers are also suitable for XBC10 units.**

## 5.0 INSTALLING THE XBC FAN UNITS AND ATTENUATORS

**The ventilation unit must be installed first–with consideration made for the length of the associated attenuators.**

Installation of the XBOXER XBC units, including all external services and controls should be installed in accordance with the appropriate site procedures, and MUST conform to all governing regulations e.g. CDM, CIBSE, IEE, and in strict accordance with the applicable Building Regulations.

The correct installation position for the units shall be decided with due regard to access and maintenance requirements, and the objective of minimising the system ductwork resistance.

The recommended installation method is to use standard Unistrut channel secured to the slab / steelwork above the unit.

Four suitable drop rods should be secured to the Unistrut channel and extended to be fixed to the unit's four mounting brackets, (two each side of the fan unit) or to other horizontal supports by others where wider load distribution is required.

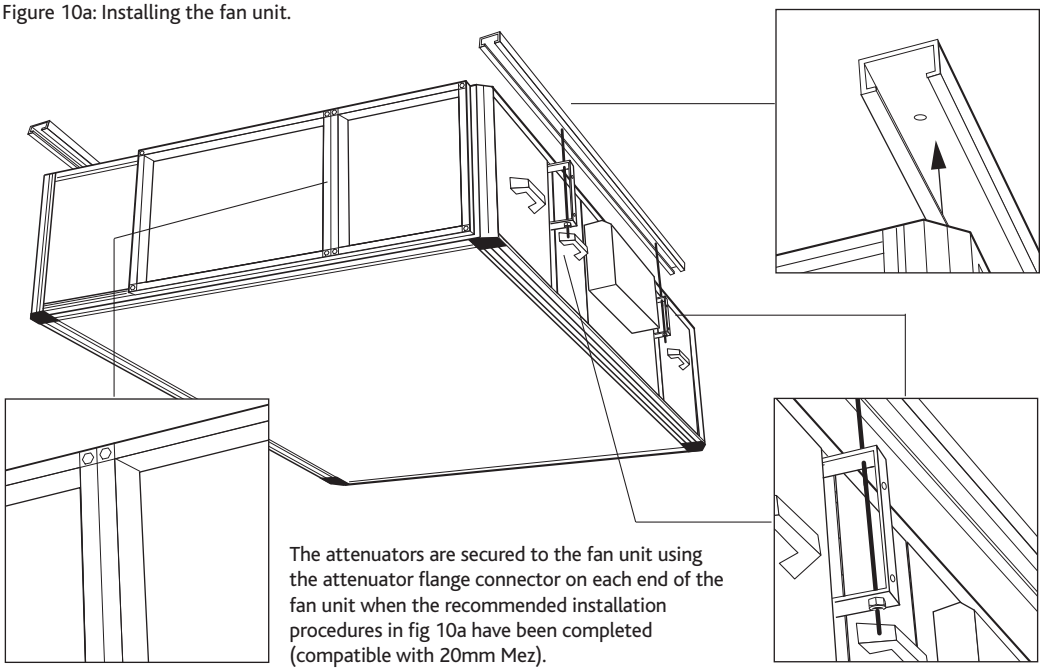
### INSTALLING THE ATTENUATORS

It is recommended that additional Unistrut channels are used to support the matched attenuators. M8 drop rods should be secured to the Unistrut channel and extended to be fixed to the four piece support brackets to be used on the underside of the attenuators. (see fig 10b).

**Note – once the attenuators are supported and levelled, and Immediately before securing the attenuator to the attenuator flange connector, remove the backing from the Foam Sealing Strip.**

The attenuators must be secured to the unit using the screws provided.

Figure 10a: Installing the fan unit.



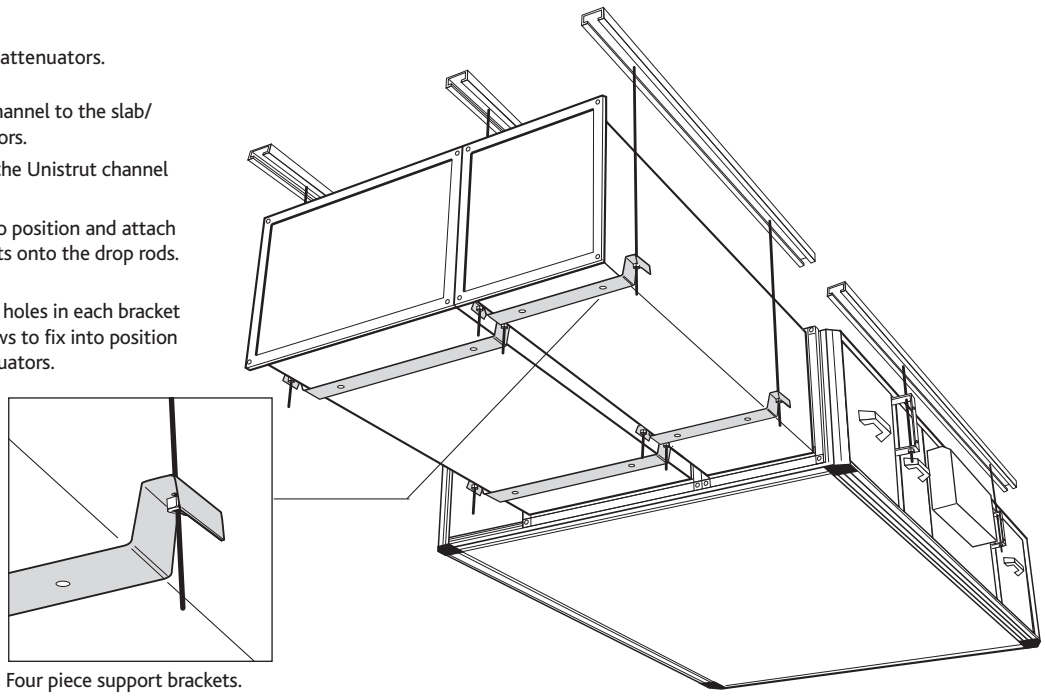
1. Standard Unistrut channel secured to the slab /steelwork above the unit.

2. Secure the four drop rod suspension system from the Unistrut channel into position through the fan unit's mounting brackets. (2 each side of the unit, see bracket positions page 4).

The attenuators are secured to the fan unit using the attenuator flange connector on each end of the fan unit when the recommended installation procedures in fig 10a have been completed (compatible with 20mm Mez).

Figure 10b: Installing the fan attenuators.

1. Secure standard Unistrut channel to the slab/ steelwork above the attenuators.
2. Secure M8 drop rods from the Unistrut channel into position.
3. Raise up the attenuator into position and attach the four piece support brackets onto the drop rods. (2 on each attenuator).
4. Utilising the 2 x 5.6mm dia holes in each bracket use relevant self tapping screws to fix into position on the underside of the attenuators.
5. Immediately before securing the attenuator to the connector, remove the backing from the Foam Sealing Strip.
6. Secure the attenuators to the attenuator flange connector on the end of the fan unit. (see fig 10).



Four piece support brackets.

## 5.1 INSTALLING THE XBC WEATHERPROOF ROOF ON ECOSMART2 (NT) FAN UNITS

**Having installed the ventilation unit and attenuators, the Weatherproof Roof can now be installed if required.**

The Roof assembly and control cover must be secured to the unit using the fixing channel provided.
When the roof has been installed onto the fan unit please ensure that the edges of the roof are fully sealed where it joins the fan unit.
This does not apply to the control cover as this will have to be removed if necessary.

### WEATHERPROOF COMPONENTS

| Item | Description | Quantity |
|---|---|---|
| A | Roof Assembly | 1 |
| B | Control Cover | 1 |
| C | Fixing Channel | 4 |

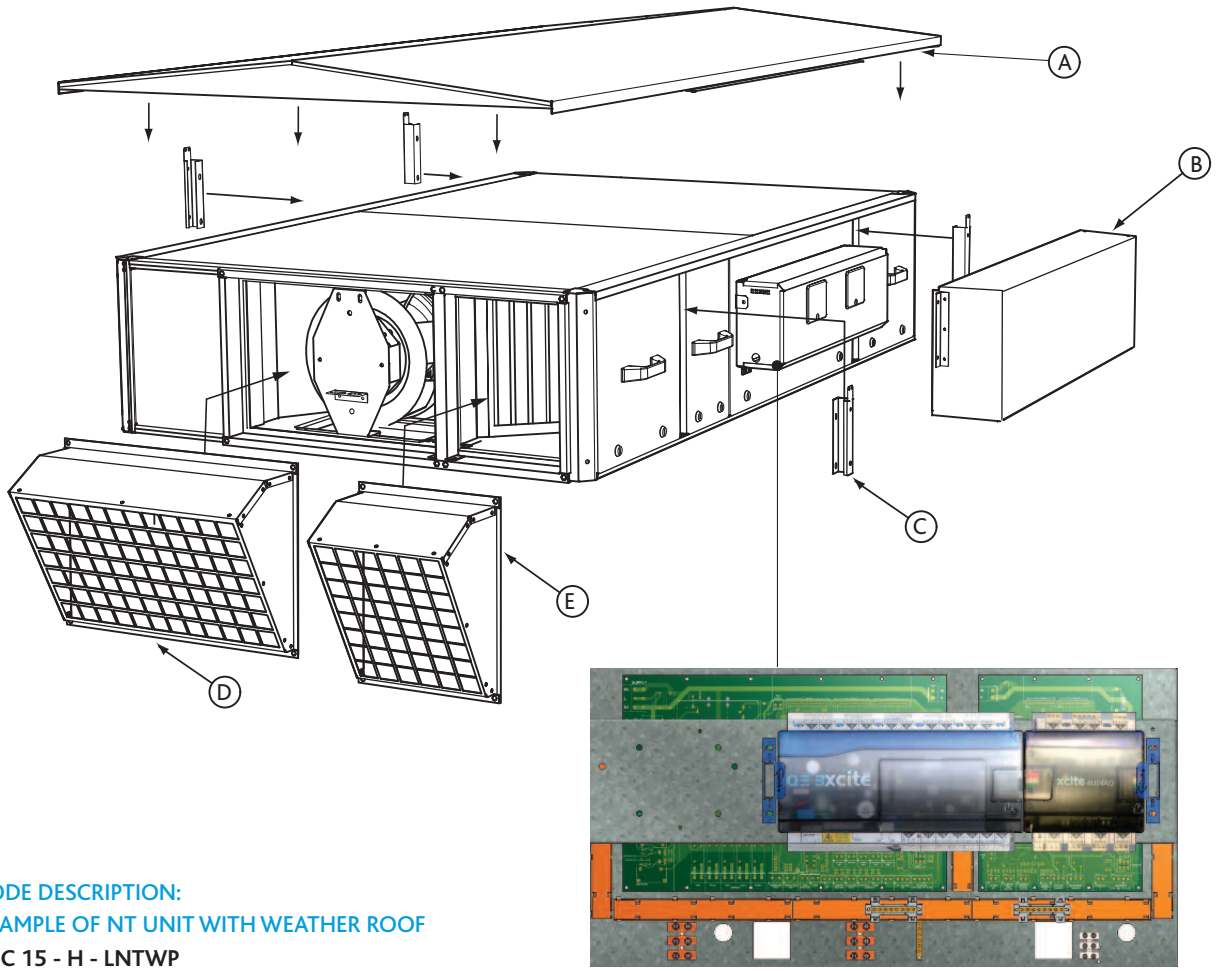
### OPTIONAL EXHAUST & INTAKE TERMINALS

| Item | Description | Quantity |
|---|---|---|
| D | Exhaust RT | 1 |
| E | Intake RT | 1 |

### UNIT CODES FOR OPTIONAL EXHAUST & INTAKE TERMINALS

| |
|---|
| XBC10-EXHAUST-RT |
| XBC10-INTAKE-RT |
| XBC15-EXHAUST-RT |
| XBC15-INTAKE-RT |
| XBC25-EXHAUST-RT |
| XBC25-INTAKE-RT |
| XBC45-EXHAUST-RT |
| XBC45-INTAKE-RT |
| XBC55-EXHAUST-RT |
| XBC55-INTAKE-RT |
| XBC65-EXHAUST-RT |
| XBC65-INTAKE-RT |

Figure 11: Installing the Weatherproof Roof, Exhaust & Intake Terminals.




### CODE DESCRIPTION:
### EXAMPLE OF NT UNIT WITH WEATHER ROOF

**XBC 15 - H - LNTWP**

## 5.2 XBC MOTORISED DAMPERS

**Internal version (example code: XBC15-MD-NT).**
**External weather proof version (example code: XBC15-MD-NT-WP).**

If Nuaire matched silencers (example code XBC15-H-MS16) are being fitted to the fan unit, the motorised damper (example code XBC15-MD-NT) needs to be fitted after the silencers (as figure 12). 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 SM230A-S drive open/drive close actuator complete with switch.

Figure 12: Installing the Motorised Damper.

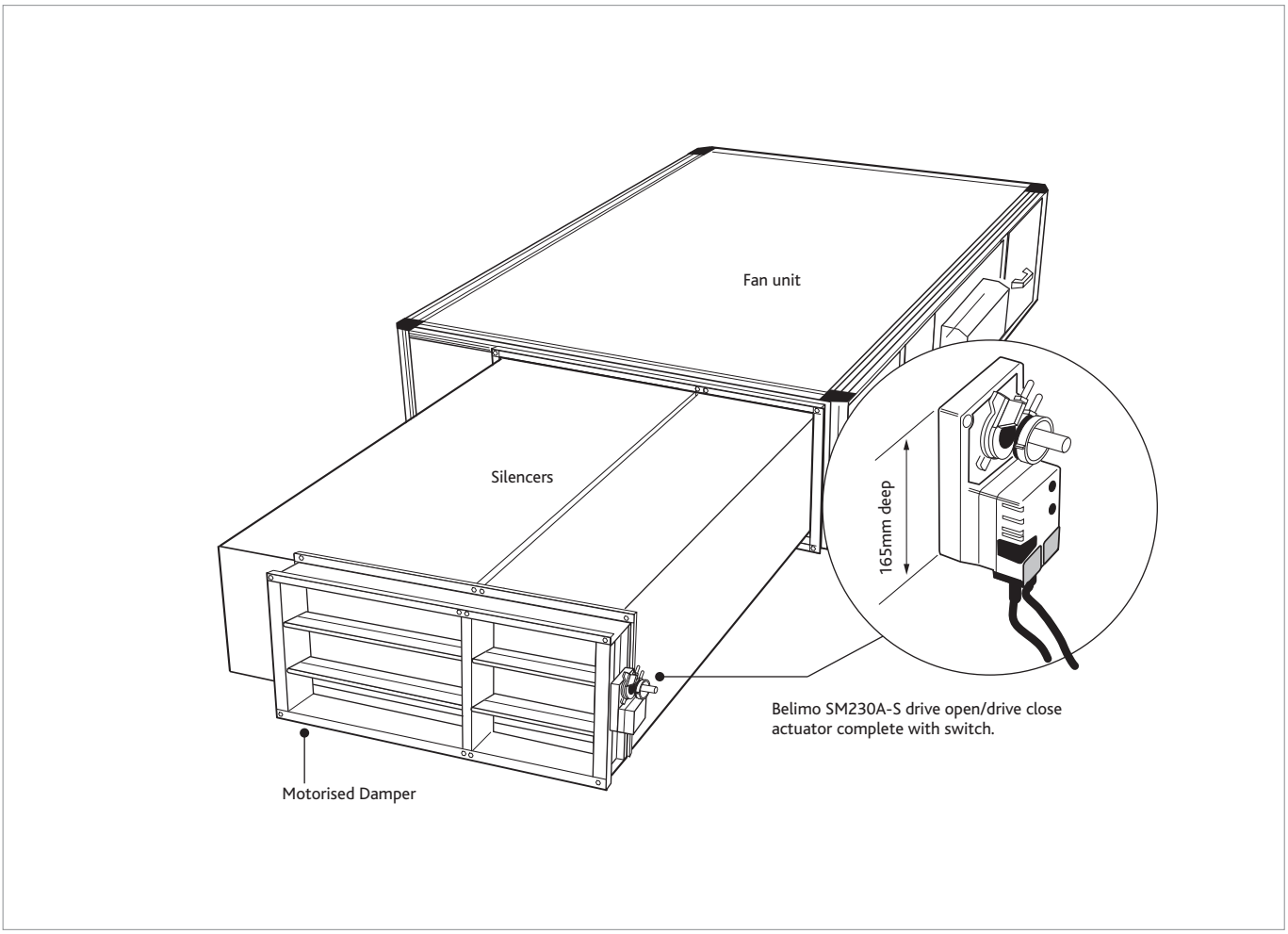
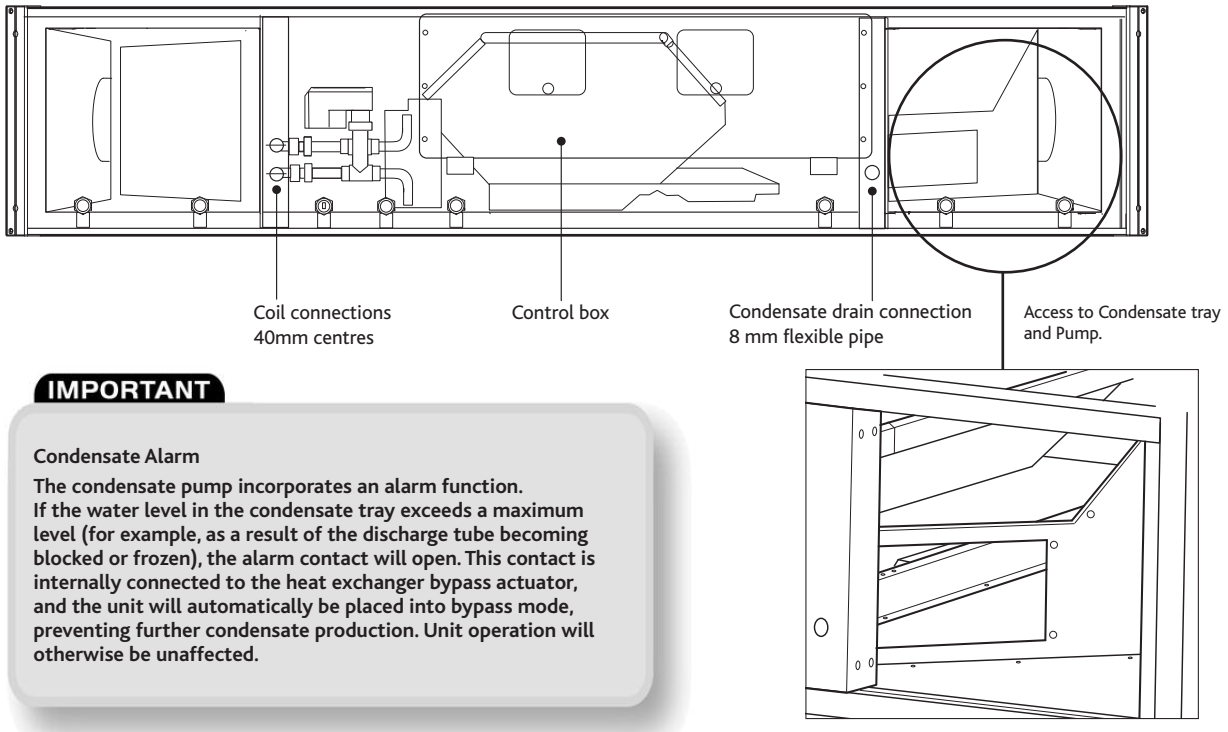


Figure 13: Control side of unit showing coil and condensate connections.




**IMPORTANT**

**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.**

## 6.0 COMMISSIONING & SETTING TO WORK

**(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 (see fig 12).
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.
**(This is a condition of the unit warranty).**

## 6.3 FAN SECTIONS

Access to the fan section is via lift off panels. (see figs 1 & 13).

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.

## 6.4 ACCESS TO FAN UNIT

Access to the fan sections on the non control side and controls side of the unit is shown in figure 1.
Access to the Dampers and actuators is shown in figure 1.

**IMPORTANT**

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

## INDEX - DESCRIPTION OF CONTROL

## 7.0 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.

## 7.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

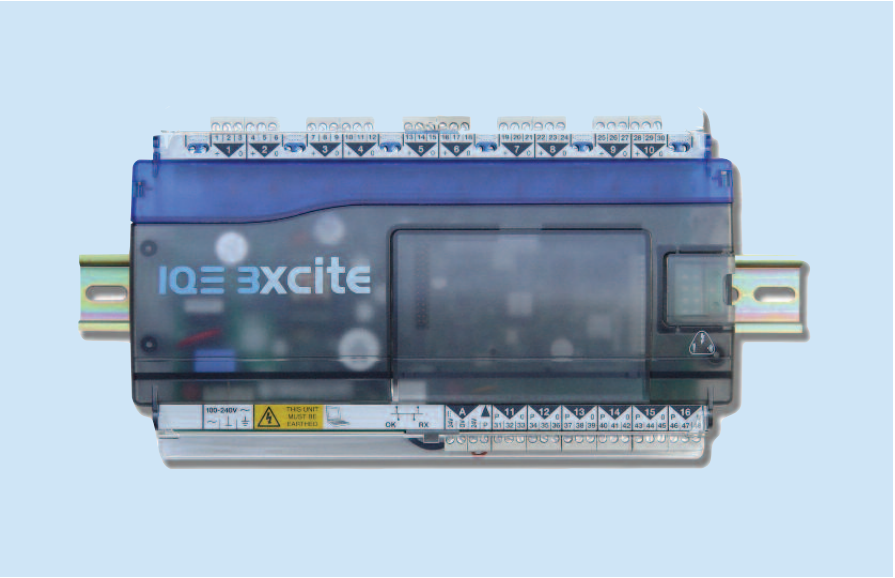
The unit integrated Ecosmart2 system provides the facility for operational efficiency and energy saving by allowing a comprehensive range of unitary control functions and / or full BMS integration (by others) via standard BACnet configuration.

### 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$^{O}$ 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%.

## 7.0 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$^{O}$ 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$^{O}$ 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.

## 7.0 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 it's 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.

ASHRAE BACnet

## 7.0 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 ECOSMART2 (NT) MODELS - AVAILABLE TREND ANCILLARY OPTIONS

## 7.0 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 (/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
- ± 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

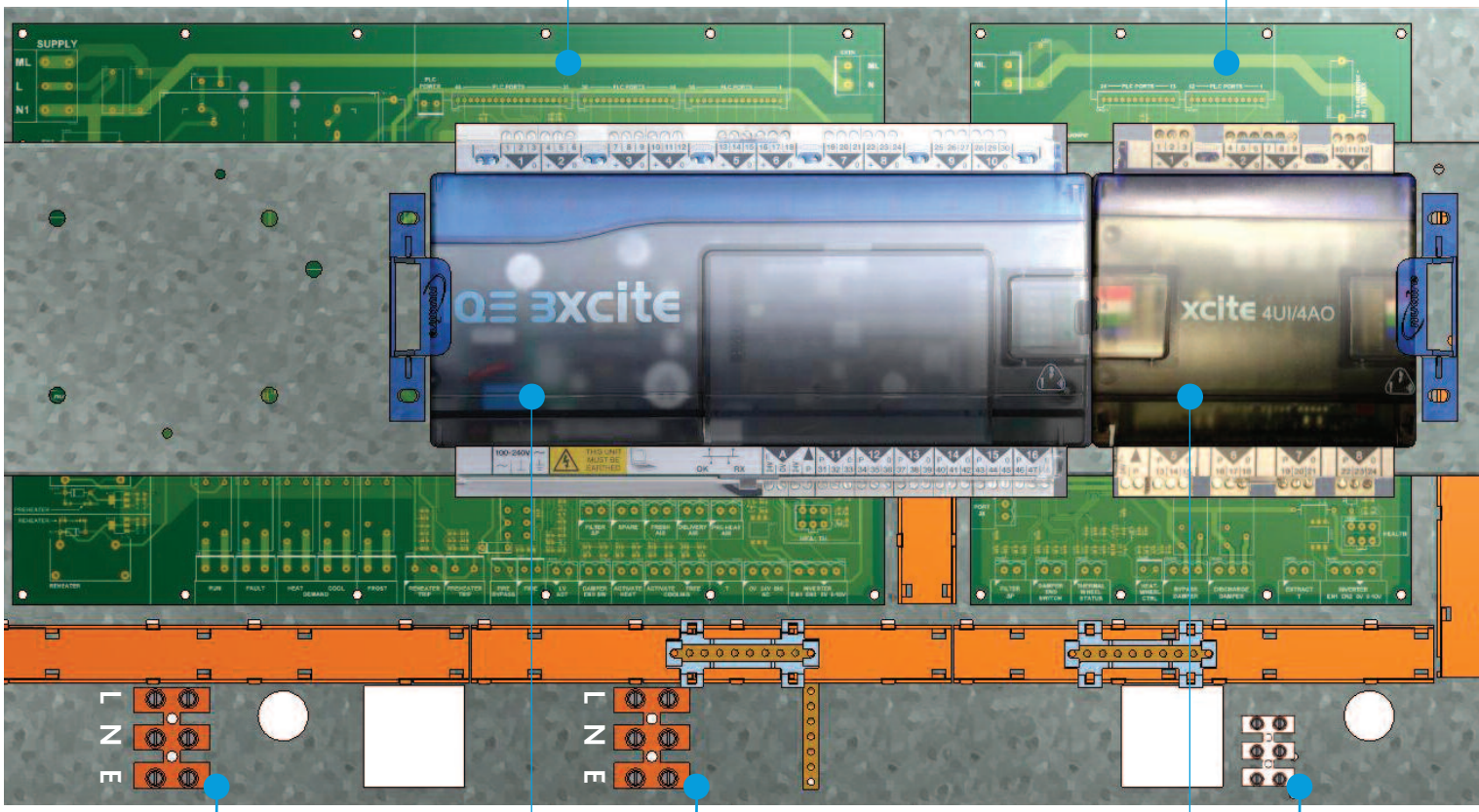
## INDEX - CONTROL / PCB LAYOUTS & SCHEMATICS

## 8.0 CONTROL LAYOUT

Figure 14.

PCB-A SEE PAGE 23

PCB-B SEE PAGE 28




Mains 240 / 50Hz
LPHW and Mains.

Mains connection if
electric heater connected.

Fused Terminal
Block for
Condensate
Pump.

IQ3XCITE/96/OEM/BAC/24

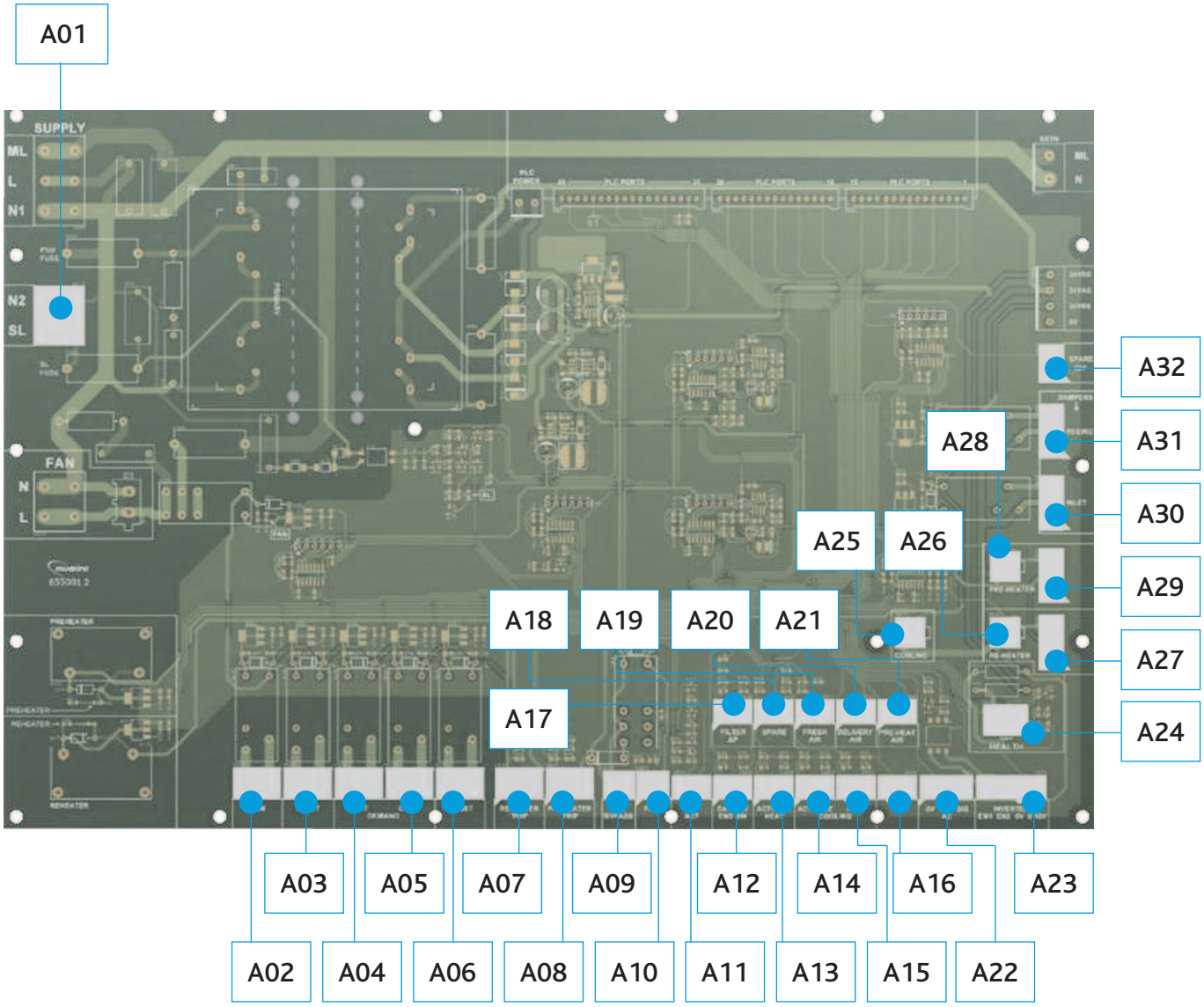
XCITE/IO/OEM/4UI/4AO

### ELECTRICAL DETAILS

| Fans without Electric Heater | | Fans with Electric Heater | |
|---|---|---|---|
| Unit Code | flc (amps) | Unit Code | Total systems flc (amps) |
| XBC15-H-N**- | 2.8 | XBC15-H-E** | 15.8 |
| XBC25-H-N**- | 6.4 | XBC25-H-E** | 25.4 |
| XBC45-H-N**- | 6.9 | XBC45-H-E** | 25.9 |
| XBC55-H-N**- | 6.9 | XBC55-H-E** | 44.9 |
| XBC65-H-N**- | 8 | XBC65-H-E** | 46 |

## 8.1 NUAIRE PCB-A (SUPPLY PCB)

Figure 15. PCB-A Terminal Positions.

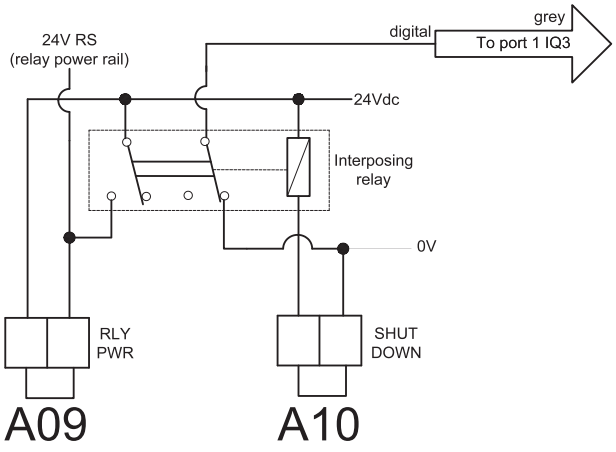



### TERMINAL DETAILS

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 27)
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 (Page 27)
A26 – LPHW re-heat control output (Page 27)
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)

## 8.2 NUAIRE PCB-A (SUPPLY PCB) CONNECTION SCHEMATICS

Figure 16. Shutdown Circuit.

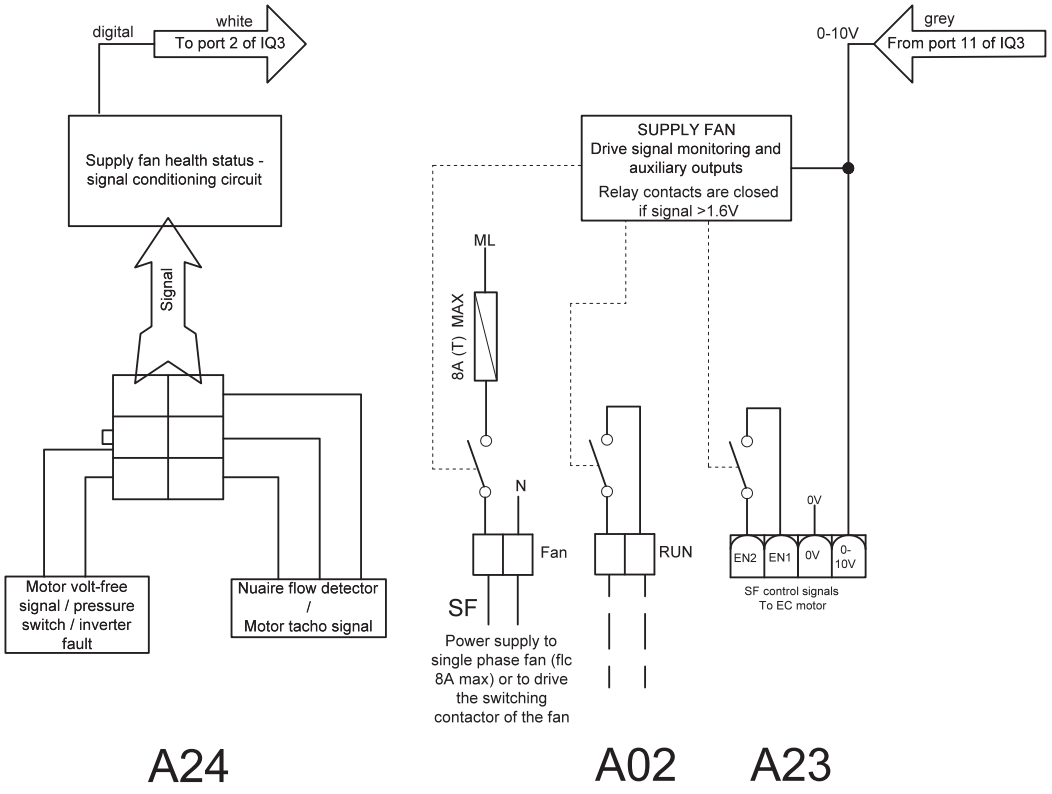



The links shown in Figure 14 can be replaced by external switches or volt-free relays.

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

A10 – Breaking the circuit will initiate software driven shutdown.

Figure 17. 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

## 8.2 NUAIRE PCB-A (SUPPLY PCB) CONNECTION SCHEMATICS

Figure 18. MUX Input 1.

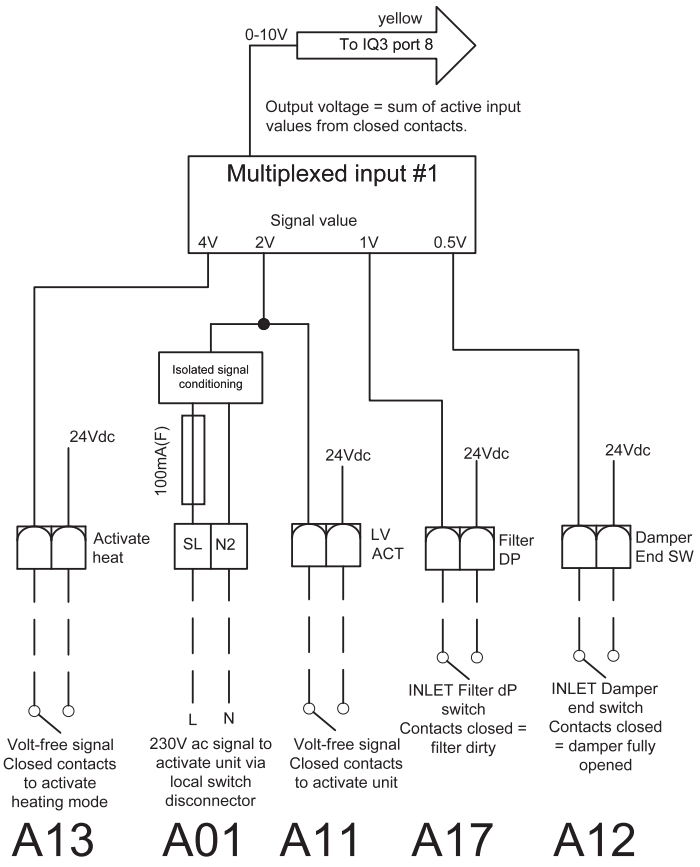
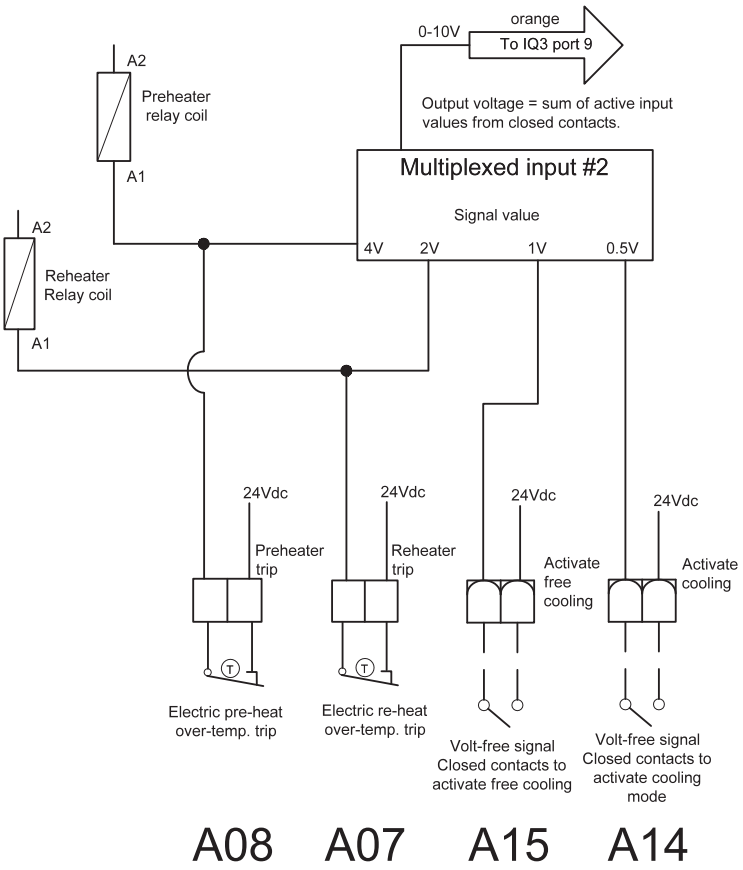


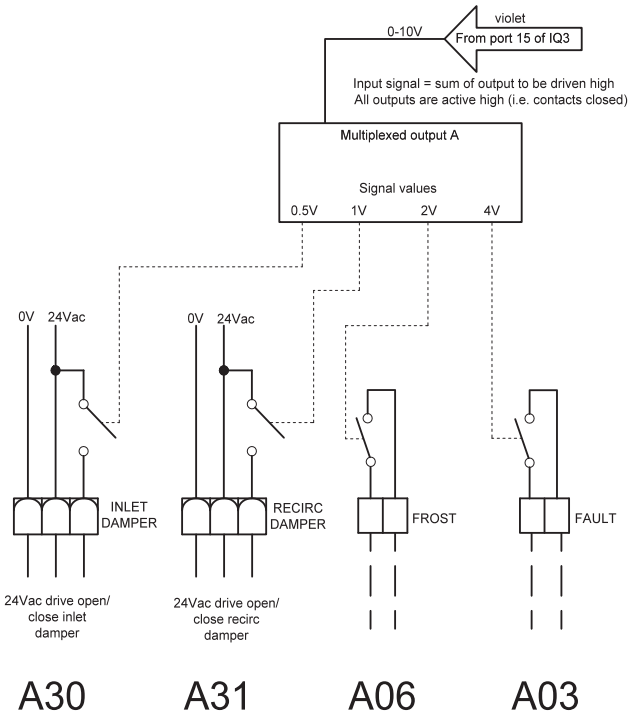

Figure 19. MUX Input 2.




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.

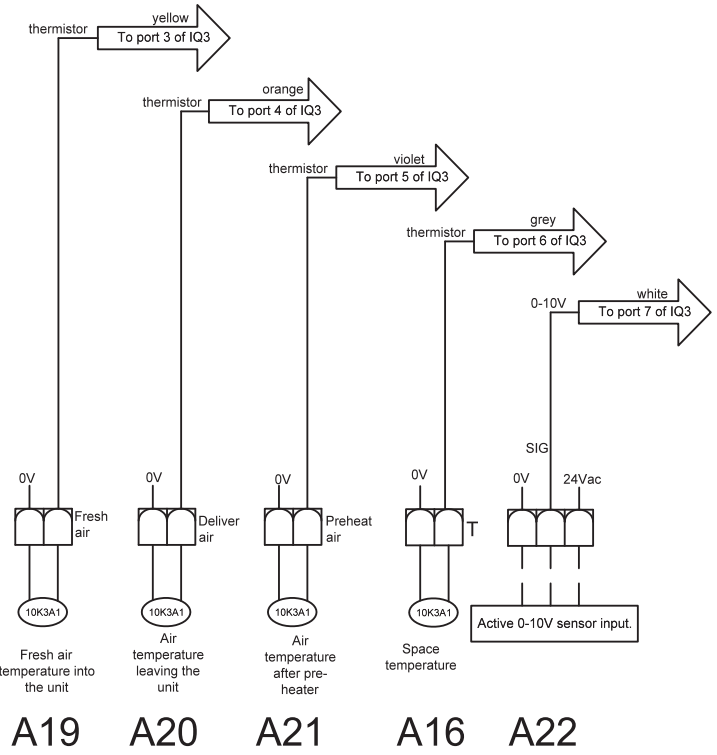
## 8.2 NUAIRE PCB-A (SUPPLY PCB) CONNECTION SCHEMATICS

Figure 20. 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

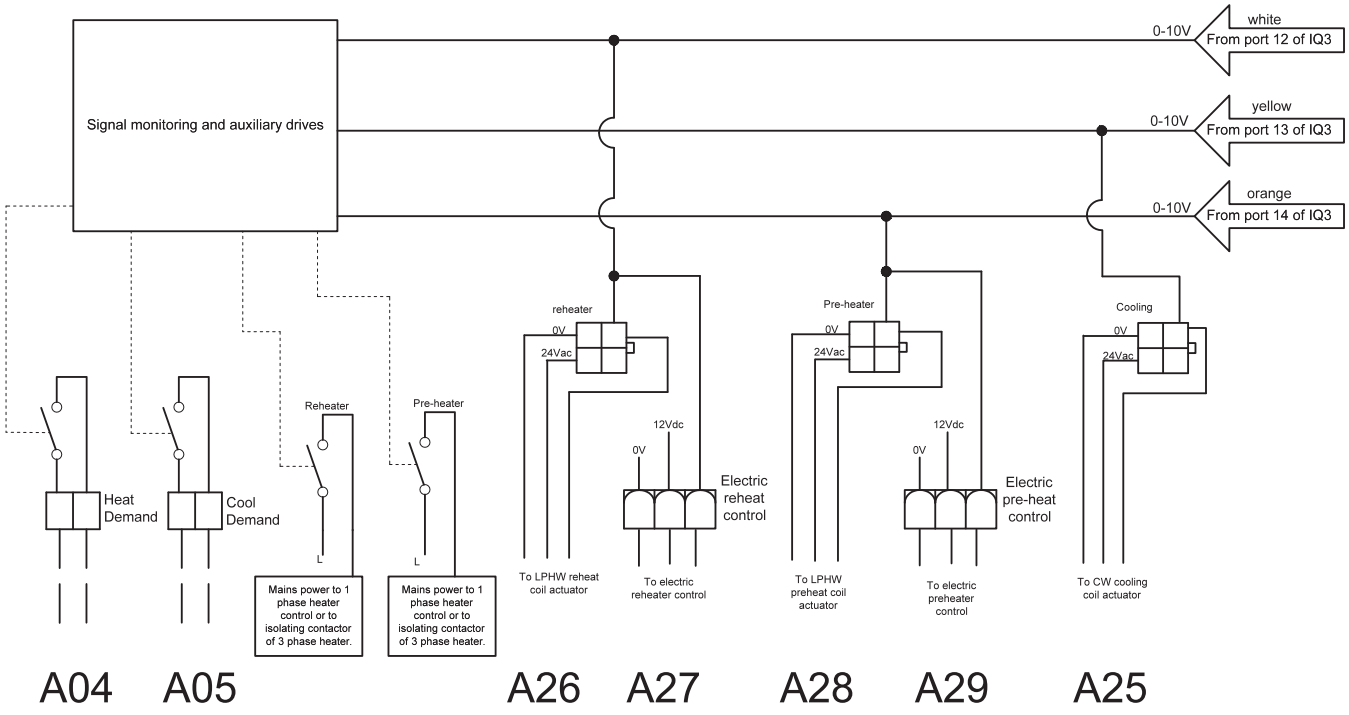
Figure 21. Analogue Inputs.




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

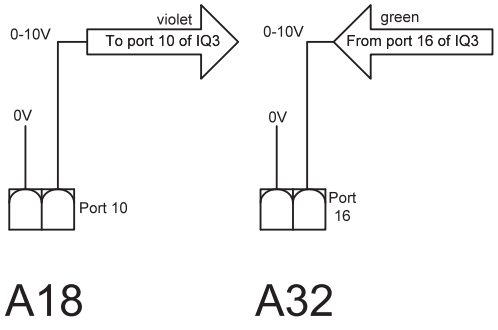
## 8.2 NUAIRE PCB-A (SUPPLY PCB) CONNECTION SCHEMATICS

Figure 22. Analogue Outputs.



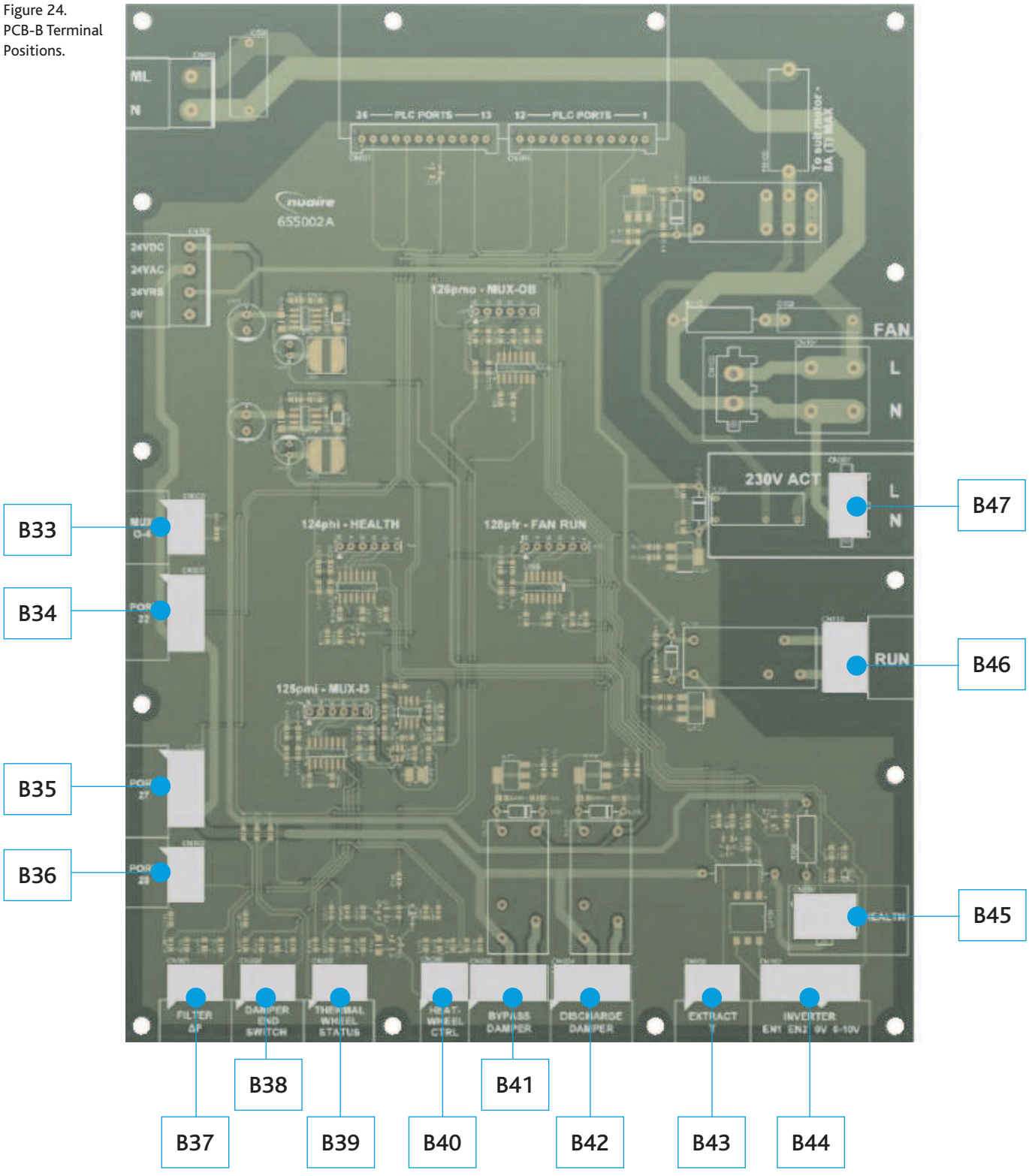

04 – Contacts closed when preheater and/or heater is active. See note 1 on page 30.
05 – Contacts closed when cooling is active. See note 1 on page 30.
26 – Modulating actuator connection. See notes 2 and 3 on page 30.
28 – Modulating actuator connection. See notes 2 and 3 on page 30.
25 – Modulating actuator connection. See notes 2 and 3 on page 30

Figure 23. Spare Analogue I/O.



## 8.3 NUAIRE PCB-B (EXTRACT PCB)

Figure 24.
PCB-B Terminal Positions.

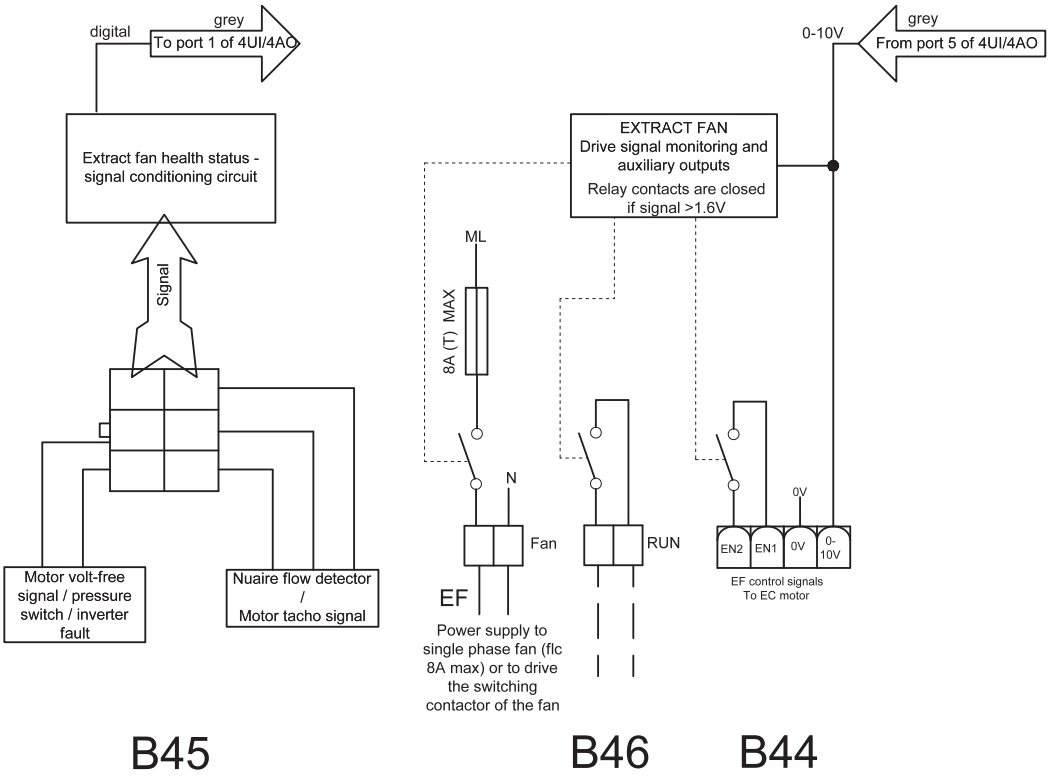



### TERMINAL DETAILS

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)

## 8.4 NUAIRE PCB-B (EXTRACT PCB) CONNECTION SCHEMATICS

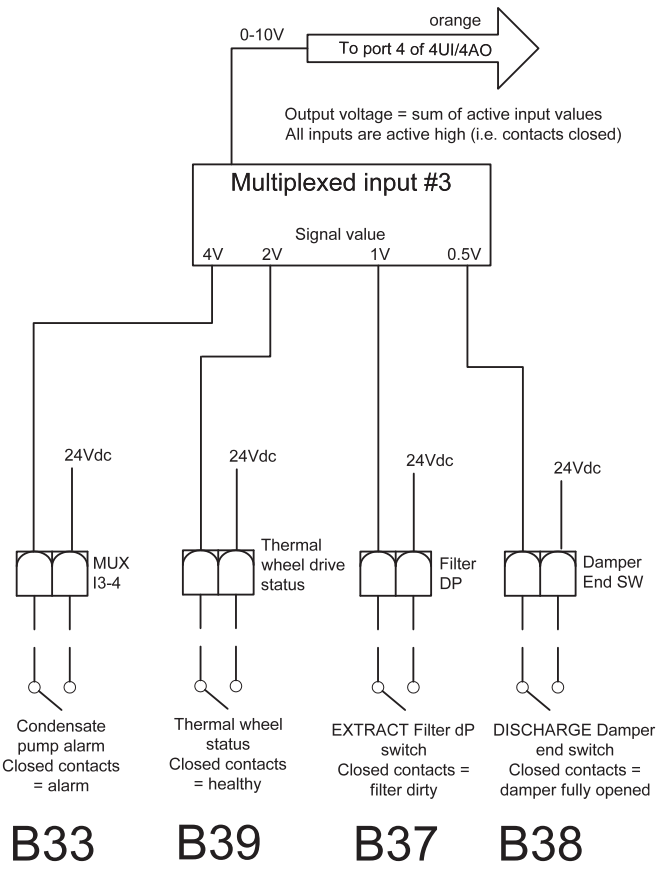
Figure 25. Extract Fan.




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

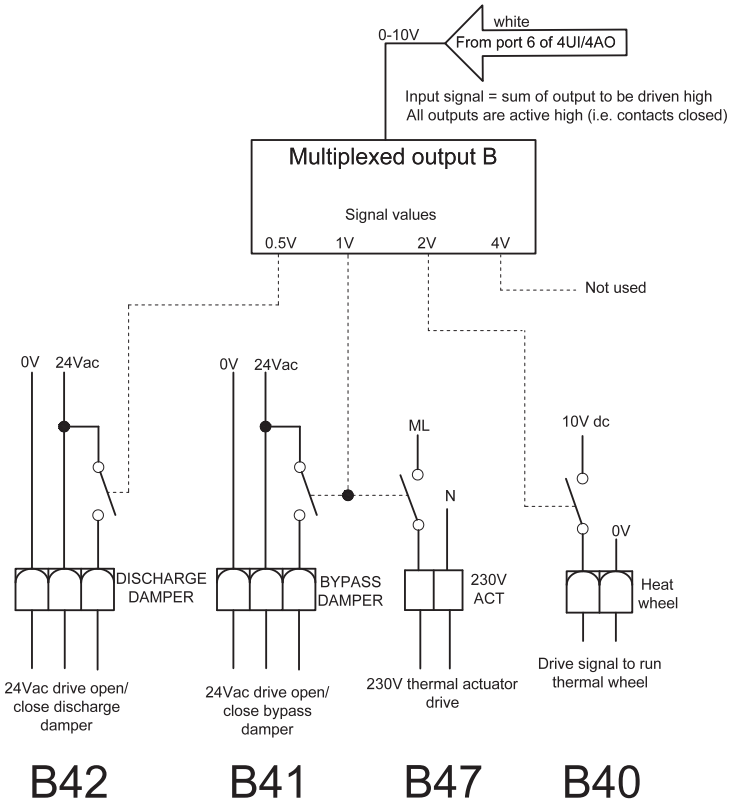
Figure 26. MUX Input 3.




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

## 8.4 NUAIRE PCB-B (EXTRACT PCB) CONNECTION SCHEMATICS

Figure 27. Mux Output B.

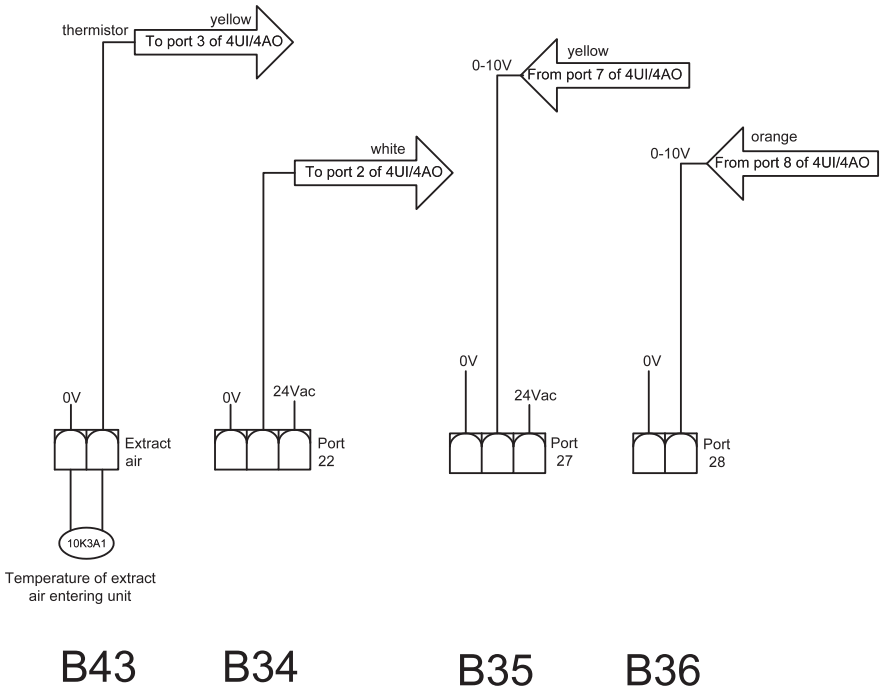



42 – 24VAC DODC actuator connection. See note 2 on page 30.

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 28. 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.

## 8.5 CONNECTION CHARTS

Figure 29. PCB-A to IQ3 Connection Chart.

| | MUX Voltage | Description | PCB-A Terminal No. | IQ3xcite/96/BAC/24 Port No. | DI | AI | DO | AO |
|---|---|---|---|---|---|---|---|---|
| | | 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 | | |
| MUX Input 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 | | | | | |
| MUX Input 2 | 4V | Pre-heater Trip | A08 | 9 | | 1 | | |
| | 2V | Re-heater Trip | A07 | | | | | |
| | 1V | Activate Freecooling | A15 | | | | | |
| | 0.5V | Activate Cooling | A14 | | | | | |
| | | 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 | | | | | |
| MUX Output A | 4V | Fault Relay | A03 | 15 | | | | 1 |
| | 2V | Frost Relay | A06 | | | | | |
| | 1V | Recirc. Damper Drive | A31 | | | | | |
| | 0.5V | Inlet Damper Drive | A30 | | | | | |
| | | Not In Use | A32 | 16 | | | | 1 |

Figure 30. PCB-B to 4UI/4AO Connection Chart.

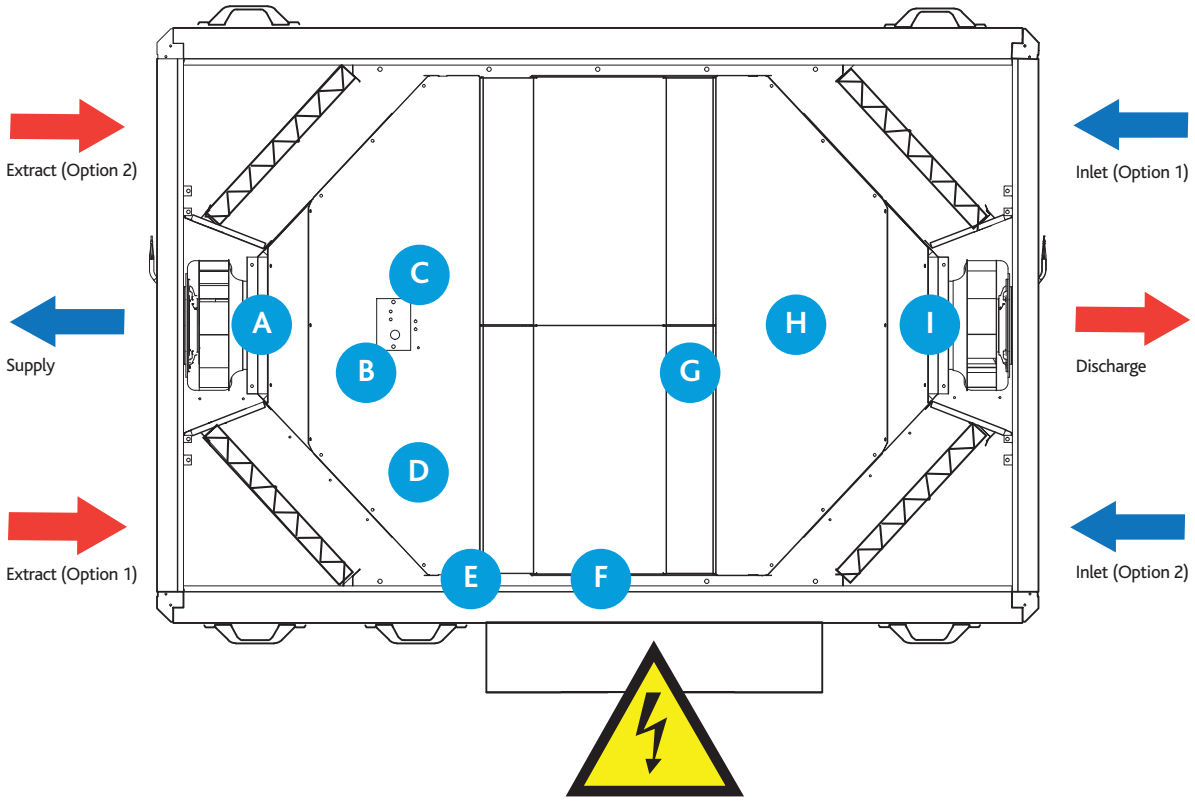
| | MUX Voltage | Description | PCB-B Terminal No. | 4UI/4AO Port No. | DI | AI | DO | AO |
|---|---|---|---|---|---|---|---|---|
| | | Extract Fan Health | B45 | 1 | 1 | | | |
| | | Not In Use | B34 | 2 | 1 | | | |
| | | Extract Air Temp | B43 | 3 | | 1 | | |
| MUX Input 3 | 4V | Condensate Pump Alarm | B33 | 4 | | 1 | | |
| | 2V | Thermal Wheel Status | B39 | | | | | |
| | 1V | Extract Filter dP Switch | B37 | | | | | |
| | 0.5V | Discharge Damper End Switch | B38 | | | | | |
| | | Extract Fan Drive | B44 | 5 | | | | 1 |
| MUX Output B | 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 |

## 8.6 NETWORK SETTINGS

**IP address is 192.168.11.12**
**Subnet mask 255.255.2555.0**
**Lan 011, node 012**

## 9.0 HARDWARE POSITIONS ON UNIT

Figure 31. XBC unit plan view.




### KEY TO HARDWARE POSITIONS

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

## 10.0 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.

## 10.1 DAMPERS

At regular intervals check that the blades move freely.

## 10.2 FILTERS (4 X G4 FITTED AS STANDARD)

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

## 10.3 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.**

## 10.4 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.**

## 10.5 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.**

## 10.6 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.**

## 11.0 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 | | ✔ |

## 12.0 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**)

## 13.0 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**

## 14.0 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 minium 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.

## NOTES

FOR MORE INFORMATION
www.nuaire.co.uk

COMMERCIAL
www.nuaire.co.uk/commercial

AIR HANDLING UNITS
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