

XBOXER

XBC 75 & 85 ECOSMART2 (NT) MODELS

INSTALLATION, CONTROL DETAILS,
OPERATING AND MAINTENANCE





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FOR XBOXER XBC 75 & 85 HORIZONTAL & VERTICAL UNITS**

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XBOXER XBC ECOSMART2 (NT) MODELS

SUPPLY & EXTRACT VENTILATION UNIT WITH HEAT RECOVERY

INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS



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

ecosmart2
POWERED BY
TREND

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

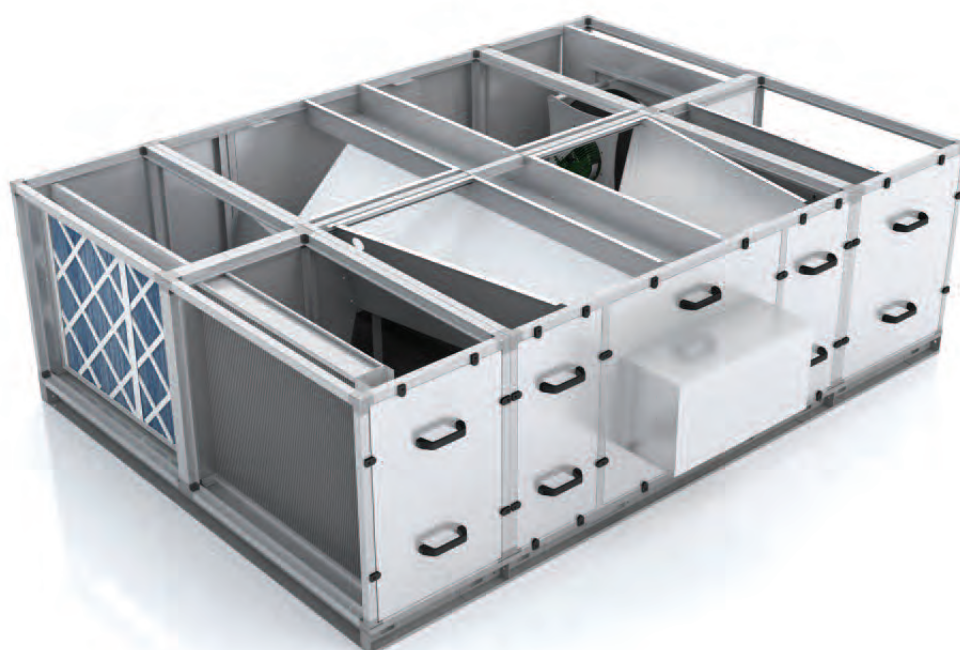
1. XBOXER XBC Range
2. Counterflow heat exchanger
3. Unit size 75 & 85
4. H = Horizontal
5. type of heater battery:
L = LPHW Heater, N = No Heater
E = Electric Heater
6. Control type:
NT = Ecosmart2 control
ES = Ecosmart control
BC = Basic control
7. R = Opposite configuration
8. WP = Weather roof factory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

CODE DESCRIPTION: MATCHED SIDE BY SIDE ATTENUATOR

XBC 75 - H - SIL900

1 2 3 4

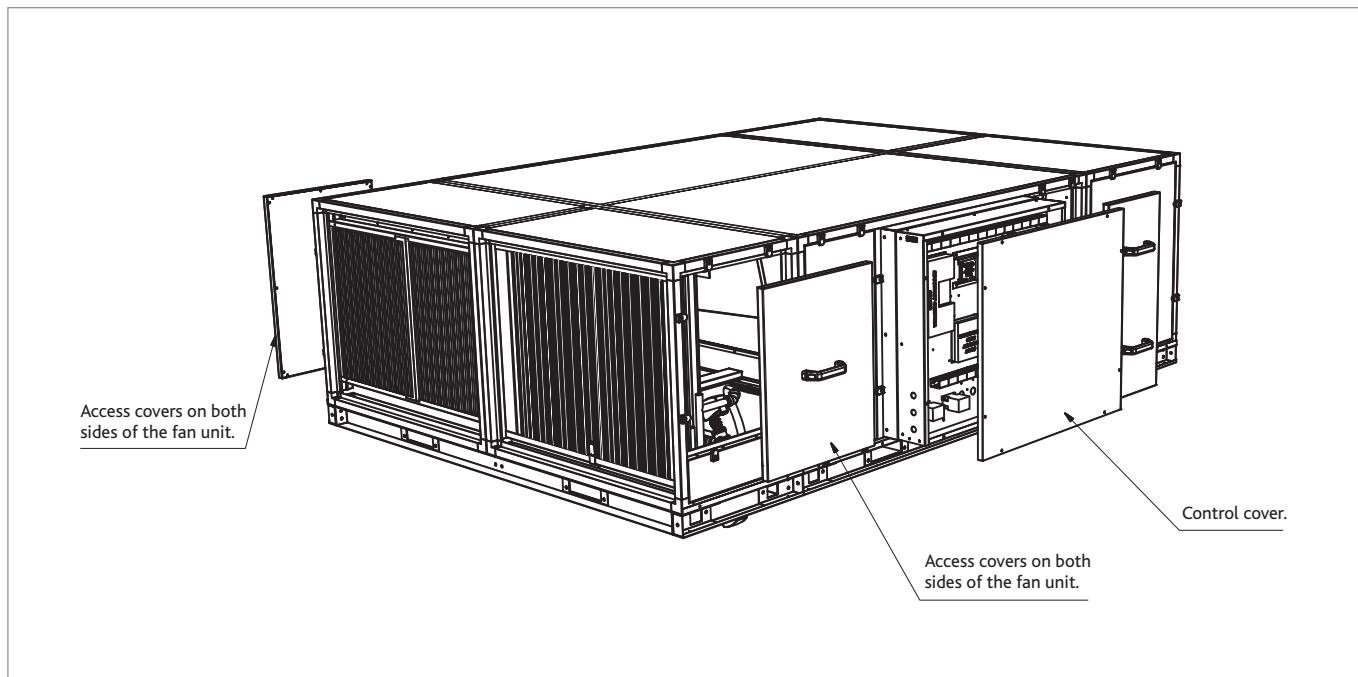
1. XBOXER XBC Range
2. Unit Size 75 & 85
3. H = Horizontal
4. Attenuator SIL900 = 900 mm length
Attenuator SIL900WP = 900 mm length with weather roof



XBOXER XBC ECOSMART2 (NT) MODELS

1.0 XBOXER XBC HORIZONTAL UNIT ACCESS

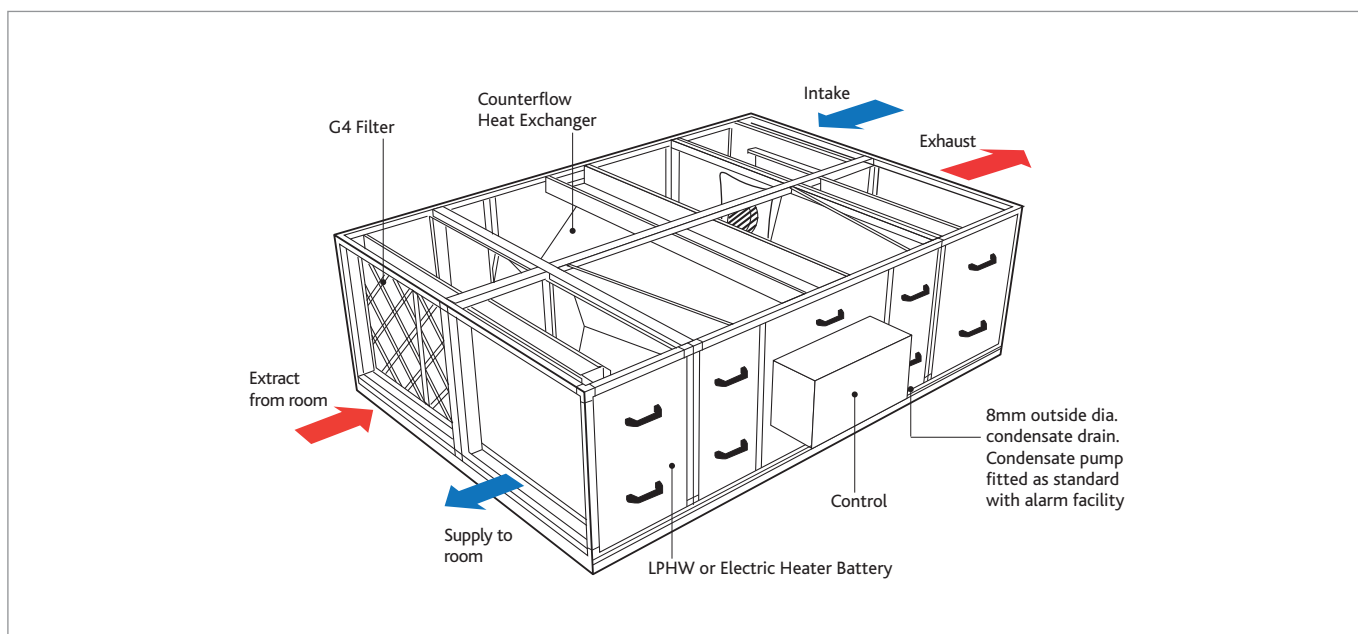
Figure 2: The unit must be installed with at least 650mm clearance from a wall / barrier to gain access from the side. Isolate before removing panels.



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.



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.

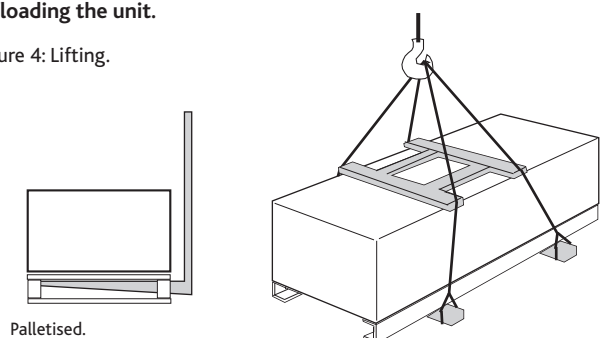
Offloading and positioning of the equipment is the responsibility of the purchaser.

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.

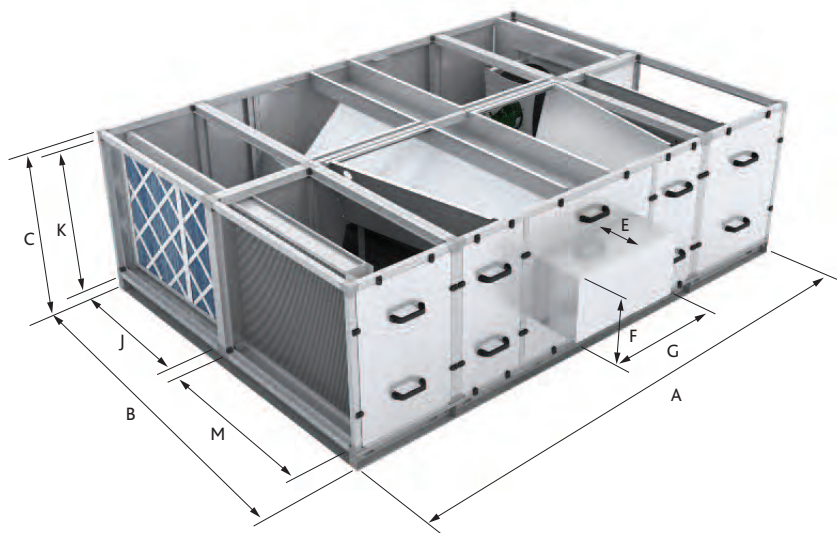
The equipment must be earthed and earth-bonded.

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

XBOXER XBC 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 ECOSMART2 (NT) MODELS

5.0 XBOXER XBC75 & 85 HORIZONTAL (NT) MOTORISED DAMPERS

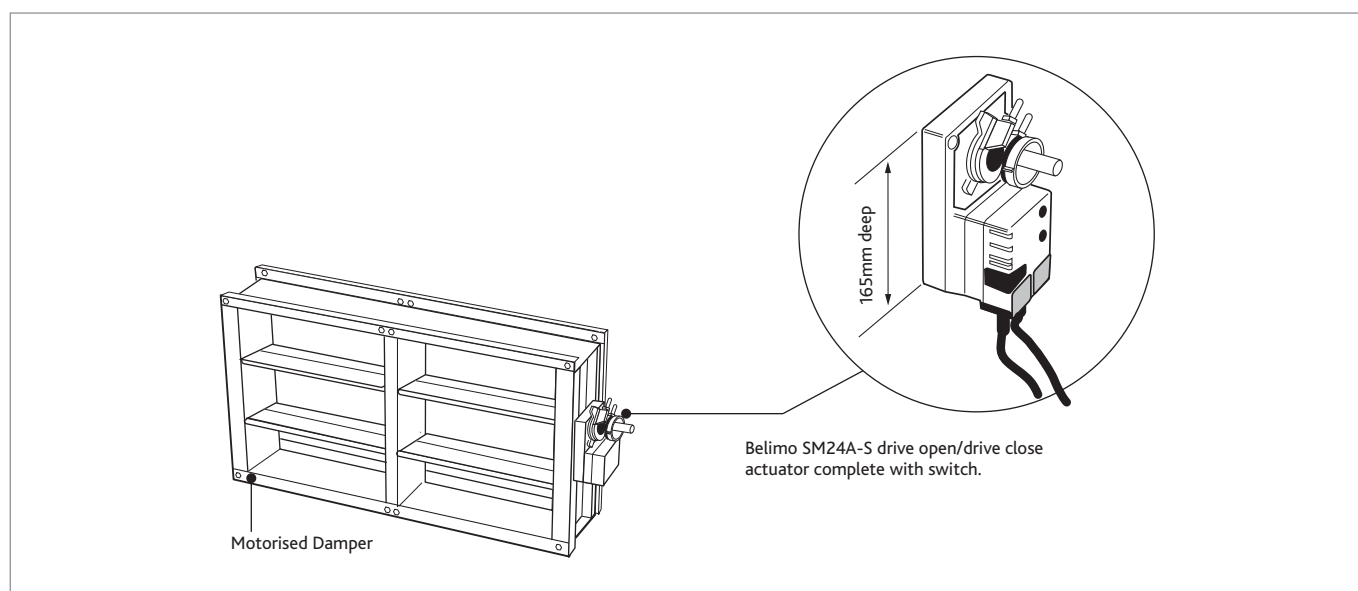
Internal version (example code: XBC75-H-MD24V).

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 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.

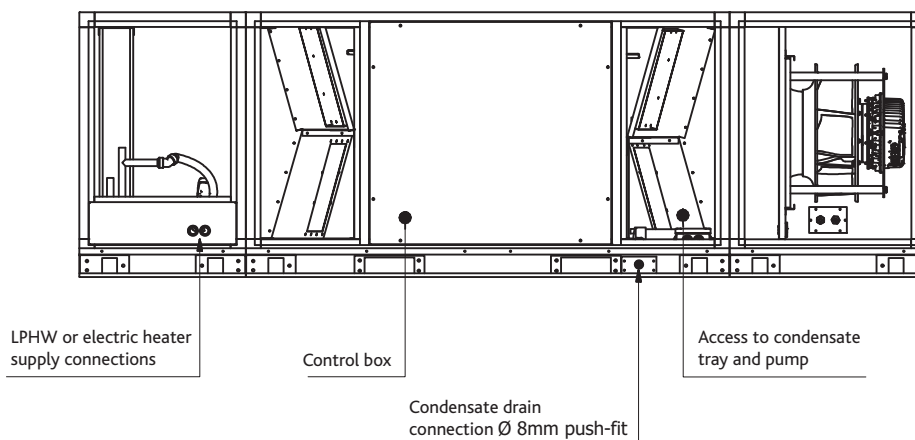
Test run motor for condition and correct rotation.

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 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

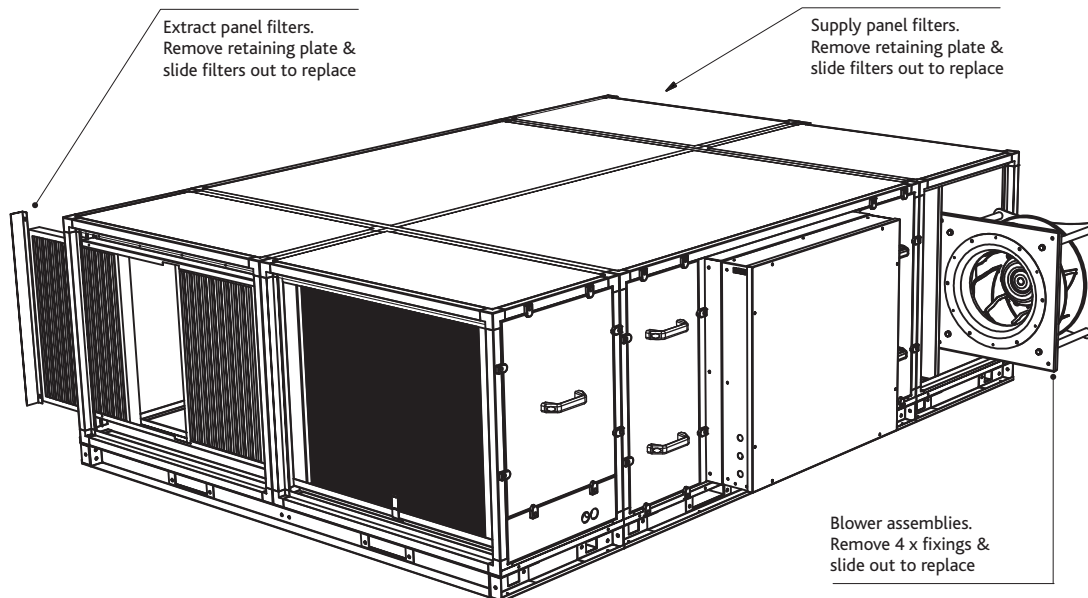
XBC85 – HORIZONTAL

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.



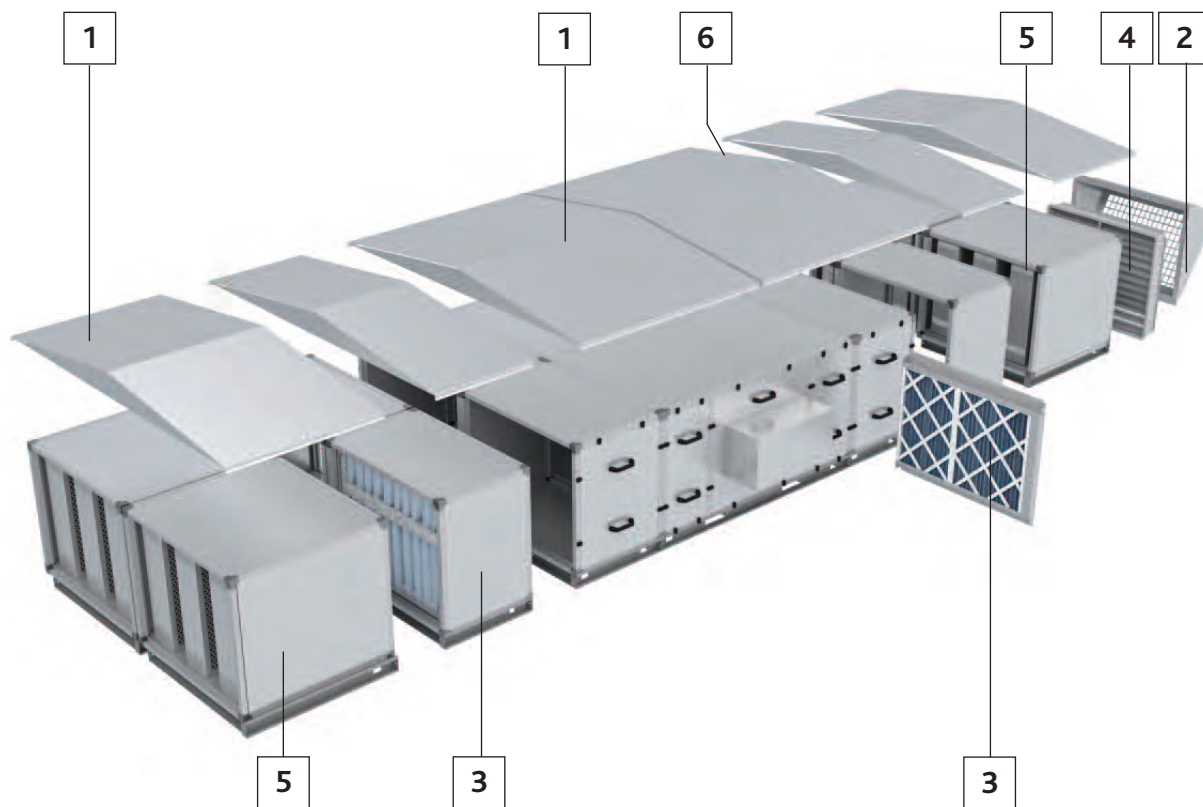
IMPORTANT

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

XBOXER XBC 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 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
	XBC75-FCE-RNT-H	Electric side by side module with base frame for Ecosmart2 control units (NT)	2000	876	600	121
	XBC85-FCE-RNT-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 Nuaire.

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



XBOXER XBC 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

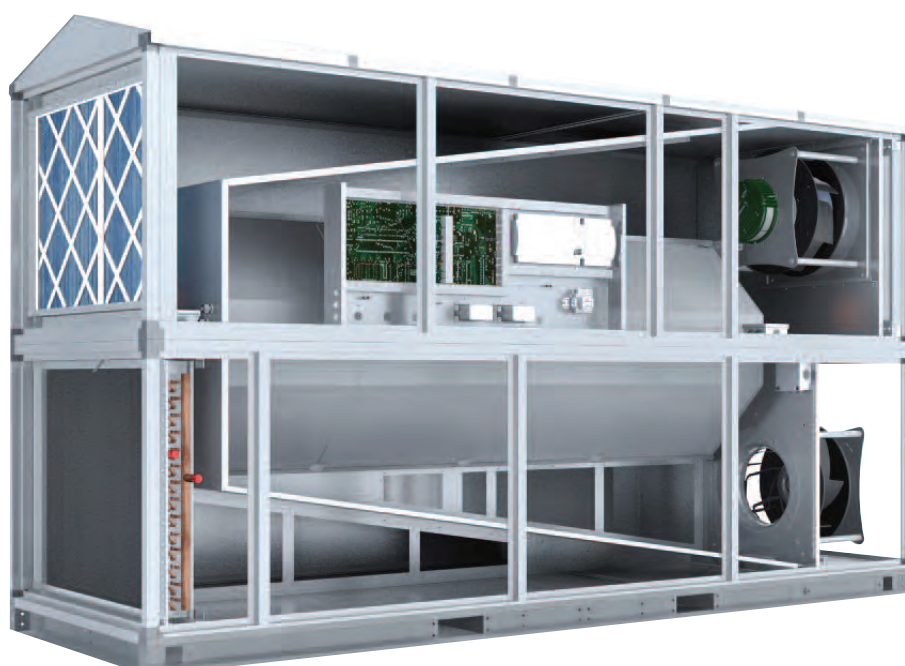
1. XBOXER XBC Range
2. Counterflow heat exchanger
3. Unit size 75 & 85
4. V = Vertical
5. type of heater battery:
L = LPHW Heater, N = No Heater
E = Electric Heater
6. Control type:
NT = Ecosmart2 control
ES = Ecosmart control
BC = Basic control
7. R = Opposite configuration
8. WP = Weather roof factory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

CODE DESCRIPTION: MATCHED DOUBLE DECK ATTENUATOR

XBC 75 - V - SIL900

1	2	3	4

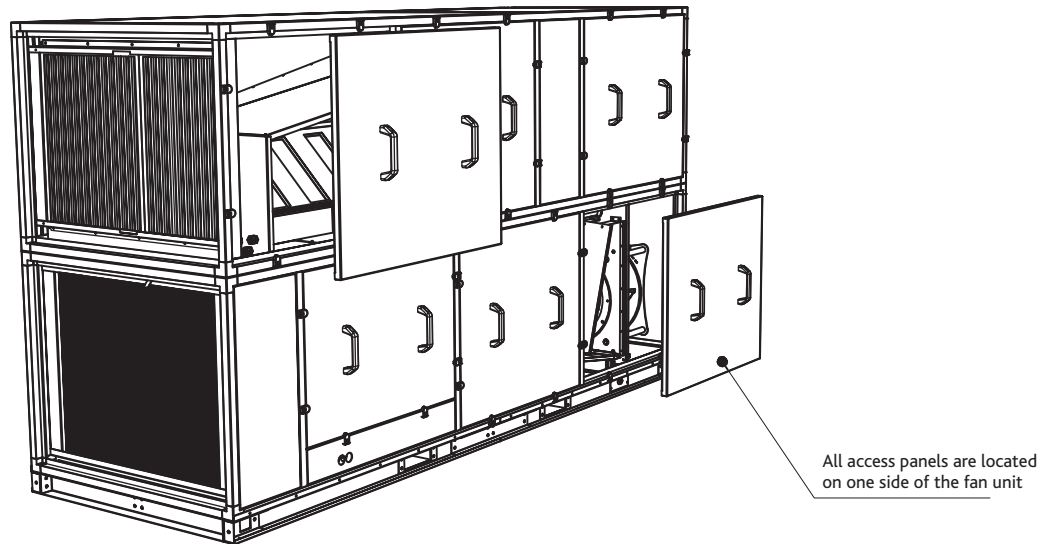
1. XBOXER XBC Range
2. Unit Size 75 & 85
3. V = Vertical
4. Attenuator SIL900 = 900 mm length
Attenuator SIL900WP = 900 mm length with weather roof



XBOXER XBC 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.**

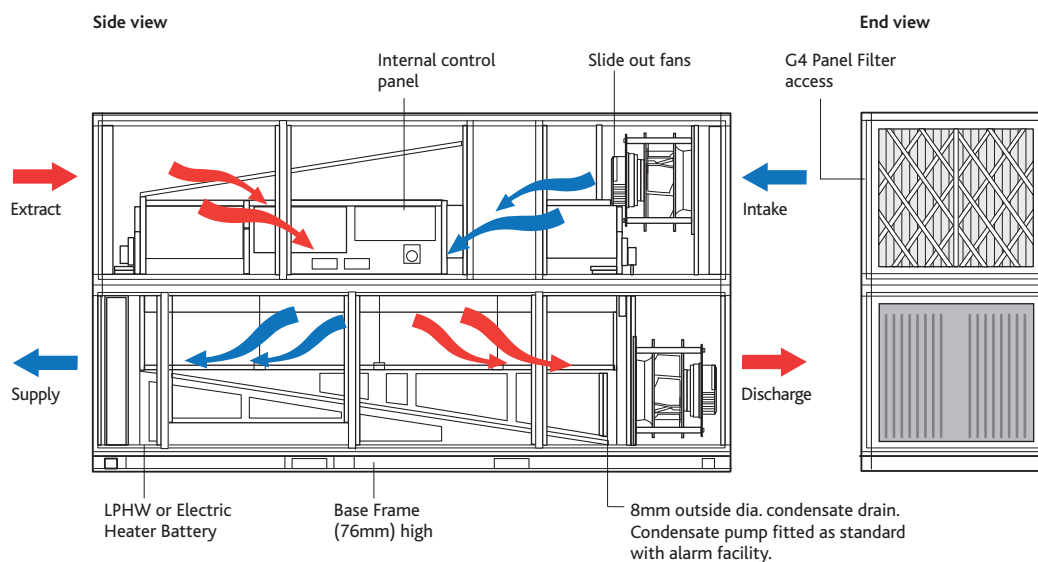


Note: Unit must be isolated before panels are removed.

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.

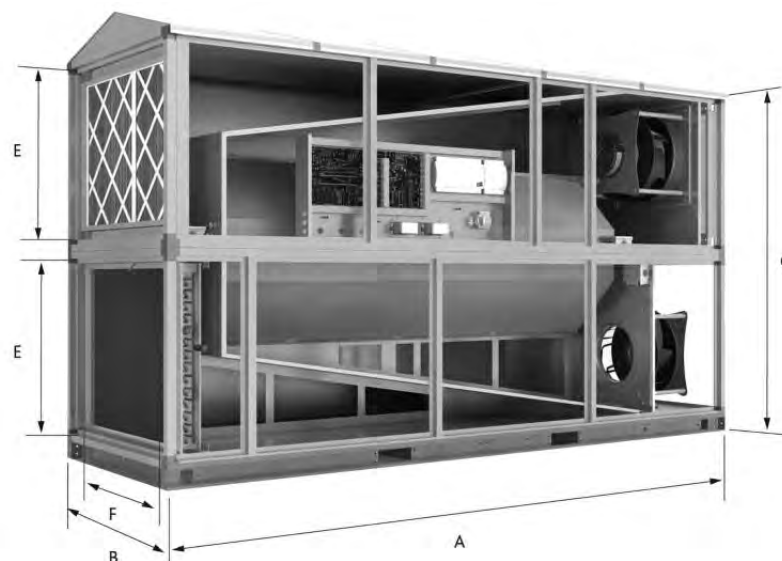
Figure 12: Vertical unit access and configuration. Standard (left hand) unit shown.



XBOXER XBC 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.

11.0 XBOXER XBC75 & 85 VERTICAL (NT) MOTORISED DAMPERS

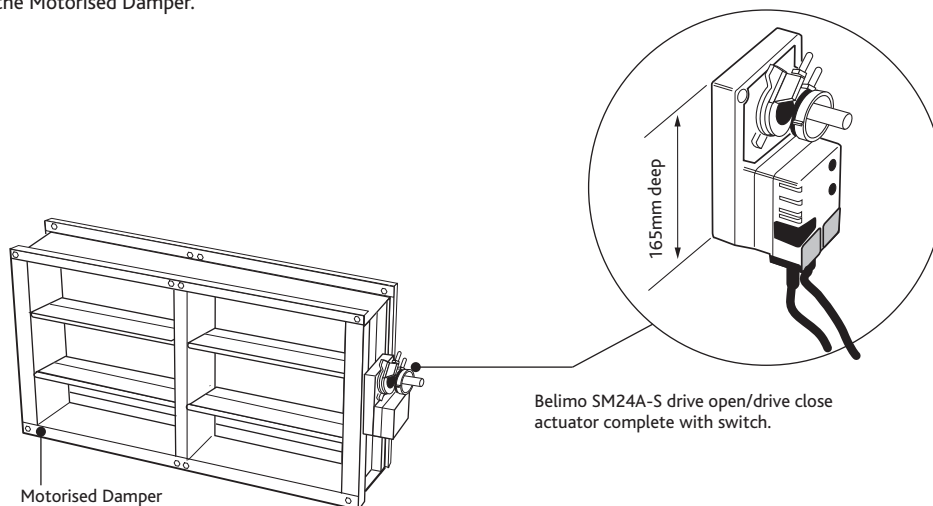
Internal version (example code: XBC75-V-MD24V).

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.



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.

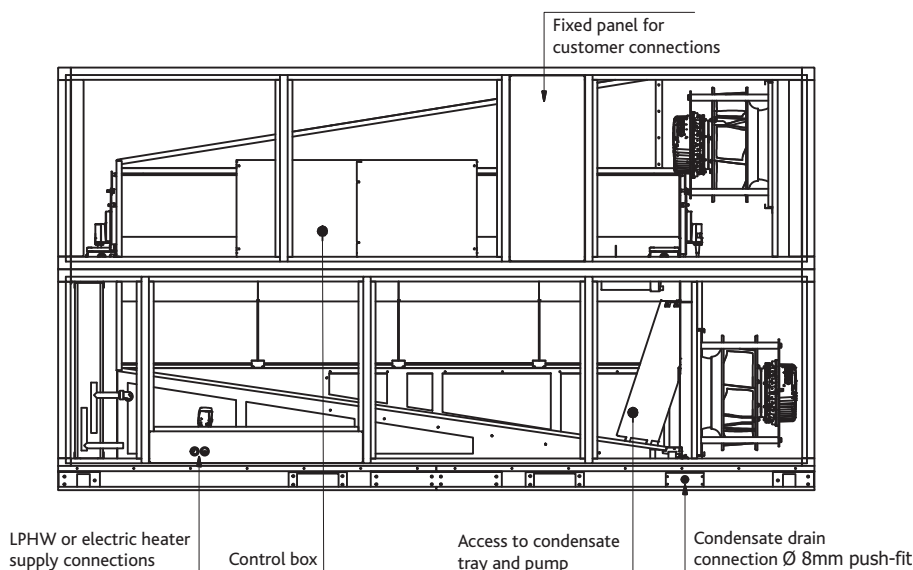
Test run motor for condition and correct rotation.

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 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

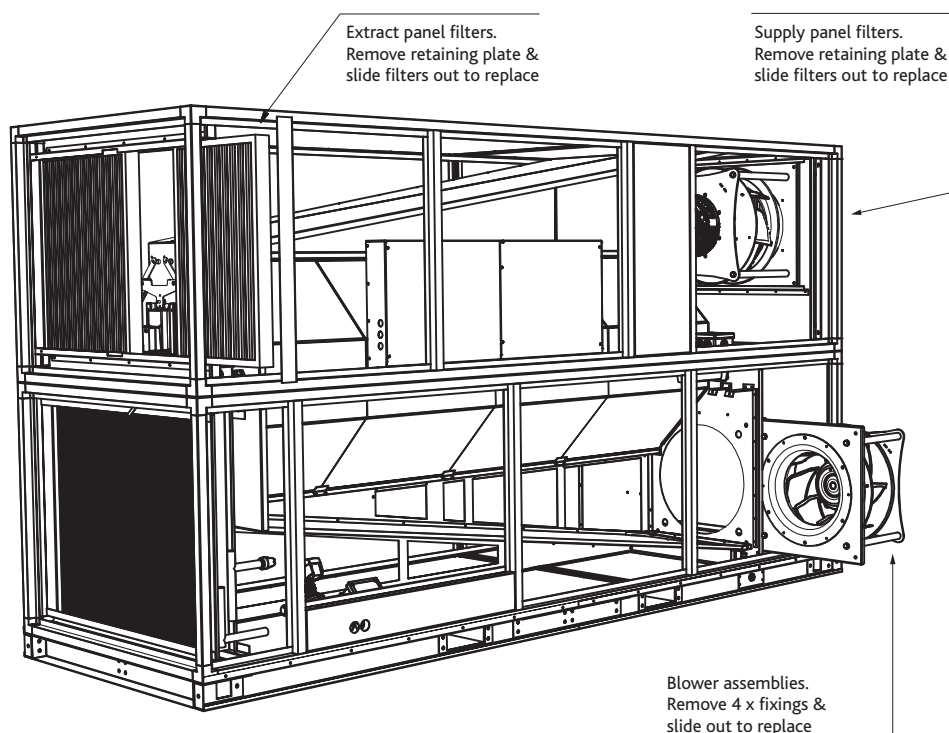
XBC85 – VERTICAL

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.



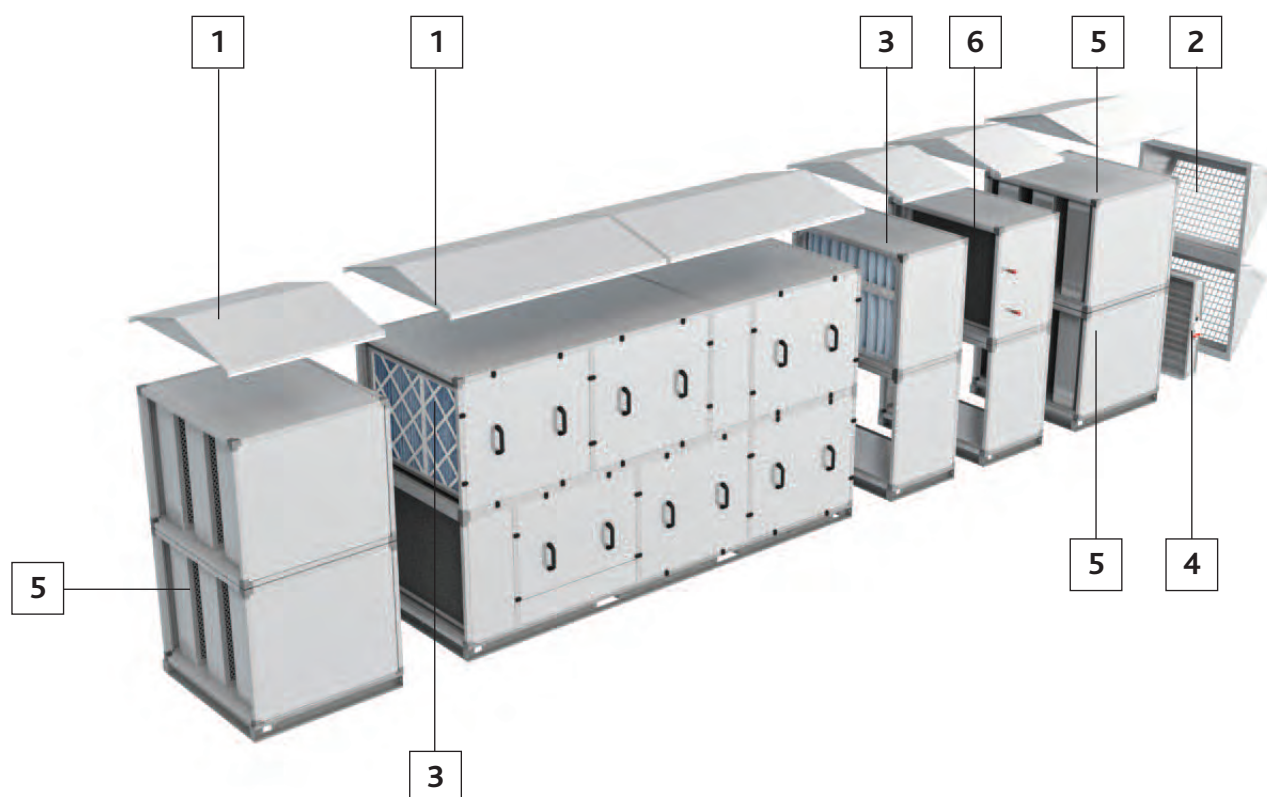
IMPORTANT

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

XBOXER XBC 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 ECOSMART2 (NT) MODELS

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

DAMPERS

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

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.



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XBOXER XBC ECOSMART2 (NT) MODELS

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.

15.1 GENERAL

The system incorporates a web enabled Trend IQ422/12/LAN/BAC/230 controller.



15.2 THE NUAIRE UNIT CONTAINS THE FOLLOWING CONTROLLABLE ITEMS:

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

15.3 ENABLE SIGNAL

The unit can be enabled via the following methods:

- Software switch (ENABLE) via SDU, IQView4, IQView8 or network.
- Switched live (230VAC) input, PIR etc.
- Low voltage contacts.
- Night cooling / summer free-cooling strategy.
- Scheduled via weekly calendar.

When the enable signal is removed, the unit will run on for a time defined by the run-on setpoint.

If an electric heater is fitted, the fans will automatically run-on for an extra 2 minutes, without heating, in order to dissipate residual heat.

15.4 OCCUPANCY CONTROL

When a Trend occupancy sensor is selected via UI4 & 5 software module, the control will look for a Trend OCC-U sensor in the appropriate input.

An occupied signal will give an enable signal.

0V = Occupied

14V = Unoccupied

15.5 BOOST

When the control receives a boost signal the fans will run at boost speed. Once the signal is removed the fans will run on for a time defined by the boost run-on setpoint.

15.6 TRICKLE MODE

When trickle mode is active, the fans will run at their minimum speed even when there is no enable signal. Heating and cooling will also function in this mode if available.

15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

The system incorporates a web enabled Trend IQ422/12/LAN/BAC/230 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).

15.7 CO₂ CONTROL

When a CO₂ sensor is selected via UI4 & 5 function knobs, and an enable signal is received, ventilation will increase to reduce CO₂ concentration the target CO₂ setpoint. The target CO₂ sensor setpoint can be changed as one of the commissioning setpoints.

15.8 SUPPLY TEMPERATURE CONTROL

While an enable signal is present, this mode modulates heating, cooling & heat exchanger bypass dampers with the aim of the supply air reaching the temperature setpoint. Please note that heating and cooling outputs will only function if the HeatingType or CoolingType setpoints are set to heating or cooling options.

15.9 FROST PROTECTION

Should the internal temperature of the unit fall below a value defined in the commissioning variables, the control will override all heating/cooling logic to open the LPHW or CW control valves, if fitted. This is to allow any protective flow through the heating/cooling coils. The supply fan will also stop and the appropriate frost protection software module will enter an alarm state. This period will last for a minimum of 5 minutes by default. The fault relay will also open. Heat and cool demand relays will not operate but digital inputs "Frost Protecting LPHW" or "Frost protecting CW" will enter an alarm state. Please note that frost protection will only function if the HeatingType or CoolingType setpoints are set to LPHW or CW.

15.10 NIGHT COOLING / SUMMER FREE COOLING

Once enabled in software, this routine uses an individual time schedule to cool the fabric of the building at night using only the external air. This mode only functions if the daytime temperature is above the setpoint, cooling is possible and if the cooling air is not too cold.

15.11 ALARMS

15.11.1 CRITICAL ALARM (LATCHING)

Once in critical alarm state the unit will drive all heating and cooling outputs to 0V. Other functions continue as normal. The critical alarm is latched and required manual reset or power cycle to clear.

Causes of critical alarm:

- Fan fail via fault circuit 1.
- Heater overtemp via fault circuit 1.

15.11.2 MAINTENANCE ALARMS (NON-LATCHING)

Once in maintenance alarm state the only action taken is de-energising of the fault relay. Once the trigger is removed, the alarm will reset automatically.

Causes of maintenance alarm:

- Condensate pump fault via alarm circuit 2 (This bypasses the heater exchanger automatically)
- Sensor Failure
- Low supply temperature, default 8°C. (This can be set to stop fans if required)
- Frost protection routine active, default 4°C (This only runs if water valves are selected as fitted)
- Excessively high supply temperature reading (this will stop heating)
- Filter fault

All alarms have a hold off period set by the setpoint "Alarm Delay".

15.11.3 THERMAL TRIP

In case of software failure, as a final resort, the electric heater is protected by a fail-safe thermal overload switch. This switch disables the heater controller once the temperature reaches 80°C. When this occurs, the critical alarm will latch in software.

Once the unit cools, the contactor will re-engage but the heater signal will remain at 0V until the critical fault is reset in software or by power cycle.

XBOXER XBC ECOSMART2 (NT) MODELS

15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

15.12 SETPOINTS

All the following are user adjustable within engineered limits:

Point Name	Description	Range	Default
ENABLE	Software enable switch	Off / On	Off
RUNONTIME	Run-on timer value	0-3600 Seconds	0
TRICKLEMODE	When On, fans will trickle even with no enable signal	Off / On	Off
SETTEMP	Desired temperature setpoint	10 to 30°C	22
DEADBAND	Dead-band for temp control	0.5°K to 10°K	3
BOOST	Software boost switch	Off/On	Off
BOOSTRUNON	Boost Run On	0-3600 Seconds	0
FROSTPROTEMP	Temperature, below which, any water valves will be overridden open	-40°C to 10°C	4
MINFROSTPROTECTPERIOD	Minimum time frost protection will be enabled	0-600 Seconds	300
DAMPERDELAY	Startup delay to allow I/O dampers to open	0-300 Seconds	0
ALARMDELAY	Alarm hold-off delay	0-20 Seconds	5
HIGHAIRTEMPALARM	High supply air temp alarm temperature	30 to 70°C	50
LOWTEMPALARM	Low supply air temp alarm temperature	-40°C to 20°C	8
FORCESTOPONLOWTEMP	Stops fans upon LOWTEMPALARM	Off/On	Off
ALARMRESET	Resets any latched alarms (Resets to Off Automatically)	Off/On	Off
SUPPLYFANMAX	Individual fan maximum speed setting	20-100%	100
SUPPLYFANMIN	Individual fan minimum speed setting. (Trickle speed)	0-100%	20
EXTRACTFANMAX	Individual fan maximum speed setting	20-100%	100
EXTRACTFANMIN	Individual fan minimum speed setting. (Trickle speed)	0-100%	20
SUPPLYFANBOOST	Supply fan boost speed	20-100%	100
EXTRACTFANBOOST	Extract fan boost speed	20-100%	100
SUPPLYFANSTARTVOLTAGE	The voltage threshold of passing 0% rotational speed	0-5V	1
EXTRACTFANSTARTVOLTAGE	The voltage threshold of passing 0% rotational speed	0-5V	1
SUPPLYFANVOLTAGELIMIT	The maximum voltage to be supplied to the fan motor	6-10V	10
EXTRACTFANVOLTAGELIMIT	The maximum voltage to be supplied to the fan motor	6-10V	10
CO2TARGET	The target setpoint for CO ₂ control	0-10000PPM	650
CO2RANGEMIN	The lower limit CO ₂ value corresponding to the limit voltage	0-10000PPM	0
CO2VOLTAGEMIN	The lower limit voltage corresponding to the limit of range	0-10VDC	0
CO2RANGEMAX	The upper limit CO ₂ value corresponding to the limit voltage	0-10000PPM	2000
CO2VOLTAGEMAX	The upper limit voltage corresponding to the limit of range	0-10VDC	10
CO2-LOOPGAIN	CO ₂ Loop Gain	0 to -30	-0.5
CO2-LOOPINTEGRAL	CO ₂ Loop Integral	0 to 30	10
CO2-LOOPDERIVATIVE	CO ₂ Loop Derivative	0 to 30	0

XBOXER XBC ECOSMART2 (NT) MODELS

15.0 DESCRIPTION OF CONTROL - UNIT CONTROLLED BY AN ECOSMART2 CONTROLLER

15.12 SETPOINTS (CONTINUED)

All the following are user adjustable within engineered limits:

Point Name	Description	Range	Default
SUMMERNIGHTFREECOOLACTIVE	Set night cooling mode as active	Off / On	0
SUMMERNIGHTFREECOOLMINTEMP	Night cooling lower cut-off temperature	5-30°C	10
SUMMERNIGHTFREECOOLFANSPEED	Night cool fan speed	20-100%	80
STC-COOLLOOPGAIN	Supply Temp Control - Cool Loop Gain	0 to -30	-5
STC-COOLLOOPINTEGRAL	Supply Temp Control - Cool Loop Integral	0 to 30	2
STC-COOLLOOPDERIVATIVE	Supply Temp Control - Cool Loop Derivative	0 to 30	0
STC-HEATLOOPGAIN	Supply Temp Control - Heat Loop Gain	0 to -30	-5
STC-HEATLOOPINTEGRAL	Supply Temp Control - Heat Loop Integral	0 to 30	2
STC-HEATLOOPDERIVATIVE	Supply Temp Control - Heat Loop Derivative	0 to 30	0
HEATINGTYPE	Heating Type 0=None, 1=LPHW, 2=Electric	0-2	0
COOLINGTYPE	Cooling Type 0=None, 1=CW, 2=DX	0-2	0
UI4FUNCTION	Input 4 Function, 0 = None, 1 = CO ₂ /T/D, 2 = Trend Occ, 3=FSC	0-3	0
UI5FUNCTION	Input 5 Function, 0 = None, 1 = CO ₂ /T/D, 2 = Trend Occ, 3=FSC	0-3	0
TACHOFITTED	Is a tacho signal monitor PCB fitted?	Off / On	Model Dependant
SOFTWAREVERSION	Shows the software number & Version	N / A	0
FANANDHEATERTEST	Factory Use Only (This resets on power cycle)	Off / On	Off
WIRINGVERIFICATION	Factory Use Only (This resets on power cycle)	Off / On	Off
FORCEOVERHEAT	Factory Use Only (This resets on power cycle)	Off / On	Off
DAMPERBYPASS	Force bypass damper into bypass mode (This resets on power cycle)	Off / On	Off
DAMPEROUTOFBYPASS	Force bypass damper out of bypass mode (Pump failure or DAMPERBYPASS switch will override this) (This resets on power cycle)	Off / On	Off
FANDAMPERTEST	Factory Use Only	Off / On	Off

XBOXER XBC 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
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
Trickle & boost switch	Y
Automatic bypass	Y
BACnet IP (Ethernet) or Trend LAN	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.



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XBOXER XBC ECOSMART2 (NT) MODELS

16.0 ELECTRICAL DETAILS

The electrical wiring must be carried out by competent persons, in accordance with good industry practice and should conform to all governing and statutory bodies i.e. IEE, CIBSE, COHSE etc.

16.1 SUPPLY

The control is powered by a 400Vac 50Hz 3 phase supply. This must be isolated local to the unit and fitted with appropriate overcurrent and fault protection.

ELECTRIC HEATER SUPPLY

For models with electric heating, the heating circuit is powered by a separate, higher current, 400VAC 3ph supply. This must be isolated local to the unit and fitted with appropriate overcurrent protection. The main supply is still required.

ELECTRICAL SUPPLY DETAILS

Unit Code	Main Circuit (FLC)	Electric Heater Circuit (FLC) (Electric Models Only*)
XBC75-H-*NT	3.5	18A
XBC75-V-*NT	3.5	18A
XBC85-H-*NT	9.5	26A
XBC85-V-*NT	9.5	26A

*Electric Heater models require two separate supplies, each with an appropriate overcurrent current protection device.

16.2 VOLT FREE CONTACTS

Note that the volt free contacts are not fused. If these are used to power any external equipment, the installer must provide adequate fusing or other protections.

These contacts are rated at 5A resistive, 0.5A inductive.

Run connections - The relay is powered when the fan is running. (These contacts are used when an I/O damper is installed. See damper section 5.2 for details)

Fault connections - No fault = the relay is powered.

Fault = the relay is unpowered.

Heat demand - the relay is powered when heating is selected.

Cool demand - the relay is powered when cooling is selected.

16.3 SWITCHED LIVE

Switch Live (SL) terminal - A signal of 100-230V a.c. will activate the switched live signal.

Switch Live 2 (SL2) terminal - A signal of 100-230V a.c. will activate the switched live 2 (Fan Boost) signal.

Note that a signal from an isolating transformer will produce an unpredictable result and is not recommended.

Volt free versions of the switched live signals are also available at terminals T33-T34 & T35-T36. Link two contacts to activate the signal.

16.4 DAMPER CONNECTIONS

A fan start delay can be imposed to allow the damper time to open. This is adjustable via display screens or commissioning tools.

If an I/O damper is fitted, it must be wired to the fan run relay, and the relay supplied with the relevant supply voltage.

See I/O Damper connection diagram for details.

16.5 NETWORK SETTINGS

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

16.0 ELECTRICAL DETAILS

16.6 CONNECTION CHART

	Description	IQ422 Terminal No.	Expansion Module Terminal No.	Din Rail Terminal No.	DI	AI	DO	AO
	Fresh Air Sensor	1 (4,5)				1		
	Supply Air Sensor	2 (6,7)				1		
	Return/Room Air Sensor	3 (8,9)		25-26		1		
	Input 4	4 (10,11)				1		
	Input 5	5 (12,13)		31-32		1		
4DIX Input	Alarm Circuit 1 (Fan, Heater)	6 (14,15)	4DIX Terminal A	27-28 (Some Models)	1			
	Alarm Circuit 2 (Pump, Filter)		4DIX Terminal B	29-30	1			
	Volt-Free Enable Input Signal		4DIX Terminal C	33-34	1			
	Volt-Free Boost Input Signal		4DIX Terminal D	35-36	1			
	Extract Fan 0-10V	7 (16,17)						1
	Supply Fan 0-10V	8 (18,19)						1
	Heat Demand 0-10V	9 (20,21)						1
	Cool Demand 0-10V	10 (22,23)						1
3RM-1 Relay Module (TRM Mode wired for binary switching)	Bypass Damper	11 (24,27)	Wired for binary switching. See 3RM Datasheet for info.				1	
	Healthy signal to Relay 4						1	
	Link from IQ422 GND to AC GND	11 (25)		23				
3RM-2 Relay Module (HRM Mode)	Volt-Free Fan Run Relay	12 (26,27)	3RM-2 Relay 1				1	
	Volt-Free Cool Demand Relay		3RM-2 Relay 2				1	
	Volt-Free Heat Demand Relay		3RM-2 Relay 3				1	
	230V Enable Input			10	1			
	230V Fan Boost Input			11	1			
	Volt-Free Healthy Relay			13-14			1	

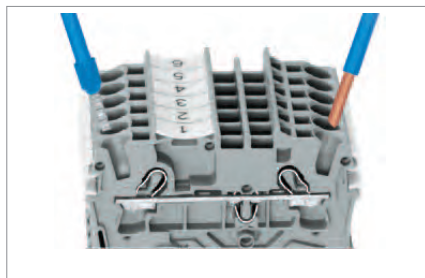
XBOXER XBC ECOSMART2 (NT) MODELS

16.0 ELECTRICAL DETAILS

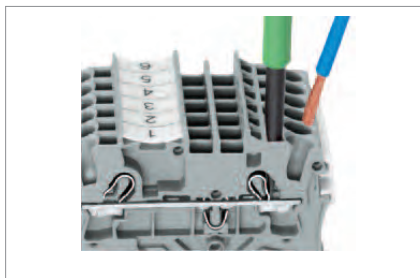
16.7 TERMINALS - WIRE CONNECTIONS

Figure 18: This control unit utilises WAGO's CAGE CLAMP® S terminal blocks, allowing for quick and easy connection.

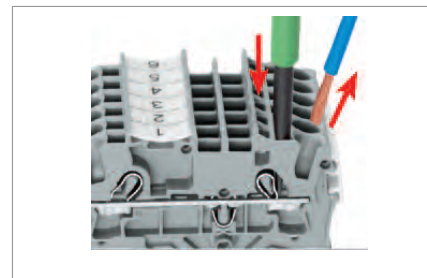
PUSH IN TERMINATION - Stripped solid conductors, fine-stranded conductors with ferrules, or ultrasonically "bonded" conductors are simply pushed in until they hit the backstop. No tool required.



TERMINATION OF FINE-STRANDED CONDUCTORS - Open the clamp by inserting an operating tool (as shown below) until it clicks into position. Then insert the conductor and remove the operating tool to complete the connection.



CONDUCTOR REMOVAL - Insert an operating tool in to the operating slot to remove the conductor, just like the original CAGE CLAMP® terminal blocks.



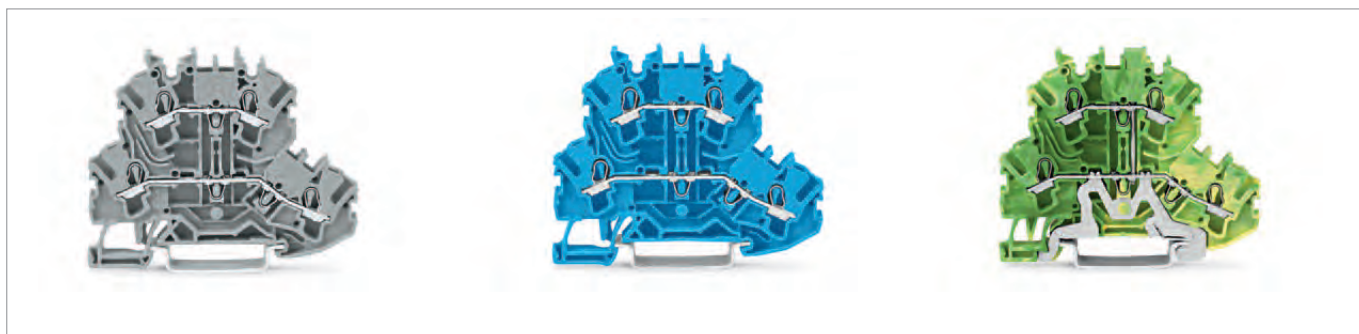
JUMPERS - Terminal blocks can be commoned together to increase the number of terminals at the same potential using push-in jumpers. In these cases the terminals are treated as one conductor.



JUMPER REMOVED - Insert the operating tool blade between the jumper and the partition wall of the dual jumper slots, then lift up the jumper.



DOUBLE DECK TERMINAL BLOCK - Each deck has a different potential (2-conductor), which creates a space saving on the rail. Decks can be commoned to adjacent terminal blocks and/or the top to the bottom deck.



EARTH TERMINAL BLOCKS - The earth terminal block (green/yellow) has a direct electrical connection to the DIN rail, with the earthing foot (earth connection only).

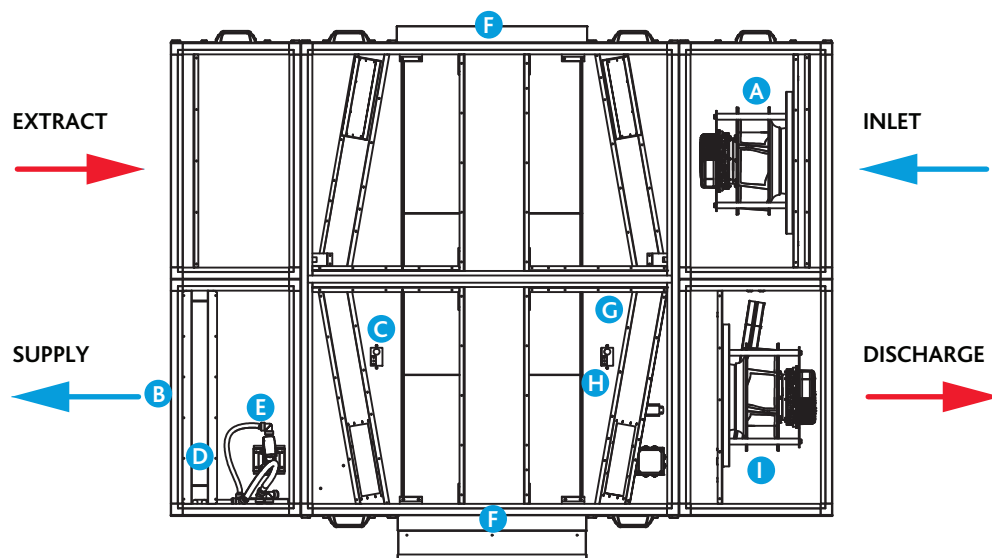


FUSE TERMINALS - Replaceable cartridge fuses are housed in quick release fuse terminals.

XBOXER XBC ECOSMART2 (NT) MODELS

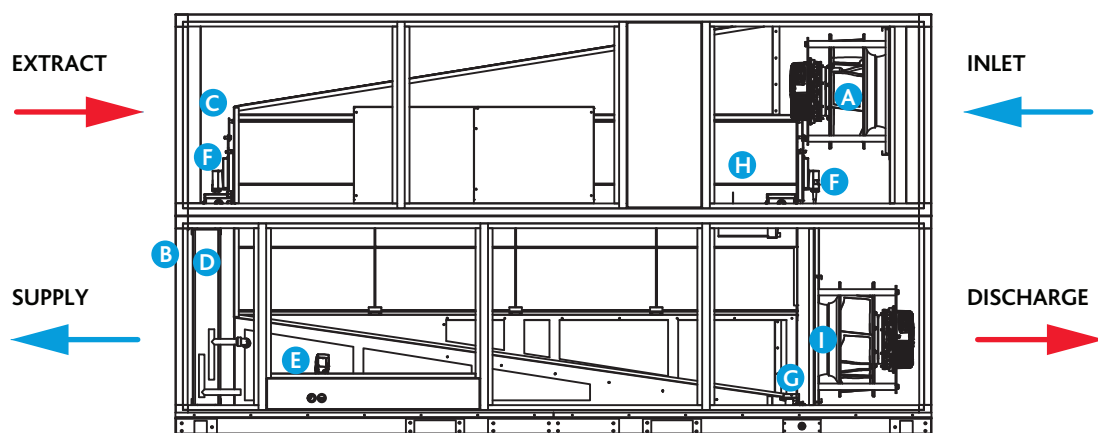
17.0 HARDWARE POSITIONS ON HORIZONTAL UNIT

Figure 19a. XBC unit plan view.



17.1 HARDWARE POSITIONS ON VERTICAL UNIT

Figure 19b. XBC unit side view.



KEY TO HARDWARE POSITIONS

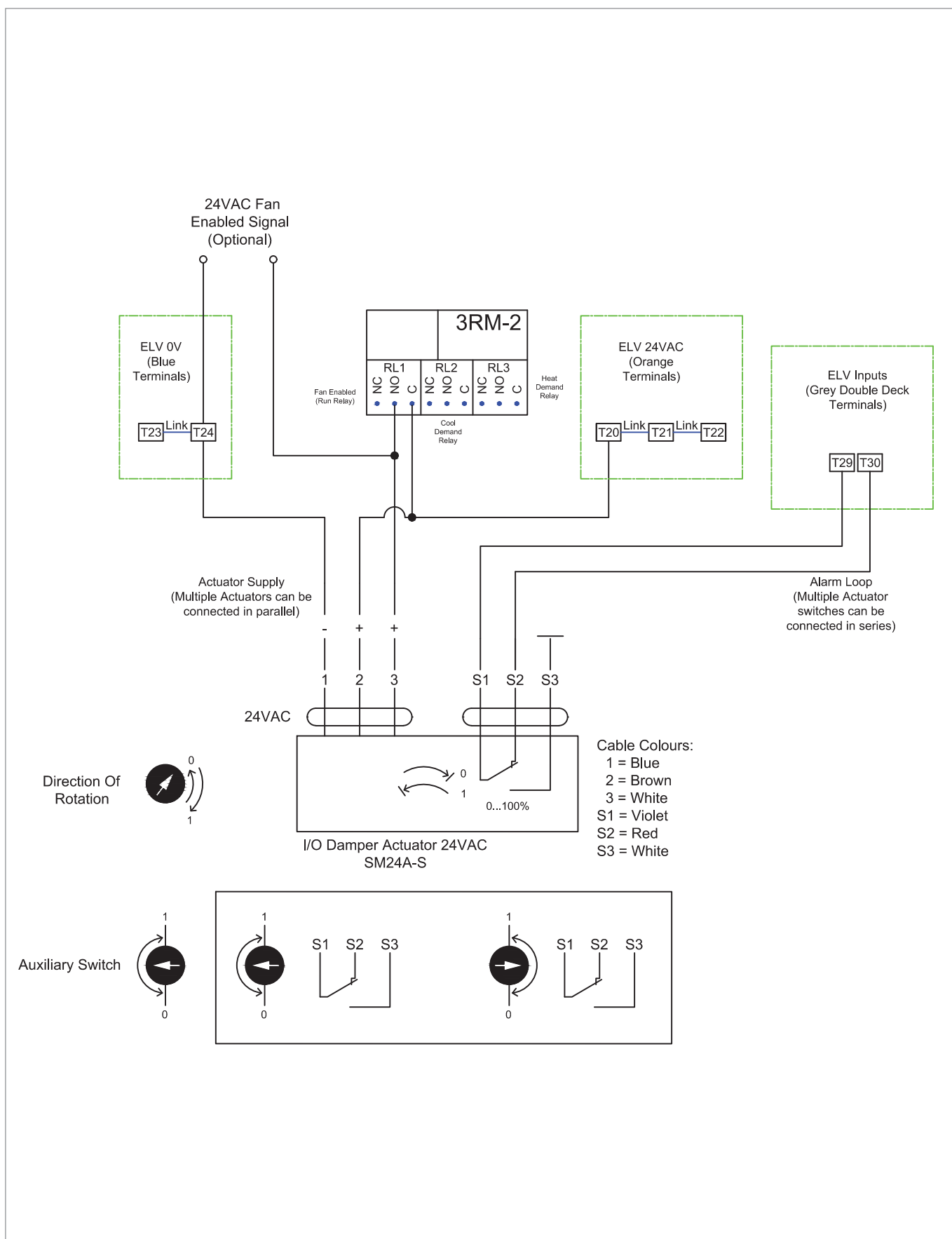
- | | |
|---|--|
| A) Supply fan (drive & health) | E) LPHW re-heat drive (LPHW models only) |
| B) Delivery air temperature sensor | F) Bypass damper drive |
| C) Extract air temperature sensor | G) Condensate pump alarm |
| D) Re-heater trip (electric heater models only) | H) Fresh air temperature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

XBOXER XBC ECOSMART2 (NT) MODELS

18.0 DIAGRAMS

18.1 I/O DAMPER CONNECTION 24V ACTUATOR VERSION (XBC75 & 85-MD-NT)

Figure 20:

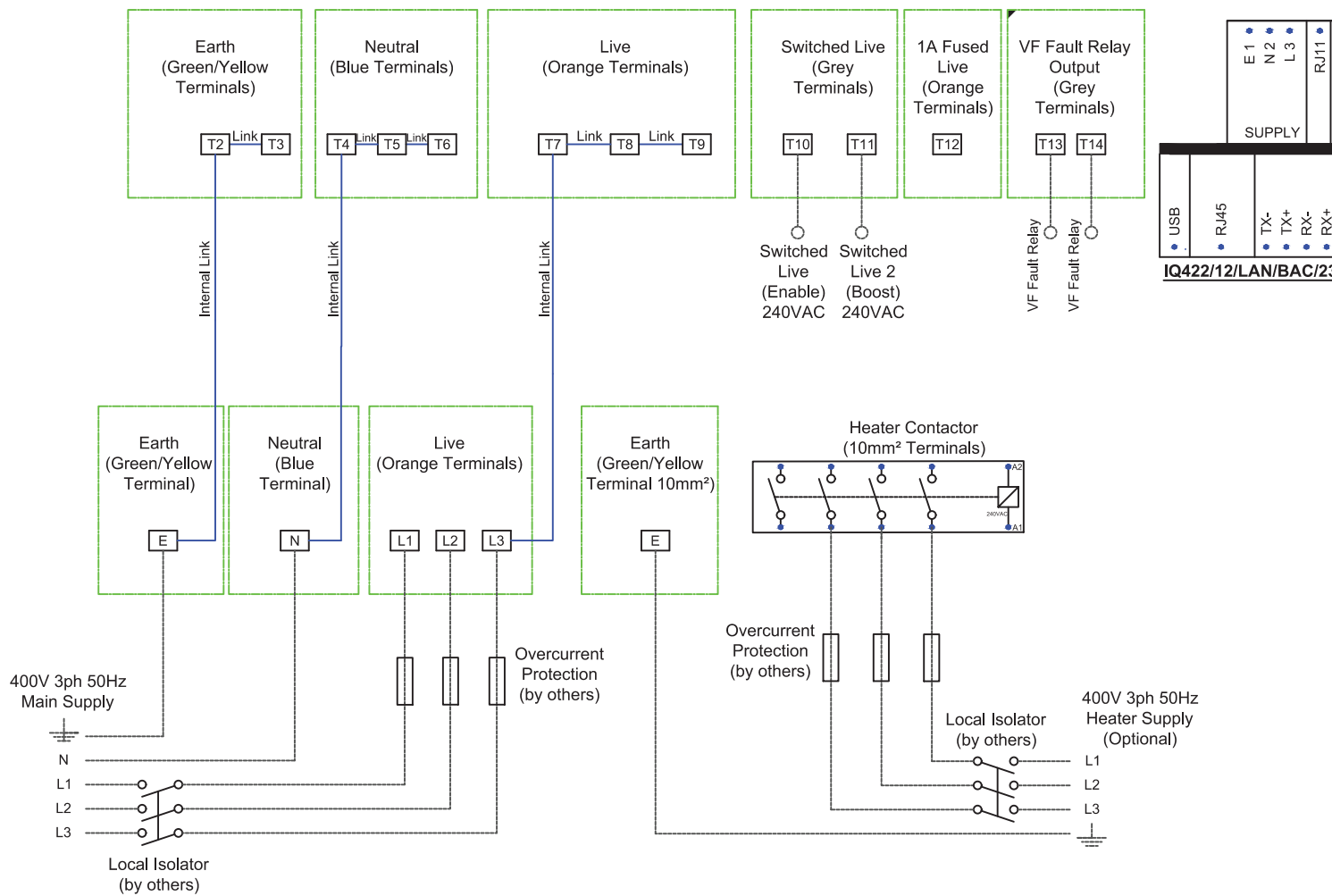


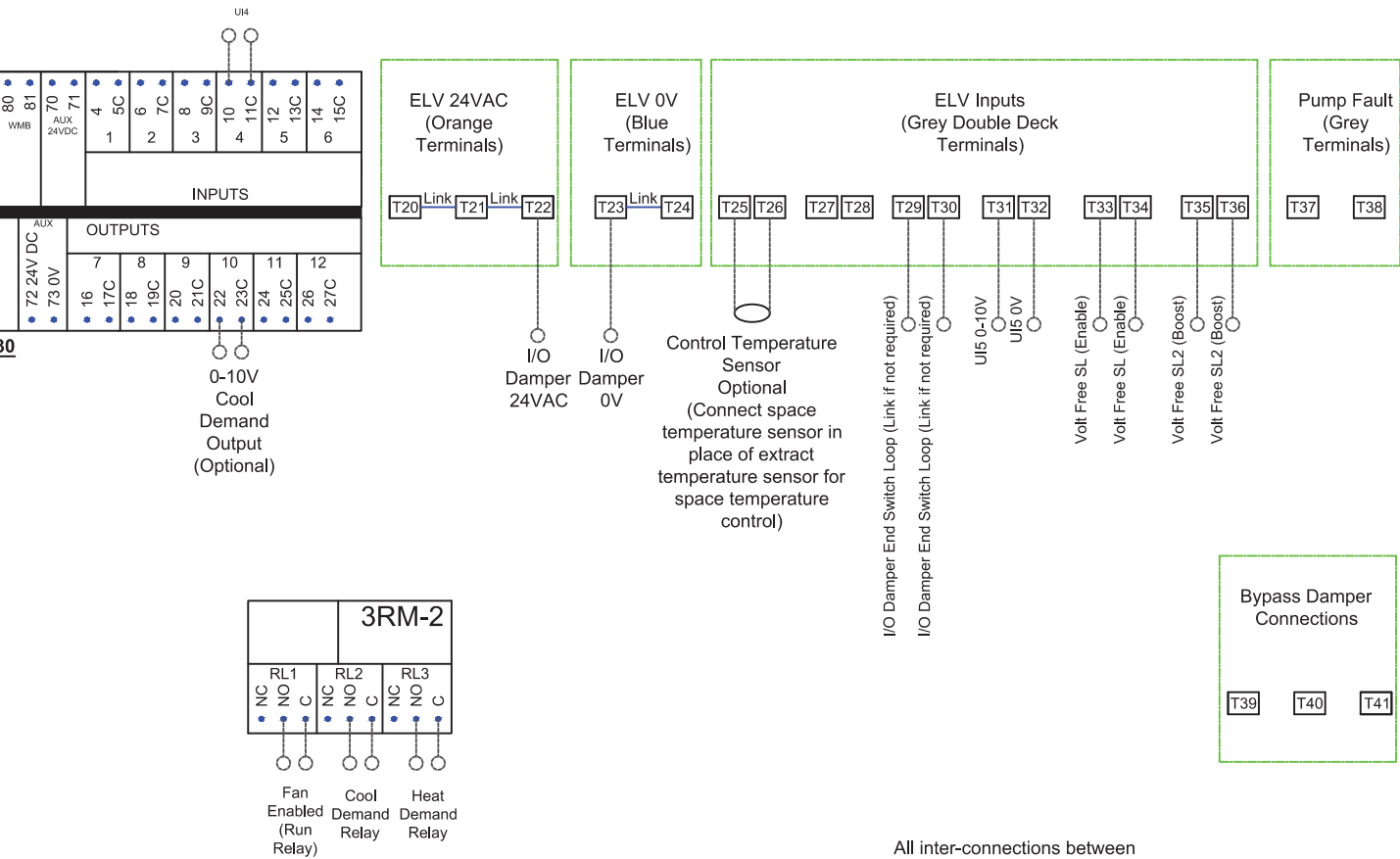
XBOXER XBC ECOSMART2 (NT) MODELS

18.0 DIAGRAMS

18.2 BASIC CONNECTION DIAGRAM

Figure 21:





All inter-connections between circuit boards are made at the factory. This diagram only shows the essential field wiring points for clarity.

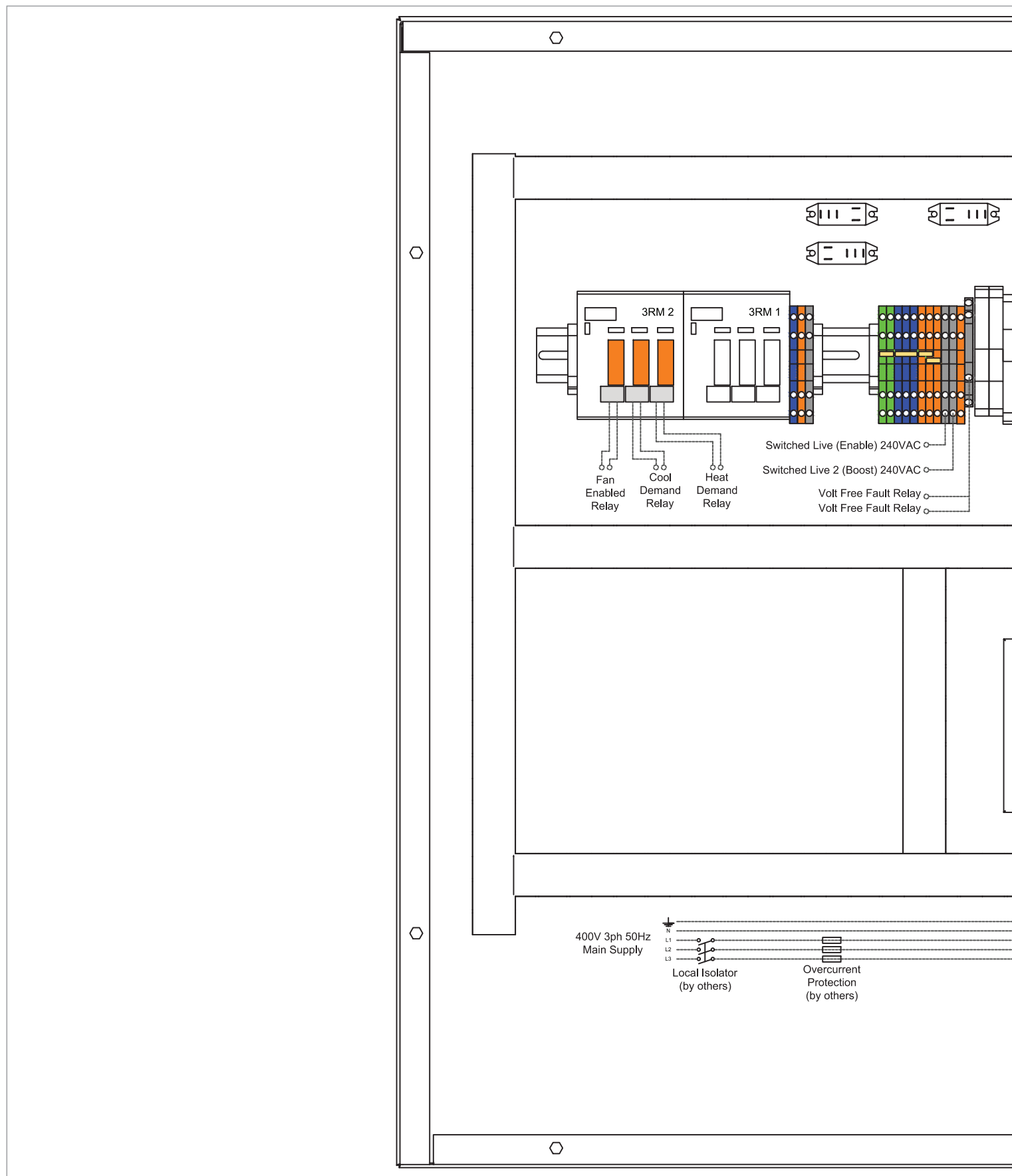


XBOXER XBC ECOSMART2 (NT) MODELS

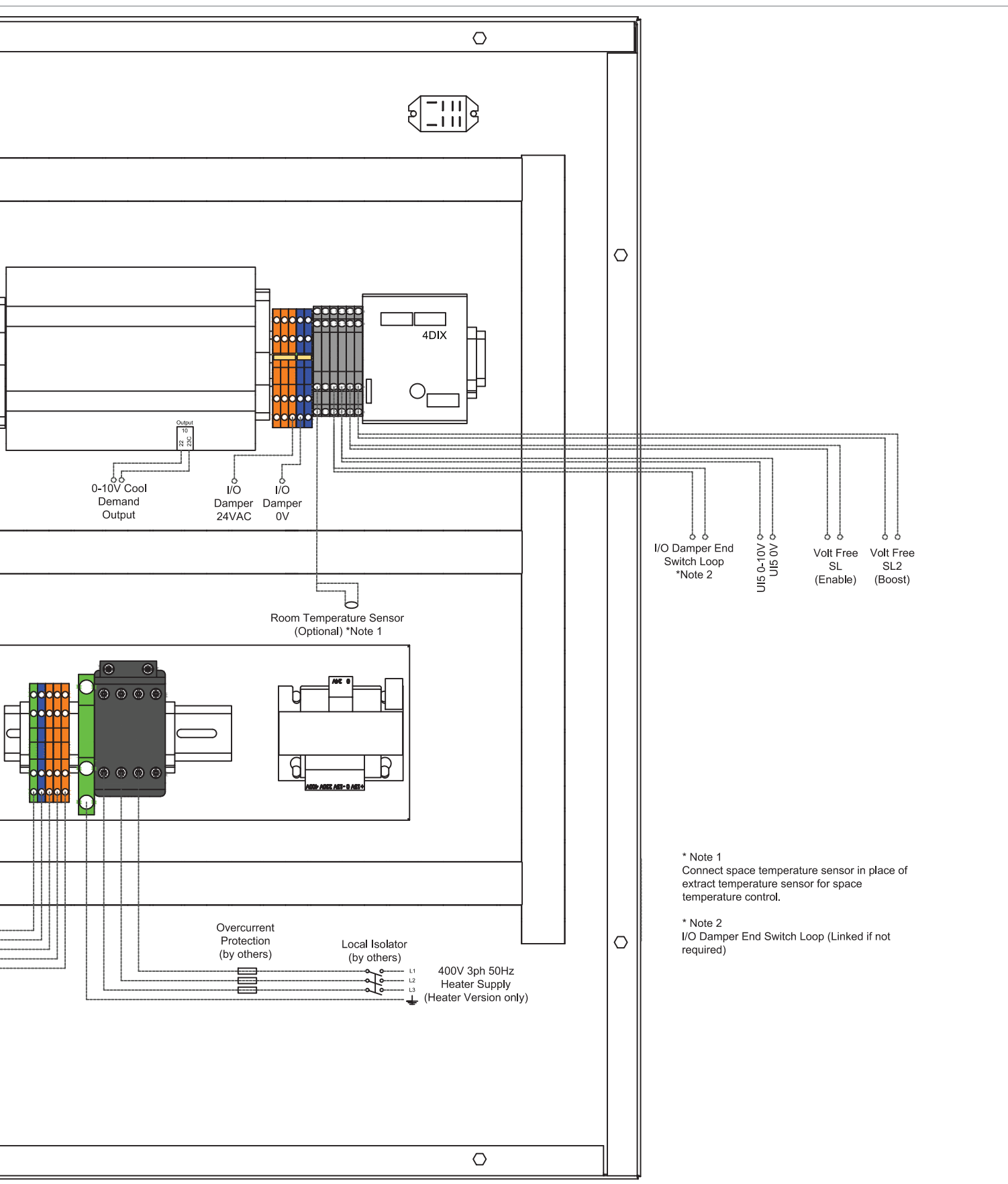
18.0 DIAGRAMS

18.3 PHYSICAL LAYOUT, HORIZONTAL

Figure 22:



XBOXER XBC ECOSMART2 (NT) MODELS

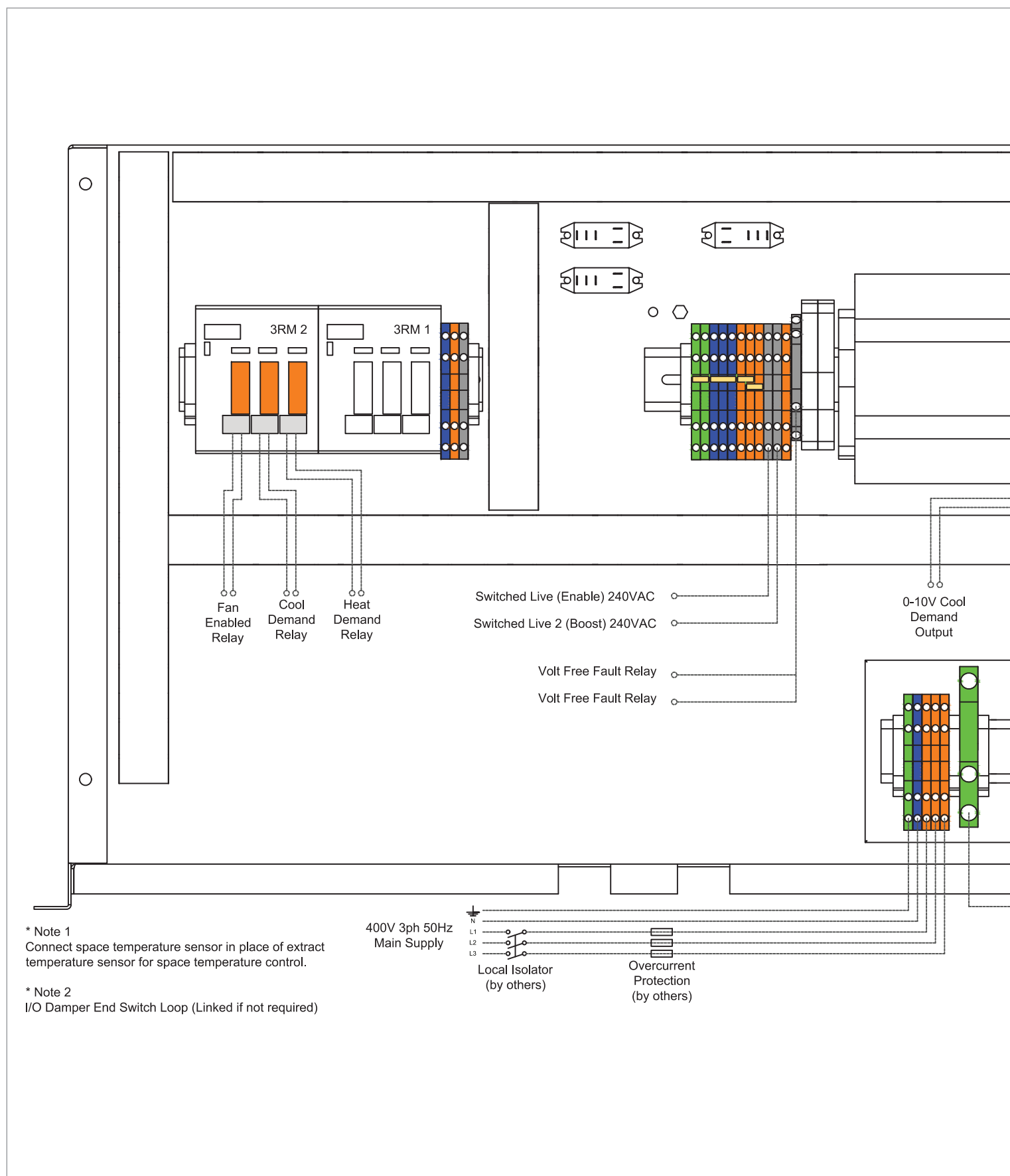


XBOXER XBC ECOSMART2 (NT) MODELS

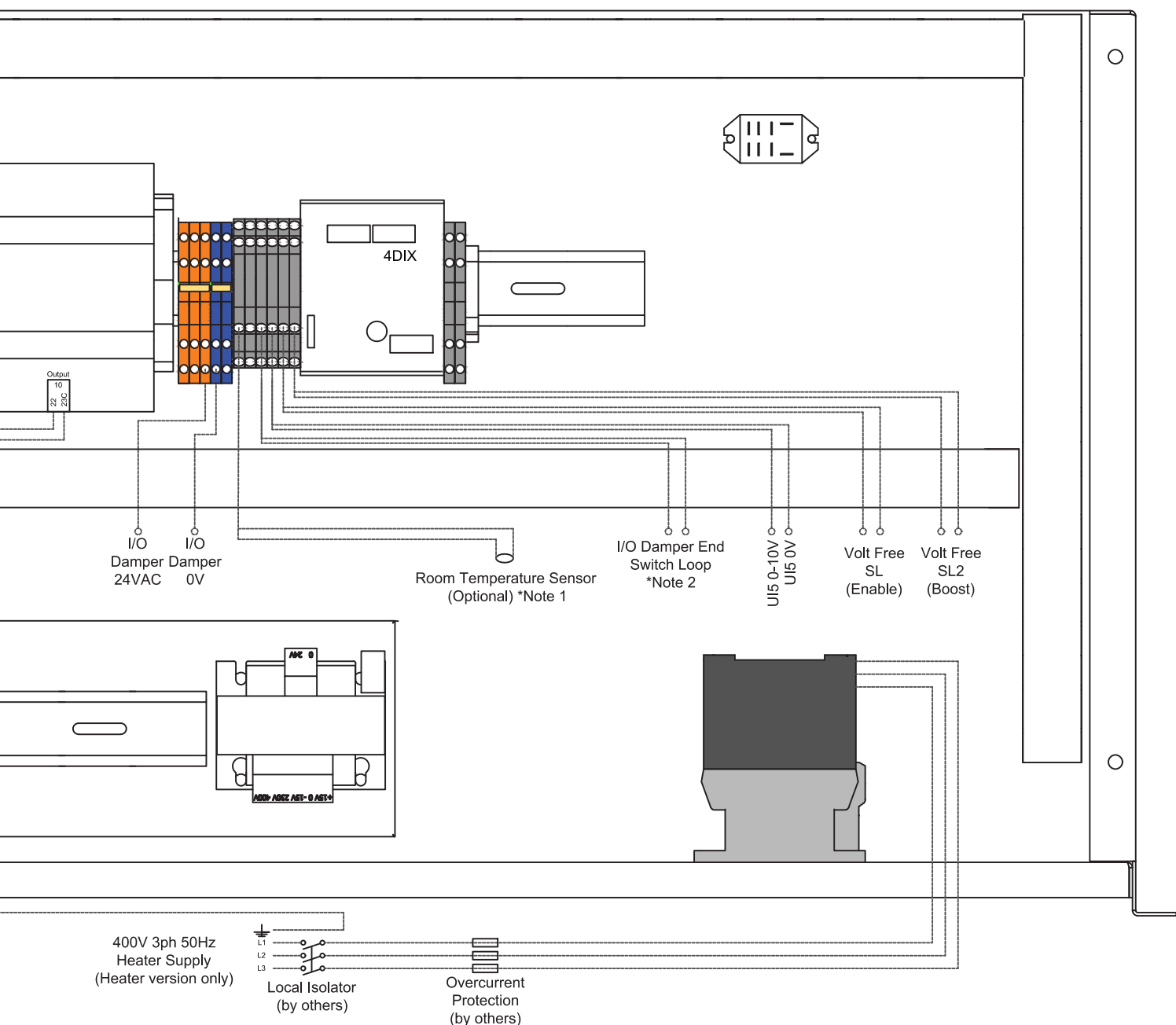
18.0 DIAGRAMS

18.4 PHYSICAL LAYOUT, VERTICAL

Figure 23:



XBOXER XBC ECOSMART2 (NT) MODELS



XBOXER XBC ECOSMART2 (NT) MODELS

18.0 DIAGRAMS

18.5 XBC75-85 WIRING (NO HEATER / LPHW HEATER)

Figure 24:

Key:

Internal Factory Connection
Optional External Connection

A1 : 24VAC Bypass Damper Actuator
A2 : 24VAC Bypass Damper Actuator
A7 : Inlet/Outlet Dampers (Optional)

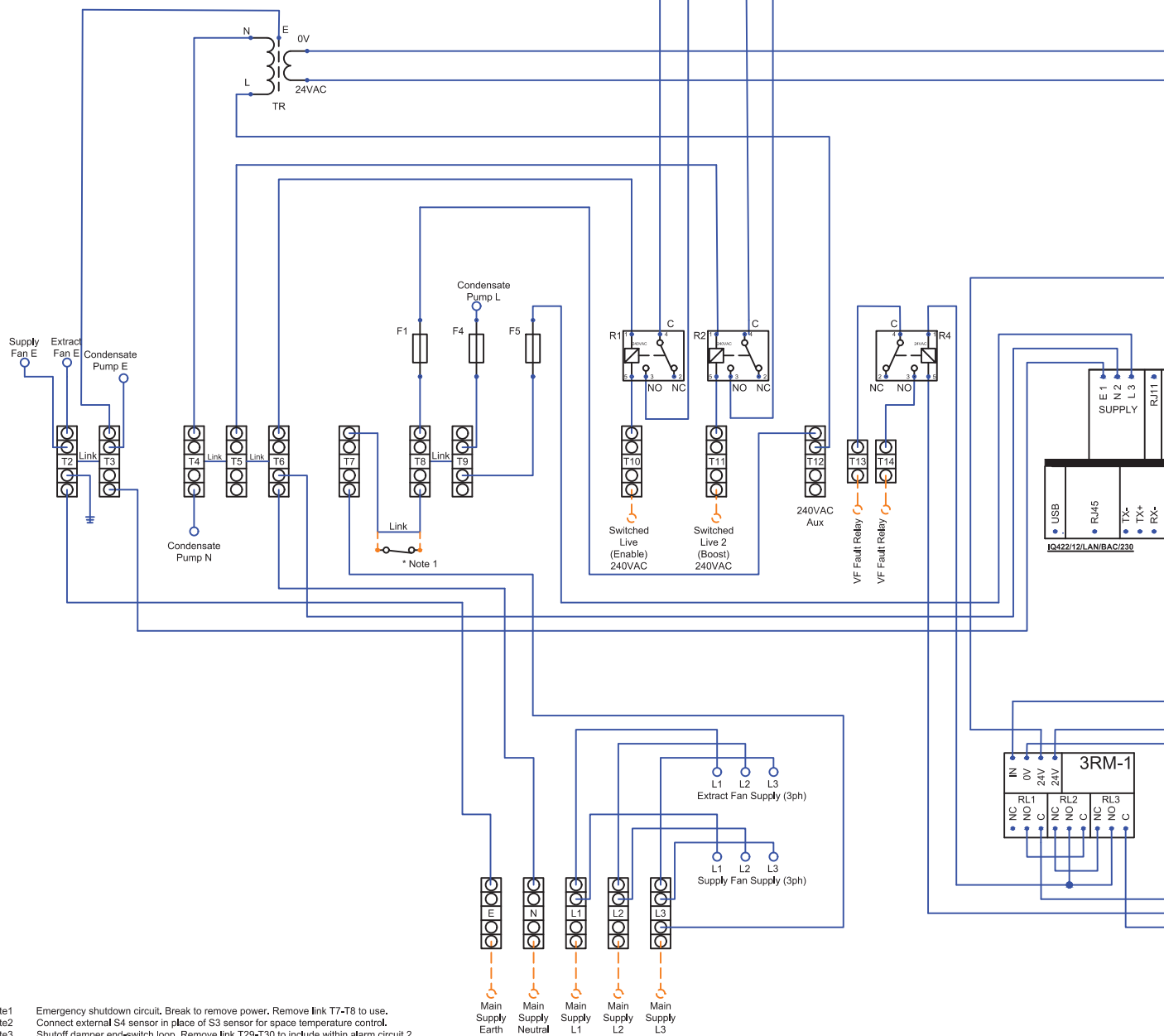
F1 : Auxiliary Fuse 1A 6,3x32mm
F4 : Condensate Pump Fuse 1A 6,3x32mm
F5 : Controller Fuse 5A 6,3x32mm
F6 : ELV Fuse 1,6A 6,3x32mm

R1 : 240VAC Switched Live Input SPDT
R2 : 240VAC Switched Live 2 (Boost) Input SPDT
R3 : 24VAC Condensate Pump Alarm DPDT
R4 : 24VAC Fault Relay SPDT

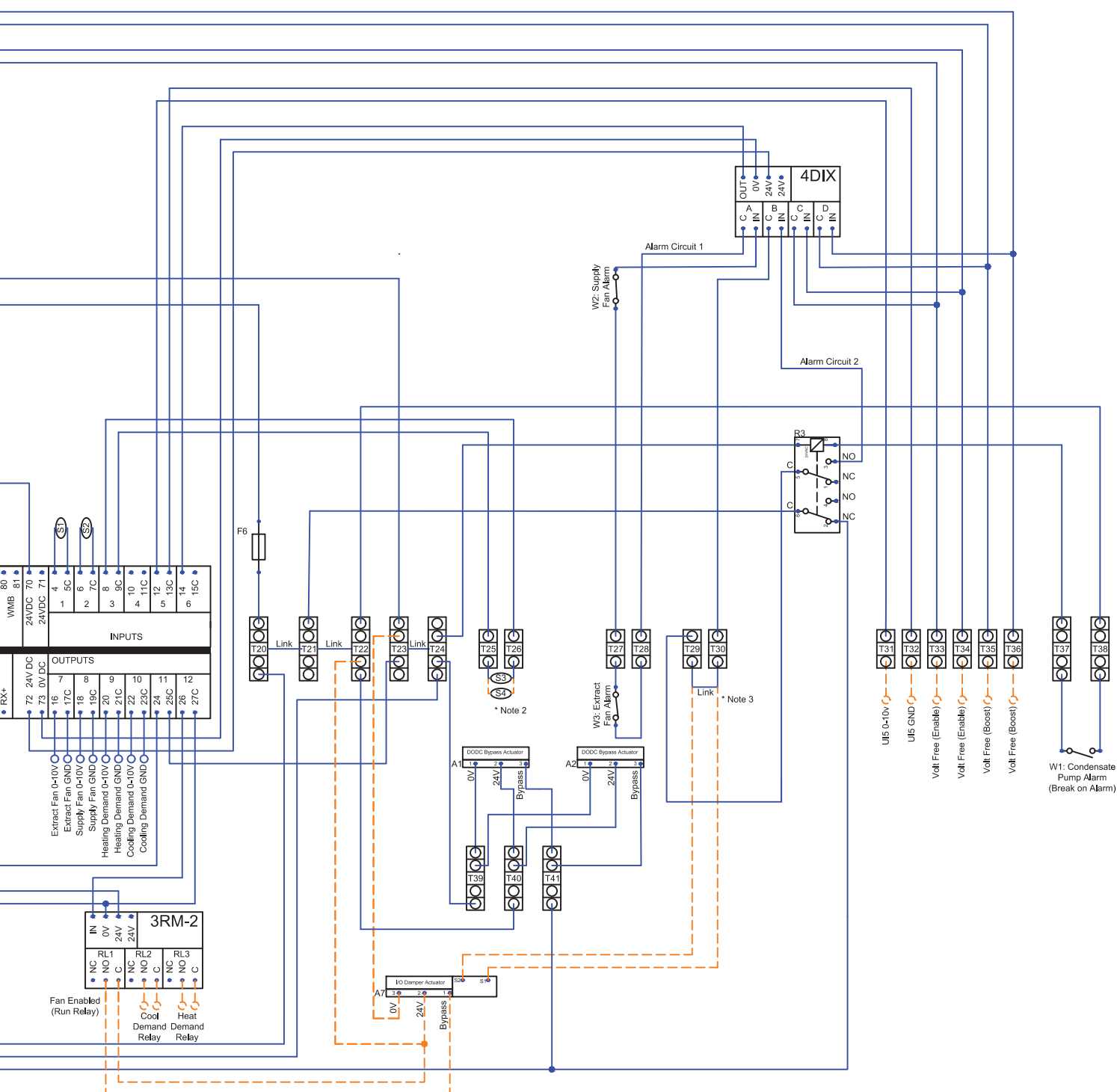
S1 : Fresh Air Temp.
S2 : Supply Air Temp.
S3 : Extract Air Temp.
S4 : Space Air Temp.

TR : Isolating Transformer 240VAC - 24VAC 40VA

W1 : Condensate Pump Alarm Contacts
W2 : Supply Fan Motor Alarm Contacts
W3 : Extract Fan Motor Alarm Contacts



- * Note1 Emergency shutdown circuit. Break to remove power. Remove link T7-T8 to use.
- * Note2 Connect external S4 sensor in place of S3 sensor for space temperature control.
- * Note3 Shutoff damper end-switch loop. Remove link T29-T30 to include within alarm circuit 2



XBOXER XBC ECOSMART2 (NT) MODELS

18.0 DIAGRAMS

18.6 XBC75-85 WIRING (ELECTRIC HEATER VERSION)

Figure 25:

Key:

Internal Factory Connection
Optional External Connection

A1 : 24VAC Bypass Damper Actuator
A2 : 24VAC Bypass Damper Actuator
A3 : Electric Heater Controller
A7 : Inlet/Outlet Dampers (Optional)

F1 : Auxiliary Fuse 1A 6.3x32mm
F4 : Condensate Pump Fuse 1A 6.3x32mm
F5 : Controller Fuse 5A 6.3x32mm
F6 : ELV Fuse 1.6A 6.3x32mm

R1 : 240VAC Switched Live Input SPDT
R2 : 240VAC Switched Live 2 (Boost) Input SPDT
R3 : 24VAC Condensate Pump Alarm DPDT
R4 : 24VAC Fault Relay SPDT

C1 : Electric Heater Trip Contactor 240VAC

S1 : Fresh Air Temp.
S2 : Supply Air Temp.
S3 : Extract Air Temp.
S4 : Space Air Temp.

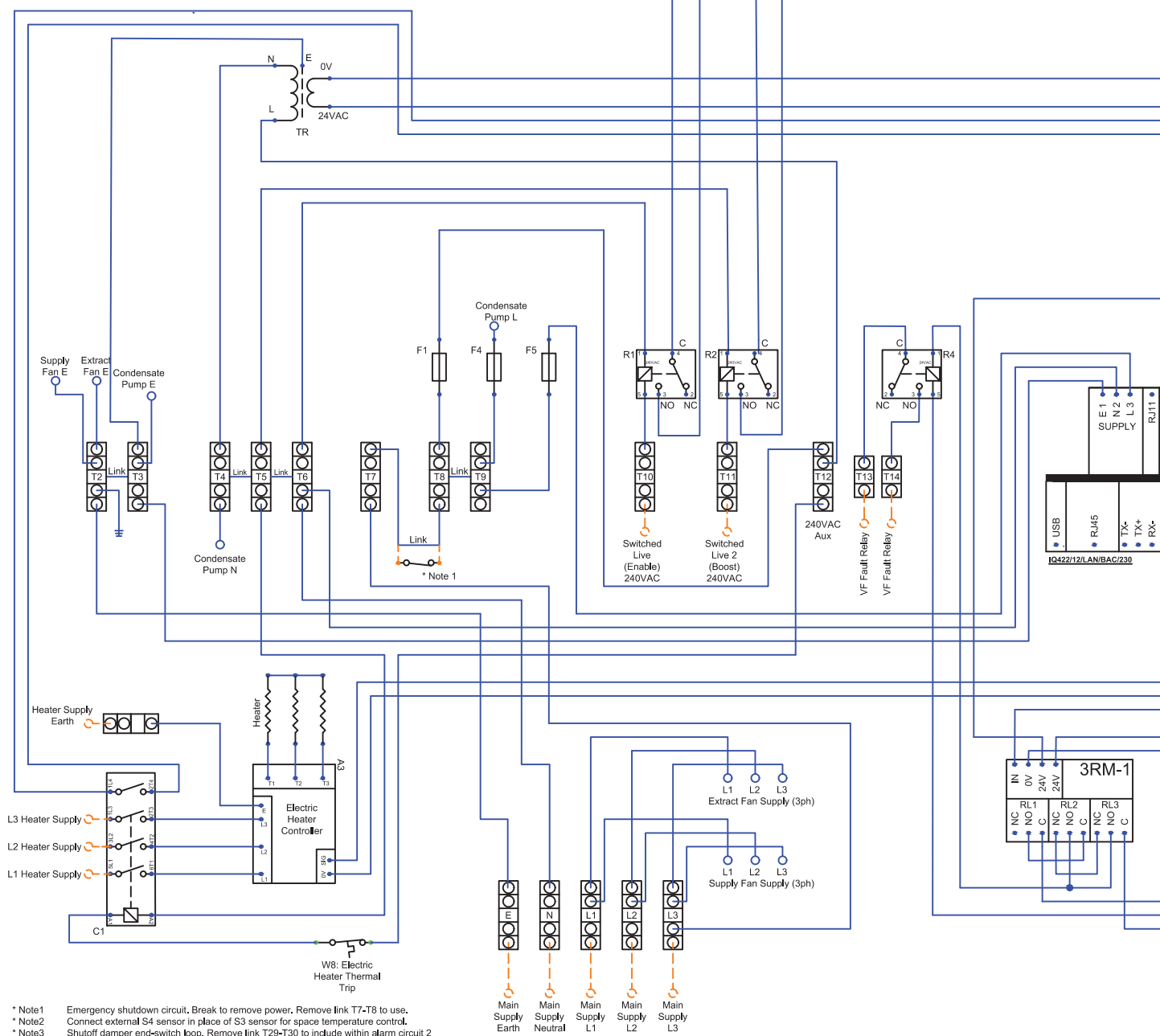
TR : Isolating Transformer 240VAC - 24VAC 40VA

W1 : Condensate Pump Alarm Contacts

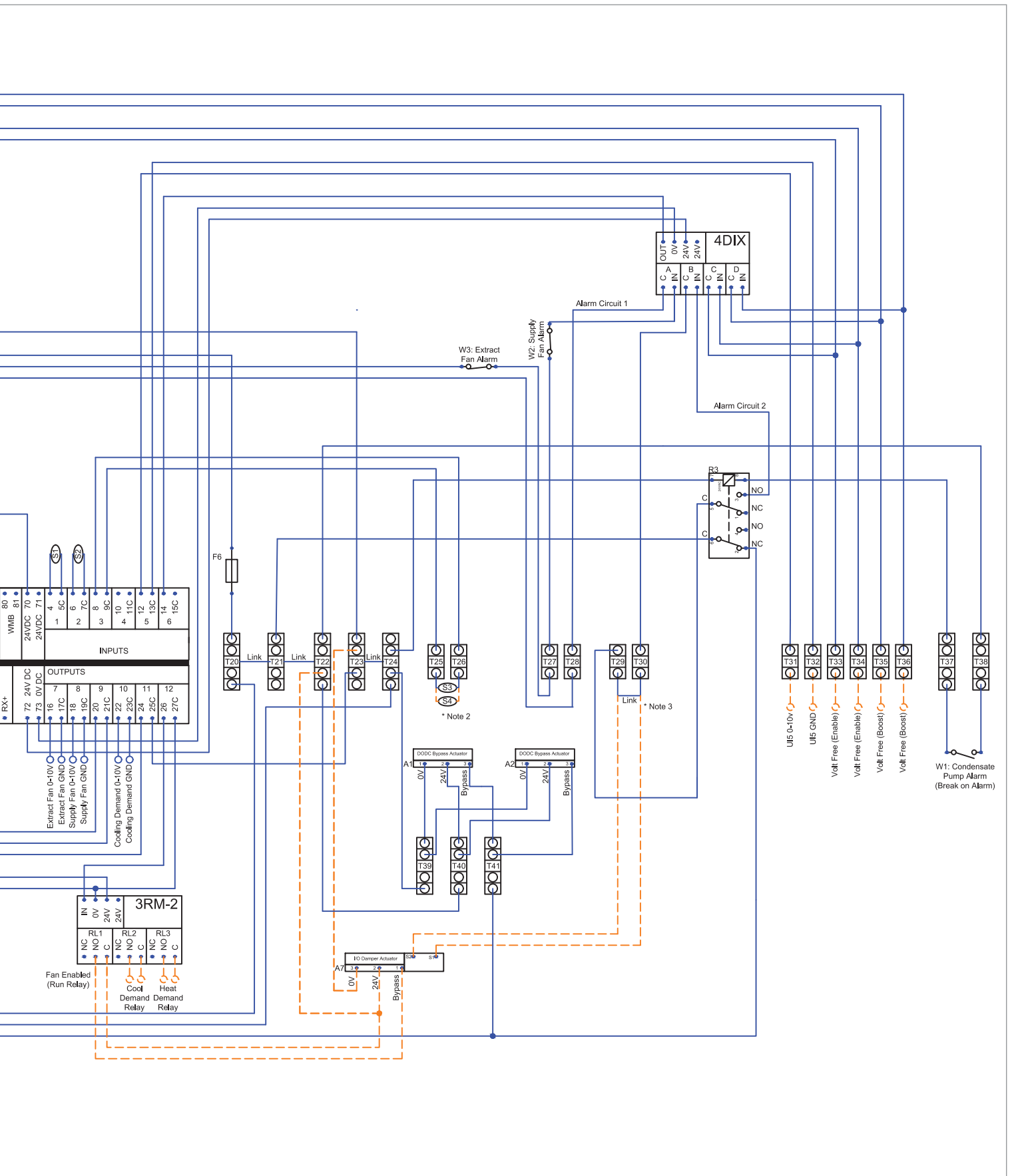
W2 : Supply Fan Motor Alarm Contacts

W3 : Extract Fan Motor Alarm Contacts

W8 : Thermal Safety Cutout (Electric Heater Only)



- * Note1 Emergency shutdown circuit. Break to remove power. Remove link T7-T8 to use.
- * Note2 Connect external S4 sensor in place of S3 sensor for space temperature control.
- * Note3 Shutoff damper end-switch loop. Remove link T29-T30 to include within alarm circuit 2





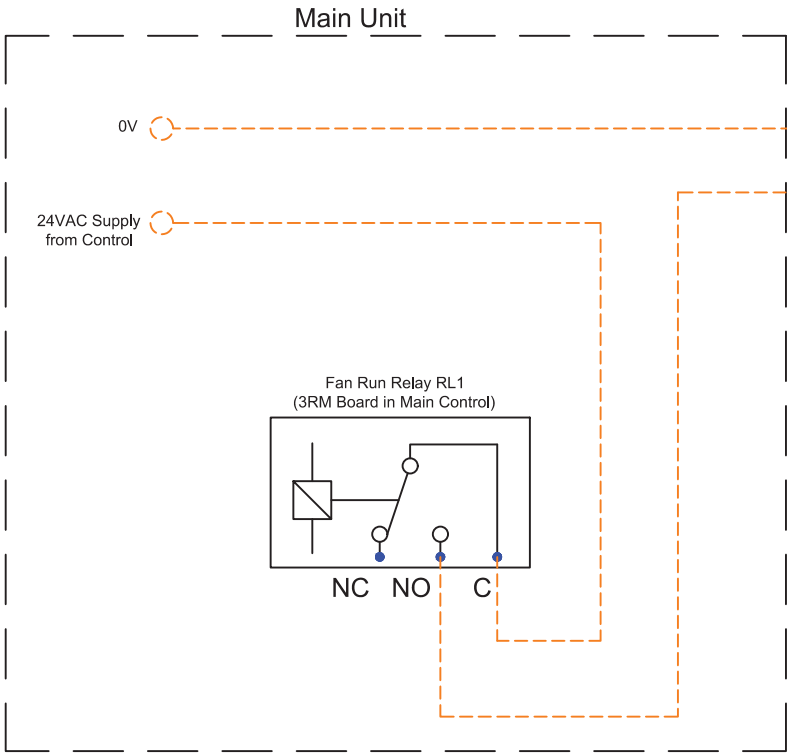
XBOXER XBC ECOSMART2 (NT) MODELS

18.0 DIAGRAMS

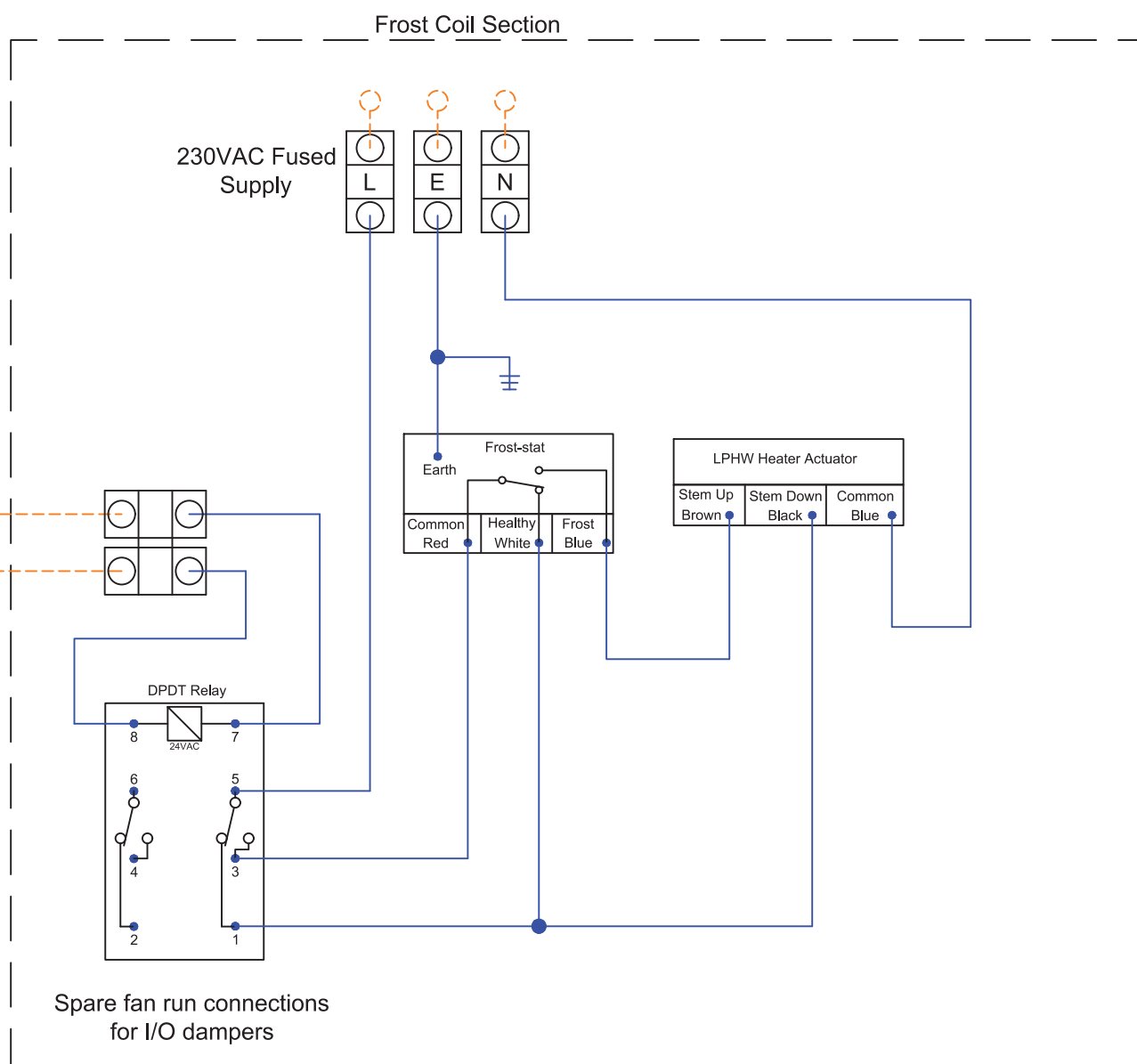
18.7 XBC75-85 FROST COIL WIRING (LPHW HEATER VERSION)

Figure 26:

Key:
Internal Factory Connection ————○
Customer Connection - - - - -○



XBOXER XBC ECOSMART2 (NT) MODELS





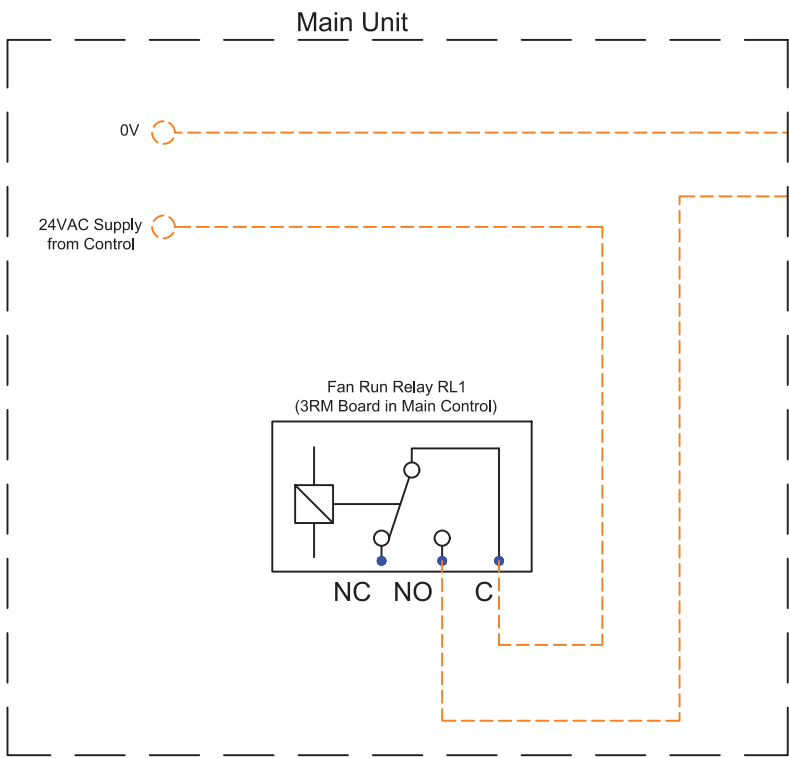
XBOXER XBC ECOSMART2 (NT) MODELS

18.0 DIAGRAMS

18.8 XBC75-85 FROST COIL WIRING (ELECTRIC HEATER VERSION)

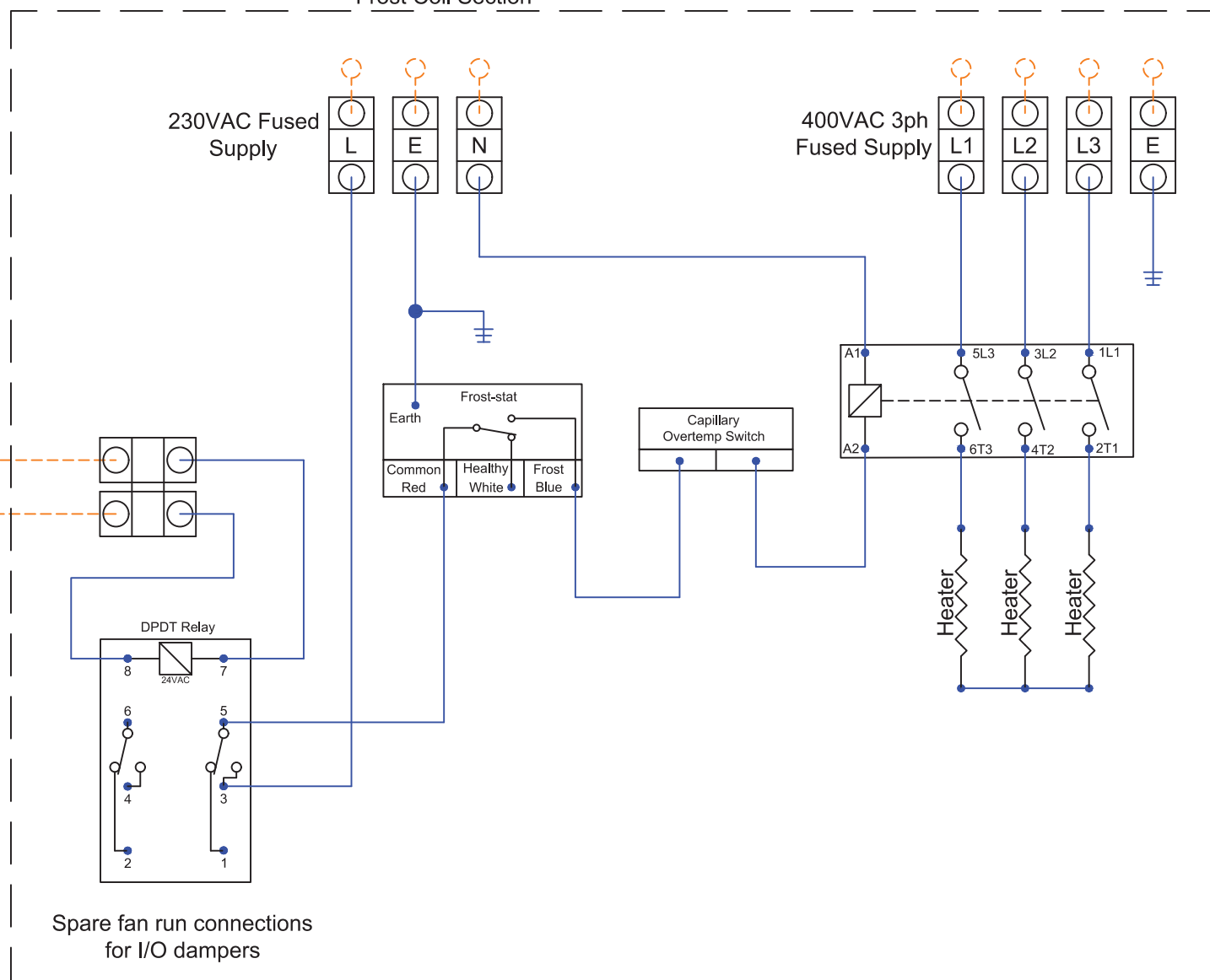
Figure 27:

Key:
Internal Factory Connection ————○
Customer Connection - - - - -○



XBOXER XBC ECOSMART2 (NT) MODELS

Frost Coil Section



XBOXER XBC ECOSMART2 (NT) MODELS

19.0 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.

19.1 DAMPERS

At regular intervals check that the blades move freely.

19.2 FILTERS (4 X G4 FITTED AS STANDARD)

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

19.3 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.

19.4 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.

19.5 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.**

19.6 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.

20.0 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		✓

21.0 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)

21.0 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

XBOXER XBC ECOSMART2 (NT) MODELS

23.0 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 e.g. 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.

FOR MORE INFORMATION

www.nuaire.co.uk

COMMERCIAL

www.nuaire.co.uk/commercial

AIR HANDLING UNITS

www.nuaire.co.uk/boxerahu



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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.