XBX

Classroom Ventilation Unit with Heat Recovery

Installation Manual

EMC Directive 2014/30/EU
LVD Directive 2014/35/EU

1.0 SAFETY INFORMATION

- The provision of the electrical supply and the connection of the unit to the mains must be carried out by a qualified electrician.
- Isolate from power supply before removing any covers. During installation / maintenance ensure all covers are fitted before switching on the mains supply.
- All-pole disconnection from the mains as shown in the wiring diagram must be incorporated within the fixed wiring and shall have a minimum contact separation of 3mm in accordance with latest edition of the wiring regulations.
- This unit must be earthed.
- Ducting must be securely fixed with screws to the spigot to prevent access to live parts. Duct runs terminating close to the fan must be adequately protected by suitable guards.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other fuel-burning appliances.
- This appliance should not be used by children or persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning the safe use of the appliance by a person responsible for their safety. Children shall not play with the appliance. Cleaning and user maintenance shall not be carried out by children.

1.1 Hazard Symbols

GENERAL WARNING

Signifies a general warning regarding hazard specified by supplementary information.

ELECTRIC SHOCK

This unit must be completely electrically isolated before any panels are removed. Check mains supply and control connections.

ROTATING PARTS

This unit contains fast moving rotational parts which may start automatically. It is the sole responsibility of the installer to adequately guard these components.

REFER TO INSTRUCTION MANUAL

Read and understand the installation and maintenance manual before installing, operating or maintaining this product.

1.2 Important Information

This manual contains important information on the safe and appropriate assembly, transport, commissioning, operation, maintenance, disassembly and simple troubleshooting of the product.

While the product has been manufactured according to the accepted rules of current technology, there is still a danger of personal injury or damage to equipment if the following general safety instructions and the warnings contained in these instructions are not complied with.

- **Read these instructions completely and thoroughly before working with the product.**
- **Keep these instructions in a location where they are accessible to all users at all times.**
- **Always include the operating instructions when you pass the product on to third parties.**

1.3 Personal Protective Equipment

The following minimum Personal Protective Equipment (PPE) is recommended when interacting with Nuaire product:

- **Protective Steel Toed Shoes -** when handling heavy objects.
- **Full Finger Gloves (Marigold PU800 or equivalent) -** when handling sheet metal components.
- **Semi Fingerless Gloves (Marigold PU3000 3DO or equivalent)** - when conducting light work on the unit requiring tactile dexterity.
- **Safety Glasses** - when conducting any cleaning/cutting operation or exchanging filters.
- **Reusable Half Mask Respirators** - when replacing filters which have been in contact with normal room or environmental air.

Nuaire would always recommend a site specific risk assessment by a competent person to determine if any additional PPE is required.

2.0 INTRODUCTION

The information contained in this document provides details of installation, operation and maintenance for installers and users of the XBX Supply & Extract units with Heat Recovery.

This supply and extract air handling unit comprises a combination of high efficiency centrifugal fans with EC motors, controls, a counterflow design enthalpy type plate heat exchanger, and supply and extract filters.

2.1 Code Description:

XBX - R
1 2

1. Range:	**Classroom Ventilation with Heat Recovery**
2. Handing:	**L - Left** **R - Right**

3.0 DELIVERY & HANDLING OF EQUIPMENT

3.1 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.

3.2 Offloading and Handling

The weight of the unit modules and palletised items is displayed on the unit rating plate or on the packaging. Some products 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.

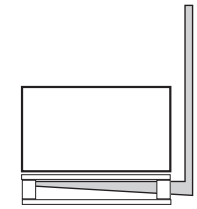
Spreaders should be used when lifting with slings to avoid damage to the unit casing. Care must be taken to ensure that slings are correctly positioned to avoid crushing and twisting of the unit casing.

3.3 Storage

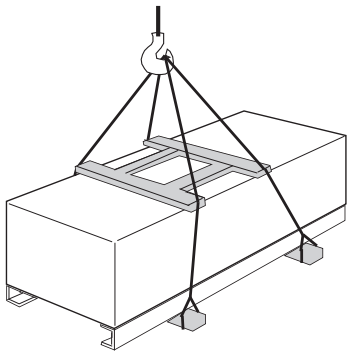
The equipment must be stored in a dry, internal location. Ductwork connection apertures shall be sealed against the ingress of dust, water and vermin.

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.

1 Unit Lifting



Palletised.



Slings via spreaders fitted to unit with base frame.

4.0 INSTALLATION

Installation must be completed by competent persons, in accordance with good industry practice and should conform to all governing and statutory bodies i.e. IEE, CIBSE, etc.

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.

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 control enclosure.

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 control circuits.

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.

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.

5.0 ACCESS

This product is available in functionally identical Left and Right hand variants.

The unit Supply and Extract connections are positioned at one end of the unit (room-side connections).

The corresponding Intake and Discharge connections are positioned at the other end of the unit. The unit must be installed with at least 600mm clearance from a wall / barrier on the access side (as required by ADF 2010).

With this clearance, access panels may be removed allowing unit filters to be changed, and the fans and heat exchanger may be inspected and cleaned as necessary.

6.0 WIRING

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, etc.

A wiring diagram is provided on page 3.

7.0 COMMISSIONING & SETTING TO WORK

7.1 Filters

XBX units come with pre fitted dirty filter alarms on both the supply and extract air streams. The IP54 pressure switch is equipped with a red visual LED alarm which will illuminate when the pressure reading surpasses that set by the adjustable dial.

Nuaire recommend the pressure switch be set to trigger when the filters experience a 25 Pa increase above the clean filter resistance for the largest commissioned airflow rate. Use the adjustment dial to set the pressure at which the switch will trip. When the pressure falls below this set value, the switch returns to its resting position.

Remove filter access panels (observe and note airflow direction labels), inspect filters for contamination with construction debris, replace as necessary. Replace access panels.

7.2 Fan Sections

Access to the fan section is via lift off panels.

Wiring to the unit terminal box should be mechanically protected and in made in accordance with the details on the motor name plate.

With the unit electrically isolated, gently rotate the fan impellers manually, checking that they spin 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.

8.0 CONTROL SPECIFICATION

The HRU is supplied with a Trend IQeco38 based control. Where 0V and common are the same across the Trend controller.

8.1 Software

The controller leaves the factory with a simple control strategy that is only suitable for testing. Before use, the controller must be reprogrammed with a suitable Trend strategy that is approved for the application.

8.2 Tacho Signal Converter (Fan Run Relay)

A PCB is fitted which provides a volt free relay output to show the fan running state. The relay is energized while all fans are running and de-energized if any fans stop.

Please note that the PCB requires at least one fan to start before the software routine runs.

8.3 Temperature Sensors (Internal)

The unit is fitted with 3 x 10K3A1 thermistors for extract, supply and fresh air temperature.

8.4 Fan Output

A 0-10v signal is required to run the supply and extract fans.
The minimum starting voltage is 2 V.

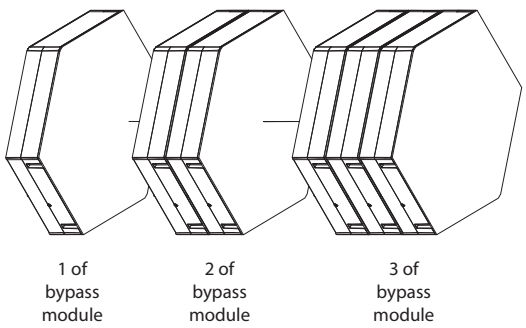
8.5 Heat Exchanger Bypass

The bypass damper provided within this unit consists of 6 bypass modules split into 3 sections (shown in figure 1). Each section is powered by an individual actuator. This allows a full range of bypass from closed to open in 1/6th increments via activation of the relevant relays.

Relay	Required Bypass Amount						
	0/6th (Closed)	1/6th	2/6ths	3/6ths	4/6ths	5/6ths	6/6ths (Open)
Actuator 1	0	1	0	0	1	0	1
Actuator 2	0	0	1	0	0	1	1
Actuator 3	0	0	0	1	1	1	1

0 = No activation
1 = Activation

2 Bypass Module Layout - Exploded View



8.6 Belimo Actuator

The IQeco38 internal relay is used to power the 24 V AC face damper actuator.

8.7 Actuators

The 3 smaller 230 V AC actuators are powered via 3 x 24 V AC relays.

8.8 Supply Voltage

207 – 253 V AC **Supply Current**
47 – 53Hz **AC Line Frequency**
Total unit load 3.9A

8.9 Operating Temperatures

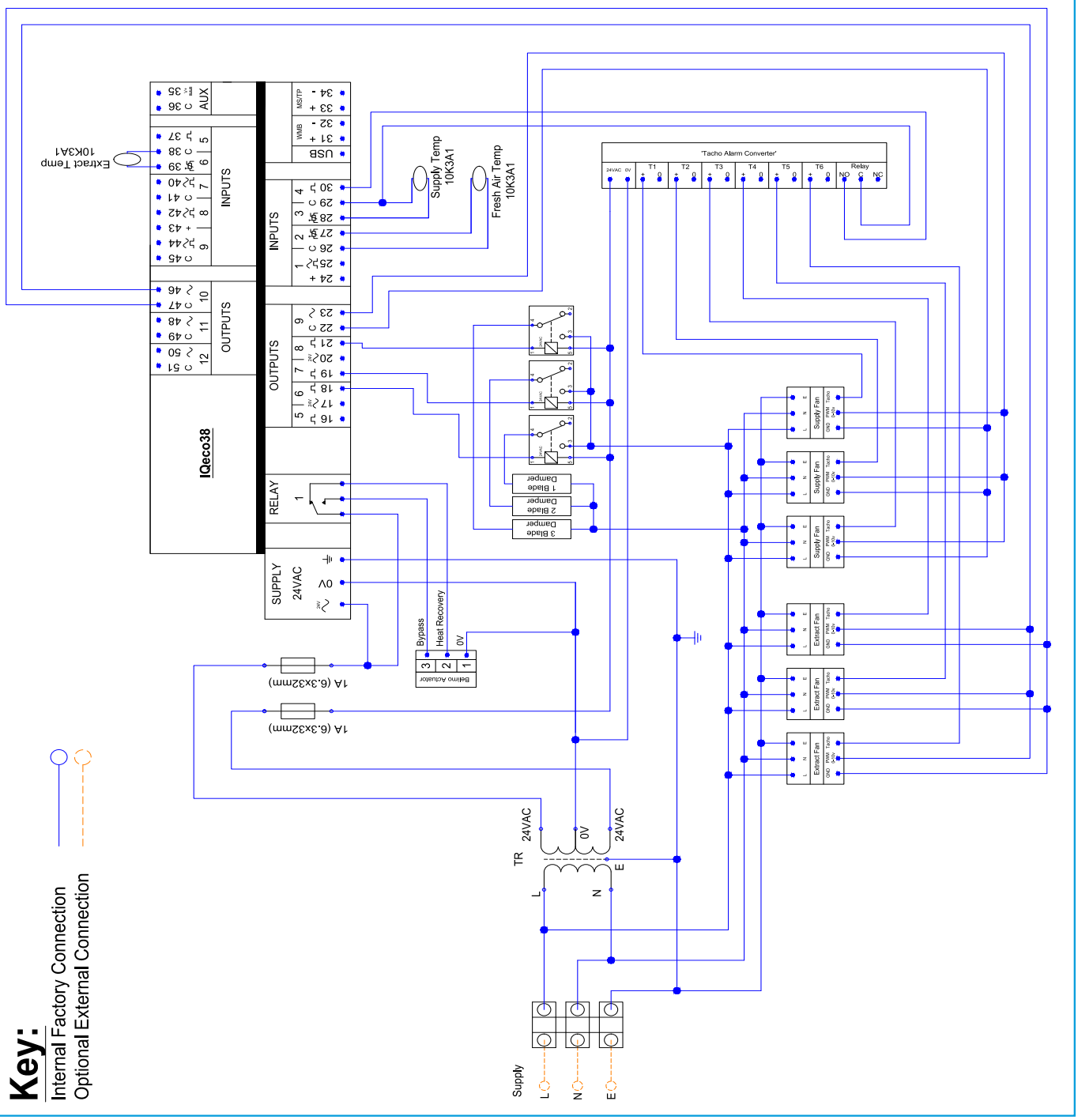
Safe operating temperatures for this unit range from: -10°C to 40°C.

8.10 Safety

- **Installation must be by qualified personnel in accordance with local applicable standards.**
- **This equipment must be earthed.**
- **Access is limited to service personnel only. Live parts are accessible when cover is removed.**
- **Residual risk of contact with fan. Maintenance personnel should take due care and attention.**
- **EC Fans use Capacitors to store mains voltage. Contact with the mains wiring must be avoided for 5 minutes following supply disconnection.**

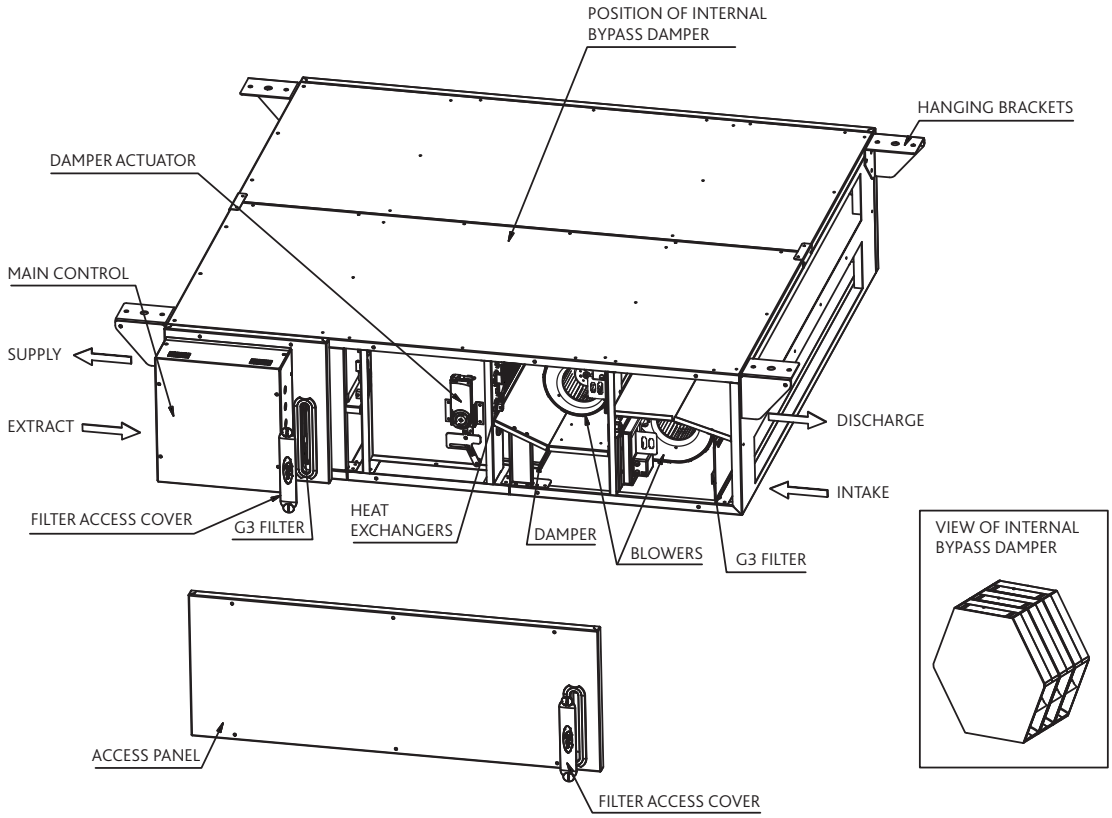
9.0 WIRING DIAGRAM

3 Unit Lifting

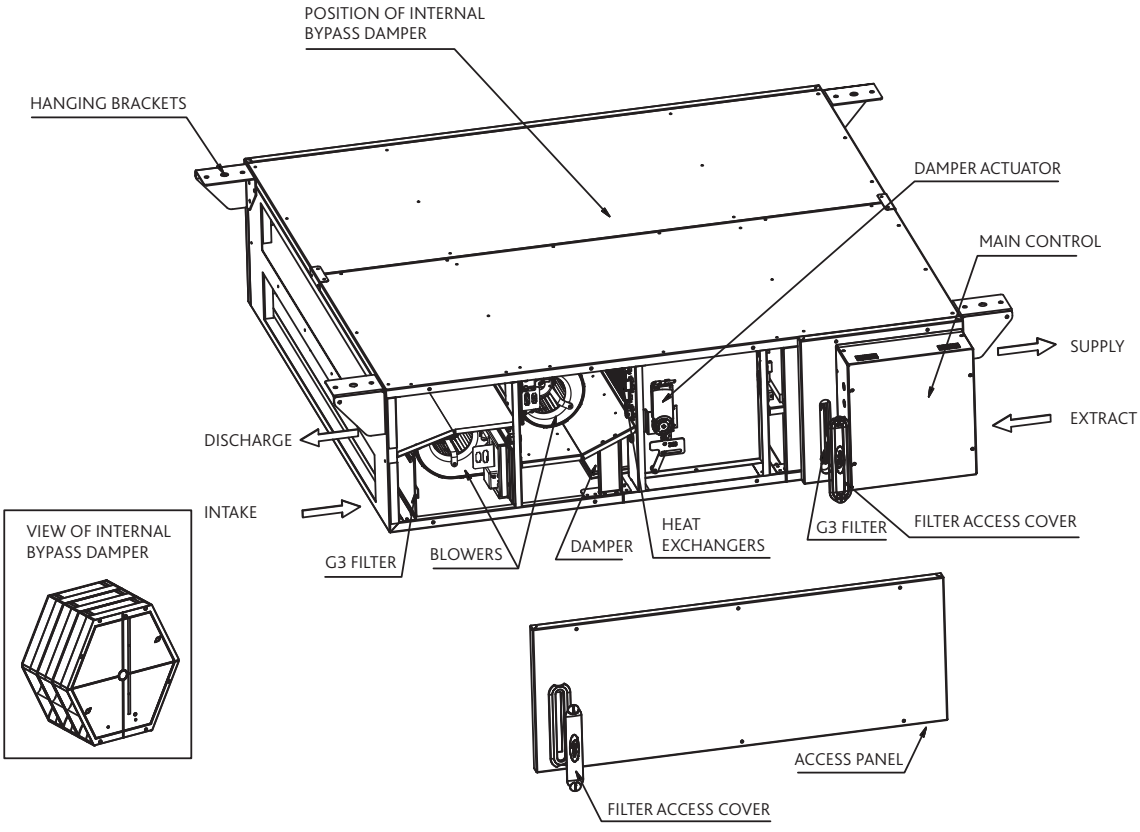


10.0 UNIT OVERVIEW

4 XBX-L Overview.

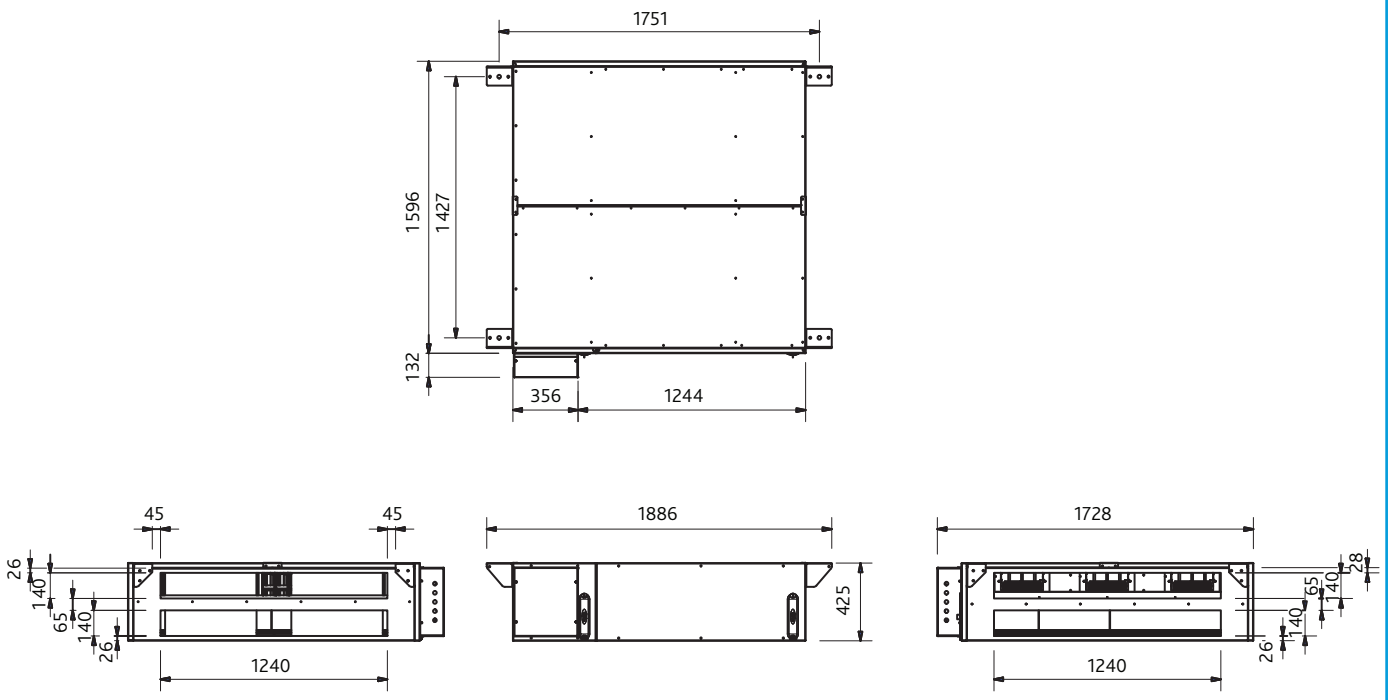


5 XBX-R Overview.

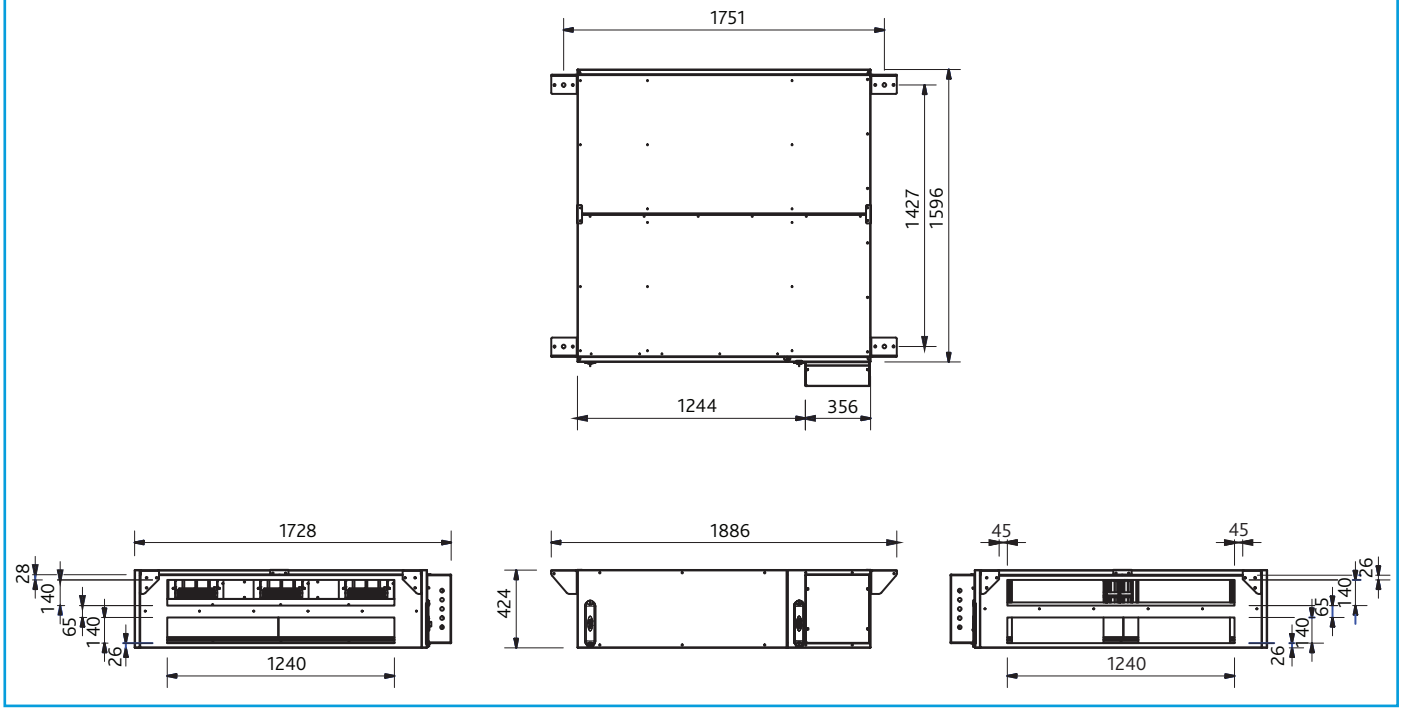


12.0 UNIT DIMENSIONS (mm)

6 XBX-L Dimensions.



7 XBX-R Dimensions.



11.0 MAINTENANCE

It is important that maintenance checks are recorded and that the schedule is always adhered to, in all cases, the previous report should be referred to.

11.1 Filters

Disposable filters should be changed when an appropriate pressure drop is achieved. The filters may also be cleaned by vacuuming.

11.2 Counter-flow 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 clean water. Do not use cleaning water at temperatures over 30°C. It is essential that the heat exchanger is air dried (without the application of heat) before being refitted to the unit.

Note that the heat exchanger is constructed from an advanced polymer that allows moisture transfer. On no account replace the heat exchanger with a physically similar type without this facility, as condensate leakage will occur.

11.3 Bypass Actuator

Where applicable, some models within this range feature a bypass actuator slider mechanism. Manually check the condition of the mechanism at regular intervals, re-greasing as required. Ensure that the pivot and sliding mechanism of the bypass actuator linkage is lubricated with a small amount of high performance multi-purpose Lithium based grease.

11.4 Maintenance Schedule

11.4.1 Routine Maintenance

- Clean all areas of unit and treat any areas of corrosion.
- Check all access doors for leakage and if necessary locks should be adjusted and any replacement gasket materials should be replaced as required.
- Any drain trays should be cleaned and repaired if necessary.

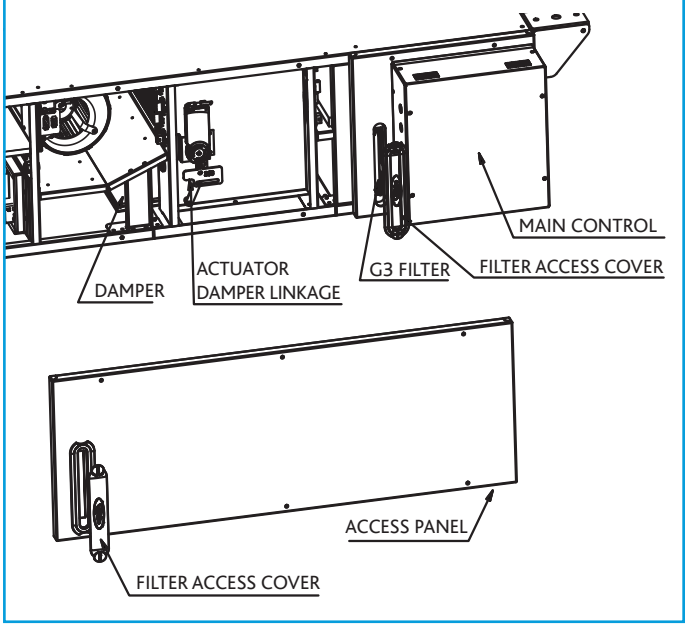
11.4.2 Every 3 Months

- Check filters and change/clean if required, failure to do so may impair the performance and energy efficiency of this unit.
- Ensure condensate drains are cleaned clear and that water can flow freely from unit.

11.4.3 Annually

- Thoroughly inspect the unit and its components for corrosion, acting immediately to treat/restore any damaged areas.
- All electrical terminals within the unit should be tightened.
- Check all earth connections.
- Check control dampers blades.
- Check operation of damper actuators and linkages and adjust as necessary.

8 Actuator damper linkage.



13.0 WARRANTY

Project specific warranty arrangements apply to this product – refer to project documentation.

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

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).

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

Failure to maintain the unit as recommended will invalidate the warranty.

14.0 END-OF-LIFE AND RECYCLING

Where possible Nuaire use components which can be largely recycled when the product reaches its end-of-life:

- Fans, motors, controls, actuators, cabling and other electrical components can be segregated into WEEE recycling streams.
- Sheet metal parts, aluminium extrusion, heating/cooling coils and other metallic items can be segregated and fully recycled.
- EPP, plastic ducting, nylon corner pieces, plastic heat exchangers, packaging material and other plastic components can be segregated into mixed plastic and widely recycled.
- Cardboard packaging, wood, used filters and other paper components can be largely recycled or fully processed in energy from waste centres.
- Remaining items can be further segregated for energy from waste centres or, as a last resort, sent to landfill. Please call After Sales Support for further information on items not listed above.

IMPORTANT

Ensure that Nuaire product is made safe from any electrical / water / refrigerant supplies before dismantling commences. This work should only be undertaken by a qualified person in accordance with local authority regulations and guidelines, taking into account all site based risks.

15.0 AFTER SALES AND REPLACEMENT PARTS

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

If ordering spares please quote the serial number of the unit together with the part number, if the part number is not known please give a full description of the part required. The serial number will be found on the identification plate attached to the unit casing.

Telephone 02920 858 400
aftersales@nuaire.co.uk

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