1.0 Introduction

The MRXBOX95AB-WH2 wall mounted units are designed to provide mechanical supply and extract ventilation with heat recovery and an integral automatic summer bypass. The units also incorporate an integral humidistat and frost protection (-5 degrees C as standard).

Integral automatic summer bypass - The bypass damper shall open automatically via a wax actuator allowing the air to bypass the heat exchanger to deliver fresh filtered air during the warmer months. The unit is supplied with independent control for both supply and extract for 3 speeds.

To recover heat from the extract air the heat exchanger block is utilised. The heat exchanger can recover up to 95% of the normally wasted heat.

Figure 1. Airflow through unit in standard configuration.

2.0 Installation

Installation must be carried out by competent personnel in accordance with the appropriate authority and conforming to all statutory governing regulations. All mains wiring must be in accordance with the current I.E.E. Regulations, or the appropriate standards. Ensure that the mains supply (Voltage, Frequency and Phase) complies with the rating label.

Please note a clear working space is required around the installed unit to allow the cover to be removed and provide sufficient access for maintenance such as filter change.

Please allow a minimum of 600mm in front of the unit and 200mm on the humidistat adjustment side. The (WH2WC unit only) will also require a minimum of 400mm above the unit for access to the receiver in its standard position. Alternatively, the receiver may be fitted away from the unit as it is wired with a flying lead.

The fan must be installed indoors, on a suitable wall away from direct sources of frost, heat, water spray or moisture generation.

For a vibration-free result the unit must be mounted to a solid wall. The unit is designed for wall mounting only on a solid wall, a gypsum block or a stud wall will not suffice. Additional measures such as extra studs or double panelling using 20mm MDF is required.

1. One part of the mounting bracket should be offered up to the wall, ensuring it’s located horizontally. Mark the fixing points through the pre drilled holes in the bracket and install with screws (by others), ensuring the interlock side is at the top, (fig. 2).

2. Install the unit on the wall by ensuring the bracket on the unit interlocks over the wall mounted bracket (fig. 3).

Note: Care must be taken to ensure the unit is installed true in all 3 dimensions. Failure to do so may result in overflow from the internal condensation drip tray.

Figure 2. Fixing the mounting bracket to the wall.

Figure 3. Mounting the unit on the wall mounted bracket.
2.1 Condensate Drain

1. If using a U-trap please ensure the U-trap has been filled to a suitable level of water to avoid any air locks.
2. If the condensation pipe is fitted in an unheated space the pipe should be insulated to prevent freezing.

2.2 Extract/input areas

The unit is designed to extract air from all wet rooms e.g. bathroom, kitchen, en-suite, utility room (with sink) and WC's.

Supply air should be to all habitable rooms e.g. bedrooms and lounge. Extract / input grilles should be adjustable valve types (not supplied).

2.3 Ducting

It is recommended that rigid ducting be used it all times. Flexible ducting has a very high resistance and it is impossible to calculate how much resistance will be on a system if used.

If used, the flexible ducting must be kept to a minimum and should always be pulled taut. A maximum of 500mm should be used on each leg.

To prevent condensation on the exterior of the outside air inlet duct and the air outlet duct from the unit, these ducts should be insulated with material having a thermal resistance of >0.625m²K/W.

Ducting must be installed in such a way that resistance to airflow is minimised. Bends should be kept to a minimum.

A minimum distance of 200mm between the appliance and any bends in ductwork is recommended. Ideally 200mm diameter or 204 x 60mm rectangular ducting should be used.

Ducting joints must be sealed with silicone type sealant and shall be adequately and reliably fixed to the appliance.

2.4 Ventilation flow rates

<table>
<thead>
<tr>
<th>Room</th>
<th>Min high rate</th>
<th>Min low rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen</td>
<td>13 l/s</td>
<td></td>
</tr>
<tr>
<td>Utility room</td>
<td>8 l/s</td>
<td></td>
</tr>
<tr>
<td>Bathroom</td>
<td>8 l/s</td>
<td></td>
</tr>
<tr>
<td>Sanitary accommodation</td>
<td>6 l/s</td>
<td></td>
</tr>
</tbody>
</table>

Whole dwelling ventilation rates

<table>
<thead>
<tr>
<th>Number of bedrooms in dwelling</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole dwelling ventilation rate l/s</td>
<td>13</td>
<td>17</td>
<td>21</td>
<td>25</td>
<td>29</td>
</tr>
</tbody>
</table>

Notes:
1. In addition, the minimum ventilation rate be should be not less than 0.3 l/s per m² of internal floor area.
   (This includes all floors, e.g. for a two-story building add the ground and first floor areas).
2. This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. This should be used as the default value. If a greater level of occupancy is expected add 4 l/s per occupant.
2.5 Air permeability and infiltration

Is the uncontrolled exchange of air between inside and outside through cracks, porosity and other unintentional openings in the building. ADF2006 gives an allowance for this in both multi and single storey buildings, however ADF2010 has an allowance for multi storey only. Additionally ADF2010 only applies this allowance for dwellings leakier than 5 m³/(h.m²) at 50Pa. (See following page).

2.6 ADF 2006 Ventilation calculations

Continuous supply and extract

Step 1: Determine the whole building ventilation rate from Table 2. Allow for infiltration by subtracting from this value:

- for multi-storey dwellings: 0.04 x gross internal volume of the dwelling heated space (m³);
- for single-storey dwellings: 0.06 x gross internal volume of the dwelling heated space (m³).

Step 2: Calculate the whole dwelling air extract rate at maximum operation by summing the individual room rates for 'minimum high rate' from Table 1.

(For sanitary accommodation only, as an alternative, the purge ventilation provisions given in ADF 2006 can be used where security is not an issue. In this case 'minimum high extract rate' for the sanitary accommodation should be omitted from the step 2 calculation).

Step 3: The required airflow rates are as follows:

- the maximum extract rate (e.g. boost) should be at least the greater of step 1 and step 2. Note that the maximum individual room extract rate should be at least those given in table 1, for minimum high rate.
- the minimum air supply rate should be at least the whole building ventilation rate found in step 1.

2.7 ADF 2010 Ventilation calculations

Design of MVHR systems

The MVHR system has been sized for the winter period. Additional ventilation may be required during the warmer months and it has been assumed that the provisions for purge ventilation (e.g. openable windows) could be used.

Step 1: For any design air permeability, determine the whole dwelling ventilation supply rate from Table 2.

As an alternative where the design air permeability is intended to be leakier than (> ) 5 m³/(h.m²) 50 Pa, allow for infiltration for all dwelling types by subtracting from the whole dwelling ventilation supply rate from Table 2; 0.04 x gross internal volume of the dwelling heated space (m³).

Step 2: Calculate the whole dwelling extract ventilation rate by summing the individual room rates for 'minimum high rate' from Table 1.

(For sanitary accommodation only, as an alternative, the purge ventilation provisions given in ADF 2010 can be used where security is not an issue. In this case 'minimum high extract rate' for the sanitary accommodation should be omitted from the step 2 calculation).

Step 3: The required airflow rates are as follows:

- the maximum whole dwelling extract ventilation rate (e.g. boost) should be at least the greater of step 1 and step 2. Note that the maximum individual room extract rate should be at least those given in table 1, for minimum high rate.
- the minimum air supply rate should be at least the whole building ventilation rate found in step 1.

For Scotland refer to BRE Digest 398.
4.0 Dimensions (mm) MRXBOX95AB-WH2 Figure 7.

![Diagram of MRXBOX95AB-WH2 dimensions](image)

Figure 8a. Dimensions: MRXBOX95-3SWITCH

- Front view: 86.0 x 23.0
- Side view: 86.0 x 15.0

Flush mounting face to wall or back box

Figure 8b. Dimensions: Unit wall mounting bracket position (viewed from the back).

- Front view: 594 x 200
- Side view: 492 CRS x 40.0 CRS

Bracket to be fitted to the wall

5 Fixing Points

Condensate drain 832mm outside
5.0 Ducting arrangements

Figure 9. Typical ducted arrangement for a wall mounted unit using 200mm dia. ducting.

Figure 10. Typical ducted arrangement for a wall mounted unit using rectangular 204 x 60mm ducting.

ALSO FROM NUAIRE -

New range of thermal ducting, an all-in-one insulated ducting system. (see installation document 671620).
5.0 Electrical Connection

IMPORTANT

For good EMC engineering practice, any sensor cables or switched live cables should not be placed within 50mm of other cables or on the same metal cable tray as other cables.

Please note: the electrical connection of the unit must be carried out by a qualified electrician.
The unit is supplied with a flexible cord for connection to the mains supply.

NOTE: In the event of 1kV transients the fans may stop running, normal operation will be resumed when the interference has ceased.

Electrical details:-
Voltage: 230V 1ph 50Hz
Consumption: 2.5 Amp
Fuse rating: 5 Amp

NOTE: This unit must be earthed.
The three core cable from the mains power supply should be connected to a fixed wiring installation, via a fused isolator, in accordance with current IEE wiring regulations.

5.1 Examples of typical wiring layouts

MRXBOX95AB-WH2
Figure 12a. Unit only.
Disconnection from the supply mains must be incorporated within the fixed wiring in accordance with the wiring regulations and shall have a minimum contact separation of 3mm.

MRXBOX95AB-WH2
Figure 12b. Unit serving one bathroom.
Disconnection from the supply mains must be incorporated within the fixed wiring in accordance with the wiring regulations and shall have a minimum contact separation of 3mm.

MRXBOX95AB-WH2
Figure 12c. Unit serving two bathrooms.
Disconnection from the supply mains must be incorporated within the fixed wiring in accordance with the wiring regulations and shall have a minimum contact separation of 3mm.
5.0 Switch
To fix the switch to a wall or back box remove the front fascia by inserting a terminal screwdriver into the two openings along the bottom edge and prise open gently. The fixing points on the back plate can then be accessed, once the switch has been secured the front fascia can then be re-fitted.

5.1 Ecosmart controls
A maximum of two Ecosmart sensors can be connected directly to the main circuit board, this can be done by cutting a small slit in the 20mm grommets situated on the top of the unit, the cable can then be threaded through to gain access to the connections on the PCB. If more than 2 connections are required an Ecosmart junction box will be required.
When a sensor is activated the unit will switch to speed 3 and run-on for 15 minutes after the signal is lost. Some sensors may also have additional optional run-on features.

6.0 Commissioning
1. For required air flow rates please refer to the design specification for the property, follow 2.4 or refer to building regulations ADF 2006-2010.
2. The unit should be run for a minimum of 10 minutes to reach steady state before commencing commissioning.
3. The humidity sensor is initially set to its least sensitive position, this should be adjusted during commissioning. Depending on storage and site conditions the unit may boost due to high relative humidity levels, this will continue until the level drops below the specified set point.
4. The unit is supplied with independent control for both normal and boost airflows. (see fig. 13).

Figure 13. Detail of unit control on front panel.

5. Correct commissioning is essential to ensure the ventilation air flow rates are met. It also ensures the unit is not over ventilating and causing excessive power consumption.
6. Adjustment valves should be locked in place to prevent further adjustment.
7. Once commissioned the home owner / tenant should be informed that the unit should not be adjusted as it will have a detrimental effect on the indoor air quality and could result in condensation and mould growth. The label covering the control has an adhesive panel which should be removed post commissioning to prevent tampering.

6.1 Humidity adjustment
This product contains an internal humidity sensor fitted into the airflow extracting from the wet rooms. When the unit senses that the humidity exceeds the set point the unit will boost to that set by the commissioned boost speed. The set point can be found on the side of the unit (see fig 7) and is at its most sensitive when turned fully clockwise. Note that the sensor is measuring humidity from all the wet rooms at the same time and should not be relied on to solely boost the unit. Additional switch should be used local to the wet rooms (see wiring diagrams).

7.0 Status Indication
The status of the unit is indicated by a series of LED’s on the front cover. The variants are listed below.

<table>
<thead>
<tr>
<th>Status</th>
<th>LED Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Mode</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Supply Fan Fault</td>
<td>○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Extract Fan Fault</td>
<td>○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Boost</td>
<td>○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Summer Boost</td>
<td>○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Frost Protection</td>
<td>○ ○ ○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Filter Change</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Summer Bypass</td>
<td>○ ○ ○ ○ ○</td>
</tr>
</tbody>
</table>

For commissioning, refer to user manual.
8.0 Maintenance/Cleaning

We recommend that the two G3 filters are inspected and cleaned after 6 months and replaced every 12 months. This will be indicated by the first LED from the right hand side flashing, the LED will flash for 5 days and then reset itself.

The filters can be removed from the unit by removing the two filter covers on the front panel of the unit. Take hold of the two circular tabs either end of the filter covers and pull out.

The filter can now be extracted by pulling the removal loop on the front edge of the filter. Once the filters have been inspected return or replace them as necessary.

Inspect the heat exchanger every 5 years. Generally check for damage and security of components. The heat exchanger should be fitted in the same orientation as originally assembled e.g. front label facing removable cover and top label nearest PCB.

Figure 14. Removing the two filter covers on the front panel of the unit.

Figure 15. The filters can be removed by pulling on the black tab on the visible end of the filters.

9.0 Replacement of Parts

Should any component need replacing extensive stocks are available for quick delivery.

Ensure that the unit is electrically isolated, before carrying out any work.

Note: The supply cable must be replaced by an electrically competent person.

When ordering spare parts, please quote the serial number of the unit and the ARC number of the purchase if possible. (This information will be available on the fan label).

10.0 Warranty

The 5 year warranty starts from the day of delivery and includes parts and labour for the first year and parts only for the remaining 4 years. This warranty is conditional on planned maintenance being undertaken.

11.0 Service Enquiries

Nuaire can assist you in all aspects of service. Our Technical Support department will be happy to provide any assistance required.

Technical Support on 029 2085 8400
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: MRXBOX95SAB-WH2
Machinery Types: Mechanical Ventilation with Heat Recovery and Summer Bypass
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

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Applied National Standards: BS848 Parts 1, 2, 2 and 5

We declare that the machine named below conforms to the requirements of EC Council Directives relating to Electromagnetic Compatibility and Safety of Electrical Equipment.

Designation of machinery: MRXBOX95SAB-WH2
Machinery Types: Mechanical Ventilation with Heat Recovery and Summer Bypass
Applied Harmonised Standards: EN50014-1, EN50014-2, EN61000-3-2, EN61000-3-3, EN60335-2-80
Basis of Self Attestation: Quality Assurance to BS EN ISO 9001 BSI Registered Firm Certificate No. FM 149

Signature of manufacture representatives:

Name: Position: Date:
1) C. Biggs Technical Director 28. 12. 13
2) A. Jones Manufacturing Director 28. 12. 13

Note: All standards used were current and valid at the date of signature.

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.

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.

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.

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 (e.g. 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. 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.

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.

Note: All standards used were current and valid at the date of signature.