MRXBOX90L

Mechanical Ventilation with Heat Recovery

Installation and Maintenance

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

1.0 Introduction

The Nuaire MRXBOX90L (Large) heat recovery unit has an efficiency of 90% and energy saving constant volume fan. The unit is supplied with a nearly 100% bypass, which can be used to interrupt the heat recovery, if desired, to supplied fresh, cool outside air. The heat exchanger is equipped with a sliding grate that shuts off the airflow through the exchanger.

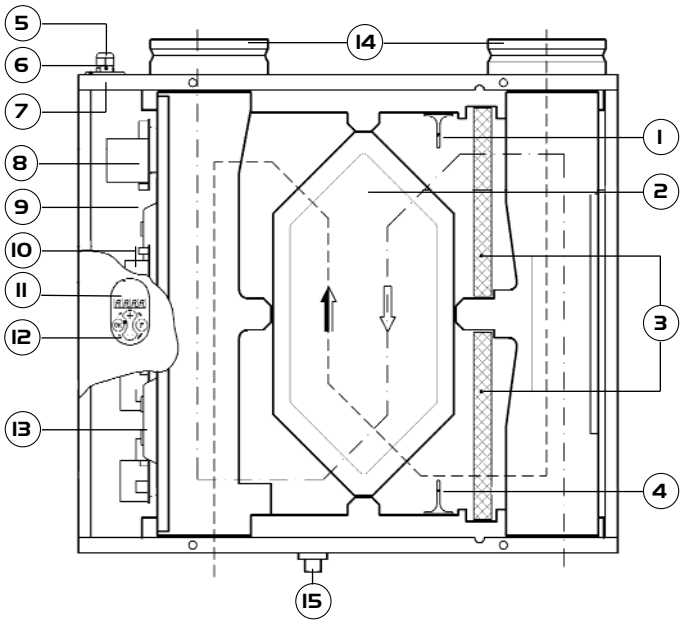
The unit has the following functions:

- **steplessly adjustable air flow rates through a control panel**
- **filter indication on the unit**
- **frost protection system that ensures optimum performance of the unit, even at very low atmospheric temperatures**
- **the unit comes ready for use**
- **all control equipment has been mounted and checked in the factory**
- **on installation, the appliance must be connected to the air ducts, the condensate discharge, the mains supply and the multiple switch**
- **the installer can change the desired air flow for every setting with the aid of the control panel on the unit**

1.1 Function components

1. Interior temperature sensor measures the temperature of the air from the dwelling.
2. Heat exchanger ensures heat transfer between inlet and outlet air.
3. Filters filter both air flows.
4. Atmospheric temperature sensor measures outside air temperature.
5. Communication connection port for cable to multiple switch.
6. Swivel plate fitted with swivels for feeding through 230V cable.
7. Open Therm connection two pole connector for Open Therm control.
8. Option pcb between user and control electronics.
9. Inlet fan feeds fresh air into the dwelling.
10. Basic pcb contains the control electronics for the basic functions.
11. Computer port for service connection purposes.
12. Control panel interface between user and electronic control.
13. Outlet fan discharges used air from the dwelling to the atmosphere.
14. Duct spigots connections for the inlet and outlet ducts.
15. Connection condensate discharge.

Figure 1. Exploded view of unit



IMPORTANT

Before commencing work, please read this installation guide throughout in conjunction with the appropriate illustrations.

1.2 Specification

	MRXBOX90L
Supply Voltage	230V~50Hz
Protection Rating	IP 32
Dimensions (W x H x D)	675 x 602 x 535mm
Duct diameter	180mm
External diameter condensate discharge	20mm
Mass kg (excluding bypass unit of 3.5kg)	32kg
Filter class	G4*
Ventilation capacity setting 1,	Factory setting 100 m^3/h
Ventilation capacity setting 2,	Factory setting 200 m^3/h
Ventilation capacity setting 3,	Factory setting 300 m^3/h
Permissible resistance duct system	150 pa at 300 m^3/h
*Filters supplied to be replaced post commisioning.	

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2.0 Dimensions

Dimensional references:

1. = Spigot to dwelling. Supply (warmed fresh air)

2. = Spigot to outside. Exhaust (cool stale air)

3. = Spigot from dwelling. Extract (warm stale air)

4. = Spigot from outside. Intake (cool fresh air)

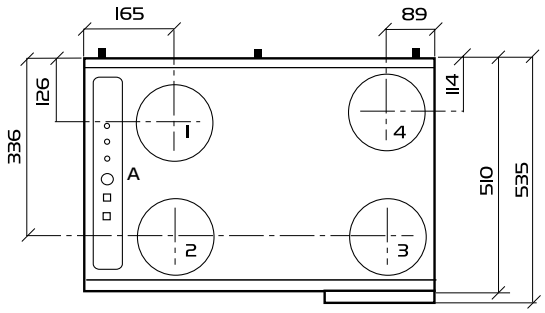
A. = Electric connections

B. = Detail wall mounting (make sure to correctly place the rubber strip, washers and caps)

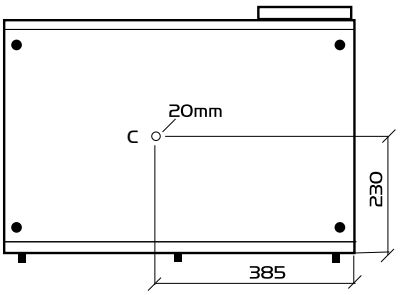
C. = Connection condensate discharge

Figure 2. MRXBOX90L Dimensions in mm.

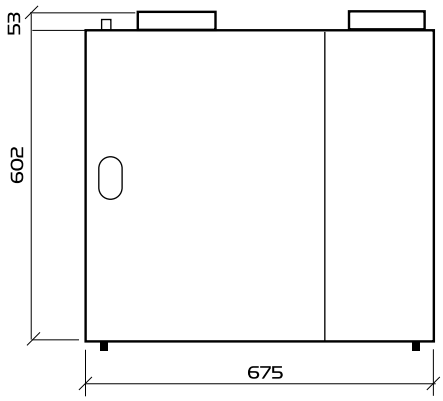
VIEW FROM TOP
4 x 180dia spigots



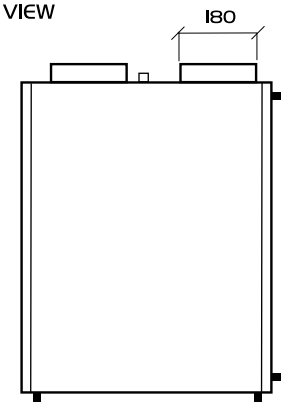
BOTTOM VIEW



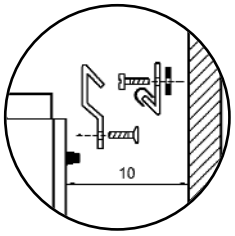
VIEW FROM FRONT



SIDE VIEW

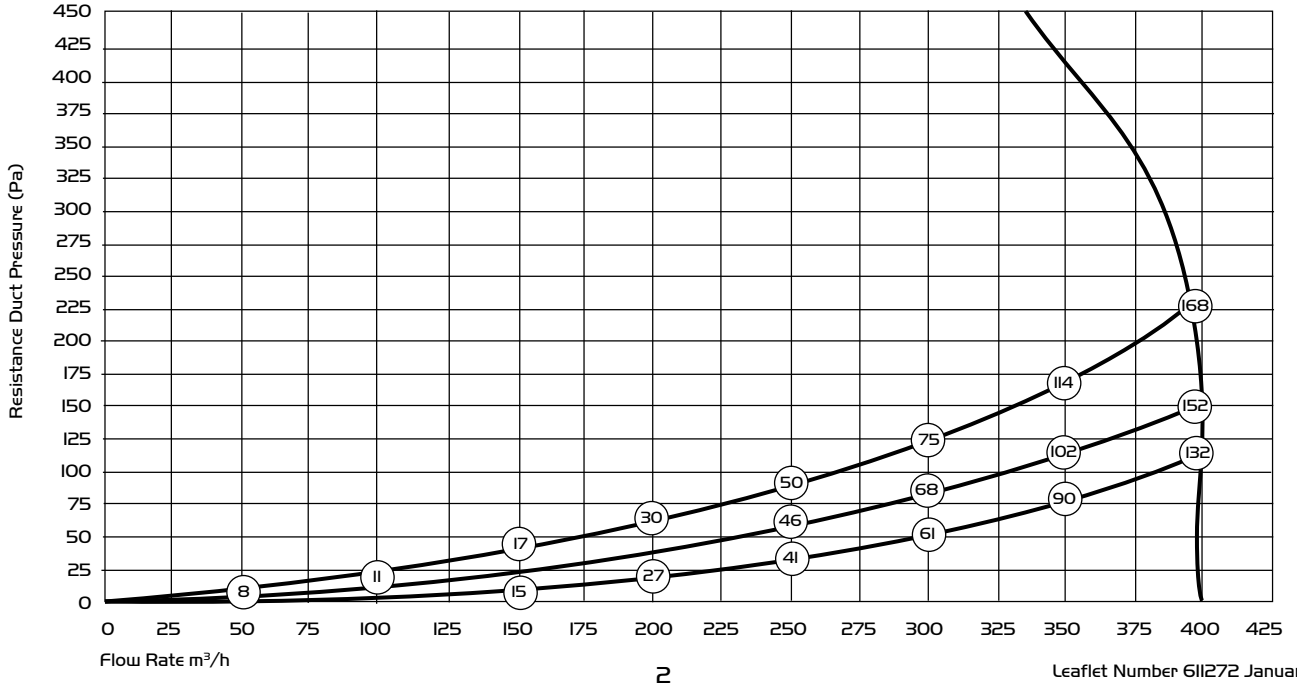


B. Detail of wall mounting.



3.0 Performance

Figure 3. **Air Performance of MRXBOX90L factory default settings.** The value stated in the circle is the capacity per fan (Watts)



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4.0 Outline description

The Nuaire MRXBOX90L is a highly advanced heat recovery unit, specially designed for minimum energy consumption and maximum comfort. This is achieved with the aid of various electronic control systems. A control unit with microprocessor controls/monitors the safe operation of the unit and ensures that the air quantities remain constant, and at the preset values. MRXBOX90L units incorporate a control panel with display, enabling stepless adjustment of the volume without having to open the unit. Moreover, information regarding the operation can be read out from the outside of the unit.

4.1 LED display system and operating panel

The MRXBOX90L control panel positioned on the front panel of the unit can be used to retrieve and modify the settings in the control unit program.

The control panel has four keys and a display.

1. = **Display**
2. = **Key "OK" (confirm, ready)**
3. = **Key increase parameter**
4. = **Function key**
5. = **Key decrease parameter**

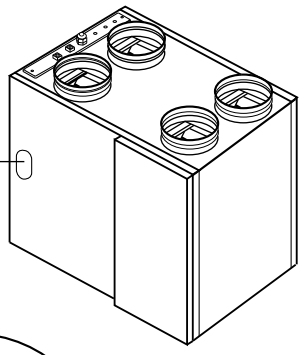
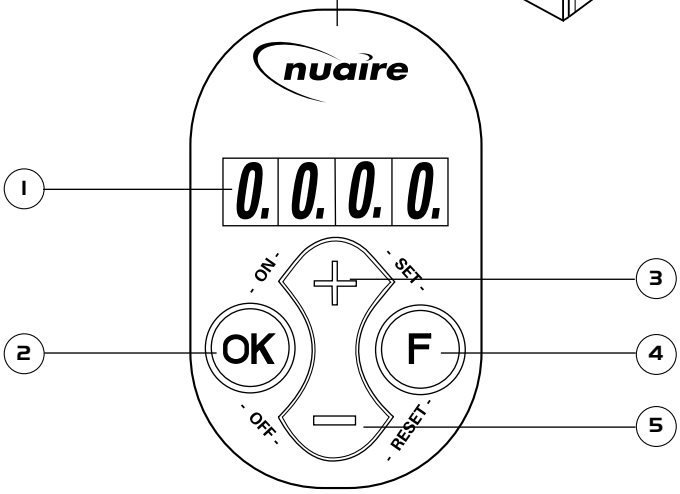


Figure 4. Control panel



On the left the display indicates the ventilation setting or the parameter type. on the right it shows the readout value, for instance the preset volume.

Example:

The display now shows (figure 5) that the unit is running at ventilation setting 3 at a flow rate of 280 m^3/h.

The four keys have the following functions:

- **F** Function key/switching on and off parameter menu
- **+** next parameter/increase value
- **-** previous parameter/decrease value
- **OK** Switching on and off settings menu/manual fault reset

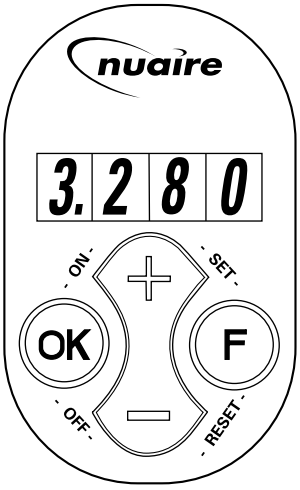
Other commands can be entered with key combinations:

- **F** and **+** (set), confirm parameter value
- **F** and **-** (reset), reset filter indication, parameter value back to factory setting
- **OK** and **+** (ON), switch on unit
- **OK** and **-** (OFF), switch off unit

This applies throughout this manual when a key has to be pressed, The key in question is printed in quotation marks and in bold.

Example: - press key **"OK"**.

Figure 5.



4.2 Bypass conditions

The bypass, makes it possible to supply fresh outside air that is not heated by the heat exchanger. This can be desirable during summer nights when the hot air in the dwelling can be replaced by cooler outside air. The bypass damper opens when the interior temperature exceeds an adjustable temperature (standard 22°C) and when the outside air is warmer than an adjustable temperature (standard 10 °C) but colder than the interior air.

Outside air supplied through the bypass is still being filtered, so the air quality is optimal, irrespective of the bypass setting.

The installer can set the bypass for different situations at adjustable parameter 8.

4.3 Frost safety

The frost protection system ensures that the secondary side of the heat exchanger (outlet side) does not freeze up by introducing an imbalance between the inlet and outlet air flows, dependent on the outside air temperature and the pressure across the heat exchanger.

Under severe conditions the inlet air flow will shut down. NB: Settings are not adjustable.

4.4 Filter indication

The unit is fitted with a filter indication system. It indicates on the display when the filter is fouled. For more detailed information refer to section 9.

IMPORTANT

Any air intake terminal MUST be installed in accordance with the appropriate regulation.
As a guide, the BS5440 series of British Standards deals with this issue and currently states that an air intake must be at a minimum distance of 300mm from a gas boiler balanced flue. Installers are advised to be aware of the requirements of this standard when installing 'through the wall' supply air ducting.
Similarly, supply and extract air grilles should be at least 300mm apart.

4.5 Option pcb (MRXBOX90-OB)

The MRXBOX90L appliance can be equipped with an option pcb. It provides the following functions.

Input 0-10 V for a carbon dioxide sensor

When several people are present in the dwelling, more CO2 is produced and then this sensor automatically increases the ventilation quantity.

Input 0-10 V for a moisture sensor

When the moisture content in the dwelling increases, for instance when someone is taking a shower, this sensor automatically increases the ventilation quantity.

Switching input for bedroom valve

With this input (make contact) the bedroom valve can be controlled, for instance using a time switch.

Switching output for bedroom valve 24 VAC

The option pcb has a built-in control for a 24 VAC bedroom valve. The valve can be connected directly to the pcb. The valve can be controlled from the switching input for the bedroom valve.

Switching output for 24 VAC flue gas safety valve

If it is recommended to combine the discharge of the central heating and the MRXBOX90L unit. The MRXBOX90L unit connection to the joint discharge must be protected with a flue gas safety valve.
The valve can directly be connected to this pcb.

Control for pre-heater up to 1000 W (MRXBOX90-PRE-HEATER)

The pre-heater ensures that the input air is kept above 0°C, so the MRXBOX90L unit can continue the balanced ventilation also at very low atmospheric temperatures. The option pcb contains a control for a preheater up to 1000 W. The pre-heater can be connected to the option pcb without separate control. The hook-up wire of the pre-heater must be fed into the appliance; the 230V power cable must separately be connected to the option pcb.

Control for post-heater up to 1000 W (MRXBOX90-POST-HEATER)

The post-heater ensures that the supply air that is blown into the dwelling can be kept at the preset temperature. That way additional warmth can be brought into the dwelling. The option pcb contains a control for a pre-heater up to 1000 W. The pre-heater can be connected to the option pcb without separate control. The hook-up wire of the pre-heater must be fed into the appliance; the 230V power cable must separately be connected to the option pcb.

Two freely programmable make contact inputs

These inputs make it possible :

- **to open the bypass without regard for the temperature conditions;**
- **to switch the inlet or outlet low or high, to circumvent the frost protection;**
- **to switch the inlet low when the bypass opens.**

Switching input for emergency

For instance a fire alarm can be connected to this input. As soon as the fire alarm is triggered, the appliance switches to emergency mode. As standard that is set to switch off the fans.

5.0 Installation

Installation must be carried out by competent personnel in accordance with the appropriate authority and conforming to all statutory and 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. It is recommended that the connection to the unit is made with flexible cable.

The unit must be fitted indoors, away from any direct sources of heat, water spray or moisture generation.

The units condensate drain must be connected to the building foul water drainage system.

If an extract grille associated with the unit is sited in a room containing a fuel burning unit, the installer must ensure that air replacement is adequate for both units. Also ensure that the units external grilles are located at least 600mm away from any flue outlet.

If the ductwork passes through an unheated loft void or similar location, it should be insulated.

Certain applications may require the installation of sound attenuation to achieve the sound levels required.

Unit installation procedure can be summarised as follows:

1. **Placing the unit (5.1)**
2. **Connecting the ducts (5.2)**
3. **Connecting the condensate discharge (5.3)**
4. **Electric wiring diagram: connecting the multiple switch and the power supply (5.4)**

MRXBOX90L units must be installed in accordance with:

- **the regulations for ventilation of dwellings and residential buildings**
- **the safety regulations for low-voltage installations (current IEE regulations)**
- **the regulations for connection to interior sewers in dwellings and residential buildings**
- **any additional regulations of the local utilities**
- **the installation instructions for MRXBOX90L**

5.1 Placing the unit

MRXBOX90L units can be directly mounted to the wall using the suspension strips supplied for that purpose. For a vibration-free result the unit must be mounted to a solid wall with a minimum mass of 200kg/m^2. (NB. a gypsum block or metal stud wall does not suffice. Additional measures such as double panelling or extra studs are required).

A mounting support for floor mounting is available (article code 217031) if required. In addition, the following aspects must be taken into account:

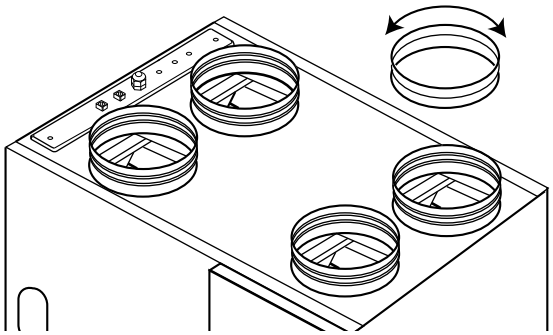
- **the unit must be placed level**
- **the installation room must be such that a good condensate discharge with air trap and pitch for condensate can be made**
- **the installation room must be frost-free**
- **make sure there is a free space of at least 70cm at the front of the unit and a free headroom of 1.8m for cleaning the filters and carrying out maintenance**

5.2 Connecting ducts

The air outlet duct does not have to be fitted with a control valve; the unit itself controls the air quantities.
To prevent condensation on the outside of the outside air inlet duct and the air outlet duct from the MRXBOX90L unit, these ducts must be insulated externally vapour-proof as far as the unit.
Pay attention to crosstalk and installation noise, also for incorporated ducts. Design the duct with separate branches to the valve to prevent crosstalk. if necessary, the input ducts must be insulated, for instance when they are installed outside the insulated shell.

A duct diameter, of 180mm is recommended for MRXXBOX90L.
The duct must always have an adequate diameter of 150mm for air quantities up to 250 m^3/h, a diameter of 160mm for air quantities up to 325 m^3/h and a diameter of 180mm for air quantities up to 400 m^3/h.
The duct spigots of MRXBOX90L are fitted with eccentric adapters of 180mm diameter. The centre of the connecting duct can be shifted by rotating these eccentric adapters.

Figure 6. Eccentric adapters



Arrange the exterior air supply from the shadowed (North) side of the dwelling, for instance from the wall or overhang.

- **install the discharge duct between the MRXBOX90L unit and the roof sleeve in such a manner that surface condensation is prevented**
- **always use an insulated ventilation roof sleeve**
- **the maximum permissible resistance in the duct system is 150 pa at the maximum ventilation capacity. if the resistance of the duct system is higher, the maximum ventilation capacity will be lower**
- **the location of the mechanical ventilation outlet and the sewer stack vent relative to the inlet must be chosen to prevent nuisance**
- **choose the location of the inlet valves to prevent fouling and draught**

5.3 Connecting the condensate discharge

The condensate discharge line for the MRXBOX90L unit is fed through the lower panel. The condensate must be discharged through a drainpipe. (see fig. 7a). The drain must discharge under the water level in the U-trap. The condensate discharge comes separately with the unit and the installer must screw it into the underside of the unit. This condensate discharge connection has an external connecting diameter of 20mm. The condensate discharge line can be glued to it, if necessary using a square bend. The installer can glue the condensate discharge in the desired position in the lower part of the unit.
See Figure 7b for an example of a connection to a drainpipe.
Pour water into the drip tray to create an air trap.

Figure 7a. The condensate must be discharged through a drainpipe.

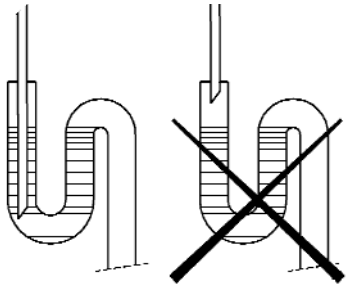


Figure 7b. The installer can glue the condensate discharge in the desired position in the lower part of the unit.

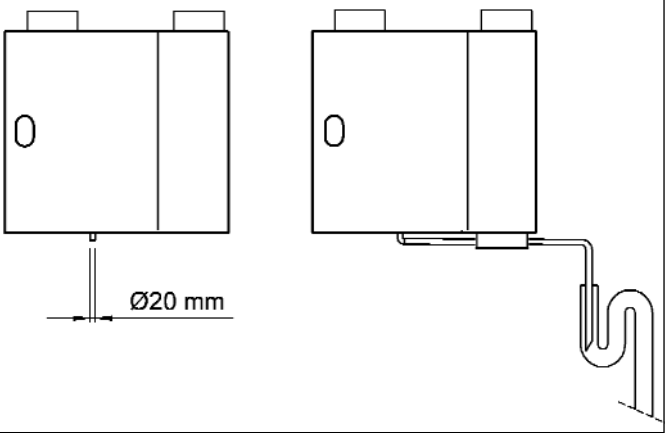
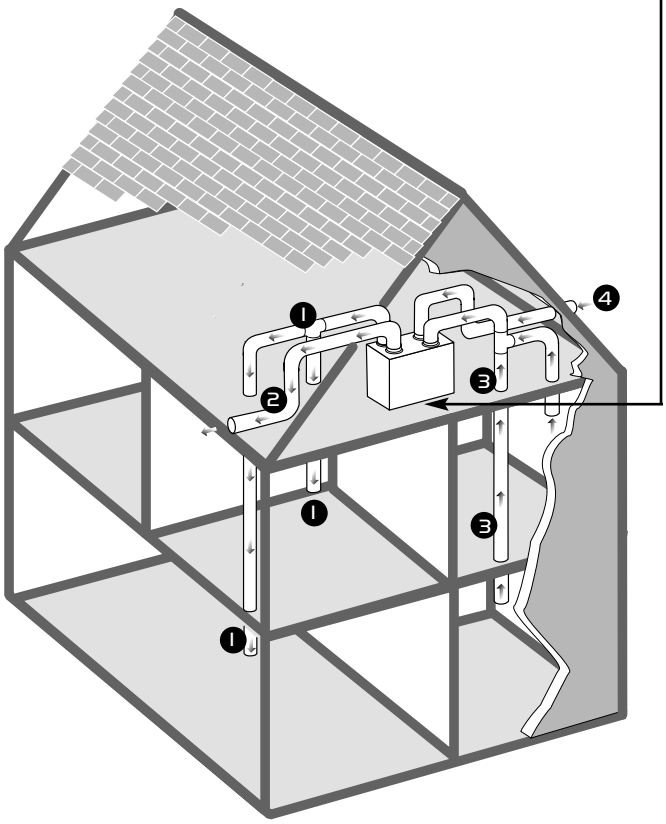


Figure 8. Typical installation with unit mounted on wall

Ducting references:

1 = to dwelling. Supply (warmed fresh air)
2 = to outside. Exhaust (cool stale air)
3 = from dwelling. Extract (warm stale air)
4 = from outside. Intake (cool fresh air)



5.4 Electrical connections

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.

Isolation - Before commencing work make sure that the unitis electrically isolated from the mains supply. Please note this product must be earthed.

Three position switch

The unit is supplied with a three position speed control switch. This is connected to the unit via a multi-core cable (supplied).

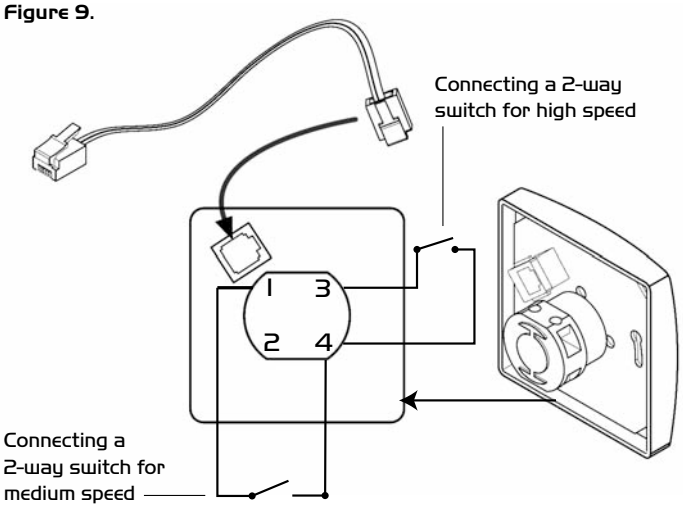
Additional switches (not supplied)

In order to boost the unit via additional remote switches, the 3 position switch must be used. On the rear of the position switch are four terminals marked 1 - 4 (see fig. 9 below). In order to boost the unit to high speed the additional switch should be wired to terminals 3 and 4.

To boost to medium speed wire across terminals 1 - 4.

Note: Do not put any voltage to these terminals as it will damage the unit beyond repair.

Figure 9.



All mains wiring must be in accordance with the current I.E.E. Regulations and must be installed by a suitably qualified person. Ensure that the mains supply (Voltage, Frequency and Phase) complies with the rating label.

The Unit should be used with a local double pole isolator switch having a contact separation of at least 3mm.

The wiring is as follows: **L (live) = Brown**
N (neutral) = Blue
Pe (Earth) = Green/Yellow

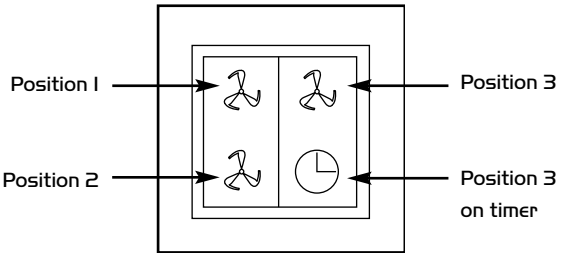
5.5 Wireless Controller (optional)

1. General

If required this optional control (see fig. 10) can be purchased direct fom Nuaire (Part number MRXBOX90-BS). Wireless remote control exists from a receiver and a sender (switch). The receiver and the transmitter have been synchronized and installation is simple and rapid. A choice can be made from two types of transmitters, (A) with two positions, (B) with four positions.

The wireless remote control can be combined with a position switch that is already mounted and in use. Think of a second switch in the bathroom.

Figure 10. Wireless remote control (optional).



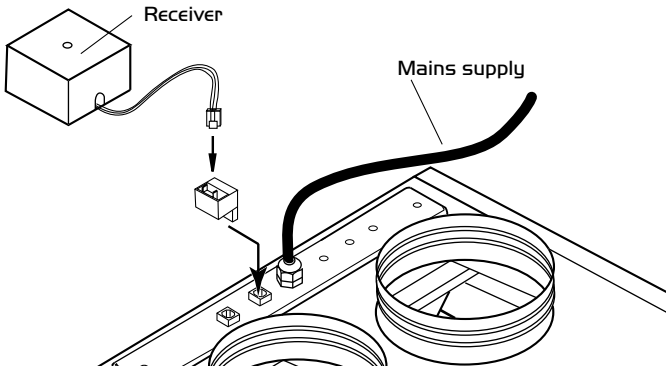
2. Receiver

The receiver as standard is equipped with a cable and small telephone plug. The telephone plug needs to be plugged into the provided splitter that in turn has to be plugged in at the upper side of the unit.

You can use 32 transmitters on 1 receiver.

Nuaire can provide you with extra transmitters.

Figure 11. The receiver is standard and equipped with cable and with a small telephone plug.



3. Transmitter with 4 positions

Button	Description
Push left upper button	unit works in position 1
Push left lower button	unit works in position 2
Push right upper button	unit works in position 3
Push right lower button (<1 sec.)	unit works 15 minutes in position 3 Switches afterwards to position 1
Push right lower button (>1 sec.)	unit works 30 minutes in position 3 Switches afterwards to position 1

4. Combination of a mechanical switch and a radio-controlled (RC) transmitter

It's possible to combine 2 RC transmitters with each other.

It's also possible to combine a mechanical switch with RC transmitter.

Which transmitter or switch is actual is mentioned below:

RC transmitter - RC transmitter	The latest change in position is actual
Mechanical switch - RC transmitter	The highest fan-speed position is actual

5. Installing the wireless remote control Mounting:

The remote control wall transmitter is a universal, extremely flat standard switch element that can be integrated into numerous control programmes by different manufacturers.

The wall transmitters are supplemented with the single or multiple frames of the desired switch program.

The switch element is so flat that the frame of the respective switch program lies directly against the wall. This allows on-wall mounting without assembly housing.

- **Fasten the central plate (the wide notches of the central plate must be positioned to accept the wall transmitter on the top or bottom)**
- **Attach the design frame, intermediate frame, wall transmitter and actuating rocker to the central plate one after the other**
- **During installation, be sure to pay attention to the orientation of the markings "O" and "I" on the wall transmitter and actuating rocker!**

The central plate can be glued or screwed in place and is easy to attach to glass and plaster. If the surface is structured, make a flat area so that the central plate will not shift during mounting. Unevenness can cause malfunctions. This is particularly important when mounting on rough walls!

1. Screws: Only use correctly sized screws. Remove the central plate from the wall transmitter and use it as a template to mark the bore holes. Drill 5-mm anchor holes, fasten the central plate and mount the switch.

2. Glue: The wall transmitters can be glued onto a flat, smooth surface like glass, painted walls, tile, furniture, wood, etc. using the included double-sided mounting film. This adhesive film completely covers the mounting plate of wall transmitter but not the entire frame. The use of single-sided decor film (can be purchased from a home-improvement store) cut to fit the frame size is recommended for mounting on glass walls. To avoid air bubbles, the decor film should first be affixed to the glass surface and then the wall transmitter should affixed using the double-sided adhesive mounting film.

Demounting:

Remove the rocker, release the intermediate frame from the snap fits on the top and bottom.

Transmission Range:

The following figures for expected transmission range may be used as a rough guide only:

- **Line-of-sight connections: 30m range in corridors, up to 100m in halls**
- **Plasterboard and dry wood: 30m range, through max. 5 walls**
- **Bricks and aerated concrete: 20m range, through max. 3 walls**
- **Ferroconcrete : 10m range, through max. 1 ceiling**

Fire-safety walls, elevator shafts, staircases and supply areas should be considered as screening.

Restriction of transmission range:

- **Switch mounted on metal surfaces, or in metal frames (up to 30% loss of transmission range)**
- **Hollow lightweight walls filled with insulating wool on metal foil**
- **False ceilings with panels of metal or carbon fiber**
- **Lead glass or glass with metal coating, steel furniture**

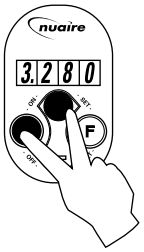
The distance between receivers and other transmitting devices such as computers, audio and video equipment that also emit high-frequency signals should be at least 0.5m

6.0 Switching the unit on and off

There are two methods to switch the unit on or off.

1. **Standby mode; the unit remains connected to the mains, when switching off only the fans are stopped.**
2. **Removing the mains lead from the power supply.**

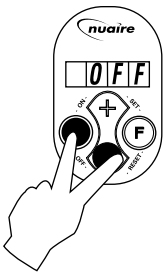
Switching on



- Connect the unit to the mains supply
- Simultaneously press the keys "**OK**" and "**+**" to switch on the unit.
  (only possible after the unit has been switched to standby - **OFF** displayed).

  The first digit on the display indicates the position of the 3-way switch.

Switching off



1. Standby mode; simultaneously press the keys "**OK**" and "**-**" to switch off the unit.
   The text **OFF** appears on the display.
2. Mains power: Isolate the unit from the supply.

IMPORTANT

When working on the unit, always disconnect from the supply by first switching it to standby within the unit and subsequently isolating from the mains supply.

IMPORTANT

Unit must not be switched off, product is designed to run continuously.

6.1 Setting the air quantity

The air quantities of the MRXBOX90L unit for settings 1, 2 and 3 are factory-set and are shown on page one.
The performance of the unit depends on the quality of the duct system as well as on the filter resistance.

Important:

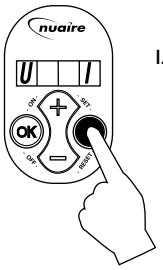
Setting 1: must always be lower than setting 2.

Setting 2: must always be lower than setting 3.

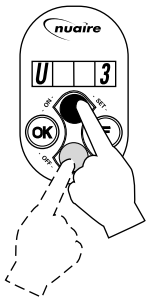
Setting 3: adjustable between 50 and 300/400 m^3/h.

If these conditions are not complied with, the air quantity of the higher setting will automatically be adjusted.

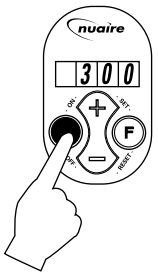
The air quantities can be modified as follows (as an example here the air quantity for setting 3 will be changed from 300 to 280 m^3/h).



1. Press key "**F**" for 3 seconds to activate the settings menu.



2. Use key "+" to select the desired parameter (U1 = setting 1, U2 = setting 2, U3 = setting 3). Settings U4 and U5 only apply when bypass is required).



3. Press key "**OK**" for 1 second to display the selected parameter value.

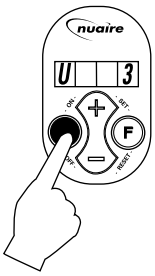
4. The selected parameter value can be changed using keys "+" or "-".

5. The modified setting can now:

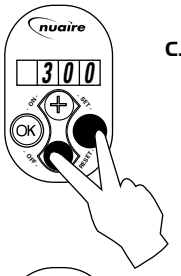
   A. Be saved and stored
   B. Be removed
   C. Be restored to factory setting

A. Simultaneously press keys "**F**" and "**+**" (first press "**F**" and then "**+**") to save the modified setting; this value now blinks 3x to confirm that it has been stored. The value remains on the display.

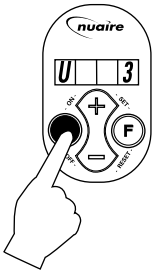
Press key "**OK**" to return to the settings menu; if required other settings can now be modified. (step 2 - 5). Continue with item 6.



B. Press key "**OK**" to return to the settings menu; without saving the modified setting.
if required other settings can now be modified. (step 2 - 5). Continue with item 6.



C. Simultaneously press keys "**F**" and "**-**" (first press "**F**" and then "**-**") to go back to factory setting. The factory setting will blink 3x and remains at that value. The modified setting has now been removed and the factory setting remains on the display.



Press key "**OK**" to return to the settings menu; If required several settings can now be modified. (see item 2 to 5) Now continue with item 6.

6. Press key "**F**" for 1 second to leave the settings menu.

6.2 Other user settings

In addition to the air quantities per setting, the user can also adjust the following parameters.

U4. Minimum atmospheric temperature bypass. this is the minimum atmospheric temperature at which the bypass opens, also when the indoor temperature satisfies the conditions. (Factory set @ 10°C).

U5. Minimum indoor temperature for the bypass. this is the minimum indoor temperature at which the bypass opens, when the atmospheric temperature also satisfies the conditions. (Factory set @ 22°C).

These two setting possibilities are made in the same manner as described in section 6.1.

6.3 Installer settings

Various other settings of the control unit can also be modified. Because some settings have an influence on the correct operation of the unit, these have been placed in a separate installer parameters set. Consequently, these parameters can only be modified by the installer. How to modify these is explained in section 7.6.

1. Fixed imbalance

This can be used to keep the pressure in the dwelling at a higher **(+)** or lower **(-)** level than the atmospheric pressure.

Positive imbalance (+): the output fan ventilates the set value in (m^3/h) less than the input fan.

Negative imbalance (-): the input fan ventilates the set value in (m^3/h) less than the output fan.

2. No contact step

This setting determines the ventilation position when no switch contact is connected to position 1; the unit will start running at the ventilation position set here.

3. Not applicable

4. Switch line 1 step

Determines what position of the multiple switch matches line 1 on the control unit.

5. Switch line 2 step

Determines what position of the multiple switch matches line 2 on the control unit.

6. Switch line 3 step

Determines what position of the multiple switch matches line 3 on the control unit.

7. Imbalance permissible

This determines whether for instance the frost protection may affect the imbalance.

8. Bypass mode

There is a choice between 3 situations.

Mode 0	**The bypass valve is not operated**
Mode 1 (standard setting)	**The bypass valve - if installed - is opened when The temperature conditions are complied with**
Mode 2	**The inlet fan starts running at the lowest possible rpm if the temperature conditions are complied with**

9. Hysteresis bypass

Here you can enter how much the indoor temperature may drop before the bypass closes or the inlet fan starts running at the normal rpm.

10. Constant pressure switched off

Here you can set whether in all cases the fans are running at constant flow or that they start running at constant pressure when a certain resistance is exceeded.
Refer to the table in section 7.7 for the factory setting.

11. Pre-heater or post-heater

This indicates whether a preheater or postheater is connected.

Setting 11.	Situation
0	**No pre-heater or post-heater**
1	**Pre-heater connected to basic pcb**
2 & 3	**Only use this selling for option pcb**

12. Temperature pre-heater

This sets the offset temperature preheater.

13. Filter message

Sets whether the filter message is shown on the display and the LED of the 3-way switch.

14. Presence option pcb

This indicates whether an option pcb is mounted.

15. Heat recovery configuration

Option setting when heat recovery is used in combination with central heating; only heat recovery or the combination central heating + heat recovery.
Only heat recovery = 0; Central heating + heat recovery = 1.

16. Fan setting for central heating + heat recovery

Fan(s) off for central heating + heat recovery
(only applicable if 15 = 1).

Setting 16.	Situation fan(s)
1	**Output fan off**
2	**Input fan off**
3	**Both fans off**

17. Repeat time in hours

for switching off the fan(s) selected under 16 for central heating + heat recovery.

18. Maximum switch-off time

in seconds for the fan(s) selected under 16 for central heating + heat recovery.

19. Minimum switch-off time

in seconds for the fan(s) selected under 16 after switching on 230V for central heating + heat recovery.

Refer to the table in section 7.7 for the factory setting.

6.4 Mounting the pre-heater on MRXBOX90L unit

- Switch off power supply of MRXBOX90L unit.
- The pre-heater unit has to be placed onto the ventilation unit, on the duct 'from outside' (4). (see fig. 12).
- Connect the wires of the pre-heater unit according the wiring diagram (below) to the required option print.
- Switch on the power supply from the MRXBOX90L unit as well as the pre-heater unit.

1 = To dwelling

2 = To outside

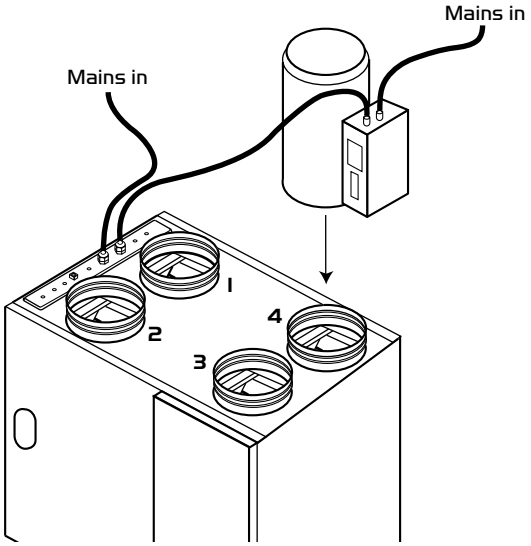
3 = From dwelling

4 = From outside

IMPORTANT

Isolation - Before commencing work make sure that the unitis electrically isolated from the mains supply. Please note this product must be earthed.

Figure 12. Typical installation for pre-heater



6.5 Wiring diagram for pre-heater unit

Figure 13.

A = Heating element (max. 1000W)

B = Safety switch for maximum temperature with manual reset

C = Power connector 230V

D = Cable, to be installed and connected

E = Option print (required for this option)

L = 230V LED, lights if safety switch (temperature) is activated

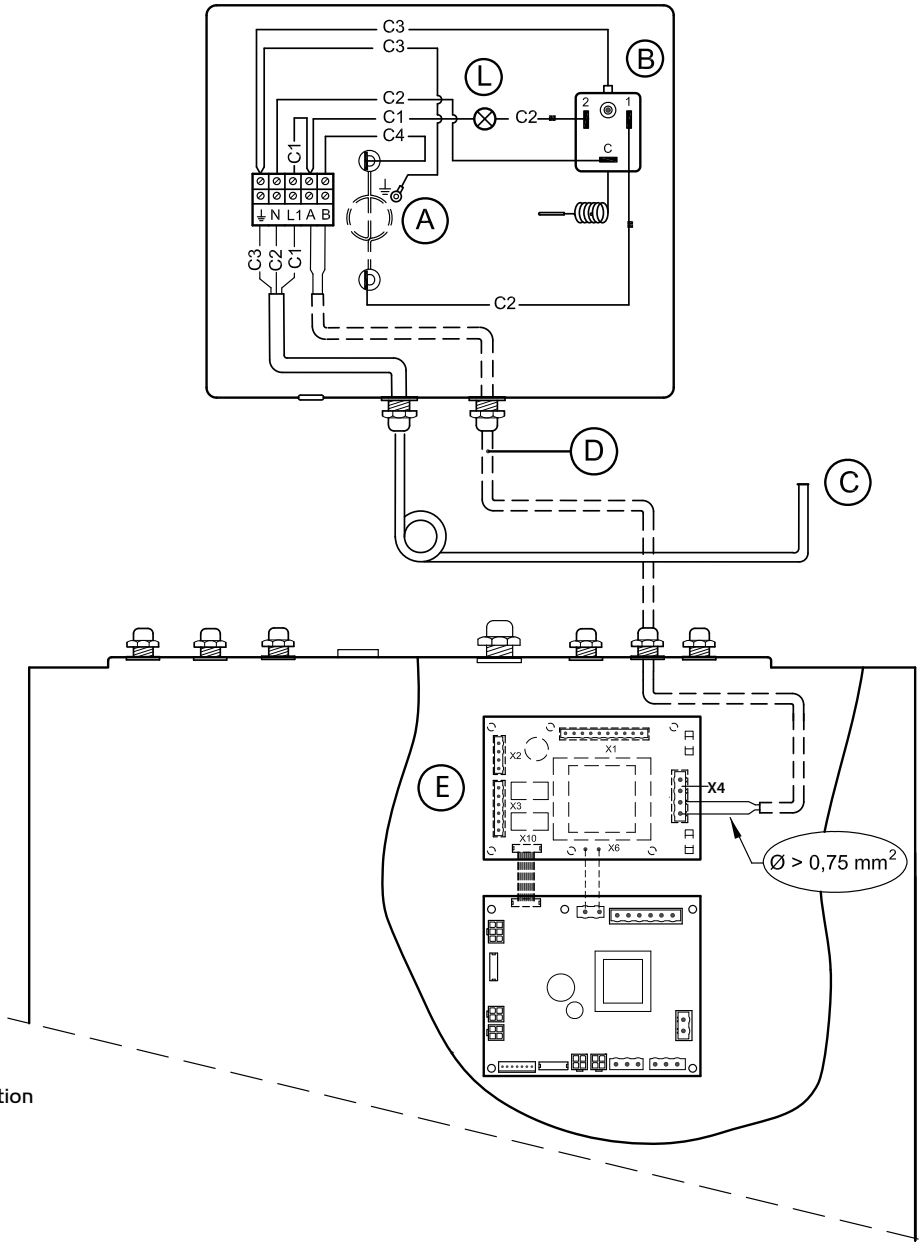
C1 = Brown

C2 = Blue

C3 = Green/yellow

C4 = Black

The control signal for the pre-heater unit has to be connected to connector X4 (230V) of the MRXBOX90L option print.



Technical specifications

Power supply:	230V-50 HZ
Weight:	2.5kg
Duct diameter:	160mm
Protection class:	IP 20
Max. rated power:	1000W
Max. rated current:	4.5A

Settings for pre-heater unit

The MRXBOX90L unit needs to be programmed to activate the pre-heater unit. This can be done via the display. (parameter PII, pre-heater present). To change this parameter, please check the installation guide Large with option print.

6.6 Wiring diagram connection pre-heater to MRXBOX90L without option pcb

Figure 14.

A = Heating coil

B = Maximum safety with manual reset

C = Connecting plug 230V/50Hz

O = Cable, to be connected by installer

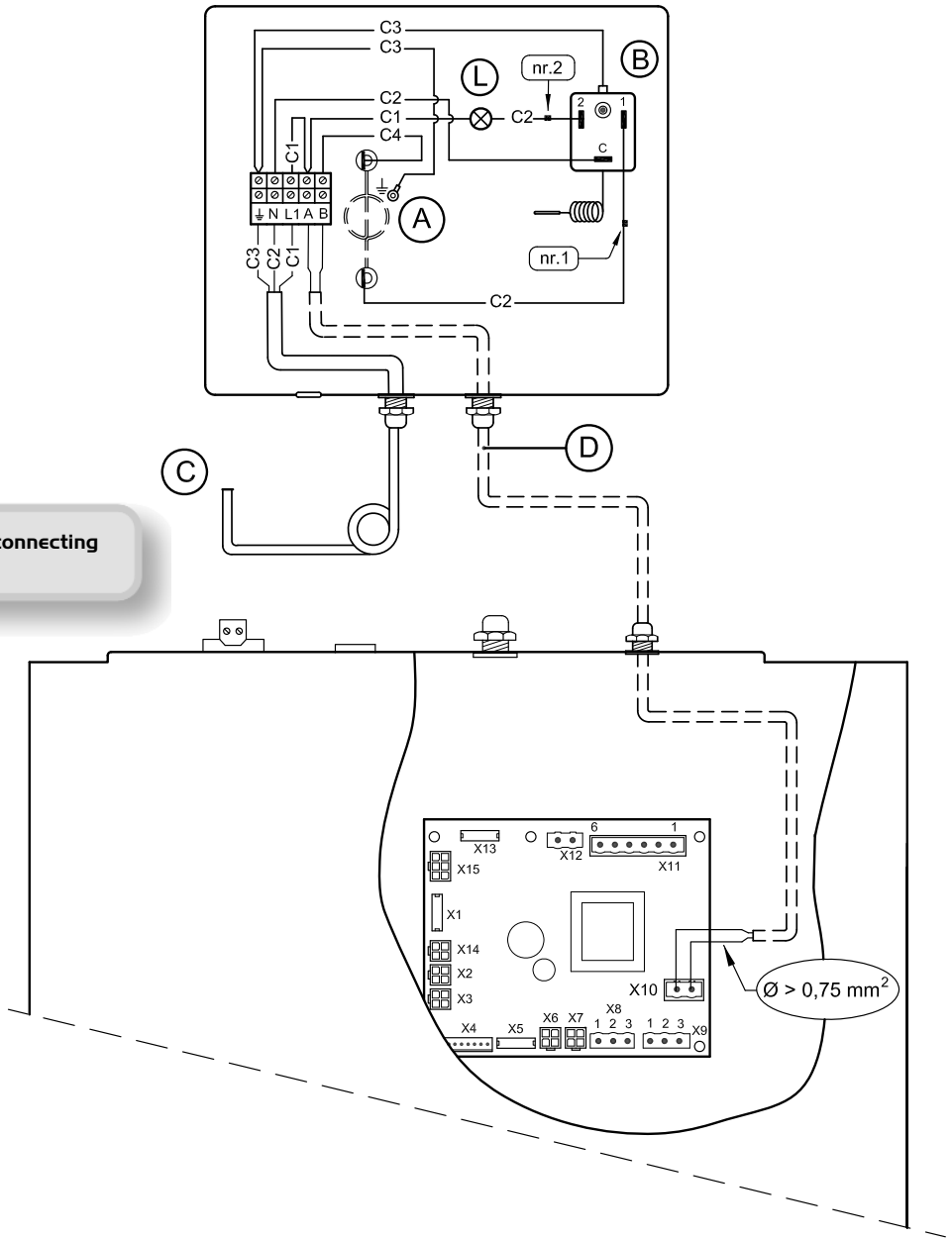
L = LED maximum safety switch lights up when activated

C1 = Brown

C2 = Blue

C3 = Green/yellow

C4 = Black



IMPORTANT

Note: Parameter II must be set at (I) when connecting the pre-heater to the basic pcb.

6.7 Mounting the post-heater on MRXBOX90L unit

- **Switch off power supply of MRXBOX90L unit.**
- **The post-heater unit has to be placed onto the ventilation unit, on the duct 'to dwelling' (1). (see fig. 15).**
- **Connect the wires of the post-heater unit according the wiring diagram (below) to the required option print.**
- **Switch on the power supply from the MRXBOX90L unit as well as the post-heater unit.**

1 = To dwelling

2 = To outside

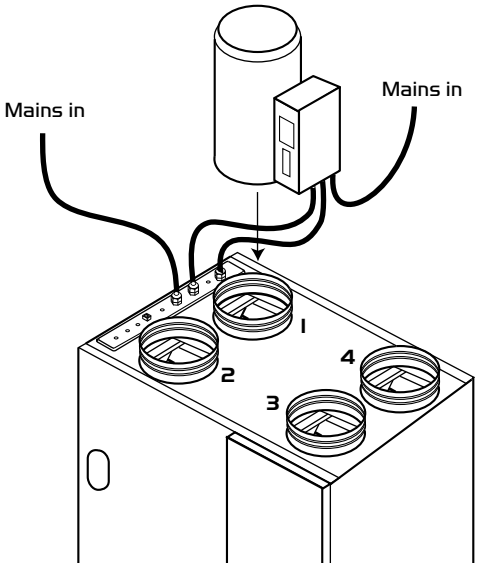
3 = From dwelling

4 = From outside

IMPORTANT

Isolation - Before commencing work make sure that the unitis electrically isolated from the mains supply. Please note this product must be earthed.

Figure 15. Typical installation for post-heater



6.8 Wiring diagram for post-heater unit

Figure 16.

A = Heating element (max. 1000W)

B = Safety switch for maximum temperature with manual reset

C = Temperature sensor

D = Power connector 230V

E = Cable, to be installed and connected

F = Option print (required for this option)

L = 230V LED, lights if safety switch (temperature) is activated

C1 = Brown

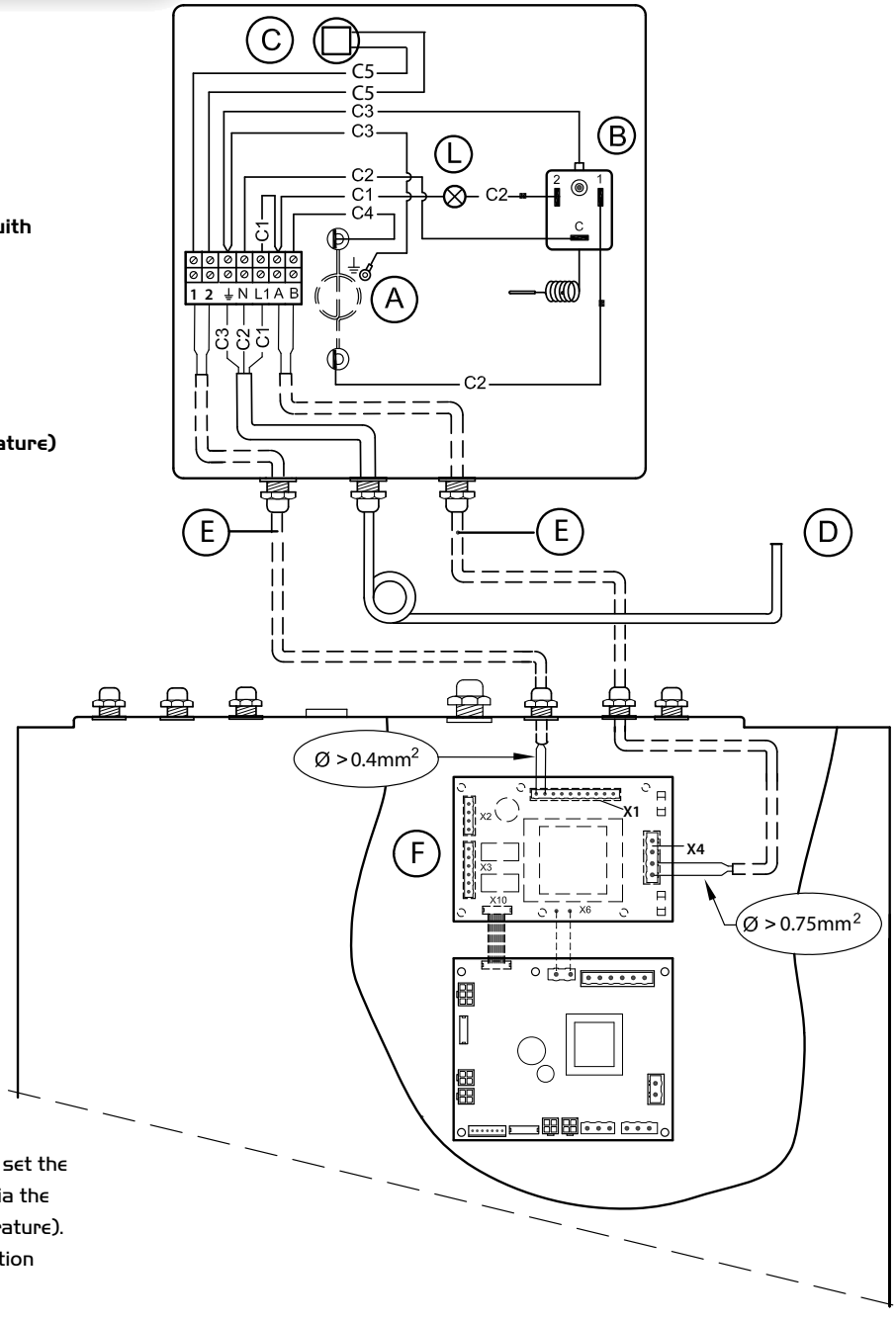
C2 = Blue

C3 = Green/yellow

C4 = Black

C5 = Yellow

The temperature sensor has to be connected to connector X1 of the MRXBOX90L option pcb. The control signal for the post-heater unit has to be connected to connector X4 (230V) of the MRXBOX90L option pcb.



Technical specifications

Power supply:	230V-50 HZ
Weight:	2.5kg
Duct diameter:	160mm
Protection class:	IP 20
Max. rated power:	1000W
Max. rated current:	4.5A

Settings for post-heater unit

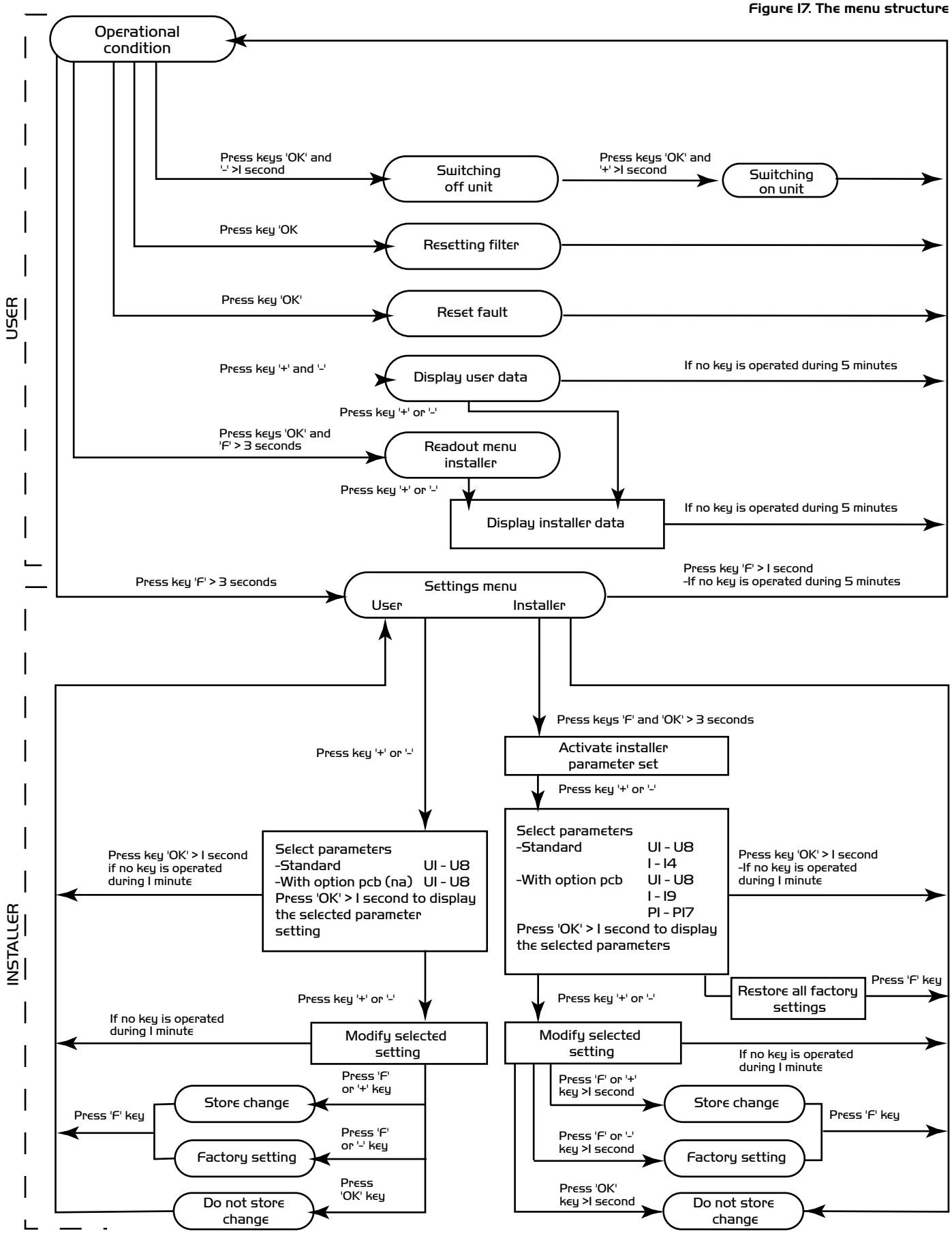
The MRXBOX90L unit needs to be programmed to set the pre-heater pre-set temperature. This can be done via the display. (parameter U6, post-heater pre-set temperature). To change this parameter, please check the installation guide Large with option print.

7.0 Menu structure display

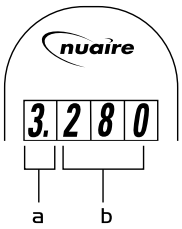
The menu structure is divided into a readout section and a settings section. The number of visible parameters depends on the parameter set. The user has parameter set "user".

The installer has the more comprehensive parameter set "installer", that can be activated and deactivated by simultaneously pressing key "**F**" and key "**OK**".

Figure 17. The menu structure



7.1 Readouts settings



The standard current position of the multiple switch and the connected outlet volume are shown (operational mode). on the left of the multiple switch to the left of the dot. The three remaining positions shown to the right of the dot represent the volume of the outlet air.

a = position multiple switch is set at

b = volume of outlet air (m^3/hr)

7.2 Reading out settings by the user

The user can read out other relevant data using keys "+" and "-" (step 1 - step 6). Step numbers are not shown on the display.

See the table below for user readout; if a key is not operated during 5 minutes, the display automatically returns to operational mode.

Use key "+" to “scroll” through the menu; press key "-" to return to step 1. in this situation no settings can be modified.

7.3 Reading out settings by the installer

A more comprehensive readout programme is available for the installer. All installer data can be viewed after pressing keys "**F**" and "**OK**" within 3 seconds. in this menu the values cannot be modified.

Activating this menu always calls up step no. 7.

See the table below for user readout.

Pressing key "+" calls up the installer and user data and pressing key "-" takes you back to step no. 1.

After 5 minutes this menu automatically disappears and the display will show the operational situation again.

In the event of an error, the error code appears on the display. Refer to page 18 for further information.

	Step number	Readout (example)	Description	Remark
User	No. 1	2.200	Current position/outlet volume m^3/h	
	No. 2	C0	Message code operating condition	C0 = No message C3 = The inlet fan runs in constant pressure mode C6 = The outlet fan runs in constant pressure mode C7 = Correction maximum air flow
	No. 3	bP.1	Bypass status (only if mounted)	0 = bypass valve shut 1 = bypass valve automatic 2 = Input at minimum
	No. 4	tP.9	Temperature from atmosphere (°C)	At negative temperature (below 0°c) than readout tP.9.
	No. 5	tS.21	Indoor temperature (°C)	
	No. 6	In.0	n.a.	
Installer	No. 7	u.156	Current input volume m^3/h	
	No. 8	u.156	Current output volume m^3/h	
	No. 9	t.180	Current pressure inlet duct (Pa)	
	No. 10	A.180	Current pressure outlet duct (Pa)	
	No. 11	u0.0	Status frost protection	0 = none, 1 - 4 = imbalance, 5 = inlet fan off
	No. 12	St.9	Temperature to atmosphere (°C) (Sensor not connected as standard)	If not connected St.75
	No. 13	Pt.18	Temperature to indoors (°C) (Sensor not connected as standard)	If not connected Pt.75

7.4 Modifying settings

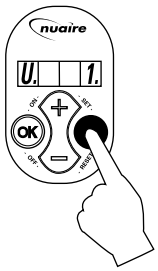
A number of settings can be modified by both user and installer to adapt the appliance to the specific situation.

7.5 Modifying settings by the user

The user can modify a limited number of settings, that is U1 to U5 inc. (see table section 7.7), how to modify these settings is described in detail in section 7.6 and is also shown in the diagram menu structure of section 7.0.

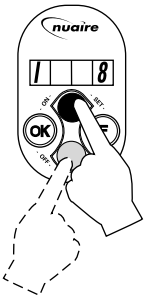
7.6 Modifying settings by the installer

The installer can modify more settings. When parameters are set incorrectly, the appliance can no longer perform up to standard, so make sure no parameters are modified incorrectly.
Also refer to the diagram menu structure section 7.0. The following actions are required to modify the settings from operational mode:
(By way of example parameter 8 (bypass mode) is changed from 1 to 2.)

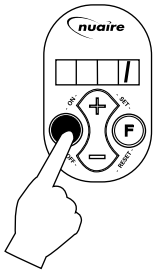


1. Press key "**F**" for 3 seconds to activate the settings menu.

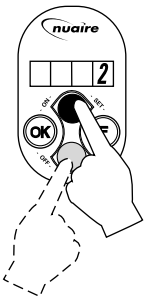
2. Press keys "**F**" and "**OK**" for 3 seconds to activate the comprehensive parameters section for the installer.



3. The desired parameter can be found with the aid of keys "**+**" and "**-**".

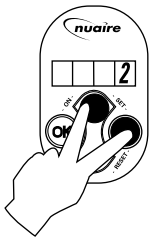


4. The setting can be viewed by pressing key "**OK**".



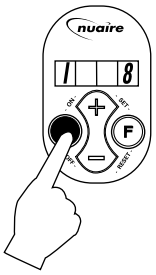
5. Use keys "+" and " –" to modify the value.

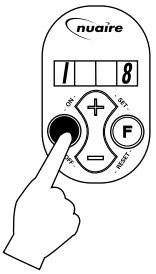
6. The modified setting can now:
   A. Be saved and stored
   B. Be removed
   C. Be restored to factory setting



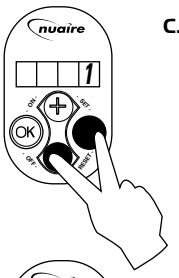
A. Simultaneously press keys "**F**" and "**+**" (first press "**F**" and then "**+**") to change the modified setting; this value now blinks 3x to confirm that it has been stored. The value remains on the display.

Press key "**OK**" to return to the settings menu; if required other settings can now be modified. (step 2 - 5). Continue with step 7.



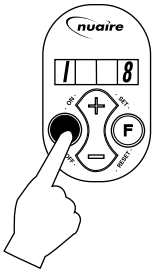


B. Press key "**OK**" to return to the settings menu; without saving the modified setting.
The previous setting will be maintained.
Continue with step 7.



C. Simultaneously press keys "**F**" and "**-**" (first press "**F**" and then "**-**") to go back to factory setting. The factory setting will blink 3x and remains at that value. The modified setting has now been removed.

Press key "**OK**" to return to the settings menu; Continue with step 7.



7. Press key "**F**" for 1 second to leave the settings menu.

7.7 Adjustable settings

The user adjustable parameters are indicated with"U".
The installer adjustable parameters are indicated with "I"
(basic pcb) or "P" (option pcb).

	Adjustable settings	Description	Adjusting range	Factory setting
User	U1	Volume step 1	50..(MAX -10)	100
	U2	Volume step 2	50..(MAX -5)	200
	U3	Volume step 3	50..400	300
	U4	Minimum atmospheric temperature bypass	5..20	10
	U5	Minimum indoor temperature bypass	18..30	22
Installer	U8	Not applicable	0.1	0 (off)
	1	Fixed imbalance	-100..+100	0
	2	No contact step	0, 1, 2, 3	1
	3	Not applicable	2. 3	2
	4	Switch line 1 step	0, 1, 2, 3	1
	5	Switch line 2 step	0, 1, 2, 3	2
	6	Switch line 3 step	0, 1, 2, 3	3
	7	Imbalance permissible	0. 1	1 (yes)
	8	Bypass mode	0, 1, 2	1
	9	Hysteresis Bypass mode	0..5	2
	10	Constant pressure switched off	0.1	0 (no)
	11	Preheater or postheater	0, 1, 2, 3	0
	12	Offset temperature preheater	-30..+30	0.5
	13	Filter message on/off	1.0	1 (on)
	14	Option pcb present	1.0	0 (no)
	15	Heat recovery configuration	0.1	0 (heat recovery)
	16	Fan off	1, 2, 3	1 (output fan)
	17	Repeat time	1..24	24 (hours)
	18	Minimum switch-off time fan(s)	1..240	60 (seconds)
	19	Minimum switch-off time fan(s) after switching on 230V	1..240	1 (second)

7.8 Faults

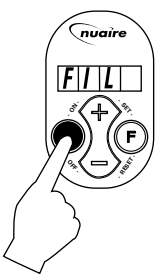
(also refer to the error code table (page 18)

If the control detects an error, this is shown on The display by means of a number, preceded by a letter **F** (Failure). If a 3-way switch with filter indication is mounted, the LED on the 3-way switch will also start blinking. Error **F9** is shown here is an example. This means some thing is wrong with the wiring to the sensor, or atmospheric temperature sensor.

The appliance remains in this error mode until the problem in question has been solved. Then the unit will reset itself (auto reset) and the display will once more show operational mode. The table on page 18 gives an overview of the errors, possible courses and the actions to be undertaken.

7.9 Filter indication

If the display shows the message "**FIL**" then This means the filters have to be cleaned. If a multiple switch with filter indication has been mounted (= option), then simultaneously with this message on the display, the LED on the switch will light up.



After the filters have been cleaned or replaced, key "**OK**" must be pressed during 1 second to reset the filter indication.
The text "**FIL**" will blink for a moment and then the display will return to operational mode.

8.0 Error code table

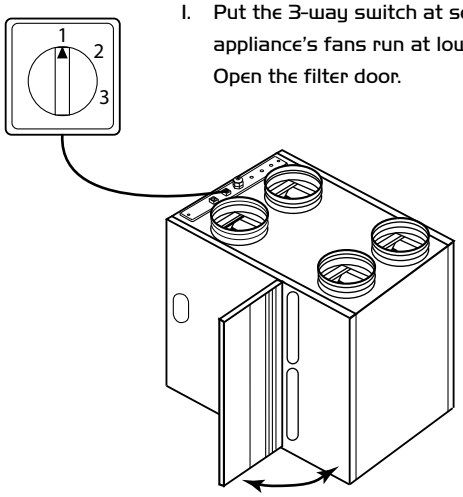
Error code	Cause	Action user	Action installer
F2	The inlet fan has stopped	• Contact the installer	• Replace the inlet fan, it is defective
F5	The outlet fan has stopped	• Contact the installer	• Replace the outlet fan, it is defective
F9	The temperature sensor that measures the temperature of the input air is defective. The unit operates as expected but the bypass is out of operation	• Contact the installer	• Check the wiring from the sensor to the basic pcb • Check the sensor connection to the wiring • Replace the sensor
F10	The temperature sensor that measures the temperature of the output air is defective. The unit operates as expected but the bypass is out of operation	• Contact the installer	• Check the wiring from the sensor to the basic pcb • Check the sensor connection to the wiring • Replace the sensor

Note: If setting 2 does not work with a mechanical rpm control device, such as a multiple switch, the RJ connector has been connected the wrong way round. Cut off one of the RJ connectors to the rpm control and mount a new connector the other way round.

9.0 Routine maintenance

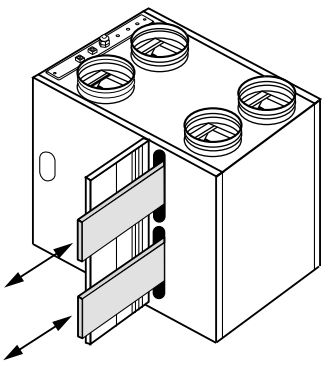
Routine maintenance is limited to periodically cleaning or replacing the filters. The filter only has to be cleaned when that is indicated on the display (it shows the text "**FIL**") or, if a multiple switch with filter indication is mounted, when the red LED at the switch lights up.
The filters must be replaced every year. It is not permitted to use the appliance without filters.

Figure 18.

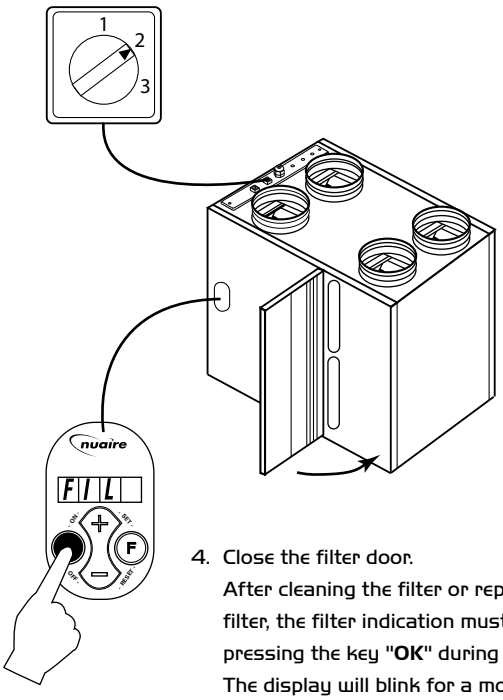


1. Put the 3-way switch at setting 1 to let the appliance's fans run at low speed.
   Open the filter door.

2. Remove the filters and note how the filters are fitted into the unit. The filters can be cleaned with a vacuum cleaner.



3. Refit the filters back into the unit the same way they were taken out.



4. Close the filter door.
   After cleaning the filter or replacing with a new filter, the filter indication must be reset by pressing the key "**OK**" during 1 second.
   The display will blink for a moment to confirm that the filter has been reset.
   The unit will return to operational mode.
   Put the 3-way switch back to the original setting.

10.0 Replacement of Parts

Should any component need replacing Nuaire keep extensive stocks for quick delivery. Ensure that the unit is electrically isolated, before carrying out any work.
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).

11.0 Warranty

The 5 year warranty starts from the day of delivery and includes 1 year parts and labour, with the remaining period parts only. This warranty is conditional on planned maintenance being undertaken.

12.0 Service Enquiries

Nuaire can assist you in all aspects of service. Our service department will be happy to provide any assistance required, initially by telephone and If necessary arrange for an engineer to call.

Customer Services Department on 08705 002 555

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:	MRXBOX90L
Machinery Types:	Mechanical Ventilation with Heat Recovery Unit
Relevant EC Council Directives:	2006/42/EC (Machinery Directive)
Applied Harmonised Standards:	BS EN ISO 12100-1, BS EN ISO 12100-2, EN60204-1, BS EN ISO 9001, BS EN ISO 13857
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	23. 01. 12
2) A. Jones		Manufacturing Director	23. 01. 12

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

To comply with EC Council Directives 98/37/EC Machinery Directive and 2004/108/EC (EMC).

To be read in conjunction with the relevant Product Documentation (see 2.1)

1.0 GENERAL

1.1 The equipment referred to in this **Declaration of Incorporation** is supplied by Nuaire to be assembled into a ventilation system which may or may not include additional components.

The entire system must be considered for safety purposes and it is the responsibility of the installer to ensure that all of the equipment is installed in compliance with the manufacturers recommendations and with due regard to current legislation and codes of practice.

2.0 INFORMATION SUPPLIED WITH THE EQUIPMENT

2.1 Each item of equipment is supplied with a set of documentation which provides the information required for the safe installation and maintenance of the equipment. This may be in the form of a Data sheet and/or Installation and Maintenance instruction.

2.2 Each unit has a rating plate attached to its outer casing. The rating plate provides essential data relating to the equipment such as serial number, unit code and electrical data. Any further data that may be required will be found in the documentation. If any item is unclear or more information is required, contact Nuaire.

2.3 Where warning labels or notices are attached to the unit the instructions given must be adhered to.

3.0 TRANSPORTATION, HANDLING AND STORAGE

3.1 Care must be taken at all times to prevent damage to the equipment. Note that shock to the unit may result in the balance of the impeller being affected.

3.2 When handling the equipment, care should be taken with corners and edges and that the weight distribution within the unit is considered. Lifting gear such as slings or ropes must be arranged so as not to bear on the casing.

3.3 Equipment stored on site prior to installation should be protected from the weather and steps taken to prevent ingress of contaminants.

4.0 OPERATIONAL LIMITS

4.1 It is important that the specified operational limits for the equipment are adhered to e.g. operational air temperature, air borne contaminants and unit orientation.

4.2 Where installation accessories are supplied with the specified equipment eg. wall mounting brackets. They are to be used to support the equipment only. Other system components must have separate provision for support.

4.3 Flanges and connection spigots are provided for the purpose of joining to duct work systems. They must not be used to support the ductwork.

5.0 INSTALLATION REQUIREMENTS

In addition to the particular requirements given for the individual product, the following general requirements should be noted.

5.1 Where access to any part of equipment which **moves**, or can become **electrically live** are not prevented by the equipment panels or by fixed installation detail (eg ducting), then guarding to the appropriate standard must be fitted.

5.2 The electrical installation of the equipment must comply with the requirements of the relevant local electrical safety regulations.

5.3 For EMC all control and sensor cables should not be placed within 50mm or on the same metal cable tray as 230V switched live, lighting or power cables and any cables not intended for use with this product.

6.0 COMMISSIONING REQUIREMENTS

6.1 General pre-commissioning checks relevant to safe operation consist of the following:

Ensure that no foreign bodies are present within the fan or casing.

Check electrical safety. e.g. Insulation and earthing.

Check guarding of system.

Check operation of Isolators/Controls.

Check fastenings for security.

6.2 Other commissioning requirements are given in the relevant product documentation.

7.0 OPERATIONAL REQUIREMENTS

7.1 Equipment access panels must be in place at all times during operation of the unit, and must be secured with the original fastenings.

7.2 If failure of the equipment occurs or is suspected then it should be taken out of service until a competent person can effect repair or examination. (Note that certain ranges of equipment are designed to detect and compensate for fan failure).

8.0 MAINTENANCE REQUIREMENTS

8.1 Specific maintenance requirements are given in the relevant product documentation.

8.2 It is important that the correct tools are used for the various tasks required.

8.3 If the access panels are to be removed for any reason the electrical supply to the unit must be isolated.

8.4 A minium period of two minutes should be allowed after electrical disconnection before access panels are removed. This will allow the impeller to come to rest.

NB: Care should still be taken however since airflow generated at some other point in the system can cause the impeller to "windmill" even when power is not present.

8.5 Care should be taken when removing and storing access panels in windy conditions.

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.

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