Britannia
kitchen ventilation

Refresh Mini, Midi & Maxi and Refresh Ultima

Installation, Operation and Maintenance Manual

Document No. F054

Issue: Final

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Revision History

Revision No.	Section(s) Revised	Revision Date	By Whom
Draft	All	28th January 2014	AST
Final	All	26th March 2014	AST

Britannia Kitchen Ventilation Ltd.
10Highdown Road
Sydenham Ind. Estate
Leamington Spa
Warwickshire
CV31 1XT
England

Phone 01926-463540
Fax 01926-463541
Email sales@kitchen ventilation.co.uk
Web www.kitchen-ventilation.co.uk

Registered in England 3062962
Registered office Whisby Road, Lincoln, LN6 3QZ

Contents

1. Overview

This installation, operation and maintenance manual covers:

Refresh Mini

Refresh Midi

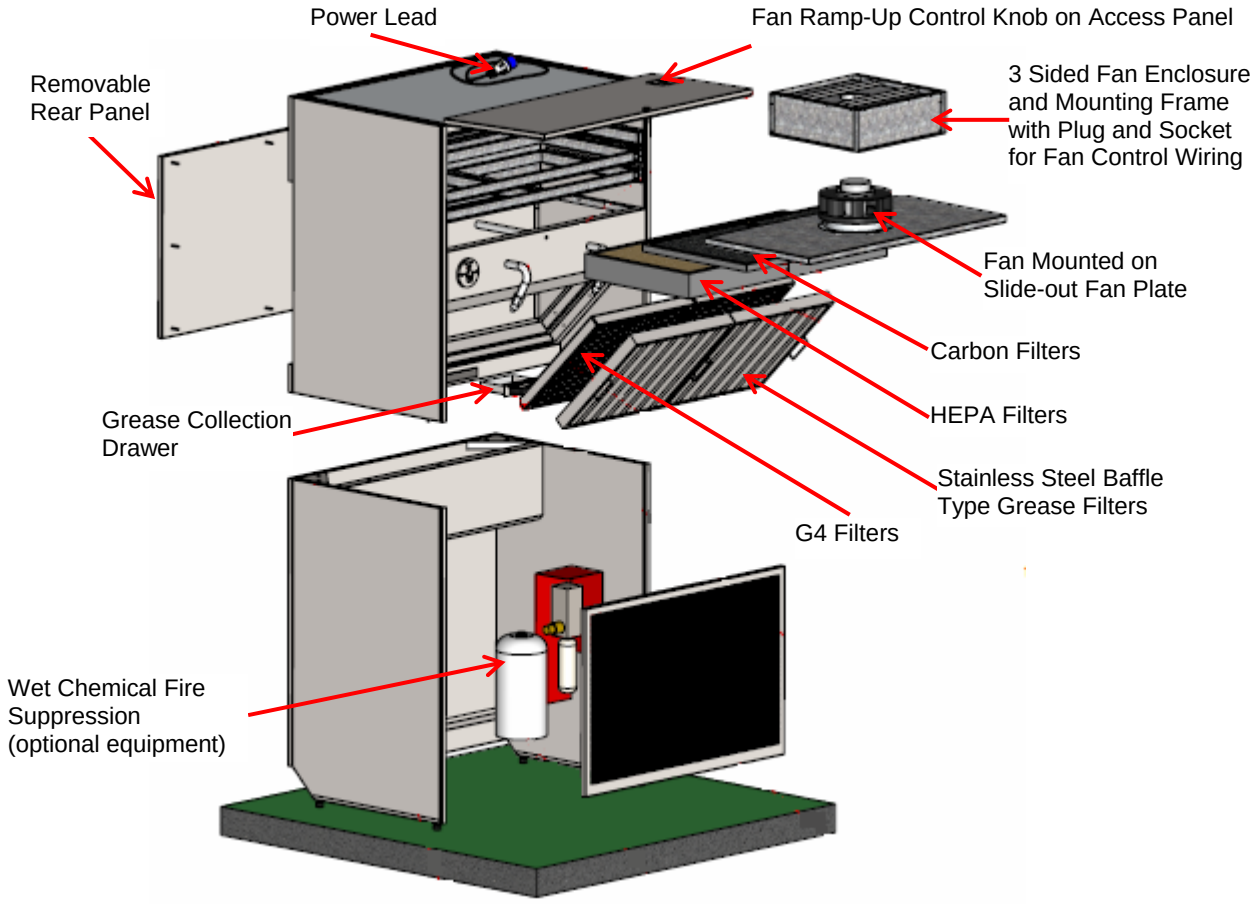
Refresh Maxi

Refresh Ultima

1.1 Refresh Mini, Midi & Maxi Units

The Refresh Mini, Midi & Maxi units are similar in construction and filtration design as the Refresh Ultima unit. The Mini, Midi & Maxi units vary in width and therefore the number of filters installed to allow further items of equipment to be installed.

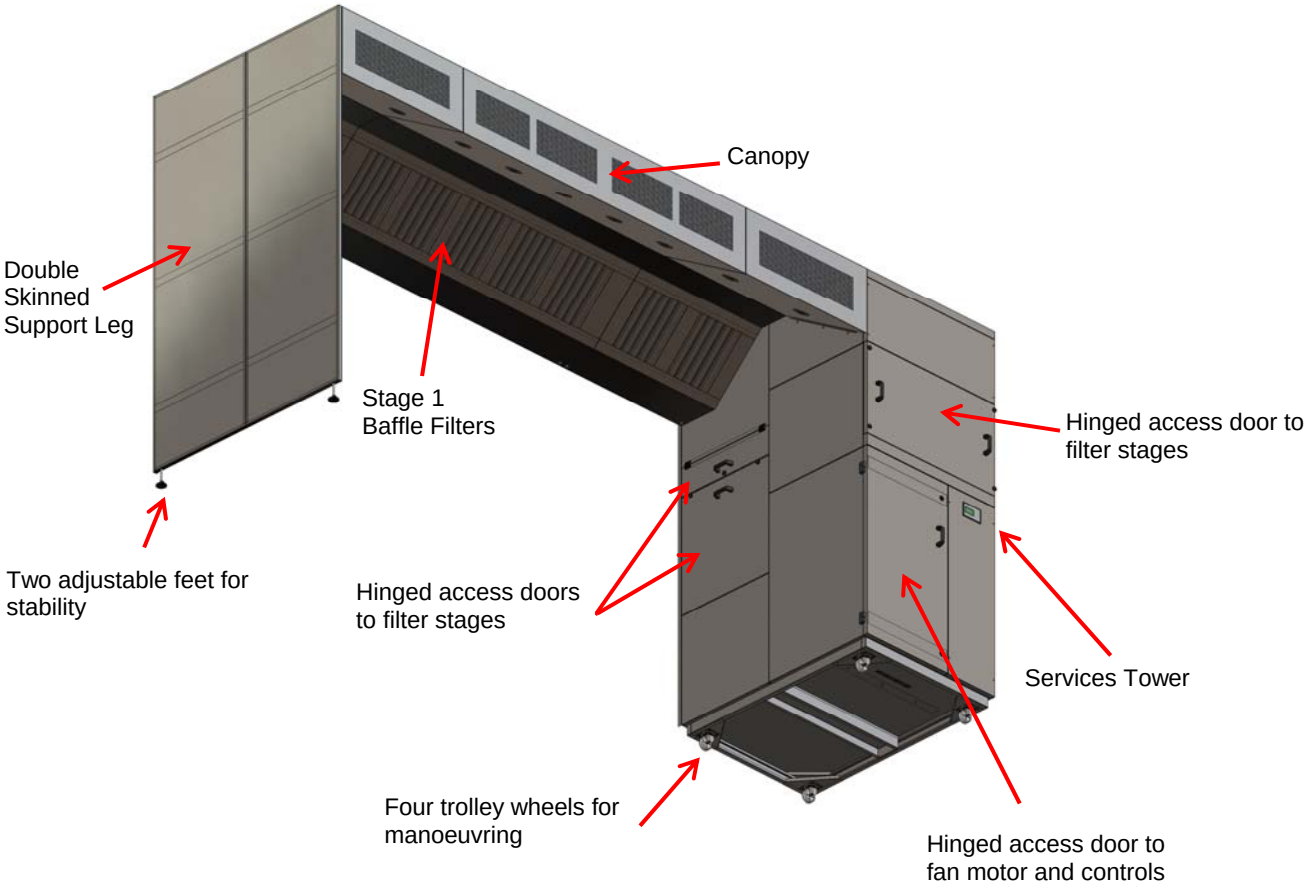
The following graphic provides a detailed overview of the unit. The Refresh 'Midi' is shown below as a 'typical' unit:



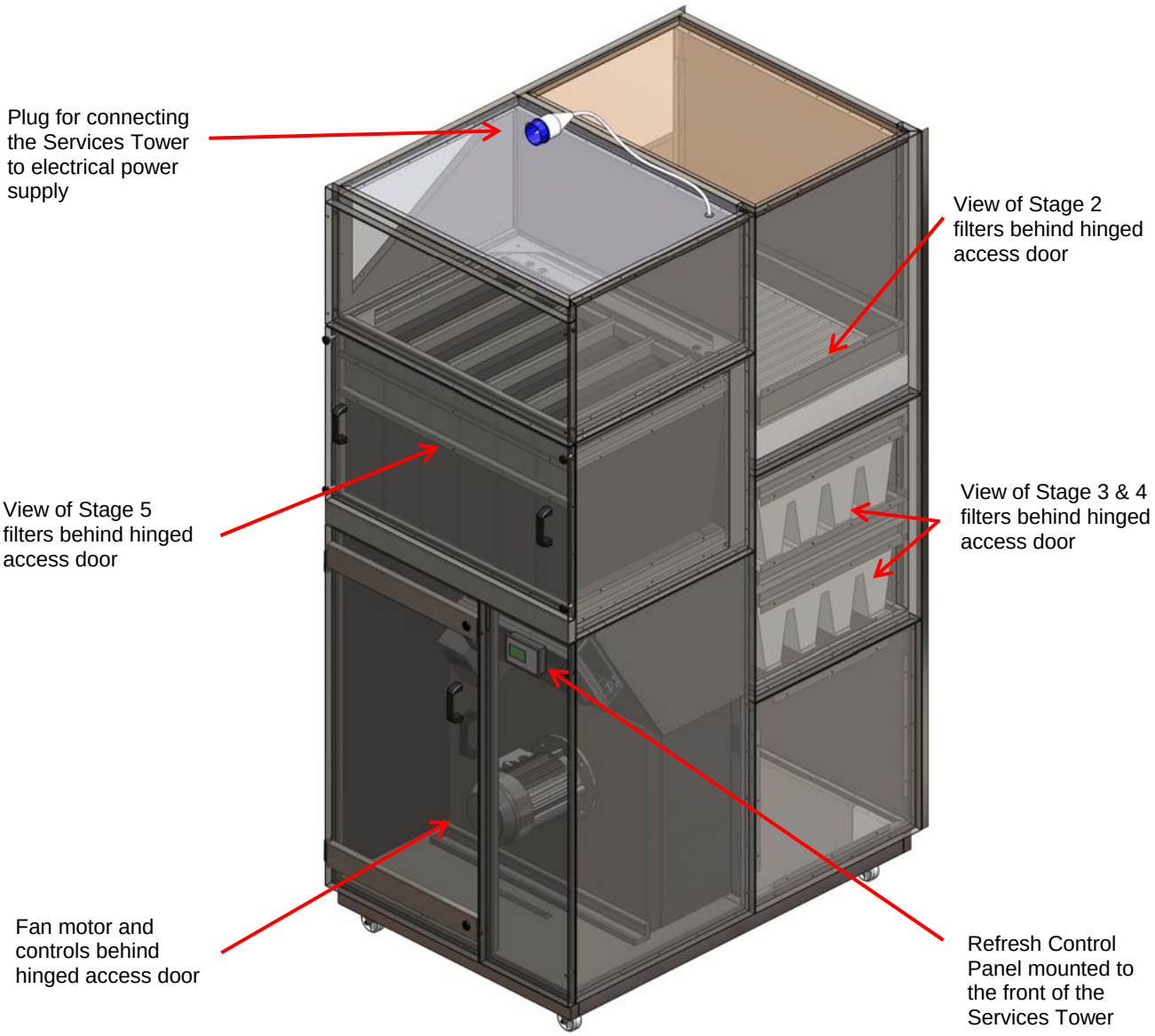
Overview of Refresh Midi Unit (Mini & Maxi are similar)

1.2 Refresh Ultima Unit

The following graphic provides a detailed overview of the unit:



Overview of Overview of Refresh Ultima Unit



Overview of Refresh Ultima Unit Services Tower

1.2.1 Glossary of Terms

This section provides a glossary of terms used in the manual.

Term	Definition
Refresh Unit	Product name given to a range of stainless steel kitchen canopies
Refresh Control Panel	Product name for the twin function intelligent controls package to control the fan speed via operator buttons and to monitor the life-time of each filtration stage
Fan	A backward curved centrifugal fan housed in the Services Tower to draw grease laden air through the filter stages
Canopy	A rigid, self-supporting stainless steel structure which acts as a point of extraction for grease laden kitchen air
Baffle Filter	A high efficiency filter for removing entrained grease and moisture from extract air
Grease Drainage Hole	Allows drainage of entrained grease droplets and moisture which fall from the grease filters

1.3 System Overview

1.3.1 Functional Description

When cooking, hot, humid and grease laden air is extracted by the unit.

1.3.1.1 Refresh Mini, Midi & Maxi

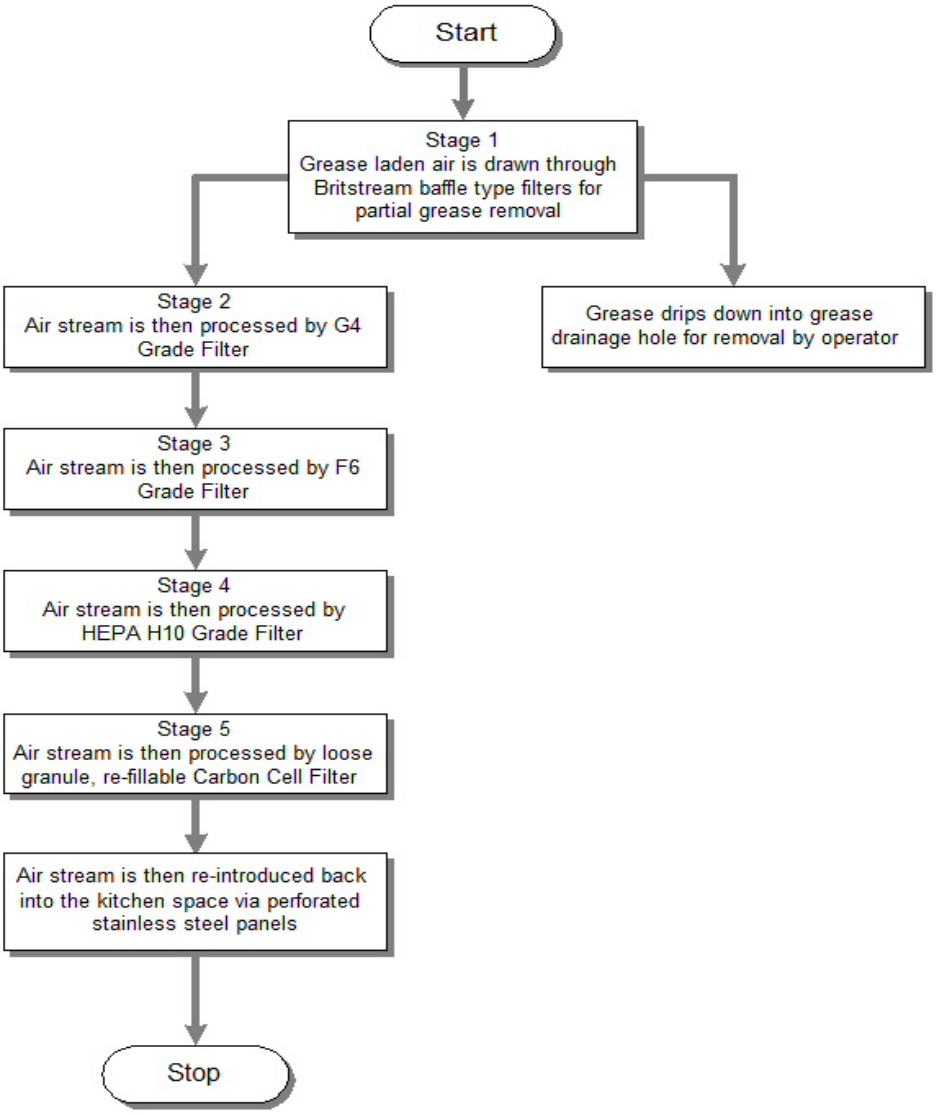
A backward curved centrifugal fan, mounted on a slide-out fan plate at the top of the unit, draws contaminated grease laden air from cooking appliances through four stages of filtration.

Note: *The Refresh Maxi has 2 no fans installed.*

The four stages of filtration are:

- **Stage 1:** High efficiency Britstream baffle-type grease filter unit mounted in front of the stage 2 filters
- **Stage 2:** G4 pleated filter panels mounted behind the baffle-type grease filters
- **Stage 3:** HEPA filter panels
- **Stage 4:** Carbon filters; loose granule, re-fillable to reduce odours

Refer to the following process flow which describes the four stages of filtration:

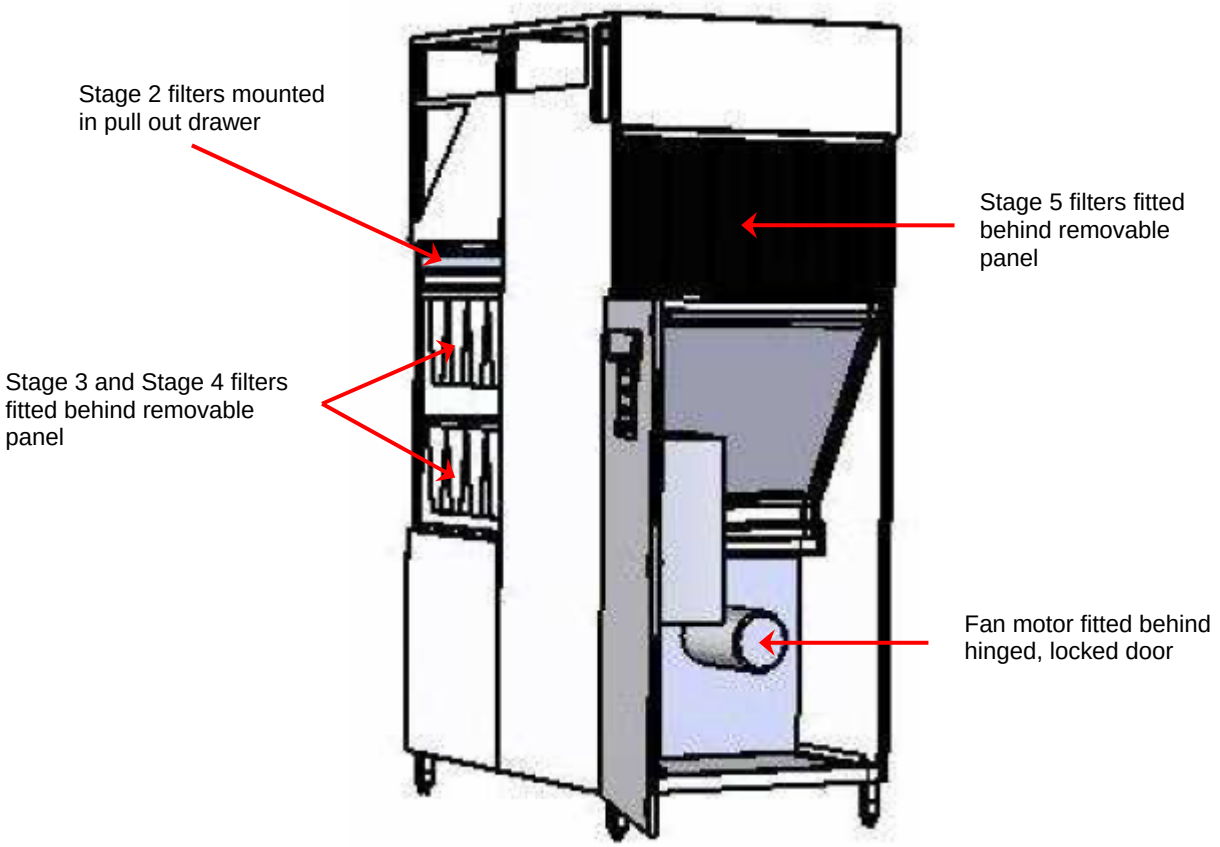


1.3.1.2 Refresh Ultima

A backward curved centrifugal fan (housed in the Services Tower) draws contaminated grease laden air from cooking appliances through five stages of filtration.

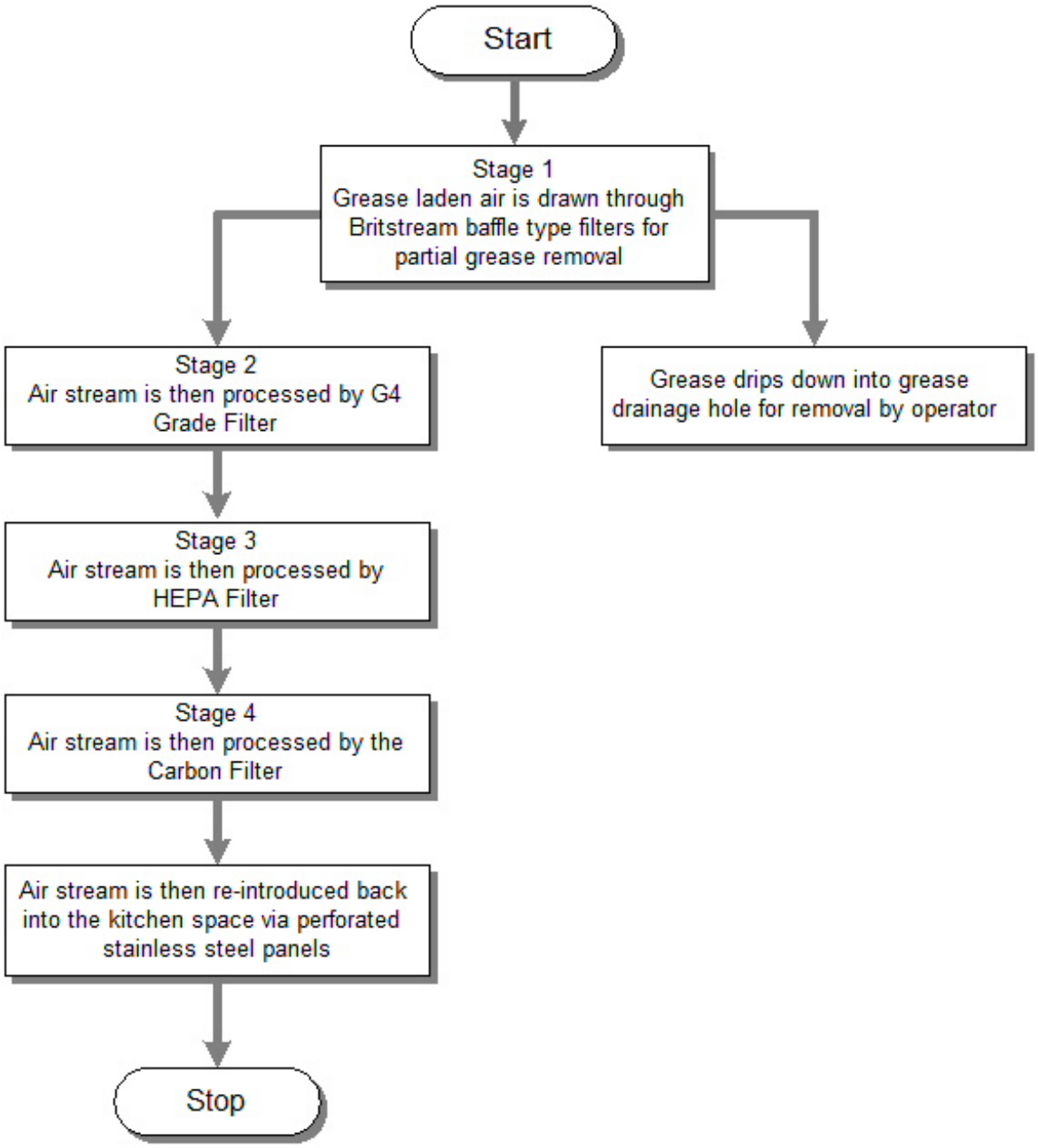
The five stages of filtration are:

- **Stage 1:** High efficiency Britstream baffle-type grease filters mounted at the front of the canopy
- **Stage 2:** G4 filter pad, mounted horizontally within the rear section of the Services Tower
- **Stage 3:** F6 filter panels mounted horizontally below the mesh panel, above stage 4 filters
- **Stage 4:** HEPA H10 filter panels mounted horizontally below the stage 3 filters
- **Stage 5:** Carbon filters; loose granule, re-fillable to reduce odours



Refresh Ultima Services Tower Showing the Location of Filter Stages 2 to 5

Refer to the following process flow which describes the five stages of filtration:

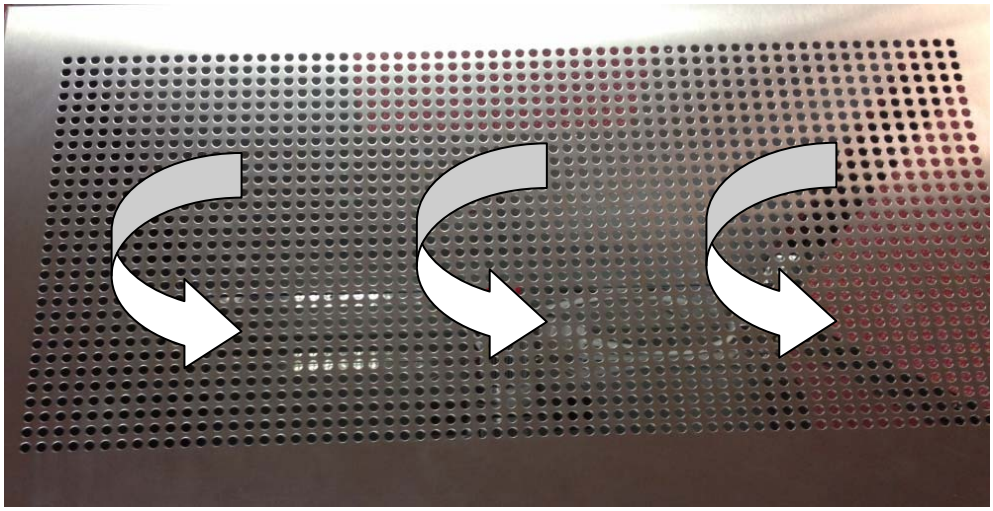


Grease Drainage Hole: Collected grease and moisture drains down and into the grease drainage hole. Refer to the picture below.

Note: The slot head drain screw has been removed for clarity.

Grease Drainage Hole

Supply Air Diffuser: The fixed supply air diffuser allows filtered air to be reintroduced back into the kitchen space. Refer to the picture below.



Perforated Diffuser Panel

LED Spot Lights: LED spot lights are fitted to the inside surface of the canopy. Refer to the picture below:

LED Spot Lights

1.3.1.3 Refresh Control Panel (Refresh Ultima)

The Refresh Ultima comes complete with a control panel fitted. The control panel is mounted at the front of the Services Tower.

Refresh Control Panel

This controls package has two functions:

1. To control the fan speed via operator buttons. The motor speed is controlled via inverter drive.
2. To monitor the life-time of each of the 4 main stages of disposable filter media types.

1.3.1.4 Filter Reset Panel (Refresh Ultima)

The filter reset panel allows the operator to set the lifecycle of the filter. The filter reset panel is mounted behind the Refresh Control panel inside the Services Tower.

Filter Reset Panel

1.3.1.4.1 Equipment Technical Summary

Note: *The following technical summary refers to the Refresh Ultima only.*

Down light size, type and wattage:

Lamp Diameter (mm)	Voltage (V)	Lamp Wattage (W)	Ingress Protection (IP) Rating
87mm Ø	240	9	65

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2. Assembly, Installation and Commissioning

2.1 Introduction

This section refers to all Refresh units.

2.1.1 Risk Assessment

A full **risk assessment** must be carried out before assembly and installation work commences on site. The risk assessment should identify all Personal Protective Equipment (PPE) requirements. This should be undertaken prior to the installation team arriving. Consideration should also be given to drafting a full method statement for the process.

2.1.2 Access and Offloading

A safe **access** route must be established into the area in which the Refresh Unit will be installed. This area is to be free from obstruction

A suitable **offloading** point must be identified before you begin to unload and it should be as close to the installation area as possible

2.1.3 Warnings and Cautions

WARNING:
DO NOT INSTALL THIS EQUIPMENT FOR THE VENTILATION OF GAS, OIL OR SOLID FUELLED EQUIPMENT. RISK TO THE HEALTH OF OPERATIVES CAUSED BY THE ACTUAL COMBUSTION PROCESS WHICH USES UP AVAILABLE OXYGEN FROM THE COOKING SPACE AND CREATES TOXIC CARBON BASED GAS EMISSIONS. ONLY ELECTRICALLY POWERED EQUIPMENT MUST EVER BE VENTILATED BY THIS TYPE OF SYSTEM

WARNING:
COMPETANT PERSONNEL FAMILIAR WITH THE ASSESSMENT OF HAZARDS AND RISKS ASSOCIATED WITH INDUSTRIAL ELECTRICAL AND VENTILATION EQUIPMENT SUCH AS FANS AND AIR HANDLING UNITS SHOULD INSTALL THE PRODUCT.

WARNING:
USE LIFTING EQUIPMENT WHICH HAS A SUITABLE SAFE WORKING LOAD FOR THE EQUIPMENT BEING LIFTED.

WARNING:
ENSURE STEPS, PODIUM STEPS, SCISSOR LIFT OR MOBILE SCAFFOLD TOWER ARE SECURE AND STABLE BEFORE USE.

WARNING:
MAKE SURE THE CANOPY IS FULLY SECURED BEFORE REMOVING THE SUPPORT STANDS

Caution:
Supplied packaging provides protection against scratches and scrapes only

2.1.4 Receipt

Step 1: Check the package is complete to the delivery note and that there are no missing items.

Step 2: Check the package is undamaged.

Step 3: Where items will not be unpacked straight away, check:

Step a) The shrink-wrap is complete and plastic banding is secure.

Step b) There are no edges protruding which can become damaged or cause injury. Where edges are exposed, cover using suitable protection.

2.1.5 Storage and Preservation

2.1.5.1 Storage

Caution:
Supplied packaging provides protection against scratches and scrapes only.

- Items must not be stored in high traffic areas. No impact protection is provided.

2.1.5.2 Preservation

- Items must be stored in dry conditions.

2.2 Assembly

2.2.1 Preparation for Unpacking

Step 1: Ensure you place items to be unpacked as near as possible to the site of installation.

Step 2: Ensure you have sufficient free space to work.

2.2.2 Unpacking Procedures

Step 1: Using a suitable tool, remove the plastic banding around the item

Step 2: Remove all packaging as necessary.

2.2.3 Preparation for Assembly

2.2.3.1 Personnel

- Skilled site engineers
- Senior site installation engineers (site Foreman).

2.2.3.2 Personal Protective Equipment (PPE)

The need for **PPE** must be identified once a full risk assessment has been carried out. Refer to *Section 2.1.1 Risk Assessment*.

Below is a list of PPE that **must** be worn when assembling BKV equipment:

- Safety footwear with steel mid-sole, steel toe caps, padded ankle protection and high grip soles.
- High visibility vest
- Kevlar gloves
- Carpenter gloves
- Safety spectacles
- Safety goggles.

Tools Required:

- Suitable and approved lifting equipment
- Adjustable support stands
- Spirit level
- Suitable hand tools]
- Suitable spanner to tighten M10 fixings.

Drawings:

- Refer to *Section 4.6 GA Diagrams* for reference.

2.2.4 Refresh Mini, Midi & Maxi Assembly Procedures

The following procedures cover only the Refresh Midi, Maxi and Ultima units as these units require assembly. The refresh Mini is supplied a one-piece unit.

Step 1: Prepare a clear & level area around the proposed installation area in accordance with the drawings with approximately 1 metre clearance all-round the unit for access.

Note: *The unit must be installed on a level surface.*

Step 2: Install the bottom unit in the proposed installation area.

Step 3: Using the spirit level, make sure the bottom unit is level. Adjust the feet accordingly as necessary and then recheck the level.

Step 4: Using safe and suitable methods lift and then position the first half of the unit on top of the base and lock into position.

Step 5: Assemble the filters and cover panels to the unit as necessary.

2.2.5 Refresh Ultima Assembly Procedures

Services Tower:

Step 1: Prepare a clear & level area around the proposed installation area in accordance with the drawings with approximately 1 metre clearance all-round the unit for access.

Step 2: Safely locate the base of the refresh unit at the correct location and in accordance with the drawings.

WARNING:
USE LIFTING EQUIPMENT WHICH HAS A SUITABLE SAFE WORKING LOAD FOR THE EQUIPMENT BEING LIFTED.

Step 3: Using the lifting equipment], lift the first half of the Services Tower unit on top of the base and lock into position.

Step 4: Slide the second half of the Service Tower unit into position next to the first half ensuring it is flush.

Step 5: Using the M10 fixings, bolt the two sections of the Service Tower together.

Step 6: Using the spanner, tighten the M10 fixings to secure the two sections.

Canopy:

WARNING:
USE LIFTING EQUIPMENT WHICH HAS A SUITABLE SAFE WORKING LOAD FOR THE EQUIPMENT BEING LIFTED.

Step 1: Using the lifting equipment and height adjustable stands, assembly the canopy on a level surface.

Step 2: Place the spirit level on the outer edge of the upper valance to level each section.

Step 3: Assemble the unit from its component parts.

2.3 Installation

2.3.1 Preparation for Installation

WARNING:
DO NOT INSTALL THIS EQUIPMENT FOR THE VENTILATION OF GAS, OIL OR SOLID FUELLED EQUIPMENT. RISK TO THE HEALTH OF OPERATIVES CAUSED BY THE ACTUAL COMBUSTION PROCESS WHICH USES UP AVAILABLE OXYGEN FROM THE COOKING SPACE AND CREATES TOXIC CARBON BASED GAS EMISSIONS. ONLY ELECTRICALLY POWERED EQUIPMENT MUST EVER BE VENTILATED BY THIS TYPE OF SYSTEM

You must have the following completed documentation before installation of this equipment:

- Site installation form
- Manufacture and location drawings
- Site survey form
- Onsite inspection form
- Risk assessments
- Suitable Method Statements.

2.3.1.1 Personnel

- Skilled site engineers
- Senior site installation engineers (site Foreman).

2.3.1.2 Personal Protective Equipment (PPE)

The need for **PPE** must be identified once a full risk assessment has been carried out. Refer to *Section 2.1.1 Risk Assessment*.

Below is a list of PPE that **must** be worn when installing BKV equipment:

- Site safety hard hat
- Safety footwear with steel mid-sole, steel toe caps, padded ankle protection and high grip soles.
- High visibility vest
- High visibility coat
- Kevlar gloves
- Carpenter gloves
- Safety spectacles
- Safety goggles
- Vented dust masks
- Ear Defenders.

2.3.1.3 Tools, Equipment, Consumables and Fixings Required

Tools:

- Spirit level
- Suitable spanner to tighten M6 fixings
- Suitable tool to tighten the canopy to the kitchen wall (where necessary).

Equipment:

- Mobile tower scaffold
- Podium steps
- Steps (when required)
- Scissor Lift (when required)
- Suitable and approved lifting equipment
- Adjustable support stands
- Battery Powered Impact Drill
- Battery Powered Hammer drills
- Battery Powered Hand drills
- Battery Powered Grinderette.

Consumables:

- Unistrut
- Fixings box containing an assortment of mechanical fixings and accessories
- Silicone sealant.

Fixings:

- M6 fixings
- M10 fixings
- Suitable screws, plugs or anchors as necessary (to fix the canopy against the wall).

2.3.1.4 General Installation Notes

To avoid the risk of accidents and damage to the kitchen Refresh Unit the following should be adhered to:

- You must install the Refresh Unit in accordance with these instructions
- Any installation work must be carried out by **competent** personnel
- In all cases, a **minimum** of two **competent** personnel are required
- Installation personnel should be fully trained in all relevant tools and equipment required to successfully install the Refresh Unit
- A safe method of access to the fixing points must be gained by use of previously identified suitable access equipment
- It is suggested that at least a small air change rate in the order of 10 to 15 air changes per hour be incorporated if possible. This will provide a small amount of background ventilation, create a negative pressure and help retain cooking odours within the kitchen space
- Before installation, check the building structure to which the Refresh Unit is to be fitted for:
  - Electric cables
  - Gas pipes
  - Water pipes.

- All equipment installed below the Refresh Unit must either be:
  - Fully removable, or
  - Mounted or positioned in such a way as to allow regular access to the filter grease drawer
  - Mounted or positioned in such a way as to allow regular access to the door on the Inside face of the tower.
- Refer to *Section 4.6 GA Diagrams* for reference.
- This guide contains WARNINGS and Cautions regarding safety procedures that must be followed.

2.3.2 Refresh Mini, Midi & Maxi Assembly Procedures

The following procedures cover only the Refresh Midi, Maxi and Ultima units as these units require assembly. The refresh Mini is supplied a one-piece unit.

Step 1: Prepare a clear & level area around the proposed installation area in accordance with the drawings with approximately 1 metre clearance all-round the unit for access.

Note: *The unit must be installed on a level surface.*

Step 2: Install the bottom unit in the proposed installation area.

Step 3: Using the spirit level, make sure the bottom unit is level. Adjust the feet accordingly as necessary and then recheck the level.

Step 4: Using safe and suitable methods lift and then position the first half of the unit on top of the base and lock into position.

Step 5: Assemble the filters and cover panels to the unit as necessary.

Step 6: To secure the unit to the building fabric (by others), at the top rear of the unit use the 2 looped end retaining wires.

2.3.2.1 Installing the Unit

Please note the following step guidelines must be taken into consideration during the installation of BKV products.

WARNING:
COMPETENT PERSONNEL FAMILIAR WITH THE ASSESSMENT OF HAZARDS AND RISKS ASSOCIATED WITH INDUSTRIAL ELECTRICAL AND VENTILATION EQUIPMENT SUCH AS FANS AND AIR HANDLING UNITS SHOULD INSTALL THIS EQUIPMENT.

Step 1: Check the unit is correctly assembled. Refer to *Section 2.2.4 Refresh Mini, Midi & Maxi Assembly Procedures*.

Step 2: Where it is necessary to fix the unit against a wall:

Step a) Using the battery powered equipment, Unistrut and fixings from the fixings box, mount the unit against the wall.

Step b) Using the spirit level, make sure the unit is still level.

Step c) Using screws, plugs or anchors, fix the unit to the wall. Using a suitable tool, tighten the fixings until the unit is fully secure.

Step 3: Connect the main power lead to the incoming power supply.

Step 4: Install the required filters, blanks and panels into correct openings and positions.

Step 5: Complete the “On site final inspection” checklist.

Step 6: The customer site contact or main contractor must inspect the completed installation and sign the “Site installation form”. All comments, provisos or alternative instructions given must be noted on this form. Leave a copy with signee for their records.

2.3.3 Refresh Ultima Installation Procedures

2.3.3.1 Installing the Canopy

Please note the following step guidelines must be taken into consideration during the installation of BKV products.

WARNING:
COMPETENT PERSONNEL FAMILIAR WITH THE ASSESSMENT OF HAZARDS AND RISKS ASSOCIATED WITH INDUSTRIAL ELECTRICAL AND VENTILATION EQUIPMENT SUCH AS FANS AND AIR HANDLING UNITS SHOULD INSTALL THIS EQUIPMENT.

WARNING:
ENSURE STEPS, PODIUM STEPS, SCISSOR LIFT OR MOBILE SCAFFOLD TOWER ARE SECURE AND STABLE BEFORE USE.

Step 1: Check the Services Tower and the canopy are correctly assembled. Refer to *Section 2.2.4 Refresh Mini, Midi & Maxi Assembly Procedures*.

Step 2: Position the steps, podium steps, scissor lift or mobile scaffold tower as necessary to aid installation.

Step 3: Safely secure the canopy to the lifting equipment.

WARNING:
USE LIFTING EQUIPMENT WHICH HAS A SUITABLE SAFE WORKING LOAD FOR THE EQUIPMENT BEING LIFTED.

Step 4: Using the lifting equipment, raise the canopy to the correct height then using the adjustable support stands safely support the canopy.

Step 5: Using the location holes on the Services Tower and the canopy, locate the two items together and then use the M6 fixings to secure. Using the spanner tighten the M6 fixings until fully secure.

Step 6: Using the holes in the canopy and the double-skinned support leg, locate the two items together and then use the M6 fixings to secure. Using the spanner tighten the M6 fixings until fully secure.

Step 7: Using a spirit level, check the lateral position of unit.

Step 8: Where applicable, using the battery powered equipment, Unistrut and fixings from the fixings box, mount the canopy to the wall.

Step 9: Using screws, plugs or anchors, fix the canopy to the wall. Using a suitable tool, tighten until the canopy is fully secure.

WARNING:
MAKE SURE THE CANOPY IS FULLY SECURED BEFORE REMOVING THE SUPPORT STANDS.

Step 10: **Slowly** lower down the support stands approximately 50mm and make sure the canopy is fully secured to the Services Tower and double-skinned support leg and also to the wall (as necessary). Further tighten the all fixings as necessary.

Step 11: Connect the main power lead to the incoming power supply.

Step 12: Peel back the poly coat to expose canopy joints. Do not remove protective film from the canopy. This will be done by others.

Step 13: Using the silicone sealant, seal:

Step a) Joins in the unit

Step b) Joints between walls and ceilings (where necessary).

Step 14: Install the required filters, blanks and panels into correct openings and positions.

Step 15: Complete the “On site final inspection” checklist.

Step 16: The customer site contact or main contractor must inspect the completed installation and sign the “Site installation form”. All comments, provisos or alternative instructions given must be noted on this form. Leave a copy with signee for their records.

2.4 Commissioning

2.4.1 Pre-commissioning Procedures

2.4.1.1 PPE

- Suitable protective clothing.

2.4.1.2 Refresh Control Panel

Once all of the wiring has been completed and tested, the system is ready to be commissioned. Refer to Section 2.4.2 below.

2.4.2 Commissioning Procedures

2.4.2.1 Setting up the Filter Lifetime Monitoring

Note: *The following procedures apply to the Refresh Ultima only.*

Filter Life Expectancies

This will vary depending upon the establishment. For this reason the life expectancies can be reprogrammed to suit. However, the pre-set default times will be as per the maintenance table for "*Medium category establishments*" unless Britannia Kitchen Ventilation has been instructed to provide a different setup (in writing and prior to delivery). Refer to *Section 4.2 Preventive Maintenance*.

Step 1: To access the filter stage reset panel, open the hinged access panels at the lower front of the Services Tower.

Filter stage reset panel

Step 2: Using the DIL switches 1, 2, 3 & 4 (toggle switches) on the front of the filter stage reset panel; the lifetime of the filters (in hours) can be set. Refer to the following table of filter lifetimes for Stages 2, 3, 4 & 5:

Mode Code	DIL switch	Filter Lifetime (hours) Stage 2	Filter Lifetime (hours) Stage 3	Filter Lifetime (hours) Stage 4	Filter Lifetime (hours) Stage 5
0*	☐☐☐☐ OOOO	54	144	144	216
1	O☐☐☐ ☐OOO	42	320	320	480
2	☐O☐☐ O☐OO	63	320	320	480
3	OO☐☐ ☐☐OO	63	320	320	720
4	☐☐O☐ OO☐O	63	480	480	720
5	O☐O☐ ☐O☐O	84	480	480	720
6	☐OO☐ O☐☐O	84	540	540	720
7	OOO☐ ☐☐☐O	84	540	540	960

* Test Mode – Filter lifetimes are in seconds

2.4.3 Post Commissioning Procedures

None, the system is plug-and-play.

3. Operation

3.1 Introduction

This section provides operating instructions for the Refresh Control Panel. The Refresh Control Panel is installed in the Refresh Ultima only.

Warnings and Cautions use the following conventions:

- **WARNING** - danger of death or to the health of personnel
- **Caution** - danger of damage to equipment.

3.1.1 Warnings and Cautions

Caution:
It is recommend that the end user should carry-out detailed in-house risk assessments for all aspects of operating Refresh Units.

3.1.2 Operation Overview

3.1.2.1 Refresh Mini, Midi & maxi

The Refresh Mini, Midi and Maxi have a hand operated dial located toward the top of the unit which the operator can turn to ramp-up the fan speed.

Dial Ramps–up the Fan Speed

3.1.2.2 Refresh Ultima

The Refresh Control Panel is comprised of an operator information screen and touch buttons. The touch buttons allow the operator to:

- Start the fans in Low Speed
- Slow the fans from High to Med, or from Med to Low speeds
- Stop the fans
- Mute active alarm sounds
- Access and cycle through information pages, messages and clock
- Access the configuration pages
- Accept any changes made in the configuration pages.

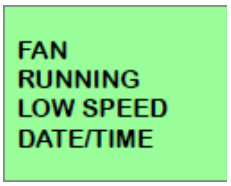
Refresh Control Panel

3.2 Operating Procedures

The following procedures can be undertaken using the touch buttons on the front of the control panel.

3.2.1 Starting-up

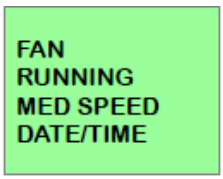
Step 1: To start-up the fans press the START /SPEED UP button. The fans will start-up in the LOW SPEED and the following screen is displayed:



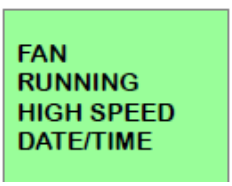
Screen Display - FAN LOW SPEED

3.2.2 Increasing the Speed of the Fans

Step 1: To increase the speed of the fans from the LOW SPEED, press the START /SPEED UP button again. The speed of the fans will incraese to the MED & HIGH SPEED.



Screen Display - FAN MED SPEED



Screen Display - FAN HIGH SPEED

3.2.3 Decreasing the Speed of the Fans

Step 1: To decrease the speed of the fans from the MED & HIGH SPEED, press the SPEED DOWN button again. The speed of the fans will decraese from HIGH to MED SPEED or MED to LOW SPEED.

3.2.4 Muting an Active Alarm

Step 1: To mute an active alarm sound, press the MUTE button.

3.2.5 Accessing the Information Screens

The operator can access the following messages:

- System status
- Fan speed
- Filter status.

Note: *Only active messages are shown.*

Step 1: To access the information screens, press the ◄ ► arrow buttons.

Step 2: To cycle through messages and clock screens, press the ▲ ▼ arrow buttons.

3.2.6 Accessing the "Configuration" Screen from the "Date/Time" Screen

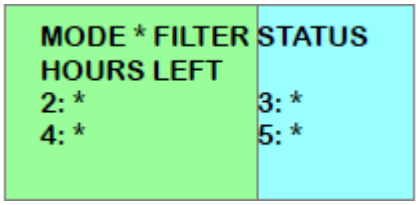
Step 1: To access the "Configuration" screen from the "Date/Time" screen, press the ESC button. The operator can make changes from the "Configuration" screen as necessary.

Step 2: To save changes made from the "Configuration" screen, press the ESC button.

Step 3: To cancel changes made from the "Configuration" screen, press the OK button.

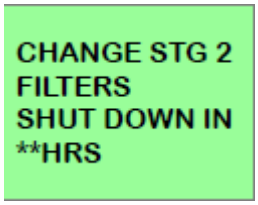
3.2.7 Filter Status Screen

Step 1: From normal operating mode, select the filter status screen by pressing the ▼ arrow. The following scrolling text is displayed:



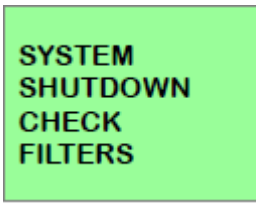
Screen Display - FILTER STATUS HOURS LEFT

Step 2: When the filters become dirty, the system will display a countdown timer warning screen. The countdown timer warning screen shows which stage filters require changing and also gives a time (in hours) when the system will shut down:



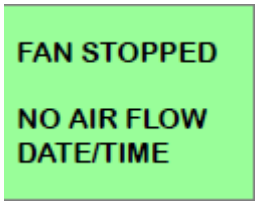
Screen Display - FILTER STATUS HOURS LEFT

Step a) If the stage filters are not changed during the time (in hours) shown on the countdown timer warning screen, then the system will SHUT DOWN and the following screen is displayed.



Screen Display - SYSTEM SHUTDOWN CHECK FILTERS

Step b) If an air flow pressure switch has been installed and the air pressure drops in the filter bank, the following screen is displayed:



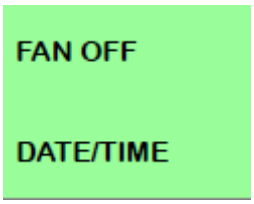
Screen Display - FAN STOPPED NO AIR FLOW

Step 3: Refer to *Section 4.2 Preventive Maintenance* for remove and replace procedures for stage filters which require cleaning or replacing.

3.2.8 Shutting-down

Step 1: To shut-down the fans, press the 

button. The fans will stop and the following screen is displayed:



Screen Display - FAN OFF

3.3 Resetting the Filter Operational Hours

The following procedures show how to stop the fans, remove and replace the stage filters which have become dirty and reset the filter operational hours:

Step 1: Shut-down the fans by pressing the STOP button. The fans will stop.

Step 2: Remove the stage filters which are displayed on the screen (CHANGE STAGE 2 FILTERS is given in the above example). Refer to the following remove procedures as necessary:

- *Removing Stage 2 Filters*
- *Removing Stage 3 Filters*
- *Removing Stage 4 Filters*
- *Removing Stage 5 Carbon Cells*

Step 3: Replace the stage filters. Refer to the following replace procedures as necessary:

- *Replacing Stage 2 Filters*
- *Replacing Stage 3 Filters*
- *Replacing Stage 4 Filters*
- *Replacing Stage 5 Carbon Cells*

Step 4: Access the filter stage reset panel by opening the hinged access panels at the lower front of the Services Tower.

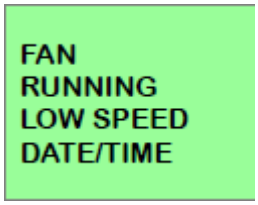
Step 5: To reset the stage filter which has been changed, press and hold the applicable reset button on the front of the filter stage reset panel.

Note: *The filter stages are given below the black reset button as 2, 3, 4 & 5.*

Filter Stage Reset Panel - FILTERS RESET

Step 6: Close the hinged access panels at the lower front of the Services Tower.

Step 7: To start-up the fans press the START /SPEED UP button. The fans will start-up in the LOW SPEED and the following screen is displayed:



Screen Display - FAN LOW SPEED

4. Maintenance

4.1 Introduction

Warnings and Cautions use the following conventions:

- **WARNING** - danger of death or to the health of personnel
- **Caution** - danger of damage to equipment.

4.1.1 Warnings and Cautions

WARNING:
IF ANY INFORMATION PROVIDED IN THIS OPERATION AND MAINTENANCE MANUAL IS NOT CLEAR YOU MUST STOP WORK AND CONTACT BRITANNIA KITCHEN VENTILATION.

WARNING:
CLEANING AND MAINTENANCE MUST ONLY BE UNDERTAKEN BY COMPETENT PERSONNEL ONCE ALL EQUIPMENT SUCH AS OVENS, GRILLS AND FYERS ARE SWITCHED OFF AND ALL SURFACES HAVE SUFFICIENTLY COOLED.

WARNING:
FILTERS STAGES SHOULD ONLY BE REPLACED BY TRAINED OPERATIVES OR BRITANNIA KITCHEN VENTILATION SERVICE TEAM, CONTACT BRITANNIA FOR FURTHER DETAILS.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

WARNING:
ACCESS TO FILTERS FOR REMOVAL & REPLACEMENT WILL OFTEN MEAN REACHING ABOVE HEAD HEIGHT. YOU MUST USE SUITABLE ACCESS EQUIPMENT AND SAFE WORKING PROCEDURES.

WARNING:
YOU MUST WEAR SUITABLE RUBBER GLOVES WHEN CLEANING WITH ANY ACID SOLUTIONS. SPECIAL PRECAUTIONS ARE NECESSARY WITH OXALIC ACID. SOLVENTS SHOULD NOT BE USED IN ENCLOSED PLACES.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
IF THE INTERNAL SURFACES OF THE SYSTEM ITSELF ARE NOT REGULARLY AND THOROUGHLY CLEANED, THEN THE RESIDUAL ODOURS OF DEPOSITED GREASE THROUGHOUT THE SYSTEM WILL BE DETECTABLE IN THE RETURN SUPPLY AIR FLOW RE-ENTERING THE ROOM SPACE.

Caution:
If primary filtration is not regularly cleaned & maintained, then hygiene and fire risks are created down-stream.

Caution:
The particulate filters are positioned to protect the fan and carbon filters. If they are not monitored and replaced regularly, then the life-span of the carbon filters will be drastically reduced and the fan will become grease loaded and could start to run out of balance causing long-term damage to bearings and impeller.

4.1.2 Equipment, Tools, Consumables and PPE

4.1.2.1 Equipment

- Commercial Dishwasher
- Suitable and approved access equipment
- Bucket.

4.1.2.2 Tools

- Allen key (6 mm)
- Small flat bladed screwdriver.

4.1.2.3 Consumables

- Lint free cleaning cloth
- Clean dry soft cloth
- Mild detergent (Fairy Liquid)
- Commercial heavy duty detergent
- 100% isopropyl alcohol
- Clean warm water
- Suitable Acetone and Alcohol
- Suitable Abrasive free stainless steel cleaning cream
- Oxalic Acid
- Suitable swab
- Suitable impregnated nylon pads
- Suitable scurf's dressed with iron free abrasives
- Suitable container to drain grease into.

4.1.2.4 PPE

- Kevlar gloves (for general equipment handling and cleaning)
- Rubber gloves (when cleaning using acid, alcohol and acetone).

4.2 Preventive Maintenance

4.2.1 Preventive Maintenance Overview

Britannia canopies and their components are designed to be easy to clean providing that cleaning intervals are not left too long. When too long a period is left between cleans, grease will become baked-on and require special attention. An enhanced aesthetic appearance will be achieved if the cleaned surface is finally wiped dry.

No grease filtration is 100% efficient and therefore there will always be a certain amount of grease carried through the filters and deposited on the internal surfaces of the filter housings, plenums and ductwork.

The amount of grease carried through any filtration system will depend very much on the type of cooking and ingredients used. If left unattended, this layer of grease on the non-visible surfaces of the Refresh Unit creates both hygiene and fire risks.

Regular inspections are recommended and should cover both the internal and external Refresh Unit surfaces, especially non-visible ones.

We strongly recommend that the end user should carry-out detailed in-house risk assessments for all aspects of maintaining Refresh Units.

When handling any components of a canopy, it is imperative that operatives wear proper, gripping, cut-resistant work-gloves for protection against metal edges, as well as the detergents and cleaning agents used. No matter how well finished a fabrication may be, it is easy to cut soft water-soaked skin during the cleaning process.

Canopies and their components by their very nature will have a coating of grease and therefore will be slippery and difficult to handle. Suitable gloves can be obtained easily through most suppliers of personal protective equipment. Access to filters for removal & replacement will often mean reaching above head height and as such, suitable access equipment and or safe working procedures may be required.

The life expectancy and efficiency of each component part of the Refresh Unit, relies upon careful maintenance of the entire system. If the maintenance of one component is neglected, then it can have a serious knock-on effect to other parts of the system rendering them useless or creating permanent damage.

In essence, good maintenance costs time and money and must be budgeted for. However, a lack of maintenance will inevitably cost many times as much in the longer term; due to repair bills, replacement parts, operator discomfort and occupational health risks.

A properly controlled and planned maintenance schedule must be implemented immediately in order that maximum system efficiency is achieved at all times so minimising occupational health risks to operatives. This will also reduce the likelihood of nuisance odours and fumes occurring.

4.2.1.1 Personnel

- Skilled site engineers
- Senior site installation engineers (site Foreman).

4.2.2 Preventive Maintenance Schedule

The frequency of preventive maintenance will depend upon:

- The type of establishment
- The level of output
- The type of cooking
- The regularity and duration of cooking.

Level of output and establishment types have been categorised as follows:

- Light: pub & bar food, small cafes, coffee shops and tea shops
- Light/medium: schools, hospitals, care homes, office and workplace kitchens
- Medium: Italian, French, hotel, pub, pizza and supermarket restaurants
- Medium/high: small, low output fast food restaurants, steak houses, kebab and chip shops
- High: large, high output fast food, Mexican, Oriental and Asian restaurants
- Very high: food production factories.

Deciding upon when cleaning should take place and how often, is mostly subjective and responsibility is ultimately with the manager of the facility.

Regular inspections are recommended and should cover both the internal and external canopy surfaces. As a very rough guide to cleaning schedules please refer to the following tables:

Cleaning and maintenance of kitchen canopies and associated items should only be carried out by suitably skilled and trained operatives, in the absence of such operatives a specialist sub-contractor should be engaged and retained for the purpose. If in-house staff members are to be used, they will require training in monitoring, testing and handling of the various components.

Failure to properly maintain the Refresh unit and its components will invalidate any warranties or guarantees.

Special care should be taken over the disposal of non-cleanable items to ensure that all relevant legislation is considered and adhered to.

The table below details the corrective maintenance procedures and frequencies required (Weeks/Hours) for all Refresh units:

Note: *The above daily, weekly & monthly time intervals assume 6 hours cooking per day and cooking on 5 days per week.*

Equipment	**Preventive Maintenance Frequency**					
	Level of Output					
	Light	**Light/ Medium**	**Medium**	**Medium/ High**	**High**	**Very High**
Cleaning Stage 1 Baffle Filters	7 Days	7 Days	5 Days	3 Days	1 Days	1 Days
Cleaning Grease Collection Drawers	7 Days	7 Days	5 Days	3 Days	1 Days	1 Days
Cleaning Refresh Unit Lighting (Ultima)	7 Days	7 Days	5 Days	5 Days	5 Days	5 Days
Cleaning Down the Refresh Unit	7 Days	7 Days	5 Days	5 Days	5 Days	5 Days
Deep Cleaning the Refresh Unit Internal Surfaces of the Canopy and Tower	6 Months	6 Months	6 Months	5 Months	3 Months	3 Months
Cleaning the Service Tower Internal Ductwork	12 Months	12 Months	8 Months	6 Months	4 Months	3 Months
Cleaning Stainless Steels						
Routine Surface Cleaning	Non-scheduled (as required depending upon output). Clean all stainless steel surfaces when it is dirty in order to restore its original appearance]					
Cleaning Fingerprints						
Cleaning Stubborn Stains and Discolouration						
Cleaning Oil and Grease Marks						
Cleaning Corrosion						
Replacing Stage 2 G4 Filters (all units)	1 Week (30 hours)	1 Week (30 hours)	2-3 days (18 hours)	2-3 days (18 hours)	1 day (6 hours)	1 day (6 hours)
Replacing Stage 3 HEPA Filters (Mini, Midi & Maxi)	6 months (720 hours)	5 months (600 hours)	4 months (480 hours)	3 months (360 hours)	2 months (240 hours)	1 month (120 hours)

Equipment	Preventive Maintenance Frequency					
	Level of Output					
	Light	Light/ Medium	Medium	Medium/ High	High	Very High
Replacing Stage 3 F6 Filters (Ultima)	6 months (720 hours)	5 months (600 hours)	4 months (480 hours)	3 months (360 hours)	2 months (240 hours)	1 month (120 hours)
Replacing Stage 4 HEPA H10 Filters (Ultima)	6 months (720 hours)	5 months (600 hours)	4 months (480 hours)	3 months (360 hours)	2 months (240 hours)	1 month (120 hours)
Replacing Stage 4 Carbon Disposable Filters (Mini, Midi & Maxi)	12 months (1440 hrs)	9 months (1080 hrs)	6 months (720 hours)	4 months (480 hours)	3 months (360 hours)	3 months (360 hours)
Replacing Stage 5 Carbon Filter Cells (Ultima)	12 months (1440 hrs)	9 months (1080 hrs)	6 months (720 hours)	4 months (480 hours)	3 months (360 hours)	3 months (360 hours)
Replacing Stage 6 Disposable Synthetic Media Pads (Ultima)	6 months	6 months	6 months	6 months	6 months	6 months

4.2.3 Preventive Maintenance Procedures

Refer to the following procedures as necessary:

- *Cleaning Stage 1 Baffle Type Grease Filters (All Units)*
- *Removing Grease from the Canopy* (All Units)
- *Cleaning the Lighting (Refresh Ultima)*
- *Cleaning Down Visible Refresh Unit Surfaces (All Units)*
- *Deep Cleaning the Refresh Unit* (All Units)
- *Cleaning the Service Tower Internal Ductwork (All Units)*
- *Cleaning Stainless Steel (All Units):*
  - *Routine Surface Cleaning*
  - *Cleaning Fingerprints*
  - *Cleaning Stubborn Stains and Discolouration*
  - *Cleaning Oil and Grease Marks*
  - *Cleaning Corrosion*
  - *Removing Scratches on Brush Satin Finishes.*

WARNING:
CLEANING AND MAINTENANCE MUST ONLY BE UNDERTAKEN BY COMPETENT PERSONNEL ONCE ALL EQUIPMENT SUCH AS OVENS, GRILLS AND FYERS ARE SWITCHED OFF AND ALL SURFACES HAVE SUFFICIENTLY COOLED.

WARNING:
ACCESS TO FILTERS FOR REMOVAL & REPLACEMENT WILL OFTEN MEAN REACHING ABOVE HEAD HEIGHT. YOU MUST USE SUITABLE ACCESS EQUIPMENT AND SAFE WORKING PROCEDURES.

WARNING:
IF THE INTERNAL SURFACES OF THE SYSTEM ITSELF ARE NOT REGULARLY AND THOROUGHLY CLEANED, THEN THE RESIDUAL ODOURS OF DEPOSITED GREASE THROUGHOUT THE SYSTEM WILL BE DETECTABLE IN THE RETURN SUPPLY AIR FLOW RE-ENTERING THE ROOM SPACE.

4.2.3.1 Cleaning Stage 1 Baffle Type Grease Filters (All Units)

Caution:
If primary filtration is not regularly cleaned & maintained, then hygiene and fire risks are created down-stream.

These are high efficiency Britstream baffle-type grease filters. Filter cleaning should only take place when cooking operations are suspended.

Step 1: Switch **OFF** and isolate the electrical power supply.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

Step 2: Safely position suitable access equipment. Remove the grease filter by gripping and lifting the panel upward and then tilting/lowering the bottom edge forward and clear of the housing. Refer to the picture below.

Step 3: Using a commercial dishwasher, clean the grease filter.

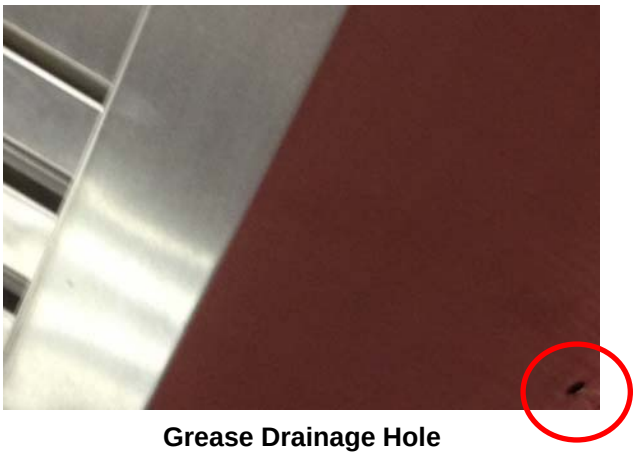
Step 4: Replace the grease filter making sure that the panel is the right way around with any framework drain holes at the front, lowest edge.

Step 5: Switch **ON** the electrical power supply.

4.2.3.2 Removing Grease from the Canopy (All Units)

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

Step 1: Safely position suitable access equipment. Place a suitable container underneath the slot head drain screw.



Grease Drainage Hole

Step 2: To empty the grease into the container, remove the slot head drain screw from the grease drainage hole.

Step 3: Once the grease has been removed, dispose of the container.

Step 4: Replace the slot head screw back into the grease drainage hole.

4.2.3.3 Cleaning the Lighting (Refresh Ultima)

Refresh Ultima canopies are fitted with LED type lights.

Clean the lighting as follows:

Step 1: Switch **OFF** the Refresh Unit lighting.

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Allow the LED lighting to cool down.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 3: Safely position suitable access equipment. Using the cloth moistened with the water and mild detergent, wipe the diffuser clean.

Step 4: Using a clean cloth moistened with the water, wipe the diffuser again to remove the detergent.

Step 5: Switch **ON** the electrical power supply.

Step 6: Switch **ON** the Refresh Unit lighting.

4.2.3.4 Cleaning Down Visible Refresh Unit Surfaces (All Units)

Step 1: Switch **OFF** the Refresh Unit lighting (Ultima only).

Step 2: Switch **OFF** and isolate the electrical power supply.

Step 3: Allow the stainless steel surface to cool.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 4: Safely position suitable access equipment. Using the cloth moistened with the mild detergent, clean all surfaces.

Step 5: Using the bucket and warm water, moisten the clean cloth and rinse all surfaces.

Step 6: Using a clean dry soft cloth, wipe all surfaces dry.

Step 7: Switch **ON** the electrical power supply.

Step 8: Switch **ON** the Refresh Unit lighting.

4.2.3.5 Deep Cleaning the Refresh Unit (All Units)

Grease can be deposited on the non-visible inside surfaces of the Refresh Unit. When allowed to build up, this can increase the risk of fire and reduce the hygiene standards of the equipment. A deep clean procedure is recommended to reduce this build-up of grease.

Step 1: Switch **OFF** the Refresh Unit lighting (Ultima only).

Step 2: Switch **OFF** and isolate the electrical power supply.

Step 3: Allow the stainless steel surfaces to cool.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 4: Safely position suitable access equipment. Using the cloth moistened with the Acetone or the Alcohol, clean all surfaces to remove oil and grease.

Step 5: Using the bucket and warm water, moisten the clean cloth and rinse all surfaces.

Step 6: Using a clean dry soft cloth, wipe all surfaces dry.

Step 7: Switch **ON** the electrical power supply.

Step 8: Switch **ON** the Refresh Unit lighting.

4.2.3.6 Cleaning the Service Tower Internal Ductwork (All Units)

Step 1: Clean the internal ductwork of the Refresh unit. Refer to Section 4.2.3.1.7 Cleaning Stainless Steel - *'Cleaning Oil and Grease Marks'* below.

4.2.3.7 Cleaning Stainless Steel (All Units)

In general, stainless steel cleaning is carried out to restore the original surface appearance to prevent corrosion and maintain hygiene standards.

All grades of stainless steel will stain and discolour due to surface deposits and can never be accepted as completely maintenance free. In order to achieve maximum corrosion resistance the surface of the stainless steel must be kept clean.

Refer to the following procedures in this section as necessary:

- *Routine Surface Cleaning*
- *Cleaning Fingerprints*
- *Cleaning Stubborn Stains and Discolouration*
- *Cleaning Oil and Grease Marks*
- *Cleaning Corrosion*
- *Removing Scratches on Brush Satin Finishes.*

4.2.3.7.1 Routine Surface Cleaning

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Allow the stainless steel surface to cool.

WARNING:
CLEANING AND MAINTENANCE MUST ONLY BE UNDERTAKEN BY COMPETENT PERSONNEL ONCE ALL EQUIPMENT SUCH AS OVENS, GRILLS AND FYERS ARE SWITCHED OFF AND ALL SURFACES HAVE SUFFICIENTLY COOLED.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 3: Safely position suitable access equipment. Using the cloth moistened with the mild detergent, clean all surfaces.

Step 4: Using the bucket and warm water, moisten the clean cloth and rinse all surfaces.

Step 5: Using a clean dry soft cloth, wipe all surfaces dry.

Step 6: Switch **ON** the electrical power supply.

4.2.3.7.2 Cleaning Fingerprints

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Allow the stainless steel surface to cool.

WARNING:
CLEANING AND MAINTENANCE MUST ONLY BE UNDERTAKEN BY COMPETENT PERSONNEL ONCE ALL EQUIPMENT SUCH AS OVENS, GRILLS AND FYERS ARE SWITCHED OFF AND ALL SURFACES HAVE SUFFICIENTLY COOLED.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 3: Safely position suitable access equipment. Using the cloth and mild detergent, clean all surfaces.

Step 4: Using the bucket and warm water, moisten the clean cloth and rinse all surfaces.

Note: *An organic solvent such as Acetone and Alcohol can also be used*

Step 5: Using a clean dry soft cloth, wipe all surfaces dry.

Step 6: Switch **ON** the electrical power supply.

4.2.3.7.3 Cleaning Stubborn Stains and Discolouration

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Allow the stainless steel surface to cool.

WARNING:
CLEANING AND MAINTENANCE MUST ONLY BE UNDERTAKEN BY COMPETENT PERSONNEL ONCE ALL EQUIPMENT SUCH AS OVENS, GRILLS AND FYERS ARE SWITCHED OFF AND ALL SURFACES HAVE SUFFICIENTLY COOLED.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 3: Safely position suitable access equipment. Using the cloth moistened with the cleaning cream, clean all surfaces.

Step 4: Using the bucket and warm water, moisten the clean cloth and rinse all surfaces.

Step 5: Using a clean dry soft cloth, wipe all surfaces dry.

Step 6: Switch **ON** the electrical power supply.

4.2.3.7.4 Cleaning Oil and Grease Marks

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Allow the stainless steel surface to cool.

WARNING:
CLEANING AND MAINTENANCE MUST ONLY BE UNDERTAKEN BY COMPETENT PERSONNEL ONCE ALL EQUIPMENT SUCH AS OVENS, GRILLS AND FYERS ARE SWITCHED OFF AND ALL SURFACES HAVE SUFFICIENTLY COOLED.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 3: Safely position suitable access equipment. Using the cloth and mild detergent, clean all surfaces.

Note: *An organic solvent such as Acetone and Alcohol can also be used*

Step 4: Using the bucket and warm water, moisten the clean cloth and rinse all surfaces.

Step 5: Using a clean dry soft cloth, wipe all surfaces dry.

Step 6: Switch **ON** the electrical power supply.

4.2.3.7.5 Cleaning Corrosion

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Allow the stainless steel surface to cool.

WARNING:
CLEANING AND MAINTENANCE MUST ONLY BE UNDERTAKEN BY COMPETENT PERSONNEL ONCE ALL EQUIPMENT SUCH AS OVENS, GRILLS AND FYERS ARE SWITCHED OFF AND ALL SURFACES HAVE SUFFICIENTLY COOLED.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU MUST WEAR SUITABLE RUBBER GLOVES WHEN CLEANING WITH ANY ACID SOLUTIONS. SPECIAL PRECAUTIONS ARE NECESSARY WITH OXALIC ACID. SOLVENTS SHOULD NOT BE USED IN ENCLOSED PLACES.

Step 3: Safely position suitable access equipment. Using the rubber gloves and the swab moistened with the oxalic acid, wet the corroded surface and allow to the acid to stand for 14 to 20 minutes.

Step 4: Using the rubber gloves and clean warm water, wash the oxalic acid away.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 5: Using the cloth moistened with the cleaning cream, clean the surfaces where the oxalic acid was applied.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 6: Using the bucket and warm water, moisten the clean cloth and rinse the surfaces where the cleaning cream was applied.

Step 7: Using a clean dry soft cloth, wipe the surfaces dry.

Step 8: Switch **ON** the electrical power supply.

4.2.3.7.6 Removing Scratches on Brush Satin Finishes

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Allow the stainless steel surface to cool.

WARNING:
CLEANING AND MAINTENANCE MUST ONLY BE UNDERTAKEN BY COMPETENT PERSONNEL ONCE ALL EQUIPMENT SUCH AS OVENS, GRILLS AND FYERS ARE SWITCHED OFF AND ALL SURFACES HAVE SUFFICIENTLY COOLED.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

WARNING:
YOU SHOULD WEAR SUITABLE GRIPPING, CUT-RESISTANT WORK-GLOVES WHEN HANDLING AND CLEANING THE REFRESH UNIT.

Step 3: Safely position suitable access equipment. Treat surface scratches as follows:

Step a) For light surface scratches; use the nylon pads to gently remove the scratches.

Step b) For deep surface scratches; use the scurf's in the direction of polishing to remove the scratches.

Step 4: Switch **ON** the electrical power supply.

4.2.3.8 Recommended Cleaning and Maintenance Contractors

Britannia can provide a range of maintenance services, from a full maintenance contract including cleaning and replacement of filters, to individual service calls and onsite training.

4.2.3.9 Maintenance of Fire Suppression Systems (Where Installed)

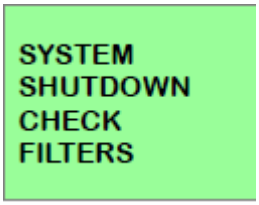
Contact details of appropriate companies can be supplied if required.

4.3 Fault Finding

4.3.1 Fault Finding Procedures

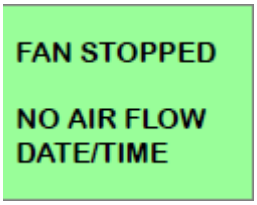
4.3.1.1 Filter Status Screens

When the stage filters become dirty the operation of the unit is reduced. If the stage filters are not changed during the time (in HRS) shown on the countdown timer warning screen, then the system will SHUT DOWN and the following screen is displayed.]



Screen Display - SYSTEM SHUTDOWN CHECK FILTERS

If an air flow pressure switch has been installed and the air pressure drops in the filter bank, the following screen is displayed:



Screen Display - FAN STOPPED NO AIR FLOW

The following procedures show how to change and reset the filters when the system has shut down:

Step 1: Remove the stage filters which are displayed on the screen. Refer to the following remove and replace procedures:

- *Removing Stage 2 Filters*
- *Removing Stage 3 Filters*
- *Removing Stage 4 Filters*
- *Removing Stage 5 Carbon Cells*

Step 2: Remove the stage filters which are displayed on the screen. Refer to the following remove and replace procedures:

- *Replacing Stage 2 Filters*
- *Replacing Stage 3 Filters*
- *Replacing Stage 4 Filters*
- *Replacing Stage 5 Carbon Cells*

Step 3: Access the filter stage reset panel by opening the hinged access panels at the lower front of the Services Tower.

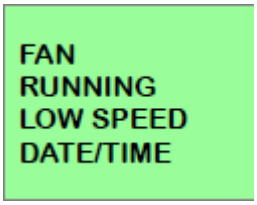
Step 4: To reset the stage filter which has been changed, press and hold the applicable reset button on the front of the filter stage reset panel.

Note: *The filter stages are given below the black reset button as 2, 3, 4 & 5.*

Filter Stage Reset Panel - FILTERS RESET

Step a) Close the hinged access panels at the lower front of the Services Tower.

Step b) To start-up the fans press the START /SPEED UP button. The fans will start-up in the LOW SPEED and the following screen is displayed:



Screen Display - FAN LOW SPEED

4.4 Corrective Maintenance

4.4.1 Maintenance Policy

Only suitably trained and competent personnel must carry out maintenance. Refer to *Section 4.2.3.8 Recommended Cleaning and Maintenance Contractors* for details of contractors suitable to maintain the equipment.

4.4.2 Removal Procedures (Refresh Mini, Midi & Maxi)

Refer to the following procedures as necessary:

- *Removing Stage 2 Filters*
- *Removing Stage 3 Filters*
- *Removing Stage 4 Carbon Filters*

4.4.2.1 Removing Stage 2 Filters

The filter is mounted horizontally within the rear section of the Services Tower.

Step 1: Switch OFF and isolate the electrical power supply.

Step 2: Remove the Stage 1 baffle type grease filter. Refer to *Section 4.2.3.1 Cleaning Stage 1 Baffle Type Grease Filters (All Units)*. The Stage 2 filter is located behind. Refer to the picture below.

Accessing the Stage 2 filter

Step 3: Using your hand, remove the Stage 2 filter panel. Refer to the picture below.

Removing the Stage 2 filter

Step 4: Use your fingers to unhook the securing clip from the filter panel flange. Remove the filter pad from the filter panel.

Step 5: Dispose of the old filter pad.

4.4.2.2 Removing Stage 3 Filters

Caution:
The particulate filters are positioned to protect the fan and carbon filters. If they are not monitored and replaced regularly, then the life-span of the carbon filters will be drastically reduced and the fan will become grease loaded and could start to run out of balance causing long-term damage to bearings and impeller.

Step 1: Using your hand, loosen the knurled thumbscrews located on the front access panel. Refer to the picture below.

Thumbscrew on Access Panel

Step 2: Using your hand, open the access panel by lifting upwards until locked in position. Using your hand, remove the Stage 3 filter panel by sliding backwards. Refer to the picture below.

Sliding Back the Stage 3 Filter Panel

Step 3: Using a commercial dishwasher, clean the pleated filter.

4.4.2.3 Removing Stage 4 Carbon Filters

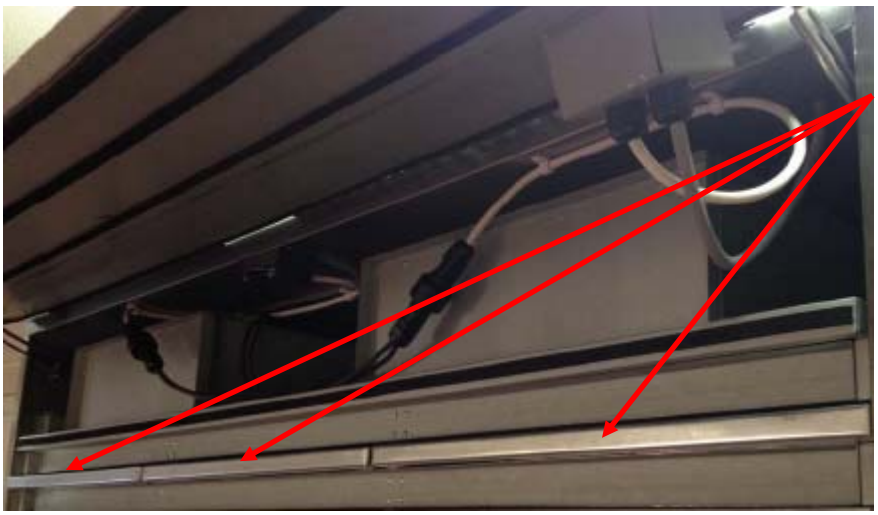
Caution:
The particulate filters are positioned to protect the fan and carbon filters. If they are not monitored and replaced regularly, then the life-span of the carbon filters will be drastically reduced and the fan will become grease loaded and could start to run out of balance causing long-term damage to bearings and impeller.

Step 1: Switch OFF and isolate the electrical power supply.

Step 2: Using your hand, loosen the knurled thumbscrews located on the front access panel. Refer to the picture below.

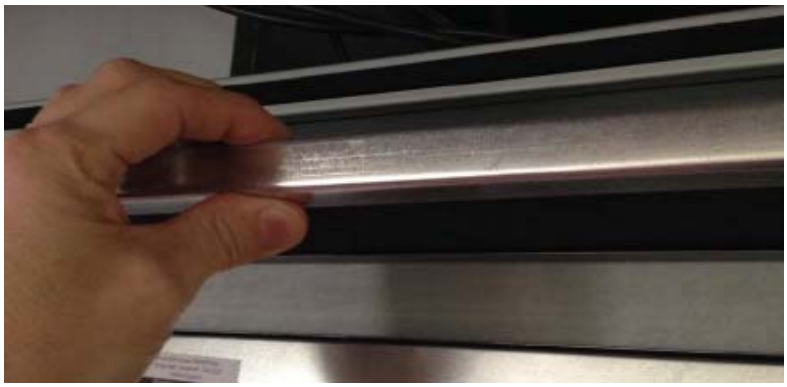
Thumbscrew on Access Panel

Step 3: Using your hand, open the access panel by lifting upwards until locked in position. Refer to the picture below.



Stage 4 Carbon Filters Behind Access Panel

Step 4: Remove each of the Stage 4 carbon filters by sliding the panel out horizontally between its guide rails. Refer to the picture below.



Removing Each of the Stage 4 Carbon Filters

Step 5: Remove the carbon filters from the panel frames.

Step 6: Dispose of the carbon filters.

4.4.3 Removal Procedures (Refresh Ultima)

Refer to the following procedures as necessary:

- *Removing Stage 2 Filters*
- *Removing Stage 3 Filters*
- *Removing Stage 4 Filters*
- *Removing Stage 5 Carbon Cells*
- *Removing an LED Lamp*

4.4.3.1 Removing Stage 2 Filters

The filter is mounted horizontally within the rear section of the Services Tower.

Step 1: Switch OFF and isolate the electrical power supply.

Step 2: Access the Stage 2 filters panels by unlocking the side access panel of the Services Tower and slide out the Stage 2 filter tray. Refer to the picture below.

Opening the Access Panel and Removing the Stage 2 filter

Step 3: Using your hand, unhook the securing clip from the top of the filter pad.

Step 4: Using your hand, remove the Stage 2 filter pad.

Step 5: Dispose of the old filter pad.

4.4.3.2 Removing Stage 3 Filters

Caution:
The particulate filters are positioned to protect the fan and carbon filters. If they are not monitored and replaced regularly, then the life-span of the carbon filters will be drastically reduced and the fan will become grease loaded and could start to run out of balance causing long-term damage to bearings and impeller.

The filter is mounted horizontally within the side access panel of the Services Tower.

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Access the Stage 3 filters panels by unlocking the side access panel of the Services Tower. Refer to the picture below.

Accessing the Stage 3 filters

Step 3: Remove each of the Stage 3 filters by sliding the panel out horizontally between its guide rails.

Step 4: Dispose of the old filters.

4.4.3.3 Removing Stage 4 Filters

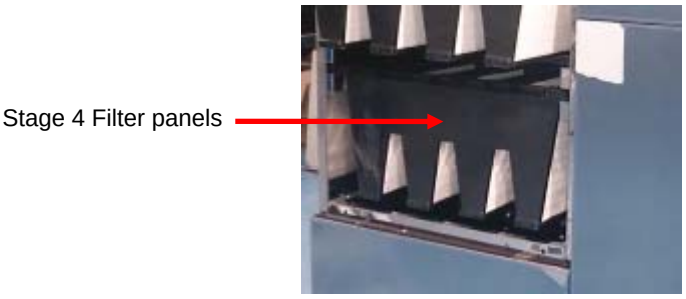
Caution:
The particulate filters are positioned to protect the fan and carbon filters. If they are not monitored and replaced regularly, then the life-span of the carbon filters will be drastically reduced and the fan will become grease loaded and could start to run out of balance causing long-term damage to bearings and impeller.

The filter is mounted horizontally within the side access panel of the Services Tower.

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Access the Stage 4 filters panels by unlocking the side access panel of the Services Tower.

Step 3: Remove each of the Stage 4 filter panels by sliding the panel out horizontally between its guide rails. Refer to the picture below.



Access the Stage 4 Filters Panels

Step 4: Dispose of the old filter panels.

4.4.3.4 Removing Stage 5 Carbon Cells

The filter is mounted within the front section of the Services Tower.

Step 1: Switch **OFF** and isolate the electrical power supply.

Step 2: Access the Stage 5 carbon cells by unlocking the upper front access panel of the Services Tower.

Step 3: Remove each of the Stage 5 carbon cells by sliding the individual vertical cells out horizontally between their guide rails. Refer to the picture below.

Removing Each of the Stage 5 Carbon Cells

Step 4: Dispose of the spent loose carbon granules inside each cell.

4.4.3.5 Removing an LED Lamp

Step 1: Switch OFF the canopy lighting and isolate the power supply.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

Step 2: Safely position suitable access equipment. Using your fingers, move the bezel away from the surface of the canopy then gently pull the fitting down.

Moving the Bezel Away from the Canopy

Step 3: Carefully squeeze the two spring clips above the bezel and gently pull the lamp down from the canopy.

Squeezing the Spring Clips

Removing the Fitting from the Canopy

Step 4: Gently pull the bezel from the fitting to access the lamp inside.

Pulling the Bezel from the Fitting

Bezel Removed

Step 5: Gently twist and pull the lamp from its fitting.

Lamp Removed

4.4.4 Replacement Procedures (Refresh Mini, Midi & Maxi)

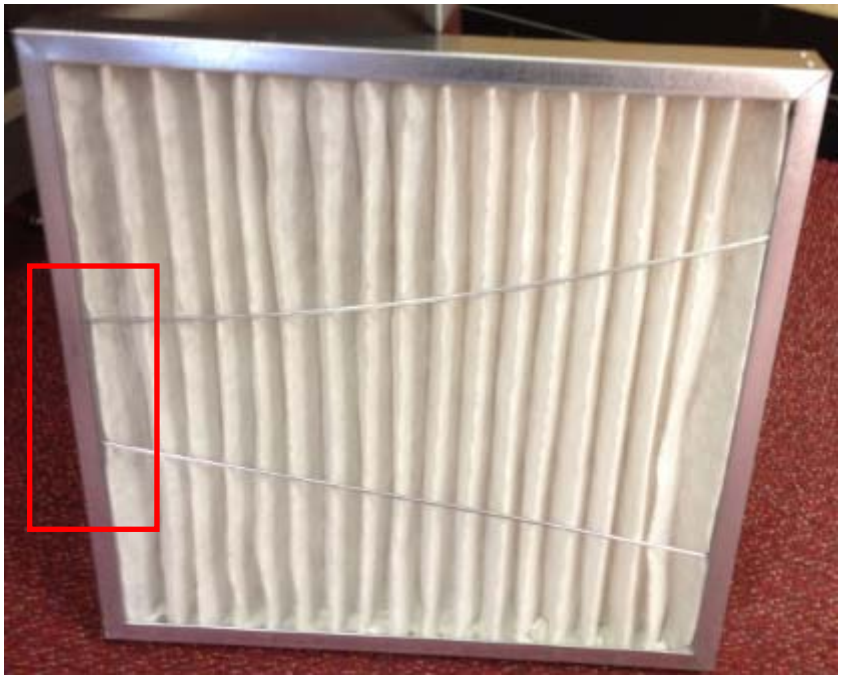
Refer to the following procedures as necessary:

- *Replacing Stage 2 Filters*
- *Replacing Stage 3 Filters*
- *Replacing Stage 4 Carbon Filters*

4.4.4.1 Replacing Stage 2 Filters

Step 1: Replace the filter pad to the filter panel frame.

Step 2: Using your fingers, lay the securing clip over the top of the new filter pad then hook the end of the securing clip under the lip of the flange of the filter panel. Refer to the picture below.



Replacing the Securing Clip over the Stage 2 Filter Pad

Step 3: Using your hand, replace the Stage 2 filter panel. Refer to the picture below.

Replacing the Stage 2 Filter Panel

Stage 2 Filter Panel Replaced

Step 4: Replace the Stage 1 baffle type grease filter. Refer to *Section 4.2.3.1 Cleaning Stage 1 Baffle Type Grease Filters (All Units)*.

Step 5: Switch **ON** the electrical power supply.

Step 6: Reset the filter operational hours. Refer to *Section 3.3 Resetting the Filter Operational Hours*.

Step 7: Check the unit is operating correctly.

4.4.4.2 Replacing Stage 3 Filters

Step 1: Using your hand, Replace each of the Stage 3 filter panels by sliding the panel in horizontally between its guide rails. Refer to the picture below.

Sliding the Stage 3 Filter Panel Forward

Step 2: Using your hand, close the front access panel.

Step 3: Using your hand, tighten the knurled thumbscrews located on the front access panel. Refer to the picture below.

Thumbscrew on Access Panel

Step 4: Switch **ON** the electrical power supply.

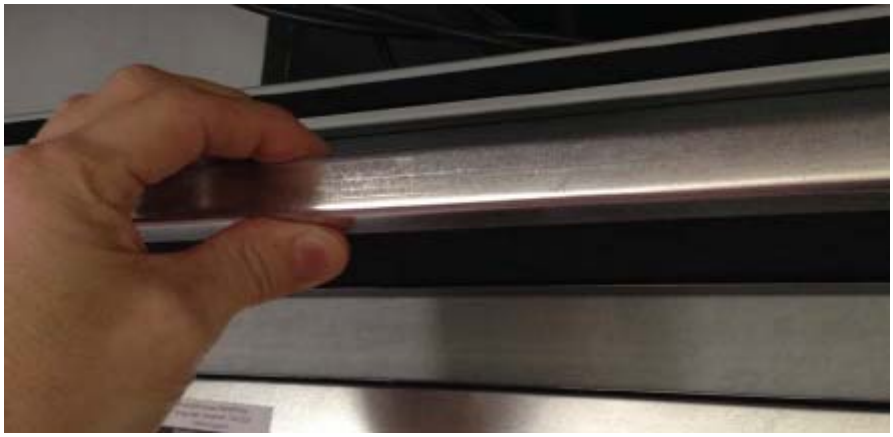
Step 5: Reset the filter operational hours. Refer to *Section 3.3 Resetting the Filter Operational Hours*.

Step 6: Check the unit is operating correctly.

4.4.4.3 Replacing Stage 4 Carbon Filters

Step 1: Replace new carbon filters to the panel frames.

Step 2: Replace each of the Stage 4 carbon filter panels by sliding the panel horizontally into the unit between its guide rails. Refer to the picture below.

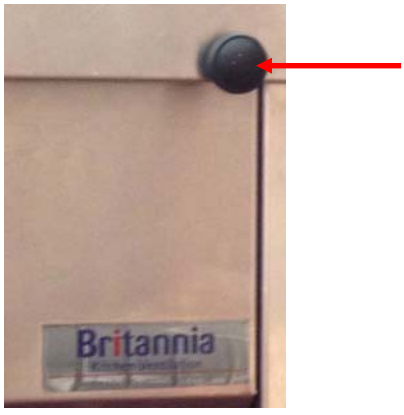


Replacing Each of the Stage 4 Carbon Filter Panels

Stage 4 Replacing the Stage 4 Filters behind Access Panel

Step 3: sing your hand, close the front access panel.

Step 4: Using your hand, tighten the knurled thumbscrews located on the front access panel. Refer to the picture below.



Thumbscrew on Access Panel

Step 5: Switch **ON** the electrical power supply.

Step 6: Reset the filter operational hours. Refer to *Section 3.3 Resetting the Filter Operational Hours*.

Step 7: Check the unit is operating correctly.

4.4.5 Replacement Procedures (Refresh Ultima)

Refer to the following procedures as necessary:

- *Replacing Stage 2 Filters*
- *Replacing Stage 3 Filters*
- *Replacing Stage 4 Filters*
- *Replacing Stage 5 Carbon Cells*
- *Replacing an LED Lamp*

4.4.5.1 Replacing Stage 2 Filters

Step 1: Using your hand, replace the Stage 2 filter pad inside the filter panel.

Step 2: Using your hand, hook the securing clip over the top of the filter pad.

Step 3: Replace the Stage 2 filter pad by sliding the panel in horizontally between its guide rails. Refer to the picture below.

Opening the Access Panel and Replacing the Stage 2 filter

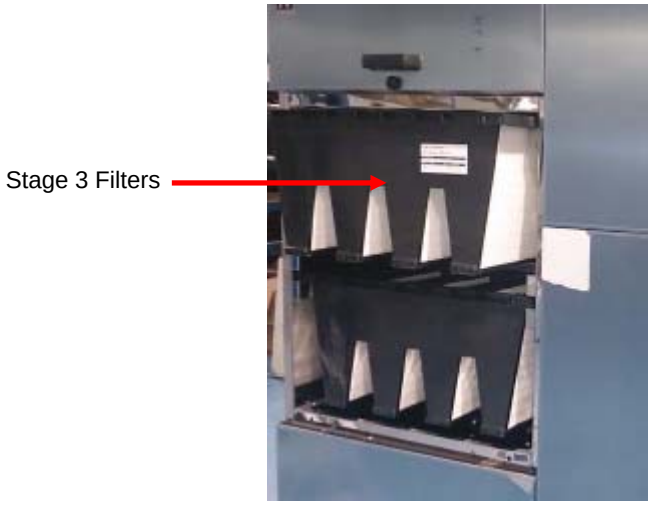
Step 4: Switch **ON** the electrical power supply.

Step 5: Reset the filter operational hours. Refer to *Section 3.3 Resetting the Filter Operational Hours*.

Step 6: Check the unit is operating correctly.

4.4.5.2 Replacing Stage 3 Filters

Step 1: Replace each of the Stage 3 filter panels by sliding the panel in horizontally between its guide rails. The filter must be mounted above the 4th Stage filter. Refer to the picture below.



Accessing the Stage 3 filters

Step 2: Close the side access panel of the Services Tower and lock.

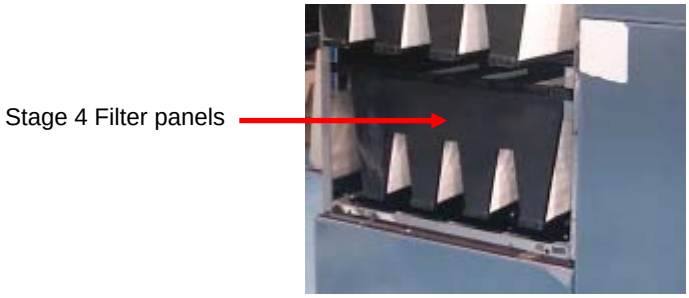
Step 3: Switch **ON** the electrical power supply.

Step 4: Reset the filter operational hours. Refer to *Section 3.3 Resetting the Filter Operational Hours*.

Step 5: Check the unit is operating correctly.

4.4.5.3 Replacing Stage 4 Filters

Step 1: Replace each of the Stage 4 filter panels by sliding the panel in horizontally between its guide rails. The filters must be mounted below the 3rd Stage filters. Refer to the picture below.



Replacing the Stage 4 Filters Panels below the Stage 4 Filters

Step 2: Close the side access panel of the Services Tower and lock.

Step 3: Switch **ON** the electrical power supply.

Step 4: Reset the filter operational hours. Refer to *Section 3.3 Resetting the Filter Operational Hours*.

Step 5: Check the unit is operating correctly.

4.4.5.4 Replacing Stage 5 Carbon Cells

Step 1: Using the correct loose granule carbon media, re-fill the cells.

Step 2: Replace each of the Stage 5 carbon cells by sliding the individual vertical cells in horizontally between their guide rails. Refer to the picture below.

Replacing Each of the Stage 5 Carbon Cells

Step 3: Close the upper front access panel of the Services Tower and lock.

Step 4: Switch **ON** the electrical power supply.

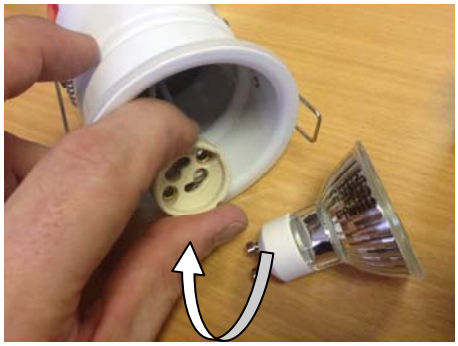
Step 5: Reset the filter operational hours. Refer to *Section 3.3 Resetting the Filter Operational Hours*.

Step 6: Check the unit is operating correctly.

4.4.5.5 Replacing an LED Lamp

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

Step 1: Gently twist and push the lamp into its fitting.

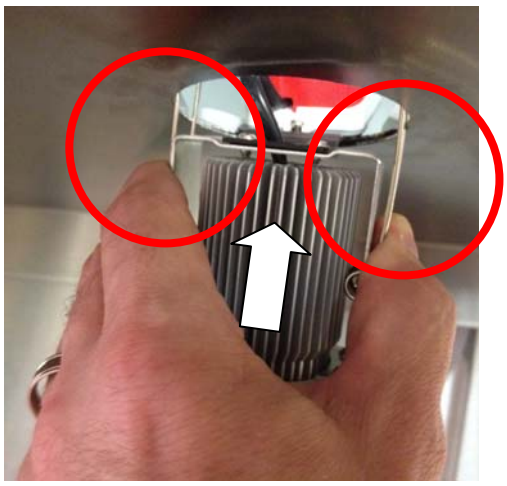


Refitting the Lamp to its Fitting

Step 2: Gently push the bezel into the fitting.

Pushing the Bezel Back into the Fitting

Step 3: Carefully squeeze the two spring clips above the bezel and gently push the lamp up and inside the canopy.



Squeezing the Clips to Replace the Lamp to the Canopy

Step 4: Using your fingers, push the bezel upwards so it is flush to the surface of the canopy.

Pushing the Lamp Flush to the Canopy

Step 5: Using the clean dry cloth, remove any finger marks from the bezel glass.

Step 6: Switch **ON** the power supply.

Step 7: Switch **ON** the canopy lighting.

4.4.6 Maintenance Checks and Visual Inspections

The table below give a schedule of visual inspections which should be undertaken.

Equipment	Level of Output					
	Light	Light/ Medium	Medium	Medium/ High	High	Very High
	Maintenance Frequency					
Visual Inspection of the Refresh Unit (Mini, Midi, Maxi & Ultima)	Monthly	Monthly	3 weekly	3 weekly	2 weekly	1 Weekly

4.4.6.1 Visual Inspection (Refresh Mini, Midi & Maxi)

Step 1: Allow the unit to cool down.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

Step 2: Switch **OFF** the fan motor from the switch located at the top of the unit.

Step 3: Remove the Stage 1 baffle type grease filter. Refer to *Section 4.2.3.1 Cleaning Stage 1 Baffle Type Grease Filters (All Units)*. The Stage 2 filter is located behind. Refer to the picture below.

Accessing the Stage 2 filter

Step 4: Using your hand, remove the Stage 2 filter panel. Refer to the picture below.

Removing the Stage 2 filter

Step 5: Do a visual inspection of the unit as follows:

Step a) Check all internal surfaces for excessive deposits of grease. Clean as necessary. Refer *Section 4.2.3.5 Deep Cleaning the Refresh Unit*.

Step b) Check all external surfaces for dust and dirt build-up. Clean as necessary. Refer to *Section 4.2.3.5 Deep Cleaning the Refresh Unit*.

Step c) Check the unit is secure.

Step 6: Check Stage 1 baffle type grease filters are free from dirt, dust and grease build up. Clean as necessary. Refer to *Section 4.2.3.1 Cleaning Stage 1 Baffle Type Grease Filters*.

Step 7: Check the condition of Stages 2 to 4 filters. If necessary, remove the filters as necessary:

Step a) For removal of Stage 2 filters, refer to *Section 4.4.2.1 Removing Stage 2 Filters*

Step b) For removal of Stage 3 filters, refer to *Section 4.4.2.2 Removing Stage 3 Filters*

Step c) For removal of Stage 4 filters, refer to *Section 4.4.2.3 Removing Stage 4 Carbon Filters*

Step 8: Refer to the following Steps for replacing filter stages as necessary:

Step a) For replacement of Stage 2 filters, refer to *Section 4.4.4.1 Replacing Stage 2 Filters*

Step b) For replacement of Stage 3 filters, refer to *Section 4.4.4.2 Replacing Stage 3 Filters*

Step c) For replacement of Stage 4 filters, refer to *Section 4.4.4.3 Replacing Stage 4 Carbon Filters*

Step 9: From the switch located at the top of the unit, switch **ON** the fan motor and check the unit is operating correctly.

4.4.6.2 Visual Inspection (Refresh Ultima)

Step 1: Allow the unit to cool down.

WARNING:
USE SUITABLE AND APPROVED EQUIPMENT WHEN WORKING AT HEIGHT.

Step 2: Switch **OFF** the fan motor from the Refresh Control panel.

Step 3: Remove the Stage 1 baffle type grease filter. Refer to *Section 4.2.3.1 Cleaning Stage 1 Baffle Type Grease Filters (All Units)*. The Stage 2 filter is located behind. Refer to the picture below.

Accessing the Stage 2 filter

Step 4: Using your hand, remove the Stage 2 filter panel. Refer to the picture below.

Removing the Stage 2 filter

Step 5: Do a visual inspection of the Refresh Unit as follows:

Step a) Check all internal surfaces for excessive deposits of grease. Clean as necessary. Refer *Section 4.2.3.5 Deep Cleaning the Refresh Unit*.

Step b) Check all external surfaces for dust and dirt build-up. Clean as necessary. Refer to *Section 4.2.3.5 Deep Cleaning the Refresh Unit*.

Step c) Check the unit is secure.

Step d) Check LED lamps are lit. Replace any LED lamps not lit. Refer to:

- *Section 4.4.3.5 Removing an LED Lamp*
- *Section 4.4.5.5 Replacing an LED Lamp*

Step 6: Check Stage 1 baffle type grease filters are free from dirt, dust and grease build up. Clean as necessary. Refer to *Section 4.2.3.1 Cleaning Stage 1 Baffle Type Grease Filters (All Units)*].

Step 7: Check the condition of stages 2 to 5. Refer to *Section 4.3.1.1 Filter Status Screens*.

Step 8: Refer to the following Steps for removing filter stages as necessary:

Step a) For removal of Stage 2 filters, refer to *Section 4.4.3.1 Removing Stage 2 Filters*

Step b) For removal of Stage 3 filters, refer to *Section 4.4.3.2 Removing Stage 3 Filters*

Step c) For removal of Stage 4 filters, refer to *Section 4.4.3.3 Removing Stage 4 Filters*

Step d) For removal of Stage 5 carbon cell filters, refer to *Section 4.4.3.4 Removing Stage 5 Carbon Cells*

Step 9: Refer to the following Steps for replacing filter stages as necessary:

Step a) For replacement of Stage 2 filters, refer to *Section 4.4.5.1 Replacing Stage 2 Filters*

Step b) For replacement of Stage 3 filters, refer to *Section 4.4.5.2 Replacing Stage 3 Filters*

Step c) For replacement of Stage 4 filters, refer to *Section 4.4.5.3 Replacing Stage 4 Filters*

Step d) For replacement of Stage 5 carbon cell filters, refer to *Section 4.4.5.4 Replacing Stage 5 Carbon Cells*

Step 10: Reset the filter operational hours. Refer to *Section 3.3 Resetting the Filter Operational Hours*.

Step 11: From the Refresh Control Panel, switch **ON** the fan motor Check the unit is operating correctly.

4.5 Spares

4.5.1 Spares Tables

The following replacement parts can be purchased from Britannia Kitchen Ventilation (refer to *Section 4.5.2*) when damaged or life expired for:

4.5.1.1 Refresh Mini, Midi & Maxi

Nomenclature	Additional Information
Stage 1 High efficiency Britstream baffle-type grease filter	UltraStream 3040
Stage 2 G4 filter	N/A
Stage 3 HEPA filter	N/A
Stage 4 Carbon filter	N/A

4.5.1.2 Refresh Ultima

Nomenclature	Additional Information	Small Service Tower	Large Service Tower
Stage 1 High efficiency Britstream baffle-type grease filter	UltraStream 3040	N/A	N/A
Stage 2 G4 filter	N/A	1 no. 595x595x50	1 no. 595x595x50 & 1 no. 595x289x50
Stage 3 F6 filter	N/A	1 no. RP6-2412 (595x595x292mm)	1 no. RP6-2412 (595x595x292mm) & 1 no. RP61212 (595x289x292mm)
Stage 4 HEPA H10 filter	N/A	1 no. SP32 AH00-2412 (595x595x292mm)	1 no. SP32 AHOO-2412 (595x595x292mm) & 1 no. SP30 AH00-1212 (595x289x292mm)
Stage 5 Carbon cells	N/A	4 no. Activated carbon filters, 144-600-440 grade 207c	6 no. Activated carbon filters, 144-600-440 grade 207c
Stage 6 Return air supply diffuser pad media	Disposable pad media cut to suit diffuser size	N/A	N/A
Fan	N/A	Systemair KBR 315 DZ	Systemair KBR 355 DZ

Down light size, type and wattage

Lamp Diameter (mm)	Voltage (V)	Lamp Wattage (W)	Ingress Protection (IP) Rating
87mm Ø	240	9	65

4.5.2 Ordering Information

Contact Britannia Kitchen Ventilation for pricing and availability of spare parts. Refer to the contact details below:

Britannia Kitchen Ventilation Ltd
10 Highdown Road
Sydenham Industrial Estate
Leamington Spa
Warwickshire
CV31 1XT
England

Phone 01926-463540
Fax 01926-463541
Email sales@kitchen ventilation.co.uk
Web *www.kitchen-ventilation.co.uk*

Use of components or replacement parts other than those supplied or recommended by Britannia Kitchen Ventilation Ltd will invalidate any warranties or guarantees.

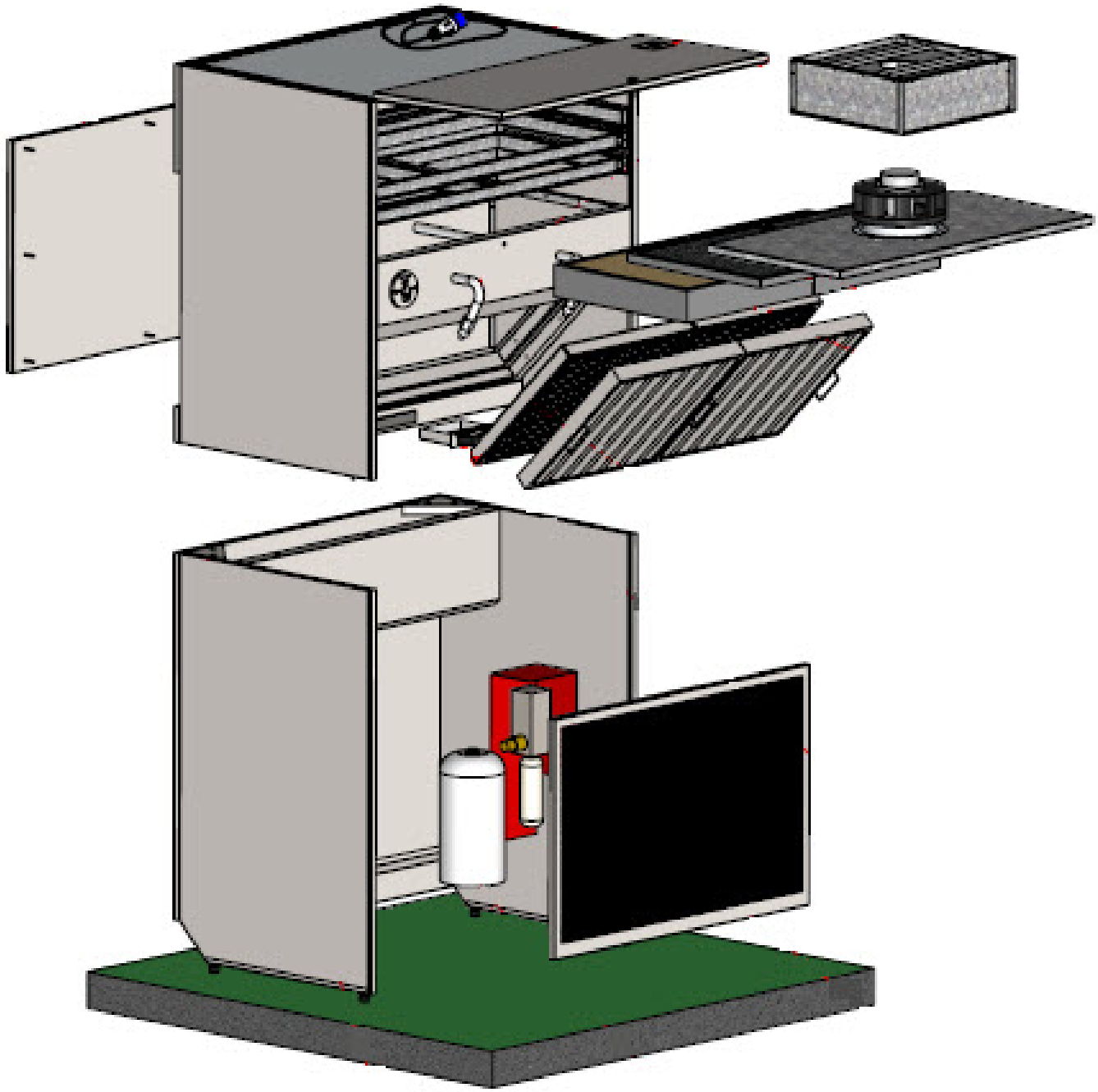
4.6 GA Diagrams

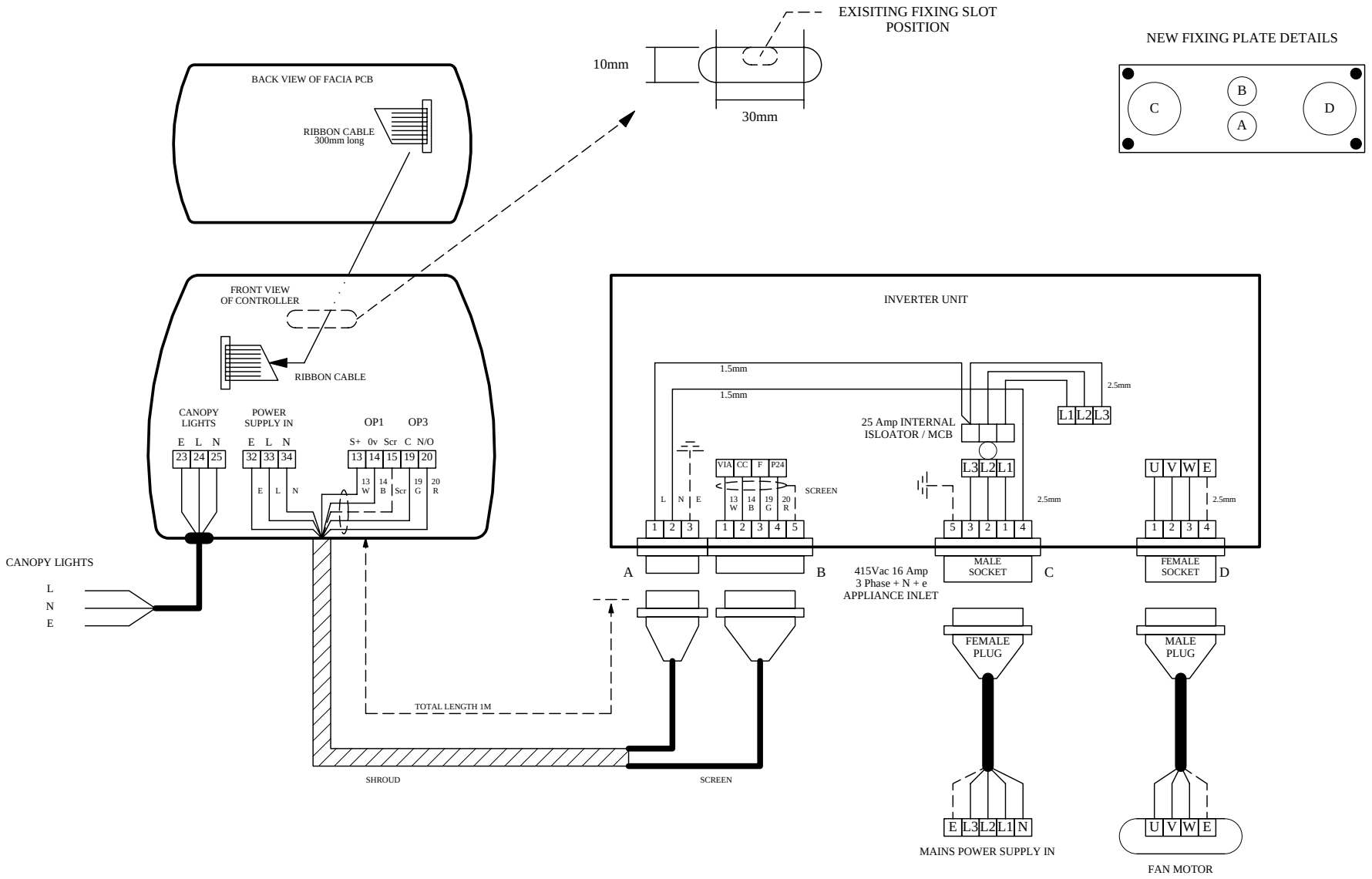
4.6.1 Refresh Mini, Midi & Maxi

Drawing No.	Drawing Title	Revision
None	Exploded View (Midi)	-

4.6.2 Refresh Ultima

Drawing No.	Drawing Title	Revision
TESP-BRIT-CS-RF01	New Refresh - Kitchen Ventilation Recirc - Canopy Wiring Diagram	-





TRENT CONTROL PANELS LTD	**CUSTOMER:**	**PROJECT REF:**	**DRAWING No:**
	BRITANNIA KITCHEN VENTILATION LTD	**NEW REFRESH - KITCHEN VENTILATION RECIRC - CANOPY WIRING DIAGRAM**	**TESP -BRIT-CS-RF01**

DRAWN BY	DATE:	CHECKED BY
AVE	30/03/07	