Monmouth Scientific

Guardian MSCT1200/1800

MICROBIOLOGICAL SAFETY CABINET

OPERATING AND MAINTENANCE MANUAL

CONTENTS

For permission requests, please write to:-
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Warning

This system must be used in compliance with these instructions and any repairs or maintenance carried out by qualified personnel.

For parts or service information please contact Monmouth Scientific on: +44 (0) 1278 458090

SECTION 1

Description of the cabinet

Working principal

Class II Microbiological Safety Cabinets are designed to provide a high level of protection for the operator, environment and sample. The cabinets work on a recirculating principal with approximately 70% of the air drawn from the working area being recirculated. The remaining 30% is exhausted via single or double HEPA filters back to the laboratory. An inflow velocity of approximately 0.7m/sec. at the working aperture provides operator protection. The recirculated air at a downward velocity provides sample protection from the laboratory environment and cross contamination between samples.

Features

- ISO Class 4 clean air
- Compliant to BS EN 12469:2000
- Available in 2 standard sizes:1200mm & 1800mm
- Advanced electronic control and monitoring system
- Double or single outlet HEPA filter on recirculating version
- HEPA filters with integral diffuser/laminator
- Electrically operated sliding sash with integrated obstruction detection safety system
- Timed start-up feature – Cabinet can be optionally set to start up unattended
- Timed standby feature – Cabinet can be optionally set to standby unattended
- Passcode protected start-up/shut down – Prevents unauthorised cabinet operation
- Easy clean glass system
- Toughened glass side windows
- Internal auxiliary electrical appliance sockets
- Low energy LED lighting
- Stainless steel removable worksurface trays
- Low overall height – fits most rooms
- Ports for connection of VHP systems
- UV decontamination lamp

Cabinets can be provided with a range of options, such as Gas, CO_2 and Water supplies, Formalin vaporisers/neutralisers, additional HEPA filters and Carbon outlet filter for use on formalin decontamination and base stands. For any non-standard requirements we can provide modifications to the existing models.

SPECIFICATIONS

Cabinet	MSCT1200	MSCT1800
Type	Recirculating	
External dimensions	W 1200mm x D 750mm x H 2195mm incl base stand (1330mm without) +66mm for optional outlet safety filter	W 1800mm x D 750mm x H 2195mm incl base stand (1330mm without) +66mm for optional outlet safety filter
Internal dimensions	W 1140mm x D 630mm x H 754mm	W 1740mm x D 630mm x H 754mm
Weight	170 Kg	240 Kg
Inflow m/sec (typ.)	0.77 m/sec	0.77
Downflow m/sec (typ.)	0.35 m/sec	0.30
Electrical requirements	230v / 50/60Hz – 10A	
Nominal power - Cabinet	150w	320w
Nominal power – Aux Sockets	2 x 1000w	
Auxiliary Electrical sockets	2 x sockets IP55 (1000w Max per socket)	
Lighting	LED >850 lux at work surface	
Filters	H14 HEPA	
Construction	Zintec steel/Aluminium, Epoxy powder coated outer casing with toughened glass side windows and Laminated safety glass sliding sash. Stainless steel base and removable worksurface trays.	

SECTION 2

Installation

Important handling procedures
The cabinet should be handled with care during the transportation and siting process. The cabinet is shipped with foam blocks and tape to secure and protect it during transit. These should be removed once finally sited and before turning the cabinet on for the first time. To remove, open the front cover. The sash will rise slightly and enable the foam to be removed.

Location
The cabinet should be sited in a draught-free location i.e. away from door entrances, corridors, ventilation supply points etc. which will affect the airflow within the work zone as recommended in BS5726:2005. The cabinet should be fully tested and commissioned by suitably qualified persons before being put into service.
If the cabinet is moved or relocated it should be recommissioned.

Ducting connection (optional)
The cabinet can be supplied or fitted with an integral Anti-blowback device c/w Ø200mm spigot for connection to extract ductwork. It is recommended that the duct system flow rate is adjustable to match the cabinet and can provide extraction at a volume/rate of at least 800m³/hr (1200) and 1300m³/hr (1800). It is recommended that a thimble connection is used within the duct to maintain stable and balanced airflow.

Electrical connection and services
The cabinets are shipped with a 2m IEC lead terminated with a standard domestic plug (type dependant on region). The lead plugs into the top, right hand side towards the rear. The IEC inlet socket is protected by a fuse. This should only be replaced with a fuse of same type and rating.

Auxiliary switched connection
A volt-free switching contact facility is provided on the cabinet fitted with anti-blowback devices for connection to external devices (eg. Duct fan). This changes state whenever the cabinet is operational (fan running). Connection is via a supplied 3 pin plug and is wired as follows:

Terminal pin	Connection
E	Common
N	N/C
L	N/O

Testing and certification
The Cabinet should be fully tested and commissioned by suitably qualified persons before being put into service. Monmouth Scientific have a nationwide team of service engineers who can take care of your installation, commissioning and service requirements. Please contact our service department on 01278 458090 for further information.

SECTION 3

Operating instructions

Basic operations

Cabinet overview

Outlet filter

Power inlet

Front panel
(Gas strut assisted
for service access)

Power switch

Visionaire ®
control panel

Electronically
controlled
sliding sash

VHP/services ports

Removable
worksurface trays
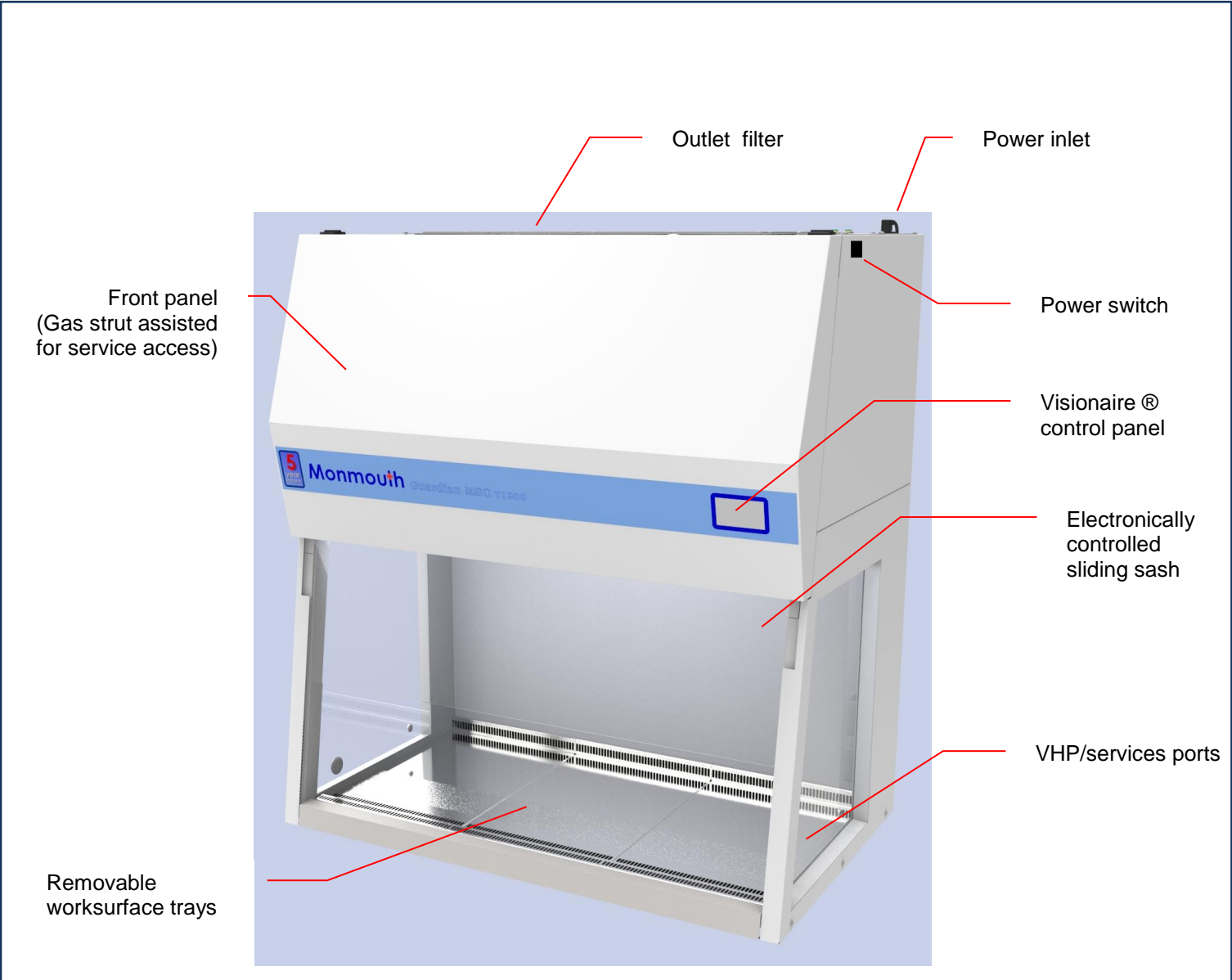
Switch the cabinet on

The main switch is positioned on the upper right hand side of the front cover.
Upon switching the unit on it will display the welcome screen for a few seconds

The system will then run a system check and display the user access code screen**
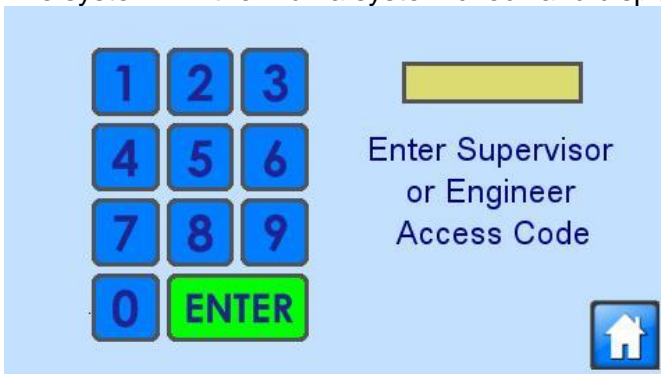
Press "*0127*" then "*Enter*" to start the cabinet. The screen will move to calibrate the sash closed position. It will then automatically open the sash to its normal working position, the fans will start and the lighting will illuminate.
During this time the following screen will be displayed:

Once the sash has reached its normal operating position and for the duration of normal day-to-day operation, the "Home" screen will be displayed and the cabinet is ready for use.

** "*Keypad cabinet access*" feature can be disabled in "*Supervisor settings*"

Controls

The cabinet is equipped with Monmouth Scientific's Visionaire® system.
It provides complete control of the cabinet and displays all the operating parameters in an easy to understand touch screen interface.

Home screen

This is displayed whilst the cabinet is operating normally in its day-to day operation.
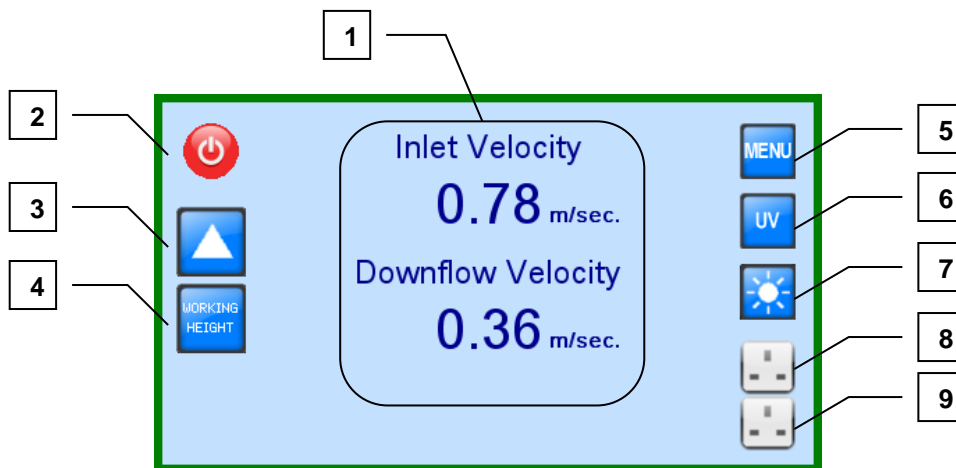
Key of features:
1. *System status display area* – Displays the Airflow velocity in real time.
2. *Standby* – Closes the sash and puts the unit to into "sleep mode".
3. *Sash up* – Press and hold to raise the sash to the desired level for access, cleaning or maintenance.
4. *Working height* – Resets the sash to its normal working position.
5. *Menu* – Access to other features such as general cabinet info, decontamination cycle and cabinet settings.
6. *UV* – Access the setup and operation of the UV sterilisation cycle.
7. *Lighting* – Access control to set the brightness or to turn the light on/off.
8. *Socket 1* – Turns the Upper auxiliary socket control on/off.
9. *Socket 2* – Turns the Lower auxiliary socket control on/off.

Sliding sash operation

The cabinet is equipped with an electrically actuated glass sliding sash.
It has one pre-set position this is its normal operating position.

In addition, there is an integrated safety system that detects obstructions within the opening and automatically prevents the sash from closing. A warning is displayed in the event of the system detecting an obstruction:
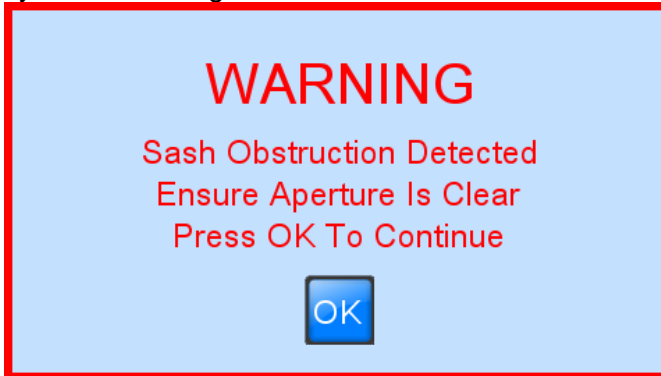
Remove the obstruction and press "*OK*". This will reset the system and the sash will close.

In addition to the pre-set position the sash may also be fully raised to enable access for cleaning or positioning of apparatus within the enclosure.

To raise the sash, select and hold the "*Sash up*" arrow icon (**3**). The sash will continue to rise until the icon is released or when it reaches the upper limit stop.

WARNING: It should be noted that containment or product protection is NOT effective if the sash is raised above its normal working height.

Should the screen be moved above its normal working height position, the main display will show ***"SASH HIGH"*** warning the user.

To return the sash to its normal position, press the *"Working height"* icon (**4**)

The sash can be also fully closed by putting the cabinet into standby – see section below for details.

Standby

Standby is a status where the cabinet is closed, the lighting is turned off and the fans are stopped. The control system is still operational.

To put the cabinet into standby, first ensure any items or obstructions are removed from the front edge of the worksurface then press the *"Standby"* icon (**2**).
If the "*Keypad cabinet access*" option is active, the user will be prompted to enter the access code (0127).

A warning screen is displayed with a 5 second countdown advising that the screen will shortly close (Pressing "*Abort shut down*" will stop the countdown and the cabinet will resume normal operation).

Once the sash has closed, the fans and lights will switch off and the standby screen is displayed.

Touching the screen will wake the cabinet , open the sash, start the fans and resume operation.

Switching the cabinet off

Once the cabinet is in standby mode it can be safely turned off at the power switch.

The cabinet should not be switched off with the sash in the open position as containment will be affected.

Lighting

The cabinet is equipped with low energy LED lighting.

The lighting levels can be adjusted or turned by pressing the *"Lighting"* icon on the home screen *(7)*. This expands to reveal the following options:

Increase brightness

On/Off

Decrease brightness
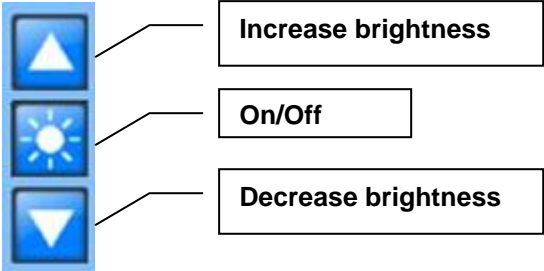
By pressing the *"Up"* or *"Down"* arrows you can adjust the brightness. Pressing the *"Lighting"* icon will turn the light off. Pressing the icon again will turn the light on.

The screen will return to the home page after 3 seconds if no icon is pressed.

Auxiliary power sockets

As standard, the cabinet is equipped with 2 auxiliary power outlet sockets for connection of ancillary equipment/apparatus.
The sockets are fuse protected and rated at 5A (1000w) each– **DO NOT EXCEED THE STATED LOAD.**

The socket outlets are switched by pressing the corresponding icon on the home screen (**8/9**).
Once activated, the relevant icon is illuminated with a red border to indicate it is switched on.
By default the sockets are left on whilst the cabinet is in standby mode. They can be set so they automatically turn off when the cabinet goes into standby mode – this option is set in the *"Supervisor settings"* page (See section 4)

Cleaning and disinfection

Surface cleaning and disinfection

Cleaning should be carried out with a non-corrosive disinfectant solution. The worksurface may be removed if required.

Glass front cleaning and disinfection

WARNING: DO NOT ATTEMPT TO OPEN THE FRONT COVER WITHOUT EITHER FULLY RAISING OR CLOSING THE SLIDING SASH – POTENTIAL GLASS BREAKAGE MAY OCCUR IF THIS INSTRUCTION IS NOT FOLLOWED.

With the sash fully raised (see sash operation section) open the front panel, the entire internal surface of the sash may be cleaned.
With the sash fully closed (see sash operation section), the front panel can be raised to allow for cleaning of the front surface of the sash.

UV Sterilisation

The cabinet is equipped with an ultraviolet germicidal lamp for sterilisation purposes.

The feature is accessed by pressing the corresponding icon on the home screen (**6**).
This will access the *"UV Sterilisation"* screen.
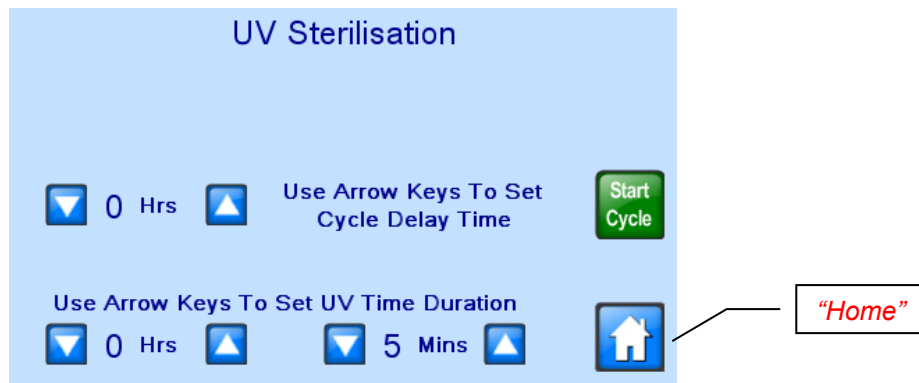
Follow the on-screen prompts to set cycle duration and delayed start time.

Pressing *"Start cycle"* will close the sash, turn the fans off and start the UV cycle or put the cabinet into standby if a delay time has been set.

Note - You can select the *"Home"* **icon at any time to abort the setup screen and return to the Home screen.**

This section should be read in conjunction with annex J of BS12469:2000 to gain full understanding of recommendations for decontamination, cleaning and fumigation of Microbiological Safety Cabinets and filters.

Decontamination with Formaldehyde – introduction

Monmouth Scientific can supply a suitable Formalin vaporiser and neutraliser for use with the cabinet. The vaporiser simply plugs into the electric socket inside the cabinet and the entire disinfection process runs under the control of the cabinet.

PLEASE THOROUGHLY READ THE VAPORISER MANUAL PROVIDED BEFORE RUNNING A DECONTAMINATION CYCLE.

Preparation prior to decontamination

- Place the vaporiser inside the cabinet and prepare it in accordance with the user manual.
- Plug the unit into the lower electric socket outlet of the cabinet.
  Ensure socket is turned off before plugging the unit in.
- From the Home screen, press "Menu" icon and select "Form"
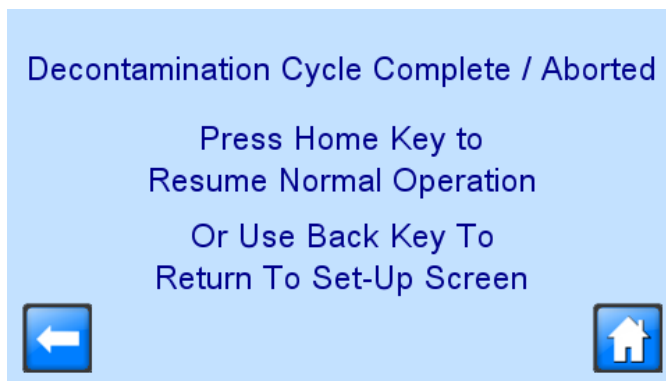- Follow the on-screen instructions:
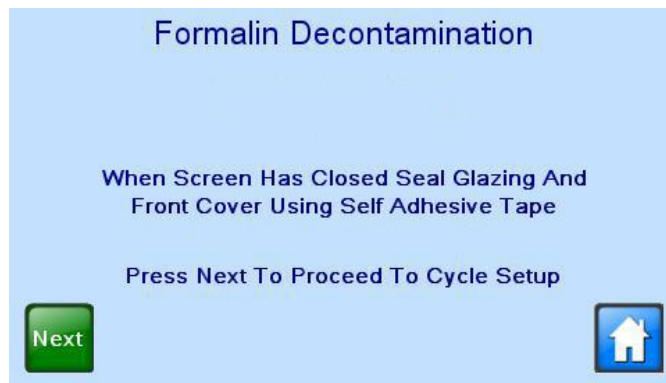
- Seal glazing and front cover surrounds with suitable self-adhesive tape.
- Fit the supplied outlet cover plate to seal the cabinet outlet. It is also recommended that this cover is sealed with suitable self-adhesive tape to provide a secondary seal.
- Press *"Next"* to proceed to the next page to setup cycle time parameters.

Formalin Decontamination

▼ 0 Hrs ▲   **Use Arrow Keys To Set Cycle Delay Time**

▼ 1 Hrs ▲   **Use Arrow Keys To Set Total Cycle Duration**   🏠

- Select cycle time/duration accordance with vaporiser manufacturer's instructions.
- During the course of the cycle, the fans will occasionally run to aid circulation of the vapour.

At the end of the cycle, follow the instructions displayed on screen:

Decontamination Cycle Complete / Aborted

Press Home Key to
Resume Normal Operation

Or Use Back Key To
Return To Set-Up Screen

←   🏠

Decontamination with Formaldehyde – Optional carbon exhaust filter kit (CEF)

This is a factory order option that consists of a carbon filter and quick-release mounting kit that fits to the top of the cabinet. This can be used whenever the decontamination cycle is run and allows for the safe and effective removal of residual formaldehyde fumes following the cycle.

Due to the specific grade of activated Carbon this option is only suitable for use with Formaldehyde.

The setup sequence is similar to a non-filtered cabinet but with additional instructions displayed at the appropriate time.

Preparation prior to decontamination

- Place the vaporiser inside the cabinet and prepare it in accordance with the user manual.
- Plug the unit into the lower electric socket outlet of the cabinet.
  Ensure socket is turned off before plugging the unit in.
- From the Home screen, press "Menu" icon and select "Form"
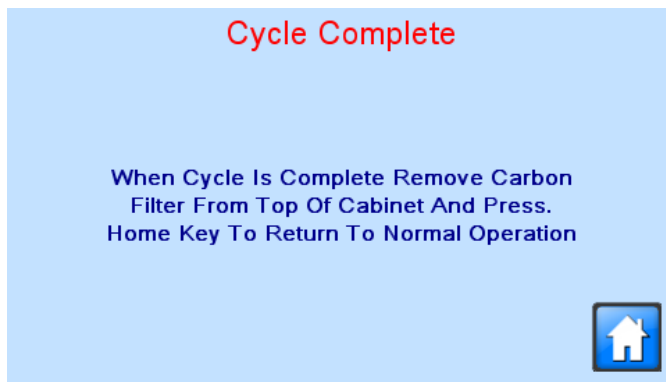- Follow the on-screen instructions:
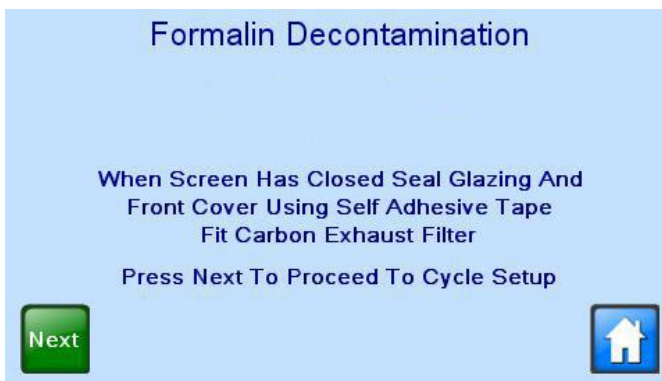
- Seal glazing and front cover surrounds with suitable self-adhesive tape.
- Fit the Carbon filter and retaining frame to the top of the cabinet outlet. Lock into place with the spring catches.
- Press *"Next"* to proceed to the next page to setup cycle time parameters.

Formalin Decontamination

▼ 5 Mins ▲   Use Arrow Keys To Set
Formalin Purge Time

▼ 0 Hrs ▲   Use Arrow Keys To Set
Cycle Delay Time

▼ 1 Hrs ▲   Use Arrow Keys To Set
Total Cycle Duration

- Select duration for post cycle purge.
- Select cycle delay time /cycle duration accordance with vaporiser manufacturer's instructions.
- During the course of the cycle, the fans will occasionally run to aid circulation of the vapour.

At the end of the cycle, follow the instructions displayed on screen:

Cycle Complete

When Cycle Is Complete Remove Carbon
Filter From Top Of Cabinet And Press.
Home Key To Return To Normal Operation

Decontamination with VHP (Vaporised Hydrogen Peroxide)

The cabinet is suitable for VHP decontamination.
Connection ports used with apparatus, 2 on the side glazing and 1 on the exhaust cover plate.

REFER TO MANUAL PROVIDED WITH YOUR VHP EQUIPMENT BEFORE RUNNING A DISINFECTION CYCLE.

Preparation prior to decontamination
- The cabinet is provided with a cover plate to seal the cabinet outlet, the cover is also equipped with a VHP connection port. It is recommended that this cover is sealed with suitable self-adhesive tape to provide a secondary seal.
- Close the sash by putting the cabinet into standby and seal the sash and cabinet with suitable self-adhesive tape.
- Remove tape prior to restarting the cabinet.

SECTION 4

Supervisor settings

This passcode protected menu page allows supervisors to set cabinet and cycle specific preferences that regular users cannot access or change.

It is accessed from the home screen by selecting *"Menu"* then the *"Settings"* icon.
This opens the password protected access screen
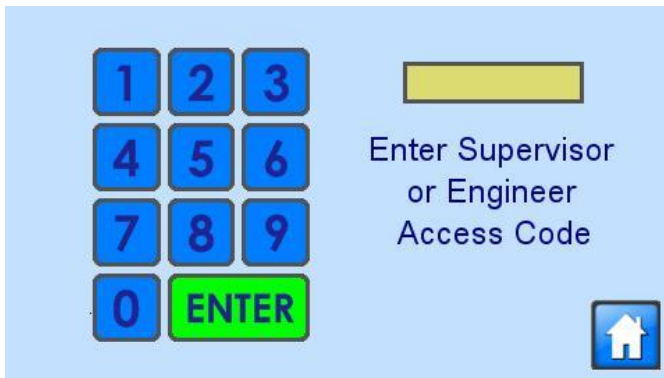
Enter the passcode to access the supervisor settings screen.

Check or uncheck the options as required and select the *"Return"* icon to save and return to the password screen. Select the *"Home"* icon to return to the Home screen.

Other options on this screen allow the supervisor to set the date and time and reset the UV tube hours (when tube is replaced – see section 5 – "Calibration and maintenance" for details).

Set Time

Allows the Supervisor to set the time and day.

Reset UV

Allows the Supervisor to reset the UV hours following a new UV tube fitment.

Are You Sure You Want To
Reset UV Tube Hours?

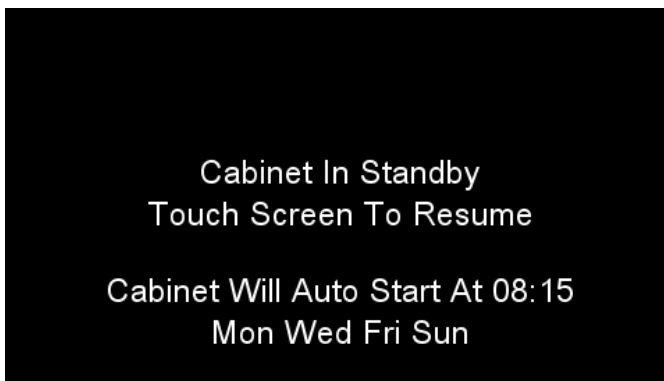YES   NO

Auto Start settings

This feature allows the Supervisor to set time and day for the cabinet to start up automatically with no user being present. This can be used to allow the cabinet to "purge" and establish a clean environment prior to use.

To set up this feature select the check box "*Auto start*" in the supervisor settings page then press the "*Auto start settings*" icon and select the required date/time.

Once the day and time are selected, press the back icon to return.
The cabinet can now be put into standby. The following screen will be displayed in place of the regular standby screen.

When the displayed day/time is reached, the cabinet will start automatically.

The selected day/time is stored in memory and will repeat until they are changed or deselected in the "*Supervisor settings*" page

Auto Standby settings

This feature allows the supervisor to set a time and day for the cabinet to automatically close the sash and go into standby at a pre-defined time with no user being present.

To set up this feature select the check box "*Auto standby*" in the supervisor settings page then press the "*Auto standby settings*" icon and select the required date/time.

Once the day and time are selected, press the back icon to return to normal operation.

When the pre-defined day/time is reached, the cabinet will automatically close the sash and enter standby mode.

The selected day/time is stored in memory and will repeat at the same time until they are changed or the feature is deselected in the "*Supervisor settings*" page.

SECTION 5

Calibration and maintenance

Note – Calibration procedures should only be carried out by suitably qualified persons and will require the use of specialised test apparatus in accordance with BS EN 12469:2000.

Please contact Monmouth Scientific on 01278 458090 for details of our maintenance and service contract options.

In order to maintain the 5 year warranty it is imperative the cabinet is serviced and calibrated by Monmouth Scientific ltd or their nominated agents.

Maintenance

NOTE - IT IS STRONGLY ADVISED TO FULLY DECONTAMINATE THE CABINET PRIOR TO MAINTENANCE PROCEDURES BEING CARRIED OUT.

Information screen

Pressing the *"Info"* icon on the main screen will display the information screen below.
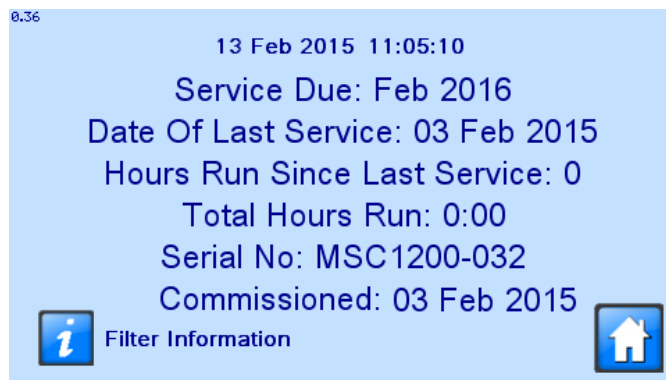
Service information is reset by a Monmouth engineer during a service visit. When a service becomes due a warning screen will be displayed momentarily on start-up during the preceding month.

Pressing the *"Info"* icon will display the screen below providing information on the filters fitted and UV tube life. The *"Return"* icon will return to the previous screen.

Replacing the UV tube

- Remove all equipment and apparatus from the cabinet.
- Fully raise the sliding sash and open the front cover (Section 3).
- Turn cabinet off at the main power switch – NOT STANDBY VIA THE SCREEN and disconnect from power supply.
- Change the UV tube – Always replace with the same type.
- Carefully lower the front cover and restart the cabinet.
- Go to the "Supervisor settings" page to reset the "Hours run" (Section 4).

Replacing the main HEPA filter

- Remove all equipment and apparatus from the cabinet.
- Fully raise the sliding sash and open the front cover (Section 3).
- Turn cabinet off at the main power switch – NOT STANDBY VIA THE SCREEN and disconnect from power supply.
- Remove the screws and lift away the filter cover panel.
- Remove the screws and the filter clamp brackets (x4).
- Lift up the HEPA plenum and secure with the hanging bracket/hook.
- Remove the HEPA and bag for disposal in accordance with local safety procedures.
- Always replace with the same type.
- Release hanging bracket/hook and lower plenum.
- Refit clamp brackets ensuring even pressure is applied along filter seal face.
- Refit filter cover panel and reseal edges.
- Carefully lower the front cover and restart the cabinet.
- Replacement filter should be DOP tested to confirm filter integrity and performance.

Replacing the outlet HEPA filter

- Put the cabinet into standby and turn the cabinet off at the main power switch and disconnect from power supply.
- Remove the screws and lift away the filter retaining frame (unplug the airflow sensor as frame is lifted away).
- Remove the HEPA and bag for disposal in accordance with local safety procedures.
- Always replace with the same type.
- Connect airflow sensor, refit filter retaining frame and reseal edges.
- Restart cabinet
- Replacement filter should be DOP tested to confirm filter integrity and performance.

Replacing the outlet safety HEPA filter

- Put the cabinet into standby and turn the cabinet off at the main power switch and disconnect from power supply.
- Remove the screws and lift away the filter retaining frame.
- Remove the HEPA and bag for disposal in accordance with local safety procedures.
- Always replace with the same type.
- Refit filter retaining frame and reseal edges.
- Restart cabinet
- Replacement filter should be DOP tested to confirm filter integrity and performance.

Spares and consumables

PART	PART NUMBER – MSCT1200	PART NUMBER – MSCT1800
MAIN HEPA FILTER	K-HF0153	K-HF0164
OUTLET FILTER	K-HF0151	K-HF0165
OUTLET SAFETY FILTER	K-HF0155	K-HF0166
CARBON EXHAUST FILTER (FORM DECONTAMINATION CYCLE FILTER)	K-CF0260	TBC
UV LAMP	GS-00432	GS-01001

Other spare parts are available – please contact Monmouth Scientific for details.

Servicing

In accordance to BSEN12469:2000 ANNEX "K", an annual service is recommended to maintain optimum operating conditions and will include the following points

- DOP test the HEPA filters.
- Check airflow and re-calibrate if necessary.
- Check and record Downflow velocity readings.
- Perform KI discus test.
- Check general condition of cabinet - glazing, hinges etc.
- Inspect electrical components, lighting, cables etc.
- Issue test report and airflow certificate.

For parts or service information:
**Please contact Monmouth Scientific on: +44 (0) 1278 458090**

SECTION 6

Service settings and calibration

This password protected menu page allows engineers and suitably qualified persons to calibrate system settings following service and maintenance procedures.

It is accessed by selecting "*Menu*" then the "*Settings*" icon. This opens the password protected access screen.
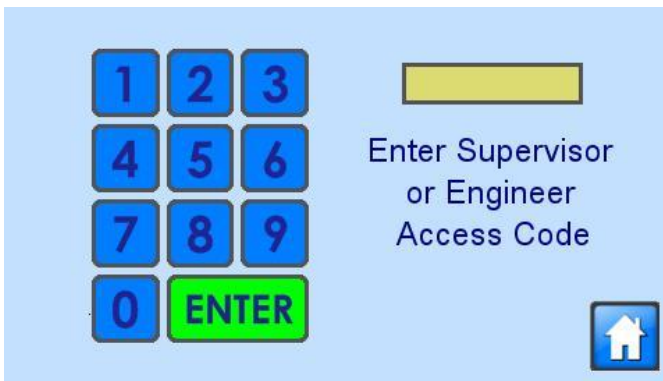
Enter the passcode to access the "Service settings" page.
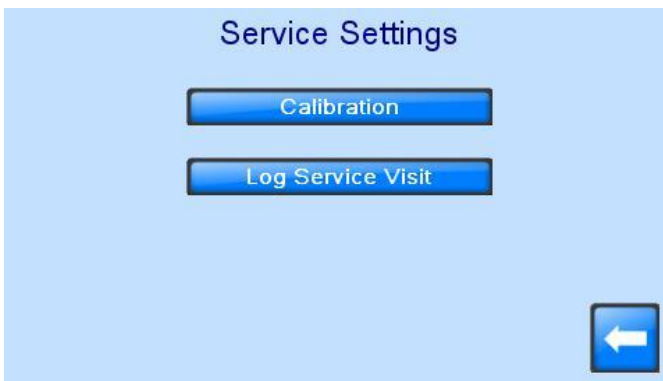
Select the "*Calibration*" icon to open the calibration page.

Four options are displayed to carry out the following procedures:

Set Fan Speeds

This enables the system airflow sensors to be set.

From the "Calibration" screen, select "Set fan speeds"

Follow the on-screen commands to carry out this function.

Airflow Sensors

This enables the system airflow sensors to be calibrated.

From the "Calibration" screen, select "Airflow sensors"

Follow the on-screen commands to carry out this function.

Sash Limits Setup

This enables the location of the sash working height to be calibrated.

From the "Calibration" screen, select "Sash limits setup"

Follow the on-screen commands to carry out this function.

Screen Calibration

This enables the location and touch accuracy of the touchscreen to be calibrated.

From the "Calibration" screen, select "Screen calibration"

Follow the on-screen commands to carry out this function.

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