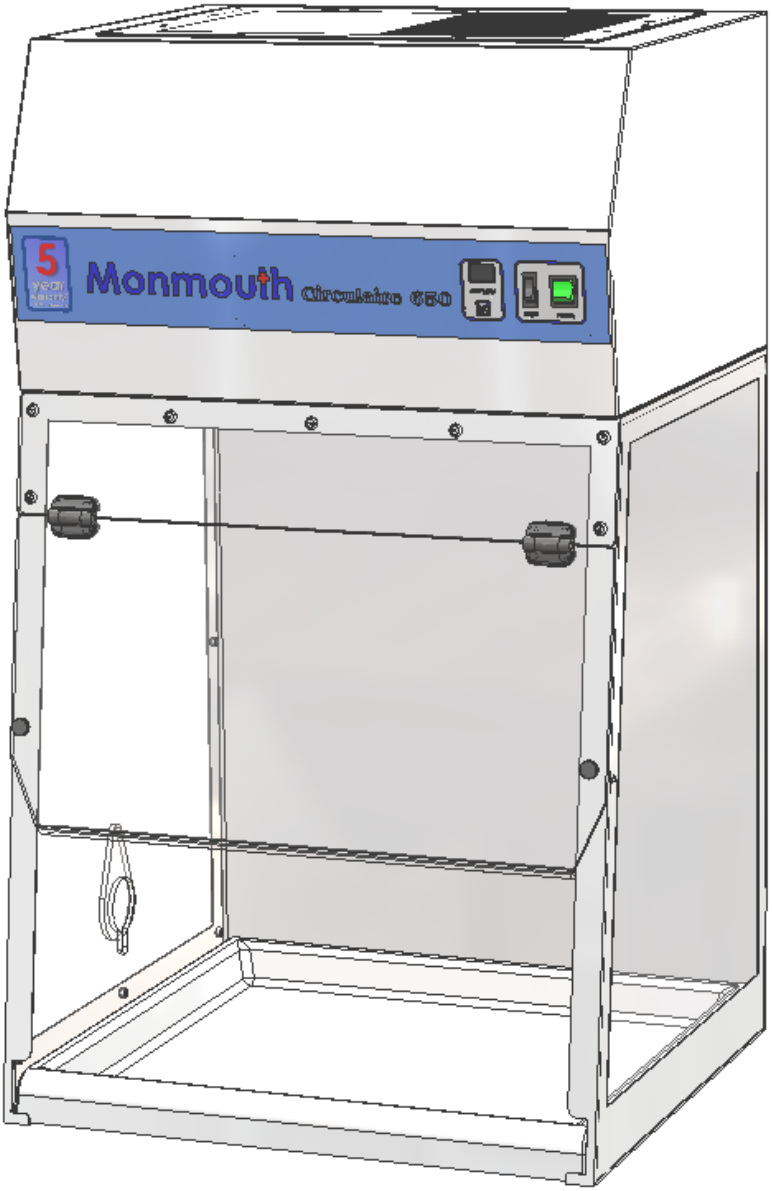
Monmouth

Circulaire

C550, C650 AND C900 FILTRATION FUME CABINET

OPERATING AND MAINTENANCE MANUAL



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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

The Circulaire range of filtration fume cabinets have been designed to provide operator and environmental protection.

The cabinet provides an inflow air velocity of >0.5m/sec through the working aperture to provide operator protection.

The standard C550, C650 and C900 units have a two-stage filter system.
The contaminated air is passed through an electro-statically charged pre-filter to remove coarse particulate, then through a deep bed activated carbon main filter to remove chemical contaminates. The clean air is re-circulated back to the laboratory.

When installed correctly the cabinet complies fully with international standards including BS7989: 2001 for filtration fume cupboards.

	Circulaire 550	Circulaire 650	Circulaire 900
External Dimensions	550mm Wide 600mm Deep 1120mm High	650mm Wide 600mm Deep 1120mm High	900mm Wide 600mm Deep 1120mm High
Internal Dimensions	530mm Wide 550mm Deep 740mm High	630mm Wide 550mm Deep 740mm High	880mm Wide 550mm Deep 740mm High

The cabinet must be positioned and used on a bench.
An optional stand or under-cupboard and GRP spillage tray can be supplied.

The cabinet may be fitted with Activated Carbon filters suitable for use with a wide range of pollutants including hydrocarbons. Activated carbon can be impregnated with chemicals to neutralise many types of contaminants.
See the section on Filter Selection for further information.

For use with particulates, a 99.997% eff. @ 0.3 micron particle size HEPA main filter should be fitted. Please contact Monmouth Scientific for further information.

SECTION 2

INSTALLATION

- The cabinet should be sited in a draught free position
- The cabinet is re-circulating and requires no connection to ductwork
- The cabinet is supplied with the main filter fitted.
- Check the pre-filter is in place by rotating the small plastic catches located inside the fume enclosure, which will allow the pre-filter retaining grille to be lowered.
- Connect the cabinet to a 13A outlet socket.

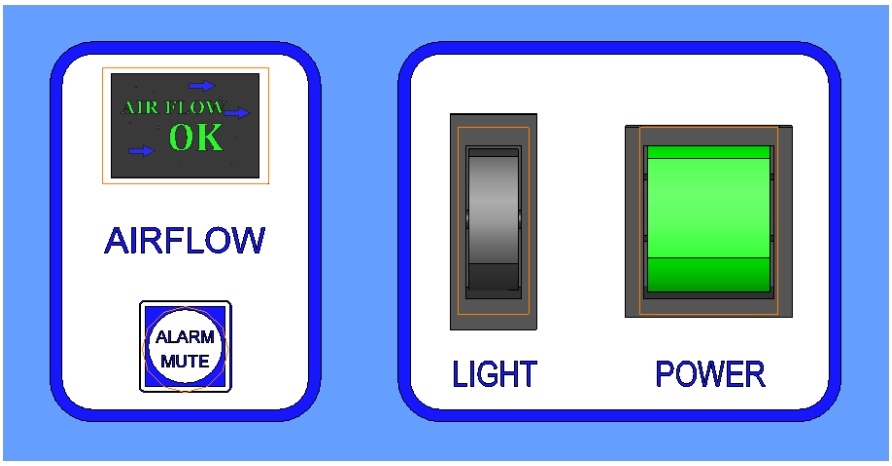
TESTING / COMMISSIONING

An airflow test certificate will be supplied for conformity to CE marking, and electrical test.

THE CABINET MUST BE TESTED EVERY 14 MONTHS TO COMPLY WITH C.O.S.H.H REGULATIONS.

OPERATION

The cabinet is started using the illuminated rocker switch on the control panel. The inflow air velocity at the working aperture is continuously monitored by an airflow monitoring system. If the airflow drops below a safe level, there will be an audible alarm and the LCD screen on the control panel will flash red.



CONTROL PANEL
With Airflow Monitoring

For models fitted with an optional carbon filter condition monitor, the exhaust air is also continuously monitored.
An audible and visual alarm will be provided if filter breakthrough is detected.

CONTROL PANEL
With Airflow Monitoring and Filter Condition Monitoring

SECTION 3

FILTERS

Filters concentrate dust, pollutants etc
Care must be taken when changing filters.

IMPORTANT: Personal Protective Equipment must be worn when changing filters including gloves and particulate facemask.

PRE-FILTER – CHANGING

This may be carried out with the cabinet running to provide additional protection to the operator.

- Rotate the small plastic catches inside the fume enclosure, which will allow the pre-filter retaining grille to be lowered giving access to the pre-filter.

MAIN CARBON FILTER – CHANGING

Check filters to be fitted are the correct grade for intended use.
Contact Monmouth Scientific for information if required.

- The cabinet should be turned off whilst changing the main carbon filter and the mains cable un-plugged.
- Remove the pre-filter (see pre-filter changing procedure above).
- Disconnect the airflow sensor plug from the back of the cabinet.
- From inside the fume enclosure, remove the four M5 nuts securing the fan / filter module.
- Lift the fan / filter module off the fume enclosure to expose the carbon filter.
- Remove the filter and seal in a marked bag for disposal.
- Fit the new filter checking the seals for integrity.
- Re-assemble the cabinet.

MAIN HEPA FILTER – CHANGING

- Carry out safety hazard assessment for safe changing.
- Follow the procedure for changing carbon filters taking extra care with operator protection. (A dropped filter can release particulate).
- Dispose of filter as hazardous waste.

FILTER SELECTION

It is most important that filters fitted are correct for the particular application.

A guide to filter selection is as follows:

Particulates – HEPA filters.
Monmouth Circulaire HEPA filters are 99.997% efficient for particulates greater than 0.3 microns. Typical applications – Asbestos / powders

Gaseous fumes – Activated Carbon filters.
Standard activated carbon is suitable for a wide range of pollutants including hydrocarbons. Activated carbon can be impregnated with various chemicals to produce a range of filter types capable of neutralizing other contaminants. Monmouth Circulaire Carbon Filters are available in the variant types listed below, which offer improved efficiency and extended filter life.

Filter Type	Application	Typical Chemicals
AC (Activated Carbon)	Hydrocarbons	Alcohols, Hydrocarbons, General use
ACID	Acid gasses	So_2, HCL, H_2So_4
FORM	Aldehydes	Formalin Glutaraldehyde
SUL	Sulphur compounds	H_2S, mercaptans
AMM	Ammonia	NH_3, NH_4
ETHER	Ethers	
SCHOOLS	Educational, Animal odours	SO_2, H_2SO_4, BR_2, H_2S, NH_3, CCL_4, hydrocarbons

- All types of activated carbon have general use capability for hydrocarbons.
- Other types are available for applications not listed above.

Filters can be manufactured in layers suitable for more than one application.

To determine correct filter type please contact Monmouth Scientific with details of your application, volumes, concentrations and temperatures etc.

MAXIMISING FILTER LIFE

- Handle minimum volumes of chemicals
- Minimise surface area of exposed chemicals to reduce evaporation rates
- Cover containers as far as practical
- Do not boil off large volumes of chemicals
- Minimise use of heat
- Acids should be at room temperature and covered as far as practical

CARBON FILTER EFFICIENCIES

Typical filter efficiencies are >99% and this efficiency is maintained for most of the filter life.

Filters should be changed when efficiency has reduced to below 90%.

ABSORPTION CAPACITIES

Monmouth Circulaire cabinets are fitted with very large capacity filters, with a typical value of >30% for hydrocarbons.
The cabinet main filter has the following nominal absorption capacities:

Model	Carbon Weight	Hydrocarbon capacity at 30% absorption
Circulaire C550	1 X 12Kg	3.6kg
Circulaire C650	1 X 14Kg	4.2kg
Circulaire C900	1 X 16Kg	4.9kg

The given weight is approximate to standard activated carbon.
Impregnated carbons have higher densities and will increase filter weight.

Contact Monmouth Scientific for absorption capacities for different applications.

SECTION 4

MAINTENANCE

The cabinet should be isolated from the electricity supply before carrying out any maintenance procedures.

FUSES

The two Type T main fuses are located in the mains inlet socket on the top of the cabinet. To access these, remove the mains lead and pull the tap using a small screwdriver.

Always replace fuses with the correct type and rating.

LIGHTING

Remove the securing screws and open the front panel to gain access to the fluorescent tube. The starter is located on the underside of the fitting.

CALIBRATION OF THE LOW AIRFLOW ALARM

This requires the use of a calibrated Ø100mm rotating vane anemometer and should be carried out by a trained service engineer.

1) Place the head of the anemometer in the centre of the aperture supported by a laboratory stand.
2) Remove the black plastic hole plug from the left hand side of the fan module to gain access to the speed controller and reduce the fan speed to achieve a face velocity of 0.35m/sec by rotating the potentiometer.
3) Turn off the cabinet and restart whilst pressing the  key.

4) Yellow colour “SET LOW AIR SPEED AND PRESS MUTE” message will display showing the alarm is in calibration mode. When the airflow has stabilised to around 0.35m/sec. Press the  key to store the set point.

5) Reset the fan speed to achieve a face velocity of 0.55m/sec.
6) Check operation of the low airflow alarm by raising the lower glazing panel. The alarm should sound when the panel is raised and stop when the panel is lowered.

CALIBRATION OF OPTIONAL FILTER CONDITION ALARM

New carbon filters must be fitted before calibrating the alarm.

1) Whilst pressing and holding the ‘Mute’ button, turn on the cabinet. When an audio beep is heard release the button.
2) The red and green indicators will flash alternately showing that the alarm is in calibration mode.
3) Leave the cabinet running for 15 minutes to allow the sensor to stabilise.
4) Press the ‘Mute’ button once. The indicators will stop flashing with the green remaining on.
5) The filter condition alarm is now calibrated.

SECTION 5

SERVICING

An annual service is recommended and testing is mandatory under C.O.S.H.H regulations and will include the following points:

- Check / replace pre-filter
- Check and record face velocity readings
- Check airflow monitor and re-calibrate if necessary
- Check condition of 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

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