

Monmouth
Circulaire

MOBILE FILTRATION FUME CABINET

OPERATING AND MAINTENANCE MANUAL



Monmouth
Scientific

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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 MFC range of fume cabinets are designed to provide operator and environmental protection. The cabinet provides an inflow of air (min>0.3m/sec) through the working aperture to provide operator protection. The contaminated air is then passed through electrostatically charged pre-filters to remove particulate and then through Activated Carbon main filters to remove chemical fumes before exhausting the air back to the laboratory.

A range of options are available, these include 2 types of filter monitoring, onboard services of Gas, Water/drainage and a light module. A quick release, wall mounted services pod is also available to allow fast and convenient connection and redeployment to multiple locations.

When installed correctly the cabinet complies fully with international standards including Building Bulletin 88 for filtration fume cupboards in schools. The cabinet has also been successfully tested by CLEAPPS and a report is available on request.

| | <i>Circulaire</i> MFC1000 |
|---------------------|---|
| External Dimensions | 1000 mm Wide 700 mm Deep 1750 mm High (1840mm when light module fitted) |
| Internal Dimensions | 985 mm Wide 500 mm Deep 840 mm High |

SECTION 2

INSTALLATION

- The cabinet should be sited in a draught free position
- The cabinet is recirculating and therefore requires no connection to ductwork
- Open the front cover using the key provided and check that the main Carbon Filters are in place and the white pre-filters are in position on top of the main filters.
- Close and lock the cover, then connect the cabinet to a 13A outlet socket
- Where fitted, connect the services hoses to the relevant point on the wall-mounted service pod.

TESTING / COMMISSIONING

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

The airflow should be checked using a vane anemometer and the results recorded. The operation of the low airflow alarm and filter condition alarm (if fitted) should also be checked, see section 5.

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

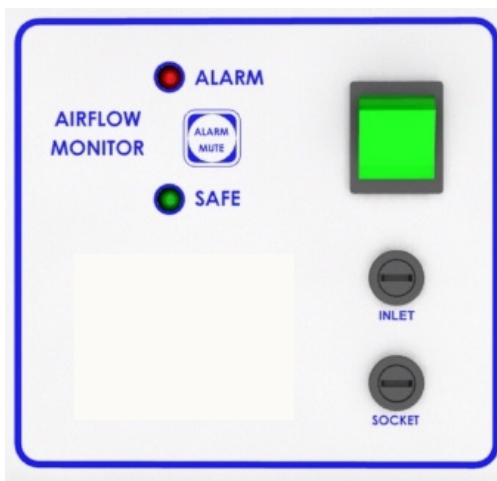
SECTION 3

OPERATION

The cabinet is available with two types of electronic monitoring system:

- Type 1.** Providing airflow monitoring. Gives visual and audible warning of airflow status.
- Type 2.** Providing both airflow and main filter condition monitoring. Gives visual and audible warning of airflow status and also carbon filter condition.

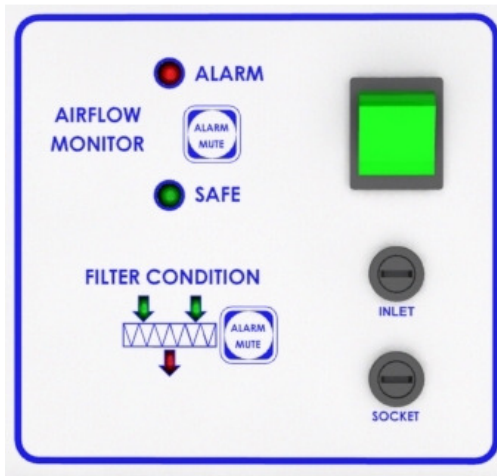
MONITORING SYSTEM (Type 1)



The cabinet is started by the illuminated rocker switch on the control panel. When the fan reaches normal operating speed the 'SAFE' warning light will come on and the cabinet is ready for use. If the 'ALARM' indicator lights and the alarm beeper sounds, the airflow has reduced to below a safe working limit ($<0.3\text{m/sec}$), pre-filters may require changing (See section 4 for details of filter changing).

Note: If an alarm sounds, first check the front hinged lower sash is closed as opening will cause the alarm to operate.

MONITORING SYSTEM (Type 2)



The cabinet is started by the illuminated rocker switch on the control panel. When the fan reaches normal operating speed the green 'SAFE' warning light will indicate that the cabinet is ready for use. If the red 'ALARM' indicator flashes and the alarm beeper sounds, the pre-filters may require changing (See section 4 for details).

After 5 mins (to allow for system stabilisation), the filter condition alarm becomes active and the 2 green arrows above the filter diagram indicate the filter is in a satisfactory condition. If the red arrow is flashing and the alarm beeper sounds then the main filter may require changing due to reaching full saturation. (see section 4 for details of filter changing).

Note: If an alarm sounds, first check the front hinged lower sash is closed as opening will cause the alarm to operate.

SECTION 4

FILTERS

Filters contain concentrated levels of dust, pollutants etc. Care must be taken when changing filters.

IMPORTANT: Personal Protective Equipment must be worn when changing filters. It should also be noted that each filter weighs at least 14kg.

PRE-FILTERS - CHANGING

- Open the front cover using the key provided.
- Lift off the white electrostatic pre-filters from the top of the main carbon filters. Pre-filters should be sealed in a bag and clearly marked for disposal

MAIN CARBON FILTERS – CHANGING

- Open the front panel with the key provided
- Remove the pre-filters as described above
- Lift and slide out the main filters (Carbon filters should be sealed in a bag and clearly marked for disposal)
- Apply a light amount of silicone grease to the sealing face of the filter gasket prior to refitting
- Refit, taking special care to ensure the filter sits evenly all around and the seal face of the gasket is not damaged

FILTER SELECTION

For use in schools and colleges, a filter with a special blend of activated carbon is fitted which ensures that all chemicals currently used within the GCSE & 'A' Level curricular and beyond are fully contained.

Filters for other applications may also be fitted. Standard activated carbon is suitable for a wide range of pollutants including hydrocarbons. Activated carbon can be impregnated with chemicals to neutralise types of chemicals and there is a list on the following pages to indicate the types available. The given weight is approximate to standard activated carbon. Impregnated carbons have higher densities and will increase filter weight.

It is most important that filters fitted are correct for the particular application. A guide to filter selection is as follows:

| Filter Type | Application | Typical Chemicals |
|------------------------|----------------------------|--|
| SCHOOLS | Educational, Animal odours | SO ₂ , H ₂ SO ₄ , BR ₂ , H ₂ S, NH ₃ , CCL ₄ , hydrocarbons |
| ACTIVATED CARBON – A/C | Hydrocarbons | Alcohols, Hydrocarbons, General use |
| ACID | Acid gasses | So ₂ , HCL, H ₂ So ₄ |
| FORM | Aldehydes | Formalin Glutaraldehyde |
| SUL | Sulphur compounds | H ₂ S, mercaptans |
| AMM | Ammonia | NH ₃ , NH ₄ |
| ETHER | Ethers | |

- All grades of activated carbon have general use capability for hydrocarbons etc.
- Other grades 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 application, volumes, concentrations, 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

Circulaire cabinets have very large filter capacities, with a typical value of >30% for hydrocarbons. The cabinets have the following nominal capacities:

| Model | Carbon Weight | Hydrocarbon capacity at 30% absorption |
|--------------------|----------------------|---|
| Circulaire MFC1000 | 2 X 14Kg | 8.4Kg |

Impregnated filters have different densities and filter capacities. Contact Monmouth Scientific for absorption capacities for different applications.

SECTION 5

MAINTENANCE

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

FUSES

The main fuse is located on the control panel and is marked "INLET" (T8A). An additional fuse protecting the double electric socket is also located on control panel and is marked "SOCKET" (T5A)

Always replace fuses with the correct type and rating.

LIGHTING (optional)

Where fitted, the fluorescent light is fitted to the top-mounted light module. The on/off switch and fuse are both located on the right hand side of the module.

TO CHANGE THE FLUORESCENT TUBE OR STARTER

- Remove the 2 module securing thumbscrews from the inside top of the main cabinet chamber.
- From the rear, the hinged module can now be tilted up and the stay arm used to hold the module open to gain access to the fluorescent tube or starter.

CALIBRATION OF TYPE 1 MONITORING SYSTEM

Airflow monitor

The airflow monitor is factory-calibrated. In the rare event of re-calibration being necessary, this should only be carried out by a trained service engineer.

CALIBRATION OF TYPE 2 MONITORING SYSTEM (optional combined airflow and filter saturation (hydrocarbon) monitor)

Airflow / filter saturation monitor

The airflow and filter saturation monitor are factory-calibrated. In the rare event of re-calibration being necessary, this should only be carried out by a trained service engineer.

SECTION 6

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 operation of filter saturation (hydrocarbon) sensor and re-calibrate if necessary
- Inspect electrical components, lighting, cables etc.
- Issue test report and airflow certificate.

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+44 (0) 1278 458090**

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