

Firefly
Vertical Laminar
Downflow Module

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General Description – 1.1

C.A.S. Vertical Laminar Flow Workstations are designed to provide a localised clean air area, for manipulations that require a particle free or sterile environment.

The unit carcase is manufactured from mild steel with an epoxy coating to give a hard durable finish.

The latest in microprocessor and fan technology is utilised to exceed the performance requirements of the European Standard BSEN 14644 Class 3, 4 or 5 and EC GMP Grade A Class F to BS 5295 Class 100 (Federal Standard 209E)

It should be remembered that CAS Vertical Laminar Flow Workstations direct the air from the work towards the operator. They must therefore not be used for work involving any materials that can produce biological or chemical hazards to the worker. For protection against such hazards Contained Air Solutions Limited produces a range of Microbiological and Pharmaceutical Safety Cabinets.

This user manual has been prepared to give basic operating and maintenance instructions. It is only ever intended to supplement existing in-house procedures and not to replace them. If further advice on the use of this equipment is required, Contained Air Solutions Limited will be pleased to assist where possible.

Quality Assurance – 1.2

Although fully tested before leaving our factory as part of the ISO 9001:2008 Quality Assurance Programme, the specified performance will only be maintained if your VLF Module is sited correctly and regularly serviced. CAS can only accept responsibility for correct functioning of your unit if: -

- The VLF Module is correctly sited in the laboratory to avoid any adverse conditions within the room that may affect the level of protection.
- It has been installed and commissioned by CAS trained personnel or approved CAS agents.
- Extension, modification, relocation, repairs or other maintenance is carried out by CAS personnel or persons authorised by CAS or, in the case of electrical work, by qualified electricians.
- In the case of repair or maintenance, replacement parts supplied by CAS must be used.
- The electrical installation surrounding the unit and to which it is connected comply with the latest IEC regulations.
- The unit is used and maintained in compliance with the instructions contained in this manual.

CE Declaration of Conformity

CAS declares that the equipment supplied conforms to the following CE directives—

2014/35/EU	The Low Voltage Directive and its amending directives
2014/30/EU	The Electromagnetic Compatibility Directive
2006/42/EC	The Machinery Directive and its amending directives

Installation – 1.3

Vertical Laminar Flow Modules are sophisticated items of equipment containing delicate filters which require expertise in their safe handling and installation into laboratories.

Poorly installed units may compromise the protection provided by the module to work being handled.

- Commissioning (**On site optional extra**)

When any unit is installed, it is necessary to carry out a number of commissioning checks in order to ensure it is fully operational and that the performance on site satisfies the current standard BS EN 14644 Class 3, 4 or 5. This includes testing the HEPA filters with a suitable challenge aerosol and a particle count test to assess the cleanliness of the cabinet.

CAS employs a team of fully trained installation and commission engineers to carry out all work necessary. This ensures that all new VLF Modules operate to the desired performance.

- Site Surveys

If you have any queries regarding the siting of your VLF Module we will be only too pleased to arrange a site survey by one of our regionally based technical support staff.

- Periodic Maintenance & Servicing

To maintain VLF Modules at their optimum level of performance and to ensure lifetime operation, regular servicing is necessary. CAS provides a full servicing and maintenance scheme tailored to suit your individual needs. For more information on this please contact our service department on 0161-655-8860.

Technical Data – 1.4

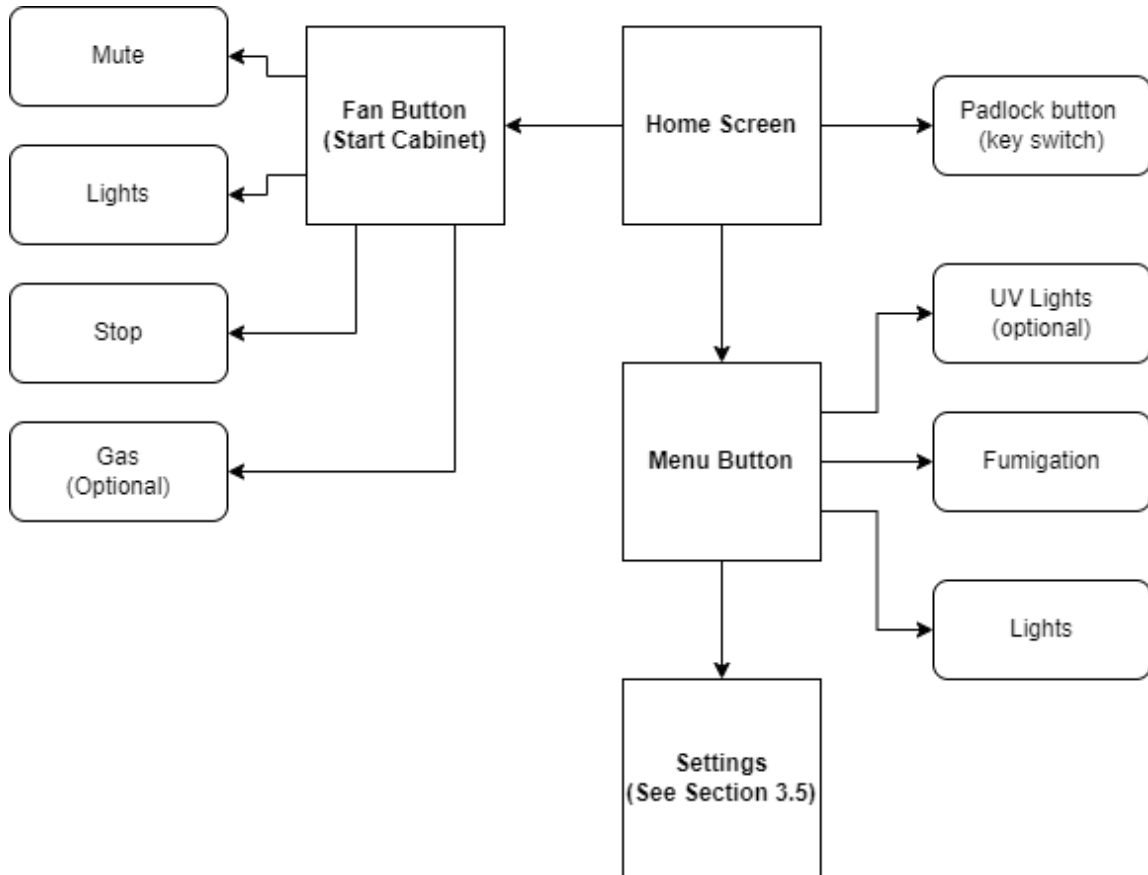
Unit Size		
Dimensions		
External Dimensions	(w/d/h)	649/549/256
Internal Dimensions	(w/d/h)	N/A
Work Tray	(w/d)	N/A
Weight Typical		
	Kg	20
Loading Capacity		
Work Surface	Kg	N/A
Air Velocity Typical		
Air Velocity	m/sec	0.45
Pressure Drop Typical		
Clean Filters	Pa	250
Dirty Filters	Pa	350
HEPA Filter Data		
HEPA Type		H14 (EN1822)
Efficiency	@ 0.3 μ	99.999%
Heat Gains Typical		
Recirc	Watts	500
Noise Typical		
Noise Level	dB (A)	<60
Light Typical		
Interior	Lux	N/A
Electrical Data Typical		
Voltage	Volts AC	230
Frequency	Hz	50
Phase	N/A	Single
Power Consumption	kW	0.70
Current	A	4
Internal Socket		230v /13 Amp

Your Manual – 1.5

This user manual has been prepared to provide a basic operating and maintenance instruction. It is intended to supplement existing in-house procedures and codes of practice, and not to replace them. If further advice is required on the use or maintenance of this equipment, the staff of Contained Air Solutions Ltd. will be pleased to assist wherever possible.

Switches & Indicators – 2.1

The diagram below shows a typical control layout for the HLF / VLF Module.



Start Up Procedure – 2.2

The following notes are for guidance where local laboratory instructions do not exist or are inappropriate. They should complement, not replace, existing codes of practice issued by your Laboratory Safety Officers.

- Ensure power supply to the unit is switched on at the rear, as evidenced by the main display being illuminated.
 - Press the fan icon on the control panel – this will energise the integral fan. The main display will show `AIRFLOW STABILISING` for 60 seconds, once the airflow is settled the display will show a safe 'green' filter status. On start up the audible alarm will sound until airflows are safe; this may be muted using the Alarm Mute icon.
-

Shut Down Procedure – 2.3

- The work area should be cleared of any apparatus / equipment and cleaned in accordance with laboratory codes of practice. The unit should be left running for a few minutes to clear any residual aerosols.
- Switch off the module by pressing the fan icon.

Cleaning Procedure – 2.4

Regular cleaning is very important to prevent the build-up of dirt and hence potentially infectious material. Routine swabbing of work surfaces with 70% v/v IMS (ethanol) or IPA (Isopropyl Alcohol) is recommended.

For cleaning the work surfaces, swabbing with a mild detergent in warm water is very effective. Phenolic or Cresolic disinfectants should be avoided as they may stain the white surfaces with a brownish colour. If they are used, any spillage should be quickly rinsed with clean water and mopped up with an absorbent tissue. Most of the quaternary ammonium compounds and the Glutaraldehyde based surface disinfectants are suitable.

NOTE: The underside of the VLF Module is formed by the HEPA filter. Although protected by a metal mesh, care must be taken not to damage the filter membrane, and splashing it should be avoided if possible. If the protective grille has become soiled it may be cleaned by gently wiping with a damp cloth.



Warning

If Hypochlorites are used to clean the stainless steel of the cabinet they will initially cause rust spots and over time may lead to further damage.

Ultraviolet Radiation (Optional) – 2.5

Ultraviolet Radiation (UV) lamps may be fitted as an optional extra; these can be fitted as new in our factory or retrofitted at a later date on site. If installed the module will have 2 short wavelength Ultraviolet (UV) tubes emitting 254 nano metres fitted inside the work area.

As a safety feature the UV tubes are interlinked with the unit lights to prevent them being used when the VLF Module is in use.

Over time, the effective life of UV tubes is known to reduce; therefore we would recommend UV tubes are replaced on an annual basis to ensure maximum efficiency.

Applications

Many bacteria are quite resistant to UV Radiation, and may require prolonged exposure for sterilisation. Dry and/or protein covered organisms may be protected against UV and may be only slightly affected if at all. However, moist, vegetative cells without too much protein covering are killed with reasonable effectiveness after 3-4 hours exposure.



Warning

Extreme care must be exercised when using UV radiation. Consult your Laboratory Safety Officer prior to use.

UV Radiation can cause burns to unprotected skin and it is very important not to look directly at the illuminated tubes with the naked eye.

Display - 3.1

The VLF Module display is located in the centre of the control membrane; it incorporates backlighting to ensure all signs can be clearly seen from the operating position.

Typical display during normal operation will show a diagram of the system with the filters displayed in green.

In the event of an alarm condition the display will clearly indicate the fault; this will remain displayed until the fault is rectified.

Alarm conditions can be found in ***section 3.2***

Should the VLF Module produce an alarm condition it may be necessary to arrange for a Service Engineer to attend site, in such cases please contact our Service Department on 0161-655-6183.

Alarm Circuits – 3.2

There is only one standard alarm circuit on the Vertical Laminar Flow Module.

1. AIRFLOW

Sensed by an real time hot wire anemometer located beneath the hood and connected via a plugged electrical cable into the main PCB, this will sense low airflow caused by fan failure or filter soiling, and transmit the signal to the display meter on the front panel and alarm circuit. In the event the alarm is triggered the display will show `LOW AIRFLOW`, and the audible alarm will sound, this can be muted using the alarm mute button.

Electrical Protection – 3.3



Warning

Ensure the VLF Module is isolated from the mains supply prior to opening access panels.

Fuses

There is one fuse mounted on the printed circuit board to protect the electrical circuits of the VLF Module. The modules controls are housed internally within the main body chassis access can be gained by removing the two front securing screws and releasing the rear clips. Once released the VLF chassis can be lifted off ensuring the sensor cable is unplugged to prevent damage.

For full details on fuse rating and the circuits it protects please see the wiring diagram attached to this manual.

Fan Speed Control – 3.4

The fan can be adjusted via the engineer's menu please see section 3.5 for more information.

To maintain optimum performance during routine planned maintenance it may be necessary to increase the VLF Module fan speed to overcome filter soiling. This can be adjusted via the front control panel membrane using the Engineer's Menu.



Warning

It is important any changes to fan speed must be made by a CAS service engineer or alternative competent service provider, failure to do this may result in the warranty being invalid.

Engineer's Menu – 3.5



Warning

It is important that any changes within the Engineer's Menu be conducted by a CAS service engineer or alternative competent service provider; failure to do so may result in the warranty being invalid.

To access the engineers' menu the VLF should have power connected and the without the fans running, the CAS home screen should be visible. Select the Menu button and then the settings icon.

A keypad will be displayed input the code **3592** to gain access to the menu

The following can be adjusted via the engineers menu;

- Cabinet configuration & type
 - Fan speeds
 - Airflow alarm parameters
 - UV Output and time configuration
 - Gas solenoid output
 - Time setting
 - Service due timer activated
 - Software revision information
 - Lighting configuration
 - Door safety switch configuration and boost inflow speed control
 - Open thimble exhaust monitoring sensor (Not applicable for enclosures)
 - Additional pressure switch configuration (Not applicable)
 - Fan fail detection (Not applicable for Enclosures)
 - Energy save mode activation (Not applicable for Enclosures)
 - PCB Input confirmation
 - PCB output confirmation
-

HEPA Filter – 4.1

The Downflow HEPA filter are mounted on the underside of the VLF Module. Access can be gained by removing the two front securing screws and releasing the rear clips.

The filter is retained by a screwed clamp. When this is released the used filter can be pulled free and removed. The frame surfaces should be cleaned carefully and any grit particles removed. The new filter gasket should be lightly greased with Dow Corning silicone grease or similar prior to being placed in position. The clamps should be replaced and tightened so as to compress the gaskets by about one third. Care must be exercised not to over-tighten and over compress the gasket. The VLF Chassis can then be replaced after ensuring the gasket is in good condition.

IMPORTANT

VLF Module must be decontaminated prior to changing any HEPA filters, see section 2.6

Only replace or examine filters if authorised to do so by the Safety Officer or the person in charge of the laboratory. To remove any filters wear disposable gloves, an apron, overalls and appropriate face covering, especially eye protection.



Warning

Ensure the unit is isolated from the mains supply prior to opening access panels.

Pre-Filter – 4.2

The pre-filter is located on top of the module and simply drops into place within the retaining frame and can be secured with two screwed tabs. The pre-filter pads should be examined frequently (Once each month) for heavy soiling and replaced on a regular basis to prolong the life of the main HEPA filter.

IMPORTANT

Only replace or examine filters if authorised to do so by the Safety Officer or the person in charge of the laboratory. To remove any filters wear disposable gloves, an apron, overalls and appropriate face covering, especially eye protection.



Warning

Ensure the unit is isolated from the mains supply prior to opening access panels.

Service Schedule 5.1

SERVICE SCHEDULE 5.1 Vertical Laminar Flow Modules

Schedule of work included in service agreement

1	Filter Integrity Test (D.O.P) on all main filter(s) and seals
2	Airflow Profiling ensuring compliance to latest British & European Standards
3	Check and adjust alarm parameters & control functions as required
4	Air cleanliness test within work zone (particle counts)
5	Check and adjust electrical and electronic controls as related to the airflow system
6	Mechanically inspect VLF Module components
7	Change main filters as necessary (Supply and fitting subject to additional charge)
8	Prepare computer generated Service Report

Above work to be carried out twice each service year

Service schedules can be tailored to suit individual needs

**For a competitive Quotation please contact our service
Department on**

0161-655-8860

Spares List 5.2

Shown below are ordering codes for the most common parts used on the Vertical Laminar Flow Modules. In addition to these items we stock a vast range of Spares, consumables and optional extras. If you cannot see what you require please give us a call on the telephone number shown below.

**** Please note serial number must be quoted when ordering ****

UK:

Overseas:

Tel: 0161-655-8860

Tel: +44-161-655-8860

Fax: 0161-655-8865

Fax: +44-161-655-8865

ORDERING CODES

Item	VLF
HEPA Filter	530 x 430 x 66 H14
Pre-Filter	340 x 340 x 25 PP Type
Fan	FAN082
Main PCB	ELC 346
Control Membrane	N/A
Light Tube	N/A
UV Light Tube (Optional)	N/A
Key Switch	N/A