

**AD 500, 1000, 1500**  
FUME EXTRACTION UNITS

OPERATIONAL INSTRUCTIONS

CE

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## SAFETY INSTRUCTIONS

### Symbols used



**Danger** Risk of electric shock, Refers to an immediately impending danger. If the danger is not avoided, it could result in death or severe (crippling) injury. Refer to manual where this symbol is displayed.



**Warning** Refers to a possibly dangerous situation. If it is not avoided, it could result in death or severe injury. Refer to manual where this symbol is displayed.

**Caution** Refers to a possibly harmful situation. If it is not avoided, damage could be caused to the product or to something in its environment.

**Important** Refers to handling tips and other particularly useful information. This does not signify a dangerous or harmful situation.

### Electrical safety

The AD range of extraction units are designed to meet the safety requirements of the Low Voltage Directive 2006/95/EC (previously numbered 73/23/EEC)



**Warning** During works with the pump/motor housing open, live, 230/115 volt components are accessible. Make sure that rules and regulations for work on live components are always observed.

**Important** To reduce the risk of fire, electric shock or injury:

1. Always isolate the system from the mains power supply before removing the pump/motor panel
2. Use only as described in the manual
3. Connect to a properly grounded outlet





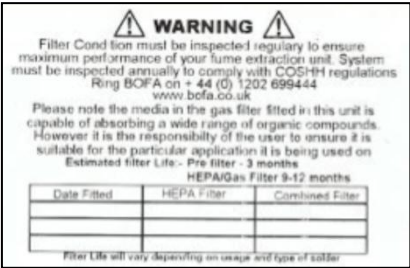
### Dangers to eyes, breathing and skin

Once used, the filters in the AD range of extraction units contain a mixture of particulates, some of which may be sub micron size. When the used filters are moved it may agitate some of this particulate, which could get into the breathing zone and eyes of the operative. Additionally, depending on the materials being lasered, the particulate may be an irritant to the skin.

**Caution: When changing used filters always wear a mask, safety glasses and gloves.**

Please note the media in the gas filter fitted in this unit is capable of adsorbing a wide range of organic compounds. However, it is the responsibility of the user to ensure it is suitable for the particular application it is being used on.

## Warning and Information Labels

Label/Symbol	Position									
 <p><b>WARNING</b> GOGGLES, GLOVES &amp; MASK MUST BE WORN WHEN CHANGING FILTERS</p> <p>Please note the media in the gas filter fitted in this unit is capable of absorbing a wide range of organic compounds. However it is the responsibility of the user to ensure it is suitable for the particular application it is being used on.</p>	<p>Left hand corner of door, to the right of the filter change label.</p>									
 <p><b>Danger</b> Disconnect the mains supply before removing this cover</p>	<p>Pump/motor access panel. Inside door top corner.</p>									
 <p><b>DO NOT COVER</b></p>	<p>Side of unit above louvers.</p>									
 <p><b>ADVANTAGE</b> MODEL AD500 SERIAL No. 01/10/AD500-059 230v 50/60Hz 6.4A</p> <p>WARNING THIS EQUIPMENT MUST BE EARTHED YEAR OF MANUFACTURE 01/2010</p> <p>SUPPLIED WITH THE FOLLOWING FILTERS Pre Filter - A1030058 Micro Filter - A1030059 Gas Filter - A1030061</p> <p>CE</p> <p>BOFA International Ltd Poole, Dorset, UK, BH17 7DX Tel: + 44 (0)1202 699444 www.laserfumeextraction.com</p>	<p>Side of unit, next to cables.</p>									
 <p><b>WARNING</b></p> <p>Filter Condition must be inspected regularly to ensure maximum performance of your fume extraction unit. System must be inspected annually to comply with COSHH regulations. Ring BOFA on + 44 (0) 1202 699444 www.bofa.co.uk</p> <p>Please note the media in the gas filter fitted in this unit is capable of absorbing a wide range of organic compounds. However it is the responsibility of the user to ensure it is suitable for the particular application it is being used on</p> <p>Estimated filter life:- Pre filter - 3 months HEPA/Gas Filter 9-12 months</p> <table border="1" data-bbox="344 1738 687 1809"> <thead> <tr> <th>Date Fitted</th> <th>HEPA Filter</th> <th>Combined Filter</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>Filter Life will vary depending on usage and type of pollutant</p>	Date Fitted	HEPA Filter	Combined Filter							<p>Top left hand corner of door.</p>
Date Fitted	HEPA Filter	Combined Filter								

# INSTALLATION

## Introduction

When a component is laser marked an amount of the surface of the substance is thermally decomposed, “burnt off”. This thermal decomposition comprises a mixture of particulate and gaseous compounds. The heat energy causes the gases and surrounding air to quickly expand moving away from the surface at high velocity entraining any particulate with the gases. This is the fume.

There are two main reasons for capturing the fume:

- 1 Operational – If ignored the fume can settle on the laser optics causing damage to the lens and impairing the quality of the marking.
- 2 Health and Safety – The particulate generated from most materials is sub micron size which is a health hazard if inhaled and some materials give off harmful gases which again operators need protecting from.

The AD range of units are suitable for extracting the fume from laser marking applications, capturing it in the multistage filter system and returning the associated clean air back into the workplace.

## Fume Capture Methods

The fume is normally captured by one of three methods: a flexible arm and nozzle close to the marking point, an enclosure around the marking area, or from the cabinet the laser is housed in.

### Arm and nozzle extraction

For most applications, the product to be marked on a conveyor will move past the stationary laser. The nozzle should be positioned as close as possible to the marking area on the side of the laser the product is moving towards. (See fig. 1)

Hose Kit (see fig. 2)

The stay put arm should be mounted as close as possible to the marking point using the horseshoe clips. Unscrew the push fit connector from the other end of the flexible hose. Cut the flexible hose to suit the distance back to the extractor connection, keeping it as short as practicable, then refit the connector and push onto the extractor inlet.

**Fig. 1**



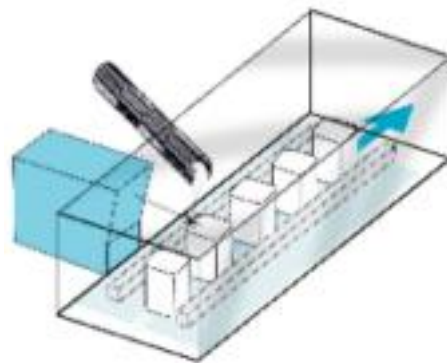
Purge air should be kept to a minimum, where possible, to prevent the fume being blown away from the nozzle

High speed bottling lines may need bigger scoops or nozzles both sides of the bottles because of the turbulence caused by the speed of the bottles

**Fig. 2**



**Fig. 3**



## Enclosures

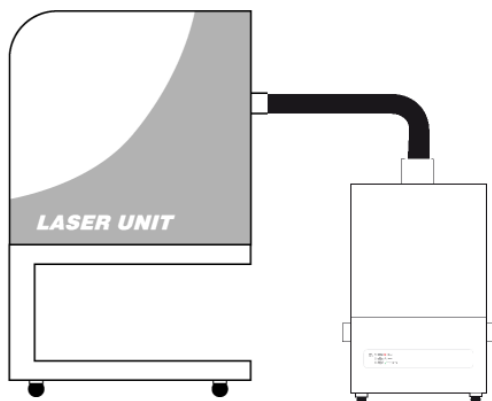
Extraction can be attached to an enclosure around the marking zone provided the extraction point is situated within 50 -75mm of the marking point.  
(See fig. 3)

## Cabinets

(See fig. 4) Cabinets normally have a 75 or 100mm spigot for fume extraction. For best performance use the same diameter hose as the spigot and reduce at extractor if necessary. Keep the hose run as short as possible.

**Extraction units should be sited in a well ventilated room.**

**Fig. 4**

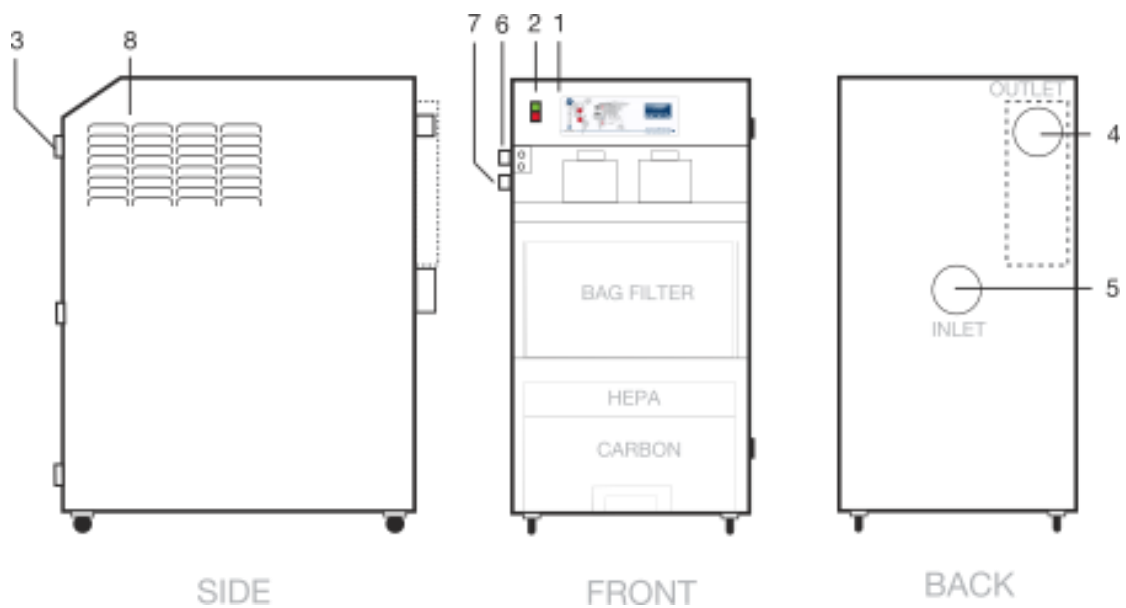


## Extractor Overview

The AD range provides extraction and filtration of the fume generated by laser marking, cutting, etching or engraving. The units are of robust design and feature ease of use with minimal maintenance. The main components are shown in Fig. 5.

**Fig. 5**

1. Unit/Filter Condition Display
2. On/Off Switch
3. Door Hinge
4. Extracted Air Outlet
5. Hose Inlet Connection
6. Signal/Interface Cable to Laser
7. Power Cable
8. Motor Cooling In/Out



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## **Extractor Installation Procedure**

### **Caution**

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Read all instructions in this manual before using this extractor.

1. Move the unit to the location where it is going to be installed and remove the unit from its packaging. The unit should be installed in a well ventilated room.

### **Caution**

Due to the weight involved the extractor unit should only be lifted using suitable lifting equipment and with regard to appropriate safety precautions. (See Appendix for product weight details).

2. Ensure that a 0.5m space is available around any louvered areas of the unit to ensure adequate air flow. Lock the two braked castors, if fitted.

### **Caution**

Do not block or cover the cooling vents on the unit, as this severely restricts airflow and may cause damage to the unit. (This may be located on the base of the unit).

### **Caution**

Under no circumstances should the exhaust outlet/s be covered as this will restrict the airflow and cause overheating.

3. Check filters are located in their correct position and carefully replace lid/close door.
4. Connect the extraction ducting between the extractor inlet and the fume capture device as detailed previously.

## **Optional Feature Considerations**

5. If fitted, the following features need to be considered when installing the unit:



### Important

If the AD unit has an exhaust air outlet spigot fitted, the exhausted air can be routed outside of the building if required. It is important to keep any ducting used to do so to a minimum, in order to reduce back pressure within the system.

**Filter blocked/System failure signal.** With this option the extraction unit will have been fitted with a pressure transducer to monitor the condition of the filters and to indicate the extractor is running. In addition to controlling the LED's on the front of the unit, this signal is available via the green and white cores of the control cable that exits the cabinet next to the power cable. The signal is a "volt free" contact, i.e. a closed circuit will exist between the green and white wires when the filter condition is good and the unit is running. This will change to an open circuit on filter blockage or system failure. This feature should only be used on control voltage circuits. The signal can be connected to the laser or alternatively to operate a beacon, siren or warning device. Open circuit condition of this circuit will not directly stop the extractor motor.

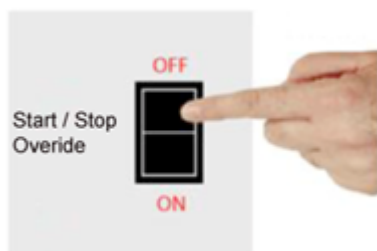
**Remote stop/start.** If this facility is installed it enables the extractor unit to be turned on and off by a signal from the laser. The red and black cores of the control cable need to be connected to a 5-30v dc supply, which when applied will start the unit and when switched off will stop the unit. However the mains power switch must be in the "on" position for the signal to be effective.

**Fig 6**



If fitted, remote operation can be overridden by using the override switch, which is mounted inside the unit (see fig. 7).

**Fig 7**



## Electrical supply connection

6. Check the integrity of the electrical power cable.

Connect the power cable to an isolated electrical supply. The mains socket outlet should be installed near the equipment and be easily accessible. The cable run to the machine should be arranged so as not to create a trip hazard.

### Caution:

Check that the mains input at the isolated supply is the same as the voltage Supply detail on the Serial Number label (**115 or 230v 50/60Hz**) before plugging the extractor unit in.

## General Safety Requirements

The mains socket outlet should be installed near the equipment and be easily accessible.

### Caution

Do not block or cover the base of the unit as this may severely restrict the air flow and could cause damage to the unit.

### Caution

This unit is over 18Kgs in weight and should only be lifted with suitable lifting equipment.

### Caution

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Read all instructions in this manual before using this extractor.



**Warning**

**Mains voltage. Dangerous voltages exist in this equipment.  
Ensure all covers are fitted before operating this equipment.**

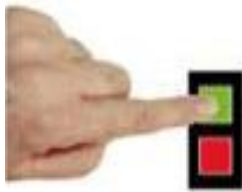
The unit is now ready for use.

## OPERATION

### Manual operation

Stainless steel AD units are turned on by depressing the green button on the front of the extractor and turned off by depressing the red button. (See fig 8.) Powder coated AD units are turned on and off by means of a green, illuminated rocker switch on the front of the unit. (See Fig 9). The AD 1500 units are fitted with an isolator switch. The units are turned on by rotating the switch on the front of the unit. (See Fig 10).

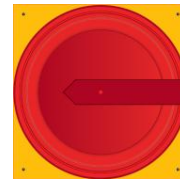
[Fig 8 Stainless Steel Units](#)



[Fig 9 Powder coated Units](#)



[Fig 10 Red Isolator Switch](#)



**Note:** In order to help ensure long term reliability of the fan unit, it is recommended that a 90 second delay period (minimum) is observed between stopping and restarting the extractor to prevent possible damage to electronic components within the fan.

### Filter condition and System failure signal - indicators

The LED's on the front panel (see fig 11 below) indicate the following conditions Filter change procedures are explained in Section 5 'Maintenance'.

[Fig 11](#)

LED'S	SHOWING	INDICATES
	Green Only	Unit is running - Filters are usable
	Green & Amber	Pre or Combined Filter 75% blocked
	Green, Amber & Red	Pre or Combined Filter Blocked and in need of replacing
	Green, Amber & Red flashing	Fault with extractor. This condition may occur for a few seconds on start up
	Red Alarm Light	Only used with optional extra Gas Filter Change LED

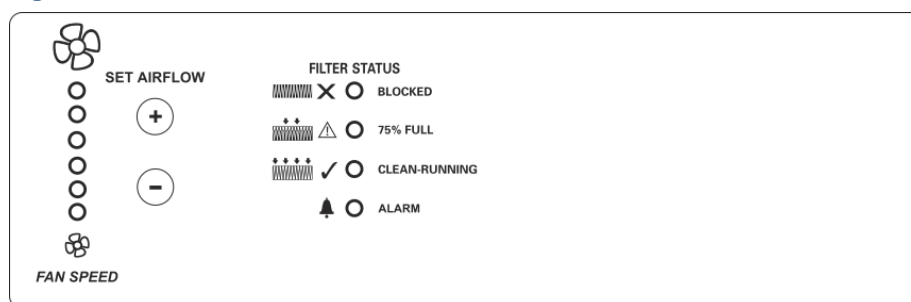
## Closed Loop Auto Flow Control

This unit is fitted with closed loop automatic flow control. This enables you to set the required airflow rate. When filters start to block, the blowers in the extractor will increase in speed compensating for any loss in performance. The extractor must be fully installed, with all pipe work connected before setting the airflow.

### Setting the Airflow

To set the airflow on your extractor, hold down the Up (+) and Down (-) arrows on the front panel for 5 seconds. (See fig 12) The green LED will now start to flash, indicating that the machine is now in set mode. You can now increase or decrease the flow by holding down either the up or down arrow. The flow is indicated by a row of 6 blue LED's on the panel, 6 being full speed and 1 being the lowest. Set the airflow on the lowest of the 6 LED's but still ensure that all of the fume is being removed. This will vary from application to application. Once you have set your speed, leave the controls for 10-20 seconds and the machine will return to operation mode. (This setup procedure should be carried out with all the ductwork connected and (if fitted) the stop/start signal present)

**Fig 12 Auto Flow Panel**



## Optional Features

### Gas Filter Change LED (VOC monitoring)

Units equipped with a VOC sensor detect the level of Volatile Organic Compounds in the exhausted air. If their presence exceeds a preset level the Alarm LED on the front panel will illuminate. This indicates that the gas portion of the combined filter is saturated and the filter needs replacing. (See fig 12). The Maintenance section describes the filter change procedure.

### VOC /HCL Sensors

Stainless steel units equipped with the PVC option contain VOC and HCL sensors which detect the level of Volatile Organic Compound and Hydrogen Chloride in the exhausted air. If their presence exceeds a preset level, the alarm red led on the front of the unit will illuminate as in Fig. 12 above. This indicates that the gas filter is saturated and needs replacing.

**Important - On initial start up the light will illuminate and may stay illuminated for up to 45 minutes while the sensor reaches its operating temperature. The HCL sensor needs replacing after approximately 18months. This will be indicated by the red light staying illuminated even though the filter is known to be serviceable.**

See the maintenance section for details on changing the HCL sensor.

## MAINTENANCE

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### **Maintenance UK**

It is a legal requirement, under regulation 9 of the COSHH regulations, that all local exhaust ventilation systems are visually inspected on a weekly basis, where possible and undergo a thorough inspection and test on an annual basis.

COSHH requires the annual inspection and testing to be carried out by a competent person with specific documentation of the results held in a log book. Bofa can provide this service, our inspectors are BOHS P601 qualified, and copies of the required initial information and forms are included in the Log book supplied with the extractor. Additionally the log book contains a form detailing the weekly inspection requirements and log for recording the results.

### **Maintenance General**

User maintenance is limited to cleaning the unit and replacing the filters with new. Only BOFA International trained maintenance technicians are authorised to carry out component testing and replacement. Unauthorised work or the use of unauthorised replacement filters may result in a potentially dangerous situation and/or damage to the extractor unit, and will invalidate the manufacturer's warranty.

### **Cleaning Unit**

The powder coated finish can be cleaned with a damp cloth and non aggressive detergent. Do not use an abrasive cleaning product as this will damage the finish. Stainless steel units should be cleaned with a proprietary stainless steel cleaner, following the manufacturer's instructions.

The cooling inlets and outlets should be cleaned once a year to prevent build up of dust and overheating of unit.

### **Replacing Filters**

The filter package needs attention when the filter change signal is alarmed and/or the green amber and red LED's on the unit are illuminated or, for units with no filter condition indication, when the unit no longer removes the fume efficiently.

A log of filter changes should be maintained by the user.

All filters are tested to BS3928. A certificate on conformity for each filter is available on request.

It is recommended that a spare set of filters are kept on site to avoid prolonged unit unavailability. Part numbers for replacement filters can be found on the filters fitted in your system. Alternatively, refer to the consumable spares table.

### **Caution**

To prevent overheating, units should not be run with a blocked filter condition, or with dust obstruction of inlets or outlets.

**Caution: When changing used filters always wear mask, safety glasses and gloves.**

### Filter replacement indication

The first few filter changes should only apply to the pre-filter. The indication that the combined filter needs replacing is when the filter alarm signal (if fitted) and LED's do not go off after the pre filter has been changed.

### Pre filter replacement

The pre filter needs changing when the filter change signal is alarmed and/or the green amber and red LED's on the unit are illuminated (if option fitted).

**Fig. 13**

1. Isolate the electrical supply to the extractor.
2. Undo the three catches on the front of the unit and open the door.
3. The pre filter (bag) is the highest of the three filters (see Fig 13). Slide the bag filter cage out of the unit. Remove the bag from the retaining cage by undoing the Velcro straps and removing the 2 locating lugs.
4. Replace with new bag ensuring the straps and lugs are fitted. Slide the filter cage back into position
5. Close the door and fasten the three latches.
6. Reconnect the electrical supply



### HEPA & Gas filter replacement

The indication that the HEPA filter needs replacing is when the filter alarm signal and LED's do not go off after the pre filter has been changed. This applies only to extractors fitted with the filter change indicator option. For units fitted with the VOC or VOC/HCL monitor option, the requirement for a gas filter change is indicated by illumination of the gas filter alarm light on the front panel. Please note that the carbon media within the gas filter is hygroscopic and will absorb moisture from the atmosphere. This is why the gas filter should be changed every twelve months regardless.

1. Isolate the electrical supply to the extractor.
2. Undo the three catches on the front of the unit and open door.
3. The HEPA & Gas filters are the lower of the three filters (see Fig 13).
4. Remove the transit strap from the top of the filters.
5. Slide the filter out of the unit on the easi-glide runners, holding tightly to the handle on the filter.
6. The filters can now be lifted away from the extractor. You can now separate the two filters by unfastening the four clips on the sides of the filter.
7. Replace the HEPA or Gas element as necessary and fasten back together using the clips.
8. Slide the filter assembly back into position on the filter glide runners.
9. Close the door and fasten the three latches.
10. Reconnect the power supply.

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## Changing the HCL sensor

If the unit is equipped with a HCL sensor, it is important to remember that this sensor needs replacing approximately every 18 months. This requirement will be indicated by the red warning light remaining illuminated even though the filters have been changed or are known to be serviceable.

1. Disconnect the unit from the mains supply
2. Undo the three latches on the door. This will expose the filters and the motor housing cover at the top.
3. Remove the bolts holding this cover to expose the motor compartment.
4. At the rear of the compartment there are two PCB's mounted to a metal cradle.
5. The HCL PCB is the higher of the two PCB's.
6. Carefully release the PCB from the cradle.
7. On the underside you will see the pink HCL sensor.
8. Unplug the sensor from the PCB and replace it with a new sensor.
9. Return the PCB to the cradle.
10. Replace the motor compartment cover.
11. Close the door and fasten the three latches.
12. The unit should now be ready for use. Please note that the HCL sensor can take up to 45 minutes to reach operating temperature. The alarm LED will stay illuminated until the sensor reaches its operating temperature.

In addition BOFA offer a service to collect your extractor and replace the HCL sensor. Please contact the supplier of your machine for further information.

### Consumable Spares

<b>Unit</b>	<b>Part Number</b>	<b>Description</b>
AD500/1000/1500	A1030058 A1030059 A1030061 A1030060 A1030062 A1070003	Pre Filter bag HEPA Filter Gas Filter HEPA Filter for PVC Applications Gas Filter for PVC Applications Replacement HCL sensor for PVC Applications

### Maintenance Protocol

Filters to be changed in accordance with instructions. Log the date of filters changed in the table below:

<b><u>Unit Serial Number</u></b>			
<b>Pre Filter</b>		<b>Combined Filter</b>	
<b>Date</b>	<b>Name</b>	<b>Date</b>	<b>Name</b>



## Fuses

The following table gives details of the fuses in this AD range of units:

Unit	Item Protected	Fuse Rating	FLC A	Voltage
AD500	12V Power Pack	1A	<0.1A	100-230V
AD500	Turbine Fan (230V)	Thermal Trip	6.8A	230V
AD500	Turbine Fan (110V)	Thermal Trip	10A	110V
AD1000	12V Power Pack	1A	<0.1A	100-230V
AD1000	Turbine Fan (230V)	Thermal Trip x2	12.8A	230V
AD1000	Turbine Fan (110V)	Thermal Trip x2	20A	110V
AD1500	12V Power Supply	1A	<0.1A	100-230V
AD1500	Turbine Fan (230V)	Thermal Trip x3	23A	230V

## Filter Disposal

Pre and combined filters are manufactured from non-toxic materials. Filters are not re-usable, cleaning used filters is not recommended. Disposal of the used filters depends on the material deposited on them. See the following table:

Deposit	EWC listing*	Comment
Non Hazardous	15 02 03	Can be disposed of as non hazardous waste.
Hazardous	15 02 02 M	The type of Hazard needs to be identified and the associated risks defined. The thresholds for these risks can then be compared with the amount of material in the filters to see if they fall into the hazardous category. If so, the filters will need to be disposed of inline with the local/national regulations.

\* European Waste Catalogue

## TROUBLE SHOOTING

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In the unlikely event of a problem with your AD extractor please contact your local representative.

OR

### **BOFA International LTD**

21-22 Balena Close  
Creekmoor Industrial Estate  
Poole, Dorset BH17 7DX, UK

Tel: +44 (0)1202 699444

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Email: [technical@bofa.co.uk](mailto:technical@bofa.co.uk)

Website: [www.bofa.co.uk](http://www.bofa.co.uk)

OR

### **Bofa Americas, Inc**

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Fax: (866) 707-2632 (BOFA)

Email: [info@bofaamericas.com](mailto:info@bofaamericas.com)

Website: [www.bofaamericas.com](http://www.bofaamericas.com)

## SYSTEM SPECIFICATIONS

### Unit: AD 500

Capacity:	500 m <sup>3</sup> /hr (294 cfm)		
Size:	Height 1220mm x Depth 600mm x Width 770mm (Height 48.03" x Depth 23.62" x Width 30.31")		
Weight:	150Kg (330lb)		
Exhauster:	Turbine Fan		
Output:	1.1Kw (1.1Kw)		
Electrical supply:	230v 1ph 50Hz (115v 1ph 60Hz)		
FLC:	6.8A (10A)		
Noise level:	Below 60dB (A) (At Normal operating speed)		
Filters:	Pre filter	Surface area	2.5 m <sup>2</sup>
		Efficiency F8	85% @ 0.8μ
	Hepa filter	Efficiency H13	99.997% @ 0.3μ
	Gas filter	Activated Carbon	25Kg

### Environmental Operating Range

Temperature	+5°C to +40°C
Humidity	Max 80 % RH up to 31°C To Max 50% RH at 40°C
Altitude	Below 2000m
Pollution Degree	2

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### Unit: AD 1000

Capacity:	1000 m <sup>3</sup> /hr (588 cfm)		
Size:	height 1220mm x depth 600mm x width 770mm (Height 48.03" x Depth 23.62" x Width 30.31")		
Weight:	155Kg (341lb)		
Exhauster:	Turbine Fan		
Output:	2.2Kw (2.2Kw)		
Electrical supply:	230v 1ph 50Hz (115v 1ph 60Hz)		
FLC:	12.8A (20A)		
Noise level:	Below 63dB (A) (At Normal operating speed)		
Filters:	Pre filter	Surface area	2.5 m <sup>2</sup>
		Efficiency F8	85% @ 0.8μ
	Hepa filter	Efficiency H13	99.997% @ 0.3μ
	Gas filter	Activated Carbon	25Kg

### Environmental Operating Range

Temperature	+5°C to +40°C
Humidity	Max 80 % RH up to 31°C To Max 50% RH at 40°C
Altitude	Below 2000m
Pollution Degree	2

## Unit: AD 1500

Capacity:	1500 m <sup>3</sup> /hr (882 cfm)		
Size:	height 1220mm x depth 600mm x width 770mm (Height 48.03" x Depth 23.62" x Width 30.31")		
Weight:	160Kg (352lb)		
Exhauster:	Turbine Fan		
Output:	3.3Kw (3.3Kw)		
Electrical supply:	230v 1ph 50Hz (115v 1ph 60Hz)		
FLC:	23A		
Noise level:	Below 68dB (A) (At Normal operating speed)		
Filters:	Pre filter	Surface area	2.5 m <sup>2</sup>
		Efficiency F8	85% @ 0.8μ
	Hepa filter	Efficiency H13	99.997% @ 0.3μ
		Surface Area	9.0m <sup>2</sup>
	Gas filter	Activated Carbon	25Kg

### Environmental Operating Range

Temperature	+5°C to +40°C
Humidity	Max 80 % RH up to 31°C To Max 50% RH at 40°C
Altitude	Below 2000m
Pollution Degree	2