

AD Universal
FUME EXTRACTION UNITS

OPERATIONAL INSTRUCTIONS

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SAFETY INSTRUCTIONS

Symbols used



Danger Refers to an immediately impending danger. If the danger is not avoided, it could result in death or severe (crippling) injury. Please consult the 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. Please consult the 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 ADVANTAGE range of extraction units are designed to meet the safety requirements of the Low Voltage Directive 2006/95/EC (previously numbered 73/23/EEC) and UL61010-1.



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 ADVANTAGE 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 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.

This unit should not be used on processes with sparks of flammable materials or with explosive dusts and gases, without implementation of additional precautions.

Warning and Information Labels

Label/Symbol	Position
	<p>Back of unit close to the top and central.</p>
	<p>Base, closest to the front, middle</p>
	<p>Next to protex clip on base.</p>
	<p>Left hand side of unit, at the bottom centre.</p>

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 ADVANTAGE 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

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.

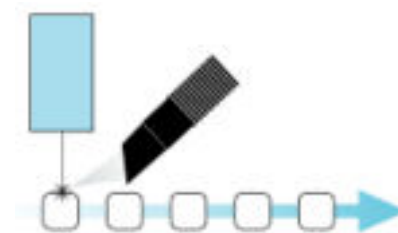
Arm and nozzle extraction

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



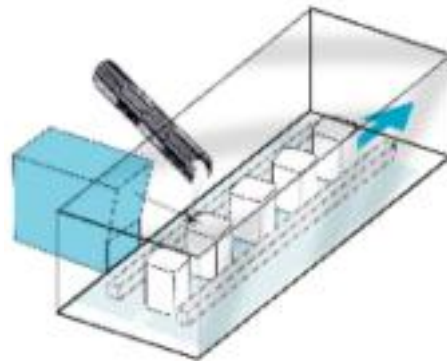
Purge air should be kept to a minimum, where possible, to prevent the fume being blown away from the nozzle.

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

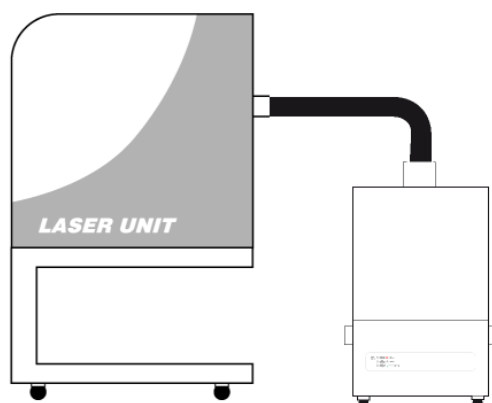
Extraction can be attached to an enclosure around the marking zone provided the extraction point is situated within 50 -75mm of the marking point.
(See fig. 3)

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](#)

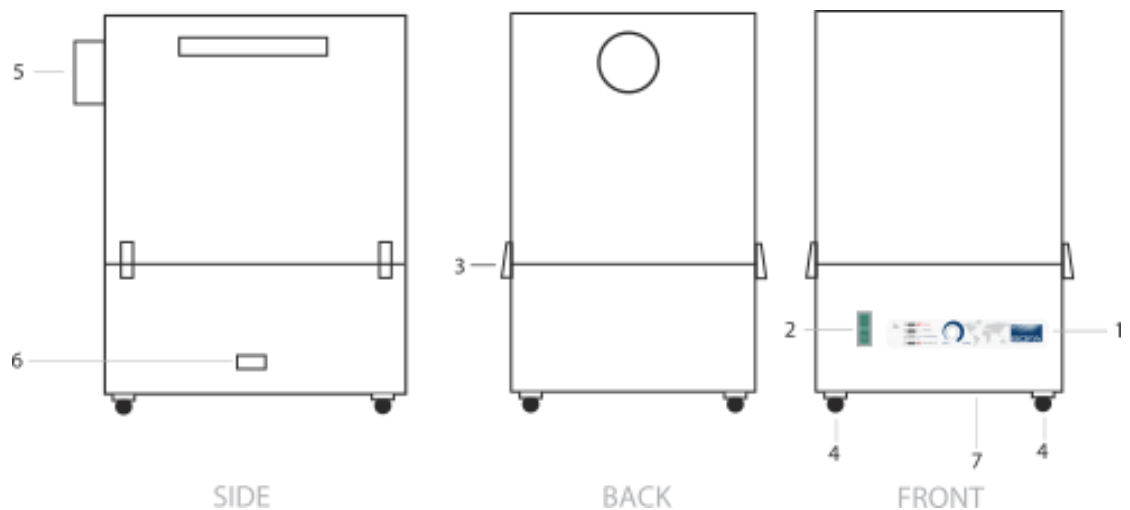


Extractor Overview

The ADVANTAGE 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. Filter Compartment Latch
4. Castors (2 lockable)
5. Extraction Hose Inlet Connection
6. Power Cable Connection
7. Exhaust and cooling air discharge



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.

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).

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 any louvers or cooling holes on the unit as this severely restricts air flow and may cause damage to 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

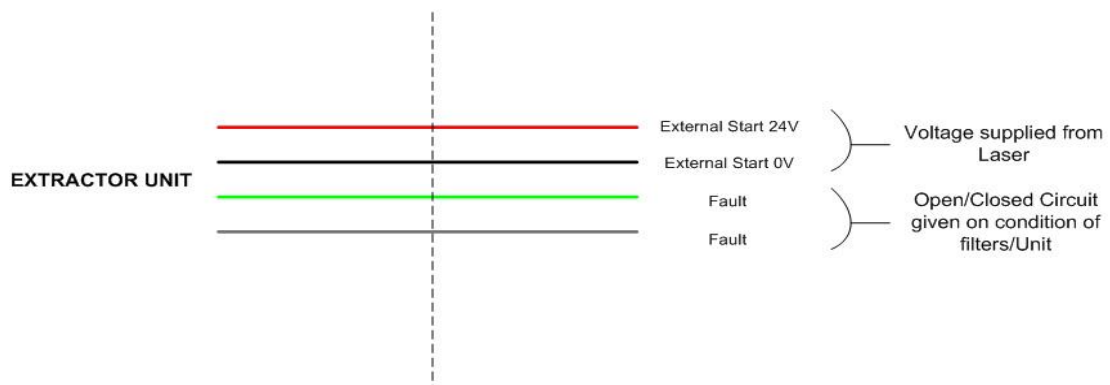
If the ADVANTAGE unit has an exhaust air outlet spigot fitted, the exhausted air can be routed outside of the building if required. It is important to keep any ducting used to do so to a minimum, in order to reduce back pressure within the system.

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 24Vdc 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. (Unless 0V stop/start option was specified when ordered, for this connect the Red & Black cores together to start the extractor.)

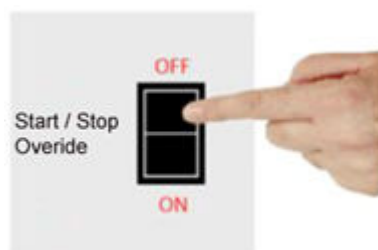
Fig 6



Remote Stop/ Start Over-Ride

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

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 - 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 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

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 ADVANTAGE 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 ADVANTAGE units are turned on and off by means of a green, illuminated rocker switch on the front of the unit. (See Fig 9).

[Fig 8 Stainless Steel Units](#)



[Fig 9 Powder coated Units](#)



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 indicators

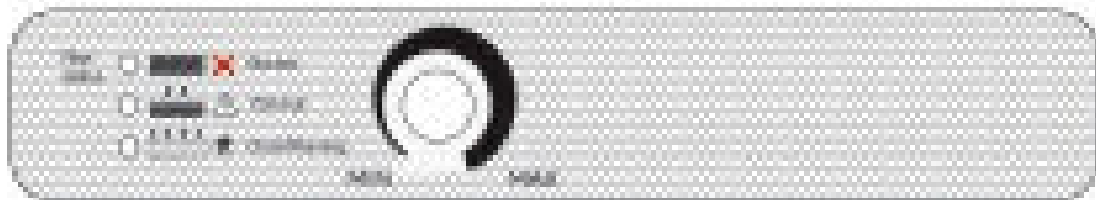
The three LED's on the front panel (see table below) indicate the following conditions

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

Filter change procedures are explained in Section 5 'Maintenance'.

Setting The Air Flow

This unit comes with a speed control feature which allows the user to set their desired air flow. This is performed by using the potentiometer situated on the front of the unit. Flow (with clean filters) can be adjusted from 200 – 380m³/h.



Note – When particulate filter option is used, filter blocked will only be indicated if flow is set above ¼ of the flow range. With blocked filter indication illuminated, the required minimum 200m³/h flow rate will only be achieved with flow set in the 'max' position.

[Fig 10 - Gas filter full indication - VOC monitor](#)



Note – When the full gas filter option is used, filter status indication will only show green (extraction fan operation/ vacuum ok) or green, amber and red flashing (fan failure/ system vacuum too low).

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 10). The Maintenance section describes the filter change procedure.

MAINTENANCE

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.

Maintenance consists of replacing filters only. Replace the filters annually or when the filter change indicator is activated.

Pre filter replacement

The filter needs changing when the green amber and red LED's on the unit are illuminated. Isolate the electrical supply to the extractor.

Gas Filter / Combined filter replacement

The filter needs changing annually, or when the filter alarm signal and LED's do not go off after changing the pre filter. Isolate the electrical supply to the extractor.

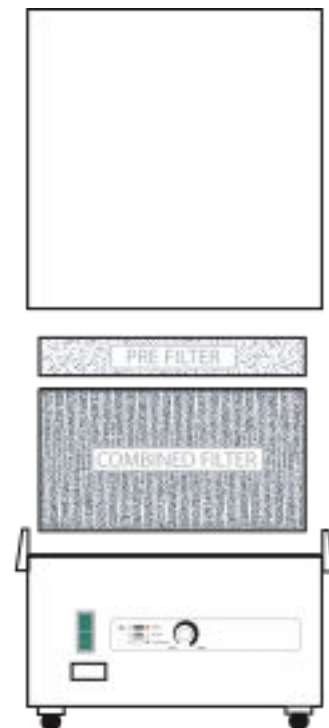
The carbon media within this filter is hygroscopic and will absorb moisture from the atmosphere. This is why the filters should be changed every twelve months regardless.

The filter needs changing annually or when the VOC light becomes illuminated. The carbon media within this filter is hygroscopic and will absorb moisture from the atmosphere.

This is why the filters should be changed every twelve months regardless.

[Fig 11](#)

1. Isolate the electrical supply to the unit.
2. Undo the protex clips on either side of the unit and lift the top section off.
3. Withdraw filters and remove any dust residue in the base.
4. Remove the pre filter from inside the combined filter and if still serviceable fit into a new combined filter.
5. Locate the new filters onto the base.
6. Replace the top section and fasten the protex clips.
7. Reconnect the power supply. (See fig 11).



Fuses

The following table gives details of the internal fuses in the Advantage range of units:

Item Protected	Fuse Rating Amp	FLC Amp	Fuse Type	Fuse Size mm
12v DC PSU	1	<1	T1AH250V	20x5

Over current protection for the extractor unit is provided by the mains two pole switch as seen in (Fig 8 & 9)

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

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

OR

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APPENDIX

System Specifications

Unit: AD Universal

Nominal Max Air Flow: 380 m³h
Size: height 670mm x depth 430mm x width 370mm
Weight: 50Kgs
Exhauster: Centrifugal Fan
Power Consumption: 1.1Kw
Electrical supply: 115-230V +/- 10% (50/60Hz)
Full Load Current: 12.5A
Noise level: 68dB (At typical operating speed)

Filter Status Indication:

Amber Light Operation @ 220m³h
Red Light Operation @ 200m³h

N.B - The above figures are only applicable with flow control set in the 'max' position

Efficiency F8	Pre Filter	Surface area	7.0 m ²
	85% @ 0.8μ		
Hepa Filter	Surface area	3.5m ²	
	Efficiency H13	99.997% @ 0.3μ	
Gas Filter	Activated Carbon	12.0Kg (20 Litres)	

Filter Options:

Heavy Duty Gas Filter 25Kgs Special Impregnated Carbon

N.B – When solvent ink filter option is used, filter status indication will only show green (extraction fan operation/ vacuum ok) or green, amber and red flashing (fan failure/ system vacuum too low). See section 3.2.

Environmental Operating Range

Temperature +5°C to +40°C
Humidity Max 80 % RH up to 31°C
 To Max 50% RH at 40°C