

BIGNEAT LIMITED
SAFETY CABINET

USER MANUAL

GUIDE TO INSTALLATION,
OPERATION, SAFETY & MAINTENANCE

HORIZONTAL LAMINAR-FLOW CABINETS

PRODUCT RANGE:

HLFO 1.0, HLFO 1.5, HLFO 2.0

HLFP 1.0, HLFP 1.5, HLFP 2.0

Manual N° & Rev:

HLF001 Rev C

BIGNEAT LIMITED
4 & 5 PIPER'S WOOD INDUSTRIAL PARK
WATERBERRY DRIVE
266400
WATERLOOVILLE
HAMPSHIRE
sales@bigneat.co.uk
PO7 7XU
www.bigneat.com

TEL. NO. +44 (023) 92

FAX NO. +44 (023) 92 263373

EMAIL:

WEBSITE:



CONTENTS

About this Manual	i
Safety Notes	ii
Choice of Correct Chemcap Filter	iii

SECTION 1	Introduction Cabinet Identity Quality Assurance Validation protocol
SECTION 2	Product Specification General Construction
SECTION 3	Installation
SECTION 4	Commissioning Initial Cleaning Operating the cabinet
SECTION 5	Safety Monitoring Replacing a Main Filter
SECTION 6	Examination & Testing

APPENDIX 1	Notes on UK COSHH Regulations
APPENDIX 2	Product Labelling
APPENDIX 3	Electrical diagrams (Sheets 1 & 2)



ii Safety Information



General

This manual is intended as a guide. Whilst every effort has been made to ensure that the statements made are accurate, no responsibility can be accepted for any editing errors or omissions contained herein. They are in accordance with the current knowledge we possess and are intended to provide information about our products and their principal function. Options for use above and beyond their design specification cannot be guaranteed.

Hazards

This equipment can cause danger through employment of high speed rotating fans and high voltages¹. Failure to observe the following recommendations will constitute an ELECTRICAL SHOCK HAZARD

Installation, Operation and Servicing

If the equipment is installed, operated and/or serviced in a manner other than as recommended by Bigneat (the manufacturer), the electrical protection and/or the airflow integrity of the enclosure could become compromised. Any such installation or use will invalidate all guarantees and warranties.

Protective Earth

The connection to the cabinet earth terminal must be provided by a permanent, assured low impedance, safety earth supply and made before any other supply voltages are made. Any subsequent disconnection of the Earth terminal (whether by accident or other cause) could make the recirculating cabinet dangerous, under some fault conditions.

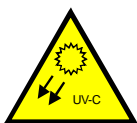
Maintenance and repair

Repair, adjustment or maintenance with safety or normally fixed covers removed whilst the cabinet is under voltage should be avoided. Skilled personnel only, aware of the potential hazards involved, should carry out these operations. No user-serviceable components are incorporated in this equipment.

Explosion & Fire risk

The equipment is not designed or certified for use in a potentially explosive atmosphere as defined in European Atex Directive 94/9/EC. Also, it should not be relied upon to provide safe containment in the event of fire caused by the process atmosphere. The end user must carry out adequate risk assessment to determine the hazards posed by the processes to be undertaken.

UV-C wavelength exposure (fitted as an optional item)



UV-C emissions are harmful to skin and eyes and reflective capabilities are high. They pose health and safety hazards to operators and those in the vicinity. Operators and Health and Safety officers should be made aware of the potential risks. The UV lamp emits no ozone.

¹ defined in BS EN 61010: 2001 as voltages greater than 33 Volts AC, (46.7 peak) 70 Volts DC

1. INTRODUCTION

Bigneat's Horizontal Laminar Flow cabinets are advanced engineered clean air and containment products utilising proven Filtration technology. Designed as freestanding equipment, they are built, tested and approved to exacting industry standards, providing extremely safe and reliable equipment.

When used as part of a comprehensive laboratory safety routine and following the recommendations in this operating manual, the cabinets will provide optimum operator and/or product protection from a range of airborne contaminants together with extended filter life.

QUALITY ASSURANCE

All HLF Cabinets are subject to factory acceptance and installation-commissioning tests by our trained engineers, in accordance with fully documented Quality Assurance Procedures and applicable National Standards.




The integrity of the design, manufacture and performance of the filtration and airflow of the cabinet, on leaving our works is assured.

ELECTRICAL SAFETY

The equipment is designed to comply with the requirements of BS EN 61010:2001 and the Low Voltage Directive.

Rating label

The cabinet is fitted with the following self-adhesive Rating and CE Mark Label, which uniquely identifies the equipment. The label should not be removed, as evidence of original Quality Assurance Tests and CE Mark integrity may be affected.

MODEL No.	<input type="text"/>		
SERIAL No.	<input type="text"/>		
SUPPLY	<input type="text"/> VOLTS	<input type="text"/> PHASE	<input type="text"/> Hz
RATING	<input type="text"/> AMPS		
DATE	<input type="text"/>		
 BIGNEAT LIMITED Units 4 & 5 Pipers Wood Waterlooille Hampshire PO7 7XU Tel: +44 (0)23 9226 6400 Fax: +44 (0)23 9226 3373 www.bigneat.com			
			

CE MARK & RATING LABEL



2.0 PRODUCT SPECIFICATION-HLFO MODELS

HLFO Cabinet range for Operator Protection

During normal operation the two centrifugal fans [installed in the fan housing mounted on top of the cabinet] develop a preset velocity horizontal airflow. This laminar type airflow is drawn horizontally (away from the operator), through the HEPA filter mounted in the rear plenum and exits via an exhaust filter at the top of the Fan housing recirculating back into the laboratory. See Figure 2.

General construction

The cabinet consists of a welded, mild steel Fan housing, containing the fans, variable speed controller, lighting unit, wiring terminal grid and exhaust-filter grille panel.

The steel fan housing (incorporating a steel rear plenum containing the HEPA filter) is fitted onto a fire retardant, safe-edge 8mm acrylic enclosure.

All steel is finished in oven-baked powder-coat gloss paint, colour White.

A HPL work surface is located at the bottom of the unit.

2.1 PRODUCT SPECIFICATION-HLFP MODELS

HLFP Cabinet range for Product Protection

During normal operation the two centrifugal fans [installed in the fan housing mounted on top of the cabinet] develop a preset velocity horizontal airflow. This laminar type airflow is drawn horizontally (towards the operator), via the HEPA filter mounted in the rear plenum and the pre-filter at the top of the Fan housing. The filtration of the laminar airflow produces a clean environment within the enclosure before recirculating back into the laboratory. See Figure 1.

General construction

The cabinet consists of a welded, mild steel Fan housing, containing the fans, variable speed controller, lighting unit, wiring terminal grid and pre-filter grille panel.

The steel fan housing (incorporating a steel rear plenum containing the HEPA filter) is fitted onto a fire retardant, safe-edge 8mm acrylic enclosure.

All steel is finished in polyester powder-coat gloss paint, colour White.

A high-pressure laminate work surface is located at the bottom of the unit



2.1 PRODUCT SPECIFICATION contd..

Type:	Laminar Flow-Product Protection			Laminar Flow-Operator Protection		
Model:	HLFP 1.0	HLFP 1.5	HLFP 2.0	HLFO 1.0	HLFO 1.5	HLFO 2.0
External dimensions:						
Cabinet width:	1000 mm	1500 mm	2000 mm	1000 mm	1500 mm	2000 mm
Cabinet depth:	762 mm	762 mm	762 mm	762 mm	762 mm	762 mm
Cabinet height:	1160 mm	1160 mm	1160 mm	1160 mm	1160 mm	1160 mm
Airflow velocity:	0.4 m/s at filter face					
Filtration system:	HEPA Filter EN 1822 Class H14 99.997% at 0.3 micron particle size					
	Activated carbon, meets BS7989:2001 and AFNOR NFX-15-211 (Optional)					
Fan type:	2 x Centrifugal Fan type: DAE225-CC01-02					
Cabinet noise level:	< 60dBA					
UV Light (optional):	UVc Germicidal type: Wavelength 253.7 nm					
Lighting:	2 x 36W strip					
Operating voltage:	220-240V 50 Hz Power: 600W					
Compliance standard:	ISO 14644-1:1999 Class 5					

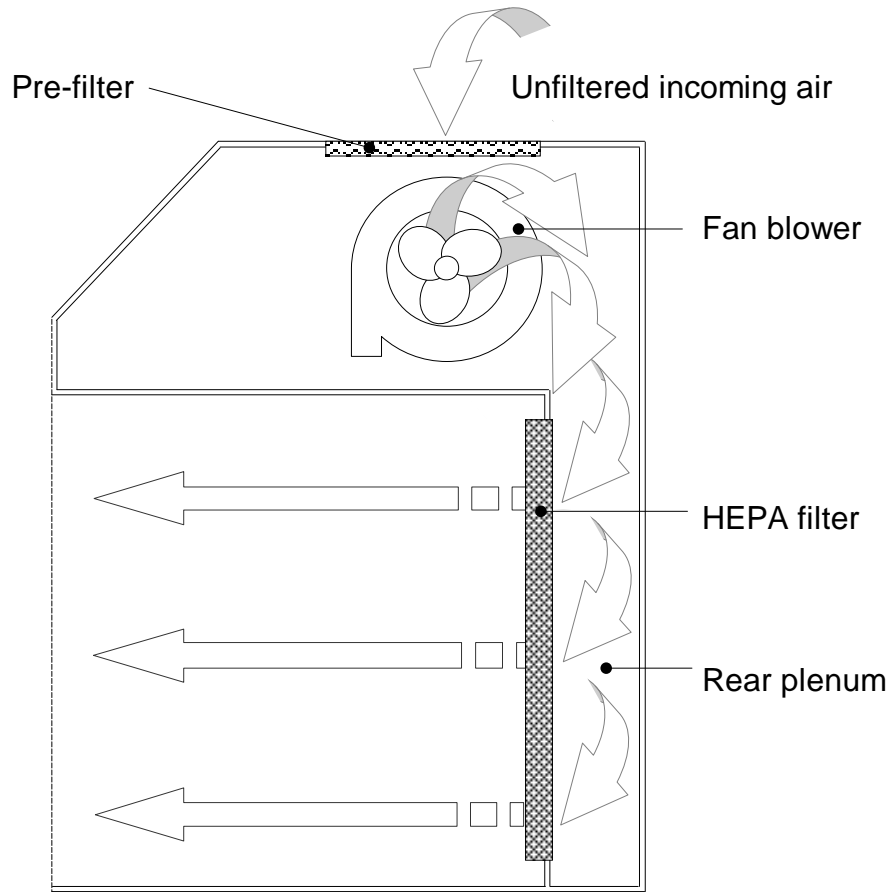


Figure 1 Airflow profile-Product Protection

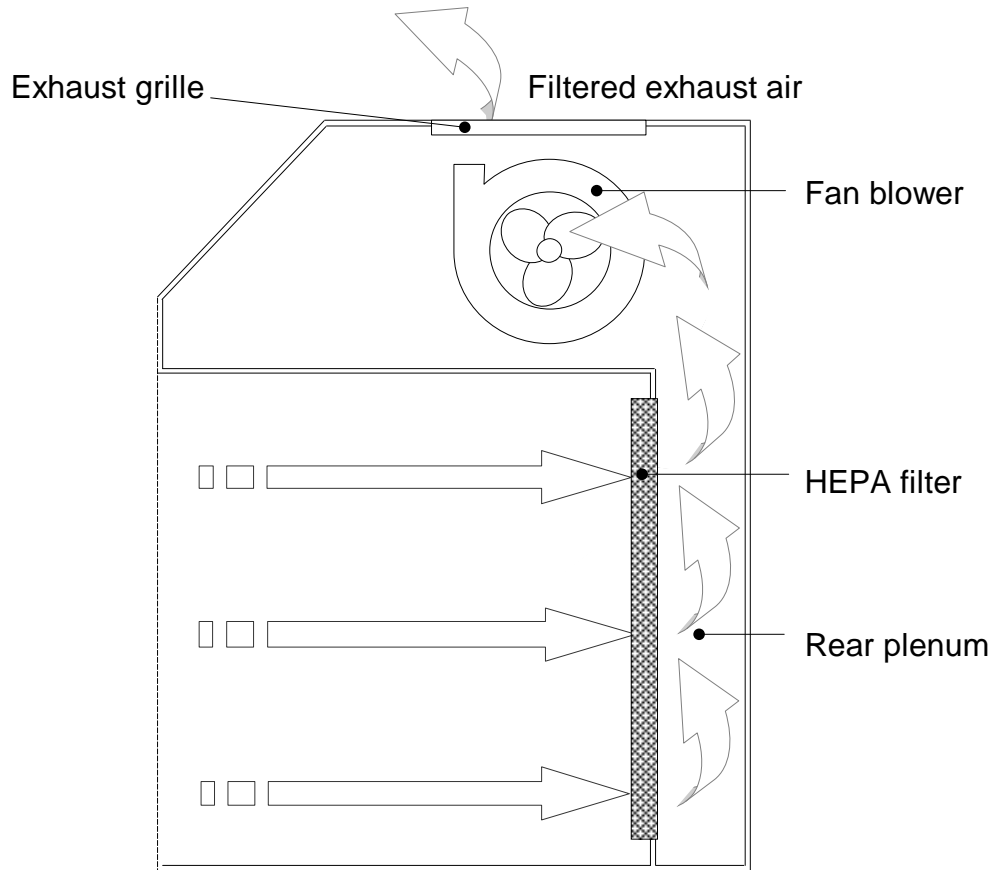


Figure 2 Airflow profile-Operator Protection



3. INSTALLATION

Site Selection

The HLF cabinet should be placed well away from open windows, doors and other sources of disruptive air changes, which may affect safe, consistent function.

Where there is a comprehensive choice of site, choose the cleaner environment, as this will reduce pre-filter maintenance costs.

Warning! The installed filters should never be obstructed in any way.

Space and ventilation

The laboratory or workroom should of course be of sufficient size to provide ample space around the cabinet to move and operate conveniently. The small but constant heat load generated by the fan and any lighting will be easily dissipated in average room sizes.

General installation recommendations

Recommendations for installation for best performance of powder control cabinets are to be found in British Standard: 7258.

Electrical connection

The cabinet should be connected to the electrical supply with the mains lead supplied, where there is a requirement to use other cable then connections should be made in accordance with the following colour code:

Green & Yellow Lead		Protective Earth
Blue		Neutral return
Brown		Live

Connect to a supply of 230 Volts, 50 Hz, single phase, 5 Amps maximum.



4.0 COMMISSIONING

Having connected the cabinet to the correct supply, switch ON by pressing the fan membrane switch, the associated green LED should be illuminated and the fan running.

For the following commissioning procedures the fans should be allowed to run for several minutes in order to stabilise, after which the airflow velocity can be set.

Measure the airflow velocity at the face of the HEPA filter using a suitably ranged and calibrated rotary-vane type anemometer. The fan speed is pre-set during factory acceptance testing to provide an average velocity at the filter face of 0.4 m/sec.

Initial Cleaning

Following commissioning, clean the interior with the fan running. The recommended method of cleaning hard surfaces is by damp wiping which has been shown to have a removal efficiency of more than 99% on particles of 5 μm , but is unlikely to pick up more than 10% of 10 μm particles.

Wipers should always be of the highest quality, non-shedding type suitable for clean room use. A variety of purpose made clean room-cleaning products is on the market and manufacturers advice should be sought for each application.

Warning! Do not attempt to clean the filter face. Although protected by a metal mesh, it remains vulnerable to accidental damage and great care should be exercised at all times.

Operating the HLF Cabinet

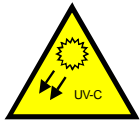
On the control panel press the Fan switch to the ON position. The fan speed will eventually stabilise at the level preset during commissioning.

Press the Light membrane switch to the ON position to illuminate the interior of the cabinet.

Using the UV lighting option.

To operate the germicidal UVc lighting, first insert the key into the UV light key-switch and select the UV light position.

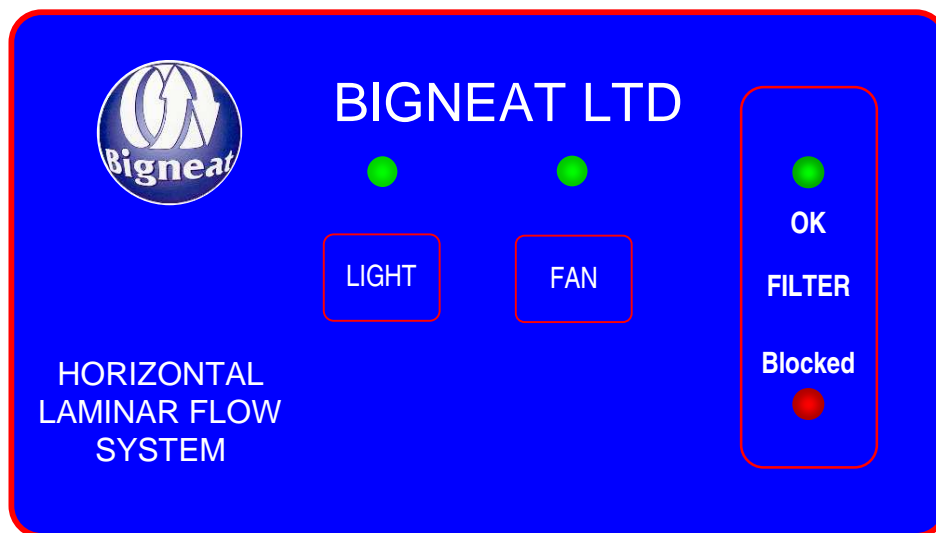
Rotate the Timer switch dial to the desired interval (max on period:30 mins)



For safety, the normal (whitelight) lamp will turn off during UV operation.

Do not attempt to look beneath the metal safety screen directly at the UVc lamp or place hands/arms into the cabinet during the cycle.

At the end of the cycle operate the keyswitch to Normal to allow normal lighting to resume (or to enable the normal light to be switched on at the control panel).



CONTROL PANEL



5.0 SAFETY MONITORING



Air Velocity

Over time, the progressive saturation of the filter will affect the laminar airflow velocity within the cabinet. The airflow will eventually fall below the [0.4 m/s] level set during original commissioning and the 'blocked filter' warning lamp will illuminate.

Adjustment to the fan speed will compensate for the reduction in airflow within the remaining adjustment range of the speed control.

Where a carbon filter option is installed take care in removing the filter as undue shaking or 'jerking' may contaminate the local area with carbon dust.

The cabinet should be checked at intermediate periods with a calibrated anemometer.

Main Filter-changing

If, the blocked filter light continues to illuminate, the Main Filters must be replaced,

The used Main filters should be extracted after undoing the ten screws fitted around the periphery of the filter clamp frame and within the enclosure.

'Double bag' and seal in a heavy-duty waste bag the used filters for disposal in accordance with your current waste disposal procedures.

Safety Warning! Protective overalls, gloves, facemask and safety glasses should be worn throughout these procedures.

Electrical Safety

The HLF Cabinet is tested as [*Class 1 electrical*] appliance, and must continue to meet the requirements of the Electricity at Work Regulations 1989. This includes the associated IEC mains cord set supplied and this along with the electrical system of the safety cabinet should be examined frequently for signs of damage. There should be regular formalised inspections carried out by a 'competent' person and must include earth bonding and insulation tests.

Cleaning & Disinfecting

Cabinet enclosures should be cleaned (and disinfected if applicable) frequently and regularly. The frequency of cleaning will depend upon the use to which the cabinet is put but as an indication cabinets for non-organic use might be cleaned weekly. Those used for pharmaceutical procedures are normally cleaned before and on completion of specific operations.

Switch off the fan. (Note: HLFO models can be safely cleaned with the fan running).

The recommended method of cleaning both acrylic and painted surfaces is by damp wiping with diluted detergent and water.

This is shown to have a removal efficiency of 99% on particles of 5 μ m, but is unlikely to pick up more than 10% of 10 μ m particles.

Note: DO NOT use a solvent-based cleaning solution as this may promote stress cracking of the acrylic material very quickly.

Wipers should always be of the highest quality non-shedding type suitable for clean room use.



UV lamp replacement

The UV lamp installed has an effective life of 6,000 hours at 80% relative UV output level. Turn the power off and allow lamp to cool before replacement to avoid potential burn and electrical shock hazard.

6.0 EXAMINATION & TESTING

COSHH Regulations

Current UK COSHH regulations recommended that this Safety Cabinet be examined, serviced and revalidated at least once every 14 months and should include the following checks:

- Average face velocity airflow and efficiency
- Filter saturation and seal Integrity
- Fan motor noise or vibration
- Electrical safety, to include mains lead

Bigneat's own Service Department has many years experience in Fume and Particulate Extraction maintenance, test and validation. We would be pleased to quote you for an appropriate Service Contract.

Call our Service department on direct telephone number: +44 (0) 23 9224 6443 for further information and advice.



APPENDIX 1

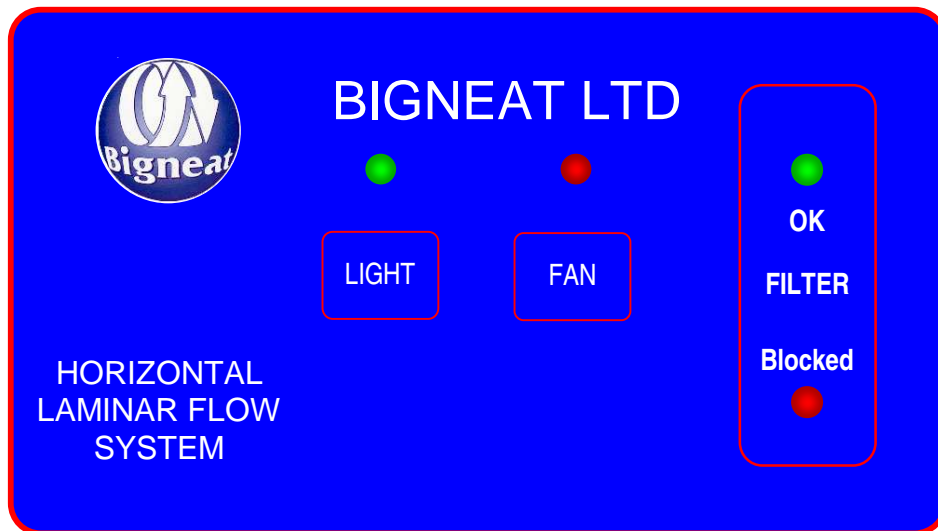
NOTES ON UK COSHH REGULATIONS

1. The “Control of Substances Hazardous to Health” (COSHH) 2004 regulations.
2. The regulations are the UK implementation of an EEC Council directive 80/1107/EEC.
3. The regulations require an employer to protect his employees and any other people (whether working for him or not) from hazardous substances.
4. A hazardous substance is defined as:-
 - a) A substance or mixtures of substances, which are on the list of hazardous substances as defined by the Classification, Packaging and Labelling Regulations 1994.
 - b) A substance for which an Occupational Exposure Limit (OEL) value exists. This list is similar to US threshold Limit value Levels (TLV).
 - c) A micro-organism, which creates a health hazard.
 - d) Dust at a substantial concentration in air.
 - e) Any substance, which creates a hazard to health, similar to the hazards created by the substances in a-d.

Note that paragraph 4e is a “catch-all” section.

5. The employer is responsible for assessing the risk to an employee.
6. The employer must prevent or control the exposure of an employee to hazardous substances.
7. The control of exposure “shall be secured by measures other than the provision of personal protective equipment”. This means the fumes must be contained, rather than providing protective suits and masks to staff.
8. OEL values must not be exceeded.
9. The employer must ensure that safety equipment is properly used.
10. The employee must use safety equipment provided correctly.
11. The employer must maintain safety equipment in good working order. In particular:-
 - a) Exhaust ventilation equipment must be examined every 14 months.
 - b) Other safety equipment must be examined at “suitable intervals”.
 - c) Records of checks, tests and repairs must be kept for 5 years.
12. Monitoring of exposure to hazardous substances must occur “in accordance with a suitable procedure”. Records of results must be kept for 5 years for general monitoring, and for 30 years when they relate to a specific employee.
13. Regular medical checks are required when working with certain listed substances, or where an identifiable disease is associated with a certain substance.
14. An employer must provide suitable instruction and training to employees regarding risks of substances and precautions to be taken.
15. Certain other regulations take precedence, such as Control of Lead at Work, Control of Asbestos at Work, radioactive, explosive or flammable regulations, Mines and Quarries Act, and medical treatment regulations.

APPENDIX 2
EQUIPMENT LABELLING



MEMBRANE CONTROL PANEL

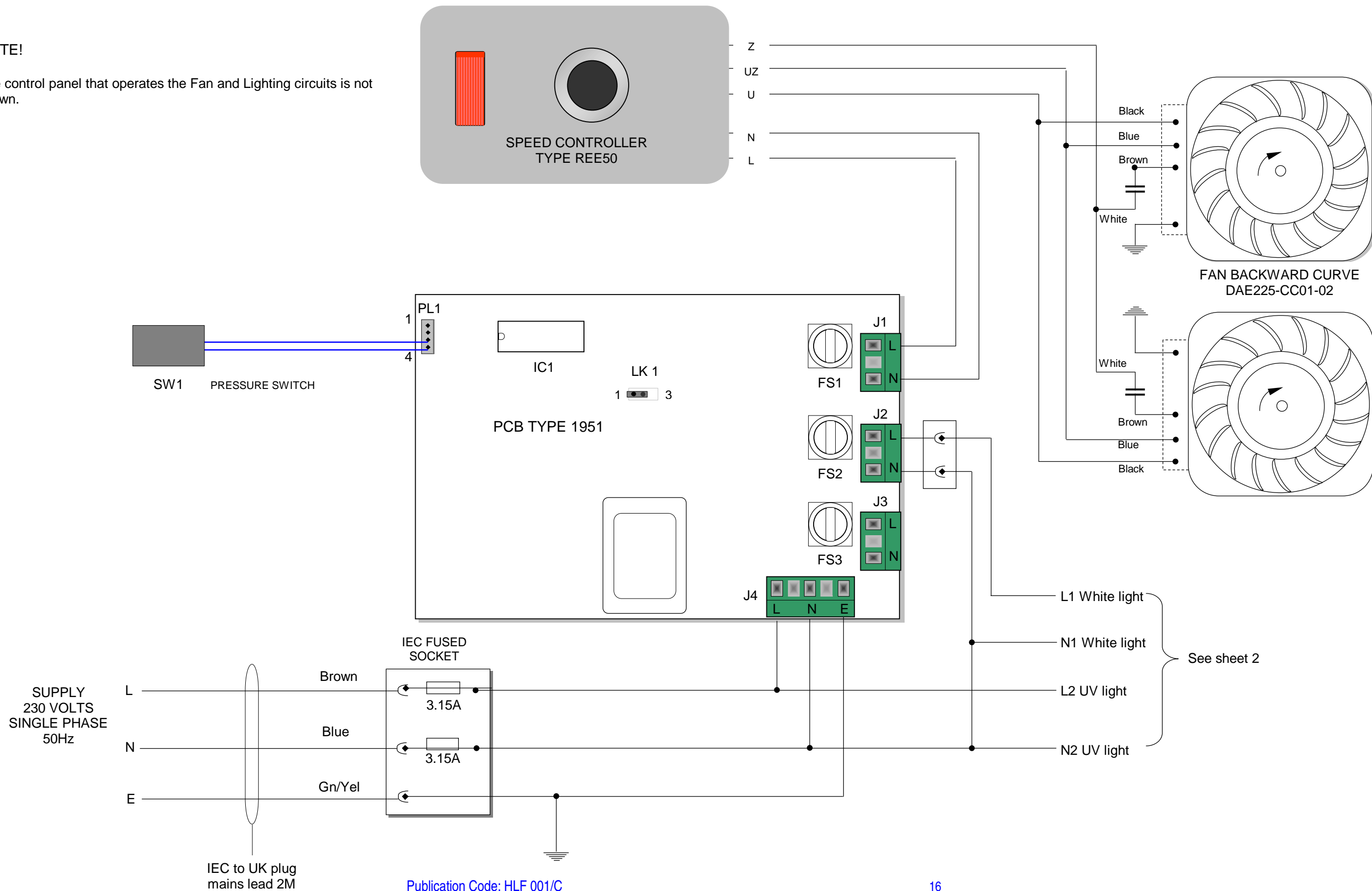


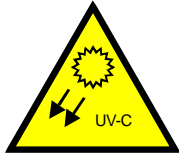
INSTALLED (OPTIONAL) FILTER IDENTITY (EXAMPLE)

APPENDIX 3

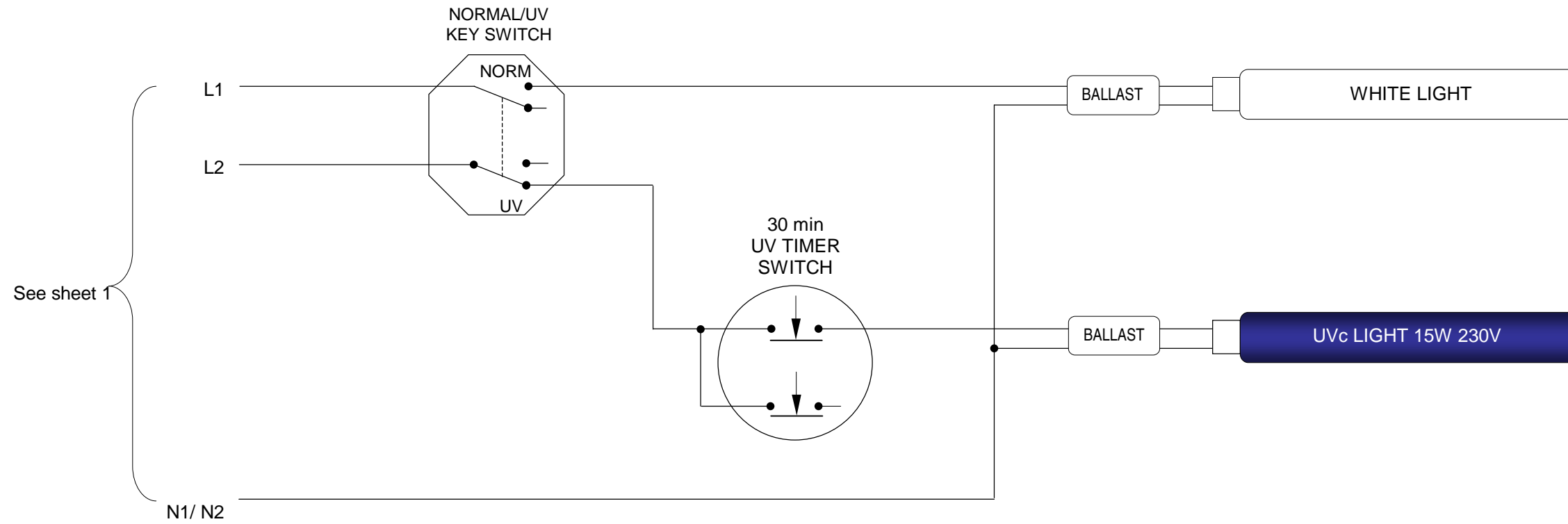
NOTE!

The control panel that operates the Fan and Lighting circuits is not shown.

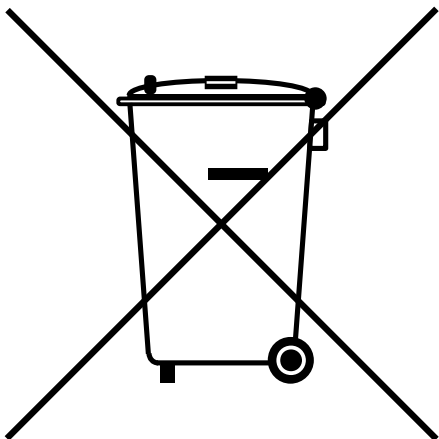




Warning!
 UV-C Radiation from the biocidal
 lamp
 is harmful to both eyes and skin



WEEE Directive 2002/96/EC and
RoHS Directive 2002/95/EC



Waste Electrical and Electronic Equipment
(WEEE) Symbol

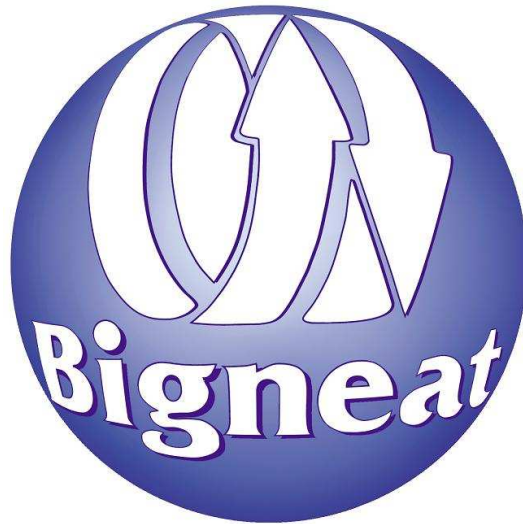
The use of the WEEE Symbol indicates that this product cannot be treated as domestic household waste at end-of-life.

By ensuring that this product is disposed of correctly, you will help protect the environment.

For more detailed information about the recycling/recovery of this product, please contact your supplier, or Bigneat Ltd. directly.

Restriction of the use of certain Hazardous Substances
(RoHS)

Bigneat Ltd. has taken all reasonable steps to ensure that the product does not contain any or more than the permitted maximum concentrations of the six designated restricted hazardous substances namely, Pb, Hg, VI, PBB, PBDE and Cd



Printed and Published by
Bigneat Limited
4 & 5 PIPERS WOOD INDUSTRIAL PARK
WATERBERRY DRIVE
WATERLOOVILLE
HAMPSHIRE
PO7 7XU

TEL: +44 (0) 23 9226 6400 FAX: +44 (0) 23 9226 3373

E-MAIL: information@bigneat.co.uk

WWW.BIGNEAT.COM