PCR Clean Air Bubble

User Manual

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2019

Lab Bubble

bsi ISO 9001 Quality Management Systems CERTIFIED

Lab Bubble

+44 (0)2392 695521
lab-bubble.com
sales@lab-bubble.com

bsi ISO 9001 Quality Management Systems CERTIFIED

DESIGNED & MADE IN BRITAIN

Lab Bubble is a product designed and manufactured by CTS Europe Ltd.
CTS Europe Ltd, 14 Ordnance Court, Ackworth Road, Portsmouth, PO3 5RZ
Registered office - CTS Europe Ltd. Station House, North Street, Havant, Hampshire, PO9 1QU.
Registered in England & Wales – Registration N° 07306969

Contents

Introduction

Thank you for purchasing a Lab-Bubble™ product, the model you have purchased is the PCR Clean Air Model.

The UV lamp system fitted to the PCR bubble provides a High Intensity short wave UV-C light source that will inactivate DNA / RNA fragments during 15-30 minutes of exposure.

The PCR Clean Air Bubble is a single pass through HEPA filtered positive pressure enclosure. Air is drawn in through the HEPA Filter Module and then passed into the PCR chamber via the side spigots in the base. The clean air then passes over the sample handling area and out into the laboratory, preventing any contaminants from entering the enclosure.

The PCR Clean Air Bubble is not a safety device that protects the operator; it is a device that creates a clean air environment for samples. Please read through this manual in order to understand how the PCR Clean Air Bubble works and how you can ensure the best level of sample protection.

Lab-Bubble™ range is manufactured by CTS Europe Ltd. CTS Europe Ltd accept no liability for any injury or damage caused by improper use.

Safety

Warnings with this guide

You will find in this manual various warning and safety instructions. The type of hazard is identified by a symbol and a title. This safety information must be observed.

Warning

This symbol indicates a hazardous situation in which there is an immediate danger of death, serious injury or damage to health if instructions are not followed.

Attention

This symbol indicates a hazardous situation in which there may be a risk of minor injury or damage to health if instructions are not followed.

Information

This symbol indicates important details on the proper use of the system.

General Safety Instructions

Information

Please note the following general safety precautions.

For your own safety please note the following:

- Working safely always takes priority at all times.
- Please read these instructions carefully before use.
- Keep the manual close by the equipment so that it is easy to refer to.
- For all questions concerning the application or correct use of this system please contact sales@lab-bubble.com.
- This document assumes that the user is familiar with all relevant guidelines and safety protocols for working in a laboratory environment, and is competent in the use of the devices connected to or inside this equipment.

Warning – UV-C Light source

These units include a shortwave UV-C Lamp. This is a powerful source of UV radiation designed to kill or inactivate micro-organisms. This will cause damage to unprotected eyes and skin.

Before operating the UV-C Sterilizing Lamp, ensure all personnel are aware of the risks associated with this type of UV Light source and that instructions for use of this equipment are followed.

SAFETY INSTRUCTIONS FOR OPERATING AND SERVICING

Information– Operating Conditions

Avoid failure due to condensation or heat.

Operate the system at a room temperature of 5-40 ° C and 20-80% RH to avoid damage caused by condensation or by overheating.

Attention – Electrical Safety

If the power lead is connected the equipment could be electrically live.

Always unplug the power cord before carrying out electrical work.

Mechanical damage to the plug and or power lead can cause wires to be exposed which can cause electric shock or fire.

Always unplug the power cord by the plug body and not the cord to prevent possible damage.

Attention – Maintenance

Improper maintenance, repair or upgrade work can cause considerable damage.

Cleaning, maintenance and repairs should be performed only by persons who are trained for these activities and understand the possible dangers. Unauthorized alterations or changes to the devices are not permitted for safety reasons. Genuine parts and accessories are designed specifically for this equipment. No liability is accepted for damage that is caused by the use of non-original parts or accessories.

System Description

Functional Description

The Lab-Bubble™ range of enclosure units are designed to have many different functions, the PCR Clean Air is designed to provide a clean air environment for samples. It is not a user safety device.

A Clean Sample Environment is achieved by:

- Enclosed Handling Area
- Easy to clean surfaces
- Germicidal UV Lamp
- Constant monitoring of air flow using an audible/visual alarm.
- Controlled airflow conditions from the extract and filtration system
- Pre-Validated filtration efficiency

The PCR Clean Air Bubble is pre-commissioned and tested at the factory ready for use when it arrives, the user just needs to reattach the ducting, sensor connector and alarm lamp and the system is ready to go.

The PCR Clean Air Bubble has a clean air filtration module which is preset at the factory commissioning stage to provide and maintain a positive pressure air flow within the enclosure to prevent any contaminants getting to the sample area.

Should this airflow drop below a set point, an airflow sensor will trigger an audible-visual alarm to indicate low flow conditions.

Filtration for particulates is provided via a HEPA Filter (High Efficiency Particulate Arrestor), which has an efficiency of at least 99.995% (H14), the HEPA filter is an absolute filter. Each filter module is individually performance tested at the factory prior to final system calibration and shipment, a certificate is provided with the installation pack.

The base section of the PCR Clean Air Bubble is formed from 10mm thick chemically resistant, process modified polyethylene. This material is very resistant to chemical attack and has the advantage that it is shaped to provide a fully bunded and easy to clean area in case of spillage.

The top section of the bubble is moulded with PETG. The grade of plastic used has very reasonable chemical resistance, however strong solvents such as Acetone should not be used to clean the surfaces.

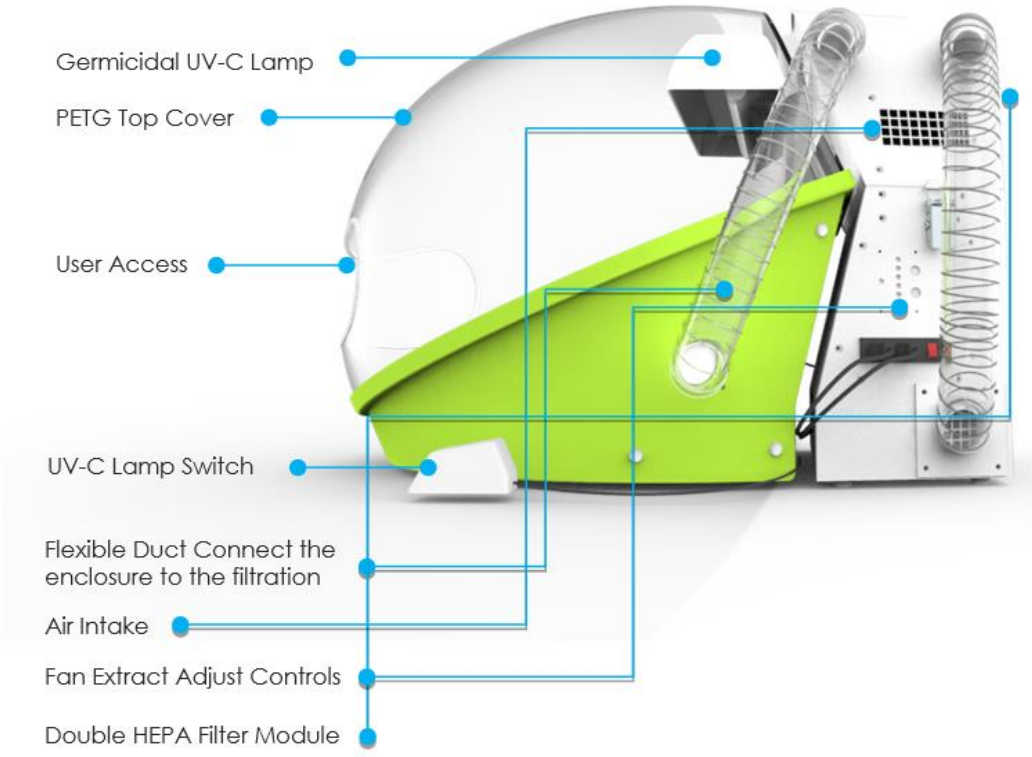
The ergonomic profile design of the enclosure body is an important aspect, as the user can lean naturally towards the enclosure to comfortably handle small sample quantities. The visibility throughout the enclosure is unobstructed and very clear.

The interior height allows the user good movement space for pipetting and handling of samples.

System Setup

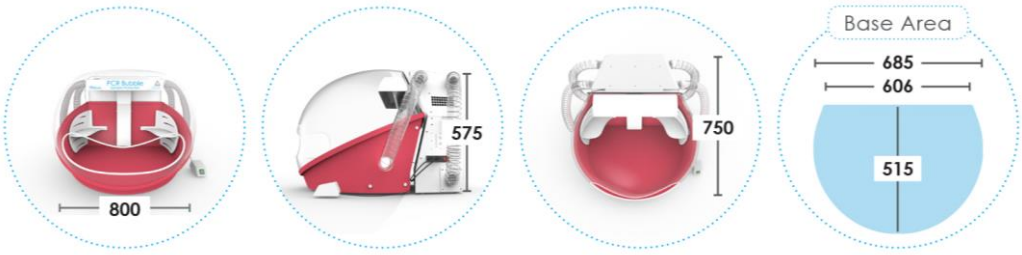
The standard system arrangement consists of having the PCR Clean Air Bubble enclosure positioned against the Clean Air Module. This setup will fit on a standard laboratory bench (750mm deep). The enclosure is connected to the clean air filtration module with flexible duct connections on either side. The air is pulled through the top of the filtration module, cleaned and passed into the enclosure via the ducting either side of the Clean Air Module.

The Clean Air Module can be positioned separately from the enclosure if required, for example under the bench. In this case a duct and sensor extension kit will be required.



Technical Specification

Model Ref	Lab-Bubble™ Clean Air Bubble	
Manufacturer	CTS Europe Ltd - containment-technology.co.uk	
Air Flow	Positive pressure Clean Air Air Change Rate (ACR) = 200 per hour	
Air Monitor	Hot wire sensor	
Lighting	Alarm Lamp: 24 volt LED strip UV-C Germicidal irradiation lamp 25W	
Weight	38Kg / 84lbs, including fan and filter	
POWER REQUIREMENTS		
Voltage	90 - 230volt 1PH 60/50Hz	
Current	230V= 2 amp Max Load	115V= 3.5amp Max Load
Consumption	0.36Kw	
Noise Level	49dB	
ENVIRONMENTAL OPERATING RANGE		
Temperature	+5°C to + 40°C	
Humidity	Max 80%RH up to 31°C	Max 50% RH at 40 °C
DIMENSIONS	**MILLIMETERS (W X D X H)**	**INCHES (W X D X H)**
Complete System	800 x 750 x 575	31.5 x 29.5 x 22.5
Enclosure Only	800 x 550 x 575	31.5 x 21.5 x 22.5
Internal Base Area	680 x 520	26.5 x 20.5



Operation

Special Safety Instructions

You will find in this manual various warning and safety instructions. The type of hazard is identified by a symbol and a title. This safety information must be observed.

Warning - UV-C Light source

These units include a shortwave UV-C Lamp, this is a powerful source of UV radiation designed to kill or inactivate micro-organisms. This will cause damage to unprotected eyes and skin.

Before operating the UV-C Sterilizing Lamp, ensure all personnel are aware of the risks associated with this type of UV Light source and that instructions for use of this equipment are followed.

Do not use the enclosure when the UV Light is activated.

Information

The PCR Clean Air Bubble is not a safety device; the correct use of this system is the responsibility of the user.

When using this enclosure the appropriate personal protective equipment (PPE) must be worn such as: safety goggles, protective overalls and gloves.

Warning - Fault conditions

If a fault occurs, refer to the maintenance and troubleshooting section. Do not use the system until the repairs have been carried out by a qualified Technician. Failure to do so will expose personnel to potential risk from improper use. If required, a qualified Lab-Bubble Technician can carry out repairs.

UV-C Lamp

Operating Instructions

Each PCR Clean Air Bubble comes with a shortwave UV-C Lamp included. The UV-C Lamp is pre-calibrated at the factory on a 30 minute timer. This is to ensure that the inside of the enclosure and surfaces are successfully decontaminated of micro-organisms.

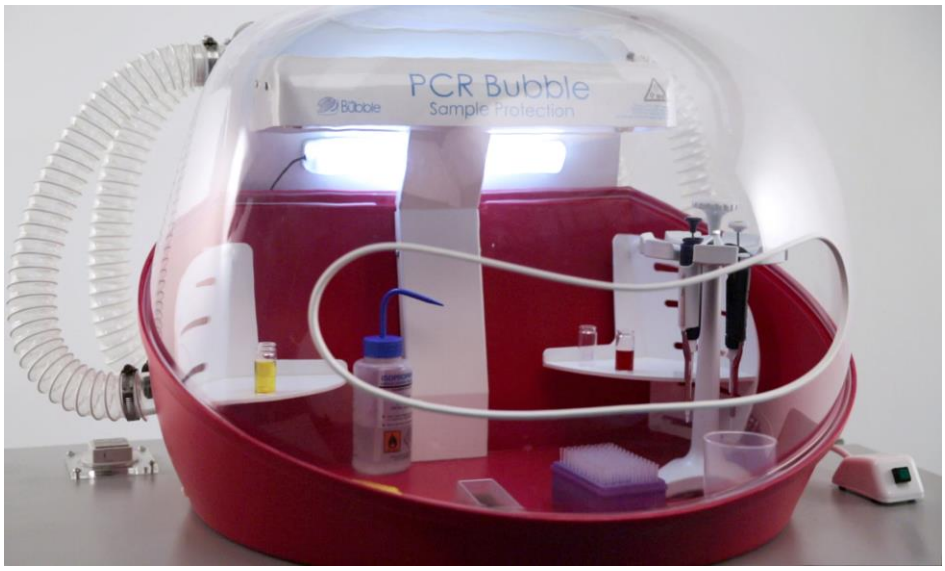
Warning - UV-C Light source

Whilst the UV-C Lamp is activated do not use the enclosure.

UV-C light can cause damage to naked skin and eyes.

Included with each PCR Clean Air Bubble is a momentary switch. When unpacking your PCR Clean Air Bubble simply place this switch in an accessible and comfortable place.

This switch is used to activate the UV-C Lamp. Once the switch is pressed, the UV-C Lamp will activate for 30 minutes. The switch will illuminate for the duration of this time. Once the 30 minutes has passed, the UV-C Lamp will de-activate and the switch will go dark once more.



Fan Filtration System and Filters

The Clean Air Module is designed to house filters used to trap airborne particulates and contaminants in the laboratory.

The Clean Air Module draws air from the laboratory through the grills on the HEPA filter (the fan motor is on the clean side) and exhausted through the spigots on the side of the fan module into the enclosure.

The air volume capacity is adjustable via a speed controller on the side of the fan module. This is factory set to be 200 Air Changes per hour within the enclosure which can be measured as 0.4m/s face velocity. The fan motor will maintain the set speed ensuring CAV (constant air volume operation).

The Clean Air Module is normally located just behind the PCR Clean Air Bubble enclosure, but can be located up to 5m away from the enclosure. The Clean Air Module should be mounted on a solid surface upright. Do not mount the fan filter unit upside down.

Maintenance Information

Replacement of the filter unit may only be undertaken by a competent technician following the procedure detailed below.

Warning

Adjustments in the Clean Air Module air volume rates may result in airflow changes. This must be carried out by a competent technician.

Filter Change

It is recommended to change the PCR Clean Air Bubble Filter every 3 Years. The filter change can be safely and easily carried out by a competent Technician.

The filter is designed so that it can be removed and bagged easily and safely for disposal.

This operation must be carried out by a competent person who understands the potential hazards associated with this procedure.

Filter Change Procedure

Warning - Ensure system is decontaminated

Before starting this procedure, ensure the enclosure is free of any sensitive samples and has been cleaned and decontaminated since last use.

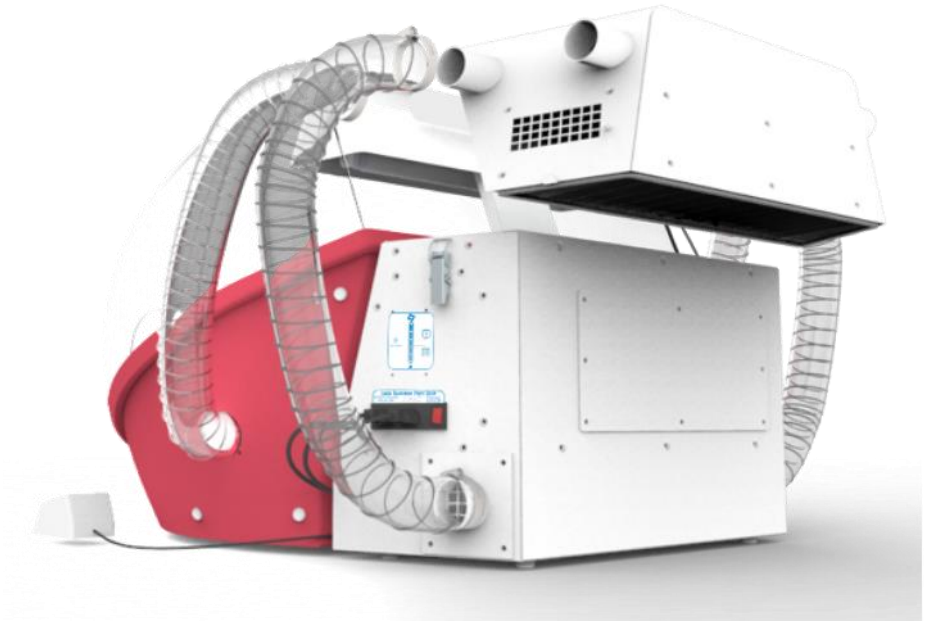
Before starting the filter change procedure make sure that the unit is switched off.

When carrying out a filter change we recommend the following PPE: Lab coat, Glasses, Double gloves and Dust mask.

The replacement filter will come pre-tested and certified to H14 Grade.

Installing a New Filter

To remove the old filter, undo the 4 jubilee clips attaching the ducting to the filter. Unclip the sides of the filter. Lift the filter off the top of the fan unit and place into a suitable waste bag.



Now that you have disposed of the old filter you will need to place the new filter on top of the fan.

Secure the filter using the fixing clips located on either side and reattach the ducting with the 4 jubilee clips.

Turn the PCR Clean Air Bubble back on and allow the flow to settle for 30 seconds. Check that the alarm lamp remains white and that there is no audible alarm. If the system displays a red alarm please refer to troubleshooting (pg18).

If the alarm is not sounding and the alarm lamp remains white then the PCR Clean Air bubble ready to use!

Maintenance Intervals

WHEN	WHAT	WHO
Before Use	- Visual inspection of the main enclosure body and Filtration system. - Check Alarm/ Lamp is operating	User
After Use	- Clean down system and turn off - Check for any physical damage	
Monthly	- Check electrical connections - Check alarm / lamp connection - Check duct connections	
Every 6 Months	- Check Face Velocity - Change UV Lamp Bulb	Competent Person
Every 18 Months	- Test/Change Filter	
Every 3 Years	- Maximum Filter Life - Filter Change Needed	

Troubleshooting

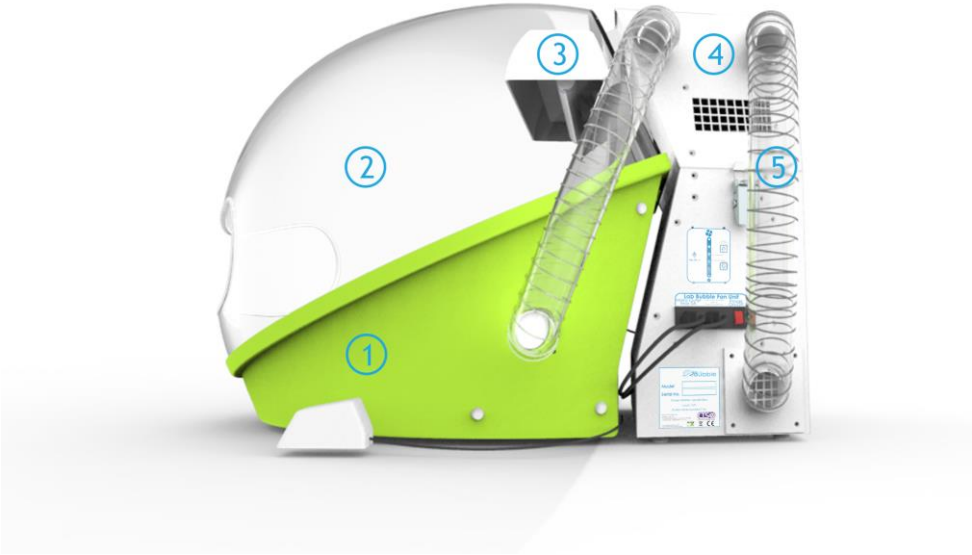
PROBLEM	ACTION	WHO
Alarm sounding intermittently	- Check sensor cable is connected to the fan Module. - Increase air flow via fan speed control on side. - Check if sensor is not obstructed - Check ducting is connected	User
Alarm lamp not working	- Check lamp is connected to fan module - Check system is powered on	
UV lamp not working	- Check connected to mains Power - Change lamp bulb	
System won't start	- Check power cord is connected - Check power switch is illuminated	

Cleaning

Lab-Bubble™ enclosures can be cleaned with standard laboratory cleaning agents. Strong solvents such as acetone should be avoided on the top mould section. The lower base section is constructed with modified Polyethylene and has a very good resistance to most strong solvents and chemicals.

Materials of Construction

1. **Base Section:** 10mm thick chemically resistant, Polyethylene.
2. **Top Mould:** 6mm PETG
3. **UV Lamp:** Powder Coated Steel
4. **Clean Air Module:** Mild Steel powder coated.
5. **Ducting:** Polyurethane with PVC coated wire spiral.



Chemical Resistance

The **top mould** section is a PETG cover, this material has a good resistance to most chemicals. Strong solvents such as Acetone will not cause any immediate effect but using it for cleaning is not recommended. Weak solvent solutions such as Methanol, Ethanol and Isopropanol will not affect this material. Strong Acid and bases will cause discoloration if in direct contact.

The **base section mould** is a modified Polyethylene and has a very good resistance to all strong acids and solvents. Some discoloration will occur with strong acids, however the material will not deteriorate.

The **ducting** is a polyurethane material commonly used in fume extraction systems. This has a limited long term resistance to strong acid and solvents when in direct contact but is designed for air suction of dust and chemical fumes.

The **Clean Air Module** is a powder coated mild steel which will have a reasonable resistance to standard cleaning solvents. Acids will cause corrosion if in direct contact.

Spares and Accessories

PART NUMBER	DESCRIPTION
Ducting Parts	
BUB-DUCT-KIT-WHT	Duct connection kit for Safety Bubble - White
BUB-DUCT-KIT-BLU	Duct connection kit for Safety Bubble - Blue
DUCT-50-WHT	50mm Dia. Flex Duct White Spiral Clear (per Meter)
DUCT-100-WHT	100mm Dia. Flex Duct White Spiral (per Meter)
DUCT-CLIP-50	Duct Jubilee Clips for 50mm Dia.
DUCT-T-50-50-100	Duct T Piece 50-50-100mm
Spares	
BUB-STY-LMP	Lab Bubble™ Alarm Lamp
BUB-PCR-BULB	Replacement Germicidal Bulb for UV-C Lamp
BUB-GRANITE	Granite Stability Block for Lab Bubble 250mm x 500mm x 20mm (LxWxH)
BUB-SHELF	Lab Bubble™ replacement shelves (Left and Right)
BUB-STY-SENS	Lab Bubble™ Airflow Sensor
BUB-BS-STY-Colour	Replacement Base (shelves not included) Select colour: (Red/Green/Blue/White/Black)
BUB-LID-STY	Lab Bubble Top Lid – Safety Variant
Accessories	
BUB-FAN-EXTN	Extension kit for Fan incl. 2 x 2M of Duct + Sensor and Lamp extension cord

Customer Service

To help us with your questions, please have the following information:

- Type / model and serial number of the system
- Details of fault.

UK & International

Tel: +44 (0)2392695521

Fax: +44 (0)2392940282

Email: sales@lab-bubble.com

Performance Standards

The PCR Clean Air Bubble complies with the following standards:

HEPA Filter Performance: EN 1822 DOP to H14 Efficiency

The PCR Still Air system is fitted with a sterilizing UV-C lamp. The intensity of the UV-C lamp is tested on every unit that leaves the factory to ensure there is a minimum intensity of 200uW/cm² measured at the base surface.

Certificates and Reports are available on request to **sales@lab-bubble.com**

Declaration of Conformity

Manufacture:	CTS Europe Ltd, 14 Ordnance Court, Ackworth Road, Portsmouth, PO3 5RZ
Product:	Lab-Bubble™
Models:	PCR Clean Air Bubble

The above named products conform to the requirements of the following European Directives:

2006/42/EC Machinery Directive

2014/30/EU EMC Directive

Conformity with the requirements of the directives is testified by adherence to the relevant parts of the following harmonised standards:

BS EN 61010-1:2010	Safety requirements for electrical equipment
BS EN ISO 12100:2010	Safety of machinery- General principles
BS EN ISO 13857:2008	Safety of machinery- Safety distances
BS EN 61326-1:2013	General EMC requirements for measurement, control & laboratory use equipment
BS EN 61000-3-2:2014	EMC limits for harmonics
BS EN61000-3-3:2013	EMC limits for voltage fluctuations & flicker

CTS Europe Ltd 1st May 2017

Sean Codling

Sean Codling
For and on behalf of:
CTS Europe Ltd

Product Decommissioning and Disposal

In accordance to the WEEE directive 2012/19/EU (waste electrical and electronic equipment)

At the end of the useful life of your Lab-Bubble, we as the manufacturer will accept the applicable electronic modules back to our facility and will dispose of these in accordance to the above directive.

The components of the Lab-Bubble that require correct disposal of in accordance to the directive are the Fan Filtration Module, Alarm/Lamp and the flow sensor assembly. All other components such as the base, top and filter unit (including ducting) are all treated as recyclable or incinerator suitable waste and must be handled locally by a Waste disposal organisation due to the fact that they will have chemical contamination.

Should you wish to return the Fan Module, Alarm/Lamp and sensor assembly, please contact us in advance (support@lab-bubble.com) and we will provide return address details and shipping or labelling requirements. In addition please:

- Unscrew Sensor assembly from the base section (Wipe the sensor clean)
- Pack Fan Module, Lamp and Sensor Assembly together in one box.
- Mark the box as 'Return Electronic Components'

Product Warranty Statement

Thank you for purchasing a product from CTS Europe Ltd.

This Limited Warranty applies to physical goods, and only for physical goods purchased from CTS Europe Ltd.

This Limited Warranty covers any defects in function, material or workmanship under normal use during the warranty period which is 12 months from the date of commissioning by a CTS approved engineer.

During the warranty period, we will repair or replace, at no charge, products, or parts of a product that prove defective because of improper material workmanship or electrical component failure. This assumes a system under normal use and maintained with manufacturer recommended spares.

A CTS product that is repaired under warranty will receive a new 12month warranty commencing on the date of repair.

This Limited Warranty does not cover any problem that is caused by:

- Conditions, malfunctions or damage which is not a result of defects in material or workmanship.
- Engineer travel costs to customer site to carry out an on-site repair.

To obtain warranty service, please contact us using the information in the system manual supplied with your product. With this information, we will be able to determine the problem and the most appropriate solution for you.

Sean Codling
CTS Europe Ltd

VISIT LAB-BUBBLE.COM

www.lab-bubble.com sales@lab-bubble.com +44(0)2392 695521