Thank you for purchasing this Esco Powder Weighing Balance Enclosure. Please read this manual thoroughly to familiarize yourself with the many unique features and exciting innovations we have built into your new equipment. Esco provides many other resources at our website, www.escoglobal.com, to complement this manual and help you enjoy many years of productive and safe use of your Esco products.

User Manual

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Powdermax

Powder Weighing Balance Enclosure

Esco PW1 User Manual
Version A - Released November 2013

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Esco reserves the right to make periodic minor design changes without obligation to notify any person or entity of such change.
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MANUAL REVISION HISTORY

REV. NO.	DATE RELEASED	DESCRIPTION OF CHANGE	REFERENCE	SERIAL # OF 1ST UNIT FOR IMPLEMENTATION

Warranty Terms and Conditions

Esco products come with a limited warranty. The warranty period will vary depending on the product purchased, beginning on the date of shipment from any Esco international warehousing location. To determine which warranty applies to your product, refer to the appendix below.

Esco's limited warranty covers defects in materials and workmanship. Esco's liability under this limited warranty shall be, at our option, to repair or replace any defective parts of the equipment, provided if proven to the satisfaction of Esco that these parts were defective at the time of being sold, and that all defective parts shall be returned, properly identified with a Return Authorization.

This limited warranty covers parts only, and not transportation/insurance charges.

This limited warranty does not cover:

- Freight or installation (inside delivery handling) damage. If your product was damaged in transit, you must file a claim directly with the freight carrier.
- Products with missing or defaced serial numbers.
- Products for which Esco has not received payment.
- Problems that result from:
    - External causes such as accident, abuse, misuse, problems with electrical power, improper operating environmental conditions.
    - Servicing not authorized by Esco.
    - Usage that is not in accordance with product instructions.
    - Failure to follow the product instructions.
    - Failure to perform preventive maintenance.
    - Problems caused by using accessories, parts, or components not supplied by Esco.
    - Damage by fire, floods, or acts of God.
    - Customer modifications to the product
- Consumables such as filters (HEPA, ULPA, carbon, pre-filters) and fluorescent / UV bulbs.
- Esco is not liable for any damage incurred on the objects used on or stored in Esco equipment. If the objects are highly valuable, user is advised to have in place independent external preventive measures such as connection to a centralized alarm system.

Factory installed, customer specified equipment or accessories are warranted only to the extent guaranteed by the original manufacturer. The customer agrees that in relation to these products purchased through Esco, our limited warranty shall not apply and the original manufacturer's warranty shall be the sole warranty in respect of these products. The customer shall utilize that warranty for the support of such products and in any event not look to Esco for such warranty support.

Esco encourages all users to register their equipment online at www.escoglobal.com/warranty or complete the warranty registration form included with each product.

ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN TIME TO THE TERM OF THIS LIMITED WARRANTY. NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THE LIMITED WARRANTY PERIOD HAS EXPIRED. ESCO DOES NOT ACCEPT LIABILITY BEYOND THE REMEDIES PROVIDED FOR IN THIS LIMITED WARRANTY OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, ANY LIABILITY FOR THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES, FOR PRODUCTS NOT BEING AVAILABLE FOR USE, OR FOR LOST WORK. ESCO'S LIABILITY WILL BE NO MORE THAN THE AMOUNT YOU PAID FOR THE PRODUCT THAT IS THE SUBJECT OF A CLAIM. THIS IS THE MAXIMUM AMOUNT FOR WHICH ESCO IS RESPONSIBLE.

These Terms and Conditions shall be governed by and construed in accordance with the laws of Singapore and shall be subject to the exclusive jurisdiction of the courts of Singapore.

Technical Support, Warranty Service Contacts
USA: 1-877-479-3726
Singapore: +65 65420833
Global Email Helpdesk: support@escoglobal.com
Visit http://www.escoglobal.com/ to talk to a Live Support Representative
Distributors are encouraged to visit the Distributor Intranet for self-help materials.

Product Appendix, Warranty Listings

Biological Safety Cabinets, Laminar Flow Cabinets, HEPA-Filtered Cabinets (except Streamline brand)	The warranty periods for BSC may vary by country. Contact your local distributor for specific warranty details.
Laboratory Fume Hoods	2 years limited.
Ductless Fume Hoods	4 years limited for Ascent Opti, 6 years for Ascent Max.
Cleanroom Equipment	1 year limited.
Laboratory Ovens and Incubators	1 year limited.
CO_2 Incubators	2 years limited.
Containment/Pharma Products	2 years limited.
Ultralow Temperature Freezer	5 years limited. 60 months on Compressor.

The warranty period starts two months from the date your equipment is shipped from Esco facility for international distributors. This allows shipping time so the warranty will go into effect at approximately the same time the equipment is delivered to the user. The warranty protection extends to any subsequent owner during the warranty period. Distributors who stock Esco equipment are allowed an additional four months for delivery and installation, providing the product is registered with Esco. User can register product online at www.escoglobal.com/warranty or complete the warranty registration form included with each product.

Policy updated on 1st January 2012 (This limited warranty policy applies to products purchased on or after 1st January 2012)

Introduction

1. Products Covered

Esco PowderMax Powder Weighing Balance Enclosure	
Electrical Rating	0.9 meters (3 feet)
220-240 V AC, 50Hz, 1Φ	PW1-3A1
110-130 V AC, 60Hz, 1Φ	PW1-3A2
220-240 V AC, 60Hz, 1Φ	PW1-3A3
100 V AC, 50/60 HZ, 1Φ	PW1-3A7

2. Safety Warning

- Anyone working with, on or around this equipment should read this manual. Failure to read, understand and follow the instructions given in this documentation may result in damage to the unit, injury to operating personnel, and / or poor equipment performance.
- Any internal adjustment, modification or maintenance to this equipment must be undertaken by qualified service personnel.
- The use of any hazardous materials in this equipment must be monitored by an industrial hygienist, safety officer or some other suitably qualified individual.
- Before you process, you should thoroughly understand the installation procedures and take note of the environmental / electrical requirements.
- In this manual, important safety related points will be marked with the symbol. ⚠
- If the equipment is used in a manner not specified by this manual, the protection provided by this equipment may be impaired.

3. Limitation of Liability

The disposal and / or emission of substances used in connection with this equipment may be governed by various local regulations. Familiarization and compliance with any such regulations are the sole responsibility of the users. Esco's liability is limited with respect to user compliance with such regulations.

4. European Union Directive on WEEE and RoHS

The European Union has issued two directives:

• Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE)

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:

Esco sells products through distributors throughout Europe. Contact your local Esco distributor for recycling/disposal.

• Directive 2002/95/EC on Restriction on the use of Hazardous Substances (RoHS)

With respect to the directive on RoHS, please note that this hood falls under category 8 (medical devices) and category 9 (monitoring and control instruments) and is therefore exempted from requirement to comply with the provisions of this directive.

Declaration of Conformation

In accordance to EN ISO/IEC 17050-1:2010

We, Esco Micro Pte. Ltd.
of 21 Changi South Street 1
Singapore, 486777
Tel: +65 6542 0833
Fax: +65 6542 6920

declare on our sole responsibility that the product:

Category : Powder Weighing Balance Enclosure
Brand : PowderMax
Model : PW1-3A1

in accordance with the following directives:

2006/95/EEC : The Low Voltage Directive and its amending directives
92/31/EEC : The Electromagnetic Compatibility Directive and its amending directives

has been designed to comply with the requirement of the following Harmonized Standard:

Low Voltage : EN 61010-1:2010
EMC : EN 61326-1:2006 Class B

More information may be obtained from Esco's authorized distributors located within the European Union. A list of these parties and their contact information is available on request from Esco.

XQ Lin
Group CEO, ESCO

This Declaration of Conformity is only applicable for 230V AC 50Hz units

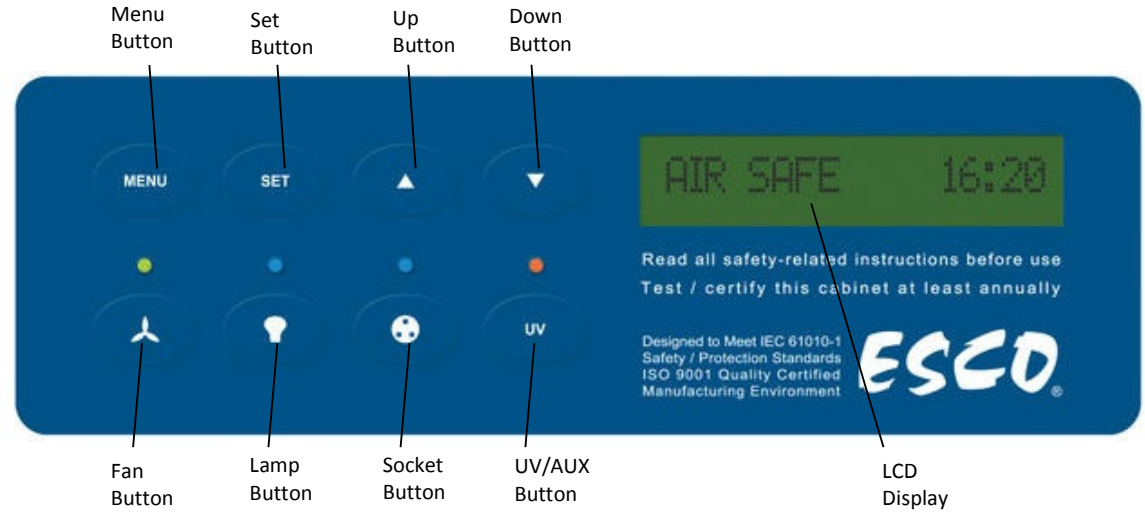
Chapter 1 - Product Information

1.1 Quick View

1. Sash Window
2. Baffle
3. ArmOpening
4. Sentinel Control System
5. Service Opening
6. Mobile Cart (Optional)

Chapter 2–Sentinel Control System

2.1 Sentinel Control System



1. Fan Button
   - Turns on and turn off the fan.

2. Lamp Button
   - Turns on and turn off the fluorescent lamps.

3. Socket Button
   - Not used.

4. UV/AUX Button
   - Not used.

5. Up (▲) and Down (▼) Arrow Button
   - Move the menu options upwards and downwards.
   - Increase and decrease corresponding value inside one of the menu options.
   - Accessing the stopwatch and experiment timer function.

6. Set or Mute Button
   - Choose the menu or sub-menu currently displayed on the LCD screen.
   - Proceed to the next step or sequence inside one of the menu options.

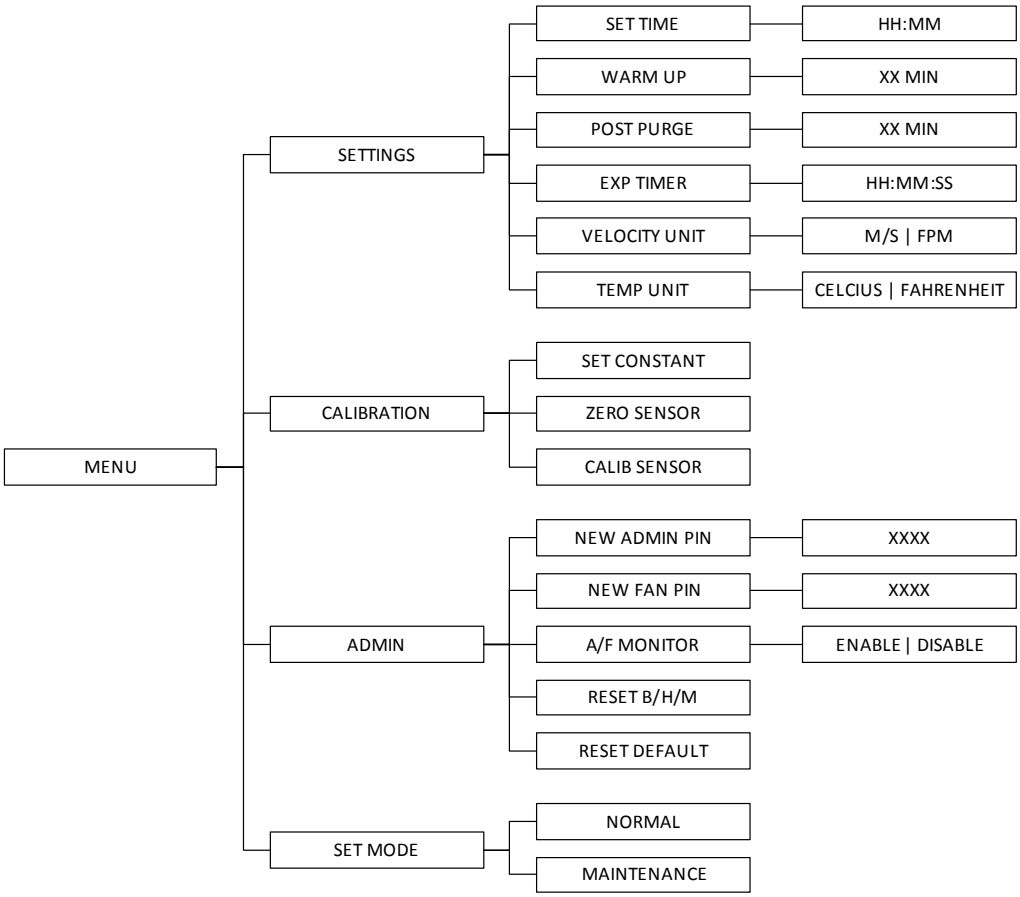
7. Menu Button

> *When you are entering menu options, the alarm will sound to indicate that the microprocessor is not monitoring the operation of the enclosure. No further warnings will be given.*

   - To enter and exit from the menu options.
   - To go back to the previous level of the menu options.
   - To access maintenance mode from error condition.

2.2 Menu Options

Please refer to the following diagram for complete reference to all menu options available.



2.2.1 Settings

Users may use the settings menu function to customize the operation of the enclosure to meet specific application requirements.

2.2.1.1 Set Clock (Time)

Users can set the time by increasing/decreasing the hour and minute values. The correct time will be maintained even after the unit is turned off.

2.2.1.2 Warm-up Time

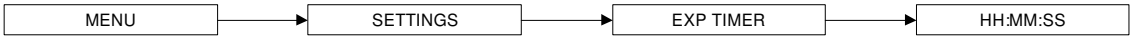
There will be a period of warm-up, before the fan is fully functioning. This is to ensure that the sensors, the blower, and the control system are stabilized, as well as purging the work zone of contaminants. The default setting is 3 minutes and the user can set it between 3 to 15 minutes.

2.2.1.3 PostPurge Time

After the user switches off the enclosureblower, there will be a post-purge period, to ensure that all contaminants are purged from the work zone. The default setting is zero minute (disable) and user can set it between 0 to 15 minutes. However, it is recommended to purge the enclosure for around 3 minutes after the work is complete.

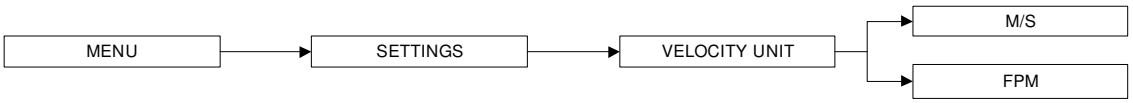
2.2.1.4 Experiment Timer

Experiment timer is a countdown timer that can be used for critical experiment. Experiment timer can be set between “00:00:00” and “17:59:59”.



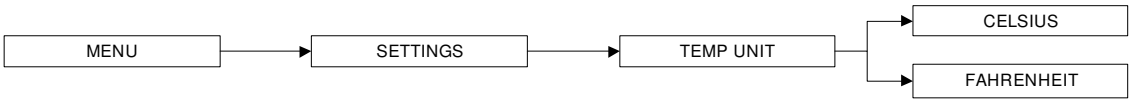
2.2.1.5Air Velocity Unit Selection

Using this option, the user can select the unit in which air velocity is measured and displayed. The user can choose between metric (m/s) and imperial (fpm).



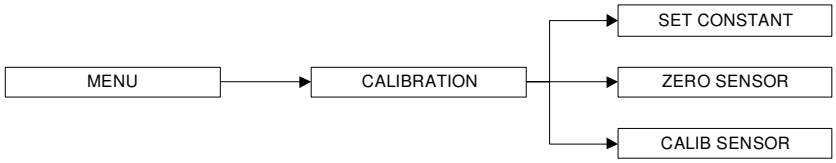
2.2.1.6Temperature Unit Selection

Using this option, the user can select the unit in which temperature is measured and displayed. The user can choose between Celsius and Fahrenheit.



2.2.2 Calibration

The purpose of calibration is to ensure the accuracy of the airflow display and alarm (if present). This involves measuring airflow with reference instrumentation and establishing reference between airflow sensor(s) on the enclosureto the standard reference. Calibration should only be carried out by trained personnel. This section presents a brief overview of the calibration menu function. For more information, refer to test report.



2.2.2.1 Set Constant

Every sensor manufactured by Esco has a specific sensorconstant which is used for temperaturecompensation performed by the temperature sensor.

2.2.2.2 Zero Sensor

This option is to let the controller record a specific sensor output voltage and correspond it to 0cmh or 0cfm.

2.2.2.3Calib Sensor

This option allows proper calibration and operation of the airflow sensor alarm. There are two points that have to be calibrated, namely airflow fail point and airflow nominal point

2.2.3 Admin Settings

The admin menu allows you to change both FAN and ADMIN PIN. The reset blowermeter functions are usually used after you change the bloweras they can easily give you the indication on when to do maintenance. While the reset default function will return the options in the settings menu to their factory settings.

2.2.3.1 New ADMIN PIN (default 0009)

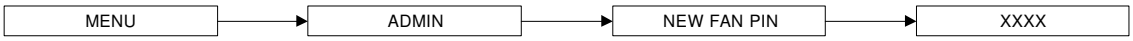
ADMIN PIN restricts access to some of the more delicate menu functions, namely admin and field calibration, which should only be accessed by a qualified personnel. User must enter four digits ADMIN PIN before accessing these menus.

ADMIN PIN can also be used to switch to maintenance mode from error condition.Setting the PIN to 0000 will disable this feature.

2.2.3.2 New FAN PIN (default 0000 - DISABLED)

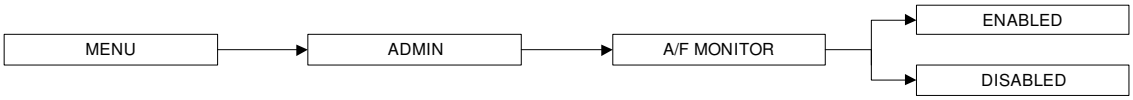
FAN PIN restricts access to fan control and some parts of the menu, settings and set mode. User must enter four-digit PIN before switching fan on or off. It is recommended that the Fan PIN be issued only to personnel authorized to use the enclosure.

Setting the PIN to 0000 will disable this feature.



2.2.3.3 Airflow Monitor

Whenever the air velocity falls below the fail point, the air fail alarm will be triggered. This option is used to enable/disable alarm. The alarm is enabled by default.



2.2.3.4 Reset B/H/M

This option is used to reset the blower hour meter. The blower hour meter indicates how long the blower has been in operation. This value can also provide some help in setting up maintenance schedule.

2.2.3.5 Reset Default

User can reset the default setting by choosing this option. The features being reset are warm-up period (3 minutes), post-purge period (0 minute), UV timer (60 minute), measurement unit (Metric), Airflow monitor (enabled), ADMIN PIN (0009), and FAN PIN (0000).

Note that the calibration settings cannot be reset as it may cause the enclosureto operate in an unsafe manner. The hour meters cannot be reset either.

2.2.4 Setting Mode

PW1 has two working mode; normal mode and maintenance mode.

2.2.4.1 Normal Mode

The normal mode is activated by factory default. In this mode, all alarms and interlocks are enabled.

2.2.4.2 Maintenance Mode

Maintenance mode should only be accessed by qualified personnel during maintenance. In this mode, all alarms are disabled and all interlocks are defeated.

Chapter 3 – Basic Enclosure Operation

3.1 Starting and Shutting Down the Enclosure

3.1.1 Turning on the Enclosure

1. Turn on the fan by pressing the FAN button. Input the Fan PIN if asked (if PIN ≠ 0000). This will start the warm up procedure (default: 3 minutes). All buttons are diabled during warm up period.
2. The enclosureis ready for work.

3.1.2 Turning off the Enclosure

1. Turn off the fan by pressing the FAN button. Input the Fan PIN if asked (if PIN ≠ 0000). This will start the post purge procedure (default: 0 minute). All buttons are disabled during post purge period.

3.2 Working in the Enclosure

- Surface-decontaminate the work area before and after using the enclosure.
- Allow the enclosureto purge any contaminant by allowing the blower to operate at least 3 minutes before and after using the enclosure.
- Minimize room activity (personnel movements, closing and opening of doors, etc.) since these external airflow disturbances may adversely affect the enclosure'sinternal airflow, thereby possibly impairing the containment capabilities of the enclosure.
- While working in the enclosure, move your hands slowly and in a controlled manner.
- PW1 uses alarms to indicate that the condition inside the enclosure is not safe for the operator, so check the LCD display to understand the cause of these alarms.

3.3 Stopwatch and Experiment Timer

- The stopwatch function can be started by pressing the UP button while the sash is closed. Pressing UP button again while the stopwatch function will stop and resume the timer. Pressing DOWN button will leave the stopwatch function and reset the timer. The timer in the stopwatch function is counting up and shown using the HH:MM:SS format.
- The experiment timer can be started by pressing the DOWN button while the sash is closed. Pressing DOWN button while the experiment timer function is working will stop and resume the timer. Pressing the UP button will leave the experiment timer function and reset the timer. The timer in the experiment timer function is counting down and shown using the HH:MM:SS format. Operator can use the SETTINGS | EXP TIMER menu (refer to section 2.2.1.4) to set the experiment timer.

3.3 Working Ergonomics

On most occasions, you would most likely be operating the enclosurein sitting rather than standing posture. There are some obvious advantages of the sitting posture:

- The physiological energy cost and fatigue involved in sitting are relatively less
- Sitting posture provides the body with a stable support

However, sitting position has some drawbacks too:

- The working area available is fairly limited
- There is a potential risk of being constrained in the same posture for a long time
- Sitting posture is one of the most stressful postures for one's back

Therefore you should pay careful attention to the following guidelines in order to achieve comfortable and healthy working conditions:

- Always ensure that your legs have enough legroom.
- Keep your lower back comfortably supported by your chair. Adjust the chair or use a pillow behind your back whenever necessary.
- You should place your feet flat on the floor or on a footrest. Don't dangle your feet and compress your thighs.
- You should keep varying your sitting position throughout the day at regular intervals so that you are never in the same posture for too long.
- Observe the following precautions with respect to your eyes:
    - Give your eyes frequent breaks. Periodically look away from the work area and focus at a distant point.
    - Keep your glasses clean.
- Arrange the items/apparatus frequently used in your work in such a way that you can minimize the physical strain involved in handling them.
- Exercise regularly

The enclosure'snoise emission has been tested and found to be in compliance with EN 12469, ISO 4871 and NSF/ANSI 49 which is important to ensure health and comfort for the operator.

Ergonomics accessories available with Esco include:

- Armrest padding
- Lab chair
- Footrest

Please contact your local distributor or Esco for more information.

Chapter 4–Service and Maintenance

4.1 Scheduled Maintenance

Proper and timely maintenance is crucial for trouble free functioning of any device and your Esco enclosureis no exception to this rule. We strongly recommend that you follow the maintenance schedule suggested hereunder in order to obtain optimal performance from your Esco enclosure.

No.	Description of Task to Perform	Maintenance to be carried out every			
		Week	Month	Quarter	1 Year
1	Clean the interior work surface, walls and sash	√			
2	Inspect alarm and measure basic airflow	√			
3	Inspect the controls of the enclosure		√		
4	Clean the exterior surfaces of the enclosure		√		
5	Check for any blockages at the hood baffles		√		
6	Inspect the enclosure's face velocity		√		
7	Inspect the enclosure for any physical abnormalities or malfunction			√	
8	Change the fluorescent lamps				√
9	Re-certification				√

Cleaning the enclosure

- Clean the work surface and walls with appropriate disinfectant agent and soap water afterward
- Clean the sash window using an appropriate disinfectant agent and glass cleaner afterward
- Use a damp cloth to clean the exterior surface of the enclosure, particularly on the front and top in order to remove dust that accumulated there
- Use clean water to finish the cleaning and wash away any residue of disinfectant agent, soapy water and glass cleaner.

Check the enclosure's functionality

- Check the enclosure's mechanical functionality; ex: sash window – lubricate if necessary
- Check the enclosure's electrical functionality; ex: fluorescent lamp – replace if necessary
- Check the enclosure's for any defect, repair immediately

Re-certification

All enclosuremust be re-certified annually by a certified engineer. See test report for recertification procedure.

4.2 Maintenance/Service Log

It is good practice (and in some cases regulatory requirement) to maintain a log of all maintenance work carried out on your enclosure.

APPENDIX

APPENDIX A: LOG RECORD

Cabinet : _____
Serial Number : _____
Person in Charge : _____

1. This log record should be used by the operator to record any new agent/virus/bacteria/germs that has been introduced to the cabinet during its operation, problems encountered, etc.
2. Any decontamination procedure performed by either the user or the technician should be recorded down as well.
3. Please also record any major maintenance procedure performed by the service technician, for example: parts replacement, recertification, etc.

Date	Event	User Signature	Supervisor Signature

In case of emergencies, please call:
Name : _____
Cell Phone Number : _____
E-mail : _____