# CONCEPT PLUS


## UM-019

## CONCEPT PLUS User Manual

*Affix Serial Number Here*

## Product Summary

Ruskinn anaerobic workstations are designed specifically to help microbiologists cope with rising workloads and provide the best primary isolation rates.

## Features and Benefits

- Quick and easy direct access with the gloveless, cuffed Ezeeyin Sleeve system.
- Single plate entry system (SPES) - standard on most models, this mailbox-like slot allows quick side entry or exit of individual plates, bypassing the interlock cycling process.
- Read plates easily without exposure to oxygen - energy-saving lighting provides perfect illumination.
- Up to 520 90mm plate capacity.
- Programmed to automate an interlock transfer -78 plates in 5 minutes.
- Optimum cell environment
    - Accurate temperature control - from ambient + 5˚C to 45˚C.
    - Accurate and automated humidity control - no dry spots.
    - Palladium catalyst maintains anaerobic environment - plus anaerobic colour-indicator strips verify anaerobic conditions.
    - Ezeeyin Sleeve system allows access without disrupting atmosphere within the chamber.
- Economic and reliable long-term savings
    - Standard dual gas operation - low gas consumption and running costs.
    - Minimal maintenance and downtime - with annual or biennial preventative maintenance kits available.

***Note.** The use of the word Interlock in this manual is medical terminology, and refers to the environmental working area between both chambers. It does not refer to the engineering safety interlock switch mechanism.

# Table of Contents

# 1. Overview and Safety Instructions

Please read this manual carefully to familiarise yourself with the operation and maintenance of the Concept Plus Workstation. **Note**: The workstation should be located in a well-ventilated area.

**For your safety, the safety of others using the workstation and those around you;**

- **The covers on both ends and the top of the workstation must not be removed by anyone other than a qualified service engineer. There are no end user serviceable parts within these covers.**
- **The AC Mains outlet that the Concept Plus workstation is connected to, MUST not be obstructed by the Concept Plus workstation or any other equipment, and MUST be accessible in case of emergency. In case of emergency, disconnect the Concept Plus workstation from the AC Mains Outlet.**
- **In case of damage to the Concept Plus workstation, disconnect the Concept Plus workstation from the AC Mains Outlet and contact your Local Distributor for advice**
- **The workstation must be connected to a protective earth.**
- **Only the power cord supplied with the workstation should be used to connect the workstation to the mains supply.**
- **Only Ruskinn Technology Limited replacement parts should be used.**
- **Gas regulators must be used for each gas supply. A 2 stage regulator should be used for a bottled gas supply. The maximum supply pressure permissible is 4 bar gauge.**
- **The maximum permissible concentration of Hydrogen in the anaerobic mixed gas is 5.5% Hydrogen.**
- **The mains supply voltage fluctuations must not exceed +/- 10% of the nominal mains voltage.**
- **The workstation must be disconnected from the mains supply before removing the front screen. The workstation must not be reconnected to the mains supply until the front screen has been reinstalled.**
- **Only the gasses specified in this manual may be used.**
- **The maximum power rating of the internal socket must not be exceeded.**
- **The humidifier tank screw cap must not be covered or blocked.**
- **The humidifier/ pressure relief tank must not be overfilled.**
- **The exhaust valve outlets must not be covered or blocked.**
- **The spot light should not be used continuously for more than 10 minutes. The spot light should be allowed to cool for at least 10 minutes between uses.**
- **The cooling fan covers and cooling vents must not be covered or blocked.**
- **The workstation should not be lifted by the glove ports, the interlock or the Single Plate Entry System.**
- **If an Uninterruptable Power Supply (UPS) system is used, both the Concept Plus workstation and the $ICO_2N_2IC$ Advanced gas mixer system must be connected to the Uninterruptable Power Supply (UPS) system.**
- **The weight limit for the rear shelf is 12.5kg. The weight must be evenly distributed.**
- **The weight limit for the interlock floor tray is 4kg. The weight must be evenly distributed.**
- **The use of Radioactive materials in the Concept Plus is strictly prohibited.**

**FAILURE TO ADHERE TO THESE SAFETY INSTRUCTIONS COULD CAUSE SERIOUS INJURY AND WILL INVALIDATE THE WORKSTATION WARRANTY. RUSKINN TECHNOLOGY LIMITED ACCEPTS NO RESPONSIBILITY FOR ANY ACCIDENT, INJURY OR LOSS CAUSED BY UNSAFE OPERATION OF THE WORKSTATION**

## 1.1 Regulatory compliance

CE

This product complies with the essential EEA requirements for Electrical Safety and the Low Voltage Directive 2006/95/EC as well as Electromagnetic compatibility as set out in the EMC Directive 204/108/EC.

## 1.2 Symbols

Before using the Concept Plus, please ensure that you are familiar with the symbols on the Concept Plus. Figure 1 explains the symbols found on the Concept Plus;

**Figure 1: Concept Plus symbols**

| Symbol | Meaning |
|---|---|
|  | Refer to user manual. |
| ~ | Alternating current |
| O | Off |
| I | On |
|  | Primary earth connection |
| CE | This product complies with the essential EEA requirements for Electrical Safety and Electromagnetic compatibility as set out in the EMC directive 2004/108/EC and the Low Voltage Directive 2006/95/EC |
|  | Caution, do not remove covers. No end user serviceable parts behind covers. Please refer to this manual in all cases where this symbol appears, in order to find out the nature of the Potential Hazard and actions to be taken in order to avoid the Hazard. |

| Symbol | Meaning |
|---|---|

| | |
|---|---|
|  | Warning, this equipment contains high voltage circuitry. |
|  | Warning:<br>Do not use toxic or Flammable substances inside the incubator. |
|  | CONCEPT Plus contains hazardous components and must not be disposed of at a household waste site. Instead it should be taken to the appropriate collection point for the recycling of electrical and electronic equipment. |
|  | Date of manufacture in format<br>YYYY MM |

## 1.3 Installation and relocation

Concept PLUS should only be installed or relocated by a qualified engineer. To arrange installation or relocation, please contact your local distributor.

## 1.4 Weight and dimensions

The Concept Plus workstation weighs approximately 80kg. Figure 2 lists the dimensions of the Concept Plus workstation.

**Figure 2: Weight and dimensions**

| | |
|---|---|
| External width | 1586 mm |
| External height | 725 mm |
| External depth | 714 mm |
| Workstation chamber internal width | 1050 mm |
| Workstation chamber internal height | 479 mm |
| Workstation chamber internal depth | 575 mm |
| Interlock internal width | 320 mm |
| Interlock internal height | 300 mm |
| Interlock internal depth | 314 mm |
| Interlock outer door clear opening width | 300 mm |
| Interlock outer door clear opening height | 250 mm |
| Interlock inner door clear opening width | 230 mm |
| Interlock inner door clear opening height | 255 mm |

# 2. Gas and electrical supply requirement

## 2.1 Gas supply requirements

The Concept Plus workstation requires 2 gas supplies;

- Oxygen free nitrogen.
- Anaerobic mixed gas.

**The maximum permissible concentration of hydrogen in the anaerobic mixed gas is 5.5%. The use of any other gas(ses) will invalidate the warranty and may cause serious injury. The Gas supplies must be securely fastened after installation.**

## 2.2 Gas regulator requirements

Gas regulators must be used with all gas supplies to the workstation. A 2 stage regulator must be used for each bottled gas supply. Regulators should be available from your local gas supplier. Ruskinn Technology Limited does not supply gas regulators.

The gas regulator should provide a minimum supply pressure of 3 bar gauge. The maximum supply pressure permissible is 4 bar gauge. A supply pressure greater than this will damage internal components of the workstation and will invalidate the warranty.

**Figure 3: Gas Requirements**

| Gas | Regulator output pressure |
|---|---|
| Nitrogen ($N_2$) | 42 to 49psi (3 to 3.5 bar) |
| **Anaerobic gas mix:**<br>$H_2$ (no greater than 5.5%)<br>$Co_2$ (no greater than 10% normally 5%)<br>$N_2$ to make up the remainder (89.5%) | 42 to 49psi (3 to 3.5 bar) |

## 2.3 Electrical supply requirements

The workstation must be connected to a mains power supply. A power cord is supplied to connect the workstation to the mains supply. Only the power cord supplied should be used to connect the workstation to the mains supply. It is advised that the workstation be located no greater than 1 metre from the plug socket. The plug socket should not be obstructed by the Concept Plus workstation. The workstation must be connected to a protective earth.

## 2.4 Voltage and frequency requirements

To ensure safe operation of the workstation, it must be connected to a supply of the correct voltage and frequency, as shown in the rating label (item 3 Figure 9). The mains supply voltage fluctuations must not exceed +/- 10% of the nominal mains voltage.

## 2.5 Power consumption

Figure 4 shows the power consumption ratings;

**Figure 4: Power consumption**

| Supply voltage and frequency | Power consumption |
|---|---|
| 240V AC, 50Hz | 200W |
| 110V AC, 60Hz | 250W |

**Note** that the power consumption is for normal operating conditions with no equipment connected to the internal power supply. Power consumption will vary dependent upon the conditions inside the workstation chamber and the conditions inside the room the workstation is located in.

## 2.6 Powering the workstation

To switch the workstation on, press the power switch (item 5 in Figure 15).

**Note** that after switching the workstation on, the commissioning cycle MUST be run before using the workstation (see Section 6.1). To switch the workstation off, press the power switch (item 5 in Figure 15).

The commissioning cycle floods the inside of the workstation with anaerobic gas to enable the removal of all oxygen.

**Note**: A glove port should be left open when the workstation is switched off, as the pressure inside the workstation will decrease as the workstation cools. The open glove port will allow the pressure inside the workstation chamber to equalise with the external pressure.

# 3. Workstation overview

## 3.1 Workstation layout

The Concept Plus workstation consists of 2 main areas; the workstation chamber and the interlock chamber. The workstation chamber is the main working area of the workstation. Access to the workstation chamber is provided by the glove ports, the Single Plate Entry System (SPES) and the interlock. The interlock consists of the interlock chamber, with an inner and outer door and a sliding floor tray. The Concept PLUS workstation is controlled via the control panel.

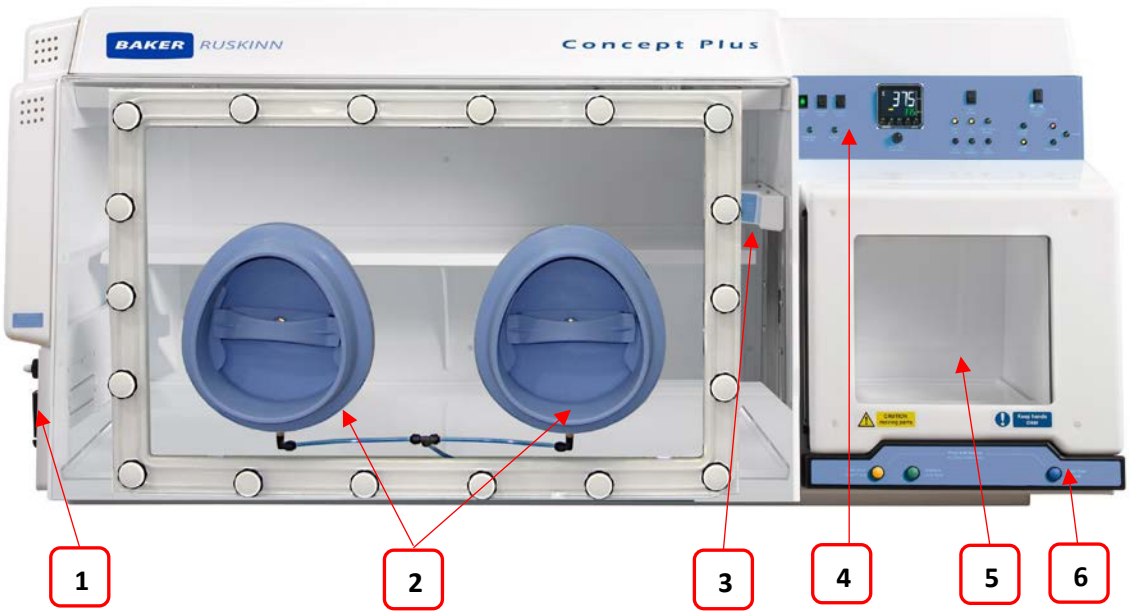
## 3.2 Component layout

Please familiarise yourself with the layout of your Concept Plus workstation.

### 3.2.1 Concept Plus Workstation Front view

Figure 5 shows the front view of the Concept Plus workstation;

**Figure 5: Concept Plus workstation front view with removable screen**

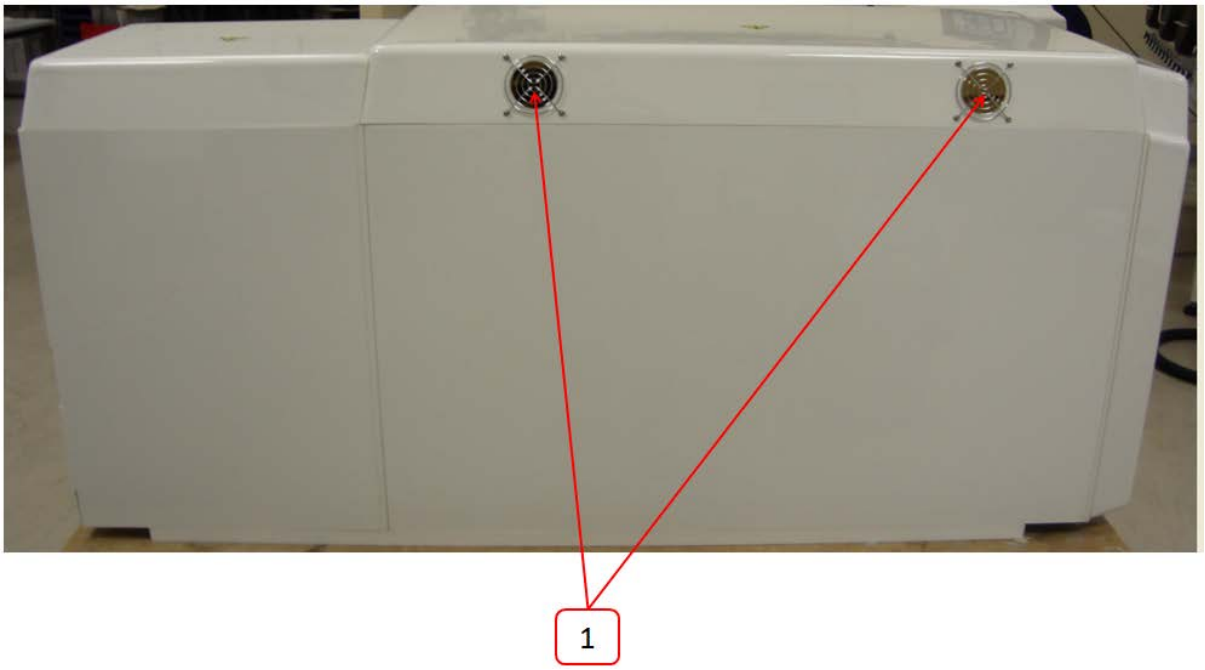



1. Single Plate Entry System (SPES).
2. Glove ports (shown without Ezee Sleeves).
3. Interlock inner door control panel.
4. Control panel.
5. Interlock outer door.
6. Interlock outer door control panel.

### 3.2.2 Rear view

Figure 6 shows the rear view of the Concept Plus workstation;

**Figure 6: Concept Plus workstation rear view**

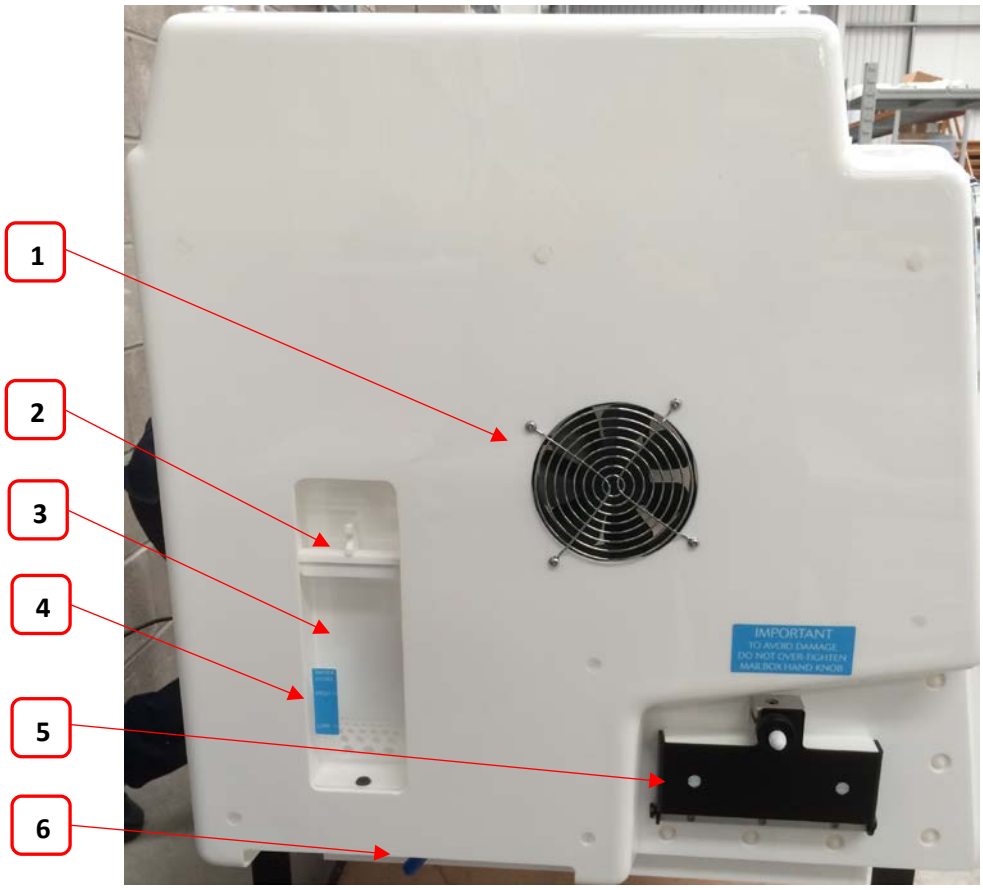



1. Cooling vent outlets.

### 3.2.3 Left side view – Standard humidifier

Figure 7 shows the left side view of the Concept Plus workstation with the standard humidifier.

**Figure 7: Concept Plus workstation left side view with standard humidifier**



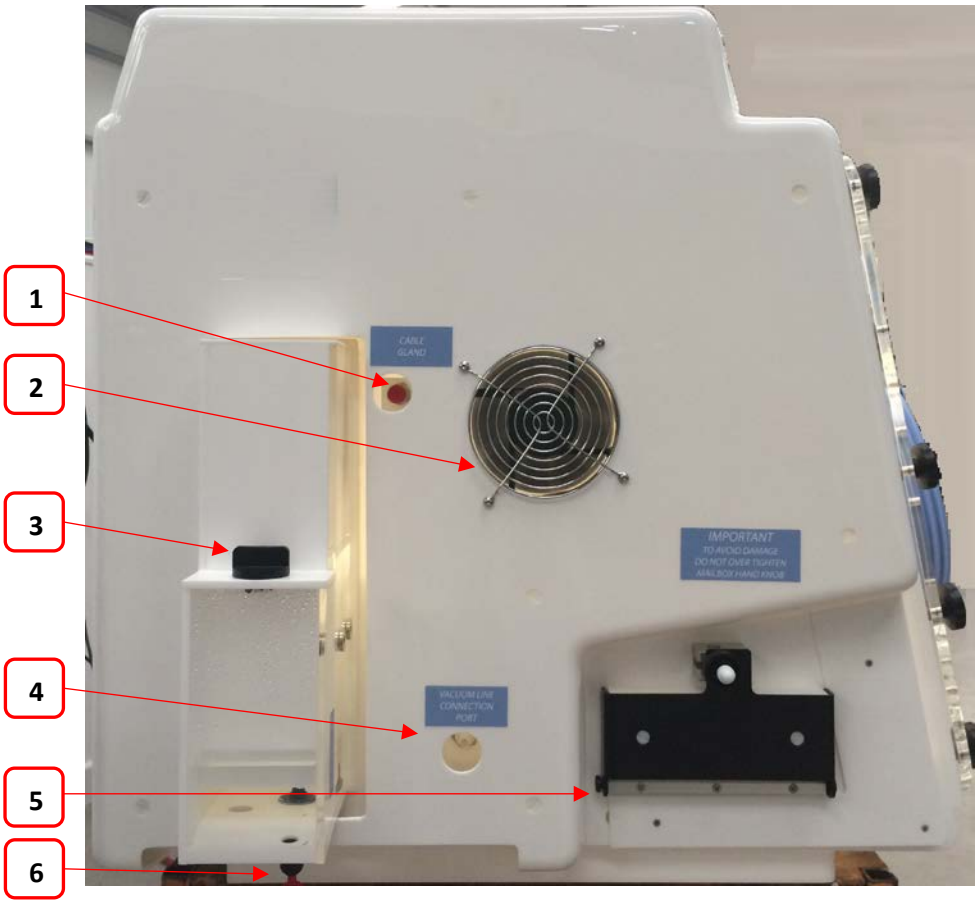

1. Condenser fan.
2. Pressure relief tank cover (pressure relief tank bung).
3. Pressure relief tank.
4. Pressure relief tank label.
5. Single Plate Entry System (SPES).
6. Pressure relief tank overflow pipe.

**Note:** Please locate a suitable container below the tubing to collect any excess water from the pressure relief tank overflow tube.

### 3.2.4 Left side view – Ultrasonic humidifier

Figure 8 shows the left side view of the Concept Plus workstation with the ultrasonic humidifier.

**Figure 8: Concept Plus workstation left side view with ultrasonic humidifier**



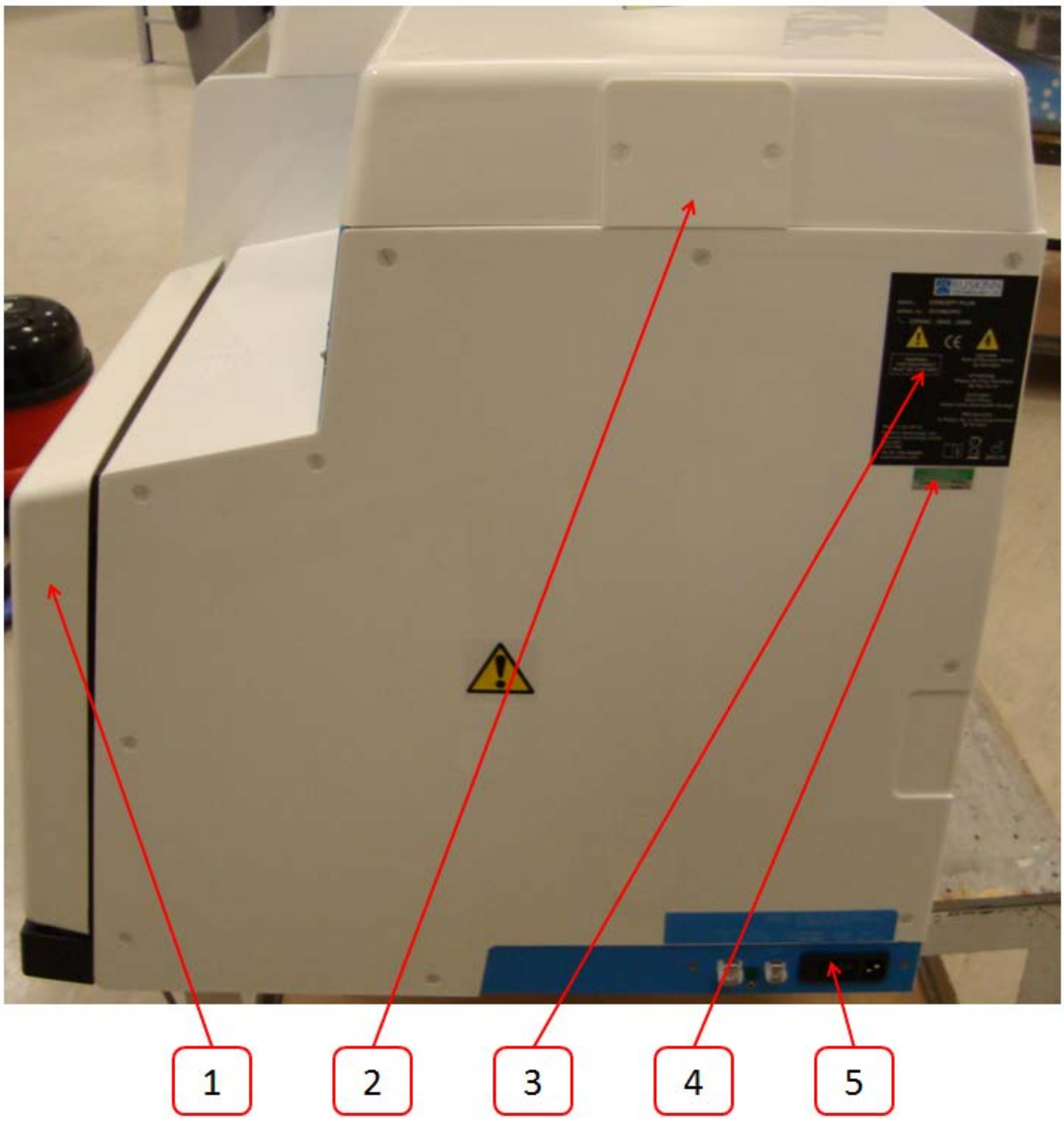

1. Cable gland (optional extra).
2. Condenser fan.
3. Humidifier tank screw cap.
4. Vacuum port.
5. Single Plate Entry System (SPES).
6. Pressure relief tank overflow.

**Note**: The humidifier tank screw cap also provides pressure relief for the workstation chamber. For this reason, do not cover the humidifier tank screw cap.

### 3.2.5 Right side view

Figure 9 shows the right side view of the Concept Plus workstation;

**Figure 9: Concept Plus workstation right side view**




1. Interlock outer door.
2. Commissioning cycle cover.
3. Serial number label.
4. Portable appliance test (PAT test) label.
5. Power entry panel.

## 3.3 Control system layout

The control system layout varies by model. Please familiarise yourself with the control system layout of your Concept Plus workstation.

### 3.3.1 Control panel – Standard humidity control

Figure 10 shows the control panel of Concept Plus workstations equipped with standard humidity control;

**Figure 10: Concept Plus workstation control panel**


1. **Power indicator**. Illuminates to indicate the workstation is connected to the mains power supply and is switched on.
2. **Chamber light switch**. Press to switch the chamber light on / off. The chamber light switches off automatically after 1 hour.
3. **Internal socket switch**. Press to switch the internal socket on / off.
4. **Temperature controller**. See section 3.3 for more details.
5. **$ANO_2$ low**. Illuminates to indicate low pressure in the anaerobic mixed gas supply to the workstation, indicating that the anaerobic mixed gas cylinder needs replacing.
6. **$N_2$ low**. Illuminates to indicate low pressure in the nitrogen supply to the workstation, indicating that the nitrogen cylinder needs replacing.
7. **Gas alarm switch**. Press to switch the gas alarm on / off.
8. **Com. Cycle active**. Illuminates to indicate that the commissioning cycle is active.
9. **Interlock purge cycle selector**. Switches between the standard interlock cycle (5 minutes) and the economy interlock cycle (4 minutes).
10. **Interlock cycle status aerobic indicator**. Illuminates to indicate that the interlock chamber is in an aerobic condition and requires purging.
11. **Interlock cycle status purge indicator**. Illuminates to indicate that the interlock purge cycle is in progress.
12. **Interlock cycle status anaerobic indicator**. Illuminates to indicate that the interlock chamber is in an anaerobic condition.
13. **Inner door indicator**. Illuminates to indicate that the interlock inner door is open.
14. **Outer door indicator.** Illuminates to indicate that the interlock outer door is open.
15. **Gas excess**. Illuminates to indicate that the gas excess system has activated.
16. **Gas demand indicator**. Illuminates to indicate a low pressure condition inside the workstation chamber.
17. **Gas change**. Illuminates to indicate that the auto gas change system has activated.
18. **Humidistat**. See section 4.3.1, more details.
19. **Socket on indicator**. Illuminates to indicate that the internal socket is switched on.

20. **Condenser fan indicator**. Illuminates to indicate the condenser fan is running.

**Note:** The interlock purge cycle selector (item 10) is an optional extra. The button is fitted to all workstations to blank the hole in the control panel if it is not in use. The interlock purge cycle user selected time option must be specified at time of order; it is not available as an aftermarket upgrade.

### 3.3.2 Control panel – Ultrasonic humidity control

Ultrasonic humidity control is available as an optional extra on the Concept Plus. Ultrasonic humidity is only available at time of order and is not available as an aftermarket upgrade. Figure 11 shows the control panel for Concept Plus workstations equipped with ultrasonic humidity;

**Figure 11: Control panel for Concept PLUS workstations with ultrasonic humidity**


1. **Power indicator**. Illuminates to indicate the workstation is connected to the mains power supply and is switched on.
2. **Chamber light switch**. Press to switch the chamber light on / off. The chamber light switches off automatically after 1 hour.
3. **Internal socket switch**. Press to switch the internal socket on / off.
4. **Temperature controller**. See section 3.3.3, for more details.
5. **$ANO_2$ low**. Illuminates to indicate low pressure in the anaerobic mixed gas supply to the workstation, indicating that the anaerobic mixed gas cylinder needs replacing.
6. **Gas alarm switch**. Press to switch the gas alarm on / off.
7. **$N_2$ low**. Illuminates to indicate low pressure in the nitrogen supply to the workstation, indicating that the nitrogen cylinder needs replacing.
8. **Com. Cycle active**. Illuminates to indicate that the commissioning cycle is active.
9. **Interlock purge cycle selector**.
10. **Condenser fan indicator**. Illuminates to indicate the condenser fan is running.
11. **Socket on indicator**. Illuminates to indicate that the internal socket is switched on.
12. **Humidity controller.** See section 3.3.3, for more details.
13. **Gas change**. Illuminates to indicate that the auto gas change system has activated.
14. **Gas demand indicator**. Illuminates to indicate that gas is being injected into the workstation.
15. **Gas Excess.** Illuminates to indicate that the gas excess system has activated.
16. **Inner door indicator**. Illuminates to indicate that the interlock inner door is open.
17. **Outer door indicator**. Illuminates to indicate that the interlock outer door is open.

18. **Interlock cycle status aerobic indicator**. Illuminates to indicate that the interlock chamber is in an aerobic condition and requires purging.
19. **Interlock cycle status purge indicator**. Illuminates to indicate that the interlock purge cycle is in progress.
20. **Interlock cycle status anaerobic indicator**. Illuminates to indicate that the interlock chamber is in an anaerobic condition.

**Note** that the internal socket switch (item 3) is fitted to all concept workstations. The interlock purge cycle selector (item 9) is an optional extra. The button is fitted to all workstations to blank the hole in the control panel if it is not in use. The interlock purge cycle user selected time option must be specified at time of order; it is not available as an aftermarket upgrade.

### 3.3.3 Temperature controller / ultrasonic humidity controller

Figure 12 shows the temperature / ultrasonic humidity controller;

**Figure 12: Temperature / ultrasonic humidity controller**


1. Not user accessible (For service personnel only)
2. Not user accessible (For service personnel only)
3. Number scrolling button. Use to move across digits. Use with buttons 4 & 5 to increase and decrease the temperature.
4. Decrease temperature (0.1°C increments) or humidity.
5. Increase temperature (0.1°C increments) or humidity.

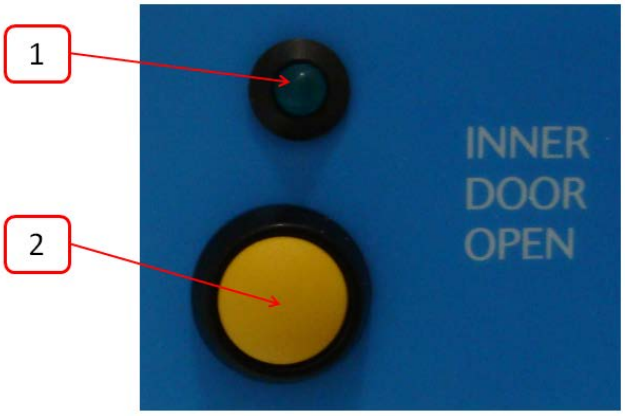
For temperature control, the white value (PV- Process Value) is the actual temperature. The green value (SV- Set Value) is the required value (the set point). All temperatures are in °C.

For ultrasonic humidity control, the white value is the actual relative humidity and the green value the required relative humidity (the set point). All humidity's are percentage relative humidity.

### 3.3.4 Interlock inner door control panel

Figure 13 shows the interlock inner door control panel;

**Figure 13: Interlock inner door control panel**




1. Inner door LED indicator. Illuminates to indicate when the interlock inner door is available.
2. Inner door button. Press to unlock the interlock inner door (when available).

### 3.3.5 Foot switch control panel

Figure 14 shows the foot switch controller which is used to operate the spot light and for glove port operation.

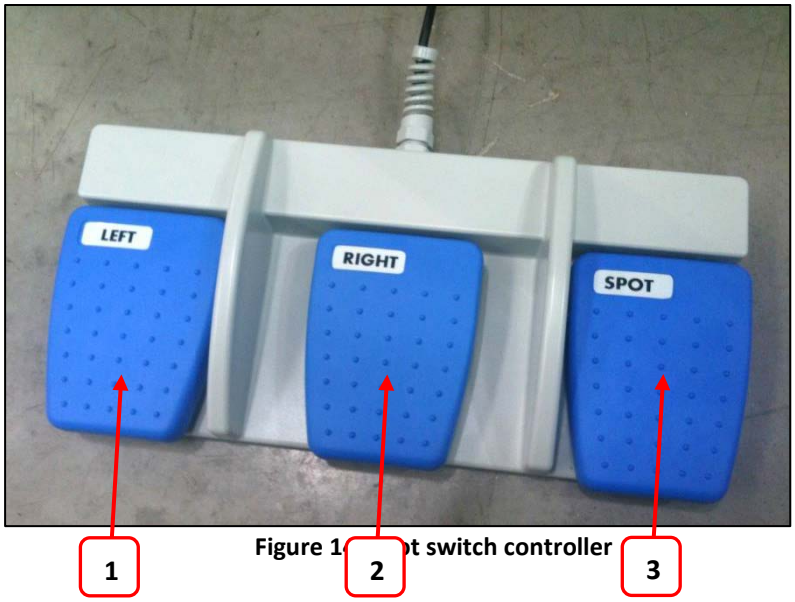


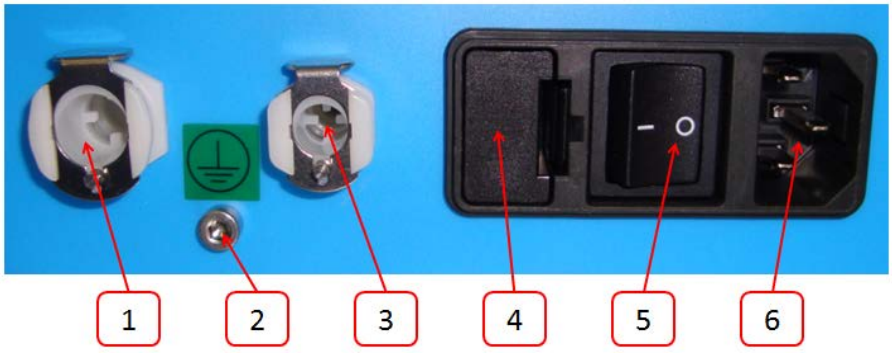

**Figure 1[illegible]t switch controller**

1. Left for Left hand side glove port
2. Right for Right hand side glove port
3. Spot for spotlight operation

### 3.3.6 Power entry panel

Figure 15 shows the power entry panel;

**Figure 15: Power entry panel**

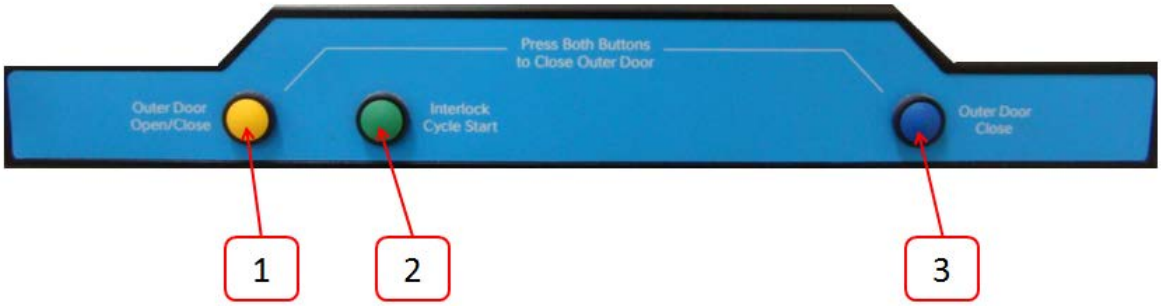



1. Nitrogen inlet.
2. Primary earth stud.
3. Anaerobic mixed gas inlet.
4. Mains fuse holder.
5. On / off switch.
6. Power cord inlet.

### 3.3.7 Interlock outer door control panel

Figure 16 shows the interlock outer door control panel;

**Figure 16: Interlock outer door control panel**




1. Outer door open / close button. Press individually to open the interlock outer door. Press the open and outer door close button (item 3) to close the interlock outer door.
2. Interlock cycle start button. Press to start the interlock purge cycle.
3. Outer door close button. Press with outer door open / close button (item 1) until the outer door indicator (item 16 Figure 10 or item 17 Figure 11) goes out to close the interlock outer door.

# 4. Temperature and humidity control

## 4.1 Temperature control

The Concept PLUS workstation can control the workstation chamber temperature between ambient Plus 5°C and 45°C.

The temperature in the main chamber can be set using the temperature controller on the control panel.

## 4.2 Setting the temperature;

Refer to Figure 12:

- To decrease the temperature set point, press button 4.
- To increase the temperature set point, press button 5.

The temperature set point will increase or decrease in intervals of 0.1°C.

## 4.3 Humidity control

The Concept PLUS workstation controls the humidity of the workstation chamber from ambient to 85% relative humidity.

Note that any equipment installed in the workstation chamber must be suitable for the humidity level inside the workstation chamber. If in doubt, consult the owner's manual for any equipment that is installed in the workstation chamber. Ruskinn Technology Limited accepts no responsibility for damage to any equipment installed in the workstation chamber that is not suitable for the conditions inside the workstation chamber.

### 4.3.1 Standard humidity control

To control the humidity of the workstation chamber using the humidistat (item 12 in Figure 10).

- To increase the humidity, rotate the humidistat clockwise.
- To decrease the humidity, rotate the humidistat anti-clockwise (counter-clockwise).

For Concept PLUS workstations fitted with standard humidity, a Petri dish/ tray of distilled water should be placed in the workstation chamber to provide the humidity source for the workstation chamber.

### 4.3.2 Ultrasonic humidity control

To control the humidity of the workstation chamber using the humidity controller (item 12 in Figure 11)

Referring to Figure 12;

- To decrease the humidity set point, press button 4.
- To increase the humidity set point, press button 5.

# 5. Environmental gas composition control

The Concept PLUS workstation provides an anaerobic (oxygen free) environment for the incubation of samples and cultures.

## 5.1 Environmental control overview

To provide an anaerobic environment, anaerobic mixed gas is injected into the workstation chamber. The hydrogen in the anaerobic mixed gas reacts with any oxygen in the workstation chamber in the presence of a catalyst to form water. The excess water is then removed by the humidity control system.

## 5.2 Using the anaerobic indicator strips

Anaerobic indicator strips are provided with the Concept PLUS to verify that the conditions inside the workstation chamber are anaerobic. Additional anaerobic indicator strips can be ordered from your local supplier. The anaerobic indicator strips should be stored sealed and at between 2$^{o}$C and 8$^{o}$C. To check the condition of the environment inside the workstation chamber using the anaerobic indicator strips;

- Open the interlock outer door (Section 6.2.2 for more detail).
- Place the anaerobic indicator strips in the interlock.
- Close the interlock outer door (Section 6.2.2 for more detail).
- Start the interlock purge cycle by pressing the interlock cycle start button (item 2 in Figure 16.)
- Access the workstation chamber via the Ezee Sleeves (see section 6.2.3, for more details).
- Open the interlock inner door (see section 6.2.3, for more details).
- Remove the anaerobic indicator strips from the interlock.
- Close the interlock inner door (see section 6.2.3, for more details).
- Open the packet of anaerobic indicator strips. Take care not to touch the anaerobic indicator strips.
- If the strip stays white, the environment is anaerobic. If the strip turns pink, there is oxygen in the environment.

**Note**: The anaerobic indicator strips should not be opened outside of the workstation chamber. Take care not to touch the anaerobic indicator strips, as this will cause them to turn pink. It is recommended that gloves are worn when using the anaerobic indicator strips.

## 5.3 Gas excess alarm/ auto gas saver system

To prevent excess gas consumption, the Concept Plus workstation is fitted with an auto gas saver system. If a significant leak occurs (for example, the SPES has been left open or the humidifier/ pressure relief tank is empty), the gas excess indicator (item 15 in Figure 10 or item 15 in Figure 11) will flash and the alarm will sound. In addition to this;

- The workstation will not inject gas into the workstation chamber.
- Gas demand is disabled.
- The interlock purge cycle is disabled.

To reset the gas excess alarm/ auto gas saver system;

- Ensure that the source of the leak has been found and corrected.
- Open the interlock outer door (see section 6.2.2, for more details).
- Press and hold the interlock cycle start button (item 2 Figure 16) for 5 seconds.
- Close the interlock outer door (see section 6.2.2, for more details).

## 5.4 Auto gas change system

The Concept Plus workstation has an auto gas change system. The auto gas change system maintains an anaerobic environment in the workstation chamber if the anaerobic mixed gas supply runs out. The auto gas change system will automatically switch from anaerobic mixed gas to nitrogen to maintain the pressure in the workstation chamber. Once the anaerobic mixed gas supply has been restored, the auto gas change system will automatically switch back to using anaerobic mixed gas to maintain the pressure in the workstation chamber.

# 6. Using the workstation

## 6.1 Commissioning cycle

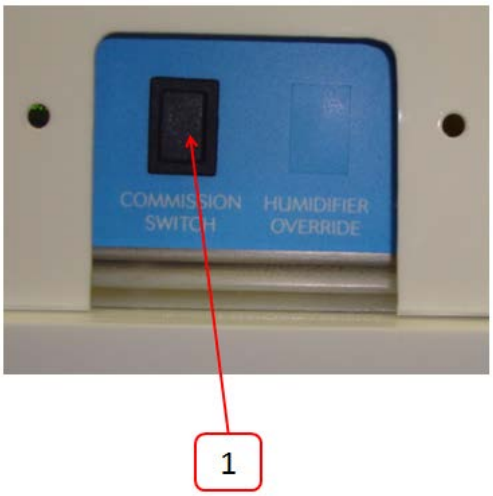
Before using the Concept Plus workstation for the first time, it must be commissioned. **The commissioning cycle must be run every time the workstation has been powered off for a long time or moved.**

**In the event of a short power interruption a "Commission Bypass" function can be used (in models from May 2013 onwards). Please refer to section 6.1.1.**

To run the commissioning cycle;

- Undo the 2 screws holding the commissioning cycle switch cover (item 2 in Figure 9) by turning anti-clockwise (counter-clockwise) using a flat bladed screw driver.
- Remove the commissioning cycle switch cover. The commission switch will then be visible, Figure 17;

**Figure 17: Commission switch**




1. Commission switch

- Switch the workstation on by pressing the on/ off switch (item 5 in Figure 15)
- Fill the pressure relief/ humidifier tank.
- Ensure that the gas supplies to the workstation are connected.
- Open the interlock inner door.
- Press the commission switch (item 1 in Figure 17).
- Wait for the commissioning cycle to run. The commissioning cycle takes approximately 25 minutes.
- When the commissioning cycle has completed, the inner door LED indicator (item 1 in Figure 13) will flash.
- Close the interlock inner door. The inner door LED indicator (item 1 in Figure 13) and the com cycle active LED indicator (item 9 Figure 10 in or item 8 in Figure 11) will stop flashing.
- Replace the commissioning cycle cover and secure by tightening the 2 screws by turning them clockwise using a flat bladed screw driver. Take care not to over tighten or cross thread the screws.

### 6.1.1 Commission Bypass

In the event of a short power interruption, the commission bypass function can be used, to bypass the commissioning cycle.

To run the bypass function

- Leave the interlock inner door closed.
- Undo the 2 screws holding the commissioning cycle cover (item2 in Figure 9) by turning anti-clockwise (counter-clockwise) using a flat bladed screw driver.
- Remove the commissioning cycle cover. The commission switch will then be visible as shown in Figure 17;
- Press and hold the commissioning switch for 5 seconds (this will bypass the commissioning cycle).
- The unit will then function as if a commissioning cycle has been completed.

## 6.2 Using the interlock

The Concept PLUS workstation has a 28.8 litre interlock for transferring materials and samples into and out of the workstation chamber. Concept Plus workstations can enable a purge facility in the interlock when placing items into the workstation.

As an optional extra (HEPA protection option) the purge facility can be operated for both entering and exiting the workstation. When transferring samples out of the workstation the interlock purge cycle must be run before the interlock outer door can be opened.

### 6.2.1 Interlock overview

The interlock consists of 4 main components;

- Interlock outer door.
- Interlock inner door.
- Interlock chamber.
- Interlock floor tray.

The interlock is accessed by opening either the outer or inner door. Note that both doors cannot be open at the same time.

### 6.2.2 Operating the interlock outer door

Before opening the interlock outer door, check that the interlock inner door is closed. To open the interlock outer door, press button 1 in Figure 16. The interlock door will automatically slide up. To close the interlock outer door, press buttons 1 and 3 in Figure 16 simultaneously. The door will automatically slide down. Once the door has located, the door seal will inflate.

### 6.2.3 Operating the interlock inner door

The interlock inner door can only be opened if the interlock has been purged, indicated by the interlock cycle status anaerobic (item 20 in Figure 10) being illuminated. To open the interlock inner door;

- Access the workstation chamber via the Ezee Sleeves.
- Press the interlock inner door button (item 2 in Figure 13).
- Slide the interlock inner door backwards to open.

To close the interlock inner door, slide the interlock inner door forwards.

**Note:** The interlock inner door should only be open when transferring materials from the interlock chamber to the workstation chamber and vice versa. The interlock inner door can be opened and closed as often as required to transfer material, providing the outer door has not been opened.

### 6.2.4 Transferring material into the workstation chamber via the interlock

To transfer material into the workstation chamber via the interlock;

- Open the interlock outer door.
- Place the required items on the interlock tray. The weight limit for the interlock floor tray is 4kg.
- Close the interlock outer door.
- Start the interlock purge cycle by pressing the interlock cycle start button (item 2 in Figure 16).
- Access the workstation chamber via the Ezee Sleeves.
- When the interlock purge cycle has completed, indicated by the interlock cycle status anaerobic (item 20 in Figure 10) being illuminated, press the inner door button (item 2 in Figure 13).
- Slide the interlock inner door backwards to open the interlock door.
- Slide the interlock floor tray into the workstation chamber by pulling it to the left.
- Move the material from the interlock chamber into the workstation chamber.
- Slide the interlock floor tray into the interlock chamber by pushing it right.
- Close the interlock inner door by sliding the interlock inner door forward.

### 6.2.5 Removing material from the workstation chamber via the interlock

To remove material from the workstation chamber via the interlock;

- Open the interlock inner door by pressing the inner door button (item 2 in Figure 13) and sliding the interlock inner door backwards.
- Slide the interlock floor tray into the workstation chamber by pulling it to the left.
- Move the material from the workstation chamber into the interlock chamber.
- Slide the interlock floor tray into the interlock chamber by pushing it right.
- Close the interlock inner door by sliding the interlock inner door forwards.
- Exit the workstation chamber via the Ezee Sleeves.
- Open the interlock outer door.
- Remove the material from the interlock chamber.
- Close the interlock outer door.

## 6.3 Hand access to the main chamber

Direct hand access to the workstation chamber is provided via the glove ports and Ezeeyin Sleeve system.

The glove ports and Ezee Sleeves can be used in 3 ways;

- Left hand glove port only, for loading items into the workstation chamber via the Single Plate Entry System (SPES).
- Both glove ports, for working inside the workstation chamber, loading items into the workstation chamber via the SPES and unloading the interlock.
- Right hand glove port only, for loading / unloading the interlock.

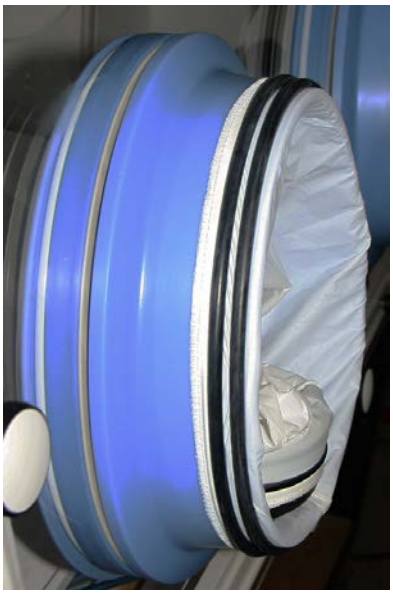
### 6.3.1 Ezeeyin Sleeve System Overview

The Ezeeyin system consists of Ezee Sleeve and a cuff.

- The sleeve attaches to the glove port via 2 O-rings.

**Note:** The workstation should not be used without the Ezee Sleeves attached.

**Figure 18: Glove port selector knob positioning**



### 6.3.2 Vacuum Operation

To ensure that no external atmosphere contaminates the workstation, a single vacuum operation is required before Glove Port access. To minimise the time, it is recommended to eliminate as much external atmosphere from the sleeve as possible prior to arm entry. This can be achieved by compressing the Sleeve before inserting the hand and arm as shown in Figure 19.

**Figure 19: Removing atmosphere from sleeve**

- Hold the desired Ezee Sleeve cuff with the opposite hand.
- Support the Ezee Cuff, push the hand through the cuff of the Ezee Sleeve.
- Insert the arm and grasp the Glove port handle in preparation for the vacuum stage, using the foot pedals.

  **Note**: Failure to grasp the Handle at this stage will make grasping it after the vacuum operation much more difficult.

**Figure 20: Arm inserted into sleeve (Shown with and without sleeve)**


1. Glove port handle

**Figure 21: Foot pedals for right and left glove ports**


1. Left for Left hand side glove port
2. Right for Right hand side glove port

While the arm is grasping the handle, generate a vacuum by operating the foot pedal for the corresponding glove port.

The vacuum operation should be continued until the maximum amount of external atmosphere has been removed from the sleeve and the sleeve exerts pressure on the arm/hand. This take approx 15 to 20 seconds.

**Figure 22: Sleeve before and after vacuum operation**

The Sleeve should pull forcefully against both the inner surface of the Glove port interior and the users arm and hand when adequate vacuum has been achieved.

**Figure 23: Glove port showing vacuum achieved**

### 6.3.1 Workstation Entry

Once the vacuum has been achieved, the Glove port handle can now be rotated in either direction to unlock the Glove port cap.

As there is a strong vacuum within the Sleeve, removal of the cap can require a reasonable amount of force. This can be made easier by pushing the uppermost part of the handle to first break the vacuum at the upper edge of the cap seal.

**Figure 24: Glove port cap**

The Glove port cap can now be stored inside the workstation using the locator feature on the rear of the cap. These slot into the storage brackets mounted within the workstation.

**Figure 25: Glove port cap storage locator**

**Figure 26: Glove port cap storage location inside workstation**

Repeat the procedure for the other hand (if both hands are entering the workstation chamber).

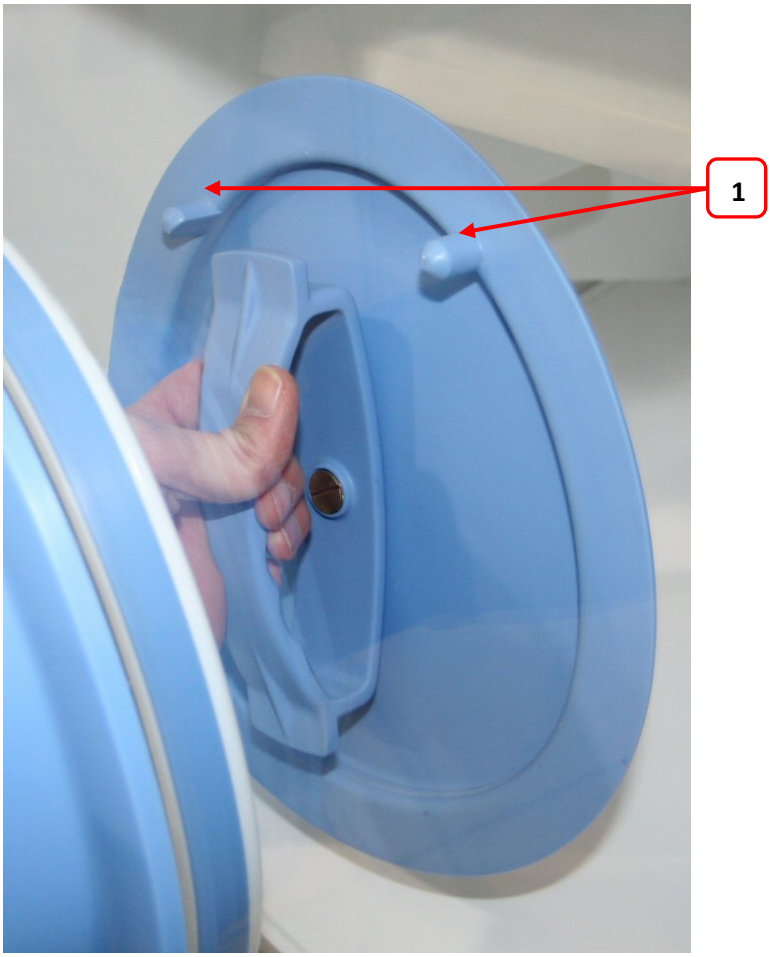
### 6.3.2 Workstation Exit

Remove Cap from storage brackets, and ensure the handle is oriented in a vertical position on the Cap. The Handle is designed with “indexing” detent features to help locate the Handle relative to the Cap.

Drawing the handle into the Glove Port, replace the cap, using the location posts to orient the Cap correctly on the Glove Port.

**Note: Care should be taken to ensure that the sleeve material does not become caught between the Cap and the Glove Port seal.**

**Figure 27: Glove port cap**




1. Cap location posts

Rotating the Handle by 90 degrees to the horizontal position will now lock the Cap to the Glove Port, allowing withdrawal of the users arm from the Sleeve.

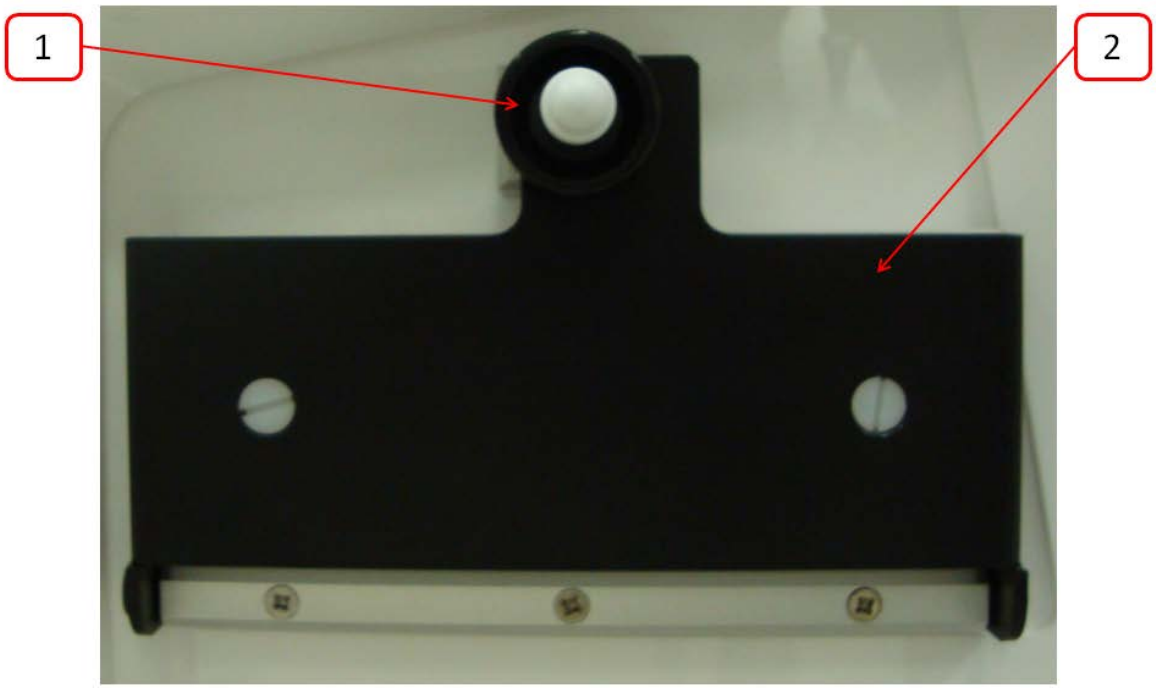
## 6.4 Single Plate Entry System (SPES)

A SPES is provided for quick and easy direct access to the workstation chamber, for loading materials. The SPES is also known as the mailbox.

### 6.4.1 SPES overview

The SPES consists of an external hinged flap and an internal hinged flap. The external flap is held in place by a thumb screw when not in use. The internal flap is self-closing. Figure 28 shows the external view of the SPES;

**Figure 28: SPES external view**




1. Thumb screw.
2. SPES external flap.

Figure 29 shows the internal view of the SPES;

**Figure 29: SPES internal view**

### 6.4.2 Using the SPES

To use the SPES;

- Undo the thumb screw on the external flap (item 1 in Figure 28).
- Whilst supporting the SPES external flap, swing the thumb screw to the left.
- Lower the SPES external flap.

Figure 30 shows the SPES when opened;

**Figure 30: SPES with external hinged flap opened**

- Push materials through the SPES internal flap into the workstation chamber. This should be done as quickly as possible to minimise gas loss from the workstation chamber.
- When all materials have been added, lift the SPES external flap back to its closed position.
- Whilst holding the SPES external flap, swing the thumb screw right to slot into the SPES external flap.
- Tighten the thumb screw.

**Note**: Do not over tighten the thumb screw. Note also that it may be easier to have your right hand in the left hand Ezee Sleeve if loading multiple items.

## 6.5 Internal lights

2 internal lighting systems are provided for the workstation chamber;

- Main chamber light.
- Spot light.

To switch the main chamber light on, press the chamber light switch (item 3 in Figure 10).

To switch the main chamber light off, press the chamber light switch (item 3 in Figure 10).

To switch the spotlight on, press and hold the spot pedal on the foot switch control panel (item 3 in Figure 14). To switch the spotlight off, remove your foot from the spot pedal on the foot switch control panel (item 3 in Figure 14).

**Note** that the spot light should not be used continuously for a period of more than 10 minutes, as this will cause the spot light to overheat. The spot light should be allowed to cool for a period of 10 minutes after each use.

## 6.6 Rear shelf

The Concept Plus workstation has a sliding rear shelf for additional storage within the workstation chamber. To slide the shelf forwards, pull the shelf towards you with both hands. To slide the shelf backwards, push the shelf away from you with both hands. The weight limit for the shelf is 12.5kg. The weight on the shelf must be evenly distributed.

## 6.7 Internal power socket

An internal power socket is provided within the workstation chamber. The socket is located on the left hand side, underneath the rear shelf. The maximum permissible power rating of equipment connected to the internal socket is shown in Figure 31.

**Figure 31: Internal socket power rating**

| Supply voltage | Power rating |
|---|---|
| 110V AC, 60Hz | 85W |
| 240V AC, 50 Hz | 190W |

## 6.8 Optional extras

Your Concept Plus workstation may be fitted with optional extra parts to provide added functionality. The available optional extra parts for Concept Plus workstations are;

- Cable gland.
- Universal cable gland.
- Gas sample port.
- Ultrasonic humidity control.
- Vacuum port.
- HEPA protection option (see section 6.2).
- Economy interlock purge

Note that these parts are not available as aftermarket upgrades; they must be fitted during the manufacture of the workstation.

### 6.8.1 Cable gland

The cable gland is used to allow cables to enter the workstation chamber without affecting the internal environment of the workstation chamber. The cable gland is suitable for cables of diameter 3.5mm to 7mm. The cable gland is located on the left hand side of the workstation

**Figure 32: Cable gland**

To use the cable gland;

- Turn the grey collar anti-clockwise (counter-clockwise) to loosen the cable gland.
- Remove the red plug.
- Push the cable through the cable gland.
- Tighten the grey collar by turning clockwise until tight. Do not over tighten the cable gland.

### 6.8.2 Universal cable gland

The Universal cable gland is used to allow cables to enter the workstation chamber without affecting the internal environment of the workstation chamber. The Universal cable gland provides a diameter of 50mm for passing through larger cables and connectors. The Universal cable gland is located on the rear of the workstation.

**Figure 33: Multi port**

### 6.8.3 Gas sample port

The gas sample port can be used to collect a gas sample from the workstation chamber. To use the gas sample port;

- Remove the outer cap.
- Push a needle connected to a syringe through the internal sponge of the gas sample port.
- Pull back the syringe to withdraw a sample of gas.
- Remove the needle from the internal sponge of the gas sample port.
- Replace the outer cap.

**Figure 34: Gas sample port**


### 6.8.4 Vacuum port

The vacuum port is used to remove liquids from the workstation chamber, for example excess media from Petri dishes. The vacuum port is located on the left hand side of the workstation.

To use the vacuum port;

- Connect the vacuum source to the external part of the vacuum port by pushing a tube from the vacuum source onto the vacuum port hose connection.
- Insert the internal vacuum hose into the internal section of the vacuum port. Figure 35 shows the internal part of the vacuum port;

**Figure 35: Internal part of vacuum port**

- When the vacuum is no longer required, remove the internal vacuum hose from the vacuum port by pressing the top of the metal part of the internal section of the vacuum port and pulling the vacuum hose. The hose should release from the vacuum port, sealing the vacuum port.
- Remove the vacuum source from the outside of the vacuum port.

### 6.8.5 Economy interlock purge

The economy interlock purge is a shorter interlock purge cycle, to reduce gas consumption. The interlock economy purge cycle length (1, 2, 3 or 4 minutes) must be specified at time of order. To use the interlock economy purge cycle press the Interlock purge cycle selector (item 10 in Figure 10). The switch will now be in the depressed position. To return to the standard interlock purge cycle, press the Interlock purge cycle selector (item 10 in Figure 10). The switch will now be in the extended position.

## 6.9 Online video user guides

Further information and demonstrations can be found at Ruskinn Technology Limited's YouTube channel;

http://www.youtube.com/ruskinntechnology

# 7. Cleaning and maintenance

## 7.1 Cleaning the workstation

To ensure that your Concept PLUS workstation remains at optimum working conditions, it must be cleaned on a regular basis. A basic clean is required after each use. Deep cleaning is required at regular intervals, dependent upon the nature of the materials used in the workstation. As a guide, a deep clean should be performed at between 3-6 month intervals.

### 7.1.1 Cleaning agents

The correct cleaning agents must be used to clean the workstation. The use of incorrect cleaning agents will damage the workstation and invalidate the warranty. The following cleaning agents are permitted;

- Ethanol, laboratory grade at a maximum concentration of 70% by volume ethanol in distilled water.
- Propanol, laboratory grade at a maximum concentration of 70% by volume propanol in distilled water.
- Tristel Fuse Sachet, 1 sachet diluted in 3 litres of distilled water, or Tristel Duo Foamer. Tristel Fuse Sachets and Duo Foamer are available from Ruskinn Technology Limited, for details.
- Ruskinn Technology Limited anti-static cleaner.
- Distilled water.

No other cleaning agents are permitted. The use of UV light is not permitted in the workstation, as it will damage the acrylic shell.

### 7.1.2 Cleaning procedure – during and after each use

During use, clean any spills immediately using paper towels soaked in an appropriate cleaning agent. Wipe dry using a dry paper towel.

After each use;

- Remove all waste materials from the workstation chamber.
- Wipe the workstation chamber floor tray using paper towels soaked an appropriate cleaning agent.
- Wipe the workstation chamber floor tray clean using paper towels to dry.
- Wipe the interlock floor tray using paper towels soaked in an appropriate cleaning agent.
- Wipe the interlock floor tray using paper towels to dry.

**Note:** It is easiest to clean the interlock from the outside.

### 7.1.3 Removing/ reinstalling the front screen

The Concept PLUS is available with a removable front screen, to facilitate easier cleaning and installation/ removal of equipment to and from the workstation chamber.

To remove the front screen;

- Remove all cells/ samples to an alternative storage facility.
- Switch the workstation off at the mains and remove the plug from the mains.
- Remove the Ezee Sleeves.
- Disconnect the glove port tubing plug in connector from each Glove port.
- Remove the front screen knobs by turning them anti-clockwise (counter-clockwise) to remove them.
- Remove the front screen by lifting it towards you. Place the front screen on a suitable surface that will not scratch the front screen.

Take care not to lose any of the front cover knobs.

To reinstall the front screen;

- Place the front screen back onto the workstation, ensuring that it is correctly aligned on the front screen studs.
- Tighten 4 front screen knobs onto the 4 corner studs by turning the knobs clockwise. Take care not to over tighten or cross thread the front screen knobs.
- Tighten remaining front screen knobs onto the front screen studs by turning the knobs clockwise. Take care not to over tighten or cross thread the front screen knobs. The knobs should be tight enough to compress the seal underneath the front screen.
- Re-connect the glove port tubing plug in connector.
- Reinstall the Ezee Sleeves
- Reinstall the glove port covers.

### 7.1.4 Cleaning procedure – deep clean

To deep clean the workstation;

Preparing the workstation

- Remove all cells/ samples to an alternative storage facility.
- Switch the workstation off at the mains and remove the plug from the mains.
- Remove the front screen as described in section 7.1.3.
- Remove any other equipment installed in the workstation chamber.

- The items inside the workstation chamber that require cleaning are;
  - The floor tray.
  - The workstation floor.
  - The ceiling panel.
  - The rear shelf panel.
  - The left hand wall.
  - The right hand wall.
  - The interlock inner door.
  - The inside of the SPES.
  - The glove port covers.
- For all workstation components, wipe with a paper towel soaked in an appropriate cleaning agent. Take care not to get cleaning agents on the fans (below the inner rear wall), plug socket and the interlock inner door control panel.
- Wipe dry using paper towels.

Cleaning the interlock chamber;

- The items inside the interlock chamber that require cleaning are;
  - The floor.
  - The floor tray.
  - The ceiling panel.
  - The rear wall.
  - The right hand wall.
  - The interlock inner door.
- For all workstation components, wipe with a paper towel soaked in an appropriate cleaning agent. Note that the interlock floor tray can be moved forwards for cleaning the interlock floor.
- Wipe dry using paper towels.

Reinstalling workstation components

- Reinstall any equipment removed from the workstation chamber.
- Reinstall the front screen as described in section 7.1.3.
- Reinstall the Ezee Sleeves section 6.3.

## 7.2 Maintaining the workstation – End user maintenance

To ensure that your Concept PLUS workstation remains at optimum working conditions, it must be maintained on a regular basis. Many basic tasks can be performed by the end user.

### 7.2.1 Filling the pressure relief/ humidifier tank

The pressure relief/ humidifier tank requires refilling if the water level is on or below the low level indication. Figure 36 shows the pressure relief/ humidifier tank level indicator;

**Figure 36: Pressure relief/ humidifier tank level indicator**


To refill the humidifier tank;

- Either open the SPES section 6.4.2 or open one of the glove port covers section 6.3 to equalise the pressure between the workstation chamber and the external environment.
- For standard humidity, remove the pressure relief tank cover/ bung. For ultrasonic humidity, remove the humidifier tank screw cap.
- Top up the humidifier until the water level is between the low and high level indicators.
- Replace the pressure relief tank cover/ bung or humidifier tank screw cap.
- Either close the SPES or close the glove port cover.

**Note: Only distilled or deionised laboratory grade water should be used. Gloves should be worn during refilling to avoid contaminating the humidifier tank. The humidifier tank should be refilled slowly and only up to the high level indicator. Do not overfill the humidifier tank.**

### 7.2.2 Replacing an Ezee Sleeve

To replace an Ezee Sleeve, ensure the cap is closed and locked to the glove port.

#### 7.2.2.1 Removing an Ezee Sleeve

To remove an Ezee Sleeve;

- Ensure that the glove port covers are closed.
- Remove the O-rings that hold the Ezee Sleeve to the glove port.
- Remove the Ezee Sleeve.

**Note**: the O-rings will be tight

**Figure 37: Removing O-ring from Sleeve**

#### 7.2.2.2 Installing an Ezee Sleeve

- To install an Ezee Sleeve;
- Place the new Ezee Sleeve onto the glove port, ensuring that the O-ring grooves are completely covered and that the Ezee Sleeve is not kinked or overlapping.

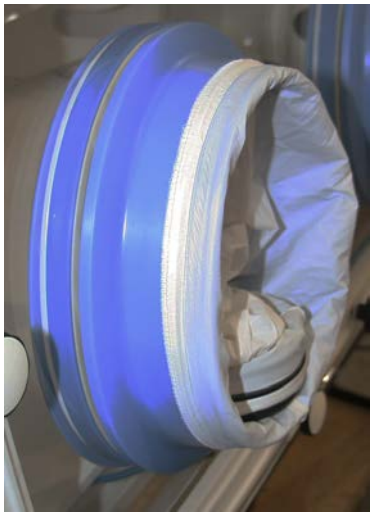
Reinstall the O-rings over the Ezee Sleeve. Note that the O-rings will be a tight fit. This is intentional, to provide a gas tight seal. Note that the O-rings must completely cover the Ezee Sleeve to provide a gas tight seal.

The large elasticated end of the sleeve should be pushed over the outer ring of the Glove Port, ensuring the elasticated edge is pushed well past the O-ring Location Grooves.

Both O-rings should then be fitted over the sleeve edge into the O-ring location grooves as shown in Figure 40. Care should be taken to ensure that the O-rings seat correctly in each groove.

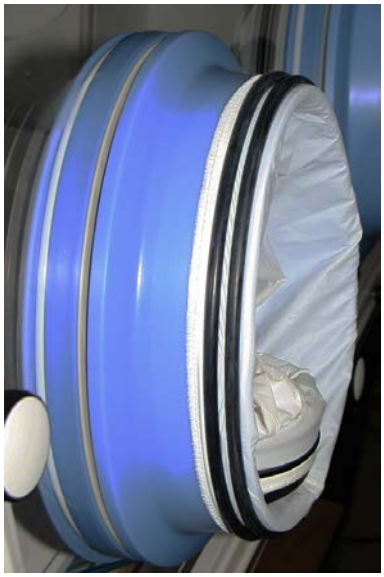
Figure 38: O ring locator grooves

Figure 39: Sleeve over outer ring and grooves



**Note: As the O-rings are designed to fit tightly over the sleeve to create an effective seal, they can be difficult to fit. It is recommended that prior to fitting, the O-rings should be stretched several times to warm up the rubber to make it more compliant.**

Figure 40: O-rings fitted over sleeve



### 7.2.3 Replacing the detox and catalyst sachets

A detox and a catalyst sachet are supplied with the Concept Plus workstation. The detox sachet absorbs volatile organic compounds, improving the air quality within the workstation chamber. The catalyst sachet contains the catalyst required for the hydrogen to react with any oxygen in the workstation, to produce an anaerobic environment. The detox sachet and the catalyst sachet need to be replaced annually. It is recommended to replace both sachets at the same time. Note that both sachets are replaced as part of an annual service.

To replace the detox sachet and the catalyst sachet;

- Remove any samples to an alternative storage facility.
- Switch off Concept Plus and disconnect from the mains power supply.
- Remove the Ezee Sleeves.
- Undo the glove port covers and place on the rear shelf.
- Lift the floor tray at the front to expose the detox and catalyst sachets. The sachets are located in the sachet holders on the underside of the floor tray.
- Slide the sachets forwards to remove them from their holders.
- Remove the sachets via the glove ports.
- Remove the new sachets from their packaging.
- Whilst lifting the floor tray at the front, slide the sachets into the sachet holder.
- Lower the floor tray, ensuring that the floor tray leg has located in the floor tray locator
- Close the glove ports using the glove port covers.
- Reinstall the Ezee Sleeves.
- Reconnect the Concept Plus to the mains power supply and switch the Concept Plus on.
- Commission the Concept Plus section 6.1.
- Allow the Concept Plus to reach an anaerobic environment in the workstation chamber by leaving the Concept Plus for a period of approximately 1 hour.
- Check that the environment in the workstation is anaerobic using the anaerobic indicator strips.
- If the environment in the workstation chamber is anaerobic, samples/ cultures may be reintroduced to the workstation chamber via the interlock.

**Note:** It is recommended to perform a deep clean when replacing the detox and catalyst sachets. The detox and catalyst sachets are replaced as part of an annual service.

### 7.2.4 Replacing the mains plug fuse – UK users only

To replace the mains plug fuse;

- Switch off Concept Plus and disconnect from the mains power supply.
- Remove the plug from the mains socket.
- Using a small flat bladed screw driver, remove the fuse cover from the mains plug. Figure 41 shows the fuse removal;

**Figure 41: Mains plug fuse removal**

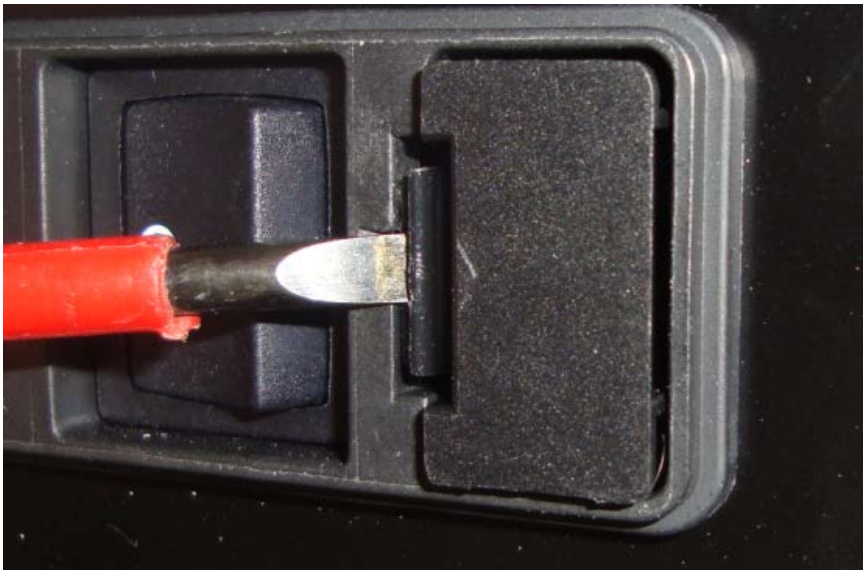
- Replace the fuse with a BS 1362 13A fuse, to match the original fuse.
- Replace the plug in the mains socket.
- Reconnect Concept Plus to the mains power supply and switch the Concept Plus on.
- Commission the Concept Plus (see section 6.1, for more details).
- Allow the Concept Plus to reach an anaerobic environment in the workstation chamber by leaving the Concept Plus for a period of approximately 1 hour.
- Check that the environment in the workstation is anaerobic using the anaerobic indicator strips (see section 5.2 for more details).
- If the environment in the workstation chamber is anaerobic, samples/ cultures may be reintroduced to the workstation chamber via the interlock. See section 6.2.4 for more details.

### 7.2.5 Replacing the mains fuses

To replace the mains fuses;

- Switch off the Concept Plus.
- Remove the plug from the mains socket.
- Remove the mains fuse drawer using a small flat bladed screwdriver. Figure 42 shows the removal of the mains fuse holder;

**Figure 42: Mains fuse holder removal**



- Replace the mains fuses. The fuse ratings are;
  - 240V 50Hz – F5A H250V
  - 220V 60Hz – F5A H250V
  - 110V 60Hz – F8A H250V
  - 100V 50 / 60Hz – F8A H250V

Fuses should be fast blow, for example Cooper Bussmann S501. Replacement fuse value to match the original fuse. For more information, contact your local distributor.

- Replace the mains fuse holder. The fuse holder will click when it is fully inserted.
- Replace the plug in the mains socket.
- Switch the Concept Plus on.
- Commission the Concept Plus (see section 6.1, for more details).
- Allow the Concept Plus to reach an anaerobic environment in the workstation chamber by leaving the Concept Plus for a period of approximately 1 hour.
- Check that the environment in the workstation is anaerobic using the anaerobic indicator strips (see section 5.2, for more details).
- If the environment in the workstation chamber is anaerobic, samples/ cultures may be reintroduced to the workstation chamber via the interlock. See section 6.2.4, for more details.

## 7.3 Service requirements

To maintain the best performance from your Concept Plus workstation, it must be serviced at regular intervals. Figure 43 lists the servicing requirements, intervals and persons capable of performing the service;

**Figure 43: Concept PLUS servicing requirements**

| Action | Frequency | By |
|---|---|---|
| Commission the workstation | Every time the workstation is switched on | End User |
| Clean workstation | After each use | End User |
| Fill humidifier tank | Weekly | End User |
| Deep clean workstation | 3-6 months depending on usage | End User |
| Replace detox sachets | Annually | End User |
| Replace catalyst sachet | Annually | End User |
| Annual service | Annually | Qualified service engineer |
| Biennial service | Biennially (2 yearly) | Qualified service engineer |

To arrange an annual or biennial service, contact your local distributor. Note that;

- The biennial service includes an annual service.
- The annual service includes the replacement of catalyst and detox sachets.
- The workstation must be cleaned before the service is performed.

Service contracts are available for all Ruskinn Technology Limited workstations. Please contact your local distributor for more information.

## 7.4 Spare parts and accessories

A range of spare parts and accessories are available for your Concept Plus workstation. Note that only Ruskinn Technology Limited spare parts should be used. The use of unapproved spare parts will invalidate the warranty of your workstation and may cause damage to your workstation.

### 7.4.1 Overview

To order spare parts and accessories, please contact your local distributor for the latest pricing and availability.

### 7.4.2 Spare parts and cleaning agents

Figure 44 lists the spare parts and cleaning agents available for your Concept Plus workstation. To order spare parts, please contact your local distributor for the latest pricing and availability. All items are sold individually except where stated.

**Figure 44: Concept Plus end user spare parts and cleaning agents list**

| Part | Where used |
|---|---|
| Small Ezeeyin Sleeve (Pair) | Ezeeyin Sleeve |
| Medium Ezeeyin Sleeve (Pair) | Ezeeyin Sleeve |
| Large Ezeeyin Sleeve (Pair) | Ezeeyin Sleeve |
| Glove port seal plate assembly | Glove ports |
| Sleeve to port O-ring | Ezeeyin Sleeve |
| Port Lube Talc | Ezeeyin Sleeve |
| Mains lead | Mains lead |
| Anti-static cleaner (600ml) | Cleaning |
| Tristel Duo Foamer | Cleaning |
| Tristel Fuse Sachet | Cleaning |
| Large Detox Sachet | VOC filtration |
| Large Catalyst Sachet | Anaerobic operation |
| Anaerobic Indicator Strips | Anaerobic operation |
| Front screen knob | Front screen |

### 7.4.3 Accessories

A range of accessories are available to enhance the functionality of your Concept Plus workstation. Figure 45 is the list of accessories for the Concept Plus workstation. Please contact your local distributor for the latest pricing and availability.

**Figure 45: Concept Plus accessories**

| Item | Description |
|---|---|
| G100/1 G100 Geotech $CO_2$ Analyser | Independent meter for measuring the Carbon Dioxide concentration in the workstation chamber |
| G100/2 G100 Geotech $CO_2$ and $O_2$ Analyser | Independent meter for measuring the Carbon Dioxide and Oxygen concentration in the workstation chamber |
| Small Petri dish holder | Holds up to 7 9cm Petri dishes for easier storage inside the workstation chamber. 3 colours available;<br>**White**<br>**Yellow**<br>**Blue** |
| Large Petri dish holder | Holds up to 14 9cm Petri dishes for easier storage inside the workstation chamber. 7 Colours available;<br>**Black**<br>**Blue**<br>**Green**<br>**Purple**<br>**Red**<br>**Yellow**<br>**White** |
| Medium stand | The workstation can be located on the stand where bench space is not available. 2 models are available, either with fixed feet or mounted on castors. Stand height approximately 800mm<br>**Stand with fixed feet**<br>**Stand with castors** |
| Anti-vibration table for multi well plates | Holds 4 multi well plates (6 well to 96 well), protecting the plates from vibration |
| Adjustable incubation tray | Holds 4 multi well plates (6 well to 96 well), adjustable feet and built in level indicator. Ideal for experiments with low media volumes |
| JuLI fluorescent cell analyser | Inverted optical microscope with touch screen control. Bright field and Blue track fluorescent imaging. Time lapse imaging function. Includes SD card. |

## 7.5 Workstation malfunction

In the event of a workstation malfunction, please check section 7.6 for a list of common problems and solutions. If you cannot find a solution to your problem, please contact your local distributor, quoting the serial number of your workstation. Until your problem is resolved the Concept Plus workstation should be switched off and disconnected from the mains supply.

## 7.6 Common problems and solutions

### 7.6.1 Workstation general problems

Figure 46 gives a list of common problems and solutions. Please consult this list as a first reference in the event of a malfunction of your workstation.

**Figure 46: Common problems and solutions**

| Problem | Cause | Solution |
|---|---|---|
| The workstation will not switch on | The workstation is not plugged in | Plug the workstation into the mains |
| | The mains socket is not switched on | Switch the mains power on |
| | The mains fuse has blown | Replace the mains fuses. See section 7.2.5, for more details |
| | The mains plug fuse has blown (UK users only) | Replace the mains plug fuse (UK users only). See section 7.2.4, for more details |
| | The ELCB has tripped | Reset the ELCB. If the ELCB continues to trip, contact your local distributor |
| The com cycle active LED is flashing | The workstation needs to be commissioned | The workstation must be commissioned every time it is switched on. Run the commissioning cycle. See section 6.1 for more details. |
| The workstation temperature will not go above ambient Plus 5°C | The heater mat thermal protection switch has activated | Wait for the heater mat thermal protection switch to reset. |
| | The heater mat fuse has blown | Contact your local distributor |
| Devices plugged into the internal socket are not powering up. | The power switch on the device is not switched on | Turn the power switch on the device on. |
| | The plug for the device is not fully inserted into the socket | Check that the plug is correctly inserted into the socket. |
| | The fuse in the device has blown and/ or the device has failed | Plug the device into another socket. If the device does not power up, there is a fault with the device. Consult the owner's manual for the device. |
| | The internal socket fuse has blown | Contact your local distributor |
| The LED indicators are | 24V power supply fuse | Contact your local distributor |

| Problem | Cause | Solution |
|---|---|---|
| not on | has blown | |
| The internal light does not illuminate when switched on | The bulb has blown<br><br>The fuse has blown | Contact your local distributor to arrange replacement |
| The spot light does not illuminate when switched on | The bulb has blown<br><br>The fuse has blown | Contact your local distributor to arrange replacement |
| The right and left vacuum pedals are not working | The auto gas saver system/ gas excess alarm has activated | See section 7.6.3 for more information on possible solutions to the problem. |

### 7.6.2 Interlock problems

Figure 47 gives a list of common interlock problems and solutions;

**Figure 47: Interlock problems and solutions**

| Problem | Cause | Solution |
|---|---|---|
| The interlock inner door will not open | The interlock outer door is open | Close the interlock outer door and run the purge cycle |
| | The interlock has not been purged | Run the interlock purge cycle |
| | The interlock is purging | Wait for the interlock purge cycle to finish |
| | There is an obstruction behind the interlock inner door | Remove the obstruction from behind the interlock inner door |
| The interlock inner door will not close | The interlock inner door is blocked | Check for obstructions to closing the interlock inner door and remove them |
| | The interlock inner door is stuck | Spillages can cause the interlock inner door to stick. Clean the interlock inner door. See section 7.1.2 or section 7.1.4, for more details<br>Press the inner interlock door release button and pull the inner interlock door handle to release the door from the seal. Apply a small amount of port Lube Talc to the inner interlock door seal. |
| The interlock outer door will not close | The interlock outer door is obstructed | Check for obstructions to closing the interlock outer door and remove them |
| The interlock purge cycle will not run | The auto gas saver system/gas excess alarm has activated | See section 7.6.3 for more information on possible solutions to the problem. |
| The interlock outer door will not open (for workstations with HEPA filer option) | The interlock has not been purged | Run the interlock purge cycle |

### 7.6.3 Gas consumption/ environmental control problems

The Concept Plus workstation is fitted with a gas demand indicator (item 14 in Figure 10 or item 14 in Figure 10). The indicator illuminates when gas is injected into the workstation chamber. When the workstation is at rest, the gas demand indicator should illuminate once every 20 minutes. At rest is defined as the workstation chamber is in an anaerobic condition with no access to the interlock chamber, i.e. the glove ports are closed, the interlock is closed and, if fitted, the SPES is closed. Figure 48 gives some common gas consumption and environmental control problems and solutions;

**Figure 48: Gas consumption/ environmental control problems and solutions**

| Problem | Cause | Solution |
|---|---|---|
| The workstation is failing to reach an anaerobic condition. | The catalyst sachet has not been installed. | Install a catalyst sachet. See section 7.2.3, more details. |
| | The catalyst sachet needs replacing. | Replace the catalyst sachet. See 7.2.3 for more details. |
| | The anaerobic mixed gas supply has run out. | Replace the anaerobic mixed gas cylinder. |
| High gas consumption at rest. | The glove port cover has been left open. | Close the glove port cover. See 6.3 for more details. |
| | The SPES has been left open. | Close the SPES. See section 6.4.1 for more details. |
| | The interlock inner and outer doors are both open. | Close the interlock inner and/ or outer doors. See sections 6.2.1 and 6.2.2, for more details. |
| | The humidifier/ pressure relief tank is empty. | Refill the humidifier/ pressure relief tank. See section 7.2.1, for more details. |
| High gas consumption in use. | The Ezee Sleeves have not been fitted correctly. | Refit the Ezee Sleeves. See section 7.2.2, for more details. |
| | The Ezee Sleeves are not sealing around the users wrists. | Ensure that the Ezee Sleeves are the correct size for the user. Ensure that any clothing and/ or jewellery that may foul the Ezee Sleeves are removed/ rolled back. Ensure that the Ezee Sleeves are tight around the user's wrists. |
| The gas excess indicator is illuminated | The glove port cover has been left open. | Close the glove port cover. See section 6.3, for more details. |
| | The SPES has been left open. | Close the SPES. See section 6.4.1 for more details. |

| Problem | Cause | Solution |
|---|---|---|
| | The interlock inner and outer doors are both open.<br><br>The humidifier/ pressure relief tank is empty. | Close the interlock inner and/ or outer doors. See section 6.2.1and 6.2.2, for more details.<br><br>Refill the humidifier/ pressure relief tank. See section 7.2.1, for more details. |
| Once the cause of the leak has been fixed, reset the automatic gas saver system. See section 5.3, for more details. | | |
| The $N_2$ low indicator is illuminated. | Low pressure in the nitrogen supply caused by an empty nitrogen cylinder. | Replace the nitrogen cylinder. |
| The $ANO_2$ low indicator is illuminated. | Low pressure in the anaerobic mixed gas supply caused by an empty anaerobic mixed gas cylinder. | Replace the anaerobic mixed gas cylinder. |
| An audible alarm can be heard | Low pressure in the gas supply, caused by an empty gas cylinder. | Replace the empty gas cylinder. The alarm can be muted by pressing the gas alarm switch (item 8 in Figure 10, item 6 in Figure 11) |

# 8. Warranty information

Ruskinn Technology Limited warrants for the applicable time period that the CONCEPT PLUS will substantially perform in accordance with the user documentation. The terms of this Agreement do not affect or prejudice the statutory rights of a consumer acquiring the Ruskinn Technology Limited CONCEPT PLUS otherwise than in the normal course of a business.

**THIS WARRANTY DOES NOT APPLY IN THE FOLLOWING CIRCUMSTANCES:**

(A) IF THE Ruskinn Technology Limited CONCEPT PLUS HAS BEEN REPAIRED BY PERSONS NOT AUTHORIZED BY Ruskinn Technology Limited; OR

(B) THE Ruskinn Technology Limited CONCEPT PLUS and associated accessories/peripherals HAVE BEEN ALTERED, MODIFIED, OR MISUSED; OR

(C) THE Ruskinn Technology Limited CONCEPT PLUS IS USED WITH NON- Ruskinn Technology Limited COMPONENTS; OR

(D) THE Ruskinn Technology Limited CONCEPT PLUS OR A COMPONENT IS USED FOR OTHER

USES (FOR EXAMPLE USE WITH OTHER CIRCUIT BOARDS OR SOFTWARE) OR

(E) THE Ruskinn Technology Limited CONCEPT PLUS HAS NOT BEEN MAINTAINED OR USED IN ACCORDANCE WITH THE INSTALLATION AND USER GUIDE. UNLESS PROHIBITED BY LAW, THIS WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, THE IMPLIED WARRANTY OF MERCHANTABILITY, OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING OR OF PERFORMANCE, CUSTOM OR USAGE OF TRADE. Ruskinn Technology Limited DOES NOT WARRANT THAT THE Ruskinn Technology Limited CONCEPT PLUS WILL FUNCTION ERROR FREE.

If within the Warranty Period, the Ruskinn Technology Limited CONCEPT PLUS does not conform to the express warranty set forth above, Ruskinn Technology Limited's sole obligation and Users sole remedy shall be, at Ruskinn Technology Limited's option: 1. to repair or replace the non-conforming component; or, 2. refund the purchase price.

**LIMITATION OF LIABLITY.**

UNLESS PROHIBITED BY LAW, Ruskinn Technology Limited WILL NOT BE LIABLE TO USER OR OTHERS

FOR ANY OTHER DIRECT, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES INCLUDING, FOR EXAMPLE, LOST PROFITS, BUSINESS, INVESTMENTS, OR OPPORTUNITIES EVEN IF Ruskinn Technology Limited HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

The parties agree that Ruskinn Technology Limited total cumulative liability to User for direct damages for all causes under this Agreement shall not exceed £5,000,000 (FIVE MILLION UK STERLING POUNDS), or the price paid for the Ruskinn Technology Limited CONCEPT PLUS, whichever is higher. Some states or countries may have laws which require liability rights different from those stated above. In such states or countries, the minimum required liability terms shall apply.

# 9. Disposal information

Concept Plus contains hazardous components and must not be disposed of at a household waste site. Instead it should be taken to the appropriate collection point for the recycling of electrical and electronic equipment. Alternatively, please contact your local distributor for disposal instructions.

Concept Plus Workstation contains recyclable parts. Please contact your local distributor for more advice.

# 10. Contact details


Ruskinn Technology Limited

| | | |
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