

**BAKER**

*RUSKINN*

**Sci-tive**

Stem Cell Investigations Total In Vitro Environment



**UM-025**

**SCI-tive Dual Asymmetric User Manual**

## Product Summary

The SCI-tive range of advanced hypoxic workstations are designed to mimic 'in-vivo' conditions providing a continuous cell culture environment which eliminates cellular stress linked to variations in temperature, pH and oxidation yielding better stem cell lines. SCI-tive allows long term cell culture under perfect hypoxic or anoxic conditions, with user defined temperature, CO<sub>2</sub> and humidity levels.

The SCI-tive Dual asymmetric workstation provides two chambers with individually controlled atmospheres.

## Features and Benefits

### Complete 'Lab in a Box'

- Large incubated working area allows incubation, passaging, media transfers and cell culture.
- Large pass-through interlock\* easily holds a variety of flasks, dishes and tubes.
- Interlock Capacity: 48 96-well Plates or up to 15 T75 flasks.

### Accurate & Stable Environmental Control

- O<sub>2</sub> stability from 0.0% (anoxia) to 20.9% (ambient) in 0.1% increments.
- CO<sub>2</sub> stability from 0.1% to 30.0% in 0.1% increments.
- Temperature control from ambient +5° C to 45° C.
- Humidity control from ambient to 85% RH.
- One touch sensor calibration.

### Economic & Reliable for Long-Term Savings

- Minimal maintenance and downtime.
- 1 year and 2-year preventative maintenance kits available.

### Convenient & Comfortable to Use

- Quick and easy direct access - Ezee Plug / Ezee Sleeve (gloveless cuffed system) allows you to get your hands inside the workstation in less than 20 seconds.
- Read plates easily without exposure to ambient oxygen conditions - energy-saving fluorescent lighting for perfect illumination.
- Automatic and easy-to-access controls.
- Advanced integrated gas mixing system with touch screen simplifies calibration process, provides rapid equilibration, and facilitates the download of data.
- Cycle programming allows a user-defined timed sequence of up to 4 different O<sub>2</sub> and CO<sub>2</sub> concentrations.
- Removable front cover (both chambers) - allows easy access for cleaning or placing instrumentation into the unit.
- Three electrical power sockets (per chamber) within each work area.
- Optional HEPA (High-efficiency particulate air) filtration system provides HEPA-filtered air within the work area to protect research from airborne contaminants.
- Optional enhanced containment package provides added protection for user.

### **Easily Accommodates Your Analytical Tools**

- Each chamber of the SCI-tive Dual can easily accommodate a variety of analytical equipment. Please contact Ruskinn or your local distributor for a list of approved products. Products must be suitably safety approved in the country of use.

**\*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.



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## 1. Overview and Safety Instructions

Please read this manual carefully to familiarise yourself with the operation and maintenance of your SCI-tive Dual 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 AC Mains outlet the SCI-tive Dual is connected to **MUST not be obstructed by the SCI-tive Dual or any other equipment, and MUST be accessible in case of emergency. In case of emergency, disconnect the SCI-tive Dual from the AC Mains Outlet.**
- In case of damage to the SCI-tive Dual, disconnect the SCI-tive Dual from the AC Mains Outlet and contact your Local Distributor for advice.
- The covers at each end, the top and the rear 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 workstation **AND** stand 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.
- The power cord set must be an appropriately rated and approved cord-set in accordance with the regulations in the country it is used in.
- Only Ruskinn Technology Limited replacement parts should be used.
- The mains supply voltage fluctuations must not exceed +/- 10% of the nominal mains voltage.
- 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. Over pressure could damage the workstation.
- For anoxic operation, Hydrogen gas in Nitrogen is required. The maximum permissible concentration is 5.5% Hydrogen in Nitrogen.
- Only the gasses specified in this manual may be used.
- The workstation must be disconnected from the mains supply before removing either of the front screens. The workstation must not be reconnected to the mains supply until the both front screens have been reinstalled.
- The maximum power ratings of the internal sockets must not be exceeded.
- Before connecting any equipment to the internal sockets ensure that the equipment has or is connected to a protective earth. If in doubt please contact the equipment manufacturer.
- The exhaust valve outlets must not be covered or blocked.
- The cooling fan covers and cooling vents must not be covered or blocked.
- The weight limit for the interlock floor tray is 4kg. The weight must be evenly distributed.
- The humidifier tank must not be overfilled.
- The SCI-tive Dual workstation should be used in a well ventilated area.
- The use of Radioactive materials in the SCI-tive Dual is strictly prohibited.
- **WARNING: Do not modify this equipment without the authorisation of the manufacturer**

**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

### 1.1.1 European Region



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 and has been tested and found to comply in full with the requirements of the following standards:

#### Electrical Safety:

EN 60601-1:2006 Medical electrical equipment - Part 1: General requirements for basic safety and essential performance.

#### Electromagnetic Compatibility

EN 60601-1-2:2007 Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic compatibility - Requirements and tests.

### 1.1.2 North America Region:



This product is UL 61010-1 Listed, and CSA C22.2 No. 61010-1 under file number E113911.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### **1.1.3 Precautions**

The SCI-tive Dual has been tested and approved to EN60601-1:2006. This means that the SCI-tive Dual meets or exceeds the requirements for electrical medical equipment in terms of its levels of emitted electromagnetic (EM) radiation and its susceptibility to electromagnetic radiation from other devices. It should be noted that the SCI-tive Dual may be affected by high levels of stray EM radiation from other electronic devices (even those which comply with relevant CISPR emission standards) that are being used in close proximity to it.






**WARNING:** This system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the equipment or shielding the location.




## 1.2 Symbols

Before using the SCI-tive Dual, please ensure that you are familiar with the symbols on the SCI-tive Dual.

**Note:** The workstation should be located in a well-ventilated area. Figure 1 explains the symbols found on the SCI-tive Dual;

**Figure 1: SCI-tive Dual 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.
	Warning, this equipment contains high voltage circuitry.
	Contains material or substances that may be hazardous to human health. Please refer to your local biohazardous material handling procedure for further advice on the handling and disposal of these items.

Symbol	Meaning
	SCI-tive Dual 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.
	USB socket
	Date of manufacture in format YYYY MM

### 1.3 System Overview, Installation and relocation

The SCI-tive Dual Workstation provides hypoxic or anoxic environments with control of temperature and humidity, to provide the optimum environment for cell biology incubation and experimentation.

SCI-tive Dual should only be installed or relocated by a qualified engineer. To arrange installation or relocation, please contact your local distributor.

**The mains socket that forms connection to the SCI-tive Dual, is not to be obstructed by SCI-tive Dual or any other equipment, and must be accessible in case of emergency. In case of emergency, disconnect the SCI-tive dual from the AC mains outlet.**

### 1.4 Weight and dimensions

The SCI-tive Dual workstation weighs approximately 355kg. Figure 2 lists the dimensions of the SCI-tive Dual workstation;

**Figure 2: SCI-tive Dual workstation dimensions**

External width	2815mm
External height (On Stand)	1897-1949mm
External depth	985mm
Workstation chamber internal width (Left)	1200mm
Workstation chamber internal width (Right)	1020 mm
Workstation chamber internal height* (Left)	620mm
Workstation chamber internal height* (Right)	808mm
Workstation chamber internal depth (Left)	600mm
Workstation chamber internal depth (Right)	760mm
Interlock internal width	270mm
Interlock internal height	210mm
Interlock internal depth	200mm
Interlock outer door clear opening width	262mm
Interlock outer door clear opening height	210mm
Interlock inner doors clear opening width	232mm
Interlock inner doors clear opening height	201mm

\* Internal height between floor tray and ceiling panel. Internal height of microscope allowed in left chamber is 600mm. Internal height of microscope allowed in right chamber is 750mm.

## **1.5 Environmental Operating Conditions**

The SCI-tive Dual Workstation should only be operated under the following environmental conditions:

- Temperature – Between 15°C and 30°C
- Humidity – Between ambient and 90% RH, Non-Condensing

## **1.6 Storage Temperature**

When not in use, the SCI-tive Dual Workstation must only be stored under the following environmental conditions:

- Temperature – Between 0°C and 30°C

Storage outside of this range may damage the workstation.

## 2. Gas and electrical supply requirements

### 2.1 Gas supply requirements

The Gas supplies are connected to the back of the SCI-tive Dual Workstation as shown in Figure 3 and Figure 4 and must be securely fasten after installation. A full description of the rear of the unit is provided in Section 3.1.4. Please refer to Figure 1 for Hazard symbol explanations.

**Figure 3: Gas and electrical connections (120V)**



**Figure 4: Gas and electrical connections (230V)**



Figure 5 lists the gasses required for operation of the workstation;

**Figure 5: SCI-tive Dual gas requirements**

Gas	Symbol	Specification
Nitrogen	N <sub>2</sub>	Oxygen Free
Carbon Dioxide	CO <sub>2</sub>	100%
Air	N/A	Compressed

In addition to the gasses in Figure 5, Figure 6 shows gasses that are required for specific conditions;

**Figure 6: SCI-tive Dual gas requirements for specific conditions**

Gas	Symbol	Specification	Replaces	Use
Hydrogen in Nitrogen	H <sub>2</sub> /N <sub>2</sub>	Maximum of 5.5% Hydrogen in Nitrogen	N/A	For anoxic mode
25% Oxygen in Nitrogen	O <sub>2</sub> /N <sub>2</sub>	Maximum of 25% Oxygen in Nitrogen	Air	For maintaining oxygen at levels higher than 17%

**NOTE:** Only gasses listed in Figure 5 and Figure 6 may be used with the workstation. **The use of any other gasses will invalidate the warranty and may cause serious injury.**

## 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. Ruskin 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.

## 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 as shown in Figure 3. Only the power cord supplied should be used to connect the workstation to the mains supply. The workstation must be connected to a protective earth.

**The mains socket the SCI-tive Dual is connected to should not be obstructed by SCI-tive Dual or any other equipment, and must be accessible in case of emergency. In case of emergency, disconnect the SCI-tive Dual from the AC mains outlet.**

## 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 stated on the rating label shown at the rear of the unit in Figure 12. The mains supply voltage fluctuations must not exceed +/- 10% of the nominal mains voltage. The input voltage and frequency for SCI-tive Dual workstations are;

Input voltage and frequency variants:

- 230 Volts AC, 50Hz
- 120 Volts AC, 60Hz.

## 2.5 Power consumption

The power consumption for the SCI-tive Dual is shown below in Figure 7.

**Figure 7: Power Consumption**

Description	120V models	230V Models
Nominal Current	8A per chamber	8A
Maximum Current	12.5A per chamber	12.5
Power	2520W	2700W

## 2.6 Powering the workstation

The SCI-tive Dual is fitted with an Un-Switched Mains Inlet to isolate the equipment from the mains supply, disconnect the mains plug from the AC Outlet.

**In case of emergency, disconnect the SCI-tive Dual from the AC mains outlet.**

### 3. Workstation overview

#### 3.1 Workstation layout

##### 3.1.1 Front view

The SCI-tive Dual workstation consists of 2 workstation chambers joined by a common interlock and is shown in Figure 8.

Each workstation has independent temperature, humidity and environmental composition control. Each side is controlled via the central touch screen controllers. The top controller controls the right hand side and the bottom controller controls the left hand side. Both workstation chambers feature;

- Removable front screens for easier access for installing equipment in the workstation and for easier cleaning.
- Removable floor trays for easier cleaning.
- Detox sachets for removal of volatile organic compounds.
- Internal racks for storage of flasks and Petri dishes.
- Two USB ports are featured below the Left hand side controller, together with 2 blue LEDs.
- USB flash drives are provided with the Workstation and have to be present at all times for data logging. Only memory storage devices are to be connected to the USB ports.
- Only USB storage devices that do not require an external power supply are to be used with the workstation.
- The Left USB stores data for the Left Hand Chamber and the Right Hand USB stores data for the Right Hand Chamber.
- The 1 or 2 blue LEDs, when lit, indicate mains power is present to each chamber of the SCI-tive Dual workstation. (1 LED (230V workstations) 2 LED for (120V workstations)).
- The Interlock door is situated below the Workstation control screens.
- A waste port (Optional extra) for the disposal of waste materials.

The left workstation chamber is designed for cell culture experimentation and incubation.

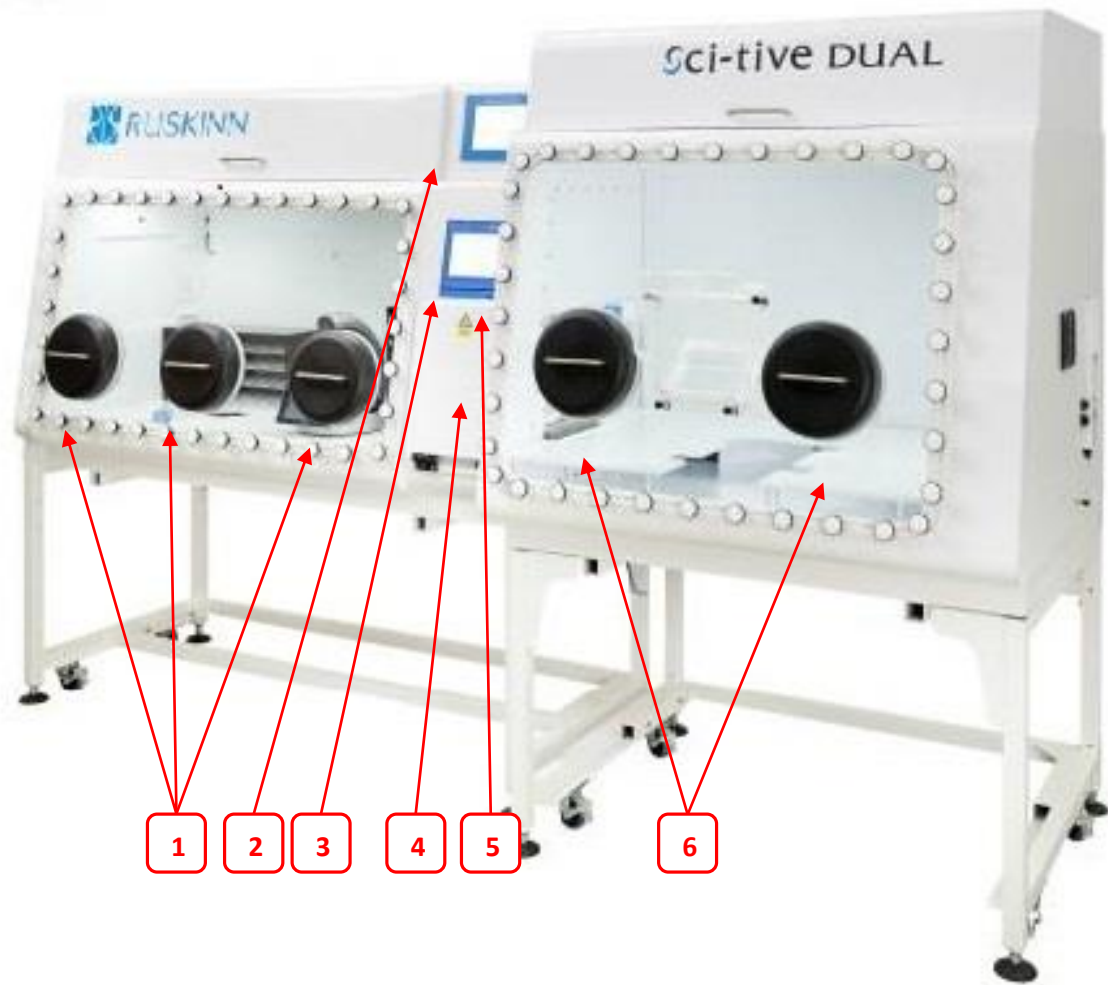
The right workstation chamber is designed to accommodate a range of inverted optical and atomic force microscopes. The chamber features:

- Split floor trays for easier installation around a microscope. The floor trays are bespoke to the microscope to be used in the workstation chamber.
- An active anti-vibration system, if a microscope is fitted, to isolate the workstation from vibrations generated by the workstation.
- A bespoke front screen with an ocular mount and an ocular cover, if an inverted optical microscope is fitted.

Please refer to the Ruskinn web site ([www.ruskinn.com](http://www.ruskinn.com)) for specific product features.

**Note:** 120V workstations feature an RCCB (Residual Current Circuit Breaker) on each chambers side panel. In 230V workstations 1 RCCB controls the workstation and is located on the left hand side.



**Figure 8: SCI-tive Dual Front View**

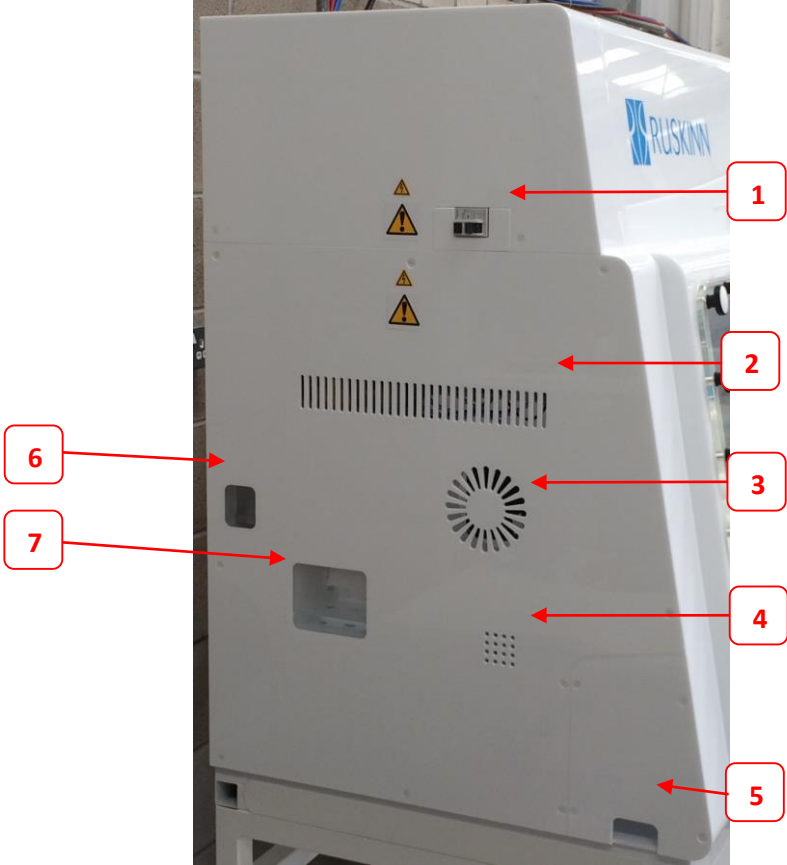
1. Left Hand chamber glove ports
2. Right hand chamber touch screen controller
3. Left hand chamber touch screen controller
4. Interlock
5. USB ports (Left hand USB for Left hand chamber, Right hand USB for right hand chamber)
6. Right hand chamber glove ports

**Note:** Only memory storage devices are to be connected to the USB port(s).  
Only USB storage devices that do not require an external power supply are to be used with the workstation.

**3.1.2 Left hand side view**

Figure 10 shows the Left hand side Figure 9 shows the RCCB for the chamber, refer to Section 7.6 for advice on steps to follow if the RCCB trips. Please refer to Figure 1 for Hazard symbol explanations.

**Figure 10: SCI-tive Dual Humidifier End Panel Left hand**



**Figure 9: RCCB**



- 1. Workstation Chamber Residual Current Circuit Breaker (RCCB)\*
- 2. Humidity Port Vent
- 3. Fan vent
- 4. Exhaust vent
- 5. Auxiliary Access Panel and Vacuum Pump line
- 6. Oil Level tank viewing area (Secondary Pressure Relief)
- 7. Humidity System Water tank viewing area

**Hazard labels: WARNING THIS EQUIPMENT MUST BE EARTHED** ⚡

**CAUTION: Risk of Electrical Shock. Do Not Open** ⚠

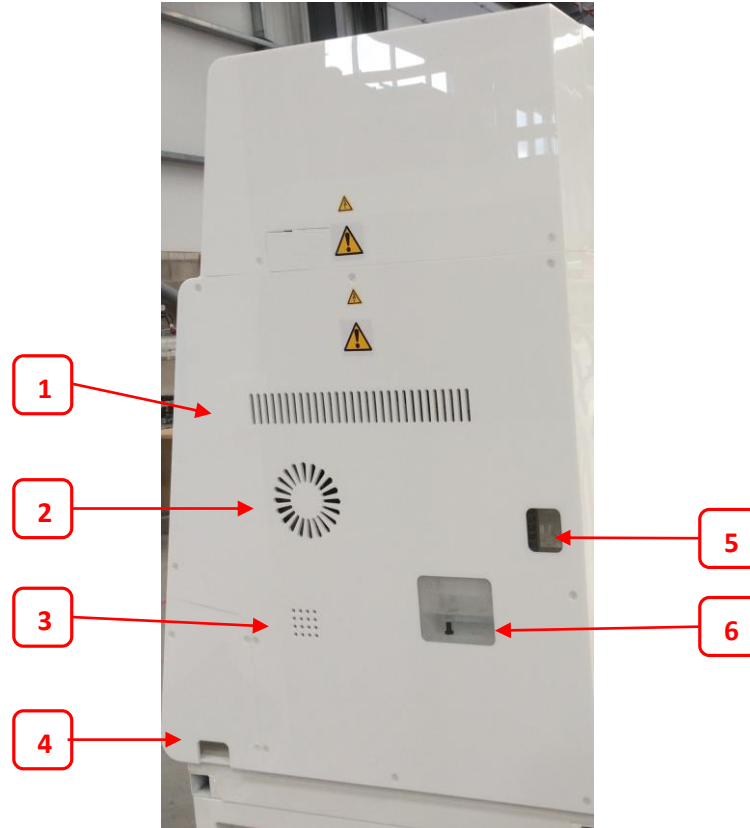
**\*On 230V workstations this RCCB is for the workstation. On 120V workstations the RCCB is only for the Left hand side chamber, and an additional RCCB is featured on the Right Hand side chamber.**

**Note:** A blue drain pipe for the condensate module can be found below each side. Locate a beaker or flask below the drain pipe, and regularly check the fill level of the beaker. The condensate module is a result of the drying process for the sample of the internal atmosphere for gas control.

### 3.1.3 Right hand side view

Figure 11 shows the right hand side of the SCI-tive Dual workstation;

Figure 11: SCI-tive Dual Humidifier End Panel Right



1. Humidity Port Vent
2. Fan vent
3. Exhaust vent
4. Auxiliary Access Panel and Vacuum Pump line
5. Oil Level tank viewing area (Secondary Pressure Relief System)
6. Humidity System Water tank viewing area

Hazard labels: **WARNING THIS EQUIPMENT MUST BE EARTHED** ⚡

**CAUTION: Risk of Electrical Shock. Do Not Open** ⚠

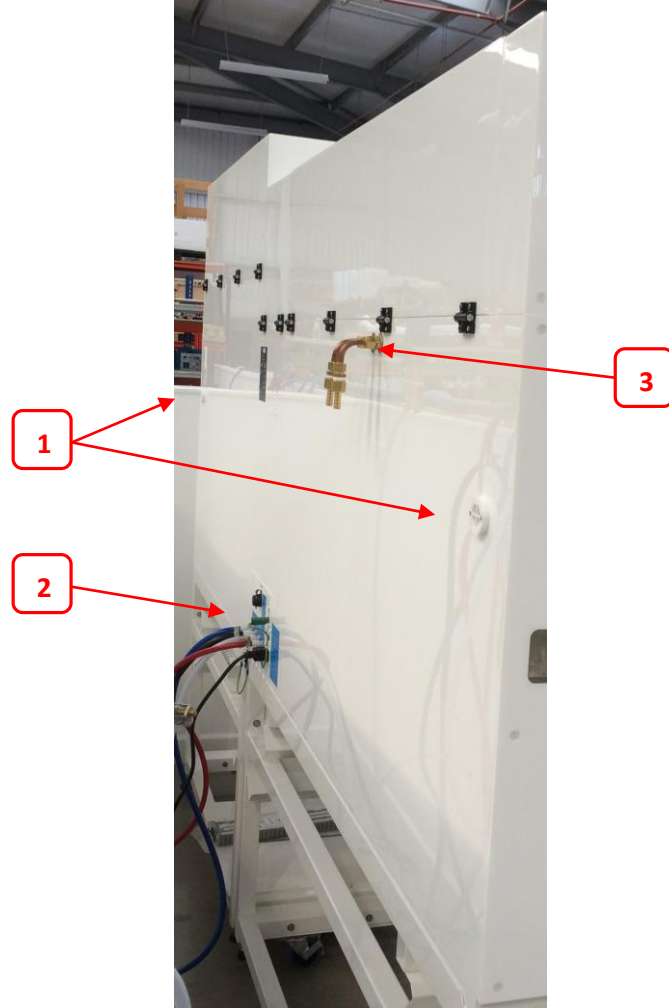
\* On 120V workstations an RCCB is featured on the right hand side panel for the Right hand side chamber.


**Note:** A blue drain pipe for the condensate module can be found below each side. Locate a beaker or flask below the drain pipe, and regularly check the fill level of the beaker. The condensate module is a result of the drying process for the sample of the internal atmosphere for gas control.

### 3.1.4 Rear View

Figure 12 shows the rear of the SCI-tive Dual workstation;

**Figure 12: SCI-tive Dual Rear view**

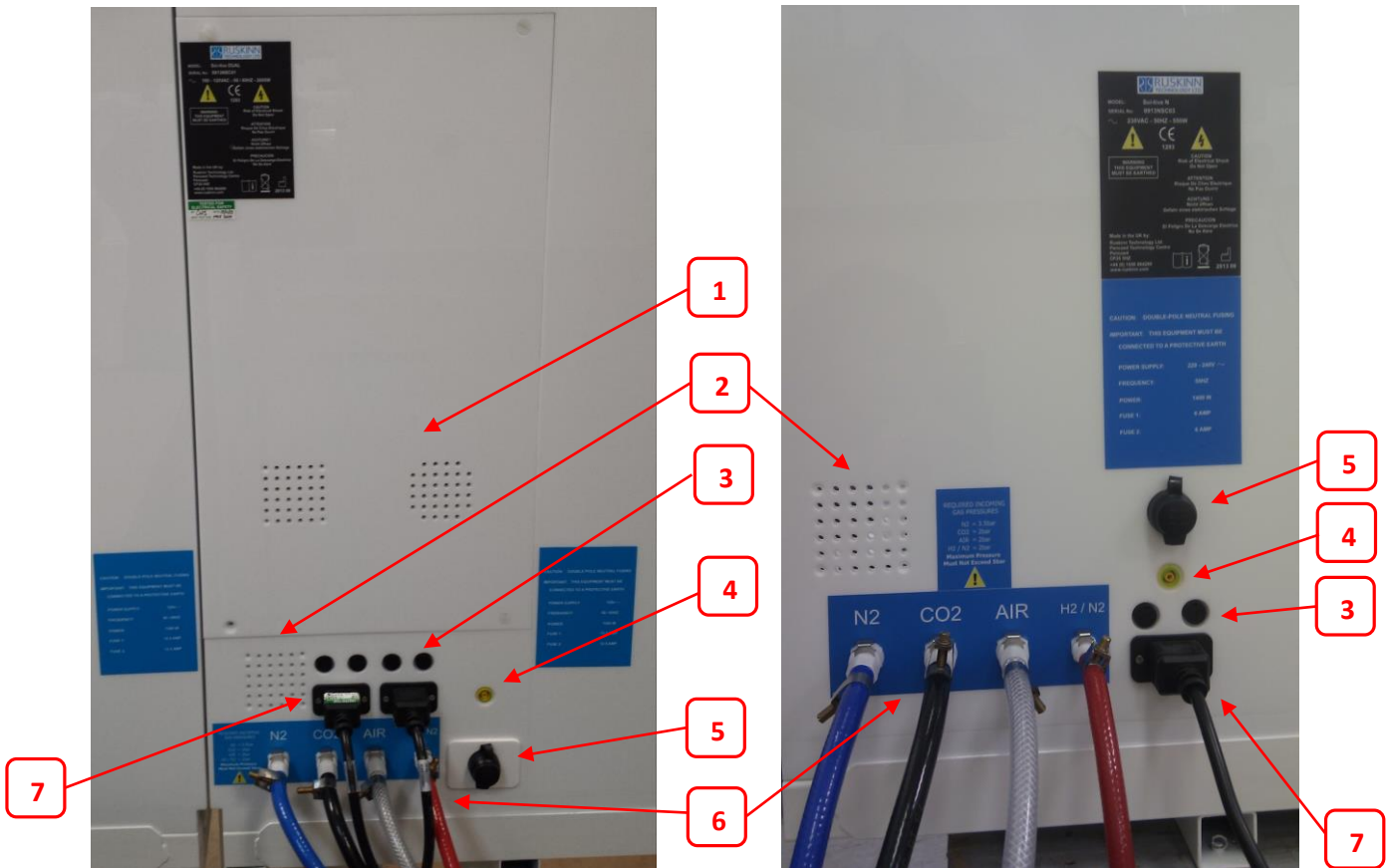


1. Secondary Pressure relief system vent  Do not obstruct
2. Rear Electrical and Gas connections (see figure below)
3. Outlets for the optional extra Heat Exchange and Chiller system (if fitted)

**Figure 13: Rear electrical connections**

120V Workstation

230V Workstation



1. Air vents. Do not obstruct vents
2. Cooling Fans.
3. Fuse Points 12.5A F1 F2 F3 F4 (2 fuse points per chamber for 120V Workstations) Fuse Point 12.5A F1 F2 for 230V workstations.
4. Primary ground.
5. Ethernet port (For service personnel only).
6. Gas inlets. (**Maximum Pressure Must Not Exceed 5bar**)
7. Mains inlets for each chamber for 120V, 1 Mains inlet for the workstation 230V.

Hazard labels: **WARNING THIS EQUIPMENT MUST BE EARTHED**

**CAUTION: Risk of Electrical Shock. Do Not Open**

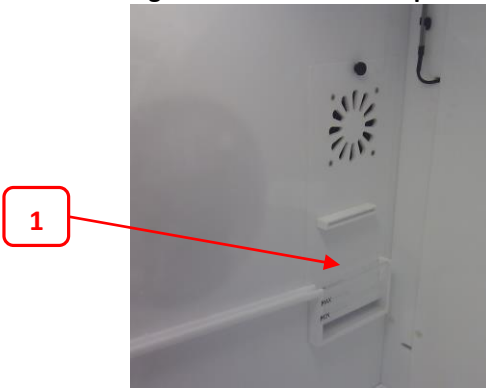
### 3.1.5 Internal Chamber

Each Chamber of the SCI-tive Dual Workstation, is equipped with:

- Two Internal lights (Left hand side and Right hand side).
- Three electrical points (Figure 16).
- Water tank access point for filling (Figure 14). Refer to Section 4.6.4 for details of filling water tank.
- Temperature and Humidity sensors.
- Interlock internal door.
- Interlock inner door control button and indicator (Figure 14) Refer to Section 5.2.1 for operation.

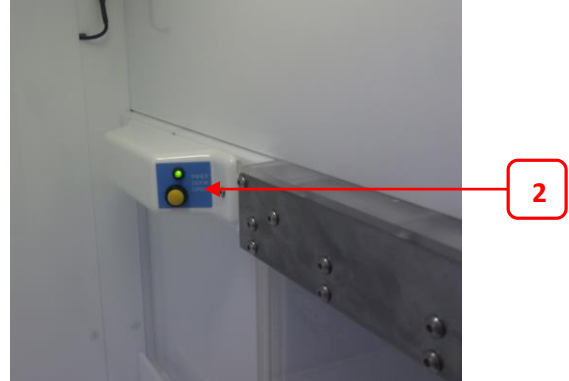
The control and operation for the above features are achieved via each chambers touch screen controller.

**Figure 14: Water Tank fill port**



1. Water Tank Acces point for filling

**Figure 15: Interlock internal door release**



2. Interlock internal door release button

**Figure 16: Internal Power sockets (120V) Internal Power sockets (230V)**

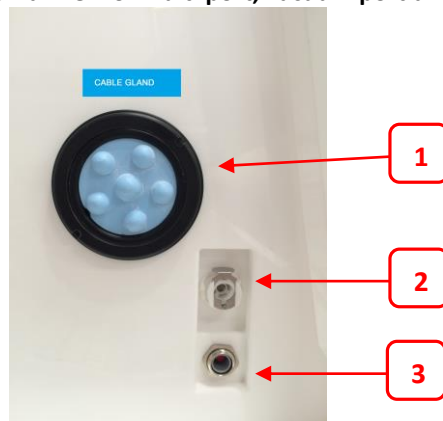


Additional features found on the side wall of each chamber, include:

- Universal Multi gland port
- Cable Gland port
- Vacuum Line port

### 3.1.5.1 Universal multi port

Figure 17: Internal view of multi port, vacuum port and cable gland



1. Universal multi gland port
2. Vacuum line port
3. Cable gland port

Figure 17 shows the internal chamber outside wall showing the Universal multi port gland, vacuum line port and cable gland port.

The Universal multi port 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.

### 3.1.5.2 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 18 shows the internal part of the vacuum port;

Figure 18: Internal view 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.

### 3.1.5.3 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 19: 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.



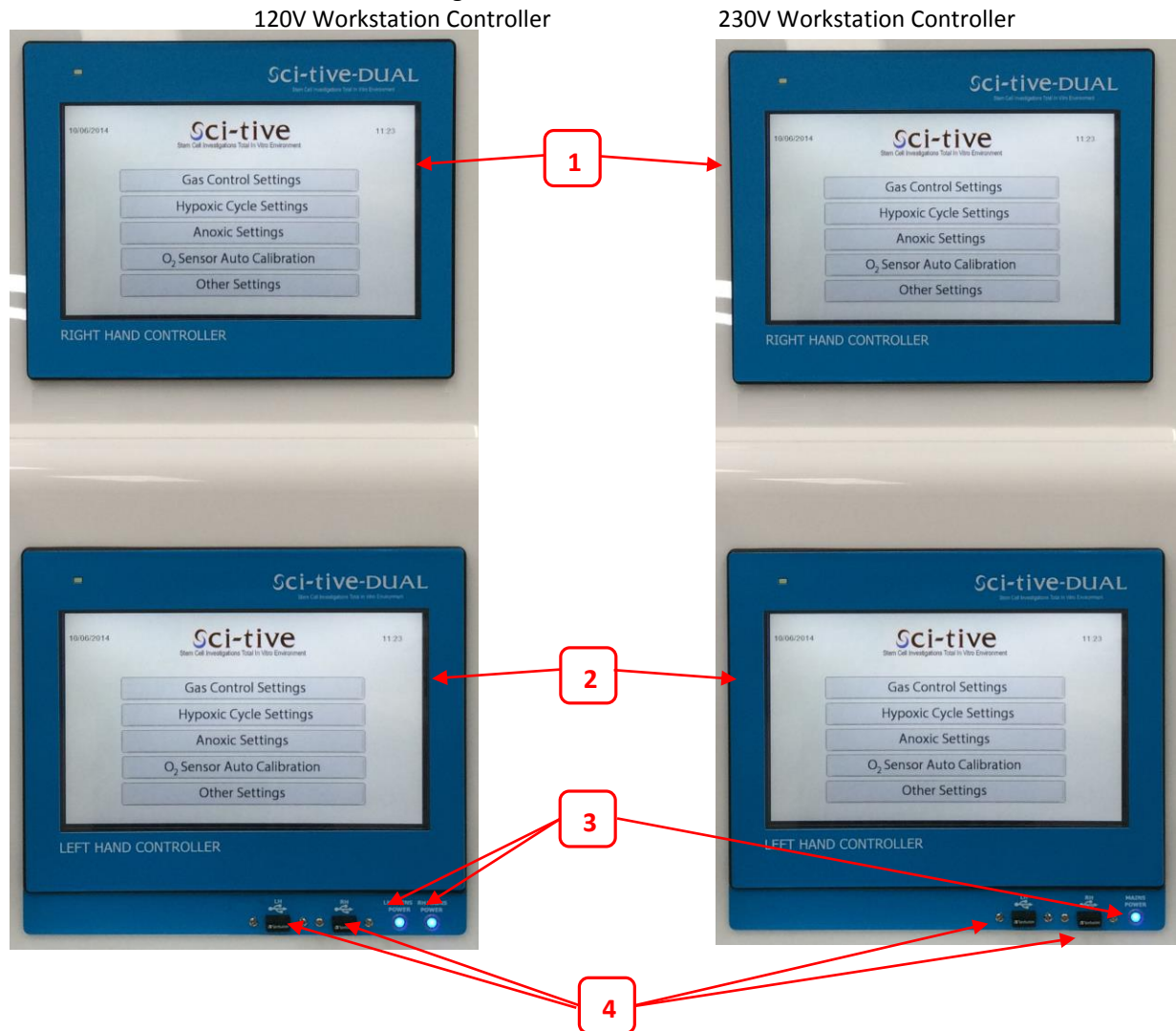
## 4. Controller Overview

### 4.1 SCI-tive Dual Workstation Control Panels

The SCI-tive Dual Workstation is equipped with two touch screen control panels.

The top screen controls the Right Hand Side chamber, and the bottom screen controls the Left Hand Side chamber. The bottom screen is the master controller for the workstation.

**Figure 20: SCI-tive Workstation controllers**



1. Right Hand Side Controller
2. Left Hand Side Controller (and Interlock control)
3. Power indicators for the SCI-tive Workstation  
The SCI-tive 120V Workstation has a mains input for each chamber and two power indicators.  
The SCI-tive 230V workstation has one mains input for the workstation and one indicator.
4. Each Chamber's USB Ports

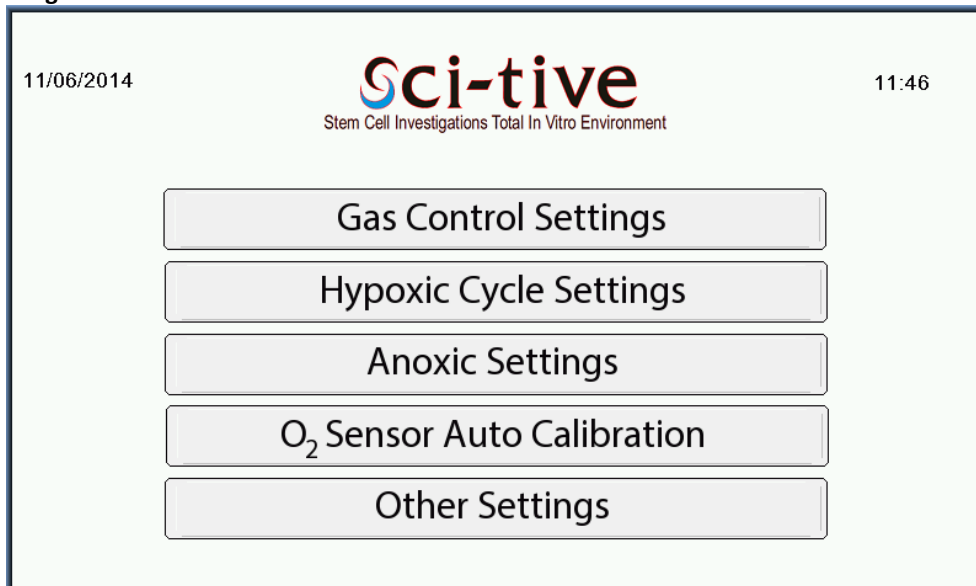
## 4.2 Initial Power Up

When the Sci-tive Dual Workstation is initially powered up the first screen displayed is as shown below in Figure 21. This is quickly followed by the Main Control Screen Top menu window as shown in Figure 22. It is recommended that the user checks both the water tank and oil tank levels before operation.

Figure 21: Initial Power Up Screen



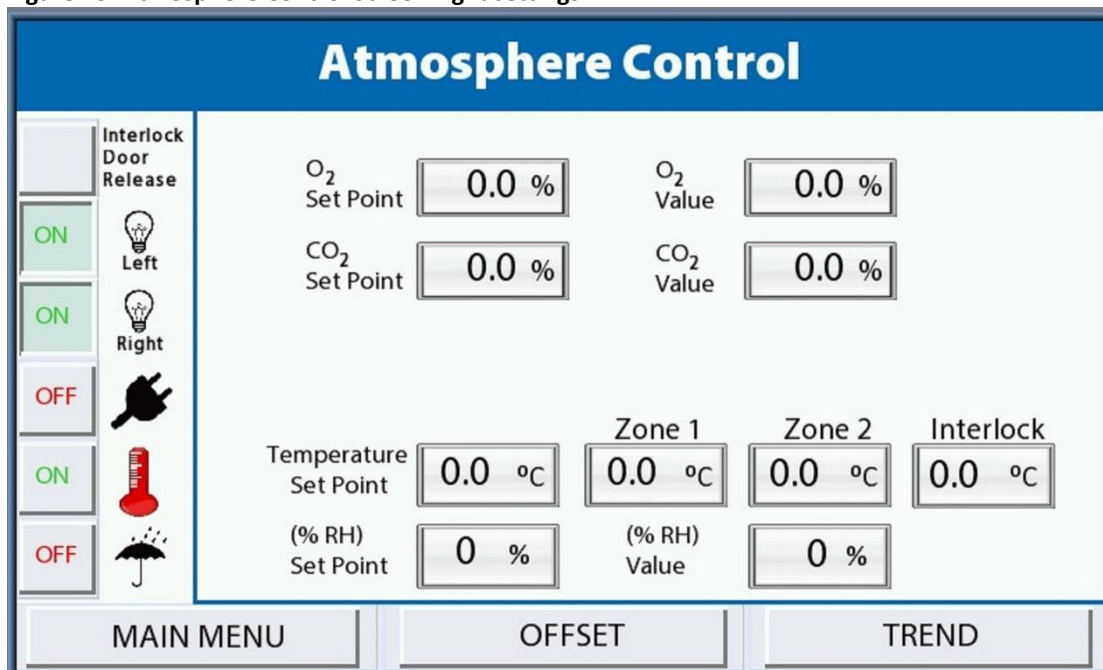
Figure 22: Main Control Screen Menu



### 4.3 Internal Lights

The internal Lights can be set from the menu on the left hand side of the “Gas Control Settings”, “Hypoxic Cycle Settings” or “Anoxic Settings” screens, which are accessed from the Main Control Screen shown in Figure 22.

Figure 23: Atmosphere Control Screen Light settings



Each chamber is equipped with two internal lights (left and right). These are displayed by a light bulb on the Left Hand Side menu, one for the left light, and one for the right light.

To activate the left light, touch the Left Light Bulb icon on the screen, and the button will change from displaying a red “OFF” indicator to a green “ON” indicator on the screen, when the light is on.

Figure 24: Light Bulb switch on and off



To switch off each light, touch the relevant left or right light bulb button, and the button will turn from displaying a green “ON” to red “OFF” and the internal light will be switched off.

#### 4.4 Internal Power sockets

Both workstation chambers have 3 internal power sockets, located on the back wall of the workstation chamber, as shown in Figure 16.

The Internal power sockets can be set from the left hand side menu of the “**Gas Control Settings**”, “**Hypoxic Cycle Settings**” or “**Anoxic Settings**” screens, which are accessed from the Main Control Screen shown in Figure 22.

To activate the internal power sockets, located at the back wall of the chamber Figure 16, press the power socket button as shown in Figure 25. The button will change from displaying a red “**OFF**” indicator to a green “**ON**” indicator on the screen, when the internal power sockets are on.

Figure 25: Internal power socket switch



To switch the internal sockets off, press the power socket button and the button will turn from displaying a green “**ON**” to Red “**OFF**” and the internal power sockets will be switched off.



The Maximum Power rating per chamber is 240W for 120V workstations



The Maximum Power rating per chamber is 480W for 230V workstations.

**Note:** The Maximum Power Rating is the combined total of the three internal mains sockets and the maximum power should not be exceeded. Note also that any devices placed inside the workstation should be checked for compatibility with the temperature and humidity conditions within the workstation chamber. Ruskinn Technology Limited accepts no liability for items damaged inside the workstation chamber that are not suitable for the conditions.

## 4.5 Temperature Control

The temperature can be set for each chamber by using the relevant Left (bottom), Right (top) touch screen controllers.

The SCI-tive Dual workstation chambers Temperature Control is set **ON** by default at power up, and the temperature in each chamber is set to 37 °C by default.

From the main menu control screen (Figure 18) select the first button “**Gas Control Settings**”. When selected, the **Atmosphere Control Screen** will be displayed as shown in Figure 27.

The Temperature Control can be set from the menu on the left hand side of the “**Gas Control Settings**”, “**Hypoxic Cycle Settings**” or “**Anoxic Settings**” screens, which are accessed from the Main Control Screen shown in Figure 22.

To switch the temperature control off, in each chamber, press the temperature control button, and the button will turn from displaying a green “**ON**” to Red “**OFF**”.

**Figure 26: Temperature Control Button**



The temperature can be controlled between ambient + 5°C and 45°C.

To change the temperature, touch the Temperature Set Point box shown in Figure 27, and a numeric pad will appear to allow a different value to be entered, as shown in Figure 28. The resolution of the temperature input setting is 0.1°C.

The Temperature Set Point box sets the temperature for each zone of the chamber and the interlock.

**NOTE:** The interlock temperature follows the temperature that has been set in the Left Hand Side Chamber, **Temperature Set Point** box. The interlock temperature cannot be set independently.

The Zone 1 and Zone 2 values display the temperature at the left and right monitor points within each chamber. **These cannot be set by the user.**

Figure 27: Atmosphere Control Screen

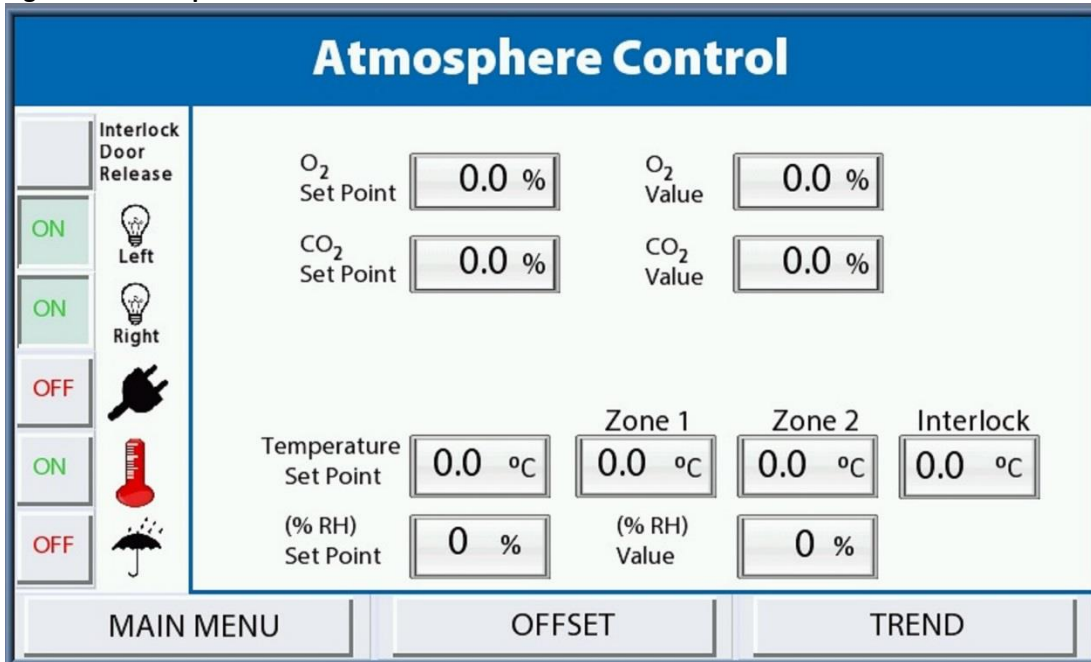
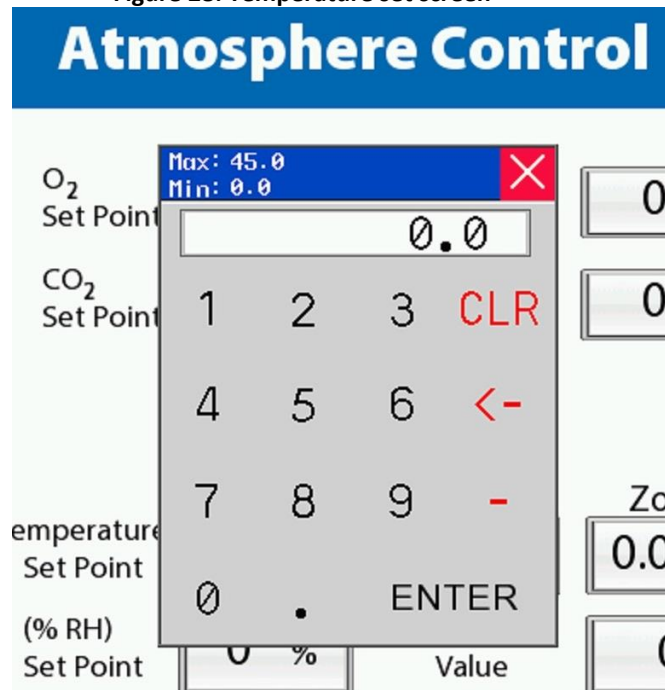


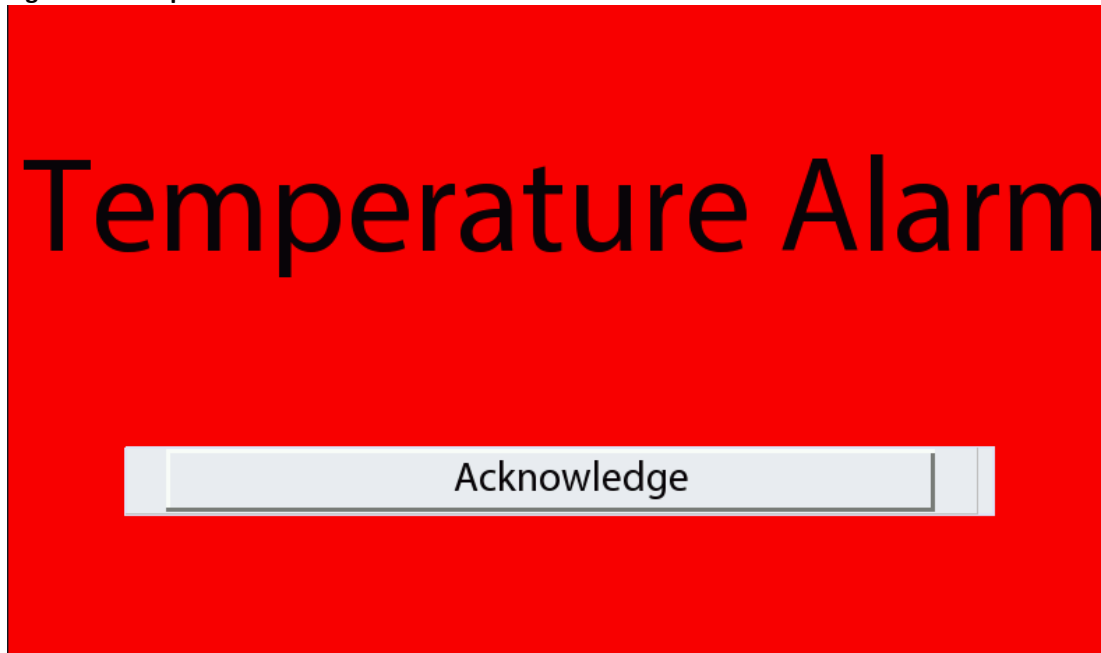
Figure 28: Temperature set screen



#### 4.5.1 Temperature alarms

Each chamber has an alarm function built into the temperature controller. An audible alarm will sound if the temperature increases or decreases +/- 1.0°C of the temperature setting. An alarm screen will appear as shown in Figure 29, and a “**Temperature Alarm Present**” message will appear on the main Atmosphere Control Screen shown in Figure 30.

Figure 29: Temperature Alarms



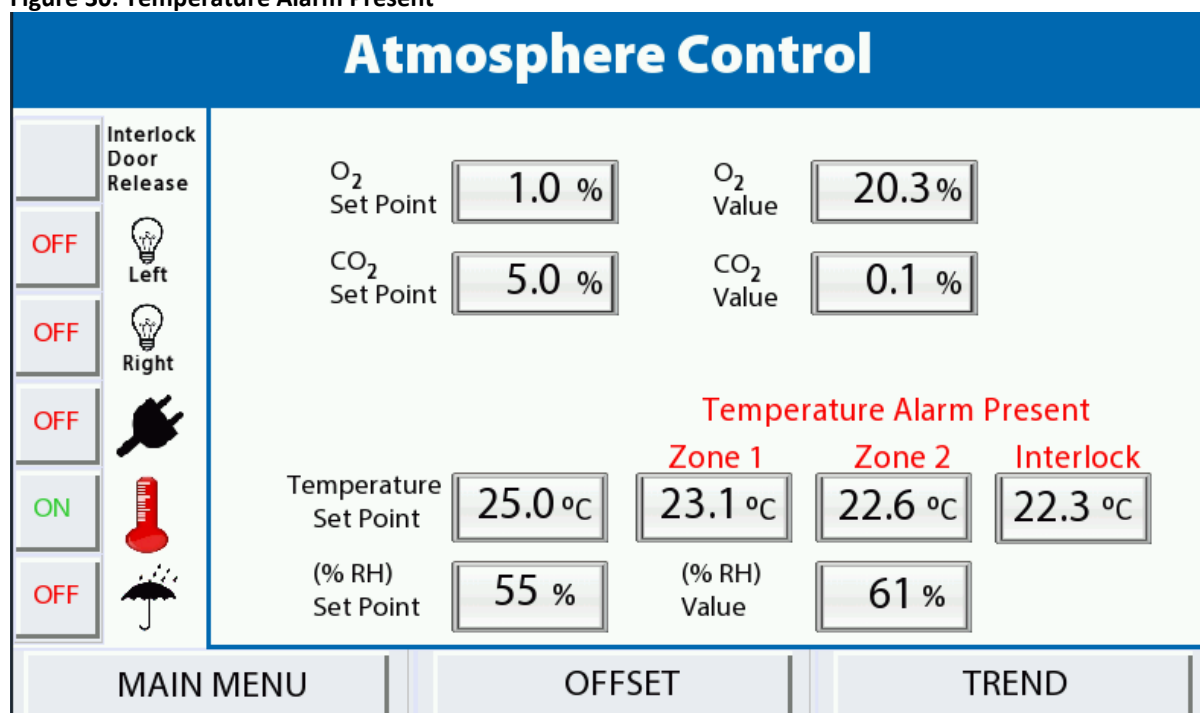
The alarm is turned off when the temperature returns to within +/- 1.0°C of the temperature setting.

The user can acknowledge the alarm, using the “**Acknowledge**” button on the alarm screen in Figure 29 which will disable the audible alarm, however the alarm is not cleared until the temperature returns to within +/- 1.0°C of the temperature setting.

If the temperature alarm is acknowledge and the temperature control system is unable to achieve the Temperature Set Point after twenty minutes the alarm will reactivate.

The temperature alarms are disabled when the temperature control is turned off from the main menu.

Figure 30: Temperature Alarm Present



The “**Temperature Alarm Present**” message is displayed on the main Atmosphere Control screen as shown in Figure 30.

The location of the temperature alarm is indicated by each of the **Zone 1**, **Zone 2**, **Interlock** words becoming red on the main screen. This is shown above in Figure 30, indicating that there is a temperature alarm present in each of the zones of the relevant chamber and the Interlock.

When the temperature adjusts to within +/- 1.0°C of the temperature setting, the temperature alarm clears.



## 4.6 Humidity control Overview

The SCI-tive Dual workstation has a humidity control function for each chamber. The humidity can be controlled between ambient and 85% relative humidity.

Note that at high humidity levels (greater than 70% relative humidity), condensation may form on the inside of the front screen of the workstation. This is due to the temperature difference between the inside of the workstation and the room it is located. To minimize the chance of condensation forming, it is recommended that the workstation is not located by air conditioning vents or windows.

The humidifier system uses a water tank to provide humidity for the workstation. Water is vaporised and is injected into the workstation chamber to increase humidity when required. If the humidity is too high, water vapour is condensed and returns to the water tank. Each workstation chamber has its own humidifier system. The humidifier system is disabled if the water level is too low. If the water level exceeds the maximum level viewed on the side panel water tank, shown in Figure 10 and Figure 11, then water is to be removed from the tank.

### 4.6.1 Humidity control

The humidity control can be activated from the menu on the left hand side of the “**Gas Control Settings**”, “**Hypoxic Cycle Settings**” or “**Anoxic Settings**” screens, which are accessed from the Main Control Screen shown in Figure 22.

The Humidity settings are achieved via a % setting from the “**Atmosphere Control Screen**”.

Before activating the humidity system, the user should check:

The water level is above the minimum level in the water tank as indicated on the end panel of the relevant chamber as shown in Figure 10 and Figure 11.

The Humidity control button is activated by pressing the rain and umbrella button as shown below.

If the humidity system is not required it can be disabled / turned off by pressing the button to **OFF**.

**Figure 31: Humidity Control Button**



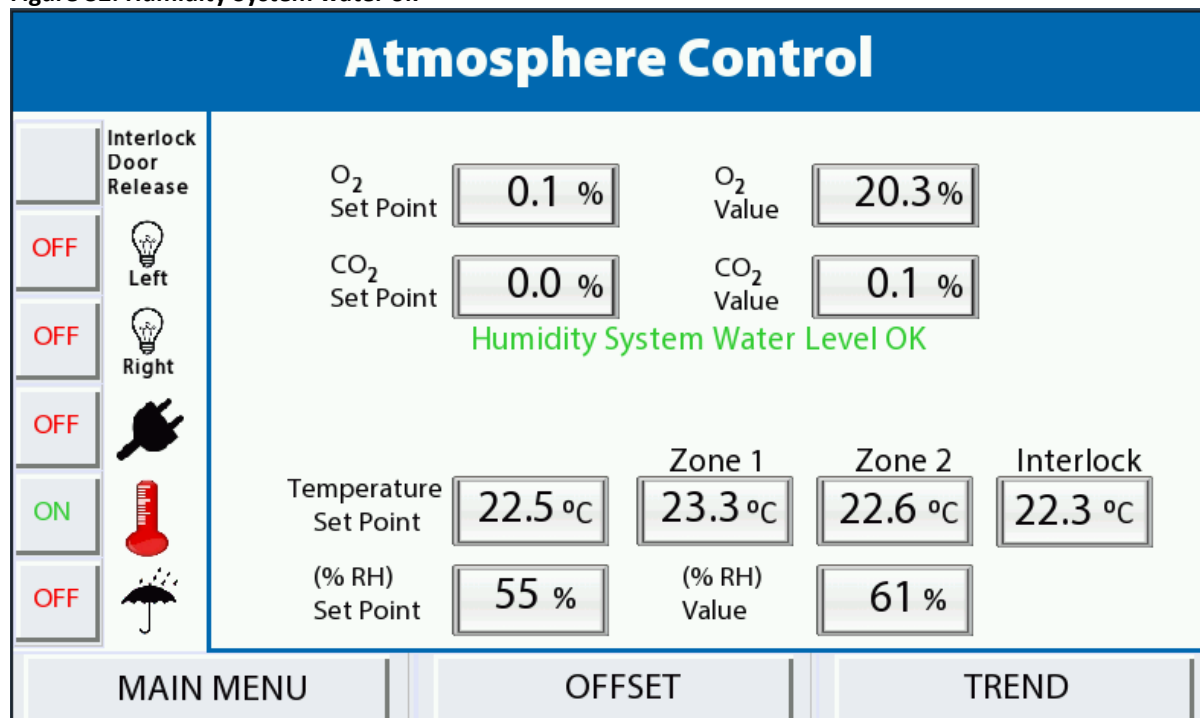
The % relative humidity can be set by entering a % value into the (% RH) Set Point box from the “**Atmosphere Control Screen**”. The % relative humidity can only be set when the humidity system is on and the humidity button indicates a green **ON**.

#### 4.6.2 Humidifier Alarms

To ensure the humidifier systems function correctly, the humidifier tanks must be filled to the correct level as indicated on the end panel of the relevant chamber as shown in Figure 10 and Figure 11. When the workstation is installed and powered up, a green information message will appear for 1 minute on the screen to show the level is ok as shown in Figure 32.

This information message will also appear after the humidifier water tank is filled to the maximum level.

Figure 32: Humidity System water ok



If the humidifier water level is too low, a **Water Low Alarm** will be displayed as shown in Figure 34 and the humidity system is disabled. The **Water Low Alarm** requires immediate attention to allow operation of the humidity system to continue. The user needs to re-fill the humidity water tank as described in Section 4.6.4, until the alarm is cleared.

The **Water Low Alarm** can be acknowledge but the humidity system will remain disabled until the water tank is filled as shown by the message on the control screen, Figure 33. **Note:** The humidity button will stay ON during this time that the system is disabled.

The **Water Low Alarm** will repeat each hour, until the water tank is filled or the humidity system is switched off.

When the tank is filled to the maximum level as shown by the indicators on the side of the water tank, the information message will be displayed for 1 minute as shown in Figure 32, to show that the level is ok.

If the water tank is filled to minimum level, the alarm will clear, the humidity system will activate, but the message in Figure 32 does not appear.

Figure 33: Humidity System Disabled

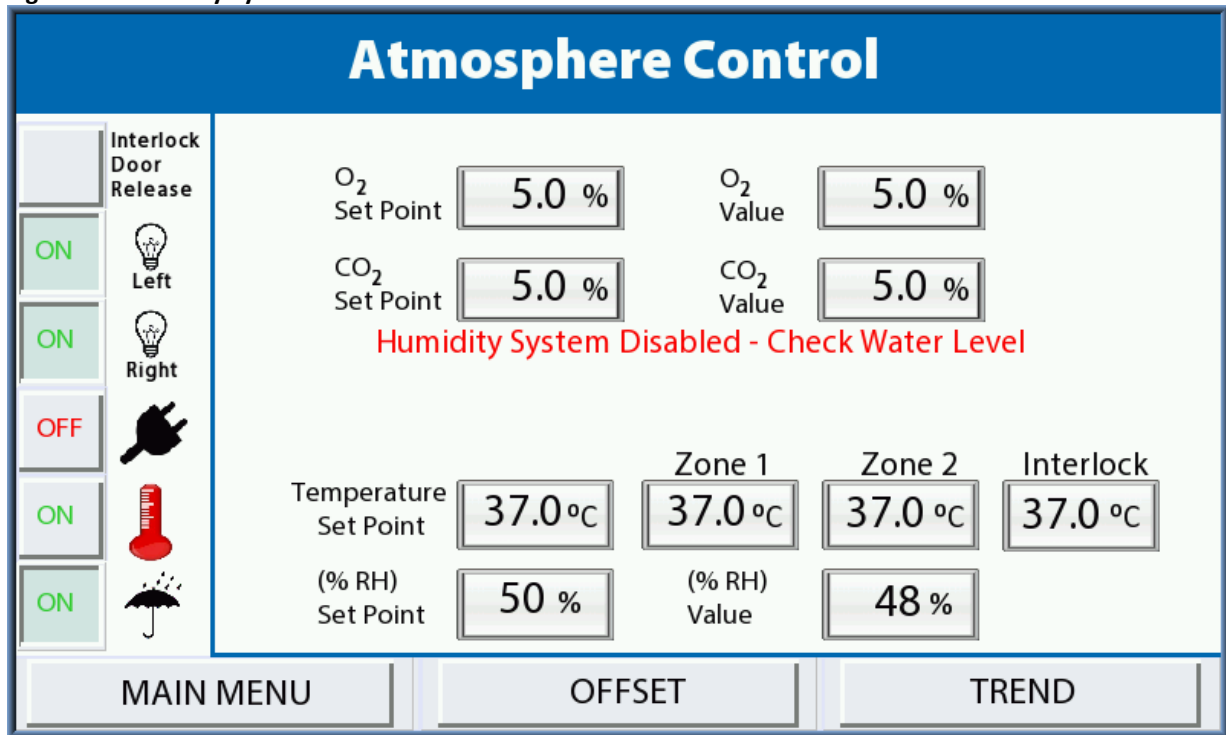
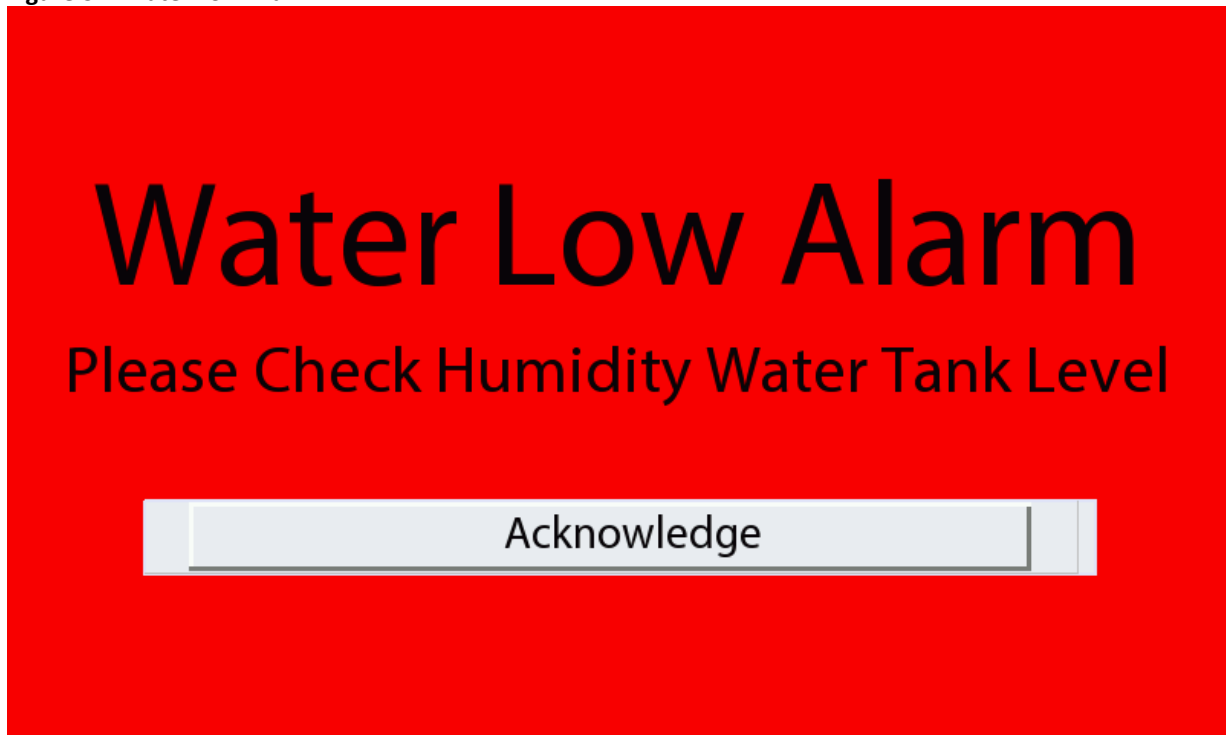


Figure 34: Water Low Alarm



#### 4.6.3 Humidifier water consumption

The humidity system injects water into the workstation chamber as a vapour. This consumes water from the humidifier tank. As the workstation is used, some humidity is lost via the interlock, the waste port, the exhaust valves and the Ezee Sleeves. The water consumption creates the requirement for the water tank to be refilled.

#### 4.6.4 Refilling the humidifier tank

The water tank is filled from inside each chamber, by means of a small water bottle with a pipette end, as shown below In Figure 35. Ionised sterile water must be used to avoid contamination.

Figure 35: Refilling the water tank

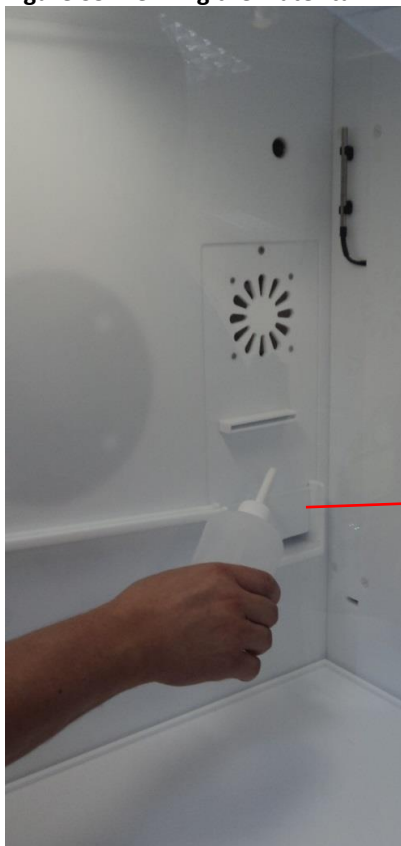


Figure 36: Water tank internal level



A water bottle with a pipette end is to be passed into the chamber through the interlock and purge process.

Once the bottle is inside the chamber, the user accesses the left most glove post, picks up the bottle of ionised sterile water and inserts water into the tank at the side of the chamber. Fill the water according to the physical **MAX** and **MIN** water level indicators on the tank.

The alarm will stop when there is sufficient water in the water tank.

Check the humidity button is ON and there are no other alarms or messages displayed on the **Atmosphere Control** screen.

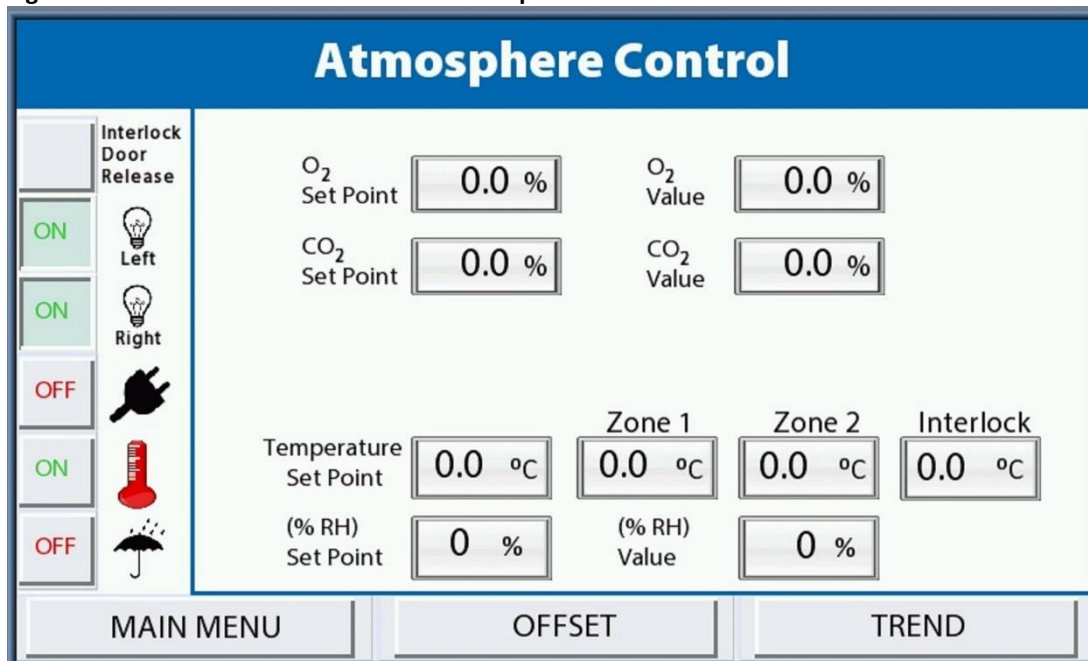
For the Right hand chamber, the water is to be filled accessing the right most glove port.

## 4.7 Environmental gas composition - Atmosphere control

To set up Gas control for the chambers the user should select “Gas Control Settings” from the main menu. Once selected the Atmosphere Control screen as shown in Figure 37 is displayed.

### 4.7.1 Gas control overview

Figure 37: Gas controller menu screen - Atmosphere Control



The O<sub>2</sub> Set point and CO<sub>2</sub> Set point can be set using the Atmosphere Control screen as shown above.

**O<sub>2</sub> Set point:** This is the required oxygen concentration. The O<sub>2</sub> set point can be set between 0.1% and 20.9% in this menu.

For oxygen concentrations of 0.0%, use the “Anoxic Control Menu” option as described in Section 4.9.

For oxygen concentrations greater than 17.0% a combination 75% Nitrogen and 25% Oxygen supply will need to be connected to the Air connection at the rear of the workstation as shown in Section 3.1.4. A red warning screen will appear if this is set above 17.0% as shown in Figure 39.

**CO<sub>2</sub> Set point:** This is the required carbon dioxide concentration. The CO<sub>2</sub> set point can be set between 0.1% and 30.0%.

**O<sub>2</sub> Value:** This is the actual oxygen concentration.

**CO<sub>2</sub> Value:** This is the actual carbon dioxide concentration.

The Trend button provides the Trend log for the parameter. Please refer to Section 4.12 for further information on the event log.

### 4.7.2 Atmosphere Control Alarms

Individual alarms are displayed on the Control Screen for low pressure on the O<sub>2</sub>, CO<sub>2</sub> and N<sub>2</sub>.

If gas pressure alarms are present check the incoming gas supplies at the rear of the workstation.

Figure 38: Atmosphere Control Alarms Screen

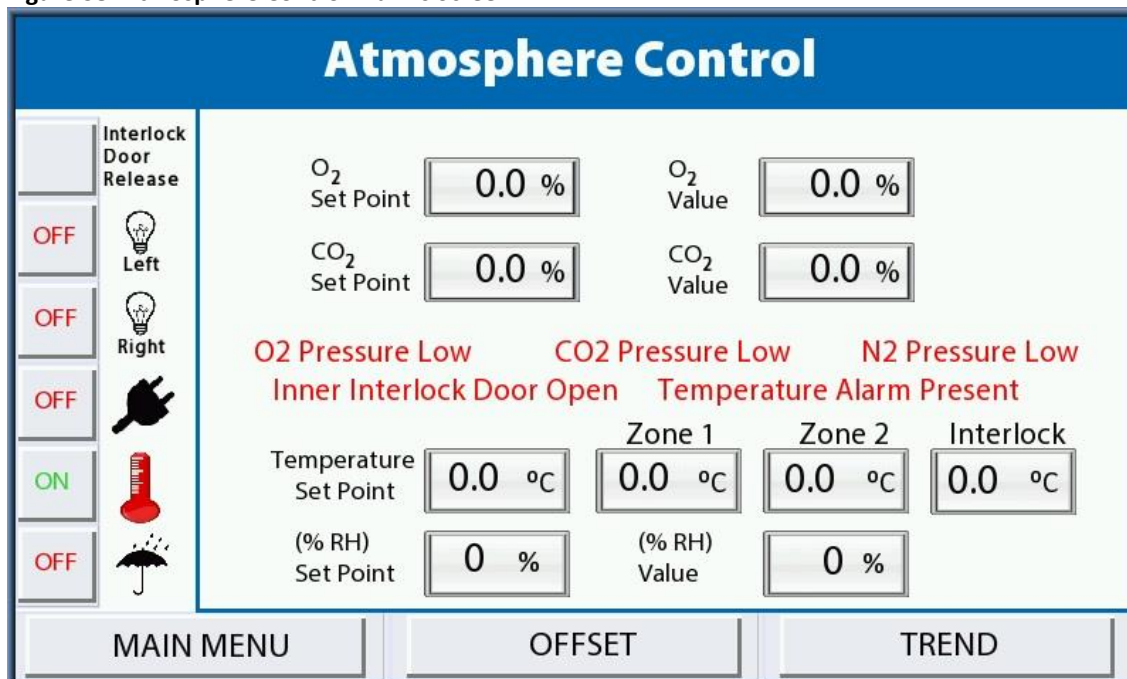
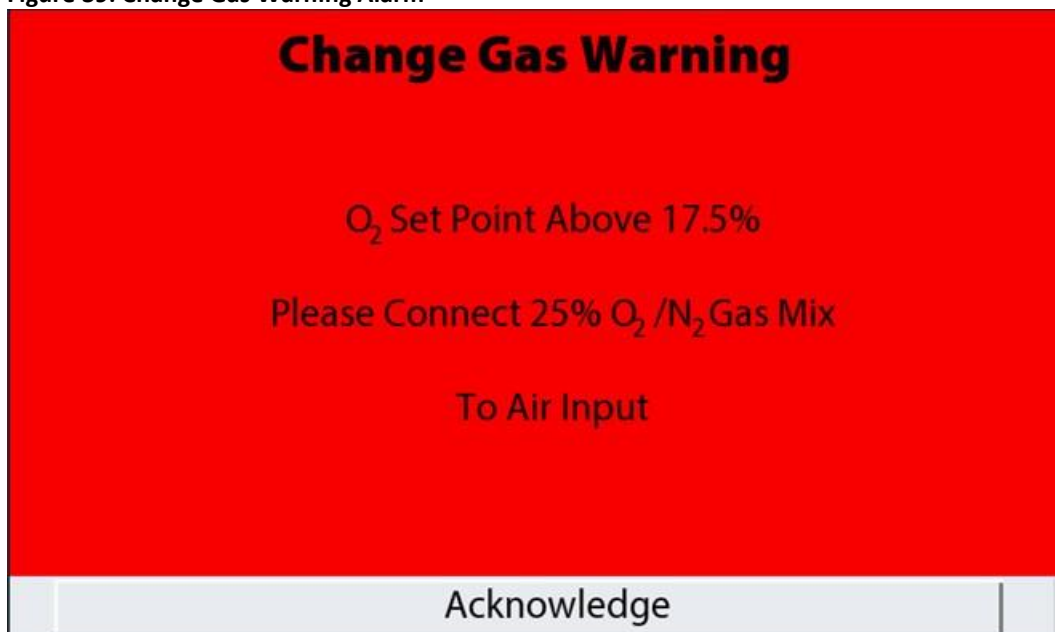


Figure 39: Change Gas Warning Alarm



This alarm occurs when the O<sub>2</sub> set point has been set above 17.5% requiring the compressed air cylinder to be changed.

The user can acknowledge the alarm, using the “**Acknowledge**” button on the alarm screen.

**Figure 40: Failure to reach Set Point Alarm**



This alarm occurs when the internal control time limit to reach Set point has been exceeded and the cycle is aborted. This function prevents excessive gas usage. It is recommended to adjust the set point and re-start the cycle. If this alarm occurs repeatedly see trouble shooting in Section 7.6.

**Figure 41: Low Pressure Time Limit Alarm**



The low pressure time limit alarm occurs when the chamber has been unable to reach the required level over a set time period (15 minutes default). This could be due to glove ports being left off, leakage, or the incoming gas supply needing to be changed.

### 4.8 Setting up a Hypoxic cycle

From the main control screen menu, select the **Hypoxic Cycle Settings** button. The user can choose to run a Continuous Cycle or a Non Continuous Cycle.

Figure 42: Main Control Menu - Hypoxic Cycle Settings

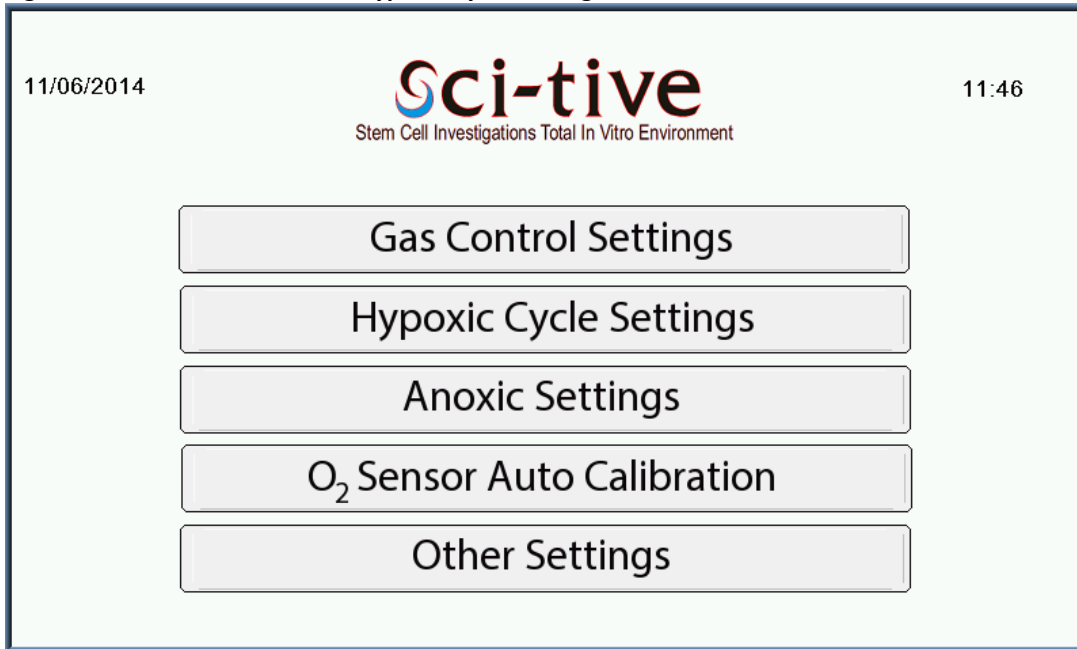
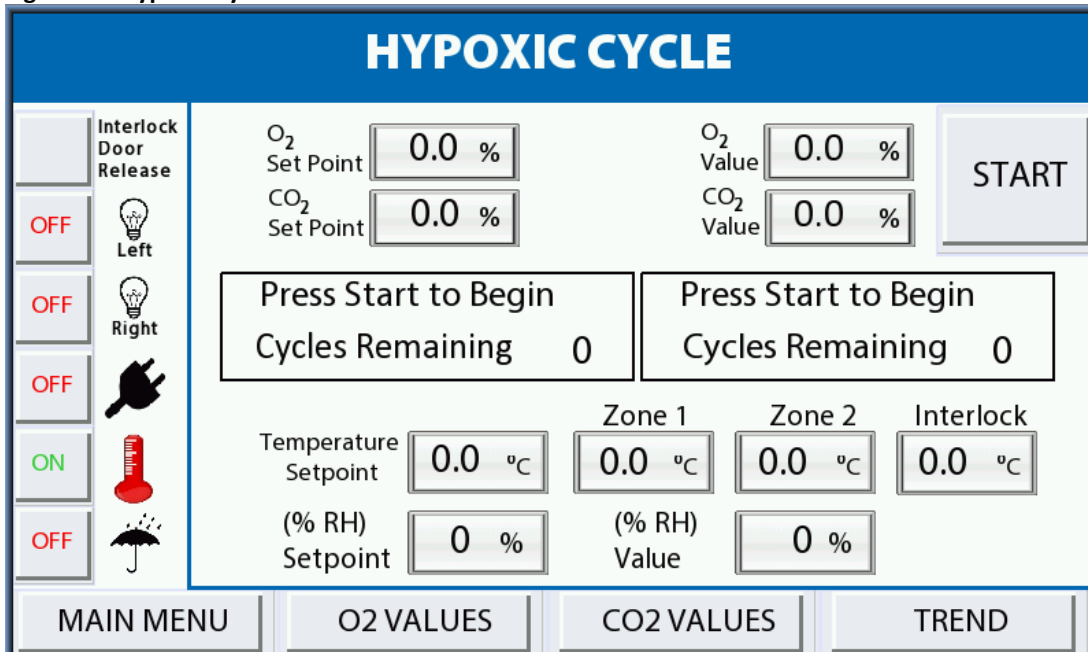


Figure 43: Hypoxic Cycle Menu

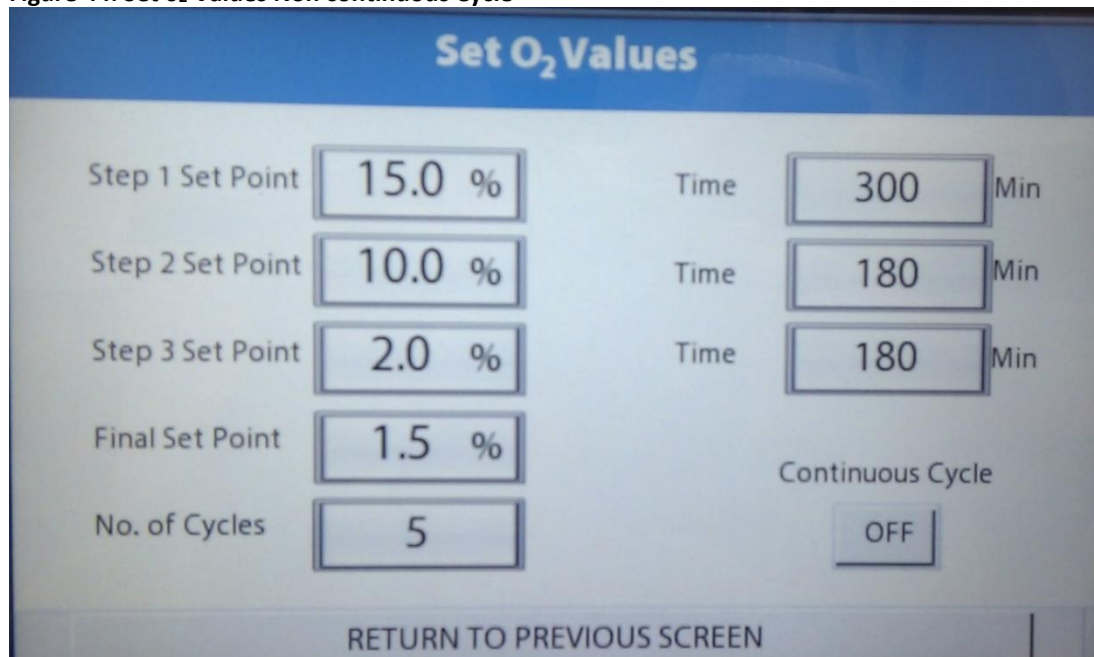


Press the **O<sub>2</sub> VALUES** button to enter O<sub>2</sub> set up screen and the **CO<sub>2</sub> VALUES** button to enter the CO<sub>2</sub> screen. The Cycles will be shown on the main **HYPOXIC CYCLE** screen shown in Figure 43.

The **TREND** button provides the Trend log for the parameter. Please refer to Section 4.12 for further information on the event log.



Figure 44: Set O<sub>2</sub> Values Non continuous Cycle



The screenshot shows a control interface titled "Set O<sub>2</sub> Values". It contains several input fields and a toggle switch:

- Step 1 Set Point: 15.0 %
- Time: 300 Min
- Step 2 Set Point: 10.0 %
- Time: 180 Min
- Step 3 Set Point: 2.0 %
- Time: 180 Min
- Final Set Point: 1.5 %
- No. of Cycles: 5
- Continuous Cycle: OFF

At the bottom, there is a button labeled "RETURN TO PREVIOUS SCREEN".

#### 4.8.1 Setting a Non Continuous Cycle

Set the cycle by setting each of the Steps and the required time for each step, by entering the required values.

**Step 1 Set point 1:** This is the oxygen concentration for the first phase of the hypoxic cycle. Time: This is the time span of the first phase of the hypoxic cycle in minutes.

**Step 2 Set point 2.** This is the oxygen concentration for the second phase of the hypoxic cycle. Time: This is the time span of the second phase of the hypoxic cycle in minutes.

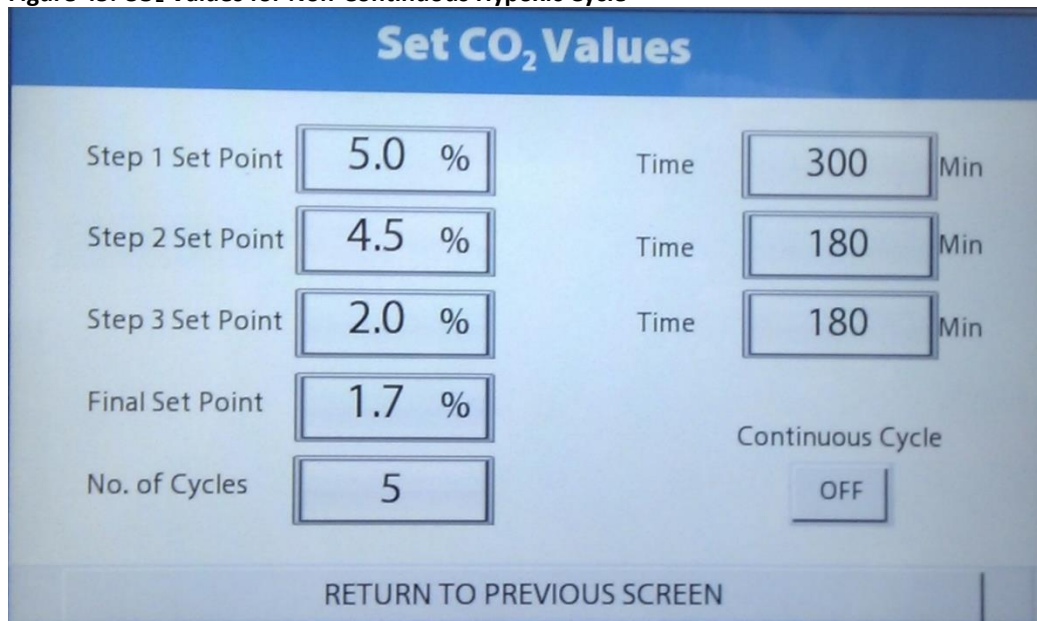
**Step 3 set point 3.** This is the oxygen concentration for the third phase of the hypoxic cycle. Time: This is the time span of the third phase of the hypoxic cycle in minutes.

**Final Set Point.** This is the oxygen concentration for the final phase of the hypoxic cycle. The final phase will operate until the cycle is aborted by the user.

**No. of Cycles.** This allows the number of cycles to be set. This can be set on either O<sub>2</sub> or CO<sub>2</sub> screens, however the number of cycles is to be set the same. This is the last value to be entered on either the O<sub>2</sub> or CO<sub>2</sub> screen.

- Select **"Set point 1"** and enter the required value (between 0.1% and 21.0%) and time in minutes. Please refer to Section 4.7.1 for setting higher than 17.0%.
- Select **"Set point 2"** and enter the required value (between 0.1% and 21.0%) and time in minutes.
- Select **"Set point 3"** and enter the required value (between 0.1% and 21.0%) and time in minutes.
- Select **"Final"** and enter the required value (between 0.1% and 21.0%) and time in minutes.
- Select **"No. of Cycle"** to set the number of cycles required.
- Return to previous screen and select **CO<sub>2</sub> Values** button.

Figure 45: CO<sub>2</sub> Values for Non-Continuous Hypoxic Cycle



The screenshot shows a control interface titled "Set CO<sub>2</sub> Values". It contains several input fields and a button:

Parameter	Value	Unit
Step 1 Set Point	5.0	%
Time	300	Min
Step 2 Set Point	4.5	%
Time	180	Min
Step 3 Set Point	2.0	%
Time	180	Min
Final Set Point	1.7	%
No. of Cycles	5	

Additional controls include a "Continuous Cycle" toggle set to "OFF" and a "RETURN TO PREVIOUS SCREEN" button at the bottom.

**Step 1 Set point 1:** This is the Carbon Dioxide concentration for the first phase of the hypoxic cycle.  
**Time:** This is the time span of the first phase of the hypoxic cycle in minutes

**Step 2 Set point 2.** This is the Carbon Dioxide concentration for the second phase of the hypoxic cycle.  
**Time:** This is the time span of the second phase of the hypoxic cycle in minutes

**Step 3 set point 3.** This is the Carbon Dioxide concentration for the third phase of the hypoxic cycle.  
**Time:** This is the time span of the third phase of the hypoxic cycle in minutes

**Final Set Point.** This is the Carbon Dioxide concentration for the final phase of the hypoxic cycle. The final phase will operate until the cycle is aborted by the user.

**No. of Cycles.** This allows the number of cycles to be set.

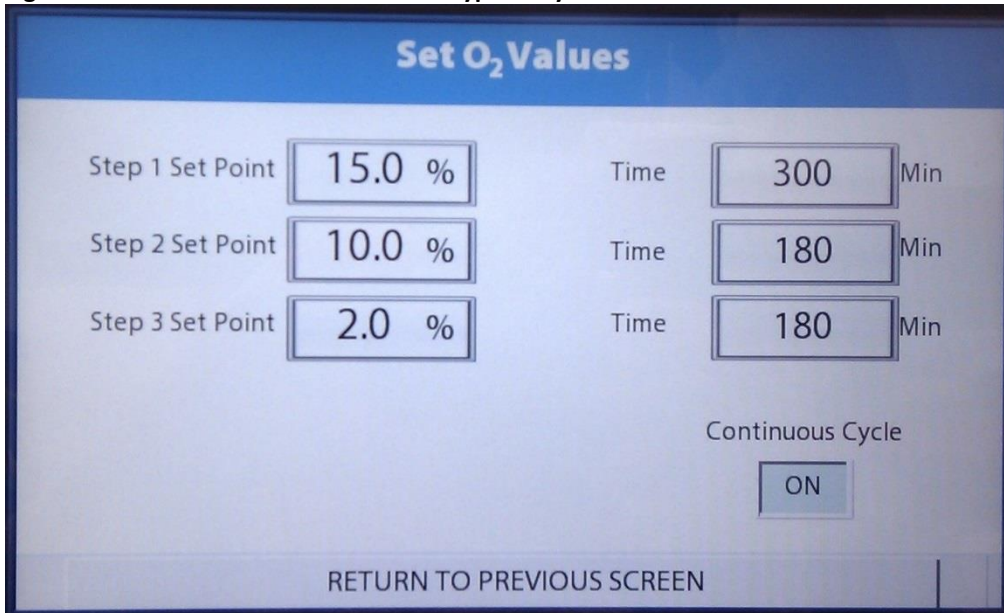
- Select "**Set point 1**" and enter the required value (between 0.1% and 30.0%) and time in minutes.
- Select "**Set point 2**" and enter the required value (between 0.1% and 30.0%) and time in minutes.
- Select "**Set point 3**" and enter the required value (between 0.1% and 30.0%) and time in minutes.
- Select "**Final**" and enter the required value (between 0.1% and 30.0%) and time in minutes.
- Return to previous screen and press **START**.

The hypoxic cycle will now start and the number of cycles remaining will be displayed on the hypoxic cycle screen as shown in Figure 43.

### 4.8.2 Setting a Continuous Cycle

To set a continuous cycle, press the **Continuous Cycle** button on the O<sub>2</sub> screen and a three Step cycle can be set with the respective times for each step.

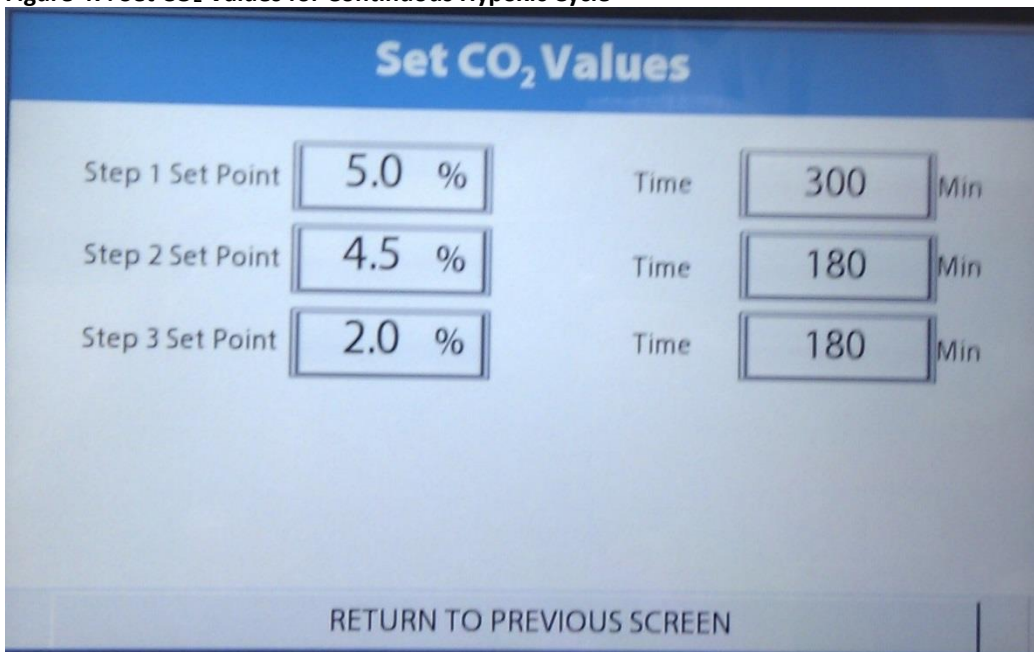
Figure 46: Set O<sub>2</sub> Values for Continuous Hypoxic Cycle



The Continuous Cycle will operate until the cycle is aborted by the user.

The Cycle is aborted by pressing the **RETURN TO PREVIOUS SCREEN** button.

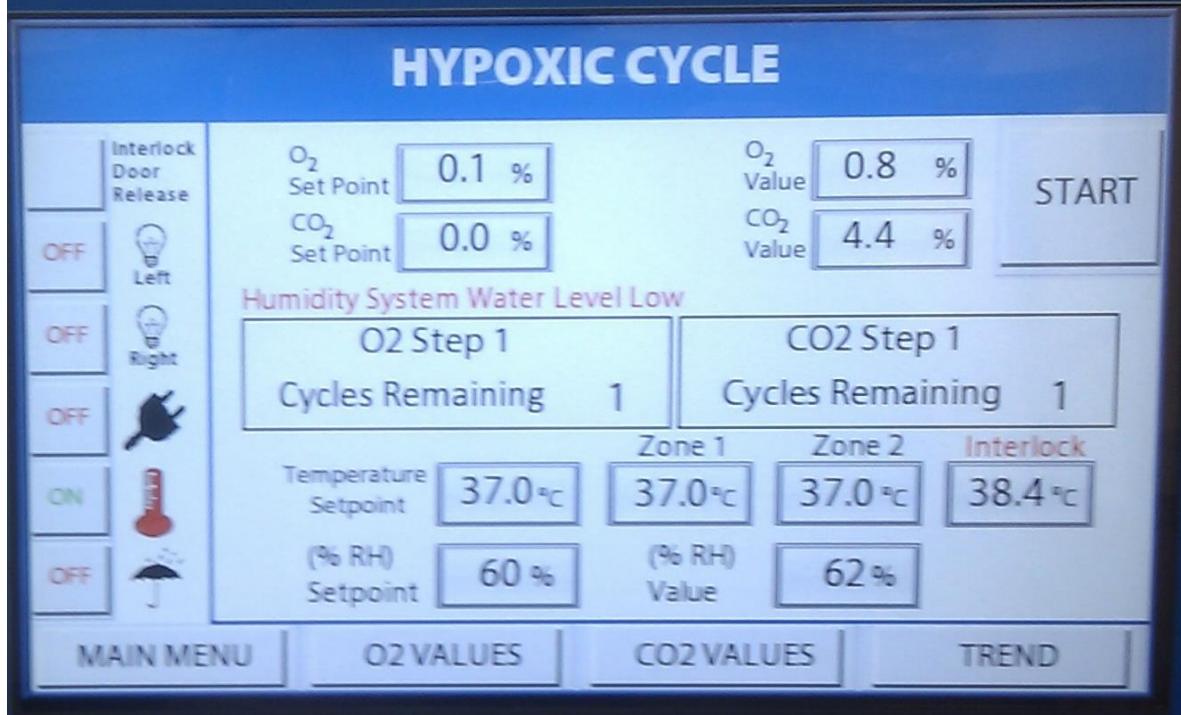
Figure 47: Set CO<sub>2</sub> Values for Continuous Hypoxic Cycle



**4.8.3 Hypoxic Control Alarms**

The “HYPOXIC CONTROL” screen will display both Humidity System and Temperature Alarm messages in Red text on the screen.

**Figure 48: Hypoxic Control Alarms**



### 4.9 Anoxic Control

The Anoxic Control menu allows the workstation to be run in anoxic mode (0.0% oxygen). To run in anoxic mode, Hydrogen gas in Nitrogen is required. The maximum permissible concentration is 5.5% Hydrogen in Nitrogen.

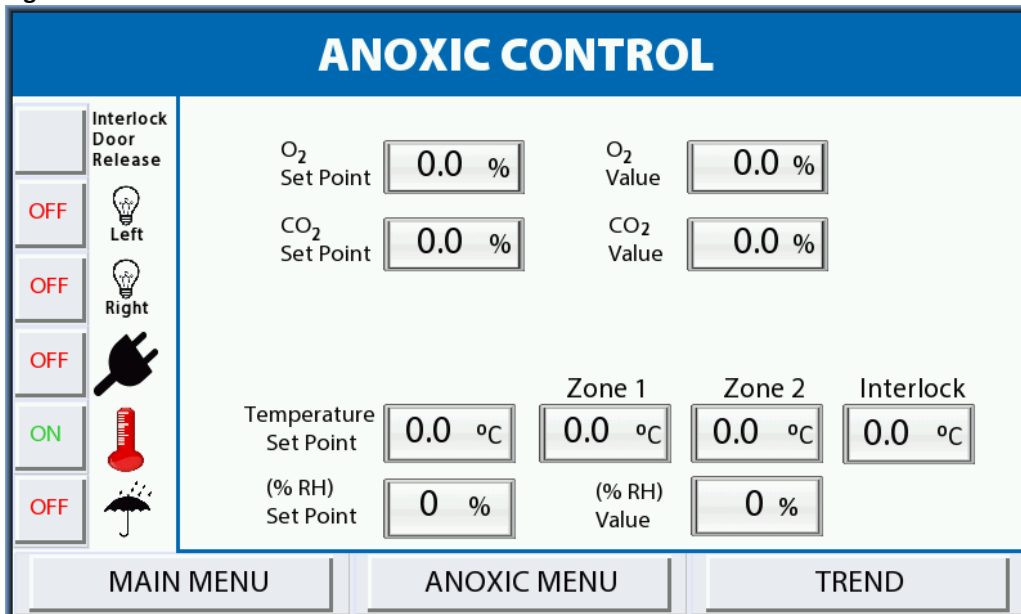
In addition to this, two small catalyst sachets are required per chamber. The catalyst combines Hydrogen and Oxygen to form water, thereby removing all Oxygen from the inside of the chamber.

**Note:** There is no oxygen control in this operating mode.

#### 4.9.1 Overview

To enter the anoxic mode, select “**Anoxic Settings**” from the main menu. The Anoxic Control screen will then be displayed as shown in Figure 49.

Figure 49: Anoxic control screen



**O<sub>2</sub> Value:** This is the actual oxygen concentration in the workstation chamber.

**CO<sub>2</sub> Set Point:** CO<sub>2</sub> % can be set.

**CO<sub>2</sub> Value:** This is the actual CO<sub>2</sub> concentration in the workstation chamber.

#### 4.9.2 Anoxic Menu

The Anoxic Menu is password protected and for use by service personnel only.

#### 4.9.3 Trend Screen

The Trend button provides the Trend log for the parameters. Please refer to Section 4.12 for further information on the Trend log.

## 4.10 Oxygen (O<sub>2</sub>) Sensor Calibration

### 4.10.1 Overview

To ensure the correct function of the gas mixer, the oxygen sensor must be calibrated. The auto calibration function of the gas mixer allows the oxygen sensor to be calibrated without destabilising the environment in the workstation chamber. Ruskinn Technology Limited recommends that the oxygen sensor is calibrated on a monthly basis using the O<sub>2</sub> Sensor calibration and replaced annually by a qualified service engineer.

### 4.10.2 Screen layout

To enter the oxygen sensor auto calibration screen, select “O<sub>2</sub> Sensor Calibration” from the main menu. Figure 50 shows the oxygen sensor calibration screen;

Figure 50: Oxygen sensor calibration screen

**Start Calibration.** This starts the oxygen sensor automatic calibration.

**Time Remaining.** This gives the time remaining in seconds of the oxygen sensor automatic calibration.

**Last Calibration.** This gives the date and time of the last oxygen sensor auto calibration.

**Change Timers.** This opens the service engineer screen, which is password protected. This function is included for the use of qualified service engineers only. If the password screen is entered accidentally press the return button on the password screen.

**Previous.** Press to return to the main menu via the return to main menu screen

### 4.10.3 Calibrating the oxygen sensor

To calibrate the oxygen sensor;

- Enter the oxygen sensor auto calibration screen by selecting “**Oxygen Calibration**” from the main menu.
- Press “**Start Calibration**”. The time remaining counter will then begin.
- Once the calibration has finished, the calibration result will be displayed.

**Note:** If the oxygen sensor fails calibration, it must be replaced.

It is recommended to replacement the sensor once a year

For oxygen sensor replacement, please contact your local distributor.

### 4.11 Setting the date and time

The date and time are set by the installer and are required for the Trend log.

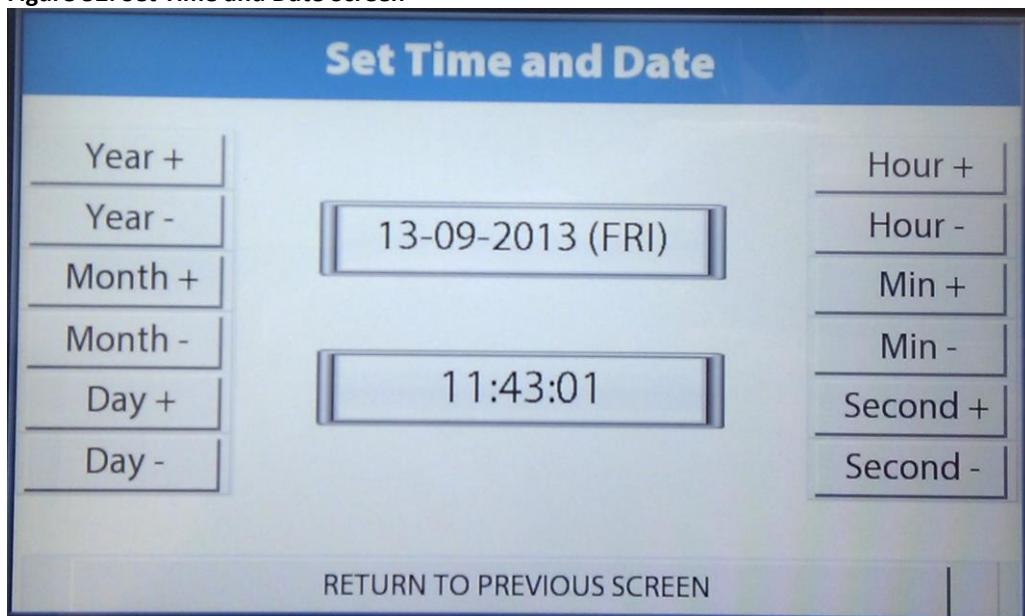
To set the date and time, select “**Other settings**” from the main menu and then press the **SET DATE/TIME** button as shown in Figure 51.

Figure 51: Settings / Help Screen



The date and time screen will be displayed as shown in Figure 52.

Figure 52: Set Time and Date Screen



Use the appropriate button to adjust the Day / Month / Year / Hour / Min / Second settings. Press “**RETURN TO PREVIOUS SCREEN**” button to return to the previous screens.



**4.12 Trend log**

The Trend log provides a historical record of the environmental conditions within the workstation. The Trend log stores all data for each chamber when there is a USB device connected. Data is recorded at 1 minute intervals.

**4.12.1 On Screen Trend log**

The on screen Trend log shows the latest 1 hour of data (60 data entries).

Figure 53: Onscreen Trend Log

The screenshot shows a control screen titled "Trend Log" with a table of data. The table has seven columns: Date (DD/MM/YY), Time (HH:MM:SS), O<sub>2</sub>%, CO<sub>2</sub>%, Zone 1 Temp. (°C), Zone 2 Temp. (°C), and Humidity (% RH). The data is as follows:

Date (DD/MM/YY)	Time (HH:MM:SS)	O <sub>2</sub> %	CO <sub>2</sub> %	Zone 1 Temp. (°C)	Zone 2 Temp. (°C)	Humidity (% RH)
05/ 11/ 13	13: 45 : 09	0.0	4.9	37.0	37.1	66.4
05/ 11/ 13	13: 45 : 09	0.0	4.9	37.0	37.1	66.3
05/ 11/ 13	13: 45 : 09	0.0	4.9	37.0	37.1	66.3
05/ 11/ 13	13: 49 : 09	0.0	4.9	37.0	37.0	66.4
05/ 11/ 13	13: 49 : 19	0.0	4.9	37.0	37.0	66.4
05/ 11/ 13	13: 50 : 56	0.8	4.8	37.0	36.9	62.2
05/ 11/ 13	13: 51 : 04	0.8	4.4	37.1	37.0	60.7
05/ 11/ 13	13: 52 : 38	0.8	4.4	37.0	37.0	61.3
05/ 11/ 13	13: 53 : 56	0.8	4.4	37.0	37.0	61.3
05/ 11/ 13	13: 54 : 04	0.8	4.4	37.1	37.1	61.4

At the bottom of the screen, there are four buttons: "PREVIOUS", a left arrow, a right arrow, and "USB Status".

Note that upon entering the event log, the earliest recorded data will be displayed. A 60 minute window can be scrolled through on the control screen. To view data over 60 minutes, the USB stick should be removed and connected to a computer. The USB device can capture many years of data.

Note that when the USB stick is removed from the workstation, there will be no data logging for the length of time that the USB is removed.

To safely remove the USB follow the next section.

**4.12.2 Removing the USB**

The Trend log is downloaded to a USB for each chamber. Each chambers USB must be present at all times of operation.

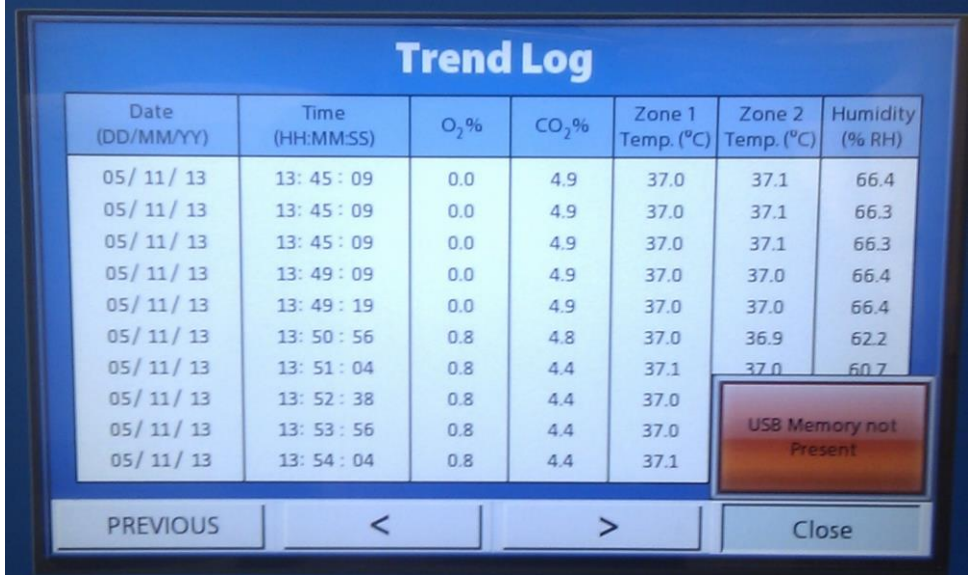
The USB can be removed by pressing the "USB Status" button (and if a USB is present), the following screen will be displayed.

Figure 54: Trend Log USB removal



The Green “Press to Safely Eject USB Memory” button should be pressed to safely remove the USB stick. The Left USB stick contains the Left Hand Side Chamber Trend Log data, and the Right USB stick contains the Right Hand Side Chamber Trend Log data. Wait until the red “USB has been ejected” message to appear as shown in Figure 55, then remove the USB.

Figure 55: Trend Log USB not present



When the USB has been removed the following alarm screen is displayed. As shown below in Figure 56.

Figure 56: USB Memory Device removed alarm



The Trend Log screen also shows a red warning box with a message that the USB Memory is not present.

### 4.12.3 Trend log on the USB device

The Trend log is continually downloaded to a USB device and can be uploaded to a PC to be analysed. Note that the USB device must be formatted in the FAT32 data format. A Ruskinn Technology Limited USB stick is provided with the workstation, pre formatted in FAT32 format. It is recommended that the Ruskinn Technology Limited USB stick should be used for downloading the event log. Note that only devices that insert directly into the USB ports should be used. Devices attached via a cable should not be used.

**Figure 57: Trend Log**

DATE	TIME	O2 PV	O2 SP	CO2 PV	CO2 SP	O2 DB	CO2 DB	O2 Count	CO2 Count	Temp SP	Z1 PV	Z2 PV	INT PV	Humidity	Humidity	PS Count	PS Value
09/06/2014	01:45:56	1.461574	5	4.335	5	0.2	0.2	0	0	37	37.1	37	37	74.19355	75	0	0.065415
09/06/2014	01:46:56	1.461574	5	4.335	5	0.2	0.2	0	0	37	37.1	37	37	74.13979	75	0	0.076809
09/06/2014	01:47:56	1.461574	5	4.335	5	0.2	0.2	0	0	37	37	37	37	74.13979	75	0	0.070057
09/06/2014	01:48:56	1.461574	5	4.35	5	0.2	0.2	0	0	37	37.1	37	37	73.9785	75	0	0.074699
09/06/2014	01:49:56	1.461574	5	4.335	5	0.2	0.2	0	0	37	37	37	37	74.05914	75	0	0.050222
09/06/2014	01:50:57	1.461574	5	4.335	5	0.2	0.2	0	0	37	37.1	37	37	73.87097	75	0	0.06035
09/06/2014	01:51:56	1.461574	5	4.335	5	0.2	0.2	0	0	37	37	37	37	74.00538	75	0	0.035029
09/06/2014	01:52:56	1.461574	5	4.335	5	0.2	0.2	0	0	37	37.1	37	37	73.84409	75	0	0.052332
09/06/2014	01:53:57	1.461574	5	4.335	5	0.2	0.2	0	0	37	37	37	37	73.92474	75	0	0.034606
09/06/2014	01:54:57	1.461574	5	4.335	5	0.2	0.2	0	0	37	37	37	37	73.92474	75	0	0.048111

The Trend log gives the following data;

- Date.
- Time.
- Oxygen concentration present value (O<sub>2</sub> PV).
- Oxygen concentration set point (OPSP).
- Carbon Dioxide concentration present value (CO<sub>2</sub> PV).
- Carbon Dioxide concentration set point (CO<sub>2</sub> PSP).
- Oxygen Deadband (O<sub>2</sub> DB).
- Carbon Dioxide Deadband (CO<sub>2</sub> DB).
- Oxygen Deadband Counter (O<sub>2</sub> Count).
- Carbon Dioxide Deadband Counter (CO<sub>2</sub> Count).
- Temperature System Set Point (Temp SP).
- Zone1 Temperature Present Value (Z1 Temp PV).
- Zone2 Temperature Present Value (Z2 Temp PV).
- Interlock Temperature Present Value (Int Temp PV).
- Humidity Set Point (Humidity SP).
- Humidity Present Value (Humidity PV).
- Pressure Switch Counter (PS).
- Pressure Switch Value (PS Value)

**Note:** The column PS Count and PS Value refer to the pressure switch which is provided for the use of service engineers.

Pressure switch count. This is the time in minutes since the last operation of the pressure switch. The pressure switch operates when the pressure in the workstation chamber falls below a set level. Nitrogen is injected into the workstation to increase the pressure, to maintain a positive internal pressure. Pressure switch value is a reading of the pressure inside the workspace measured in Kilopascals (kPa).

**Note:** “Deadband” is the control limit around the target. In this limit gas will not be injected. E.g. For a deadband of 0.2 around a 5% target, gas will not be injected if the sensor reads anywhere between 4.8% and 5.2%.

When the USB is removed from the workstation, there will be no data logging for the length of time that the USB is removed.

### **4.13 Gas usage, change times and stability**

The workstation uses a combination of nitrogen, compressed air and carbon dioxide to maintain the desired atmospheric conditions inside the workstation chamber. The amount of gas consumed by the workstation will depend upon the environmental conditions required, and the frequency of use.

For more information on the Gas usage, please refer to *CI-001 SCI-tive Testing and validation document* on the Ruskin web site ([www.ruskinn.com](http://www.ruskinn.com)).

## 5. Using the interlock

The interlock is provided as a means of introducing and removing material to and from the workstation chamber without disturbing the internal atmosphere of the workstation chamber.

**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.

### 5.1 Interlock overview

The interlock consists of a small chamber with two inner doors and an outer door. Inside the chamber there is a heated sliding tray. The tray can slide into either workstation chamber when the required interlock inner door is open. This is to provide easier access to items transferred through the interlock.

The interlock inner environment is controlled through the purging process to control the oxygen level to the user setting value. This allows the user to introduce samples in the interlock at any required level up to 10% oxygen. Items cannot enter the chamber until a successful purge has been completed.

**Figure 58: Interlock door Open and Closed**

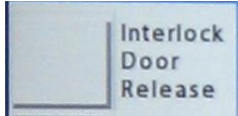


Please refer to Figure 1 for Hazard Warning Label Explanation.

## 5.2 Opening the interlock outer door

To open the interlock outer door, press and hold the interlock door button for 3 seconds from the “**Gas Control Settings**”, “**Hypoxic Cycle Settings**” or “**Anoxic Settings**” screens, which are accessed from the Main Control Menu on the Left and Right Hand Chamber control screen.

Figure 59: Interlock Door Release Button



To close the interlock outer door, push the interlock outer door closed. A click will be heard when the outer door closes as the magnets engage to lock the interlock outer door.

### 5.2.1 Opening the interlock inner doors

To open the interlock inner doors, press the interlock inner door button inside the chamber. This can only be pressed when the LED illuminates.

Figure 60: Inner door open button



To close the interlock inner doors, slide the open interlock inner door forwards until closed.

Only 1 inner interlock door can be opened at one time.

### 5.2.2 Transferring material into a workstation chamber via the interlock

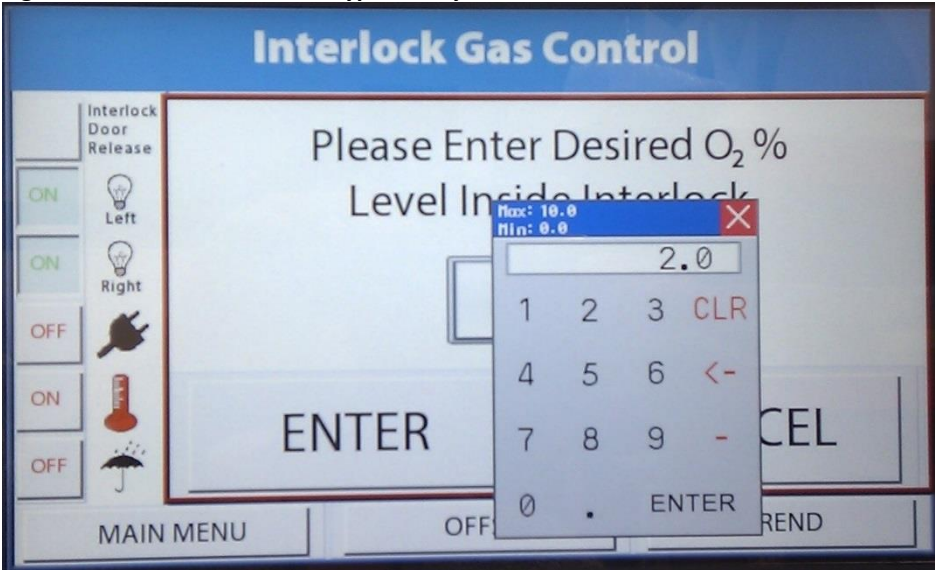
To transfer materials into a workstation chamber it is necessary to set the desired O<sub>2</sub> level for the interlock.

- Press and hold the interlock outer door button for 3 seconds on the main screen to open the interlock outer door.
- Pull the interlock outer door down to fully open the interlock outer door. **Warning: Do not place items on the interlock outer door. This could cause damage to the interlock outer door and the shell of the workstation.**
- Place the material to be transferred into a workstation chamber onto the interlock floor tray inside the interlock chamber.
- Close the interlock outer door.

Figure 61: Interlock O<sub>2</sub> desired level



Figure 62: Interlock O<sub>2</sub> level keypad entry



When the interlock door is closed a purge of the interlock will take place. The doors cannot be opened at this time and the following screens will be displayed.



Figure 63: Interlock purge in Progress

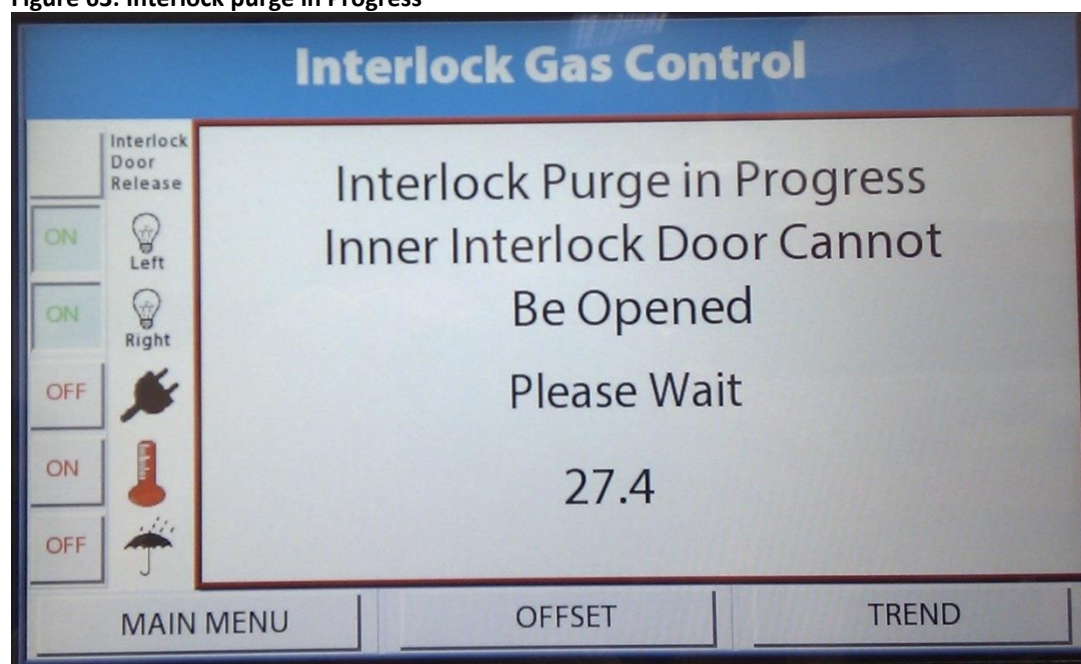


Figure 64: Interlock Purge Complete



- Enter your hands into the workstation chamber via the Ezee Sleeves.
- When the interlock inner door LEDs are illuminated press the interlock inner door button to release the interlock inner door clamps.
- Slide the interlock inner door back.
- If required, slide the interlock tray into the workstation chamber.
- Remove material from the interlock floor tray and place in the workstation chamber.
- When all material has been removed from the interlock floor tray, push the interlock floor tray back into the interlock chamber.
- Slide the interlock inner door forward to close the interlock chamber.

**Note:** The interlock inner doors should not be left open other than when moving material from the interlock chamber to a workstation chamber and vice versa.

If the interlock door is left open for more than 30 seconds, the LED flashes to indicate the inner door should be closed.

### **5.2.3 Removing material from the workstation chamber via the interlock**

To remove materials from the workstation chamber;

- Open and close the outer Interlock door, and repeat the purge process.
- When the interlock inner door LEDs are illuminated press the interlock inner door button to release the interlock inner door clamps.
- Slide the interlock inner door back.
- If required, slide the interlock tray into the workstation chamber.
- Place the materials to be removed onto the interlock floor tray.
- When all material has been placed on the interlock floor tray, push the interlock floor tray back into the interlock chamber.
- Slide the interlock inner door forwards to close the interlock chamber.
- Remove hands from the Ezee Sleeves.
- Press and hold the interlock outer door button for 3 seconds to open the interlock outer door.
- Pull the interlock outer door down to fully open the interlock outer door. **Warning: Do not place items on the interlock outer door. This could cause damage to the interlock outer door and the shell of the workstation.**
- Remove the material from the interlock floor tray inside the interlock chamber.
- Close the interlock outer door.

#### 5.2.4 Transferring material between the workstation chambers

To transfer materials between the workstation chambers;

- Open and close the outer door and purge system.
- When the interlock inner door LEDs are illuminated press the interlock inner door button to release the interlock inner door clamps.
- Slide the interlock inner door back.
- If required, slide the interlock tray into the workstation chamber.
- Place the materials to be removed onto the interlock floor tray.
- When all material has been placed on the interlock floor tray, push the interlock floor tray back into the interlock chamber.
- Slide the interlock inner door forwards to close the interlock chamber.
- Remove hands from the Ezee Sleeves
- Enter your hands into the other workstation chamber via the Ezee Sleeves.
- When the interlock inner door LEDs are illuminated press the interlock inner door button to release the interlock inner door clamps.
- Slide the interlock inner door back.
- If required, slide the interlock tray into the workstation chamber.
- Remove material from the interlock floor tray and place in the workstation chamber.
- When all material has been removed from the interlock floor tray, push the interlock floor tray back into the interlock chamber.
- Slide the interlock inner door forward to close the interlock chamber.

#### 5.2.5 To cancel a purge

To cancel a purge the user can press the **CANCEL** button to open the interlock door. If a purge has started the “**Interlock Door Release**” button can be pressed and held for 3 seconds from the menu screen of the Left Hand Side chamber Control Panel, as shown in Figure 59.

### 5.3 Hand access to the workstation chambers

Direct hand access to the workstation chambers is provided via the glove ports and the Ezee Sleeve system. The Ezee Sleeves provide direct bare hand (or gloved) access to the workstation chamber.

#### 5.3.1 Ezee Sleeve overview

The Ezee Sleeves consists of a sleeve, a cuff and a mandrel. There are 3 sizes of Ezee Sleeve available; small, medium and large. Each size of Ezee Sleeve has a corresponding mandrel.

The sleeves attach to the glove ports via 2 O-rings. The cuff is then attached to the sleeve via an O-ring. The mandrel inserts into the cuff when the sleeves are not in use. When in use, the mandrels can be stored in the mandrel holder, located above the interlock inner door.

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

#### 5.3.2 Entering a workstation chamber using the Ezee Sleeves

To enter a workstation chamber via the Ezee Sleeves;

- For each workstation chamber, remove the glove port covers from the 2 glove ports to be used by turning the covers anti-clockwise (counter-clockwise) then lifting the glove port covers away from the glove port. The glove port covers can be stored in the glove port cover holders located on the workstation stand.
- Hold the left most Ezee Sleeve cuff with your right hand and hold the mandrel with your left hand.
- Supporting the Ezee Sleeve cuff with your right hand, use your left hand to **slowly** push the mandrel and your left hand through the cuff. Ensure that you have pushed your arm through far enough such that the cuff is tight around your wrist.
- Place the mandrel on the floor tray.
- Hold the other Ezee Sleeve cuff with your left hand (from inside the workstation chamber) and hold the mandrel with your right hand.
- Supporting the Ezee Sleeve cuff with your left hand, use your right hand to **slowly** push the mandrel and your right hand through the cuff. Ensure that you have pushed your arm through far enough such that the cuff is tight around your wrist.
- Place the mandrels in the mandrel holder.

**Note;**

- The cuffs must be properly supported when entering the workstation chamber. Failure to support the cuffs can cause the Ezee Sleeves to come off the glove ports.
- The Ezee Sleeve cuffs must be tight around the wrists. This is to ensure a gas tight seal between the cuff and the wrists. Remove any jewellery and/ or wrist watches from the wrists before using the Ezee Sleeves. The sleeves of clothing should be rolled up to prevent them entering the cuffs of the Ezee Sleeves.
- Ezee Sleeves can be lubricated with Talc for easier use. Talc is available from Ruskinn Technology Limited.
- Care should be taken when using the right workstation chamber to avoid any microscopes/ equipment fitted in the workstation chamber when entering the workstation chamber using the Ezee Sleeves.

### 5.3.3 Exiting the workstation using the Ezee Sleeves

To exit the workstation chamber via the Ezee Sleeves;

- Remove the mandrels from the mandrel holder and place on the floor tray.
- Supporting the Ezee Sleeve cuff with your right hand, use your left hand to **slowly** pull the mandrel and your left hand through the cuff. Ensure that the mandrel is correctly seated in the cuff.
- Supporting the Ezee Sleeve cuff with your left hand, use your right hand to **slowly** pull the mandrel and your right hand through the cuff. Ensure that the mandrel is correctly seated in the cuff.
- Place the mandrels on the floor tray of the workstation (still inside the sleeves).
- Replace the glove port cover by turning the cover clockwise.

**Note:** Ensure that the cuffs are properly supported when entering the workstation chamber. Failure to support the cuffs can cause the Ezee Sleeves to come off the glove ports. Note also that the mandrels must be correctly inserted into the cuffs, such that a gas tight seal is formed.

### 5.3.4 Arm gas displacement volume and pressure changes

When entering and exiting the workstation chamber using the Ezee Sleeves, the internal volume of the workstation will change due to the displacement of your arms. The change in volume will cause a change in pressure within the workstation.

When entering the workstation, the pressure inside the workstation chamber will increase. This will cause the exhaust valve to open to relieve the pressure. The water level in the humidifier will also increase until the pressure has returned to its normal level. To minimise the pressure increase, enter the workstation via the Ezee Sleeves **slowly**.

When exiting the workstation, the pressure inside the workstation chamber will decrease. This will cause the gas mixer to inject nitrogen into the workstation, as the pressure switch activates. The level in the humidifier will also decrease, until the pressure has returned to its normal level. To minimise the pressure decrease, exit the workstation via the Ezee Sleeves **slowly**.

## 5.4 Waste port

SCI-tive Dual can be equipped with a waste port in each chamber, for disposing of waste materials from the workstation.

Figure 65: Waste Port



Hazard Warning: Contains material or substances that may be hazardous to human health. Please refer to your local biohazardous material handling procedure for further advice on the handling and disposal of these items.

### 5.4.1 Waste port overview

The waste port consists of 3 sections; the waste port, the waste port lid and the waste port base. In addition to these components, a waste port bag is required to avoid gas leaks.

**The waste port must be used with the bag.**

### 5.4.2 Using the waste port

To use the waste port;

- Remove the lid from the waste port by turning it anti-clockwise (counter-clockwise).
- Place the waste material inside the waste port.
- Replace the lid by turning it clockwise until it is tight. Care should be taken not to over tighten or cross thread the lid.

Note: The end user is responsible for disposing of all waste. Waste should be dry. It is not recommended to place paper waste inside the waste port as it may be blown back into the workstation chamber when using the waste port at a later time.

### 5.4.3 Waste port bags.

Only Ruskinn Technology Limited waste port bags should be used with the waste port. For ordering details for additional waste port bags, please refer to the Ruskinn Web site ([www.ruskinn.com](http://www.ruskinn.com)).

## 6. Optional extras

The SCI-tive Dual workstation may be fitted with optional extra parts to provide added functionality. The available optional extra parts for SCI-tive Dual workstations are;

- Gas sample port.
- Ultrasonic humidity control.
- HEPA protection option

**Note:** These parts are not available as aftermarket upgrades; they must be fitted during the manufacture of the workstation.

### 6.1.1 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 66: Gas sample port**



## 7. Cleaning and maintenance

### 7.1 Cleaning the workstation

To ensure that the SCI-tive Dual 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.
- Ruskinn Technology Limited anti static cleaner.
- Distilled water.

No other cleaning agents are permitted.

**The use of UV light is prohibited in the workstation, as it will damage the acrylic shell. The use of UV Light within the Workstation will invalidate the warranty.**

#### 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(s).
- Wipe the workstation chamber floor tray(s) using paper towels soaked an appropriate cleaning agent.
- Wipe the workstation chamber floor tray(s) 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.
- If the workstation chamber has been used, check the waste port bag. If the waste port bag is full, empty the waste port bag.



### 7.1.3 Cleaning procedure – deep clean with front screens removed

To deep clean the workstation;

#### Preparing the workstation

- For the relevant workstation chamber return the Control screen to the main menu.
- Turn the humidity control on both chambers off.
- Remove all cells/ samples to an alternative storage facility.
- Open the interlock outer door. Leave the interlock door in a vertical position to avoid damage whilst cleaning the workstation chamber.
- Switch the workstation off at the mains and remove the plug from the mains.
- Remove the front screens.
- Remove the storage racks from the left workstation chamber.
- Remove any other equipment installed in the workstation chambers.
- In each chamber, remove the workstation floor tray by tilting the floor tray up from the right hand side.
- Remove the detox sachets.
- Remove the waste port lid.
- Remove the waste port bag

#### Cleaning the workstation chambers

- The components that require cleaning are;
  - Workstation floors.
  - Workstation side walls.
  - Workstation inner rear walls (the rear wall that is visible from the front of the workstation).
  - Workstation floor trays.
  - Workstation ceiling panels.
  - Interlock inner doors.
  - Storage racks.
  - Front Screens.
  - Waste port
- 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 sockets, interlock internal door control panels.
- Wipe dry using paper towels.
- For the front screens ensure that both sides are cleaned.
- Clean any other equipment placed in the workstation following the manufacturer's instructions.
- Care should be taken to avoid the front screen studs when cleaning inside the workstation chamber.

#### Cleaning the interlock chamber

- The components that require cleaning are;
  - Interlock inner doors.

- Interlock chamber floor tray.
- Interlock chamber side wall.
- Interlock chamber rear wall.
- Interlock chamber ceiling.
- Interlock chamber floor.
- Interlock outer door (inside and outside).

Note that the interlock floor tray can be lifted for cleaning. Figure 67 shows the interlock floor tray levels;

**Figure 67: Interlock Floor Trays**



- For all interlock components, wipe with a paper towel soaked in an appropriate cleaning agent. Take care not to get cleaning agents on the wiring for the heater mat.
- Wipe dry using paper towels.
- When the interlock chamber is clean, close the interlock outer door.

#### **7.1.4 Reinstalling workstation components**

- In each chamber, place the floor tray inside the workstation chamber. Ensure that the floor tray is correctly sat on the floor tray pillars.
- Reinstall any equipment removed from the workstation chambers.
- Reinstall the storage racks.
- In each chamber replace the waste port lid.
- Underneath the workstation chamber, install a new waste port bag
- Reinstall the front screens
- Plug the workstation back in at the mains.
- Switch the workstation on.
- Allow the temperatures to rise to within 2°C of set point in both workstation chambers.
- Switch the humidity controls on from the main control menu.
- Select the required mode from the main control menu for both workstation chambers.
- Cells can be reintroduced to the workstation from the alternative storage facility.

## 7.2 Maintaining the workstation – End user maintenance

To ensure that your SCI-tive Dual 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 Replacing an Ezee Sleeve

To remove an Ezee Sleeve;

- For the relevant workstation chamber return the Control screen to the main menu.
- For each chamber, remove a glove port cover by turning the cover anti-clockwise (counter-clockwise). The glove port cover can be stored in the glove port cover holders located on the workstation stand.
- Supporting the cuff with one hand, use the other hand to push the mandrel through the cuff.
- Place the mandrel on the workstation floor tray.
- Remove the O-rings that hold the Ezee Sleeve to the glove port. Note that the O-rings will be tight. Figure 68 shows the O-ring removal.

**Figure 68: O-ring removal**



- Remove the Ezee Sleeve.
- Remove the mandrel from the workstation chamber.

To install an Ezee Sleeve;

- Place the mandrel inside the workstation chamber on the floor tray. Make sure that the mandrel is the correct size for the Ezee Sleeve being installed.
- 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.
- It is recommended to use 2 O rings on each Glove port at all times
- 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 O-rings should be located into the 2 O-ring grooves on the glove port.
- Supporting the cuff with one hand, pull the mandrel through the cuff with the other hand.
- For the each chamber, replace the glove port cover by turning the cover clockwise.

### 7.2.2 Changing the waste port bag

To change the waste port bag;

- Ensure that the waste port lid is closed.
- Supporting the waste port bag with one hand, roll the white O-ring off with the other hand.  
Figure 69.

Figure 69: Waste port bag removal



- Dispose of the waste in the bag. The end user is responsible for ensuring that all waste is disposed of in the correct manner.
- Place the O-ring over the top of the new bag.
- Place the new bag onto the waste port. Note that the bag will support its own weight on the waste port.
- Slide the O-ring up until it is completely seated in the O-ring groove. The O-ring must be seated in the groove to provide a gas tight seal.

### 7.2.3 Removing and reinstalling the front screens

The front screens of the workstation can be removed to provide a large aperture for cleaning and equipment installation purposes. **Note:** Front screen washers have been phased out, if your product has washers please follow the instructions. If no washer were installed please ignore washer instructions. To remove the front screen;

- For the relevant workstation chamber return the Control screen to the main menu.
- Turn the humidity controls off at the main menu.
- Remove all cells/ samples to an alternative storage facility.
- Switch the workstation off.
- Unplug the workstation from the mains power supply.

- For each chamber, remove the glove port covers by turning the cover anti-clockwise (counter-clockwise). The glove port covers can be stored in the glove port cover holders located on the workstation stand.
- Remove the Ezee Sleeves.
- Undo the front screen knobs by turning anti-clockwise (counter-clockwise). Store the glove port knobs in a safe location.
- Remove the front screen knob washers. Store the front screen knobs in a safe location.
- Remove the front screen by lifting away from the workstation.

To reinstall the front screen;

- Place the front screen back onto the workstation, ensuring that it is correctly aligned on the front screen studs.
- Place a front screen washer on each of the 4 corner 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.
- Place the remaining front screen washers on the front screen studs, ensuring that there is 1 washer on each stud.
- 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.
- Reinstall the Ezee Sleeves
- Reinstall the glove port covers.
- Plug the workstation back in at the mains.
- Switch the workstation on.
- Allow the temperature to rise to within 2°C of set point.
- Switch the humidity controls on at the main menu
- Select the required modes from the Gas Control menu.
- Cells can be reintroduced to the workstation from the alternative storage facility.

**Note:** Take care not to over tighten the front screen knobs, as this will damage the front screen.

#### 7.2.4 Replacing detox sachets

Detox sachets are supplied with SCI-tive Dual workstations. The detox sachets adsorb volatile organic compounds, improving the air quality within the workstation chamber. Detox sachets need to be replaced annually.

To replace the detox sachets;

- For the relevant workstation chamber return the Control screen to the main menu.
- Turn the humidity controls off at the main menu.
- Remove all cells/ samples to an alternative storage facility.
- Switch the workstation off.
- Unplug the workstation from the mains power supply.
- Remove the front screen.
- Remove the storage racks from the each chamber.

- Remove any other equipment installed in the workstation chamber(s).
- In each chamber, lift the front of the floor tray.
- Remove the old detox sachets from their holders.
- Remove the new detox sachets from their packaging and place in the sachet holders.
- Lower the front of the floor tray back to its usual position.
- Reinstall any equipment removed from the workstation chamber.
- Reinstall the storage racks.
- Reinstall the front screen
- Plug the workstation back in at the mains.
- Switch the workstation on.
- Allow the temperature to rise to within 2°C of set point.
- Switch the humidity control required at the main menu.
- Select the required Gas Control modes from the main menu.
- Cells can be reintroduced to the workstation from the alternative storage facility.

**Note:** It is recommended that a deep clean be performed at the same time as replacing detox sachets. The sachets should be replaced in both workstation chambers at the same time. Detox sachets are replaced as part of an annual service.

### 7.2.5 Installing/ replacing a catalyst sachet

Catalyst sachets are available as an accessory for SCI-tive Dual workstations. The catalyst sachets are required for anoxic operation of the workstation.

To install the catalyst sachets;

- For the relevant workstation chamber return the Control screen to the main menu.
- Turn the humidity controls off at the main menu.
- Remove all cells/ samples to an alternative storage facility.
- Switch the workstation off.
- Unplug the workstation from the mains power supply.
- Remove the front screen.
- Remove the storage racks from each workstation chamber.
- Remove any other equipment installed in the workstation chamber(s).
- In the each chamber, lift the front of the floor tray.
- Remove 1 detox sachet from its holder. (The detox sachet can be dried out and stored).
- Remove the new catalyst sachet from its packaging and place in the sachet holder.
- Lower the front of the floor tray back to its usual position.
- Reinstall any equipment removed from the workstation chamber.
- Reinstall the storage racks.
- Reinstall the front screen
- Plug the workstation back in at the mains.
- Switch the workstation on.
- Allow the temperature to rise to within 2°C of set point.
- Switch the humidity control required at the main menu.
- Select the required Gas Control modes from the main menu.

- Cells can be reintroduced to the workstation from the alternative storage facility.

To replace the catalyst sachets;

- For the relevant workstation chamber return the Control screen to the main menu.
- Turn the humidity controls off at the main menu
- Remove all cells/ samples to an alternative storage facility.
- Switch the workstation off.
- Unplug the workstation from the mains power supply.
- Remove the front screens
- Remove the storage racks from the left workstation chamber.
- Remove any other equipment installed in the workstation chamber(s).
- In the each workstation chamber, lift the front of the floor tray.
- Remove the catalyst sachet from its holder.
- Remove the new catalyst sachet from its packaging and place in the sachet holder.
- Lower the front of the floor tray back to its usual position.
- Reinstall any equipment removed from the workstation chamber.
- Reinstall the storage racks.
- Reinstall the front screens.
- Plug the workstation back in at the mains.
- Switch the workstation on.
- Allow the temperature to rise to within 2°C of set point.
- Switch the humidity controls required at the main menu.
- Select the required Gas Control modes from the main menu.
- Cells can be reintroduced to the workstation from the alternative storage facility.

**Note:** It is recommended that a deep clean be performed at the same time as installing/ replacing catalyst sachets. The sachets should be installed/ replaced in both workstation chambers at the same time, if both workstation chambers are to be used anoxically.

### **7.2.6 Cleaning the Water Tank**

Please refer to the Ruskinn web site ([www.ruskinn.com](http://www.ruskinn.com)) on Water tank cleaning.

### 7.2.7 Replacing the mains fuse

The Dual SCI-tive has 4 fuses, 2 fuses per chamber.

To replace the mains fuse;

- Remove the plug from the mains socket.
- Remove the mains fuse caps using a small flat bladed screwdriver and turning Anti-Clockwise.

**Figure 70: Fuse holder (230V)**



**Fuse holder (120V)**



- Remove fuses for each chamber from the fuse holders, and retain the Black mains fuse caps
- Insert a new fuse into each of the mains fuse caps, the fuse type is:
  - T12.5 A 250V \*
- Insert the fuse cap and fuse fully into the fuse holder and using a small flat bladed screwdriver, turn the mains fuse cap clockwise to secure.
- Replace the plug in the mains socket.
- Switch the SCI-tive Dual workstation on.

For more information, contact your local distributor.

**\*Note: Replacement fuse must match the original fuse**



### 7.3 Service requirements

To maintain the best performance from your SCI-tive Dual workstation, it must be serviced at regular intervals. Figure 71 lists the servicing requirements, intervals and persons capable of performing the service;

**Figure 71: SCI-tive Dual servicing Requirements**

Action	Frequency	By
Clean workstation	After each use	End User
Empty waste port bag	Weekly	End User
Fill humidifier tanks	Weekly (minimum) Daily check recommended	End User
Calibrate oxygen sensors	Monthly	End User
Deep clean workstation	3-6 months depending on usage	End User
Replace detox sachets	Annually	End User/ Qualified service engineer
Replace catalyst sachets (if used)	Annually	End User/ Qualified service engineer
Annual service	Annually	Qualified service engineer
Biennial service	Biennial	Qualified service engineer

To arrange a 1 year or 2 year service, contact your local distributor. **Note** the 2 year service includes a 1 year service.

## 7.4 Spare parts and accessories

A range of spare parts and accessories are available for your SCI-tive Dual 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 72 lists the spare parts available for your SCI-tive Dual 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 72: SCI-tive Dual end user spare parts and cleaning agents**

Part	Where used
Small Ezee Sleeve	Ezee Sleeve
Medium Ezee Sleeve	Ezee Sleeve
Large Ezee Sleeve	Ezee Sleeve
Medium Mandrel	Small Ezee Sleeve
Large Mandrel	Medium Ezee Sleeve
Extra Large Mandrel	Large Ezee Sleeve
Sleeve to port O-ring	Ezee Sleeve
Talc	Ezee Sleeve
Glove port compression O-ring (2)	Glove ports
Oxygen Sensor	Gas Controller
3m Hydrogen supply hose and clips	Gas Mixer
3m Carbon Dioxide supply hose and clips	Gas Mixer
3m Compressed Air supply hose and clips	Gas Mixer
3m Nitrogen supply hose and clips	Gas Mixer
Mains lead	Mains lead
Front screen knob	Front screen
Front screen washer	Front screen
Waste port bags (50)	Waste port
Anti static cleaner (600ml)	Cleaning
Tristel Duo Foamer	Cleaning
Tristel Fuse Sachet	Cleaning
Small Detox Sachet	VOC filtration
Small Catalyst Sachet	Anoxic operation
Small Sachet Holder	VOC filtration/ anoxic operation
Anaerobic Indicator Strips	Anoxic operation
T12.5A 250V Mains Fuse	Mains Fuseholder

### 7.4.3 Accessories

A range of accessories are available to enhance the functionality of your SCI-tive Dual workstation. Please contact your local distributor for the latest pricing and availability.

## 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. If the problem is related to the gas mixer, please download the event log to a USB device as it will be required by your local distributor. If the malfunction cannot be resolved, the workstation must be turned off and the plug disconnected from the mains.

## 7.6 Common problems and solutions

### 7.6.1 Workstation general problems

Figure 73 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 73: 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.
	The earth leakage circuit breaker has tripped	Reset the earth leakage circuit breaker. If the circuit breaker continues to trip, contact your local distributor.
RCCB trips	Electrical failure or fuse blown	Remove any internal electrical connection from the internal sockets, and re-set the RCCB. If the RCCB trips again, disconnect SCI-Dual Workstation from the mains supply and contact your local distributor.
The touch screen controllers and LED indicators are not on	Power supply fuse has blown.	Contact your local distributor
A constant alarm is sounding	The temperature is outside of the alarm range inside a workstation chamber	If the temperature is at the desired set point, check for leaks from glove ports.
	The water level in the humidity tank is low	Check water level and add more sterilised ionised water if required.
	The gas pressure is low	Check Gas tanks.
Devices plugged into the internal socket are not powering up	The internal socket is not switched on	Check that the internal power is switched on Press the power switch button on the controller
	The power switch on the device is not switched on	Check that the plug is correctly inserted into the socket



Problem	Cause	Solution
	The plug for the device is not fully inserted into the socket	Check that the internal power switch is illuminated. If it is, the device fuse has blown or the device has failed
	The fuse in the device has blown and/ or the device has failed	Contact your local distributor
	The internal socket fuse has blown	
Failure to Reach Set Point	Time required to reach Set Point exceeded	Check for leaks: -Replace port covers -Check interlock door closed -Check oil level on Secondary Pressure Relief System -Confirm gas lines and fittings are correct

### 7.6.2 Interlock problems

Figure 74 gives a list of common interlock problems and solutions;

**Figure 74: Interlock problems and solutions**

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
An interlock inner door will not open	The interlock outer door is open  The other interlock inner door is open  The interlock is purging	Close the interlock outer door and wait for the interlock purge cycle to run  Close the other interlock inner door.  Wait for the interlock purge cycle to finish
The interlock inner door will not close	The interlock floor tray is in the way The interlock inner door is stuck	Slide the interlock floor tray fully into the interlock chamber 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 open	An interlock inner door is open	Close the interlock inner door
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

## 8. Warranty information

Ruskinn Technology Limited warrants for the applicable time period that the SCI-tive Dual 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 SCI-tive Dual otherwise than in the normal course of a business.

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

(A) IF THE Ruskinn Technology Limited SCI-tive Dual HAS BEEN REPAIRED BY PERSONS NOT AUTHORIZED BY Ruskinn Technology Limited; OR

(B) THE Ruskinn Technology Limited SCI-tive Dual and associated accessories/peripherals HAVE BEEN ALTERED, MODIFIED, OR MISUSED; OR

(C) THE Ruskinn Technology Limited SCI-tive Dual IS USED WITH NON- Ruskinn Technology Limited COMPONENTS; OR

(D) THE Ruskinn Technology Limited SCI-tive Dual OR A COMPONENT IS USED FOR OTHER USES (FOR EXAMPLE USE WITH OTHER CIRCUIT BOARDS OR SOFTWARE) OR

(E) THE Ruskinn Technology Limited SCI-tive Dual 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 SCI-tive Dual WILL FUNCTION ERROR FREE.

If within the Warranty Period, the Ruskinn Technology Limited SCI-tive Dual does not conform to the express warranty set forth above, Ruskinn Technology Limited's sole obligation and User's 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 LIABILITY.**

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 SCI-tive Dual, 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

SCI-tive Dual 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.

SCI-tive Dual Workstation contains recyclable parts. Please contact your local distributor for more advice.

## 10. Contact details

### Ruskinn Technology Limited

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