

BAKER

RUSKINN

User Manual UM-052

PhO₂x Box



Affix Serial Number Sticker Here

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INTRODUCTION

Please read this manual carefully before using the PhO₂x Box and familiarise yourself with all aspects of using the system. The Baker Company (Baker) or Ruskinn Technology Ltd (now Baker Ruskinn) does not accept responsibility for accidents to personnel or damage to the PhO₂x Box system resulting from incorrect use.

The PhO₂x Box system includes a Gas Controller and Cell Culture Chamber. It has been specifically designed and developed to meet the requirements of all laboratories. The unit is ergonomically laid out to ensure maximum operator comfort and optimization of space for media preparation, manipulation, and analysis. PhO₂x Box is designed to give optimum 'in-vitro' conditions for cell culture in a simple and easily controlled manner.

The system has built in gas control with Oxygen and Carbon Dioxide sensors to enable constant monitoring of the atmosphere. Hypoxic/Physoxic conditions are created using Nitrogen (N₂), Carbon Dioxide (CO₂) and Air (O₂) to achieve the desired atmosphere. The user can select the Oxygen concentration from 0.1% to 20.0%, and Carbon Dioxide concentrations from 0.1% to 20.0%, both in 0.1% increments.

Many unique features of the PhO₂x Box system are covered in detail in this manual. It is recommended that the user be fully conversant with the instruction and procedures, and that the operator familiarises themselves with all aspects and functions of the system before it is commissions to maintain optimum performance.

SAFETY INSTRUCTIONS

Baker Ruskinn does not accept any responsibility for damages caused by using the equipment for other purposes than described in this user manual.

- The mains appliance coupler and plug are the AC mains supply isolation device and must be easily accessible when installed.
- In case of emergency disconnect the PhO₂X Box from the AC Mains Outlet.
- Ensure that the connecting cable is not squeezed or bent when the unit is being installed or moved.
- All installation work and adjustments to the unit must be carried out by qualified personnel. Work performed by persons with insufficient technical knowledge may adversely affect the performance of the unit or cause physical injury or damage to the equipment.
- All servicing and repairs must be carried out by a qualified customer service engineer. Only genuine spare parts must be used.
- In case of damage to the PhO₂X Box, disconnect the system from the mains outlet and contact your local distributor.
- All covers and lids must only to be removed by a qualified service engineer.
- Nothing but the Gas Controller should be placed on the top of the Cell Culture Chamber.
- The power cord supplied with the system and should be used to connect to the mains outlet. If a replacement is required it must be adequately rated for the application.
- All cables and pipes should be routed to ensure that they do not pose a trip hazard.
- Mains supply Voltage fluctuation must not exceed $\pm 10\%$ of the nominal Voltage.
- Gas regulators must be used for each gas supply. A 2 stage regulator is recommended with a maximum supply pressure of 5 Bar. Over pressure could damage the Cell Culture Chamber.
- Only the gases specified in this user manual may be used.
- All gas bottles must be adequately secured before connection to the system.
- The end user is responsible for all materials and equipment places inside the system.
- The Gas Controller must not be operated at an ambient temperature over 40°C.
- The internal fan inlet and outlet must not be covered or blocked.
- There should be no naked flames close to the system.
- The use of radioactive materials is strictly prohibited.

CAUTION: Asphyxiation Risk

The PhO₂X Box uses Nitrogen (N₂) and Carbon Dioxide (CO₂) as part of normal use with the volume released externally is inconsequential. In the event of a leak or malfunction this gas release may become excessive. DO NOT OPERATE this unit in a SMALL ENCLOSURE such as a small room or walk-in closet. An accidental release of Nitrogen or Carbon Dioxide could create an asphyxiating atmosphere in a small space.

If the equipment is not used in a manor specified by the manufacturer, the protection provided by the equipment may be impaired.

Failure to adhere to these safety instructions could cause serious injury and will invalidate the system warranty. Baker Company/Baker Ruskinn accepts no responsibility for any accident, injury or loss caused by unsafe operation of the system.

REGULATORY COMPLIANCE

European Region

 **CE Marking - for sales in the EU & NI**

This product has been tested and complies with EU Directives 2014/35/EU (Low Voltage), 2014/30/EU (Electromagnetic Compatibility), and 2011/65/EU (RoHS as amended by EU 2015/863)

 **UKCA Marking – for Sales in GB**

This product also complies with the following Statutory Instruments:

SI 2016 No. 1101	The Electrical Equipment (Safety) Regulations 2016
SI 2016 No. 1091	The Electromagnetic Compatibility Regulations 2016
SI 2012 No. 3032	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

WEEE:



This equipment must be disposed of in accordance with the Waste from Electrical and Electronic Equipment (WEEE) Directive

This product must not be treated as household waste. Instead, it shall be handed over to an appropriate collection point for the recycling of electrical and electronic equipment.

If in doubt, please return this equipment to Ruskinn Technology Ltd who will correctly dispose of it for you.

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.

Precautions

The PhO₂x Box has been tested and approved to EN61010-1, 61326-1, and 61326-2-6. This means that the PhO₂x Box meets or exceeds the requirements for General and IVD electrical Laboratory 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 PhO₂x Box 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.

Symbols

Before using the PhO₂x Box, please ensure that you are familiar with the symbols.









Symbol	Meaning
	Refer to user manual.
	Centre positive power supply
	DC Power supply
	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
	UKCA Marking – for Sales in GB.
	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.
	PhO ₂ x Box contains hazardous components and must not be disposed of at a household waste site. Instead it should be taken to the appropriate collection point for the recycling of electrical and electronic equipment.
	Date of manufacture in format YYYY MM

Table 1: List of Symbols

TRANSPORT AND STORAGE

When not in use, the PhO₂x Box System must only be stored within a temperature of between 0°C and 30°C

Storage outside of this range may damage the system.

LOCATION AND HANDLING OF THE PHO₂X BOX SYSTEM

To arrange installation or relocation please contact your local distributor.

The mains appliance coupler and plug are the AC mains supply isolation device and must be easily accessible.

ENVIRONMENTAL OPERATING CONDITIONS

The PhO₂x Box Gas Controller should only be operated under the following environmental conditions:

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

The Gas Controller must be located in a well-ventilated area.

ORDER CODES

Order code	Description
PBX-001	PhO ₂ x Box System- Gas Controller and Large Black Cell Culture Chamber
PBX-002	PhO ₂ x Box System- Gas Controller and Large Clear Cell Culture Chamber
PBX-003	PhO ₂ x Box System- Gas Controller and Small Black Cell Culture Chamber
PBX-004	PhO ₂ x Box System - Gas Controller and Small Clear Cell Culture Chamber
PBX- LBE	Large Black Culture Chamber, connects to PhO ₂ x Box Gas Controller
PBX- LCE	Large Clear Culture Chamber connects to PhO ₂ x Box Gas Controller
PBX- SBE	Small Black Culture Chamber connects to PhO ₂ x Box Gas Controller
PBX- SCE	Small Clear Culture Chamber connects to PhO ₂ x Box Gas Controller
PBX-GLAND	Cable Gland Optional accessory for PhO ₂ x Box-(must be factory fitted if chosen)
SK0150	4 Year Service Kit for PhO ₂ x Box, to be implemented by End User at month 48 after purchase
PBX-ANOX	Anoxic Optional accessory for PhO ₂ x Box

CONTENTS

- Gas Controller
- Cell Culture Chamber (Large/Black or Small/Black or Large/Clear or Small/Clear)
- Power Cord (country specific)
- Umbilical Cable (3m)
- Gas tubes x 2 (6mm diameter x 3m each)
- Pressure Relief Adapter (for working at <1% O₂ or >10% CO₂)
- Calibration Adapter
- Aquasorb Sachets x 5 (for humidity)
- Detox Sachet x 1
- Shelf Pegs
- Shelves

DIMENSIONS

		Small Chamber		Large Chamber	
		mm	inches	mm	inches
External dimensions	Width	355	14	355	14
	Height	173	6.8	238	9.4
	Depth	369	14.5	369	14.5
Internal dimensions	Width	335	13.2	335	13.2
	Height	140	5.5	205	8.1
	Depth	280	11	280	11
	Volume	13.1 Litres		19.2 Litres	
Workstation capacity 96 well plates	Number of plates (128x86x17mm)	8 plates on shelf, (4 stacks of 2 plates high on shelf)		24 plates, (4 stacks of 2 plates high per shelf, 3 shelves)	
Workstation capacity T 75 flasks	Number of flasks (150 x 80x 36mm)	6 (On shelf)		18 (6 on each shelf)	
PhO ₂ x Box System	kgs/lbs	5.5kgs/12.1lbs (chamber) & 5.5kg/12.1lbs (controller)		6.5kgs/14.3lbs (chamber) & 5.5kg/12.1lbs (controller)	

Usable Internal Volume: 13.1 litres (Small Chamber) | 19.2 litres (Large Chamber)

		Gas Controller Unit	
		mm	inches
Gas Controller External dimensions	Width	325	12.8
	Height	238	9.4
	Depth	298	11.7

SERVICE REQUIREMENTS

Electrical Supply Requirements

The Gas Controller must be connected to a mains power supply. A power cord is supplied to connect the Gas Controller to the mains supply. If an alternative power cord is used it must be rated appropriately for the power requirements of the Gas Controller, refer to Table 2. The Gas Controller must be connected to a protective earth (ground).

To ensure safe operation of the Gas Controller, 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. The mains supply voltage fluctuations must not exceed +/- 10% of the nominal mains voltage. The input voltage and frequency for PhO₂x Box systems are:

Voltage Range	Frequency	Nominal Power	Rated Current	Rated Power
220 to 240 Vac	50/60Hz	15W	.625A	15W
110 to 120 Vac	50/60Hz	15W	.625A	15W

Table 2: Electrical Service Requirements

Please note that the applicable ratings for the Gas Controller configuration are detailed the labelling at the rear of the product as shown in Figure 1.



Figure 1: PhO₂x Box Rear Connections

1. External Gas Supply Inlets
2. Mains Input Connector
3. Memory Card Slot (Push to install and release memory card)
4. Umbilical connector for Cell Culture Chamber
5. Mixed Gas Outlet to Cell Culture Chamber
6. O₂ Sample

Gas Supply Requirements

The Gas Controllers gas supply inlets are located at the rear of the unit as shown in Figure 1.

For standard physiological environment operation of the system the input gas requirements are:

Gas	Symbol	Specification	Regulator Output Pressure
Nitrogen	N ₂	Oxygen Free (Industrial or medical)	58 to 72.5psi (1 to 5 bar)
Carbon Dioxide	CO ₂	(Industrial or medical)	42 to 49psi (1 to 3.5 bar)

Table 3: Standard Gases

Additional operational modes are available which will require the following gas connections:

Gas	Symbol	Specification	Use	Regulator Output Pressure
5% Hydrogen in Nitrogen*	H ₂ /N ₂	Maximum of 5.5% Hydrogen in Nitrogen (Industrial or medical)	For anoxic mode	42 to 49psi (1 to 3.5 bar)

Table 4: Additional gases for specific operating modes

For the gas supply we recommend direct connections of the gas bottle regulator to ensure minimal pressure drops and flow rate restrictions.

The gas regulator should provide a minimum supply pressure of 3 bar gauge. The maximum supply pressure permissible is 5 bar gauge. A supply pressure greater than this will damage internal components of the PhO₂X Box and will invalidate the warranty.

Only the above stated gases are to be used with the system. Failure to comply with this may cause the product to become hazardous.

Note – Gas consumption levels will be subject to variation depending on selected gas levels, door openings and external conditions.

* - Recommended Hydrogen concentrations are compliant to BS EN ISO 10165:2010 (Classification of Flammable Gasses). The use of Hydrogen concentrations up to a maximum of 10% in Nitrogen (N₂) is the responsibility of the user and must be assessed by the user in accordance with local safety regulations at the installation location.

PHO₂X BOX OVERVIEW

Front View

The Small and Large PhO₂x Box Cell Culture Chambers are shown below in Figure 2 and Figure 3 respectively with the Gas Controller.

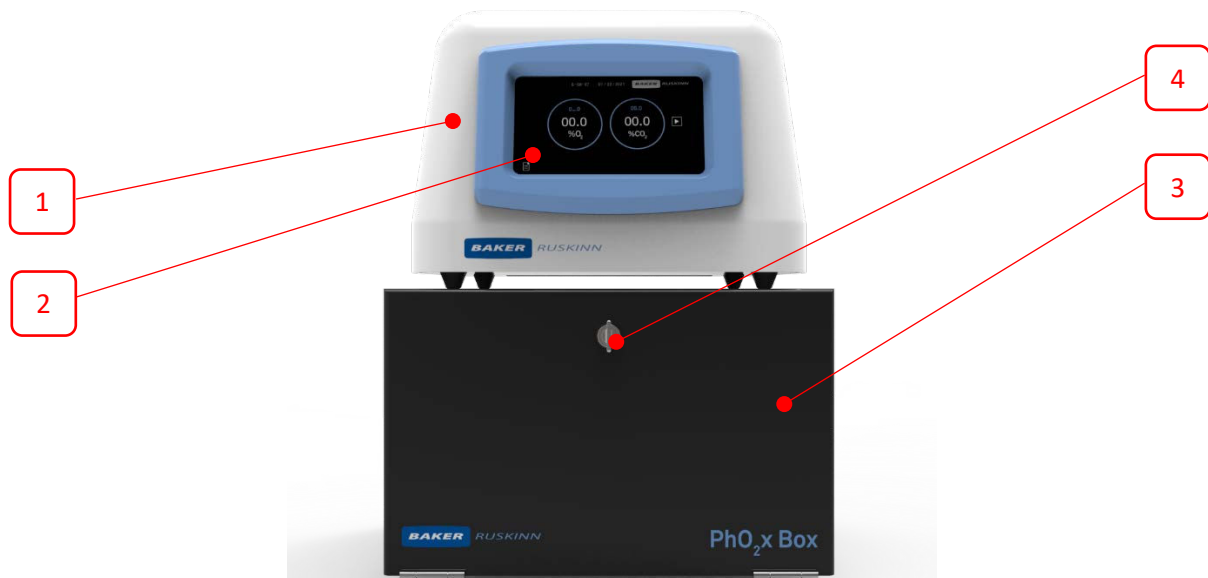


Figure 2: Gas Controller on top of the Large Black Cell Culture Chamber



Figure 3: Gas Controller on top of the Small Black Cell Culture Chamber

1. PhO₂x Box Gas Controller
2. Touchscreen Controller
3. Cell Culture Chamber
4. Door release mechanism

Front Interior Views



Figure 4: Left Side Internal View (Large Black Cell Culture Chamber)

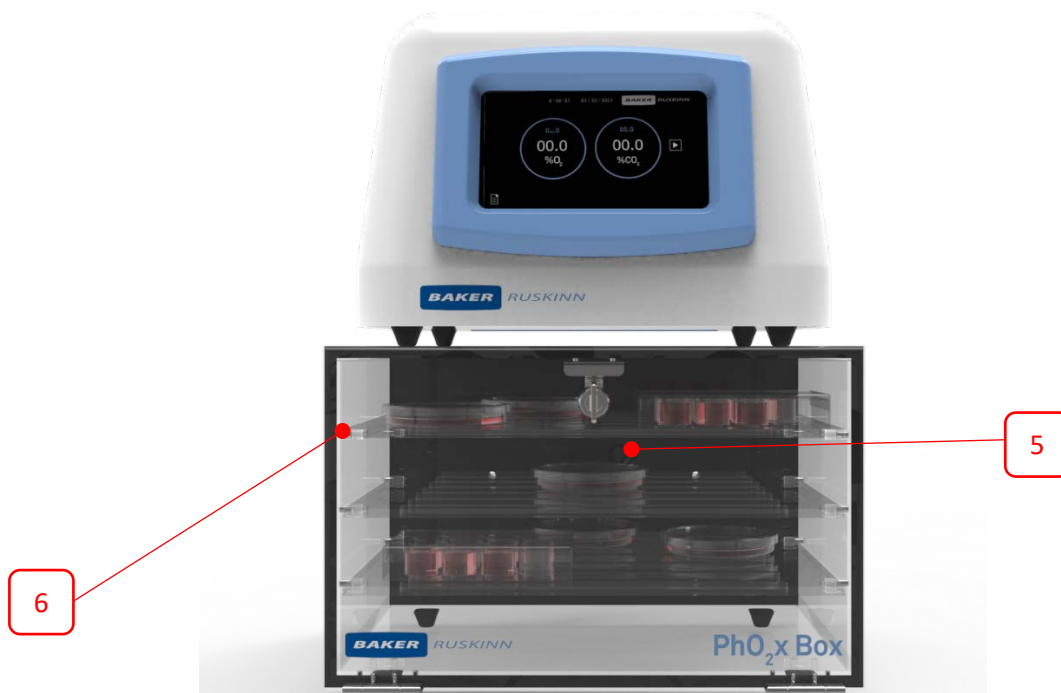


Figure 5: Front Internal View (Large Clear Cell Culture Chamber)

1. Shelves (3 supplied with Large Chamber, 1 with Small Chamber)
2. Door Release mechanism bracket
3. Door Seal
4. Door
5. Inlet/Outlet fan pattern x 2 (DO NOT OBSTRUCT)
6. Shelf Supports

Rear View

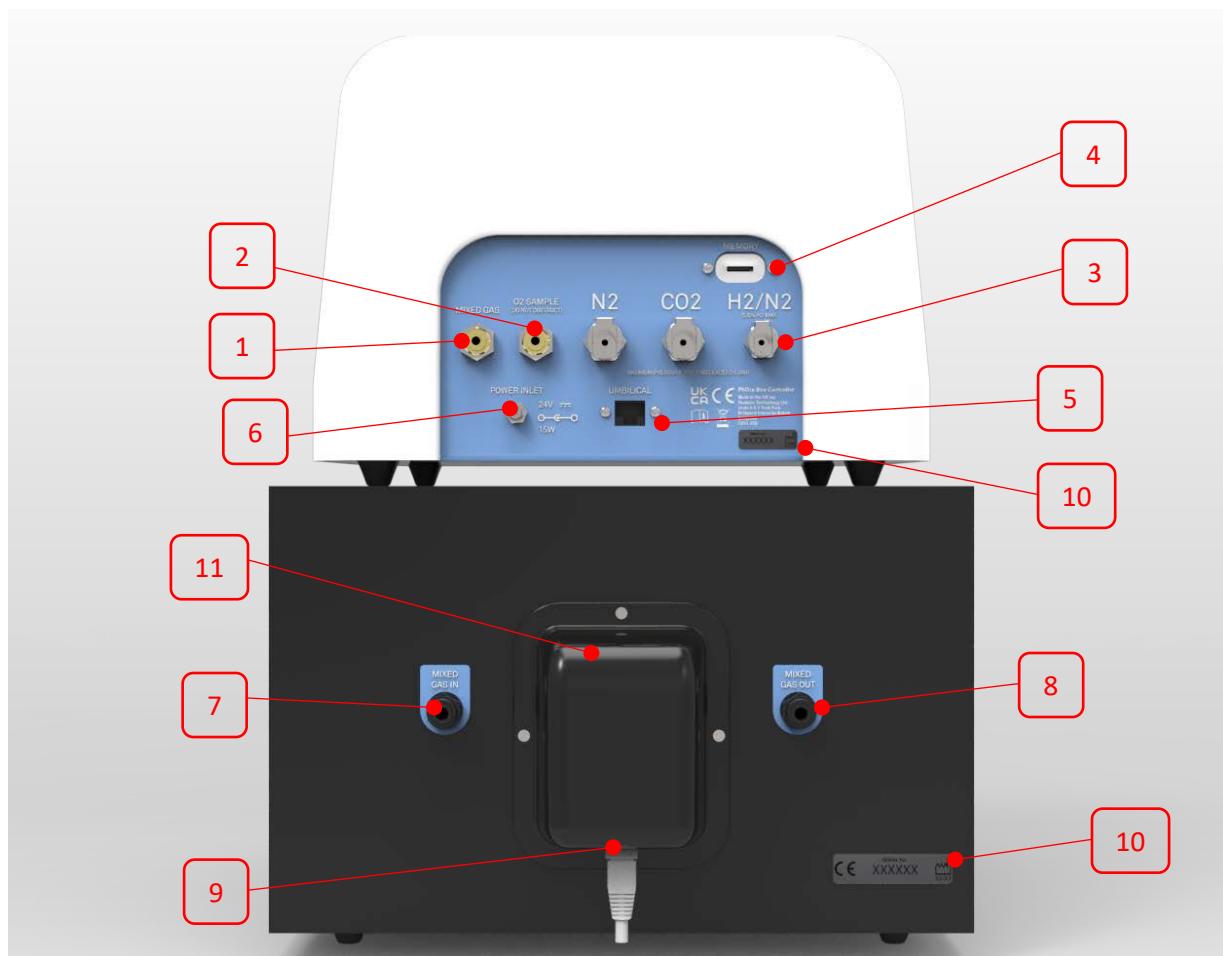


Figure 6: Rear End Panel and Supply Connections

1. Mixed Gas Outlet for Cell Culture Chamber
2. O₂ Sample
3. External Gas Inlets
4. Memory Card Slot
5. Gas Controller/Cell Culture Chamber Umbilical (Ethernet Cable)
6. Power Input
7. Mixed Gas Inlet from Gas Controller
8. Mixed Gas Outlet (if Cell Culture Chamber is inside an Incubator or Workstation attach a 6mm gas tube and lead it outside Incubator or Workstation)
9. Cell Culture Chamber/Gas Controller Umbilical (Ethernet Cable)
10. Serial Number Label
11. Sensor Housing

USING THE SYSTEM

Operating the door

The door achieves a seal using a single, quarter turn compression mechanism.

To open the door, rotate the compression mechanism anticlockwise to the position illustrated in Figure 7 and pull door down.

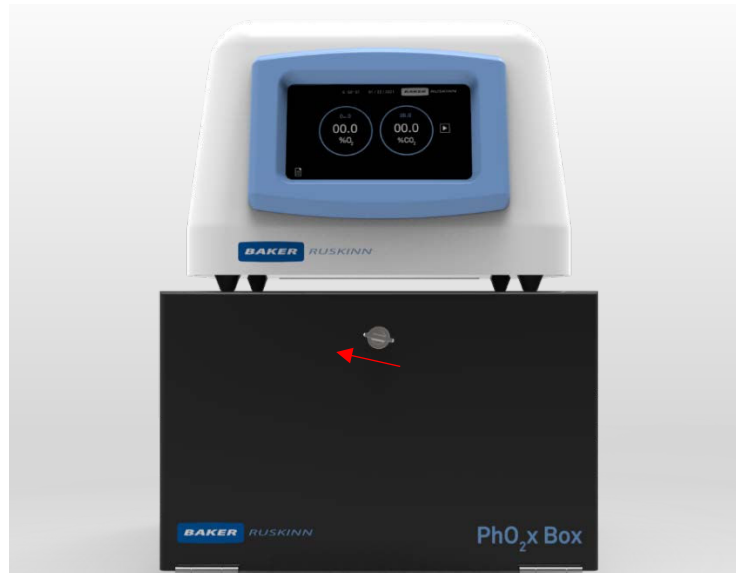


Figure 7: Compression mechanism in open position

To close the door, ensure the compression mechanism is in the 'open position' and push door towards the chamber. Once the seal is touching the chamber, rotate the compression mechanism to the position illustrated in Figure 8.

Note – Compression mechanism **must** be pointing vertically as shown in figure to achieve an air tight seal. Failure to do so may result in reduced performance.



Figure 8: Compression mechanism in closed position

Positioning the shelves in the Cell Culture Chamber

The shelves within the PhO₂x Box are removable.

3 Shelves are supplied with a Large Cell Culture Chamber and 1 with a Small Cell Culture Chamber.

To remove a shelf (2 in Figure 9), open the door, lift the shelf carefully off the shelf brackets (1) and withdraw it from the Cell Culture Chamber.

To refit, place the shelf into Cell Culture Chamber, align shelf brackets with the corresponding cut outs on the bottom of each shelf and press down.

Note – The shelf pins should not be removed.

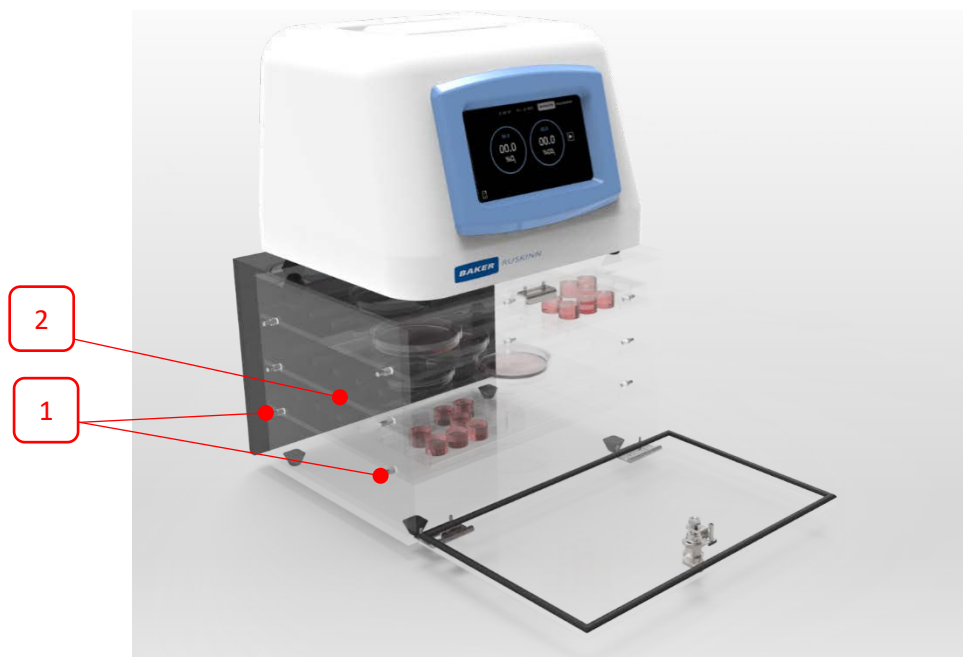


Figure 9: Shelf removal and installation

Cable Gland Option (PBX-GLAND)

PhO₂x Box is capable of accommodating up to six, optional single cable glands.

These can be used for passing cabling for additional hardware into the Cell Culture Chamber.

The standard positions for the cable glands are either side of the mixed gas in and out fitting on the rear of the Cell Culture Chamber as per below.

To install cabling, simply remove the outer nut along with the rubber washer and feed in the cable through both parts.

Replace washer into the gland body and tighten nut back on.

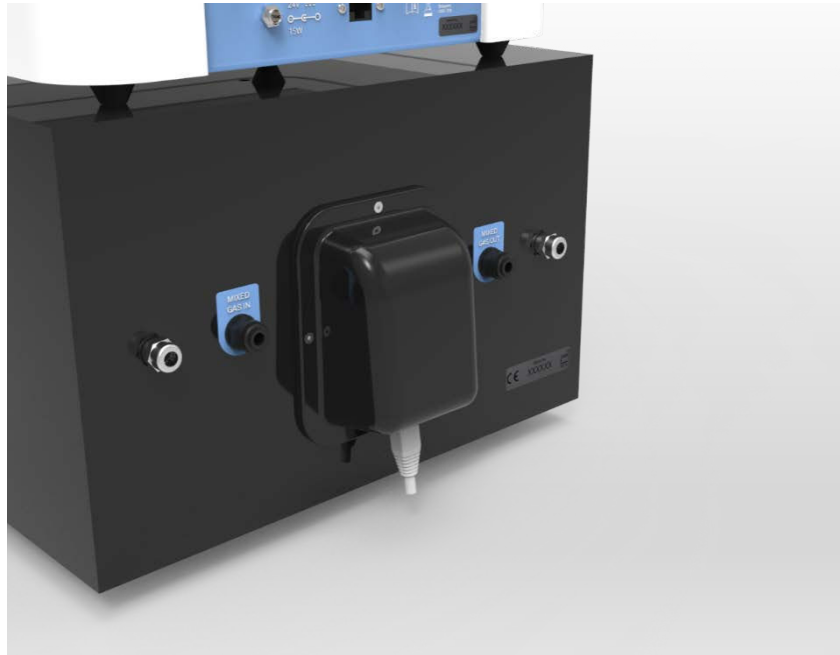


Figure 10: Showing 2 optional cable glands

Humidity introduction

To run an elevated level of humidity within the chamber an Aquasorb sachet can be installed.

These sachets contain a small amount of a super absorbent polymer that has the ability to absorb 500 times its weight in water that is then evaporated into the Cell Culture Chamber atmosphere. The chamber allows the humidity to rise to a maximum of 100% RH.



Figure 11: Aquasorb Sachets - Empty and Re-hydrated

The sachets are supplied 'dry' and require charging before use by placing the sachet in a tray of deionised (DI) water.

The sachet will expand as it absorbs the water to fill the volume of the sachet. Once complete and hydrated, lightly shake and/or wipe off any excess water droplets and then place inside the chamber.

The sachets can be 're-hydrated' multiple times and are capable of continuous use for a number of months if kept clean. It is up to the end user to decide on the frequency of replacement, but we recommend every month or two to change the sachet. Additional sachets can be purchased from Baker Ruskinn or your local distributor.

USING THE GAS CONTROLLER TOUCHSCREEN

Home Screen

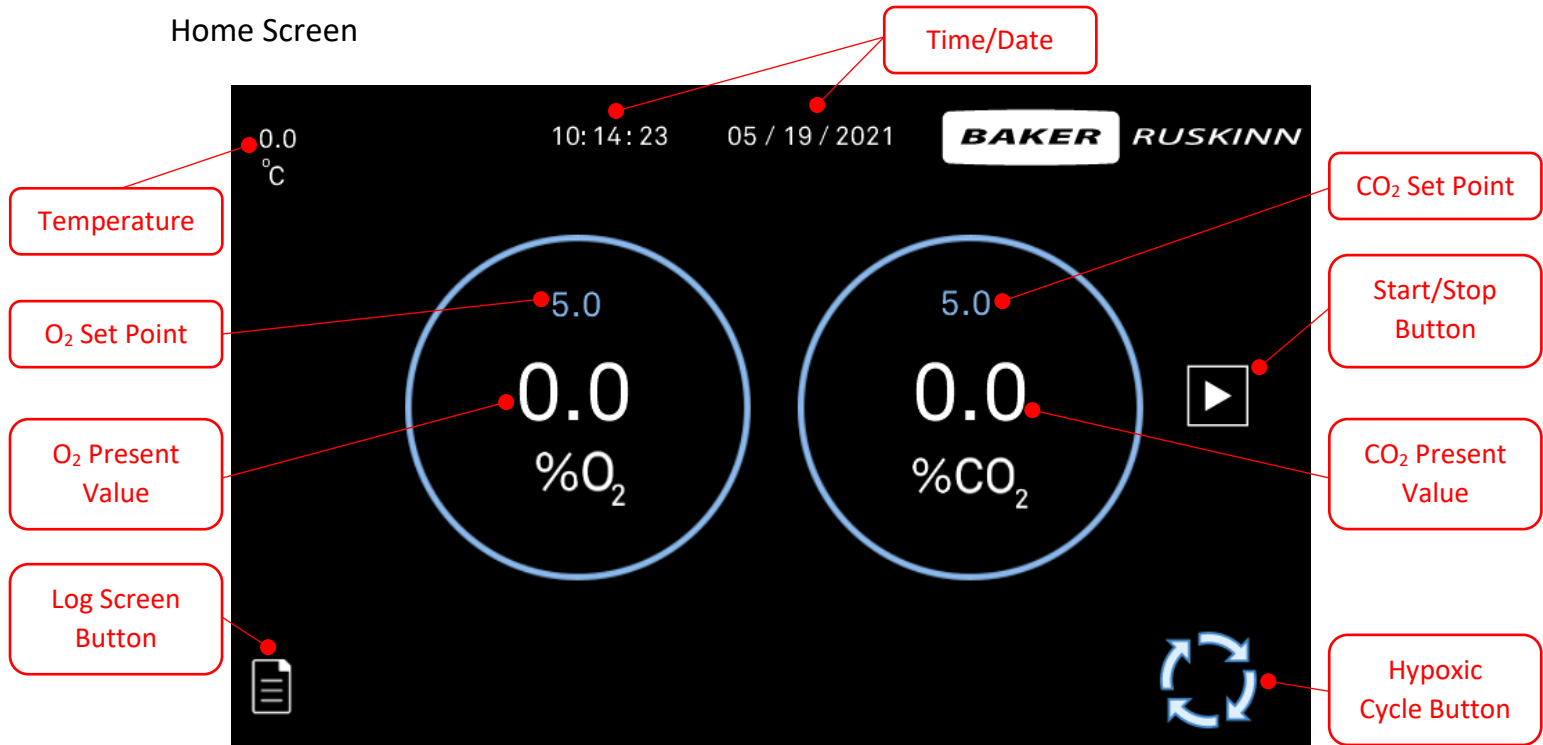


Figure 12: Home Screen

The Home Screen is displayed on start up of the Gas Controller.

An overview of current O₂ and CO₂ along with current setpoints are displayed within their relevant areas.

Pressing the relevant gas circle area, brings up the setpoint selection pop up.

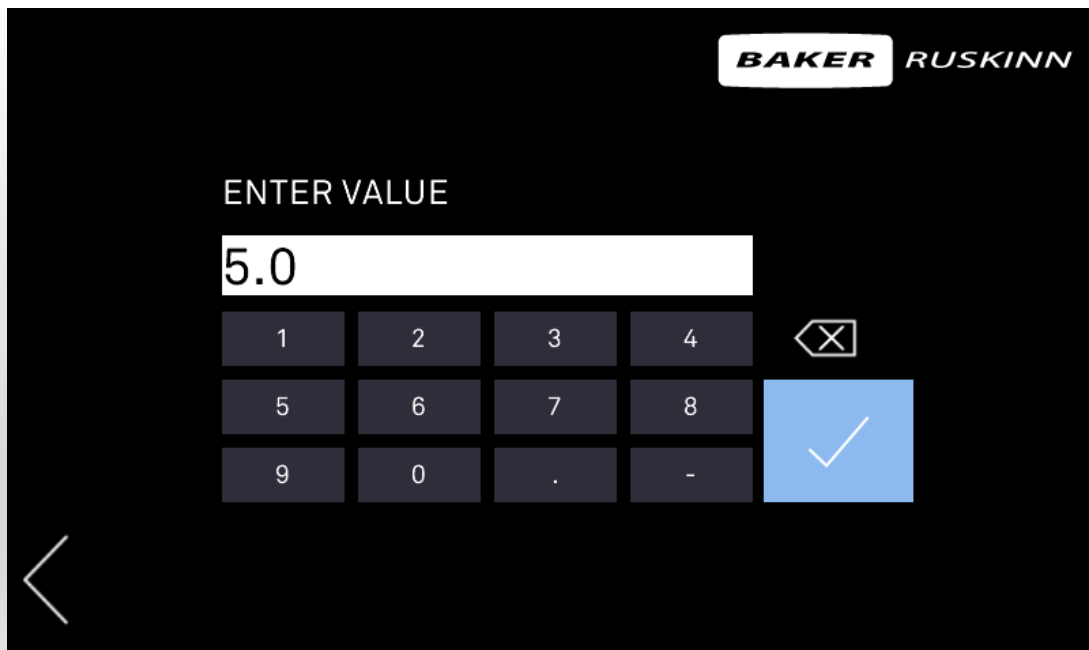


Figure 13: Gas setpoint selection pop up

Select the desired gas levels and press ok to return to the home screen.

Note – *O₂ Gas level range – 0.1% - 20.9%, CO₂ 0.1% - 20% both in 0.1% increments.*

The Gas Controller will remain in a dormant state until the Start/Stop button is pressed.

Pressing the Start/Stop button will begin mixing to the selected setpoints.

To stop mixing, press the Start/Stop button.

Current time and date is displayed at the top of the screen.

Settings Menu

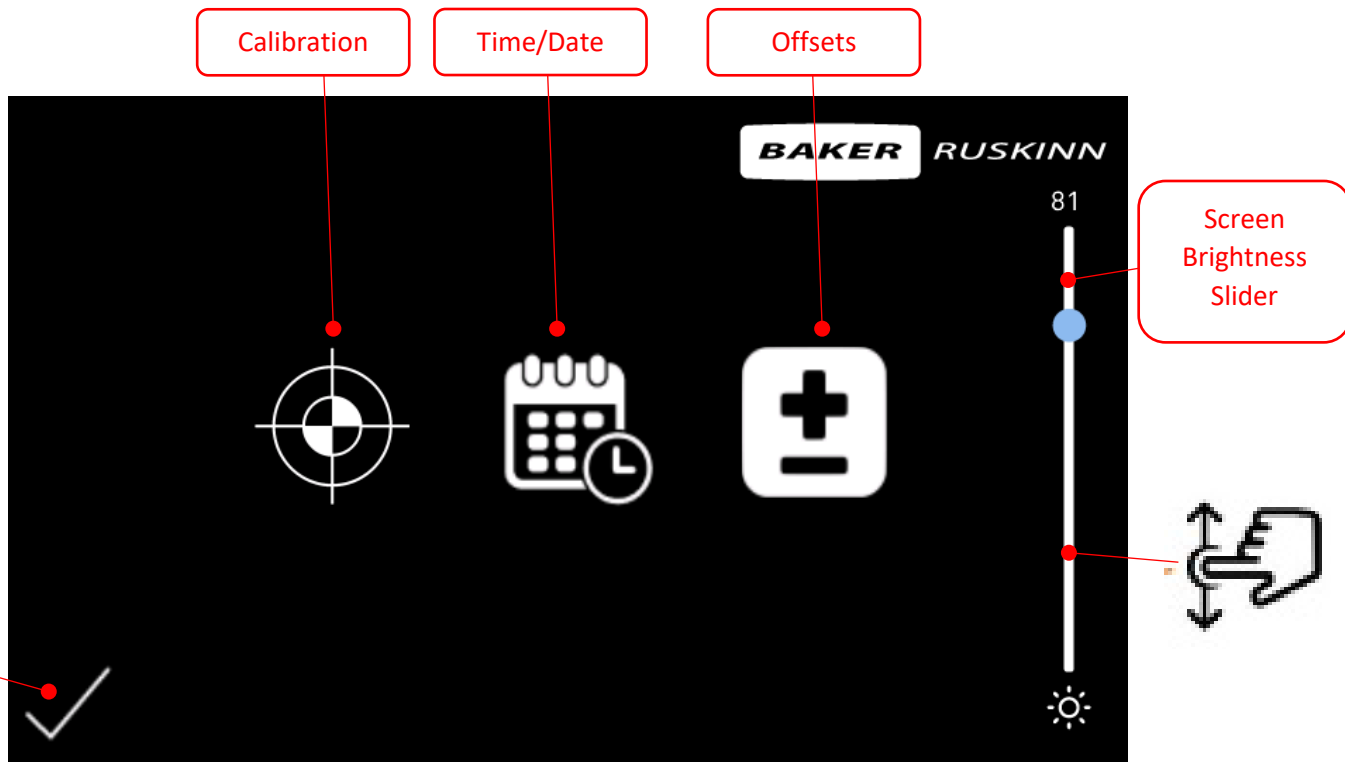


Figure 14: Time/Date Screen

To access the setting menu, press the area displaying the time and date on the home screen.

This screen contains the calibration menu, Time/Date adjustments and the Offsets menu.

The screen brightness can also be adjusted by using the sliding scale on the right hand side of the screen. The adjustment range is from 1-100.

Once desired adjustments are complete press the 'check mark' symbol at the bottom left of the screen to confirm and return to the Home Screen.

Time/Date Screen

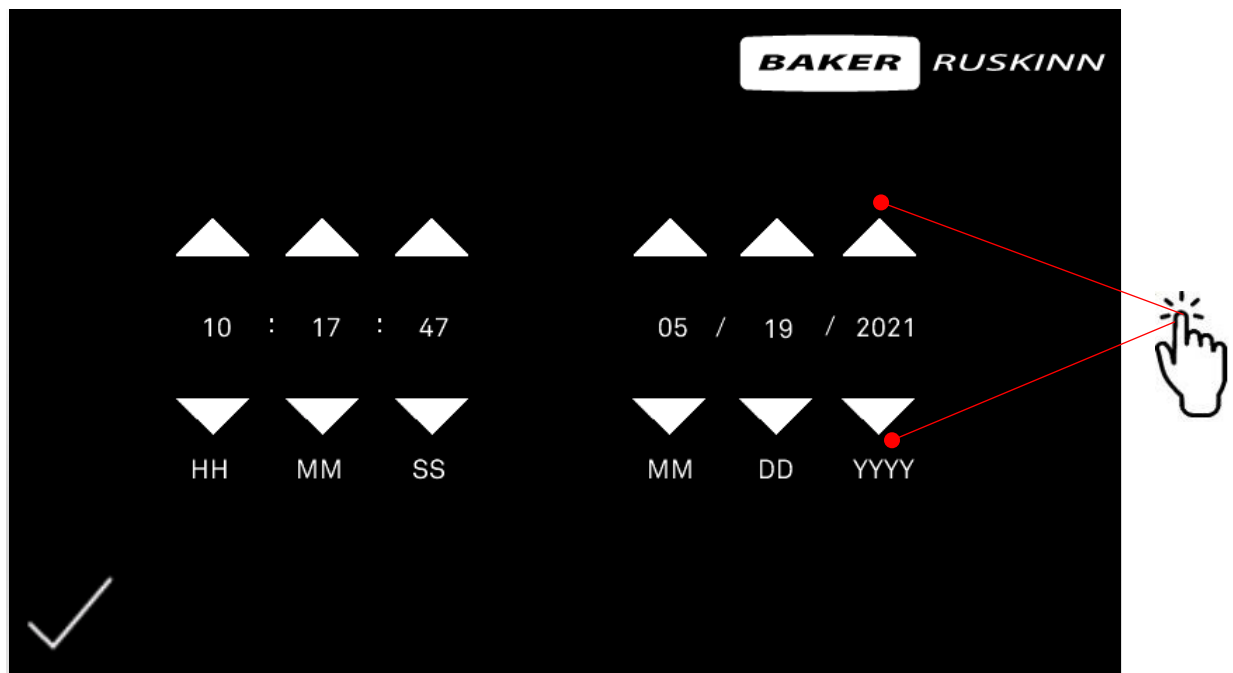


Figure 15: Time/Date Screen

To access the Time/Date screen, press the area displaying the time and date on the home screen.

Amend the time and date to the desired values using the up and down arrows.

Note – Date is displayed in MM/DD/YYYY format.

Once desired adjustments are complete press the 'check mark' symbol at the bottom left of the screen to confirm and return to the Home Screen.

Offsets

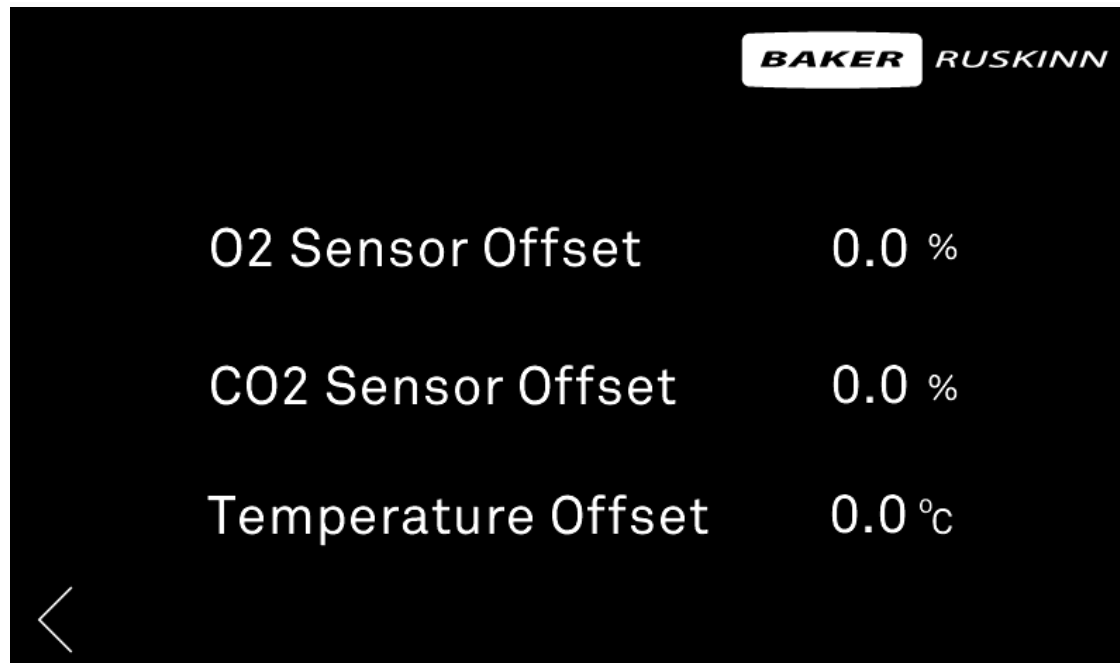


Figure 16: Offsets Menu Screen

The O₂, CO₂, and Temperature sensors are all able to be offset from their displayed values. This may be required to match up to third party sensing equipment.

O₂ Sensor Calibration (Please locate Calibration Adaptor supplied)

The O₂ sensor is positioned inside the sensor housing on the rear of the Cell Culture Chamber. Calibration is required on this sensor periodically, to ensure sensor accuracy.

A minimum of a monthly calibration cycle is recommended under normal use conditions.

To calibrate the O₂ sensor, enter the O₂ Calibration screen on the Gas Controller.

The on screen display then walks through the steps required to perform the calibration cycle. Press the next button once the required action is complete to progress.

The calibration cycle is summarised below:

1. From the gas mixing menu, enter settings by touching the time / date display



2. Press the 'Sensor Calibration' Icon.



3. Press 'Begin Calibration Cycle' button.



4. Following the on-screen prompts, Remove the blue 6mm tube from the 'Mixed Gas In' fitting on the rear of the Cell Culture Chamber.
Tube is removed by depressing the collar on the fitting then pulling up the tube.
5. Press the button on screen to move to the next step
6. Insert the tube securely into the hole on the Calibration Adaptor.
7. Press the button on screen to move to the next step
8. Open the door of the Cell Culture Chamber and remove all the shelves.
9. Push the Calibration Adaptor and tube assembly securely into the corresponding fan patterns on the rear wall of the Cell Culture Chamber.
10. Press the button on screen to move to the next step
11. The Gas Controller will then inject Nitrogen as required.
12. When prompted, Press the button on screen to move to the next step
13. Remove the Calibration Adaptor and tube assembly and allow sensor to stabilise in ambient air.
14. Press the button on screen to move to the next step
15. The screen will display a pass or fail Icon when procedure is complete
(In the case of a fail result, repeat the calibration process. If calibration is not possible, contact your local service representative quoting your serial number)
16. Replace shelves and close the Cell Culture Chamber door.
17. Remove the blue 6mm tube from the Calibration Adaptor.
18. Replace blue 6mm tube back into the 'Mixed Gas In' fitting on the rear of the Cell Culture Chamber.
19. Tube simply push fits.
20. The calibration is now complete.

On Screen Data Log

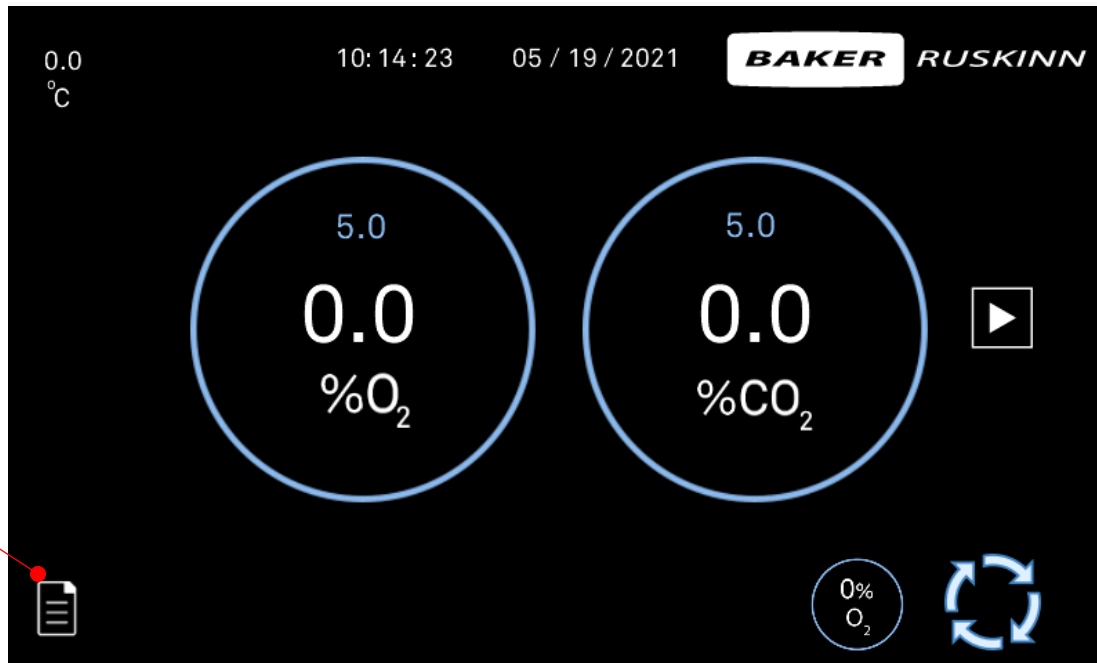


Figure 17: Home Screen Log Button

To view the on screen data log, press the Log Screen Button located at the bottom left of the home screen.

The screenshot shows the Baker Ruskin Log Screen. The Baker Ruskin logo is in the top right. A table displays the following data:

Date	Time	O2 Value	CO2 Value
1/5/2021	10:23:04	0.0	0.0
1/5/2021	10:21:59	0.0	0.0
1/5/2021	10:20:54	0.0	0.0
1/5/2021	10:19:49	0.0	0.0
1/5/2021	10:18:45	0.0	0.0
1/5/2021	10:17:40	0.0	0.0
1/5/2021	10:16:35	0.0	0.0
1/5/2021	10:15:30	0.0	0.0
1/5/2021	10:14:25	0.0	0.0
1/5/2021	10:13:20	0.0	0.0

A back arrow is at the bottom left. A hand icon with a vertical double-headed arrow is on the right, pointing to the table, indicating that the data can be scrolled.

Figure 18: Log Screen

The on screen log displays the values from the last 10 minutes recorded at 1 minute increments.

The data can be scrolled back on screen over a one week period.

To return to the Home Screen, press the back arrow button at the bottom left.

Hypoxic Cycling

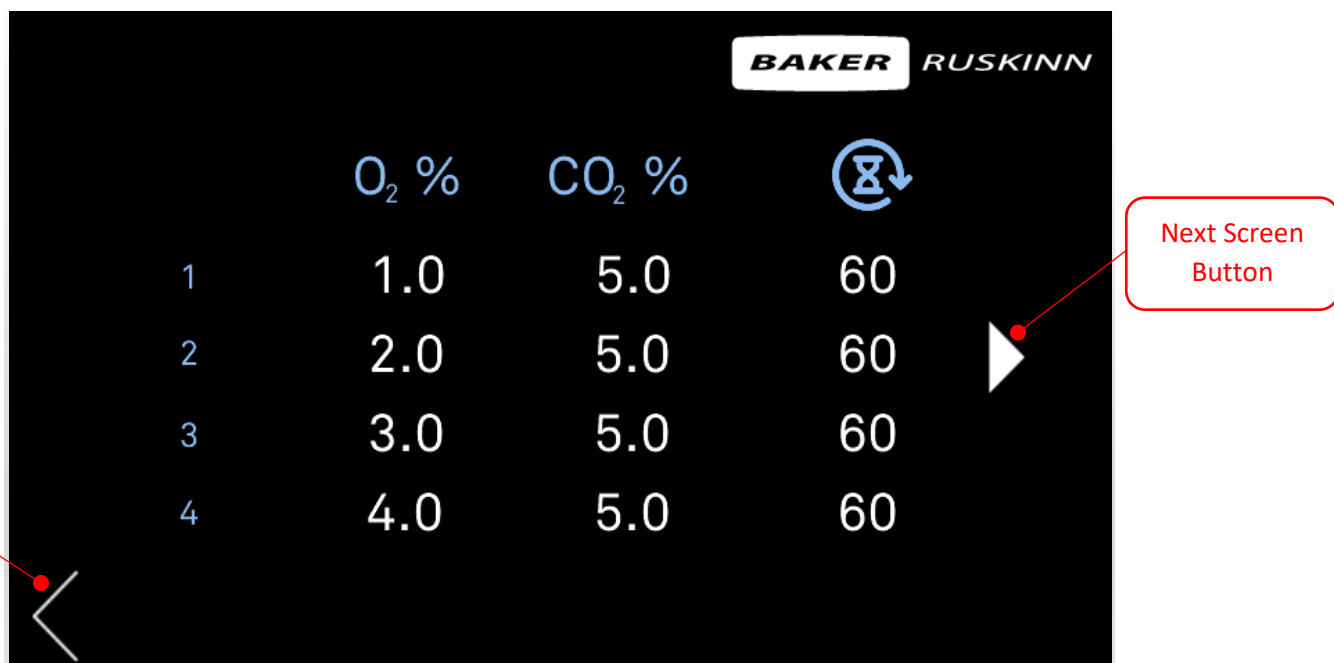


Figure 19: Hypoxic Cycle Setting Screen

The Hypoxic Cycle menu is accessed from Hypoxic Cycle button on the main screen.

It allows for dynamic changing of the O₂ and CO₂ levels over fixed time periods. The initial setting is for continuous cycling for up to 4 set-points.

The timing values define how long the O₂ and CO₂ levels are maintained for once they have been achieved. This means that there is a time period between the steps that is not able to be set as it is dependent on the difference between the set-points within the gas control software.

Pressing on any of the values will bring up a selection box to enter in the required setting. If only 2 values are required for the cycling then set step 1 and 2 as required, then set step 3 & 4 to a time period to 0 minutes with the O₂ and CO₂ set-points the same as step 2.

Once the settings are correct then press the start/stop button to begin the cycling. The continuous cycling will stop by pressing the Start/Stop button a second time.

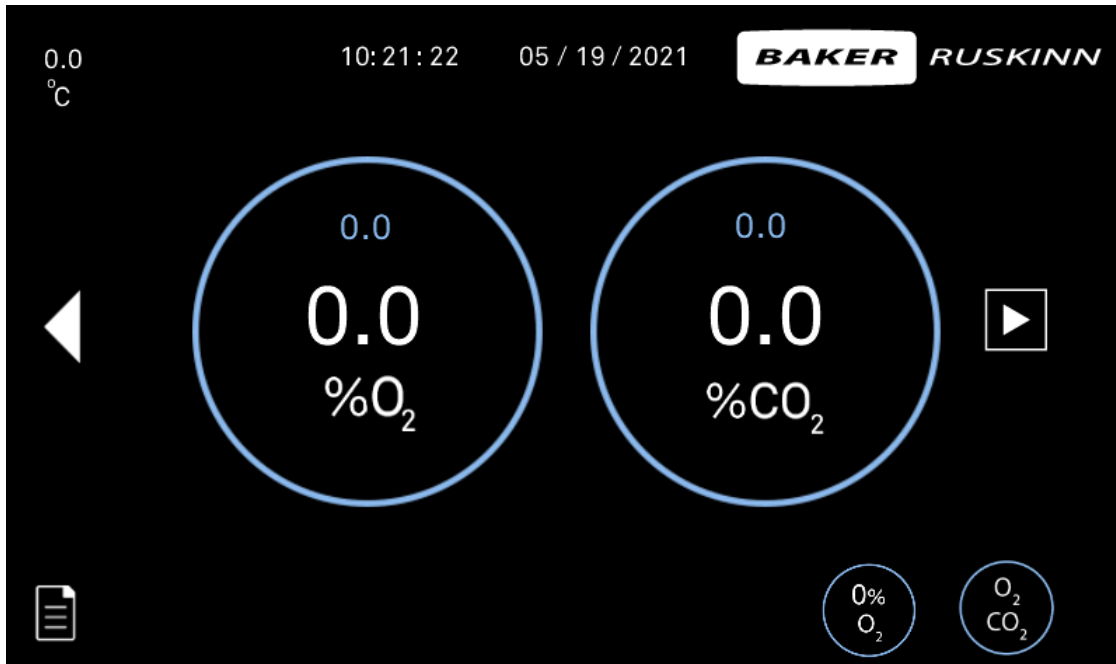


Figure 20: Hypoxic Cycle Summary Screen

Pressure Relief Adaptor (For use when setting O₂ at <1% and CO₂ >10%)

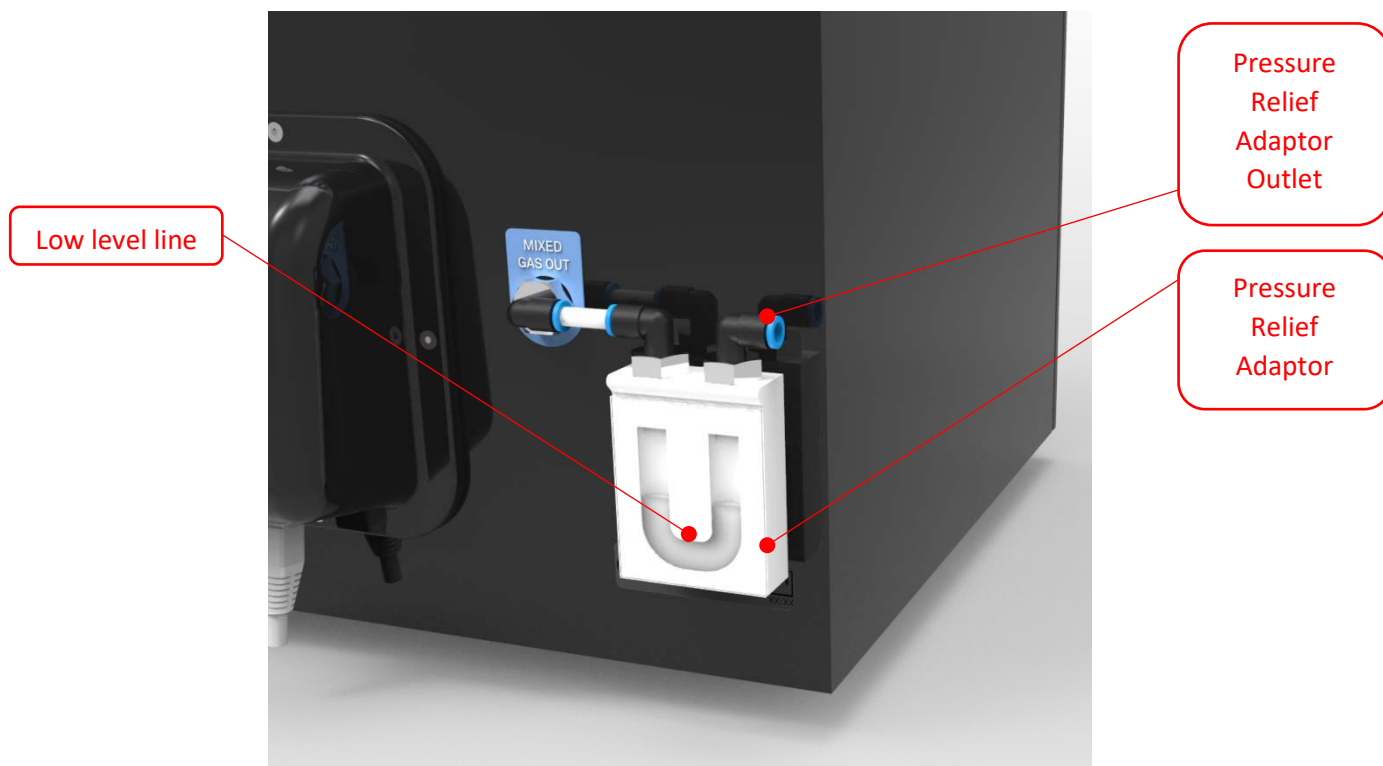


Figure 21: Pressure Relief Adaptor Attachment

The Pressure Relief Adaptor is a small, oil filled, pressure relief system that should be installed if O₂ levels of below 1% or CO₂ levels of above 10% are selected. An on screen message will advise it's attachment and the fitting procedure when these levels are selected.

Its primary purpose is to increase gas consumption efficiency.

It is installed onto the Mixed Gas Outlet as shown above with a push fitting into the mixed gas outlet. It can then be secured in place onto the rear of the Cell Culture Chamber via a suction cup attached to the rear of the Pressure Relief Adaptor.

If the unit be installed inside an Incubator or Workstation, 6mm tubing can be attached to the Pressure Relief Adaptor Outlet and routed out as normal.

Should the oil level in the Pressure Relief Adaptor drop below the low level line, it can be topped through the Pressure Relief Adaptor Outlet.

CLEANING AND SERVICE REQUIREMENTS

Service and Cleaning Overview

To maintain optimal performance of the PhO₂x Box system, it must be serviced at regular intervals. Lists the servicing requirements, intervals and persons capable of performing the service are detailed in Table 5.

Important notice:

Your Baker Ruskinn System includes a 2 year warranty. This is only valid if each annual service is carried out in accordance with Table 5 below.

Action	Frequency	By
Clean Cell Culture Chamber and seal	After each use	End User
Deep clean Cell Culture Chamber	3-6 months	End User
Replace catalyst sachets (if used)	Annually	End User/ Qualified service engineer
Replace detox sachets (if used)	Annually	End User/ Qualified service engineer
Preventative Maintenance Service	4 Years	Qualified service engineer

Table 5: Cleaning and Service Details

To order service kits or to arrange a service engineer visit contact your local distributor. For a service engineer visit please ensure that the unit is in a safe state and decontaminated if required.

To arrange a service contract, contact your local distributor.

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

- Ethanol, laboratory grade at a maximum concentration of 70% by volume ethanol in distilled or deionized (DI) water.
- Isopropanol, laboratory grade at a maximum concentration of 70% by volume Isopropanol in distilled or deionized (DI) 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 Baker Ruskin.
- Distilled or deionised (DI) water.

No other cleaning agents are permitted.

The use of UV light is prohibited in the Cell Culture Chamber as it will cause permanent damage. The use of UV Light within the Cell Culture Chamber will invalidate the warranty.

Note: Where 3rd party instruments or apparatus are used within the chamber, please refer to the applicable manufacturers for guidance on approved cleaning agents. If these cleaning agents are not listed above, please remove the instrument or apparatus from the Cell Culture Chamber to undertake cleaning to prevent damage to the Cell Culture Chamber or 3rd party instrument / apparatus

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 Cell Culture Chamber(s).
- Wipe the inside of the Cell Culture Chamber using paper towels soaked in an appropriate cleaning agent and squeezed to remove excess fluid.
- Wipe the Cell Culture Chamber clean using paper towels to dry.

TROUBLESHOOTING

The Gas Controller will not switch on

- Check the Gas Controller is plugged in
- Check the Mains socket is switched on
- Check the plug fuses have not blown

If all the above fail to switch the Gas Controller on contact your local distributor.

Low Gas Pressure

The main causes for the System to identify low input gas pressures:

- The gas input pressure is set to low.
 - Check the gas supply bottle pressure is set to the recommended levels defined in the 'Gas Supply Requirements' section.
- The gas bottle has run out.
 - Check the gas supply bottle to make sure that it is not empty.
- A gas connection between the bottle and the System has come undone.
 - Inspect the gas supply line from the System to the bottle to check there it has not be disconnected.

If all the above fail to clear the alarm then contact your local distributor or Ruskinn.

WARRANTY INFORMATION

The Baker Company/Baker Ruskinn warrants for the applicable time period that the PhO₂x Box 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 Baker Ruskinn PhO₂x Box otherwise than in the normal course of a business.

This warranty does not apply in the following circumstances:

- (A) If the Baker Ruskinn PhO₂x Box has been repaired by persons not authorized by Baker Ruskinn; or
- (B) The Baker Ruskinn PhO₂x Box and associated accessories/peripherals have been altered, modified, or misused; or
- (C) The Baker Ruskinn PhO₂x Box is used with non Baker Ruskinn components; or
- (D) The Baker Ruskinn PhO₂x box or a component is used for other uses (for example use with other circuit boards or software) or
- (E) The Baker Ruskinn PhO₂x box 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. Baker Ruskinn does not warrant that the Baker Ruskinn PhO₂x box will function error free.

If within the Warranty Period, the Baker Ruskinn PhO₂x Box does not conform to the express warranty set forth above, Baker Ruskinn's sole obligation and Users sole remedy shall be, at Baker Ruskinn's option: 1. to repair or replace the non-conforming component; or, 2. refund the purchase price.

Limitation of Liability.

Unless prohibited by law, Baker Ruskinn 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 Baker Ruskinn has been advised of the possibility of such damages.

The parties agree that Baker Ruskinn 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 Baker Ruskinn PhO₂x Box 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.

DISPOSAL INFORMATION

PhO₂x Box 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.

PhO₂x Box contains recyclable parts. Please contact your local distributor for more advice

CONTACT DETAILS

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