

# Hypoxia/Cell Culture Workstations



# 01 | Our Credentials

*Don Whitley started his career in microbiology and haematology laboratories, before moving into the sale of laboratory products. This experience helped him to develop novel ideas for improving the working life of scientists through the use of labour-saving equipment and automated solutions, leading to the formation of Don Whitley Scientific Limited in 1976.*

We continue to design, develop and manufacture our products in the UK and have been granted patents for many of our innovations. We now offer a range of controlled atmosphere workstations for cultivation of mammalian cells under physiologically appropriate conditions of normoxia or hypoxia. This product line has recently been enhanced by the introduction of our internal HEPA filtration system, which combines precise atmospheric control with cleanroom conditions for cell culture.

Our product range has been sold in over 50 countries through our worldwide network of distributors.

For more information on any of our additional services, please contact us: +44 (0)1274 595728 or [sales@dwscientific.co.uk](mailto:sales@dwscientific.co.uk)

Top right: Don Whitley Chairman & Founder receiving his honorary doctorate.





*Our greatest assets are our satisfied customers...*

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I bought a Whitley Workstation when I worked in London. I was so pleased with the product that when I moved to Denmark, I ordered another one. It is a beautifully well thought through and reliable product – it simply does what it says it does.

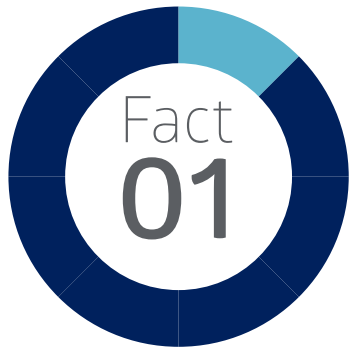
*Janine Erler, Biotech Research and Innovation Centre, University of Copenhagen, Denmark.*

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The precise control of oxygen tension by the H35 has improved the quality of our results considerably. Also, a previous instrument I used did not have the facility to programme cycling oxygen tensions, so the H35 has opened up a new avenue of research for us.

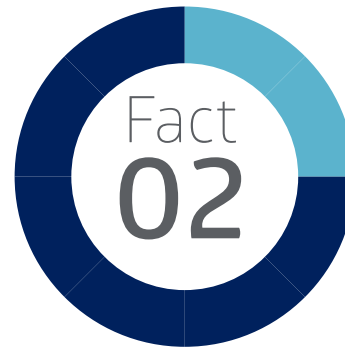
*Dr Dan Tennant, Hypoxia and Metabolism Group, School of Cancer Sciences, University of Birmingham.*

# 03 | Unique Innovations



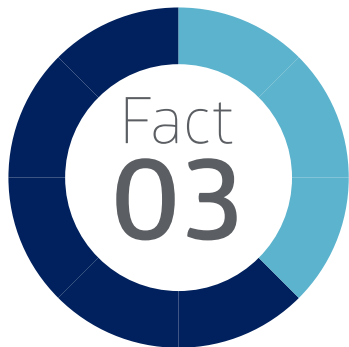
## *Oval Sleeved Ports*

Patented oval, sleeved ports allow greater freedom of movement and operator comfort. This system allows you to work gloved or bare handed.



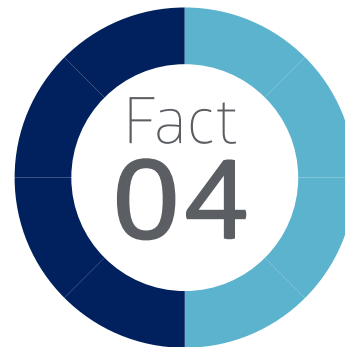
## *Colour Touchscreen*

Intuitive full colour touchscreen that is ethernet-enabled for remote access. The touchscreen interface displays the status conditions of all controlled parameters and also allows the user to change operating parameters to suit specific test conditions. Alarm conditions are clearly displayed and PIN code controlled user access levels protect user adjustable parameters.



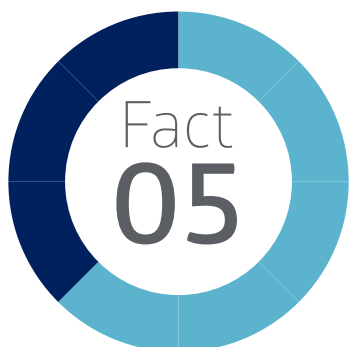
## *HEPA Filtration*

In the Whitley HEPA Filtration System all the atmosphere in the chamber passes through the filter hundreds of times an hour, quickly creating and maintaining a particle-free environment. The HEPA system exceeds the requirements stipulated by ISO 14644 (Class 3), as referenced in the Cell Tissue Culture Directive, or Class 1 of US Federal Standard 209E. Unlike some other systems, DWS integrates the filter within the workstation. Because the warm, moist atmosphere isn't pumped to an external filter, the filter does not become saturated with condensate and thus rendered ineffective.



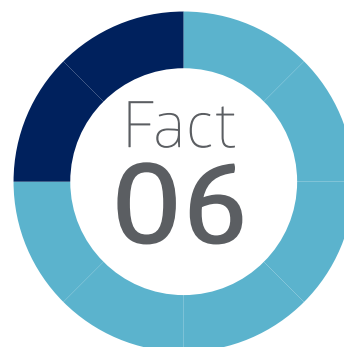
## *Automatic Humidification*

The Automatic Humidification System provides a sterile source of humidity without the need for the user to increase the humidity by adding open trays/containers of water to the workstation. The automatic humidification system does not increase the maximum level of humidity that can be achieved but will increase the humidity very quickly and does so without contaminating the atmosphere.



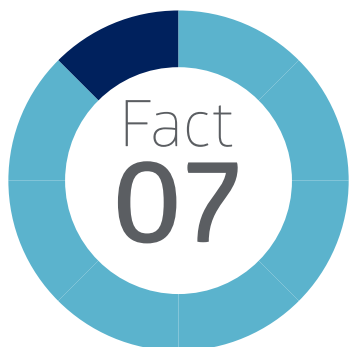
### *Whitley Removable Front*

This feature allows for thorough cleaning and the transfer of bulk samples and equipment. With swing latches that are turned 90° - and don't need to be removed - it's very easy to attach and detach the Whitley Removable Front. There are no parts to store (or lose!) or that can be overtightened.



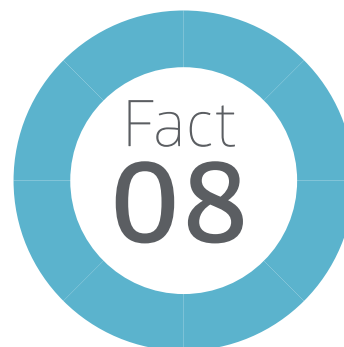
### *Data Download/Traceability*

There is an option to purchase data logging software for all Whitley Hypoxystations. This feature allows the recording of temperature, humidity and chamber pressure conditions for traceability and reference. The information is displayed on the touch screen in graphical format. The recorded data can be downloaded in only 10 seconds via the USB interface to a memory stick and exported to our bespoke, pre-formatted spreadsheet software.



### *Oxygen Profiling*

This option allows the user to pre-programme different oxygen levels. The user can determine how long the Hypoxystation atmosphere remains at a particular oxygen level before being automatically adjusted to higher or lower concentrations. Oxygen sensing is in real time with no delay as the sensor is inside the chamber.



### *Internal Oxygen Sensor*

O<sub>2</sub> sensing, monitoring and control are key components of accurate atmosphere control in a hypoxic workstation. The Hypoxystation has an integrated O<sub>2</sub> sensor located in the incubation chamber, under the same environmental conditions as your cell cultures and other samples. This allows for a precise, real-time feedback system that constantly monitors the internal atmosphere. Hypoxystations can quickly respond to any changes to ensure user settings are accurate and reproducible. Having an integrated O<sub>2</sub> sensor eliminates the need to extract a gas sample and pump it to an external or remote monitoring system for evaluation.

# 05 | The Fastest Oxygen Control on the Market

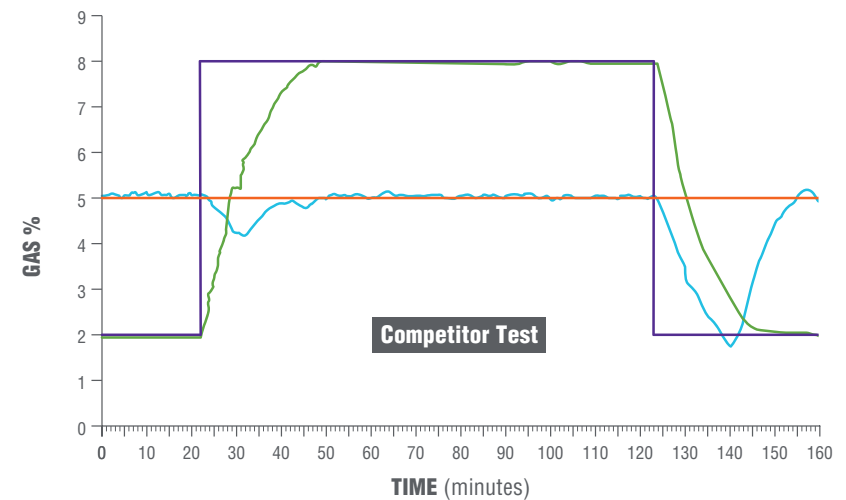
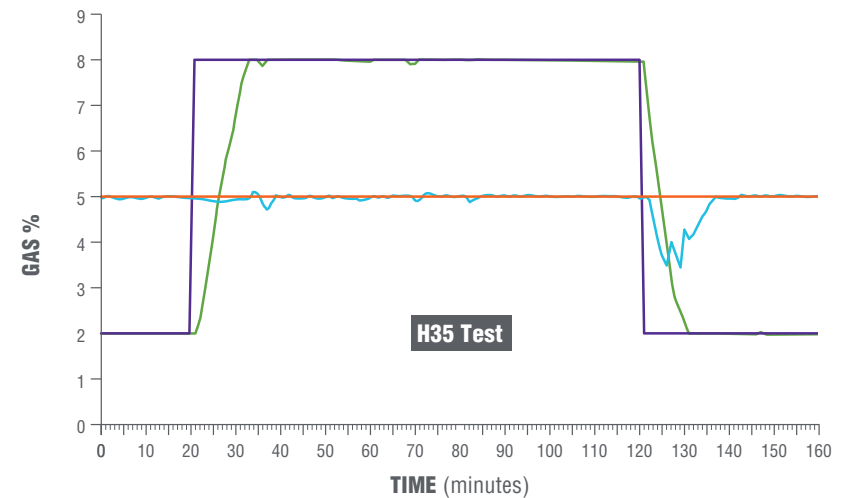
*If you need a workstation that responds rapidly to changes in oxygen set point, read on. We have conducted tests that lead us to believe that no other manufacturer's hypoxic workstations are able to offer the same accuracy and speed of response to set point changes as those achievable in Whitley Workstations.*

The Whitley Hypoxic Workstations allow the control of oxygen concentration in 0.1% increments over the range 0 to 20% and the control of carbon dioxide concentration in 0.1% increments over the range 0 to 15%. Unlike workstations produced by some other manufacturers, the sophisticated control mechanisms used in Whitley H range workstations allow the selected gas mixture to be rapidly and accurately attained and adjusted.

To document the speed with which atmospheric oxygen concentrations can be changed in an H35 workstation, we conducted tests in our own laboratory and used the workstation's data logging facility to record the results during the test period.

These graphs demonstrate that the Whitley H35 Hypoxystation responds very rapidly to changes in oxygen set point. Due to the influx of gas (air or N<sub>2</sub>) after a change in O<sub>2</sub> set point, there is an inevitable brief, temporary decrease in CO<sub>2</sub> concentration. However, the H35 control mechanisms ensure that this decrease is minimised and the original CO<sub>2</sub> set point is regained quickly. Furthermore, this accuracy is achieved over the full range of operating conditions, including very low oxygen concentrations (0.1 to 1.0%).

We recommend that anyone considering the purchase of an apparently similar workstation should request equivalent oxygen control data from the manufacturer for comparative purposes.



# Whitley H25 Hypoxystation

# 06



H25 Door Latch



H25 Airlock



The H25 is our smallest Hypoxystation, ideal for those with limited space or for smaller research projects. The H25 has the same accurate level of control of oxygen, carbon dioxide and humidity as the other Hypoxystations, as well as fully integrated gas mixing.

With a main chamber capacity of 180 litres but a small footprint, the H25 could be your first step into conducting more physiologically relevant research.

## FEATURES

- A 6 litre airlock: a cycle takes just 20 seconds
- Control oxygen in 0.1% increments up to 20%; carbon dioxide in 0.1% increments up to 15%; and relative humidity up to 80%.
- New style oval ports where the door folds flat into the chamber floor, taking up no extra space in the workstation itself
- Data logging option allows the downloading of data to a memory stick in seconds
- A side loading single sample entry system is available
- A variety of options and accessories are available to tailor your Hypoxystation to your specific needs.
- Ethernet enabled for remote access to touchscreen.

*Please see pages 19-20 for a full list of features and options.*

# 07 | Whitley H35 Hypoxystation

The H35 Hypoxystation creates hypoxic and anoxic conditions within a controlled and sustained workstation environment. It is ideal for cell and tissue culture researchers wanting to accurately control oxygen, carbon dioxide, temperature and humidity.

This Hypoxystation has a generous 300 litre capacity and a colour touchscreen control panel for ease of use and for the visual display of parameters.

## FEATURES

- Control O<sub>2</sub> in 0.1% increments up to 20%; CO<sub>2</sub> in 0.1% increments up to 15%; and RH up to 80% for flexibility in your research and confidence in your results.
- Colour touchscreen control panel for ease of use and for visual display of parameters including airlock cycle status.
- Integral 12 litre airlock accommodates up to 44 x 96 well plates or 7 x 500ml Duran bottles and completes a cycle in only 60 seconds.
- The optional HEPA model is fitted with the unique Whitley Internal HEPA Filtration System where all the atmosphere passes through the filter hundreds of times an hour, cleaning the chamber environment quickly. Exceeds the level of atmosphere cleanliness stipulated by Class 3 of ISO14644.
- Gas mixing achieved instantly via a unique, fully integrated control system – rapidly create your selected environmental conditions and minimise bench space required.
- Easy, accurate, 2-point oxygen sensor calibration.

*Please see pages 19-20 for a full list of features and options.*



Single Sample Entry System



Data download

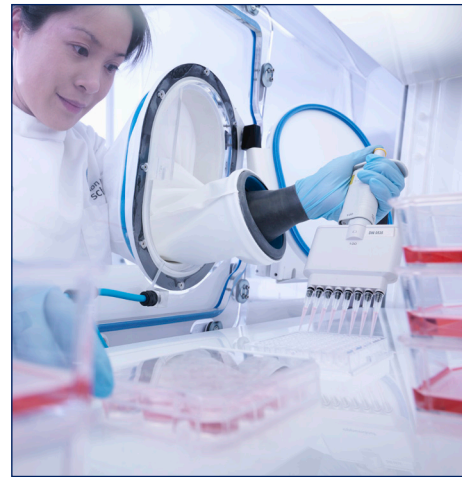




# Whitley H45 Hypoxystation | 08



H45 Touchscreen



Room to work and incubate



The H45 provides the facility to mimic *in vivo* conditions, providing a continuous cell culture environment that eliminates cellular stress linked to variations in temperature, pH levels and oxidation – resulting in better cell lines. The 3-port workstation features 3 patented oval ports and has a 440 litre capacity. The 12 litre airlock will accommodate a variety of pipettes, culture flasks and electrical equipment for use in the chamber.

## FEATURES

- Control O<sub>2</sub> in 0.1% increments up to 20%; CO<sub>2</sub> in 0.1% increments up to 15%; and RH up to 80% for flexibility in your research and confidence in your results.
- The H45 is also available as an H45 HEPA, equipped with the Whitley Internal HEPA Filtration System. Exceeds the level of atmospheric cleanliness stipulated by Class 3 of IOS 14644.
- Additional HEPA filters can be fitted to reduce the possibility of bacteria contained inside workstations being released via the main chamber exhaust valve and the airlock exhaust valve.
- With three ports you have convenient access to the entire incubation and working areas.
- Fitted with a removable front to allow for thorough cleaning and the transfer of bulk samples and equipment for use in the Hypoxystation.
- Available with a fully automatic humidification system so you can add moisture while maintaining a sterile environment.

*Please see pages 19-20 for a full list of features and options.*

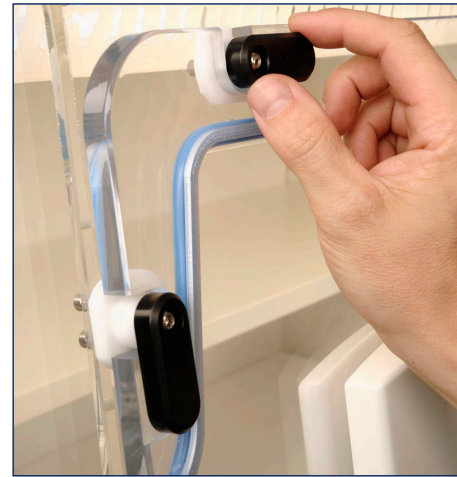
# 09 | Whitley H55 Hypoxystation

This huge workstation has a capacity twice the size of the H35 and is ideal for accommodating items of equipment for use inside the chamber. As with all our Hypoxystations, the H55 provides the facility to mimic in vivo conditions in a continuous cell culture environment that eliminates cellular stress linked to variations in temperature, pH levels and oxidation. The H55 has two 12 litre airlocks, one at either end of the workstation. Items such as pipettes, culture flasks and other vessels can be introduced and removed through both airlocks. The four patented, oval glove ports allow two people to work in the chamber at the same time.

## FEATURES

- Fitted with a removable front to allow for thorough cleaning and the transfer of bulk samples and equipment for use in the workstation.
- Controls O<sub>2</sub> in 0.1% increments up to 20%; CO<sub>2</sub> in 0.1% increments to 15%; and RH up to 80% for flexibility in your research and confidence in your results.
- HEPA Filtration model available – all the atmosphere inside the chamber passes through the filter hundreds of times an hour, which ensures the chamber environment is cleaned quickly.
- Additional HEPA filters can be fitted to reduce the possibility of bacteria contained inside the workstation being released via the main chamber exhaust valve and the airlock exhaust valve.
- Comfortable to work in and with excellent visibility.
- Innovative colour touchscreen with PIN-code protected user levels.
- A chamber capacity of 600 litres – plenty of room to work and incubate.

*Please see pages 19-20 for a full list of features and options.*



*A Removable Front*



*Four patented, oval glove ports*



# Whitley H85 Hypoxystation

# 10



Refrigeration Unit



H85 Touchscreen

Used for a variety of cell culture applications, the H85 Hypoxystation accurately controls O<sub>2</sub>, CO<sub>2</sub>, temperature and humidity to create hypoxic and anoxic conditions. It has a large 300 litre capacity and a very generous airlock. This workstation is available with an optional refrigeration unit designed to operate at 8°C (although other set temperatures are available if required). The H85 is ideal for use in university laboratories, hospitals and cancer research facilities.

## FEATURES

- Control O<sub>2</sub> in 0.1% increments up to 20%; CO<sub>2</sub> in 0.1% increments up to 15%; and RH up to 80% for flexibility in your research and confidence in your results.
- Fitted with patented, oval ports that act as mini airlocks so you can transfer flasks at the same time as you enter or withdraw from the chamber.
- Features a large 36 litre, integral airlock - internal dimensions: 295 x 295 x 350mm (w x d x h).
- Colour touchscreen control for ease of use and visual display of parameters such as temperature and humidity.
- Ethernet-enabled for remote access.
- Gas mixing achieved instantly via a unique, fully integrated control system - rapidly create your selected environmental conditions and minimise bench space required.
- Option of 3 different types of single sample transfer system.

*Please see pages 19-20 for a full list of features and options.*



# 11

## Whitley H95 Hypoxystation

The Whitley H95 Hypoxystation has been designed specifically for researchers requiring the ability to accurately control O<sub>2</sub>, CO<sub>2</sub>, temperature and humidity. It allows the user to control O<sub>2</sub> in 0.1% increments from 0.1% up to 20%; control CO<sub>2</sub> in 0.1% increments from 0.1% to 15%; carry out straightforward calibration of the oxygen sensor; control temperature between 5°C above ambient and 45°C; and to control relative humidity at 80% RH or higher. The airlock is fitted with an automatic internal door and provides an easy and rapid method for the transfer of up to 133 x 96 well plates or 252 x T25 culture flasks from the laboratory to the workstation.

### FEATURES

- The H95 has a chamber capacity of 600 litres and an airlock capacity of 36 litres
- Colour touchscreen interface allows easy monitoring of all parameters simultaneously
- Multifunctional porthole system with 2 pairs of ports so can be used by 2 users at the same time
- Each port acts as a mini airlock to transfer small items of lab ware
- Patented oval gloveports to allow bare handed or gloved operation and maximum comfort in use
- Automated de-humidification as standard
- Ethernet enabled for remote access to touchscreen
- A wide range of options and accessories to tailor the system to your particular working conditions.

*Please see pages 19-20 for a full list of features and options.*



*Working in a H95 Hypoxystation*



*H95 Porthole System*



# Whitley H135 HEPA Hypoxystation

12



Remote Access



Removable Front



The H135 HEPA is the tallest, widest, deepest hypoxic chamber in the Whitley range. It has a usable internal volume of almost 900 litres and can accommodate a variety of items of equipment such as live cell imaging devices, microscopes, plate readers, etc. The generous internal height facilitates easy pipetting. All cell manipulations can be performed without removing them from your required hypoxic conditions. Providing precise environmental control whilst leaving plenty of room to work, incubate and conduct analysis.

## FEATURES

- Large removable front fitted with either two or three ports.
- Fitted with the Whitley Internal HEPA Filtration System as standard.
- Optional Enhanced Biological Containment.
- Two optional 'chilling' systems: to remove heat created by instrumentation in the chamber or to cool the atmosphere to less than 10°C.
- 16 litre airlock – no risk of compromising conditions inside the chamber (and it's flushed with nitrogen as an additional cost saving).
- As with some of our other Hypoxystations, the option of being connected to a Whitley i2 Instrument Workstation.
- Precise control of O<sub>2</sub>, CO<sub>2</sub> and N<sub>2</sub>.
- Automated O<sub>2</sub> calibration.
- Bespoke trolley included.

*Please see pages 19-20 for a full list of features and options.*

# 13

## Whitley H155 HEPA Hypoxystation

The Whitley H155 HEPA Hypoxystation is the tallest, widest, deepest hypoxic chamber in the Whitley Workstation range. It has a usable internal capacity of 1800 litres and can accommodate a variety of items of equipment such as live cell imaging devices and microscopes. All your cell manipulations can be performed without removing them from hypoxic conditions. This workstation provides precise environmental control whilst leaving plenty of room to work, incubate and conduct analysis. Two rapid 16 litre airlocks prevent compromising conditions inside the chamber when you are entering and exiting. The airlocks operate independently and take only 60 seconds to run a cycle. Each airlock can accommodate 10 x 500ml Duran bottles.

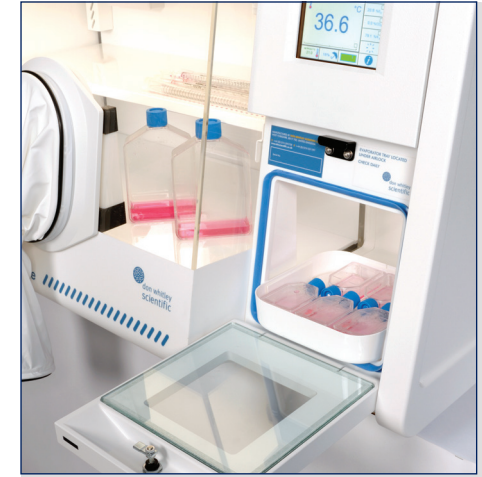
### FEATURES

- Precise control of oxygen, carbon dioxide and nitrogen – provides flexibility in your research and confidence in your results.
- Equipped with the Whitley Internal HEPA Filtration System with optional Enhanced Biological Containment. Levels of atmospheric cleanliness inside the workstation exceed the requirements of ISO 14644 Class 3 and we can provide proof of atmospheric cleanliness.
- Two removable fronts (each fitted with two patented oval ports) facilitate the transfer of large items of equipment for use inside the chamber.
- Innovative, full colour touch screen that is Ethernet-enabled for remote access.
- Fully automated oxygen calibration routine (patent pending) saves time, no risk of user error and ensures the accuracy of your results.
- Other options include double internal power socket, refrigeration, front loading single sample entry system, cable glands and storage trays.

*Please see pages 19-20 for a full list of features and options.*



*Large capacity*



*Using the airlock*



# Whitley i2 Instrument Workstation

14



Transfer Tunnel



Integral Incubator

The Whitley i2 Instrument Workstation enables scientists to use Seahorse Extracellular Flux (XF) Analysers in hypoxic conditions. The i2 has been developed specifically to meet the precise requirements of the XF Analyser. This workstation can be used as a stand-alone unit or connected to a Whitley Hypoxystation via the Whitley Transfer Tunnel, enabling preparation of cell lines under hypoxic conditions and their transfer directly into the i2 without exposure to air. Another unique feature is the integral incubator, which enables you to precondition cellware and incubate plates and media at 37°C under the same atmospheric conditions as the XF Analyser.

## FEATURES

- Maintains an internal temperature no higher than 28°C, excludes carbon dioxide and provides precise oxygen control.
- Equipped with a generous working area in which to conduct preparatory work and supplied complete with removable front, internal mains sockets and a wireless footswitch to control the patented oval ports.
- 12 litre airlock, with a cycle time of just 60 seconds, accommodates up to 44 x 96 well plates or 84 x T25 tissue culture flasks plus numerous other flasks, pipettes and laboratory consumables.
- An integral 37°C incubator that can accommodate up to 8 x 96 well plates.
- The combination of a Whitley i2 Instrument Workstation and Seahorse XF Analyser permits simultaneous, real-time analysis of mitochondrial respiration and glycolysis in mammalian cells under precisely controlled hypoxic conditions.

*Please see pages 19-20 for a full list of features and options.*



# 15

## Whitley GMP Isolator

The patented Whitley H135 GMP Isolator is designed to fast track your allogenic approval. Experience unrivalled control and consistency through enhanced contamination reduction, cell behaviour control, and cell growth.

With a compact and closed design, our re-circulating technology enables our isolators to be housed in Grade D cleanrooms. Helping you develop scalable and cost-effective cleanroom alternatives capable of saving \$20,000/m in operations. Process, incubate and refrigerate your oxygen sensitive products in Grade A conditions without the need to expose cells to atmospheric conditions. Avoiding HIF-1 oxygen shock and contamination risks associated with incubator-BSC transfer.

### The Whitley Difference:

- Contamination Control: ISO3 unidirectional flow - 100X less particles than Grade A, crucial for safe and effective ATMPs.
- Control & Consistency: Ensure consistent processing with customisable atmosphere control (oxygen, carbon dioxide, humidity, and temperature) for in vivo, low oxygen conditions. Improving control of cell behaviour, proliferation, and differentiation.
- Enhanced Cell Growth: large incubation and processing capacity with atmosphere control for increased stem cell production and yields.

Please see dedicated Whitley GMP Isolator brochure for full details.







# 17

## Whitley AsPROvac

The Whitley AsPROvac is an all-in-one laboratory aspirator to ensure biological liquid waste can be aspirated and disposed of quickly and safely. Whether it is the delicate removal of supernatants or the rapid emptying of larger culture flasks, this flexible system has a range of 1 – 20 vacuum levels to alter the aspiration speed. A range of aspiration tools are provided to enable you to aspirate from a variety of vessels. AsPROvac features a novel, quick-release cap/lid assembly, a shatterproof 4 litre autoclavable waste bottle and digital display of the vacuum level. The hand-held aspirator comprises a single tip and an adaptor for 8 channel tips.

The AsPROvac laboratory vacuum system is ideal for use with a Whitley Hypoxystation (that has a vacuum take-off port fitted).

### FEATURES

- Self-closure connectors avoid the escape of liquids and aerosols.
- Equipped with a novel, quick-click lid – with no multi-turn screw that the previous user has over-tightened!
- Supplied with a 4 litre, shatterproof waste bottle.
- All parts that come into contact with the liquid waste are autoclavable.
- The integral display shows the vacuum level selected - perfect for speeding up the emptying of large vessels or reducing the level for the delicate and careful removal of smaller quantities of biological liquid waste.
- Lightweight so can be moved around the laboratory with ease.



# Whitley Media Conditioner

# 18



Although Whitley Workstations allow tight control of the conditions under which cells/bacteria are cultured, unintentional oxygen may be introduced during media changes if the fresh media has not previously been equilibrated with the incubation atmosphere. Now you can equilibrate rapidly – and ensure even greater accuracy in your research. The Whitley Media Conditioner (UK Patent No. GB2579704) allows easy transfer into the chamber environment. Although this product was designed to be used inside the Hypoxystation, microbiologists may benefit from a device of this type when reduced atmospheric oxygen concentrations are of interest.

## FEATURES

- Equilibrate up to 400ml of liquid medium with an atmosphere containing 0.1% oxygen in just 65 minutes.
- Equilibration of smaller volumes (100ml or 200ml) in atmospheres containing higher oxygen concentrations requires as few as 12 minutes.
- Cycles optimised for use at a temperature of 37°C.
- The unit fits perfectly into the airlock of a Whitley Hypoxystation so can be transferred easily into the chamber environment for use and then removed when necessary.
- A fast, flexible system that will save a considerable amount of time and is a new tool for improving outcomes in your research.

O2 conc. (%)	Volume / 100 ml	Volume / 200 ml	Volume / 400 ml
0	40 minutes	60 minutes	95 minutes
0.1-1	30 minutes	40 minutes	65 minutes
3	14 minutes	20 minutes	35 minutes
5	12 minutes	15 minutes	25 minutes

Features	Whitley H25 Hypoxystation	Whitley H35 Hypoxystation	Whitley H45 Hypoxystation	Whitley H55 Hypoxystation
Chamber Volume	180 litres	300 litres	440 litres	440 litres
Port / Airlock Capacity	6 litres	12 litres	12 litres	12 litres
Porthole System	Manual	Manual	Manual	Manual
Gas Supplies	CO <sub>2</sub> / Air / N <sub>2</sub>	CO <sub>2</sub> / Air / N <sub>2</sub>	CO <sub>2</sub> / Air / N <sub>2</sub>	CO <sub>2</sub> / Air / N <sub>2</sub>
Footswitch	Wireless	Wireless	Wireless	Wireless
Auto Sleeve Gassing	○	○	○	○
Internal Mains Socket	○	○	○	○
Storage Trays	○	○	○	○
Lighting	●	●	●	●
Inspection Lamp	○	○	○	○
Single Sample Entry	○	○	○	○
O <sub>2</sub> Profiling	○	○	○	○
CO <sub>2</sub> Monitoring	●	●	●	●
Refrigeration	-	-	-	-
Data Logging	○	○	○	○
Airlock Cycle Time	20 seconds	60 seconds	60 seconds	60 seconds
Extra Cable Glands	○	○	○	○
HEPA Filtration	-	○	○	○
Vacuum Take-off	○	○	○	○
Automatic Dehumidifier	●	●	●	●
Automatic Humidifier	-	○	○	○
Chilled Incubation Compartment	-	○	○	○
Removable Front	-	○	○	○
Workstation Trolley	○	○	○	○
Remote Access	●	●	●	●
Dimensions w/d/h (mm)	790 / 720 / 710	1255 / 720 / 710	1660 / 720 / 710	1660 / 720 / 710
Weight (lbs/kg)	163 / 74	231 / 105	295 / 134	295 / 134
KEY:	● Fitted as standard		○ Option available	- Not applicable

Whitley H85 Hypoxystation	Whitley H95 Hypoxystation	Whitley H135 HEPA H/station	Whitley H155 HEPA H/station	Whitley i2 Instrument W/station	Features
300 litres	600 litres	900 litres	1800 litres	600 litres	Chamber Volume
36 litres	36 litres	16 litres	16 litres (2x Airlocks)	12 litres	Port / Airlock Capacity
Manual	Manual	Manual	Manual	Manual	Porthole System
CO <sub>2</sub> / Air / N <sub>2</sub>	CO <sub>2</sub> / Air / N <sub>2</sub>	CO <sub>2</sub> / Air / N <sub>2</sub>	CO <sub>2</sub> / Air / N <sub>2</sub>	Air / N <sub>2</sub>	Gas Supplies
Wireless	Wireless	Wireless	Wireless	Wireless	Footswitch
○	○	○	○	○	Auto Sleeve Gassing
○	○	○	○	●	Internal Mains Socket
-	-	○	○	-	Storage Trays
●	●	●	●	●	Lighting
-	-	○	○	○	Inspection Lamp
○	○	○	○	○	Single Sample Entry
○	○	○	○	-	O <sub>2</sub> Profiling
●	●	●	●	-	CO <sub>2</sub> Monitoring
○	-	○	○	○	Refrigeration
○	○	○	○	○	Data Logging
3.5 minutes	3.5 minutes	60 seconds	60 seconds	60 seconds	Airlock Cycle Time
○	○	○	○	○	Extra Cable Glands
○	○	●	●	-	HEPA Filtration
○	○	○	○	○	Vacuum Take-off
●	●	●	●	-	Automatic Dehumidifier
-	-	○	-	-	Automatic Humidifier
-	-	○	-	-	Chilled Incubation Compartment
-	-	●	●	●	Removable Front
○	○	●	●	○	Workstation Trolley
●	●	●	●	●	Remote Access
1570 / 760 / 840	2415 / 760 / 840	1473 / 1056 / 1063	2875 / 1056 / 1063	1702 / 825 / 1863 (including trolley)	Dimensions w/d/h (mm)
330 / 150	456 / 207	386 / 175	771 / 350	286 / 130	Weight (lbs/kg)

# 21

## HEPA Filtration

*Don Whitley Scientific (DWS) can now offer the unique Whitley Internal HEPA Filtration System to provide a high degree of product/sample protection on modified atmosphere workstations. HEPA fitted workstations are ideal for use as part of a pharmaceutical manufacturing process, for the cultivation of slow-growing anaerobes, or for applications requiring complex manipulations under anaerobic conditions (ie biochemical assays).*

Using innovative circulation technology, all the atmosphere in the chamber passes through the filter every four seconds, quickly creating and maintaining a particle-free environment (tested down to 0.3µm – exceeding ISO 14644 Class 3, as referenced in the Cell Tissue Culture Directive, or Class 1 of US Federal Standard 209E).

Unlike some other systems, DWS integrates the filter within the workstation. Because the warm, moist atmosphere isn't pumped to an external filter, the filter does not become saturated with condensate and thus rendered ineffective.

Although DWS workstations are positive pressure devices, this HEPA filtration system provides the highest known level of atmospheric cleanliness of any positive pressure modified atmospheric workstation. Tests have determined that aerosols of bacterial cells and spores are trapped by the system, thereby preventing the contamination of any media present in the workstation.

### POTENTIAL USES OF A WHITLEY HEPA FILTERED WORKSTATION:

Our Hypoxystation range allows researchers to have precise, accurate control of oxygen, carbon dioxide, temperature and relative humidity. With the addition of the HEPA filtration system, these workstations are often used for applications such as:

- **Cancer Research**
- **Neurology**
- **Cardiovascular research**
- **Stem cell work and many other types of cell culture work**

Microaerobic (or variable atmosphere) workstations are ideal for the study and isolation of fastidious organisms such as *Campylobacter* spp and *Helicobacter pylori*. These workstations can also benefit from the Whitley Internal HEPA Filtration System.

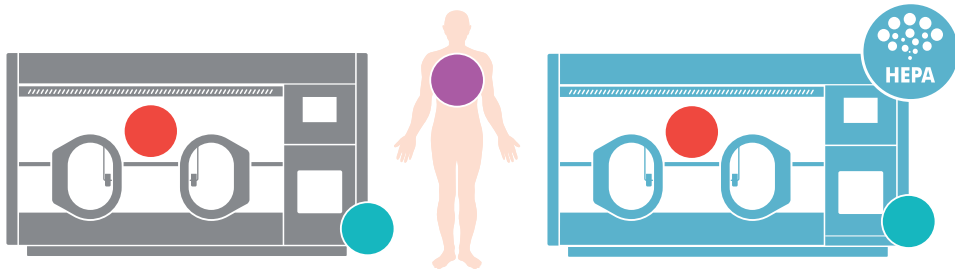


## THE EVIDENCE

Tests were carried out in the DWS GLP compliant laboratories on the use of the Whitley HEPA Filtration System within an anaerobic chamber. Two Whitley Workstations were used - one fitted with HEPA filtration, one without HEPA. These tests demonstrated that the system produces a rapid and substantial reduction in bacterial contamination of the atmosphere. Atmosphere was sampled from three locations - the chamber interior, the location adjacent to the pressure relief valve outlet, and the external atmosphere adjacent to the chamber (in the operator's position). The results confirmed that no bacterial colonies were recovered from any of the sampling points after 2 minutes of the introduction of bacteria by nebulization.

The full results of these experiments are shown in the adjacent tables and the paper can be found on our website under Whitley A35 downloads.

<https://www.dwscientific.com/whitley-anaerobic-workstations/whitley-a35-workstation>



**Table 1:** Recovery of *K. rhizophila* colonies from standard anaerobic chamber (No HEPA)

Before nebulization	During nebulization ( $1.9 \times 10^8$ cfu / 5 min)	After nebulization						
		0	2 min	5 min	10 min	15 min	20 min	30 min
0	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$
0	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$	$\geq 258$
Before nebulization	During nebulization ( $1.2 \times 10^8$ cfu / 5 min)	After nebulization						
0	$\geq 258$	0	2 min	5 min	10 min	15 min	20 min	30 min

**Table 2:** Recovery of *K. rhizophila* colonies from HEPA filtered anaerobic chamber

Before nebulization	During nebulization ( $2.1 \times 10^8$ cfu / 5 min)	After nebulization						
		0	2 min	5 min	10 min	15 min	20 min	30 min
0	$\geq 258$	55	2	0	0	0	0	0
0	0	0	0	0	0	0	0	0
Before nebulization	During nebulization ( $1.2 \times 10^8$ cfu / 5 min)	After nebulization						
0	$\geq 258$	0	2 min	5 min	10 min	15 min	20 min	30 min

**Table 3:** Recovery of *C. beijerinckii* colonies from HEPA filtered anaerobic chamber

Before nebulization	During nebulization ( $3.3 \times 10^8$ cfu / 5 min)	After nebulization						
		0	2 min	5 min	10 min	15 min	20 min	30 min
0	232	8	0	0	0	0	0	0

# 23

## Ergonomics/Anthropometrics

Whitley products are used all over the world by differently sized people so we have always taken great pains in our development process to consider:

- Different heights of users
- Sizes of hands/arms
- Whether users need to wear gloves
- How much illumination is needed
- Whether users will work seated or standing.

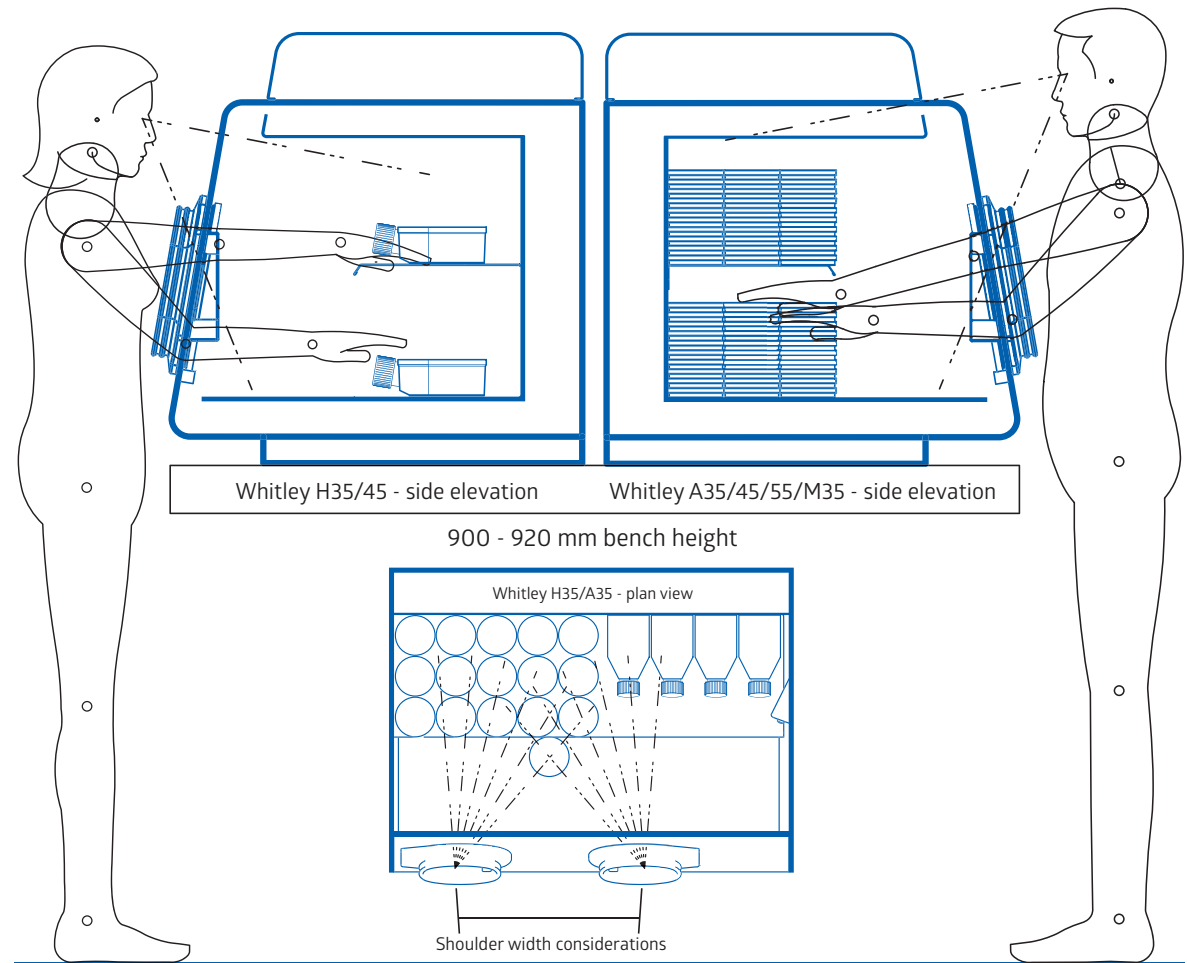
We utilise this knowledge when designing our products, defining the physical dimensions of our equipment so that they are safe, efficient, and comfortable to use. However, there are some other options/accessories that may help to tailor your workstation to your specific needs:

### Visibility

Whitley Workstations take into account the size of users to ensure optimised line of sight. It is essential that users are able to see clearly what they are doing so this is an important consideration.

### Motorised Height Adjustable Trolley

This optional accessory allows the height of the workstation, whilst remaining in situ, to be altered to suit different users in the lab and accommodate those who prefer to work standing or seated.







### *Oval Porthole System*

This patented port system enables users to work comfortably, especially when working for long periods, using gauntlets, gloves or even with bare hands. The oval shape of the ports allows for maximum movement and reach within the chamber.

### *Cupboards*

A range of cupboards has been designed for use with the Motorised Height Adjustable Trolley to provide convenient storage for consumables and items of equipment that may be needed for use in the workstation, enabling users to keep such items close to hand.

### *Human/Machine Interface*

We place a great deal of emphasis on ensuring our customer-facing interfaces/screens are as intuitive, inviting, concise and unambiguous as possible. We favour an icon-based system to 'storyboard' the look and not only create a visually pleasing display but ensure that the layout is logical and easy to follow.



These complementary services support the design, manufacture and supply of Whitley Workstations.



## IN-HOUSE LABORATORY

### *Scientific support services*

It's not every laboratory equipment manufacturer that has its own in-house laboratory with experience in tissue and cell culture, food, water, environmental, pharmaceutical and clinical work.

As well as having developed a great deal of experience culturing in hypoxic conditions, the team of DWS scientists have a key role in new product development.

They are also on hand to help customers with the best practical, productive ways of using products supplied by DWS.



## SERVICE AND MAINTENANCE

### *Comprehensive service plans*

We offer UK customers comprehensive maintenance and repair contracts on a variety of laboratory equipment from many different manufacturers.

We are the only company able to take advantage of training from our in-house colleagues who design and manufacture Whitley products – and, of course, have their day-to-day support.

We also ensure all our engineers have been trained by the manufacturers of any equipment they service.

**Engineer coverage across the UK**

**Fast response time**

**Stock of parts carried to ensure a first time fix**



## WORKSTATION TRAVEL GRANT

### *You could be entitled to up to £250*

If you have used a Whitley Hypoxystation in your work and can include a DWS logo and a photograph of your Hypoxystation on your scientific poster, let us know and you could be entitled to a grant of up to £250.

We have grants available for those who are able to:

**Include a Don Whitley Scientific logo on their poster**

**Mention how they use their Whitley Workstation or Hypoxystation in their work**

**Include a photograph of the workstation on their poster (perhaps with someone using it)**

**Provide a follow-up article for our blog (which we will link to your poster on our website)**

**Provide a photo(s) of you presenting your paper/poster at the conference.**



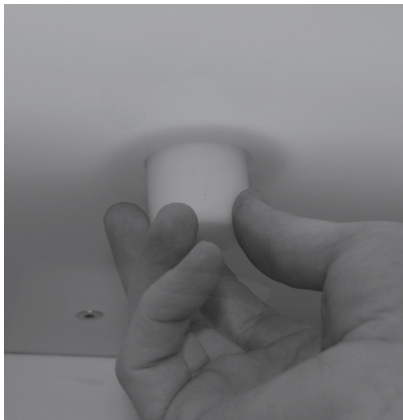
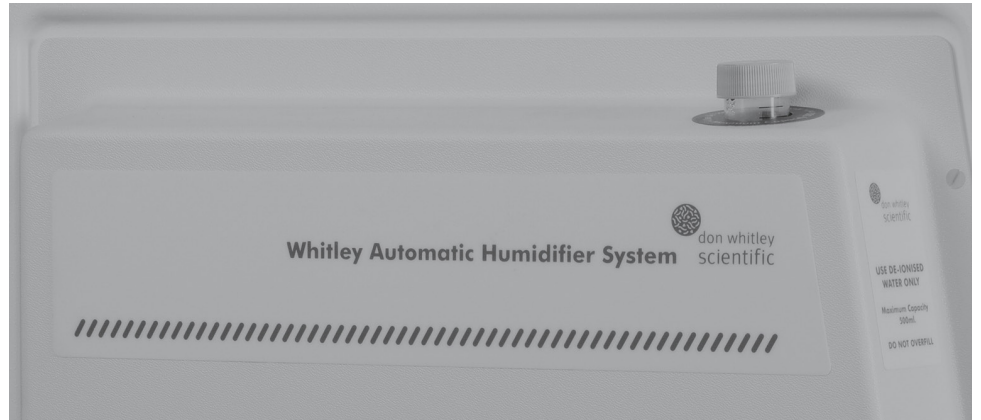
## TEMPERATURE MAPPING

### *On-going compliance*

In today's increasingly regulated environment, the need to demonstrate on-going compliance with quality and safety standards is part of laboratory life.

DWS is UKAS accredited to provide temperature mapping of Whitley Workstations, other hypoxic chambers, incubators, ovens, fridges or freezers using up to 12 thermocouples. This is useful when you need to identify any temperature gradients that may be present and need to be avoided when carrying out particularly sensitive incubation tasks.

Our on-site service means the work can be carried out at your convenience with prompt supply of certification. If you have a DWS service contract, you can arrange for your temperature mapping to be done at the same time as a routine service or repair work for the most cost-effective price.



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