

Detailed Specification

Whitley MG1000 Workstation + TG Airlock

Statements in **red** in the Detailed Specification refer to features and benefits which we believe are exclusive to Don Whitley Scientific.

1. Whitley MG1000 Anaerobic Workstation + TG Airlock

The Whitley range of anaerobic and variable atmosphere workstations combines advanced ergonomics, contemporary aesthetics and superb atmospheric conditions. The Whitley MG1000 anaerobic workstation + TG airlock is the top of the range model within the Whitley range. The equipment is modular and upgradeable, thereby protecting your investment should your sample throughput levels change in the future.

2. Modularity

The Whitley range of workstations is a modular system, with all principal sub-assemblies fully inter-changeable. The equipment enclosure is easily removable without compromising atmospheric conditions.

3. Capacity

The workstation will accommodate up to 1400 x 90mm plates.

4. Construction Material

The chamber is manufactured from a combination of 6mm and 10mm acrylic for structural stiffness and optical clarity. After fabrication, the structure is annealed. The annealing process relieves the stresses induced in the structure as a natural consequence of machining and polishing acrylic fabrications.

Don Whitley Scientific Limited guarantees the integrity of the chamber for ten years.

Other workstation components are manufactured from a variety of materials including expanded PVC, mild steel and cast polyurethane. Each component has been designed and manufactured for optimum performance.

5. Size

Physical dimensions: 2415mm x 840mm x 760mm (L x H x D).

Incubation area: 1680mm x 440mm x 330mm (L x H x D).

Two 10mm thick removable shelves divide this space into two areas, the lower of which is 220mm high, the upper being 210mm high.

Working area: The working area is 1680mm wide x 160mm deep with a height of 330mm at the front of the chamber, rising to 440mm immediately in front of the incubation area.

6. Gas Requirements

The workstation operates on a patented system utilising three separate gas cylinders of hydrogen, carbon dioxide and nitrogen. **With an airlock attached to the system, this workstation can operate on this three gas mixing system offering significant savings on workstation running costs.**

7. Gas Alarms & Control Systems

Various audible and visual system indicators, fail-safe devices and alarms are provided:

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Low gas pressure: if the pressure of anaerobic gas mixture fed to the workstation falls below the necessary minimum level, a buzzer will sound and a labelled lamp on the front panel of the workstation will illuminate.

Power interruption: in the event of an interruption to the mains power supply to the workstation, a buzzer will sound.

A battery back-up system enables some functions of the workstation to continue to operate even if mains power is interrupted for several hours. Our tests confirm that anaerobic conditions have been maintained for over eight hours following a simulated mains power failure.

Continuous flow: if incoming gas flows for more than five minutes, a buzzer will sound and the appropriate lamp on the front panel will illuminate. The gas supply to the workstation will be cut off automatically. This feature is bypassed during system commissioning.

Porthole status: **green and red lamps indicate whether the rear porthole doors are open or closed and sealed. These lamps are activated by the actual position of the relevant components in the door-closure mechanism.**

Gas demand: a green lamp on the front panel confirms when gas is flowing into the chamber.

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Low gas pressure: lamps will illuminate and a buzzer will sound when the cylinder of supply gas is running low. Replacing the cylinder will reset this facility.

Power interruption: in the event of an interruption to the mains power supply to the airlock, a buzzer will sound.

Fault: various conditions are brought to the attention of the operator by a combination of illuminated lamps and audible alarms. Further details are contained with the Whitley User Manual, supplied to you at the time of installation.

Inner door status: a steady amber light indicates the door is closed and sealed. A flashing amber light indicates the door is open.

Outer door status: a steady amber light indicates the door is closed. A flashing amber light indicates the door is open. If the outer door is left open for more than five minutes, an intermittent alarm will sound and the appropriate lamp will flash. Closing and sealing the door will silence the alarm.

8. System Operation:

8.1 Anaerobic Gas Control

The MG1000 Workstation + TG Airlock operates from one cylinder of ready-mixed anaerobic gas (80%N₂/10%CO₂/10% H₂). A pressure switch on the workstation is set to maintain a slight positive internal pressure. Any pressure drop within the workstation permits gas to flow into the unit. In addition, a timer controls the delivery of an injection of a small volume of gas at pre-determined intervals. This ensures that fresh gas is regularly introduced into the chamber, helping to maintain anaerobic conditions.

8.2 Oxygen Reduction

A sachet of palladium catalyst is fitted in a holder under the hinged floor at the rear of the chamber. The sachet is kept dry by the warm internal atmosphere passing over it. The function of the catalyst is to reduce levels of oxygen by causing the oxygen to combine with the hydrogen contained within the anaerobic gas mixture. The water vapour produced by this reaction is removed automatically by the humidity control system.

8.3 Removal of Volatile Fatty Acids

A sachet of Anotox™ is fitted in a holder under the hinged floor at the rear of the chamber. Anotox™ is a Don Whitley Scientific patented compound, the function of which is to remove volatile fatty acids and hydrogen sulphide from the chamber atmosphere.

8.4 Humidity Control

The MG1000 anaerobic workstation is fitted with a fully automatic humidity control system that does not require any operator intervention. A pump, controlled by a timer, opens regularly for a set duration, allowing water to pass to an external reservoir and evaporate. The reservoir is fitted with a biocide-treated filter. This system ensures effective removal of any excess moisture in the chamber. The humidity level is controlled by a humidistat located in the chamber, connected to a cooling fan. A switch located on the front control panel permits the user to over-ride the humidistat, allowing the fan to run continuously if required.

8.5 Temperature Control

The operating temperature of the workstation can be set between 5°C above ambient and 45°C by adjusting the set point value on the temperature controller. Detailed instructions are contained within the Whitley User Manual which is supplied to you at the time of installation.

A small internal incubator (able to operate at up to 65°C) is available as an optional extra.

8.6 System Monitoring

The MG1000 anaerobic workstation can be fitted with monitoring probes for connection to an external monitoring system if required. One spare gland is provided as standard; other glands can be fitted during manufacture if requested.

8.7 Maintaining and Indicating Anaerobiosis

Maintenance of anaerobiosis in the MG1000 anaerobic workstation is achieved through the reduction of oxygen by hydrogen in the presence of the palladium catalyst. The combination of hydrogen and oxygen occurs in the ratio of 2:1 by volume to form water vapour. All that is necessary to maintain stringent anaerobic conditions is to ensure the catalyst is active and the ratio of hydrogen to oxygen is at least 2:1. Under such conditions oxygen concentrations within the chamber will be less than 5 ppm.

We advocate that at least one of the following control strains are used, namely *Bacteroides fragilis*, ATCC 25285; *Bacteroides thetaiotaomicron*, ATCC 29741; *Clostridium perfringens*, ATCC 13124. Growth of the control organism will clearly show the ability of the test system to support anaerobic growth. Additionally the size of inhibition zone around a metronidazole can be measured to provide a quantitative control measure. As metronidazole is only active under anaerobic conditions, the user will be alerted to possible cabinet failure should the inhibition zone size fall below pre-determined limits. Our Technical Note MA3 applies.

8.8 Sample Manipulation

All Don Whitley Scientific anaerobic and variable atmosphere workstations are designed to provide generous working areas. Advanced ergonomic design ensures user comfort. The oval shape of the patented portholes allows greater freedom of movement and operator comfort compared with the use of conventional, circular portholes.

9. Plate Transfer System

The MG1000 anaerobic workstation is fitted with four portholes arranged in two pairs. The patented porthole system provides both a means of sample transfer and operator entry and exit. Each porthole can be used to transfer up to 20 x 90mm plates (making it possible to transfer up to 80 plates in total) at the same time as an operator's arms are inserted or withdrawn from the cabinet.

The airlock provides an additional easy method for the transfer of up to 90 x 90mm plates from the laboratory to the worksation. Airlock cycle time is only 6 minutes.

Note: Anotox™ is a registered trademark owned by Don Whitley Scientific Limited.