



## Global Climate Simulation SSR Environmental & Hypoxic Rooms

Providing global climate simulation for sports and human science research departments offering cutting edge facilities for human performance testing and training.



## SSR ENVIRONMENTAL & HYPOXIC ROOMS

The Sports & Science Rooms (SSR) are designed to simulate some of the more inhospitable conditions found in the world and allow sports and human science departments to assess the performance of athletes in a variety of temperature and humidity controlled environments.

Training in the chamber can be carried out on various ergometers whilst attending staff carry out physiological studies on willing test subjects.

Temperatures ranges are available from  $-40^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  with variable humidity from 5%RH to 98%RH.

An optional Hypoxic system which utilises the latest high flow technology to simulate altitude within the chamber can also be provided.

High air flow rates flush the environmental chamber with pre filtered air. The Oxygen content delivered to the chamber is controlled anywhere between sea level conditions of 20.9%, down as low as 11%, simulating an altitude of 5000 meters.

The flow rates can be adjusted from 500 litres per minute upwards. Typical systems deliver 1500 litres per minute which is sufficient to ensure Carbon Dioxide build up from exercising subjects is flushed out of the chamber along with odours and other pollutants.



The equipment consists of an air compressor that delivers high pressure air to the hypoxic module. Inside the hypoxic module the high pressure is passed through a membrane constructed of special hollow fibres. The smaller Oxygen molecules are forced through the fibres leaving a higher concentration of Nitrogen or Hypoxic air, this air is then passed into the chamber where it is monitored by a special oxygen sensor. Hypoxic air is delivered to the chamber rather than almost pure Nitrogen, this ensures that safety is maintained and also provides greater mixing within the chamber with no minimal fluctuations in Oxygen percentage.



## CLIMATIC SIMULATION

SSR Chambers are specifically designed for human performance testing and training. The chamber provides the test subjects with the opportunity to experience extreme environmental conditions and provide the ability to carry out fundamental research on human response to those conditions. This facility greatly assists in the preparation of athletes for competitive sporting activities throughout the world.

The chamber can also be used to test clothing, equipment and occupational tasks in extremes of temperature in a scientifically controlled environment.



## INTRODUCTION OF EXERCISING EQUIPMENT

SSR rooms are designed and built to accurately control a stable environment which is constantly being altered by the heat output from ergometers and the athletes themselves who also breath out water vapour and Carbon Dioxide, which needs to be removed from the atmosphere. Ideally the chamber would be a sealed unit but the necessity to inject fresh air or Oxygen reduced air for Hypoxic conditions along with the need to expel CO<sub>2</sub>, means sealing is not an option. It therefore becomes a careful balancing act of the incoming and outgoing conditions to achieve the required environment. Design Environmental has all the necessary experience gained over many years by producing these chambers for various educational and research organisations.



## ROOM SIZE & CONFIGURATION

Design Environmental rooms can be provided in almost any size but experience has shown that at least 3m of internal height should be accommodated if possible. Size variations are achieved by interlocking various size foam insulated panels with tongue and groove joints that are fastened with camlocks. The joints are vapour sealed and the rooms are designed for assembly on site.

### Options include:

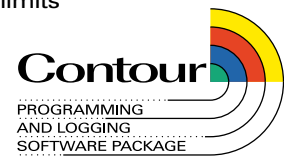
- Viewing windows
- Cable ports
- Sample hatches
- Power sockets
- Personnel Air Locks
- Specialised lighting
- Internal finish
- Laminar or turbulent airflow
- Air fans for wind simulation
- Additional data logging facilities
- Control stations

## CLIMATE CONTROL & LOGGING

Climate control and logging is provided by Contour software, a powerful but simple to use package using state of the art technology for programming, logging and supervision of Test Chambers. Contour uses advanced screen display technology for easy data entry and retrieval. An almost unlimited number programmes of multiple segments can be stored and recalled to run both simple or complex test profiles.

### Take advantage of the many functions, which are standard within Contour:

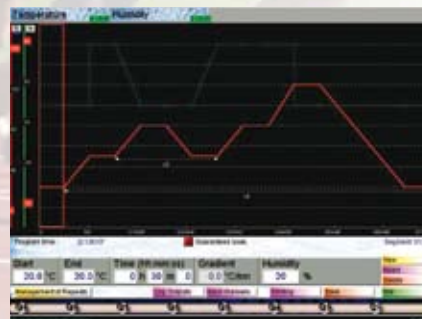
- Real time supervision.
- Graphic programming
- Acquisition of test item temperature data
- Chamber health monitor
- Multi graph presentation
- Program updates by the Internet
- Password protected
- Centralised control and monitoring of multiple chambers
- Remote control via RS232/IEEE/Ethernet
- Transfer of data to Excel
- Delayed chamber start up
- Selectable upper and lower abort limits
- Test archiving
- Chamber loading management
- Produce customised reports
- Graph zoom and cursor
- Comprehensive help menu



- Scrolling information display
- Temperature set and actual value
- Humidity set and actual value
- Chamber status display
- Contour help

Service schedule monitor

Digital channel status display



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## CLIMATE GENERATION PLANT

Refrigeration plant can be mounted internal adjacent to the SSR or external remote within 20m.

Remote external plant removes the noise and the heat dissipation from inside the building and low noise condensers can be supplied where noise pollution may be a problem to nearby office or residential areas.

Refrigeration plant can also be provided with air or water cooled condensers. If water cooled an external water chiller will be required which helps to reduce noise levels and waste heat.

Heat dissipation and noise from air cooled internal refrigeration plant can be reduced by detaching the condenser unit and installing it outside the building.

## HYPOXIC PLANT

Provision of hypoxic air requires an air compressor with a series of filters, which is ideally remotely located from the SSR. Compressed air is then fed to the hypoxic module and then into the conditioning system of the SSR. Hypoxic modules can be remote or adjacent to the SSR.

## COMPLIANCE WITH EUROPEAN & INTERNATIONAL STANDARDS

Design Environmental chambers fully conform with all EU and a wide range of International standards. All chambers are CE marked and manufactured under an independently approved ISO9001:2000 quality management system.

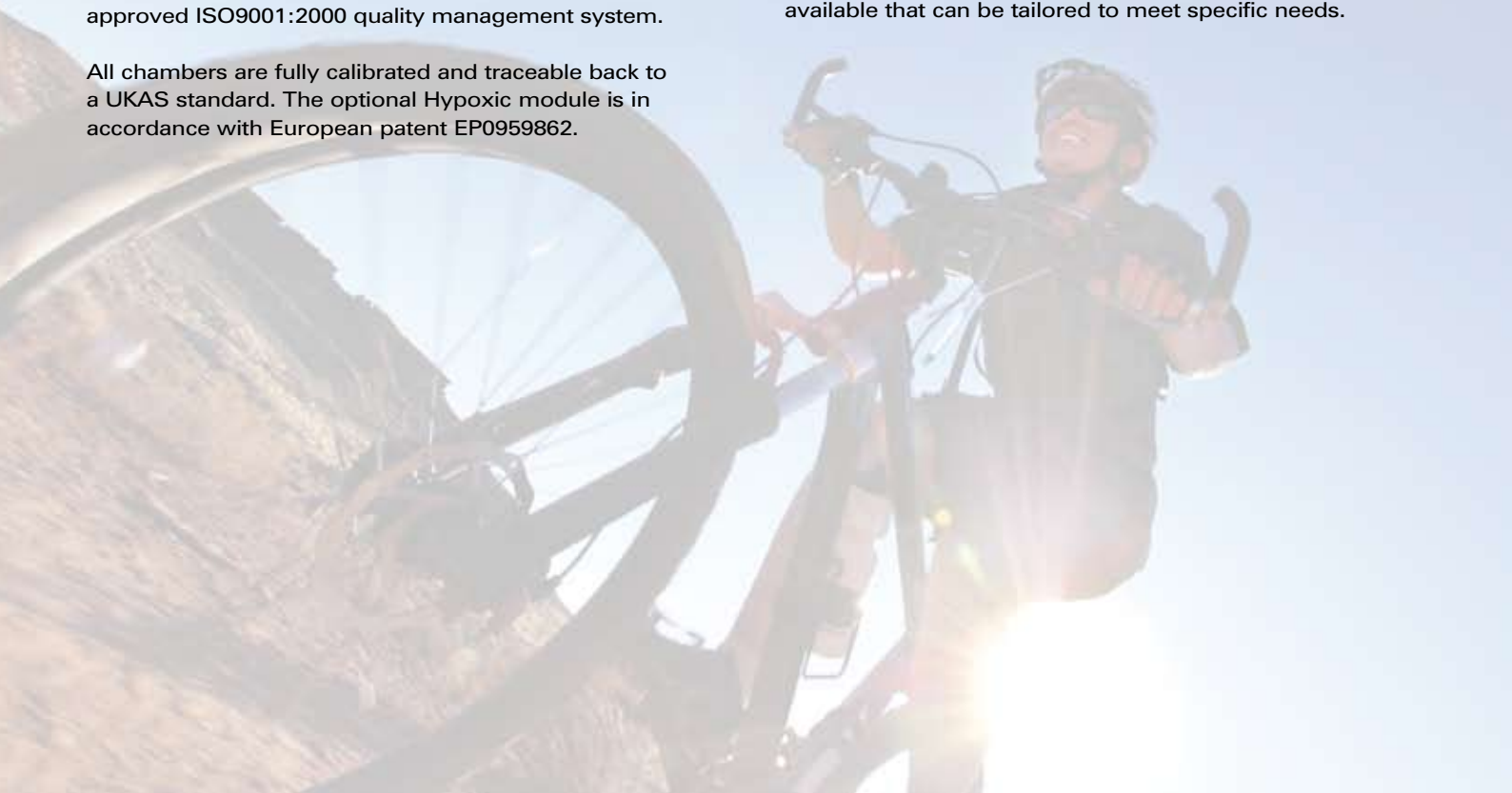
All chambers are fully calibrated and traceable back to a UKAS standard. The optional Hypoxic module is in accordance with European patent EP0959862.



## COMPREHENSIVE AFTER SALES SUPPORT

The equipment you rely on every day requires regular maintenance to keep it running at its best. With regularly scheduled maintenance, failures can be avoided, eliminating crisis situations, product loss and lost productivity due to downtime.

Design Environmental offer World wide product support with UK based engineers and International agents to cover breakdowns and repairs. Preventative maintenance contracts with or without traceable calibration are also available that can be tailored to meet specific needs.



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