GANSHORN
powered by SMTEC

AltiTrainer®

Individual altitude simulation

Innovation for hypoxia training and testing

SCHILLER
The Art of Diagnostics

ALTITUDE SIMULATION.

AltiTrainer® is an innovative device for creating hypoxic and hyperoxic conditions.

Hypoxia training is a training method based on the adaptation of the body to reduced oxygen levels. Classically, this is done at high altitudes. Of course, that's not always practical, sometimes impossible and not economically viable for every workout. The AltiTrainer® allows individual reduction of the oxygen fraction in the inhaled air. The body's physiological adaptations to hypoxia can lead to improved athletic performance and overall well-being. The benefits of hypoxia training on athletic performance have been investigated in numerous studies. It was found that hypoxia training in combination with intense interval training (HIT) or strength training can lead to significant improvements in cardiorespiratory fitness and muscle strength.

Simulates altitudes up to 5,500 m

Safe and comfortable

Time efficient altitude training

Hypoxic training

Mitochondrial interval training (IHT)

Easy to use

PHYSICAL ADVANTAGES

Hypoxia is a physical challenge for the body, various physiological responses occur. These include increased capillarization, which provides better oxygen supply to e.g. muscles and brain. A decrease in average heart rate and blood pressure contributes to the stimulation of fat metabolism. This can lead to slower fatigue and a reduced recovery time, which in return can increase training intensity. Training under oxygen deprivation can help to enhance the power output and speed.

Further it can increase anabolic hormone responses. One explanation for the positive effects of hypoxia training on athletic performance is improved mitochondrial function. Training in hypoxic environments increases the density of mitochondria in the body, resulting in higher energy production and improved athletic performance.
Further studies have shown that hypoxia training can lead to an increase in blood volume and

hemoglobin, which improves oxygen uptake and utilization in the body.
It helps to shift the anaerobic threshold, which is the intensity at which the body begins to produce lactic acid. This allows endurance athletes to train at higher intensities and increase their performance. In addition, hypoxia training can help shorten recovery time after exercise by stimulating the body to produce growth hormones, which aid in the regeneration and repair of muscle tissue.

Vogt et al. (2001): "Molecular adaptations in human skeletal muscle to endurance training under simulated hypoxic conditions" J Appl Physiol.
Geiser et al.(2001): Training High - Living Low: Changes of Aerobic Performance and Muscle Structure with Training at Simulated Altitude, Training and Testing
Czuba et al. (2016): "Intermittent hypoxic training improves anaerobic performance" Plos one Journal
Serebrovskaya et al. (2016): "Intermittent hypoxia training as non-pharmacologic therapy for cardiovascular diseases"
Rybnikova et al. (2022): "Intermittent Hypoxic Training as an Effective Tool for Increasing the Adaptive Potential, Endurance and Working Capacity of the Brain", Pavlov Institute Physiology of Russian Academy of Sciences

THE DEVICE

Nitrogen through compressed gas cylinder (quick connection)

Microprocessor in connection with oxygen detector

Main unit

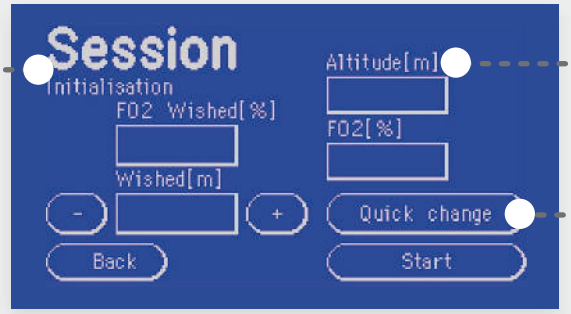
Breathing mask

Hose for nitrogen supply under pressure

Control panel
Backlit touch display

Parameters:

- ✓ Altitude (m)
- ✓ FO_2 (%)
- ✓ Duration (Hypoxie)
- ✓ Co_2 Level



Current simulated altitude

Quick change to desired height

Display size: 8 x 11 cm

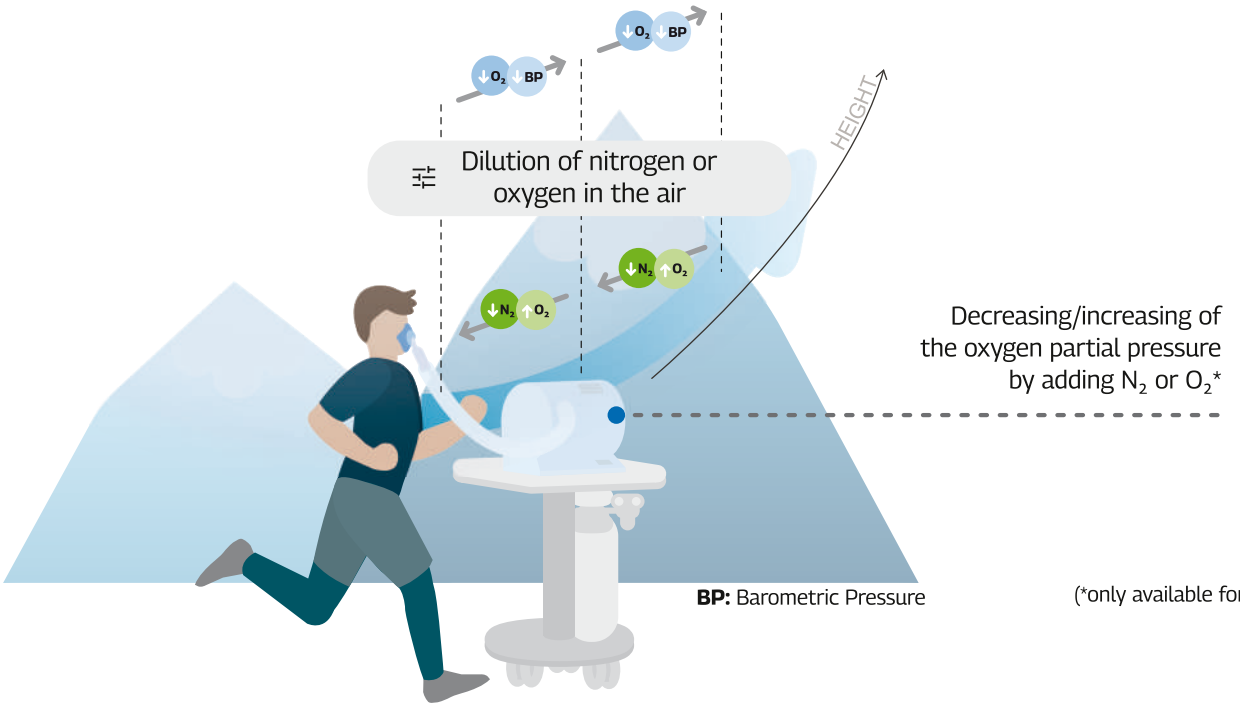
TRAINING EXAMPLE

The AltiTrainer® method consists of training at altitude for a limited time, then recovering to normal altitude or continuing the training at a lower altitude. Specifically, training is done once or twice a week for 30 to 40 minutes at an altitude of about 2.500 m at the anaerobic threshold. Initial results are achieved quickly - after just two weeks, the training load often needs to be increased as the anaerobic threshold shifts. Increases in VO_2max of 8 % and time limit of 35% have been observed in elite athletes during the final phase of preparation.
AltiTrainer® enables the athlete to train under hypoxia and hyperoxia conditions at individually adjusted breathing rates up to 190 l/min. The method can be also used for resting phases. The user can change the inhaled oxygen fraction (FO_2) at any time by simply touching the screen. The gas mixture is automatically mixed according to the user's needs.

OPERATING PRINCIPLE

Lowering the partial pressure of oxygen by reducing the amount of N_2.

The addition of nitrogen (N_2) above the usual **78%** reduces the fraction of oxygen (O_2).
This simulates the effect of the decreasing partial pressure of oxygen at high altitudes.



APPLICATIONS

Simulated Altitude Training (IHT)

Individual altitude training (IHT) with regeneration on the ground. AltiTrainer® allows simulations of altitudes up to 5500 m above sea level. Intensive hypoxia training with ventilation flows of up to 200 L/min is possible.

Interval hyperoxic hypoxic training (IHHT)

AltiTrainer® allows training in alternating hyperoxic and hypoxic environments. While recovering ing in hyperoxic environment, patients and individuals with reduced oxygen uptake can benefit from the hypoxic rehab and improve their cardiocasular health and overal condition.

Medical research

Exposure to high altitude causes reactions in the body. Associated changes in condition are the subject of ongoing research. Thanks to the versatility of the AltiTrainer®, suitable tests can be safely configured for patients and research.

Hypoxic Challenge Test (HCT)

The patient is exposed to a low-oxygen environment while their vital signs, oxygen saturation, and other physiological parameters are monitored. With the AltiTrainer, HCT can also be performed without a hypoxia chamber.

FURTHER BENEFITS

Flexible

Connection to almost all stationary sports equipment possible

Economical

Produces just the amount of gas which is consumed

Adjustable

FO_2 customizable at any time. Any altitude between 1,500 - 5,500 lectable. Hyperoxic conditions also possible.

Unlimited flow rates

By using N_2 directly from gas cylinder, flow rates are virtually unlimited. In addition, no compressor is required.

SET UPS

Hypoxia training with the AltiTrainer® is suitable for all sports on stationary equipment, be it treadmills, ergometers or e.g. rowing machines. It offers full flexibility and can be quickly switched between different devices. Therefore one single AltiTrainer® meets the needs of different user groups, which makes its use very effective.

Use with treadmill

Use with ergonomic bike

SCHILLER

The Art of Diagnostics

SCHILLER, founded in 1974 by Alfred E. Schiller is a successful group with 30 subsidiaries and a global sales network. Today, SCHILLER is a world-leading manufacturer and supplier of devices for cardiopulmonary diagnostics, defibrillation and patient monitoring as well as software solutions for the medical industry.

Over the last 27 years, SCHILLER has established itself as a leader in the medical technology sector in India. With 400+ employees, two production centres and a R&D facility SCHILLER makes state-of-the-art healthcare equipment accessible through a network of 100 sales & service personnel spread across more than 45 locations. Our product range covers Critical Care, Anaesthesia, Emergency Care, Cardiology, Pulmonology, Radiology and Robotics.

GANSHORN

SCHILLER GROUP

For 40 years GANSHORN has been manufacturing a complete state-of-the-art portfolio of pulmonary function testing systems for spirometry, bodyplethysmography, diffusion, bronchial provocation and cardiopulmonary stress testing. With its technological innovations, the company has been a leader in the diagnostics market since 1982. Many of these are now perceived as gold standards. In order to meet high quality standards, all key components are made in Germany. All devices are created in modern processes in Bavaria, from the initial idea to distribution.

Scan here to know more

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SCHILLER
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