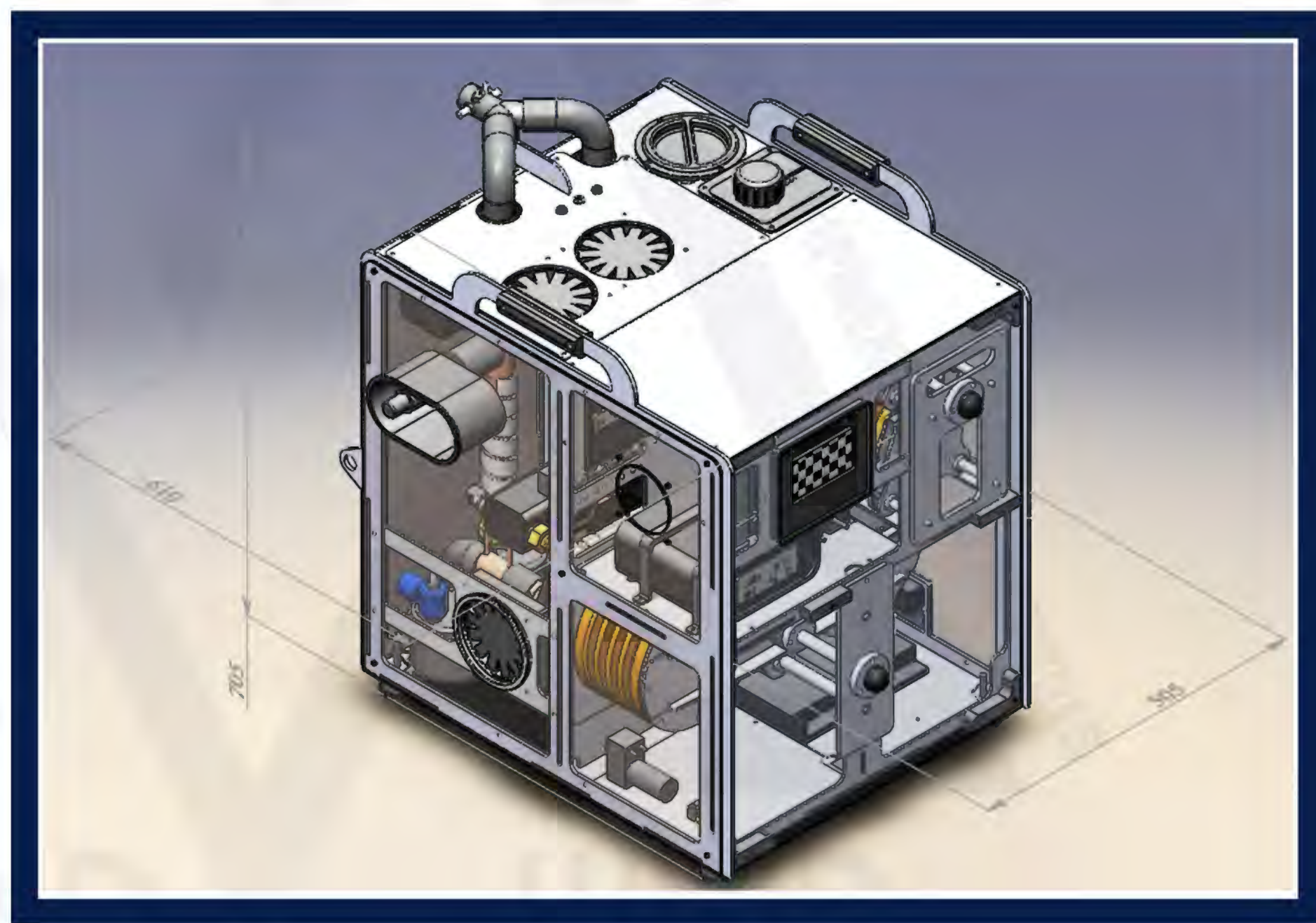


The OXY ROBOT Test Bench 4.0, for self-rescuers, oxygen and air respirators



The test bench is designed for simulating a human external respiration. It simulates oxygen consumption and carbon dioxide release, providing a specified volume and frequency of ventilation, a temperature of 37 °C and a relative humidity of 92 to 100% in the breathing mixture.

The test bench is equipped with modern means of automation of testing processes. It is managed by the operator via a personal computer. Through the user-friendly interface, the control of the test bench does not require the operator to have any additional knowledge and skills. The automation means allow automatically maintaining the test parameters (temperature, humidity, etc.) in an automatic mode, switching from one breathing mode to another (from the load at rest to medium and heavy load, and back), according to a predefined program or by the operator's command. During the test, an automatic recording of the protocol for the operation of the respiratory protective device is performed, followed by a presentation of the result in a graphical or tabular form. The result is saved for a set of statistics and other application tasks.

The simulation test bench of human external respiration is used to test isolating breathing apparatus, isolating gas masks, isolating self-rescuers, and other respiratory protection devices of isolating type in accordance with the requirements and load conditions defined by any standard in the world (in Russia, the United States, the EU, South Africa, Australia, etc.). During the tests, the test bench ensures control of all parameters provided for by standard documentation.



Scope of application

We have created a test bench for a wide range of users:

1) Test bench for RPE (Respiratory Protective Equipment) developers:

- research and verification of the characteristics of the RPE developed, their working parts and elements.

2) Test bench for RPE manufacturers:

- testing of RPE, their parts and elements, including at all stages of development;
- RPE acceptance and mass production testing.

3) Test bench for certification centers and laboratories:

- certification testing;
- monitoring the RPE quality;
- tests to compare the characteristics of similar RPE.

4) For PRE users:

- RPE incoming inspection;
- RPE quality monitoring throughout the lifetime of the device;
- the possibility of extending the storage and operation period based on the results of own tests (in agreement with the Developer).



Operating principle

During the exhalation phase, the test bench flows the breathing mixture through the humidifier, where the mixture is heated to the temperature and humidity specified, to the respirator inlet. At the inspiratory phase, due to the valve system, the breath simulator takes the breathing mixture from the device under test, thereby forming a closed breathing loop and implementing a test circuit with CO₂ accumulation.

Operating conditions

Parameter	Value
ambient temperature	plus 10 to plus 35 °C
atmospheric pressure	84 to 106.7 kPa (630 to 800 mm Hg)
relative humidity	10 to 80%

Performance characteristics

Overall dimensions, mm	Value
height	730
width	514
length	630
Weight	no more than 60 kg
Power supply	220 V 50 Hz
Consumer power demand	no more than 2.5 kW



General specifications

Parameter	Value
Depth Frequency	0.5 to 3.5 dm ³
Lung ventilation	5 to 40 min ¹
Exhalation temperature	3 to 120 dm ³ /min
Exhalation relative humidity	37°C
Volumetric flow rate of carbon dioxide	92 % to 100%
Volumetric flow rate of nitrogen	0.3 to 4.3 dm ³ /min
Volume fraction of carbon dioxide on exhalation	0.5 to 15.0 dm ³ /min up to 5%
Volume flow rate simulation of oxygen consumption	0.2 to 17.0 dm ³ /min
The ratio of the duration of the phases and volumes of inspiration and expiration (an adjustment is possible)	1:1
Testing temperature	Ambient (room)

(if there is a climatic chamber, it is possible to perform the RPE tests within the limits set by the customer)



Basic Components

The product includes a breath simulator, a humidifier, a valve system, a set of monitoring and control devices, and a micro controller, compactly mounted on a single frame.

The product does not include a climatic chamber and a CO2 absorber.

