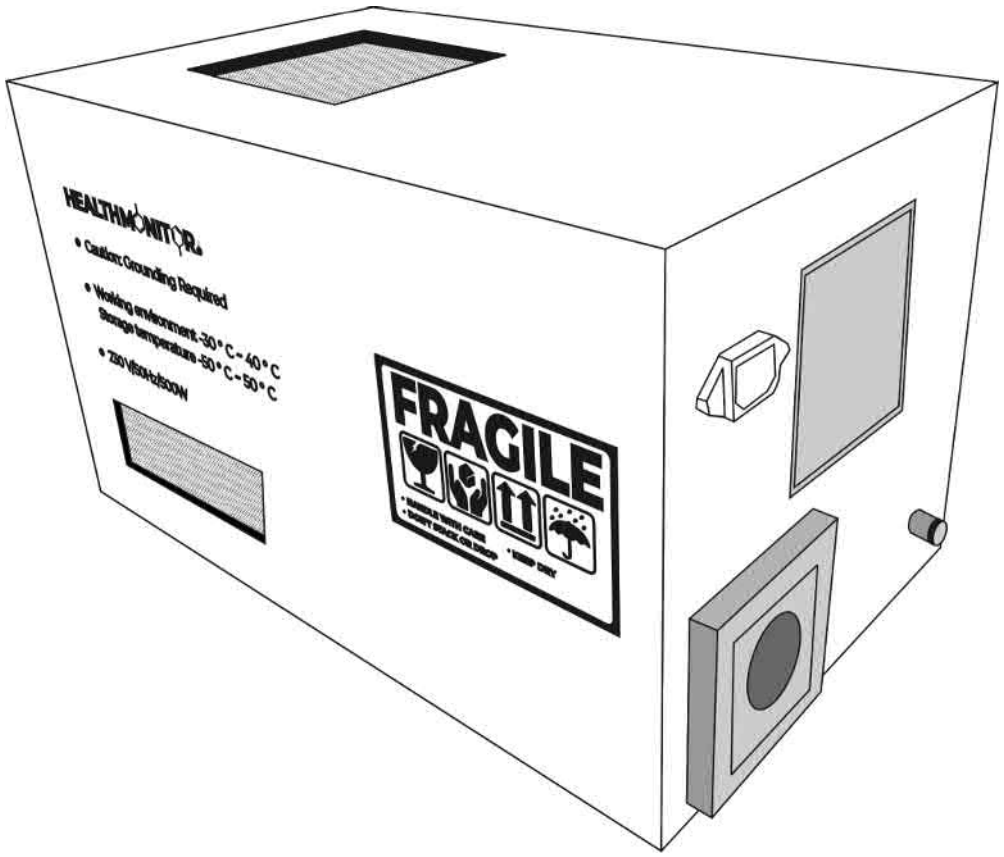
HEALTHMONITOR® SPORT OPERATION MANUAL



Imprint

Product Identification:

Operation Manual (Original) Healthmonitor® Sport

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1. ABOUT THIS DOCUMENT

1. Types of delivery set

1.1 Basic delivery set:

	
Name	**Quantity**
Healthmonitor® Sport gas analyzer	1
Fluoroplastic connecting hose for exhalation	5
Quick-detachable adapter	5
Individual disposable mouthpiece	250
Plastic connector for mouthpieces	5
Vacuum pump Value 260N	1
Fluoroplastic connecting hose for Vacuum pump	1
Power cord	1

1.2 Extended delivery set

Name	Quantity
Healthmonitor® Sport gas analyzer	1
Fluoroplastic connecting hose for exhalation	5
Quick-detachable adapter	5
Individual disposable mouthpiece	250
plastic connector for mouthpieces	5
Vacuum pump Value 260N	1
Fluoroplastic connecting hose for Vacuum pump	1

Power cord	3
Desktop PC	1
Touch-screen monitor	1
Keyboard	1
Computer mouse	1
PC-monitor connecting wire	1
Kiosk case	1

Additional details (optional):

- Cameras
- Microphone
- Speakers
- QR code reader
- NFC reader
- Passport reader, ID card scanner
- Debit/credit card reader
- Bill acceptor
- Receipt printer
- Printer for test results
- Disposable mouthpiece feeding system

These operating instructions describe the Healthmonitor® Sport at the time supplied. They are an integral part of the product and contain important information that is necessary for safe operation and maintenance.

These operating instructions apply to all variants of the Healthmonitor® Sport and are intended primarily for staff and visitors of sport and fitness clubs:

- To ensure safe and trouble-free operation, read these operating instructions before starting up the device and follow the guidance they contain.
- Keep the operating instructions somewhere near to the device.
- Pass on the operating instructions to any subsequent owner or user.

Scientificcoin LLC accepts no liability whatsoever for any faults or damage that result from the failure to follow these operating instructions.

- If you still have any questions after reading these operating instructions, please contact Healthmonitor® Customer Service at the official website https://healthmonitor.pro, or by e-mails: support@healthmonitor.pro, admin@healthmonitor.pro.

1.1 Available languages

These operating instructions were originally produced in English and have been translated into several other languages. The translations are available on the website https://healthmonitor.pro on PDF files.

1.2 Trademarks

Product names and registered or unregistered trademarks that are used in this instruction manual are used only for identification and remain the property of the owner in each case.

For example, Healthmonitor® is a registered trademark of Scientificcoin LLC.

2. SAFETY

2.1. Intended use

The Healthmonitor® Sport has been designed and built as a piece of sport equipment, which determines low and ultra-low concentrations of gases exhaled by athletes. Its intended use in the sports field is effective training planning, an indication of biological phases, assessments of the current level of physical fitness, fatigue and psychological stress of the athletes.

The Healthmonitor® Sport gas analyzer measures the athlete's exhaled gases online.

The analysis includes such processes as

- anaerobic threshold,
- aerobic threshold,
- lipolysis,
- glycolysis,
- metabolic profile.

The neural network developed by our company analyses the athlete’s conditions during both resting and sports activity. All this, coupled with our AI capabilities, is essential to provide ad hoc training programs and effective workouts.

2.2 Use other than that intended

Use of any kind other than that referred to and any application that does not comply with the technical specifications constitutes use other than that intended. The operator alone is liable for any damage brought about by use of the device in a manner other than that intended.

The following uses are expressly forbidden:

- Use in areas that require explosion-safe apparatus.
- Supply of liquids and solids inside the device.
- Supply of substances that may explode or ignite as a result of shock, friction, heat or sparks (eg explosives).
- Operation at ambient temperatures> 45 ° C.
- Use with open or defective housing.
- Repairs by unauthorized personnel

2.3 Staff qualification

These operating instructions are aimed at the following target groups: Users.
Users are persons that meet the following criteria:

- They have been instructed in the use of the device.
- They are familiar with the contents of these operating instructions and the applica- ble safety regulations and apply them.
- They are able on the basis of their training to assess the risks associated with the use of the device.

Operator
The operator (generally fitness center manager) is responsible for the following aspects:

- The device must be correctly installed, commissioned, operated and serviced.
- The staff must comply with the local applicable requirements and regulations for safe working practices.
- Safety-related incidents that occur while using the device should be reported to the manufacturer admin@healthmonitor.pro.

2.4 Residual risks

The device has been developed and manufactured using the latest technological advances. Nevertheless, risks to persons, property or the environment can arise if the device is used incorrectly.

To prevent damages to this device, it is necessary to follow the instructions completely.

Appropriate warnings in this manual serve to alert the user to these residual dangers.

2.4.1 Faults during operation

If a device is damaged, sharp edges or exposed electrical wires can cause injuries.

- ➔ Regularly check the device for visible damage.
- ➔ If faults occur, switch off the device immediately, unplug the power cord and inform the manufacturer.
- ➔ Do not continue to use devices that are damaged.

2.5 Modifications

Unauthorized modifications may impair safety and lead to accidents.

- ➔ Use only genuine Healthmonitor gas analyzer accessories, spare parts and consumables.
- ➔ Technical modifications to the device or accessories should only be carried out with the prior written approval of Scientificcoin LLC and only by authorized Healthmonitor gas analyzer technicians.

Scientificcoin LLC accepts no liability whatsoever for damage arising as a result of unauthorized modifications.

3. PRODUCT DESCRIPTION

3.1. General information

The Healthmonitor® Sport is an emission spectroscopic gas analyzer that determines low and ultra-low concentrations of gases, including those exhaled by humans.

The device operates on measurements in the visible range of the electromagnetic spectrum that is performed based on the physical process of glow discharge and that are recorded by suitable sensors, where the data obtained by said measurements is evaluated by special software operations by a computer.

The device measures the amount, concentration, and ratio of certain gases present in the exhaled breath of a person. This also includes measurement of the ambient air without the presence of exhaled air of the test subject, which is used as background measurement during the evaluation process. The evaluation of the measurement is then performed by a dedicated software suite that incorporates customized machine learning methods.

Sports training induces immediate reactions in the person's exhaled gases. HEALTHMONITOR® device is a tool for effective training planning, an indication of biological phases, assessment of the current level of physical fitness, fatigue, and psychological stress. The device is able to significantly increase the effectiveness of the training process not only for professional sportsmen but also for normal users who work out in the gym. While analysing the effectiveness of the training through detecting the metabolic processes like lipolysis the user can get rid of non-effective training or too much training and significantly decrease the time for sportsmen to achieve results.

Analysis takes up to 3 minutes. Stage one takes 15 seconds to clean the system after each test and determine the concentration of gases in the ambient air. Stage two takes 10 seconds for a person to exhale into the device. After that, the device returns to stage one. While cleaning and resetting the system, the software performs calculations on a remote server using a neural network and displays the results on the computer screen. The rest of the processes, such as entering personal data and email address, reading the test results and preparing a person for exhalation etc., require ca. 1 to 2.5 minutes.

The sensor of the device has high spectral selectivity and is furthermore not sensitive to the water vapor that is present in human exhaled air.

The test procedure requires a disposable mouthpiece featuring a one-way valve that prevents the backwards suction of air, which makes the use of the device completely safe for the person performing the test.

The device does not require special installation conditions and it is intended for use in any premises - sport centers, government agencies, in any places with a large crowd of people.

3.2 Description of function.

The Healthmonitor® Sport is based on the measurement of a glow discharge at visible wavelengths using emission spectroscopy.

The spectral range covers all gaseous compounds observed in the visible region of the spectrum and partially covers the infrared region. Certain gas compounds are biomarkers indicative of metabolic changes in the body.

The device is assembled from various electronic components, where the main function is performed by a spectrometer, which monitors changes in a glow discharge during the supply of a sample of air exhaled by a person.

The glow discharge burns in a special glass cell located inside the device, into which the analyzed air enters through a fluoroplastic tube. To create a glow discharge, a high-frequency generator is placed into the gas analyzer, as well as a vacuum pump, which is an additional device. The body is made of plastic.

Inside the device, there are the following parts:

- spectrometer, based on a plastic case, closed by an aluminium box;
- pump for pumping out samples of the analyzed gas sample;
- 24-volt power supply
- a high-frequency generator that creates a capacitive discharge;
- microcontroller
- 12-volt power supply
- microelectronics.
- there is a fan in the upper part of the device.
- two connections for an intake of exhaled air and a vacuum pump placed on a front panel of the device box.
- on the rear panel of the box, there is a window with a thermometer and a microcontroller, as well as a "START" button, two USB cables for PC, and a socket for connecting a power cable to a 220-volt electrical system.

The device requires a vacuum pump connected to the device via a 220-volt supply cable and a polyurethane hose for pumping out.

3.3 Configuration

The device itself is supplied in the following configuration:

1. **Healthmonitor® Sport -** reads exhaled air data through a spectrometer. There are 2 USB cables coming out of the gas analyzer for connection to a computer. The gas analyzer has built-in: a standard 220V jack, a socket for turning on the vacuum pump, 2 fittings - one for supplying by special fluoroplastic hoses the analyzed gas sample, second for connecting by PVC hoses a vacuum pump.

Working conditions:

- environment air temperature from +10 to +35 ° C;
- air humidity at a temperature of +25 ° C is not more than 80%;
- atmospheric pressure should be between 84 and 106.7 kPa (630 to 800 mm Hg).

Sensitivity (detection range of gas concentrations - depending on the type of gases)	1 - 10000 PPB
Spectrometer parameters	Detector type: CMOS (CMOS)

	Spectral range of the detector: 200-1000 nm Detector Pixels: 2048 Pixel size: 14x200 µm Dynamic Range: 10000 Sensitivity: 1300 V / lx .s Input aperture: 50µm Power supply: 5V, 250mA (USB) Data transfer rate: full spectrum transmitted at 1 ms period (USB 2.0)
Electric power, W	35
Mains supply voltage, V, not more	220±10 %
Frequency, Hz	50
Noise level, Speed / dBA no more	50
Overall dimensions, mm	410x250x230
Weight, kg, no more	5
Lifetime	2 year

The control unit is assembled on the basis of the GREAT IT Nano 3.0 CH340 ATMEGA328 microcontroller.

The high-frequency generator has the following characteristics:

- operating voltage no more than 200V,
- current consumption no more than 800 mA,
- output power, no more than 16W,
- power consumption, no more than 16W,
- generator solation frequency, 150-170 MHz.

To expel the air of the previous test, vacuum diaphragm pumps KYK50BPM are used, with a supply voltage of 12 volts, power consumption of 10 watts.

A 12-volt power supply is provided by the LS IP67 waterproof power supply unit SLIM 36W DC 12V AC 170-260V 2.5A (aluminum), overall dimensions 110 * 33 * 23 mm.

For air recirculation inside the case, 120x120x30 mm fans are used, supply voltage 12 volts, capacity - 2.93 m3 / min.

The power consumed by the fan at the rated supply voltage does not exceed 4.08 W.

2. **VACUUM PUMP Value VE-260N** - provides a vacuum in the system, due to which the discharge in the glass cell burns.

Technical characteristics:

- Frequency (50 Hz),
- total pressure (15 micron),
- dimensions (395*145*257 mm),
- weight (15,9 kg),
- voltage (220 V).

To control the parameters of the vacuum in the system, we recommend using a vacuum gauge, which is purchased separately. Vacuum should be in the range between 1-1500μ (depending on the passport of the gas analyzer).

Example of vacuum gauge (Supco VG64 Digital Vacuum Gauge, 0 to 12000 μ (0 to 1,600 Pa)):

3. **Tubes, fittings, adapters for disposable mouthpieces.**
   These components are subject to mandatory sterilization in an alcoholic or other sanitizing solution.

3.3.1 Basic delivery set:

3.3.2 Extended delivery set

3.3.3 Connections

3.3.4 Vacuum Pump connection

3.3.5 Environment conditions

In working mode:

- environment air temperature from +10 to +35 ° C;
- air humidity at a temperature of +25 ° C is not more than 80%;
- atmospheric pressure should be between 84 and 106.7 kPa (630 to 800 mm Hg).

Storage:

- The device must be stored in factory packaging.
- The operating documentation must be kept together with the device.
- The device should be stored in permanent dry rooms at temperatures from -30 to +50 for no more than 3 year.

4. TRANSPORT, DISPOSAL

4.1 Transport

Risk of breakage due to incorrect transportation

- ➔ Make sure that all parts of the device are safely packed in such a way as to prevent breakage, ideally in the original box.
- ➔ Avoid sharp movements during transit.
- ➔ After transportation, check the device for damage.
- ➔ Damage that has occurred in transit should be reported to the carrier.
- ➔ Keep packing for future transportation.

4.2 Disposal

The service life of the device is about 10,000 hours, the expired device must be returned to the manufacturer Scientificcoin LLC (Russia) for subsequent disposal or recycling.

5. INSTALLATION

- Place the device on a level and stable surface.
- Connect the device by power cord to 220V grounded power supply.
- Connect two USB cables to your computer or laptop. (it is important that each USB cable must be connected directly to the USB slot on the computer. Don't use USB splitters.)
- Install the pump no more than 1.5 meters from the HEALTHMONITOR device (below the level of the HEALTHMONITOR gas analyzer)
- Connect the fluoroplastic connecting hose to the hole on the HEALTHMONITOR gas analyzer marked vacuum and connect this hose to the vacuum pump
- Connect the vacuum pump to the electrical socket placed on the HEALTHMONITOR device.

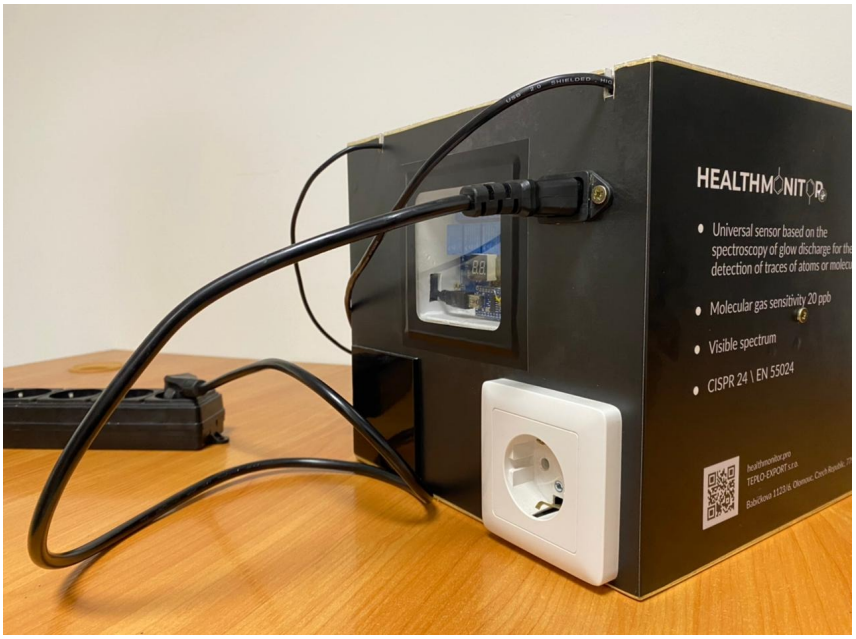
Attention: it is forbidden to install the device outdoors, in dusty and dirty rooms, in rooms with high humidity. Protect from direct sunlight and water inside the device. The device is intended for sports diagnostics and cannot be used in factories, industries, and other areas with increased requirements for dust and moisture protection.

6. OPERATION

6.1 Instructions for the initial setup

1. Connect the device to the computer - input 2 USB cables to the computer.

2. Connect the power cord to the device.

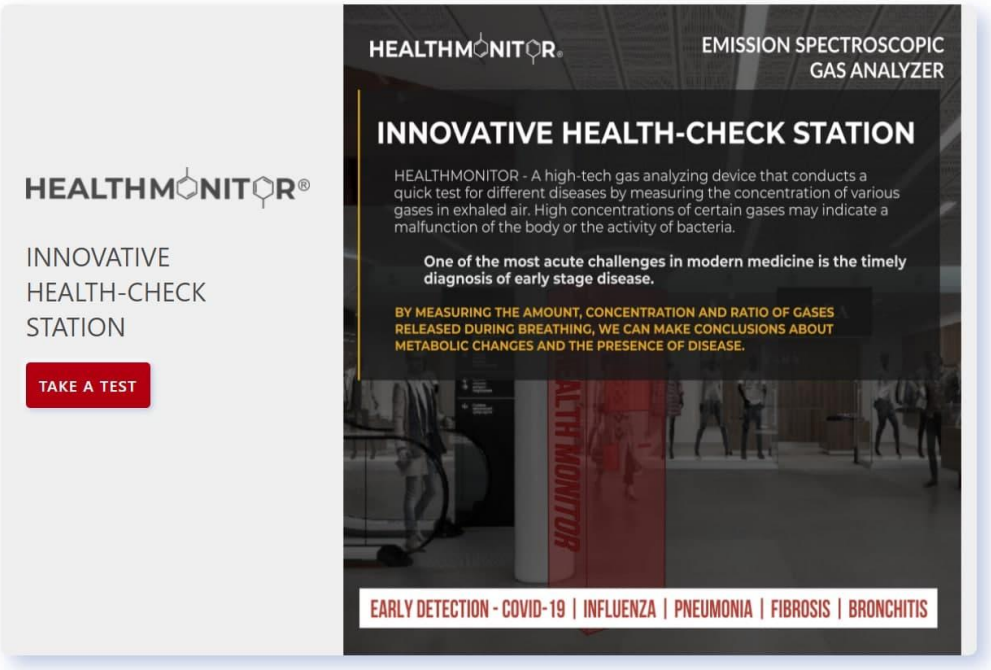


3. Connect the vacuum pump to the electrical socket placed on device

4. Connect fluoroplastic connecting hose from vacuum pump socket into device socket (Vacuum) and fluoroplastic connecting hose for exhalation with plastic connector for mouthpieces into a quick-detachable adapter (Air Sample) in front of the device.

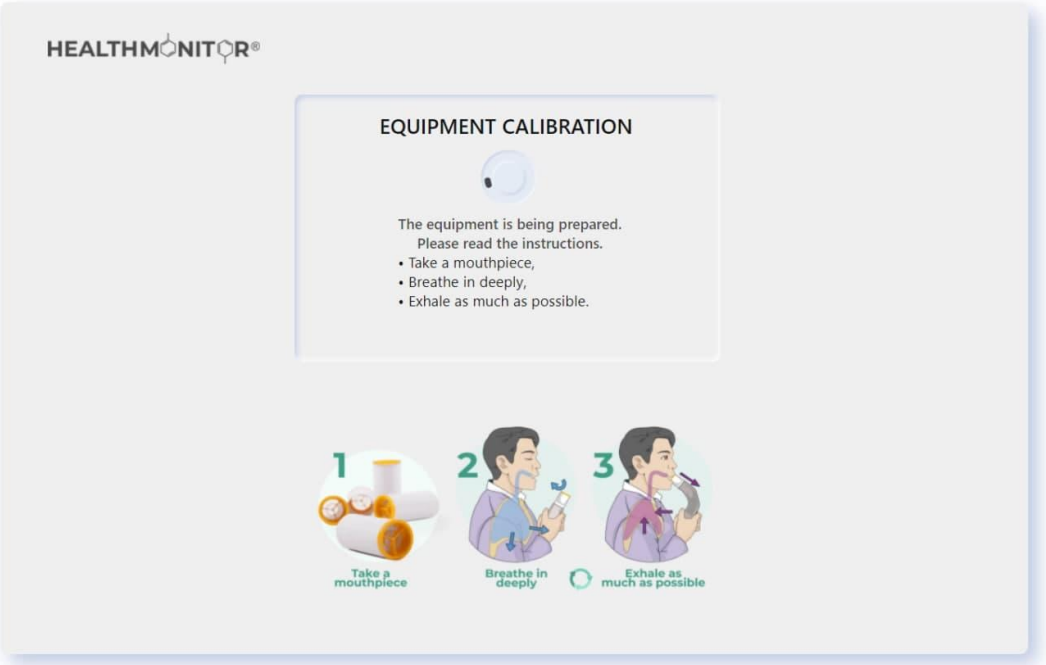
5. Make sure that all the wires and tubes that come from the gas analyzer are safely connected. Contacts must be reliable.
6. Run the software "HEALTHMONITOR_connection.exe". The application will launch a vacuum pump and other equipment located inside a gas analyzer. Follow the instructions provided by the software. If the equipment is working properly, you will see a message that the calibration was successful. Each new start-up of the equipment (device, PC, vacuum pump, wires, hoses) after disconnecting takes about 15 minutes.

Figure 1



(Figure 1) shows the main slide of the software. To start the test, press the “START TEST” button. Then the equipment calibration slide will appear on the screen.

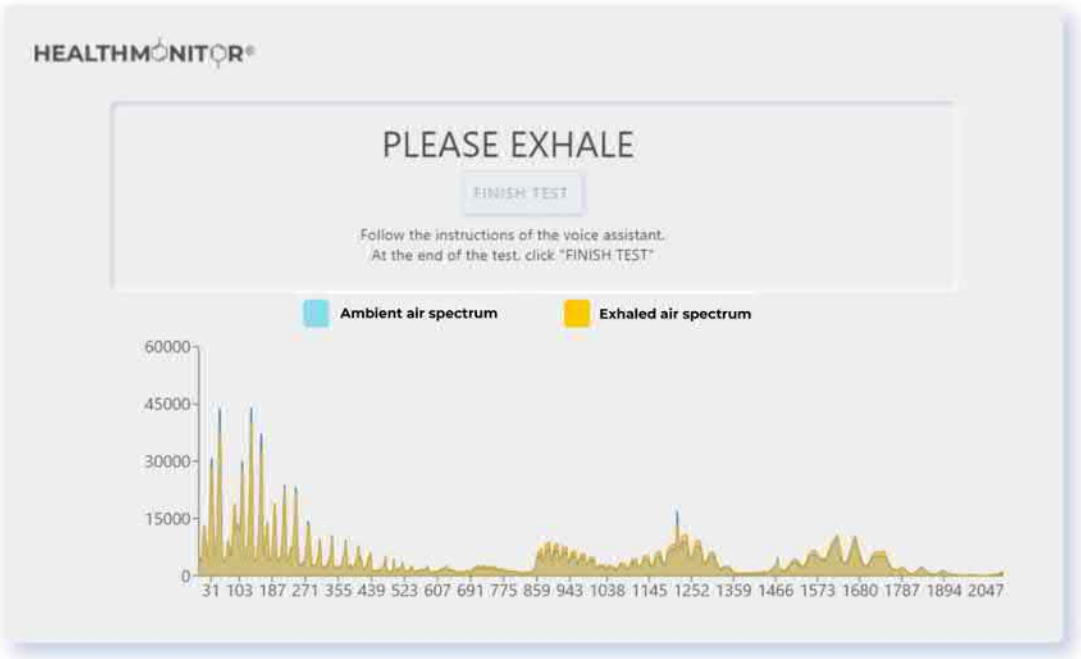
Figure 2



(Figure 2). Average calibration time 15 seconds. At this time, the device purges the hoses located in the inside of the gas analyzer through which ambient air is

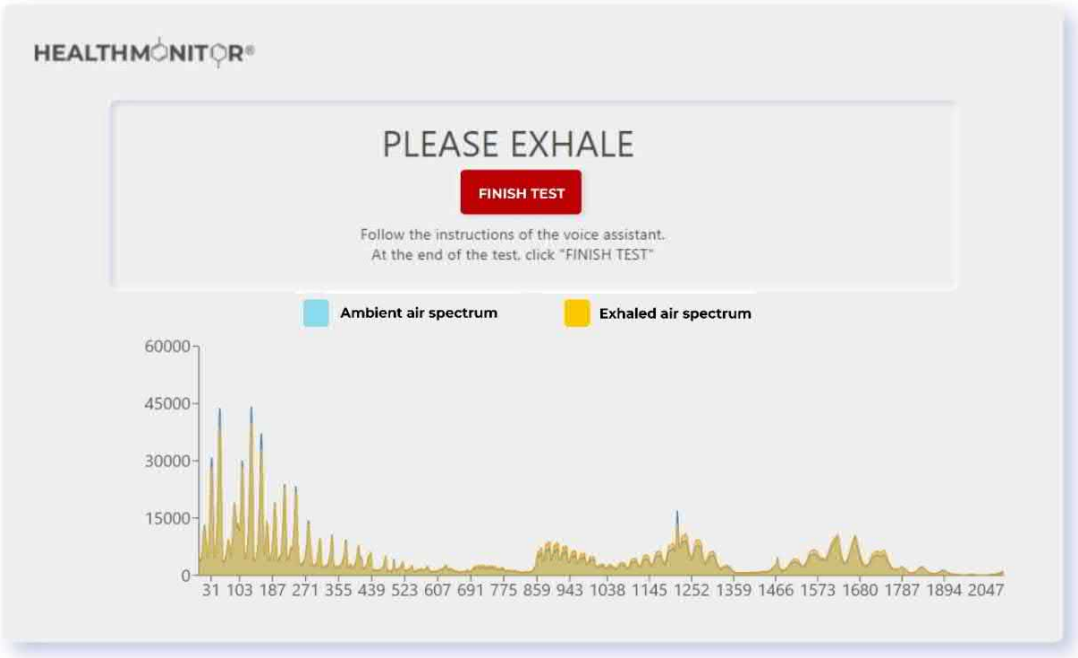
supplied. The spectrum of the ambient air is recorded by a gas analyzer and is the basis for measuring the exhalation of a person. În each subsequent test, the device repeats the same procedure to compare the current ambient air with the person's exhalation.

Figure 3



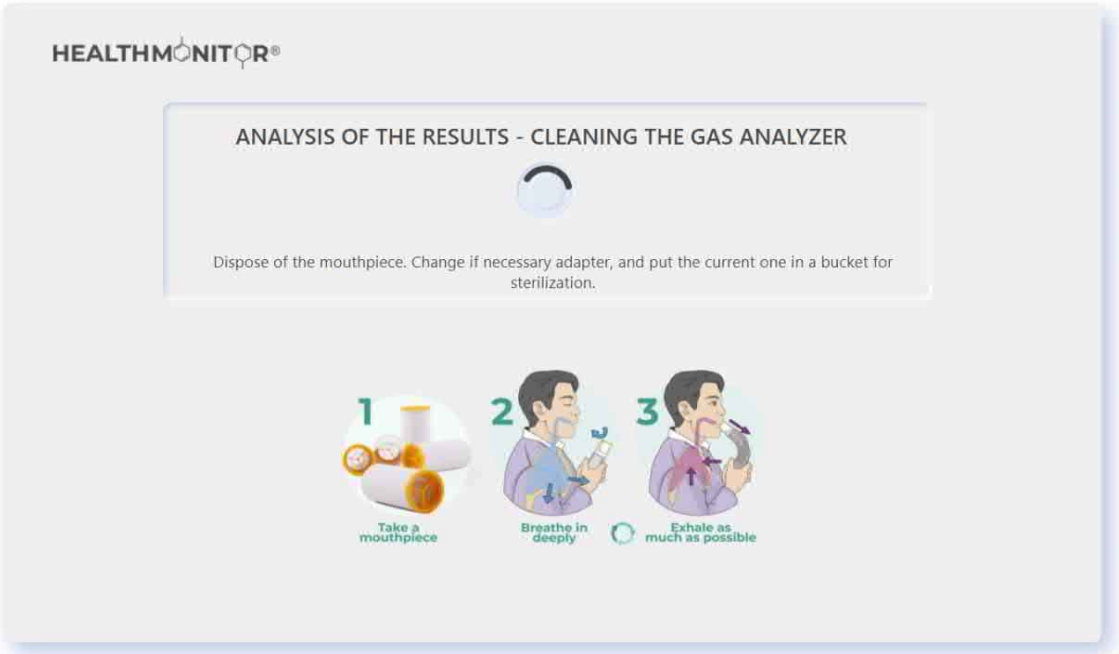
(Figure 3) shows a test slide in which you can see the spectrogram. After the person exhales, the spectrogram will change. For the high accuracy of the test, it is necessary to make two full breaths with the mouth into the mouthpiece.

Figure 4



After the air inflated by a person will be enough, the red button “FINISH TEST” will be highlighted (Figure 4).

Figure 5



Press the “FINISH TEST” button, after which your exhalation will be analyzed for 10-15 seconds (Figure 5), and then the system will give your result.

After reviewing the test results, you can press the “SEND RESULTS BY EMAIL” button and the software will return to the main menu.

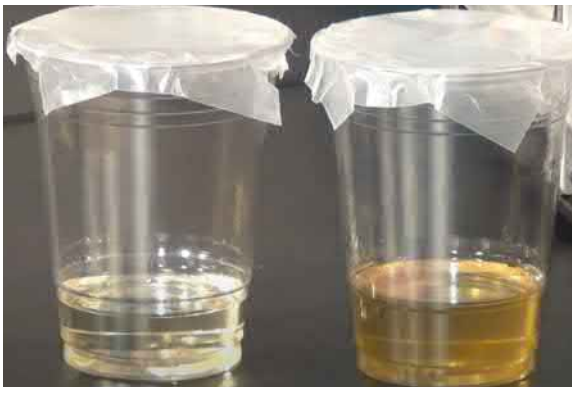
6.2 Consumables:

6.2.1 Individual disposable mouthpieces are mandated for each person. The first batch is supplied together with the equipment - 250pcs.

	
Individual disposable mouthpieces with one-way valve. (dimensions: 27x65x1.4 mm).	Fluoroplastic connecting hose for exhalation with a quick-detachable adapter and plastic connector for mouthpieces These components are subject to mandatory sterilization in an alcoholic or other sanitizing solution every 30 tests.
	
Plastic connector for mouthpieces with a quick-detachable adapter. These	Quick-detachable adapter

components are subject to mandatory sterilization in an alcoholic or other sanitizing solution every 30 tests.	
	
Plastic connector for mouthpieces	Example testing on a gas analyzer.

6.2.2 It is required to change the oil in the vacuum pump once every month. Oil for the first month is provided with equipment, subsequent oil replacements are purchased by the end-user.

	
To change the oil, unscrew the yellow cap (No. 1)	The photo shows a comparison of new oil (left) and used oil to be replaced (right)

	
An example of a typical sludge signaling the need for an oil change. Formation of "flakes" in the process of oil oxidation.	- Required characteristics of vacuum oil: - Density at 15 ° C - 0.881; - Viscosity at 40 ° C - 68 cSt; - Viscosity at 100 ° C - 8.7 cSt; - Viscosity index - 98; - Pour point - - 30 ° C; - Ignition temperature - 230 °C; - T.A.N. - 1.0 mg KOH / g;

7. CLEANING AND SERVICING.

THE SENSOR IS INDIFFERENT TO THE WATER VAPOR PRESENT IN THE HUMANS EXHALED AIR AND POSSESSES A HIGH SPECTRAL SELECTIVITY.

A sensor based on a glow discharge, due to the bombardment of the inner surface of the discharge cell by high-temperature ions and electrons, is self-cleaning and does not require periodic replacement or maintenance.

Due to the evacuation of the air received during the previous test, no gases exhaled by a person accumulate in the internal tubes of the device.

The case of the device requires weekly dust cleaning to prevent contamination of the internal components of the gas analyzer.

8. HELP WITH FAULTS.

If you find any errors during the operation of the device, please contact the support service at support@healthmonitor.com; within 24 hours, a Skype/ Zoom call will be assigned to analyze the situation.

9. DATA STORAGE AND DATA TRANSMISSION. SAVING TEST RESULTS/ ADMINISTRATION:

For the convenience of the device owner, we have created a cloud application that allows our customers to control the work of any number of devices belonging to them (download link is available on the official company website https://healthmonitor.pro).

10. Guarantee.

This product is protected by this Limited Warranty:
Warranty service is the responsibility of Scientificcoin LLC or your regional authorized service centers (if available in your area).
Two years limited Healthmonitor® Sport gas analyzer warranty from original purchase date.
One year limited support equipment warranty from original purchase date. (Vacuum pump, PC, monitor, etc))

Exceptions: Damage caused by improper use of the device, use outside a building, insufficient or inappropriate power supply, improper connection to a grounded power source of sufficient voltage, natural disasters.

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