

USER GUIDE

SOEKS ECOVISOR F4

ИУПТС.414313.006П1

Developed and manufactured in Russia



A2-1611

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Contents
Description and device operation
Purpose
Specifications
The device
Proper use
Switching on/off
Main menu of the device
Service information
Nitrate measurement
Radiation measurement
Electromagnetic field measurement
Water measurement
Settings
Technical support
Battery replacement
Accumulator charging
Performance life, storage and recycling
Performance life
Storage
Recycling
Transportations
Manufacturer's warranty

The following user guide will provide you with comprehensive information on how to use your SOEKS Ecovisor F4 device. We strongly recommend you read the entire user guide and follow all of the instructions listed on this guide. The manufacturer has the right to change the interface of the device after updating the device's firmware.

Safety instructions

Before using the device, please read all of the safety instructions listed below and pay attention to them when using the device. Disregard of safety instructions can lead to malfunction or total breakdown of the device. The manufacturer's warranty is not valid if it is discovered the reason of breakdown because of failure to follow the safety instructions below.

- 1. Do not connect the device to a computer or USB connector when you are using normal (AAA) batteries. This may lead to battery fire outbreak or explosion. You should only use the USB connector charger with rechargeable batteries.
2. This device is not waterproof. You should avoid getting the device wet or use it in areas with high humidity. An exception to this would be when using the device in water quality defining mode. When measuring water quality, you should only dip the probe in water.
3. You should avoid dropping the device and other physical impacts that can lead to damages to the device.
4. Do not leave the device for exposed to sunlight or high temperatures for a significant period of time. This can lead to electrolyte leakage from the battery and can cause the device to malfunction.
5. Do not leave the device for long period of time near devices that generate strong magnetic fields. For instance, do not leave it near magnets and electric motors. Also, keep the device away from places where strong electromagnetic signals are generated. For example, near radio transmissions.
6. Do not perform measurements in proximity to mobile phones and microwave ovens as this may lead to distortion in the device's measurement.
7. Do not try to pull apart the device or fix it yourself.
8. When setting up batteries, beware of battery polarity. Incorrect placement of the battery may result in the device malfunctioning.

Description and device operation

Purpose

SOEKS Ecovisor F4 is designed to:
- perform express analysis of nitrate contents in fresh fruit and vegetables. Nitrate content analysis is based on conductivity of alternating high-frequency current in the measured product (ionometry).
- measure radiation exposure level and identifying radioactive contaminated foods and products. Radiation level is measured according to the power level of ion radiation (gamma radiation and beta particles flux).
- recording of electromagnetic field in facilities, living areas and from domestic appliances. When electromagnetic fields are detected, electric and magnetic field intensities are evaluated.
- water quality evaluation. The analysis is based on measurement of high-frequency alternating current conductivity.

Specifications

Table with 3 columns: Name of application, Indication, and Scale range. Rows include Nitrate tester, Water quality measurement, Dosimeter, Electromagnetic field, and General specifications.

Device

Main parts of the device consist of:

- 1. Micro USB slot for charging the accumulator.
2. Touchscreen for displaying information and menu navigation.
3. OK button for switching the device on/off, confirmation button.
4. LEFT button for menu navigation, return to previous menu when pressing for 2 seconds.
5. RIGHT button - menu navigation.
6. Measuring probe is inserted in the product to measure nitrate content level.
7. Protective cap protects the probe.

Proper use

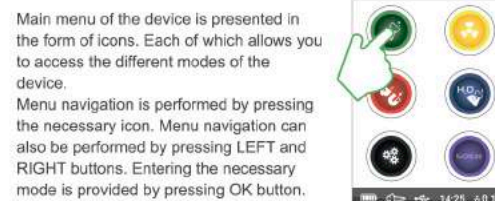
Switching On/Off

In order to turn on the device, you must press OK button briefly. In order to turn off the device, you must press and hold OK button for 2 seconds.

Main menu of the device

ATTENTION! Before using the device for the first time, must be removed the insulation film from battery, pulling on it.

The device has touchscreen capability. Interface management can be performed with both buttons and touchscreen.



- Main menu of the device consists of following selections:
- "Nitrate tester" - measures the nitrate content level in food products.
- "Dosimeter" - measures the radiation exposure.
- "EMF" - records electromagnetic fields in facilities, living areas and from domestic appliances.
- "Water quality measurement" - evaluates content level of solid substances (impurities) in water.
- "Settings" - device performance settings
- "Information" - manufacturer's contact information

Service information

- There is a following service information on the display:
1. Battery charge level indicator.
2. Accumulated dose indicator.
3. The protective cap is off.
4. Connection to the PC.
5. Current time.
6. Radioactive particles indicator.
7. Current indication of radiation exposure

Nitrate measurement

Measurement of nitrate content level is based on patented technology of bioassayed product ionometry (Patent of invention No 23 90 767 Ionometry Method for bioassayed products and the device for its performance) and has been developed by SOEKS company.

The technology is based on a specialized procedure method that puts high-frequency electric current through pulp.

Electromagnetic field measurement

Electromagnetic field (EM field)

Electromagnetic field (EM field) is a special form of matter, which allows interaction of charged particles. It represents interrelated alternating electric and magnetic fields. EM field spreads from one space point to another in form of electromagnetic progressive waves running from source.

EM field is made up of particle charges. In physics lessons, for example, students perform experiments with ebonite electrification, which demonstrate, what electric field is.

Magnetic field is created when electrical charges move through conductor.

In order to characterize electric field strength, we use "electric field intensity" definition (mark sign - E, measurement unit - V/m (Volt per meter)). Magnetic strength is characterized by N magnetic field strength, measurement unit - Am (Ampere per meter). When measuring very low and extremely low frequency, "magnetic density" definition is often used (mark sign - V, measurement unit - Tl (Tesla)).

Electromagnetic field influence on human's health

Experimental Data of Russian and foreign research show that electromagnetic fields are highly bioactive and can negatively impact our health.

Many researches of EM field's biological effect allow us to detect the most susceptible body functions: nervous, immune, endocrine and reproductive systems. These bodily functions are critical.

EM fields influence mostly organs with high water concentration. These are the eyes, brain, stomach and kidneys.

The following are symptoms of EM field influence: fatigue, irritability, sleep disorders, memory impairment and lack of attention span.

Biological effect of EM fields tends to accumulate over time and may result in adverse health impacts such as degenerating central nervous system, blood cancer (leukemia), encephaloma or endocrine system disorders.

Afterwards, information about radiation exposure level is displayed.



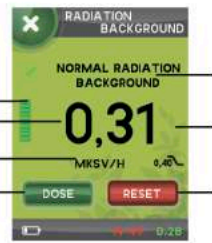
"Normal radiation background". Normal radiation exposure that is harmless for a human.

"Increased radiation background". You should not stay in an area with such radiation for more than 30 minutes.

"Dangerous radiation background". You should leave this area immediately.

When being in "Dosimeter" mode, the following information is displayed:

- 1. Accuracy indicator scale. The higher the scale, the more accurate the result that you will obtain.
2. Current evaluation of radiation exposure level.
3. Measurement units.
4. "DOSE" button (switching to accumulated dose mode).
5. Information about radiation exposure status.
6. Limit threshold.
7. "RESET" button (resetting the current radiation exposure data).



In order to measure the radiation exposure of food products, construction supplies and others materials, perform following:

- 1. Measure the radiation exposure level at a distance of a few meters from the measured object.
2. Set the device directly near the measured object and measure the radiation exposure at the possible nearest distance to the measured object.
3. Compare the results that have been received at a distance and near the object.

In order to measure contaminated liquid, measure directly above the water's surface.

Radiation measurement (Dosimeter)

Some chemical elements (so called radioactive isotopes) contain unstable nucleus that decay into small elementary particles or quanta. Detachment of elementary particles or quanta is called radiation.

Radiation is called ionizing, because it leads to atomic ionization of substance that is struck by radiation. Ionization is called the process of striking one or a few electrons out of atom. After that, nucleus and left electrons create a system that is positively charged and is called an ion.

Ionized atoms strongly differ from average nucleus. Ions destroy other molecules by breaking a bond between nucleuses. That is the reason why ionized radiation has a harmful impact on human's health.

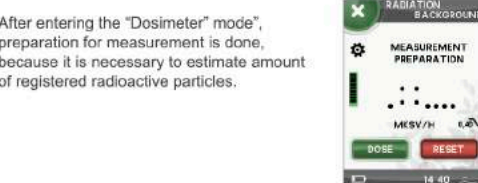
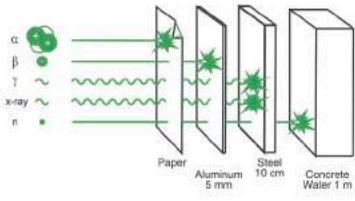
Radiation influence on human's body is called irradiation. Radiation transpires any body tissues and ionizes their particles and molecules. This leads to creation of ionized nucleuses (ions or so-called free radicals) that destroy molecules and leads to death of tissue cells.

As mentioned before, nuclear disintegration into elementary particles is accompanied by radiation of these particles. This radiation is divided into following types:

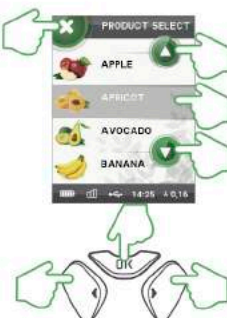
Alpha decay (alpha particles) are inert helium nucleus, the most massive particles.

Beta decay (beta particles) are electrons that move with an enormous speed. They are able to penetrate our body for a few centimeters.

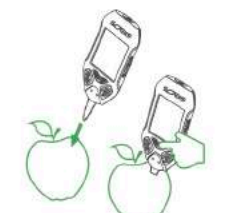
Gamma decay (gamma particles) consist of gamma ray quantum, which although are considered to be particles, represent at the same time electromagnetic radiation such as sunlight, radio waves and x-rays. Their different consists only of big energy that every gamma quantum carries. Gamma decay always spreads with the light velocity when other particles are not that speedy. In comparison with alpha and beta particles, you need a lot more material, concrete or lead in order to protect yourself from gamma decay.



After entering the "Nitrate tester" mode, you will see a list of products. You must choose a product from the list. Press the UP and DOWN icons on the display or press LEFT and RIGHT buttons on the device to navigate through the menu.



You can confirm your choices by pressing icon of the product in the list or by pressing OK button on the device. In order to return to main menu, press X icon in upper left corner of the display or press and hold LEFT button on the device.



After making your choices, the device will perform the product probe calibration. When calibrating, the probe must not be inserted into product. After calibration, the device will display the product name, its standard nitrate content (mg/kg) and recommendations on how to insert the probe. You must then insert the probe into product, wait until temperature stabilizes (this will be shown by the indicator in upper right corner of the display screen) and then press MEASURE icon on the display or OK button on the device once the temperature stabilized.

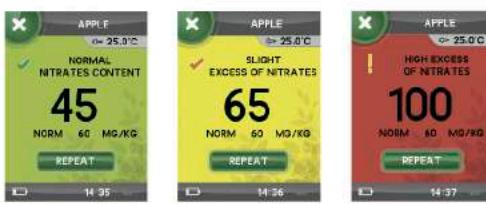


Indicator of product's temperature drop. Indicator of product's temperature rise.

In order to get the most accurate result, we recommend inserting the probe for as shown in the picture. In order to get the most accurate result, we recommend you wait for temperature to stabilize.



After the measurement process is completed, information about the nitrate content in the product will be displayed.



"Normal nitrate content". The product is safe for consumption. "Insignificant excess of standard". Product can be consumed in small quantity. Heat processing is recommended. It is not recommended for children and the elderly to consume the product. "Significant excess of standard". It is recommended not to consume the product.

ATTENTION! There are fruit and vegetables in the list of Nitrate tester, which has air cavities (for instance, bell pepper). When measuring such products, it is important not to insert the probe into the air cavity. When the probe is inserted into the air cavity, the measurement result will be inaccurate.



Every plant contains ions of potassium, magnesium, sulfur, copper, chlorine, plenty of organic acids and other elements in certain amounts that are necessary for proper growth.

The amount of every single element (ionic or molecular) is determined by bio-organic components of certain plant (every plant has a basic level of ion concentration) and by contents of water and soil where the plant grows.

People often use fertilizer to aid plants growth. For instance, saline fertilizers such as nitrates and phosphates. These fertilizers break down and reach the plant, which then absorbs these fertilizers.

Circulated within the plant, saline ions (nitrates, phosphates and etc.) accumulate in different plant parts including the plant's fruits. This leads to higher amounts of electrolytes and to higher electrical conductivity of the fruit as well.

SOEKS Ecovisor F4 is mastered according to nitrate ions content. Percentage of these in fruit and vegetables is identified by an independent analysis method (potentiometric identification of nitrate content according to Russian National Standard (GOST) "Fruit and vegetables recycling products. Nitrate content identification").

The result of the device's express analysis is shown by the device in the form of nitrate ion concentration and comparing this to maximum permissible concentration for certain product. The device measures the nitrate concentration per kilogram of product net. 200-300 mg of nitrates consumed in a period of less than 24 hours are considered to be safe for an adult. 600-700 mg of nitrates consumed in a period of less than 24 hours are considered toxic.

For instance, when measuring a beetroot using the device, the device measures 1000 mg of nitrates per kg of the beetroot. This means that you can eat up to 200 g of this beetroot without risks to your health.

When measuring a watermelon, the device shows 350 mg per kg of the watermelon and one should be aware of the fact that consuming more than 2 kg of the watermelon may pose some risks to your health.

One should also understand that the shown result is evaluative and cannot be compared to quantified chemical analysis at an advanced laboratory.

Such analysis requires significant amount of time and costs. Nevertheless, the presence of such laboratory and qualified analytical chemist at home is beyond the reach for the majority of people, and Ecovisor F4 allows you to avoid buying harmful products and protect yourself and your family, especially young children.

Nitrate tester analysis takes only a few seconds. In order for the device to continue working, all you need is battery replacement or accumulator charging similar to that of a mobile phone.

Of course, you may ask yourself if there increased electrical conductivity is not nitrate ions? That kind of situation is possible but will the consumer feel more relieved when buying a product with increased amount of phosphates or any other ions instead of nitrates or when buying an already good product? One should not forget that basic electrical conductivity is determined for every single type of fresh fruit or vegetable, but when the product goes bad, the content and concentration of organic acids change.

ATTENTION! We strongly do not recommend the use of this device to measure nitrate content in liquids and chemically and/or heat-treated products as well as products that are not included in the device's extensive menu list. The data produced by the device will likely be misleading and inaccurate.



One should also remember that the device is designed for measuring products at room temperature. Changes in the product temperature can increase measurement inaccuracies. This is likely to be the case when the device is used to evaluate products that have just been taken out of fridge or have been exposed to sun rays. SOEKS Ecovisor F4 is equipped with thermal compensation function, by means of embedded temperature gage in probe of the device. Thanks to software patches, when performing a measurement using this device, you can get the same measurement result even when temperatures of measured products are different.

Electromagnetic field in facilities

Electric field strength of 50 Hz commercial frequency in facilities (at 0.2 m distance from windows and walls, 0.5-1.8 m high from floor) should not exceed 500 V/m (kilovolt per meter).

Magnetic field strength of 50 Hz commercial frequency in facilities (at 0.2 m distance from windows and walls, 0.5-1.5 m high from floor) should not exceed 10 mCTI (microtesla).

Electric and magnetic field of 50 Hz commercial frequency can be evaluated when domestic appliances are turned off and local lighting is turned on. Electric field is evaluated when ambient lighting is off and magnetic field is evaluated when ambient lighting is on.

Electromagnetic field in living area

Electrical field of 50 Hz commercial frequency from overhead transmission lines and other objects on the territory of residential constructions should not exceed 1 kV/m (kilovolt per meter) at 1.8 m height from ground. Magnetic field strength of 50 Hz commercial frequency from overhead transmission lines and other objects on the territory of residential constructions should not exceed 25 mCTI (microtesla) at 1.8 m height from ground.

Electromagnetic field from domestic appliances

If used at home, domestic appliances are sources of electromagnetic strength, one must evaluate their effect at a distance 10+-0.1 cm. In addition to this, EM field should be measured standing in front of, behind and next to the object (except TV).

Electromagnetic field from TV with a diameter less than 51 cm (20") is measured at a distance of 50+-1 cm in front of, behind and next to the TV (when screen diameter is more than 51 cm, EM field is measured the same way at a distance of 100+-1 cm). The device must be turned on prior to measurement and in use for at least 20 minutes before measuring.

Electromagnetic field from PC

Electric field strength from PC ranging from 5 Hz to 2 KHz should not exceed 25 V/m (volt per meter). Magnetic flux density from PC ranging from 5 Hz to 2 KHz should not exceed 0.25 mCTI (microtesla).

Electromagnetic field is measured at 50 cm distance from the screen.



