

EMERALD®

OPERATING MANUAL

EMERALD HOME 250 SPA DEVICE

FOR FRESH WATER PURIFICATION AND ELECTROCHEMICAL TREATMENT



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Important! Before using the EMERALD HOME 250 SPA Device (hereinafter referred to as the «EMERALD Device» or «Device»), please carefully study this Operating Manual. With careful use and compliance with the requirements specified in this Operating Manual, the EMERALD Device will serve you for many years.

1. INTRODUCTION

Congratulations on your purchase of the EMERALD HOME 250 SPA Device for water purification and electrochemical treatment. You have invested wisely in the well-being of your family, and you have also taken a very important step towards improving your health!

EMERALD HOME 250 SPA Device is a professional compact system to produce from ordinary tap water in flow-through mode drinking water with antioxidant properties (catholyte), purified from microbes and microbial toxins, iron, manganese, hydrogen sulfide, heavy metal ions and harmful organic compounds (including herbicides, pesticides, hormones, antibiotics, antidepressants). Antioxidant water enriched with molecular hydrogen using electrochemical activation (ECA) technology, has a beneficial effect on the entire body, normalizing metabolism and the functioning of internal organs, cleansing them from toxins, strengthening the immune system, and toning up the whole body.

The peculiarity of the EMERALD HOME 250 SPA Device is an increased productivity of 250 l/h, which allows using this equipment not only for obtaining pure antioxidant water for drinking purposes, but also to carry out antioxidant water therapies in the form of baths or showers in the field of balneotherapy procedures for the treatment, prevention and restoration of impaired body due to oxidative body stress elimination. Antioxidant drinking water effectively neutralizes toxic forms of active oxygen, including free radicals, and restores the optimal balance of oxidative and reduction reactions (REDOX status of the body) in the intercellular fluid and inside the cells, which is a prerequisite for the correct functioning of all fundamental vital processes of the body.

EMERALD HOME 250 SPA Device produces cold or warm pure electrochemically activated catholyte from ordinary tap water in a flow-through mode and are used in resorts and sanatoriums, medical and rehabilitation centers as well as in fitness, spa and massage centers for providing safe and effective antioxidant drinking water.

EMERALD HOME 250 SPA Device is certified both in Russia and abroad, including European CE certificate of conformity, European ROHS declaration (environmental certificate), ISO 9001 quality management system certificate, hygiene certificate (expert report) of Rospotrebnadzor, EAC certificate of conformity, GOST R certificate of conformity.

EMERALD HOME 250 SPA Device is developed jointly with the Vitold Bakhir Institute of Electrochemical Systems and Technologies, which is the world's main scientific center in the field of electrochemical activation. Many years of experience and modern discoveries, as well as the direct participation of V.M. Bakhir, Doctor of Technical Sciences, professor, have made it possible to combine the most advanced water purification and activation technologies in the EMERALD HOME 250 SPA Device.

2. INFORMATION ABOUT ANTIOXIDANT WATER - CATHOLYTE

Theoretical concepts

Electrochemically activated catholyte is antioxidant water with pronounced electron-donor properties. Catholyte is obtained from fresh water, in which powerful unipolar action (in the double electric layer at the cathode of the electrochemical module) causes formation and storing of metastable products of cathode electrochemical reactions, in particular, molecular ions HO_2^- , O_2^- , OH^- .

Electrochemically activated catholyte exhibits an electron-donor ability, i.e., it is a strong reducing agent and reduction catalyst in various physicochemical reactions, including biochemical ones. Catholyte provides for effective neutralization of toxic forms of active oxygen, including free radicals, and restoration of the optimal balance of oxidative and reduction reactions (REDOX-status) of the body in the intercellular fluid and in cells, which is directly related to the correct course of all fundamental life processes of the body.

Practical application of catholyte

Electrochemically activated catholyte is one of the best antioxidants. Antioxidants found in foods, vitamins or dietary supplements do not give a person proper protection. Due to their large size, their molecules are not able to penetrate into cells and neutralize toxic oxidants (including free radicals).

Antioxidant water from EMERALD HOME 250 SPA Device has a beneficial effect on the entire body, normalizing metabolism and the functioning of internal organs, cleansing toxins, and also strengthening the immune system, improving memory and toning up the body.

Antioxidant water has a positive effect on the body when consumed as part of a regular diet and protects against the action of strong toxic oxidants. The mechanism of action of antioxidant water is based on the transfer of protective electron-donor properties to the body's internal environments, helping the body's internal antioxidant system to cope with excessive exposure to various oxidative factors of technogenic origin (polluted air, poor quality of drinking water and food, stress and overwork, alcohol and cigarettes). Catholyte stimulates tissue respiration, which enhances the action of vitamins and chemical antioxidants in the body. Antioxidant water also weakens the effect of ionizing radiation, i.e. exhibits radioprotective properties characteristic of antioxidants. Antioxidant water improves passive immunity and general condition of the body, improves the functioning of the gastrointestinal tract and urinary tract, and normalizes blood counts.

Water treated in EMERALD HOME 250 SPA Devices, like any natural antioxidant water, retains its electron-donor properties for no more than a day from the date of obtaining. After this period, the redox potential (ORP) of the treated water returns to the original ORP values of non-activated water, on average, in the range (+100) ÷ (+250) mV, SCE. When boiling, the electron-donor properties of antioxidant water also decrease. Antioxidant water produced in the EMERALD Device should be stored for no more than a day in glass containers with a closed lid, away from direct sunlight and heat sources.

3. ANTIOXIDANT WATER APPLICATION METHODS

Main application methods

Consuming as part of a normal diet - The human body is more than 70% water. Water plays the most important role in the life of the human body. An adult needs to consume about 2 or 3 liters of water per day to maintain the normal functioning of the body.

Cooking - food on antioxidant water is cooked faster and retains more beneficial properties. Antioxidant water is great for soaking fruit, vegetables, fish and meat - due to its strong extraction properties, catholyte actively removes harmful chemicals from foods, such as growth hormones and antibiotics.

Making drinks - in addition to drinking antioxidant water from EMERALD Device, you can enhance the antioxidant effect due to synergistic phenomena and make antioxidant drinks using natural antioxidants - freshly squeezed juices of carrots, apples, various berries, by adding antioxidant water from EMERALD Device to them. Herbal teas prepared with this water acquire a special taste and aroma. Ice cubes made of frozen antioxidant water will give the drink an extra benefit.

Air humidification - antioxidant water is useful in the form of a mist when used in humidifiers. Humidified air with microdrops of antioxidant water, having the properties of a reducing agent, produces a beneficial effect on the respiratory and cardiovascular systems, prevents asthma attacks and allergic diseases.

Cosmetic purposes - for cosmetic purposes, antioxidant water is useful for washing, in the form of ice cubes for wiping the face, or in the form of a spray to moisturize the skin. Moisturizing masks based on antioxidant water will have a special effect.

Pets, plants and seeds - pets will prefer antioxidant water to regular tap or bottled water. The use of water from the EMERALD Device for watering houseplants or germinating seeds will promote their accelerated growth and development.

Important!

The latest technology in the EMERALD Device allows you to get clean and healthy antioxidant water while maintaining a neutral acid-base balance (pH level). pH neutral antioxidant water is suitable for regular consumption as part of a normal diet. Due to the similarity with the internal environment of a human, such water is instantly absorbed by the body and holistically restores it.

EMERALD HOME 250 SPA Device is not a medical device. Before using catholyte for preventive or therapeutic purposes, consult a specialist. The information on the properties and methods of using catholyte presented in this section is for reference only and does not apply to medical reports.

Antioxidant water therapy in the form of baths and showers

An advanced direction in the field of balneotherapy is antioxidant (electron-donor) water therapy in the form of baths and showers using electrochemically activated catholyte produced from fresh drinking water.

Antioxidant water therapy in the form of baths or showers based on purified electrochemically activated catholyte produced from fresh water is an effective and safe method for regulating the REDOX status of the internal environment of the body. Antioxidant water therapies enable to restore the body at the cellular level, normalizing the balance of oxidative and reduced chemical compounds in the extracellular and intracellular fluids, which is a prerequisite for the correct functioning of all fundamental vital processes of the body.

The effectiveness of this procedure is due to the fact that when a person is immersed in a bath with catholyte, about 67 % of the skin gets into direct contact with the electron donor liquid medium and the negative electrostatic charge of activated water is transferred into the blood through the skin. Taking into account that the blood flow through the skin areas which are in contact with the catholyte is approximately 0.3 l/min and the total blood flow in the body is about 5.5 l/min, one will obtain the following result: during a 7 minute antioxidant bath therapy, approximately 33 % (about 1.5–2 liters) of the total circulating blood volume in the body is subjected to percutaneous electrochemically activated catholyte treatment. Moreover, one could achieve even better results by means of combining courses of antioxidant baths or showers with courses of antioxidant water drinking which will result in synergistic effect. ¹

It is important to note that only electrochemically activated water or aqueous solutions have the necessary properties for carrying out effective antioxidant water therapies. The following experiments have shown that the ORP value of physiological solution in sealed containers made of glass and fluoroplastic (dielectrics), after immersing the ampoules in the cathode chamber of a working diaphragm electrolyzer with exposure for 30 minutes, significantly changed into the negative values zone (< 0 mV). That is, the phenomenon of a contactless electrochemical activation of the solutions inside the sealed ampoules that do not conduct electric current was detected. The relaxation of negative ORP values in the ampoules to an equilibrium state took around 2 hours. However, in the case of immersion of the same sealed glass and fluoroplastic ampoules with physiological solution in non-activated strong alkali solutions, the ORP inside the ampoules did not change. Thus, non-activated alkaline solutions do not transfer reducing properties through non-conductive materials. Accordingly, simple water alkalization for sanitary bath therapies, for example with baking soda, does not give the desired effect.

Effective electron-donor water therapy in the form of baths or showers directly depends not only on the methodology of carrying out this procedure, but also on the quality of the equipment used for producing electrochemically activated catholyte.

The water treatment scheme in EMERALD HOME SPA Devices is based on authentic MB-11 electrochemical modules and allows for producing up to 250 l/h of cold or warm electrochemically activated catholyte from ordinary tap water in a flow-through mode with ORP value in the range of (-150)÷(-450) mV, while maintaining a neutral pH level in the range of 7.0÷8.5 units. Preservation of the neutral acid-base balance of the catholyte in line with notable ORP shift towards reduction values is an important factor for producing antioxidant water similar in ORP and pH values to biological fluids of the body, making antioxidant water therapies in the form of baths and showers safe and effective.

¹ Bakhir V. M., Panicheva S. A., Prilutsky V. I., Panichev V. G. ELECTROCHEMICAL ACTIVATION: INVENTIONS, SYSTEMS, TECHNOLOGY. M., 2021, ISBN 978-5-600-03153-1 - p. 400-401.

At the same time, the electrochemically activated catholyte in EMERALD HOME SPA Devices undergoes a complex scheme of water purification from microbes, microbial toxins, biofilms, heavy metals, iron, manganese, hydrogen sulfide, harmful organic compounds, free chlorine and organochlorine compounds, turbidity and impurities, while preserving all the necessary useful microelements in the purified water.

Summing up, the water treatment method in EMERALD devices is environmentally friendly and safe, since the electrochemical modules exchange only electrons with water, taking them away from the water in the anode chamber, where oxidation reactions take place and the water is enriched with oxygen, and loading electrons into the water in the cathode chamber, where reduction reactions take place and the water is enriched with hydrogen. Therefore, the electrochemically activated catholyte from EMERALD devices is in fact pure drinking water with pronounced electron-donor (antioxidant) properties which meets all the main Russian and international requirements for drinking water, including the international WHO recommendation «Guidelines for drinking-water quality».

Important! EMERALD HOME 250 SPA Device is not a medical device. Before using catholyte for preventive or therapeutic purposes, consult a specialist. The information on the properties and methods of using catholyte presented in this section is for reference only and does not apply to medical reports.

4. PRINCIPLES OF WATER TREATMENT

The EMERALD Device has high performance and runs on cold or warm tap water (not higher than 45 °C), producing up to 250 liters of purified antioxidant drinking water (catholyte) per hour.

EMERALD Device ensures high quality of drinking water purification due to the consistent combination of water activation in electrochemical modules and the use of auxiliary environmentally friendly filter elements. The main elements of the EMERALD Device are 6 (six) MB-11 type electrochemical modules (diaphragm flow-through electrochemical Bakhir modular elements), in which oxidation reactions take place at the anode and reduction reactions at the cathode (Fig. 1). Auxiliary elements in the Device are a catalytic filter and an electrokinetic filter. A distinctive feature of EMERALD Device is the absence of replaceable and wear parts.

All processes of water purification and electrical treatment in Device are as close as possible to what happens to water in wildlife. It has become possible to repeat the natural processes of water purification and treatment due to the creation of reliable electrochemical modules, which are the main elements of the system. The modules consist of two flow-through chambers: anode and cathode. It is in these chambers that, under the influence of a positive current on the anode and a negative current on the cathode, the water treatment processes suggested by nature are reproduced.

In the anode chamber of the module oxidative reactions take place, during which microbes and microbial toxins are destroyed. In nature, a similar process of antimicrobial protection, phagocytosis, has been occurring in all living organisms for millions of years without any failures. Also, in the anode chamber, harmful organic compounds (including hormones and antibiotics), iron, manganese and hydrogen sulfide are oxidized.

In the cathode chamber, reduction reactions take place during which water again acquires useful antioxidant properties due to enrichment with hydrogen. In nature, similar processes occur during the contact of spring water with rocks, as well as during phase transitions in the process of melting glaciers. Also, cathode water treatment can effectively remove heavy metals.

The auxiliary catalytic filter consisting of natural coal of the highest standard (grade A hydroanthracite) is used to purify water from oxidized organic and organochlorine compounds (including herbicides, pesticides, surfactants, phenols, antibiotics, antidepressants, hormones).

The auxiliary electrokinetic filter, consisting of the purest natural mountain quartz, is an environmentally friendly analogue of a mechanical fine filter and serves to purify water from mechanical impurities, heavy metal hydroxides, oxidized forms of iron, manganese, hydrogen sulfide.



Fig. 1. A new generation MB-11 type electrochemical module, appearance.

Useful information!

All water purification and activation processes in EMERALD Devices are as close as possible to what happens to water in living Nature, since the mechanism of fresh water purification in Nature is represented by two main processes: redox reactions and filtration.

Therefore, in EMERALD Devices the combination of electrochemical anode and cathode water treatment with environmentally-friendly filter elements requiring no replacement provides deep water purification from microbes, microbial toxins, biofilms, heavy metals, iron, manganese, hydrogen sulfide and harmful organic compounds.

The safety of water treatment using ECA technology is ensured by the complete absence of any chemicals in EMERALD Devices. MB-11 type electrochemical modules in which electrical treatment of water takes place, exchange only electrons with water, taking them from the water in the anode chamber, where oxidative reactions take place and the water is enriched with oxygen, and introducing the electrons into the water in the cathode chamber, where reduction reactions take place and the water gets enriched with hydrogen.

This allows the catalytic and electrokinetic filters to work in «clean condition». In the hydraulic scheme of the EMERALD Device, they are located after the anode destruction of microbes, microbial toxins and biofilms, which significantly increases their efficiency and service life. Therefore, the filter elements in the EMERALD Device are protected from microbial growth, fouling with harmful biofilms and water pollution by microbial toxins!

It is important to note that EMERALD Device has no consumables or wear parts. Electrochemical modules and auxiliary filter elements (catalytic filter and electrokinetic filter) do not require periodic replacement under the operating conditions described in this Operating Manual.

The main stages of water treatment in EMERALD Device



Fig. 2. Anode chamber.

Stage 1. Anode chamber of the MB-11 electrochemical module

- ◆ Destruction of microorganisms, microbial toxins and biofilms in the water flowing through the anode chamber of the electrochemical module;
- ◆ Oxidative destruction of organic compounds, such as herbicides, pesticides, antibiotics, hormones, antidepressants, surfactants, phenols, petroleum products;
- ◆ Water purification from iron, manganese and hydrogen sulfide due to instant oxidation and subsequent filtration;
- ◆ Water enrichment with oxygen.



Fig. 3. Catalytic filter.

Stage 2. Catalytic filter

- ◆ Water purification from a wide range of organic and inorganic dissolved impurities after oxidative destruction in the anode chamber of the module;
- ◆ Water purification from free chlorine and organochlorine compounds;
- ◆ Water taste improvement and elimination of unpleasant odors, including through the anode removal of phenols and hydrogen sulfide.



Fig. 4. Cathode chamber.

Stage 3. Cathode chamber of the MB-11 electrochemical module

- ◆ Water treatment in the cathode chamber of the electrochemical module imparting antioxidant (electron donor) properties to water, reducing the water redox potential to the zone of reduction values;
- ◆ Water purification from heavy metal ions converted into insoluble hydroxides to be subsequently removed on an electrokinetic filter;
- ◆ Microelements useful and necessary for human body are preserved in water: calcium, magnesium, sodium, potassium, lithium, iodine;
- ◆ Water enrichment with hydrogen;



Fig. 5. Electrokinetic filter.

Stage 4. Electrokinetic filter

- ◆ Final purification of water from mechanical impurities, hydroxides of heavy metals, iron, manganese, hydrogen sulfide;
- ◆ Guaranteed water clarity, removal of turbidity and impurities.

5. PRECAUTIONARY MEASURES

- ◆ For normal operation of the EMERALD Device, it is necessary to comply with the requirements for its operation and maintenance specified in this Operating Manual.
- ◆ Before you start using the Device, please read this manual carefully. If you have any questions regarding the connection or operation of the EMERALD Device, please contact our authorized dealers for advice or call our customer service.
- ◆ Device is intended for purification and electrical treatment of only tap drinking water from centralized water supply systems, corresponding to SanPiN 2.1.4.1074-01!
- ◆ If the tap water does not meet the requirements of SanPiN 2.1.4.1074-01, or if there are visible suspensions, turbidity and rust flakes in the tap water, it is necessary to use a preliminary water purification system before inlet to the Device, purchaseable immediately with the Device (see Table 6), or to be ordered separately.
- ◆ Do not use the Device to treat microbiologically unsafe water or water of unknown origin without appropriate pre-disinfection. If you have a weakened immune system or if you require absolutely pure water for medical reasons, please consult your doctor before using the Device.
- ◆ Do not run hot water with temperature more than 45 °C through the Device, as this may damage it (see DEVICE OPERATION section).
- ◆ To ensure the declared water treatment parameters, it is recommended not to use and drain the first 3 liters of purified water in the OPERATION mode (approximately 1 minute) when the Device is idle for more than 10 hours. If the Device is idle for a long time (more than 72 hours), the first 15 liters of purified water in the OPERATION mode should also be drained (approximately 5 minutes of Device operation).
- ◆ Do not use for food purposes the first 15 liters of treated water immediately after connecting the Device.
- ◆ The Device is not intended for use by children, people with physical and mental disabilities, lacking the necessary experience and knowledge, except in cases of direct instruction by a person responsible for their safety.
- ◆ When using the electrical system, basic safety precautions should always be followed to reduce the risk of fire, electric shock and/or personal injury.
- ◆ Before operating the Device, make sure that all hydraulic and electrical connections are secure. Do not leave the running Device unattended;
- ◆ Materials a plumber uses for sealing the joints must not enter the Device. Avoid adding vegetable oil, petroleum jelly, or other lubricants, solvents, ammonia, alcohols, or strong cleaning solutions to the system. They can seriously damage the Device.
- ◆ Regular maintenance of the EMERALD Device should be carried out to wash the filter elements and electrochemical modules (see DEVICE MAINTENANCE section).

Electrical safety measures:

- ◆ The assemblage of the electrical outlet to connect the Device to the electric network must be carried out by qualified electricians in accordance with the laws in force in your country of residence.
- ◆ To prevent the risk of electric shock, do not place the Device near water or other liquid substances. The socket should not be located directly above the sink or in any other place where water can enter it. Before connecting to the power supply, make sure that the Device and all its elements are dry. During operation, all elements of the EMERALD Device must be dry and not leaking.
- ◆ For the proper functioning of the EMERALD Device, your outlet must be uninterrupted, have a working ground contact and be connected through a residual current device (RCD) or a differential circuit breaker with a rated leakage current of 30 mA!
- ◆ Be sure to disconnect the Device from the power supply during long breaks in operation. Do not use any other power supply or adapter in place of the supplied power cord. Check the power cord, power plug, and the Device itself for damage. If any damage is found, please contact the nearest service center for examination or repair of the Device.
- ◆ Incorrect connection to the electric network supply can lead to the risk of electric shock.
- ◆ In order to avoid accidents, it is strictly forbidden to carry out any repair/maintenance work without disconnecting the Device from the electric network!

Additional Security Measures:

- ◆ Use only spare parts approved by the manufacturer.
- ◆ Do not use the Device for purposes other than those intended. Do not use the Device outdoors. Do not use the Device for water desalination.
- ◆ Do not disassemble or repair the Device yourself. Contact an authorized service center. In order to reduce the risk of fire or electric shock, it is strongly recommended not to disassemble the electronic components of the Device.
- ◆ Avoid rough handling of the Device, do not drop or hit it. Do not store or transport the Device with residual water at an ambient temperature below 0°C. Use Device only in vertical position.
- ◆ The room in which the Device is located must have a balanced ventilation system.

6. DEVICE FEATURES

Table 1. Specifications

Recommended productivity, no more than, liters per hour	250
Consumed electrical power, not more than, W	200
Specific electricity consumption, not more than W* h/l	0.8
Supply voltage - standard socket with grounding (for adapter), V.	110 - 220
Power supply frequency, Hz	50 - 60
Overall dimensions (excluding inlet and protruding parts), WxHxD, mm	400x600x200
Gross weight, kg	16.1
Net weight, kg	12.6

Table 2. Processing parameters of water purification *

Efficiency of anode oxidation of divalent iron ions at their concentration in source water of 3 mg/l, %	92 - 95
Efficiency of catalytic conversion of chlorine-oxygen oxidants into hydroperoxides in the catalytic filter, %	60 - 70
Efficiency of conversion of trivalent iron ions into hydroxide at their concentration in source water of 0.1 mg/l, %	80 - 90
Reduction of permanganate oxidizability of water at the concentration in the source water of 10 mg/l, %	70 - 85
Efficiency of removal of hydroxides of heavy metals and iron on the electrokinetic filter at their concentration in source water of 0.5 mg/l,%	80 - 90
Disinfection of water at 300 colony-forming units (CFU) per 1 ml in source water, %	99

Table 3. Parameters of catholyte and anolyte in terms of ORP and pH *

The reduction of the ORP of the catholyte relative to the ORP of the source water, mV, SCE	(-250)...(-700)
The increase in the pH of the catholyte relative to the pH of the source water, pH units	0.5 - 2.0

Table 4. Operating conditions

Ambient temperature, °C	+5...+40
Relative air humidity (at 25 °C), no more than, %	80
Tap water temperature, °C	+1...+45
Temperature of flushing solution of citric acid, not more than, °C	+70
Water line pressure, bar	1 - 5
Total dissolved solids (TDS) of supplied tap water, mg/l	100 - 400
pH of supplied tap water	6 - 9

* The averaged parameters are given. In each specific case, the results of water treatment are individual in nature and differ from each other due to the different physical and chemical composition and the level of contamination of the treated water.

7. DELIVERY SET

Table 5. Delivery Set

No.	Item	Number, pcs.	Appearance
1.	EMERALD HOME 250 SPA Device.	1	
2.	Plug with built-in RCD 30 mA and network cable with IEC320 C14 plug for connecting the Device to the electric network.	1	
3.	EMERALD HOME flushing tank with 1/4" and 1/2" connection fittings .	1	
4.	Diverter for connection to the faucet spout with an M22 plug and a nipple for 1/2" tube; a set of adapters: M G1/2" x M22, F G1/2" x M22, M22 x M24, clamp adapter, worm drive clamp 8-12 mm. *	1	
5.	Mud filter with F G1/2" x F G1/2" plugs; a set of fittings for connecting the water pre-treatment system: 2 pcs. fittings M G1/2" - 1/2" tube.	1	
6.	Shower head with connector M G1/2", shower head holder, flexible hose with connectors F G1/2" - F G1/2", quick-release fitting M G1/2" - 1/2" tube.	1	
7.	Set of connecting tubes: 1/2" tube, 6 m; 1/4" tube, 2 m.	1	
8.	Set of fittings and fasteners for Device connection: 2 pcs. elbow fitting tube 1/2" - nipple 1/2"; 1 pc. straight fitting tube 1/2" - tube 1/2"; 4 pcs. sliding holder for fixing tubes; 2 pcs. screw 6x60 galv. with dowel 10x60.	1	
9.	Fitting kit: wrench for fittings and tubes, set of fixing clip-locks and plugs for 1/4" and 1/2" fittings.	1	
10.	Operation Manual.	1	

* M (male) – male threading, F (female)–female threading, G1/2" – G-thread 1/2".

Tab. 6. Auxiliary items purchased separately

No.	Name	Number, pcs.	Appearance
Add. 1	T-bend with a ball valve for connection to the water supply line with connections: M G1/2" – F G1/2" (female thread) - M G3/4"; connecting fitting F G3/4" – tube 1/2".	1	
Add. 2	Slim Line 10" flask for water treatment filters, a bracket, a wrench and a set of fittings for connection. The kit includes 2 pcs. fitting M G1/2" - 1/4" tube for connecting the flask with water supply line and with the Device.	1	
Add. 3	Post filter with activated carbon, replaceable, for Slim Line 10" flask.	1	
Add. 4	Mechanical polypropylene filter, 5 microns, replaceable, for Slim Line 10" flask.	1	
Add. 5	Filter with ion-exchange resin for water softening (removal of hardness salts), replaceable, for Slim Line 10" flask.	1	
Add. 6	Water iron removal filter, replaceable, for Slim Line 10" flask.	1	

8. DEVICE CONNECTION

Description of the main elements on the EMERALD Device casing

Fig. 6 shows the main elements of the EMERALD HOME 250 SPA Device located on the casing. For easy use, the numbering of elements in Fig. 6 and on the main Device connection diagrams in OPERATION and FLUSHING modes is the same.



Fig. 6. Main elements on the EMERALD HOME 250 SPA Device casing, left, front and right view.

1. EMERALD HOME 250 SPA Device;
2. Plug for connecting the network cable to the Device;
5. INLET fitting for supplying tap water to the Device;
6. CATHOLYTE fitting for the outlet of purified antioxidant water;
7. FLUSHING fitting for supplying flushing solution (only used in FLUSHING mode);
8. CATHOLYTE REGULATOR shutoff valve for regulating the flow rate of the catholyte outlet;
9. Electronic display with ammeter and voltmeter;
10. Electronic display with water temperature sensor;
11. FLUSHING ON/OFF button.

General rules for handling John Guest® type quick-release fittings

Connection of white tubes 1/2" and 1/4" with fittings is done manually. John Guest® type quick-release fittings allow, if necessary, for carrying out tubes and fittings connecting/disconnecting procedures repeatedly. When properly connected, the tube enters the fitting hole by 15-18 mm. The correctness and reliability of the connection is checked by the return movement of the tube after connecting to the fitting. With a force of 8–10 kgf, the tube should not be pulled out of the fitting.

Important! Do not apply force when performing these procedures! Proper connection/disconnection of John Guest® tubes and fittings does not require excessive force!

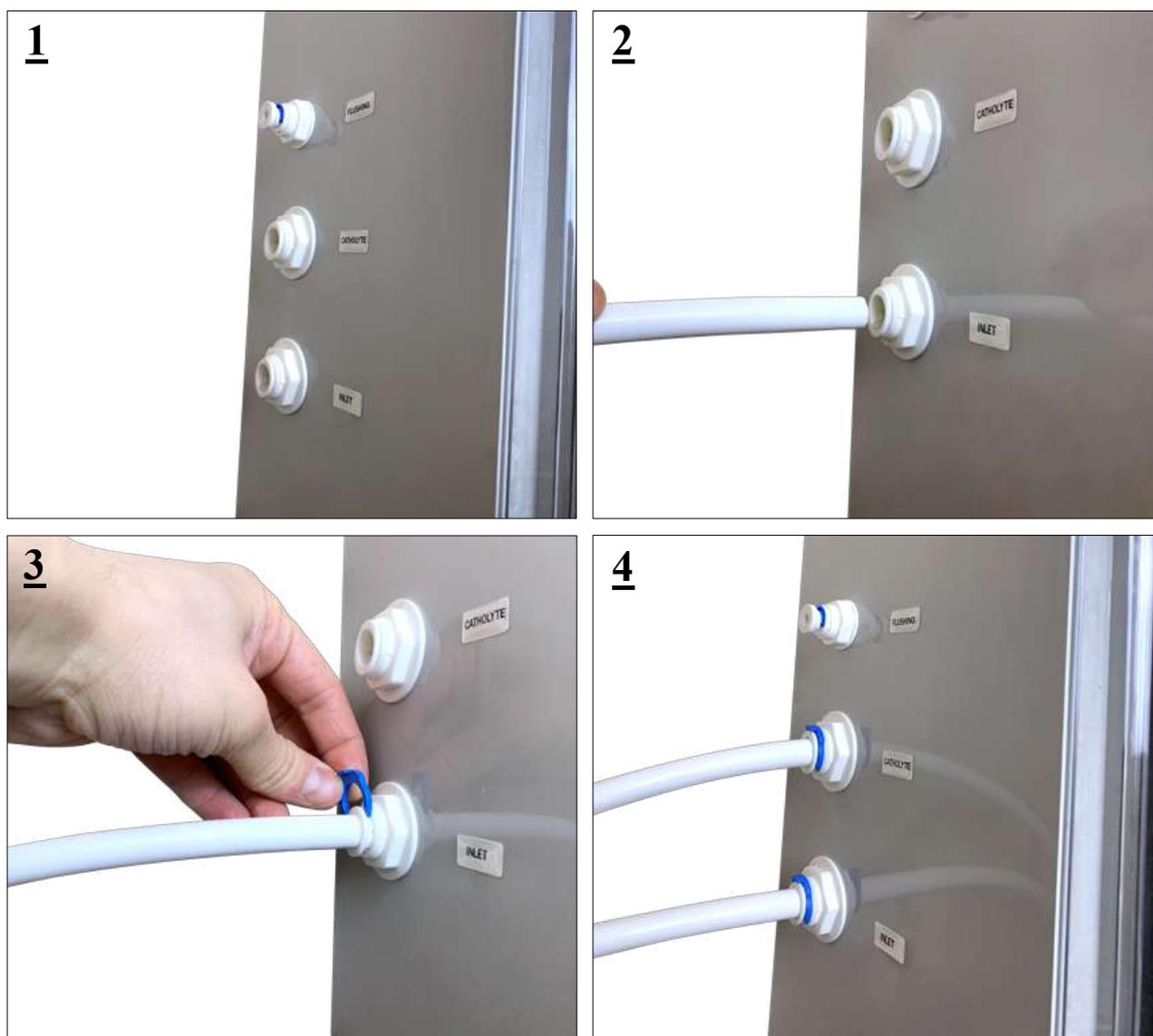


Fig. 7.1. General principles for connecting tubes to quick-release fittings.

CONNECTING TUBES AND CLOSING PLUGS TO QUICK-RELEASE FITTINGS.

Connecting tubes or plugs to fittings is to be performed in accordance with Fig. 7.2:

- ◆ Insert the tube by hand into the fitting hole (1) as far as it will go. When properly connected, the tube enters the fitting hole by 15-18 mm;
- ◆ Insert a fixing clip-lock (2,3) into the gap between the sliding collet ring and the base of the fitting;
- ◆ Check that the connection is secure by moving the tube back. With a force of 8 to 10 kgf, the tube should not be pulled out of the fitting.

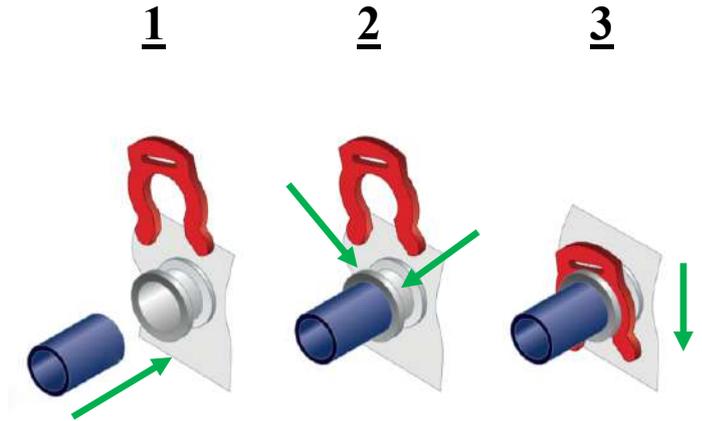


Fig. 7.2. Connecting tubes and closing plugs to quick-release fittings on the Device casing.

DISCONNECTING TUBES AND CLOSING PLUGS FROM QUICK-RELEASE FITTINGS.

Disconnecting tubes or plugs from fittings is to be performed in accordance with Fig. 7.3:

- ◆ Remove the fixing clip-lock from the fitting (2);
- ◆ Using a hand or a special wrench (9, Tab. 5), press the collet ring of the fitting to its base (3);
- ◆ While holding the collet ring of the fitting in the pressed position (3), pull the tube or plug out of the fitting by hand (4).

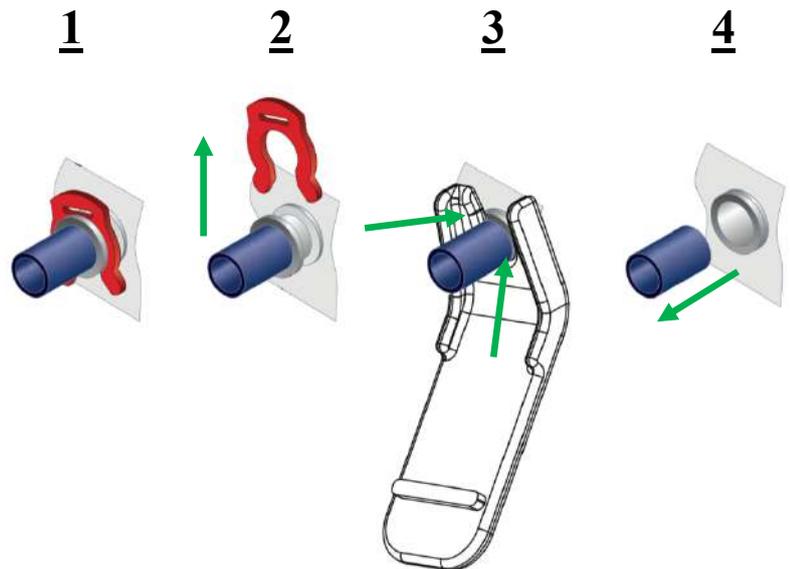


Fig. 7.3. Disconnecting tubes and closing plugs from quick-release fittings on the Device casing.

Connecting the EMERALD Device

This section describes the basic EMERALD Device connection method recommended by the manufacturer. If you use an alternative method of EMERALD Device connecting, you must make sure that the method you choose does not contradict other terms of this Operation Manual. In case of violation of the terms of EMERALD Device installation and operation, warranty claims may be rejected.

The Device is attached to the wall using screws and dowels, for which there are special hangers on the rear wall of the Device casing. If necessary, to strengthen the structure, it is possible to additionally mount a horizontal support from below the Device, on which it will be possible to place the Device and, after that, fix it to the wall through hangers using screws or anchor bolts.

To connect the EMERALD Device to the water supply line, use a diverter nozzle with a set of adapters (4, Table 5), which is directly connected to the faucet spout instead of the standard aerator. As an alternative, it is possible to connect the Device to the water supply line through a t-bend with a ball valve (Add. 1, Tab. 6), which is installed in the gap in the water supply line (not included in the standard delivery set).

To start using the EMERALD Device, it is necessary to connect the Device using connecting hoses (white tube 1/2" in size and the parts included in the delivery package, in accordance with the main connection diagram in Fig. 8. The white tube is cut into the required lengths already at the installation site. In domestic conditions, you can cut the tube with a regular kitchen or stationery knife using a cutting board. To fix the tubes when laying them, use the sliding tube holders from the delivery set (8, Table 5).

Keep the tubes and plugs remaining after the Device installation! You will need them to carry out the FLUSHING mode (see DEVICE MAINTENANCE section), as well as to transport the Device.

Fixed connection of EMERALD Device requires certain skills in working with plumbing equipment. We recommend using the services of authorized specialists of the company EMERALD ECOTECHNOLOGIES LLC, a representative of the dealer network or the services of a qualified plumber of the housing and communal services organization at your place of residence. Do not install the system in a place where its maintenance would be difficult. Do not install the equipment in a place where the Device casing will be exposed to water or direct sunlight. Before starting the connection, shut off the cold and hot water tap, and then open the cold and hot water valves on the faucet to relieve pressure in the system.

Important! During installation, pay attention to the inlet and outlet tubes passing freely along radii to exclude kinks. To avoid excessive tube pressure on the Device water inlet and outlet fittings (5,6, Fig. 8), evenly fix the water inlet and outlet tubes during installation using the sliding tube holders (8, Table 5). Threaded connections without sealing gasket must be sealed (e.g. with plumbing thread).

To enhance the antioxidant properties of purified water, as well as to improve its organoleptic qualities, it is possible to use a replaceable activated carbon post filter which is installed in Slim Line 10" flask (Table 6. Add. 2,3) after the EMERALD HOME 250 SPA Device. The post filter connection diagram is given in Appendix №1.

CONNECTION DIAGRAM OF EMERALD HOME 250 SPA DEVICE IN THE BATHROOM.

The procedure for connecting the EMERALD Device is carried out in accordance with the diagram in fig. 8 and consists of the following stages:

- ◆ Connecting to the water supply line (4,5);
- ◆ Connecting the pure antioxidant water outlet tube (6);
- ◆ Connecting the Device to the electric network (2,3).

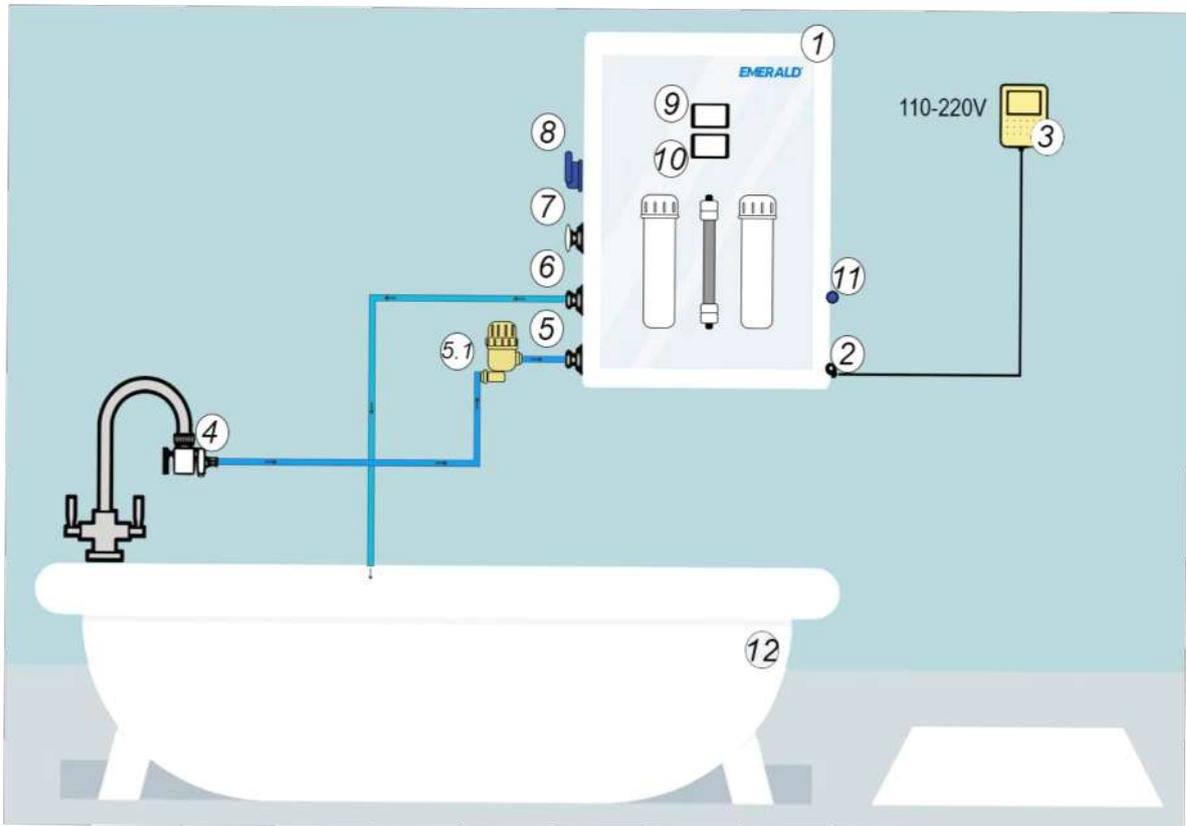


Fig. 8. Connecting diagram of EMERALD Device in the bathroom.*

1. EMERALD HOME 250 SPA Device;
2. Plug for connecting the network cable to the Device;
3. Power plug for connecting to the electric network (with built-in RCD 30mA);
4. Diverter connected to the faucet spout for supplying tap water to the Device;;
5. INLET fitting for supplying tap water to the Device;
- 5.1. Mud filter for preliminary mechanical water purification (or other system of preliminary water treatment);
6. CATHOLYTE fitting for the outlet of purified antioxidant water (directly to the bathroom or to shower head (6, Tab. 5);
7. FLUSHING fitting for supplying flushing solution (only used in FLUSHING mode);
8. CATHOLYTE REGULATOR shutoff valve for regulating the flow rate of the outlet catholyte;
9. Electronic display with ammeter and voltmeter;
10. Electronic display with water temperature sensor;
11. FLUSHING ON/OFF button;
12. Bath/shower.

* The activated carbon post filter connection diagram is given in Appendix №1.

CONNECTION TO THE WATER SUPPLY LINE VIA DIVERTOR.

The main elements of the diverter (Fig.9.1):

1. Female thread F22 for connection to the faucet spout instead of a standard aerator or to adapters from the delivery set;
2. A nipple for 1/2" tube for connecting the water supply tube to the Device;
3. The main line for the operation of the diverter in the mode of a conventional faucet;
4. Water flow regulator/switch on the diverter.

The diverter delivery set also includes the following adapters*:

- ◆ Adapter for diverter M G1/2" x M 22;
- ◆ Adapter for diverter F G1/2" x M 22;
- ◆ Adapter for diverter M 22 x M 24;
- ◆ Clamp adapter for diverter;
- ◆ Worm drive clamp 8-12 mm for fixing the water supply tube on the side fitting of the diverter.

*M – male thread, F –female thread, G1/2" – cylindrical tube thread 1/2"

INSTALLING THE DIVERTOR ON THE FAUCET.

Before starting the connection, shut off the cold and hot water tap, and then open the cold and hot water valves on the faucet to relieve pressure in the system.

To connect the diverter to the faucet:

- ◆ Remove the regular aerator from the faucet spout;
- ◆ Install the diverter on the faucet using adapters from the delivery set if necessary;
- ◆ To fix the diverter on the faucet, press it against the faucet and tighten the ring with sealing gasket at the base of the diverter with your hand or an adjustable wrench;

To connect a tube to the diverter:

- ◆ Pass the worm drive clamp through the water supply tube;
- ◆ Put the water supply tube up to the stop on the side fitting of the diverter (2, Fig. 9.1);
- ◆ Tighten the worm drive clamp to secure the connection using a screwdriver or wrench.

SUPPLYING WATER TO THE DEVICE WITH A DIVERTOR.

The vertical position of the water flow regulator on the diverter (1, Fig. 9.2) - water is drained into the bathroom and is NOT supplied to the Device. The faucet works normally.

Horizontal position of the water flow regulator on the diverter (2, Fig. 9.2) – water is supplied to the Device. The faucet works in the mode of supplying warm or cold tap water to the Device.



Fig. 9.1. Diverter with a set of adapters for connection to a faucet.

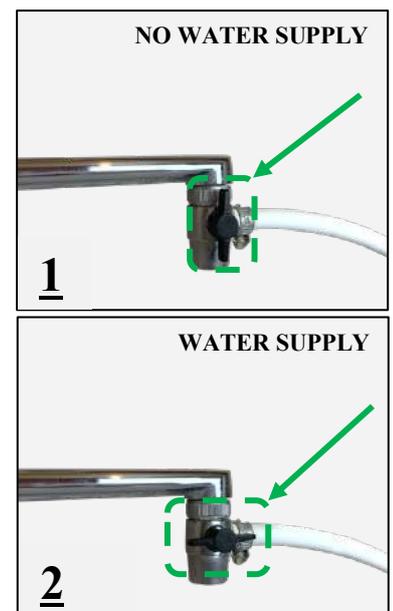


Fig. 9.2. Water flow switch by the regulator on the divertor

CONNECTION TO COLD WATER SUPPLY VIA T-BEND.

An alternative option for supplying water to the Device is to connect it to the main water supply line through a t-bend with a ball valve (Fig. 10.1) type M G1/2" - F G1/2" - M G3/4", which is installed in the gap in the water line (purchased separately, see Aux. 1, Table 6. Included with the t-bend is a fitting type F G3/4" - 1/2" tube for connecting the water supply tube to the t-bend.

The main connections on the t-bend and fitting (Fig. 10.1):

1. Female thread G1/2";
2. Male thread G1/2";
3. Male thread G3/4";
4. Female thread G3/4";
5. Quick-release fitting for tube 1/2";

To connect to the water line:

- ◆ Shut off the water supply line at the inlet, and then open the shutoff valve of this line at the outlet to relieve pressure in the pipe;
- ◆ When using a flexible hose, unscrew the union nut of the flexible hose, through which water is supplied to the outlet. Insert a t-bend with a ball valve into the gap between the main line and the flexible hose (Fig. 10.2).
- ◆ Next, on the threaded connection on the t-bend type M G3/4" (3, Fig. 10.1), screw the fitting for connecting the water supply tube (4, Fig. 10.1) to the stop);
- ◆ Connect a 1/2" tube to the mating part of the fitting (5, Fig. 10.1) for supplying water to the Device (5, Fig. 8); fix the quick-release fittings with clip-locks;
- ◆ Tighten all screw connections with a wrench or adjustable wrench. Check the reliability of all connections.

Important! When connecting these elements, do not overtighten the connections! This can lead to a damage of the t-bend or fitting, including a hidden one (with long-term consequences). Threaded connections without sealing gasket must be sealed (e.g. with Tangit uni-lock® plumbing thread). The amount of sanitary sealing material used must not be excessive! In case of any mechanical damage to the connection unit due to improper installation and use, warranty claims may be rejected.



Fig. 10.1. T-bend with a ball valve for connection to the water supply line.

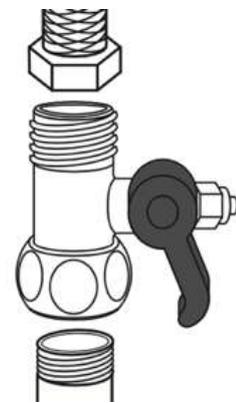


Fig. 10.2. An example of mounting a t-bend with a ball valve into a gap in the water supply line.

CONNECTING THE PRE-FILTERS BEFORE THE WATER INLET TO THE DEVICE.

The delivery set includes a mud filter with plugs type F G1/2" - F G1/2" (Fig. 11.1) and two fittings for connecting type M G1/2" - 1/2" tube. The mud filter is used for preliminary mechanical purification of water before it is supplied to the Device. Water filtration is carried out by a stainless steel metal mesh built into the fixed part of the case (3, Fig. 11.1). Main connections on the filter and fittings (Fig. 11.1):

1. Water inlet - female thread G1/2";
2. Water outlet - female thread G1/2";
3. Fixed part of the filter case;
4. Male thread G1/2";
5. Quick-release fitting for 1/2" tube;
6. Male thread G1/2";
7. Quick-release fitting for 1/2" tube.



Fig. 11.1 Mud filter (left) with fittings for connection (right).

The mud filter is connected in accordance with the diagram in Fig. 8. When connecting the mud filter, make sure that the direction of the water flow corresponds to the arrows on its case. To connect the mud filter to the gap of the Device water supply tube, do the following (Fig. 11.1):

- ◆ Screw the fittings with threaded connections into the corresponding plugs on the filter (1.4) and (2.6); Threaded connections are sealed;
- ◆ Connect the first part of the water supply tube from the diverter (4, Fig. 8) to the plug (5) on the fitting installed at the water inlet to the filter;
- ◆ Connect the second part of the water supply tube to the plug (7) on the fitting installed at the water outlet from the filter;
- ◆ Blue fixing clip-locks are installed in all quick-release fittings.

Important! In case of non-compliance of the source tap water with the requirements of SanPiN 2.1.4.1074-01, it is possible to install an additional preliminary water treatment system instead of the mud filter (or before it) (purchased separately, see Table 6). To do so, just like with a mud filter, a Slim Line 10" flask with plugs F G1/2" x F G1/2" (Fig. 11.2) is connected to the gap in the tap water supply tube, with a replaceable filter (mechanical polypropylene, carbon, ion-exchange or iron removal filter) installed in the twisting part of the case (3), depending on the type of contaminants in the source water. To do so:

- ◆ The selected filter is installed in the flask (3);
- ◆ The corresponding threaded parts of the connecting fittings (4.5) are screwed into the threaded plugs of the flask (1.2). Threaded connections are sealed;
- ◆ In accordance with the water flow arrows on the flask case, the water supply tube from the diverter (4, Fig. 8) is connected to the flask water inlet fitting (4), and the flask water outlet fitting (5) is connected to the INLET fitting (5, Fig.8) on the Device; the blue fixing clip-locks are installed in all quick-release fittings.



Fig. 11.2. Slim Line 10" flask with fittings.

CONNECTING OF THE FLEXIBLE HOSE AND THE SHOWER HEAD.

The outlet tube of the purified antioxidant water from the Device (6, Fig. 8) can go directly down into the bath, and can also be connected to the flexible hose and shower head using the quick-release fitting type M G1/2" - 1/2" tube. To do so (Fig. 12):

- ◆ The corresponding threaded connection of the flexible hose (2) is screwed onto the threaded connection of the shower head (1);
- ◆ The other end of the flexible hose (3) is screwed onto the appropriate threaded connection of the quick-release fitting (4);
- ◆ The purified water tube (6, Fig. 8) is inserted into the quick-release fitting (5);
- ◆ Blue fixing clip-locks are installed in all quick-release fittings.



Fig. 12. Connecting of the flexible hose and shower head to the Device.

Connecting the EMERALD Device to the electric network

Connecting the EMERALD Device to the electric network is carried out in several stages (Fig. 13):

- ◆ The network cable from the delivery set with an IEC320 C14 plug is connected to the appropriate plug on the side of the Device casing (1), and the network cable plug with built-in RCD (30mA) is connected to an electrical outlet (2);
- ◆ To supply power to the Device, you must first press the yellow start button (3) on the plug case. After pressing the button on the plug case, the LED indicator should light up;
- ◆ Next, you need to move the button (4) located next to the cable plug on the Device casing to the on position («I»);
- ◆ After switching the power supply button to the on position, the built-in LED inside the Device casing will sequentially turn on all the three main indicator colors (red, green, blue) to check their operability, after which the LEDs will turn off and the Device will switch to STANDBY mode;
- ◆ In STANDBY mode, the Device is connected to the electric network and will turn on/off automatically if there is water flow due to the built-in flow sensor. When the water flow opens, the flow sensor is triggered and turns the Device into the basic OPERATION mode. As soon as the water flow stops, the flow sensor automatically turns off the Device, switching it back to the STANDBY mode (for a description of the basic modes, see the *Basic operating modes* paragraph, DEVICE OPERATION section).
- ◆ The red TEST button on the network cable plug case is designed to test the RCD's performance. Be sure to check the operability of the built-in RCD before putting the Device into operation!

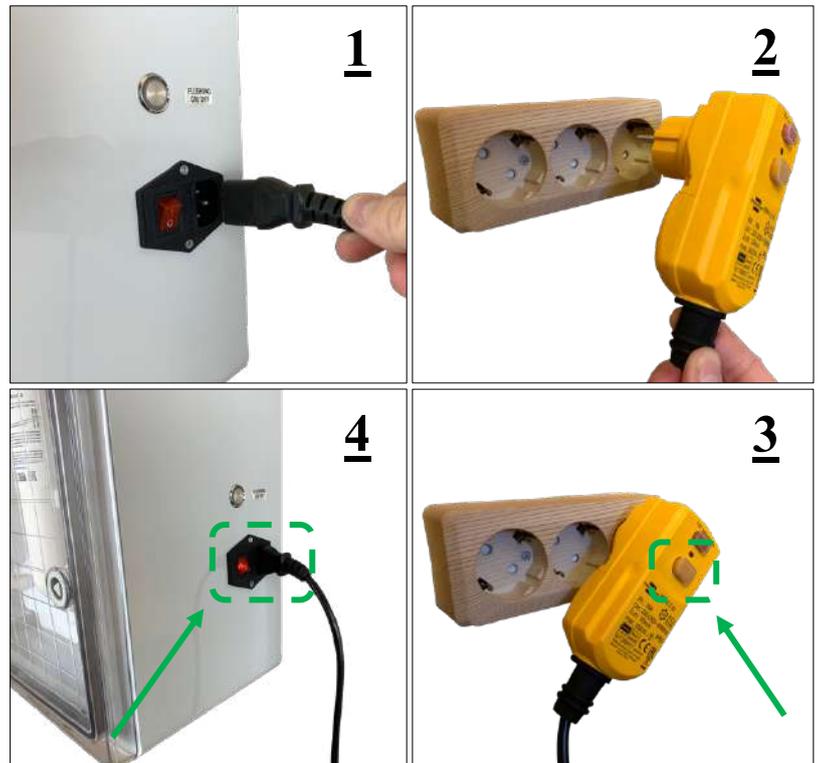


Fig. 13. EMERALD Device connecting diagram to the electric network using the network cable.

Important! Make sure that the Device is connected in an electrically safe manner to an electrical network with suitable characteristics (see SAFETY PRECAUTIONS and DEVICE FEATURES sections). To comply with electrical safety measures, the electrical outlet to which the EMERALD Device is connected must work uninterruptedly, have a valid ground contact, and be connected through a residual current device (RCD) or a differential circuit breaker (RCBO) with a rated leakage current of 30 mA!

Do not disconnect the Device from the power supply while the Device is in the OPERATION mode!

9. DEVICE OPERATION

Basic operating modes

STANDBY mode.

In the STANDBY mode, the Device is connected to the tap water supply line (with the shutoff valve on the faucet closed) and connected to the electric network. Water does not flow through the Device. The LED is not lit. The electronic display is off.

OPERATION mode.

In the OPERATION mode, the shutoff valve on the faucet opens, water starts flowing through the Device, the built-in flow sensor turns on the Device, there is a sound signal, the LED lights up green, the voltage and current begin to be displayed on the electronic display. This mode is the main one for Device operation.

In the OPERATION mode, the voltmeter always shows, on average, 24V. This is the voltage applied by the Device power supply to the electrochemical modules. The ammeter readings in the OPERATION mode take on different values depending on the total salinity of the water and the Device pollution degree, characterizing the efficiency of water treatment. The optimal values of the ammeter in the OPERATION mode should be in the range **1.0A - 4.0A**.

If the current strength values are below this range, this means either a low total mineralization of the source water (in this case, an auxiliary mineralizer filter can be placed as a pre water treatment stage before the Device, order separately), or a high Device pollution degree (in this case, it is necessary to perform flushing (see DEVICE MAINTENANCE section).

Some features of the OPERATION mode.

- ◆ **After 3 600 liters** (approximately 18 hours of operation) of purified water in the OPERATION mode, the LED will turn orange when the Device is turned on, indicating that it is DESIRABLE to flush the Device with an acid solution.

- ◆ **After 4 000 liters** (approximately 20 hours of operation) of purified water in the OPERATION mode, the LED will turn red when the Device is turned on, indicating that the Device **MUST** be flushed with a citric acid solution. Using the Device in the OPERATION mode with red color is not allowed by the rules of this operating manual.

EMERALD Device functioning in OPERATION mode

SWITCHING THE DEVICE INTO OPERATION MODE WITH A DIVERTER.

To turn on the Device:

- ◆ Move the regulator on the diverter first to the vertical position (1, Fig. 9.2);
- ◆ Open the shutoff valve on the faucet and adjust the required water temperature (not higher than 45 °C);
- ◆ Slowly move the regulator on the diverter to the horizontal position (2, Fig. 9.2) so that water begins to flow into the Device. As soon as water begins to flow through the Device, it will automatically switch to OPERATION mode. When the Device is filled with water for the first time, short-term on/off switching of the system is possible within the first 10 seconds from the moment water is supplied to the Device.
- ◆ When the Device is turned on in OPERATION mode (Fig. 14), there is a sound signal, the LED located inside the casing lights up, and both indicator displays turn on (9,10 Fig. 6).



Fig. 14. EMERALD HOME 250 SPA Device in the OPERATION mode.

To turn off the Device:

- ◆ Close the shutoff valve on the faucet. As soon as the water stops flowing through the Device, it will automatically turn off and switch to STANDBY mode, the LED and indicator displays will turn off;
- ◆ If necessary, move the regulator on the diverter back to the vertical position (1, Fig. 9.2).

Important! Do not use for food purposes the first 15 liters of treated water immediately after connecting the system.

It is also recommended not to use and drain the first 3 liters of purified water in the OPERATION mode (approximately 1 minute) when the Device is idle for more than 10 hours. If the Device is idle for a long time (more than 72 hours), the first 15 liters of purified water in the OPERATION mode should also be drained (approximately 5 minutes of Device operation).

Water flow setting

The optimal range of water flow through the EMERALD HOME 250 SPA Device is **180 - 250 l/h** (approximately 3 – 4.0 l/min.)!

Adjustment of the water flow rate through the EMERALD HOME 250 SPA Device is carried out by means of:

- ◆ Faucet shutoff valve - adjusting the rate of the inlet water flow;
- ◆ CATHOLYTE REGULATOR shutoff valve on the Device casing (Fig. 15) - adjustment of the speed of the outlet water flow.

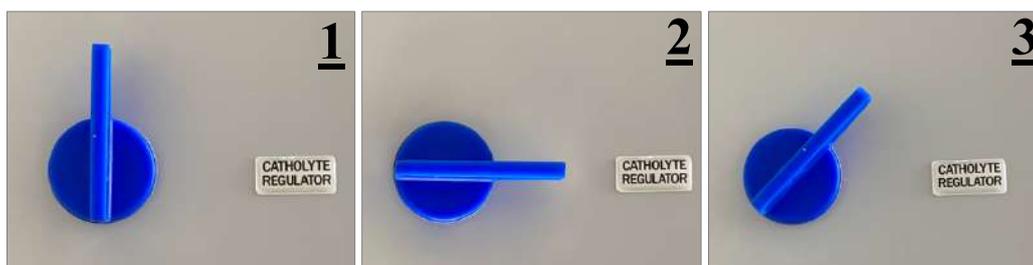


Fig. 15. CATHOLYTE REGULATOR shutoff valve for adjusting the water flow rate through the Device.

1. Vertical position - the valve is completely open;
2. Horizontal position - the valve is completely closed;
3. Middle position - the valve is half open (used for the reduction of the CATHOLYTE flow rate out of the Device).

Important! Do not close the CATHOLYTE REGULATOR shutoff valve completely (horizontal position 2, Fig. 15) if there is water flow in the Device (with the open shutoff valve on the faucet) as it may cause excessive pressure in the hydraulic elements of the Device.

During OPERATION, as the electrochemical modules and filter elements of the Device get dirty, the water flow rate may gradually decrease. To restore the normal flow rate, it is necessary to flush the Device (see DEVICE MAINTENANCE Section).

The Device operation indication

Multifunctional LED

The LED built into the Device casing allows you to evaluate the following:

- ◆ What mode the Device is in;
- ◆ How many liters of treated water have passed through the Device;
- ◆ When to do the Device flushing.

Electronic display with ammeter and voltmeter

The electronic display consists of an ammeter and a voltmeter and allows you to visually evaluate the Device efficiency. The voltmeter (upper numerical scale) indicates the voltage applied to the electrochemical modules in volts (V). In the EMERALD Device, the voltage is stable and is 24V. The ammeter (lower numerical scale) indicates the current flowing in the electrochemical modules during water treatment in amperes (A). The optimal values of the ammeter in the OPERATION mode should be in the range **1.0A – 4.0A**.

A decrease in the current on the ammeter in the OPERATION mode by **more than 3 (three) times** relative to the initial values (provided that the Device is operating on the same water) indicates that it is necessary to flush the Device (see DEVICE MAINTENANCE section).



Fig. 16. Main indicators of EMERALD HOME 250 SPA Device.

10. DEVICE MAINTENANCE

To achieve the maximum quality of water purification and electrical treatment in the EMERALD HOME 250 SPA Device, as well as to ensure drinking water quality standards, the user must regularly flush the Device with a solution of citric acid. With timely and uncomplicated maintenance, your Device will produce pure antioxidant drinking water of high quality with the required characteristics for many years.

Internal parts of the Device (electrochemical modules and auxiliary filter elements) are not fast-wearing and are regenerated with a citric acid flushing solution.

Important! The activated carbon post filter is a replaceable filter (Table 6, Add. 3). For the most efficient water treatment, it is recommended to change this filter every time after carrying out the FLUSHING procedure. Before starting the FLUSHING mode, the post filter must be disconnected. Only after the full completion of the FLUSHING mode a new post filter can be connected. After connecting of a new post filter, be sure to drain the first 15 liters of water without its usage.

The EMERALD Device maintenance consists in regular flushing of the entire system (including electrochemical modules and filter elements) with a citric acid solution to remove accumulated contaminants. The frequency of maintenance of the Device and EMERALD depends on the quality of the source water and the operation mode. On average, when Device operates on tap drinking water that complies with SanPiN 2.1.4.1074-01, the Device should be flushed at least once every 1 months or after 4 000 liters of purified water (whichever comes first).

The EMERALD Device automatically monitors the consumption of treated water and alerts the user when flushing is required:

- ◆ **After 3 600 liters** (approximately 18 hours of operation) of purified water in the OPERATION mode, the LED will turn orange when the Device is turned on, indicating that it is DESIRABLE to flush the Device with an acid solution.

- ◆ **After 4 000 liters** (approximately 20 hours of operation) of purified water in the OPERATION mode, the LED will turn red when the Device is turned on, indicating that the Device MUST be flushed with an acid solution.

Important! LED indicator allows the user to evaluate only the maximum allowable amount of treated water, after which it is necessary to flush the Device. Given the large difference in the quality of the source water in different regions, the need for flushing may occur earlier (before the red color of the LED in the OPERATION mode).

To more accurately determine the Device pollution degree and the need to flush it, the user should focus on the following factors:

- ◆ Reduction of the current strength indicated on the electronic display (Fig. 16) **by more than (three) 3 times** relative to the initial values (provided the Device operates on the same water with the same total mineralization);
- ◆ Reduction of the water flow rate through the Device **by more than 2 (two) times** (provided the same pressure level in the cold water supply line is maintained);
- ◆ Degradation of organoleptic qualities of the treated water;

Preparing EMERALD Device for FLUSHING mode

Before connecting the Device for FLUSHING mode, in accordance with the diagram in fig. 17:

- ◆ Close the shutoff valve on the faucet (4) so that no water enters the Device;
- ◆ Disconnect the tap water supply tube from the tap water INLET fitting (5). Install a plug in the fitting (5) so that the flushing solution does not come out of the fitting;
- ◆ Remove the fixing clip and plug from the FLUSHING fitting (7). Leave the fitting open.

Important! For a more efficient FLUSHING mode, it is necessary to first remove the remaining water from the Device so that the flushing solution does not mix with cold water residues inside the hydraulic elements. To do so:

- ◆ Press the FLUSHING on/off button (11) once. After a single press of the button (11), the Device will turn on in the FLUSHING mode, the LED inside the casing will turn blue, and the built-in circulation pump will start working, removing the remaining water from the Device through the CATHOLYTE outlet tube (6). Before pressing the button (11), make sure that the CATHOLYTE REGULATOR valve (8) on the Device casing is fully open (it is in the vertical position - 1, Fig. 15). It is forbidden to turn on the FLUSHING mode with the valve (2, Fig. 15) completely closed, as this can create excess pressure and damage the hydraulic elements of the Device;
- ◆ After 4 minutes from the moment of pressing the button (11), when the bulk of the water has already left the Device, the pump will turn off automatically;
- ◆ After stopping the pump, disconnect the Device from the electric network by moving the power supply button located on the Device casing (4, Fig. 13) to the OFF position («0»);

Important! Do not attempt to completely remove residual water from the Device, as small amounts of water will still continue to flow out of the Device when the pump is on. The main task is to remove the bulk of the water from the Device, so it is not recommended to use the switched on pump in this mode for more than 4 minutes!

Preparing the citric acid flushing solution

To carry out the EMERALD Device flushing procedure, it is necessary to prepare one and a half liters of citric acid flushing solution in the EMERALD HOME flushing tank (12, Fig. 17). The citric acid flushing solution is prepared at the rate of 150 grams of citric acid per one and a half liters of water. It is recommended to dilute citric acid crystals in hot water, and flush with a solution with a temperature of 60-70 °C (not higher!).



Important! It is not allowed to flush the EMERALD Device with a citric acid solution with a temperature of more than 70°C. This can damage the hydraulic elements of the system! Use temperature gauges to accurately determine the temperature of the flushing solution.

All work related to the preparation of the flushing solution, as well as the entire flushing process of the Device, should be carried out using personal protective equipment for the skin and eyes!

Connecting Diagram of EMERALD Device in FLUSHING mode

The procedure of connecting the EMERALD Device in the FLUSHING mode is performed in accordance with the diagram in fig. 17 and consists of the following stages:

- ◆ Preparing the citric acid flushing solution in the flushing tank (13);
- ◆ Connecting the flushing solution supply tube to the Device (14,7);
- ◆ Connecting the flushing solution outlet tube (6,15);
- ◆ Connecting the Device to the electric network (2,3).

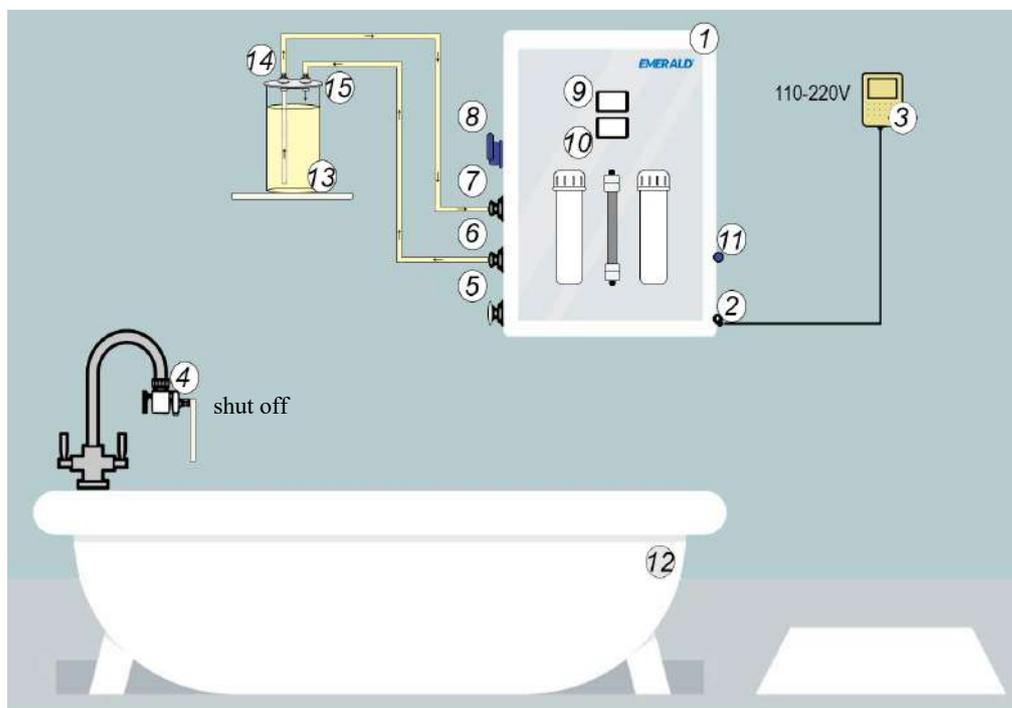


Fig. 17. EMERALD Device Connection diagram in FLUSHING mode.

1. EMERALD HOME 250 SPA Device;
2. Plug for connecting the network cable to the Device;
3. Power plug for connecting to the electric network (with built-in RCD 30mA);
4. Diverter connected to the faucet spout for supplying tap water to the Device (the water supply tube is disconnected);
5. INLET fitting for supplying tap water to the Device (closed with a plug);
- 5.1. Mud filter for preliminary mechanical water purification (disconnected);
6. CATHOLYTE fitting – the flushing solution outlet back to the circulation tank, connection made with a 1/2" tube;
7. FLUSHING fitting – the flushing solution supply to the Device, connection made with a 1/4" tube;
8. CATHOLYTE REGULATOR valve – in open position (1, Fig. 15);
9. Electronic display with ammeter and voltmeter;
10. Electronic display with water temperature sensor;
11. FLUSHING ON/OFF button;
12. Bath/shower room.
13. EMERALD HOME flushing tank;
14. Flushing solution supply fitting from the circulation tank (the inlet tube is lowered into the tank with the flushing solution);
15. Flushing solution return fitting from the Device back to the tank.

FLUSHING mode

To start the FLUSHING mode, the EMERALD Device must be connected in accordance with the diagram in fig. 17 and be in STANDBY mode. All hydraulic and electric connections must be securely fixed. The flushing tank must be placed on a level and stable surface.

Important! The flushing tank has a special flow restrictor in its return fitting (15, Figure 17), so the circulation rate of the flushing solution during the FLUSHING mode is only about 200 to 400 ml per minute. The flow restrictor at the outlet of the flushing solution is necessary to circulate the flushing solution under pressure during the CIRCULATION stage so as to distribute it completely through the internal parts of hydraulic elements of the Device which increases the effectiveness of the flushing procedure.

FLUSHING mode is carried out in a semi-automatic mode and consists of three main stages:

1) **CIRCULATION** stage. At this stage, the built-in pump is turned on and the process of pumping and circulating of the flushing solution through all the main hydraulic elements of the Device begins.

2) **HOLD UP** stage. At this stage, the built-in circulation pump is turned off and the flushing solution is kept inside the hydraulic elements of the Device to more effectively dissolve the accumulated contaminants.

3) **WASHING OUT** stage. At this stage, the Device is connected again according to the basic OPERATION mode scheme (Fig. 8) to wash out dissolved contaminants and residual citric acid flushing solution from the Device using cold tap water supply.

To turn on the FLUSHING mode, press the FLUSHING ON/OFF button once (11, Fig. 17). After pressing the button, the LED inside the casing turns blue, and the built-in circulation pump starts working circulating the flushing solution through the system. Then, for 20 minutes, the Device works in automatic mode, alternating between the CIRCULATION and HOLD-UP stages. This procedure consists of 4 similar successive cycles, each lasting for 5 minutes. and including:

- ◆ CIRCULATION stage - **4 min.**
- ◆ HOLD-UP stage - **1 min.**

In 20 minutes, after completion of all 4 cycles, the LED in the Device starts flashing blue, signaling that the CIRCULATION and HOLD-UP stages are completed.



Fig. 18. Connection example of EMERALD Device in FLUSHING mode.

Next, the user should disconnect the flushing tank and connect the Device according to the basic scheme of the OPERATION mode (see Fig. 8). In this mode, one should carry out the WASHING-OUT stage and rinse the Device with cold tap water to wash out the dissolved dirt and residues of the citric acid flushing solution.

The WASHING OUT stage takes 15 minutes. First, you need to supply tap water to the Device by opening the shutoff valve on the faucet (4, Fig. 8) and turning the regulator on the diverter to the horizontal position (2, Fig. 9.2). The tap water going out from the Device must be discharged into drainage. During the 15 minutes of the WASHING OUT stage, the full OPERATION mode does not start, the LED inside the Device flashes green, the electrochemical modules are not energized, the current on the ammeter is close to zero. After 15 minutes, the WASHING OUT mode is automatically switched off (the green LED stops flashing) and the Device enters the basic OPERATION mode: there is a sound signal, the LED lights up permanently green, the electrochemical modules are energized and the current indicator appears on the ammeter.

This completes the entire FLUSHING mode!
The Device is again ready for use in OPERATION mode!

Some features of the FLUSHING mode.

- ◆ The user by means of the FLUSHING ON/OFF button (11, Fig. 17) can always pause the FLUSHING mode (press once) and start it from the beginning (press once again). This function allows the user to pause the FLUSHING mode if necessary (for example, if there is a problem with pumping the flushing solution into the Device) and resume this mode again.
- ◆ After switching on/off the FLUSHING mode, the subsequent water supply will always start the WASHING-OUT stage for the first 15 minutes, regardless of whether the FLUSHING program has been completed or not. This function is non-volatile (energy-independent) and has priority. This allows for the user and the Device itself protection in case of violation of the FLUSHING mode (for example, in the event of a power failure of the Device during the FLUSHING mode);
- ◆ If any failure occurs during the FLUSHING mode, you need to repeat this procedure from beginning to end before using the Device in the OPERATION mode;
- ◆ To increase the useful life of the flushing tank and connecting tubes, we recommend after the FLUSHING mode, rinsing these elements thoroughly with warm tap water, drying and removing before the next flushing;
- ◆ Please note that when connecting/disconnecting the Device in FLUSHING mode, a small amount of water or flushing solution may leak from the tubes and fittings.

Mud filter maintenance

During the Device maintenance, it is also necessary to inspect and, if necessary, clean the stainless steel filter mesh (2, Fig. 19) built into the mud filter case (1 and 3, Fig. 19). To do so:

- ◆ After making sure that there is no pressure in the water supply line, disconnect the mud filter from the water supply tubes and the Device. Next, manually or using a special wrench, unscrew the upper part of the case (1, Fig. 19) of the mud filter from the lower part (3, Fig. 19);
- ◆ Remove the filter mesh and, if dirty, wash the mesh thoroughly under the running water for 2 minutes;
- ◆ If part of the dirt remains on the filter mesh, it must be soaked for 20 minutes in the citric acid flushing solution. The parameters of the solution and the method of preparation are described in the paragraph “*Preparing the citric acid flushing solution*”. For soaking the filter mesh, 500 ml of the flushing solution can be prepared with a proportion of 50 grams of citric acid per 500 ml of water. Citric acid crystals are recommended to be diluted in hot water, and soaking is to be carried out in a solution with a temperature of 60 to 70°C (not higher!);
- ◆ After soaking the filter mesh in the citric acid solution, it must be thoroughly washed again under running water for 2 minutes to remove dissolved impurities and residues of the flushing solution;
- ◆ Install the filter mesh tightly back into the bottom part of the dirt filter case and screw the upper part of the case onto the lower one up to the stop (manually or with a wrench).



Fig. 19. Disassembled mud filter.

Important! When tightening the mud filter case, especially when using a wrench, do not overtighten this connection, as this can lead to violations (including hidden ones, with long-term consequences) in the integrity of the design and tightness of the mud filter elements.

11. TROUBLESHOOTING GUIDE

Table 7. Troubleshooting guide

Trouble	Probable Cause	Troubleshooting practice
<p>Device does not turn on.</p> <p>LED and electronica display do not light up.</p>	<p>1. The hydraulic and electrical connections of the Device are connected incorrectly.</p> <p>2. The flow sensor does not work and does not turn on the Device due to insufficient pressure and/or insufficient water flow rate in the Device.</p> <p>3. No electrical contact/electric network power</p>	<p>1. Connect the hydraulic and electrical connections according to the DEVICE CONNECTION section.</p> <p>2. Ensure the necessary pressure in the tap water supply line (see Table 1), and also set the proper water flow rate.</p> <p>3. Check for electrical contact/electric network power.</p>
<p>Unable to increase water flow rate.</p> <p>The water flow rate in the Device is below normal.</p> <p>The citric acid flushing solution is not pumped into the Device.</p>	<p>1. Insufficient pressure in the tap water line.</p> <p>2. The filter elements are dirty and/or deposits of hardness salts have formed in the cathode chambers of the electrochemical modules.</p> <p>3. The filter element at the mud filter is clogged (2, Fig. 19)</p>	<p>1. Provide the necessary pressure in the water supply line (see Table 1).</p> <p>2. Flush the Device with a citric acid solution and change replaceable filters (see DEVICE MAINTENANCE section).</p> <p>3. Rinse the mud filter (see Section 9, paragraph Mud filter Maintenance)</p>
<p>The citric acid flushing solution is not pumped into the Device.</p> <p>It is necessary to pause the FLUSHING mode for troubleshooting.</p>	<p>1. The hydraulic and electrical connections of the Device in FLUSHING mode are made incorrectly.</p> <p>2. The FLUSHING mode can be paused using the FLUSHING ON/OFF button.</p>	<p>1. Connect the hydraulic and electrical connections in the FLUSHING mode according to the diagram in fig. 17. Check that the connection tubes pass freely along the radii without kinks.</p> <p>2. To pause the FLUSHING mode, press the FLUSHING ON/OFF button (9, Fig. 17) once. To start the FLUSHING mode, press the button again.</p>

12. WARRANTY

The manufacturer guarantees that the Device complies with the requirements of the technical specifications, subject to observing the conditions of operation, transportation, storage and installation specified in this Operating Manual. The period of free warranty service for EMERALD Device is 2 (two) years from the date of its sale, but not more than 3 (three) years from the date of manufacture. In the absence of the date of sale and the stamp of the trading organization, the period of free warranty service is calculated from the date of production.

The manufacturer warrants that the EMERALD Device (excluding accessory and replacement filters/cartridges) will be free from defects (as defined below) under correct use for a period of 2 years from the date of purchase. A product is considered to be defective if the defect is due to defective material or workmanship, or if such a defect interferes with or impairs the end customer's use of the EMERALD Device.

Warranty obligations are valid only in the presence of correctly completed payment documents and this Operating Manual.

The warranty does not cover:

- ◆ EMERALD Device, which has been used for other purposes or in a way that is contrary to the instructions in this Operating Manual;
- ◆ Any EMERALD Device that has been used incorrectly, crashed, physically damaged, improperly installed or misused, altered, mishandled, or exposed to adverse external factors (including but not limited to, lightning, flood or fire);
- ◆ Any EMERALD Device that has been damaged due to improper repair, modification, alteration or service by anyone other than an authorized warranty and service representative of the manufacturer or an authorized sales partner;
- ◆ Any EMERALD Device found to be defective or degraded due to the use of any non-original spare parts or accessories (including non-original water pre-treatment filters) not intended for use with the EMERALD Device;
- ◆ Any EMERALD Device not installed using the original kit supplied with the pack.

The manufacturer is also released from liability in the following cases: EMERALD Device or its parts have external mechanical damage; EMERALD Device has not been serviced in a timely manner (in accordance with the instructions of this Operating Manual); the filter elements (if they are included in the delivery and the specific Device model) have exhausted their resource, but have not been replaced or serviced in a timely manner; this Operating Manual with the dates of production and/or sale are lost and there are no other ways to determine the service life of the product; when the consumer uses spare parts from other manufacturers that are different from the original components included in the kit; when installing and operating the Device in excess of the limits established by the technical requirements for the operating conditions of the product; under the influence of force majeure circumstances; in other cases provided for by law.

Legal disclaimers

The design of EMERALD Devices is constantly being improved, so the product you have purchased may differ slightly from that described in this Operating Manual while maintaining all the declared performance properties. The manufacturer reserves the right to make changes and improvements to the Device design that do not impair the Device operational properties and the quality of the resulting product;

Although all necessary measures have been taken to verify the text of this Operating Manual, the manufacturer does not guarantee its completeness or the absence of errors.

Claims

EMERALD ECOTECHNOLOGIES LLC is the authorized company to receive all complaints and requests, including warranty claims for the EMERALD Device.

To make claims under this warranty, you can leave a claim on our official website www.emerald.eco, as well as call the company's service department at the unitary number: 8 (495) 928-77-71 or write to info@emerald.eco. You are kindly requested to contact us at the above contacts before you decide to send the Device for diagnostics.

In order to make a claim under this warranty, the buyer must notify EMERALD ECOTECHNOLOGIES LLC in writing of the defect found within two (2) months after the defect was discovered, but no later than two (2) months after the end of the relevant warranty period.

Important! The manufacturer and official trading partners are not responsible in case of problems caused by the condition of the water pipes and sanitary fittings of the buyer. The unsatisfactory condition of the supply water pipes, plumbing fittings and the buyer's failure to comply with the conditions necessary for connecting the Device and the conditions set forth in this Operating Manual are grounds for refusing to install the Device, as well as warranty service. In the case of independent connection and service maintenance of Device, the manufacturer and official trading partners are not responsible and do not accept claims in case of problems caused by violation of the rules for connection and maintenance of Device stated in this Operating Manual. The manufacturer and official trading partners are not responsible and do not accept claims if the EMERALD Device was used for other purposes or in a way that contradicts the instructions in this Operating Manual.

13. TRANSPORT AND STORAGE

EMERALD HOME 250 SPA Device does not contain harmful, toxic, flammable or explosive substances. Transportation of the Device can be carried out by any type of land or air transport (except for unheated compartments during the cold season). The product is stored in a packed form, avoiding drying, freezing, direct sunlight, at a distance of at least 1 meter from heating Devices, at an ambient temperature of at least 5 °C and not above 40 °C, away from substances with a strong odor. EMERALD Device has a warranty period of 3 (three) years from the date of manufacture.

14. ACCEPTANCE AND SALE CERTIFICATE

EMERALD HOME 250 SPA Device (shortened name EMERALD) complies with Tech. cond. № 28.29.12-001-19313776-2018 and is recognized as serviceable.

ID number _____
Release date _____
Quality control test _____

MANUFACTURER:

EMERALD ECOTECHNOLOGIES Limited Liability Company (abbreviated name EMERALD ECOTECHNOLOGIES LLC)

600035, Russia, Vladimir city, Kuibysheva street, 26A



EMERALD HOME 250 SPA Device (shortened name EMERALD) is manufactured by EMERALD ECOTECHNOLOGIES LLC. The company EMERALD ECOTECHNOLOGIES LLC has the exclusive rights to manufacture EMERALD Devices, as well as to carry out their service and warranty maintenance. The company EMERALD ECOTECHNOLOGIES LLC has the exclusive right to transfer to its official trading partners all the necessary powers for the sale of EMERALD Devices, as well as for their service and warranty maintenance.

For service and warranty issues, please contact:

EMERALD ECOTECHNOLOGIES Limited Liability Company

600035, Russia, Vladimir city, Kuibysheva street, 26A

Tel.: 8 (495) 928-77-71; E-mail: info@emerald.eco;

Website: www.emerald.eco

WARRANTY CARD

Date of sale _____

Shop stamp _____ L.S.

Electronic version of this document is available by the link below:



APPENDIX №.1. POST FILTER CONNECTION

To enhance the antioxidant properties of purified water, as well as to improve its organoleptic qualities, it is possible to use a replaceable activated carbon post filter which is installed in Slim Line 10" flask (Table 6. Add. 2,3) after the EMERALD HOME 250 SPA Device.

Table 8. Activated carbon post filter delivery set

No.	Item	Number, pcs.	Appearance
1	Slim Line 10" flask for water treatment filters, a bracket, a wrench and a set of fittings for connection. The kit includes 2 pcs. fitting M G1/2" - 1/4" tube for connecting the flask with water supply line and with the Device.	1	
2	Post filter with activated carbon, replaceable, for Slim Line 10" flask	1	

Post filter with activated carbon is installed in the Slim Line 10" flask. To install the filter and connect the flask you need (Fig. 19.1):

- ◆ The flask is attached to the wall using a bracket (6) and screws;
- ◆ In the unscrewed part of the flask (3) the cartridge with carbon post-filter is installed, then the upper and lower parts of the flask are tightly screwed to each other on the thread;
- ◆ The corresponding threaded parts of the connecting fittings (4,5) are screwed into the threaded plugs of the flask (1,2). Threaded connections are sealed;
- ◆ CATHOLYTE outlet tube from the Device (6, Fig. 8) is cut into two parts;
- ◆ According to the water flow direction arrow on the flask body, the first part of the tube coming out of the CATHOLYTE fitting (6, Fig. 8) is connected to the flask water inlet fitting (4);
- ◆ The second part of the tube is connected to the flask water outlet fitting (5) and goes directly to the bath or shower head;
- ◆ All quick-release fittings are fixed with blue fixing clip-locks.



Fig. 19.1. Slim Line 10" flask with fittings.

Important! The activated carbon post filter is a replaceable filter. For the most efficient water treatment, it is recommended to change this filter every time after carrying out the FLUSHING procedure of the EMERALD HOME 250 SPA Device. Before starting the FLUSHING mode, the post filter must be disconnected. Only after the full completion of the FLUSHING mode a new post filter can be connected. After connecting of a new post filter, be sure to drain the first 15 liters of water without its usage.

CONNECTION DIAGRAM OF EMERALD HOME 250 SPA DEVICE WITH POST FILTER.

The procedure for connecting the EMERALD Device is carried out in accordance with the diagram in fig. 19.2 and consists of the following stages:

- ◆ Connecting to the water supply line (4,5);
- ◆ Connecting the pure antioxidant water outlet tube and the post filter (6, 6.1);
- ◆ Connecting the Device to the electric network (2,3).

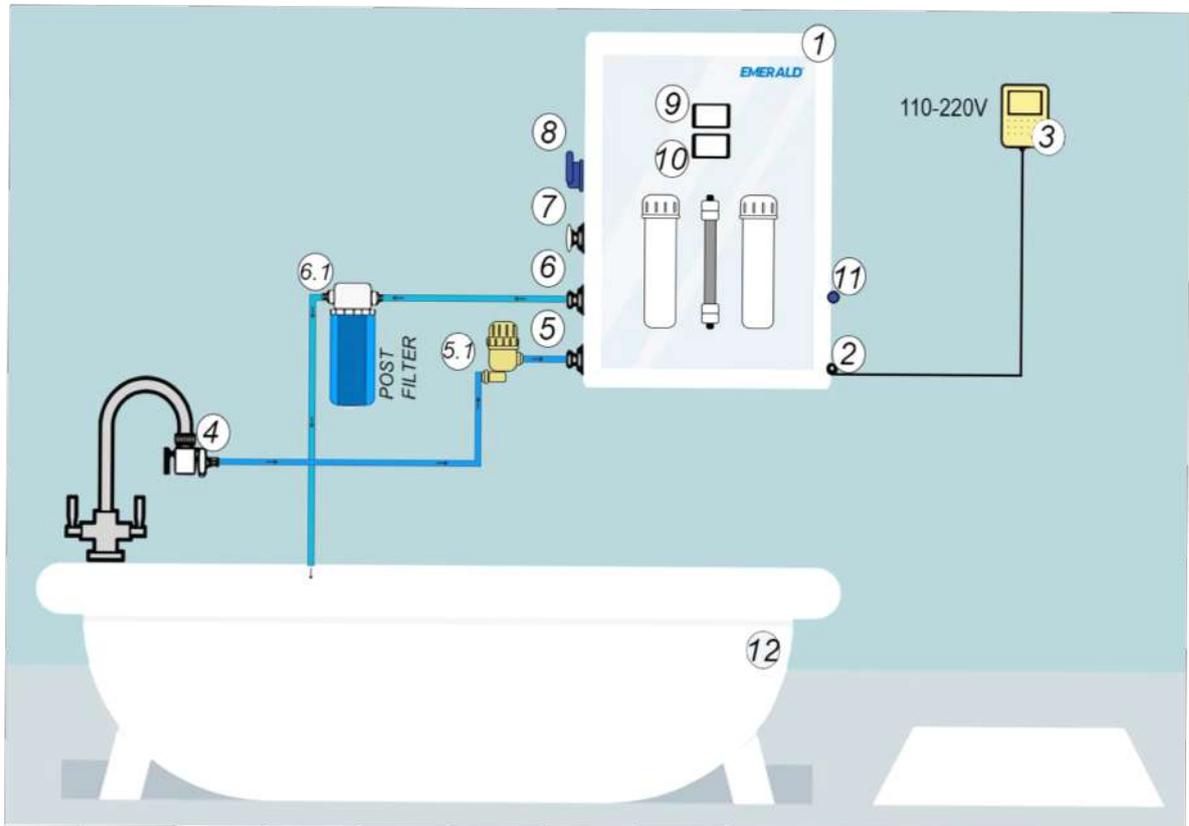


Fig. 19.2 Connecting diagram of EMERALD Device in the bathroom.

1. EMERALD HOME 250 SPA Device;
2. Plug for connecting the network cable to the Device;
3. Power plug for connecting to the electric network (with built-in RCD 30mA);
4. Diverter connected to the faucet spout for supplying tap water to the Device;;
5. INLET fitting for supplying tap water to the Device;
- 5.1. Mud filter for preliminary mechanical water purification (or other system of preliminary water treatment);
6. CATHOLYTE fitting for the outlet of purified antioxidant water (directly to the bathroom or to shower head (6, Tab. 5);
- 6.1. Replaceable activated carbon post filter installed in a Slim Line 10" flask;
7. FLUSHING fitting for supplying flushing solution (only used in FLUSHING mode);
8. CATHOLYTE REGULATOR shutoff valve for regulating the flow rate of the outlet catholyte;
9. Electronic display with ammeter and voltmeter;
10. Electronic display with water temperature sensor;
11. FLUSHING ON/OFF button;
12. Bath/shower.

APPENDIX № 2. CERTIFICATES

1. CE CERTIFICATE OF CONFORMITY OF THE EUROPEAN UNION

شهادة - 증명서 - Certificat - Сертификат - 證明書

Form QAT_10-M05, version 00, effective since March 25th, 2020



Certificate of Compliance

No. 0D201203.EEW054

Certificate's Holder: EMERALD ECOTECHNOLOGIES, LLC.
600026, Russia, Vladimir city, Kulbysheva street, 26A

Certification ECM Mark: 

Product: Devices for Purification and Electrochemical Treatment of Water and Aqueous Solutions

Brand: EMERALD

Model(s): PRO, HOME, OFFICE, COTTAGE, SPA, STEL, VENDING, ECO, BIO, AQUA

Verification to: Standard:
EN 60335-1:2012/A13:2017, EN 55014-1:2017,
EN 55014-2:2015, EN 61000-3-2:2014,
EN 61000-3-3:2013

related to CE Directive(s):
2014/35/EU (Low Voltage)
2014/30/EU (Electromagnetic Compatibility)

Remark: This document has been issued on a voluntary basis and is a product of the manufacturer. It is our opinion that the technical documentation received from the manufacturer is satisfactory for the requirements of the ECM Certification Mark. The ECM Certification Mark above can be affixed on the products according to the ECM regulation about its use and its use.

Additional information: Additional information about the marking:
The manufacturer is responsible for the CE-Marking process, and if necessary, must refer to a Notified Body. This document has been issued on the basis of the regulation on ECM Voluntary Mark for the certification of products. RG01_ECM rev.3 available at www.entecema.it

Issuance date: 03 December 2020
Expiry date: 02 December 2025

Reviewer
Technical expert
Amanda Payne



Addressee
ECM Service Director
Luca Boganni



Ente Certificazione Macchine Srl
Via C.A. Bello, 243 - Loc. Castello di Serravalle - 40053 Valsamoggia (BO) - ITALY
☎ +39 051 6705141 📠 +39 051 6705156 🌐 info@entecema.it 🌐 www.entecema.it

2. RoHS EUROPEAN UNION DECLARATION OF CONFORMITY



EC Declaration of Conformity

No: DaC.047.2020 Dated «03» December 2020

RoHS Directive (2011/65/EU)

of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast).

Manufacturer: EMERALD ECOTECHNOLOGIES LLC

Legal address: 600026, Russia, Vladimir city, Kulbysheva street, 26A

Product: Devices for purification and electrochemical treatment of water and aqueous solutions

Brand: EMERALD

Type/Model: PRO, HOME, OFFICE, COTTAGE, SPA, STEL, VENDING, ECO, BIO, AQUA

Pb, Hg, Cd, Cr (VI), PBBs and PBDEs could not be detected over the limited by the European Directive 2011/65/EU (recast).

This is to certify that, on the basis of the tests, the above described object of the declaration corresponds to the "Directive" 2011/65 / EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast). It is possible to use RoHS marking demonstrate the compliance with protecting environment.

Signed for and on behalf of the manufacturer by

Authorized representative: Business Mission GmbH

Address: Locumer Straße 55, 30519 Hannover, Germany

Name and function: Director Julia Tsybulevska

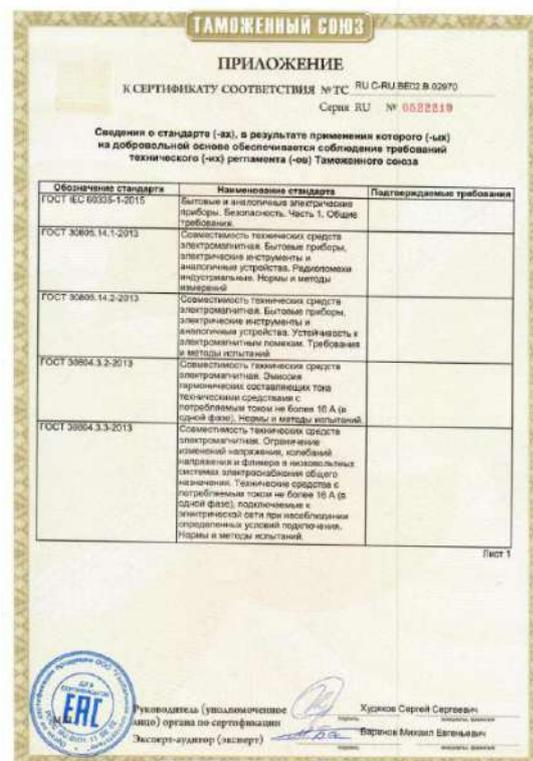
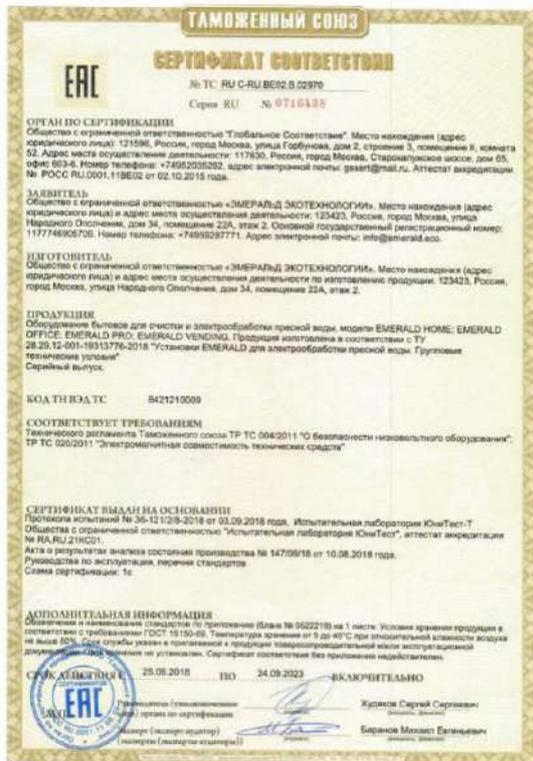
Signature / Stamp:  

RoHS

3. ISO 9001-2015 CERTIFICATE OF CONFORMITY OF THE QUALITY MANAGEMENT SYSTEM



4. EAC CERTIFICATE OF CONFORMITY OF THE EAEU CUSTOMS UNION



5. HYGIENIC CERTIFICATE, EXPERTS' REPORT FROM RUSSIAN GOVERNMENT OFFICIALS (ROSPOTREBNADZOR)

УТВЕРЖДАЮ
Главный врач
ФБУЗ «Центр гигиены и эпидемиологии
в Владимирской области»,
руководитель органа инспекции
М.В. Буланов

УТВЕРЖДАЮ
Генеральный директор
ФБУЗ «Центр гигиены и эпидемиологии
в Владимирской области»
А.А. Брытенок

№ 5712 от 22.11.2018 г.

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ № 907

1. Наименование продукции: Оборудование для очистки и электрообработки пресной воды, торговая марка «EMERALD», модели EMERALD HOME, EMERALD OFFICE, EMERALD PRO, EMERALD BUSINESS.

2. Организация-изготовитель: Общество с ограниченной ответственностью «ЭМЕРАЛД ЭКОТЕХНОЛОГИИ», 123423, г. Москва, ул. Народного Ополчения, дом 34, этаж 2, помещение 22А.

3. Поставитель заключению: Общество с ограниченной ответственностью «ЭМЕРАЛД ЭКОТЕХНОЛОГИИ», 123423, г. Москва, ул. Народного Ополчения, дом 34, этаж 2, помещение 22А.

4. Представленные материалы:

- ТУ 28.29.12-001-19313776-2018;
- Сертификат соответствия № ТС RU С-RL.ВЛ.В.02970 от 25.09.2018;
- Декларация о соответствии ЕАЭС № RU.Д.ВЛ.МОН.0.00712/18 от 26.10.2018;
- Протокол лабораторных исследований ИК-анализа лабораторного центра «Центр государственного санитарно-эпидемиологического надзора» Управления логистики Президента Российской Федерации (ФГУБУ «Центр - тоссанализатор»), АТЕСТАТ № РОСС RU.0001.510440 Федеральной службы по аккредитации (Срок действия с 26 октября 2013 г. по 26 декабря 2018 г.) № ИФП-П800-11-18 от 13 ноября 2018 г.;
- Протокол лабораторных исследований ИК-анализа Лаборатория АНО «Независимый институт анализа и сертификации (группа аккредитации № РОСС RU.0001.21115, срок действия до 24.02.2019 г.) № 124 С - 127 С от 02.04.2018 г.

5. Область применения продукции: доочистка пресной воды от органических примесей, микроорганизмы и ионов тяжелых металлов, снижение окислительно-восстановительного потенциала пресной воды.

Исходные материалы № 907, от 22.11.2018 г., страница 1 из 4
04.12.01.2018

6. Цель экспертизы: установление соответствия (несоответствия) продукции требованиям раздела 3 «Требования к материалам, деталям, оборудованию, используемым для водочистки и водоподготовки», раздела 7 «Требования к продукции машиностроения, приборостроения и электротехнико» главы II Единых санитарно-эпидемиологических и гигиенических требований к товарам, подлежащим санитарно-эпидемиологическому надзору (контролю), утвержденных решением Комиссии Таможенного союза от 28.05.2010 г. № 299.

7. Основание проведения санитарно-эпидемиологической экспертизы: заявление-ходатайство № 1249 от 21.11.2018 г.

8. Проведение санитарно-эпидемиологической экспертизы: поручено: эксперту, врачу по общей гигиене ОКГ и ГТ ФБУЗ «Центр гигиены и эпидемиологии в Владимирской области» Брытенок А.А.

9. Порядок проведения работ: Санитарно-эпидемиологическая экспертиза проводится по соответствию классификации раздела 3 «Требования к материалам, деталям, оборудованию, используемым для водочистки и водоподготовки» раздела 7 «Требования к продукции машиностроения, приборостроения и электротехнико» главы II Единых санитарно-эпидемиологических и гигиенических требований к товарам, подлежащим санитарно-эпидемиологическому надзору (контролю), утвержденных решением Комиссии Таможенного союза от 28.05.2010 г. № 299 на основании представленных результатов лабораторных исследований продукции, данных документально-технической документации изготовителя продукции.

10. Результаты лабораторных и (или) инструментальных исследований:

Исследования по 7 разделу:

- Напряженность электрического поля – не более 18 кВ/м;
- Напряженность электрического поля частотой 50 Гц – не более 0,5 кВ/м;
- Надвигая магнитного поля частотой 50 Гц, мГс, не более – 5;
- Эквивалентные уровни шума, дБА – не более 45;
- Выборки общие:
 - Корректированный уровень вибростойкости, дБА – не более 62;
 - Корректированный уровень виброускорения, дБА – не более 20.

Исследования по 3 разделу:

Корпус (ИВУ):

- Исследование водной вытяжки (дистиллированная вода, температура 25°С, время экспозиции 3 суток): Запах, запах – не более 2; Мутность, ЕМФ – не более 2,6; Пеннообразование – отсутствие; стабильной крупнопузырчатой пены, высота мелкопузырчатой пены у стенок цилиндра – не выше 1 мм; Привкус – отсутствие; Цветность, градусы – 20; Наличие осадка – отсутствие; Волновой показатель (рН) в пределах 6 – 9; Величина перманганатной окисляемости, мг/л – не более 5;
- Миграция химических веществ в модельную среду (дистиллированная вода, температура 25°С, время экспозиции 3 суток), мг/л, не более:
 - Формальдегид – 0,05; Спирт метиловый – 3; Спирт этиловый – 0,1; Спирт изобутиловый – 0,15; Ацетальдегид – 0,2; Этанолсигнал – 0,2; Ацетин – 2,2.

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Распределитель (полиэтилен):

- Исследование водной вытяжки (дистиллированная вода, температура 25°С, время экспозиции 3 суток): Запах, запах – не более 2; Мутность, ЕМФ – не более 2,6; Пеннообразование – отсутствие; стабильной крупнопузырчатой пены, высота мелкопузырчатой пены у стенок цилиндра – не выше 1 мм; Привкус – отсутствие; Цветность, градусы – 20; Наличие осадка – отсутствие; Волновой показатель (рН) в пределах 6 – 9; Величина перманганатной окисляемости, мг/л – не более 5;
- Миграция химических веществ в модельную среду (дистиллированная вода, температура 25°С, время экспозиции 3 суток), мг/л, не более:
 - Формальдегид – 0,05; Спирт метиловый – 3; Спирт этиловый – 0,1; Спирт изобутиловый – 0,15; Ацетальдегид – 0,2; Этанолсигнал – 0,2; Ацетин – 2,2.

Препаратная (резина):

- Исследование водной вытяжки (дистиллированная вода, температура 25°С, время экспозиции 3 суток): Запах, запах – не более 2; Мутность, ЕМФ – не более 2,6; Пеннообразование – отсутствие; стабильной крупнопузырчатой пены, высота мелкопузырчатой пены у стенок цилиндра – не выше 1 мм; Привкус – отсутствие; Цветность, градусы – 20; Наличие осадка – отсутствие; Волновой показатель (рН) в пределах 6 – 9; Величина перманганатной окисляемости, мг/л – не более 5;
- Миграция химических веществ в модельную среду (дистиллированная вода, температура 25°С, время экспозиции 3 суток), мг/л, не более:
 - Пурал Д - 1; Капазол - 3; Дибутилфталат - 0,2; Цинк - 5.

Мембрана (полиэтилэфон):

- Исследование водной вытяжки (дистиллированная вода, температура 25°С, время экспозиции 3 суток): Запах, запах – не более 2; Мутность, ЕМФ – не более 2,6; Пеннообразование – отсутствие; стабильной крупнопузырчатой пены, высота мелкопузырчатой пены у стенок цилиндра – не выше 1 мм; Привкус – отсутствие; Цветность, градусы – 20; Наличие осадка – отсутствие; Волновой показатель (рН) в пределах 6 – 9; Величина перманганатной окисляемости, мг/л – не более 5;
- Миграция химических веществ в модельную среду (дистиллированная вода, температура 25°С, время экспозиции 3 суток), мг/л, не более:
 - Бензол - 0,01; Фенол - 0,001.

ВЫВОДЫ ЭКСПЕРТА:

По результатам проведенных испытаний типового представителем образца, экспертами представленной документации, модельная продукция «Оборудование для очистки и электрообработки пресной воды» торговой марки «EMERALD», модели EMERALD HOME, EMERALD OFFICE, EMERALD PRO, EMERALD VENDING, соответствует требованиям главы II Единых санитарно-эпидемиологических и гигиенических требований к товарам, подлежащим санитарно-эпидемиологическому надзору (контролю), утвержденным решением Комиссии Таможенного союза от 28.05.2010 г. № 299 (раздел 3 и 7).

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Удостоверяю законность применения, хранения, транспортирования, маркировки, утилизации, периодического лабораторного контроля продукции изделия быть и соответствия с действующим санитарным законодательством РФ, подлежащим Единым санитарно-эпидемиологическим и гигиеническим требованиям к товарам, подлежащим санитарно-эпидемиологическому надзору (контролю), требованиями нормативной документации изготовителя - ТУ 28.29.12-001-19313776-2018.

Эксперт: врач по общей гигиене
ФБУЗ «Центр гигиены и эпидемиологии
в Владимирской области»
Технический директор органа инспекции

А.А. Брытенок
С.Е. Воробьева

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