

# **EMERALD<sup>®</sup>**

## **OPERATING MANUAL**

# **EMERALD HOME 60 OFFICE DEVICE**

FOR FRESH WATER PURIFICATION AND ELECTROCHEMICAL TREATMENT



## CONTENTS

<b>1. INTRODUCTION.....</b>	<b>2</b>
<b>2. INFORMATION ABOUT ANTIOXIDANT WATER - CATHOLYTE .....</b>	<b>3</b>
Theoretical concepts.....	3
Practical application of catholyte .....	3
<b>3. PRINCIPLES OF WATER TREATMENT.....</b>	<b>5</b>
The main stages of water treatment in EMERALD Device.....	7
<b>4. PRECAUTIONARY MEASURES.....</b>	<b>8</b>
<b>5. DEVICE FEATURES .....</b>	<b>10</b>
<b>6. CONTENTS OF DELIVERY .....</b>	<b>11</b>
<b>7. DEVICE CONNECTION .....</b>	<b>13</b>
Description of the main elements on the EMERALD Device casing.....	13
General rules for handling John Guest® type quick-release fittings .....	14
Connecting EMERALD Device under sink with clean water tap.....	16
Connecting the t-bend with a ball valve to the water supply line. ....	18
Connecting the water pre-treatment system.....	19
Connecting the EMERALD Device to the electrical network.....	20
<b>8. DEVICE OPERATION .....</b>	<b>21</b>
Basic operating modes .....	21
Device operation indication .....	22
<b>9. DEVICE MAINTENANCE .....</b>	<b>23</b>
Auxiliary elements for carrying out FLUSHING mode .....	24
Preparing Device for FLUSHING mode.....	25
Preparing the citric acid flushing solution .....	25
FLUSHING Mode.....	26
EMERALD Device connection diagram at CIRCULATION and HOLD-UP stages .....	29
EMERALD Device connection diagram at the WASHING-OUT stage .....	30
Mud filter maintenance .....	31
<b>10. TROUBLESHOOTING GUIDE .....</b>	<b>32</b>
<b>11. WARRANTY .....</b>	<b>33</b>
<b>12. TRANSPORT AND STORAGE.....</b>	<b>34</b>
<b>13. ACCEPTANCE AND SALE CERTIFICATE .....</b>	<b>35</b>
<b>APPENDIX № 1. CERTIFICATES .....</b>	<b>36</b>

**Important!** Before using the EMERALD HOME 60 OFFICE Device (hereinafter referred to as «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 60 OFFICE 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 60 OFFICE Device is a professional compact system to produce from ordinary tap water in flow-through mode pure 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.

EMERALD HOME 60 OFFICE Device is used in apartments, office buildings, government agencies, fitness and spa centers, kindergartens, schools and universities, catering facilities, medical and preventive institutions to obtain clean and biologically beneficial antioxidant drinking water.

EMERALD HOME 60 OFFICE 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 Rosпотrebnadzor, EAC certificate of conformity, GOST R certificate of conformity.

EMERALD HOME 60 OFFICE 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 60 OFFICE 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  $\text{HO}_2^-$ ,  $\text{O}_2^-$ ,  $\text{OH}^-$ .

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 60 OFFICE 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 60 OFFICE 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  $(+100) \div (+250)$  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.

## *SOME APPLICATIONS OF CATHOLYTE*

**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 60 OFFICE 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.

### 3. PRINCIPLES OF WATER TREATMENT

The EMERALD Device is high performance and runs on cold tap water, producing 40 to 60 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 2 (two) 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.

Auxiliary catalytic filter, consisting of natural activated carbon, serves for final water purification from oxidized organic and organochlorine compounds (including herbicides, pesticides, surfactants, phenols, antibiotics, antidepressants, hormones).

Auxiliary electrokinetic filter, consisting of foamed polypropylene, is used for fine mechanical cleaning of impurities, heavy metal hydroxides, oxidized forms of iron, manganese, hydrogen sulfide.



**Fig. 1. 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 MB-11 electrochemical modules in the Device MB-11 have a long service life (more than 2 million liters of treated water) and 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 consisting of natural activated carbon

- ◆ 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 consisting of foamed polypropylene

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

#### 4. 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 cold 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.
- ◆ To ensure the declared characteristics of purified water, when the Device is idle for more than 10 hours, drain the first 2 liters of purified water (approximately 2 minutes) when the device is turned on in the OPERATION mode. If the Device is idle for a long time (more than 72 hours), the first 15 liters of purified water should be drained (approximately 15 minutes) when the Device is switched on in the OPERATION mode.
- ◆ Do not run warm or hot water through the Device, as this may damage it (see DEVICE OPERATION section).
- ◆ Do not use for food purposes the first 10 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.

## 5. DEVICE FEATURES

**Table 1. Specifications**

Recommended productivity, no more than, liters per hour	60
Water cooling productivity (5–10 C°), l / h	3
Water heating productivity (85–95 C°), l / h	5
Power consumption during water treatment, no more than, W	100
Power consumption during water cooling, W	100
Power consumption during water heating, W	500
Specific electricity consumption, not more than W* h/l	1.7
Supply voltage - standard socket with grounding (for adapter), V.	110 - 220
Power supply frequency, Hz	50 - 60
The number of electrochemical modules of MB-11 type, pieces	2
Overall dimensions (excluding inlet and protruding parts), WxHxD, mm	260x995x324
Gross weight, kg	17.4
Net weight, kg	14.3

**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

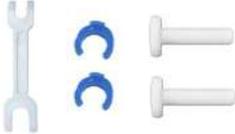
**Table 4. Operating conditions**

Ambient temperature, °C	+5...+40
Relative air humidity (at 25 °C), no more than, %	80
Tap water temperature, °C	+1...+30
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.

## 6. CONTENTS OF DELIVERY

**Table 5. Contents of Delivery**

No.	Item	Number, pc.	Overall view
1.	EMERALD HOME 60 OFFICE Device.	1	
2.	Network cable with an IEC320 C14 plug for connecting the Device to the electrical network (the network cable is built into the Device casing).	1	
3.	EMERALD HOME flushing tank with connection fittings.	1	
4.	A set of connecting tubes: 1/4" tube for quick-release fittings, 4 meters; PVC tube for drain valve, with a clamp, 1 meter.	1	
5.	A set for working with fittings: a wrench for fittings and tubes, a set of spare clips and plugs for 1/4" fittings.	1	
6.	A holder for glasses, with a platform and fixing screws.	1	
7.	Operation Manual.	1	

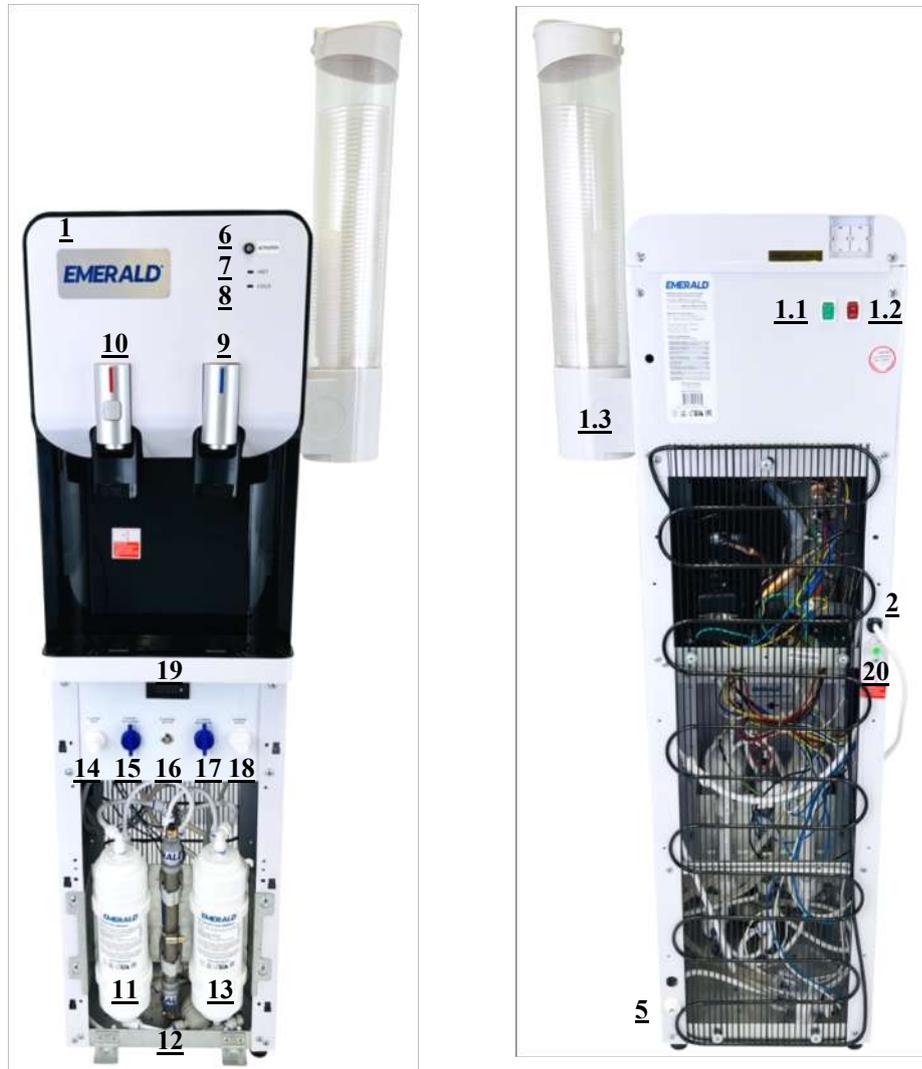
**Table 6. Additional items sold separately**

No.	Item	Number, pc.	Overall view
Add. 1	Filter 1, activated carbon, replaceable, for quick-release fittings 1/4".	1	
Add. 2	Filter 2, mechanical polypropylene foam filter, 5 micron, replaceable, for 1/4" quick-release fittings.	1	
Add. 3	Slim Line 10" flask for water pre-treatment cartridges with a bracket, a wrench and a set of fittings for connection. The kit includes 2 pcs. of M G1/2" - 1/4" tube fittings, for connecting the flask with water supply line and the Device.	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	
Add. 7	Water mineralizer filter (to increase the electrical conductivity of water), replaceable, for a 1/4" tube.	1	

## 7. DEVICE CONNECTION

### Description of the main elements on the EMERALD Device casing

Fig. 6 shows the main elements of the EMERALD HOME 60 Device located on the front and rear of the casing. For user convenience, the numbering of elements in Fig. 6 and on the Device connection diagrams in the OPERATION and FLUSHING modes is the same.



**Fig. 6. Main elements on the EMERALD HOME 60 Device casing.**

1. EMERALD HOME 60 OFFICE Device; 1.1. Water cooling ON/OFF button; 1.2. Water heating ON/OFF button; 1.3. Plastic holder for glasses; 2. Network cable for connecting the Device to the electrical network (built into the Device casing); 5. INLET fitting for water supply to the Device; 6. LED Indicator; 7. Water heating HOT indicator; 8. Water cooling COLD indicator; 9. Cold water outlet tap; 10. Hot water outlet tap; 11. Filter 1, replaceable, activated carbon; 12. MB-11 electrochemical modules; 13. Filter 2, replaceable, foamed polypropylene; 14. FLUSHING INLET fitting for supplying flushing solution to the Device (in FLUSHING mode); 15, 17. FLUSHING REGULATOR valves for regulating water flows in FLUSHING mode; 16. FLUSHING ON/OFF button to turn on/off FLUSHING mode; 18. FLUSHING OUTLET fitting for flush solution outlet from Device (in FLUSHING mode); 19. Electronic display with ammeter and voltmeter; 20. Water drain valve located on the rear of the Device casing.

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

The connection of the 1/4" tubes to the fittings is done manually. John Guest® type quick-release connections allow you to repeat the procedures for connecting/disconnecting the tubes and fittings if necessary. When properly connected, the tube enters the fitting hole by 15-18 mm. 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 to 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!

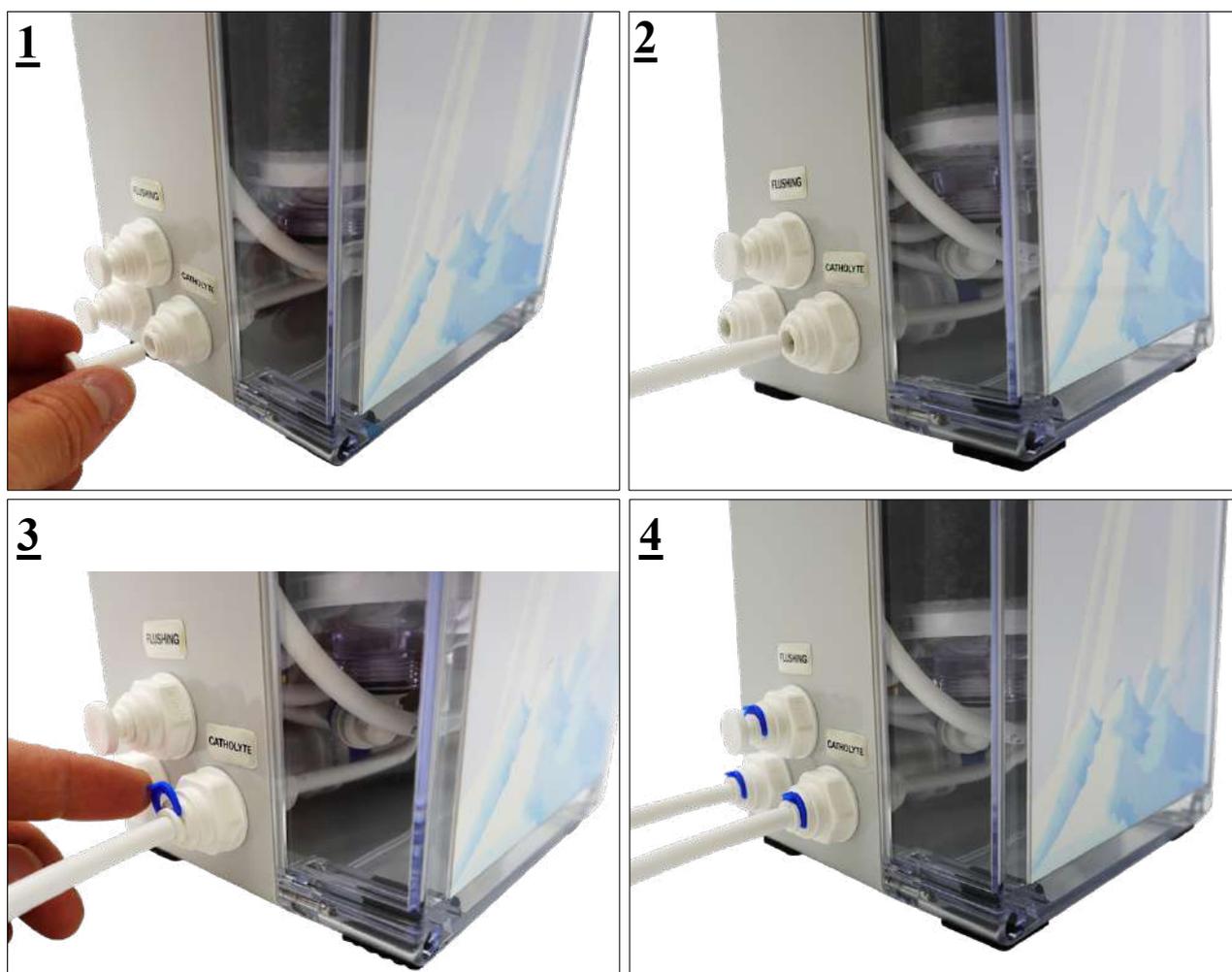


Fig. 7.1. General principles for connecting the tubes to John Guest® quick-release fittings.

## 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.

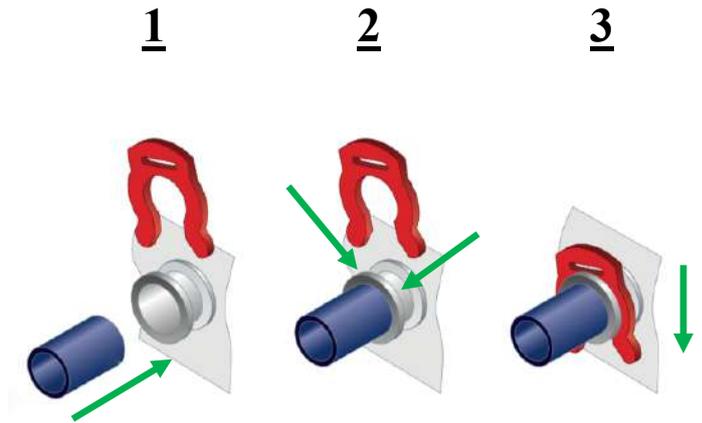


Fig. 7.2. Connecting tubes and closing plugs to quick-release fittings on the Device casing.

## 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).

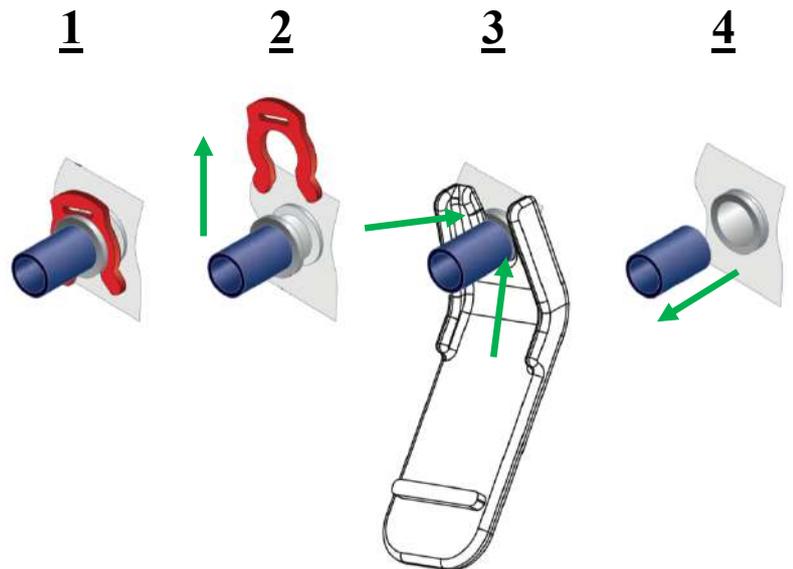


Fig. 7.3. Disconnecting tubes and closing plugs from quick-release fittings on the Device casing.

## **Connecting EMERALD Device under sink with clean water tap**

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

The EMERALD Device is placed unattached on a flat and stable horizontal surface. To connect the EMERALD Device, you need to do it using connecting hoses (1/4" tube and the parts included in the delivery set), in accordance with the diagram in Fig. 8. The white tube is cut into the required lengths already at the installation site. You can cut the tube with a regular kitchen or stationery knife using a cutting board.

**Important!** 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.

Before starting the Device connection procedure, be sure to read the basic principles of connecting the white tube to fittings, described in the General Rules for Handling John Guest® Quick-release fittings

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 Device 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.

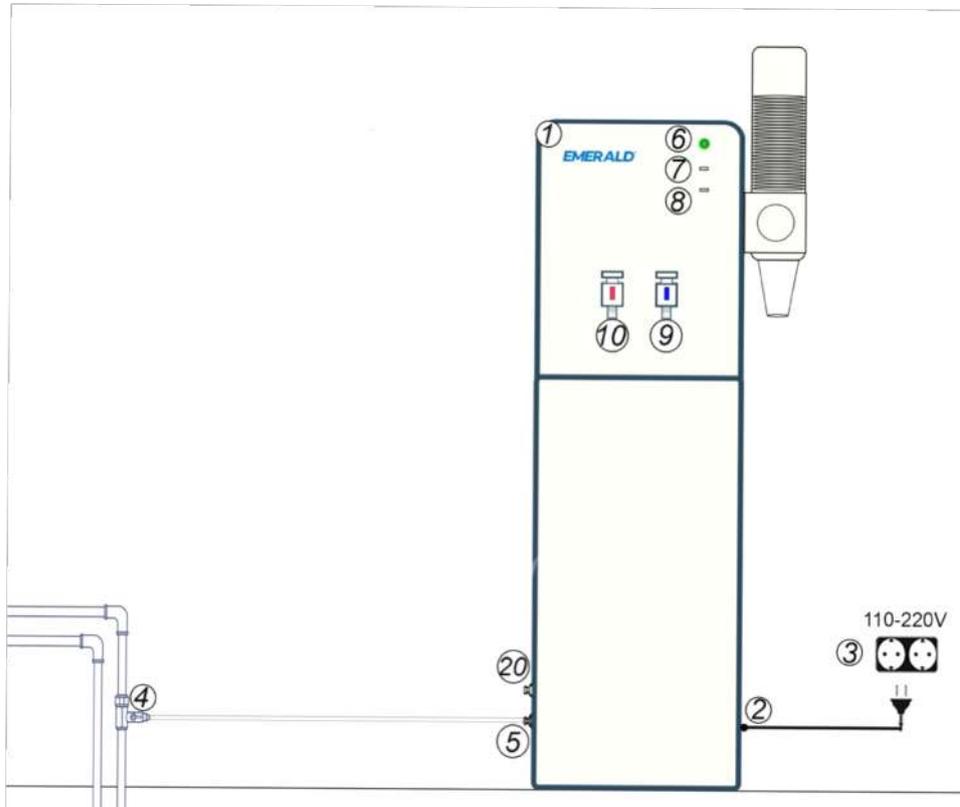
Turn off the cold water supply valve before connecting, and then open the cold water valve on the kitchen faucet to relieve pressure in the pipe.

After the Device is fully connected, make sure that all connections are tight. During installation, pay attention to the fact that the inlet and outlet tubes pass freely along radii to exclude kinks.

## CONNECTION DIAGRAM OF EMERALD HOME 60 OFFICE DEVICE IN OPERATION MODE.

The connection procedure for the EMERALD Device is performed in accordance with the diagram in Fig. 8 and consists of the following stages:

- ◆ Connecting to the cold water pressure line (4,5);
- ◆ Connecting the Device to the electrical network (2,3).



**Fig. 8. EMERALD Device Connecting Diagram in OPERATION Mode.**

1. EMERALD HOME 60 OFFICE Device;
2. Network cable for connecting the Device to the electrical network (built into the casing);
3. Plug to connect the Device to the electrical network;
4. T-bend with a ball valve for supplying water to the Device;
5. INLET fitting for water supply to the Device;
6. LED Indicator;
7. Water heating HOT indicator;
8. Water cooling COLD indicator;
9. Cold water outlet tap;
10. Hot water outlet tap;
11. Filter 1, replaceable, activated carbon;
12. MB-11 electrochemical modules;
13. Filter 2, replaceable, foamed polypropylene;
14. FLUSHING INLET fitting for supplying flushing solution to the Device (not used);
- 15.17. FLUSHING REGULATOR valves for FLUSHING mode (not used);
16. FLUSHING ON/OFF button to turn on/off FLUSHING mode (not used);
18. FLUSHING OUTLET fitting for the flushing solution outlet from the Device (not used);
19. Electronic display with ammeter and voltmeter;
20. Water drain valve located on the rear of the Device casing.

## Connecting the t-bend with a ball valve to the water supply line

The connection is made in accordance with the diagram in Fig. 9:

- ◆ Shut off the cold water supply to the sink, and then open the cold water shutoff valve on the kitchen faucet to relieve pressure in the pipe;
- ◆ When using the flexible connection, unscrew the union nut of the flexible cold water connection (7), through which water is supplied to the faucet. Insert a t-bend with a ball valve (1) into the gap between the cold water line (3) and the flexible hose. If there are no sealing rings (2) at the threaded connections, seal the connections (for example, using Tangit uni-lock<sup>®</sup> plumbing thread);
- ◆ Insert the union nut from the t-bend nipple (4) through the 1/4" tube (5);

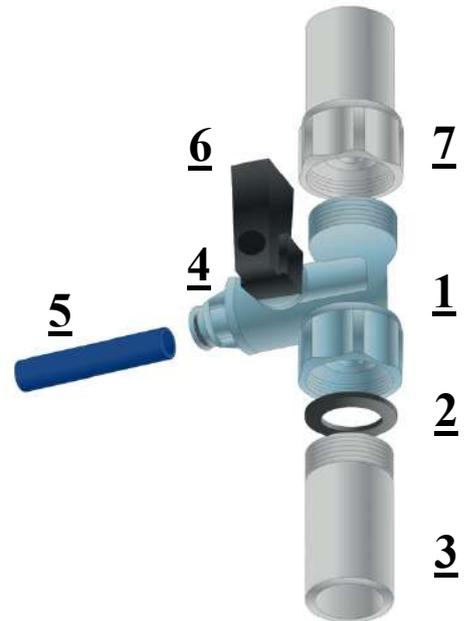


Fig. 9. Connection diagram of a t-bend with a ball valve to the water supply.

**Important!** When connecting these elements, do not overtighten the connections! This can lead to a damage of the t-bend or valve, including a hidden one (with long-term consequences). The amount of plumbing sealing material used must not be excessive! In the event of any mechanical damage to the connection node due to improper installation and use, warranty claims may be rejected.

Water is supplied to the Device through the t-bend by the valve (Fig. 10).

- 1) The vertical position of the valve - no water supply;
- 2) The horizontal position of the valve - water is supplied to the Device.

**Important!** To avoid water hammer on the hydraulic components of the Device, the valve on the t-bend must always be opened smoothly for the water to enter the Device gradually.

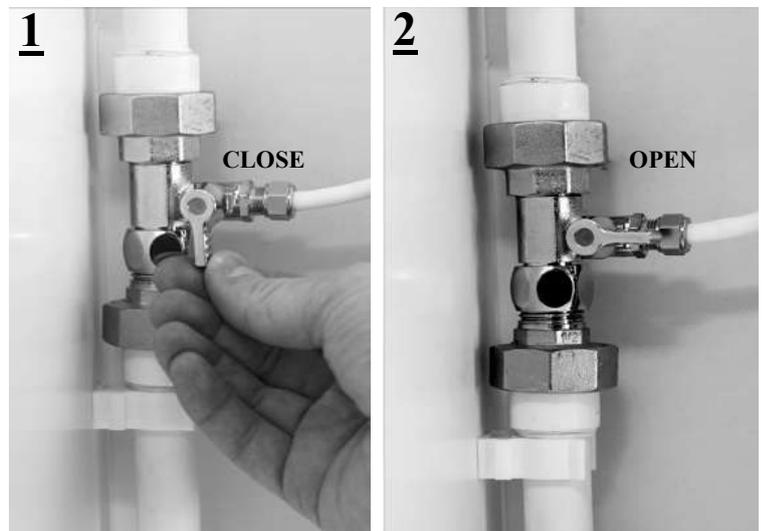


Fig. 10. Water supply to the Device using a t-bend with a ball valve.

## Connecting the water pre-treatment system

In case of non-compliance of the source water with the requirements of SanPiN 2.1.4.1074-01, it is possible to connect a pre-treatment system before the Device (purchased separately, see Table 6). To do this, connect a Slim Line 10" main flask (Fig. 11), before the Device, to the break in the cold water supply pipe, into which, depending on the source water contamination type, various replaceable filters are installed (mechanical polypropylene, ion-exchange or iron removal filter).

Connecting diagram (Fig. 11):

- ◆ The flask is attached to the wall using a fixing plate (6) and screws;
- ◆ The desired cartridge is installed in the unscrewed part of the flask body (3), after which the upper and lower parts of the flask are tightly twisted together along the thread;
- ◆ The corresponding threaded parts of the connecting fittings (4.5) are screwed into the threaded fittings of the flask (1.2). Threaded connections are sealed;
- ◆ The cold water inlet tube (4.5, Fig. 8) is cut into two parts;
- ◆ According to the water flow arrow on the flask body, the first part of the tube coming from the t-bend (4, Fig. 8) is inserted into the flask water inlet fitting (4);
- ◆ The second part of the tube is inserted into the water outlet fitting from the flask (5) and connected to the INLET fitting on the Device body (5, Fig. 8);
- ◆ Blue locking clips are set in all quick-release connections.



**Fig. 11. Slim Line 10" main flask with connection fittings.**

## Connecting the EMERALD Device to the electrical network

To connect the EMERALD Device to the electrical network, plug the network cable (2, Fig. 8) built into the Device case into the electrical socket (3, Fig. 8).

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;

For a description of the main modes, see *Basic operating modes* paragraph, *DEVICE OPERATION* section.

**Important!**

Make sure that the Device is connected in a safe and secure manner to an electrical network with suitable characteristics (see Sections *PRECAUTIONARY MEASURES* and *DEVICE FEATURES*).

Turning off the power supply button, as well as disconnecting the network cable from the plug on the casing or from the electrical socket is only allowed when the Device is turned off (when the Device is in STANDBY mode). Do not turn off the power button or disconnect the network cable while the Device is in OPERATION mode.

To comply with electrical safety measures, the electrical outlet to which the EMERALD Device is connected must work uninterruptedly, have a working ground contact, and also be connected through a residual current device (RCD) or a differential circuit breaker (differential breaker) with a rated leakage current of 30 mA!



**Fig. 12. Connecting the EMERALD Device network cable to the electrical network.**

## 8. DEVICE OPERATION

### Basic operating modes

#### STANDBY Mode.

In STANDBY mode, the Device is pressurized and connected to the cold water pressure line, as well as to the electric network. The cold and hot water outlets are closed (not in use). Water does not flow through the Device. The LED is off (6, Fig. 6). The electronic display is switched off (19, Fig. 6).

#### OPERATION Mode.

To switch the Device into the OPERATION mode, use a glass to press on any of the two cold (9, Fig. 8) or hot water supply taps (10, Fig. 8). As soon as water begins to flow through the Device, the built-in flow sensor turns on the Device, a sound signal is heard, the LED lights up green (6, Fig. 6), the electronic display (19, Fig. 6) starts showing the voltage and current. This mode is the main one for the functioning of the Device. After the water flow through the Device stops, the flow sensor turns off the Device, and the Device automatically switches to STANDBY mode.

In OPERATION mode, the voltmeter always shows, on average, 24V. This is the voltage supplied 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 contamination degree, characterizing the efficiency of water treatment. The optimal values of the ammeter in the OPERATION mode should be in the range **0.5A – 3.0A**.

If the current values are below this range, this means either a low total mineralization of the source water (in this case, you can put an additional filter-mineralizer before the Device - see add. 7, Table 6), or a strong degree of contamination of the Device (in this case, flushing is necessary, see DEVICE MAINTENANCE section).

Some features of the OPERATION mode:

- ◆ **After 800 liters** (approximately 13 hours of operation) of purified water in OPERATION mode, the LED will turn yellow when the Device is turned on, indicating that the Device SHOULD be flushed with an acid solution.
- ◆ **After 1000 liters** (approximately 17 hours of operation) of purified water in OPERATION mode, the LED will turn red when the Device is turned on, indicating that the Device MUST be flushed with an acid solution. Using the Device in the OPERATION mode with red color is not allowed by the rules of this manual.

**Important!** Before switching on the water cooling (1.1, Fig. 6) and/or heating (1.2, Fig. 6) functions, it is essential to bleed air from both cold (9, Fig. 8) and hot water outlet taps (10, Fig. 8) to the moment when water flows from each tap. To do this, press each tap in turn with a glass and wait for the moment when water starts to come out of the tap. This procedure must be carried out with both water outlet taps each time the Device is connected to the pressure water supply line or after maintenance.

The user can collect purified activated water in the OPERATION mode through any of the two water outlet taps, regardless of whether the cooling and/or heating water functions are turned on/off. That is, the functions of cooling and heating water do not affect the functioning of the Device water treatment system in OPERATION mode.

Note, it is not recommended to draw water from two outlet taps at the same time!

## Device operation indication

### LEDs (Fig. 13)

The multi-function *ACTIVATION* LED (top) shows the operating mode the Device is in, and also allows the user to evaluate the resource after which maintenance should be carried out.

The *HOT* indicator lights up red when the water is being heated.

The *COLD* indicator lights up blue when the water is being cooled.



Fig. 13. Indicator LEDs.

### Electronic display (Fig. 14)

The electronic display consists of a voltmeter and an ammeter 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 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 **0.5A – 3A**.

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



Fig. 14. Electronic display with voltmeter (top) and ammeter (bottom).

### Water flow rate

An indirect indicator of the optimal Device operation is a stable water flow rate from the cold (9, Fig. 8) and hot water (10, Fig. 8) outlet taps. The optimal range of water flow through the EMERALD HOME 60 OFFICE Device through one of the outlet taps should be from 1.0 to 1.5 l/min!

During operation, as the electrochemical modules and filter elements of the Device get dirty, the water flow rate may gradually decrease. It is not recommended to use the Device at a water flow rate of less than 0.5 l/min. (30 l/h.), as in this case the water flow sensor may fail, and the Device will turn off from the OPERATION mode even if there is flow from the outlet taps. To restore the normal flow rate, it is necessary to flush the Device and change the replaceable filter elements (see *DEVICE MAINTENANCE* Section).

## 9. DEVICE MAINTENANCE

To achieve the maximum quality of water purification and electrical treatment in the EMERALD HOME 60 Device, as well as to ensure drinking water quality standards, the user should regularly flush the Device with a citric acid solution and change the replaceable filters. With timely and uncomplicated maintenance, your Device will produce clean, high quality antioxidant drinking water with the required characteristics for many years.

The internal elements of the Device (electrochemical modules and auxiliary filter elements) do not require periodic replacement and are regenerated with a citric acid wash solution.

**Important!** Filters 1 and 2 (11,13, Fig. 6) are replaceable filters. For the most efficient water treatment, it is recommended to change these filters each time the FLUSHING mode is carried out.

Maintenance of the EMERALD Device consists in regular flushing of the entire system (including electrochemical modules and auxiliary filter elements) with a citric acid solution to remove accumulated contaminants, as well as changing the replaceable filters. The frequency of the EMERALD Device maintenance depends on the quality of the source water and the mode of operation. On average, when the Device is operated on tap drinking water that complies with SanPiN 2.1.4.1074-01, the Device should be flushed at least once every 3 months or after 1000 liters of purified water (whichever comes first).

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

◆ **After 800 liters** (approximately 13 hours of operation) of purified water in OPERATION mode, the LED will turn orange when the Device is turned on, indicating that the Device SHOULD be flushed with an acid solution.

◆ **After 1000 liters** (approximately 17 hours of operation) of purified water in OPERATION mode, the LED will turn red when the Device is turned on, indicating that the Device MUST be flushed with an acid solution. Using the Device in the OPERATION mode with red color is not allowed by the rules of this manual.

**Important!** Color indication allows the user to evaluate only the maximum allowable amount of purified water, after which it is necessary to flush the Device. Considering the large difference in the quality of the source tap water in different regions, the need for flushing may occur earlier than the indicated dates (before the red LED in the OPERATION mode).

To evaluate the Device contamination degree and the need to flush it more accurately, one should focus on the following factors:

- ◆ Reduction of the current strength indicator on the electronic display (Fig. 14) **by more than 3 (three) times** relative to the initial values (provided that the Device operates on the same water with the same total mineralization);
- ◆ Reducing the water flow rate through the Device **by more than 2 (two) times** (provided that the pressure level in the cold water supply line is maintained at the same level);
- ◆ Deterioration of organoleptic qualities of treated water;

## Auxiliary elements for carrying out FLUSHING mode

### Internal compartment of the device casing

The bottom lid of the Device casing is held by two spring bushings in the lower part of the casing (Fig. 15). In order to open the lid, you need to slightly press the lid down with both hands - the springs will compress and the lid can be removed by shifting it away from the main part of the casing. In order to close the lid, you need to put it back into the two lower spring holes, slightly press the lid down and put it in place, pressing it against the main body of the casing. Do not apply force when performing these procedures! Proper detachment/attachment of the lid does not require excessive force!



Fig. 15. The bottom lid of the Device casing, closed.

### Key positions of FLUSHING REGULATORS in the FLUSHING mode

To carry out the FLUSHING mode, at different stages the following positions of the valves located in the internal compartment of the Device are used (Fig. 16):

- 1) Both valves are open - vertical position (water enters and exits the Device);
- 2) Both valves are closed - horizontal position (water does not enter or exit);
- 3) The left valve is closed (horizontal position) and the right valve is open (vertical position) - water does not enter the Device, but the remaining water can drain from the hydraulic system);



Fig. 16. Key positions of the FLUSHING REGULATORS in FLUSHING mode.

### Water drain valve from Device

To drain the water from the Device, there is a drain valve on the back of the casing (Fig. 17).

- ◆ To open the valve and drain the water: place a tank with water at least 20 liters in volume to the drain valve; unscrew the plastic clamping nut 1; remove the plug from the hole of the drain valve 2; if necessary, put a silicone hose on the threaded part of the drain valve and fix it with a clamp 3; drain the water.
- ◆ To close the valve: insert the plug into the drain hole of the valve; tighten the plastic clamping nut.



Fig. 17. Drain valve on the back of the Device casing.

## Preparing Device for FLUSHING mode

### Before switching the Device to FLUSHING mode:

- ◆ Close the tap on the t-bend (1, Fig. 10) installed in the water supply line;
- ◆ Open the casing lid (Fig. 15);
- ◆ Set the FLUSHING REGULATOR valves to position 3 (Fig. 16);
- ◆ Remove the plug from the FLUSHING INLET fitting (14, Fig. 6). However, it is NOT necessary to remove the plug from the second FLUSHING OUTLET fitting (18, Fig. 6) at this stage!
- ◆ Put any convenient tank, at least 20 liters in volume (24), to the drain valve (20), to collect the outgoing liquid;
- ◆ Open the drain valve to remove the bulk of the water from the Device (Fig. 17);
- ◆ After the drain valve has been opened and the bulk of the water has flown out, press the FLUSHING ON/OFF button (16, Fig. 6) once to turn on the pump and remove any remaining water from the Device. After pressing the button once, the LED (6, Fig. 6) will turn blue, and the built-in pump will start working, removing residual water from the Device through the drain valve. Before pressing the button and turning on the pump, make sure that all the previous phases have been completed!
- ◆ After 60 seconds from the moment of pressing the button, when the remaining water has already left the Device, press the FLUSHING ON/OFF button (16, Fig. 6) once more to turn off the pump;
- ◆ After turning off the pump, disconnect the Device from the electric network by unplugging the power cable from the electrical outlet.
- ◆ Insert a plug into the valve drain hole (20) and tighten the plastic clamp nut (Fig. 17). Discharge all the liquid that has come out of the Device into the tank (24) into the drain;

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 water from the Device, so it is not recommended to use the switched on pump in this mode for more than 60 seconds!

### Preparing the citric acid flushing solution

To carry out the EMERALD Device flushing procedure, it is necessary to prepare one liter of citric acid flushing solution in the EMERALD HOME flushing tank (3, Table 5). The citric acid flushing solution is prepared at the rate of 100 grams of citric acid per one liter 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!

## FLUSHING Mode

To start the FLUSHING mode, the EMERALD Device must be connected according to the diagram in fig. 19 and be in STANDBY mode. All hydraulic and electrical connections must be securely fixed. The flushing tank must be placed on a flat and stable surface (for example, on a worktop next to the sink, on the floor, or on the bottom shelf of the sink cabinet).

The **FLUSHING** mode is carried out semi-automatically and consists of three main stages:

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

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

3) **WASHING-OUT** the Device with plain cold tap water. At this stage, the Device is connected according to the diagram in Fig. 20 for washing out dissolved contaminants and residues of the flushing solution from the Device with water.

### *CIRCULATION AND HOLD-UP STAGES*

Before starting the CIRCULATION and HOLD-UP stages, the user must disconnect the old replaceable Filters 1 and 2 and connect 1/4" tube pieces instead (see Fig. 18). New filters should be connected only after the WASHING-OUT stage has been completed.

To turn on the FLUSHING mode, press the FLUSHING ON/OFF button once (16, Fig. 19). After pressing the button, the LED turns blue, and the built-in pump starts to work and circulate the flushing solution through the Device. Then, for **20 minutes**, the Device works in automatic mode, alternating between the CIRCULATION and HOLD-UP stages. This procedure consists of 4 similar consecutive cycles, each lasting for 5 minutes and including:

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

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



Fig. 18. EMERALD Device connection example in FLUSHING mode, CIRCULATION and HOLD-UP stages.

## *WASHING-OUT STAGE*

At this stage, the Device is connected according to the diagram in Fig. 20 for washing out dissolved contaminants and residues of the flushing solution from the internal hydraulic elements of the Device with cold tap water.

To start the WASHING-OUT stage (Fig. 20):

- ◆ Disconnect the flushing tank from the Device;
- ◆ Set plugs in fittings 14 and 18;
- ◆ Turn the FLUSHING REGULATOR valves to the open position 1 (Fig. 16);
- ◆ Put any convenient tank (24) at least 20 liters in volume to the drain valve (20) to collect the outgoing liquid;
- ◆ Open the drain valve (20);
- ◆ Slowly open the valve on the t-bend installed in the water supply line (4) to supply water to the Device;
- ◆ Wash the Device with water for **15 minutes**.

During the WASHING-OUT stage, the full-scale OPERATION mode does not start, the LED flashes green, the electrochemical modules are not energized, the current on the ammeter is close to zero.

After 15 minutes, the WASHING-OUT stage ends up automatically and the Device enters the OPERATION mode: there is a sound signal, the LED turns solid green, the electronic display starts showing voltage and current.

## *CONNECTING AND FLUSHING NEW REPLACEABLE FILTERS*

After the completion of the WASHING-OUT stage and the transition of the Device to the OPERATION mode, the user needs to connect new replaceable filters instead of tubes and, according to the connection diagram in Fig. 20, wash the new filters with water. To do this (Fig. 20):

- ◆ Close the valve on the t-bend installed in the water supply line (4);
- ◆ Wait for the bulk of water to drain from the drain valve (20);
- ◆ Turn the FLUSHING REGULATOR valves to the closed position 2 (Fig. 16);
- ◆ Disconnect the tubes (11,13) and replace them with new replacement filters (11 - activated carbon filter, 12 - polypropylene filter);
- ◆ Turn the FLUSHING REGULATOR valves to the open position 1 (Fig. 16);
- ◆ Slowly open the valve on the t-bend installed in the water supply line (4) to supply water to the Device;
- ◆ Wash the new filters for **5 minutes**.

This completes the FLUSHING Mode. Now the user needs to connect the Device again according to the OPERATION mode diagram (Fig. 8). To do so:

- ◆ Close the valve on the t-bend installed in the water supply line (4);
- ◆ Wait for the bulk of water to drain from the drain valve (20);
- ◆ Insert a plug into the valve drain hole (20) and tighten the plastic clamp nut (Fig. 17). Discharge all the liquid that has come out of the Device into the tank (24) to the drain;
- ◆ Connect the Device according to the OPERATION mode diagram (Fig. 8);
- ◆ Insert blue locking clips into all quick-release fittings;
- ◆ Slowly open the valve on the t-bend installed in the water supply line (4) to supply water to the Device;
- ◆ Before turning on the cooling and/or heating functions, bleed air from both cold (9) and hot water (10) outlet taps until water flows from each tap. To do this, press each tap one by one with a glass and wait for the moment when water starts to come out of the tap.

**The Device is ready for use in OPERATION mode!**

#### **Some features of the FLUSHING mode.**

- ◆ The user can pause the FLUSHING mode anytime using the FLUSHING ON/OFF button (16) (press once) and restart it (press once again). This function allows the user, if necessary, to pause the FLUSHING mode (for example, if there are problems 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 and has priority. This allows protecting the user and the Device itself in case of a disturbance in 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 OPERATION mode;
- ◆ To increase the useful life of the EMERALD HOME flushing tank and connecting tubes, we recommend after the FLUSHING mode, to wash these elements thoroughly before the next flushing with warm tap water, dry and remove;
- ◆ 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.

## EMERALD Device connection diagram at CIRCULATION and HOLD-UP stages

The EMERALD Device connecting procedure in the FLUSHING mode is performed in accordance with the diagram in fig. 19 and consists of the following stages:

- ◆ Closing the valve on the t-bend installed in the water supply line (1, Fig. 10);
- ◆ Preparation of flushing citric acid solution in a tank (21);
- ◆ Connecting the flushing tank to the Device;
- ◆ Switching the FLUSHING REGULATOR valves to the closed position 2 (Fig. 16);
- ◆ Setting 1/4" tubes instead of replaceable filters (11.13);
- ◆ Connecting the Device to the electrical network (3).

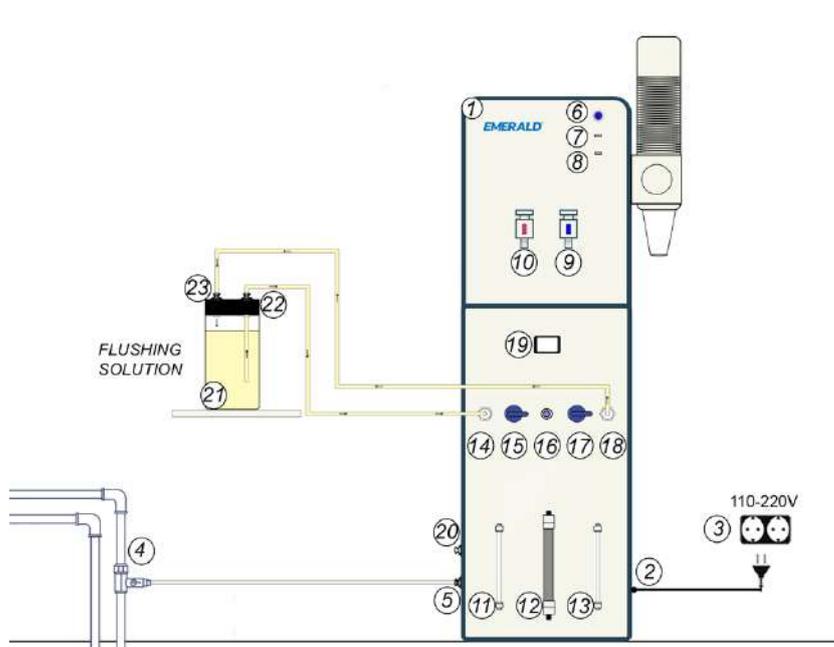


Fig. 19. EMERALD Device connecting diagram in FLUSHING mode, CIRCULATION and HOLD-UP stages.

1. EMERALD HOME 60 OFFICE Device;
2. Network cable for connecting the Device to the electrical network (built into the casing);
3. Plug to connect the Device to the electrical network;
4. T-bend with a ball valve (shut off at stages CIRCULATION AND HOLD-UP);
5. INLET fitting for water supply to Device;
6. Indicator LED;
7. Water heating HOT indicator;
8. Water cooling COLD indicator;
9. Cold water outlet tap;
10. Hot water outlet tap;
11. Tube 1/4", set instead of Filter 1 made of activated carbon;
12. MB-11 Electrochemical modules;
13. Tube 1/4", set instead of Filter 2 made of polypropylene;
14. FLUSHING INLET fitting for supplying flushing solution to the Device;
- 15.17. FLUSHING REGULATOR valves in the closed position 2 (Fig. 16);
16. FLUSHING ON/OFF button to turn on/off FLUSHING mode;
18. FLUSHING OUTLET fitting to let the flushing solution flow out from the Device;
19. Electronic display with ammeter and voltmeter (not used).
20. Water drain valve located on the back of the Device casing (not used).

## EMERALD Device connection diagram at the WASHING-OUT stage

The EMERALD Device connecting procedure at the WASHING-OUT stage is carried out in accordance with the diagram in fig. 20 and consists of the following stages:

- ◆ Setting plugs in fittings 14 and 18;
- ◆ Installing the drain tank (24) and opening the drain valve (20);
- ◆ Switching the FLUSHING REGULATOR valves to the open position 1 (Fig. 16);
- ◆ Opening the valve on the t-bend installed in the water supply line (2, Fig. 10);
- ◆ Connecting the Device to the electrical network (3).

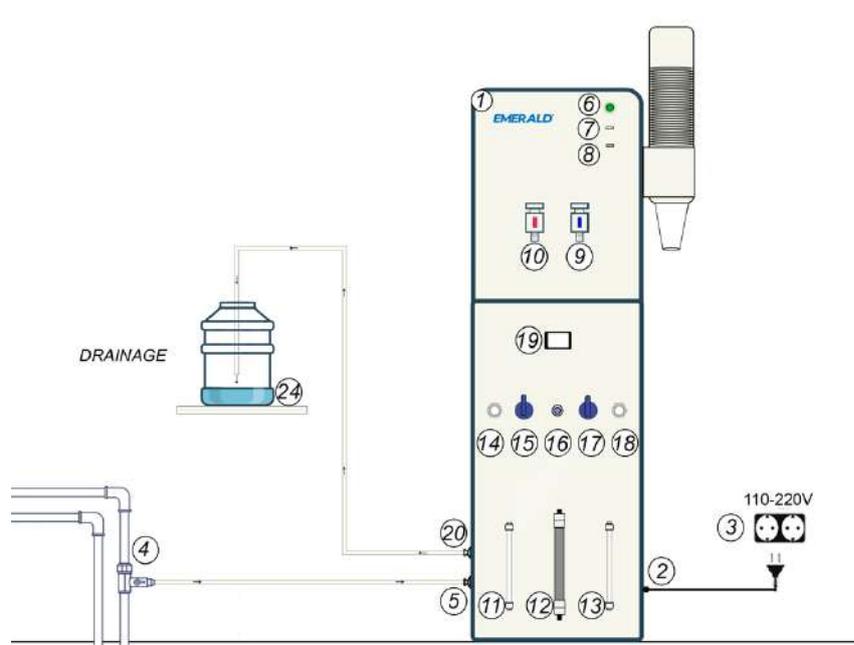


Fig. 20. EMERALD Device connecting diagram in FLUSHING mode, WASHING-OUT stage.

1. EMERALD HOME 60 OFFICE Device;
2. Network cable for connecting the Device to the electrical network (built into the casing);
3. Plug to connect the Device to the electrical network;
4. T-bend with a ball valve (opened at the WASHING-OUT stage);
5. INLET fitting for water supply to the Device;
6. LED Indicator;
7. Water heating HOT indicator;
8. Water cooling COLD indicator;
9. Cold water outlet tap;
10. Hot water outlet tap;
11. Tube 1/4" or new activated carbon Filter 1 (depending on the phase of the WASHING-OUT stage);
12. MB-11 Electrochemical modules;
13. Tube 1/4" or new polypropylene Filter 2 (depending on the phase of the WASHING-OUT stage);
14. FLUSHING INLET fitting - a plug is set;
- 15.17. FLUSHING REGULATOR valves in the open position 1 (Fig. 16);
16. FLUSHING ON/OFF button to turn on/off FLUSHING mode (not used);
18. FLUSHING OUTLET fitting – a plug is set;
19. Electronic display with ammeter and voltmeter (not used);
20. Water drain valve located on the back of the Device casing (used to drain water during the WASHING-OUT stage);
24. Drainage tank at least 20 liters in volume (used to collect water coming out of the drain valve during the WASHING-OUT stage).

## Mud filter maintenance

During the maintenance of the Device, it is also necessary to inspect and, if needed, clean the stainless steel filter mesh (2, Fig. 21) built into the body of the mud filter (1 and 3, Fig. 21) located in the lower parts of the Device casing, under electrochemical modules (12) and replaceable filters (11,13). To do so:

- ◆ Close the valve on the t-bend installed in the water supply line (4);
- ◆ Put any convenient tank (24) To the drain valve (20) to collect the outgoing liquid;
- ◆ Open the drain valve (20);
- ◆ Wait for the bulk of water to drain from the drain valve (20);
- ◆ Turn the FLUSHING REGULATOR valves to the closed position 2 (Fig. 16);
- ◆ Remove the fixing clip-locks and disconnect the mud filter from the tubes;
- ◆ Then unscrew the upper part of the body (1, Fig. 21) of the mud filter (3, Fig. 21) manually or using a wrench;
- ◆ Remove the filter mesh and, if contaminated, thoroughly wash the mesh under running water for 2 minutes;
- ◆ If part of the dirt remains on the filter mesh, it must be soaked for 20 minutes in a citric acid flushing solution. The parameters of the solution and the method of preparation are described in the paragraph *Preparation of the citric acid flushing solution*. For soaking the filter mesh, one can prepare 500 ml of flushing solution from 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 carried out in a solution with a temperature of 60-70°C (not higher!);
- ◆ After soaking the filter mesh in a citric acid solution, one should thoroughly wash it 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 lower part of the mud filter body and screw the upper part of the body onto the lower one until it stops (manually or using an adjustable wrench); Connect the mud filter back to the corresponding tubes, focusing on the arrows of the water flow direction on the filter body;
- ◆ Insert the blue clip-locks into all quick-release fittings;
- ◆ Insert a plug into the valve drain hole (20) and tighten the plastic clamp nut (Fig. 17). Discharge all the liquid from the Device collected in the tank (24) into the drain;
- ◆ Switch the FLUSHING REGULATOR valves to the open position 1 (Fig. 16);
- ◆ Slowly open the valve on the t-bend installed in the water supply line (4) to supply water to the Device;
- ◆ Before turning on the cooling and/or heating functions, bleed air from both cold (9) and hot water (10) outlet taps until water flows from each tap.



Fig. 21. Disassembled mud filter.

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

## 10. TROUBLESHOOTING GUIDE

**Table 7. Troubleshooting guide**

Trouble	Probable Cause	Remedy Method
<p>Device does not turn on.</p> <p>LED and electronic display do not light up.</p>	<p>1. The hydraulic and electrical connections of the Device are joined 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/power supply in the network.</p> <p>4. FLUSHING REGULATORS (15,17) are in the horizontal (closed) position.</p>	<p>1. Join the hydraulic and electrical connections according to the CONNECTION DEVICE section.</p> <p>2. Provide the necessary pressure in the water supply line (see Table 1).</p> <p>3. Check for electrical contact/network power.</p> <p>4. In OPERATION mode, both FLUSHING REGULATORS must be in the vertical (open) position (1, Fig. 16).</p>
<p>Unable to increase water flow rate.</p> <p>The water flow rate in the Device is below normal.</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 in the mud filter is clogged (2, Fig. 21)</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 the replacement filters (see <i>DEVICE MAINTENANCE</i> Section).</p> <p>3. Wash the mud filter (see Section 9, paragraph <i>Mud filter maintenance</i>)</p>
<p>Flushing citric acid solution is not pumped into the Device.</p> <p>It is necessary to pause FLUSHING mode for troubleshooting.</p>	<p>1. The hydraulic and electrical connections of the Device in FLUSHING mode are joined incorrectly.</p> <p>2. The FLUSHING mode can be paused using the FLUSHING ON/OFF button (16, Fig. 19).</p>	<p>1. Join the hydraulic and electrical connections according to the FLUSHING mode diagrams. Pay attention to the fact 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 (16, Fig. 19) once. To start the FLUSHING mode, press the button once more.</p>

## 11. 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](http://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](mailto: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.

## **12. TRANSPORT AND STORAGE**

EMERALD HOME 60 OFFICE 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.

### 13. ACCEPTANCE AND SALE CERTIFICATE

EMERALD HOME 60 OFFICE Device (shortened name EMERALD) complies with Tech. cond. № 28.29.12-001-19313776-2018 and is recognized as serviceable.

**Factory 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 60 OFFICE 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. CERTIFICATES

## 1. CE CERTIFICATE OF CONFORMITY OF THE EUROPEAN UNION

Form QAT\_10-M05, version 00, effective since March 25th, 2020

شهادة - Certificate of Compliance - 증명서 - Сертификат - 證明書



### 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 certification mark above can be affixed on the products according to the ECM regulation about its use and its use.

Additional information need classification 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](http://www.entecema.it)

**CE**

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

Reviewer  
Technical expert  
Amanda Payne



Approver  
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

RoHS

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:** Loozener Straße 55, 30519 Hannover, Germany

**Name and function:** Director Julia Tsybulevska

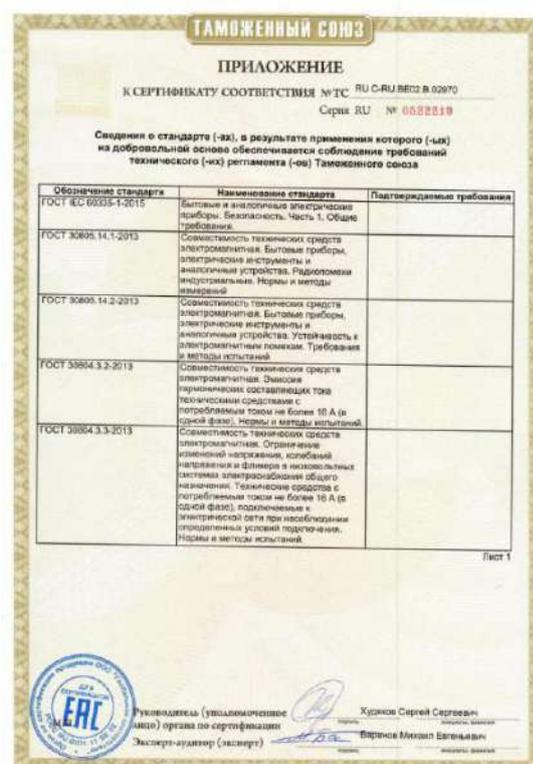
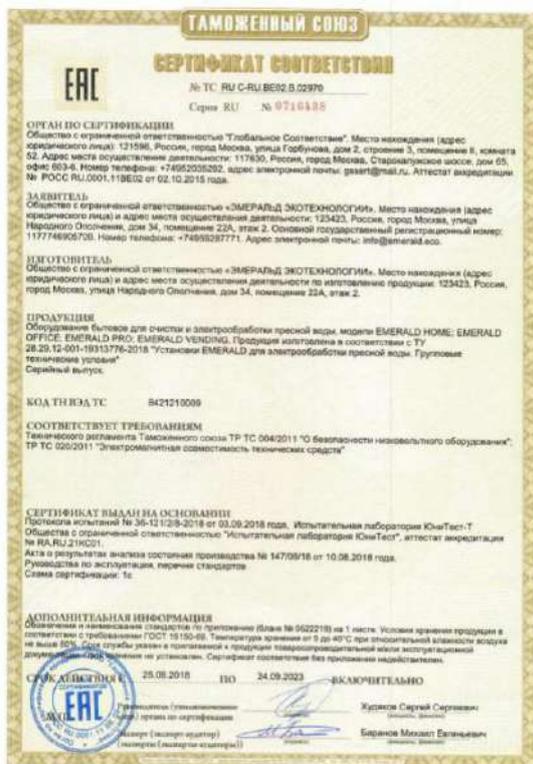
**Signature / Stamp:**  

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)**

  
 Федеральная служба  
 по надзору в сфере защиты прав  
 потребителей и безопасности товаров  
 (Роспотребнадзор)  
 Федеральное бюджетное  
 учреждение здравоохранения  
 «Центр гигиены и эпидемиологии  
 в Владимирской области»  
 Толкачев ул., д.5, г. Владимир, 600003  
 Тел./факс: (4922) 53-88-28  
 E-mail: vlad@fbs.gov.ru  
 ОГРН/ОГРНИП: 502301228243,  
 ИНН/КПП: 3327819090/332601001  
 Адрес в Едином государственном реестре юридических лиц: 50-01-39060

**УТВЕРЖДАЮ**  
 Главный врач  
 ФБУЗ «Центр гигиены и эпидемиологии  
 в Владимирской области»,  
 директор государственной инспекции  
 Роспотребнадзора  
 М.В. Буланов

  
 № 6712 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.CE.01.ВЛА.02970 от 25.09.2018;
- Декларация о соответствии ЕАЭС № RU.D-ВЛ.00011.00712/18 от 26.10.2018;
- Протокол лабораторных исследований Исламкановского лабораторного центра «Центр государственного санитарно-эпидемиологического надзора» Управления администрации Президента Российской Федерации (ФГБУ «Центр государственного надзора»), АТТЕСТАТ № РОСС RU.0001.510440 Федеральной службы по аккредитации (Сред. действия с 26 октября 2013 г. по 26 декабря 2018 г.) № ИОП-18/00-11-18 от 13 ноября 2018 г.
- Протокол лабораторных исследований Исламкановского лабораторного центра «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.

Информационное заключение № 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 водопользования», раздела 7 «Требования к оборудованию, используемому для водопользования и водоподготовки», раздела 7 «Требования к продукции машиностроения, приборостроения и электротехники» 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» Брылевскому А.А.

**9. Порядок проведения работ:** Санитарно-эпидемиологическая экспертиза проводится на соответствие требованиям раздела 3 «Требования к материалам, деталям, оборудованию, используемому для водопользования и водоподготовки», раздела 7 «Требования к продукции машиностроения, приборостроения и электротехники» 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;
- Напряженность магнитного поля частотой 50 Гц, мГц, 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 3;
- 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.

Информационное заключение № 907 от 22.11.2018 г., страница 2 из 4  
 04.12.01.2018

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 3;
- 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.

Противосифон (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 3;
- Миграция химических веществ в модельную среду (дистиллированная вода, температура 25°С, время экспозиции 3 суток), мг/л, не более:
  - Турам Д - 1; Каптан - 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 3;
- 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).

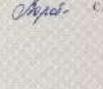
Информационное заключение № 907 от 22.11.2018 г., страница 3 из 4  
 04.12.01.2018

Специалист Бюро технического, химического, биологического, радиационного, ультразвукового лабораторного контроля продукции должны быть в соответствии с действующим санитарным законодательством РФ, подлежащими 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»

  
 А.А. Брылевский

Технический директор органа инспекции

  
 С.Е. Воробьева

Информационное заключение № 907 от 22.11.2018 г., страница 4 из 4  
 04.12.01.2018

