EMERALD®

PROFESSIONAL WATER PURIFICATION
AND ACTIVATION DEVICES

EMERALD HOME
DEVICES

LIVING WATER FOR YOUR HEALTH

ENGINEERED IN
COOPERATION WITH
VITOLD BAKHIR
INSTITUTE

THE UNIQUE DEVICES,
WHICH COMBINE AND ACCELERATE THE NATURAL WATER PURIFICATION AND ACTIVATION PROCESSES

EMERALD HOME devices are professional water purification systems providing crystal-clear drinking water with beneficial antioxidant properties.

EMERALD HOME devices manufactured by EMERALD ECOTECHNOLOGIES LLC represent the most up-to-date electrochemical water treatment equipment for disinfection, purification and conditioning of fresh water by means of electrochemical activation (ECA) technology.

EMERALD HOME devices, depending on the modification, have a productivity from 20 to 5000 liters per hour and are used for purification of tap water, as well as of water from underground and surface water sources (including wells, boreholes, rivers and lakes).

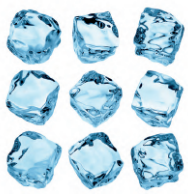
EMERALD HOME devices have been engineered in cooperation with Vitold Bakhir Electrochemical Systems and Technologies Institute and are based on authentic MB-11 and MB-26 electrochemical modules of the new generation.

EMERALD HOME type devices have been produced for both domestic and industrial use for more than 30 years. This equipment is used in city apartments and country houses, in office buildings, fitness and spa centers, in kindergartens, schools and universities, in the hotel and restaurant business, as well as in various health institutions.

EMERALD HOME devices provide a complex scheme of water purification from microbes and microbial toxins, 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.

It is important to note that drinking water from EMERALD HOME devices passes cathode treatment in the MB electrochemical modules and acquires increased biological activity due to the restoration of antioxidant (electron-donor) properties and enrichment with molecular hydrogen. The average ORP and pH parameters of cathode-activated water (catholyte) in EMERALD devices are the following: ORP = (-150)...(-400) mV and pH = 7.0–8.5 units.*

Antioxidant water
Emerald Home
(-150)...(-450) mV



Glacier water
(-150)...(-450) mV

Mother's milk
–70 mV

Orange juice
+50 mV

Green tea
+70 mV

One of the best antioxidant for people is pure cathode-activated water (catholyte). Antioxidants found in foods, vitamins or dietary supplements do not give the desired effect.*

** Antioxidant properties are characteristic of liquids with a negative oxidation-reduction potential (ORP), measured in millivolts (mV).*

Bottled water
+200 mV

Coffee
+300 mV

Basic water filters
+300 mV

Tap water
+350 mV

Sports drinks
+400 mV

Sodas
+550 mV

Most traditional drinks have a positive ORP value, being, in fact, oxidizing agents. Their regular usage gradually acidifies and destroys the body at the cellular level.*

** ORP values of specified liquids may vary and differ from those stated in the tables.*

It's scientifically proven that the use of pure antioxidant water has a beneficial effect on the body, normalizes metabolism and the functioning of internal organs, cleanses wastes and toxins, strengthens the immune system, improves memory and increases the physical vigor.

The uniqueness of water treatment in EMERALD HOME devices lies in the fact that purified water acquires pronounced antioxidant properties, while maintaining a neutral acid-base balance (pH), which makes it safe and suitable not only for antioxidant water therapies to correct oxidation-reduction (REDOX) status of the body and neutralize oxidative stress, but also for regular drinking as part of a daily diet.

Antioxidant water is also used for watering plants and seedlings, watering pets, preparing beverages and herbal teas, washing food, humidifying indoor air, preparing cosmetic masks and drugs.

A new promising direction is the use of pure antioxidant water in the form of baths and showers. This is an effective method of regulating the REDOX status of the body, which allows for a quick release of the body from a state of chronic oxidative stress.

Efficiency and safety of EMERALD type devices has been studied in Russia, Japan, Germany, USA, Great Britain, Czech Republic, India, Mexico, Malta, Cyprus and other countries. The results of the studies are positive and are confirmed by the relevant certificates.*

Purified antioxidant water from EMERALD devices fully complies with international quality standards for drinking water, including the WHO Guidelines for drinking-water quality.

MB-11 ELECTROCHEMICAL MODULE OF THE NEW GENERATION

PURIFICATION METHOD	CRUTIAL WATER TREATMENT CRITERIA						
	Destruction of microbes	Removal of microbial toxins and biofilms	Purification from organic compounds and heavy metals	Purification from iron, manganese and hydrogen sulfide	Taste and smell Improvement	Preservation of useful microelements	Enrichment of water with molecular hydrogen
Standard filters (mechanical and carbon)	–	–	–	–	+	+	–
Reverse Osmosis (RO)	–	–	+	+	+	–	–
Standard filters + UV lamp	+	–	–	–	+	+	–
Reverse osmosis + UV lamp	+	–	+	+	+	–	–
Electrochemical activation	+	+	+	+	+	+	+

** [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, 249-260 p.]*

ECA technology used for water treatment in EMERALD device is a nature-like and reagent-free technique of regulating the physicochemical properties of water

All the processes of water purification and activation in EMERALD devices are as close as possible to what happens with water in living nature since the mechanism of fresh water purification in nature is basically represented by the two main processes: oxidation-reduction (REDOX) reactions and filtration.

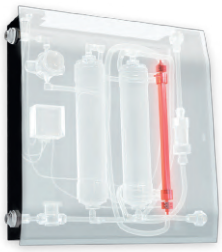
That is why the combination of electrochemical anode and cathode water treatment in line with ecological filtration modules in EMERALD devices provides deep water purification from microbes, microbial toxins, biofilms, heavy metals, iron, manganese, hydrogen sulfide and harmful organic compounds.

ECA water treatment technology is environmentally friendly and safe, since the MB 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.

BASIC WATER TREATMENT SCHEME IN EMERALD HOME DEVICES

STAGE 1. ANODE CHAMBER OF MB ELECTROCHEMICAL MODULE

In the anode chamber oxidation reactions take place, providing:



- Full elimination of microorganisms of all spices and forms (bacteria, viruses, fungi, spores, mycobacteria) including the removal of microbial toxins and biofilms;
- Oxidative destruction of harmful organic compounds: herbicides, pesticides, surfactants, antibiotics, hormones, antidepressants, phenols, oil products;
- Purification from iron, manganese and hydrogen sulfide due to their instant oxidation and further filtering;
- Enrichment of water with oxygen.

STAGE 2. CATALYTIC FILTER

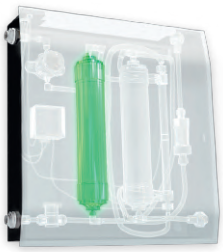
- Water purification from a wide range of organic and inorganic dissolved impurities that were oxidized in the anode chamber of MB module;
- Free chlorine and organochlorine compounds removal;
- Water taste improval and unpleasant odor elimination (also due to the anode removal of phenols and hydrogen sulfide).

STAGE 3. THE CATHODE CHAMBER OF MB ELECTROCHEMICAL MODULE

In the cathode chamber reduction reactions take place, providing:

- Enhancement of antioxidant (electron-donor) properties of water with simultaneous maintaining of neutral pH level;
- Purification from heavy metal ions with their conversion into insoluble hydroxides and subsequent removal on the electrokinetic filter;
- Preservation of all trace elements in the purified water: calcium, magnesium, sodium, potassium, lithium, fluorine, iodine;
- Enrichment of water with hydrogen.

STAGE 4. ELECTROKINETIC FILTER



- Final purification from mechanical impurities after anode and cathode water treatment, including hydroxides of heavy metals and oxidized organic compounds, iron, manganese and hydrogen sulfide;
- Removal of turbidity and impurities for guaranteed water transparency.

GENERALIZED INDICATORS OF WATER TREATMENT EFFICIENCY IN EMERALD HOME TYPE DEVICES*

Disinfection of water at 300 colony-forming units (CFU) per 1 ml in source water, %	99.9999
Odor elimination at 20°C, %	95–99
Anodic oxidation of divalent iron ions at their concentration in source water of 3 mg/l, %	90–99
Surface active substances (surfactants) elimination at their concentration in source water of 3 mg/l, %	90–99
Permanganate index decrease at the initial value in source water of 10 mg/l, %	80–85
Heavy metals, iron hydroxides, manganese and hydrogen sulfide removal, %	80–95
Catalytic conversion of chlorine-oxygen oxidants to hydroperoxide in the catalytic filter, %	60–70
ORP reduction relative to the source water ORP level, mV	(-200)...(-700)
pH changes relative to the source water pH level, units	±1

* *Source: generalized results of studies of water treatment efficiency in EMERALD HOME type devices conducted by authorized scientific centers in Russia (Moscow, St. Petersburg, Izhevsk, Samara, Sergiev-Posad) and abroad (USA, Great Britain, Czech Republic, India, Mexico, Lithuania, Latvia, Kazakhstan, Uzbekistan, Malta, Cyprus). [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, 506–509 p.]*

CATHOLYTE — ANTIOXIDANT WATER

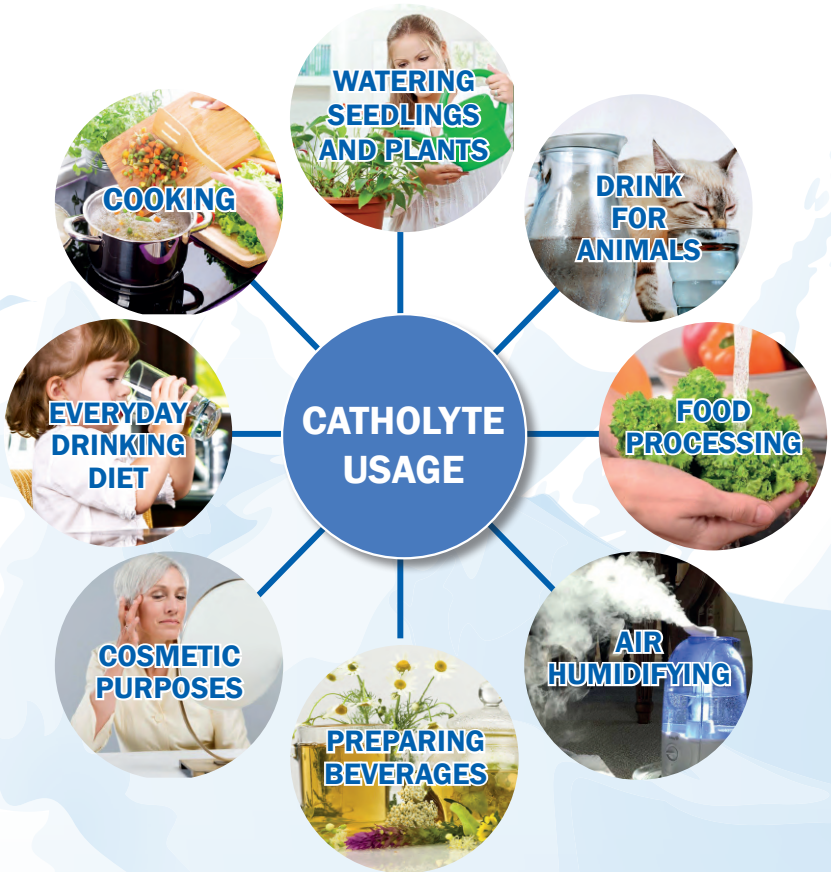
Electrochemically activated catholyte is pure antioxidant water with pronounced electron-donor properties. Catholyte is obtained from fresh water, in which, as a result of powerful unipolar action (in the electric double layer of the cathode chamber of the electrochemical module), metastable products of cathodic electrochemical reactions are formed and stored, in particular, molecular ions HO_2^-, O_2^-, OH^-.

Electrochemically activated catholyte exhibits electron-donating ability, i.e., it is a strong reducing agent and a reduction catalyst in various physicochemical, including biochemical, reactions. Cathode-activated drinking water effectively eliminates the oxidative body stress by neutralizing toxic forms of active oxygen, including free radicals, and restoring 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.

The use of antioxidant drinking water enriched with molecular hydrogen has a beneficial effect on the entire body, normalizes metabolism and the functioning of internal organs at a fundamental level. Hydrogen molecules, having a minimum size, are able to quickly penetrate into cells and neutralize the action of toxic free radicals, restoring the normal performance of the internal (endogenous) antioxidant body system (antiradical chain).

Unlike traditional antioxidants (especially vitamins or dietary supplements), cathode-activated antioxidant water can reduce the ORP of the internal environment of the body to reduction values less than < 0 mV in the zone of action of endogenous antioxidants. This condition is essential for restoring the normal reactions that make up the enzymatic antiradical chain blocked during chronic oxidative stress and, accordingly, for normalizing the process of electron and proton transfer along the entire antiradical chain.

THAT IS WHY CATHODE-ACTIVATED ANTIOXIDANT WATER HAS QUITE A NUMBER OF SCIENTIFICLY PROVEN USEFUL PROPERTIES:



- Restores the energy balance, protects against stress and overwork;
- Strengthens the immune system, improves memory and performance;
- Protects from the negative effects of the environment, including UV exposure and radiation;
- Reduces allergic and inflammatory reactions, as well as weather sensitivity;
- Increases resistance to physical stress and accelerates the restoration of muscle tissue;
- Normalizing metabolism and functioning of internal organs;
- Enhancing the effect of drugs, vitamins and dietary supplements;
- Strengthening bones and joints, reducing osteoarticular pain, reducing swelling;
- Relieving diseases of gastrointestinal tract and urinary system;
- Removes wastes and toxins, cleans the body from heavy metals and radioactive elements;
- Normalizes blood pressure and improves blood composition, reducing sugar and cholesterol;
- Increases body hydration, improves the condition of the skin and nails, reduces hair loss;
- Enhances the effect of beauty aids (cosmetic);
- Reduces wrinkles and overweight.

EMERALD HOME DEVICES

PRODUCT LINE

1. EMERALD HOME 60 DEVICE

EMERALD HOME 60
is a compact device for
producing pure drinking water
with antioxidant properties
from ordinary tap water
in a flow-through mode.
Due to the compact size
the EMERALD HOME 60 device
can be installed either under
or above the sink.

CONNECTION DIAGRAM OF EMERALD HOME 60 DEVICE

The list of main elements:

1. EMERALD HOME 60 device;
2. Plug for connecting the power supply (adapter) to the device;
3. Power supply (adapter) connected to the electric network;
4. T-bend with a ball valve for supplying cold tap water to the device;
5. INLET fitting for water supply to the Device;
5.1. Mud filter for mechanical pretreatment of water;
6. CATHOLYTE fitting for purified antioxidant water outlet;
6.1. Post filter with activated carbon;
7. FLUSHING fitting for the inlet of flushing solution (used only in Flushing mode);
8. Electronic display with ammeter / voltmeter;
9. FLUSHING on/off button for Flushing mode activation;
10. Sink/worktop;
11. Clean antioxidant water outlet tap with a shutoff valve.

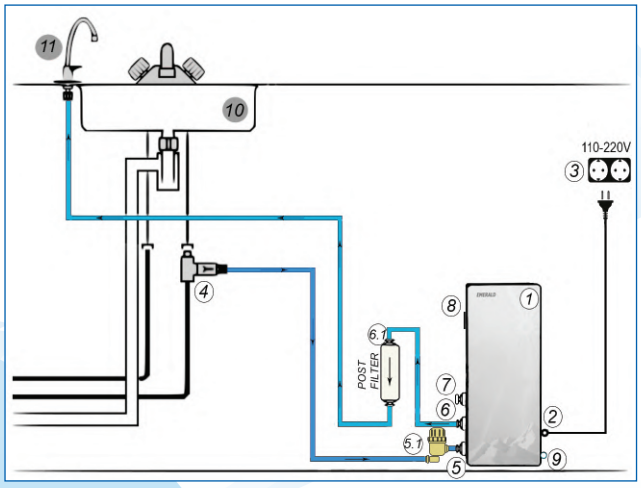


TABLE 1.1. TECHNICAL FEATURES

Performance in pure antioxidant water (catholyte), liters per hour	60
Power consumption, no more than, W	60
Supply voltage (standard socket with grounding), V	110–220
Overall dimensions, WxHxD, mm	140x353x121
Net weight, kg	3
The number of electrochemical modules of MB-11 type, pieces	2
The number of water treatment stages, pieces	6
Purification costs of 1000 liters of water, $	3

TABLE 1.2. WATER TREATMENT EFFICIENCY*

Disinfection of water at 300 colony-forming units (CFU) per 1 ml in source water, %	99.9999
Odor elimination at 20 °C, %	95–99
Anodic oxidation of divalent iron ions at their concentration in source water of 3 mg/l, %	90–99
Surface active substances (surfactants) elimination at their concentration in source water of 3 mg/l, %	90–99
Heavy metals and iron hydroxides elimination on an electrokinetic filter at their concentration in source water of 0.5 mg/l, %	80–90
Permanganate index decrease at the initial value in source water of 10 mg/l, %	80–85
Average ORP of purified water, mV	– 300
Average pH of purified water, pH units	7.5

** Aggregated indicators obtained on tap water with the following parameters: Total dissolved solids (TDS) 250 mg/l, ORP +300 mV, pH 7.0 units. In each specific case, the obtained results may differ from the indicated ones due to the difference in physico-chemical composition and contamination level of the purified water.*

TABLE 1.3. CONTENTS OF DELIVERY

Item	**Number, pieces**
EMERALD HOME 60 device	1
Power supply (adapter) with the network cable for power supply	1
EMERALD HOME flushing unit with connection fittings	1
T-bend with a ball valve (1/2"-1/2"-1/4") for connection to the cold tap water supply line	1
Tap for purified antioxidant water	1
Mud filter with connection fittings	1
Activated carbon post filter for 1/4" tube with the connection set	1
Set of connecting tubes, size 1/4"	1
Operation manual	1
Additional optional items	
Diverter for the kitchen tap with a set of nozzles for connecting the device over the-sink	1
Filter for preliminary water purification with a Slim Line 10" flask and variety of replaceable filter cartridge to choose from: mechanical filter 5 microns, activated carbon filter, iron removal filter, ion exchange filter, mineralizer filter	1

TABLE 1.4. TERMS OF USE

Ambient temperature, °C	+5...+40
Relative humidity (at 25 °C), no more than, %	80
The temperature of tap water, °C	+1...+30
The temperature of citric acid flushing solution, no more than, °C	+70
Pressure at the inlet water supply line, bar	1–5

2. EMERALD HOME 60 LUX DEVICE

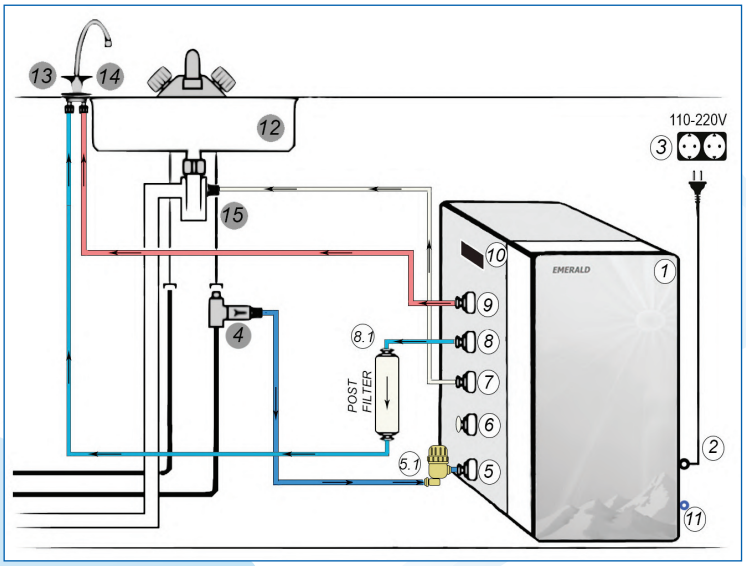
EMERALD HOME 60 LUX device is a compact system for obtaining from ordinary tap water in flow-through mode both drinking water with antioxidant properties (catholyte) and antimicrobial water with disinfecting properties (anolyte).

Anolyte is an environmentally friendly and completely safe for humans and animals, universal disinfectant with a wide spectrum of action, to which microflora is unable to develop resistance. In the EMERALD HOME 60 LUX device, anolyte is produced in the anode chambers of the MB-11 electrochemical modules from tap water using ECA technology without adding any chemical compounds.

CONNECTION DIAGRAM OF EMERALD HOME 60 LUX DEVICE

The list of main elements:

1. EMERALD HOME 60 LUX device;
2. Plug for connecting the network cable to the device;
3. Power plug for connecting to the electric network;
4. T-bend with a ball valve for supplying tap water to the device;
5. INLET fitting for water supply to the Device;
5.1. Mud filter for mechanical pretreatment of water;
6. FLUSHING fitting for the inlet of flushing solution (used only in Flushing mode);
7. DRAINAGE fitting for drainage water outlet;
8. CATHOLYTE fitting for purified antioxidant water outlet;
8.1. Post filter with activated carbon;
9. ANOLYTE fitting for purified antimicrobial water outlet;
10. Electronic display with ammeter / voltmeter;
11. FLUSHING on/off button for Flushing mode activation;
12. Sink/worktop;



13. Catholyte outlet flow control valve on a double water tap;
14. Anolyte outlet flow control valve on a double water tap;
15. Drain clamp connected to the trap of the kitchen sink for the drainage outlet;

TABLE 2.1. TECHNICAL FEATURES

Performance in pure antioxidant water (catholyte), liters per hour	60
Performance in pure antimicrobial water (anolyte), liters per hour	60
Power consumption, no more than, W	100
Supply voltage (standard socket with grounding), V	110–220
Overall dimensions, WxHxD, mm	200x360x150
Net weight, kg	4.4
The number of electrochemical modules of MB-11 type, pieces	2
The number of water treatment stages, pieces	10
Purification costs for 1000 liters of water, $	3

TABLE 2.2. WATER TREATMENT EFFICIENCY*

Disinfection of water at 300 colony-forming units (CFU) per 1 ml in source water, %	99.9999
Odor elimination at 20°C, %	95–99
Anodic oxidation of divalent iron ions at their concentration in source water of 3 mg/l, %	90–99
Surface active substances (surfactants) elimination at their concentration in source water of 3 mg/l, %	90–99
Heavy metals and iron hydroxides elimination on an electrokinetic filter at their concentration in source water of 0.5 mg/l, %	80–90
Permanganate index decrease at the initial value in source water of 10 mg/l, %	80–85
Average ORP of Catholyte, mV	– 400
Average pH of Catholyte, units	8.0
Average ORP of Anolyte, mV	+750
Average pH of Anolyte, units	5.5
Oxidants concentration in Anolyte (in terms of active chlorine), mg/l	5–10

** Aggregated indicators obtained on tap water with the following parameters: Total dissolved solids (TDS) 250 mg / l, ORP +300 mV, pH 7.0 units. In each specific case, the obtained results may differ from the indicated ones due to the difference in physico-chemical composition and contamination level of the purified water.*

TABLE 2.3. CONTENTS OF DELIVERY

Item	**Number, pieces**
EMERALD HOME 60 LUX device	1
Network cable for connecting the device to the electric network	1
EMERALD HOME flushing unit with connection fittings	1
T-bend with a ball valve (1/2"-1/2"-1/4") for connection to the cold tap water supply line	1
Double water tap for catholyte and anolyte outlet	1
Mud filter with connection fittings	1
Activated carbon post filter for 1/4" tube with the connection set	1
Drain clamp for 1/4" tube for drainage connection	1
Set of connecting tubes, size 1/4"	1
Operation manual	1
Additional optional items	
Diverter for the kitchen tap with a set of nozzles for connecting the device over the-sink	1
Filter for preliminary water purification with a Slim Line 10" flask and variety of replaceable filter cartridge to choose from: mechanical filter 5 microns, activated carbon filter, iron removal filter, ion exchange filter, mineralizer filter	1

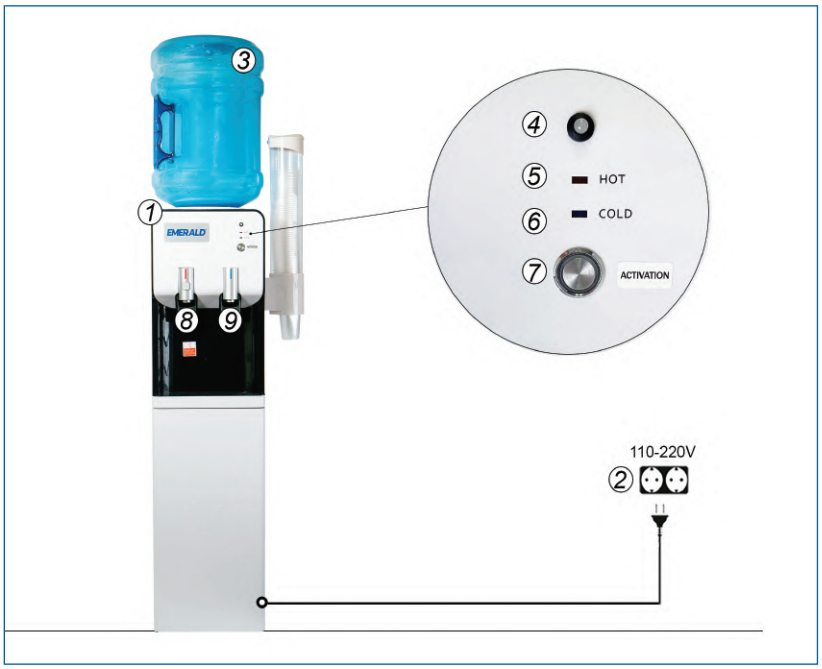
TABLE 2.4. TERMS OF USE

Ambient temperature, °C	+5...+40
Relative humidity (at 25 °C), no more than, %	80
The temperature of tap water, °C	+1...+30
The temperature of citric acid flushing solution, no more than, °C	+70
Pressure at the inlet water supply line, bar	1–5

3. EMERALD HOME 20 OFFICE B DEVICE

EMERALD HOME 20 OFFICE B is a device for purification and activation of drinking water drawn in a standard PET bottle for water dispensers. The device is high effective producing up to 20 liters of purified antioxidant water (catholyte) per hour from ordinary fresh water.

EMERALD HOME 20 OFFICE B device is especially useful in public places with high consumption of drinking water, as it can substantially save money and time on regular purchases of bottled water for traditional water dispensers. EMERALD HOME 20 OFFICE B devices are used in office buildings, fitness and spa centers, kindergartens, schools and universities, catering facilities, as well as in various health and wellness centers.



CONNECTION DIAGRAM OF EMERALD HOME 20 OFFICE B DEVICE

The list of main elements:

1. EMERALD HOME 20 OFFICE B Device;
2. Network cable for connecting the Device to the electrical network;
3. Standard 19 liters plastic bottle for water dispensers filled with fresh drinking water (bottled or tap water);
4. LED Indicator;
5. Water heating indicator;
6. Water cooling indicator;
7. ACTIVATION button to turn on the water treatment mode ;
8. Hot water outlet tap;
9. Cold water outlet tap.

TABLE 3.1. TECHNICAL FEATURES

Performance in pure antioxidant water (catholyte), liters per hour	20
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	10
Power consumption during water cooling, W	50
Power consumption during water heating, W	500
Supply voltage (standard socket with grounding), V	110–220
Overall dimensions, WxHxD, mm	260x995x324
Net weight, kg	10.8
The number of electrochemical modules of MB-11 type, pieces	2
The number of water treatment stages, pieces	6
Purification costs for 1000 liters of water, $	3

TABLE 3.2. WATER TREATMENT EFFICIENCY*

Disinfection of water at 300 colony-forming units (CFU) per 1 ml in source water, %	99.9999
Odor elimination at 20°C, %	95–99
Anodic oxidation of divalent iron ions at their concentration in source water of 3 mg/l, %	90–99
Surface active substances (surfactants) elimination at their concentration in source water of 3 mg/l, %	90–99
Heavy metals and iron hydroxides elimination on an electrokinetic filter at their concentration in source water of 0.5 mg/l, %	80–90
Permanganate index decrease at the initial value in source water of 10 mg/l, %	80–85
Average ORP of purified water, mV	-300
Average pH of purified water, pH units	7.5

** Aggregated indicators obtained on tap water with the following parameters: Total dissolved solids (TDS) 250 mg / l, ORP +300 mV, pH 7.0 units. In each specific case, the obtained results may differ from the indicated ones due to the difference in physico-chemical composition and contamination level of the purified water.*

TABLE 3.3. CONTENTS OF DELIVERY

Item	**Number, pieces**
EMERALD HOME 20 OFFICE B device	1
Network cable for connecting the device to the electric network (integrated into the body case)	1
EMERALD HOME flushing unit with connection fittings	1
Set of connecting tubes, size 1/4"	1
Operation manual	1
Additional optional items	
Filter for preliminary water purification with a Slim Line 10" flask and variety of replaceable filter cartridge to choose from: mechanical filter 5 microns, activated carbon filter, iron removal filter, ion exchange filter, mineralizer filter	1
Cup dispenser for purifier, white	1

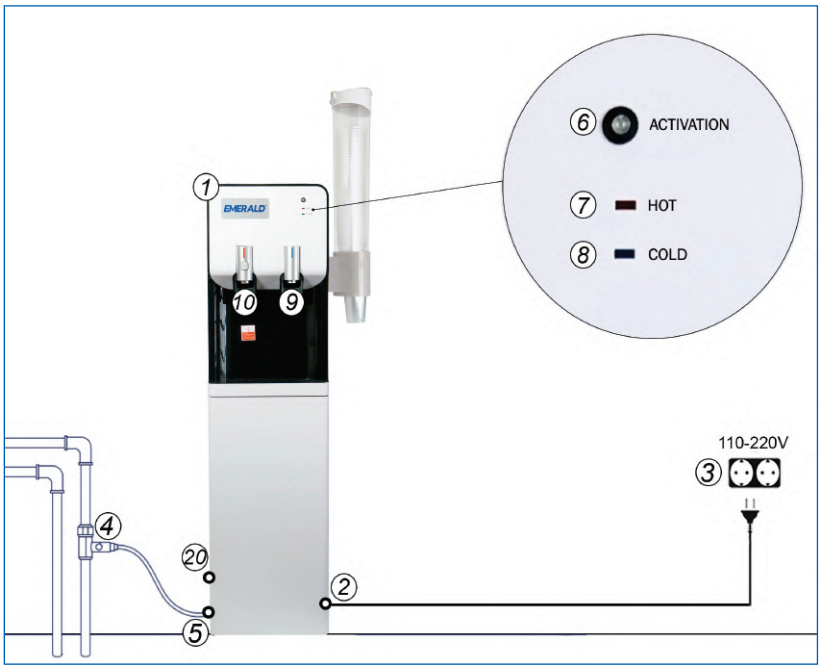
TABLE 3.4. TERMS OF USE

Ambient temperature, °C	+5...+40
Relative humidity (at 25 °C), no more than, %	80
The temperature of tap water, ° C	+1...+30
The temperature of citric acid flushing solution, no more than, °C	+70
Pressure at the inlet water supply line, bar	1–5

4. EMERALD HOME 60 OFFICE DEVICE

EMERALD HOME 60 OFFICE is a device for producing hot and cold pure drinking water with antioxidant properties in flow-through mode. The device is made in a form of a point-of-use water dispenser and is connected to the cold tap water supply line.

EMERALD HOME 60 OFFICE device is especially useful in public places with high consumption of drinking water, as it can substantially save money and time on regular purchases of bottled water for traditional water dispensers. EMERALD HOME 60 OFFICE devices are used in office buildings, fitness and spa centers, kindergartens, schools and universities, catering facilities, as well as in various health and wellness centers.



CONNECTION DIAGRAM OF EMERALD HOME 60 OFFICE DEVICE

The list of external elements:

1. EMERALD HOME 60 OFFICE Device;
2. Network cable for connecting the Device to the electrical network;
3. Power plug for connecting to the electric 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 indicator;
8. Water cooling indicator;
9. Cold water outlet tap;
10. Hot water outlet tap;
20. Water drain valve.

TABLE 4.1. TECHNICAL FEATURES

Performance in pure antioxidant water (catholyte), 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
Supply voltage (standard socket with grounding), V	110–220
Overall dimensions, WxHxD, mm	260x995x324
Net weight, kg	14.3
The number of electrochemical modules of MB-11 type, pieces	2
The number of water treatment stages, pieces	8
Purification costs for 1000 liters of water, $	3

TABLE 4.2. WATER TREATMENT EFFICIENCY*

Disinfection of water at 300 colony-forming units (CFU) per 1 ml in source water, %	99.9999
Odor elimination at 20°C, %	95–99
Anodic oxidation of divalent iron ions at their concentration in source water of 3 mg/l, %	90–99
Surface active substances (surfactants) elimination at their concentration in source water of 3 mg/l, %	90–99
Heavy metals and iron hydroxides elimination on an electrokinetic filter at their concentration in source water of 0.5 mg/l, %	80–90
Permanganate index decrease at the initial value in source water of 10 mg/l, %	80–85
Average ORP of purified water, mV	-300
Average pH of purified water, pH units	7.5

** Aggregated indicators obtained on tap water with the following parameters: Total dissolved solids (TDS) 250 mg / l, ORP +300 mV, pH 7.0 units. In each specific case, the obtained results may differ from the indicated ones due to the difference in physico-chemical composition and contamination level of the purified water.*

TABLE 4.3. CONTENTS OF DELIVERY

Item	**Number, pieces**
EMERALD HOME 60 OFFICE device	1
Network cable for connecting the device to the electric network (integrated into the body case)	1
EMERALD HOME flushing unit with connection fittings	1
T-bend with a ball valve (1/2"-1/2"-1/4") for connection to the cold tap water supply line	1
Set of connecting tubes, size 1/4"	1
Operation manual	1
Additional optional items	
Filter for preliminary water purification with a Slim Line 10 " flask and variety of replaceable filter cartridge to choose from: mechanical filter 5 microns, activated carbon filter, iron removal filter, ion exchange filter, mineralizer filter	1
Cup dispenser for purifier, white	1

TABLE 4.4. TERMS OF USE

Ambient temperature, °C	+5...+40
Relative humidity (at 25 °C), no more than, %	80
The temperature of tap water, ° C	+1...+30
The temperature of citric acid flushing solution, no more than, °C	+70
Pressure at the inlet water supply line, bar	1–5

5. EMERALD HOME 250 SPA DEVICE

EMERALD HOME 250 SPA devices are used for antioxidant water procedures in the form of baths or shower using purified cathode-activated water (catholyte). Antioxidant water therapies are used for prevention and treatment of impaired functions of endogenous antioxidant body system by neutralizing oxidative stress and restoring the optimal REDOX status of the internal biological fluids.

EMERALD HOME 250 SPA devices produce 250 l/h of cold or warm 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 water therapies in the form of baths and showers.

Antioxidant (electron-donor) water therapies is an advanced direction in the field of balneotherapy procedures being effective method for regulating the REDOX status of the internal environment 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. 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.

Moreover, EMERALD HOME 250 SPA devices enable to preserve the neutral acid-base balance (pH) of the catholyte in line with notable ORP shift towards reduction values which is an important factor for producing antioxidant water similar in ORP and pH values to biological fluids of the body, making antioxidant water therapies safe and effective.

CONNECTION DIAGRAM OF EMERALD HOME 250 SPA DEVICE

The list of main elements:

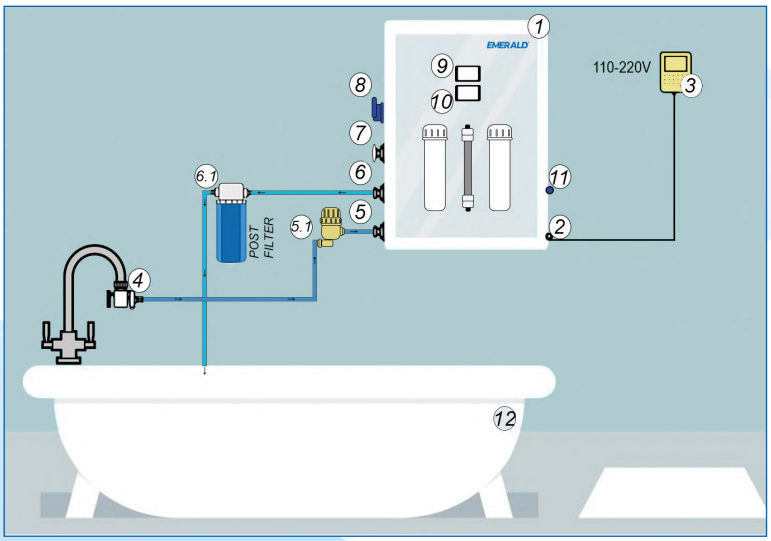
1. EMERALD HOME 250 SPA device;
2. Plug for connecting the network cable to the device;
3. Power plug for connecting to the electric network (with built-in RCD 30mA);
4. Diverter connected to the faucet spout for suppling tap water to the device;
5. INLET fitting for water supply to the Device;

5.1. Mud filter for mechanical pretreatment of water;

6. CATHOLYTE fitting for purified antioxidant water outlet;

6.1. Activated carbon post filter installed in a Slim Line 10” flask;

7. FLUSHING fitting for the inlet of flushing solution (used only in Flushing mode);
8. Catholyte outlet flow control valve;
9. Electronic display with ammeter/voltmeter;



10. Electronic display with water temperature indicator;
11. FLUSHING on/off button for Flushing mode activation
12. Bath or shower.

TABLE 5.1. TECHNICAL FEATURES

Performance in pure antioxidant water, liters per hour	250
Power consumption, no more than, W	200
Supply voltage (standard socket with grounding), V	110–220
Overall dimensions, WxHxD, mm	400x600x200
Net weight, kg	12.6
The number of electrochemical modules of MB-11 type, pieces	6
The number of water treatment stages, pieces	6
Purification costs for 1000 liters of water, $	3

TABLE 5.2. WATER TREATMENT EFFICIENCY*

Disinfection of water at 300 colony-forming units (CFU) per 1 ml in source water, %	99.9999
Odor elimination at 20°C, %	95–99
Anodic oxidation of divalent iron ions at their concentration in source water of 3 mg/l, %	90–99
Surface active substances (surfactants) elimination at their concentration in source water of 3 mg/l, %	90–99
Heavy metals and iron hydroxides elimination on an electrokinetic filter at their concentration in source water of 0.5 mg/l, %	80–90
Permanganate index decrease at the initial value in source water of 10 mg/l, %	80–85
Average ORP of purified water, mV	-350
Average pH of purified water, pH units	7.5

** Aggregated indicators obtained on tap water with the following parameters: Total dissolved solids (TDS) 250 mg / l, ORP +300 mV, pH 7.0 units. In each specific case, the obtained results may differ from the indicated ones due to the difference in physico-chemical composition and contamination level of the purified water.*

TABLE 5.3. CONTENTS OF DELIVERY

Item	**Number, pieces**
EMERALD HOME 250 SPA device	1
Network cable for connecting the device to the electric network with an integrated 30 mA ground fault circuit interruption (GFCI)	1
EMERALD HOME flushing unit with connection fittings	1
Diverter 1/2" connected to the bathroom faucet spout with a set of nozzles	1
Shower head with flexible connection to the purified water outlet tube	1
Mud filter with connection fittings	1
Slim Line 10" flask with activated carbon post filter and a set for connection	1
Set of connecting tubes, sizes 1/2" and 1/4"	1
Operation manual	1
Additional optional items	
T-bend with a ball valve (1/2"-1/2"-3/4") for connection to the cold tap water supply line	1
Filter for preliminary water purification with a Slim Line 10" flask and variety of replaceable filter cartridge to choose from: mechanical filter 5 microns, activated carbon filter, iron removal filter, ion exchange filter, mineralizer filter	1

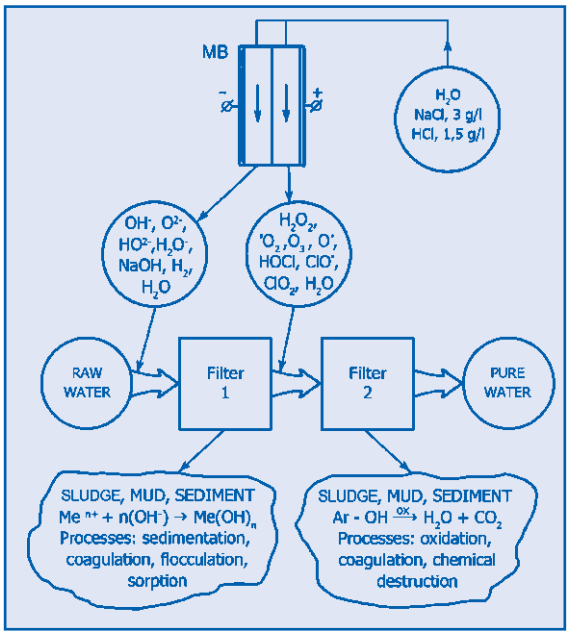
TABLE 5.4. TERMS OF USE

Ambient temperature, °C	+5...+40
Relative humidity (at 25 °C), no more than, %	80
The temperature of tap water, °C	+1...+45
The temperature of citric acid flushing solution, no more than, °C	+70
Pressure at the inlet water supply line, bar	1–5

6. EMERALD HOME 1000 TURBO DEVICE

EMERALD TURBO type devices are professional systems for integrated purification of any fresh water from underground and surface sources (including wells, boreholes, rivers, lakes, etc.) for the use in country houses, production needs of enterprises, as well as in the hotel and restaurant business to obtain high quality disinfected drinking water. EMERALD TURBO devices can also be used for purification of swimming pool water, sea and artesian water, domestic and industrial waste water.

All EMERALD TURBO devices are based on the new EM-TURBO water purification technology, with its active phase consisting in dosing into the general flow of purified water a gas-liquid medium synthesized in the anode and cathode chambers of the electrochemical MB modules from a specially prepared aqueous solution of electrolytes (working solution). The passive stages of the EM-TURBO technology are represented by filtration, flotation and the accompanying processes of coagulation, flocculation, hydrate formation, oxidation, sedimentation and sorption using replaceable mechanical polypropylene filters or automatic self-cleaning disk and string-membrane filters.



EMERALD TURBO devices are considerably more economical and efficient than conventional water treatment systems. Only 30 watts of electricity and 5 grams of salt are needed to purify 1 000 liters of water. Therefore, the purification cost of 1 000 m3 liters of water using the EM-TURBO technology is, on average, 14 USD, which is at least 10 times lower than water purification using reverse osmosis (RO).

EM-TURBO WATER TREATMENT SCHEME

CONNECTION DIAGRAM OF EMERALD HOME 1000 TURBO DEVICE IN A COUNTRY HOUSE

The list of main elements:

1. EMERALD HOME 1000 TURBO device;
2. Storage and supply tank with working solution (H_2O — 1 liter, NaCl — 3-5 g/l, HCl 30-38% — 5-10 ml/l);
3. Filter 1 — replaceable mechanical filter (5 micron) made of expanded polypropylene;
4. Filter 2 — replaceable mechanical filter (5 micron) made of expanded polypropylene;
5. Purified water storage tank with a float level sensors;
6. Pressure boosting station for supplying purified water from the storage tank «5» to the water distribution system of the cottage.

TABLE 6.1. TECHNICAL FEATURES

Performance in purified water, liters per hour	300–1000
Consumption of the working solution, l/h	0.8–2.0
Power consumption, no more than, W	300
Output voltage, adjustable, V	0–30
Output current, adjustable, A	0–10
Supply voltage (standard socket with grounding), V	220
The frequency of the supply network, Hz	50–60
Overall dimensions, WxHxD, mm	600x1300x500
Net weight, kg	42
The purification cost of 1 000 m^3 liters of water, $	14

TABLE 6.2. WATER TREATMENT EFFICIENCY*

Disinfection of water at 1000 colony-forming units (CFU) per 1 ml in source water, %	99.9999
The efficiency of the anodic oxidation of divalent iron ions with concentration in water 5 mg/l, %	99–100
The conversion efficiency of iron, nickel and molybdenum ions into hydroxide with their concentration in water 3 mg/l, %	99–100
The removal efficiency of heavy metals, manganese, aluminum and hydrogen sulfide, %	95–99
Odor elimination at 20°C, %	95–99
Surface active substances (surfactants) elimination at their concentration in source water of 3 mg/l, %	95–99
The change in pH of the purified water, pH units	± 0.3
The change in total dissolved solids (TDS) of the purified water, mg/l	± 0–20

**Average indicators of water purification efficiency. In each specific case, the obtained results may differ from the indicated ones due to the different physicochemical composition and pollution level of the purified water.*

TABLE 6.3. CONTENTS OF DELIVERY*

Item	Number, pieces
EMERALD HOME 1000 TURBO device	1
Set of fittings and tubes used for the installation of the device	1
Float level sensors with the set of connecting cables	2
Operation manual	1

** Storage tanks «2» and «5», as well as pressure boosting station «6» are sold separately*

TABLE 6.4. TERMS OF USE

Ambient temperature, °C	+15...+25
Relative humidity (at 25 °C), no more than, %	85
The temperature of tap water,°C	+4...+20
Pressure at the inlet water supply line, bar	2–6

7. EMERALD HOME 5000 TURBO DEVICE

EMERALD TURBO devices are effectively used for swimming pools water treatment:

— The world's best technology for water disinfection by environmentally friendly oxidants solution (hydrochloric acid, hydrogen peroxide, ozone, singlet oxygen);

— The world's only technology capable of removing all biological falls from the bodies of bathers (urine, sweat, blood, saliva, etc.) including epithelial cells from the swimming pool water;

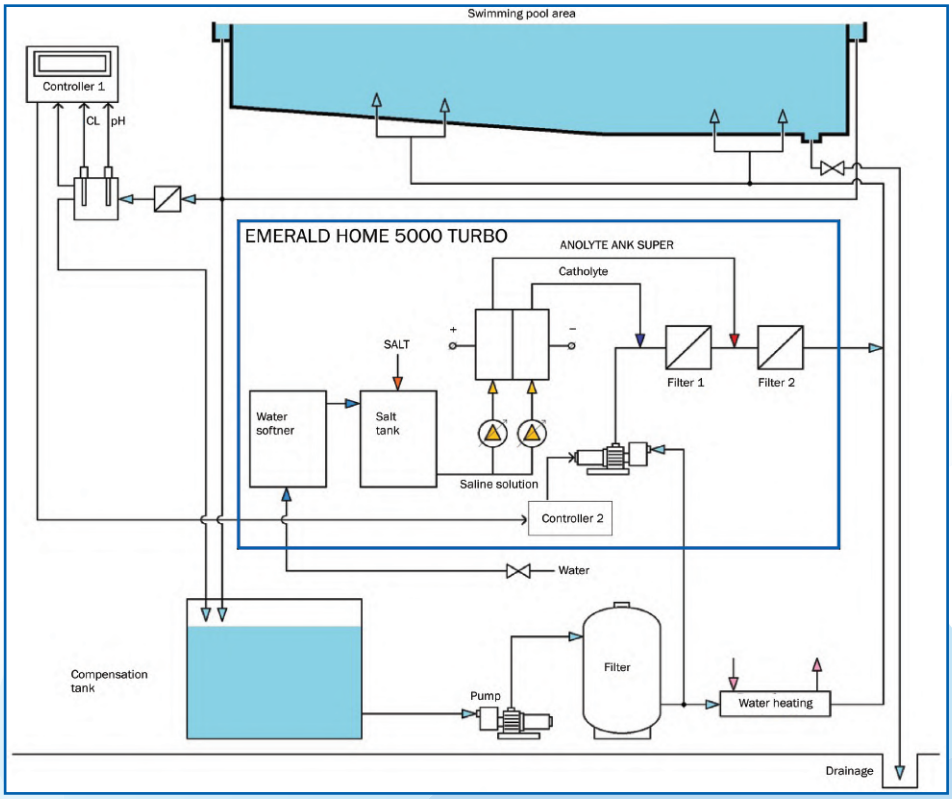
— Aggressive and hazardous disinfectants are eliminated. Cylinders with chlorine are simply replaced by EMERALD TURBO devices without changing the hydraulic scheme;

— The formation of slime, mold, algae and biofilms is completely eliminated;

— No need for a complete cleaning of the pool associated with water drainage and seasonal shutdown of swimming pools;

— There is no chlorine smell in the water, no eye or skin irritation.

CONNECTION DIAGRAM OF EMERALD HOME 5000 TURBO DEVICE IN A SWIMMING POOL



The EMERALD TUBRO devices are connected to the existing swimming pool water circulation system via a bypass from where 4–10% of the total water flow is withdrawn. The withdrawn water is purified in the devices to the required standards and returned to the main water flow via the second bypass installed downstream.

REMOTE FILTRATION UNIT OF THE EMERALD HOME 5000 TURBO DEVICE

TABLE 7.1. TECHNICAL FEATURES

Performance in purified water, liters per hour	2000–5000
Consumption of the working solution, l/h	4–10
Power consumption, no more than, W	600
Output voltage, adjustable, V	4–8
Output current, adjustable, A	7–25
Supply voltage (standard socket with grounding), V	220
The frequency of the supply network, Hz	50–60
Total net weight of the device (electrochemical unit + filtration unit), kg	150
Overall dimensions of the electrochemical block, WxHxD, mm	600x1600x600
Overall dimensions of the filtering unit, WxHxD, mm	800x1200x600
The purification cost of 1 000 m^3 liters of water, $	14

TABLE 7.2. WATER TREATMENT EFFICIENCY*

Disinfection of water at 1000 colony-forming units (CFU) per 1 ml in source water, %	99.9999
The efficiency of the anodic oxidation of divalent iron ions with concentration in water 5 mg/l, %	99–100
The conversion efficiency of iron, nickel and molybdenum ions into hydroxide with their concentration in water 3 mg/l, %	99–100
The removal efficiency of heavy metals, manganese, aluminum and hydrogen sulfide, %	95–99
Odor elimination at 20°C, %	95–99
Surface active substances (surfactants) elimination at their concentration in source water of 3 mg/l, %	95–99
The change in pH of the purified water, pH units	± 0.3
The change in total dissolved solids (TDS) of the purified water, mg/l	± 0–20

**Average indicators of water purification efficiency. In each specific case, the obtained results may differ from the indicated ones due to the different physicochemical composition and pollution level of the purified water.*

TABLE 7.3. CONTENTS OF DELIVERY*

Item	**Number, pieces**
EMERALD HOME 5000 TURBO device	1
Set of fittings and tubes used for the installation of the device	1
The set for connection to the swimming pool water quality sensors	1
Operation manual	1

** Exact delivery set is agreed with the customer.*

TABLE 7.4. TERMS OF USE

Ambient temperature, °C	+15...+25
Relative humidity (at 25 °C), no more than, %	85
The temperature of tap water,°C	+4...+20
Pressure at the inlet water supply line, bar	2–6

TABLE 7.5. THE RATION OF THE DEVICES PERFORMANCE TO SWIMMING POOL VOLUME

Model of the Device	Performance in pure water, l/h	Maximum swimming pool volume, m^3
EMERALD HOME 1000	1 000	80
EMERALD HOME 5000	5 000	250

EMERALD HOME DEVICES

PROFESSIONAL WATER PURIFICATION AND ACTIVATION DEVICES

Technical conditions 28.29.12—001—19313776—2018

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For detailed information follow the link in the QR code

ENGINEERED IN COOPERATION WITH VITOLD BAKHIR INSTITUTE

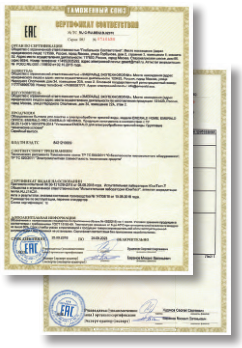
EMERALD HOME devices are manufactured by EMERALD ECOTECHNOLOGIES LLC. The company has exclusive rights to manufacture EMERALD HOME devices, as well as to carry out their maintenance and warranty service. EMERALD ECOTECHNOLOGIES LLC has the exclusive right to transfer to its official trading partners all the necessary powers to sell EMERALD HOME devices, as well as to carry out their maintenance and warranty service.

CERTIFICATES

CE CERTIFICATE OF CONFORMITY OF THE EUROPEAN UNION

RoHS DECLARATION OF CONFORMITY OF THE EUROPEAN UNION

ISO 9001-2015 CERTIFICATE OF CONFORMITY OF QUALITY MANAGEMENT SYSTEM



EAC CERTIFICATE OF CONFORMITY OF THE EURASIAN ECONOMIC UNION

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

Made in Russia