ENTERPRISE “BURBULIUKAS”

WATER IONIZERS
PTV-K, PTV-A

PATENT No.2002102394

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TECHNICAL DESCRIPTION

AND

USER MANUAL

1. GENERAL REFERENCES

1.1. The following definitions are used in the instruction:
1.1.1. **Ionizer PTV** - is a household appliance, in which ionized or silvered water is produced by water electrolysis.
1.1.2. **Ionized water** - is acidic or alkaline water, which is simultaneously obtained in separate containers of the water ionizer.
1.1.3. **Alkaline water (catholyte) -** has a slight negative electrical charge and alkaline properties.
1.1.4. **Acidic water (anolyte) -** has a slight positive electrical charge and acidic properties.
1.1.5. **Partition** (membrane) - divides containers in two parts, is conductive to the ions but prevents water from mixing.
1.1.6. **Silvered water** - is water containing silver ions, concentration of which is measured in milligrams per litre (mg/l).
1.1.7. The appliance meets electrical safety and user safety requirements.

2. TECHNICAL CHARACTERISTICS

Two types of devices are produced: modification K – for production of ionized and silvered water; and modification A – for production of ionized water only. Their technical characteristics are provided in the chart.

Title of parameter	Values of Parameters	
	K	**A**
Capacity of container, l	1,4	1,4
Power supply voltage, V~	230	230
Alternating current frequency, Hz	50	50
Fuses, VP,A	2	2
Average duration of electrolysis producing:		
- ionized water, min	6	6
- silvered water, sec	2-3	
Mass of silver electrode (purity 999,9), g	9,7+/-0,1	
Power used in producing:		
- ionized water, W	100	100
- silvered water, W	3	
Mass of the device does not exceed, kg	1,0	1,0
Using conditions:		
- air temperature	5 to 40^{o}C	5 to 40^{o}C
- relative air humidity	to 80% at 25^{o}C	to 80% at 25^{o}C
- mains water temperature	10 to 25^{o}C	10 to 25^{o}C
- degree of protection against water getting in	IPX 1	IPX 1
Overall dimensions, mm	190 x 160 x 200	190 x 160 x 200

NOTE. Follow the manufacturer's instructions provided in this user manual when using the ionizer to avoid hazard to safety.

3. PACKAGE

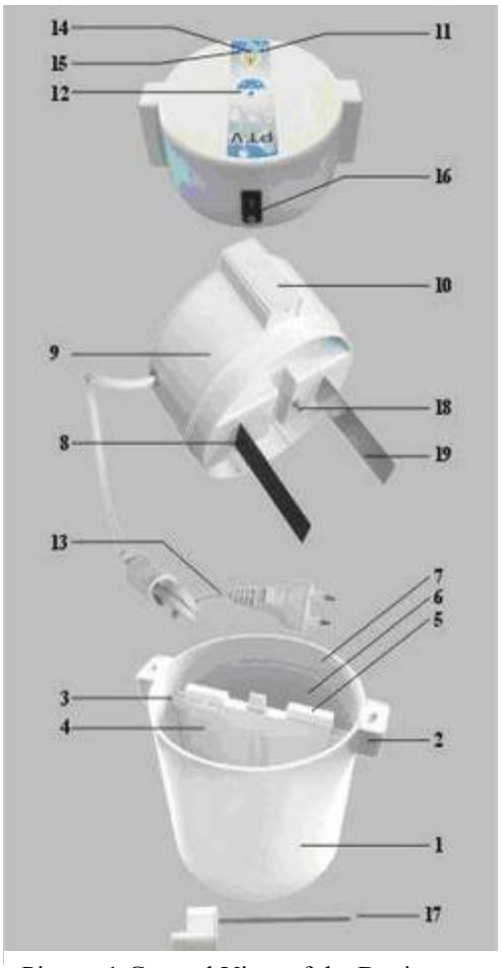
Title	Modification	
	K	**A**
Water ionizer PTV	1	1
Removable vessel	1	1
Technical description and user manual	1	1
Spare partition, set	1	1
Holder with a round silver electrode	1	-
Packing box	1	1

4. DESIGN AND PRINCIPLE OF OPERATION

4.1. The device consists of a lower container (1), a removable vessel (3) and an enclosure (9). (See picture 1)

4.2. The lower container (1) is an electrolysis container. In the upper part of it two handles are installed. (2) A removable semi round vessel is built in the container (3), in which parchment partition with two plate form plastic retainers are set instead of the front wall (4). Partition is fastened in the top with a fixer (5). On the inner side of the container and the vessel there are two marks: lower (6) indicates minimum and upper (7) – maximum water level.

1.Lower container.
2.Handles of lower container
3.Removable vessel
4.Partition with retainer
5.Fixer
6. Mark of lower level of water
7. Mark of upper level of water
8;19.Electrodes of production of ionized water (flat)
9. Enclosure
10.Handles of enclosure
11.Red indicator J
12.Decorative board
13.Cord with plug
14.Green indicator
15 Red indicator A
16. Switch
17.Holder with round silver electrode (mod.K)
18.Contact for connection of silver electrode
(mod.K)



Picture 1 General View of the Device

4.3. In the enclosure (9) an electrical scheme is installed that is covered from inside with a plastic cover. In the cover flat electrodes (8;19) and round contact (18;mod.K) are fixed.

Flat electrodes are meant for production of activated water and round contact – for connection of silver electrode (mod. **K).** . On the board (12) located on the top of the enclosure three LEDs are mounted: the middle, green one (14), lights when the device is operating (is switched on), simultaneously one of the red LEDs (11;15) lights which indicate that activated or silvered water is produced.. On the other side of the enclosure there is a cord with a plug (13).

4.4. Parchment partition is fitted between two plastic plate form retainers in such way, that arrows on the outer sides of the plates are directed downwards. Then partitions with retainers (4) is mounted into special notches of the removable vessel (3) and fastened with a fixer (5).

4.5. During water electrolysis acidic water is generated at the black electrode (8) and alkaline water - at the light one (19). Partition (4) of the removable vessel (3) doesn't allow ionized water to mix.

4.6. When producing silvered water (mod. **K**), the removable vessel (3) is not necessary.

4.7. A switch (16) is mounted on the enclosure (9) for switching the device on and off.

The device control scheme does not allow to switch on the modes of production of activated and silvered water at one time.

5. PROPERTIES OF IONIZED WATER AND ITS APPLICATION

5.1. **Alkaline water (catholyte) -** is a natural stimulator, stimulates growth of plants, accelerates germination of seeds, flowering of domestic flowers, revives faded flowers, vegetables, etc. It is a soft, odorless water having taste of rainwater.

5.2. **Acidic water (anolyte) - is a natural bactericide**, kills small pests, various microbes, bacteria, fungi. It is good in disinfecting soil, tare, fresh vegetables, fruit, etc. It is a sourish water having typical acid and weak chlorine odor.

5.3. Ionized water should be kept in tightly closed jars protecting it from direct sunlight. It not recommended to keep it in refrigerator. Alkaline water preserves its properties for up to 3 days and acidic water - for up to 7 days.

5.4. Properties of ionized water are characterized by two indexes: **ORP**- oxidation- reduction potential and **pH –** hydrogen index.

ORP is characterized by positive or negative charges (mV) that charge ionized water (respectively anolyte + and catholyte -).

pH values can fluctuate between 0 to 14 units. Potable water is neutral, its pH is about 7,0. pH of alkaline water fluctuates from 8,0 to 11,0 pH (the bigger this number, the more alkaline water is) and of pH of acidic water is from 6 to 2,4 pH (the smaller this number, the more acidic water is).

5.5. In the 1st table dependence of pH and ORP values on the working duration of the device is presented. These pH and ORP values have been obtained during testing of water used by the company- producer. In case of different composition of water values can differ. A minor difference of pH(+/-0,2-0,3) and ORP values does constitute practical influence.

Table 1

Water from tap				
	Catholyte		Anolyte	
Time (min)	ORP	pH	ORP	pH
0	117	7,22	117	7,22
5	-815	9,66	811	5,07
10	-886	10,08	1051	2,51
15	-896	10,17	1085	2,32
20	-905	10,22	1103	2,21
25	-911	10,33	1112	2,13
30	-914	10,39	1120	2,07

It is essential to know that a negative oxidation - reduction potential acquired by ionized alkaline water lasts a relatively short period of time. Keeping the alkaline ionized water in a closed container from which water is continuously used, after 24 to 36 hours the negative ORP value becomes practically zero or slightly positive. (These water pH values - 8.5 to 9.5 – last a much longer period of time: 4-7 days). Therefore, **ionized alkaline water should be used as fresher as possible**, or at least it should be used within 12 hours from its production.

Shops are available with ionized alkaline water in different containers, as indicated on the label. However, this water, at best, can be considered *alkaline*, as the ORP value of the water shall not remain negative.

6. PRODUCTION OF IONIZED WATER (MODIFICATIONS A AND K)

6.1. Holding the lower container (1) on its handles (2) remove the enclosure (9) of the device.
6.2. Make sure the partition with retainers of the removable vessel (4) is tightly inserted into the notches of the vessel.
6.3. Pour cold water from tap: first of all into the removable vessel (3) then into the lower vessel (1**) up to the lower marks** (6).
6.4. Put the enclosure (9) on the lower container (1) so that the dark electrode (8) would get into the removable vessel.(3).
6.5. Connect the cord with the plug (13) to the socket and turn on the switch (16). On the enclosure (9) green (14) and red A (15) indicators light up. Set the working duration of the device according to the chart 1.
6.6. After the set time passes pull the plug of the cord (13) from a socket, take off the enclosure (9), pour out from the removable vessel (3) the acidic and then alkaline water into prepared, tightly closed jars.
6.7. Just produced alkaline water is turbid and sometimes foamy. After pouring alkaline water into a jar, sediments and foam precipitate on the bottom, water becomes clear and suitable for using (the amount of sediments precipitated shows the level of contamination of water and they shouldn't be used).
6.8. Just produced acidic water has a slight acidic and chlorine odor and is sourish.
6.9. When working with the device water can heat up to 40 degrees.
6.10. Wash the removable vessel (3) and lower container (1) with water. **It is PROHIBITED to wash with water the enclosure (9) containing the electric part!**
6.11. Clean the light electrode (19) and the contact (18) with soft cloth dipped in vinegar. It is not necessary to clean the dark electrode (8).
6.12. Dry the lower container (1), the enclosure (9) and removable vessel (3) without taking out the partition. Assemble the device and store it in dry place.

Notes:

1. **Use the device strictly to the sequence of operations.**
2. For production of ionized water use tap water.
3. It is recommended to pour out (do not use) the produced ionized water after the first use in a new appliance or after the change of the membrane.

The **membrane** is made from a special material suitable for electrolysis. Do not use other materials than those specified by the manufacturer.

4. After taking the removable vessels (3) out of the container (1) the membrane may slightly leak through the bottom of the vessel. It does not affect the production of ionized water. If the leak is more significant - the membrane must be changed.
5. **Anode electrode** (the dark) is produced by using rare inert metals (ruthenium and iridium) and oxide mixtures on the titanium base. These electrodes have good electrochemical and physical-mechanical properties. Their longevity or life span is very high.

Anodes made from any other metal are not suitable for water ionizers as the emission of gases takes place in an acidic medium during the electrolytic. Cl^- ions contained in the solution are soluble. In this way metal, from which the electrode is made, complex ions, from which Cr and Ni ions or their compounds are very harmful to human health, enter the acidic water.

The dark electrode must be replaced in case of damage of the electrode's covering layer.

7. PROPERTIES OF SILVERED WATER AND ITS APPLICATION

7.1. **Silvered water** kills microbes, bacteria. Small silver doses (0,01 mg/l) positively affect organism.

7.2. Impact of silvered water depends on concentration of silver ions: the bigger this concentration, the stronger the impact and the more quickly it begins. In the 2nd table silver ions dependence on the working duration of the device is presented.

7.3. Silvered water preserves its bactericidal properties for several months.

7.4. For production of silvered water potable water is used. It is recommended to use filtered, spring water, or tap water that has settled for several hours.

7.5. Silvered water of low concentration is entirely clear, tasteless and odourless it has to be kept in dark premises. When boiling silvered water silver sediments precipitate and it losses its properties.

7.6. If you regularly drink silvered water, its' concentration can not exceed 0,01 mg/l (UN 48-1994.). Such concentration is obtained when device is turned on for 2 seconds (see 2 table).

Table 2

Working duration of device	Concentration of silver ions in water, mg/l	Working duration of device	Concentration of silver ions in water, mg/l
2 sek.	0,010	5 min.	1,671
5 sek.	0,027	10 min.	3,315
10 sek.	0,056	15 min.	5,022
15 sek.	0,082	20 min.	6,613
30 sek.	1,170	30 min.	9,950
60 sek.	0,339	40 min.	13,27
		60 min.	20,00
		90 min.	30,00
		108 min..	35,00

8.PRODUCTION OF SILVERED WATER (MODIFICATION K)

8.1. Holding the lower container (1) on its handles (2) remove the enclosure (9) of the device.

8.2. Put the holder with the round silver electrode (17) on the contact (18) located on the enclosure (9) .

8.3. Take out the removable vessel (3).

8.4. Pour water into the lower container (1) up to the lower mark (6).

8.5. Put the enclosure (9) on the lower container(1).

8.6. Connect the plug of the string type cord (13) to the electricity supply socket and turn on the switch (16). Green indicator (14) and red J indicator (11) on the enclosure must light. From the chart 2 choose duration of working time of the device.

8.7. After the set time, turn off the switch (16), pull the plug of the cord (13) from a socket, take off the enclosure (9), pour out the silvered water into the non-transparent, tight jar that has to be stored in a dark room.

8.8. Carefully clean the silver electrode and the light flat electrode with a soft cloth. Electrodes that are more dirty can be cleaned with a cloth dipped in vinegar. Dark varnishes occurring on the silver electrode do not influence the quality of silvered water.

8.9. Dry the lower container (1) and the enclosure (9). Assemble the device and store it in dry place.

8.10. When producing silvered water for a longer time period dark spots occur on the bottom of the lower container (1). It is a residual effect of silver sediments. These spots do not influence the quality of silvered and activated water and further exploitation of the device.

It is PROHIBITED to wash with water the enclosure (9) containing the electric part!

9. SAFETY REQUIREMENTS

9.1. The device can be connected to the power supply when the lower container (1) and the removable vessel (3) are filled with water and the enclosure (9) is put on.

9.2. The device should be protected from children and shouldn't be left without attendance.

9.3. **IT IS PROHIBITED**

9.3.1. To remove the enclosure (9) from the lower container (1) when the device is connected to the power supply.

9.3.2. To keep the operating device near open fire, sparking devices.

9.3.3. To switch on the device for longer 40 minutes when producing ionized water.

9.3.4. To reassemble, wash the enclosure (9) of the device with water.

9.3.5. **To assemble the device that has not dried up after the use.**

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10. POSSIBLE FAULTS AND WAYS OF THEIR REMOVAL

No	Fault symptom	Possible reason	Remedy
1	The device does not start, indicators do not light, electrolysis does not take place	No power supply.	Check power supply.
2	Ionization is performed weakly: during the set time water of weaker concentration is obtained	1.Partitions are contaminated 2.The light electrode is contaminated	1.Replace partitions with the new ones 2.Clean the light electrode with vinegar

11. GUARANTEES

11.1. Guarantee period is 24 months from the sales day if the user has not violated the requirements of this instruction.
11.2. During guarantee period deliver faulty device to the store it was purchased from or to the enterprise manufacturer.
11.3. Guarantee does not apply in case of mechanical break of the device or if these instructions were not followed during its operation.

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Sales date:

(signature)