

# Bipolar air ionizer “Yantar’ 5A”

With remote control

*Specifications and operating instruction*

## Specifications

“Specifications and operating instruction” is the main document, which should be used with ionizer “Yantar 5A”.

Bipolar ionizer “Yantar 5A” is used to generate the required number of positive and negative simultaneously, to maintain air ion composition of indoor air in industrial facilities, public places, and living quarters.

Bipolar ionizer “Yantar 5A” has undergone sanitary certification. The certificate was issued by the Tatarstan Republic (Russian Federation) Centre of Hygienic Certification and Licensing.

Additional information about Bipolar ionizer “Yantar 5A” is available at [www.ionization.ru](http://www.ionization.ru). Customers may also call: +7 (843) 2009988 (in Kazan’).

### 1. Functions of the appliance

The latest model of bipolar ionizer Yantar 5A is meant to create pre-set concentration of both positively and negatively charged light air ions within the area of human breathing (in accordance with sanitary code).

Bipolar ionizer Yantar 5A can be used: in apartment houses and public buildings, including clinics; at manufacturing of microelectronic devices (i.e. “clean rooms”), in computer rooms, in data centers, in the rooms with artificial climate – to maintain healthy atmosphere.

Operating conditions:

- operating temperature  $22 \pm 5$  °C
- relative humidity (RH)  $30 \div 80\%$
- atmospheric pressure  $760 \pm 44$  millimeters of mercury

### 2. Reference specifications

1	Type of ionizer	needle-shaped (corona discharge)
2	Range of ions concentration (N+, N-) within 2 m (night mode <sup>1</sup> )	from 2.000 to 50.000 air ions/cm <sup>3</sup>
3	Range of ions concentration (N+, N-) at a distance of 2 m (medium mode)	from 2.000 to 80.000 aerions/cm <sup>3</sup>
4	Range of ions concentration (N+, N-) at a distance of 2 m (max mode)	from 1.000 to 150.000 aerions/cm <sup>3</sup>
5	Unipolarity factor	1±0,3
6	Size of attended room	1–4 persons, up to 60 cubic meters
7	Time of continuous running	Not limited
8.1	Ozone concentration generated by unit	No more than 0.03 mg/m <sup>3</sup> (average daily MAC* for atm. air)

<b>8.2</b>	NO <sub>2</sub> concentration generated by unit	No more than 0.04 mg/m <sup>3</sup> (average daily MAC* for atm. air)
<b>9</b>	Electrostatic field strength	No more than 0.2 kV/m
<b>10</b>	Noise level of operation	No more than 37.5 dBA
<b>11</b>	Safety distance to operating ionizer	0.6 m
<b>12</b>	Fan size	92x92 mm
<b>13</b>	Power consumption	Less than 5 watt
<b>14</b>	Overall dimensions, no more than	130x105x175 mm
<b>15</b>	Power requirements	120/220 V, 50-60 Hz
<b>16</b>	Gross weight, no more than	1400 gram

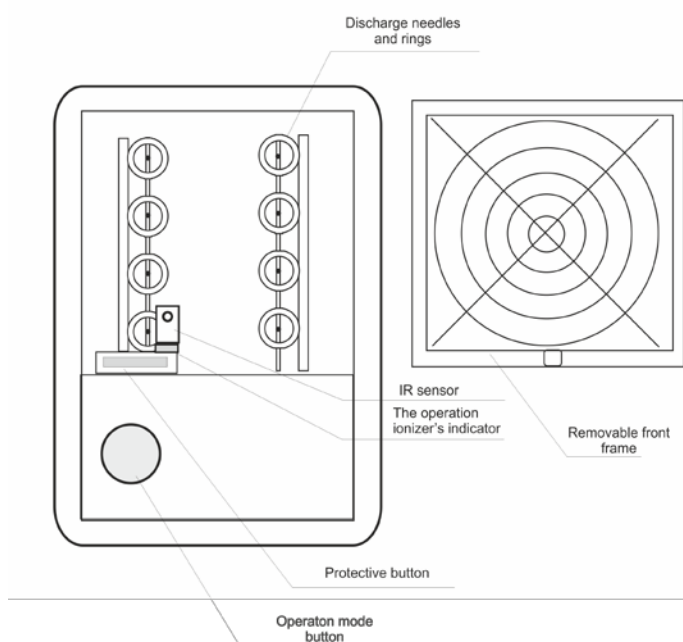
To gauge ion concentration, air ion counter must be used. It should be able to gauge both polarities.

\*(MAC) - maximum allowable concentration

### 3. Delivery set

- |   |   |
|---|---|
| 1. Ionizer "Yantar' 5A"                 | 1 |
| 2. Remote Controller                    | 1 |
| 3. Power Supply Unit <sup>2</sup> (PSU) | 1 |
| 4. Technical specification              | 1 |
| 5. Warranty certificate                 | 1 |
| 6. Packaging                            | 1 |

### 4. Layout



*Bipolar air ionizer "Yantar 5A"* is a desktop device. The most of front and rear panels are occupied by concentric grills. The air is sucked through the rear panel by the fan, and is blown away through the front panel.

The frame and the grill on the front panel are detachable to allow easy dusting of needles and cleaning scurf.

It's recommended to clean the needles in 2 steps. First – with wool and alcohol, then with an erasing rubber (e.g. at the tip of the pencil) – approximately once a month; frequency of this operation may vary depending on the cleanness of the room. Also it's important to periodically clean the frame with vacuum cleaner, to avoid performance degradation.

**The operating voltage at needles can reach 4000 volts, so ensure the ionizer is switched off from the power mains before detaching the frame.**

On the front panel, there's ionizer ON/OFF button.

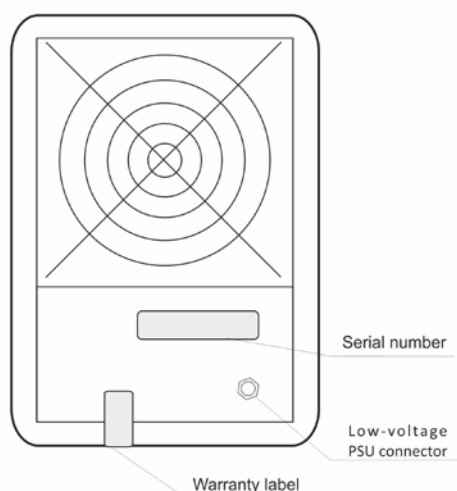
In the bottom left corner behind the frame there are LED indicator and a photo receiver. On initial power-on, the LED is lit, the ionizer starts at the minimum output mode ("night mode"), the next push of the button switches the ionizer into the "medium output" mode, two pushes in series will switch the ionizer to the mode of maximum output. On the next push, the ionizer switches off (goes stand by). Each push is confirmed by the LED flashing.

Ionizer can be manipulated with the remote control unit.

Functions of remote control buttons:

BUTTON	OPERATION
1..9, 0/AV, CHANNEL+/-	Set ionizer modes – 10 gradations, turning the indicator on. Pressing «1» - activates the minimal output mode, «0/AV» - activates maximum output mode.
VOLUME+/-	Control air ion concentration control.
STANDBY	"Stand by" mode. On pressing this button, the unit goes into stand-by mode.
DISPLAY	Turn off the LED.
PICTURE SELECT	Turns on LED indication of air ion concentration. The more LED flash frequency is – the higher is the air ion concentration.

## Rear Panel Layout



Adjustments to concentration and unipolarity factor cannot be made without the air ion counter, which gauges both polarities simultaneously.

There are not any other ways of accurate tuning of these parameters.

At the initial customization, all these values are set to an average level, at which the unipolarity factor is nearly unity (1), and ion concentration at the distance of 3 metres is not exceeding 30,000 ions per sq. centimeter. But as ions absorbability in various places varies significantly, it is recommended to customize the parameters values right in the place where the ionizer is going to be used. That's the reason why ion-counter is required.

In spite of the fact that the ionizer is powered by a 12V DC PSU, the voltage inside the ionizer runs up to 4.000 volt, **therefore disassembling the unit is prohibited. The ionizer is serviceable only by qualified personnel.**

### 5. The serial number and labeling.

There are labels "Yantar5A" and "Bipolar Ionizer" on the front panel. On the rear panel there is a strap with the serial number.

### Operating instruction

### 6. General guidelines

6.1. The key requirement which ensures trouble-free operation of air ionizer, is strict adherence to instructions.

6.2. Only properly functioning units are allowed to use.

6.3. If there is a significant temperature difference between the warehouse (outdoor temperature) and the place, where the appliance is going to be used (indoor temperature) – it's necessary to keep the appliance at indoor temperature for 3 hours minimum.

6.4. Check integrity of the package, according to the § 3 of this “*Technical specifications and operating instruction*” document.

6.5. Inspect the delivery set for completeness and integrity, to verify the absence of external defects and damage. Verify panels and controls for integrity.

6.5. Make wet room cleaning and provide aeration of the room on a daily basis.

**ATTENTION! It's forbidden to close air holes on the rear panel of ionizer.**

## 7. Safety

Dangerous operational factors (for the functioning unit) are:

- The unit gets powered from the AC (alternating current) line, of 220 volts;
- There's a high voltage (4 kV) in ion production chamber of the unit.

In this connection it's necessary to adhere to the following provisions while operating the unit:

- Do not remove the front panel while ionizer is operating – doing so is allowed only if power supply is switched off, and it's absolutely necessary to pull PSU plug out of the socket;
- Do not use appliance in shower, bathroom, etc. locations of high humidity.

**IT'S FORBIDDEN to disassemble the appliance with the power ON.**

**Maintenance of the appliance should be carried out only in authorized service centre.**

## 8. Installation Instruction

8.1. Ionizer “Yantar 5A” should be operated in a heated apartment in normal service conditions:

- operational temperature range **20+/- 10**
- relative humidity range (RH) **25-80%**
- atmospheric pressure range **760+/- 44** mm of mercury column.

8.2. Rooms should be kept clean, no dust accumulation is allowed.

8.3. Make sure the air flow into back inlet is good enough, make sure it is not blocked with any object.

8.4. The unit should be installed on the horizontal surface so that the air from the unit is directed towards the person (area that requires ionization). The optimal distance to the person is 2.5 to 4.5 meters. The optimal height to install the unit is at the one's face level (+/-50 cm).

### Setting up procedure

9.1. Put the unit near the breathing area in accordance with the recommendations of the § 8.4.

9.2. Connect the cable of power supply to the ionizer.

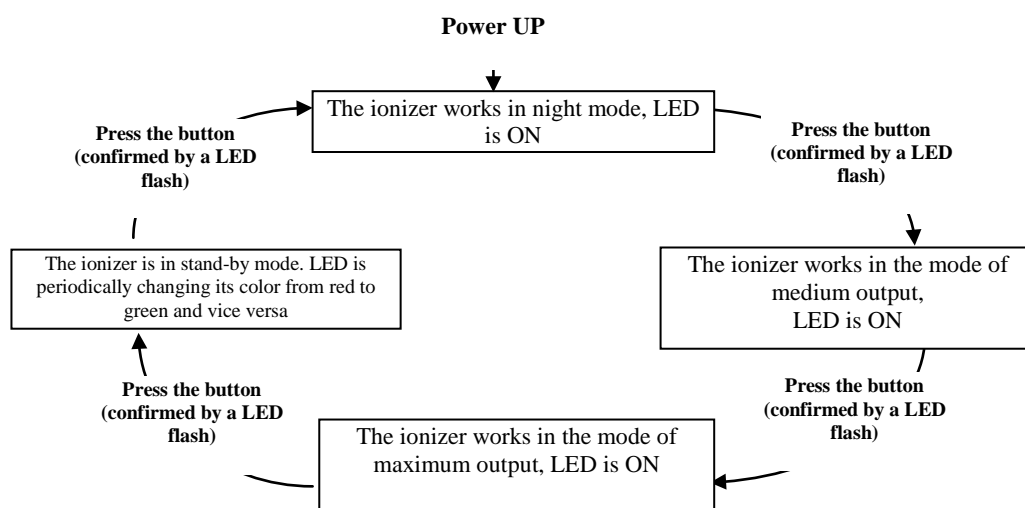
9.3. Plug PSU into ~220V socket (120 volt – in North America).

9.4. Push the ON/OFF button. The LED should be lit, and the fan should start rotating at the minimum speed (airflow and ion concentration are minimal, the noise of the fan is subtle, one can barely hear it). This mode is recommended to use at night or in small offices/rooms. The LED is on permanently.

9.4.1. Press the button once again. This will be confirmed by LED flashing, puts the ionizer into the “medium output” mode. At the same time, fan speed and airflow will increase (as compared to “night mode”), as well as ion concentration. This mode is recommended for small offices.

9.4.2. Pressing the button twice puts the ionizer into the “maximum output” mode. Pressing the button thrice will switch off the ionizer (it goes standby), high-voltage and the fan will be powered off.

Each button press is followed by the LED flashing.



9.5. If air ion counter is at hand, it's necessary to adjust ion concentration:

9.5.1. Let the ionizer work for 20 minutes;

9.5.2. Put the air ion counter to the area of breathing (within the area that requires ionization – 2.5 to 4.5 meters from the ionizer) and gauge ion concentration according to the operating instruction of air ion counter. If there is inconsistency between the gauged results and sanitary code, it's necessary to adjust the parameters in the following way:

9.5.3. If ions concentration is different from the preset, it's necessary to rotate regulator Ku on the rear panel (ions unipolarity factor) to a small angle, and keep an eye on how the readings at the ion counter digital display will be changing over several minutes.

9.5.4. If the ratio of ions is different from the recommended, it's necessary to rotate the regulator U (ions unipolarity) to a small angle, and keep an eye on how the readings at the ion counter digital display will be changing over several minutes.

9.5.5. Repeat the operations, mentioned in 9.5.3,9.5.4, as necessary.

9.5.6. On matching the gauging results and sanitary code recommendations, set up process for ionizer is complete.

9.5.7. Having finished the gauging, switch ion counter OFF.

9.6. Having finished, disconnect ionizer's PSU from the AC mains.

9.7. Remote control unit operation.

9.7.1. Turn power supply of counter ON and activate it. Set the time of accumulation to 1 second (press two buttons: WORK and CALIBRATION on the counter, simultaneously)

9.7.2. Send the ionizer into programming mode by pressing the following buttons in series: «\*» «\*» «\*» «\*» «SELECT» (password). As a result, LED will fade.

Keys functions of the remote control unit in the programming mode:

Button	Operation
1..10, CHANNEL+/-	Fan speed setting (rpm) – 10 values.
VOLUME+/-	Set the parameter to be programmed.
STANDBY	Enter the "Setting Positive Impulse Duration" mode.
MUTE	Enter the "Setting Negative Impulse Duration" mode.
DISPLAY	Enter the "Setting Negative and Positive impulses count per burst" mode (for the pre-set rpm of the fan).
PICTURE SELECT	Confirm the parameter to be saved (ENTER)

SLEEP	Return from the programming mode to operating mode, saving calibration values.
PREVIOUS	Display calibration values (from EEPROM) on the PC screen (requires a panel).

### 9.7.3. Set Positive Impulse Duration.

#### 9.7.3.1. Press the button STANDBY.

9.7.3.2. Use the buttons VOLUME+,VOLUME- to set the required level of ionization at the maximum ratio of positive and negative ions.

9.7.3.3. Press the SELECT button. Warning: extra duration values can cause acoustic noises or disruptive discharge.

### 9.7.4. Set Negative Impulse Duration.

#### 9.7.4.1 Press the button MUTE.

9.7.4.2 Use the buttons VOLUME+,VOLUME- to achieve the required level of ionization at maximum ratio of positive and negative ions.

#### 9.7.4.3 Press the button SELECT.

9.7.5. Record the characteristics at various fan rotation speeds. On-off time ratio can be adjusted within 1 to 10 (10 values total).

The burst consists of 32 impulses, NMINUS of them are negative, the rest are positive. The amount of impulses for 10 fan RPM speeds are stored in EEPROM.

#### 9.7.5.1 Press DISPLAY button (to enable calibration mode).

#### 9.7.5.2 Press button 10 (to set maximum fan speed).

9.7.5.3 Use the buttons VOLUME+,VOLUME- to set +/- ratio to approximately 70%.

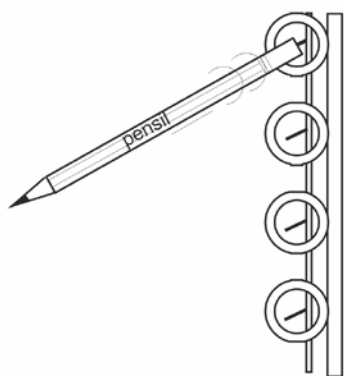
9.7.5.4 Press the button SELECT to save the duration value to EEPROM.

9.7.5.5 Repeat § 4.3.3-4.3.4 for all 10 speeds.

9.7.5.6 Press the button SLEEP - after that the values from RAM are copied to EEPROM, and the appliance switches back to the operating mode.

9.7.5.7 Set unipolarity and concentration controls to the mid-position. Carry out a sampling inspection of unipolarity at different fan speeds. Re-adjust it, using the above controls, as necessary.

## 10. Maintenance check and service.



It's recommended to check the state of in and out air openings by external examination. Accumulation of dust and nap on the grid of ionizer and in its chambers isn't allowed. In case the appliance has become dirty, it's necessary to clean it by the vacuum cleaner. Before such cleaning and before removing the front panel you should switch the appliance off from the AC mains, as the voltage on electrodes reaches 4,000 V!

For your convenience, front panel is detachable to make cleaning easier. Once or twice a month, especially in dusty conditions, it's recommended to remove the grilled frame, clean up the edges of the needles with an alcoholic solution, then with an eraser, as shown in the picture. Be careful with the needles – they must not touch metal rings. The needles must be centered in the rings. In case of severe

contamination of ionizer's insides, the performance of ionizer significantly degrades.

To remove the front frame, pull the bottom part using a firm object (a screwdriver, a knitting needle). To replace the grill, start with its bottom part, make sure that it fits properly and that the safety button is pressed, then insert the upper part of the grill. If the safety button isn't pressed, the ionizer won't start – this is to prevent electrical shock of the user.

## 11. Possible failures and troubleshooting

Troubleshooting of failures, related to the opening of the appliance, is performed by user or by the authorized service centre.

The failures which are listed in the table below can be attributed to reasons which are possible to detect without opening the appliance. If elimination of this reasons doesn't lead to the resolution of the failure, then the appliance should be returned for repair, as directed.

**Attention! While trying to eliminate failures, it is necessary to disconnect the appliance from the AC mains!**

Failure	Possible reason	Troubleshooting
1. When you switch the appliance ON, neither of the indicators are lit	There is no or poor contact in the cable connector	Verify the reliability of the contact
	The PSU is failing.	Replace PSU.
	Front frame is installed incorrectly (protection button is not depressed).	Reinstall the front frame in accordance with §10.
2. The fan rotates, but the indicator is not lit.	The lamp on the switch is fused.	The unit should be sent for replacement to the service-center.
3. The ionizer doesn't respond to the commands of the remote controller	The batteries of the remote controller are dead	Replace the batteries of the remote controller

<sup>1</sup>Night mode – when green switch is lit, fan slows down, with concentration of air ions going down – noiseless mode is set.

<sup>2</sup> External Power Supply Unit (PSU), IN: 220V, 50Hz, OUT: 15V DC (stabilized), 400 mA, Polarity: external contact is negative. Optionally, impulse PSU can be supplied. IN voltage: AC 110–250V.