



**PSB-Gals**  
Ultrasonic Equipment Center

## ULTRASONIC CLEANER



## USER MANUAL

Model: PSB-\_\_\_\_\_



Made in Russia

**CONGRATULATIONS!** You have just purchased an ultrasonic cleaner production PSB-Gals. We are working in the design and manufacture of ultrasonic equipment since 1998. Thank you for choosing us. We wish you a pleasant work.

The team of PSB-Gals

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### 1. PRODUCT DESCRIPTION

1.1. Ultrasonic cleaners (volume from 1.3 liters to 56.0 liters), hereinafter referred to as "the USC", designed for cleaning wares from fats, oils, polishing pastes and other process contaminants; producing stable emulsions of immiscible liquids; grinding (dispersion) of solid and liquid particles; acceleration of chemical reactions; mixing and stirring.

1.2. Cleaning is carried out in aqueous solutions with the addition of technical detergents of the Gals series (production of PSB-Gals).

1.3. Application area:

- ✓ enterprise electronic, watch, jewelery, aviation, chemical industry;
- ✓ mechanical, machine-building plants;
- ✓ medical institutions;
- ✓ field and stationary analytical laboratories.

1.4. Operating conditions:

- ✓ height above sea level not more than 1'000 m;
- ✓ ambient temperature from +1°C to +35°C;
- ✓ an upper value of relative humidity - 80% at ambient temperature +25°C;
- ✓ the operating position in space - vertical deviation from the vertical position is not more than 5° in any direction.

### 2. THE DEVICE AND THE PRINCIPLE OF OPERATION

2.1. The general view of the USC is presented in Figure 1 and Figure 2.

2.1.1. The working unit of the USC is a ultrasonic tank 1 (Figure 2), made of food grade stainless steel, with piezoceramic transducers 3 (Figure 2) built into its bottom, which are the source of ultrasonic vibrations.

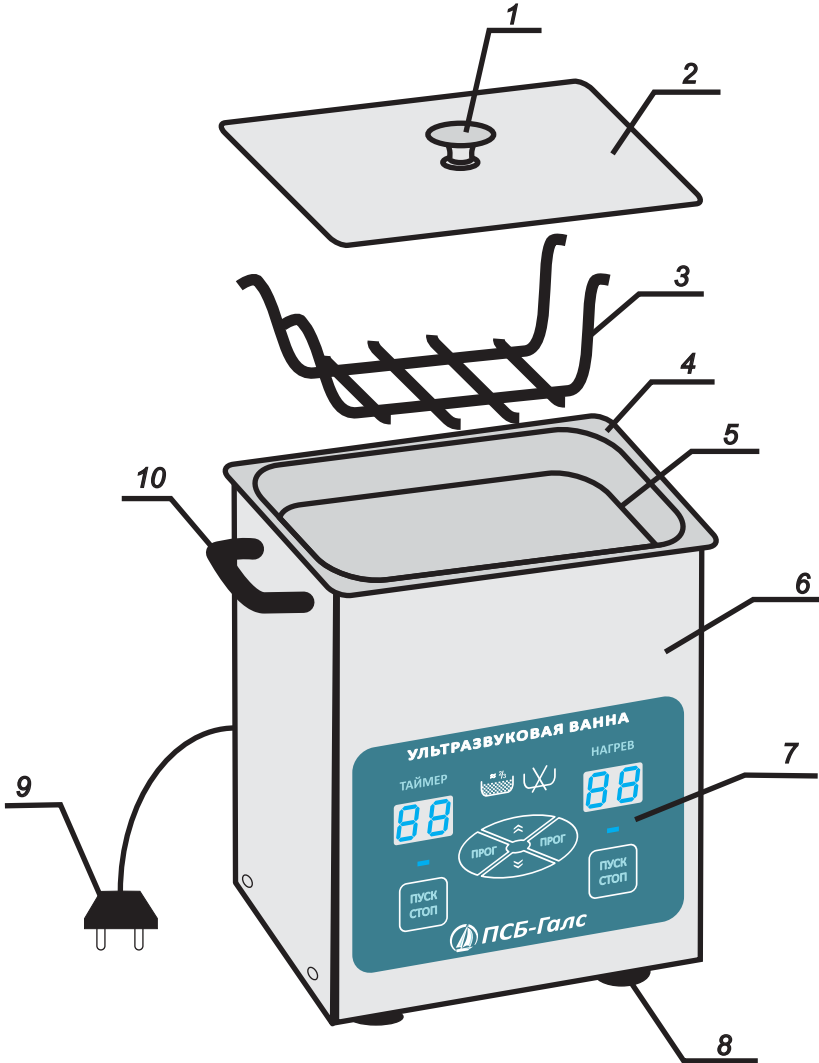
2.1.2. The heating elements 2 (Figure 2) are installed on the rear wall of the ultrasonic tank 1 (Figure 2).

2.1.3. USC control unit is located on the front panel.

2.1.4. The ultrasonic tank is connected to an ultrasonic generator 4 (Figure 2), which converts the voltage of the electrical network (~220 V, 50 Hz) into high-frequency electrical oscillations (22-60 kHz), using wires 5 (Figure 2).

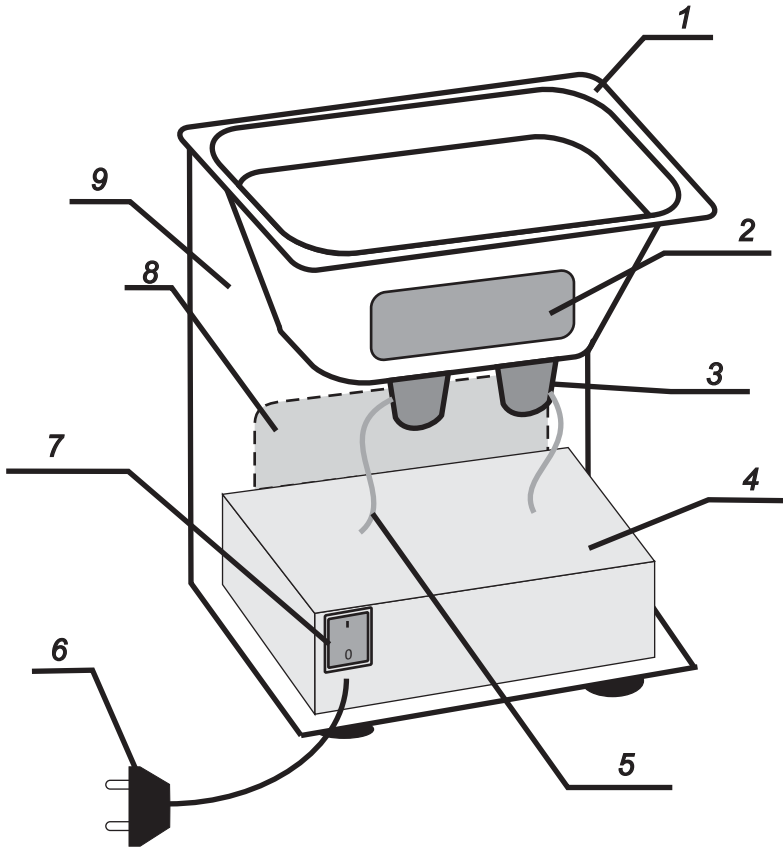
2.1.5. On the USC, with a volume of 4.0 liters and more, the design provides handles 10 (Figure 1) on both sides for the transfer of the USC.

2.1.6. The USC is manufactured with a digital control panel. The appearance of the control panel is shown in Figure 3.



**Figure 1.**

1 - cover handle; 2 - cover; 3 - hanging lattice; 4 - ultrasonic tank; 5 - fill level mark; 6 - body; 7 - control panel; 8 - feet; 9 - power cord from mains; 10 - handles (only on USC with a volume of more than 4.0 liters)

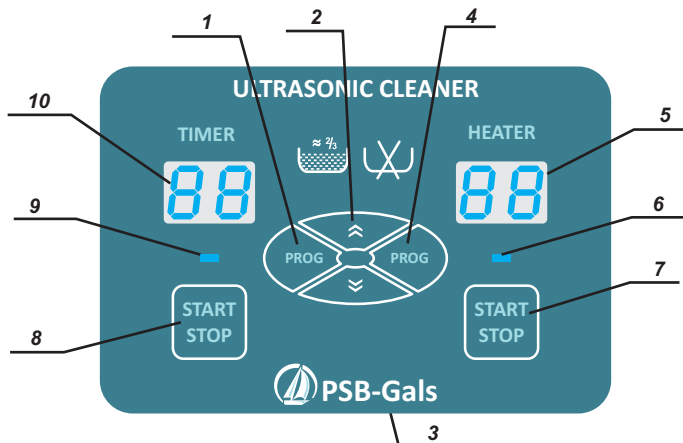


**Figure 2.**

*1 - ultrasonic tank; 2 - heating elements; 3 - ultrasonic transducers; 4 - ultrasonic generator; 5 - wires; 6 - power cord from mains; 7 - power on / off button; 8 - control panel; 9 - body.*

2.2. Operating principle. USC work is based on the principle of electronic converting mains energy into mechanical elastic vibrations using piezoelectric effect.

When exposed to high intensity ultrasound to the liquid formed high and low pressure zones. During the period of low pressure in liquid form microcavities containing almost a vacuum in which the surrounding liquid evaporates and the vapor bubbles are formed. As a result, the subsequent compression (high pressure), steam bubbles are compressed and collapse with the formation micro impact cumulative jets. If this occurs at the division "liquid product be cleaned," the surface is exposed to the sum of these impacts, called "cavitation", which provides a cleaning effect comparable to the impact of countless brushes.



**Figure 3.**

1 - on/off button timer programming mode; 2,3 - button to increase/decrease the value programmed values; 4 - on/off button thermostat programming mode; 5 - fluid temperature display; 6 - LED work heaters; 7 - on/off button of the heating elements; 8 - on/off button of the ultrasonic generators; 9 - LED work ultrasonic generator; 10 - indication of the timer.

### 3. CONTENTS OF DELIVERY

3.1. Contents of delivery is given in Table 1.

**Table 1**

Name	Amount, PC.
Ultrasonic Cleaner Assembly	1
Cover	1
Hanging lattice	1
User manual	1
Packaging	1

### 4. TECHNICAL DATA

4.1. The power supply of the product is an ultrasonic generator that connects to the electrical network ~220 V, 50-60 Hz, using cable 6 (Figure 2).

4.2. USC have:

- ✓heating system and thermal stabilization of the cleaning solution in the ultrasonic tank;
- ✓phase locked loop;
- ✓timer with automatic shut-off of ultrasound after a preset time;
- ✓overload protection.

- 4.3. The operating frequency in kHz is indicated in the model name (see first page).
- 4.4. Amplitude modulation - up to 90%.
- 4.5. Equivalent sound level in the workplace, no more than - 80 dBA.
- 4.6. Vibration level, not more than - 50 dB.
- 4.7. The main parameters and dimensions on the USC are given in Table 2.

**Table 2.**

Model	Volume	Thermostat	Timer	Generator power	Power of heaters	Power Consumption	Ultrasonic tank <i>(length x width x height)</i>	Overall dimensions <i>(length x width x height)</i>	Weight
	<i>liter</i>	<i>°C</i>	<i>min</i>	<i>W</i>	<i>W</i>	<i>W</i>	<i>mm</i>	<i>mm</i>	<i>kg</i>
PSB-13xx-05	1,3	25-75	1-99	50	150	200	155x145x100	176x165x235	1,5
PSB-28xx-05	2,8	25-75	1-99	100	150	250	235x135x100	265x165x235	2,2
PSB-40xx-05	4,0	25-75	1-99	150	300	450	295x145x100	325x175x315	2,9
PSB-57xx-05	5,7	25-75	1-99	150	300	450	295x145x150	325x175x335	4,5
PSB-80xx-05	8,0	25-75	1-99	250	450	700	500x135x150	600x180x370	6,2
PSB-95xx-05	9,5	25-75	1-99	200	450	650	300x240x150	325x265x335	6,7
PSB-120xx-05	12,0	25-75	1-99	200	450	650	300x240x200	335x265x335	6,9
PSB-140xx-05	14,0	25-75	1-99	300	600	900	300x320x150	400x300x300	7,5
PSB-180xx-05	18,0	25-75	1-99	300	600	900	300x320x200	400x300x330	8,0
PSB-220xx-05	22,0	25-75	1-99	550	600	1'150	505x305x150	530x325x350	9,0
PSB-280xx-05	28,0	25-75	1-99	550	600	1'150	505x305x200	530x325x350	9,2
PSB-440xx-05	44,0	25-75	1-99	1'100	600	1'700	505x610x150	710x550x350	36,0
PSB-560xx-05	56,0	25-75	1-99	1'100	600	1'700	505x610x200	710x550x380	40,0

Where "xx" is the operating frequency in kHz.

### 5. SAFETY WARNINGS

- 5.1. Before working with the USC, you should carefully read the sections of this manual.
- 5.2. By the operation of the USC allowed to persons who have been oriented on safety and have read Section 5, 6 and 7 of this manual.
- 5.3. Before switching on the product to the power grid is necessary:
  - ✓ check the presence of ground in the outlet, if it is not available, then connect the product to ground;
  - ✓ check the integrity of the power cable insulation.
- 5.4. It is forbidden to turn on the USC without filling the ultrasonic tank with water. During operation, it is not allowed to evaporate water below the average level.
- 5.5. During operation, downtime and keeping the USC it is necessary to exclude the possibility of water ingress, as well as other foreign objects inside the body.
- 5.6. It is strictly forbidden to pour flammable liquids (alcohol, acetone, gasoline, diesel fuel, etc.) into the ultrasonic tank.
- 5.7. When using aggressive cleaning solutions (acid, alkali, etc.), it is mandatory to use personal protective equipment, which includes rubber gloves, goggles, etc.
- 5.8. During the operation of the USC, do not immerse your hands in the cleaning solution in the ultrasonic tank. If it is necessary to rotate the parts during the cleaning process, the hands should be protected with two pairs of gloves: outside - rubber, inside - woolen or cotton.

5.9. It is strictly forbidden to open the body of the USC. The repair of the USC is made by the manufacturer or an authorized workshop. There are no serviceable parts inside.

5.10. The product is protected against overloads, which protects it from failure and is triggered by sudden voltage surges in the electrical network, sudden changes in the water level in ultrasonic tank, etc.

5.11. Operator as a means of personal protection is recommended to use anti-noise headphones.

5.12. To avoid exposure to harmful vapors of the solution on a person, the ultrasonic cleaning areas should be included in the exhaust ventilation network.

## **6. GETTING STARTED, OPERATING PROCEDURE AND OPERATING INSTRUCTIONS**

6.1. After opening the manufacturer's package, check the completeness of the delivery for compliance with Section 3 of this manual, make sure that there are no mechanical damages on the blocks and wires.

6.2. If, before the preparation of the USC for work, it was in other climatic conditions than specified in paragraph 1.4 of this manual, the USC must be kept in normal climatic conditions for at least four hours.

6.3. The USC should be installed on a firm, level surface in order to avoid overturning during operation.

6.4. When connecting to the mains, the USC body must be securely grounded. For grounding the USC have grounding-type plug. The connection of the USC to the mains must be made through a socket having a grounding contact. Using the USC without grounding is prohibited.

6.5. The ON / OFF button of the power supply 7 (figure 2) must be in the "off" position ("0").

6.6. Fill the ultrasonic tank 4 (figure 1) with a detergent to the mark 5 (figure 1). It should be remembered that the USC can only be turned on after the aqueous solution has been poured.

6.7. Secure the hanging lattice 3 (figure 1) to the sides of the ultrasonic tank 4 (figure 1).

6.8. Connect the power cord plug 9 (figure 1) to the mains socket ~220 V, 50-60 Hz.

6.9. Turn the power button 7 (figure 2) to the "on" ("I") position.

6.10. On the digital control panel of the product (figure 3), set the parameters:

- ✓detergent temperature using button 4 (figure 3);

- ✓operation time using button 1 (figure 3).

The current parameters are displayed on the LED panel 5 and 10 (figure 3) under the words "Heater" and "Timer" respectively. Change the parameters by pressing the buttons:

- ✓1 or 4 "PROG" (figure 3) to activate the timer or thermostat programming mode, respectively;

- ✓2 "▲" or 3 "▼" (figure 3) to increase or decrease the value of the programmable parameters respectively;

6.11. Press the "Start / Stop" button 7 (figure 3) to heat detergent to the set temperature, the heater operation LED 6 (figure 3) will light up. After the temperature of the detergent has reached the set value, the indicator light turns off and the temperature will automatically maintained at the preset level.

- 6.12. To turn off the heater operation, if you do not need to keep the temperature, press the "Start / Stop" button 7 (figure 3), the LED indicator of the heater 6 (figure 3) will turn off.
- 6.13. After reaching the desired temperature of the detergent, place your product (to be cleaned) on the hanging lattice and turn on the ultrasonic generator.
- 6.14. The ultrasonic generator is switched on by pressing the "Start / Stop" button 8 (figure 3), the ultrasonic generator LED indicator 9 will turn on (figure 3) and you will hear the characteristic sound of the cavitating liquid, which indicates the normal operation of the USC.
- 6.15. At the end of the time set on the timer, the ultrasonic generator will automatically turn off.
- 6.16. To prematurely shut down the ultrasonic generator, it is necessary to press the "Start / Stop" button 8 (figure 3), the LED indicator of the ultrasonic generator 9 (figure 3) will turn off.
- 6.17. At the end of the operation, set button 7 (figure 2) to "Off" ("0") position, unplug the power cord from the mains, allow the detergent to cool for 15-20 minutes and drain it. Then wash the ultrasonic tank with clean water and wipe the surface with a dry cloth.

## 7. PACKAGING, TRANSPORTATION AND STORAGE RULES

- 7.1. The USC and its components and accessories are packed in carton box.
- 7.2. User manual is inside the box.
- 7.3. The USC must be stored in a package in a heated room with a temperature from +5 to +40° C and a relative humidity not more than 80%. The room should not contain vapors of alkali, acids and other chemicals that cause corrosion of metal parts.
- 7.5. The USC can be transported in an upright position by any kind of closed transport at a temperature from -25 to +50° C.
- 7.6. After transporting the USC at negative temperatures, it must be kept under normal conditions for at least 24 hours.

## 8. TYPICAL MALFUNCTIONS AND METHODS OF THEIR ELIMINATION

- 8.1. This product is equipped with an overload protection that protects the USC from failure and is triggered by sudden power surges in the electrical network, a sudden change in the level of the detergent in the ultrasonic tank, and the like.
- 8.2. There are no serviceable parts or components inside the USC. To avoid electric shock, it is absolutely forbidden to open the body of the USC!

№	Malfunction	Possible troubleshooting
1	When the "POWER" button is turned on, the indicator light does not turn on.	1. Check if the USC is connected to the mains. 2. Visually check the integrity of the power cable. 3. Check if there is a voltage in the electrical network by a tester or a known good device. 4. If these steps do not correct the problem, contact the manufacturer.



<b>№</b>	<b>Malfunction</b>	<b>Possible troubleshooting</b>
2	When the ultrasonic generator button is turned on, the indicator light is on, and the USC does not work.	1. Proceed as follows: ✓ bring the button 7 (figure 2) to the "off" position ("0"); ✓ disconnect the power plug from the mains; ✓ repeat the inclusion of the USC according to clause 6 of this manual. 2. If these steps do not correct the problem, contact the manufacturer.

### **9. MANUFACTURER INFORMATION**

9.1. Ultrasonic Equipment Center PSB-Gals Limited.

9.2. Legal and post address: Dmitrovskoje shosse, 110, building 32. Moskva, Russia, 127411.

9.3. Office address: Dmitrovskoje shosse, 157, building 9, office 93107. Moskva, Russia, 127411.

9.4. Phone: +7 (495) 25-88-321, +7 (916) 705-87-03.

9.5. Site: [www.psb-gals.ru](http://www.psb-gals.ru).

9.6. E-mail: [support@psb-gals.ru](mailto:support@psb-gals.ru).

9.7. Skype: psb-gals.

## 10. DETERGENTS

10.1. Use of the following detergent in the USC is strictly prohibited:

- ✓ flammable liquids (gasoline, acetone, kerosene, alcohol, etc.);
- ✓ precipitating substances;
- ✓ substances that give on the walls of the bath resistant film;
- ✓ concentrated acid;
- ✓ concentrated alkali;
- ✓ substances whose vapors are dangerous or toxic to humans.

10.2. General recommendations for cleaning up various contaminants:

Application area	Type of pollution	Recommendations
Car service and repair	Injectors, carburetors, sensors, wheel disks, engine parts, bearings, etc.	10-20% aqueous solution of "Gals-Auto", the temperature is 40-60° C
	Spark plugs, rusted parts	5-10% aqueous solution of weak acids (acetic, citric, oxalic...), temperature - 20-40° C
Jewelry industry	Polishing pastes, remnants of flasks, etc.	5-20% aqueous solution of "Gals-Jeweler", temperature - 20-60° C;
	Fats, domestic, organic pollution, etc., pre-sale preparation	5-20% aqueous solution of "Gals-Jeweler", temperature - 40-60° C;
Electronic industry	Remains of various fluxes, fatty, mechanical impurities	10-20% aqueous solution of "Gals-Electronics", temperature - 50-60° C;
Medicine, stomatology	Organic, fatty, mechanical impurities	10-20% water solution "Gals-Universal", temperature - 40-60° C;
Mechanical engineering	Polishing, lapping, drilling pastes; mechanical, abrasive contamination; Grease and oil contaminants (including preservative greases)	10-20% water solution "Gals-Universal", temperature - 40-60° C;

## ADDRESSES OF WARRANTY WORKSHOPS

### Russia, Moscow

Ultrasonic Equipment Center PSB-Gals Limited.

Dmitrovskoje shosse, 110, building 32. Moskva, Russia, 127411.

Dmitrovskoje shosse, 157, building 9, office 93107. Moskva, Russia, 127411.

Phone: +7 (495) 25-88-321, +7 (916) 705-87-03.

Site: [www.psb-gals.ru](http://www.psb-gals.ru), [www.psb-gals.com](http://www.psb-gals.com)

E-mail: [support@psb-gals.ru](mailto:support@psb-gals.ru).

Skype: psb-gals.

### Spain, Santiga

SonoWat SL

Poligono Industrial Santiga Argenters 11-13 Nave 7

08130, Sta. Perpetua de la Mogoda (Barcelona)

Phone: +34 (937) 29-47-83

Fax: +34 (937) 19-18-08

Site: [www.sonowat.com](http://www.sonowat.com)

E-mail: [cial@sonowat.com](mailto:cial@sonowat.com)

### WARRANTY CARD

The manufacturer guarantees that the USC conforms to the technical requirements under the rules of operation, transport and storage.

The warranty period of the product, approved technical control of the manufacturer, is 12 months from the date of shipment to the consumer.

Warranty and post-warranty repair shall be the manufacturer or authorized manufacturer workshop.

Warranty repair is made upon presentation of the service center USC assembly and completed warranty card without corrections.

The warranty repairs may be refused in the following cases:

- ✓ external mechanical damage;
- ✓ failure to comply with the operating conditions set forth in this manual;
- ✓ traces of exposure to chemicals;
- ✓ traces of exposure to elevated temperature;
- ✓ finding within the USC body a foreign object, insects, etc.
- ✓ traces of repair workshops, unauthorized manufacturer;
- ✓ corrections in the warranty card or lack thereof;

For all matters arising in the course of operation of the product, as well as for maintenance and repair, contact the manufacturer.

Serial No \_\_\_\_\_

Date of manufacture (DD.MM.YYYY) \_\_\_\_\_

Date of sale (DD.MM.YYYY) \_\_\_\_\_

Date of receipt for repair (DD.MM.YYYY) \_\_\_\_\_

Date of issue to the owner (DD.MM.YYYY) \_\_\_\_\_

Signature of the owner:

Quality of repair is satisfied:  yes \_\_\_\_\_  no \_\_\_\_\_