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**Portable EHF and IR therapy apparatus**

**With changeable oscillators  
CEM®-TECH MINI**

**TY 9444-002-28833138-2009**

**Operating Manual**

SLAN 944429.00.02 PE

## 1. Purpose

1.1. The portable EHF-IR therapy apparatus with changeable CEM-TECH oscillators (hereinafter “apparatus with changeable therapeutic oscillators”), is intended for the treatment of patients with low intensity and background electromagnetic energy in Extremely High Frequency (EHF) and infrared (IR) ranges when used on biologically active points of the body and areas of the skin.

1.2. The apparatus and removable therapeutic oscillators can be used in a wide range of medical and prophylactic establishments, both individually under doctor's direction in inpatient or outpatient settings and also as a means of self- and mutual help.

1.3. The apparatus can be used in premises with an ambient temperature of between +10 and +35 °C and relative humidity of no more than 80 % at +25 °C.

1.4. The portable apparatus runs off an internal power supply and is intended for inpatient use.

## 2. Technical Specifications

2.1. The apparatus consists of the control unit (the apparatus proper) with a built-in number 4 oscillator (channel 1) and separate changeable oscillators connected to the apparatus (channel 2) via a flexible cable with plugs.

2.2. The CEM TECH apparatus can be complemented with oscillators on the following frequencies:

- No. 1: 40-43 Hz (fixed wavelength in the range 7.5-6.977 mm) (EHR);
- No. 2: 52-57 GHz (fixed wavelength in the range 5.769-5.263mm) (EHR);
- No. 3: 57-63 GHz (fixed wavelength in the range 5.263-4.762mm) (EHR);
- No. 4: wideband Gann sound spectrum;
- No. 5: infrared in the range 0.7-1.2 μm (IR).

2.3. When connecting oscillators No. 1-3, a pulse power flux density of not less than  $5 \times 10^{-10} \text{ W/cm}^2$  on the surface is ensured.

2.4. The oscillator impulse frequency is fixed at 4GHz in the first mode and 9 GHz in the second and third modes.

2.5. The unit is powered by two type LR03/AAA batteries with a rated voltage of 2x1.5V.

Continuous working time with new batteries is at least 100 hours.

2.6. Overall dimensions of the apparatus are not more than 110 x 55 x 30 mm.

2.7. The weight of the apparatus is no more than 150g.



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### 3. Configuration

3.1. The configuration of the apparatus is shown in Table 1.

Table 1

Item	Name	Qty
1	Apparatus with built-in oscillator	1
2	Detachable oscillator No. 4	1
3	USB 2.0, A/mini B 5P (length 1.0-1.8m) connector cable for detachable oscillator	1
4	Operating manual	1
5	Packaging	1

3.2. The changeable detached oscillators shown in Table 2 can also be added to the apparatus.

Table 2

Oscillator Number	Description
No.1	Red mark on cover, fixed wavelength in range 7.5 – 6.977 mm
No.2	Green mark on cover, fixed wavelength in range 5.769 – 5.263 mm
No.3	Blue marking on cover, fixed wavelength in the range 5.263 – 4.762mm
No.4	Yellow marking on cover (NOISE)
No.5	Oscillator case has blue marbled guards, oscillator on cable, non-detachable, IR, wavelength in the infrared range 0.7-1.2 $\mu\text{m}$

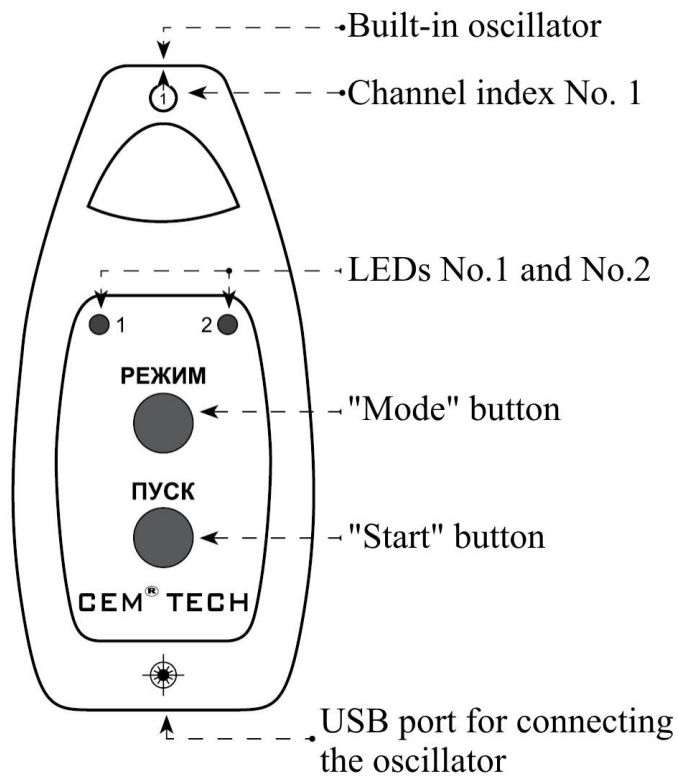
Note: you may choose which/how many additional oscillators to order.

### 4. Configuration apparatus

4.1. The apparatus is enclosed in a plastic case containing:

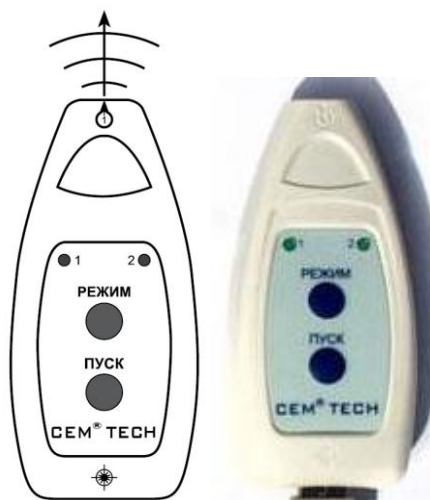
- ~ an electronic circuit for voltage supply to the solid-state oscillators simultaneously on two channels (1 is built-in, 2 is detached);
- ~ a built-in oscillator;
- ~ a battery compartment with two batteries.





**Fig.1**  
**External view of CEM TECH**

4.2. Built-in oscillator No. 4 (channel 1) is located in the upper tapering part of the apparatus casing (fig.1). The output and direction of the energy are shown in fig. 2.



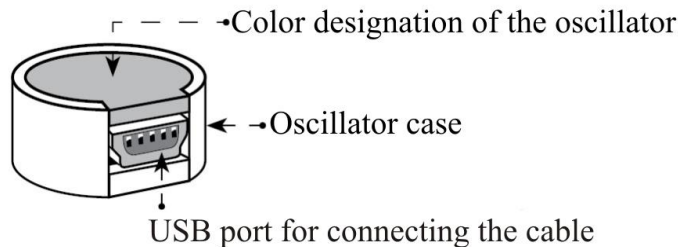
**Fig.2**



### Direction of energy from the built-in oscillator

4.3. The USB port for connecting the changeable detached oscillators to channel 2 is located on the lower part of the apparatus casing (fig.1).

4.4. The detached oscillators come in the form of cylindrical plastic cases which accommodate the solid-state EHF oscillators (fig.3)



**Fig.3**

### External view of detached oscillator for the CEM TECH

4.5. On the front panel there are two buttons, “Mode” and “Start”, which control the apparatus’s operation and two LEDs indicating its operating mode (fig.1).

4.5.1. The apparatus has three modes of operation:

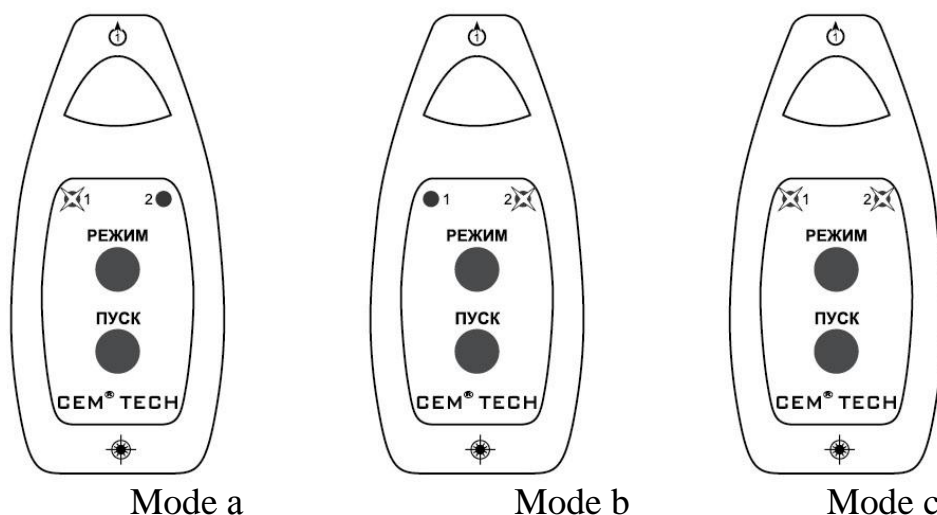
- a) 5 min. session (Anti Stress)
- b) 1 min. session (FRI-therapy recording)
- c) 10 min. session (General/local treatment)

4.5.2. Pressing the “Mode” button turns on the apparatus and selects the operating mode.

On the first press, the apparatus is turned on and LED 1 lights up. This means that mode “a” is selected.

With a second press, LED 2 lights up and mode “b” is selected.

With a third press, both LEDs light up and mode “c” is selected (fig.4).



**Fig.4.**

### Display when selecting CEM TECH operating mode

4.5.3. After the mode has been selected, the apparatus is turned on using the “Start” button.

4.5.4. While the apparatus is operating LED 1 will blink intermittently if no detachable oscillator is connected. If a detachable oscillator is connected, both LEDs will blink. Independently of the oscillators working, the apparatus will emit a soft chirping sound during the course of the session. These light and sound indicators show that the apparatus and oscillators are working properly.

4.5.5. After the session is complete, the apparatus automatically turns itself off in 10-15 seconds.

4.5.6. If, after the operating mode has been selected, the “Start” button is not pressed for several seconds, the apparatus automatically turns itself off.

4.6. The apparatus's information label with its serial number is located on the bottom of the battery compartment (under the batteries).

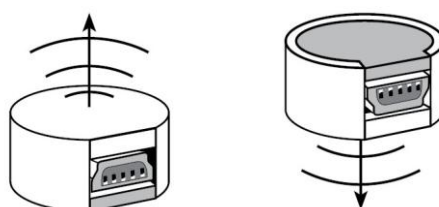
## 5. Safety Instructions

5.1. You must be familiar with the current operating manual before operating the apparatus.

5.2. To protect patients and medical staff from electric shock, the apparatus meets the standards for Type C products with internal power supply under GOST R 50267.0-92.

5.3. *While the apparatus is in operation, you must not expose unprotected eyes to the end of the oscillator that emits energy (with the oscillator at a distance of less than 50 cm from the eyes). Doing so may result in undesirable physiological effects.*

**Caution! The detached oscillator emits energy from the side opposite the side with the color-coded oscillator number (fig. 5).**



**Fig. 5**

### Energy direction from detached oscillator

When working with only a detached oscillator, the apparatus must be oriented in such a way that the energy output of the built-in oscillator is directed away from patient and operator.

5.4 For the purposes of electromagnetic compatibility (EC), this apparatus is classified as class B, group 1 under GOST R 51318.11-99.

5.5 The apparatus uses radio frequency energy only for the execution of internal functions. The interference level of radiofrequency emissions is low and does not cause interference with nearby electronic equipment.

The therapeutic oscillators are sources of low intensity EHF and IR energy for the purposes of therapeutic action on points of the patient's body and do not cause interference with nearby electronic equipment.

The apparatus is marked with the sign for non-ionizing energy in accordance with IEC 60417 (graphic symbol 5140):



5.6 The apparatus is resistant to radiofrequency electromagnetic waves in the range 80-2000 MHz with impact amplitude of 3V/m, and to magnetic waves of industrial frequency tension of 3A/m.

5.7 Caution! The apparatus is sensitive to the effects of electromagnetic discharge (ESD) on the connector cable to the detached oscillator.

The apparatus carries the ESD sensitivity sign in accordance with IEC 60417 (graphic symbol 5134):



To prevent ESD, the following measures must be observed:

- connect and disconnect the oscillators only when the apparatus is turned off;

- before using the apparatus, the operator should discharge static electricity by touching a large metal object such as a heating pipe or water pipe;
- wear clothing that reduces the accumulation of electrostatic charge.

5.8 The apparatus can be used in locations where the floors are wood, concrete or ceramic tiling.

If the floors are covered with synthetic material, then the relative air humidity should be at least 30%.

5.9 The apparatus should only use the cable supplied, or a USB 2.0 A/mini B 5P type cable from Belsis, Hama, Sony, Link Bits or Gembird. The length of the connector cable to the detached oscillator must be at least 0.5m and no more than 1.8m.

The use of cables of other lengths or types is prohibited, as this can cause an increase in interference emission and a decrease in resistance to interference.

5.10. Connecting the apparatus and therapeutic oscillators to any other equipment via connecting cables is prohibited.

## **6. How to Use the Apparatus**

### 6.1. Check that the apparatus is functioning.

#### 6.1.1. Turn on the apparatus by pressing the "Mode" button.

When the apparatus is turned on, battery charge is checked and indicated by the LEDs.

If the battery charge has been exhausted, the LEDs on the front panel will blink intermittently when the apparatus is turned on. This means that the batteries must be replaced (see. para. 11 "Changing the batteries").

If the battery charge is normal, LED 1 will light up when the apparatus is turned on.

6.1.2. After apparatus function has been checked, the apparatus will automatically switch itself off in 10-15 seconds if no buttons are pressed.

## 6.2. Working with the built-in oscillator:

6.2.1. Before starting the procedure, pick up the apparatus and place it on the patient's skin, directing the working surface of the built-in oscillator towards the area of treatment (fig.6).

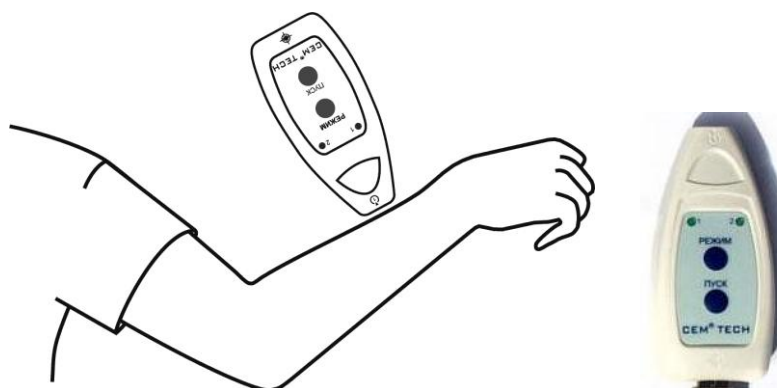


Fig.6.

6.2.2. Turn the apparatus on and choose the operating mode by successively pressing the “Mode” button (details in 4.5.1-4.5.2.)

6.2.3. Press the “Start” button to start the selected operating mode.

LED 1 will blink intermittently during the entire session and you will hear a chirping noise.

6.2.4. At the end of the session LED 1 will stop blinking and will stay lit for 10-15 seconds. Then the apparatus will automatically turn off and the LED will go out.

## 6.3. Working with a detached oscillator:

6.3.1. Before starting the procedure, use the connector cable to connect the changeable detached oscillator to the apparatus.

6.3.2. Place the oscillator's working surface on the skin's surface in the area of treatment and secure it with an adhesive bandage, leaving the cable free to be removed.

The apparatus must be placed so that the energy output from the built-in oscillator is directed away from the patient and operator.

In some cases it is possible to carry out a procedure with two oscillators. In such cases, the apparatus must be placed on the patient's skin, directing the working surface of the built-in oscillator at the treatment area alongside the detached oscillator.

6.3.4. Turn the apparatus on and select the operating mode for the apparatus by successively pressing the “Mode” button (details in 4.5.1-4.5.2.)

6.3.5. Press the “Start” button to start the selected operating mode for the apparatus.

LEDs 1 and 2 will blink intermittently during the entire session and you will hear a chirping sound.

6.3.6. At the end of the session the LEDs will stop blinking and will remain lit for 10-15 seconds as in fig.4, depending on the mode in which the apparatus was operating. Then the apparatus will automatically turn off and the LEDs will go out.

6.3.7. Disconnect the connector cable from the oscillator.

To work in DFI mode, leave the oscillator attached to the treatment area.

6.4. To end a session early, simply press “Start” again.

## 7. Maintenance

7.1. The operator can check battery charge as described in 6.1.

7.2. The operator can change the battery as described in 11.

7.3. The operator can check the functioning of the apparatus and oscillators using the LEDs as described in 4.5.4.

7.4. The manufacturer recommends carrying out an annual inspection on the EHF energy from the oscillators using the special equipment in the warranty maintenance paragraph.

## 8. Troubleshooting

Common problems and their solutions are provided in Table 2.

Table 2

	<b>Problem</b>	<b>Likely Cause</b>	<b>Solution</b>	<b>Note</b>
1	Apparatus does not turn on	No batteries in apparatus	Insert batteries	If installation of properly charged batteries does not solve the problem, send the apparatus in for repair .
		No charge left in batteries	Replace batteries	
2	When apparatus is turned on, both LEDs blink intermittently	Batteries low	Replace batteries	
3	Apparatus is working, but there is no indication that the oscillators are connected	Cable physically damaged	If cable is damaged, get a new cable	If no damage is visible, send the apparatus and oscillators in for repair. Do not attempt to repair the apparatus yourself.
		Oscillator physically damaged	If oscillator is damaged, obtain a new one	
		USB port on apparatus damaged	Send apparatus in for repair	

## 9. Storing the Apparatus

9.1. Store the apparatus in the manufacturer's packaging in premises with an air temperature of between +5 and +40 °C and humidity of no more than 80% at a temperature of +25 °C (storage conditions for group 1 (C) GOST 15150-69).

9.2. If the apparatus will not be used for more than two years, the batteries must be removed.

## 10. Operating Instructions

*10.1. The apparatus is a source of low-intensity EHF and IR light from the oscillator. Use of the apparatus is only permitted after acquaintance with this manual.*

*10.2. The apparatus must be used in strict adherence to the accompanying user documentation.*

*10.3. When working with the apparatus the safety measures outlined in paragraph 5 of the current manual must be observed.*

*10.4. Care must be taken when working with the detached oscillators to protect them from blows, bumps and falls to avoid damage.*

*The oscillator connector cable must not be bent, broken, stretched while rubbing, or pulled when disconnecting the oscillator from the apparatus port.*

*When disconnecting or connecting the connecting cable to the apparatus or oscillator, the connector cable should be held only by the connector.*

**10.5. Before use, it is recommended that the oscillator be disinfected with a flannel cloth (or gauze, cotton ball), lightly moistened with ethyl alcohol. Before disinfection the cloth should be thoroughly squeezed out.**

**To prevent liquid from getting inside the body of the oscillator, YOU MUST NOT wipe the EHF oscillator with a very moist cloth or cotton ball.**

**The apparatus manufacturer permits the use of other disinfectants approved by Russian health authorities.**

*10.6. The “Mode” and “Start” buttons should only be pressed at intervals of at least 1-2 seconds, otherwise a failure or false start may occur.*

*10.7. To avoid damage to the apparatus and oscillators*

### **YOU MUST NOT:**

- use carbon zinc batteries for the power supply (with the R03 marking);
- immerse the oscillators in water;
- subject the unit to blows and excessive mechanical stress;
- give the oscillators to children;
- swallow the oscillators.

## 11. Changing the Batteries

11.1. If the batteries need changing, the LEDs will blink when the apparatus is turned on (see para.6.1.)

11.2. To change the batteries:

- open the battery compartment cover;
- take out the old batteries;
- insert the new batteries, observing the polarity;
- close the battery compartment;
- check that the apparatus is functioning (see para.6.1).

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