

ООО «РЦ АРТ», Екатеринбург, Россия

RU

Электростимулятор с внутренним и выносными электродами портативный для стимуляции БАТ и БАЗ и электропунктурной диагностики

**ДиАДЭНС-ПК**  
**РУКОВОДСТВО ПО ЭКСПЛУАТАЦИИ**

РЦ АРТ 01.3-03.7-03 РЭ  
ТУ 9444-002-35266303-2005

LLC "RC ART", Ekaterinburg, Russia

EN

Portable electrostimulator with built-in and remote electrodes, for stimulation of Biologically Active Points (BAP) and Biologically Active Zones (BAZ) and for electropuncture diagnosis

**DiaDENS-PC**  
**OPERATION MANUAL**

RC ART 01.3-03.7-03 RE  
TU 9444-002-35266303-2005

"RC ART" GmbH, Ekaterinburg, Russland

DE

Tragbarer Elektrostimulator mit Innen- und Ausgangselektroden für die Stimulation von BAP und BAZ sowie für die Elektropunkturdiagnostik

**DiaDENS-PC**  
**BETRIEBSANLEITUNG**

RC ART 01.3-03.7-03 RE  
TU 9444-002-35266303-2005

## CONTENTS

<i>Part 1. Technical passport</i> .....	71
1. Function.....	71
2. Technical characteristics.....	72
3. Complete set.....	75
4. Safety rules.....	76
5. Device system and function.....	77
6. Technical maintenance.....	81
7. Possible problems and troubleshooting.....	82
8. Storage and transportation.....	84
9. Utilisation.....	84
10. Manufacturer warranty.....	85
 <i>Part 2. Operation instruction</i> .....	 87
1. General considerations.....	87
2. Treatment conditions.....	89
3. The electrostimulation intensity.....	90
4. Operating methods.....	91
5. Modes of operation.....	92
6. Recommended treatment zones and points.....	123
 Certificate of acceptance.....	 191
 <i>Supplement 1.</i>	
<i>Atlas of recommended treatment zones and points</i> .....	<i>193</i>

This Operation Manual (OM) cover electrostimulator with built-in and remote electrodes, the portable one for stimulation of the BAP and BAZ and for electropuncture diagnosis Di-DENS-PC.

The Operation Manual includes Technical Passport and the Operation Instructions.

## **PART 1**

# **TECHNICAL PASSPORT**

### **1. FUNCTION**

The DiaDENS-PC device is used for electric stimulation of biologically active points and zones (BAP and BAZ), for auricular diagnosis, mini acupuncture diagnosis and the diagnosis by the Voll method. The device is equipped with built-in and remote electrodes.

The DiaDENS-PC device is intended for individual application in therapeutic-prophylactic institutions and at home in compliance with directions given by the attending physician, autonomously, or along with computer diagnostics. The personal computer will be used for accumulation and storage of the diagnosis data.

**2. TECHNICAL CHARACTERISTICS**

2.1. Electric impulses of the device (Fig. 1) must have output parameters as follows:

2.1.1. the impulse minimal parameters:

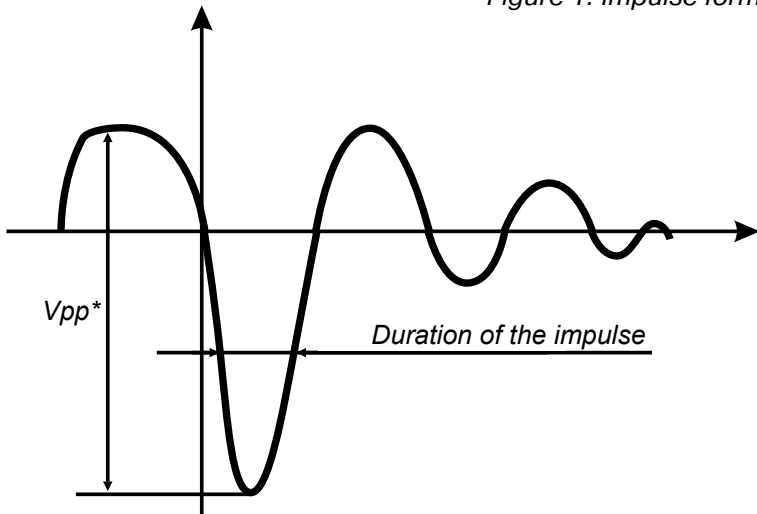
- duration of the impulse positive part, us, not exceeding.....5
- amplitude of the impulse positive part, V, not exceeding.....10
- amplitude of the impulse negative part, V, not exceeding.....10

2.1.2. maximal parameters of the impulse:

- duration of the impulse positive part, us.....500±70
- amplitude of the impulse positive part, V.....30±10
- amplitude of the impulse negative part, V, without load .....350±70
- with load (20 ± 5%) kOhm.....300±70

2.1.3. Minimum load resistance under which the parameters of the impulse keep, Rmin.....500 Ohm

*Figure 1. Impulse form*



\*  $V_{pp}$  – voltage peak to peak

2.2. The device has the frequencies of impulse sequence settings in Hz as follows:

2.2.1. Range 1:

- $10 \pm 2$  including MED and SCREENING modes
- $20 \pm 2$
- $60 \pm 2$
- $77 \pm 2$
- $77 \pm 2$  and  $10 \pm 2$ , modulated with frequency  $2 \pm 0.1$
- $77 \pm 2$  with modulation by amplitude
- $140 \pm 5$
- $200 \pm 5$

2.2.2. Range 2: from 1 to 9.9 with increment  $0.1 \pm 0.05$ .

2.3. The maximal current

(voltage 9 V).....not exceeding 40 mA.

2.4. Power supply:

battery of 6F22 type, voltage.....9 V

It will be admissible to use storage batteries of 6F22 type, voltage at least 9 B\*.

2.5. Mass of the device, kg, not exceeding.....0.35

2.6. With remote therapeutic and diagnostic electrodes, kg, not exceeding.....0.7

2.7. Overall dimensions of the device, mm, not exceeding.....210x55x45

2.8. Overall dimensions of therapeutic electrode, mm, not exceeding.....125x10

2.9. Overall dimensions of passive diagnostic electrode, mm, not exceeding.....100x20

Overall dimensions of active diagnostic electrode, mm, not exceeding.....130x10

2.10. The device is connected to the computer via serial port by protocol RS-232.

---

*\* Order of Operation (types of chargers, charging methods) is given in the Manual for accumulators; period of work of the apparatus with accumulators depends on the accumulators' specifications.*

2.11. The device will be automatically switched off not later than in 10 minutes after the device has been idle or after last application of electrodes to skin surface.

2.12. Operational conditions:

- surrounding temperature, °C..... 10-35
- air pressure..... 70- 100 kPa
- relative air humidity..... 30-93%

If the device was stored at the temperature lower than 10°C, keep it under normal climatic conditions for at least two hours prior to using it.

2.13. Amplitude at minimal power is 5% from amplitude at maximum power.

The equipment fulfil the Electromagnetic compatibility (EMC) in accordance with the IEC-60601 - 1 -2 and the additional standard of the IEC-60601-2-10.

This medical product bears the CE mark in accordance with the Medical Device Directive (MDD) 93/42/EEC.



— an item of the B type with the operational part of the F type.

**Attention!** *The device contains fragile elements. Protect it from blows.*

### 3. COMPLETE SET

3.1. The version of complete set of the DiaDENS-PC device corresponds to the Table 1.

*Table 1*

Name	Number
Electrostimulator “DiaDENS-PC”	1
Operation Manual, including Technical Passport and Operation Instructions	1
Electrode remote, therapeutic	1
Electrode, diagnostic	1
Connecting computer cable	1
CD, software	1
User Manual for the DiaDENS-PC software	1
Case	1
Cover for electrostimulator	1
Packaging	1
Power supply: battery of the 6F22 type	1

#### 4. SAFETY RULES



*Read carefully all information contained in this Operation Manual in respect to your safety, as well as recommendations for correct use and maintenance of the device.*

4.1. The device presents no danger for patients because of using low-voltage inner power supply. When connected to personal computer, the device presents no danger either when used with connection a cable specifically designed for safety operation.

4.2. The device can not be used for treatment or diagnosis of patients who have implanted electronic devices (for instance, cardiostimulator) or for treatment of patients with individual intolerance of electric current.

4.3. During stimulation, the patient must not be connected to any high-frequency electrical device other than personal computer connected with a special cable provided in complete set.

4.4. During stimulation or diagnosis with the computer connected to the device, one must not simultaneously touch the patient and the computer frame.

4.5. Warning of potentially dangerous factors:

- simultaneous use of the device and other electric equipment by the patient (apart from personal computer connected with special cable) may cause burns and potentially damage the device;

- operation of the device near (within about 1-metre distance) of a short-wave or microwave therapeutic equipment, may induce instability of the device output data.

## 5. DEVICE SYSTEM AND FUNCTION

5.1. The device consists of the frame 1 (Fig. 2) with built-in electrodes 13 (Fig. 3); cover 14 (Fig. 3) for changing power supply.

The complete assembly of DiaDENS-PC device includes:

- remote therapeutic electrode (Fig. 2.1).
- diagnostic electrode (Fig. 2.2).

In addition, to the device, other remote therapeutic electrodes of the model series from the enterprise-manufacturer can be attached.

**Attention!** *The remote therapeutic electrode may only be used in THERAPY mode.*

Before using the remote electrode, the skin in the treatment area should be dampened with water or treated with Malavtilin ointment by apply small amount of it until completely absorbed.

5.2. The device is equipped with a liquid-crystal indicator “2” (Fig. 2).

5.3. The device has control buttons as follows (Fig. 2):

- key “3” (“B”) – for switching on the BIOREPER mode and MiniAS mode (simultaneously with the key “9” – “On”);
- key “4” (“V”) – for switching on the VOLL mode and BIO-VOLL mode (simultaneously with the key “9” – “On”);
- key “5” (“FREQUENCY +”) – for increasing the frequency in THERAPY mode, for switching to the modes “7710”, “77AM”, “SCREENING”, “MED”;
- key “6” (“POWER +”) – for augmentation of the stimulation power;
- key “7” (“FREQUENCY –”) – for decreasing the frequency in THERAPY mode and for switching o the modes “7710”, “77AM”, “SCREENING”, “MED”;
- key “8” (“POWER –”) – for decreasing the stimulation power;
- key “9” (“On”) – for switching the device on;
- key “10” (“Off”) – for switching the device off;

- 5.4. The device has sockets as follows (Fig. 2):
- slot “11” – for connection of remote therapeutic electrodes;
  - slot “12” – for connection of diagnostic electrodes and connecting to personal computer.

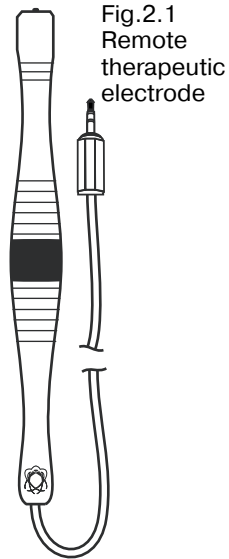


Fig.2.1  
Remote  
therapeutic  
electrode

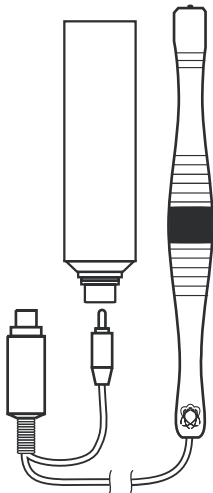


Fig. 2.2  
Remote diagnostic  
electrode

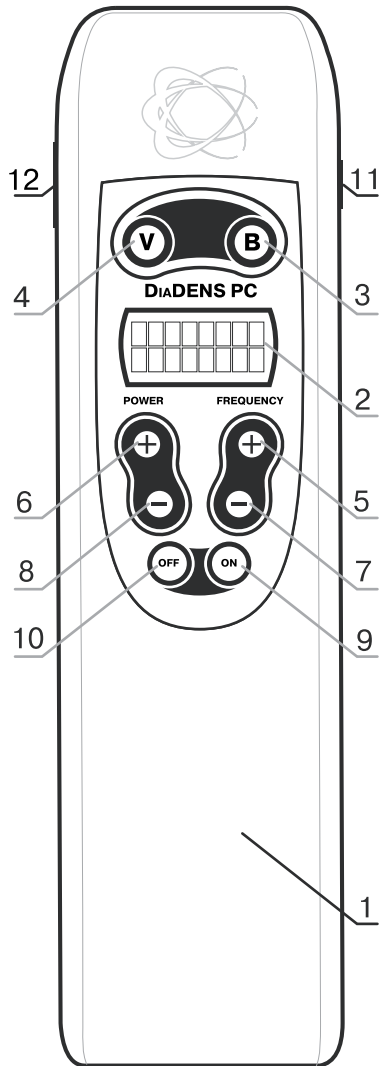


Fig. 2  
The DiaDENS-PC device

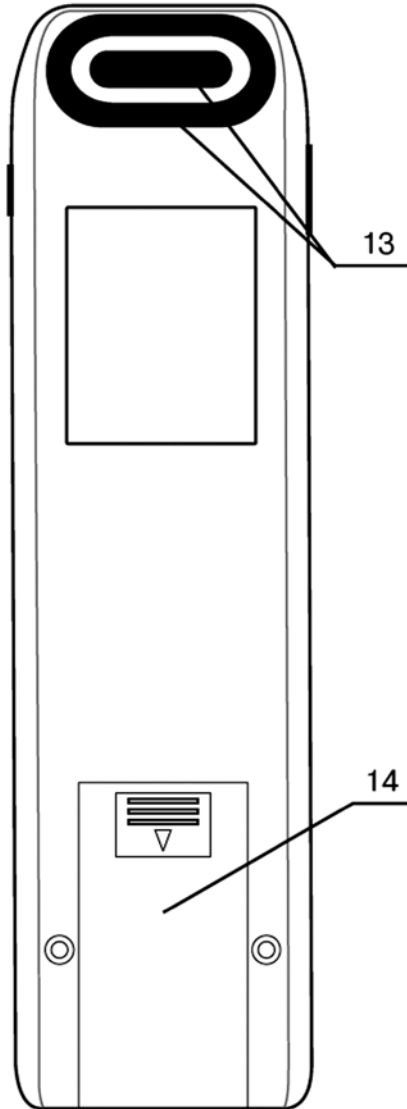


Fig. 3  
The DiaDENS-PC device (the reverse side)

## 6. TECHNICAL MAINTENANCE

6.1. Daily technical maintenance must consist of the operations as follows:

- visual inspection of the device;
- disinfection.

For cleaning the electrodes, use standard disinfectants (e.g. 70% rubbing alcohol) and soft cleaning tissues.

6.2. Checking of the device function will be performed in compliance with directions stipulated in the Section Modes of Operation.

6.3. If the device will not be operated for a prolonged period of time, it will be necessary to remove the power supply from the battery block 14 (Fig. 3).

6.4. When the message CHANGE BATTERY appears, the power supply should be replaced.

6.5. Replacement of power source:

- open the cover of battery block 14 (Fig. 3);
- extract the power source from the device;
- put in the battery block new power source according to polarity.

Use only power sources recommended by the manufacturer.

## 7. POSSIBLE PROBLEMS AND TROUBLESHOOTING

Possible problems and troubleshooting are presented in Table 2

Table 2

Problem	Possible cause	Troubleshooting
Device automatically switches to THERAPY state from STAND-BY state	Electrodes are dirty	p. 6.1
Device switches off if the message CHANGE THE BATTERY appears, or it does not switch on	Voltage of the power supply is less than 7.9 V	Replace the power supply
When using remote electrodes, the device stays constantly in the STAND-BY state	No contact between the device and the remote therapeutic electrode	Check the contact of the slot 11 (Fig. 2)
	Dry skin	Swipe with tampon wetted with water
Device performs no measuring in the VOLL, BIOFOLL and BIOREPER, MiniAS modes.	No contact between the device and the remote diagnostic electrode	Check the contact of the slot 12 (Fig. 2)
	Dry skin	Swipe with tampon wetted with water

Device does not transfer data to personal computer	Disrupted connection between the device and personal computer	Check the contact: 1. Slot 12 (Fig. 2) 2. Slot of computer connection
	Software failure	Reinstall software from the CD
	Wrong COM-port specified	Specify the COM-port, to which device is connected (see "User Manual for the DiaDENS-PC software")

**Attention!** All other problems will be repaired at the manufacturer's or by manufacturer service centers

## 8. STORAGE AND TRANSPORTATION

Transportation conditions:

- temperature -50°C to +50°C;
- relative air humidity up to 93% at the temperature +25°C.

Storage conditions:

- temperature -50°C to +40°C;
- relative air humidity up to 93% at the temperature +25°C.

## 9. UTILISATION



All packing material is environmentally safe and can be reused.



Separate assemblage of electric and electronic equipment.

Do not throw away device in the garbage! It contains valuable materials that could be reused or recycled thus helping us protect the environment. Please, submit the materials to specially designated places (consult with respective services in your region) for their collection and recycling.

## **10. MANUFACTURER WARRANTY**

10.1. The manufacturer guarantees the device complies with requirements of Technical Specifications (TU) 9444-002-35266303-2005 if the operational, transportation and storage conditions are observed.

10.2. Device service life: 5 years.

When using the device properly, its service life can be considerably longer.

10.3. The warranty period for the device: 24 months as of the date of sale. The warranty period of the power supply will be determined by its manufacturer.

10.4. Retailer (manufacturer) or organization functioning as retailer (manufacturer) based on the contract concluded with it, is not liable for defects if they occur after delivery of the device to the user as a consequence of:

1) violating the rules of transportation, storage, maintenance or operation by the user, as these rules are indicated in this Operation Manual;

2) actions by third parties;

3) force majeure circumstances.

10.5. The warranty does not cover the items with damaged manufacturer's seals.

10.6. In the event of the device failure or defect discovered during the warranty period or in the event of incomplete assembly, the owner must send an application for repair (substitution) to the manufacturer, indicating surname, name, patronymic, address, telephone, brief description of the defect, date and conditions of its occurrence.

## PART 2

# OPERATION INSTRUCTIONS

### 1. GENERAL CONSIDERATIONS

Use of reflex zones and points for prophylactics treatment and rehabilitation of the body functions is one of the most ancient and efficient ways of physio- and reflex-therapy.

Numerous studies indicate that a multi-layer reflex and neurochemical responses triggering a cascade of regulatory and adaptive mechanisms of the organism underline the therapeutic effect of the dynamic electroneurostimulation (DENS).

The device will be used with due consideration of concomitant symptoms and syndromes:

- as an independent method of treatment the event of allergic responses to pharmacotherapy as well as in presence of contraindications for other methods;
- as a component of integrated therapy for reinforcing the effect of basic medicinal, homeopathic or manual therapy, as well as psychotherapy and other treatment techniques;
- as a symptomatic treatment for various diseases and syndromes.

**Attention!** *The first and often the only sign of a serious disease might often involve a sudden occurrence of pain of any localization. Therefore if the pain occurs for the first time and then repeatedly occurs again and intensifies, immediately contact your physician.*

### EFFECTS OF ELECTRONEUROSTIMULATION

- anaesthetic;
- anti-inflammatory;
- regulation of vascular tone;
- improvement of microcirculation;
- antipyretic;
- immune-modulating and anti-allergy;
- regulation of smooth and skeletal muscle tone.

**INDICATIONS FOR APPLICATION:**

- pain syndromes;
- respiratory diseases, digestive diseases, cardiovascular, skeletal-muscle, uro-genital, nervous, endocrine systems, OTO diseases, eyes and skin diseases in adults and children;
- rehabilitation and recovery following treatment, surgical interventions, and lesions;
- effects of unfavourable pathogenic factors (stress, intense physical or psycho-emotional loads, other unfavourable conditions).

**CONTRAINDICATIONS:**

## Absolutee:

- individual intolerance of electric current;
- presence of implanted cardiostimulator.

## Relative\*:

- epilepsy;
- neoplasms of any aetiology and localization (in advanced stages of oncological process, the electrostimulation can be performed as a palliative (auxiliary) measure including elimination of the pain syndrome;
- acute fevers of unknown aetiology;
- venous thrombosis;
- condition of acute mental excitement, alcohol or drug intoxication.

**ATTENTION!** *Do not apply the device in the zone of direct heart projection at the front!*

---

*\* in these cases, application of the electrostimulator should be first discussed with the attending physician*

## **2. TREATMENT CONDITIONS**

No special conditions are required for performing the DENS. The room for the electrotherapy must be dry, clean and well lighted. During the electrotherapy session, the patient may be seated or reclining comfortably. After the session, it is recommended to have a 10-15-minute rest.

During the procedure, the electrostimulator must be held in one hand and manipulated lightly. The device electrodes should be in permanent contact with the patient's skin during the procedure. Following each procedure, the device electrodes will be treated with a standard disinfectant (e.g. 70% rubbing alcohol). The devices should be stored with dry electrodes.

### 3. THE ELECTROSTIMULATION INTENSITY

Determining the dynamic electroneurostimulation intensity will be done individually, based on patient's subjective feelings. The electrostimulation intensity will be conventionally divided into three energy ranges: *the minimal, comfortable and maximal those*.

The first (at the threshold of feeling), *minimal energy range* corresponds to effect of a weak intensity when the patient feels either no subjective sensations or a slight vibration. It will be used in working with elementary school children and preschool-age children as well as with elderly patients.

The second (over the feeling threshold but lower than the pain threshold), *comfortable energy range* corresponds to the effect of medium intensity when the patient feels vibration, pleasant pricking or slight burning but no pain. It will be used as the main range of the energy effect.

The third (sensation at the pain threshold), *maximal energy range* corresponds to a high intensity effect when the patient feels painful pricking or burning. Such an intensity of effect might be followed by involuntary muscle contractions in spots near established electrode (the myo-stimulating effect). It will be only applied in THERAPY mode in the event of obvious pain syndrome in adolescents and in adults as well as for emergency treatments.

The electroimpulse effect is not recommended in the energy range intolerable for the patient. At the treatment stages, the electrostimulation power levels might be increased or decreased depending on the patient sensitivity changes and elimination of the pain syndrome.

#### **4. OPERATING METHODS**

The dynamic electroneurostimulation will be performed in three ways: *stable, labile and labile-stable*.

The stable method (fixed position of the electrode) will be used when treating small zonal spots. In the labile way, the built-in electrodes of the stimulator will be evenly shifted over the affected zone, maintaining constant contact between the electrode and the body surface, at the rate of 0.5 to 2-3 cm/sec. The shifting will be performed with straight, anfractuous, circular and other motions depending on the size and form (relief) of the area under treatment.

In labile method, a delay (stabilising) of the built-in electrodes will be admissible, for instance over the painful areas. Thus, the labile-stable method of action will be performed.

The pressure of the device upon the skin will depend on patient's subjective feelings.

## 5. MODES OF OPERATION

5.1. Schemes of the mode sequences in the device are presented in Tables 3, 4.

Table 3



Will be successively changed by pushing FREQUENCY “-” key* 						<b>Will be set automatically on switching the device on</b>		Will be successively changed by pushing FREQUENCY “+” key ** 			
1.0-9.9 Hz***	Screening	MED	10 Hz	20 Hz	60 Hz	<b>77 Hz</b>		77.10	77AM	140 Hz	200 Hz
* The modes will be switched back by pressing FREQUENCY “+” key ** The modes will be switched back by pressing FREQUENCY “-” key *** Brief pressing the key: 0.1 Hz step of change, long pressing the key: 1.0 Hz step of change											

Table 4

“V” key	Simultaneous pressing of the “F” and “On” keys	“B” key	Simultaneous pressing of the “B” and “On” keys
VOLL	BioVOLL	BIOREPER	MiniAS

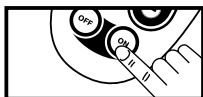
### 5.1.1 TEST mode

TEST mode is intended for evaluation of functional condition of the body organs and systems by means of searching for zones where the skin electrical resistance will sharply differ from adjacent areas (the latent trigger zones (it is also intended for treatment of the skin areas symmetrical to the complaint projection (the symmetry principle).

**Attention!** *In the TEST mode, search for latent trigger zones will be performed rather than diagnosis.*

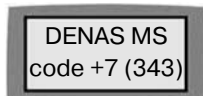
The energy range: minimal or comfortable. The operating method: stable (the electrodes will be shifted after receiving a sound signal).

The TEST mode only works at the frequency of 10 Hz. In treatment, the built-in electrodes only will be used.



Switch on the device.

To switch the device on press the “On” key. A sound track will be played and manufacturer information will be displayed on the screen (20 sec).



Following that, the device will switch to the STAND-BY state.

For emergency termination manufacturer information, press and hold any key (except the “Off”) until appearance on the screen of the STAND-BY state.



Choose the MED mode.

Keep pressing “FREQUENCY –” key until “MED” appears on the screen.



Establish the device electrodes on the selected skin area (Section 6).

Set the action power.

**Attention!** The power control shall be done according to the patient's feelings, at the moment of the electrode contact with skin surface. The pain sensitivity threshold should not be exceeded.

At the moment of switching the device on, the power value will be zero.

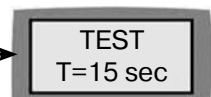


For increasing of the power press and hold "POWER +" key. The power will start increasing evenly from 0 to 99 conventional units. On the screen, the change of power from P00 to P99 will be shown, for instance P35.



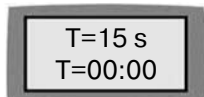
For decreasing of the power press and hold "POWER -" key. The power will start decreasing evenly from 99 to 0. On the screen, the change of power from P99 to P00 will be shown.

**Attention!** During operation of the device in the TEST mode, the electrodes on the patient's skin should be established in the "stable" way, i.e. one must not shift the device electrodes directly during its operation in the TEST mode.



Following establishment of the action power, the message

"STAND-BY" will be substituted with the message informing of the start of the TEST mode. In stabilising of the skin resistance under the electrode, the device will emit a sound signal, and in the upper line of the screen for a few seconds the time of the testing action will be indicated.



In the TEST mode, you must not wait for termination of the regime if the period lasts over one minute; you must shift elec-

trodes to the adjacent area and regard this latter area as a latent trigger one, and then to move over to treatment of the next zone.

Make records of the obtained time values in respect to the testing action in order to reveal the latent trigger zones.

Those zones whose TEST values differ considerably from the majority of numbers either towards increase or decrease will be the latent trigger zones. These should necessarily be treated in the THERAPY mode during 1-5 minutes at the frequency 60 or 77 Hz.



To do this press the “FREQUENCY +” key until F60 or F77 appear on the screen and treat the zones at the second (comfortable) energy level.



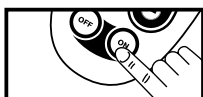
### 5.1.2. The SCREENING mode

The SCREENING mode provides quick evaluation of the zone condition prior to and after DENS treatment. The SCREENING mode is intended for fast search of latent trigger zones. One measurement of the skin surface resistance occurs within first five seconds.

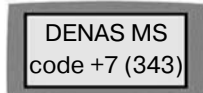
**Attention!** *The mode is intended for fast search of latent trigger zones rather than for diagnosing.*

The action energy range: minimal or comfortable. The operation method: stable (the electrodes will be shifted after receiving the sound signal).

The SCREENING mode works at the frequency of 10 Hz.



During the operation, the built-in electrodes only will be employed  
Switch on the device.



To switch the device on press the “On” key. A sound track will be played and manufacturer information will be displayed on the screen (20 sec).



For skipping manufacturer's message, press and hold any key (except the "Off") until STAND-BY appears on the screen. Switch on the SCREENING mode.



To do this, press the "FREQUENCY -" key until the first line of SCR appears.



Establish the device electrodes on the selected skin area (Section 6). Set the action power.

**Attention!** *The power control will depend on patient's feelings, at the moment of the electrode contact with skin surface. The pain sensitivity threshold should not be exceeded.*

At the moment of switching the device on, the power value will be zero.



For increasing the power press and hold "POWER +" key. The power will start increasing evenly from 0 to 99 conventional units. On the screen, the change of power from P00 to P99 will be shown, for instance P42.



For decreasing of the action power press and hold "POWER -" key. The power will start decreasing evenly from 99 to 00. On the screen, the change of power from P99 to P00 will be shown.



**Attention!** *During operation of the device in the SCREENING mode, the electrodes on the patient's skin should be established in the "stable" way, i.e. one must not shift the device electrodes directly during its operation in the SCREENING mode.*

When the device finds contact of the electrodes with skin surface, the message **STAND-BY** will be replaced with indication of the stable time interval: 5 seconds, during which changing of the trigger zone condition will be determined in response to impulse sent by the device. On termination of the 5-second period, the device emits a brief sound signal and displays measurement result in the form of index  $\Delta LT$  (with-in the range from 0 to 100 units), e.g. = 8. Make notice of the value obtained.



Move to diagnosing the next zone.

Those zones whose  $\Delta LT$  values differ considerably from the majority of numbers either towards increase or decrease will be the latent trigger zones. These zones must be treated in **THERAPY** mode during 1-5 minutes at the frequency of 60 or 77 Hz. To do this, press the “**FREQUENCY +**” key until appearance on the screen of F60 or F77 and treat the zones at the second (comfortable) energy level.

### 5.1.3. The **THERAPY** mode

The **THERAPY** mode operates:

- at frequencies of 1.0 to 9.9 Hz (with the minimal step 0.1 Hz);
- at frequencies of 10, 20, 60, 77, 140 and 200 Hz;
- in therapeutic modes 77.10 and 77AM.

At operation in **THERAPY** mode, both the zonal (with the aid of inbuilt electrodes) and pointed (with the aid of remote electrode) action.

Recommendations for choosing therapeutic frequencies:

- 1.0-9.9 Hz – “infraslow”. These will be used for action upon biologically active points and zones with altered parameters revealed after electropuncture diagnosis performed by the method of **VOLL** or **BIOVOLL**. Treatment formula and choice of

optimal frequency will be performed individually, after analyzing the obtained diagnosis data. Additionally, these frequencies can be used with the built-in electrode of the device with due consideration of the indications presented in Table 5.

*Table 5*  
*The list of frequencies used in the device*  
*DiaDENS-PC for some diseases, syndromes and symptoms*  
*within the range 1..9.9 Hz\**

Frequency, Hz	Characteristics of the pathological condition
1.2	Autoimmune diseases, tachycardia, knee joint weakness
1.6	Arthritis-arthrosis
1.7	Acne, abscess, hypotension, dermatitis, parodontosis, sympathetic-tonic action, furunculosis, eczema
2.2	Fatigue, pustular eczema
2.5	Insomnia, vegetative disorders, hypermenorrhoea, headache associated with the nasal sinus diseases. haemorrhages, brain contusions, lesions, menorrhages, uterine myoma, oedemas, toxic and infectious liver damages, hepatitis, cirrhosis, parodontosis, sinusitis, contusions, eczema
2.6	Virile syndrome, haemorrhoids, headaches in liver diseases, intestinal headache, dermatitis, impotence
2.8	Nephritis, nephrolithiasis, renal colic, nephrosclerosis, uremia
2.9	Rhinitis, sinusitis
3.3	Arteriosclerosis, hypertension, otosclerosis, toxic and infectious liver damages (hepatitis, cirrhosis), nephrolithiasis, renal colic, nephrosclerosis, uremia, nephritis, furunculosis, hypertension against the background of atherosclerosis

3.5	Gall-stone disease, nephrolithiasis, renal colic, knee joint weakness, menorrhages
3.6	Inflammation, moodiness, irritability
3.8	Allergy, haemorrhoids, spasms of various genesis
3.9	Neuralgia, sleep disorders (the phase of falling asleep)
4.0	Adipose-genital dystrophy (obesity), asthma, virile syndrome, haemorrhoids, hypermenorrhoea, endocrine headache, dizziness, hypophyseal disorders, impotence, menopause, menorrhages, pancreatic disorders
4.6	Parathyroid gland functional disorders (effect upon the calcium balance)
4.9	Virile syndrome, meningeal headache, climax, menorrhages, obesity, occipital muscle rigidity, furunculosis, monoalgias
5.5	Vascular headache
5.8	Otogenic headache, depressions
5.9	Spastic paralysis
6.0	Hypertension, headaches in liver diseases, occipital muscle rigidity, extrasystoles, systolic hypertension, <u>for heightening alertness and mental capacity</u>
6.3	Headaches due to cerebral angiospasm, neuroses, irritability, brain concussion
6.8	Myalgia, muscle seizures
7.5	Neuralgia of the trigeminal nerve
7.7	Spastic paralysis
8.0	Headache of intestinal genesis, asthma, allergic bronchitis
8.1	Diuretic action (including the effect upon potassium and sodium balance), nephrolithiasis, renal colic, nephritis, cystitis (pyelocystitis)
8.5	Insomnia

8.6	Fractures, duodenal ulcer
9.2	Hypertension, otogenic headache, nephrogenic headache, gout, diastolic hypertension, dermatitis, spastic paralysis, nephrosclerosis, uremia, furunculosis, eczema (including the one combined with renal function disorders), diabetes mellitus
9.3	Flaccid paralysis
9.4	Adnexitis, obstructive bronchitis, hypertension, gastrogenic headache, intestinal headache, urogenital headache, endocrine headache, duodenitis, impotence, oedemas, paresthesias, paresis, prostatitis, pectoral angina, erythema nodosum, furunculosis, cystitis (pyelocystitis), eczema, parametritis, gastric ulcer, ulcerous-necrotic endomyocarditis
9.5	Hypertension, headache of vascular genesis, climacteric hypertension, laryngitis, parodontosis
9.6	Arthritis-arthrosis, Bechterew's disease, depressions, spine lesions, osteochondrosis
9.7	Arthritis-arthrosis, sciatica, gout, nephrosclerosis, uremia, rheumatism
9.8	Toxic and infectious damages to the liver, hepatitis, cirrhosis
* A.V. Samokhin, Yu.V. Gotovsky. <i>The electropuncture diagnosis by the R. Foll technique</i> . – M.: The Centre of Intellectual Medical Systems IMEDIS, 2003. – 512 p.	

– 10, 20 Hz – “low” frequencies. They will be used in problem zone with direct projection, in universal zones and the zones reinforcing the systemic effect. This effect occurs within 20-60 minutes, lasting for several hours.

Indications: diseases of internal organs, muscular-skeletal system including traumas (sub-acute and remote periods), postoperative period.

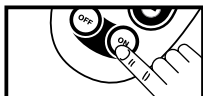
– 60, 77 and 140 Hz – “high” frequencies. These will be used in problem zone with direct projection, segmental zones, trigger zones. The effect occurs within 5-10 minutes, lasting for one or more hours. Indications: inflammatory and functional diseases of the internal organs with a moderate pain syndrome, circular disorders.

– 200 Hz – “superhigh” frequencies. These will be used in problem zone with direct projection. The effect occurs within first minutes, lasting afterwards from several minutes to one hour. To prolong the effect, after elimination of pain, the device action can be continued at low or high frequencies. Indications: sharp pain due to disease and lesion of the muscular-skeletal system in acute period and pathological condition of the peripheral nervous system.

Auxiliary therapeutic modes:

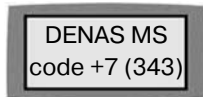
– 77.10 – in this mode, alternation of pulses with frequencies of 77 and 10 Hz, occurs with equal intervals. It produces obvious relaxing effect in the form of reducing the wakefulness level, induces relaxation and drowsiness. It can be effectively used for elimination of pain, in sleep disorders, and anxiety conditions.

– 77.AM – in this mode, pulse alternation occurs with the frequency of 77 Hz, with equal intervals and with even increment and drop of the amplitude. This mode produces effects opposite to those of the mode “7710”. It is effective when used as a preventive and treatment of physical and mental fatigue, for emotional stress, or depressions.



Switch on the device.

To switch the device on press the “On” key. A sound track will be played and manufacturer information will be displayed on the screen (20 sec).



For skipping manufacturer information, press and hold any key (except the “Off”) until “STAND-BY” appears on the screen.

Set the action frequency at 1.0-9.9, 10, 20, 60, 77, 7710, 77AM, 140 or 200 Hz.



On switching the device “On”, a 77 Hz frequency will be automatically set.



To set the frequency 1.0 to 60 Hz, press the “FREQUENCY –” key until desired frequency appears on the screen.



To set the frequency 140 and 200 Hz, press the “FREQUENCY +” key until “F 140” or “F 200” appears on the screen, respectively.

**Attention!** *In the interval between 9.9 and 10 Hz, there are SCREENING mode (described above) as well as MED mode (as described below).*

All frequencies will be switched on by pressing the “FREQUENCY +” or “FREQUENCY –” key, except for frequencies from 1.0 to 9.9 Hz, for which a brief pressing of the key will correspond to alteration of the frequency with a 0.1 Hz step, whereas a prolonged pressing will set a 1.0 Hz step.



Establish the device electrodes on the selected skin area (Section 6).  
Set the action power.

**Attention!** *The power control will be adjusted based on patient’s feelings, at the moment of the electrode contact with skin surface. The pain sensitivity threshold should not be exceeded.*

At the moment of switching the device on, the power value will be zero.



For increasing of the power press and hold “POWER +” key. The power will start increasing evenly from 0 to 99 conventional units. On the screen, the change of power



STAND-BY  
P35 F200

from P00 to P99 will be shown, for instance P35.



For decreasing of the action power press and hold “POWER –” key. The power will start decreasing evenly from 99 to 00. On the screen, the change of power from P99 to P00 will be shown.



STAND-BY  
P00 F200

After setting the action power, the message “STAND-BY” will be replaced with the beginning of THERAPY mode and indication of the action time.



THERAPY  
T=00.07

The duration of procedure in THERAPY mode, in the zone of direct projection of the pain or in functional disorder, will depend on patient’s responses as follows:

- complaint is completely eliminated;
- patient feels much better;
- beneath the electrode, bright reddening of the skin occurs as well as sensation of “formication”, warmth of lightness;
- patient falls asleep.



The duration of treatment of the latent trigger zones is 1 to 5 minutes.

To switch the device off, press the “Off” key.



GOOD  
HEALTH



GOOD  
BYE

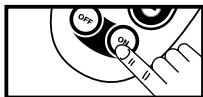
The device will display the messages “GOOD HEALTH” and “GOOD BYE” and, after a musical fragment, the device will switch off.

#### 5.1.4. The MED mode

The MED (Minimal Effective Dose) mode will be applied for intense physical or mental work; in physical or mental strain, in chronic fatigue syndrome, difficulties getting up in the morning,

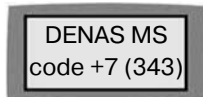
drowsiness, difficulty concentrating, and as preventive measure in cold and flu seasons.

It will be used once per session in a course treatment.



Switch on the device.

To switch the device on press the “On” key. A sound track will be played and manufacturer information will be displayed on the screen (20 sec).



For skipping manufacturer information, press and hold any key (except the “Off”) until “STAND-BY” appears on the screen.

Set the action frequency to 10 Hz.



To do this press the “FREQUENCY –” key until appearance of “F 10” on the screen, once more press the key “FREQUENCY –” and MED mode will switch on.



Establish the device electrode on the HE-GU zone.



**Attention!** *The power control will be adjusted based on patient’s feelings, at the moment of the electrode contact with skin surface. The pain sensitivity threshold should not be exceeded.*

Set the action power.

In switching the device on, the power value is zero.

For increasing of the power press and hold “POWER +” key.



The power will start increasing evenly from 0 to 99 conventional units. On the screen, the change of power from P00 to P99 will be shown.



For decreasing of the action power press



STAND-BY  
P00 MED

and hold “POWER –” key. The power will start decreasing evenly from 99 to 00. On the screen, the change of power from P99 to P00 will be shown.

**Attention!** During operation of the device in the MED mode, the electrodes on the patient’s skin should be established in the “stable” way, i.e. one must not shift the device electrodes during the procedure.

After setting the action power, the message “STAND-BY” will be replaced with a message of beginning of the MED mode I phase: the TEST regime.

TEST  
T=00:03

On stabilising of the skin resistance beneath the electrode, the device will emit sound signal and in the upper line of the screen for a few seconds the time of testing action will be displayed.

T=15  
T=00:03

Then the second phase of the MED will begin: continuous stimulation for 5 minutes; a message “THERAPY” will appear and time counting will begin in respect to minimally effective dose of the device action. On termination of the 5 minute period, a sound signal will be emitted indicating completion of the MED mode.

THERAPY  
T=05:00

THERAPY  
T=01:07

To switch the device off, press the “Off” key. The device will display the messages “GOOD HEALTH” and “GOOD BYE” and, after a musical fragment, the device will switch off.



GOOD  
HEALTH

GOOD  
BYE

### **5.5 VOLL mode**

VOLL mode is based on the method developed by R. Voll. The Voll method is a method of electropuncture diagnosis through electric channels for evaluation of functional condition of all internal organs of the human body. The method is also intended for testing and selection of individual medicinal, homeopathic preparations and biologically active additives.

**Attention!** *The mode is intended for evaluation of functional condition of the organs and systems rather than diagnosings. We may discuss conditions when the function is reduced, normal or activated.*

The studies with the Voll method can be performed in several ways:

1. Express-evaluation of the functional condition by the end points of the meridians (which is enough for performing diagnostic procedures at home) (Supplement 1, Fig. 1, 2);
2. Evaluation of the functional condition by control or other points of meridians\*;
3. Medicinal testing.

#### **Preparing for diagnosis**

Two days prior to the diagnosis procedure, it is recommended that patient avoids tonics. On the day of the diagnosis, two hours before the procedure, the patient should avoid taking coffee, or tea, or food. Immediately before the procedure, it is recommended for patient to sit in a comfortable position and relax for about 15 minutes.

Prior to the session, remove all devices generating high-frequency electromagnetic fields (cell telephones, pagers, high-frequency ovens, TV-sets, irons, etc.). The patient will have to

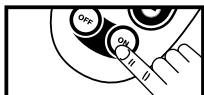
---

\* *the methods of diagnosis by the control and other points of the channels were described in detail in the reference for this theme. These techniques, operation-wise, do not differ from the express-evaluation but demand serious theoretical and practical training of the operator-physician performing the diagnosis and will not be discussed in this Instruction.*

remove jewelry, glasses, and a watch. During the examination, the patient must be seated or reclining comfortably.

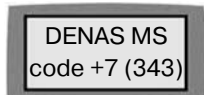
**Attention!** During the session, do not touch the patient with both two hands simultaneously.

### Operating VOLL mode autonomously



Switch the device on.

To do this, press “On” key. A sound track will be played and manufacturer information will appear on the screen (20 sec).



Following that, the device will go into STAND-BY mode.



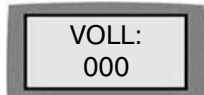
For skipping manufacturer information, press and hold any key (except the “Off”) until “STAND-BY” appears on the screen.

Connect the diagnostic electrodes to the slot.



To switch to VOLL mode press “V” key.

**Attention!** The patient will hold passive electrode in his/her hand opposite to the side being tested (e.g. when testing the left Vhand or left foot, the passive electrode will be held by patient’s right hand).



### Express evaluation of functional condition

Wet the applicator of active diagnostic electrode with a wet tampon prior to every establishment of the electrode on the skin.

Establish the active diagnostic electrode in the projection of the measurement point, gradually enhancing the pressure of the electrode until achieving stable measurements on the screen.

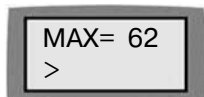
**Attention!** For measurement points situated on the finger and toe phalanxes, establish the active electrode at a 45° angle to the skin surface.

**A deeper evaluation of the condition involves examination using the arrow drop effect.**

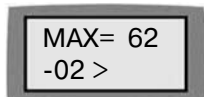
In revealing the maximal value, without breaking contact between the electrode and the measurement point and without changing the pressure force applied to the skin, press keys



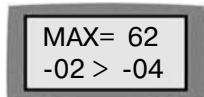
“POWER +”. On the screen, the maximal value “MAX=...” will appear and then the device will perform two measurements with a 1 second interval, their values indicating difference of current and the maximal magnitude of electric current. The data will stay on the screen for 3-4 seconds.



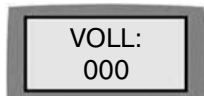
Values will be recorded in a special form (diagnostic chart) for subsequent analysis.



Then the device will return to its initial state and display message “VOLL”: the measurement procedure may be repeated for the next point.



It is not recommended to perform measurements of the same point more than 3 times in a row as this will disturb haemodynamics of this point leading to deviation of the parameters: they will no longer be accurate for diagnostic purposes.



### **Medicinal testing**

The first measurement of the parameters will be performed with no medication. Then the substance to be tested will be placed into the contour of the passive diagnostic electrode and the measurement will be repeated for the same points.

**Attention!** *Do not place the samples under study into the passive electrode without packaging them first, as it is not recommended to wash the electrode, whereas particles of the sample remaining on the electrode surface will distort values of measurements obtained in subsequent diagnosis.*

Comparing the parameters obtained, we may conclude on the fact how the substance under study affects the state of the meridians.

If necessary, we may continue the testing a different medicine.

### **Analysis of the results obtained**

For the express-diagnosis, the normal values are about 50-65 units. Values over 65 units indicate hyperfunction of inflammation; whereas values below 50-30 units are specific for hypofunction of degeneration condition; values lower than 20 units indicate atrophy or complete failure of the function.

For the express-diagnosis using the arrow drop effect, the difference between the maximal and subsequent values must not exceed 5 units (irrespective of the measurement sign); if the difference is over 5 units (irrespective of the measurement sign), this will indicate activation of pathological processes in the organs located at a given meridian.

For medicinal testing: if the parameters obtained for the sample under study are within the range of normal values (or nearly normal) for a given patient, then the substance under study will produce optimal effect upon the organism. And if the parameters differ considerably from the average value, then the substance under study will not be recommended for this particular patient.



To exit from "VOLL", press the "V" key.



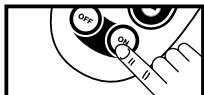
To switch the device off, press the "Off" key. The device will display the messages "GOOD HEALTH" and "GOOD BYE" and, after a musical fragment, the device will switch off.



### **Operating VOLL mode with connecting to personal computer**

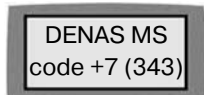
Install software from the CD on personal computer (this has to be done just once) according to the User Manual for the DiaDENS-PC software.

Connect the device with the computer by cable from the complete assembly, as shown in the Figure.



Switch the device on.

To do this, press "On" key. A sound track will be played and manufacturer information will appear on the screen (20 sec).



Following that, the device will go into STAND-BY mode.



For skipping manufacturer information, press and hold any key (except the "Off") until "STAND-BY" appears on the screen.

Connect the diagnostic electrodes to the slot.



To set the VOLL mode press "V" key. Start the VOLL programme on the computer. For further studies see the software reference information.

**Attention!** *The patient will hold passive electrode in his/her hand opposite to the side under testing (e.g. when testing the left hand or left foot, the passive electrode will be held by patient's right hand).*

Perform the studies: the technique and rules of the testing are presented in the Section Operating VOLL mode autonomously.

### **5.6. BIOVOLL mode**

The BIOVOLL mode is based on the method developed by R. Voll (see Section 5.5. VOLL mode). BIOVOLL is a modification of the R. Voll classic method; it differs by preliminary determining of testing voltage in In-Tan point. This improvement allows you to take into consideration individual electric conductivity in

testing which allows to obtain more precise parameters from the BAPs and requires no wetting of electrode prior to testing the point. The scale of the current under measurement and severity of pathological condition corresponds to Voll's scale system. The method is also recommended for testing choosing medicinal, homeopathic preparations as well as biologically active ingredients for individual patients. The medicinal testing is based on the remote action phenomenon, i.e. the device records the responses of the body to remote material objects.

**Attention!** *The mode is intended for evaluation of functional condition of internal organs and systems rather than diagnosis.*

The studies can be performed as follows:

- express-evaluation of the functional condition by meridian end points (this will be enough for a preliminary evaluation when testing at home) (Supplement 1, Figures 1, 2);
- medicinal testing;
- evaluation of the functional condition by the control and other points of meridians\*.

#### *Preparing for the study*

Two days prior to the diagnosis procedure, it is recommended that patient avoids tonics.

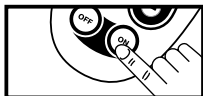
On the day of the diagnosis, two hours before the procedure, the patient should avoid taking coffee, or tea, or food. Immediately before the procedure, it is recommended for patient to sit in a comfortable position and relax for about 15 minutes. Prior to the session, remove all devices generating high-frequency electromagnetic fields (cell telephones, pagers, high-frequency ovens, TV-sets, irons, etc.). The patient will

---

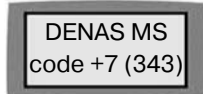
\* *the methods of diagnosis by the control and other points of channels are described in detail in the reference to this topic. These techniques, in their operation with the device, do not differ from the express-evaluation but demand serious theoretical and practical training of the operator-physician performing the diagnosis and will not be discussed in this Instruction.*

have to remove jewelry, glasses, and a watch. During the examination, the patient must be seated or reclining comfortably.

### **Operating BIOVOLL mode autonomously**



Switch the device on.



To do this, press “On” key. A sound track will be played and manufacturer information will appear on the screen (20 sec).



Following that, the device will go into STAND-BY mode.

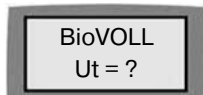
For skipping manufacturer information, press and hold any key (except the “Off”) until “STAND-BY” appears on the screen.

Connect the diagnostic electrodes to the slot.

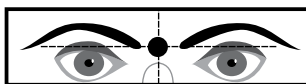
**Attention!** Only the remote electrodes designated for this will be connected to the DiaDENS device slots. Connection of other devices to the device slot is prohibited.



Switch the BIOVOLL mode by simultaneous pressing the “On” and “V” keys.



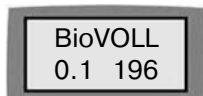
Determining of individual testing voltage:



Put the active electrode to In-Tan point situated on the mid-line between eyebrows on the patient’s nose.



Press and hold the “POWER +” key. Selection of testing voltage will start, the voltage values being displayed in the lower right corner of the screen; in the lower left corner, value of proceeding current will be displayed in In-Tan point.





**Attention!** If the current 10  $\mu\text{A}$  is not achieved, then the message “LOW CURRENT” will appear and this will mean that you failed to reach In-Tan point; it will be necessary to change position of the active electrode.

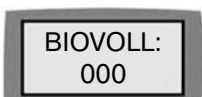
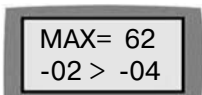
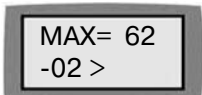
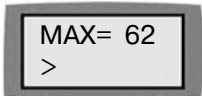
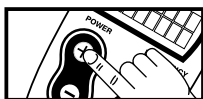
The express-evaluation of functional condition:

– put the diagnostic pointed electrode to the measurement point projection gradually increasing pressure by the electrode until achieving stable measurements on the display screen.

**Attention!** For measurement points on the finger and toe phalanxes, establish the active electrode at a 45° angle to the skin surface.

**Attention!** During the study, the measurements will be performed on both hands and both feet.

A deeper evaluation of the energy meridian condition may be performed using the arrow drop effect:



On appearance of the maximal value, without breaking contact between the active electrode and the measurement point and without changing the force of pressure of the electrode upon the skin, press “POWER +” key. The maximal value “MAX=...” will appear on the screen and then the device will perform two measurements within a 1 second interval, indicating the difference between proceeding and maximal values of the current. The data will be kept on the screen for 3-4 seconds.. The value will be recorded in a special form (diagnostic chart) for subsequent analysis.

Then the device will return to its original mode and display the message “BIOVOLL”. The measurement procedure can then be repeated for the next measurement point.

It is not recommended to perform measurements for the same point more than 3 times in a row as this will disturb haemodynamics in this point leading to deviation of the parameters: they will no longer be accurate for diagnostic purposes.

*Medicinal testing:*

First the evaluation of energy meridian initial condition will be performed (see above).

The first measurement of the parameters will be performed with no medication. Then the substance under testing will be placed in the contour of the passive diagnostic electrode and the measurement will be repeated for the same points.

**Attention!** *Do not place the samples under study into the passive electrode without packaging them first, as it is not recommended to wash the electrode, whereas particles of the sample remaining on the electrode surface will distort values of measurements obtained in subsequent diagnosis.*

Comparing the parameters obtained, we may conclude on how the substance under study affects the condition of the meridians.

If necessary, we may continue the testing for a different medicine.

*Analysis of the results obtained*

For the express-diagnosis, normal values are about 50-65 units indicating harmonious condition of the meridian. Values over 65 units indicate energy levels above norm, whereas values below 50 units are specific for the energy insufficiency of the meridian under study.

For the express-diagnosis using the arrow drop effect, the difference between the maximal and subsequent values must not exceed 5 units (irrespective of the measurement sign). If the difference is over 5 units, this will indicate activation of pathological processes in the organs located at a given meridian.

For the medicinal testing: if the values obtained in the course of testing approximate normal those or are within the range of normal values, then this substance will produce a favourable

effect (will harmonise the meridian). If after introduction of the substance under study the parameters differ considerably from the normal values as compared with initial data, then the use of this medicine is not recommended.

### **Operating BIOVOLL mode with connecting to personal computer**

Install the software from the CD to personal computer (this will have to be done only once) according to the User Manual for the DiaDENS-PC software. Connect the device to the computer by cable from the complete assembly. Connect diagnostic electrodes to the cable slot.



Switch the BIOVOLL mode by simultaneous pressing the “On” and “V” keys. Start the programme. For further studies see the software reference.

The technique and rules of testing are presented in the Section Operating BIOVOLL mode autonomously.

### **5.7. The BIOREPER mode**

Bioreper is a method of functional electropuncture auricular diagnosis (on external ear). The study will be performed at testing voltage individual for each patient, i.e. with due consideration of individual electric conductivity.

**Attention!** *The mode is intended for evaluation of functional condition of internal organs and systems rather than diagnosis. We can discuss conditions when the function is reduced, normal or activated.*

Highly significant will be findings for specific organs (existence of points representing concrete organs).

The technique allows us to reveal pathological conditions at “pre-disease” stage, select the optimal treatment procedure and examination, to evaluate functional condition of diseased organs and systems in dynamics, when performing another testing. Due to low current (lower than 15 uA) in measurement points, no morphological changes occur.

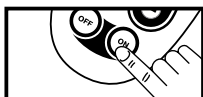
### Preparing for diagnosis

Two days prior to the diagnosis procedure, it is recommended that patient avoids tonics. On the day of the diagnosis, two hours before the procedure, the patient should avoid taking coffee, or tea, or food. Immediately before the procedure, it is recommended for patient to sit in a comfortable position and relax for about 15 minutes.

Prior to the session, remove all devices generating high-frequency electromagnetic fields (cell telephones, pagers, high-frequency ovens, TV-sets, irons, etc.). The patient will have to remove jewelry, glasses, and a watch. During the examination, the patient must be seated or reclining comfortably.

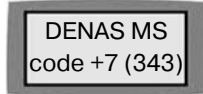
**Attention!** During the session, do not touch the patient with both hands simultaneously.

### Operating BIOREPER mode autonomously



Switch the device on.

To do this, press "On" key. A sound track will be played and manufacturer information will appear on the screen (20 sec).



Following that, the device will go into STAND-BY mode.



For skipping manufacturer information, press and hold any key (except the "Off") until "STAND-BY" appears on the screen.

Connect the diagnostic electrodes to the slot.



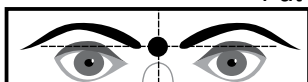
To switch on the diagnostic regime of BIOREPER method, press "B" key.

The patient will hold passive electrode in his/her hand (the patient's hands must not touch each other or cross).



Determining of individual testing voltage.

Put the active electrode to In-Tan point



situated on the mid-line between eyebrows on patient's nose. Press



BIOREPER  
10.0 196

and hold the “POWER +” key: selection of testing voltage will start, the voltage values being displayed in the lower right corner of the screen; in the lower left corner, value of proceeding current will be displayed for In-Tan point.

UT=1.96 V  
10.0  $\mu$ A

In the upper line of the screen, value of the testing voltage will appear: “UT= “, in the lower line – value of the proceeding current. This will be the individual voltage for this patient for this procedure.

The device is ready for diagnosis.

LOW  
CURRENT

**Attention!** *If the current 10  $\mu$ A is not reached, then the message “LOW CURRENT” will appear and this will mean that you failed to reach In-Tan point; it will be necessary to change position of the active electrode.*

### Diagnosis

The passive electrode will be held in the palm on the side of the auricle under testing. The active electrode will be put to the auricle point of measuring (Supplement 2, Fig. 3) for period not exceeding 2-3 seconds for each point. It will be necessary to provide even and equal pressure, without slipping the electrode off the point. It is not recommended to perform measurements for the same point more than two times in a row or to perform measurement for a single point for over 5 seconds.

UT=1.96 V  
8.0  $\mu$ A

The current values will be indicated in  $\mu$ A in the lower part of the screen; they should be recorded in a special form (diagnostic chart) for subsequent analysis.

### Analysis of the results obtained:

Following completion of the diagnostic session, the values obtained will be analysed in compliance with Table 6. On the ba-

sis of this information, a conclusion will be drawn that will reflect probable condition of the pathological process, the character and phase of the disease, and serve as the basis for development of the device action formula and therapy algorithm.

*Table 6*  
*Correspondence of current values for auricular points (AP)*  
*and degree of severity of the pathological condition in points*  
*and direction of the functional changes*

Current value in AP, $\mu\text{A}$	< 1	1	2-3	4-7	8-11	12-15
Severity degree of pathological condition	moderate and severe	weak	normal	weak	moderate	severe
Direction of the functional changes	hypofunction		normal	hyperfunction		



To exit BIOREPER mode, press “B” key.



To switch the device off, press the “Off” key. The device will display the messages “GOOD HEALTH” and “GOOD BYE” and, after a musical fragment, the device will switch off.



### **Operating BIOREPER mode with connecting to personal computer**

Install the software from the CD to personal computer (this will have to be done just once). Connect the diagnostic electrodes to the cable slot.



To go to BIOREPER mode, press “B” key. Start the programme on the computer. For further studies see the software reference.



The testing technique and rules are presented in the Section Operating BIOREPER mode autonomously.

### **5.8. The MiniAS mode**

MiniAS is a method of functional electropuncture diagnosis within the MiniASupuncture systems of the hand, scalp, etc. The study will be performed at voltage levels individual for each patient, i.e. with due consideration of individual electric conductivity of tissues at a given moment.

**Attention!** *The mode is intended for express-evaluation of functional conditions of internal organs and systems rather than diagnosis.*

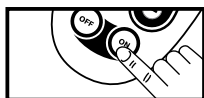
The technique allows you to evaluate functional condition of diseased organs and systems in dynamics, when performing another testing.

### *Preparing for diagnosis*

Two days prior to the diagnosis procedure, it is recommended that patient avoids tonics. On the day of the diagnosis, two hours before the procedure, the patient should avoid taking coffee, or tea, or food. Immediately before the procedure, it is recommended for patient to sit in a comfortable position and relax for about 15 minutes. Prior to the session, remove all devices generating high-frequency electromagnetic fields (cell telephones, pagers, high-frequency ovens, TV-sets, irons, etc.). The patient will have to remove jewelry, glasses, and a watch. During the examination, the patient must be seated or reclining comfortably.

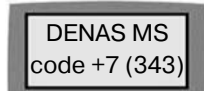
**Attention!** *During the session, do not touch the patient with both hands simultaneously.*

### **Operating MiniAS mode autonomously**



Switch the device on.

To do this, press “On” key. A sound track will be played and manufacturer information will appear on the screen (20 sec).



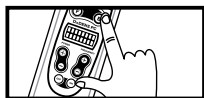
Following that, the device will go into STAND-BY mode.



For skipping manufacturer information, press and hold any key (except the “Off”) until “STAND-BY” appears on the screen.

Connect the diagnostic electrodes to the slot.

**Attention!** *Only the remote electrodes designated for this will be connected to the DiaDENS device slots. Connection of other devices to the device slot is prohibited.*

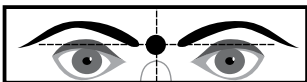


To switch MiniAS diagnosis on, press simultaneously the “On” and “B” keys.

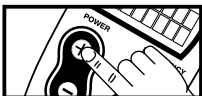
The patient will hold passive electrode in his/her hand (the patient’s hands must not touch each other or cross).



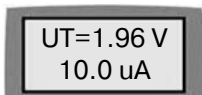
### Determining individual testing voltage



Put the active electrode to In-Tan point situated on the mid-line between eyebrows on the patient's nose.



Press and hold the "POWER +" key: selection of testing voltage will start, the voltage values being displayed in the lower right corner of the screen; in the lower left corner, value of proceeding current will be displayed for In-Tan point.



In the upper line of the screen, value of the testing voltage will appear: "UT= ", in the lower line – value of the proceeding current. This will be the individual voltage for this patient for this procedure.

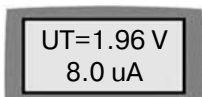


**Attention!** *If the current 10 uA is not reached, then the message "LOW CURRENT" will appear and this will mean that you failed to reach In-Tan point; it will be necessary to change position of the active electrode.*

### The MiniAS testing technique

The patient will hold passive electrode in his or her free hand. The active electrode will be put to the necessary measurement point – for maximum of 2-3 seconds for each point.

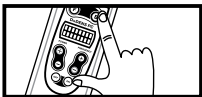
It will be necessary to provide even and equal pressure, without slipping the electrode off the point. It is not recommended to perform measurements for the same point more than two times in a row or to perform measurement for a single point for over 5 seconds.



The current values will be indicated in uA in the lower part of the screen; they should be recorded in a special form (diagnostic chart) for subsequent analysis.

### ***Operating MiniAS mode with connecting to personal computer***

Install the software from the CD to personal computer (this will have to be done just once) according to the User Manual for the DiaDENS-PC software. Connect the device to the computer by cable from the complete assembly. Connect diagnostic electrodes to the cable slot.



Switch the device over to the MiniAS mode by simultaneous pressing the “On” and “B” keys. Start the programme on the computer. For further studies see the software reference.



The testing technique is presented in the Section Operating MiniAS mode autonomously.

## 6. RECOMMENDED TREATMENT POINTS AND ZONES

### ***6.1. Local zone of the damage focus (the zone of direct projection of the patient's complaint)***

One of the simplest and most effective ways of the DENS performance involves direct treatment of the area of detailed and localised zone of pain, damage focus or direct surface (skin) projection of the organ with disturbed function. The zone will be treated in the THERAPY mode until achieving a clinical effect. For instance, in lumbalgia, on the small of the back zone; in knee joint damage, directly upon the damaged joint area.

### ***6.2. Metamer-segmental zones***

The location and distribution of the spinal nervous roots, nerves, nervous plexuses and of the vegetative nervous system nodes will be subject to the law of metamerism. The same spinal segments will serve, at that, as the innervation device and, respectively, the device of information transfer from an internal organ and a certain skin area and back. The existing recommendations (Table 1) make it possible to perform the DENS in patient's complaint within the zone of a certain dermatomer (Supplement 1, Fig. 4, 5), which produces a regulating effect on the respective segment of the spinal cord and sympathetic ganglion and leads to the necessary therapeutic effect. Treatment of metamer-segmental zones is simple and efficient, and is scientifically substantiated from the standpoint of the modern neurophysiology.

Table 7

*Peripheral parts of the metamer-segmental zones (dermatomers) recommended for the device treatment for pain syndromes and diseases of the locomotor system*

Dermato- mers	Symptoms and diseases
C1-C2	tension of the occipital muscles, torticollis, tension and poor mobility of the spine muscles, pain in the shoulder area, hemiplegia;
C3-D1	damage of muscles in the occiput area, pain in the occiput, torticollis, damage of the shoulder joints and shoulder muscles, back muscles, hemiplegia;
Th1-Th2	– sensation of tension in the spine, – spasms of the neck and back (contractions), – tension of the occipital muscles, pain in the scapulae area, pain syndrome in damage of knee joints, paralysis of the upper extremities;
Th2-Th3	– pain and tension of muscles in the area of the back, small of the back, shoulder, occiput, torticollis, intercostals neuralgia
Th3-Th4	movement disorders in the neck area, tension of the occipital muscles, pain in the area of the shoulder external surface, in the shoulder-blade, chest, in the lumbar area, abdomen, damage to the spine lumbar segment and sacrum;
Th4-Th5	diseases of the neck, damage of muscles and spine at the shoulder-blade level;
Th5-Th6	tension of muscles in the area of the back and spine, pain in the back and chest at respective level, intercostals neuralgia, pain in the spine and spastic muscles of the back (contracture);
Th6-Th7	sensation of tension in the occiput area, pain in the back and neck, limitation of the spine mobility, back muscles contractions, intercostals neuralgia;

Th7-Th8	damage of muscles and joints of the lower extremities, lumbar area, paravertebral muscle contracture (spastic muscles along the spine);
Th9-Th10	damage of the muscles and skeleton of the lumbar area and lower extremities;
Th10-Th11	– damage of the muscles of the anterior abdominal wall, small of the back; – contractions and mobility disturbance in the spine;
Th11-Th12	pain in the back, weakness of extremities;
Th12-L1	pain in the stomach, back and spine;
L1-L2	pain and contractions in the lumbar area, tension of the spine and small of the back muscles, oedemas of the lower extremities;
L2-L3	pain and tension in the back and small of the back, sensation of tension in the spine muscles, pain in the hip, paralysis of the lower extremities, lumbalgia;
L3-L4	damage of muscles, skeleton and soft tissues of the small of the back;
L4-L5	pain in the lumbar area and lateral part of the pelvis; anaesthesia (absence of sensitivity) of the leg skin (the Prot disease), pain on external surface of the knee joint, paralysis of the lower extremities;
L5-S1	paralysis of the lower extremities, lumbalgia, lumbago, sciatica;
S1-S2	pain in the abdomen, sacrum and hip joint, lumbago;
S2-S3	pain in the sacrum, small of the back, spine, damage of the knee joint, pain in the lower extremity joints;
S3-S4	pain in the small of the back, sciatica, pain in the spine;

S4-S5	pain in the small of the back, back, sacral-coccygeal area, pain in the area of lateral surface of the buttock, lumbalgia, sciatica, tension of the spine muscles, weakness of the leg muscles, paralysis of the legs, paralysis of muscles of the of the shin, foot.
-------	---

### **6.3. Zones of general treatment**

These zones will be included in the action formula when it is necessary to stabilise therapeutic effect of local and segmental response and to obtain a general adaptive response of the body.

1) The back midline as well as two paravertebral lines (next to the spine) – Supplement 2, Fig. 6, 7;

2) Projections of the trigeminal nerve branch endings on the face (Supplement 1, Fig. 8);

3) Hands and feet (the hands will be treated from the radio-carpal joint to the finger tips on their palm and dorsal surfaces, the feet will be treated from the ankle-joint to the toe tips on the sole and dorsal surfaces).

The common zones will be studied in TEST mode or SCREENING mode. On finding latent trigger zones (see below), they will be treated in THERAPY mode.

### **6.4. Trigger zones**

Disturbances of function and structure of internal organs will lead in certain limited skin areas, muscles, tendons, periosteum to appearance of areas with distorted coloration, disturbed sensitivity, enhanced painfulness, dense areas, changed electric conductivity and other changes usually not observed in a healthy organism, and absent in symmetrical body areas. These pathological zones and points were named the trigger zones [12].

The trigger zones (TZs) will be conventionally divided into active and latent.

The active TZs will be located by physician in the course of

interviewing the patient and his or her examination; these are local zones of reflected painfulness and enhanced sensitivity, for instance Supplement 1, Fig. 9, 10.

The latent TZs will be determined in the TEST mode by difference of parameters in the points under testing. On finding latent trigger zones, they will be treated in the THERAPY mode.

*More detailed information is presented in the following reference:*

1. *The Manual of Dynamic Electroneurostimulating Therapy DENAS, The 2nd edition, revised and updated// Chernyshev V.V., Malakhov V.V., Vlassov A.A., Rubtsova O.I., Ivanova N.I. – Ekaterinburg, 2002 – 284 p.*

2. *The Universal Register of the DENS-therapy// Chernyshev V.V., Malakhov V.V., Riavkin A.Yu., Riavkin S.Yu. – Ekaterinburg, 2003. – 165 p.*